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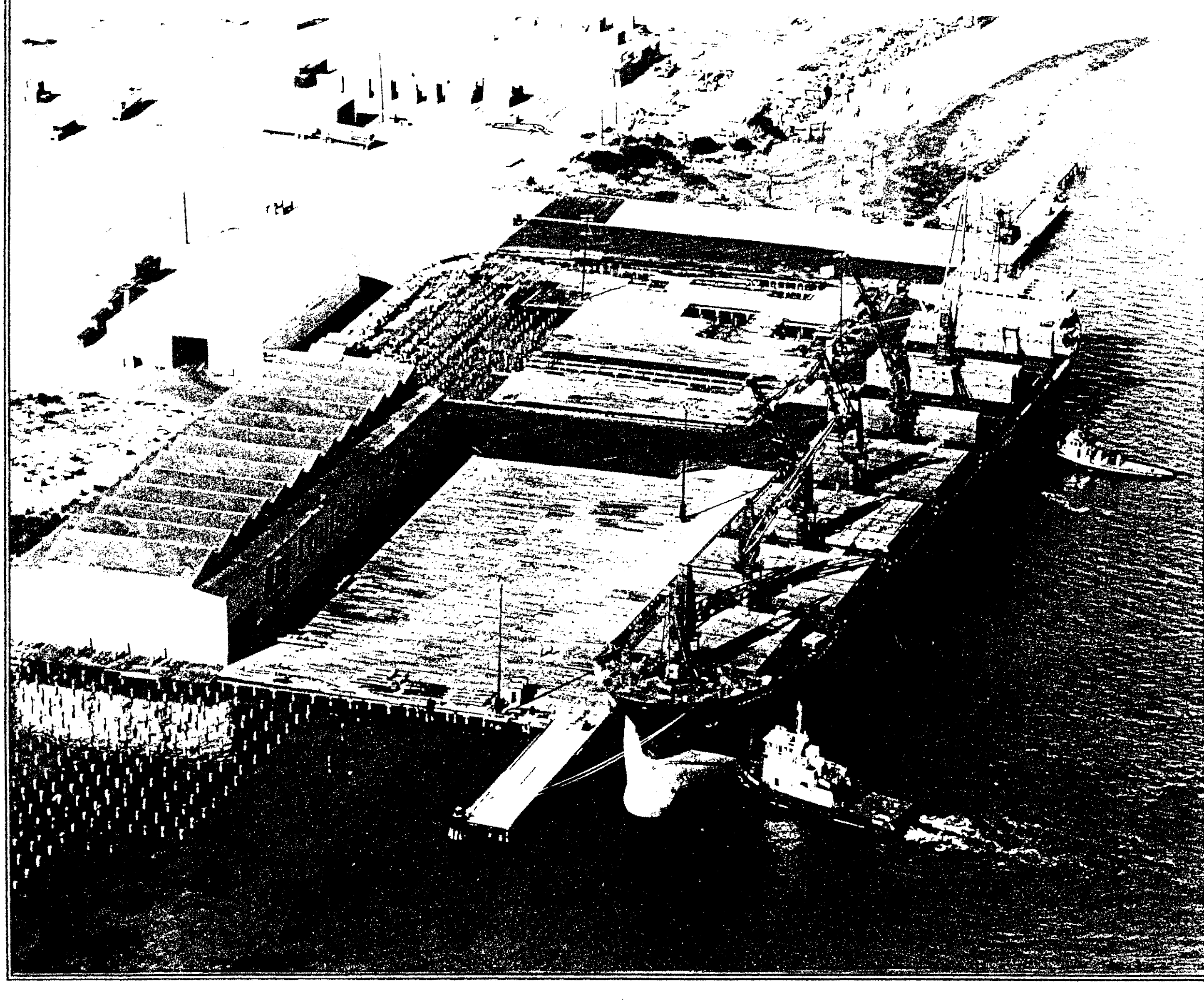
HUMBOLDT BAY HARBOR
RECREATION
and
CONSERVATION DISTRICT

# DRAFT ENVIRONMENTAL IMPACT REPORT
# for
# LOUISIANA - PACIFIC CORPORATION
# SAMOA TERMINAL RECONSTRUCTION

prepared by
**PACIFIC AFFILIATES CONSULTING ENGINEERS**



ADMINISTRATIVE DRAFT #4

ENVIRONMENTAL IMPACT REPORT

June 17, 1994

Prepared by:

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**This Draft EIR is prepared on Totally Chlorine Free (TCF) paper.**

# PREFACE

The following document is the Draft Environmental Impact Report for the Louisiana Pacific Corporation Samoa Terminal Reconstruction Project. This Report was prepared by Pacific Affiliates Consulting Engineers for and under the review of the Humboldt Bay Harbor, Recreation and Conservation District, the lead CEQA agency.

The following summary outlines the California Environmental Quality Act (CEQA) 1993 requirements for Contents of Environmental Impact Reports (Article 9, Section 15121, and the Intended Use of Environmental Impact Reports (Chapter 1, Section 21002.1).

Contents of Environmental Impact Reports
Article 9, Section 15121 (CEQA Guidelines)

(a) An EIR is an informational document which will inform public agency decisionmakers and the public generally of the significant environmental effects of a project, identify possible ways to minimize the significant effects, and describe reasonable alternatives to the project. The public agency shall consider the information in the EIR along with other information which may be presented to the agency.

(b) While the information in the EIR does not control the agency's ultimate discretion on the project, the agency must respond to each significant effect identified in the EIR by making findings under Section 15091 and if necessary by making a statement of overriding considerations under section 15093. (CEQA Guidelines)

(c) The information in an EIR may constitute substantial evidence in the record to support the agency's action on the project if its decision is later challenged in court.

Intended Use of Environmental Impact Reports
Chapter 1, Section 21002.1 (CEQA Guidelines)

(a) The purpose of an environmental impact report is to identify the significant effects of a project on the environment, to identify alternatives to the project, and to indicate the manner in which those significant effects can be mitigated or avoided.

(b) Each public agency shall mitigate or avoid the significant effects on the environment of projects it approves or carries out whenever it is feasible to do so.

(c) In the event that economic, social, or other conditions made it infeasible to mitigate one or more significant effects of a project on the environment, the project may nonetheless be approved or carried out at the discretion of a public agency, provided that the project is otherwise permissible under applicable laws and regulations.

(d) In applying the policies of subdivisions (b) and (c) to individual projects, the responsibility of a public agency which is functioning as a lead agency shall differ from that of a public agency which is functioning as a responsible agency. A Public agency functioning as a lead agency shall have the responsibility of considering the effects, both individual and collective, of all activities involved in a project. A public agency functioning as a responsible agency shall have responsibility for considering only the effects of those activities involved in a project, which it is required by law to carry out or approve. This subdivision applies only to decisions by a public agency to carry out or approve a project and does not otherwise affect the scope of the comments the agency may wish to make pursuant to Section 21104 or 21153. (CEQA Guidelines)

DRAFT ENVIRONMENTAL IMPACT REPORT
OF PROPOSED MARINE TERMINAL
FOR LOUISIANA PACIFIC CORPORATION

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## I. EXECUTIVE SUMMARY

### A. Introduction

This Executive Summary provides an overview of the environmental effects associated with the reconstruction of the Louisiana Pacific Corporation Samoa Terminal Dock, located southerly of the Hwy. 255 Bridge, Humboldt County, California. The Summary provides the project background and objectives, project alternatives considered, potentially significant adverse impacts, and mitigation measures for the identified impacts.

Intended Use of this Environmental Impact Report Document

This Environmental Impact Report (EIR) has been prepared in accordance with the California Environmental Quality Act (CEQA) Statutes and Guidelines pursuant to Section 21151 of CEQA. The Humboldt Bay Harbor, Recreation and Conservation District is the local lead agency for this EIR. The Harbor District, as lead agency, shall have the responsibility of considering the effects, both individual and collective (cumulative), of all activities of the proposed project as well as insuring that significant effects are avoided or mitigated whenever feasible.

Additionally, the District is responsible for insuring consistency with Ordinance No. 7 implementing certain portions of the Humboldt Bay Master Plan including maintenance of navigational channels and maintenance and improvement of environmental quality.

The purpose of the EIR document is to assist public agency decision makers and the public in understanding: the potentially adverse significant environmental impacts of the project; the possible ways to eliminate or lessen the potentially significant adverse impacts; and to identify any reasonable alternatives to the project. This EIR is also intended to support the permitting process of involved agencies whose discretionary approvals must be obtained for specific portions of the project.

## Project Background and Objectives

The Louisiana Pacific Kraft Pulp and Lumber Mill is located on the Samoa Peninsula, bordered by the Pacific Ocean on the west and Humboldt Bay on the east (see Figures 1 and 1A). The Mill exports by marine vessel (cargo ships and barges), finished and unfinished lumber, raw pulp, and various other break-bulk forest related products. The L-P Samoa Terminal Dock, commonly known as Redwood Dock, is the staging, transfer, loading and off-loading point for products leaving and entering the Samoa Mill site. The aging wooden structure, located near the north end of L-P's currently utilized industrial land, has provided many years of service for its users. The six acre marine transfer terminal has survived countless repairs, partial reconstructions and even fire throughout its history, but the age of the structure coupled with the many patchwork repairs have rendered the major portion of the facility unfit and unsafe for continued transfer operations. Within the past year, several transfer and loading vehicles have broken through the work surface during routine activities. The present condition of the facility has severely effected the efficiency of transfer and loading operations, causing break-bulk cargo to be staged off the work surface and the use of smaller loading vehicles and equipment crossing the work surface in order to continue safe transfer operations. Louisiana Pacific Corporation, since occupying the Samoa Mill Site in the 1960's, and extending the life of the structure through an extensive repair and maintenance program, realizes that to continue exporting products from the L-P Mill Site, and to remain competitive in the global pulp and forest products markets, an efficient, safe facility must be constructed. The proposed reconstruction of the Samoa Terminal Dock will allow L-P to utilize modern loading and transfer vehicles, equipment, and procedures, and relieve the potential liabilities associated with the continuance of operations at the existing facility.

Following the evaluation and study of the existing export facilities located on Humboldt Bay and weighing the environmental concerns associated with the construction of a new facility, it has been decided by the Applicant (Louisiana Pacific Corp.) that reconstruction of the existing Samoa Transfer Terminal will be the most efficient alternative for the continued export of products from the Samoa Mill site. Reconstruction of the Transfer

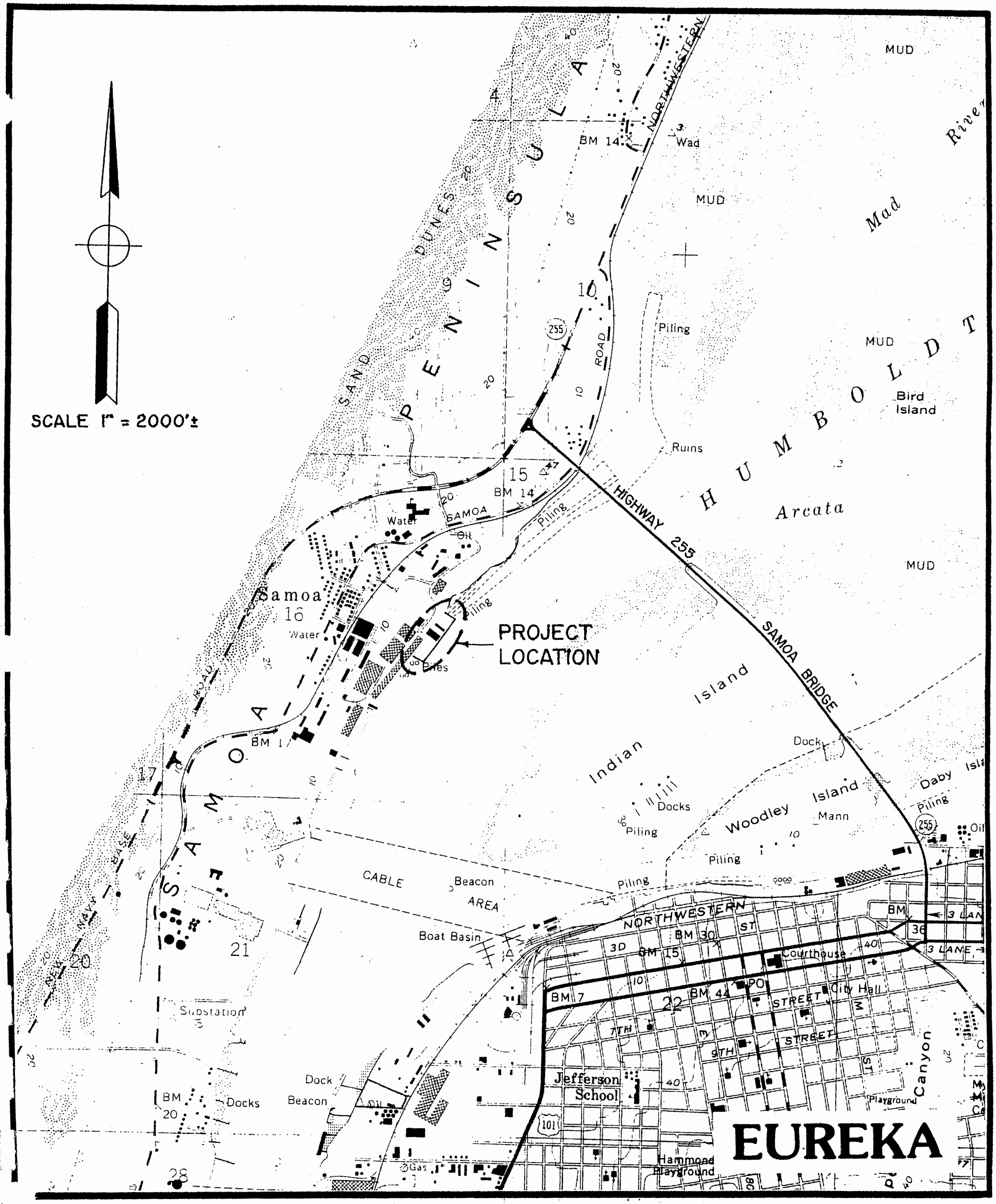


FIGURE 1

LOCATION MAP

**PACIFIC AFFILIATES**

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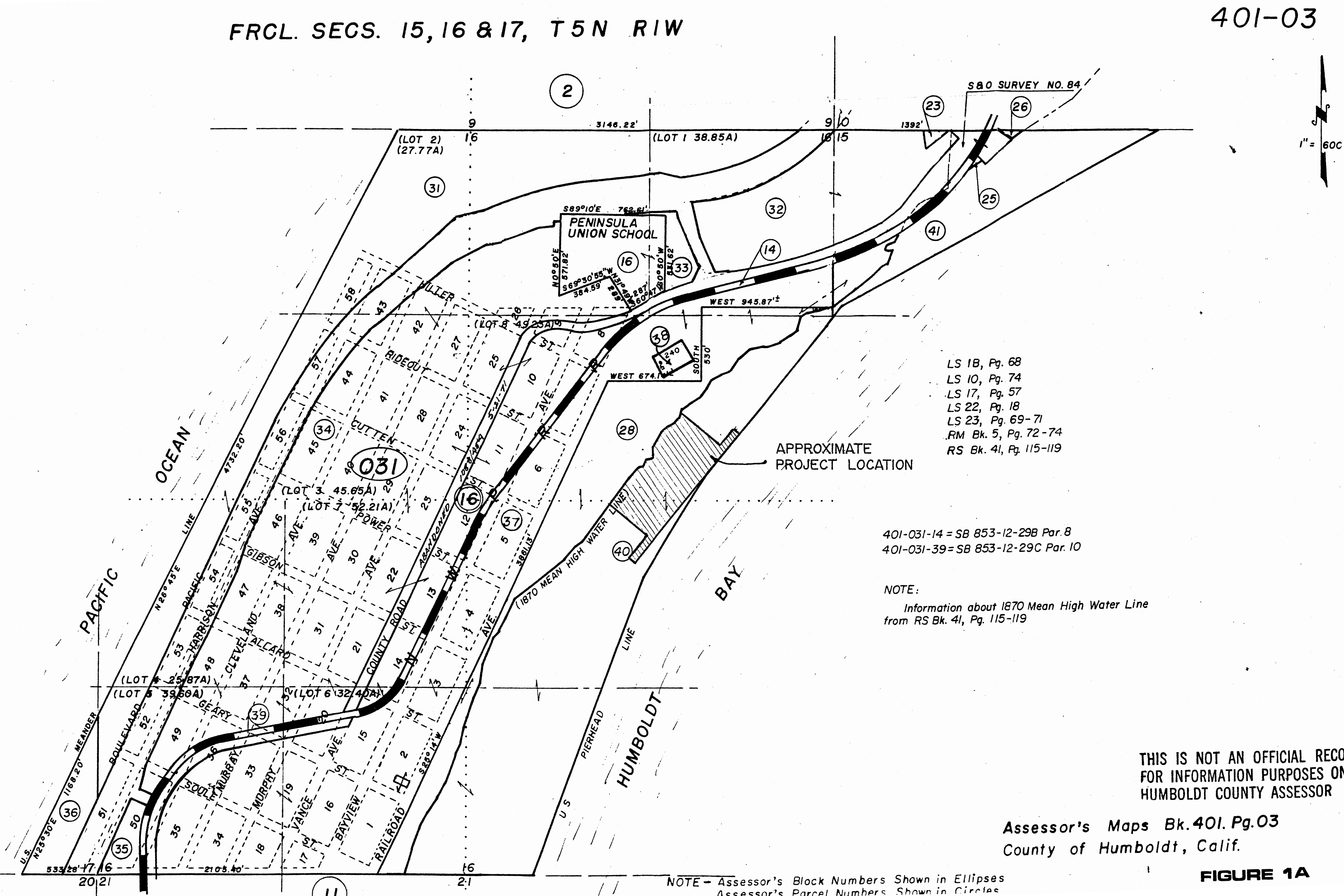

FRCL. SECS. 15, 16 & 17, T5N R1W
401-03
1" = 600'
S&O SURVEY NO. 84
(LOT 2) (27.77A)
(LOT 1 38.85A)
3146.22'
1392'
PENINSULA UNION SCHOOL
S89°10'E 762.61'
WEST 945.87'±
WEST 674.1
SOUTH 530
(LOT 8 49.23A)
(LOT 3 45.65A)
(LOT 7 52.21A)
(LOT 4 25.87A)
(LOT 5 39.60A)
(LOT 6 32.40A)
031
PACIFIC OCEAN
HUMBOLDT BAY
U.S. MEANDER LINE
U S PIERHEAD LINE
(1870 MEAN HIGH WATER LINE)
APPROXIMATE PROJECT LOCATION
LS 18, Pg. 68
LS 10, Pg. 74
LS 17, Pg. 57
LS 22, Pg. 18
LS 23, Pg. 69-71
RM Bk. 5, Pg. 72-74
RS Bk. 41, Pg. 115-119
401-031-14 = SB 853-12-29B Par. 8
401-031-39 = SB 853-12-29C Par. 10
NOTE:
Information about 1870 Mean High Water Line from RS Bk. 41, Pg. 115-119
THIS IS NOT AN OFFICIAL RECORD FOR INFORMATION PURPOSES ONLY HUMBOLDT COUNTY ASSESSOR
Assessor's Maps Bk. 401. Pg. 03
County of Humboldt, Calif.
NOTE - Assessor's Block Numbers Shown in Ellipses
Assessor's Parcel Numbers Shown in Circles


**FIGURE 1A**

Terminal to current export industry standards is vital to L-P's future as a competitor in the global pulp and lumber products markets.

Project Description

The proposed project will include demolition of the existing decaying wooden transfer terminal, construction of a concrete sheet pile bulkhead wall at the perimeter of the existing structure, placement of engineered fill behind the bulkhead wall, construction of concrete pier extensions north and south of the bulkhead structure, and dredging of the area between the west line of the Samoa Channel and the south pier extension. Suitable dredge spoils will be utilized as fill behind the bulkhead wall with the balance being pumped to an existing disposal area located between the Samoa Bridge (Route 255) and the Samoa Cookhouse. (See Figure 2)

Project Alternatives

CEQA Statutes and Guidelines (Title 14 of the California code of Regulations, Section 15126 [d]) requires consideration of a range of reasonable alternatives to the proposed project, or location of the project, that could feasibly achieve the basic objectives of the project. The EIR must also address the effects of not constructing the project and discuss the alternatives capable of eliminating any significant environmental effects or reducing them to a level of insignificance, even if these alternatives impede, to some degree, the attainment of the project objectives, or would be more costly.

No off-site alternatives studied were considered feasible due primarily to lack of structural competency and distances from the L-P Mill site. These factors coupled with the lack of acquirable, developed waterfront property that would not require substantial alteration or modification and subsequent environmental loss, eliminated the off-site alternatives. The Simpson Pulp Mill transfer facility, located to the south of the L-P Mill, the most practical of the off-site alternatives, is in a state of inactivity and its return to service is not known. The Simpson site is not for sale or lease at this time.

