Yaquina Bay and River Dredged Material Disposal Plan

Lincoln County, Oregon
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Section I  Introduction
SECTION I - INTRODUCTION

The Problem

Oregon's coastal waterways have provided important transportation linkages since the first human habitation of the Pacific Northwest. In almost all cases, the use of the waterways has expanded in direct proportion to the increased economic activity in the towns along the coastal bays and rivers. This growth in navigational demand has resulted in the use of larger barges and ships which often require deeper water depths than can be accommodated by the natural river and bay channels. In order to allow access for these vessels, dredging (the removal of bottom materials from below the water surface) has occurred in many of Oregon’s waterways. By removing bottom sediments and deepening the river channel, both commercial and recreational vessels can gain access to the ocean, upriver ports and riverside docks, moorages and marinas, thus enhancing the useability of both the waterway and the adjacent land areas.

The stream transport of sediments from the upland areas to the ocean is part of the natural geologic processes that are occurring along Oregon's coast. As these sediments are transported downstream, a significant portion of them are deposited within river shoals, slow moving bays, and ocean entrance channels. Therefore, the depths of many of the navigation routes are constantly lessened as a result of natural deposition, and dredging must occur at regular intervals in order to maintain these navigational depths.

Navigational trends in Yaquina Bay and River closely parallel those outlined for the Oregon Coast as a whole. As the area has become an important center for industry, commercial fishing and recreation, increasing demands have been placed on the navigation system. Within the bay and river, both public and private investments in navigational improvements have been made in order to facilitate the movement of goods and people between upriver areas and the ocean. Major public navigation improvements have included the construction of an entrance channel at the mouth, a turning basin near McLean Point and an upriver channel, extending through Toledo. The public port districts in both Newport and Toledo have constructed moorage facilities and the Port of Newport is currently implementing construction of a large recreational marina in the lower bay. In addition to these public investments, private businesses have also constructed navigational improvements including the barge loading facility operated by Newport Terminals, and the variety of private commercial and recreational marinas which are scattered along the river. The continued use of these facilities, and the anticipated construction of new navigation facilities, requires continued dredging of the bay and river to allow vessel access.

Before bottom sediments can be dredged from the bay and river, it is necessary to locate areas upon which those materials can be placed. Historically, Yaquina Bay and River dredged material have been placed on...
a combination of ocean and land disposal sites depending on the location of the materials to be dredged and the composition of the sediments to be removed. In general, sediments between the mouth of Yaquina Bay and McLean Point have been transported to the ocean for deep water disposal, while materials dredged from the remainder of the river have been placed on land in the upriver areas. Dredged materials from the bay and entrance channel were also used to construct major new land areas in the lower bay including McLean Point and much of the Oregon State University and Port of Newport property at South Beach.

Due to a range of environmental, engineering and topographic constraints within Yaquina Bay, sites upon which dredged materials may be placed are in limited supply; yet, if navigation is to continue within the bay and river, sufficient sites must be identified so that dredging activities may continue. Although the Corps of Engineers is responsible for maintenance of the entrance channel, turning basin and river channel, they will perform the scheduled maintenance dredging only after the local port districts have obtained the necessary sites for dredged material disposal. The ports of Newport and Toledo must also locate adequate sites for the placement of materials that are dredged from their existing moorage areas, as well as any new port projects. In addition, the private businesses operating marinas and industrial barge sites along the bay and river must also locate sites for disposal of the dredged materials generated by the maintenance of those facilities.

In order for either a land or in-water area to be judged suitable for the disposal of dredged materials, it must meet a wide range of environmental, engineering and cost criteria. Because of the difficulty in satisfying all of these criteria, acceptable dredged material disposal sites are considered to be a scarce resource. Along Yaquina Bay and River this is particularly true due to the limited amount of flat land areas adjacent to the shoreline. In recognition of the potential scarcity of suitable dredged material disposal sites, the State of Oregon (through its coastal goals) and Lincoln County (through its comprehensive planning process) have commissioned this report to identify areas which will be adequate to meet the disposal needs for the next 20 years. In addition to the selection of sites which meet the established environmental and engineering criteria, this dredged material disposal plan must also outline the policies and procedures governing the use of the sites as well as to outline a program for plan implementation.

Statewide Planning Goals and Guidelines for Coastal Resources have been adopted by the Oregon Land Conservation and Development Commission and became effective January 1, 1977. The Estuarine Resources Goal (Goal #16) requires that local governments prepare comprehensive management programs aimed at protecting and maintaining the unique environmental, economic and social values of each estuary and associated wetlands. In addition, Implementation Requirement #5 of the goal states: "Local government and state and federal agencies shall develop comprehensive programs, including specific sites and procedures for disposal and stockpiling of dredged materials." This dredged material disposal plan for Yaquina Bay and River has been prepared as a portion of Lincoln County's efforts to revise its comprehensive plan and to prepare an estuarine management plan under the provisions contained in Goal #16.
Section II  Dredging Methods and Constraints
SECTION II - DREDGING METHODS AND CONSTRAINTS

Dredging Technology

Historically, the use of dredging equipment has been required in Yaquina Bay and River to remove sediment from the bay entrance, channel, river shoal areas, and other areas such as ship or barge berths and boat basins. The methods used in bay and river since 1950 include use of hopper dredges, pipeline dredges and bucket (clamshell) equipment. Selection of such equipment depends upon economics, which in turn is determined by the quantities and characteristics of the dredged material, channel restrictions, weather, environmental protection, shape of the dredging site and the availability and location of disposal areas. Each type of dredge has characteristic efficiencies of operation, production and cost under specific situations.

In the development of both short-range and long-range dredged disposal plans, costs of dredging are very dependent upon productivity and disposal site preparation. Further development or advances in dredging technology could also have significant impact on plan selection and cost. However, current dredging methods and anticipated methods identified in this report for use in the next 15-20 years must be based on current technology.

Costs presented throughout the discussion are for relative comparison and are not intended to be preliminary engineering estimates for actual work. Reasonable assumptions as to costs are defined under the section on Unit Cost Criteria.

Most dredging work in Yaquina Bay is accomplished by one of three methods: clamshell or bucket dredging, hopper dredging or pipeline dredging. Maintenance dredging in the lower bay is generally completed by hopper or bucket dredge, while hydraulic pipeline dredges are used in the upper river channel. Any of the three methods may be commonly used for new construction depending upon the constraints of the particular project. Most of the private marina and industrial dredging is completed by bucket dredges.

- Bucket (Clamshell) Dredge

The bucket dredge is well suited to working in confined areas, and is therefore used in most of the small boat marinas and narrow channels along Yaquina Bay and River. Bucket dredges operate efficiently and minimize water quality problems as long as the dredged materials are firm and of medium to heavy grain size. They are most economical when dredging small quantities, and when quantities exceed several thousand cubic yards, other methods are generally more economical.

When using bucket dredges, dredged material can either be placed on dump barges or directly onto trucks, if the dredge is operating close to shore. Both of these techniques constitute "rehandling" of the material, but do allow transportation of the dredged materials to disposal sites some distance from the dredging location.
Bucket dredges are also generally utilized for digging in gravel or rock, and for the removal of stumps and debris. The available sizes for bucket dredges range from capacities of 2 to 18 cubic yards.

- **Hopper Dredge**

A hopper dredge is a self-contained ocean-going vessel that is designed for both hydraulic dredging and the transport of the dredged material to a dumping area. Dredging is accomplished while the vessel is in motion and dredged materials are placed on the hopper dredge until the hoppers are filled and the dredge is moved to another water area (generally in the open ocean) for disposal. Dredging is accomplished through suction pipes which are lowered to "vacuum" bottom materials. Hopper dredges can operate where rough water would make other methods of dredging impractical.

In Yaquina Bay, hopper dredges are used primarily for maintenance dredging of the bar and inner channel upstream to McLean Point. The sandy material dredged in those locations is hauled directly to an offshore open ocean disposal site. Due to weather and bar conditions, hopper dredging is generally scheduled during the months of April through September.

- **Pipeline Dredge**

The pipeline dredging method consists of a large centrifugal pump which is mounted on a specially designed barge. The lower end of the pipeline is equipped with a revolving cutterhead that breaks up the bottom materials so they can be drawn into the suction pipe. The cutterhead is lowered to the bottom on a large hinged ladder that extends forward from the front, or bow, of the barge. The cutterhead depth can be controlled by cables attached to the ladders. The pipeline, which extends from the edge of the barge to the shore or to an area of in-water disposal, floats on pontoons.

The pipeline dredge is held in position during dredging by anchors, swing lines, and spuds. (Spuds are long heavy shafts that are hung from masts near each corner of the stern of the dredge). Pipeline dredges are identified by the diameter of the discharge line and generally are available from 8 to 30 inch sizes. The chief advantages of pipeline dredge use include: 1) movement of large volumes of material in a short period of time, 2) ease of transport of the pipeline, and 3) simultaneous dredging and disposal operations. Major limitations to the use of pipeline dredges are as follows: 1) disposal areas must be relatively close to the dredging operations since costs escalate rapidly as pipeline length is increased or disposal area elevated, 2) pipeline dredges are unable to operate in open or rough water areas, 3) buried logs, large boulders and discarded wastes, such as cable, present serious obstacles to the operation of the impeller; and 4) the anchoring cables and pipeline can present a temporary obstruction to navigation in confined channels.

- **In-Water Disposal**

Pipeline dredges normally pump to confined land disposal sites. Recently, however, attention has been directed toward the use of pipeline dredges for in-water disposal, where material is removed from one section of the bay river and placed in another portion of the bay or river that is also under water. Often times materials are placed in shoreline areas or other
reaches where natural shoaling occurs or where useful tideland, marshland or other significant biological habitat can be created.

In-water disposal may be possible in upper Yaquina Bay and within Yaquina River up to river mile 11. Specific constraints to its use include: 1) avoidance of existing or developable oyster rearing areas, 2) limiting use to disposal of sediments which can settle rapidly, 3) timing dredging to seasons which limit interference with fish migration, and 4) selection of sites based on aquatic habitat needs and river hydrology.

**Unit Cost Criteria**

When land disposal of dredged materials from a Federal project is required, the sponsor must prepare the disposal sites to contain the dredged materials and to protect the surrounding land or water areas. Although actual dredging operations can vary widely due to equipment availability and a host of other factors, the costs associated with site preparation and dredging operations are presented below to allow an economic comparison of selected sites. These estimates are approximate and are based on information generated on other local projects. All costs are estimated in 1977 dollars. The cost items which must be considered for land disposal are as follows:

- **Land**

  The acquisition of land, rights-of-way, or easements is subject to appraised market value. In the event of purchase for purposes of preserving and developing disposal sites, a cost of $1,000 per acre is assumed. Where leased land is reclaimed or enhanced through filling, no significant cost is assumed.

- **Clearing and Stripping**

  Cost of preparing a site by removing timber, brush, structures and general grading is assumed on the basis of $1,000 per gross acre.

- **Surface Drainage and Relocation**

  If disposal sites have upland surface water drainage, it must be diverted around the area to be filled by means of an open channel or culvert. Where this work is required, a cost of $20.00 per lineal foot is assumed.

- **Dike Construction**

  Confined disposal sites include construction of containment dikes using on-site materials, if suitable. Typical dikes, with not less than 2:1 slopes, are assumed to cost: $4 per lineal foot for 5-foot high dikes, $12 per lineal foot for 10-foot; and $24 per lineal foot for 15-foot high dikes. If off-site material must be brought in, costs are assumed to be approximately five times the above costs.

- **Return Flow Pipeline**

  Where permanently installed discharge lines are used, pipelines are assumed to be buried, placed under roads and extended to deep water. Average cost installed is estimated at $30 per lineal foot for 18-inch pipe. Outfall segments are estimated at $50 per foot.
Pipeline Dredging

Use of a 12- to 16-inch pipeline dredge and placement of material on disposal sites that are located not over 4,000 feet from the dredge, or over 10 feet above mean sea level, will result in an estimated cost per cubic yard of $2.00. For each additional 1,000 feet in distance or 10 feet in added elevation, the basic cost increases by $.50 per cubic yard.

If the dredged material were to be stockpiled, and trucked away at a later date, additional costs would be incurred for reloading and transporting the material. These costs could result in a doubling of the $2.00 cost per cubic yard.

Bucket Dredging and Hauling

The cost to bucket dredge and barge haul dredged materials to an open ocean disposal site would be $2.50 per cubic yard from River Mile 0 upstream to River Mile 3. For every additional three miles of hauling, the cost would increase approximately $.90 per cubic yard.

Mobilization

Each dredging contract requires mobilizing of equipment, transport and miscellaneous administrative costs. A cost of $20,000 per contract was assumed.

Revegetation

Review of recent U.S. Army Corps of Engineers revegetation projects in Coos Bay indicates that adequate revegetation can be accomplished at a maximum cost of $50.00 to $75.00 per acre.
Section III  Dredging Needs and Options
Yaquina Bay Dredged Material Disposal Plan
SECTION III - DREDGING NEEDS AND OPTIONS

Although the materials dredged from the mouth of Yaquina River to McLean Point have historically been disposed of in an open ocean disposal site, most of the dredged materials from the remaining channel maintenance and new projects have been disposed of on land. These general trends are expected to continue, resulting in a continuing need for additional land disposal sites. Channel conditions and cost factors favor the use of pipeline dredges; therefore, land disposal sites must occur in close proximity to the dredge areas. Because of this close relationship between dredge sites and disposal sites, the bay and river have been divided into a series of segments, indicating areas in which dredging will need to occur and presenting the sites which would be suitable for disposal of those specific materials. This presentation allows dredging needs and options to be viewed in concert, and provides a mechanism for establishing which sites should be utilized and what the priorities for their use should be. Each river segment is discussed separately in this chapter including a description of the past and future expected dredging requirements and an analysis of the individual sites that are available to meet that need. Table 1 indicates the river segments and their corresponding river mile delineations.

<table>
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<tr>
<th>River Segment</th>
<th>Approximate River Mile Segment</th>
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<tbody>
<tr>
<td>1</td>
<td>Entrance to RM 3.0</td>
</tr>
<tr>
<td>2</td>
<td>RM 3.0 to RM 5.7</td>
</tr>
<tr>
<td>3</td>
<td>RM 5.7 to RM 7.9</td>
</tr>
<tr>
<td>4</td>
<td>RM 7.9 to RM 9.8</td>
</tr>
<tr>
<td>5</td>
<td>RM 9.8 to RM 11.7</td>
</tr>
<tr>
<td>6</td>
<td>RM 11.7 to RM 12.9</td>
</tr>
<tr>
<td>7</td>
<td>RM 12.9 to RM 14.3</td>
</tr>
</tbody>
</table>

The discussion within each river segment is broken into two major categories: Dredging Needs and Dredging Options. Within the Dredging Needs discussion the geographic areas in which dredging will occur, quantities of materials to be moved, and the basic characteristics of the materials are identified.
Both public and private dredging activities are inventoried, including both maintenance of existing projects and proposed construction of new facilities. The dredging options portion of each river segment discussion outlines the sites that are available to meet the identified needs and provides the following information relative to each site:

Description of the Site: The site description includes data on the size, location, land use, and physical and biological characteristics of each site.

Disposal Use of the Site: This section includes a discussion of both the engineering and environmental considerations which provide guidelines for the use of the sites. For each site, engineering considerations concerning site capacity, design criteria, land preparation, cost estimates and future use potential are presented. In addition, the environmental effects of site use are also evaluated.

A summary discussion for each river segment compares the dredging needs with the options and outlines the available alternative actions.

Although the dredging needs and options are specific to each individual segment, many of the issues are applicable to the entire extent of the river. The following paragraphs discuss in general terms some of the issues which will be addressed repeatedly in the site specific analysis.

General Dredging Requirements

The quantities of dredged materials generated from maintenance of authorized depths for the entrance channel, turning basin, and lower bay navigation channel (inner channel) exceed, by far, any other maintenance needs. Dredging at the entrance of Yaquina Bay is required on an annual basis. The necessary frequency of dredging and the amount of material to be removed is dependent upon the shoaling rate resulting from ocean current patterns. Tidal currents and freshwater stream flow are additional determinants in the specific location of shoals from year to year.

Dredging in areas other than the entrance channel and turning basin depends primarily on the demands of shipping, mooring of small boats and berth capacity. Over the past eight years, shoaling patterns in the Yaquina River appear to be quite stable, with little or no change in most of the channel from McLean Point to Toledo. Since 1969, the authorized channel from Oneatta Point to Toledo has not been maintained. Shoaling has increased the backlog of dredging needed to maintain a ten foot channel depth. In some areas, depths have decreased to eight feet. Review of hydrographic data and computed prism volumes in 1973 and 1974 compared with 1977 information show very little difference in recent shoaling patterns, and no apparent rate of increase or decrease is evident. Thus, it has been concluded that upon rehabilitation of the channel to the authorized ten foot depth, future shoaling should not be as significant, and the frequency of maintenance dredging may be only once every 10 to 15 years.
### TABLE 2  HISTORICAL DREDGING DATA FOR YAQUINA BAY AND YAQUINA RIVER TO BASIN

<table>
<thead>
<tr>
<th>Fiscal Year</th>
<th>Location</th>
<th>Type of Dredging</th>
<th>Purpose</th>
<th>Quantity, C.Y.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1931-1956</td>
<td>Insufficient Data Available</td>
<td>Pipeline</td>
<td>New Work</td>
<td></td>
</tr>
<tr>
<td>1957</td>
<td>Yaquina River</td>
<td>Pipeline</td>
<td>New Work</td>
<td>254,543</td>
</tr>
<tr>
<td>1962</td>
<td>Yaquina River</td>
<td>Pipeline</td>
<td>Maintenance</td>
<td>61,140</td>
</tr>
<tr>
<td>1968</td>
<td>Yaquina River</td>
<td>Pipeline</td>
<td>Maintenance</td>
<td>84,122</td>
</tr>
<tr>
<td>1969</td>
<td>Yaquina River</td>
<td>Pipeline</td>
<td>Maintenance</td>
<td>46,698</td>
</tr>
<tr>
<td>1970*</td>
<td>Entrance Bar</td>
<td>Hopper Dredge</td>
<td>Maintenance</td>
<td>638,065</td>
</tr>
<tr>
<td>1971</td>
<td>Entrance Bar</td>
<td>Hopper Dredge</td>
<td>Maintenance</td>
<td>995,830</td>
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<tr>
<td>1972</td>
<td>Entrance Bar</td>
<td>Hopper Dredge</td>
<td>Maintenance</td>
<td>969,366</td>
</tr>
<tr>
<td>1973</td>
<td>Entrance Bar</td>
<td>Hopper Dredge</td>
<td>Maintenance</td>
<td>470,772</td>
</tr>
<tr>
<td>1974</td>
<td>Entrance Bar</td>
<td>Hopper Dredge</td>
<td>Maintenance</td>
<td>981,212</td>
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<tr>
<td>1974</td>
<td>Turning Basin</td>
<td>Hopper Dredge</td>
<td>Maintenance</td>
<td>15,276</td>
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<tr>
<td>1975</td>
<td>Turning Basin</td>
<td>Hopper Dredge</td>
<td>Maintenance</td>
<td>58,357</td>
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<tr>
<td>1975</td>
<td>Entrance Bar</td>
<td>Hopper Dredge</td>
<td>Maintenance</td>
<td>613,406</td>
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<tr>
<td>1976</td>
<td>Entrance Bar</td>
<td>Hopper Dredge</td>
<td>Maintenance</td>
<td>621,825</td>
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<tr>
<td>1976</td>
<td>Turning Basin</td>
<td>Hopper Dredge</td>
<td>Maintenance</td>
<td>20,939</td>
</tr>
</tbody>
</table>

Source: United States Army Corps of Engineers, Portland District
Historical dredging data for Yaquina Bay and River are shown in Table 2. The accumulation of sediments by river mile which has occurred since the most recent dredging action is shown in Table 3. From River Mile 3.0 to 6.0 (McLean Point to Oneatta Point) very little dredging is required to maintain a depth of 18 feet and no dredging is required for maintenance of a 10 foot channel. Above River Mile 6.0 approximately 420,000 cubic yards would require removal to provide a 10 foot channel with two feet of overdepth dredging. Thereafter it is assumed that 100,000 to 120,000 cubic yards would accumulate every 10 years.