Undeveloped lands, adjacent to the project site, or located elsewhere on Humboldt Bay,

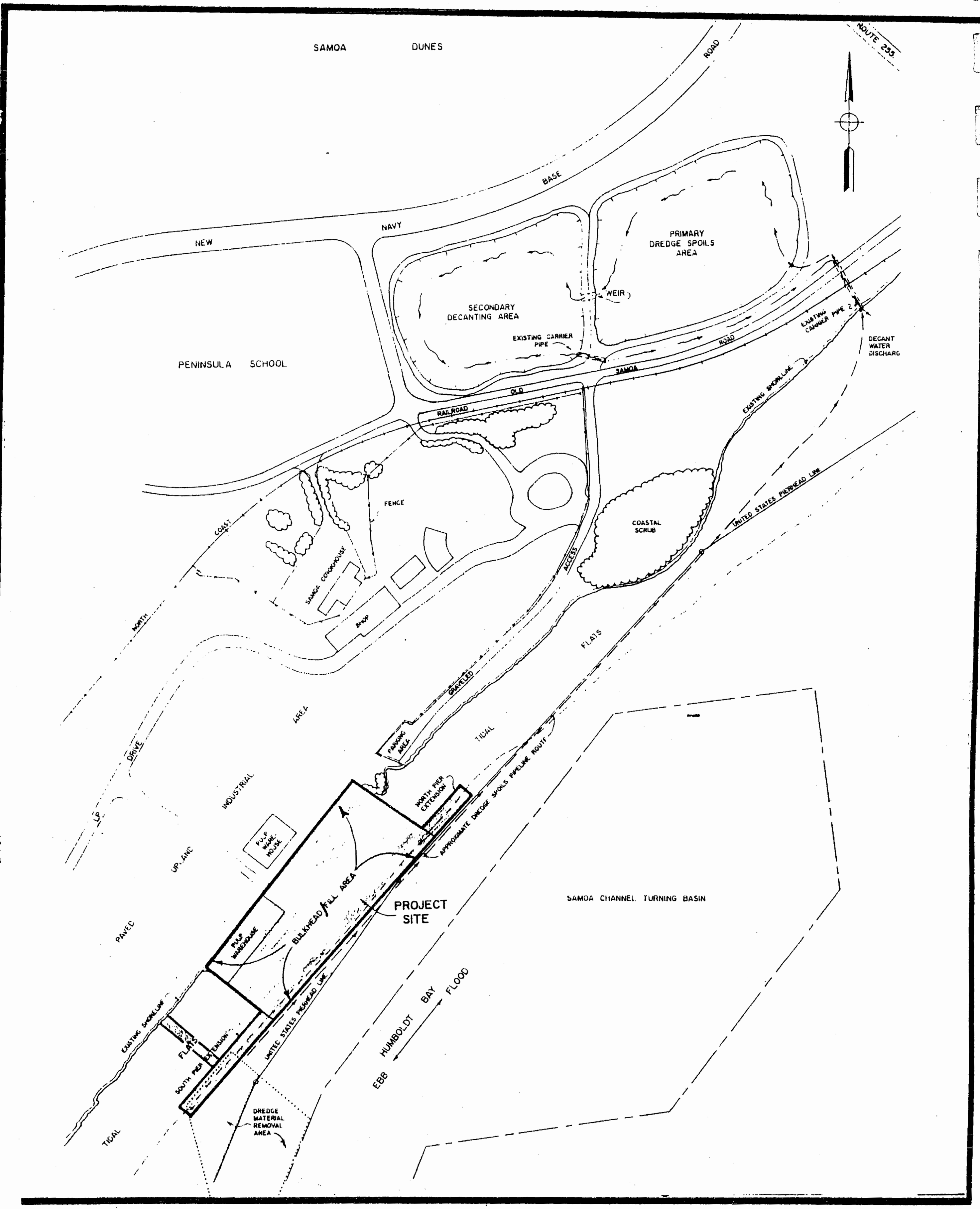


**FIGURE 2**

SITE MAP

**PACIFIC AFFILIATES**

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were deemed unsuitable due to the excessive environmental disturbance and permanent environmental losses associated with their development.

On-site alternatives consist of several wharf and bulkhead/fill configurations at the presently existing terminal location. The existing site was determined to be the best location for reconstruction of the transfer terminal, taking advantage of the proximity to the Samoa Shipping Channel, the terminal's relation to L-P's industrial use of the Samoa Mill facilities, and the environmentally diminished state of the existing site. Potential alternatives were screened to determine if they could meet the industrial needs of the mill and the structural requirements of the transfer vehicles and equipment without significantly impacting the environment. Comparative Analysis of the considered alternatives is presented in Section IV, Table 3. The following alternatives are evaluated in this EIR:

Alternative B-1: Concrete Dock

Demolition of the existing facility and replacement with a concrete pile supported concrete dock utilizing the same configuration as the project alternative.

Alternative B-2: 1500 foot Bulkhead and Fill

Demolition of the existing facility and construction of a 1500 foot long bulkhead without pier extensions.

No-Project Alternative: Utilization of existing wooden transfer terminal

No demolition or reconstruction of the facility.

Project Impacts and Mitigation

Table I provides a summary of the expected resource impacts and mitigation measures associated with the construction of the new transfer terminal. Comparative alternative summary is provided in Section IV. Alternative Evaluation. For the project, no significant impacts were identified concerning Land Use, Air Quality, Traffic and Circulation, Public Utilities, Recreation and Aesthetics, Light and Glare, and Tidal

# TABLE 1

## SUMMARY OF IMPACTS & MITIGATION
## for
## LOUISIANA PACIFIC CORPORATION
## SAMOA TERMINAL RECONSTRUCTION PROJECT

### RESOURCE: LAND USE

| ALTERNATIVE | IMPACT SIGNIFICANCE CRITERIA | IMPACTS AND CONCLUSIONS | MITIGATION | MONITORING |
|---|---|---|---|---|
| Project | Major change in land use or planning. | No significant effect. | No mitigation necessary. | No monitoring necessary. |



### RESOURCE: SOILS & GEOLOGY

| ALTERNATIVE | IMPACT SIGNIFICANCE CRITERIA | IMPACTS AND CONCLUSIONS | MITIGATION | MONITORING |
|---|---|---|---|---|
| Project | Bulkhead wall could be damaged from earth shaking or liquefaction of underlying soil. | Design based upon site soils report and findings. Local earthquake zone standards should reduce impacts to less than significant. | Plans and calculations will be reviewed and approved by the Humboldt County Building Department. | Project plans shall be approved by the Humboldt County Building Dept. Construction inspection will be performed to ensure compliance with approved project plans. Underlying soils will be sampled and evaluated, and findings incorporated in the project design. |
| | Placement of fill and installation of sheet pile wall may cause compaction and consolidation of underlying soils' | Possible minor change in submarine contours in the immediate project area; not a significant effect. | Minor disturbance of soils will not create significant impact. No mitigation is proposed. | No monitoring necessary. |
| | New structure could be at risk from Tsunami run-up. | Tsunami run-up could damage the structure. | No mitigation necessary. | No monitoring necessary. |

# RESOURCE: AIR QUALITY

| ALTERNATIVE | IMPACT SIGNIFICANCE CRITERIA | IMPACTS AND CONCLUSIONS | MITIGATION | MONITORING |
|---|---|---|---|---|
| Project | Fugitive dust and carbon monoxide may be generated by the construction process and associated vehicles. | Surrounding area may experience increased levels of particulates during the construction process and demolition. Not considered a significant impact. | Watering of areas and operations that may generate dust will be conducted. All equipment and machinery used during the construction will be equipped with proper mufflers and pollution control devices. | Visual inspection of site activities and anticipation of weather conditions. Adherence to equipment maintenance schedules and immediate repair of malfunctioning equipment. |

# RESOURCE: WATER QUALITY

| ALTERNATIVE | IMPACT SIGNIFICANCE CRITERIA | IMPACTS AND CONCLUSIONS | MITIGATION | MONITORING |
|---|---|---|---|---|
| | Dredging, driving pile and filling bulkhead could cause a temporary increase in suspended solids. | Increased suspended solids will be generated during the construction. | Wastewater Discharge Plan, Monitoring and Sampling Program designed by the State Water Quality Control Board to control the amount of suspended solids from construction will be followed. | Daily sampling of sediments and monthly reports to California Regional Water Quality Control Board. |
| Project | Spreading of contaminated sediments by dredging, disposal, and spoils dewatering may contaminate other habitats. | Cutter suction dredging will not produce significant clouds of suspended sediments. Sediments will be contained within disposal area or confined within bulkhead wall. | Wastewater Discharge Plan, monitoring, sampling and reporting to evaluate daily water quality. Compliance standards as set forth by the State Water Quality Control Board will provide compliance measures. | Daily sampling of sediments and monthly reports to California Regional Water Quality Control Board. |
| | Dredging may cause decreased levels of dissolved oxygen in the waters of the project area. | Reduced dissolved oxygen levels will be limited to the dredging area by use of cutter suction dredge and will be short term. | Use of cutter suction dredge to reduce the amount of suspended sediments. | Compliance with Waste Discharge Requirements and Regional Water Quality Control Board Standards for the project. |

## RESOURCE: BIOLOGICAL RESOURCES

| ALTERNATIVE | IMPACT SIGNIFICANCE CRITERIA | IMPACTS AND CONCLUSIONS | MITIGATION | MONITORING |
|---|---|---|---|---|
| Project | South pier extension and gangway could shade eelgrass beds, and may cause thinning and possible loss of species within the shaded areas. | Possible loss of intertidal vegetation. | Recreation of tidal habitat area, replanting, monitoring and continued scientific study will be conducted as per the "Mitigation / Monitoring Program". | See Section V. Mitigation / Monitoring Program |
| | There may be loss of intertidal benthic organisms by filling of intertidal habitat area. | Although habitat abundance and diversity beneath the existing dock are low, this habitat will be permanently lost along with inhabitants. | Recreation of intertidal habitat and monitoring program will be incorporated to offset losses. See Section V. "Mitigation / Monitoring Program". | See Section V. Mitigation / Monitoring Program |
| | Loss of existing piling and rocky habitat areas by demolition of the existing dock and filling may cause reduction of related habitat species. | Demolition of existing structure will result in temporary loss of pile and rocky habitat, species and abundance. | New structure will quickly recolonize. Rocky habitat will be created at the project site and throughout the mitigation area. | See Section V. Mitigation / Monitoring Program |
| | Loss of subtidal habitat and species abundance may be caused by project dredging and fill. | Dredging and filling will result in losses of subtidal benthic organisms and habitat area. | Creation of equally diverse but dissimilar habitat area. See Section V. "Mitigation / Monitoring Program". | See Section V. Mitigation / Monitoring Program |
| | Possible temporary reduction of fish species during construction. Possible permanent loss of a portion of shaded habitat by filling and removal of piling. | Dredging and other construction activities will cause a temporary reduction of species in the project area. Shaded habitat will be temporarily lost by removal of piling. | New structure will recolonize and support species that utilize shaded habitat (pier extensions). permanent losses will be offset in the "Mitigation / Monitoring Program". | See Section V. Mitigation / Monitoring Program |

## RESOURCE: TRAFFIC & CIRCULATION

| ALTERNATIVE | IMPACT SIGNIFICANCE CRITERIA | IMPACTS AND CONCLUSIONS | MITIGATION | MONITORING |
|---|---|---|---|---|
| Project | Project may cause increase in highway and adjacent route traffic. | Highway traffic will increase temporarily during construction. Not a significant impact. | No mitigation necessary. | No monitoring necessary. |

## RESOURCE: PUBLIC UTILITIES

| ALTERNATIVE | IMPACT SIGNIFICANCE CRITERIA | IMPACTS AND CONCLUSIONS | MITIGATION | MONITORING |
|---|---|---|---|---|
| Project | Increased demand for public utilities above existing levels. | Project will not significantly alter the existing level of utilized public utilities. | No mitigation necessary. | No monitoring necessary. |

## RESOURCE: RECREATION & AESTHETICS

| ALTERNATIVE | IMPACT SIGNIFICANCE CRITERIA | IMPACTS AND CONCLUSIONS | MITIGATION | MONITORING |
|---|---|---|---|---|
| Project | Structure and alterations to shoreline may prevent recreational activities and cause offensive views. | Recreational opportunities will not be affected. The new facility will significantly alter any views of Humboldt Bay. | No mitigation necessary. | No monitoring necessary. |

## RESOURCE: CULTURAL / ARCHAEOLOGICAL

| ALTERNATIVE | IMPACT SIGNIFICANCE CRITERIA | IMPACTS AND CONCLUSIONS | MITIGATION | MONITORING |
|---|---|---|---|---|
| Project | Archaeological or historical sites may be disturbed by construction excavation. | Damage or loss of artifacts or archaeological resources. | An Archaeologist will be employed to oversee the construction and excavations. | Visual inspection of construction activities by Project Archaeologist. |

## RESOURCE: NOISE

| ALTERNATIVE | IMPACT SIGNIFICANCE CRITERIA | IMPACTS AND CONCLUSIONS | MITIGATION | MONITORING |
|---|---|---|---|---|
| Project | Project may cause substantial increase in noise levels due to construction activities. | Demolition of the existing structure and driving of pile will temporarily increase noise levels and vibration in the surrounding areas. | Operational hours during construction will be limited. No work will be conducted on weekends or holidays. | Adherence to normal working hours schedule. Regular maintenance of vehicles and equipment. |

## RESOURCE: LIGHT & GLARE

| ALTERNATIVE | IMPACT SIGNIFICANCE CRITERIA | IMPACTS AND CONCLUSIONS | MITIGATION | MONITORING |
|---|---|---|---|---|
| Project | Additional lighting at dock may produce an increase in light and glare on and off site. | Lighting of work areas will be an increase of the existing levels. | Lights will be shielded and hooded and positioned to illuminate the project site area, not off-site areas. | Installation of hooded lighting, and containment of lights to the project site. |

## RESOURCE: TIDAL HYDROLOGY

| ALTERNATIVE | IMPACT SIGNIFICANCE CRITERIA | IMPACTS AND CONCLUSIONS | MITIGATION | MONITORING |
|---|---|---|---|---|
| Project | Structure may effect tidal velocities and sedimentation rates of the surrounding tidal area. | Minor change in current velocities and sedimentation may occur. | Monitoring of the surrounding area to record changes and possible effects, or trends. | Annual hydrographic and land surveys of the project site. |

Hydrology. The project Mitigation and Monitoring Plan specified in this document, when approved, properly implemented and monitored will reduce impacts to less than significant.

B. **Summary of Environmental Impacts & Mitigation**

1. Significant Environmental Impacts

* Potential soil and geological stability problems.

* Temporary increases in suspended sediments and turbidity during dredging.

Potential water quality effects from de-watering of the bulkhead and dredge spoils areas.

Introduction of sediment encapsulated toxics into new habitat areas.

* Loss of existing on-site biological resources.

* Dust, and other factors deriving from construction activities.

* Possible disturbance of archaeological resources during construction.

2. Unavoidable Effects

* Temporary increases in suspended sediments and turbidity during dredging.

* Potential water quality effects from the dewatering of the bulkhead and dredge spoils areas.

* Loss of existing on-site biological resources.

* Noise, dust, and other factors deriving from construction activities.

* Possible disturbance of archaeological resources during construction.

* Potential cumulative effects; biological, water quality, air quality, light and glare, off-site biological, cultural/archaeological, and aesthetics.

3. Growth-Inducing Impacts

The potential for growth inducement occurs where development or improvements of infrastructure removes a significant barrier to development, or creates additional capacity for land development that exceeds the planned growth for the area. The project is not growth inducing. The project is a reconstruction of an existing cargo terminal dock. (The new terminal will allow L-P to expand its cargo transport capacity to be more consistent with overall capacity of the mill.) The terminal is not being reconstructed to take advantage of an increase in quantity of range of goods to be shipped over the terminal. Mill capacity and market conditions govern volume and level of activity at the proposed project site.

4. Cumulative Impacts

There have been several recent studies of the economic potential of Humboldt Bay Harbor that have produced a revitalized interest in the rehabilitation and development of the Humboldt Bay and Port and associated Bay Waterfront independent of the proposed Samoa Terminal reconstruction project. The City of Eureka has developed a list of "high priority" projects for the Eureka Waterfront most of which involve facility revitalization and reconstruction, and have entered into a Memorandum of Understanding with the Humboldt Bay Harbor, Recreation and Conservation District to aid in the coordination and promotion of harbor development.

There have not been any reasonably recent past projects that would produce cumulative impacts. At present there are five harbor projects either with approved permits or within the agency review and permit process. These projects are:

1) Humboldt Bay Response Corporation, Launch Ramp (Permits Pending)

2) David L. Schneider, Reconstruction of Dock A (Permits Pending)

3) Humboldt Bay Harbor, Recreation and Conservation District, Woodley Island Improvement Project, Dry Stack Storage, Launch Ramp and Work Dock Completion (Permits Acquired)

4) City of Eureka, Eureka Inner Reach Channel Berthing Facility (Permits Pending)

5) Humboldt Bay Harbor, Recreation and Conservation District and U.S. Army Corps of Engineers, Humboldt Bay Harbor Deepening Project (DEIS/EIR)

The following projects are currently in the pre-design or conceptual stages of development and are listed as follows:

6) City of Eureka, Rehabilitation of the Eureka Small Boat Basin

7) City of Eureka, Develop Fisherman's Market/Farmer's Market & Dock

8) City of Eureka, Reconstruct Landing Dock

9) City of Eureka and Humboldt Bay Harbor Recreation and Conservation District, Reconstruct Dock B, Multi-Use Marine Terminal

Several of these slated projects have the potential to produce cumulative effects. (See Section VI.C.)

## II. INTRODUCTION

The Louisiana-Pacific Corporation (LP) has applied to the Humboldt Bay Harbor, Recreation and Conservation District for a Coastal Development Permit to replace an existing wooden transfer dock with a concrete bulkhead wall and fill, concrete pile supports, and concrete surface pier extensions. Dredging of the area between the south pier extension and the west line of the Samoa Channel will be required to facilitate moorage and safe movement of vessels to and from the dock. Disposal of dredge spoils will be in a previously approved and utilized disposal site on LP property. (See Figure 1.)

Humboldt Bay Harbor, Recreation & Conservation District is the Lead Agency under the California Environmental Quality Act (CEQA). The Harbor District prepared an Initial Study (environmental checklist) and determined that an Environmental Impact Report (EIR) should be prepared for the proposed project.

A Notice of Preparation (NOP) was circulated to the State Clearinghouse and local agencies with jurisdiction or concern over aspects of the proposed project. Responses to the NOP identified the following as issues to be addressed in the EIR: (See Appendix 6 for N.O.P. Responses)

* Application for and approval of a Conditional Use Permit as required by the County of Humboldt for the disposal of dredge spoils material at an upland site and for excavation of historic fill material from the proposed mitigation site.

* Project conformance with the Humboldt County General Plan - Volume 1, and the Humboldt Bay Area Plan (HBAP), and the Humboldt County Coastal Zoning Regulations.

* Development of a comprehensive Mitigation and Monitoring Plan to eliminate or reduce to less than significant all project impacts.

* Study and inventory of the listed, proposed, and candidate endangered species that may be effected by the project or that may occur within the project area, and preparation of comprehensive mitigation measures for the avoidance if impacts directly or indirectly affecting the species.

* Application for and approval of permits from the United States Army Corps of Engineers consistent with Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403), and Section 404 of the Clean Water Act (CWA), (33 U.S.C. 1344).

* Prevention and reduction of water quality impacts, such as turbidity, siltation, and chemical and petroleum spills, shoreline erosion, and current influences of structures placed in open waters.

* The N.O.P. response from the State Lands Commission mentions that the District should apply to all other agencies having approval authority, including the City of Eureka. (The project is not within the jurisdiction of the City of Eureka.)

## A. <u>Project Description</u>

The existing wooden dock is approximately 75 years old. The dock has been repaired and maintained continually over the years but its advanced age has resulted in a state of structural uncertainty. The proposed project will include demolition of the existing wooden transfer terminal, construction of a concrete sheet pile bulkhead wall and placement of engineered fill within the confines of the sheet pile enclosure, construction of new concrete piers supported on concrete pilings north and south of the bulkhead/fill area, and dredging of the area between the south pier extension and the main shipping channel. The dredge spoil disposal area is located northerly of the dock, in an area between the Samoa Cookhouse and the Samoa Bridge, Route 255. This upland disposal site has been used for disposal of dredged material in conjunction with maintenance dredging at the project site and various other dredging operations within the North Bay (see Figure 2).

1. Construction of Bulkhead and Demolition of Existing Dock

The concrete bulkhead (sheet pile wall) will be constructed around the existing wooden dock (except for extensions) prior to its demolition. The bulkhead will be constructed of interlocking concrete sheet pile that will be driven from the existing work surface. Sheet piling will be installed as close to the perimeter of the existing dock as possible while maintaining the same alignment to the Pierhead and Channel lines. (See Figure 3.) Following the Installation of the sheet pile bulkhead wall, the existing wood dock, pilings, concrete debris, and unsuitable underlying material will be removed in preparation for fill.

The wooden dock and dependent structures will be demolished relying upon the surrounding bulkhead to contain debris. The existing dock will be removed using standard equipment such as cranes, excavators, and loaders to remove the wooden decking and extract the piling.

The demolition contractor will remove the debris from the site and dispose of material in an approved manner.

2. Placement of Fill, Concrete Surface and Pier Extensions

Engineered fill material will be derived from three possible sources, dredged material from the area fronting the south pier extension, excavated material from the mitigation site, or previously deposited material from the "superbowl", an existing borrow site located on the Samoa Peninsula, adjacent to the Eureka Airport. If additional materials are needed; gravel, crushed rock, quarry spalls, etc. they will be obtained from permitted local sites. All sources of fill will come from previously approved sites that have undergone CEQA review. Legally, no operator should be mining or selling aggregate from a site that has not been approved under the Surface Mining and Reclamation Act (SMARA) and/or

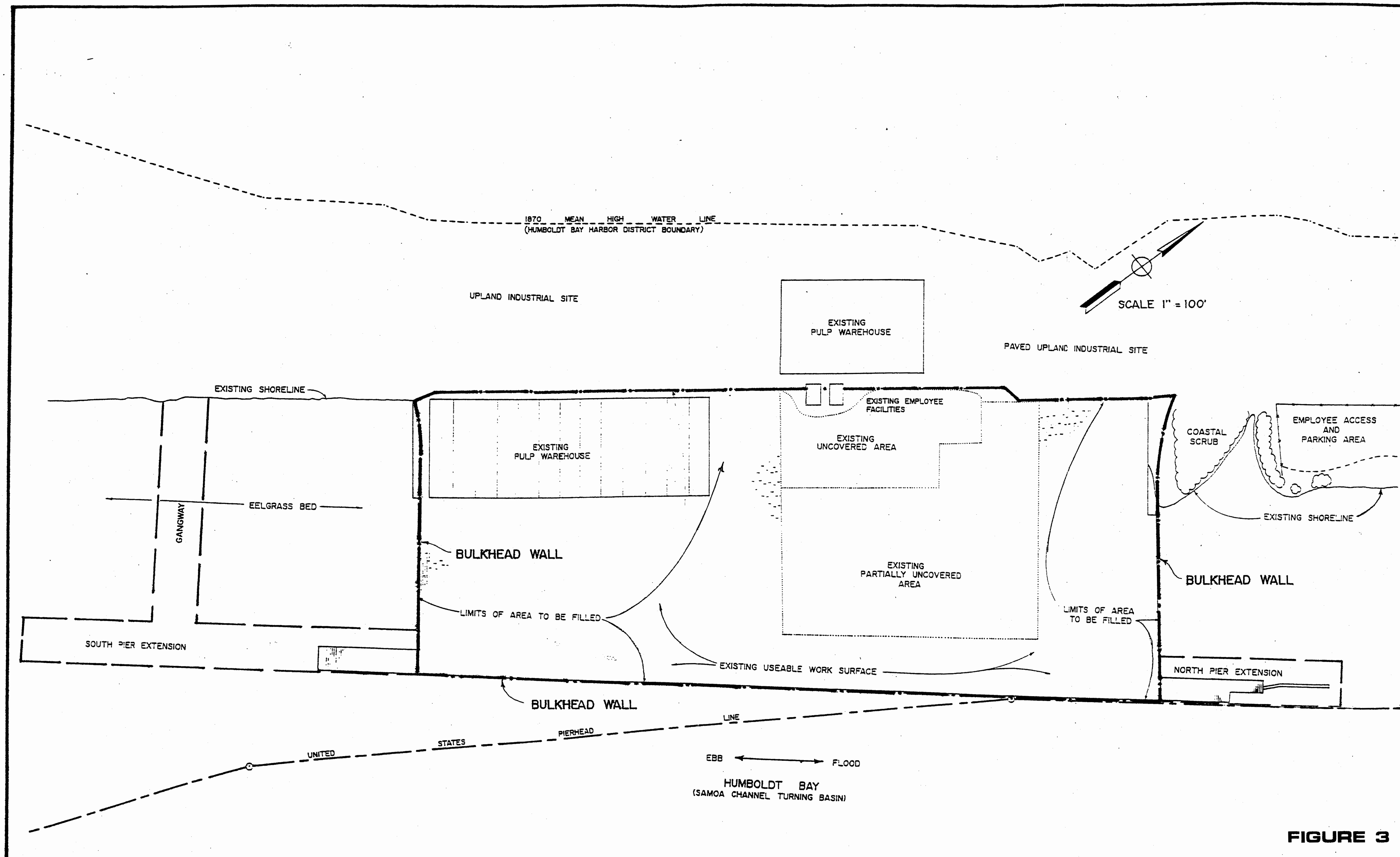


FIGURE 3

SAMOA TERMINAL

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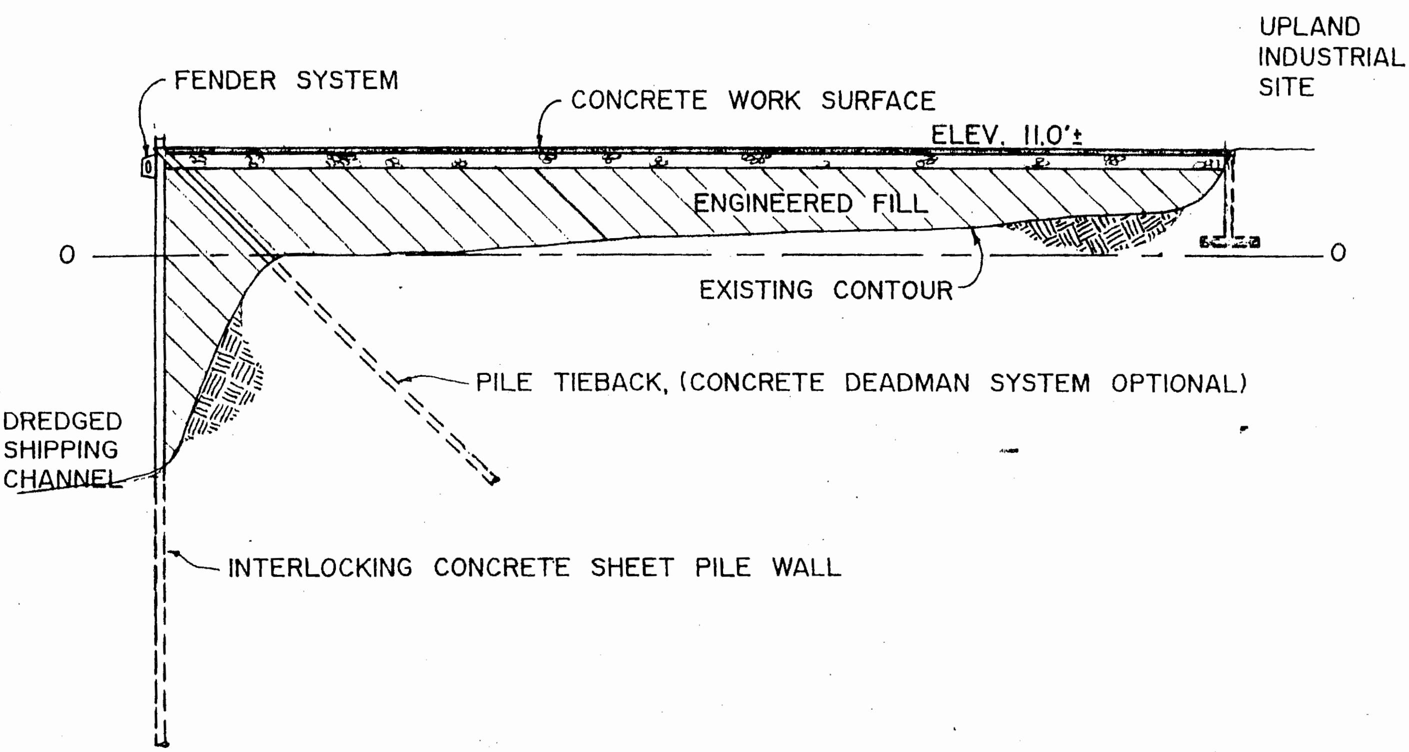
CEQA. An estimated 95,000 cubic yards of engineered fill material will be placed and compacted within the bulkhead enclosure, providing anchorage for the bulkhead wall tie-back system (see Figure 4). Once filled, the fifty foot wide concrete pier extensions, gangway and moorage dolphins will be constructed. Prior to installation of the finished surface, utilities (water, sanitary sewer, storm drain, filtered separator system, electrical ...) will be installed. Following the installation of utilities, a six inch thick concrete slab will be poured over the compacted fill material. Site buildings, lighting, hydrants, moorage cleats, fender system, etc. will be placed upon the concrete surface in conformance with the approved project plans and specifications.

The northern pier extension will extend 200 feet from the northeast corner of the bulkhead and the south pier extension will terminate 450 feet south of the southeast corner of the bulkhead (see Figure 3 and Figure 5).

The total length of the completed structure will be 1500 feet. The filled area will encompass approximately six acres of combined tidal and intertidal mudflats. Elevation of the finished work surface will be + 11.00 feet MLLW.

3. Dredging and Disposal

The subtidal area between the south pier extension and the west line of the Samoa Channel will be dredged to a depth of -35 feet Mean Lower Low Water (MLLW) consistent with the federally authorized depth of the Samoa Channel. Dredging will be performed using a floating hydraulic cutter suction dredge. An estimated 110,000 cubic yards of subtidal sediments will be removed from a six acre area fronting the south pier extension. Dredge materials will be loosened by the rotating cutter head and suctioned and pumped through a submerged 12-inch diameter conveyance line. Suitable dredged materials will be used as fill material behind the bulkhead wall, and the balance of the dredged material will be pumped to the upland dredge spoils disposal area. Dredge piping will be routed along the tidal bench north of the terminal to an existing carrier pipe which passes beneath




## BULKHEAD/FILL CROSS SECTION

NOT TO SCALE

FIGURE 4

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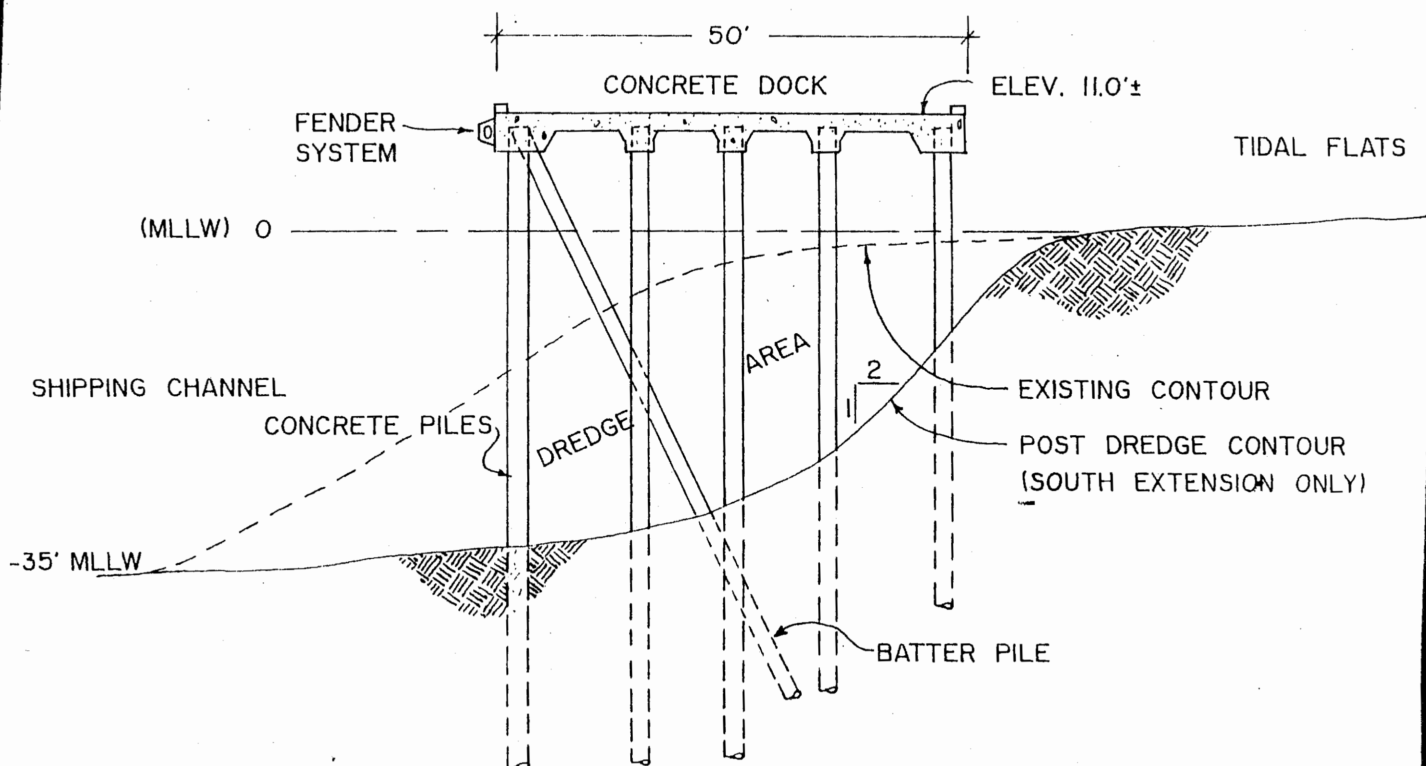


## CONCRETE PIER EXTENSION CROSS SECTION

NOT TO SCALE

**FIGURE 5**

SAMOA TERMINAL

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the railroad line and Old Samoa Road 700 feet southwest of the Samoa Bridge Overcrossing. All dredging equipment within the Bay will be provided with appropriate navigational marking and lighting, and, if necessary, a Notice to Mariners made. The disposal area is composed of two diked areas encompassing approximately seven acres each. The dredge spoils will enter the elevated primary decanting area where the coarse heavier sediments settle. Remaining turbid waters will flow through a weir to the lower secondary area for final decanting prior to Discharge to Humboldt Bay through the spoils line carrier pipe (see Figure 2). Surveys conducted in January, 1994 by Pacific Affiliates Consulting Engineers show the current capacity of the disposal site at 65,000 cubic yards. If the project dredge spoils are unsuitable and cannot be utilized as fill material, the existing diked disposal site walls would need to be increased in height by 4 feet. The four foot increase in height would accommodate he entire project spoils estimate of 110,000 cubic yards. Existing dredge spoils from within the site will be utilized to build up the dikes. Equipment and vehicles can perform these tasks from within the existing site, and reduce the disturbance to surrounding vegetation. Following utilization of the dredge material disposal site, sand shall be spread on the exposed dikes to encourage natural revegetation. Daily sampling and monitoring of discharge waters and background conditions will be performed during dredging operations. Sample testing and analysis will be provided by a licensed laboratory approved by the California State Regional Water Quality Control Board. All discharge conditions, sampling, monitoring and reporting will be in conformance with the approved Waste Discharge Requirements for Louisiana Pacific Corporation Samoa Cargo Dock Dredging, Order No. 87-76, as prepared by the California Regional Water Quality Control Board (see Appendix 1). The Waste Discharge Requirements for the project are being reviewed by the Regional Water Quality Control Board and amended to include any additional requirements of this project.

The dredge spoils upland disposal site is located southeast of the junction of Highway 255 (Samoa Bridge) and New Navy Base Road. The upland disposal site has been utilized by LP and others in the past for various maintenance dredging projects within Humboldt Bay. U.S. Army Corp of Engineer permits have been secured in the past in compliance with Section 404 and a new permit will be required as part of this project. (See Section II B. for more discussion of permits and other regulatory requirements).

Construction is scheduled to commence in the fall of 1994 and continue for a period of approximately 9 - 12 months, following the approval of all permitting agencies.

## B. Regulatory Requirements

### 1. Harbor District Permit

The proposed project site is located on land leased by the Humboldt Bay Harbor, Recreation, and Conservation District (Harbor District) to L-P. The proposed project will require a Harbor District Permit from the Harbor District. The Harbor District was established by Chapter 1283, Statutes of 1970, as amended and was authorized by the voters in 1973. The granting legislation specified jurisdiction over all tidal, submerged, and other lands granted to the district: Humboldt Bay, meaning the land and overlying waters, to the limit of tidal action, including all rivers, sloughs, estuaries and tributary areas, subject to tidal action, including only the portions of Indian, Woodley, and Daby Islands bayward of mean high water. The Harbor District interprets the phrase "subject to tidal action" as being the elevation of mean higher high water.

The general mandate of the District is to promote development in and around Humboldt Bay and to conserve and protect the Bay resources. The District has permit, planning, and leasing authority over areas under its jurisdiction and may engage in capital construction. The District also regulates use and control of pollution, dredging, and filling through Ordinance No. 7, (see Appendix 2) adopted by the District Commissioners in 1976, to implement certain portions of the 1975 Humboldt Bay Master Plan prepared by Koebig and Koebig, Inc. (Vol. II., Shapiro, 1979).

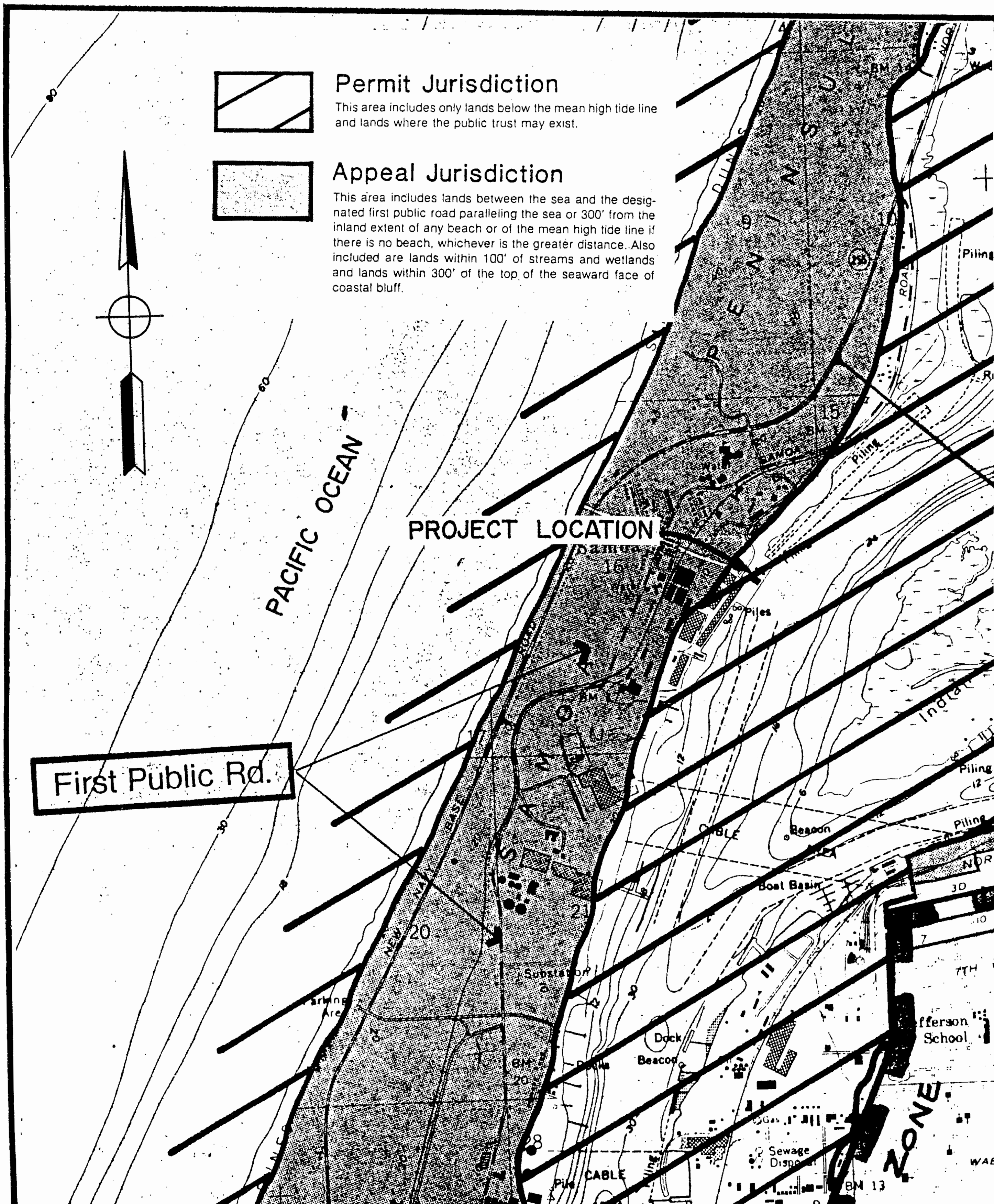
2. <u>Coastal Development Permit</u>

The California Coastal Act requires a coastal development permit for any development or portions of development located within the coastal zone. Section 15206 of CEQA defines criteria for projects of statewide, regional or area wide significance which includes projects within the California Coastal Zone. Lead agencies are required to submit a DEIR to the State Clearinghouse and also to the local area council of governments for review and comment.

The construction of the proposed project will require a Coastal Development Permit from the California Coastal Commission upon approval of the Harbor District Permit and Humboldt County Conditional Use Permit for the dredge disposal site. The Coastal Commission performs a "functionally equivalent" CEQA review as part of its permit evaluation responsibilities. The permit is required for development within the Coastal Zone as set forth in the Local Coastal Plan Element of the Humboldt County General Plan within the jurisdiction of the Humboldt County Planning Division. (See Figure IIIA.0)

3. <u>California Department of Fish and Game</u>

The California Department of Fish and Game (DFG) is a responsible agency under CEQA and reviews Coastal Development Permit applications for the Coastal Commission. Pursuant to the California Endangered Species Act (CESA), and Fish and Game Code Section 2050 et.seq., state agencies must consult with the DFG to determine whether their projects are "likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of habitat essential to the continued existence of the species." Additionally, if the DFG concludes that a project would cause such jeopardy, they must identify "reasonable and prudent alternatives" that can




LP SAMOA TERMINAL
COASTAL ZONE
JURASDICTION

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FIGURE IIIA.(

avoid the problem. The lead agency must adopt these alternatives unless it can make certain findings specified in the Fish and Game Code Section 2092.

4. State Lands Commission

The State Lands Commission (SLC) is a responsible and/or trustee agency under CEQA. The State acquired sovereign ownership of all tidelands and submerged lands and beds of navigable waterways upon its admission to the United States in 1850. The SLC also has residual and review authority for tide and submerged lands legislatively granted in trust to local jurisdictions (Public Resources Code sections 6301 and 6306). California holds a fee ownership in the bed of the bay between the two ordinary high water marks. The entire bay is subject to a public trust easement. Sovereign interest has been granted in trust by the Legislature to the Harbor District pursuant to Chapter 225, Statutes of 1945, as amended.

5. Section 10 and 404 Permits

Project construction will require review under Section 10 and Section 404 prior to issuance of a permit from the San Francisco District, U.S. Army Corps of Engineers. The Corps is responsible for activities in or upon the navigable waters and adjacent wetlands of Humboldt Bay under provisions of Section 10 of the River and Harbor Act of 1899 and Section 404 of the Federal Water Pollution Control Act Amendments of 1977 as amended by the Clean Water Act of 1977. Section 10 covers the construction of any structure in or over any navigable water of the United States, the excavation from or depositing of material in such waters, or the accomplishment of any other work affecting the course, location, condition, or capacity of such waters. Section 404 review is specifically for the discharge of dredged or fill material into the waters of the United States at specified disposal sites.

The Army Corps of Engineers has jurisdictional authority pursuant to Section 404 of the Clean Water Act (33 U.S. Code 1344) that governs the discharge of dredged or fill material into the waters of the United States, and Section 10 of the

Rivers and Harbors Act that prohibits unauthorized obstruction or alteration of any navigable waters of the United States.

Other Federal agencies play responsible roles in the Section 10 and 404 permit review process. The National Marine Fisheries Service reviews and submits recommendations to the corps related to issuance of permits in accordance with the Fish and Wildife Coordination Act (1958). Similarly, the U.S. Fish and Wildlife Service reviews and submits recommendations to the Corps related to issuance of permits in accordance with the Fish and Wildlife Coordination Act (1958) and consultation pursuant to the Endangered Species Act (1973).

The Environmental Protection Agency (EPA) review and submits recommendations to the Corps related to the issuance of permits. All federal agencies are guided by the National Environmental Policy Act (NEPA) of 1969 which requires avoiding, minimizing, rectifying, reducing and compensation for significant impacts.

6. Notice of Intent (NOI) to Comply with NPDES Requirements

The project will require a National Pollutant Discharge Elimination System Permit (NPDES) from the State Water Resources Control Board for storm water discharges associated with industrial activities under the National Pollutant Discharge Elimination System Program.