**TABLE 3** ACCUMULATED SEDIMENT FOR YAQUINA BAY AND YAQUINA RIVER, RIVER MILE 0.5 to 14.1 (As measured in Spring, 1977)

<table>
<thead>
<tr>
<th>River Mile</th>
<th>Authorized Depth (Ft.)</th>
<th>Sediment Volume (Cubic Yards)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5 to 1.0</td>
<td>30</td>
<td>2,850</td>
</tr>
<tr>
<td>1.0 to 2.0</td>
<td>30</td>
<td>6,880</td>
</tr>
<tr>
<td>2.0 to 3.0</td>
<td>30</td>
<td>108,300</td>
</tr>
<tr>
<td>3.0 to 4.0</td>
<td>18</td>
<td>0</td>
</tr>
<tr>
<td>4.0 to 5.0</td>
<td>18</td>
<td>0</td>
</tr>
<tr>
<td>5.0 to 6.0</td>
<td>18</td>
<td>0</td>
</tr>
<tr>
<td>6.0 to 7.0</td>
<td>10</td>
<td>21,400</td>
</tr>
<tr>
<td>7.0 to 8.0</td>
<td>10</td>
<td>4,300</td>
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<tr>
<td>8.0 to 9.0</td>
<td>10</td>
<td>2,400</td>
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<tr>
<td>9.0 to 10.0</td>
<td>10</td>
<td>16,100</td>
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<tr>
<td>10.0 to 11.0</td>
<td>10</td>
<td>10,700</td>
</tr>
<tr>
<td>11.0 to 12.0</td>
<td>10</td>
<td>12,100</td>
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<tr>
<td>12.0 to 13.0</td>
<td>10</td>
<td>8,000</td>
</tr>
<tr>
<td>13.0 to 14.0</td>
<td>10</td>
<td>38,400</td>
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<td><strong>TOTALS</strong></td>
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<td><strong>231,430</strong></td>
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</tbody>
</table>

Source: United States Army Corps of Engineers, Portland District

Historical dredging records, other than for the Corps of Engineers projects, are limited. Since 1971, Section 10 permits required by Federal law have numbered 11 are are listed in Table 4. These projects are generally related to moorages, industrial docking facilities or log dumps. The quantities of materials dredged are low in comparison to channel maintenance. Much of this material has been hauled to upland disposal sites for deposition.
The quantities of dredged materials listed within the following river segment discussions are estimated on an annual basis and for ten year periods through 1999. These quantities were calculated from historical dredging records and projected needs of identifiable proposed projects. Dredging solely for the purpose of filling is not represented in these estimates.

Dredged Material Characteristics

Bottom sediments subject to dredging and disposal can be categorized as being either ocean sand or upland sediment, namely silty sand. Older materials, both in the bay and river tend to be more silty and of lighter density. However, recently deposited sediments (with the exception of Depoe Slough in Toledo) appear to be heavier and contain more sand.

The Army Corps of Engineers has conducted physical and chemical analysis of Yaquina Bay sediments at a limited number of sites within the bay and river. In addition, the Environmental Protection Agency (EPA) performed several tests at five locations in 1969. The results of these two test situations form the basis for the following discussion.

- Physical Characteristics

Bottom sediments throughout the project are of predominantly sandy material, ranging from nearly all sand in the lower bay to silty sand in the river at Toledo. Poor quality material (predominantly highly organic silts and clay) exist near the mouth of Depoe Slough and upstream in Depoe Slough to the limit of proposed dredging. The existing Newport commercial boat basin also contains poor quality materials, evidencing a higher percent of organics. With the exception of those two areas, settling properties of the bottom sediments are moderate to good. Material densities indicate moderately good fills are possible if adequate dewatering and compaction are obtained. Table 5 lists the measured physical properties along various river miles within the bay and river.
<table>
<thead>
<tr>
<th>River Mile</th>
<th>Site Description</th>
<th>Percent Greater Than 5 mm (Gravel)</th>
<th>Percent Less Than .08 mm (Silt &amp; Clay)</th>
<th>Density In Place (9 Ms/L</th>
<th>Void Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.5</td>
<td>Commercial Boat Basin</td>
<td>8</td>
<td>24</td>
<td>1657</td>
<td>1.52</td>
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<tr>
<td>1.5</td>
<td>Commercial Boat Basin</td>
<td>0</td>
<td>43</td>
<td>1493</td>
<td>2.37</td>
</tr>
<tr>
<td>1.5</td>
<td>Commercial Boat Basin</td>
<td>0</td>
<td>8</td>
<td>1868</td>
<td>0.95</td>
</tr>
<tr>
<td>2.2</td>
<td>Caffel Bros. Log Dump</td>
<td>0</td>
<td>8</td>
<td>1868</td>
<td>0.776</td>
</tr>
<tr>
<td>2.25</td>
<td>Caffel Bros. Log Dump</td>
<td>0</td>
<td>32</td>
<td>1585</td>
<td>1.868</td>
</tr>
<tr>
<td>6.4</td>
<td>Above Marker #25</td>
<td>0</td>
<td>13</td>
<td>1703</td>
<td>1.406</td>
</tr>
<tr>
<td>7.6</td>
<td>Near Bay Beacon #28</td>
<td>0</td>
<td>9</td>
<td>1797</td>
<td>1.114</td>
</tr>
<tr>
<td>9.5</td>
<td>Near Marker #38</td>
<td>0</td>
<td>9</td>
<td>1870</td>
<td>0.933</td>
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<tr>
<td>10.8</td>
<td>Below Marker #47</td>
<td>2</td>
<td>8</td>
<td>1831</td>
<td>1.030</td>
</tr>
<tr>
<td>12.7</td>
<td>Mouth Depoe Slough</td>
<td>0</td>
<td>93</td>
<td>1219</td>
<td>6.315</td>
</tr>
<tr>
<td>13.7</td>
<td>Publisher's</td>
<td>0</td>
<td>10</td>
<td>1706</td>
<td>1.347</td>
</tr>
</tbody>
</table>

Source: United States Army Corps of Engineers, Portland District
• Chemical Characteristics

Sampling and analysis of bottom sediments as listed in Table 6 show very minimal problems for pollutant release upon resuspension. Samples taken from the vicinity of Depoe Slough appear to be polluted and will require greater care in dredging, and confined land disposal. Some material in various river sections may depress dissolved oxygen if land disposal sites do not adequately contain the materials. For this reason, two cell disposal systems should be provided wherever possible above River Mile 6.

• Toxicity of Dredged Material

The release of toxic materials into an aquatic habitat as a result of dredging and the disposal of dredged materials can cause serious ecosystem damage. The extent of the hazard can be identified in part by performing elutriate tests on the materials to be dredged. Tests performed by the Corps of Engineers on samples from the turning basin area showed extremely low releases of heavy metals. Table 7 shows the heavy metal characteristics for a sample of locations in Yaquina Bay and River.

<table>
<thead>
<tr>
<th>River Mile</th>
<th>Cadmium</th>
<th>Lead</th>
<th>Zinc</th>
<th>Mercury</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0</td>
<td>-</td>
<td>-</td>
<td>92.50</td>
<td>0.22</td>
</tr>
<tr>
<td>1.5</td>
<td>6.65</td>
<td>9.28</td>
<td>178.20</td>
<td>0.120</td>
</tr>
<tr>
<td>2.2</td>
<td>4.80</td>
<td>12.97</td>
<td>55.00</td>
<td>0.035</td>
</tr>
<tr>
<td>6.4</td>
<td>4.62</td>
<td>13.20</td>
<td>178.20</td>
<td>0.065</td>
</tr>
<tr>
<td>7.6</td>
<td>5.12</td>
<td>8.84</td>
<td>29.10</td>
<td>0.123</td>
</tr>
<tr>
<td>9.5</td>
<td>7.01</td>
<td>14.02</td>
<td>262.90</td>
<td>0.203</td>
</tr>
<tr>
<td>10.8</td>
<td>5.45</td>
<td>11.39</td>
<td>222.80</td>
<td>0.128</td>
</tr>
<tr>
<td>12.7</td>
<td>17.65</td>
<td>26.74</td>
<td>374.80</td>
<td>0.060</td>
</tr>
<tr>
<td>13.7</td>
<td>3.80</td>
<td>14.10</td>
<td>209.90</td>
<td></td>
</tr>
</tbody>
</table>

Source: United States Army Corps of Engineers, Portland District

Upon resuspension of sediments in bay water, soluble heavy metal concentrations were less than 0.1 percent of the undisturbed sediment concentration by weight. In the bay, soluble zinc averaged 0.2 mg/kg compared with over 200 mg/kg dry weight in the commercial boat basin sediments. The source of zinc in the commercial boat basin sediments is believed to be the marine paints used on the commercial fishing boats. Zinc is a predominant trace metal in a reducible phase. By maintaining high dissolved oxygen levels within the dredging and dredged material disposal sites, zinc concentrations can be greatly minimized. The presence of reduced iron in high water content sediments, normal to Oregon Coast tributaries, aids in improving water quality since iron oxides, formed upon suspension, tie up trace metals and orthophosphate, inhibiting their release to the water phase.

* A two cell disposal system is one in which both a primary and a secondary cell are utilized to maximize the amount of sediment that settles at the site. The dredged material is first pumped into the primary cell and then directed over a weir into the secondary cell. This system is generally used when the disposal material is characterized by fine sediments or chemical contamination.
### TABLE 6
CHEMICAL CHARACTERISTICS OF
YAQUINA BAY & RIVER BOTTOM SEDIMENTS
(Results of Elutriate Testing)

<table>
<thead>
<tr>
<th>River Mile</th>
<th>Total Solids (Percent)</th>
<th>Volatile Solids (Percent)</th>
<th>COD (gm/kg)</th>
<th>Organic Material (Percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0</td>
<td>35</td>
<td>3.2</td>
<td>18.0</td>
<td>--</td>
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<tr>
<td>1.5</td>
<td>64</td>
<td>3.9</td>
<td>42.9</td>
<td>5.2</td>
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<tr>
<td>2.2</td>
<td>70</td>
<td>2.5</td>
<td>23.9</td>
<td>3.2</td>
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<tr>
<td>6.4</td>
<td>71</td>
<td>2.4</td>
<td>21.2</td>
<td>3.5</td>
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<tr>
<td>7.6</td>
<td>54</td>
<td>6.1</td>
<td>54.8</td>
<td>2.3</td>
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<tr>
<td>9.5</td>
<td>70</td>
<td>2.1</td>
<td>7.0</td>
<td>1.3</td>
</tr>
<tr>
<td>10.8</td>
<td>71</td>
<td>1.9</td>
<td>4.0</td>
<td>2.2</td>
</tr>
<tr>
<td>12.7</td>
<td>31</td>
<td>13.9</td>
<td>222.4</td>
<td>16.2</td>
</tr>
<tr>
<td>13.7</td>
<td>69</td>
<td>1.5</td>
<td>4.1</td>
<td>4.4</td>
</tr>
</tbody>
</table>

Source: United States Army Corps of Engineers, Portland District
United States Environmental Protection Agency
Acid pH conditions in the dewatered land disposal sites may lead to some leaching of heavy metals. The high buffering properties and organic content of the saline soils would minimize this effect. Under unsaturated flow conditions, leaching rates are also anticipated to be very low.

Site Selection Criteria

As discussed previously, specific sites proposed for the disposal of dredged materials were evaluated on the basis of a combination of engineering and environmental criteria. Engineering criteria were utilized to insure that use of the sites was feasible and that cost considerations were reasonable. In many instances, environmental considerations were the overriding factor in the elimination of a site because, although the site may have been engineeringly feasible, disposal of dredged material would have caused loss of significant natural habitat areas. The following paragraphs outline the major criteria that were used in the evaluation and selection of the proposed dredged material disposal sites.

- Environmental Criteria

Environmental criteria are primarily concerned with maintaining the integrity of the natural estuarine eco-system and limiting any changes which would adversely affect that system. Maintenance of wetland areas including intertidal mudflats, tide lands, salt marshes and other marsh lands was a primary concern, and the disposal of materials in such areas was essentially prohibited. The effect of disposal and the resulting water runoff on all fish and wildlife habitat was evaluated, and sites which would have recorded significant degradation were eliminated from further consideration. In addition, the water quality effects resulting from site use were also evaluated.

Other concerns included potential land use effects, including the effect of disposal on prime farmlands and existing or potential recreation sites.

- Engineering Criteria

Engineering feasibility and cost efficiency are closely tied and were, therefore, evaluated jointly. Since the upriver areas will most probably be dredged by use of a pipeline dredge, it was essential that and sites be identified within the operational range of a pipeline dredge. This factor alone meant that sites would, by necessity, occur adjacent to the river. In addition, the physical features of each site were evaluated in order to determine whether site preparation was feasible, and many sites were eliminated due to a low return on site preparation expenditures. Some sites, although acceptable from an environmental standpoint, were too small to warrant the necessary site preparation costs.

Each of the potential dredged material disposal sites were evaluated against the above criteria. The sites presented in the latter portions of this chapter generally were able to meet this complex set of criteria and were considered acceptable for use by the Federal and State agencies responsible for the issuance of fill permits.
Site Preparation

Although some of the sites presented herein have previously been used for the placement of dredged materials, many of the disposal sites have not been used previously, and therefore would require site preparation prior to the placement of the disposal materials. General considerations for site preparation include: leveling to insure uniform application for maximum dewatering, clearing to remove existing vegetation, dike construction in order to confine the dredged materials, installation of weirs and spillways, surface drainage relocation, utility location and return flow or outfall construction. Several of the above items are considered temporary, but may be permanent and remain in place to enable future reuse of the site.

The figures included within this discussion illustrate typical details for embankment protection and return spillway design and construction. Dikes may be constructed to serve as either perimeter, interior or training dikes. Perimeter dikes require the greatest care in construction to provide long term stability and to avoid accidental breaks or spills during use. Interior dikes are used when more than one cell is required to provide adequate settling. Training dikes are sometimes constructed from the film material to direct inflow and to prevent short circuiting of the disposal material and runoff.

Certain regulatory agencies have developed general guidelines for the construction ofcontinued disposal sites to insure the retention of solids and the protection of water quality. These guidelines establish standards for crest heights of weirs, minimum standing water levels, avoidance of over filling, location of outfalls and retention time for settling. These factors must also be considered in the preparation of specific sites. (Chapter 4 further discusses guidelines for the disposal of dredged materials.)

Site Reuse Potential

A key determinant in the disposal of dredged materials is the use of the land subsequent to the disposal of the material. Depending on its reuse potential, dredged materials may be either a highly desirable or undesirable commodity. The following paragraphs provide a general description of the reuse potential of Yaquina Bay and River sediments.

- Agricultural Use

Since Yaquina River sediments consist of silty sand and contain approximately 5 percent organic material, they should be moderately suitable for the cultivation of agricultural crops. Although the level of organics is comparatively low and would require soil enhancement, the major concern with sediment use is it's high salt content. In order to remove this salt water from the sediments, the dewatered sediments must be subjected to extensive irrigation with freshwater until the salts are leached out. One solution to the salt content problem is to remove the existing top soil from the site prior to the disposal of the dredged materials and stockpile it until the filling has been completed. Once the disposal material is sufficiently dewatered, the top soil can be replaced over the dredged material. This application procedure can cost approximately $3,500 per acre when up to 2 feet of top soil is removed and replaced. In areas characterized by high freshwater rainfall, natural leaching may be sufficiently rapid to alleviate the need for this expenditure.
TYPICAL DETAIL
EMBANKMENT PROTECTION

TYPICAL DETAIL
RETURN SPILLWAY
Many areas, particularly in the vicinity of Boone Island and upriver from Toledo, are characterized by poorly drained diked tidelands and wetlands. Application of dredged material could raise the elevation of those lands resulting in improved drainage conditions and thereby enhancing their agricultural value. Seasonal flooding is also reduced or eliminated. Such agricultural land enhancement must be weighed against the permanent loss or eventual reclaiming of wetland habitat and the possible creation of further flood hazard for adjacent land.

**Engineered Fill**

In most cases, Yaquina Bay and River dredged materials appear to have reasonably good structural qualities. However, since consolidation, dry density and compaction test data are not available, conclusive analytical projections cannot be made. The ability to dewater sediments, particularly those upriver of the turning basin, is also an important consideration since it can take several years to adequately dry fills of silty materials 4 to 5 feet in depth and additional time for consolidation and compaction. Sandy dredged material from the lower bay will begin compaction almost immediately upon placement.

Mechanical means of filling and compaction can be used to shorten this time period, resulting, however, in increased costs.

Dredged material from the Depoe Slough area in Toledo may be of poor quality for even moderate structural loads. Accumulated sediments from the Newport commercial boat basin should only be placed in disposal sites where light to moderate structural loads may be imposed, unless further soils investigations indicate otherwise. Examples of acceptable uses for those materials include open storage, unimproved parking areas and sub-base fill for areas which can later be surcharged with good quality materials.

**Wildlife Habitat Creation**

The development of artificial marshlands and other forms of aquatic habitat for shellfish, water fowl or important food chain vegetation has gained considerable interest in recent years. The Corps of Engineers Waterways Experiment Station has conducted numerous demonstrations, producing some striking results. Some of the approaches include:

-- construction of disposal islands planted with dry land vegetation as wildlife cover for nesting or feeding,

-- creation of intertidal marshlands,

-- creation of mudflats from areas previously below intertidal levels.
It could be beneficial to evaluate some of these new techniques for specific application in Yaquina Bay. Through Section 150 of the 1976 Water Resources Development Act, the Corps of Engineers has authority to fund the development, creation or restoration of marshlands associated with maintenance activities. Use of this authority should be further explored as it relates to specific sites under consideration in this document.

The following sections outline the dredging needs and options for each river segment from the mouth of Yaquina River upriver through Toledo. Specific disposal sites are mapped and preliminary guidelines for their use are described.
Yaquina Bay Dredged Material Disposal Plan

River Segment 1
Scale 1"=1760'

Disposal Site
Shoaling Area

Wilsey & Ham
RIVER SEGMENT 1 (ENTRANCE CHANNEL TO McLEAN POINT RIVER MILE 3)

Dredging Needs

- Maintenance of Existing Projects

According to the U.S. Army Corps of Engineers, federal maintenance of the authorized entrance channel, inner channel upstream to McLean Point, and the turning basin located at McLean Point, is estimated to generate approximately 13 million cubic yards of dredged materials over the next 20 years. Historically, this material has been disposed in an off shore ocean disposal site which is approved for use by the Environmental Protection Agency.

The Newport commercial boat basin, which is operated by the Port of Newport, will require maintenance dredging twice over the next 20 year period. Dredging quantities are estimated at about 125,000 cubic yards for each maintenance effort, for a total of 250,000 cubic yards of material. Due to the chemical composition of these bottom sediments, disposal should occur on a contained land site where runoff can be closely regulated.

Newport Terminals currently has a permit to dredge 27,000 cubic yards of material annually from its barge loading area. Assuming that this volume were to continue throughout the planning period, they would generate a total of 540,000 cubic yards of material. The facility manager indicated that they have applied for a permit to dispose of those materials in the off shore ocean disposal site currently used by the U.S. Army Corps of Engineers, and they expect that the permit will receive the necessary approvals.

The Embarcadero Marina east of Port Dock 7 is expected to generate approximately 8,000 cubic yards of material during the 20 year planning period.

- Construction of New Projects

The Port of Newport is proceeding with plans to construct a 600 slip small boat basin along South Beach. Construction of the marina would require the removal of approximately 365,000 cubic yards of material. Due to the shallow bottom configuration, pipeline dredging is the most cost effective dredging method. The Port has applied for the necessary permits to dispose of the materials on 28 acres of adjacent land. Maintenance dredging for the South Beach Marina is expected to total 20,000 cubic yards every five years over the projected 20 year planning period.

Table 8 summarizes the projected dredging needs for River Segment 1 during the 20 year plan time frame.
TABLE 8
RIVER SEGMENT 1 DREDGING NEEDS

<table>
<thead>
<tr>
<th>Project</th>
<th>Land Disposal Quantity</th>
<th>Ocean Disposal Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Entrance channel-turning</td>
<td>13,000,000 cy</td>
<td></td>
</tr>
<tr>
<td>basin maintenance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Commercial boat basin</td>
<td>250,000 cy</td>
<td></td>
</tr>
<tr>
<td>maintenance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Newport Terminals maintenance</td>
<td>540,000 cy</td>
<td></td>
</tr>
<tr>
<td>4. South Beach Marina construction</td>
<td>365,000 cy</td>
<td></td>
</tr>
<tr>
<td>5. South Beach Marina maintenance</td>
<td>80,000 cy</td>
<td></td>
</tr>
<tr>
<td>6. Embarcadero Marina maintenance</td>
<td>8,000 cy</td>
<td></td>
</tr>
<tr>
<td>TOTAL DREDGING NEEDS</td>
<td>703,000 cy</td>
<td>13,540,000 cy</td>
</tr>
</tbody>
</table>

Disposal Options

- Ocean Disposal

Dredged materials resulting from channel maintenance have historically been disposed in the EPA approved ocean disposal site that is located directly off shore of Yaquina Bay. The site is in approximately 60 feet of water and past records indicate that 700,000 cubic yards of material have been disposed annually at that site. This results in about four feet of dredged material being evenly deposited over the entire site each year. According to U.S. Army Corps of Engineers records, only minimal long term changes in bottom topography have resulted from disposal of the materials. This suggests that most of the materials deposited at the site are transported out of the disposal area. The ultimate resting place for this material is unknown. Recent studies have shown that faunal disturbance of the benthos in a disposal area results in the alteration of the benthic community structure. Essentially, the benthic community becomes dependent upon the periodic change which results from the disposal of the material. If the disposal materials are similar to the site bottom materials, then only minimal long-term impacts occur. This appears to be the case at the current ocean disposal site.

There is no indication that the presently used site will be rendered unuseable during the 20 year planning period. Indeed, since the benthic community has already been altered from its natural state, it may be best to continue use of that site, rather than to unnecessarily alter additional ocean communities.
Land Disposal

The sites listed in Table 9 are generally acceptable for the disposal of dredged materials within River Segment 1. Each site is discussed individually in the following pages.

<table>
<thead>
<tr>
<th>Site No.</th>
<th>Approximate Capacity</th>
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</thead>
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<tr>
<td>1</td>
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</tr>
<tr>
<td>2</td>
<td>50,000</td>
</tr>
<tr>
<td>3</td>
<td>150,000</td>
</tr>
<tr>
<td>4</td>
<td>150,000</td>
</tr>
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<td>5</td>
<td>35,000</td>
</tr>
<tr>
<td>6</td>
<td>1,000,000</td>
</tr>
</tbody>
</table>

TOTAL CAPACITY 1,435,000
Yaquina Bay Dredged Material Disposal Plan

Figure 1
Scale 1" : 400'

Wilsey & Ham
SITE 1 (Illustrated on Figure 1)

Site Description

Location: Approximately 150' south of the South Beach log pond and west of road.

Size: 350' x 700'

Capacity: 50,000 cubic yards, @ 5 feet depth, uncompacted.

Physical Characteristics: This is a flat, active dune land, having experienced recent disturbance (land clearing and leveling by removal of material). The soils are dune land material. Seasonal fresh water exists on the south border. This is suspected to be surface run-off, as the source could not be identified.

Biological Characteristics: The vegetation is comprised of tree lupine, beach grass and shorepine. The south border is made up of a thick riparian community and a freshwater marsh. Small mammals include mice, shrews, and possibly raccoon. Various bird species would use the lupine-beach grass vegetation, as well as the riparian thickets.

Zoning: Planned marine

Comprehensive Plan: Planned marine and recreation

Ownership: Private ownership - Kenneth Dodd and Kenneth Stafferson

Engineering Considerations

Method of Dredging: Pipeline dredge

Design Criteria: Dike using on-site materials as required to prevent flooding of adjacent land and maintain approximately 100 foot setbacks from edge of log pond. Return flow may be discharged through a common pipeline with disposal Site 2 into deep water near the boat basin. Discharge would not affect either marsh or tidelat areas.

Site Preparation: Some leveling must occur. Minor utility relocation, power lines and buried telephone cable may be required. An undercrossing casing for the South Beach access road will be necessary.

Unit Site Preparation Cost: $0.77/cubic yard

Future Use Constraints: None. May have potential for stockpiling of clean sand for later removal as fill material.
Environmental Considerations:

Effects of Disposal: Disposal materials are expected to come from the South Beach marina and would probably have low toxic levels, therefore, the area would reestablish its present biological condition within a short (5-7 years) period of time. The riparian vegetation to the south should be protected, as the annual inhabitants are concentrated within that area. Surface freshwater also passes through the southern part of the site, and should be protected along with the riparian vegetation. General effects on the site would be short term, without significant loss. The placement of highly toxic materials on the site would restrict its future biological development. Re-vegetation and reestablishment of faunal groups would be retarded, and restricted in some cases. If highly toxic materials were placed on the site, future natural habitat use would be severely restricted.

Other Considerations:

The current property owners have indicated that their future plans for the site preclude its use as a dredged material disposal site. Since the other available sites within River Segment 1 have sufficient capacity to meet the disposal needs over the next 20 years, this site has been given a low priority for use.

The current zoning and comprehensive plan designations for this site are planned marine and recreation. The placement of disposal material on the site would not preclude either use, but would result in a postponement of that use until the fill materials had sufficiently compacted.
SITE 2 (Illustrated on Figure 2)

Site Description

Location: Approximately 800' southeast of proposed South Beach Boat Basin

Size: 500' x 400'

Capacity: 50,000 cubic yards, @ 10 feet, uncompacted

Physical Characteristics: The Soil Conservation Service has designated the area an active duneland. The topography consists of a series of low-lying knolls, progressing to a significant "hill" on the south border of the site. There are no freshwater creeks or saltwater channels on the site. An abandoned log pond borders the easterly edge.

Biological Characteristics: A floral community consisting of shorepine, tree lupine, willow, European beachgrass and peavine exists on the site. Small perching birds (sparrows, chickadees, warblers, etc.) use the vegetation for food and shelter, but are not limited to this ecotype. Small mammals using the area may include shrews, moles, mice and bats.

Zoning: Planned marine

Comprehensive Plan: Planned marine and recreation

Ownership: Public - Port of Newport

Engineering Considerations:

Method of Dredging and Filling: Pipeline dredge

Design Criteria: Refer to Site 1. Provide 50' - 100' setback near log pond

Site Preparation: Refer to Site 1

Unit Site Preparation Cost: $0.75/cubic yard

Future Use Constraints: None

Environmental Considerations:

Effects of Disposal: The less polluted disposal materials would have only a temporary effect on the area. The beach grass-lupine vegetation community would reestablish itself in five to eight years time, if not sooner. Faunal groups would move out of the area during the
Yaquina Bay Dredged Material Disposal Plan

Figure 2
Scale 1": 400'

Wilsey & Ham
filling period, and would not reestablish until revegetation began. Some species of small mammals could possibly be buried during the disposal stage. Such losses would not be considered significant. The east side of the site should be established, through revegetation and diking practices, as a buffer zone to protect the nearby log ponds. The ponds act as resting and feeding areas for various shorebirds and waterfowl. Rehabilitation of these log ponds is currently being undertaken by the Port of Newport, as a portion of the South Beach marine project.

The more polluted disposal materials could be placed on the site if the site was designated a future parking area or trailer site, or some similar human development. Polluted materials could retard revegetation attempts, and this would limit the future biological development of the site. The site is currently planned for use in conjunction with disposal of materials for the construction of the South Beach marina.

Other Considerations:

The current comprehensive plan and zoning designations for this site allow planned marine and recreation use. Disposal of dredged materials on this site would not preclude such use, and in fact would allow for site preparation which could enhance the future useability of the site. The land is currently owned by the Port of Newport and it is expected that its use will be complementary to the South Beach marina project and other planned recreation improvements.
SITE 3 (Illustrated on Figure 2)

Site Description

Location: Just South of Ore-Aqua, South Beach

Size: 1050' x 500'

Capacity: 150,000 cubic yards

Physical Characteristics: This site extends from the beach front area on the west side to rolling, active duneland on the east side. The dunes are temporarily stabilized by vegetation. No water influence is evidenced in the area. The area contains previous dredged material.

Biological Characteristics: The vegetation is comprised of the European beach grass-tree lupine community. Small mammals would include mice. Perching birds use the area for feeding and resting purposes, and shorebirds use the beach front area for feeding purposes.

Zoning: Marine - Planned

Land Use Designation: Planned marine and recreation

Ownership: Public - Port of Newport

Engineering Considerations:

Method of Dredging and Filling: Pipeline dredge

Design Criteria: Refer to Site 1

Site Preparation: Refer to Site 1

Unit Site Preparation Cost: $0.24/cubic yard

Future Use Constraints: None

Environmental Considerations:

Effects of Disposal: This area would experience short-term effects if dredge materials were placed on it. Natural revegetation could take place within five to seven years, with reestablishment of the faunal groups occurring concurrently.
It is expected that the dredged materials placed on this site would result from the construction of the South Beach marina project. Materials generated from the maintenance of the marina could also be placed on this site. It is unlikely that future maintenance materials from the South Beach marina will be polluted with heavy metals, therefore they should not pose any disposal problem.

Other Considerations:

The current comprehensive plan and zoning designations for this site allow planned marine and recreation use. Disposal of dredged materials on this site would not preclude such use, and in fact would allow for site preparation which could enhance the future useability of the site (although postponing the time of use until settling and compaction had occurred.) The land is currently owned by the Port of Newport and it is expected that its use will be complementary to the South Beach marina complex and other planned recreation improvements.
SITE 4 (Illustrated on Figure 2)

Site Description:

Location: Immediately east and southeast of the Marine Science Center, South Beach.

Size: 600' x 900'

Capacity: 150,000 cubic yards

Physical Characteristics: The site is predominantly flat and lies only a few feet above mean higher high water. It is an old fill site which was used extensively over ten years ago. The eastern border of the site faces Idaho Tide Flats and fill material would be contained behind the high water wash line. No freshwater flow occurs within the site boundaries.

Biological Characteristics: The vegetation consists of tree lupine, peavine, and European beach grass communities, which were established after the previous filling. Small mammals, such as mice and rabbits, may use the area extensively. Small perching birds, such as the sparrows and warblers, use such areas for resting and feeding. The larger shrubs that exist on the eastern border act as important buffers for water birds that feed or loaf in the Idaho Tide Flats.

Zoning: Marine - Planned A-1

Comprehensive Plan: Planned marine and recreation

Ownership: Public--Oregon State University
Marine Science Center

Engineering Characteristics:

Method of Dredging: Pipeline Dredge

Design Criteria: Dikes using on-site materials as required to contain dredged materials until dewatered and to prevent spillage of materials within 100 feet of tidelands and improvements. Return flow should be diverted north to the deep water channel.

Site Preparation: Some ground leveling must be accomplished.

Unit Site Preparation Cost: $0.30/cubic yards

Future Use Constraints: None
Environmental Considerations

Effects of Disposal: This site is an old fill area which has established a lupine-beachgrass community over the past ten years. The area is a good example of what can be expected to happen on old fill lands if left to natural processes. If the site were filled again with relatively clean dredged materials, it would reestablish a similar vegetation community.

The east and south sides of the site should be developed into buffer zones to act as protection belts for the Idaho Tide Flats. The tide flats are used extensively by shorebirds and migrating waterfowl, and therefore should be protected from human interference.

Other Considerations

The current Lincoln County Comprehensive Plan designates the site for planned marine and recreation use. The use of the site for the disposal of dredged materials would not preclude that use, although it would postpone future construction until the necessary compaction had occurred. The site is currently under the ownership of the State of Oregon, Oregon State University. Placement of dredged materials on the site does not conflict with their future plans for site use.
Yaquina Bay Dredged Material Disposal Plan

Figure 3
Scale 1" : 400'
SITE 5 (Illustrated on Figure 3)

Site Description:

Location: Port of Newport Docks 3, 7 and 9; Newport

Size: 1200' x 200'

Capacity: 35,000 cubic yards, at a 2.5' addition to the existing ground level.

Physical Characteristics: This area is a previous fill site, which has been maintained as a parking lot and storage area for the port docks.

Biological Characteristics: There are no biological characteristics to consider, if fill plans stay above mean higher high water.

Zoning: Industrial

Comprehensive Plan: Marine Industrial

Ownership: Public - Port of Newport

Engineering Considerations:

Method of Dredging and Filling: Pipeline Dredge

Design Criteria: Limited filling using only clean, dense, sandy material may be beneficial for future site use. The existing use would be temporarily displaced until the new fill can dewater and be compacted. Return flow should be directed to deep water outside the basin.

Site Preparation: Relocation of improvements and stored equipment. Construct dikes sufficient to prevent street flooding and direct return flow to spillway and outfall pipe. Extend external rip rap.

Site Unit Development Cost: $0.60/cubic yard

Dredging Cost: Approximately $2.00/cubic yard

Future Use Constraints: None

Environmental Considerations:

Effects of Disposal: No biological effects could be expected in this site, as there are no established biological communities in close proximity. The area is used as a parking lot and storage area and is denuded of vegetation.
Other Considerations

The site is currently designated for marine industrial use in the Lincoln County Comprehensive Plan. Use of the site for the disposal of dredged materials would not preclude that future use. Parking is currently in short supply along the bay front and use of this site for disposal activities would remove it from parking use until settling and repaving had occurred. Due to these circumstances, Site 5 has been given a low priority for use as a future dredged material disposal site. The site is owned by the Port of Newport, therefore conflicts between disposal and other uses are not expected to occur.
SITE 6 (Illustrated on Figure 4)

Site Description:

Location: McLean Point. Sunset Terminals, Caffel Lumber Company, LNG Plant; Newport.

Size: 1600' x 2400'

Capacity: 1,000,000 cubic yards (5 feet, uncompacted)

Physical Characteristics: The area is recent filled land. The site is flat, and maintained as a loading/unloading terminal; log storage area, and future development site. A paved access road exists along the easterly edge.

Biological Characteristics: As long as all fill material remains isolated from the water's edge, no biological characteristics must be considered.

Zoning: Marine Industrial

Comprehensive Plan: Marine Industrial

Ownership: Corporate - Sunset Terminals

Engineering Considerations:

Method of Dredging and Filling: Pipeline Dredge

Design Criteria: May be phased on use of multiple cells with a single secondary pond, spillway and outfall pipe. Provide a setback along the easterly access road. Reserve internal cell for disposal of commercial boat basin sediments.

Site Preparation: Construct containment dikes from on-site materials. Direct return flow to deep water channel west of turning basin.

Site Unit Development Cost: $0.10/cubic yard

Dredging Cost: Approximately $2.00/cubic yard

Future Use Constraints: None

Environmental Considerations:

Effects of Disposal: This large area is devoid of vegetation. Most of the site is used for log storage, transporting of shipping materials,
Yaquina Bay Dredged Material Disposal Plan

Figure 4
Scale 1" : 400'

Wilsey & Ham
and open storage. There are no vegetation communities in existence. Any faunal use of the area would necessarily be of a highly mobile character and would most likely be capable of avoiding destruction by fill material.

Other Considerations:

Much of the site is currently being used for marine industrial purposes, and a large portion of the area in use is utilized for log storage. Placement of dredged materials on this site could cause temporary inconveniences to the current industrial operations. Close cooperation and coordination between the Port of Newport and Sunset Terminals management will be necessary in order to maximize the efficient use of the site.

It is expected that use of the site for the disposal of dredged materials could be accomplished through either easement or lease agreements between the Port of Newport and Sunset Terminals ownership. The land is currently designated for marine industrial use in the comprehensive plan. Use of the site for the disposal of dredged materials would have no long term impacts upon that use; however, it could cause short-term operating inconveniences or postponement of some development plans. Placement of dredged materials on the site should not have any effect on the types of future facilities that would be constructed on the site.
Summary & Recommendations

It is expected that the dredged materials generated within the entrance channel and turning basin will continue to be disposed in the existing offshore ocean disposal site. Therefore, approximately 703,000 cubic yards of material will require land disposal. Of this total, 258,000 cubic yards of dredging would occur along the north shore of the bay, while 445,000 cubic yards would result from the construction and maintenance of the South Beach Marina. The total estimated capacity of the north shore sites (Sites 5 and 6) is estimated at 1,035,000 cubic yards, substantially above the 258,000 projected disposal needs. The majority of dredged materials would result from the maintenance dredging of the commercial boat basin. It is recommended that these materials be placed on Site 6, since preliminary sediment samples indicate that the material would not be suitable for ocean disposal and would require a confined upland disposal site. Use of Site 6 will require close coordination and cooperation with the property owner to ensure that the existing industrial operations are not unduly interrupted. Since the capacity of Site 6 is approximately 1,000,000 cubic yards, and the disposal needs are 125,000 cubic yards every ten years, the Port of Newport should be able to coordinate use of Site 6 without significant interruption of existing industrial uses, or inconvenience to the property owner.

The dredged materials resulting from the maintenance dredging at the Embarcadero Marina could be placed on either Site 5 or 6, or could be hauled by truck to an upland disposal site. Because of the parking relocation that would result from the use of Site 5, that site has a low priority for use, unless small quantities of dredged materials could be confined to a limited portion of the site.

The capacity of the dredged material disposal sites on the south side of the bay is about 400,000 cubic yards uncompacted. Estimates indicate that the construction of the South Beach Marina will generate about 365,000 cubic yards of dredged materials, while maintenance activities over the next 20 years will result in the disposal of an additional 80,000 cubic yards, at the rate of 20,000 cubic yards every five years. The existing capacity of 365,000 cubic yards is measured on an uncompacted basis, and if material is allowed to compact before additional disposal occurs, the capacity of the sites would be increased. Maintenance dredging would not be required until 5 years after the marina began operation. This time lapse would allow ample time for compaction of the construction materials so that maintenance materials could be placed on those previous disposal sites. The five year interval between each maintenance dredging action would allow for continued settling and compaction, so that the maintenance sites could be reused and their capacity increased.

The property owners of Site #1 have indicated that they have development plans for that site which are not compatible with use of the site for...
the disposal of dredged materials. For that reason Site #1 is designated as a low priority site. It is possible that use of that site would not be required during the 20 year planning period, if compaction of disposal materials increased the capacity of some of the remaining sites.
River Segment 2
CORPS OF ENGINEERS RECORDS INDICATE THAT APPROXIMATELY 29,000 CUBIC YARDS OF MATERIAL WILL REQUIRE REMOVAL ALONG RIVER SEGMENT 2 DURING THE 20 YEAR PLANNING PERIOD. THIS IS BELIEVED TO BE A MAXIMUM FIGURE, SINCE HISTORICALLY DREDGING HAS NOT BEEN NECESSARY ALONG THIS SEGMENT. IN ADDITION TO THE POSSIBLE CHANNEL MAINTENANCE DREDGING, TWO PRIVATE MOORAGES WITHIN SEGMENT 2 HAVE INDICATED THE FOLLOWING POSSIBLE DISPOSAL REQUIREMENTS:

<table>
<thead>
<tr>
<th>Project</th>
<th>Disposal Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sawyers</td>
<td>5,000 cubic yards (unlikely)</td>
</tr>
<tr>
<td>Riverbend Moorage</td>
<td>32,000 cubic yards</td>
</tr>
<tr>
<td>Total Private Marina</td>
<td>37,000 cubic yards</td>
</tr>
</tbody>
</table>

No new projects are anticipated within River Segment 2. The possibility of deepening the authorized river channel from 10 feet in depth to 18 feet was explored by the study team; however, the proposal was found to have insufficient local support to generate a favorable cost-benefit relationship. On that basis, it appears highly unlikely that authorization for channel deepening would occur during the 20 year planning period.

Table 10 summarizes the dredging needs which have been identified within River Segment 2.