Section 402(p) of the 1987 amendments to the Clean Water Act establishes a framework for regulating municipal and industrial storm water discharges either directly or indirectly to surface waters. The federal regulations allow authorized states to issue general permits or individual permits to regulate storm water discharges. The State Water Resources Control Board (State Water Board) has elected to issue a statewide general permit that will apply to all industrial storm water discharges requiring a permit except construction activity. A separate statewide general permit was adopted on August 20, 1992 for construction activity of five acres or more, including clearing, grading and excavation.

To obtain authorization for continued and future industrial storm water discharge, owners and operators must submit to the State Water Board a Notice of Intent (NOI) to be covered by this general permit. The general permit requires dischargers to 1) eliminate most non-storm water discharges to storm water sewer systems; 2) develop and implement a storm water pollution prevention plan (SWPPP); and, 3) perform monitoring of discharges to storm water sewer systems. As of October 1, 1992, dischargers under the State Water Board's general permit will be required to implement Best Management Practices (BMPs) and Best Conventional Pollutant Control Technology (BCT) to reduce storm water discharge until they receive a permit.

Current Waste Discharge Requirements for the LP Samoa Cargo Dock Dredging (Order No. 87-76) issued by the Regional Water Quality Control Board (RWQBC) for past dredging operations will apply to dredging for the proposed project which must comply with specific limitations and provisions including monitoring and reporting requirements. (See attached WDR Requirements, Appendix 1.) Waste Discharge Requirements are currently being reviewed by the Regional Board and amended to include any additional requirements of this project.

7. <u>Waste Discharge Requirements (WDRs)</u>

Waste Discharge Requirements (WDRs) and a Monitoring and Reporting Program will be required for the proposed project. Louisiana Pacific currently possesses a Waste Discharge and Monitoring Program for conducting dredging operations associated with the maintenance of the Samoa Terminal Dock (Order No. 87-76, I.D. No. 1B87018RHUM) prepared by the California Regional Water Quality Control Board (CRWQCB). This permit covers the proposed dredge site, upland disposal areas and discharge and monitoring guidelines and reporting requirements. (See Appendix 1.) Waste Discharge Requirements are currently being reviewed by the Regional Board and amended to include any additional requirements of this project.

8. <u>County Building Permit</u>

All construction work will be required to obtain building permits from Humboldt County Building Division. Project Plans and specifications will comply with accepted engineering standards including the Uniform Building Code (UBC) for Seismic Zone 4.

9. <u>Humboldt County Conditional Use Permit</u>

Placement of dredge spoils within the upland disposal site and the excavation of historic fill material for the creation of the project mitigation site necessitates the application for and approval of a Conditional Use Permit from the Humboldt County Planning Department. A Humboldt County Coastal Development Permit is not necessary for this project (Sidnie Olson, Humboldt County Planning Department, 1994).

## III. ENVIRONMENTAL SETTING, IMPACTS & MITIGATION

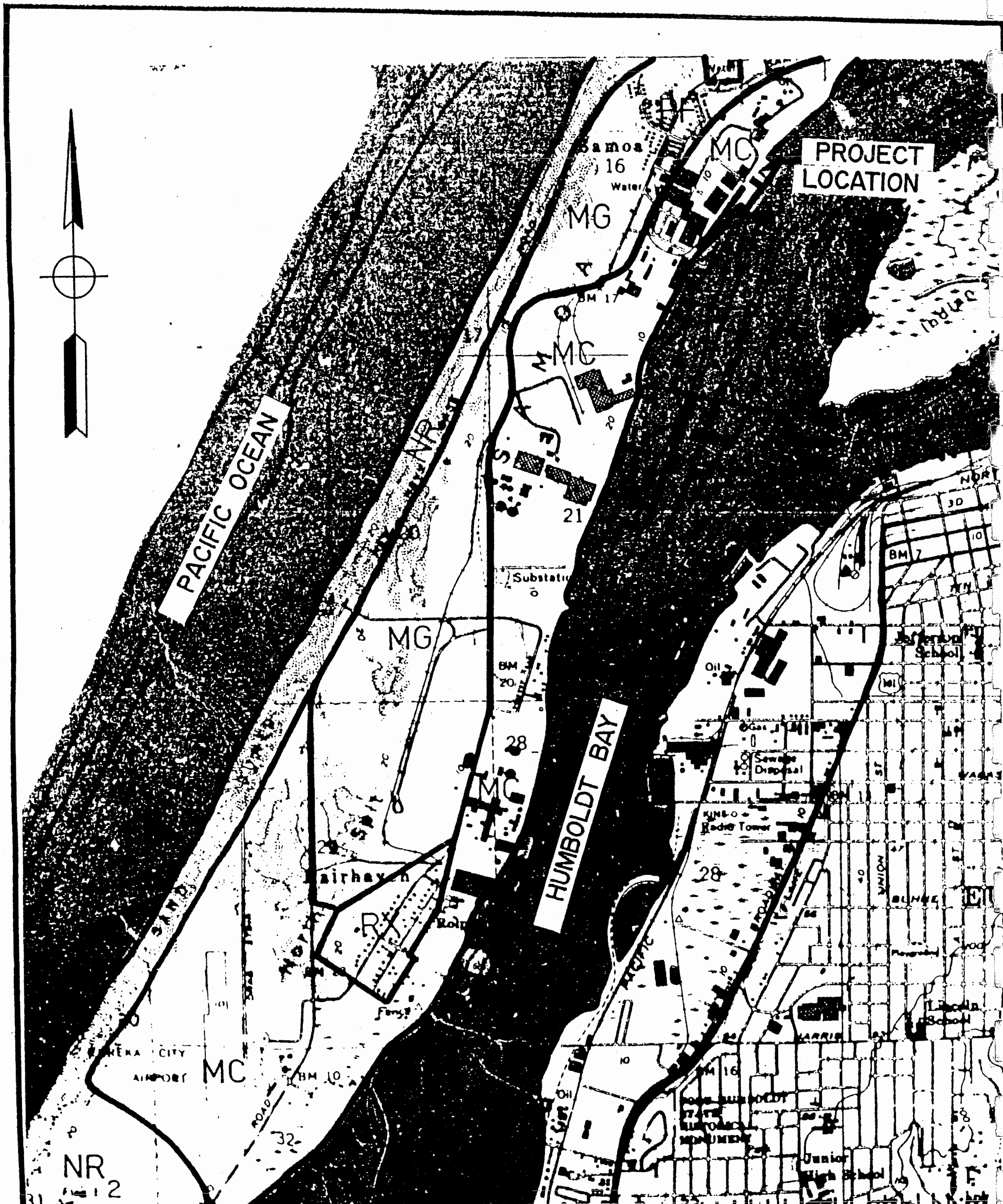
### A. Land Use

The majority of information incorporated into this section was derived from <u>Final Environmental Impact Report for the Louisiana-Pacific Corporation Pollution Prevention Project</u>, prepared by ENSR Consulting and Engineering for Humboldt County Planning and Building Department, April 1993.

1. <u>Environmental Setting</u>

a. <u>General Plan Designations</u>

The Humboldt Bay Area Plan (HBAP) for the Humboldt County Local Coastal Program (LCP) designates the land use for the project site as Industrial/Coastal Dependent (MC). (See Figure IIIA.1) The purpose of the MC designation is to protect and reserve parcels on or near the sea for industrial uses dependent on, or related to, the harbor. The principally permitted uses within the MC designation




LP SAMOA TERMINAL
HUMBOLDT AREA PLAN MAP

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FIGURE IIIA.1

are any coastal-dependent industrial use that requires access to a maintained navigable channel in order to function. Uses allowed with a Conditional Use Permit include, but are not limited to, facilities that require alterations, improvements, and relocations of existing general industrial uses within the MC designation. The existing L-P mill and the facilities proposed to be constructed within the existing site are conditional uses within the MC designation and will require a conditional use permit from Humboldt County.

b. Zoning Designations

i. Coastal Dependent Industrial Development

Section A314-5 of the Humboldt County Code classifies the project site as Coastal Dependent Industrial Development. The purpose of this zone is to ensure that Coastal-Dependent Industrial Development is located within, contiguous with, or in close proximity to, existing developed industrial areas, or where such areas are not able to accommodate it, to locate such development in other areas with adequate public services and where it will not have significant adverse effects on coastal resources. Section A314-5(C) requires Environmental Review of a proposed facility to include a comparative evaluation of alternative sites within appropriate land use designations for the proposed project. Alternative sites are rated according to a priority system with the most desirable being a Priority 1 site. A Priority 1 site has existing facilities suitable, with minor alteration, to accommodate the proposed use, or could accommodate the proposed use through expansion. The existing L-P pulp mill, including the proposed project site, is a Priority 1 site.

ii. Industrial Development Findings

Section A314-5(E) requires Industrial Development Findings before Coastal-Dependent Uses can be approved as listed below:

1. Coastal Dependent Industry

   a. The proposed use will be located on the site with the lowest numeric priority (i.e., priority 1 is the lowest), if feasible.

   b. If proposed on a site with a Priority 3 or 4:

      i. That the proposed use cannot feasibly be accommodated in Priority 1 or 2 sites; or

      ii. The use of Priority 1 or 2 sites would be more environmentally damaging; and

      iii. To deny the project because it cannot feasibly be located in the least environmentally damaging location would adversely effect the public welfare.

Required Mitigation Measures

Section A314-5(G) requires coastal-dependent facilities to be designed and operated to incorporate the following mitigation measures, as applicable:

1. Adverse environmental effects will be mitigated to the maximum extent feasible and will conform to the applicable provisions of the Special Area Regulations, and the other resource protection regulations of this Division;

2. Maximum feasible and legally permissible multi-company use shall occur;

3. The total volume of oil spilled shall be minimized;

4. Approved facilities shall have ready access to the most effective feasible containment and recovery equipment for spills;

5. Approved facilities shall have onshore deballasting facilities to receive fouled ballast water from tankers where operationally or legally required;

6. New development or expansion of marine petroleum transfer facilities will not increase the risk of an oil spill to Humboldt Bay;

7. Where expansion of existing marine petroleum transfer facilities or construction of new facilities may result in an increased risk of spill associated with the expanded facility, such risk will be mitigated through alteration of existing operations.

Dredge Spoils Disposal Regulations

Section A314-13 establishes regulations to ensure that spoils disposal is planned and carried out to avoid significant disruption to marine and wildlife habitats and water circulation, and that spoils discharge or disposal takes place in the least environmentally damaging manner and location, and that feasible mitigation measures be provided to minimize adverse environmental effects.

These regulations apply throughout the coastal zone, wherever dredge spoils are proposed to be discharged or deposited. Dredge spoils disposal is preferred at those sites designated on the resource protection maps of the Coastal Land Use Plan. Dredge spoils disposal sites identified on the Humboldt Bay Area Plan Resource Protection Maps shall be protected for spoils disposal. Dredge spoils disposal shall be approved only if the applicable Industrial Development Findings in Chapter 5 of the Humboldt County Code are made. (See Supplemental Findings below.)

Geologic Hazard Regulations

Section 314-16 establishes Geologic Hazard Regulations to ensure that risks to life and in high and potentially high geologic hazard areas shall be minimized and further, to assure stability and structural integrity, and neither create nor contribute significantly to erosion, geologic instability or destruction of development sites or surrounding areas or in any way require the construction of protective devices that would substantially alter natural landforms along bluffs and cliffs. New development will be reviewed, approved and cited in accordance with the "Geologic Hazards Land Use Matrix" in the Humboldt County General Plan.

Industrial Performance Standards

Section A314-18 establishes minimum standards for the operation of industrial development in Humboldt County and applies to all industrial use types. The Standards for Industrial Development that impact Residential Zones is not applicable to the proposed project. The nearest residence to the proposed project is in Samoa (northwest of the L-P Mill) approximately 0.2 miles away and in Fairhaven approximately 1.4 miles away. Standards for Industrial Development that Impact Non-Residential Zones are listed below:

1. Noise. Mitigating measures shall be required where necessary to insure that noise generated by industrial operations does not exceed 70 dB(A) anywhere off the site premises.

2. Lights. No restrictions.

3. Traffic. No restrictions.

4. Vibrations. No perceptible vibrations shall be permitted to interfere with adjacent land uses.

5. Electronic Interference. No visual or audible interference of radio or television reception by operations shall be permitted.

6. Dust Control. All areas used for parking, traffic circulation and material storage shall be surfaced with asphalt concrete.

7. All manufacturing and fabricating areas shall be enclosed in buildings.

8. All equipment and materials storage areas adjacent to any residential zone shall be screened by walls, fences, or adequate plantings to a height of not less than six feet, and said fencing and planting shall conform to all yard requirements.

Required Findings

Section A315-14 requires specific findings for all discretionary permits including conditional use permits and coastal development permits as follows:

1. The proposed development is in conformance with the County General Plan;

2. The proposed development is consistent with the purposes of the existing zone in which the site is located;

3. The proposed development conforms with all applicable standards and requirements of these regulations; and

4. The proposed development and conditions under which it may be operated or maintained will not be detrimental to the public health, safety, or welfare.

Supplemental Findings

In addition to the required findings, Section A315-16 establishes Supplemental Findings required for approval of a coastal development permit. The following findings apply to the proposed project.

G. Industrial Development Findings

1. Coastal-Dependent Industry

a. The proposed use will be located on the site with the lowest numeric priority, if feasible.

3. Dredge Spoils Disposal

a. Where dredge spoils disposal is proposed at the King Salmon site designated on the Resource protection map such disposal will mitigate erosion and protect water quality and existing uses;

b. Provisions for disease and vector control have been included in the project.

c. In the Humboldt Bay Planning Area, opportunities for island building that would be beneficial to the overall productivity of the Bay have been reviewed as an alternative disposal site; and

d. The project includes provision to protect water quality.

H. Public Safety Impact Findings

2) Coastal Geologic Hazard

a. The development will be sited and designed to assure stability and structural integrity for the expected economic lifespan while minimizing alteration of natural landforms.

3) Coastal Shoreline Protection

a. The Structure is the least environmentally damaging feasible alternative.

I. Resource Protection Impact Findings

3. Coastal Scenic Areas

a. The project is sited and designed to be subordinate to the character of the setting. Project site not in a designated Coastal Scenic Area. (See Figure IIIA.2)

5. Coastal View Areas

a. To the maximum extent feasible, the project is sited so as not to interfere with public views to and along the ocean from public roads and recreation areas.

6. Coastal Dune and Beach Areas

a. All development:

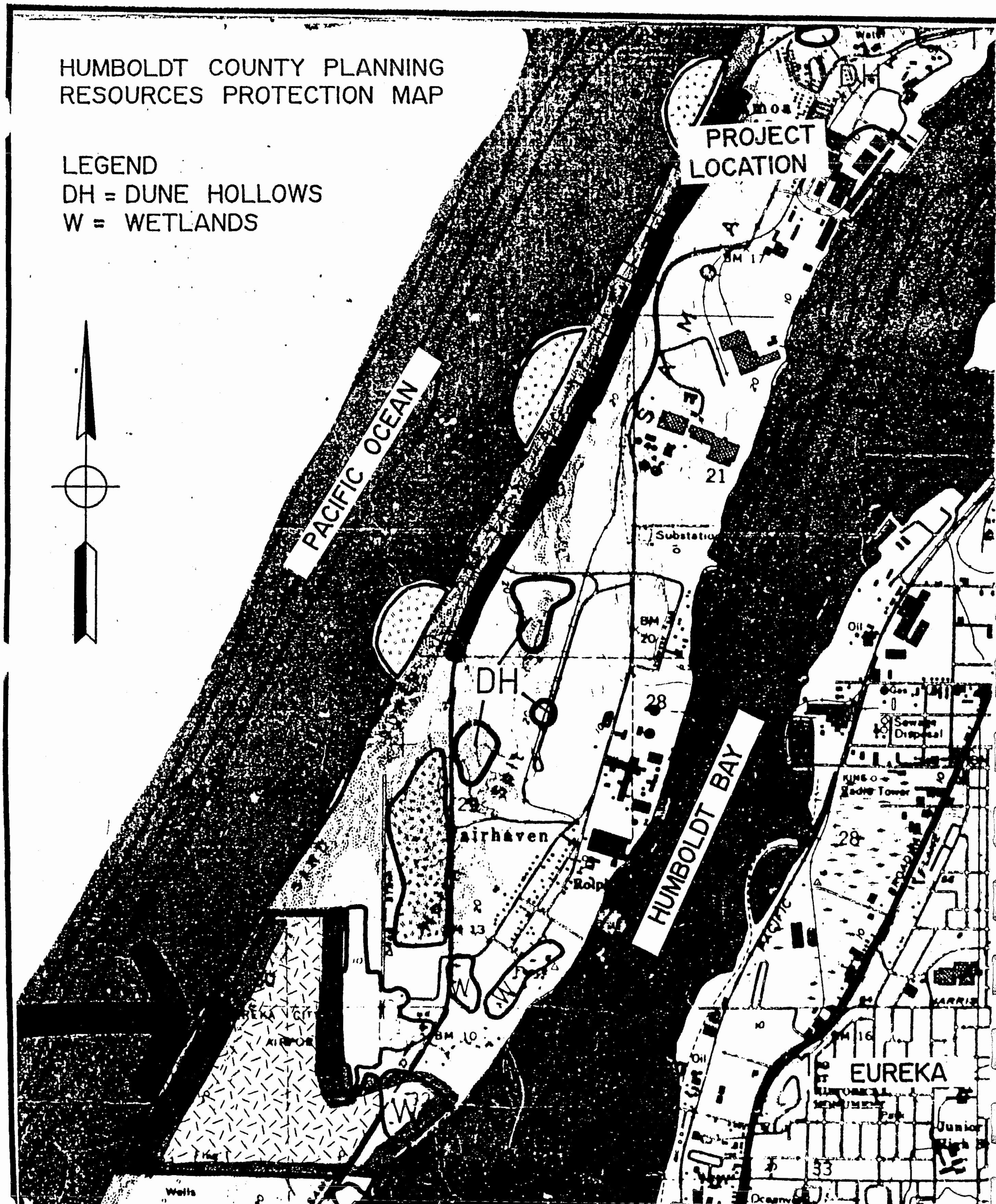
i. Development shall be sited and designed to prevent impacts which would significantly degrade such areas, and shall be compatible with the continuance of such habitat areas; and

ii. There is no less environmentally damaging feasible alternative.

iii. The development will not interfere with the protection of dredge spoils disposal locations designated on the HBAP Resource Protection Maps.

Coastal Public Access Protection

The purpose of these regulations is to insure that development permitted by the County and located within the County's Coastal Zone does not interfere with public access required through use. The Public Access Protection regulations apply to all lands located between the first public road and the sea. The proposed project is on the bay side of the Samoa peninsula and will not interfere or negate public access to the ocean side beaches of the peninsula.




LP SAMOA TERMINAL

RESOURCE PROTECTION MAP

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FIGURE IIIA.2

2. Impacts

Impact Significance Criteria for Land Use:

- Major change in land uses or planning designations
- Possible cumulative effects

The potential land use impacts of the proposed project are related to compliance with the Ordinance No. 7 (see Appendix 2) adopted to implement certain portions of the Humboldt Bay Master Plan, the Humboldt Bay Area Plan (HBAP) of the Humboldt County Local Coastal Program, and the Coastal Zoning Regulations of the Humboldt County Code.

Humboldt Bay Area Plan:

The proposed project is consistent with the purpose of the MC designation (Industrial/Coastal Dependant) to protect and reserve parcels on or near the sea for industrial uses dependent on, or related to, the harbor and is a coastal-dependent industrial use that requires access to a maintained navigable channel in order to function.

According to the Coastal-Dependent Industrial development policies of the HBAP, facilities are encouraged to locate and expand within existing sites and are permitted reasonable long-term growth where consistent with the HBAP. The existing L-P pulp mill is a Priority 1 site having existing facilities suitable, with minor alteration, to accommodate the proposed use. The HBAP specifies that industrial uses include mitigation and design features for compatibility with adjacent land uses; in particular, screening and/or landscaping to buffer adjacent residential or recreation uses. The land surrounding the project site is all designated for industrial development. The nearest residence to the proposed project is in Samoa (northwest of the L-P Mill) approximately 0.2 mile away and in Fairhaven approximately 1.4 miles away.

Coastal Zoning Regulations:

The proposed project is in conformance with the regulations set forth in the Coastal Zoning Regulations of the Humboldt County Code. The proposed project is a principally permitted use under the MC zoning classification. Section 314-5(C), which requires environmental review to address alternatives, is discussed in detail in Section IV. Alternative Evaluations.

Applicable Findings for Industrial Development can be made for the proposed project; specifically, the proposed site is a Priority 1 site (the lowest numeric priority) as per Section A314-5(E).

The proposed project has been designed and will be operated incorporating the mitigation measures specified in Section A314-5(G). Adverse environmental effects will be mitigated to the maximum extent feasible and will conform to the applicable provisions of the Special Area Regulations, and other resource protection regulations. Table 1. provides a summary of the possible environmental impacts and proposed mitigation measures for the proposed project.

Although not correctly practiced, multi-company use of L-Ps facilities may be feasible in the future as set-forth in Section A314-5(G)2. L-P has submitted a Spill Contingency Plan (SCP) to the State Lands Commission to reduce the risks of potential oil spills during construction activities. The plan provides specific response procedures for minor and major onshore and offshore spill scenarios. L-P's facilities do not require the use of tankers or deballasting facilities for oil-contaminated ballast; and the proposed project is not a marine petroleum transfer facility.

The proposed project will deposit dredge spoils on an existing, previously approved and permitted dredge spoils site (See Figure 2 and Section II, Project Description).

The proposed project will not disturb Dredged Spoils Reserve Areas as per HBAP Resource Protection Maps and Section A314-13 of the Coastal Zoning Code.

The foundation and structural design of the proposed project will conform to the Geologic Hazards Land Use matrix contained in the Humboldt County General Plan. The engineering design will use appropriate earthquake resistant methods that would minimize damage and protect facilities due to ground failures resulting from strong earthquake shaking. (See Section III B. for more detailed discussion of Soils and Geology).