**TABLE 10**

**RIVER SEGMENT 2 - DREDGING NEEDS**

<table>
<thead>
<tr>
<th>Project</th>
<th>Disposal Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. River Channel Maintenance</td>
<td>29,350 cy.</td>
</tr>
<tr>
<td>2. Sawyers Marina Maintenance (unlikely)</td>
<td>(5,000 cy)</td>
</tr>
<tr>
<td>3. Riverbend Marina Maintenance</td>
<td>32,000 cy</td>
</tr>
<tr>
<td>TOTAL DREDGING NEEDS</td>
<td>66,350 cy</td>
</tr>
</tbody>
</table>
Disposal Options

- Ocean Disposal

Materials from this portion of the river channel have not historically been transported to the ocean for disposal since the shallow (10 feet) channel depth generally prohibits the large hopper dredges from accessing the area. However, shallow draft bucket dredges could be used to place channel maintenance materials on barges which could then be towed to the off shore disposal site for disposal of the materials. Composition of the material is generally acceptable for ocean disposal, however, testing of the specific materials to be disposed would be required prior to disposal.

- Land Disposal

Table 11 lists the land disposal sites which are available within River Segment 2. All of these sites can be served by pipeline dredge.

<table>
<thead>
<tr>
<th>Site No.</th>
<th>Approximate Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>30,000 cy</td>
</tr>
<tr>
<td>8</td>
<td>7,000 cy</td>
</tr>
<tr>
<td>9</td>
<td>16,200 cy</td>
</tr>
<tr>
<td>10</td>
<td>6,200 cy</td>
</tr>
<tr>
<td><strong>TOTAL CAPACITY</strong></td>
<td><strong>59,400 cy</strong></td>
</tr>
</tbody>
</table>

Discussions of the individual sites are contained on the following pages.
SITE 7 (Illustrated on Figure 5)

Site Description

Location: Immediately southeast of Coquille Point

Size: 1300' x 250'

Capacity: 30,000 cubic yards, at 5' depth uncompacted.

Physical Characteristics: Old fill site, maintained as a level area along the river front. No water influence is evidenced.

Biological Characteristics: Some natural revegetation has occurred with a few grasses and small shrubs beginning to establish themselves. Bird and mammal populations probably use the area in a transient manner.

Zoning: Marine commercial

Comprehensive Plan: Marine commercial

Ownership: Private - Roy Sawyer

Engineering Considerations:

Method of Dredging: Pipeline dredge with direct disposal or bucket dredge with truck hauling to site.

Design Criteria: Embankment rehabilitation by extension of rock and rip rap should occur to prevent erosion.

Site Preparation: Minimal preparation necessary for site use. Construct berms of on-site material to prevent spillage onto adjacent tidelands. Drainage improvements along highway would be minor.

Site Unit Development Cost: $0.30/cubic yard.

Dredging Cost: Variable

Future Use Constraints: Unless dense, sandy material is used for fill and good compaction occurs, short term usage should involve only light foundation loadings or open space uses.

Environmental Considerations:

Effects of Disposal: The site is existing fill material, and does not support a strong vegetation community. Grasses and small shrubbery
Yaquina Bay Dredged Material Disposal Plan

Figure 5
Scale 1" = 400'

Disposal site
Peripheral diking
Interior diking
Natural barrier
Outfall
Discharge point
Outfall pipe
Primary fill area
Secondary fill area
Overflow
Surface drainage
occur in the area, but have not established significant growths. The northeast border of the area is lined with older trees, which have established along the bank of a small drainage ditch. The trees support some faunal life, but could easily revegetate.

Other Considerations:

Site 7 is currently unused, but recent plans have been proposed by the owner for marine commercial uses that would be consistent with the existing county comprehensive plan. Use of the site for the disposal of dredged materials would not preclude future marine commercial use, but could postpone that development unless mechanical compaction methods were used to increase the compaction rate. Site 7 is the only area along this stretch of the river that has sufficient capacity to handle the projected maintenance dredging needs of the Riverbend Marina.

If Site 7 is to be used to meet the maintenance dredging needs of either the river channel or Riverbend Marina, use of the site could extend over a 20 year period. It is questionable whether the present owner would wish to leave the site undeveloped until its disposal capacity has been reached. Due to the time factor, it may be necessary for either the Port of Newport, or private marina operators to explore either acquisition or a long-term lease for this site.

The water and tideland areas adjacent to Site 7 receive significant sport fishing use. Specific plans for disposal of dredged materials on the site should protect that use.
Yaquina Bay Dredged Material Disposal Plan

Figure 6
Scale 1" : 400

Wilsey & Har
SITE 8 (Illustrated on Figure 6)

Site Description

Location: South of Margaret's Marine Ways, 1/2 mile north of Oneatta Point.

Size: 500' x 100'

Capacity: 7,000 cubic yards at 5 feet depth, uncompacted

Physical Characteristics: This site is a past fill area, and is level except for a small pond. Though water collects in the pond, there are no fresh-water creeks or streams running onto the site.

Biological Characteristics: There is very little vegetation on the site, as fill activity has been fairly recent. Small mammals and birds may use the site, but only in a transient manner.

Zoning: Marine Commercial

Comprehensive Plan: Marine Commercial

Ownership: Private - M. S. Cassell

Engineering Considerations:

Method of Dredging and Filling: Bucket dredge and truck haul to site.

Design criteria: Similar to Site No. 7

Site Preparation: Similar to Site No. 7. No outfall is required.

Site Unit Development Cost: Negligible

Dredging Cost: Variable

Future Use Constraints: Unless dense sandy material is used to complete the site and good compaction occurs, short term usage should be for open storage or open space.

Environmental Considerations:

Effects of Disposal: This is a small area that has been recently filled with dredged material. Very little vegetation exists in the area, other than grasses and a thin line of trees on the east border. Faunal life is minimal, and probably transient. No significant wildlife losses could be expected to occur as a result of site use.
After the placement of future dredge materials on the site, revegetation would be possible. Given a chance to develop a solid floral community in the area, the various wildlife niches would be filled. However, due to location and surrounding land-uses, the site may be better suited for strictly human uses.

Other Considerations:

The small capacity of this site limits its usefulness to the disposal of material generated by maintenance dredging at the local moorages and marinas. Bucket dredges would remove the material from the moorage areas and place it on trucks for hauling to the site. It is possible that the proposed marina development adjacent to Site 8 will generate dredged materials, and they also could be placed on this site.

The disposal of dredged materials on Site 8 would not significantly increase the future useability of the site. It is currently zoned for marine commercial use and the owner has proposed construction of a marina on the site. Placement of dredged materials on the site would not preclude that development, but could postpone it until adequate compaction had occurred. Lease or easement arrangements between the site owner and disposal users would be the preferable implementation mechanism. Because of its relatively small capacity, Site 8 has a low priority for use within this river segment.
SITE 9 (Illustrated on Figure 7)

Site Description:
Location: Across main road from Riverbend Moorage, at Oneatta Point
Size: 250' x 250'
Capacity: 16,200 cubic yards @ 7 feet depth, uncompacted

Physical Characteristics: This site is the base of a drainage system, where the fresh water in-flow flattens out from steep ridges. The "bottom-land" is fairly narrow with slight sloping. The soil type is an Astoria silt loam. The water in-flow is a creek, and flows year-round. A small fresh-water marsh exists in the middle of the site.

Biological Characteristics: Vegetation is dominated by a thick riparian alder grove, with an understory of blackberry, reed grass, huckleberry, and salal. Various perching birds, such as vireos, warblers, and finches, nest and feed in the area. Moles, shrews, raccoon and deer use the area as well.

Zoning: A-2
Comprehensive Plan: Single-family residential
Ownership: Private - Riverbend Marina

Engineering Considerations:
Method of Dredging and Filling: Pipeline dredge or bucket dredge with truck haul to site.
Design criteria: May be filled approximately five to seven feet. Some drainage diversion is necessary along the northwest border of the site. Runoff should be controlled to prevent siltation of nearby tideland. If a pipeline dredge is used, outfall must extend to deep water area.
Site Preparation: Clearing is required, as well as leveling if used by pipeline dredge. Construct dikes of on-site material sufficient to prevent spillage onto highway or into drainageway.

Site Unit Development Cost: $0.60/cubic yard
Dredging Cost: Variable
Future Use Constraints: Similar to Site No. 8
Yaquina Bay Dredged Material Disposal Plan

Figure 7
Scale 1" : 400'

Disposal site
Peripheral dike
Interior dike
Natural barrier
■ Outfall
□ Discharge point
△ Outfall pipe
P Primary fill area
S Secondary fill area
△ Overflow
---- Surface drainage
Environmental Considerations:

Effects of Disposal: The existing thick alder grove would be cleared if the site were used for disposal activities. Disposal of materials over the entire site would result in inundation of a small freshwater marsh. However, the marsh could be avoided, resulting in decreased site capacity. The initial loss of flora and fauna would be significant. Faunal species would relocate where niches were available, though some individuals would perish at the outset or during the relocation attempt.

After disposal, the area could be replanted, and the vegetation community could reestablish itself in seven to ten years. The marsh would be lost permanently; however, due to its small size, this is not considered a significant loss. Faunal groups would reestablish themselves as the floral community developed.

Other Considerations:

The existence of a freshwater marsh in Site 9, although small in size, causes this site to receive a very low priority for use when evaluated by the state and federal permit review agencies. If the site were to be used, it is probable that the marsh and natural drainageways would require significant protection and drainage diversion.

The site is currently owned by Riverbend Marina, thus use of the property for their disposal needs does not require either acquisition or use agreements. The current comprehensive plan designates the land for future single-family residential use. It is possible that if the Riverbend Marina owners wish to convert the property to residential use, dredged materials from their marina could be used during the early stages of site preparation. Sufficient lead time would be necessary in order to allow for compaction and settling prior to construction.
SITE 10 (Illustrated on Figure 7)

Site Description:
Location: Adjacent to and south of Riverbend Marina (Oneatta Point)
Size: 240' x 200'
Capacity: 6,200 cubic yards at 3.5 feet depth, uncompacted

Physical Characteristics: The site is a flat area, currently used as a dredged material disposal site. Water drainage from nearby slopes is channeled underneath a portion of the site through a culvert system. The outfall is clear of the disposal site.

Biological Characteristics: Due to recent filling activity, there has been no reestablishment of the biologic community.

Zoning: Marine commercial
Comprehensive Plan: Marine commercial
Ownership: Private - Riverbend Marina

Engineering Considerations:
Method of Dredging and Filling: Bucket dredge with truck haul to site.
Design Criteria: Use berms constructed of on-site material to prevent spillage onto adjoining tideland. Additional rip rap and erosion control may be necessary.

Site Preparation: Maintain berms
Site Unit Development Cost: Negligible
Dredging Cost: Variable
Future Use Constraints: Similar to Site No. 8

Environmental Considerations:
Effects of Disposal: This is an existing fill site, and no vegetation, other than grasses, has been established. Future materials should not alter the current condition, so no loss to vegetation or wildlife is expected.
After the dredged material disposal is completed, revegetation could take place with communities establishing themselves in seven to ten years. Faunal groups will move into the area as habitats become established. However, due to the site location and adjacent land uses, it may be more feasible to use the site for commercial or recreational purposes.

Other Considerations

Site 10 is currently used for the disposal of dredged materials removed during the maintenance dredging of Riverbend Marina, and continuation of this use is proposed until the site reaches its capacity. The site is designated for marine commercial use in the current comprehensive plan and will be available for that use after disposal and the necessary compaction have occurred. No implementation action is required since Riverbend Marina is the current owner of the site.
Summary & Recommendations

It is projected that dredging within River Segment 2 will generate approximately 66,000 cubic yards of dredged materials. Channel maintenance accounts for about 30,000 cubic yards of this total, although since this river segment has not previously required channel dredging, it is questionable whether it will in the future. The remaining 32,000 to 37,000 cubic yards of dredged materials would result from the maintenance dredging of the marinas that are located along River Segment 2.

The total capacity of the four sites located within River Segment 2 is between 39,000 and 40,000 cubic yards, which results in a deficit of about 26,000 cubic yards. In addition, Site 8 is a low priority site due to its small capacity, while Site 9 is a low priority site due to the existing marsh habitat. Since sufficient land areas have not been identified within River Segment 2 to meet the projected disposal needs, other options must be evaluated. The following possible options are suggested:

Option 1: Channel maintenance materials within River Segment 2 could be removed by bucket dredge, placed on barges and transported to the off shore ocean disposal site for dumping. This would leave the land sites available for use by the marina owners for disposal of their maintenance dredging materials. When Riverbend Marina has filled Site 10 to its capacity, they will need to locate a disposal site upon which they can place the additional 26,000 cubic yards of material they will generate during the 20 year planning period. The only site within River Segment 2 that could accommodate that volume would be Site 7 which is currently in private ownership. The other options available to Riverbend Marina include development of Site 9 and placement of a portion of their dredged materials on that site during site preparation, or stockpiling their material on Site 10 and trucking them to an upland site for disposal. (Criteria for upland disposal sites are discussed in Section IV).

Option 2: Sites 7 or 10 (or both) could be used as stockpile sites although neither site is particularly well-suited for that use. If these sites were developed for stockpiling, both the channel and marina maintenance materials could be placed on the sites assuming that the dredged materials were trucked away at regular intervals. The stockpiled materials could be made available for public use or trucked for disposal to upland sites prepared by the port and the private marina operators. Trucking the dredged materials substantially raises the disposal costs, unless the materials can be sold or given away to a private party that will transport them at their own expense.
Option 3: The capacity of the land sites within River Segment 2 is sufficient to meet the projected channel maintenance needs without utilizing Sites 8 and 9. If the port reserved Sites 7 and 10 for disposal of channel maintenance materials, the marina operators would be forced to locate other (probably upland) sites for the disposal of their maintenance dredging materials, resulting in increased maintenance costs. These additional private costs could be offset by port participation in upland disposal site acquisition and possible financial support through the purchase of the equipment necessary to transport the dredged materials.

Option 1 is the recommended option due to its lower costs, easier implementation and better suitability for the sites involved. It is currently unknown whether channel maintenance dredging will be necessary; however, since the channel materials are believed to be suitable for ocean disposal, it is reasonable to dispose of them in that manner. Lincoln County may wish to assist Riverbend Marina in their location of suitable disposal sites, both as relates to Sites 6-10 identified in this document, or in relationship to upland sites.
River Segment 3
Yaquina Bay Dredged Material Disposal Plan

River Segment 3
Scale 1"=1760'

Disposal Site

Shoaling Area

Wilsey & Ham
RIVER SEGMENT 3 (RIVER MILE 5.7 TO RIVER MILE 7.9)

Dredging Needs

- Maintenance of Existing Projects

Maintenance of the navigation channel in River Segment 3 would result in the dredging of about 75,000 cubic yards over the next 20 years. This is the only maintenance dredging that would occur along this segment.

- Construction of New Projects

No new projects have been identified within River Segment 3.

Disposal Options

Three sites have been identified for possible disposal of dredged materials within River Segment 3. Table 12 lists those sites and their estimated capacities.

<table>
<thead>
<tr>
<th>Site No.</th>
<th>Approximate Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>37,000 cy</td>
</tr>
<tr>
<td>12</td>
<td>32,000 cy</td>
</tr>
<tr>
<td>13</td>
<td>30,000 cy</td>
</tr>
<tr>
<td>TOTAL CAPACITY</td>
<td>99,000 cy</td>
</tr>
</tbody>
</table>

The physical characteristics and parameters for use of each of the above sites is contained in the site discussions on the following pages.
Yaquina Bay Dredged Material Disposal Plan

Figure 8
Scale 1" : 400'

Wilsey & Ham
SITE 11 (Illustrated on Figure 8)

Site Description:
Location: Approximately 1,800 feet east of Poole's Slough on the south side of Yaquina River.
Size: 200' x 500'
Capacity: 37,000 cubic yards at 10 feet, uncompacted

Physical Characteristics: This site is the opening of a small drainage system, which flattens out and widens at the base of the steep hills. The north end of the site is diked by the county road. The site slopes upward to the south, and the north end has the lowest elevation. Soil type is a Fendall silt loam. A seasonal creek runs through the site draining the surrounding hills.

Biological Characteristics: Grasses cover the "bottomlands" of the site, and some freshwater marsh vegetation is visible. The hills surrounding the site are covered by alder and Douglas fir. Shrews, moles and squirrels inhabit the site, as well as various perching birds, including woodpeckers.

Zoning: A-2
Comprehensive Plan: Rural residential
Ownership: Private - Elizabeth Hall, c/o Russell O. Sinnhuber

Engineering Considerations:
Method of Dredging and Filling: Hydraulic pipeline
Design Criteria: Upland drainage must be diverted through the fill site. Protect road embankment on north by construction of a gravel cut-off wall. A sand blanket with plastic filter fabric placed over the surface should reduce clogging upon placement of dredged material. Maintenance of low soil saturation is important to stability of the road embankment (See Figure 8). Return flow should be to deep water.

Site Preparation: Construct drainage diversion with use of culvert, spillways, road undercrossings for filling and return flow, and wall. Some minor clearing and leveling is necessary.

Site Unit Development Cost: $0.44/cubic yard
Dredging Cost: $3.00/cubic yard range due to higher elevation.

Future Use Constraints: Open space use is desirable for at least 10 years to allow adequate settling and compaction.

Environmental Considerations:

Effects of Disposal: This site contains a small ecotype used primarily by moles, shrews and perching birds. Filling of the site would destroy some species and force the rest to attempt to relocate. Displaced fauna would have to relocate in areas where niches were available or perish. The habitat that would be lost is not unique to the overall area. The site could be revegetated, and new habitat types established in three to seven years.

Other Considerations:

Site 11 is currently undeveloped, but is designated for rural residential use in the current comprehensive plan. Placement of disposal materials on the site would provide a suitable residential building site; however, use of the site would be precluded for 7 to 10 years after filling had been completed. Because Site 11 may not be filled to capacity for approximately 10 years, it would be 15-20 years before a permanent residence could be constructed on the site. The current owner has indicated that he would like to develop the site in 5-7 years, and would not be willing to have disposal materials placed on the site after that time. This site is a high priority use site, since it is the only available land disposal site within River Segment 3. In order to maximize its efficient use for the disposal of dredged materials, acquisition may be necessary.
SITE 12 (Illustrated on Figure 9)

Site Description:

Location: Approximately 0.4 miles east of Oregon Oyster Company on north side of highway.

Size: 300' x 275'

Capacity: 32,000 cubic yards at 10 feet depth, uncompacted

Physical Characteristics: Low-lying area surrounded by hills, which is the basin for a small drainage system. The soil is a Coquille silt loam. There are small tide channels, as well as a small fresh-water creek.

Biological Characteristics: This site is considered a diked marsh in transition to a terrestrial grassland. The site is primarily grasses, with the salt varieties occurring on the edges of the small tide channels. The borders along the hills to the west, north, and east are covered by a Douglas fir, sitka spruce, alder, and maple floral assemblage. Various moles, shrews, mice and raccoon use this habitat, as well as several perching birds.

Zoning: A-2

Comprehensive Plan: Rural residential

Ownership: Private - Leta May Johnson, c/o Saralee Wells

Engineering Considerations:

Method of Dredging and Filling: Pipeline Dredge

Design Criteria: Similar to Site No. 11 (See Figure 8)

Site Preparation: Similar to Site No. 11

Site Unit Development Cost: $0.60/cubic yards

Dredging Cost: $2.00/cubic yard range

Future Use Constraints: Similar to Site No. 11

Environmental Considerations:

Effects of Disposal: The filling of this site would inundate a diked marsh, permanently closing off the small tide channels that presently
Yaquina Bay Dredged Material Disposal Plan

Figure 9
Scale 1" = 400'

Wilsey & Ham
exist. Most of the site is in transition to terrestrial grassland, which could be reestablished after the disposal project is completed. The faunal groups dependent upon the tide channels would relocate where possible or perish. Those groups existing in the grassland environs would probably relocate, without significant loss. Once vegetation was reestablished, the faunal groups would return to make use of the various habitats.