The proposed project will meet or exceed the minimum standards for operation of industrial development as set forth in Section A314-18 Industrial Performance Standards. The proposed project does not impact residential zones and the standards for such do not apply. Except for temporary noise impacts related to project construction, the project will be in conformance with the not to exceed 70 dB(A) noise standards as set forth in D(1) for operation. According to the ENSR (1993) study, noise levels of 58 dB(A) have been recorded for New Navy Base Road (within 2000 feet of the proposed project) and the nearest noise-sensitive receptor (residential area) is over 1,000 feet away. Construction-related impacts associated with heavy machinery and pile-drivers will be short-term and temporary and are not expected to be significant. Additionally, the proposed project is not expected to create any perceptible vibrations as set forth in Standard D(4); nor will it interfere with electrical transmissions as set forth in Standard D(5).

The proposed project meets all the required findings for discretionary permits (Section A315-14), specifically, the project conforms with the General Plan (Humboldt Bay Area Plan); the purposes of the existing zoning (Coastal-Dependent Industrial Development-MC); all applicable standards and requirements of the zone regulations; and will not be detrimental to the public health, safety, or welfare.

Additionally, the project complies with the applicable findings required in Specific Findings (Section A315-16); project site is a priority 1 site, having existing facilities to accommodate the proposed use through expansion, as per Industrial Development Findings (Section G(1) (a); Dredge Spoils Areas will include provisions for disease and vector control and to protect water quality as per Dredge Spoils Areas (Section G.(3)(b) and (d).

Public Safety Impact Findings can be made for Coastal Geologic Hazard Section H(2)(a), as the project will be sited and designed to assure stability and structural integrity for the expected economic lifespan while minimizing alteration of natural landforms; and Coastal Shoreline Protection Section H(3)(a), the project being the least environmentally damaging feasible alternative.

The project is sited and designed to be subordinate to the character of the setting (project site not in a designated Coastal Scenic Area) as required in Section I(3)(a) for Coastal Scenic Areas; is sited so as not to interfere with public views (Section I(5)(a) for Coastal View Areas; and, will be sited and designed to prevent impacts which would significantly degrade Coastal Dune and Beach Areas, and shall be compatible with the continuance of such habitat areas; there is no less environmentally damaging feasible alternative; and, the development will not interfere with the protection of dredge spoils disposal locations designated on the HBAP Resource Protection Maps as required in Section I(6)(a). Impacts on vegetation and wildlife species are discussed in detail in Section III E. Biological Resources.

Findings are also required for compliance with the County's Coastal Plan, and 404 of the Clean Water Act.

<u>Coastal Plan</u>

The proposed project is consistent with applicable Coastal Zone management Act provisions from the Humboldt County Local Coastal Plan (LCP) as summarized below:

Provision 30211 - Development shall not interfere with the public's right of access to the sea shore acquired through use, or legislative authorization, including, but not limited to, the use of dry sand and rock coastal beaches to the first line of terrestrial vegetation.

Provision 30212 - Public access from the nearest public roadway to the shoreline and along the coast shall be provided in new development projects where (1) it is inconsistent with public safety, military security needs, or the protection of fragile coastal resources, (2) adequate access exists nearby, or (3) agriculture would be adversely affected. Dedicated accessway shall not be required to be opened to public use until a public agency or private association agrees to accept responsibility for maintenance and liability of the accessway.

Provision 30230 - Marine resources shall be maintained, enhanced, and where feasible, restored. Special protection shall be given to areas and species of special or biological or economic significance. Uses of the marine environment shall be carried out in a manner that will sustain the productivity of coastal waters and that will maintain healthy populations of all species of marine organism adequate for long-term commercial, recreational, scientific, and educational purposes.

Provision 30231 - The biological productivity and the quality of coastal waters, streams, wetlands, estuaries, and lakes appropriate to maintain optimum populations of marine organisms and for the protection of human health shall be maintained, and where feasible, restored through, among other means, minimizing adverse affects of waste water discharges and entrainment, controlling runoff, preventing depletion of ground water supplies and substantial interference with surface waterflow, encouraging areas that protect riparian habitats, and minimizing alteration of natural streams.

Provision 30233 - a) the diking, filling, or dredging of open coastal waters, wetlands, estuaries, and lakes shall be permitted in accordance with other applicable provisions of this division, where there is no feasible, less environmentally damaging alternative, and where feasible mitigation measures have been provided to minimize adverse environmental effects, and shall be limited to the following:

> 2) maintaining existing, or restoring previously dredged, depths in existing navigational channels, turning basins, vessel berthing, and mooring areas, and boat launching ramps.

b) dredging and spoils disposal shall be planned and carried out to avoid significant destruction to marine and wildlife habitats and water circulation. Dredge spoils suitable for beach replenishment should be transported for such purposes to appropriate beaches or into suitable longshore current systems.

Provision 30240 - a) environmentally sensitive habitat areas shall be protected against any significant disruption of habitat values, and only uses dependent on such resources shall be allowed within such areas. b) development in areas adjacent to environmentally sensitive habitat area and parks and recreation areas shall be sited and designed to prevent impacts which would significantly degrade such areas and shall be compatible with the continuance of such habitat.

Provision 30244 - where new development would adversely impact archeological or paleontological resources, as identified by the State Historic Preservation Officer, reasonable mitigation measures shall be required.

Section 404 Clean Water Act of 1977, as amended - The findings of Section 404 (b) (1) provide findings of compliance with the restrictions on proposed disposal sites for the discharge of dredge or fill material as follows:

i) There is no practical alternative to the proposed discharge that would have less adverse effect on the aquatic ecosystem, and there are no other significant adverse environmental consequences; or

ii) The proposed discharge will not result in significant degradation of the aquatic ecosystem; or

iii) The proposed discharge includes all appropriate and practicable measures to minimize potential harm to the aquatic ecosystem; or

iv) There is sufficient information to make a reasonable judgment as to whether the proposed discharge will comply with these Guidelines.

Findings under this section will be set forth in writing by the permitting authority.

3. Mitigation

No mitigation measures are necessary as there are no significant land use impacts associated with the proposed project. Mitigation measures for other project related impacts are discussed in detail in their appropriate sections of this DEIR.

## B. Soils & Geology

The majority of information incorporated into this section was derived from the ENSR (1993) study and Appendix D. Geology Report, Draft Environmental Impact Report for the City of Arcata on Proposed Annexation, General Plan Amendment, and Zone Change by Universal Forest Products, Inc. prepared by SHN Consulting Engineers & Geologists (1992).

1. Environmental Setting

a. Soils

The project site is located on the eastern (bayward) side of the North Spit of

Humboldt Bay, 4.5 miles north of the entrance of Humboldt Bay. The underlying strata is predominantly alluvium and sedimentary deposits of the Hookton Formation, found throughout the Humboldt Bay Basin. The North and South Spits and the land masses adjacent to Humboldt Bay is underlain by up to 400 feet of clay, silt and gravels of the Hookton Formation. Water well boring on the North Spit suggests that late Pleistocene and Holocene age (approximately 10,000 years) alluvium bay fill and deposits overlie the Hookton Formation to a depth of 100 feet (Curtis and Hamilton 1972). Soils of the North Spit have been mapped as riverwash, beaches, and dune lands by Mclaughlin and Harradine (1965) and as alluvium and sand dunes by Kilbourne et al. (1980) (as cited in the Humboldt County Planning and Building Department 1992). (See Figure III B.1.)

Sediments underlying the Samoa Channel range from loose to dense sands with traces of silt and fine gravel in the southern reaches to firm clay with shell fragments nearer the northern terminus. Typical transported bottom sediments are comprised of sandy silt, originating from the Arcata Bay. The transition zone between the high flats and the channel bottom is predominantly classified as moderately clayey silt (Shapiro and Associates 1976). The transition zone makes up approximately 90 percent of the project dredge area. Sediments removed during 1991 by EVS Environment Consultants classifies the sediments underlying the channel bottom in close proximity of the project site as silty clay with shell fragments, Bioassays and Bioaccumulation testing-Humboldt Harbor Deepening Project, EVS Environment Consultants, February 1993. (See Table III B.2., Grain Size Data.)

This area of the Spit is overlain with assorted layers of imported fill materials, clay, silts, rock, lumber processing by-products, etc. These thin layers have been historically deposited by several scenarios of development and redevelopment of the site and surrounding properties.

Surveys conducted within the industrial complex at the Samoa Mill site reported

# GENERAL SOILS MAP

HUMBOLDT COUNTY

| | ASSOCIATION | SLOPE |
|---|---|---|
| BL | BAYSIDE-LOLETA | 0-9% |
| FR | FERNDALE-RUSS | 0-9% |
| HR1 | HOOKTON-ROHNERVILLE | 0-15% |
| HR2 | HOOKTON ROHNERVILLE | 3-50% ERODED |
| LM1 | LARABEE-MENDOCINO | 0-30% |
| LM2 | LARABEE-MENDOCINO | 30-50% |
| DB | DUNE LAND-BEACH | |

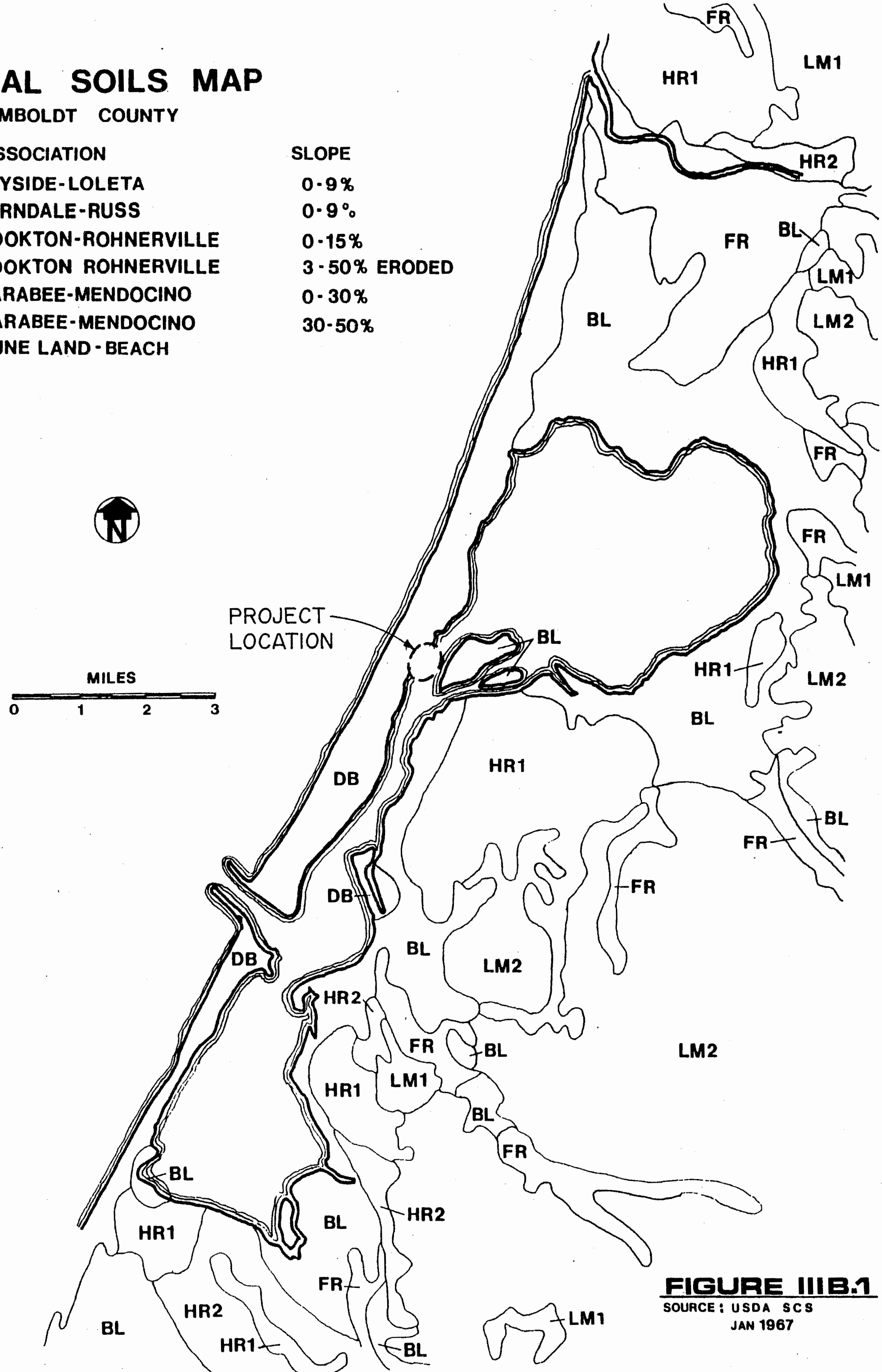
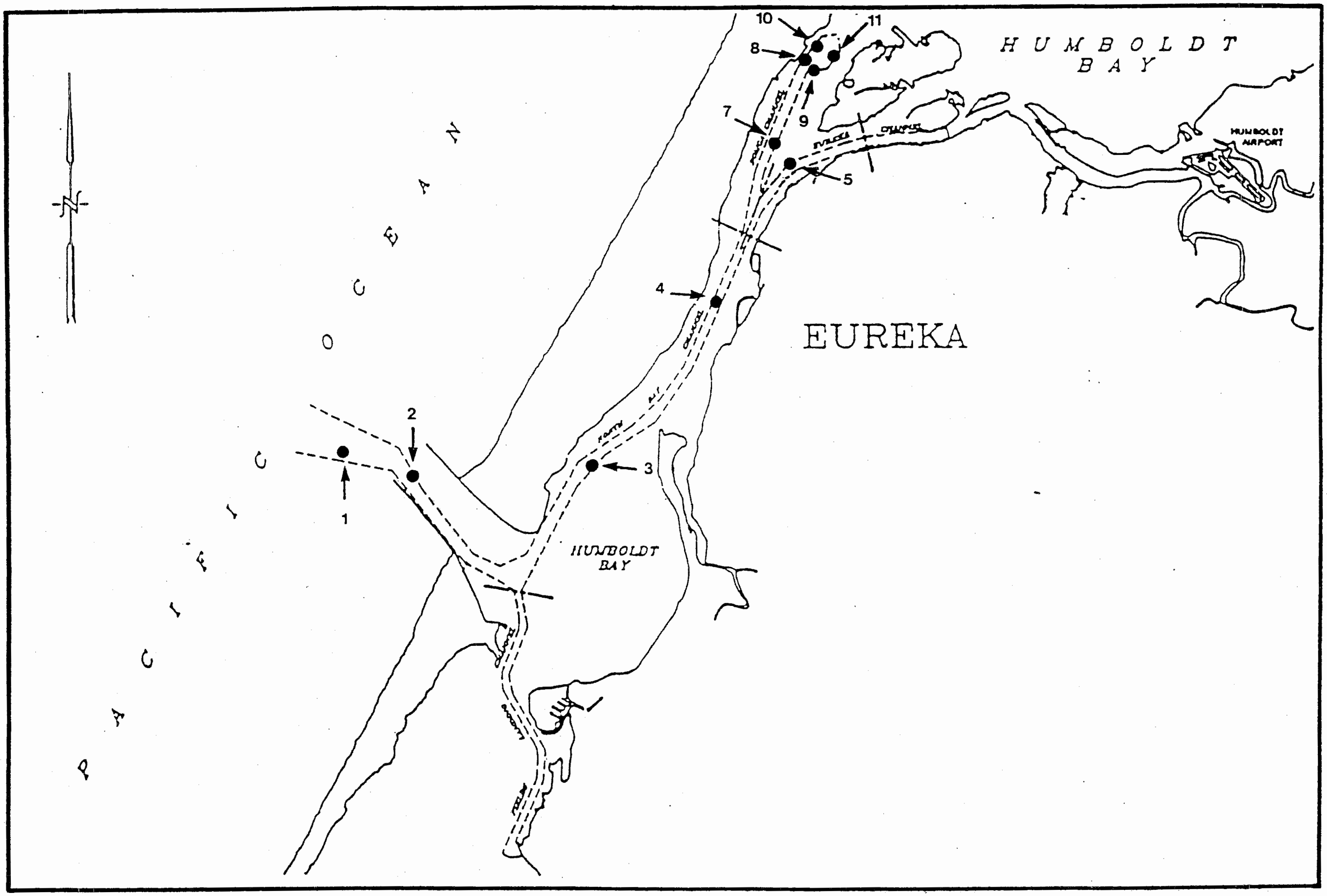



**FIGURE IIIB.1**

SOURCE: USDA SCS
JAN 1967

TABLE IIIB.2




Humboldt Harbour-Samoa and Eureka Channel sediment sampling location

## TABLE IIIB.2

**Grain Size Data – Humboldt Harbor Deepening Project (4/274–12.5)**

| | | Control | Reference | HB-1 | HB-2 | HB-3 | HB-4 | HB-5 | HB-7 | HB-7 (Dup.) | HB-8 | HB-9 | HB-10 | HB-11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Particle Size** | | | | | | | | | | | | | | |
| Sieve #4 | (>4.76mm) | N/A | 0.0 | 0.0 | 0.0 | 1.7 | 0.0 | 4.4 | 34.8 | 34.8 | 2.1 | 0.0 | 0.0 | 4.6 |
| Sieve #10 | (4.76–2.00mm) | N/A | 0.0 | 0.0 | 0.8 | 1.3 | 0.1 | 3.3 | 4.8 | 4.9 | 0.1 | 0.6 | 0.1 | 0.2 |
| Sieve #18 | (2.00–1.00mm) | N/A | 0.2 | 0.2 | 8.0 | 11.1 | 7.6 | 10.8 | 6.3 | 7.0 | 0.4 | 0.3 | 0.4 | 0.9 |
| Sieve #40 | (1.00–0.42mm) | N/A | 0.3 | 10.9 | 63.8 | 61.4 | 62.3 | 45.9 | 15.0 | 14.3 | 2.5 | 3.3 | 8.7 | 22.3 |
| Sieve #60 | (0.42–0.25mm) | N/A | 4.6 | 80.1 | 25.8 | 20.9 | 28.4 | 31.2 | 15.9 | 15.5 | 21.6 | 31.1 | 62.3 | 51.8 |
| Sieve #100 | (0.25–0.105mm) | N/A | 69.9 | 7.1 | 0.7 | 1.6 | 0.6 | 2.1 | 2.8 | 2.4 | 16.2 | 21.1 | 15.0 | 10.3 |
| Sieve #200 | (0.105–0.074mm) | N/A | 13.9 | 0.3 | 0.1 | 0.1 | 0.1 | 0.1 | 0.2 | 0.6 | 2.8 | 3.6 | 1.2 | 0.6 |
| Phi #4.0 | (74.0–62.4μm) | N/A | 3.6 | 0.0 | 0.0 | 0.2 | 0.0 | 0.3 | 0.6 | 1.4 | 3.0 | 5.7 | 1.5 | 1.1 |
| Phi #4.5 | (62.4–44.2μm) | N/A | 2.7 | 0.2 | 0.0 | 0.3 | 0.1 | 0.2 | 1.5 | 1.1 | 7.8 | 7.4 | 2.7 | 1.6 |
| Phi #5.0 | (44.2–31.2μm) | N/A | 0.3 | 0.2 | 0.0 | 0.0 | 0.2 | 0.1 | 1.5 | 1.5 | 5.5 | 4.2 | 1.0 | 0.3 |
| Phi #5.5 | (31.2–22.1μm) | N/A | 1.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.8 | 1.7 | 5.1 | 3.8 | 1.5 | 1.0 |
| Phi #6.0 | (22.1–15.6μm) | N/A | 0.6 | 0.0 | 0.0 | 0.4 | 0.0 | 0.4 | 3.5 | 3.5 | 7.8 | 4.5 | 1.1 | 1.1 |
| Phi #7.0 | (15.6–7.8μm) | N/A | 0.3 | 0.1 | 0.1 | 0.0 | 0.1 | 0.5 | 2.5 | 2.5 | 5.3 | 3.5 | 1.3 | 0.8 |
| Phi #8.0 | (7.8–3.9μm) | N/A | 1.0 | 0.1 | 0.1 | 0.4 | 0.4 | 0.1 | 2.4 | 2.1 | 4.1 | 1.8 | 0.9 | 0.9 |
| Phi #9.0 | (<3.9μm) | N/A | 1.4 | 0.8 | 0.6 | 0.6 | 0.1 | 0.6 | 6.4 | 6.7 | 15.7 | 9.1 | 2.3 | 2.5 |
| **Sediment Type*** | | | | | | | | | | | | | | |
| Gravel | (>4.76–2mm) | 0.0 | 0.0 | 0.0 | 0.8 | 3.0 | 0.1 | 7.7 | 39.6 | 39.7 | 2.2 | 0.6 | 0.1 | 4.8 |
| Sand | (2mm–63μm) | 98.5 | 92.5 | 98.6 | 98.4 | 95.3 | 99.0 | 90.4 | 40.8 | 41.2 | 46.5 | 65.1 | 89.1 | 87.0 |
| Silt | (63–4.0μm) | 0.7 | 6.1 | 0.6 | 0.2 | 1.1 | 0.8 | 1.3 | 13.2 | 12.4 | 35.6 | 25.2 | 8.5 | 5.7 |
| Clay | (<4.0μm) | 0.8 | 1.4 | 0.8 | 0.6 | 0.6 | 0.1 | 0.6 | 6.4 | 6.7 | 15.7 | 9.1 | 2.3 | 2.5 |
| Percentage of material retained on Sieve #200 | | N/A | 88.9 | 98.6 | 99.2 | 98.1 | 99.1 | 97.8 | 79.8 | 79.5 | 45.7 | 60.0 | 87.7 | 90.7 |

Results are expressed as percent, dry weight basis.
N/A = not available
* Percent values calculated from particle size values.