Other Considerations:

Site 12 is not recommended for current use due to its wetland/marsh habitat. If it were to be used, mitigation would be required as outlined in Goal 16 of the State Planning Goals. Its close proximity to the shoaling areas makes it an acceptable disposal site from an engineering standpoint; however, the presence of wetland/salt water conditions makes it unacceptable from an environmental standpoint. The site is included within this analysis because it could possibly be used if adequate mitigation were provided in return. However, the cost of providing mitigation could offset the benefits provided by the site's close proximity to the navigation channel.

At this time use of Site 12 is not recommended. The resource agencies represented in the review of this document believe that the site would make an excellent mitigation area. Removal of the existing tidegate would return the tidal influence that previously occurred on the site. For that reason it is suggested that Site 12 be considered for the county's mitigation bank as an acceptable site for future mitigation.
SITE 13 (Illustrated on Figure 9)

Site Description:

Location: Approximately 0.6 miles east of Oregon Oyster Company on the north side of the highway.

Size: 500' x 200'

Capacity: 30,000 cubic yards at 10 feet depth, uncompacted

Physical Characteristics: The site is a former marsh that was diked by the construction of the county road. The soil is a Coquille silt loam. Freshwater flows into the area from upland drainage system, although not in significant quantities. Tidal influence occurs daily due to a faulty tidegate.

Zoning: A-2

Comprehensive Plan: Rural Residential

Ownership: Private - Claude Reinoehl

Engineering Considerations:

Method of Dredging and Filling: Pipeline dredge

Design Criteria: Similar to Site No. 11 (See Figure 8)

Site Preparation: Similar to Site No. 11

Site Unit Development Cost: $0.45/cubic yards

Dredging Cost: $2.00/cubic yard range

Future Use Constraints: Similar to Site No. 11

Environmental Considerations:

Effects of Disposal: A diverse marsh assemblage would be destroyed by the filling of this site. The marsh is regularly flushed by tidal action, and supports a variety of freshwater and saltwater grasses. As a marshland, it supports various shorebirds and some waterfowl. The floral groups would be buried by the dredged materials, and could not be replaced. The marine fauna using the area would be destroyed also. Avifaunal and mammalian use of the site would be terminated, as the various species would be forced to relocate. The role of the marsh as a nutrient producer for the estuarine system would also be terminated.
Vegetation could be reestablished after the disposal program is completed. As the vegetation stabilized, habitats would develop which would encourage the influx of terrestrial faunal species, bringing in various small mammals and birds. This may take seven to ten years after the placement of dredge materials.

Other Considerations:

Site 13 is not recommended for current use due to the saltwater marsh which exists on the site. If it were to be used, mitigation would be required as outlined in Goal 16 of the State Planning Goals. It's close proximity to the shoaling areas makes it an acceptable disposal site from an engineering standpoint; however the presence of wetland/saltwater marsh conditions makes it unacceptable from an environmental standpoint. The site is included within this analysis because it could potentially be used if adequate mitigation were provided in return. However, the cost of providing acceptable mitigation could offset the benefits provided by the site's close proximity to the navigation channel. In addition, the property owner has voiced strong opposition to use of the site for the disposal of dredged materials, since he has plans to construct a trout pond on the site.

At this time use of Site 13 is not recommended. The resource agencies represented in the review of this document believe that the site would make an excellent mitigation area. Removal of the tidegate and the road debris placed on the site by Lincoln County would return the tidal influence that previously occurred on the site. For this reason, it is suggested that Site 13 be considered for the county's mitigation bank as an acceptable site for future mitigation.
Summary & Recommendations

Dredging needs within River Segment 3 are estimated to be approximately 75,000 cubic yards over the 20 year planning period. Although the total capacity of the three sites identified in this segment is 99,000 cubic yards, only one of the sites (Site 11) is readily acceptable to the state and federal agencies which are responsible for review of permit applications. Since sufficient land sites are, thus, not available in River Segment 3, other options must be explored for disposal of the projected dredged materials.

Option 1: Site 11 has a capacity of 37,000 cubic yards, which would accommodate about one-half of the dredged materials generated within River Segment 3. By extending the length of the hydraulic pipeline and using a booster pump, it is expected that materials from all of the shoaling areas in River Segment 3 could be disposed on Site 11. The capacity of Site 11 would meet the dredging needs for the next 10-12 years. After Site 11 has been used to capacity, additional materials can be bucket dredged and barged to the offshore ocean site for disposal. The current property owner has expressed a desire to develop his property for residential use within the next few years. Therefore, implementation of Option 1 would probably require purchase acquisition of the site.

Option 2: The Port of Toledo may be able to negotiate a short-term lease with the Site 11 property owner if the site were to be used only once, and in the near future. Thus, the site could be used for disposal of materials generated during the next dredging period, and all subsequent materials would be barged to the off shore ocean site for disposal. Because of the settling and compaction time needed before development could occur on the site, the property owner may not believe this to be an attractive alternative.

Option 3: All dredged materials from River Segment 3 could be disposed in the off shore ocean disposal site. This would result in higher dredging costs during the first 10-12 years since use of the hydraulic pipeline dredge is generally less costly than barging the materials 6-8 miles to the ocean for disposal.

Option 1 or 2 is recommended for River Segment 3 and the choice between the two is dependent upon the arrangements which can be made between the Port of Toledo and the property owner. Option 1, which would probably require the outright purchase of the site is the preferable option because it allows maximum use of the site.
Option 3, however, may become increasingly viable if bucket dredges are used to remove shoaling areas within River Segment 2. This would result in more efficient use of the bucket dredge and barge. The Port of Toledo should coordinate closely with the Corps of Engineers to determine when they will schedule future channel maintenance dredging. This information will assist the Port in deciding which option is the most acceptable.
River Segment 4
Yaquina Bay Dredged Material Disposal Plan

River Segment 4
Scale 1"=1760'

Disposal Site
Shoaling Area

Wilsey & Ham
RIVER SEGMENT 4 (RIVER MILE 7.9 TO RIVER MILE 9.8)

Dredging Needs

- Maintenance of Existing Projects

Approximately 54,000 cubic yards of dredged material would be generated by Corps of Engineers channel maintenance over the upcoming 20-year planning period. This is the only maintenance dredging projected to occur within River Segment 4.

- Construction of New Project

No new construction activities resulting in the disposal of dredged materials have been identified within River Segment 4.

Disposal Options

Table 13 outlines the proposed sites and their approximate capacities.

<table>
<thead>
<tr>
<th>Site No.</th>
<th>Approximate Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>14</td>
<td>19,000 cy</td>
</tr>
<tr>
<td>15</td>
<td>15,000 cy</td>
</tr>
<tr>
<td>16</td>
<td>60,000 cy</td>
</tr>
<tr>
<td>TOTAL CAPACITY</td>
<td>94,000 cy</td>
</tr>
</tbody>
</table>

The following pages present a description of the physical characteristics and the potential use of each of the above sites.
Yaquina Bay Dredged Material Disposal Plan

Figure 10
Scale 1" : 400'

Wilsey & Ham
SITE 14 (Illustrated on Figure 10)

Site Description:

Location: Approximately 0.9 miles east of Oregon Oyster Company on the north side of the highway.

Size: 500' x 130'

Capacity: 19,000 cubic yards at 10 feet depth, uncompacted

Physical Characteristics: This is a flat marshland area that has been diked on the south side by the county road. The soil is the Coquille silt loam type. Freshwater inflow and tide channels exist on the site.

Biological Characteristics: The flora is a mature high marsh in transition to terrestrial grassland. Saltwater vegetation is mixed with upland vegetation, with upland birds being the primary avifaunal users. Smaller mammals, such as the shrews, moles, field mice and raccoons, probably also use the area.

Zoning: A-1

Comprehensive Plan: Rural residential

Ownership: Private - Mae E. Sherman

Engineering Considerations:

Method of Dredging and Filling: Pipeline dredge.

Design Criteria: Similar to Site No. 11 (See Figure 8)

Site Preparation: Similar to Site No. 11

Site Unit Development Cost: $0.70/cubic yards

Dredging Cost: $2.00/cubic yard range

Future Use Constraints: Similar to Site No. 11

Environmental Considerations:

Effects of Disposal: The placement of dredged materials on this site would inundate a mature high marsh. The marsh would be irretrievably lost.
and various marine species, as well as saltwater vegetation, would be sacrificed. The terrestrial grass areas of the site could be reestablished in seven to ten years after placement of the dredged materials. Mammal and bird species would relocate, and probably return to the area after habitats were reestablished.

**Other Considerations:**

Site 14 is not recommended for current use due to its mature high marsh characteristics. If it were to be used, mitigation would be required as outlined in Goal 16 of the State Planning Goals. Its close proximity to the shoaling areas makes it an acceptable disposal site from an engineering standpoint; however, the presence of wetland/saltwater conditions makes it unacceptable from an environmental standpoint. The site is included within this analysis because it could possibly be used if adequate mitigation were provided in return. However, the cost of providing mitigation could offset the benefits provided by the site's close proximity to the navigation channel.

At this time, use of Site 14 is not recommended. The resource agencies represented in the review of this document believe that the site would make an excellent mitigation area. Removal of the existing tidegate could return the marsh to the estuarine system. For that reason it is suggested that Site 14 be considered for inclusion in the county's mitigation bank as an acceptable site for future mitigation.
SITE 15 (Illustrated on Figure 11)

Site Description:

Location: Just east of Boone Island, north of Boone's Slough

Size: 50' x 800'

Capacity: 15,000 cubic yards at 10 feet depth, uncompacted.

Physical Characteristics: Low, slump area between private road and sloping hills. The soil is Coquille silt loam, and experiences a high water table each year. Freshwater influence may occur during substantial local runoff.

Biological Characteristics: The area is mostly comprised of grasses bordered by evergreen trees. Some shrubbery (blackberries, etc.) occurs sporadically. Because of its narrow width, the site is probably used by a small number of animals. Some moles and shrews may nest in the area.

Zoning: A-1

Comprehensive Plan: Natural Resources - Dikeland

Ownership: Private - Ed Stanwood

Engineering Considerations:

Method of Dredging and Filling: Pipeline dredge

Design Criteria: Prevent redirect from returning to Nute Slough.

Site Preparation: Very little work required to prepare site.

Site Unit Development Cost: Negligible

Dredging Cost: $2.00/cubic yard range

Future Use Constraints: Limited to open space until settling and compaction have occurred. Initial salt content may limit agricultural use until leaching reduces levels. High rainfall amounts would increase leaching rate.

Environmental Considerations:

Effects of Disposal: This narrow band of area follows a private dirt road and cannot be considered an ecotype of its own. Filling
the area would bury grasses and certain shrubs (blackberries), but would not eliminate the plants from the general area. Parts of the local habitats would be temporarily lost, but species using those habitats could readily relocate.

The site could be revegetated in three to seven years and habitats could be reestablished during that time. Any losses in the area would be temporary.

Other Considerations:

Placement of dredged materials on Site 15 would raise the area around the existing roadway to the point that the road and adjacent lands would be level. The area is currently designated as Natural Resource - Dikeland in the comprehensive plan and filling of the site would not create any pressure for higher intensity uses.

It is expected that use of the site could be accomplished by lease or easement agreement with the property owner.
SITE 16 (Illustrated on Figure 11)

Site Description:

Location: Southeast edge of Boone Island, just north of Boones Slough, approximately 2,700 feet from river channel.

Size: 300' x 1000'

Capacity: 60,000 cubic yards at 5 feet depth, uncompacted.

Physical Characteristics: Low-lying, flat area bordered on the north by the slopes of Boone Island, and to the south by Boones Slough. The soil is the Coquille silt loam, and portions are inundated each season by the flooding of Boones Slough. There is no tidal influence as the dike contains tide gates. Several seasonal creeks drain into the area from the hills to the north. The site has been reclaimed for farming and grazing.

Biological Characteristics: The site is primarily covered by various grasses. Small mammals (shrews and moles) live in the area, and larger mammals (raccoons, nutria, etc.) probably use the site for water access. During the drier season, field birds feed in the grasses (sparrows, finches, etc.). During the flood and migration seasons, waterfowl (ducks and geese) use the area for feeding and loafing. Fairly large freshwater marshes exist just north of the site, with partial spreading of the marshland into the site area.

Zoning: A-1

Comprehensive Plan: Natural resource - Dikedland

Ownership: Private - Ed Stanwood

Engineering Considerations:

Method of Dredging and Filling: Pipeline Dredge

Design Criteria: Fully diked with general diversion of upland drainage around perimeter. Wetland and seasonally flooded areas would not receive disposal materials. Use of multiple cells may permit return flow to adjacent slough. (Without multiple cells, discharge would be returned to the river, avoiding effects to any marsh tide-flat areas.) Highway undercrossing for pipeline filling would be required. Dikes should average 10 feet plus freeboard. Capacity can be varied to suit need by constructing one or all primary cells. Creation of additional freshwater marsh through placement of fill materials.
Site Preparation: Construction of perimeter and interior dikes, weirs, spillways and highway undercrossing casing. Tidegates may require replacement or rehabilitation. Some minor leveling would be required. Material for diking may be taken from areas where marsh creation or restoration can occur.

Site Unit Development Cost: $0.27/cubic yard

Dredging Cost: $3.00/cubic yard range

Future Use Constraints: None upon completion of dewatering and compaction. May be desirable to reuse portions of the site over extended period of time. Final use should be compatible with adjoining natural areas.

Environmental Considerations:

Effects of Disposal: This site is used by migrating birds for transient habitat. The area contains some grazing foods for waterfowl, but is primarily used as a loafing area. For the most part, the site parallels the north shore of Boone’s Slough and the birds using the shoreline are drawn to the site because of the calm slough waters. No filling would occur within the existing freshwater marsh or seasonally flooded areas unless it was associated with the creation of additional freshwater marsh area. Therefore waterfowl use would be maintained or increased.

The current freshwater marsh areas would be protected from dredged materials, and site use would result in the creation of additional freshwater marsh area.

Other Considerations:

Through Section 150 of the 1976 Water Resources Development Act, the Corps of Engineers has authority to fund the development, creation or restoration of marshlands associated with maintenance dredging activities. Site 16 could be utilized in such a manner. As shown on Figure 11, portions of the site could be altered to increase the amount of freshwater marsh. This habitat is currently of limited availability and is highly productive for the total ecosystem. The comprehensive plan designates this area for Natural Resource use. Disposal of dredged materials would be used to enhance this use, and it is expected that the current land use designation would be preserved.

The current owner of Site 16 offered use of the site in order to raise the land that is now seasonally inundated by flood waters. He presently uses the adjacent land for pasture and hoped to utilize the filled land in the same manner. The proposed dredge disposal plan for this site would place fill material only on the upland areas, or in the lowlands as necessary for the creation of additional freshwater marsh. Thus, the proposed plan is not consistent with the property owners current plans for the site. On that basis, it may be necessary for the Port of Toledo to acquire the site, although a lease or easement agreement would be preferable from an economic standpoint.
Summary & Recommendations

Although the existing disposal sites within River Segment 4 have a capacity of about 94,000 cubic yards, their use constraints and placement in relationship to the shoal areas does not allow maximum efficient use of that available capacity. Approval to use Site 14 would be difficult to achieve due to its mature high marsh characteristics; therefore, it is recommended that the site be placed in Lincoln County's mitigation bank and slated for future mitigation. Sites 15 and 16 have a combined capacity of 75,000 cubic yards, which substantially exceeds the projected 54,000 cubic yards of disposal materials. However, these sites are not located within close proximity to all of the shoaling areas.

The dredged materials located below River Segment 4 could be disposed by use of bucket dredge and barging to the off shore ocean disposal site or possibly by pipeline dredge to Site 16. Careful analysis of bottom sediments will be necessary prior to ocean disposal to ensure that the sediments are acceptable for that disposal method. Current data indicates that they generally are, particularly in light of the very limited alternatives available along this segment of the river, and the mitigation potential of Site 14.

The Port of Toledo and the Corps of Engineers should evaluate specific dredging costs immediately prior to dredging action to determine whether it is more cost efficient to bucket dredge the material or to use the necessary additional booster pumps to pipeline the material from these lower shoals to Sites 15 and 16. If the bucket dredge is used in River Segment 3, then bucket dredging and ocean disposal should provide a more cost efficient disposal method. However, if a land site is used in River Segment 3, then it would be more cost efficient to pipe the material to Sites 15 and 16, rather than to incur bucket dredge mobilization costs for dredging of such a small quantity of material (about 20,000 cubic yards over 20 years).

Sites 15 and 16 would be used for the disposal of dredged materials from the upper shoaling areas (approximately River Mile 8.9 to 9.8). Site 15 would require only minimum preparation so would be available even though it has a relatively small capacity. Site 16 is proposed for development as a freshwater marsh, utilizing Corps of Engineers funds available through Section 150 of the 1976 Water Resources Development Act. Dredged materials would be placed on upland sites, or as necessary to create additional freshwater marsh area.
River Segment 5
RIVER SEGMENT 5 (RIVER MILE 9.8 TO RIVER MILE 11.7)

Dredging Needs

- Maintenance of Existing Projects

Channel maintenance within River Segment 5 is expected to generate approximately 88,000 cubic yards of material within the 20 year planning period. Dredging of the Georgia Pacific log dump can be expected to add an additional 10,000 cubic yards of material. It is possible, but unlikely, that Criteser's Moorage would require some maintenance dredging during this time frame. Mr. Criteser has estimated the quantity to be about 16,000 cubic yards.

- Construction of New Projects

The Port of Toledo is currently preparing plans to construct a small moorage area adjacent to the Toledo Airport. The initial dredging for that proposal would entail removal of approximately 20,000 cubic yards of material. Maintenance of the basin throughout the planning period would add an additional 10,000 cubic yards of material. No specific plans for this facility have been prepared and it is not a high priority for port action, therefore, it will be included in this analysis as a possible project, rather than a specific project.

TABLE 14
RIVER SEGMENT 5 - DREDGING NEEDS

<table>
<thead>
<tr>
<th>Project</th>
<th>Disposal Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Channel maintenance</td>
<td>88,000 cy</td>
</tr>
<tr>
<td>2. Criteser's Moorage (unlikely)</td>
<td>(16,000 cy)</td>
</tr>
<tr>
<td>3. Georgia Pacific log dump</td>
<td>10,000 cy</td>
</tr>
<tr>
<td>4. Toledo Airport &amp; Moorage Preliminary Const.</td>
<td>(20,000 cy)</td>
</tr>
<tr>
<td>5. Toledo Airport Moorage maintenance</td>
<td>(10,000 cy)</td>
</tr>
</tbody>
</table>

TOTAL DREDGING NEEDS 144,000 cy
Disposal Options

Within River Segment 5, two disposal sites along the airport have been identified. The combined capacity of these sites totals about 91,000 cubic yards. Each of these sites (Site 17 and 18) are described in the following pages.
SITE 17 (Illustrated on Figure 12)

Site Description:
Location: Landing strip area, Toledo Airport
Size: 200' x 1800'
Capacity: Potential maximum of 66,000 cubic yards at 5 feet depth, uncompacted.

Physical Characteristics: This site encompasses the general landing strip of the airport. The site is bordered on the west by the Yaquina River, and on the east by low hills. The area is currently improved as the airport runway. No water influence occurs.

Biological Characteristics: The land is denuded of vegetation, and no faunal groups are suspected of using the site.

Zoning: A-2
Comprehensive Plan: Public
Ownership: Public - State of Oregon, Department of Transportation, Aeronautics Division

Engineering Considerations:
Method of Dredging and Filling: Pipeline dredge.

Design Criteria: Should be reserved for primarily sand dredged material having structural fill properties. Existing improvements will be lost and would require relocation until dewatering and compaction are completed. Site can accommodate about 5 feet of fill.

Site Preparation: Very little work would be required. Construct dikes as required to prevent spillage of dredged material into drainage courses or adjacent areas.

Site Unit Development Cost: $0.40/cubic yard
Dredging Cost: $2.00/cubic yard range

Future Use Constraints: None upon completion of dewatering and compaction of fill materials.
Yaquina Bay Dredged Material Disposal Plan

Figure 12
Scale 1" = 400'

Wilsey & Ham
Environmental Considerations:

Effects of Disposal: This site is currently used as an airstrip, and as such has limited habitat value. No vegetation or wildlife would be affected by the filling of this site. All fill material would be confined to the uplands and would not affect the adjacent intertidal areas.