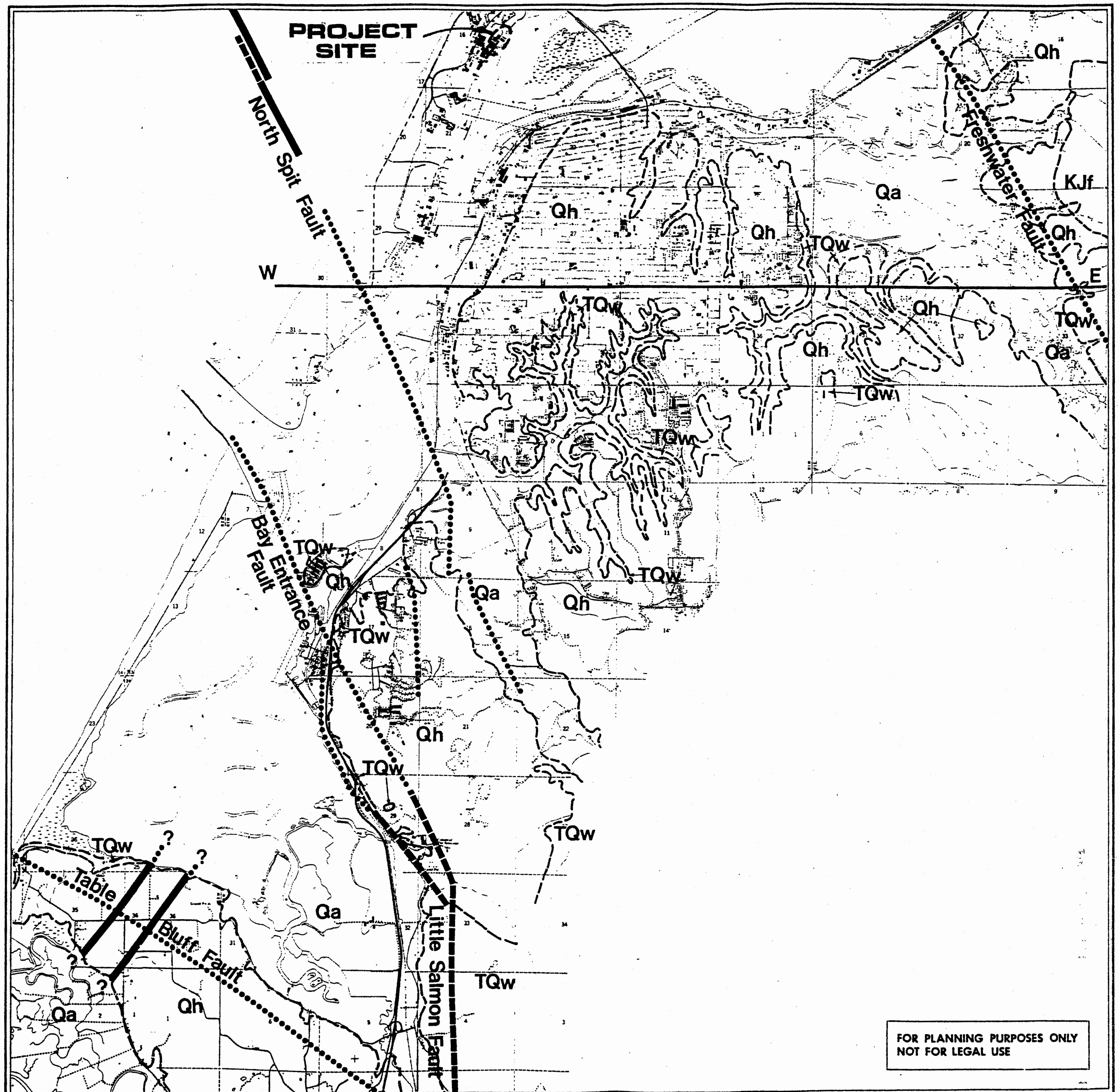
that the soils are poorly graded sands with medium to very dense consistency (Harris Group 1988). Although medium to loose soils are found at some locations, the majority of the Mill site consists of dense soils as a result of compaction due to traffic. The area is relatively level as a result of grading and filling that has occurred prior to the 1960's. Some additional grading has occurred during the past 20 years in conjunction with mill utilities construction and maintenance.

b. Geology

The geomorphology of the northern California coastline is a result of active tectonism in the area. The coastal area near Humboldt Bay is situated near the Gorda-Pacific-North American triple junction, which is defined as the juncture of the San Andreas Fault,the Mendocino Escarpment, and the Gorda Ridge (HSU 1990b). It is the Gorda Plate that generates much of the earthquake activity in the region. There are twelve active or potentially active faults and fault zones that could produce earthquakes in the Humboldt Bay area. Of the twelve faults, the North Spit, Bay Entrance, Little Salmon-Yager, and Freshwater Faults are closest to the proposed project site, with approximate distances ranging from about one to six miles. (See Figure III B.3.)

Although there is earthquake potential in the general area, the slope stability of the study area is considered to be "relatively stable" according to the Seismic Safety Map - Humboldt Bay and Vicinity (North Sheet, July 1979 - Humboldt County Planning Department 1989). Earthquake shaking in the study area is characterized as moderate alterations, but predominantly longer periods with longer duration of shaking. Field et al (1980) suggest that an earthquake of magnitude 6.0 on the Richter scale can be expected to occur on an average of once in every 10 years. Three major earthquakes occurred in April of 1992 measuring 7.1, 6.5 and 6.7 on the on the Richter scale.

There is slight risk for a tsunami to affect coastal areas due to potential seismic activity in the Pacific Ocean. Tsunamis are produced mainly by undersea




# GEOLOGY

## LEGEND

| | |
|---|---|
| Qa | Recent Deposits |
| Qh | Hookton Formation |
| TQw | Wildcat Group |
| KJf | Franciscan Formation |

Faults

- Approx. Location
- Inferred Location
- Concealed Extension

Contacts

- Approx. Location
- Cross Section Line

N

HUMBOLDT BAY WETLANDS REVIEW
&
BAYLANDS ANALYSIS

**FIGURE IIIB.3**

Source: Earth Sciences Associates 1975
Moring 1976
Ogle 1953

earthquakes of magnitude greater than 6.5 on the Richter scale with the water depth being less than 650 feet from the center of the earthquake. In the open ocean, waves resulting from the earthquake are usually several feet high and can last for several minutes to several hours. When tsunami waves reach coastal areas,the wave height increases significantly because of decreases in water depth. The tsunami waves affect the coastal area as a violent rush of tide. Over 500 tsunamis have been recorded in the Pacific Basin. The most dramatic tsunami recorded in the Humboldt Bay area was a result of the 1964 Alaska earthquake when the water level rose 1 meter in about 20 minutes. The April 25, 1992 Cascadia Subduction Zone earthquake generated a tsunami that arrived at the mouth of Humboldt Bay within 30 minutes of the earthquake, with a height of approximately 3 feet. Larger magnitude earthquakes would be expected to generate large tsunamis.

Project Geotechnical Feasibility Assessment

The following synopsis is extracted from the Samoa Terminal Reconstruction Project Geologic and Geotechnical Setting and Feasibility Assessment as prepared by:

Busch Geotechnical Consultants
P.O. Box 222
Arcata, CA 95521

June 3, 1994

BUSCH GEOTECHNICAL CONSULTANTS

**June 3, 1994**

## Geologic and Tectonic Setting

The L-P terminal reconstruction site is roughly 100 km north of the Mendocino triple junction, within the onland portion of the Cascadia fold and thrust belt, and thus tectonics at the site are directly related to the subduction of the underthrust ocean Gorda plate beneath the North America plate. The project site is located on a structural high (the Eureka anticline) that lies between the broad Freshwater syncline to the north and the much smaller Elk River syncline to the south. The site is roughly midway between fault systems to the north and to the south.

Faults nearest the site to the north are the Freshwater fault (about 5 km/3 mi) away, the Greenwood Heights fault (6 km/4 mi), and the Fickle Hill fault (8 km/5 mi). The Freshwater and Greenwood Heights faults are potentially active faults that may be capable of generating about a 6.8 $M_w$ earthquake. The Fickle Hill fault is an active thrust fault capable of generating about a 7.2 $M_w$ earthquake.

Faults nearest to the south are associated with the Little Salmon fault system. These include the Little Salmon and related secondary faults on Humboldt Hill, and the North Spit, Buhne Point, Hookton Channel, and Bay Entrance faults in the vicinity of the mouth of Humboldt Bay. The closest of these faults, the North Spit fault, is about 4 km (2.5 mi) away. The Little Salmon fault is about 8 km (5 mi) away. These faults probably rupture when the Little Salmon fault ruptures. LSf faulting events are on the order of 7.6 to 7.8 $M_s$ and probably are associated with Cascadia subduction zone earthquakes.

Although most workers consider the Manila-Samoa spit to be Holocene (less than 10,000 years old), the density of the sands at the L-P pulp mill site poses an enigma. Deep borings done on L-P property on the spit have encountered medium dense to dense sands up to about 15 ft <u>above</u> current sea level, and some very dense sands underlie these. Typically these sands lie below up to about 10 ft of loose eolian (wind-blown) dune deposits, a highly variable thickness of old fill soils, or both. Since dune, beach, and shallow littoral sands are loose when deposited and densify slowly over time, it seems likely that the medium dense to dense sands in the shallow subsurface are older deposits, not Holocene ones. Conceivably, the present-day dune and beach deposits mantle an older erosional remnant of a Late Pleistocene surface. East of the bay along US 101 where it is called South Broadway, cliffs of the late Pleistocene Hookton Formation border the road. Deep boreholes drilled west of the road at the edge of the bay have recorded medium dense to dense Hookton Fm. sands. These deposits unquestionably extend to the west beneath the present-day bay-fill sediments. Conceivably, they rise again beneath the Manila-Samoa spit as an erosional remnant of either the Hookton Fm. or the older (Tertiary-Quaternary) undifferentiated Wildcat Group "bedrock" exposed on the Eureka upland.

Northern California contains numerous tectonic structures capable of generating strong ground motion that could affect the project site. Chief among these are 1) internal faults within the oceanic Gorda plate; 2) the Mendocino fault (the boundary between the Gorda and Pacific plates); 3) the megathrust of the Cascadia subduction zone (Csz); 4) faults within the Mad River fault zone [MRfz] and Little Salmon fault system [LSfs] in the North America plate; and 5) the San Andreas fault system. Table 1 summarizes the significant active and potentially active Quaternary faults and fault zones within about 100 km of the L-P terminal renovation site. The table does not list all known capable faults.

The Mendocino fault and intraplate faults in the Gorda plate are the most probable sources of a significant regional earthquake. The Mendocino fault could produce about a M 7.25 to M 8.0 earthquake, and the Gorda plate, about a M 7.5. The megathrust of the Cascadia subduction zone (Csz) is the convergent boundary between the underthrust Gorda plate and the accretionary margin of the North America plate. Faulted and folded late Quaternary sediments, plus drowned bay margin forests and layered sequences of bay muds and peats indicative of repeated instantaneous subsidence of estuarine marshes, indicate that large subduction zone earthquakes occurred in the Humboldt Bay area during the Holocene. An evaluation of the potential seismic hazard of the southern end of the Csz suggests that past Csz events have been on the order of magnitude 8.5 or higher.

The northern segment of the San Andreas fault is capable of generating a magnitude 8+ earthquake (the 1906 San Francisco earthquake on this segment registered 8.3 M). Inland San Andreas system faults are capable of generating up to about a 7.4 to 7.6 M earthquake.

## Geologic Hazards and Risks

Four geologic hazards potentially could affect the project site: 1) seismic shaking, 2) fault-rupture, 3) liquefaction-induced ground failure and other seismogenic ground failure, and 4) flooding by tsunami run-up. In addition, soils hazards exist at the project site.

### 1) Seismic Shaking Hazard and Risk

Presumably, final engineering design will be based in part on the seismic accelerations probable at the site. In this light, of special interest are the Maximum Probable Earthquake (MPE) and the Maximum Credible Earthquake (MCE). The Maximum Probable Earthquake (MPE) is the earthquake that has a 1% probability of occurring each year. The Maximum Credible Earthquake (MCE) is the largest possible earthquake that could strike a site.

Although the Gorda plate has generated a 7.5 M earthquake, the MPE for Eureka generally is considered to be a 7.0 to 7.3 M event, presumably occurring in the southern Gorda plate or on the Mendocino fault. Assuming a 100-year design life for the terminal reconstruction project, several MPEs are likely to occur during the design life of the structure.

The MCE for the Humboldt Bay region is an 8.5 M or larger earthquake generated by a rupture along the Cascadia megathrust. If the southern segment alone ruptured (Cape Mendocino to about the Oregon border), the event theoretically would be about 8.5 $M_w$. If the entire length of the megathrust ruptured, the magnitude could be comparable to that of the 1964 Alaskan earthquake [$M_w$ 9.2] or the 1960 Chilean earthquake [about $M_w$ 9.6]. Both of these earthquakes were great subduction zone earthquakes. During a Csz earthquake, Modified Mercalli Intensities along the coast most likely would exceed MMI X, and they could approach MMI XII.

The probability of the MCE is poorly constrained. The recurrence interval for Csz events appears to be on the order of about 300 to 500 years, and about 300 years has elapsed since the last MCE in Humboldt County. Current thought is that there is about a 10% to 30% probability that a Csz event will occur within the next 50 years (Priest, 1994, pers. commun.).

Recent work by Woodward-Clyde Consultants for Humboldt State University (WCC, 1989) concludes that for a 50-year project design life there is a 50% probability that an acceleration of 0.33 g will be exceeded, a 25% probability that an acceleration of 0.47 g will be exceeded, and a 10% probability that an acceleration of 0.67 g will be exceeded. These accelerations are peak horizontal rock accelerations and do not take into account possible site amplification.

Many, if not most, building codes and design recommendations are based on a 10% probability of exceedance in 50 years. The terminal renovation site is in Seismic Zone 4.

2) Fault-Rupture Hazard and Risk

No fault is mapped as crossing the site, there are no northwest-trending faults or lineaments that align with the site mapped in the Eureka upland or visible on aerial photographs, and there are no geomorphic features suggestive of faulting in the immediate site vicinity. Based upon our review of published literature, geologic and topographic maps, and stereo pairs of aerial photographs, we infer that the risk of fault rupture is NEGLIGIBLE at the L-P terminal reconstruction site.

### 3) Liquefaction Hazard and Risk

Liquefaction is the total or partial loss of strength of a saturated deposit due to oscillatory vibrations such as earthquake waves. Geologically young (Holocene), saturated, unconsolidated, cohesionless, sandy sediments are particularly susceptible to liquefaction.

Liquefaction-induced ground failures at a site may include the loss of bearing strength of near-surface soils, the distortion/dismemberment of the upper soil layer associated with jostling and/or differential settlement of decoupled soil blocks, and, where relief is available, block gliding or lateral spreading.

Although there are no written records of liquefaction in the immediate site vicinity, numerous other sites along the bay have experienced liquefaction and liquefaction-induced ground failures during past earthquakes. The absence of a record of liquefaction does not mean that the site has not experienced liquefaction, nor does it mean that the site will not liquefy during a future earthquake.

Our data base for evaluating (predicting) the liquefaction potential of the terminal renovation site includes regional seismicity (the probable repeatable accelerations accompanying the predicted MPE and MCE), inferences about the subsurface geology and the depth to groundwater, and materials information and standard penetration test (SPT) blowcount data from past project sites on L-P grounds near the terminal.

As part of our feasibility-level evaluation of the terminal renovation site we reviewed the logs of 48 boreholes drilled between 1959 and 1988 on the L-P pulp plant site in the vicinity of major structures. We were able to reach feasibility-level conclusions in which we have a high degree of confidence, assuming that the original blowcount data are valid.

Based on a review of the available logs in light of the geologic setting, we infer that foundation-bearing soils at the project site are primarily medium dense to very dense poorly graded fine to medium sands with a normalized SPT blowcount ($N_1$ value) over 45. In general, sands with a $N_1$ of over about 45 have a NEGLIGIBLE liquefaction potential, even at the high predicted accelerations of the MCE.

Localized deposits of near-surface sands with $N_1 < 45$ probably are present at the site, and these may have a HIGH liquefaction potential under the accelerations of the MPE, if saturated. However, the groundwater table probably exceeds 10 feet in depth. Coarse sands, gravels, and clayey silts present at the site, if any, are unlikely to liquefy during a severe shaking event, even if saturated. Any loose fills or uppermost native sediments confined within the bulkhead will be removed before the engineered fill is placed, thus eliminating their liquefaction potential. The detailed geotechnical study recommended to support final engineering design will assess the liquefaction potential and ground failure potential of the specific construction areas.

In conclusion, although the risk is HIGH that the site will be affected by strong ground shaking within the project design life, the risk that the shaking will cause liquefaction at the site probably is NEGLIGIBLE during the MPE and LOW during the MCE.

Several types of liquefaction-induced ground failures are possible at a site with a liquefaction potential. These include loss of bearing strength, oscillation of decoupled soil blocks, and, if adequate relief is available, types of mass movement such as block gliding and lateral spreading (see CEE, 1985). In general, if the liquefaction potential of a site is LOW, the risk of liquefaction-induced ground failure also is LOW.

Although the liquefaction potential of bearing strata at the terminal reconstruction site presumably is NEGLIGIBLE to LOW, it is possible that slope failures of the deep-water channel margin could occur--unrelated to liquefaction--during a very strong earthquake. Lurch cracking, with subsequent wedge failures, probably is the most likely failure mode. In general, the denser the sands along the channel margin are, the less likely they are to fail during a strong earthquake. Our feasibility-level assessment of the ground failure potential at the terminal reconstruction site is based on our knowledge of the geologic setting and materials characteristics and strengths from boreholes by others. Our assessment is that the risk of slope failure probably is LOW--and certainly is no higher than MODERATE--along the channel margin because the site sediments probably are mostly dense sands.

## 4) Tsunami Hazard and Risk

A tsunami is a seismically generated sea wave. Because the work surface of the proposed reconstructed terminal will be about 11 feet above MLLW (approximately the elevation of the existing work surface), it presumably could be inundated by tsunami run-up. Unlike Crescent City Bay, Humboldt Bay has not been affected significantly by a tsunami in the historical record. Humboldt Bay experienced its two known 1.0-m tsunami inundation events during 1946 and 1964. Both were from distant sources. In conclusion, the risk of inundation by a distant-source tsunami at the site presumably is NEGLIGIBLE to LOW.

The recent recognition of the seismic capability of the Cascadia subduction zone (Heaton and Kanamori, 1984; Clarke and Carver, 1992) suggests that near-source tsunamis may pose a greater hazard than distant-source tsunamis. Empirical data from other subduction zones suggests that a M 8.5 Csz earthquake along the northern California coast could generate a near-source tsunami with a run-up of over 10 m (33 ft) in low-lying coastal areas. Evidence for paleo-tsunami run-up heights of 6+ meters (20 ft) already has been discovered in mid-coastal Oregon. The April 1992 Cape Mendocino earthquake, interpreted as a Csz earthquake (albeit, an atypically small one), generated a near-source tsunami whose first wave pulse arrived at the bay within 30 minutes. The maximum height of the maximum wave train was <1 ft at North Spit.

## Potential Effects of a Cascadia Subduction Zone Earthquake

Effects in addition to strong seismic shaking will accompany a Cascadia subduction zone event. During past Csz events, large areas of coastal Washington, Oregon, and northern California--including portions of Humboldt Bay--have subsided instantaneously, causing inundation of low-lying coastal areas. This phenomenon is called "coseismic subsidence." If a Csz event were to occur in the Humboldt Bay region, the site vicinity potentially could experience coseismic subsidence of up to about 2 m (>6 ft). The risk of coseismic subsidence during the project design life is the same as the risk of a Csz event (estimated at 10-30% during the next 50 yrs).

If coseismic subsidence were to occur during a Cascadia subduction zone earthquake, the terminal work surface presumably would drop to about 5 ft above MLLW. The risk of marine flooding and damage by tsunami would increase above its present level.

## Soils Hazards and Risks

Soils hazards at the proposed terminal reconstruction site include the settlement and differential settlement of any loose native sands and uncontrolled fill soils present. Settlements could be seismogenic, load-induced, or time-dependent. Time-dependent consolidation occurs extremely slowly so is unlikely to cause significant structural damage to the proposed structure within its economic lifespan (50 years) or even double that (risk is LOW). Earthquake-induced settlements of about 1% to 6% of the sediment column thickness have been reported.

Overall settlements tend to occur where loose materials are present, and seismogenic and load-induced differential settlements typically occur where grossly different material types and strengths underlie a structure. Our review of the borehole logs for the L-P pulp mill site suggests that the <u>foundation-bearing</u> materials at the terminal reconstruction site are likely to be medium dense and dense sands with a LOW overall settlement potential, although weaker interbeds may exist.

Although the medium dense and denser sands are unlikely to settle significantly, load-induced settlements of any loose materials (fill or native soils) would occur during construction if these materials were not removed from the construction site, <u>as is planned</u>. Additional consolidation of loose materials during strong earthquakes would be likely and potentially could damage the structure (risk is LOW to MODERATE). Mitigation will be achieved by removing the loose materials before engineered fills are placed.

## Mitigation of Existing Geologic and Soils Hazards and Risks

It is not possible to reduce the risk of seismic shaking or coseismic subsidence, but proper engineering design based on site-specific subsurface data will reduce the risk of damage due to the critical secondary hazards such as liquefaction, liquefaction-induced ground failure, channel margin slope failure, and seismogenic or load-induced settlement of loose materials. It is unnecessary to mitigate the risk of fault-rupture.

The geotechnical consultant has recommended that final engineering design be based on site-specific subsurface data, accurate materials strength information, current seismic standards, and applicable Uniform Building Code guidelines. The required study should include deep drill data, the results of materials testing, and recommendations to support engineering design.

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**Table 1.**
**Active and Potentially Active Quaternary Faults within about 100 km of the L-P Terminal Reconstruction Site***

| Fault/Fault Zone | Type | Distance from the site (km/mi) | Magnitude |
|---|---|---|---|
| Lost Man/Sulphur Ck | R/rl | 60/37 | ? |
| Grogan | R/rl | 35/22 | 7.4 |
| Bald Mountain | R/rl? | 28/17 | 6.9-7.5 |
| Fickle Hill | T | 8/5 | 7.2 |
| Freshwater | R | 5/3 | 6.8 |
| Little Salmon | T | 8/5 | 7.6-7.8 |
| Russ | R | 37/23 | 6.3-7.2 |
| Eaton Roughs-Lake Mtn | rl | 35/22 | 7.4 |
| Garberville-Maacama | rl | 46/28 | 7.6 |
| Mendocino fault | rl | 52/32 | 7.5? |
| San Andreas | rl | 63/39 | 8.3 |
| Gorda plate (offshore) | ll, rl | 60/37 | 7.5 |
| Gorda plate (subducted) | ll, rl | 22/14 | 7.5 |
| CSZ (megathrust) | T | 20/12 | 8.4-9.5 |

**NOTES:** * = not all known capable faults within 100 km of the site are listed on this table. Omitted faults are either associated with a named system or are less capable. Examples include the Buhne Point, North Spit, and Bay Entrance faults associated with the Little Salmon fault at Humboldt Bay. Key to fault types: R = high-angle reverse, T = low-angle reverse (thrust), rl = right lateral strike-slip, ll = left lateral strike-slip, R/rl = high-angle reverse fault with a right-lateral component. Unless otherwise indicated in a following note, the cited magnitudes are moment magnitudes for a <u>characteristic faulting event</u>, as cited in Wesnousky (1986). Data for Lost Man/Sulphur Creek faults from Kelsey and Carver, 1988. Magnitude for Garberville fault herein assumed to be same as that for the Maacama fault, by virtue of its connection; for Eaton Roughs fault, herein assumed to be the same as that for the Lake Mountain fault, by virtue of its connection; for the Russ fault and Bald Mountain fault, MCE, Kilbourne et al. (1980); for the Mendocino fault and Gorda plate (offshore), historic MCE, Dengler et al., 1992; for Gorda plate (subducted), estimated herein; MCE for for the Little Salmon fault, $M_S$ (Clarke and Carver, 1992); for CSZ, $M_W$, southern segment vs. entire zone (Clarke and Carver, 1992).

2. Impacts

Impact Significance Criteria for Soils & Geology:

- Bulkhead wall could be damaged from earth shaking or liquefaction of underlying soil.

- Placement of fill and installation of sheet pile wall will cause compaction and consolidation of underlying soils (not a significant impact).

- New structure could be at risk from Tsunami run-up.

- Possible cumulative effects.

Soils and geologic conditions that could impact the proposed project include potential liquefaction, differential compaction, or seismic settlement and ground shaking, and potential tsunami inundation.

a. Liquefaction, Differential Compaction or Seismic Settlement

The type of soil most susceptible to ground failure from liquefaction during an earthquake is saturated loose, clean, uniformly graded sand. Since most soils within the mill complex are characterized as medium to very dense sands, the potential for liquefaction is considered low to moderate. Further soils exploration will be conducted and results integrated into the project design, plans and specifications. (ENSR, FEIR; Louisiana Pacific Corp. Pollution Prevention Project, April 1993, and Busch Geotechnical, 1994)

b. Ground Shaking

Strong ground shaking from earthquakes in the Humboldt Bay area could affect both onshore and offshore facilities at the Samoa Mill site, including the proposed project (ENSR, FEIR; Louisiana Pacific Corp. Pollution Prevention Project, April 1993). It is expected that strong ground shaking will effect the project site during the life of the structure, however, the risk that the ground shaking will cause liquefaction is negligible during the Maximum Probable Earthquake and low during the Maximum Credible Earthquake. (Busch Geotechnical, 1994)

c. Tsunami

The potential risk of damage to the project from tsunami runup is considered low. Because of the narrow constriction at the mouth of Humboldt Bay, inundation of the site would require overtopping of the North Spit. The most recent Tsunami's to strike the North Coast occurred in 1960 and 1964. Moderate to severe damage with loss of life at Crescent City to the north while Humboldt Bay incurred little or no damage. Inundation of low lying peripheral areas of the bay did not occur during either tsunami. Although tsunamis have reached Humboldt Bay only infrequently in the past, the possibility exists for future recurrence of tsunamis. (Draft EIS/EIR, Humboldt Harbor and Bay Deepening Navigation Study, April 1994, U.S. Army Corps of Engineers and Humboldt Bay Harbor, Recreation and Conservation District)

Cumulative Impacts:

The proposed projects slated for Humboldt Bay may individually be effected by seismic related activities such as tsunamis, liquefaction, and ground shaking. These potential effects can be reduced by conforming to regional seismic design standards and incorporating findings from specific soils investigations into project design. Tsunamis are a concern to all developments in low lying coastal areas. Tsunamiscan be a significant cumulative effect, however, their impact is not mitigable. (See Cumulative Impacts VI.C.)

3. Mitigation

a. Liquefaction, Differential Compaction or Seismic Settlement

The design of the facility will be in conformance with the seismic standards for the Humboldt Bay Region, and the Humboldt County Plan Geologic Hazards Land Use matrix, as well as engineered design based upon findings generated in the Preliminary Soils Report and project site soils investigations. Footings and foundations should be constructed to account for liquefaction potential, in accordance with the latest addition of the Uniform Building Code (UBC) for Seismic Zone 4.

b. Ground Shaking

All structures will be designed and constructed to withstand strong ground shaking. Engineered design shall be based upon conformance with seismic standards for the Humboldt Bay Region, Humboldt County Plan Geologic hazards Land Use Matrix, and findings of the Preliminary Soils Report and project site soils investigations.

c. Tsunami

Evacuate to high ground.

## C. Air Quality

1. Environmental Setting

The project site is located in the within the North Coast Air Basin, which covers Del Norte, Humboldt, Mendocino, and Trinity Counties in their entirety and part of Sonoma County. Air pollutant point sources found within the air basin are regulated by the North Coast Unified Air Quality Management District (NCUAQMD). Air quality standards include the National Ambient Air Quality Standards (NAAQS) and State of California standards. Regulatory agencies assess the impact of any source on ambient air quality by comparing the estimated ambient air pollutant concentrations associated with the source to the established standards.

Currently, Humboldt County is a non-attainment area for particulate matter of less than 10 micrometers in diameter (PM-10) by State standards, however it meets all Federal Air Quality Attainment Standards. For other point source pollutants, (ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, and sulfate) the air basin is an attainment area. (ENSR FEIR; Louisiana Pacific Corp. Pollution Prevention Project, April 1993)

The L-P Samoa Mill is classified as a major source of air pollution by regulatory agencies. Regulations implementing the Prevention of Significant Deterioration (PSD) provisions of the federal Clean Air Act establish incremental allowances for ambient air quality impacts. If a major source of air pollution is constructed, or there is a major modification to such a source, PSD review would be triggered and ambient air quality impacts for criteria pollutants from net emission increases would be compared to allowable PSD increments (ENSR, 1993).

2. Impacts

Impact Significance Criteria for Air Quality:

- Fugitive dust and carbon monoxide could be generated by the construction process and associated vehicles.

- Possible cumulate effects.

Air quality-related impacts associated with the proposed project include the generation of fugitive dust and carbon monoxide exhaust from diesel and gasoline engines. Fugitive dust will be generated during demolition of the existing wooden dock facility, consisting most of saw dust and wood fiber from wooden decking and piles. This source will be temporary and is not expected to exceed emission standards for PM-10. As noted in the project description (Section II.A.1), the concrete bulkhead will be constructed around the existing wooden dock prior to demolition. The wooden dock will be demolished relying upon the surrounding bulkhead to contain debris. The existing dock will be removed using standard equipment such as cranes and loaders to remove decking and extract piles. The demolition contractor will remove the debris from the site and dispose of material in an approved manner.

Fugitive dust and carbon monoxide may also be generated during the transport, placement and compaction of engineered fill material.

Dredge spoils pumped to L-Ps upland dredge spoils disposal site will be de-watered over time. Sediments contained in the dredge spoils tend to be composed of sand, gravel or clay and biogenous material such as shell fragments and plant material. Additionally, there may be wood fragments from timber industry operations, rip-rap, sand, and other construction materials used in dikes, bulkheads, and other structures which become sediments (Shapiro, 1979). Experience at the existing dredge spoils site suggests that once de-watered, the dredge spoils become hardened and cracked and are not likely to become air borne when winds course over the material, and will not be a source of fugitive dust.

Fugitive dust is not expected to be a significant effect once the project is constructed and operational. The project and access roads to the project will be paved with asphalt and concrete further eliminating potential sources of fugitive dust.

Carbon monoxide exhaust will be generated from diesel and gasoline engines used in equipment both during construction and operation.

Cumulative Impacts:

All the proposed projects analyzed have the potential to produce varying amounts of fugitive dust and carbon monoxide from construction activities and the use of vehicles and equipment. Construction practices such as, watering of exposed earthen areas during periods of dry weather and wind, limited unnecessary idling of vehicles and equipment, conducting regular and needed maintenance of vehicles and equipment and equipping them with proper mufflers and pollution control devices will significantly reduce air quality impacts. (See Section VI.C.)

3. Mitigation

Dust watering will be used to mitigate the generation of fugitive dust resulting from demolition, transport, placement, and compaction of engineered fill. Watering will be conducted on a regular basis during construction, especially during periods of dry weather and winds. Sprinkler nozzles installed on the watering truck should be capable of distributing an even stream of water across the active construction areas. Mitigation of fugitive dust generation on site will reduce the on-site air quality impacts to less than significant.

All equipment and machinery used in the construction and operation of the proposed project shall have standard mufflers and pollution control devices as required by the Motor Vehicle Code of California.

## D. Water Quality

### 1. Environmental Setting

The majority of information incorporated in this section is derived from the Draft Program Environmental Impact Report for City of Eureka Enterprise Zone Designation prepared by Winzler & Kelly, Consulting Engineers for the City of Eureka in 1985. The Winzler & Kelly document incorporated material from the EIR for the Greater Eureka Area Wastewater Management Plan (Winzler & Kelly, 1980); the EIR for the Exxon Jacket Assembly (Humboldt County, 1984); and, the Humboldt Bay Wetland Review & Baylands Analysis, Volumes I,II, and III (Shapiro & Associates, 1979).

Water quality standards for Humboldt Bay are under the jurisdiction of the State Water Resources Control Board as administered by the North Coast Regional Water Quality Control Board. These standards consist of beneficial uses and water quality objectives for specific constituents as specified in the Water Quality Control Plan for the North Coast Basin, and supporting regulations in the California codes. (Winzler and Kelly, 1985)

The present beneficial uses of Humboldt Bay specified in the Basin Plan are: agriculture, industry, navigation, recreation, commercial and sport fishing, cold freshwater habitat, wildlife habitat, preservation of rare and endangered species, marine habitat, fish migration and spawning, and shellfish harvesting.

Water Quality characteristics of Humboldt Bay are influenced by a number of factors, including tidal interchange, fresh water inflow, wastewater discharge, and annual dredging.

a. Tidal Influences

Inflow from the ocean affects salinity and temperature of Humboldt Bay waters. During the summer and fall salinity tends to be higher. Salinity also varies substantially over a tidal cycle. Water temperatures tend to be lower in the in the fall and winter. Salinity and temperature are vertically well-mixed. Inflow from the ocean is also a source of suspended sediment, estimated at 706,000 - 876,000 cubic yards per year. Dissolved oxygen (DO) levels in the bay are strongly influenced by exchange with the ocean and vary over the tidal cycle. Occasionally, at high tide, DO tends to decrease from the bay entrance to Arcata. DO values below 6mg/L (DO objective set by State Water Board in 1975) occur occasionally due to the inflow of nearshore marine waters having low DO because of coastal upwelling. (Winzler and Kelly, 1985)

b. Fresh water inflow

Contributions of freshwater to Humboldt Bay include Janes Creek, Jolly Giant Creek, Jacoby Creek, Freshwater Slough, Elk River, and Salmon Creek. Non-point source coliform loading is the principal water quality contaminant and levels in Janes Creek and Jolly Giant Creek increase substantially following rainfall. The source of this fecal contamination is from domestic animals grazed within the watersheds. Stream discharges also contribute approximately 118,000 cubic yards per year of suspended sediment to the Bay. Water quality investigations conducted in regions of North (Arcata) Bay to determine quality of bay waters as related to the culture of shellfish indicate that coliform levels vary widely (Winzler & Kelly, 1985).

c. Wastewater discharge

Studies conducted by U.S. Food and Drug Administration in 1978 conclude that during wet weather or upon malfunctioning of one of the four sewage treatment plants discharging to Mid Bay or to Arcata Bay, fecal waste presented an unacceptable potential health hazard to consumers of shellfish. Since this study, the three Eureka treatment plants have been replaced by the greater Eureka area sewage treatment plant, which discharges secondary effluent to the Pacific Ocean by the entrance channel on outgoing tides. The State Mussel Watch Program found Humboldt Bay to be one of the least pollution bays in the State (DEIS/EIR, Humboldt Harbor and Bay Deepening Navigation Study, April 1994).

d. Dredging and disposal

Annual maintenance dredging of the North Bay, Fields Landing, Samoa and Eureka channels is performed by the U.S. Army Corps of Engineers using hydraulic cutter suction hopper dredge. The annual average dredge volume, based on Army Corps dredging records to 1975, is 811,000 cubic yards per year. The Corps reports a suspended sediment measurement of 35 mg/l in the water column at an unspecified site. Turbidity measurements taken in 1972 show that about 90 percent of the light is absorbed within 1 to 2 yards of the water surface, with the more turbid conditions observed in the early summer. Dredging requires a Section 10 permit and Section 404 permit from the Army Corps of Engineers. Section 10 permits cover the construction of any structure in or over any navigable water of the United States, the excavation from or depositing of material in such waters, or the accomplishment of any other work affecting the course, location, condition, or capacity of such waters.

Section 404 permits are specifically for the discharge of dredged or fill material into the waters of the United States at specified disposal sites.

e. Sediment Toxicity

Sediment sampling in Humboldt Bay was conducted during December of 1991 by EVS Environment Consultants under contract by the U.S. Army Corps of Engineers, San Francisco District, in conjunction with the EPA. The scope of the

EVS sampling and testing was to determine whether the sediments within Humboldt Harbor are suitable for ocean disposal in compliance with Section 103 of the Marine Protection Research and Sanctuaries Act.

The following section summarizes the data from the EVS Final Report relative to the samples proximal to the project site (HB-8 and HB-9). (See figure III D.1 for sample locations.)

Complete chemical and physical analysis of the sediments from sites HB-8,150 feet east of the project dredge area, and HB-9, 750 feet southeast of the project dredge area, indicated that most metals, some organic compounds, dioxins and furans were detected at elevated levels relative to the reference sediment. Copper was the only metal detected at more than two times the concentration of the reference sediment. (See Appendix 3 for results.)

Of the organotin, phenol and Polynuclear Aromatic Hydrocarbons (PAH) compounds detected, concentrations were very close to detection limits (See Appendix 3 for results). The largest number, and the highest concentrations of dioxins and furans were found in HB-8 sediments.Results of the suspended phase and solid phase toxicity tests were generally consistent with the results of the chemical analyses. Mysid (shrimp-like invertebrates) and flatfish toxicity tests demonstrated no toxicity. Tissue analysis showed significantly higher concentrations of chromium, copper, lead and nickel in the test sediment treatments. Tissue analysis revealed low levels of H7CDD (Chlorinated Dibenzodioxins) in HB-8 clam samples. Dioxin, O8CDD was found in all tissues except the clam reference sediment tissues (EVS Consultants, 1993). A slight potential for the release of trace amounts of dioxin (0.3 picograms/gram) from sediment in the area of Sample HB-8 exists during dredging at the affected location. Chemical reactions between the suspended sediments and the water column are possible during the dredging operation, but dioxin is extremely hydrophobic and strongly binds to sediments. In addition, the use of a cutter

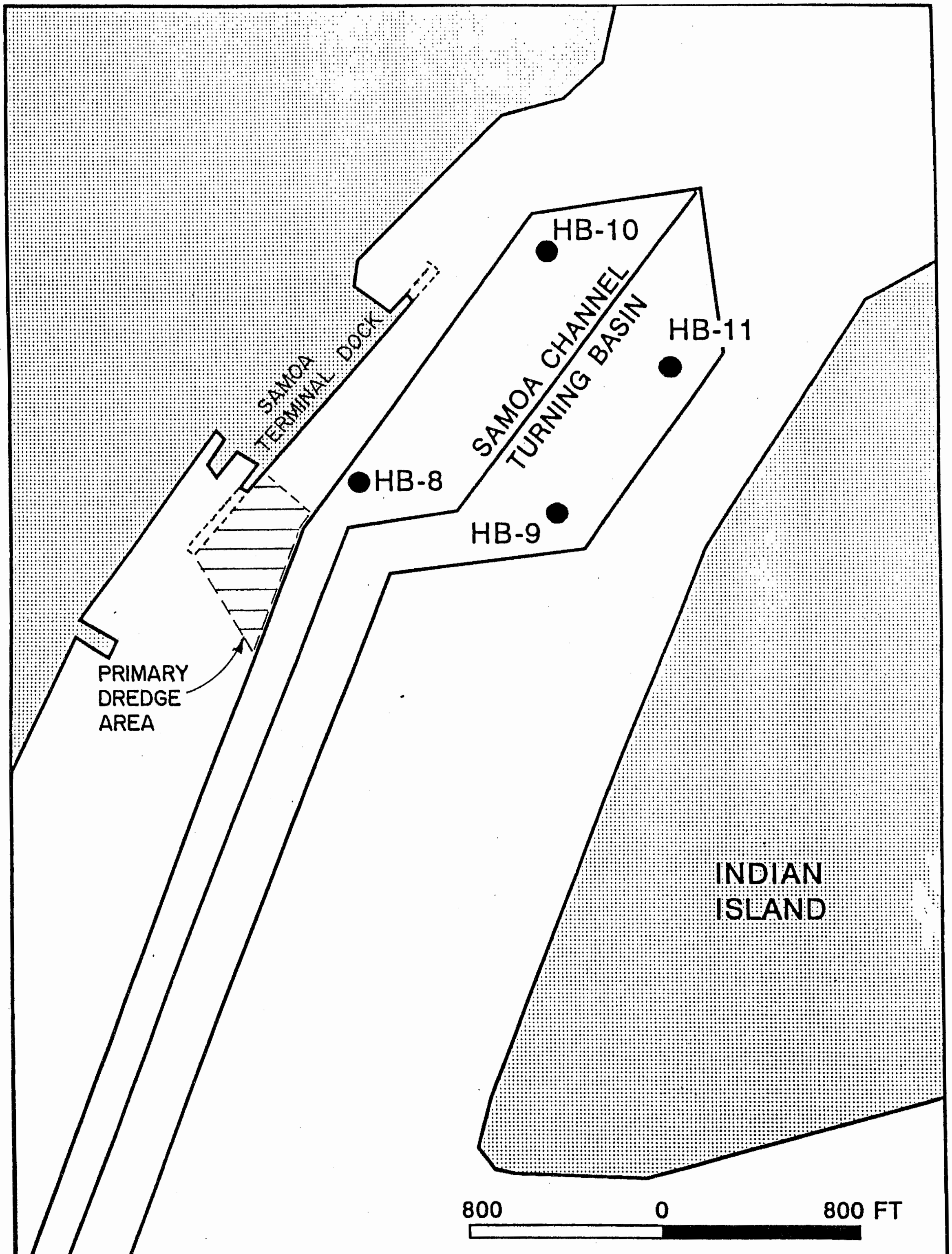


FIGURE IIID.1

EVS ENVIRONMENTAL CONSULTANTS 1993

SAMOA CHANNEL

SEDIMENT SAMPLE LOCATIONS

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suction dredge on this material will cut down significantly on the concentration of suspended sediment plume resulting from dredging. (DEIS/EIR Humboldt Harbor and Bay Deepening Navigation Study, April 1994)

f. Storm Water Run-off

The upland industrial site adjacent to the Samoa Terminal Dock and the Terminal work surface currently drain surface waters and storm water run-off directly into Humboldt Bay. The adjacent paved upland site contains a storm drain system with several discharge points along the rubble bank fronting Humboldt Bay. The Terminal work surface is of wood planked construction with no current means of capturing and treating run-off.

g. Vessel Deballasting

Ocean going ships carry, as ballast, seawater that is pumped into ballast tanks or holds in order to balance cargo loads and provide navigational stability and maneuverability while unloaded vessels are under way. During loading of ships, ballast may be pumped from hold to hold (circulated around the ship) or pumped off into the Harbor in which the ship is loading. Ships entering Humboldt Bay may carry up to 16,000 tons (4,324,600 gallons) of ballast water that may be pumped off as the ship is loaded with cargo. (Charles Gulbe, Acting Port Captain, Star Shipping Company, Interview) The release of transported ballast water has the potential to facilitate invasions of non-indigenous marine organisms that are carried from port to port as ballast is pumped on and off the loading and unloading ships. The marine invasions can cause substantial alteration of the biotic community structure and function. Ships have used water as ballast regularly since the 1880's, thus recognizing the species that have historically been released and invaded biotic communities is a difficult task without substantial knowledge of a specific region's ecological patterns, evolution and biogeography. (The Global Transport of Non-indigenous Marine Organisms, James Carlton and Jonathan Geller, Science, Vol. 261, July 2, 1993).

h. Discharge of Oily Bilge Water

The current facility has no in place system for accepting the discharge of oily bilge water from loading vessels. Current U.S. Code of Federal Regulations specify that all facilities loading or unloading vessels weighing over 400 tons gross weight must have the capability of receiving oily waste and bilge water in conformance with Vol. 33 CFR, Section 155.430, 158.230 and subsequent applicable sections of the U.S. Code of Federal Regulations concerning receiving standards for oil waste and bilge water. The project will include in conjunction with the storm water oil water separator system a receiving and containment system for oil waste and bilge water.

2. Impacts

Impact Significance Criteria for Water Quality:

- Dredging, driving of pile and filling bulkhead could cause a temporary increase in suspended solids.

- Dredging and/or disposal could result in exposure to toxic material and public health effects.

- Possible cumulative effects.

Water quality related impacts resulting from the proposed project will include temporary increases in suspended sediments and turbidity during dredging (de-watering of the bulkhead and dredge spoils areas), and limited and temporary increase in debris on surface water during demolition. (See II A. 3. for description of dredging and disposal.)

Dredging activity related to the proposed project will employ a cutter suction dredge to remove bottom sediments in the subtidal area between the south pier extension and the west line of the Samoa Channel to a depth of -35 feet Mean Lower Low Water (MLLW) consistent with the federally authorized depth of the

Samoa Channel. Bottom sediments will consist of original and recently deposited material.