Other Considerations:

The quantity of materials that could be placed on this site is unknown, and is dependent upon the type of runway improvements that will be proposed by the State of Oregon. It is suggested that disposal materials be stock-piled on Site 18 and/or adjacent to the runway so that they will be available for use during construction of the runway improvements. Because of the uncertainty over future runway expansion (in both length and width), this site has a very low priority. The Corps of Engineers and the Port of Toledo should make every effort to coordinate their plans with the Department of Transportation in order to maximize the amount of dredged material that can be placed on the site.
SITE 18 (Illustrated on Figure 12)

Site Description:

Location: Southeast of, and adjacent to, the Toledo Airport

Size: 200' x 350'

Capacity: 25,000 cubic yards at 10 feet, uncompacted. Capacity could be substantially increased if utilized as a stockpile site.

Physical Characteristics: A flat area, bordered on the east by sloping hills and on the west by the Yaquina River. The soil is a Coquille silt loam, with a freshwater creek flowing through the site from the east.

Biological Characteristics: Much of the area has recently been disturbed, denuding most of the vegetation. Along the small creek that runs through the site, however, is a thick growth of shrubs (blackberry) and some trees (alder). These thickets support a number of perching birds and small mammals. Sparrows, finches, and blackbirds use the area, as well as shrews, moles, and raccoons.

Zoning: A-2

Comprehensive Plan: Single family residential

Ownership: Private - Jay and Roland Kiersey

Engineering Considerations:

Method of Dredging and Filling: Pipeline Dredge

Design Criteria: Requires diversion of surface and upland drainage around site. Construct dikes as required to protect adjacent areas from spillage. Protect stream and riparian vegetation with adequate buffers. Discharge return flow into deep water.

Site Preparation: Some minor clearing and leveling required. Return flow may use common spillway and outfall pipeline with Site No. 17. Construct five-foot dikes plus freeboard, spillway and weirs as required.

Site Unit Development Cost: $0.76/cubic yard

Dredging Cost: $2.00/cubic yard range
Future Use Constraints: None upon completion of dewatering and compaction.

Environmental Considerations

Effects of Disposal: This site is primarily composed of blackberry brambles, and as such supports a number of perching birds and small mammals. The area would have to be cleared of vegetation for the placement of dredged materials, which would presumably move most (if not all) of the faunal species out of the site. Most of the fauna would relocate in surrounding areas, experiencing only a temporary interference.

After the fill program was completed, vegetation could be planted for the reestablishment of the habitat, or the area could be maintained for human uses.

If the site is maintained as a long-term stockpile site, revegetation would not occur.

Other Considerations:

The location of Site 18 makes it suitable for stockpile use, even though the available land area is somewhat smaller than is generally used for that purpose.

The Toledo comprehensive plan designates this area for large lot single family residential use. The stockpiling activities will be of sufficiently small scale not to interfere with adjacent airport or residential uses. Because of the long-term nature of stockpiling activities, it is expected that the Port of Toledo will wish to acquire the site for permanent use.
Summary & Recommendations

The capacity of the two land disposal sites identified in River Segment 5 is dependent upon the specific plans for future airport expansion and the potential use of Site 18 for stockpiling purposes. Approximately 144,000 cubic yards of material will require disposal within this river segment over the next 20 years. The capacity of the existing land sites is estimated to be about 90,000 cubic yards, although the 65,000 cubic yards indicated at Site 17 are dependent upon future airport expansion and the timing of that expansion.

By lengthening the pipeline and using booster pumps, it will be possible to place dredged materials from the northern portion of River Segment 5 on Site 19 (within River Segment 6). Approximately 20,000 cubic yards of material from this segment could be placed on that site. In addition, about 10,000 cubic yards of material from the southern portion of River Segment 5 could be placed on Site 15 or 16 in River Segment 4. This would leave about 58,000 cubic yards of channel maintenance material that would require placement on Sites 17 and 18. Without stockpiling, Site 18 has a total capacity of 25,000 cubic yards. When prepared as a stockpiling site, the capacity of Site 18 would be substantially increased over the long run and would be limited only by the Port's ability to dispose of the stockpiled materials.

The increased costs of bucket dredging and hauling that would be incurred this far upriver makes that method almost prohibitively expensive in River Segment 5.

Georgia Pacific has historically used a bucket dredge to remove the materials from their log dump and has then hauled the materials by truck to an upland disposal site. This method of disposal is recommended to continue for future maintenance of the log dump. In addition, construction and maintenance dredging of the proposed Toledo airport boat basin should be handled in the same manner.

The Port of Toledo currently own approximately 30 acres of salt marsh along the east bank of Yaquina River at the southern boundary of River Segment 5. The Port purchased this property for use as a disposal site, but its biological characteristics may prevent it from being used for that purpose. The Port may wish to retain ownership of that site for use as a future mitigation site.
River Segment 6
Yaquina Bay Dredged Material Disposal Plan

River Segment 6
Scale 1"=1760'

Wilsey & Ham

Disposal Site
Shoaling Area
RIVER SEGMENT 6 (RIVER MILE 11.7 TO RIVER MILE 12.9)

Dredging Needs

- Maintenance of Existing Projects

Maintenance of the navigation channel in River Segment 6 will require the removal of about 34,000 cubic yards of material, while the maintenance of the channel in Depoe Slough will result in the dredging of an additional 20,000 cubic yards during the 20 year planning period. The maintenance of the Georgia Pacific barge facility will produce 40,000 cubic yards of material. Thus, maintenance of existing facilities will require the disposal of 94,000 cubic yards of dredged material.

- Construction of New Projects

The Port of Toledo anticipates first phase construction of a boat moorage facility in Little Toyko Harbor. Initial dredging would generate approximately 20,000 cubic yards of material, about 10,000 of which would be used for land site preparation. An additional 20,000 cubic yards of material would result from maintenance of the facility.

Total disposal requirements for River Segment 6 are listed in Table 15.

<table>
<thead>
<tr>
<th>Project</th>
<th>Approximate Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Channel maintenance</td>
<td>34,400 cy</td>
</tr>
<tr>
<td>2. Depoe Slough maintenance</td>
<td>20,000 cy</td>
</tr>
<tr>
<td>3. Little Tokyo Harbor Marina construction</td>
<td>20,000 cy</td>
</tr>
<tr>
<td>4. Little Tokyo Harbor Marina maintenance</td>
<td>20,000 cy</td>
</tr>
<tr>
<td>5. Georgia Pacific Barge facility</td>
<td>40,000 cy</td>
</tr>
<tr>
<td><strong>TOTAL DREDGING NEEDS</strong></td>
<td><strong>134,400 cy</strong></td>
</tr>
</tbody>
</table>
Disposal Options

Two sites with a combined capacity of 186,000 cubic yards have been identified in River Segment 6. Both are located in close proximity to the dredge sites, and the site on the southern shore has been previously utilized for the disposal of dredged materials. The Port of Toledo currently holds an easement on that parcel for future disposal of dredged materials. The characteristics and use of these sites is discussed on the following pages.
SITE 19 (Illustrated on Figure 13)

Site Description:

Location: Across river from Georgia Pacific Company mill, Toledo

Size: 350' x 600

Capacity: 66,000 cubic yards (10 feet, uncompacted)

Physical Characteristics: This site is a large, flat, previously filled area, that sits atop an old river marsh. The only water influence that may occur would be during a flood stage of the Yaquina River.

Biological Characteristics: A grass and shrub community has established itself on the site since fill was placed there in 1969. The site is probably used primarily in transience by local bird and mammal populations, as the surrounding environment is more desirable for food and shelter purposes.

Zoning: A-2

Comprehensive Plan: General Industrial

Ownership: Private - Skelton Estate

Engineering Considerations:

Method of Dredging and Filling: Pipeline Dredge

Design Criteria: Dikes should be improved and extended around the fill site to provide a multiple-cell configuration. At least ten feet of diking is required but could be raised for future filling. May require small initial dredging work to provide diking material.

Site Preparation: Very little work is required other than dike construction with on-site material, if available. Construct spillway, weirs and return flow pipeline to deep water portion of river channel. Disposal would be limited to those areas which have been previously filled.

Site Unit Development Cost: $0.18/cubic yard

Dredging Cost: $2.00/cubic yard range

Future Use Constraints: Limited to open space in the short-term because of slow dewatering and compaction. Upon leaching of salts, will be suitable for grazing and agricultural use.
Yaquina Bay Dredged Material Disposal Plan

Figure 13
Scale 1"=40'
Environmental Considerations:

Effects of the Disposal: This site is an old fill site, used in 1969 for the disposal of local dredged materials. The vegetation that has reestablished there (various grasses) has done so naturally. No revegetation effort was made, thus the development of new habitat in the area has been slow. Faunal use of the site is most likely transient, in that birds or mammals use the site only in passing. If revegetation were enhanced through a replanting effort, habitat would develop more rapidly and fauna would more readily use the site.

The placement of additional dredged materials on the site will have little effect on the present condition, since the disposal of materials will be limited to areas which have been previously filled. Disposal techniques will protect adjacent wetlands from degradation.

Other Considerations:

The Toledo Comprehensive Plan designates Site 19 for future general industrial use, although the current zoning is A-2, or agricultural. It is questionable whether future industrial use is suitable adjacent to the wetland habitats that exist to the west and south of the site. This area serves an important flood control function by providing a natural overflow area, and thus protects the land immediately across the river as well as downstream. Expansion of high intensity uses into that area could potentially alter the flood hydrology of the river. It is suggested that the City of Toledo closely examine this area during its comprehensive plan revision process.

The property owner has indicated a willingness to have dredged materials placed on the site, and the Port of Toledo has previously entered into easement agreements for that use. If the future land use of the site becomes a critical issue, it may be advisable for the Port to acquire the site in order to control the future use.
Yaquina Bay Dredged Material Disposal Plan

Figure 14
Scale 1"=400'
SITE 20 (Illustrated on Figure 14)

Site Description:

Location: Just North of the Georgia Pacific Corporation plywood mill, in Toledo

Size: 500' x 900'

Capacity: 120,000 cubic yards at 8 feet depth, uncompacted

Physical Characteristics: Flat, open area, with some berms on the north side. The area is an old fill site. Freshwater drainage occurs along the north edge from an undetermined source (suspected of draining from the north Toledo hills)

Biological Characteristics: Most of the site is open land, with scattered bunches of grasses, shrubbery and young alder. The northwest part of the site borders a small freshwater marsh. Small birds, such as sparrows, warblers, and finches use the area. Various small mammals also use the area for feeding and nesting purposes.

Zoning: Industrial

Comprehensive Plan: General Industrial

Ownership: Corporate - Georgia Pacific

Engineering Considerations:

Method of Dredging and Filling: Pipeline Dredge

Design Criteria: May be phased or constructed in multiple cells for use with various qualities of dredged material. Major drainage relocation or drain construction necessary. Use dikes to contain material. Return flow should be to the river. Dikes or buffers will be created to protect the adjacent freshwater marsh areas.

Site Preparation: Construct dikes, spillway, weirs and drainage improvements. Some minor clearing and leveling required.

Site Unit Development Cost: $0.18/cubic yard

Dredging Cost: $3.00/cubic yard range

Future Use Constraints: Will be determined by quality of fill material. Better quality materials will allow higher use. Area filled with silty, high organic dredged material should be reserved as open space or for open storage.
Environmental Considerations:

Effects of Disposal: This area has been extensively disturbed by recent human activity. Very little habitat is now available, as the vegetation is mostly scattered grasses and shrubs with some young alders. Any effects on the local flora or fauna would be temporary and minimal. The freshwater marsh to the north should be buffered and preserved.

Other Considerations:

Site 20 has sufficient capacity for long-term use both as a disposal site and as a stockpile site. The relatively large area would allow creation of numerous cells, and flexibility in the placement of the materials. This flexibility should allow minimum conflict with future Georgia Pacific development and storage plans.

The Toledo comprehensive plan designates this area for general industrial use. Placement of dredged materials on the site would not preclude this use. However, silty or highly organic materials should be confined to a small portion of the site, so that future structural use of most of the area is not hampered. Close coordination between Georgia Pacific, the Port of Toledo and the Corps of Engineers is encouraged in order to minimize conflicts over site use. It is expected that a lease or easement agreement would be the most feasible implementation mechanism.
Summary & Recommendations

The location and capacity of the proposed disposal sites and the shoaling areas are well matched within River Segment 6. The use of both Site 19 and 20 will be necessary. Current projections estimate that the dredging needs for this segment of the river are about 135,000 cubic yards, while the capacity of the two sites is about 186,000 cubic yards. All materials from Depoe Slough should be placed on Site 20 since it affords the best opportunity for adequate processing of the silty sediments found in that location.
River Segment 7
Yaquina Bay Dredged Material Disposal Plan

River Segment 7
Scale 1" : 1760'

Wilsey & Ham
RIVER SEGMENT 7 (RIVER MILE 12.9 TO RIVER MILE 14.3)

Dredging Needs

- Maintenance of Existing Projects

Maintenance of the navigation channel above Depoe Slough has not occurred since 1961. Therefore, approximately 48,000 cubic yards of material will require removal from Butler Bridge upstream to the Publishers Paper Co. log storage area during the 20 year planning period.

In order to maintain their barge loading facility, Publishers Paper Co. removes 250-300 cubic yards of material every 5 years. They place this small quantity of material directly on the plant parking lot by use of a bucket dredge.

- Construction of New Projects

No new projects have been identified within River Segment 7.

Disposal Options

Three potential sites with a total capacity of about 420,000 cubic yards have been identified in River Segment 7. Table 16 lists the individual sites and their estimated capacities. The physical characteristics and potential use of these sites are described in the following pages.

<table>
<thead>
<tr>
<th>Site No.</th>
<th>Approximate Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>21</td>
<td>115,000 cy</td>
</tr>
<tr>
<td>22</td>
<td>155,000 cy</td>
</tr>
<tr>
<td>23</td>
<td>150,000 cy</td>
</tr>
<tr>
<td>TOTAL DISPOSAL OPTIONS</td>
<td>420,000 cy</td>
</tr>
</tbody>
</table>

TABLE 16
RIVER SEGMENT 7 - DISPOSAL OPTIONS
Disposal site
Peripheral diking
Interior diking
Natural barrier
Outfall
Discharge point

Yaquina Bay Dredged Material Disposal Plan

Figure 15
Scale 1" = 400'

Wilsey & Ham
SITE 21 (Illustrated on Figure 15)

Site Description:

Location: Upstream from the mouth of Olallie Creek, southeast of the Georgia Pacific Pulp Plant settling ponds.

Size: 375' x 1125'

Capacity: 75,000 C.Y. at 5 feet depth, uncompacted

Physical Characteristics: This site has a varying topography, with a series of small knolls throughout the area. In the low lying areas much of the land is flat. The Coquille silt loam soil has been covered by dredged materials. The site may experience a high water table during the wetter seasons.

Biological Characteristics: The area has been disturbed extensively in the past, so that any vegetation or wildlife existing on the site has established in recent times. Shrubs are the predominant vegetation (scotch broom), with a strong stand of riparian (alder) vegetation along the creek.

Zoning: Industrial

Comprehensive Plan: General Industrial

Ownership: Corporate - Georgia Pacific

Engineering Considerations:

Methods of Dredging and Filling: Pipeline Dredge

Design Criteria: Important to divide site with interior diking so that adequate settling of dredged materials occurs. Return flow will be to Olallie Creek. Existing dikes should be improved to prevent loss or spillage to the creek. Existing poor water quality in Olallie Slough will restrict dredging times. Dredging efforts must be coordinated with Oregon Department of Fish and Wildlife in order to minimize effects on the fish runs.

Site Preparation: Improve dikes using on-site material, construct weirs, spillway and discharge pipe installation.

Unit Site Development: Cost: $0.27/cubic yard range

Dredging Cost: $3.00/cubic yard range

Future Use Constraints: If filled with dredged material from the vicinity of Depoe Slough, the area should remain in open space use until adequate settling and compaction has occurred.
Environmental Considerations:

Effects of Disposal: This area has been extensively disturbed by recent human activity, and therefore supports no strong habitats. Small shrub groups exist scattered throughout the site, but none are extensive enough to support a diverse faunal group. The filling of the site would cause minimal effects to the local environment. Of greatest concern is the marsh area on the northeast border that lines Olallie Creek. This is a well established marsh, and should be protected from adverse impacts. Future use of the site should take into consideration the preservation of the marsh. The proposed diking system will protect the existing riparian system so that wildlife impacts will be minimal.

Close coordination with the Oregon Departments of Environmental Quality and Fish & Wildlife will insure that placement of dredged materials occurs during a time period that will minimize water quality and fisheries impacts in Olallie Slough.

Other Considerations:

Only a small portion of the capacity of this site would be used during the 20 year planning period, and dredged material placement could be coordinated so as not to interfere with other planned uses of the site. The current comprehensive plan designates Site 21 for future general industrial use. The placement of dredged materials on this site does not preclude this use; however, adequate settling and compaction must occur prior to structural use of the site. Close coordination with Georgia Pacific is advised in order to insure the most efficient short-term and long-term use of the site.
SITE 22 (Illustrated on Figure 15)

Site Description:
Location: Upstream from the mouth of Olallie Creek, on the east side of the creek.
Size: 600' x 1,000'
Capacity: 110,000 cubic yards at 5 feet depth, uncompacted

Physical Characteristics: The site is a flat pasture, with berms formed along the waterfront. The soils is the Coquille silt loam variety, with water influence possibly occurring during flooding of the Olallie Creek.

Biological Characteristics: As pastureland, the site is restricted in both floral and faunal assemblages. Pasture grasses are the main plant types, and some burrowing mammals may live there. Field birds (crowned sparrows, goldfinches, etc.) would use the area for feeding.

Zoning: A-2
Comprehensive Plan: Rural residential
Ownership: Private - Ray and Lurena Fieber

Engineering Considerations:
Method of Dredging and Filling: Pipeline Dredge
Design Criteria: Similar to Site No. 21
Site Preparation: Similar to Site No. 21
Site Unit Development Cost: $0.11/cubic yards
Dredging Cost: $3.00/cubic yard range
Future Use Constraints: May be phased and returned to grazing and agricultural use after dewatering and initial settling.

Environmental Considerations:
Effects of Disposal: This diked pasture would not experience significant adverse impacts due to the disposal of dredged materials. Shrews, moles and gophers may be the only fauna that would be directly influenced by the fill action. Some of these mammals may perish, or
relocate. Field birds, such as blackbirds and meadowlarks, would feed elsewhere. The habitat is not unique to the area and no significant impacts would occur as a result of its use.

The site could be replanted in grasses after two to four years, and the pastureland could be regained in five to ten years. Any impacts on the area would be temporary.

Close coordination with the Oregon Departments of Environmental Quality and Fish & Wildlife would be necessary to insure that dredging schedules were consistent with water quality and fisheries needs.

Other Considerations:

The current comprehensive plan designates this area for rural residential use. The placement of dredged materials on the site should not preclude this use; however, structural use of the site would be postponed until adequate settling and compaction had occurred. Raising the elevation of the property through placement of disposal materials should not create additional pressures for conversion to more intensive land uses.

Neither the capacity of Site 21 nor Site 22 could be fully utilized during the 20 year planning period. These sites are in close proximity to each other; therefore, use of only one of the sites would be sufficient to meet the short-term dredging needs. The Port of Toledo may wish to negotiate with both property owners to determine which site is the preferable option. It is expected that a long-term lease or easement would provide the necessary implementation flexibility.
SITE 23 (Illustrated on Figure 16)

Site Description:
Location: Southern portion of Publishers Paper's log storage area
Size: 400' x 400'
Capacity: 40,000 cubic yards at 5 feet depth, uncompacted

Physical Characteristics: A flat, open area, bordered on the west by the Yaquina River and to the east by railroad tracks. The soil is Fendall silt loam, and experiences seasonal high water tables. Berms line the river-side border. Existing use is log and slash storage.

Biological Characteristics: The site is currently used for storage of logs and slash material. There is no significant flora or fauna on the site. Adjacent uses include pastureland which experiences annual inundation due to a high water table.

Zoning: Industrial (I-1)
Comprehensive Plan: General Industrial
Ownership: Corporate - Publishers Paper Co.

Engineering Considerations:
Method of Dredging and Filling: Pipeline Dredge
Design Criteria: Similar to Site 21.
Site Preparation: Similar to Site 21
Unit Site Development: Cost: $0.22/cubic yard
Dredging Cost: $2.00/cubic yard

Future Use Constraints: None upon completion of dewatering and compaction, but limited to non-structural loading for 5 to 10 years. Latter is subject to further soils investigation.

Environmental Considerations:
Effects of Disposal: Placement of additional dredged materials on the site would have no adverse environmental effects. Habitat use is restricted by the current use of the site. Direct outfall into the river channel would prevent any adverse impacts to the adjacent pasture/wetland area.
Other Considerations

Use of Site 23 will require close coordination with Publisher's Paper Co. in order to maximize continuing efficient use for both log storage and dredged material disposal purposes. The land is currently zoned for general industrial use, and placement of dredged materials on the site will not alter that use. All materials will be placed on top of existing fill.

The area adjacent and southeast of Site 23 is currently open pasture that experiences seasonal inundation due to a high water table. Publisher's has indicated that they would be willing to receive fill material on that property; however, filling cannot occur due to the existence of a wetland habitat.

Negotiation of a lease between Publisher's Paper Co. and the Port of Toledo is the advisable implementation mechanism.
Summary & Recommendations

The capacity of the available dredged material disposal sites in River Segment 7 far surpasses the anticipated need, although it is expected that Georgia Pacific may use a portion of Sites 22 and 23 for disposal and settling of their sludge pond wastes. Sites 21 and 23 have the highest priorities for use since they have been previously disturbed by disposal activities.
SECTION IV DISPOSAL GUIDELINES

The individual disposal site discussions contained in the previous section presented the engineering considerations and use criteria for each proposed disposal site. These criteria vary for each site depending upon both the characteristics of the site and of the dredged material to be placed on the site. Although different criteria were applied to specific sites, there are a number of disposal guidelines which should be applied to all disposal sites. The following general guidelines were developed through review of technical literature, interviews with dredging and disposal technicians, and discussions with federal and state agency personnel responsible for the review of disposal activities.

1. Drainage Diversion

   Proper diversion of surface water runoff must be provided to maintain the integrity of the natural streams and drainageways. Leaching of disposal runoff into the waterway must be controlled and all disposal runoff water must enter the waterway through an appropriate outfall. Underground springs must be identified and protected.

2. Sediment Quality & Turbidity

   Dikes should be well constructed and large enough to encourage proper "ponding" and to prevent the return of suspended fines into the waterway or estuary. Ponds should be designed to maintain at least one foot of standing water at all times to further encourage proper settling. Weirs should have 2-3 inch crest heights.

   Sediment analysis has been recently performed on material from a number of sections of the navigation channel, as well as the commercial boat basin and South Beach Marina site. Prior to dredging, sediment analysis should be performed for off-channel and nearshore areas that may contain finer silt or organic matter. This will ensure that proper disposal precautions can be planned for in the specific design of the disposal sites.
3. Timing

The timing of dredging and disposal activities should be coordinated with the Department of Environmental Quality and the Department of Fish and Wildlife to ensure adequate protection of biologically productive elements such as fish runs, spawning activity, etc. In general, disposal should occur during periods of adequate river flow to aid flushing of suspended sediments. Timing of disposal action is particularly important in the Olallie Creek area of Toledo due to existing poor water quality conditions.

4. Land Surface Use

Disposal of dredged materials should occur on the smallest possible land area in order to minimize the quantity of land that is disturbed. Clearing of land should occur in stages on an as needed basis. Reuse of existing disposal sites is preferrable to the creation of new sites in order to minimize the total land area covered by disposal material.

5. Revegetation

Revegetation of disposal sites should occur as soon as is practicable in order to retard wind induced erosion and to restore wildlife habitat value to the site. Native species should be used and reference should be made to the Inter-Agency seeding manual prepared by the Soil Conservation Service. Efforts should be made to minimize the time necessary to achieve leaching of salts from the soils.

6. Toxic Materials

Materials dredged from the Newport commercial boat basin and Depoe Slough in Toledo will have higher toxic characteristics than materials removed from other parts of the bay and river. Sites which will contain these materials have been designed to include secondary cells in order to achieve good quality effluent. The discharge from these sites should be monitored to ensure that adequate cell structures have been constructed and are functioning properly.
7. Upland Disposal

In some instances dredged materials will be trucked to upland disposal sites for final disposal. The following criteria should be used to evaluate the selection of and design for upland disposal sites:

- minimize the effects on receiving streams or drainageways
- minimize the effects on vegetation and wildlife
- provide adequate diversion of surface water
- minimize adverse primary or secondary land use effects
- locate the site where it is easily accessible to trucks

8. Land Use

As discussed further in Section V, the effects of dredged material disposal on land use must be addressed in the County's Comprehensive Plan. It is the county's responsibility to accept land use policies to prohibit filled land from creating pressure for more intensive uses than those outlined in the county's plan and policies. This issue will be further addressed in the implementation discussion in Section V.

9. Influent discharge points will be placed at a sufficient distance from outfall points to maximize settling.

10. Federal and state water quality standards will be considered during all phases of the disposal activity.
Section V Implementation
SECTION V IMPLEMENTATION

The economy of the Yaquina Bay and River region is dependent upon continuing navigational use of the waterway. In order for navigation to continue, dredging must occur to maintain the necessary channel depths. In turn, the ability to dredge is dependent upon the availability of adequate sites for the disposal of dredged materials. Along Yaquina Bay and River the supply of land disposal sites which meet the necessary environmental and engineering criteria is limited, and those that are acceptable must be considered as a scarce resource, worthy of careful allocation in order to maximize the public benefit. Due to the scarce nature of these sites, a program must be evolved to insure that the sites are reserved for disposal use and are available for disposal when needed. Preparation of a workable implementation program requires answering two major questions:

1. Planning Options: How should the proposed sites be designated in the comprehensive plan and zoning ordinance?

2. Site Use Options: What kind of arrangements for site use should be made between the applicable public agencies and the private property owner?

A variety of answers to these questions are discussed below.

Planning Options

Placing dredged materials on a land site must be viewed as a short-term use of that land resource. Once the disposal action has been completed and the necessary settling, compaction and stabilization has occurred, the land becomes available for a variety of land uses depending upon the specific site characteristics and location. Therefore, although a specific site may be utilized for the disposal of dredged materials throughout a 20 year period, the disposal use is only temporary and the land may be converted to a more permanent use after the disposal has been completed.

The primary concern in the preparation of the Yaquina Bay and River dredged material disposal plan has been the relative scarcity of acceptable disposal sites, especially above River Mile 3.0. The study team believes that the sites identified in Section II are the only land sites adjacent to the shoreline which are able to receive the approval of the applicable federal and state permit agencies. If these sites are not made available for the disposal of dredged materials, other, more expensive, disposal options must be explored.
The loss of these sites to other permanent uses prior to the placement of dredged materials would result in increased public costs and could potentially inhibit not only the maintenance of the existing navigation routes, but the development of new economic enterprises as well.

It is the recommendation of the study team that the dredged material disposal sites determined to be necessary for future use should be reserved in a special overlay zone in the comprehensive plan. Since disposal use is a short-term use of the land, we recommend that the comprehensive plan land use designation for the sites reflect the long-term desired use such as residential, commercial, industrial or recreational. By that action, the property owner is informed of the county's long-term policies for the particular parcel. In the short-term, however, it is recommended that a "dredged disposal site overlay zone" be placed on all acceptable sites, in essence reserving those sites for the disposal of dredged materials. Use of the site would be allowed if it did not result in the construction of permanent facilities and was consistent with the comprehensive plan. Once the disposal of the total quantity of dredged materials was completed, the overlay zone would be removed, and the land would be available for the use designated in the comprehensive plan.

The adoption of such an overlay zone would reserve the land for the disposal of dredged materials, while identifying the anticipated long-term use of the land area. Property owners would not be prohibited from the short-term use of the land, but would be limited to uses which did not create a permanent commitment of the land. Again, this type of a reserve system is suggested based on the limited availability of acceptable sites and the belief that use of the available sites must be maximized for the public benefit.

Site Use Options

A variety of implementation options are available for use by the Ports of Newport and Toledo in order to acquire use of the necessary disposal sites. The specific option chosen for each site should be dependent upon the site conditions, discussion with the property owner and the potential future use of the site. The following pages describe a wide range of methods that are available to implement the proposed plan. These include property acquisition, easements, purchase of development rights, property exchanges and other related methods. Any one or a combination of these options may be used based on the preferences of the local implementing agencies.
Before the actual site acquisition methods are described, it is important to understand the method by which site acquisition is funded. The study team explored a variety of state and federal funding programs to determine the availability of outside funding for use in program implementation. At this point, no federal or state funding programs have been identified which would aid the local agencies in plan implementation. In the past, acquisition of disposal sites has been the financial responsibility of the individual port district benefiting from the action or the private party initiating the dredging. This is expected to continue. Although Lincoln County will supply planning and implementation support, they are not expected to share in the implementation costs with one possible exception. If a proposed dredged material disposal site has future potential for public use including recreation, shoreline access or other uses of public benefit, then the county may wish to purchase the site and convert it to that designated use after the disposal activities have been completed.

The following paragraphs define a range of acquisition and use options which are available to the local implementing agencies:

- Easements

The property owner and the port district may enter into an easement agreement whereby the property owner grants the right to place dredged materials on his/her land. The owner retains full use and ownership rights to the land, but allows materials to be placed on the property under the conditions outlined in the easement. When disposal is completed, full use of the site reverts to the owner.

This method is most applicable when the private property owner either desires fill material to be placed on the land to enhance the sites future potential, or at least has no objection to the placement of the material. Because the owner maintains direct use of the site during and after disposal, the cost of acquiring easements is generally less than many other methods. Use of easements is common practice among port districts and the Port of Toledo currently has easements on two of the sites identified in Section III. Easement acquisition may or may not be accompanied by financial reimbursement to the private property owner depending upon the contract agreement reached between the port district and the owner.

- Fee Purchase

The port districts have the option of purchasing outright the sites on which dredged materials are to be placed. Although this option entails higher costs than does easement acquisition, it has several advantages. Many of the sites identified in Section III would not receive all of the necessary disposal materials for a period of 10 to 20 years and permanent use of the site would not be available until after that time. If the port districts and the county believe that
the property owner will not be willing to wait for that period of time, they may wish to purchase the property and absorb the expense of holding the land.

By use of a land banking program, the port districts could purchase disposal sites in unimproved form and retain ownership until the disposal has occurred. After settling and compaction, the port districts could resell the property, thus returning it to the private sector. Although this method would result in increased front-end costs, the future sale of the improved property could result in long-term financial gain to the port districts. Use of public bond funds or creation of a local revolving fund would be possible means of generating the necessary revenue. Again, this implementation method could be used in combination with other methods, thus decreasing the quantity of land to be acquired.

As mentioned previously, if Lincoln County determined that sufficient public benefit could be gained from site acquisition, the county could purchase selected disposal sites and reserve them for future public use. After the disposal activities were completed, the county would make the necessary additional improvements to implement the planned public use of the site.

- Purchase of Development Rights

This implementation method assumes that property ownership carries with it a certain amount of development rights. These rights are transferable and they can be purchased either on a temporary or a permanent basis. If the port district were to purchase the development rights of a piece of property, they would, in essence, be buying a portion of the property owner’s use of the land. Although the property owner would retain full ownership of the land, the use would be restricted to those activities spelled out in the purchase agreement.

Since purchase of development rights can be for a temporary period, the port districts could buy those rights until the disposal actions were completed. At that time the development rights contract could be cancelled, and full use of the site would revert to the property owner.

- Property Exchange

In some instances the port districts may wish to acquire disposal sites through the exchange of property with the disposal site owner. In effect, the port would trade title to a parcel of land they currently own for title of the disposal site they wish to acquire. This method is feasible if the port districts own land that would be desirable to disposal site owners.
When use of a proposed site is implemented by means other than site acquisition, the issue of property taxation must be resolved. If use of a privately owned site prohibits the land owner from making full use of the site, the question remains: Should the property owner carry the tax burden? Lincoln County should explore the possibility of awarding tax deferments on dredged material disposal sites until the site is again available for general use. If it is not possible to implement such a tax deferral, then the Ports of Newport and Toledo should be prepared to negotiate the tax payments for those sites on which use is restricted until disposal has been completed.

Relationship to Comprehensive Plan

The selection of dredged material disposal sites and the preparation of the necessary implementation program are a significant work effort in Lincoln County's comprehensive planning program. The Estuaries Goal adopted by the Oregon Land Conservation and Development Commission states that "local government and state and federal agencies shall develop comprehensive programs, including specific sites and procedures for disposal and stockpiling of dredged materials." When the dredged material disposal plan has been reviewed and adopted by the Lincoln County Planning Department and Board of Commissioners, it will become county policy. As the Planning Department continues with their efforts to resolve the land use issues that are necessary in order to revise the county's comprehensive plan, the dredged material disposal plan will become an integral working portion of the revised comprehensive plan.

The future use of many of the disposal sites and the effect that filling would have on site and adjacent land use cannot be evaluated until after the current revisions to the county's comprehensive land use plan have been completed. The state and federal resource agencies that participated in the review of the dredged material disposal plan expressed concern over the future land use of the proposed disposal sites. The exact land use designations that will be applied to those sites will not be known until the planning program has been completed. The agencies will be afforded an opportunity to participate in that program and to review the proposed comprehensive plan. Their input during that process (as well as the permit review process) should ensure compatible shore-line land use designations.

Plan Review

It is recommended that Lincoln County, in conjunction with the Ports of Newport and Toledo and the Corps of Engineers, review the dredged material disposal plan at 5 year intervals. The purpose of these reviews will be to examine current navigational requirements, the condition of the proposed sites, new permit requirements and the extent to which the plan has been implemented. Any changes
which would enhance the plan's ability to guide the disposal of dredged materials or respond to changing conditions, should be prepared and submitted to the permit review agencies for their review and comment. As necessary, revisions to the plan should be submitted to the Board of County Commissioners for their approval.

Site Use and Permit Review

Prior to actual use of the sites for the disposal of dredged materials, the ports and the Corps of Engineers must prepare specific design materials and determine when and how the sites will be utilized. At that time it will be necessary to apply for the applicable Section 10 and Section 404 permits at both the federal and state level. After approval of the permits, the sites will be available for use, subject, however, to any conditions placed on the permit approval.
SECTION VI  FUTURE CONSIDERATIONS

Although the dredged material disposal plan is directed towards the location of disposal sites for only the upcoming 20 years, Lincoln County and the Ports of Newport and Toledo should begin to look beyond that timeframe and to anticipate some of the future problems.

The disposal activities which will occur within the next 20 years will use most of the available near shore land disposal sites along the bay and river. Some land capacity at both Newport and Toledo may remain subsequent to that time, however, along the river the available land sites will be filled to capacity. Land disposal by pipeline dredge is generally the least expensive disposal option (second only to large hopper dredge use which is limited by draft to the lower bay); therefore, future reliance on other methods such as stockpiling or bucket dredging and barging to the ocean for disposal will significantly increase future disposal costs. Thus, it should be recognized that although implementation of this plan will be cost efficient in the short-run, use of the available sites for current needs will force the selection of more expensive options in the future.

At the initiation of the study process it was hoped that near shore land disposal sites could be found for most of the material to be dredged over the next 20 years. However, this was not the case, particularly from River Mile 3 upriver to River Mile 9.0. Along that portion of the river, the plan recommends that most disposal material be removed by bucket dredge and barged to the ocean for disposal. Unless new equipment and/or disposal techniques become available in the future, it is expected that use of that method will continue unless an increased demand for fill material makes stockpiling a more economically attractive alternative. Technical advances in the field of dredging mechanics may provide some options in the future which are not currently available. One option which is now being used elsewhere along the Pacific Coast is in-water disposal. By this method shoaling materials can be disposed of in deep natural holes, or used to create wetlands. Another method of in-water disposal is termed "flow lane dispersal", the purpose of which is to place the shoal material in the major flow lane so that it will be moved downstream and out of the channel into the ocean.

Although dredging is the common answer to the problem of shoaling in the bay and river, a second approach may be to take steps to control the problem at its source, that is to control the amount of sediment which enters the estuarine system. Over the past 50 years a marked decrease in sedimentation has been noted within Yaquina Bay and River which is believed to be attributable to improved forest practices and road construction techniques, as well as decreases in timber harvesting in the watershed. However, it is
generally believed that more can be done to control the sediment load carried to the Yaquina River. Lincoln County may wish to consider the following erosion control measures during the preparation of the revised comprehensive plan:

- maintenance of natural riparian vegetation along the river and streams draining into the river
- maintenance of vegetation along roadway cuts and drainageways
- riprap placement on stream banks with high erosion potential
- construction restrictions on unstable soils that are subject to high erosion potential
- continued involvement in the improvement and monitoring of forest practices

Inclusion of policies relating to these issues within the Comprehensive Plan may have long-term effects upon the amount of sediment which reaches the river, which could in turn decrease the future dredging requirements.
Section VII  Appendix and Agency Response
Existing Federal Projects In Yaquina Bay & River

(1) Two high tide rubblemound jetties at the Yaquina entrance. The jetties are 1,000 feet apart at their outer ends. The north jetty is 7,000 feet long, and the south jetty is 8,600 feet long.

(2) An 800-foot spur jetty and five groins on the channel side of the south jetty.

(3) An entrance channel 40 feet deep and 400 feet wide.

(4) A channel 30 feet deep and 300 feet wide from the inner end of the entrance channel to McLean Point, including a turning basin 30 feet deep, 900 to 1,200 feet wide, and 1,400 feet long.

(5) A channel 18 feet deep and 200 feet wide from the end of the 30-foot channel at River Mile 2.4 to Yaquina.

(6) A small boat mooring basin at Newport formed by construction of a breakwater about 2,650 feet long, a shore wing about 400 feet long, and dredging within the mooring basin area to a depth of 10 feet.

(7) A channel 10 feet deep and generally 150 feet wide in Yaquina River and 200 feet wide in Depot Creek, extending from the town of Yaquina to Toledo.

(8) A channel 10 feet deep and 150 feet wide in Yaquina River from Depot Creek to Mile 14, including a turning basin 10 feet deep, 350 feet wide, and 500 feet long.
Federal and State Agency Participation in Dredged Material Disposal Plan Process

The following federal and state agencies participated in the planning process to develop the Yaquina Bay Dredged Materials Disposal Plan. Agency representatives assisted with selection of site evaluation criteria, reviewed specific proposed disposal sites and suggested general disposal guidelines. Letters from each of the agencies discussing their participation and general support of the plan follow:

Federal Agencies

Corps of Engineers, Portland District
Department of the Army

U.S. Environmental Protection Agency, Region X
National Marine Fisheries Service
National Oceanic & Atmospheric Administration
United States Department of Commerce

Fish and Wildlife Service
United States Department of the Interior

State Agencies

Division of State Lands
Department of Fish and Wildlife
Department of Land Conservation and Development
Department of Environmental Quality
Ms. Nancy Tuor
Wilsey & Ham
222 SW Harrison, Suite 4
Portland, OR 97201

Dear Ms. Tuor:

Portland District has reviewed the dredge material disposal plan your firm prepared for the Port of Newport. A copy of the plan was transmitted to this office by letter dated 19 August 1977.

As you are aware, the Portland District participated in your firm's efforts leading to the preparation of the final disposal plan. Members of the Navigation and Environmental Resources staffs of the Portland District attended meetings and a member of the Navigation Division staff participated in an on-site review by many Federal and State agencies for the proposed disposal sites.

In recent years disposal of dredge material for maintenance of the Yaquina River Project has become a serious problem, and the study is both timely and will be of direct benefit to this office. We approve of the sites as set forth in the plan and look forward to their utilization during future maintenance projects.

The Ports of Toledo and Newport as project sponsors for the Yaquina River Project will be required to secure the rights-of-way for the sites when they are needed for use by the Corps of Engineers maintenance activities. It is anticipated that these ports will begin acquisition of some of the sites in the near future. We plan to coordinate directly with the Ports of Toledo and Newport during the winter months in an attempt to select those sites which we feel should have an early priority for their acquisition program.

The report will obviously aid Federal, State, and local interests in reviewing permit applications for use of those sites that are included
Ms. Nancy Tuor

in the disposal plan. However, the plan in itself does not eliminate any of the requirements for processing of Section 10 and Section 404 permits through the Corps of Engineers.

Portland District appreciates the efforts provided in completion of this report. It removes many of the unknowns presently involved in planning for the disposal of dredge material and will allow us to perform maintenance in a timely and efficient manner.

Sincerely yours,

Redacted for Privacy

HARVEY L. ARNOLD, JR.
Colonel, Corps of Engineers
District Engineer
Dear Ms. Tuor:

This letter is in response to your request that I provide our formal review and comments on the Yaquina Bay and River Dredged Material Disposal Plan. In addition to the minor editorial suggestions we discussed by phone, the following comments are provided.

We are still concerned about the discharge of pipeline dredged material into disposal sites 9, 11, 12, 13, 14 and perhaps 15. These areas are small in size and would have very short retention times for settling out particulates. Discharging hydraulic dredged material into these sites will likely cause unacceptable turbidity levels and loss of settleable solids to adjacent receiving waters. Unfortunately, we can not suggest any operational procedure that would significantly enhance the settling capacity unless dredge discharge rates are reduced to low levels. Use of chemical coagulants may help, but these are costly and still may not solve the problem.

The discussion of disposal guidelines in Section IV was generally adequate. The advance specifications on the location of disposal site outfalls and discharge points was particularly useful. However, no guidance was presented on proper location of the disposal pond influent discharge. An influent discharge located in close proximity to an outfall structure will allow dredged material to short circuit through the disposal site. This can result in an unacceptable loss of dredged material to adjacent tidelands and waterways. Thus, influent discharges should be located to allow the greatest opportunity for dredged material to settle out before the return water flows over the outfall structure.
Notwithstanding the concerns mentioned above, we fully support the planning process used in the development of this plan. It represents an excellent example of how a long term maintenance dredging plan can be developed. Coordination with our Agency allowed us to review and provide early comments on the acceptability of proposed disposal sites. Although we have recommended against the use of the smaller sites for pipeline dredging disposal, clamshell dredging into barges could be an acceptable alternative. We have no objection to the other disposal sites identified in the plan.

The future success of this plan, however, will depend on whether the proposed sites can be acquired and used for dredged material disposal. If placement of dredged material over the next 15-20 years is restricted to the acceptable sites identified in the plan, our permit review process will be greatly expedited.

Sincerely,

Redacted for Privacy

Ronald A. Lee, Chief
Ocean Disposal & Construction Permits Section
September 13, 1977

Nancy Tuor, Project Manager
Wilsey & Ham
222 S.W. Harrison, Suite 4
Portland, Oregon 97201

Dear Ms. Tuor:

We have completed our detailed review of your July 1977 Yaquina Bay and River Dredged Material Disposal Plan. This reply supersedes our August 26, 1977, letter intended to comply with your very short review period.

We support the July 1977 Yaquina Bay 2-year dredged material disposal plan as an integral part of the land and water-use planning process for the Yaquina Bay estuary. We have participated with your firm throughout the planning process including the on-site inspection of the sites involved. We feel certain this planning process will receive the same wide use as has Lincoln County's previously established national example, "The Yaquina Bay Land and Water Use Plan".

In general, the Yaquina Bay Dredged Material Disposal Plan only includes sites that have been carefully screened to avoid impacts on fishery resources. Several sites, however, as discussed in our June 13, 1977, comments (enclosed) on the draft plan should be reaffirmed. Other than the concerns expressed below under Specific Comments, we will be able to expedite our comments during the Section 10/404 permit process. In addition, protection of dredge material sites for future disposal by acquiring or zoning is a concept that has been encouraged since the inception of the coastal planning process. We encourage the Ports of Toledo and Newport and Lincoln County to proceed with this process.

Specific Comments

Wildlife Habitat Creation

Page 18. This concept should be carefully approached. Please refer to the enclosed letter from Dr. Donaldson (ODFW) to North Pacific
Division Engineer, Major General Peel dated May 25, 1977.

Page 45, Site 7. No mention is made of present recreational fishing. Sloping and bank stabilization should acknowledge this important use. Please refer to our June 13, 1977, comments.

Page 54, Site 10. Immediately adjacent herring spawning areas should be referenced. Construction of berms and bank protection should consider these values. Please refer to our June 13, 1977, comments.

Page 63, Site 12. Although the immediate use of this site is not recommended within the plan, its inclusion as a numbered site is questionable. Please refer to our June 13, 1977, comments.

Page 66, Site 13. Same comment as Site 12 above.

Page 73, Site 14. Same comment as Site 12 above.

Page 78, Site 16. This site would be acceptable if wetlands were avoided.

Page 91, Site 19. We understand that only fill on top of existing upland is intended for this site. A statement under "Design Criteria" and/or "Site Preparation" would clarify the point. Please refer to our June 13, 1977, comments.

Page 95, Site 20. The site preparation statement should include buffer or diking requirements necessary to protect the freshwater marsh. Please refer to our June 13, 1977, comments.

Thank you for the opportunity to participate in the Yaquina Bay land and water-use planning process. We feel the above specific comments are relatively minor and that the plan in general is a good one. Your firm's successful technique of involving State and Federal agency personnel from the onset in this planning process promotes a better understanding amongst agency personnel and development interests. Hopefully, similar planning techniques can be used on other estuarine systems in Oregon.

Sincerely,

Redacted for Privacy

Dale R. Evans
Division Chief

Enclosure

cc: Ron Lee, EPA
    Mary Yoshinaka, FWS, ES
    Jim Lauman, ODFW

                                     Stan Hamilton, DSL
                                     Glen Carter, DEQ
                                     Ted LaRoe, LCDC
Ms. Nancy Tuor
Wilsey and Ham
222 S.W. Harrison
Suite 4
Portland, Oregon 97201

Dear Ms. Tuor:

We have reviewed the Yaquina Bay and River Dredged Material Disposal Plan as requested in your August 19, 1977 letter and have the following comments on the plan and its development.

The process used to develop this plan, which involved early participation by Fish and Wildlife Service representatives in developing spoil site selection criteria, inspecting specific disposal sites, and reviewing earlier drafts of this plan appears to be a positive approach to the problem of future dredge spoil disposal. We are pleased to see that long term spoil disposal has been addressed in a manner that will hopefully be satisfactory to both resource agencies and those who will benefit from future dredging.

We are in general agreement with the specific disposal sites selected and recommended spoil disposal procedures and priorities set forth in this plan. Concerns and recommendations expressed by Service representatives have been indicated in the final disposal plan. Although we generally agree with designated disposal sites, it should be recognized that the Fish and Wildlife Service will be required to review and comment upon any future Section 10 and Section 404 permit applications issued by the Corps of Engineers for dredging and spoil disposal. However, we believe our participation in development of this plan will greatly facilitate our review and comment upon such permits.
Major General Wesley E. Peel  
Division Engineer, North Pacific Division  
U. S. Army Corps of Engineers  
P. O. Box 2870  
Portland, Oregon 97208

Dear General Peel:

The Oregon Department of Fish and Wildlife agrees with the intent of Section 150, Public Law 94-587. As is noted, wetland areas important in the wildlife food chain, flood control and water quality have been lost.

Resource agencies view the creation of wetlands through disposal of dredged materials with mixed feelings. Certainly it is desirable to increase the amount of wetland habitat; however, filling of water area is undesirable. Thus, we believe that wetland creation via dredge spoil placement would bring about environmental trade-offs that are difficult, at best, to evaluate.

The majority of marshland losses have resulted by diking or filling for agricultural or industrial use. Thus, the environmentally preferred methods for marshland expansion should be to open dikes or remove tidegates and excavation of uplands.

The Department would welcome the opportunity to work with the Corps in identifying potential sites for creation of wetlands. Prior to submitting a list of potential sites, it would be advisable to have your staff brief us on the Corps' authority under Section 150 of PL 94-587.

If I can be of further assistance, please call.

Sincerely,

JOHN R. DONALDSON, Ph.D.  
DIRECTOR  
JRD-JL:ek  

cc  
Department of Environmental Quality  
Division of State Lands  
Environmental Protection Agency, Ron Lee  
National Marine Fisheries Service, Charles K. Walters  
U.S. Fish and Wildlife Service, John W. Kincheloe
We understand that Lincoln County and the Ports of Toledo and Newport will soon begin to acquire the proposed disposal sites to insure their future availability. We encourage this approach and hope that high priority disposal sites can be obtained.

We appreciate the opportunity to have participated in the development and review of this plan and believe this process will be of value in developing much needed long range dredge spoil disposal plans for other Oregon estuaries.

Sincerely yours,

Redacted for Privacy

Field Supervisor

cc: EPA
NMFS
ODFW
DSL
Division of State Lands

1445 STATE STREET, SALEM, OREGON 97310  PHONE 503-380-5

September 29, 1977

Nancy Tuor
Wilsey & Ham
222 Southwest Harrison, Suite 4
Portland, OR 97201

Dear Ms. Tuor:

The Division of State Lands has completed its review of your firm's report entitled Yaquina Bay and River Dredged Material Disposal Plan dated July, 1977. We commend you on your clear and concise handling of a very important concern to users of Yaquina Bay and River.

Our agency has been involved in this project since its inception; and we are satisfied, generally, with the results and recommendations. We sincerely appreciate the opportunity to "get on board early" that you extended to the natural resource agencies.

Insofar as detailed site comments are concerned, we concur with the statements of the National Marine Fisheries Service (letter dated September 13, 1977) and the Oregon Department of Fish and Wildlife (letter dated September 14, 1977). We urge you to consider those comments carefully and incorporate them in your plan.

The major point we wish to make is that the dredge and spoil activities anticipated in the Yaquina Bay Disposal Plan will require fill-removal permits from the Division of State Lands under ORS 541.605 to 541.695 and the Corps of Engineers under their Section 10 and Section 404 programs. These permits will be required even though the proposed project has been anticipated in the comprehensive planning process and approved by the natural resource agencies. We do assure you that prior consideration and acceptance of a proposed project will greatly simplify and speed up the permit process.

We do not anticipate any modification in the existing permit circulation process to specifically accommodate proposed projects that would be consistent with this dredge disposal plan. However, we would anticipate a much faster response from state and local agencies because most of the controversy surrounding any of these sites has already been considered.

We understand that Lincoln County and the Port of Newport may be acquiring some of the sites discussed in the plan. Within the
September 29, 1977

Constraints suggested by the National Marine Fisheries Service and the Oregon Department of Fish and Wildlife for selected sites, we see no reason not to pursue acquisition plans.

We appreciate the opportunity to comment on this plan.

Sincerely,

WILLIAM S. COX
Director

Stanley F. Hamilton, P.E.
Waterway Manager

Redacted for Privacy
Wilsey & Ham  
c/o Nancy Tuor  
222 S. W. Harrison, Suite 4  
Portland, Oregon 97201

Dear Nancy:

The Oregon Department of Fish and Wildlife has completed review of your July 1977 report, "Yaquina Bay and River Dredged Material Disposal Plan". We found the document to be quite thorough and were pleased to see many resource concerns identified in the document. Your company and the county are to be congratulated for including resource agencies during plan development as this allows for identification and resolution of problems during plan formulation.

The department feels that the plan does an excellent job of presenting environmental, engineering and topographic constraints for dredge spoil placement within that portion of Yaquina Bay upstream of the 101 bridge. We are very encouraged by the farsightedness of the county in recognizing the need for development of a long-range disposal plan which takes into consideration those factors.

We generally support the use of identified disposal sites and anticipate favorable recommendations to permitting agencies. We do however have some reservation about the use of certain disposal sites. Comments relating to the use of specific sites are contained in the below listed specific comments.

The following itemized comments relate to specific portions of the plan, comments are referenced by page number and paragraph.

1. Page 3, paragraph 2....We concur with the strategy of utilizing current dredging methodology in the identification of disposal sites for the next 10 to 20 year period. However, we strongly recommend that the county modify the plan as new dredging techniques become available.
2. Page 4, paragraph 6 (in-water disposal). State and federal natural resource agencies have strong concern over in-water disposal of dredged materials by pipeline dredge. Therefore, this alternative method of spoil placement should only be considered after thorough coordination with resource agencies. The thought of creating additional esturine marshes does in itself appear desirable, however the resultant loss of existing tidal or subtidal lands must be evaluated. The Department of Fish and Wildlife's position regarding this activity is contained within the attached letter to Major General Peal.

3. Page 3, paragraph 3. There appears to be some inconsistency regarding soluble zinc concentrations presented in this paragraph to the information contained in Table 7.

4. Page 15, paragraph 5. The conclusion that spoils placed with the use of a pipeline dredge must necessarily fall adjacent to the river is based more on past dredging history rather than on technological limitations. The use of in-line booster pumps could increase the distance between disposal and dredging sites.

5. Page 18, paragraph 5. (Wildlife Habitat Creation) Refer to Comment #2.

6. Page 40. (River Segment 1 - Summary & Recommendations) The department concurs with the report and suggests the following order of use for upland disposal sites (6,5,3,,1,2,4).

7. Page 47, paragraph 2. The report fails to mention current use of the area for sport fishing. We recommend that this use be taken into consideration.

8. Page 56. (River Segment 2 - Summary & Recommendations) The department concurs with the recommendations contained in the report. However, have concern over the use of Site 9 due to its marshy nature and existing wildlife habitat. We suggest the following order of use for identified upland sites (10,7,8,).

9. Page 68. (River Section 3-Summary & Recommendations) The department agrees with the presented findings. Dredge disposal sites 12 and 13 are esturine march and very close coordination would be required with resource agencies prior to any placement of dredge materials.
10. Page 80....(River Segment 4 - Summary & Recommendations)
The department discourages the use of site 14 as it is a mature high marsh. In addition, site 16 would require very close coordination prior to placement of dredged materials. Site 16, as explained on page 78, does currently have substantial wildlife utilization.

11. Page 97....(River Segment 6 - Summary & Recommendations)
It must be clarified that spoil placement at site 19 is limited to coverage of existing uplands.

12. Page 108....(River Segment 7 - Summary & Recommendations)
Approval of site 23 would be limited to placement of spoils on existing uplands.

In conclusion, the Department of Fish and Wildlife believes the project plan to be a workable document that the County and local Ports can utilize in coping with dredge material disposal during the next ten to twenty years. We must emphasize that the disposal sites identified within the plan have been given very careful and thorough consideration, and that they represent the extent of upland locations deemed engineeringly and environmentally acceptable for placement of dredged materials. Thus, they are a valuable resource which must be managed judiciously to insure the availability of upland disposal sites for future high priority dredging projects.

If we may be of additional service or further explain or comments please call.

Sincerely,

Redacted for Privacy

JOHN R. DONALDSON, Ph.D.
Director

JRD:JEL:mb

Attach:

cc: National Marine Fisheries Service, Mr. Charles K. Walters
U. S. Fish & Wildlife Service, Mr. John W. Kincheloe
Department of Environmental Quality
Division of State Lands
Environmental Protection Agency, Mr. Ron Lee
Corps of Engineers
September 14, 1977

Ms. Nancy Tuor, Project Manager
Wilsey & Ham
222 S.W. Morrison, Suite 4
Portland, Oregon 97201

Dear Nancy:

This letter is in response to your request for our review of the Yaquina Bay and River Dredged Material Disposal Plan. As part of that request you asked that four points be addressed. We have done so to the extent applicable and have included related comments for your and Lincoln County's consideration.

1. The Department's participation has occurred through the Field Representative for Lincoln County. Interest in the plan has been high because, to our knowledge, it is the first plan developed pursuant to implementation requirement #5 of the Statewide Planning Goal for Estuarine Resources. Overall, our reaction to the plan is positive and we consider it an excellent document. Lincoln County certainly deserves credit for undertaking the effort with your assistance. In a sense we therefore view the plan as a model that a number of other local governments will want to examine to support their own similar efforts. In this same connection however, you should consider including in the introductory material some additional background information on the Estuarine Resources Goal in general and implementation provision #5 in particular. It seems to us that this would easily supplement the existing problem statement. You should also consider adding a diagram of the process used to develop the plan so its readers would more fully understand both the context and content of the plan. As an item of business we request that the customary credit language on the attached sheet be printed on the inside cover or title page of the document.

2 & 4. Neither the Department or Commission can give full approval to the plan at this time. Rather, when the provisions of the Dredge Materials Disposal Plan are included as part of the comprehensive land use plans for Lincoln County and the Cities and Ports of Newport and Toledo the Commission could fully approve them under an
acknowledgement of Compliance (Section 20 1(a) of 570 amending ORS. 197). It does appear however, that the plan adequately addresses the provision of the Estuarine Resources Goal mandating a dredged materials disposal plan.

It is also the Commission's expectation that the process of coordinated development and implementation of comprehensive plans would result in agreement on the plan and its implementing provisions. Accordingly, we support your efforts on soliciting agency reviews and agreement on the plan and hope that Lincoln County continues to pursue this approach. It should be stressed, though, that acknowledgement of compliance is given only for a complete comprehensive plan including implementation provisions. Accordingly, the disposal plans discussion on Disposal Guidelines, Implementation and Future Considerations (pages 109-119) will need to be directly related to other aspects of the Estuarine Resources Goal and the other Statewide Planning Goals as well (for instance, a particular reference should be noted under Implementation provision #4 of the Coastal Shorelands Goal).

This is not meant to say that immediate use of the plan is not feasible at this time because it should be. However, full implementation must continue to be vigorously pursued while completing development of overall comprehensive land use plans.

3. It would be desirable when agreement on the comprehensive plan occurs and is acknowledged that the implementation provisions include a streamlined permit review process at least for the disposal sites designated in the plan. In this regard, a streamlined process would undoubtedly benefit the procedures to be implemented under the Federal Consistency provisions of Oregon's Coastal Management Program approved under the Coastal Zone Management Act of 1972. This would be particularly relevant to the Section 10 and Section 404 permits of the Corps of Engineers where there is a corresponding state level permit review process.

Thank you for the opportunity to review and comment on the plan, and if I can be of further assistance please contact me.

Sincerely,

[Redacted for Privacy]

James R. Moss
Acting Director

NC:mb
Ms. Nancy Tuor, Project Manager  
Wilsey & Ham  
222 S. W. Harrison, Suite 4  
Portland, OR 97201

RE: Proposed Spoils Disposal Program  
Yaquina Bay - Lincoln County  
North Coast Branch

Dear Nancy:

During the past six months, I have been representing the Department of Environmental Quality in a review of proposed spoil sites on Yaquina Bay in Lincoln County. I personally reviewed each proposed site and submitted written comments on the first draft of the dredge disposal plan. After reviewing the final report of the "Yaquina Bay and River Dredged Material Disposal Plan" by Wilsey & Ham, July 1977, I feel our agency's concerns have been adequately satisfied.

It should be emphasized that the Permit Review Program will still be required in certifying the proposed sites. However, I would anticipate that our streamlining of this process would be permissible in light of our agency's activities during the past six months. I understand that the County and the Ports of Toledo and Newport will soon begin the acquisition program (either of land or easement) for these sites receiving support of all the agencies.

I would like to take this opportunity to commend you and your staff for a very fine job in the preparation and incorporation of recommendations on specific sites in the final Dredge Disposal Plan. If I can be of any further assistance, please contact me at our North Coast Branch Office at 842-6637, Tillamook.

Sincerely,

Redacted for Privacy

Murray M. Tilson, P.E.  
Regional Engineer  
Clatsop, Tillamook & Lincoln Counties

cc: R. H. Fetrow, Salem-North Coast Region  
cc: F. M. Bolton, Regional Operations  
cc: G. L. Carter, Water Quality Division  
cc: Lincoln County Board of Commissioners, 225 Olive St., Newport