The primary physical effects of dredging are the creation of minor holes or channels which change the hydraulics in the vicinity, and the temporary suspension of clouds of sediments, causing turbidity in the water. The finer the sediment, the higher the turbidity. Finer grained sediments (silts and clays) are found in the parts of the tidal channels farthest from the Bay entrance and in the higher mudflats of North Bay. The navigational channels themselves have rather coarse grained sediments, and dredging of these channels does not create significant turbidity.

Concentration of total suspended solids (TSS) vary with the material being dredged and the type of dredge vessel. Gravels and sands settle out quickly, whereas silts may remain in suspension for up to several hours. The amount of sediments suspended by hydraulic cutterhead (to be used in this project) are vastly reduced compared to a clamshell dredge. In comparison to a clamshell dredge the percentage of suspended material is very small. Pipelines extending from the seafloor to the upland site all but eliminate mid water and surface plumes. Suspended materials are restricted to the immediate vicinity of the cutterhead itself. Elevated suspended sediment concentrations are on the order of a few grams/liter within 3 meters of the cutterhead dredge, and a few hundred milligrams/liter within 200 meters of the cutter. Thus suspended sediment concentrations decrease with increasing distance from the dredging operation. (DEIS/EIR Humboldt Harbor and Bay Deepening Navigational Study, April 1994)

Dissolved Oxygen (DO) levels tend to decline in the vicinity of dredging operations when the suspension of anoxic sediment creates high oxygen demand. The greatest fluctuations in DO occurred at or near bottom sampling locations within 50 meters of the dredge. In all cases, background levels in DO were regained with 10 minutes of the sampling event, DO levels decline for short periods of time. DO levels in the immediate vicinity of the dredging operation may become depressed below the minimum Regional Water Quality Control Board requirement for a short period of time (10 minutes or less). Due to short duration of effects, impacts to DO in the water column are expected to be insignificant. (DEIS/EIR Humboldt Harbor and Bay Deepening Navigational Study, April 1994)

Dredging may also destroy or adversely affect flora and fauna in the water and aquatic land habitats. (See Section III E. for discussion of Biological Resources.)

Dredge spoils, if determined to be unsuitable for fill behind the bulkhead wall, will be pumped to L-Ps upland disposal site located southeast of the junction of Highway 255 (Samoa Bridge) and New Navy Base Road. The upland disposal site has been utilized by LP and others in the past for various maintenance dredging projects within Humboldt Bay. U.S. Army Corp of Engineer Section 404 permits have been secured in the past and a new permit will be required as part of this project. Dredging and disposal will be regulated by Waste Discharge Requirements (WDRs) and Monitoring and Reporting Program as adopted by the State Water Quality Control Board, Order No. 87-76. The WDRs are currently being reviewed by the Regional Water Quality Control Board and amended to include any additional requirements of this project.

Tidal currents may be altered due to placement of the bulkhead within the waters of Humboldt Bay and by deepening the area between the south dock extension and the west line of the Samoa Channel. This is not expected to result in significant impact. (See Hydrology Study, Appendix 5.)

Adjacent site and project area storm water run-off are proposed to be contained by a storm drain system in connection with a filtered separator system prior to discharge, greatly improving the discharge water quality of the project site.

Short-term and temporary changes in water quality of the immediate area of the Samoa Channel will occur during construction, driving of piling, dredging, and de-watering of the bulkhead and dredge spoils area. These effects are not expected to be significant and following project completion, the water quality of the site and surrounding areas will return to typical seasonal conditions.

There may be releases of non-indigenous marine organisms into waters of Humboldt Bay by the deballasting of vessels during the loading process. Louisiana Pacific Corporation is one of seven active marine terminals on Humboldt Bay that service vessels utilizing large quantities of ballast water. Foreign and domestic ships deballast into Humboldt Bay and other Ports along the Pacific Coast and around the World. This is a necessary practice of shipping as it aids navigation, maneuverability and balance of vessels while they are loading, unloading and under way. There is evidence that deballasting and the associated releases of non-indigenous marine organisms have impacted other biotic communities, however, without extensive local biological community study and inventory, evaluation of ballast water origination, entrained organisms present in those waters and ports of origination, methods of treatment and discharge and numerous other factors associated with this potential impact, it's significance as an impact to Humboldt Bay cannot be ascertained. It is highly possible that releases of non-indigenous organisms have occurred and will occur in the Bay from vessel deballasting operations, but to quantify this impact without extensive biotic study would not be feasible.

Cumulative Impacts:

All of the proposed projects, during construction, may cause increased suspended solids in the water column by driving of pile, dredging, filling, dewatering and other related activities. These activities are generally of short duration and should not produce significant cumulative effects to the water quality in Humboldt Bay. Dissolved oxygen levels in and around project sites may be temporarily reduced, dependant upon the composition of the sediments being disrupted, tidal circulation and activity duration. Proposed projects and their related activities will be of a temporary nature and of short duration in specific areas and should not significantly effect Humboldt Bay water quality. (See Cumulative Impacts, Section VI.C.)

3. Mitigation

No significant adverse water quality impacts are expected as a result of the proposed project.

Storm waters and site run-off will be collected and treated prior to discharge into down gradient water courses and will comply with the Storm Water Pollution Prevention Plan prepared for the project and approved by State Regional Water Quality Control Board.

Dredging and disposal will be regulated by Waste Discharge Requirements (WDRs) and Monitoring and Reporting Program as adopted by the State Water Quality Control Board for the L-P Samoa Cargo Dock Dredging, Order No. 87-76. The WDRs are currently being reviewed by the Regional Water Quality Control Board and amended to include any additional requirements of this project.

A Section 10 permit and Section 404 permit will be obtained from the Army Corps of Engineers. Conditions of approvals of these permits are expected to create additional safeguards for environmental quality.

Trace levels of toxic chemicals were found within sediment adjacent to the project location (EVS Consultants, 1993). Further mitigation is not feasible.

Use of a cutter suction dredge for removal of project sediments will minimize the amount of suspended sediments and spread of contaminants to other areas of the bay. Encapsulation of the dredge materials either behind the bulkhead wall or within the upland disposal area will remove contaminants from the sensitive marine environment. Significant impacts to any biological community which may be inhabiting the L-P dredge material disposal site are expected to be minimal and insignificant since the disposal site is highly degraded and has low habitat value. (DEIS/EIR Humboldt Harbor and Bay Deepening Navigation Study, April 1994)

The release of non-indigenous marine organisms from vessel ballast water transport and discharge is without standards or regulations in regards to treatment or quality, therefore mitigation for this possible impact cannot be quantified. Assuming a mitigation standard of zero tolerance, for release of ballast water, and that the release of ballast water is specifically related to the loading operation as it occurs in order to balance cargo loads and to maintain adequate draft and maneuverability of the vessel, each individual facility on the bay and elsewhere would have to provide means for treatment and elimination of all entrained biota.

Being that there are no current State standards or federal regulations concerning release of clean vessel ballast water the methods for mitigation of this potential impact are considered either unfeasible or undetermined.

## E. Biological Resources

The information incorporated in this section is derived from the Biological Resources Investigation, Louisiana-Pacific Dock Modifications, Samoa, California by Karen Theiss and Associates, Biological and Environmental Consultants, May, 1994. (See Appendix 4 for complete Biological Report and resource listings).

### 1. Environmental Setting

#### a. Terrestrial Vegetation

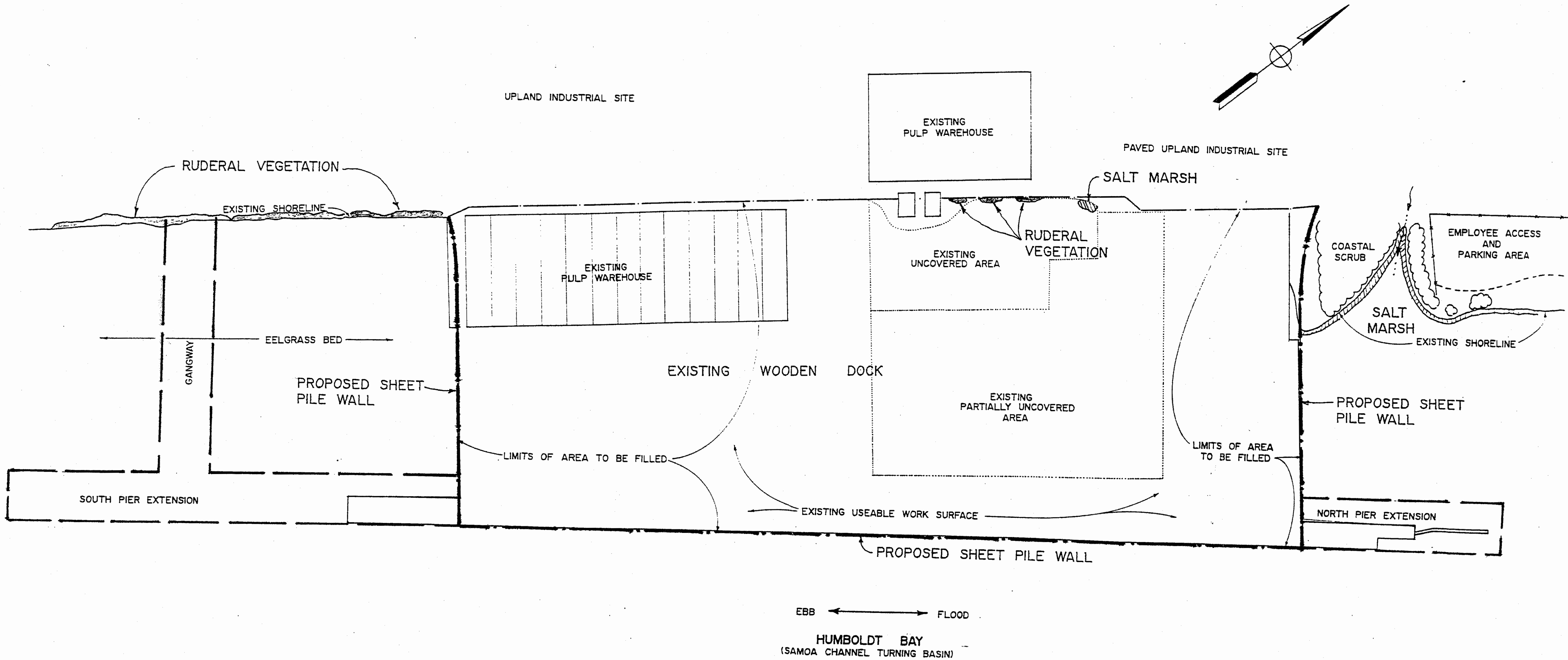
Vegetation at the Louisiana-Pacific Dock site is very sparse, due to the historic industrial nature of the area. There are strips of weedy vegetation along the edge of the southerly paved area and also along the westerly edge of the dock. A more extensive area of disturbed coastal scrub vegetation is located north of the existing dock. A small drainage course runs through the area discharging into the bay. Very small patches of low quality salt marsh occupy the transition area between the upper intertidal and upland vegetation. (See Figure III E.1)

The Dredge Spoil Disposal Site has been used for dredge spoils in the past. (See Figure III E.2) The disposal site consists of a primary and secondary dewatering area, a decant water return channel and carrier pipe to discharge decant water into Humboldt Bay. The primary dewatering area supported extremely sparse vegetation with scattered pickleweed and clumps of dogtail. The Secondary dewatering area is characterized by a much more extensive vegetated area. The major portion being vegetated by pickleweed. Incidental species include pampas grass, willow herb, velvet grass, coyote bush, and yarrow. The outer slopes of the primary and secondary dewatering areas supported mainly ruderal vegetation, with the following species being readily evident: bush lupine, Himalaya berry, pampas grass, sea fig, velvet grass, yarrow, Chilean aster, field mustard and common butterweed. The decant water return canal supported sparse individuals of pickleweed and virtually no other vegetation. (A complete listing of species is located in Appendix 4). No rare, endangered, or sensitive plant species were noted at either site during field investigations. The patches of salt marsh are extremely small and have minimal habitat value.

b. <u>Terrestrial and Avian Wildlife</u>

The extent of development and activity at the L-P Dock, as well as a very restricted vegetated area, act to minimize the diversity and numbers of wildlife species occurring in this area. What wildlife activity exists is likely restricted to the upland area north of the existing parking lot, and is probably comprised of small reptiles, mammals, and birds.

Due to the lack of trees and woody shrubs and a concurrent scarcity of roosting and nesting areas, the habitat value for avian species in the disposal area is expected to be low. Some ground dwelling animals probably utilize the area for foraging and nesting (See Appendix 4 for complete listing of biological resources).




# EXISTING SITE VEGETATION

SCALE 1" = 100'±

**FIGURE IIIE.1**

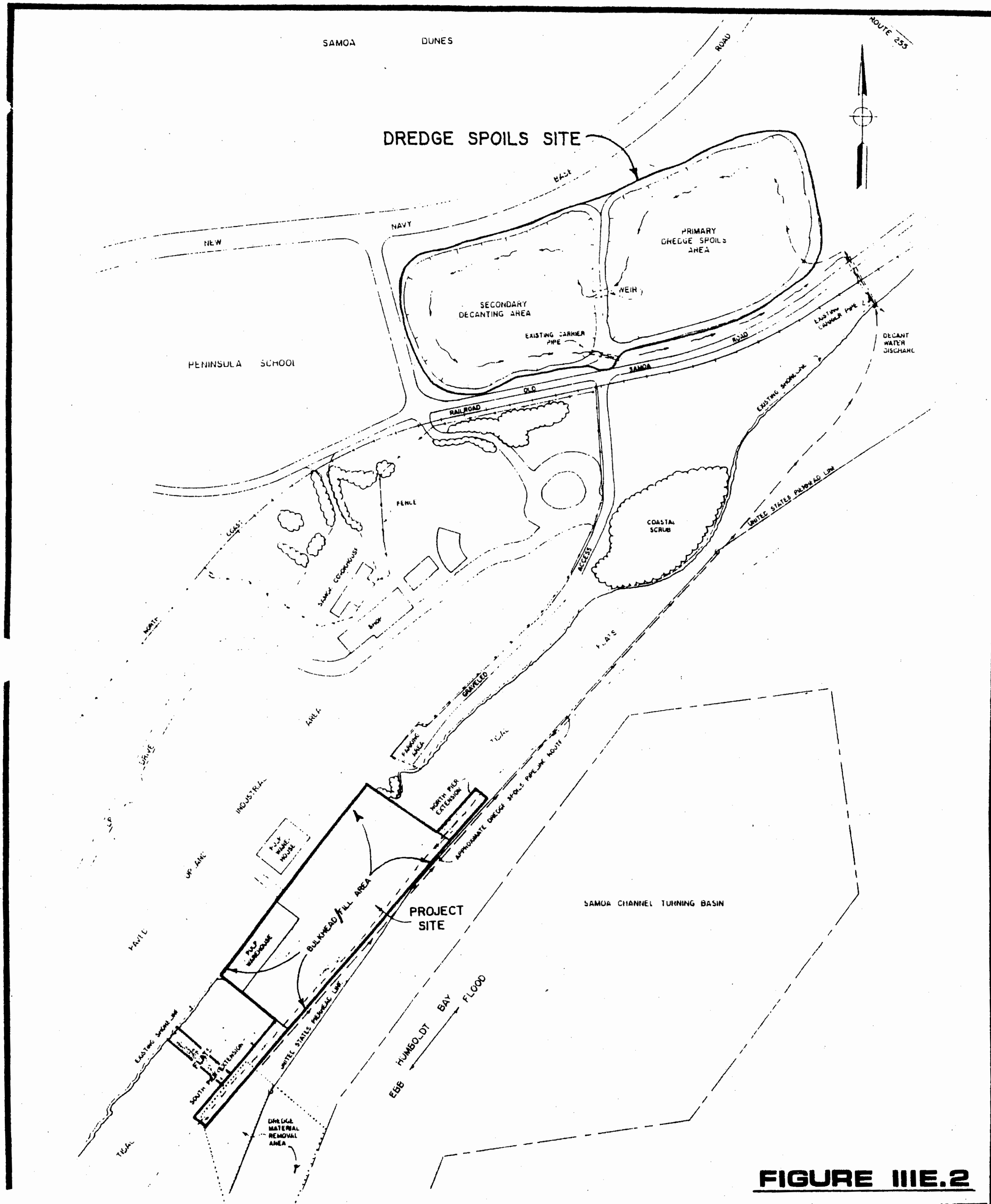



FIGURE IIIE.2

SAMOA TERMINAL

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Several wildlife species included on the DFG list of Special Animals could occur in the project area. The American peregrine falcon, which is listed by both the State and Federal governments as an Endangered Species, migrates through the area and several winter near the Bay. The Northern Harrier (marsh hawk) is a year-round resident which regularly forages in the open habitats of the north spit and could be expected at the Disposal Site. The Osprey is also a year-round resident and, while it would not use any of the project habitats for feeding, roosting, or nesting, it may be observed flying overhead.

c. <u>Intertidal Vegetation</u>

Intertidal vegetation includes sparse individuals of green algae and eelgrass. The algae is located primarily on a few piers and posts at the edge of the openings in the existing dock, and on cobbles at the upper edge of the mudflat. The eelgrass is located in a bed south of the existing dock. (See Figure 3.) Eelgrass density is fairly variable. The mean density is highest about 200 feet from the upper edge of the intertidal zone, and lowest approximately 100 feet from the upper edge of the intertidal zone. (See Appendix 4)

Eelgrass densities, production, and extent of growth in Humboldt Bay vary greatly from year to year and from season to season. Eelgrass density at the L-P Dock site is among the lowest of eelgrass densities reported from other areas in Humboldt Bay and is substantially less than the dense eelgrass beds in South Bay and at Fields Landing.

d. <u>Intertidal Wildlife</u>

A wide variety of avian species utilize the intertidal mudflats for feeding and some for resting. Birds characteristic of this habitat include waders, shorebirds, some waterfowl, gulls, and terns. The intertidal habitat value is expected to be at least moderate due to the presence of the eelgrass beds though the potential value is likely lessened by adjacent industrial activity. A list of common and uncommon bird species expected in the intertidal mudflat is located in Appendix B of Appendix 4.

e. Intertidal Benthic Organisms

A general lack of species abundance and diversity exist in the project intertidal area. Core samples obtained from the project area indicate a large amount of undecayed wood fiber, which probably originated as sawdust and bark from the nearby mill. The combination of this particulate matter, shade from the decking over the dock, and hydrocarbons from industrial activity are the most likely contributing factors. (See Appendix D of Appendix 4.)

f. Subtidal Benthic Organisms

Samples obtained from subtidal mudflat habitat contained particulate organic matter, polychaetes, crustaceans and clams (See Appendix D of Appendix 4).

g. Piling/Rock

The species abundance and distribution on pilings and rocks in the project areas was stratified by tidal influence and contact with the substrate. Subtidal piling areas contained more species and individuals, as did ropes and ladders hanging from the dock which did not allow access to predators such as starfish. Intertidal pilings under the dock typically supported only scattered small barnacles. Twenty six species were found on pilings and rocks which did not occur on the mudflats, including sponges, anemones, hydra, barnacles, carellid amphipods, crabs, clams, snails, bryozoans, starfish, tunicates, and algaes (See Appendix D of Appendix 4.)

h. Fishes

Fish species most common to Humboldt Bay and likely to utilize the project area include Pacific herring, northern anchovy, longfin smelt, Pacific tomcod, shiner perch, walleye surfperch, white surfperch, bay goby, Pacific staghorn sculpin, speckled sanddab, and English sole. A list of fish species potentially occupying the waters of the project area to varying degrees is located in Appendix E of Appendix 4.

2. Impacts

Impact Significance Criteria for Biological Resources:

- South pier extension and gangway could shade eelgrass beds, causing thinning and possible loss of species within the shaded areas.

- Loss of intertidal benthic organisms by fill of intertidal habitat area.

- Loss of existing piling and rocky habitat areas by demolition of the exiting dock and filling.

- Temporary loss of fishes during construction. Permanent loss of a portion of shaded habitat by filling and removal of piling.

- Possible cumulative effects.

a. Terrestrial Vegetation

The vegetation at the dock facility will be totally removed as part of the project implementation. Since much of the vegetation is ruderal in nature and restricted in its distribution, the impacts are expected to be minimal or negligible. Most of the disturbed upland vegetation at the disposal site is growing on previously deposited dredge spoils. The impacts associated with removal of vegetation will be minimal since this assemblage will recolonize the area following spoils disposal.

b. Terrestrial and Avian Wildlife

The impacts of project implementation on terrestrial wildlife resources are expected to be minimal to negligible in and around the existing dock facility, due to the low wildlife use at present. The impacts to wildlife species at the disposal site are also expected to be minimal, due to the lack of vegetative cover and species diversity.

c. Intertidal Vegetation

Construction of the new pier on the south side of the bulkhead will result in the cover and fill 0.34 acres (14,775 square feet) of eelgrass bed, thus permanently removing this habitat. Eelgrass is important to a variety of species, and has been in a decline statewide over recent years.

d. Intertidal Wildlife

Those species that utilize the mudflats will be displaced during construction, but are expected to return. The overall habitat value of this mudflat, and thus the density and diversity of species utilizing this area is expected to decline as a result of increased human and equipment activity. Indirect impacts, such as stormwater runoff, accidental spills, and debris deposition, would further degrade this habitat and further limit its potential habitat value.

e. Intertidal Benthic Organisms

Construction of a perimeter bulkhead around the existing dock will cause the permanent loss of an equivalent area of intertidal mudflats. The invertebrate species presently occupying the substrate will not be able to recolonize the new concrete structure. Dredging associated with the dock expansion and construction will convert a portion of intertidal mudflat to subtidal mudflat. The proposed extension of piling supported dock areas to the north and south and the additional gangway from shore will increase the amount of shaded intertidal mudflat and cause a moderate decline in species abundance and diversity. Because of the current low quality of the project area intertidal mudflat habitat and consequent lack of species abundance and diversity, these impacts are not expected to be significant.

f. Subtidal Benthic Organisms

The proposed project dredging along the south approach to the new dock from the main shipping channel will increase the total area of subtidal mudflat habitat. The existing subtidal habitat is of relatively low quality due to a high percentage of particulate organic matter, so the increase is likely to be considered a significant project benefit.

g. Piling/Rock Organisms

Removal of all pilings and rocks and replacement with a concrete perimeter bulkhead will cause a temporary loss of the species presently living on those habitats. The majority of species abundance and diversity was found on the perimeter pilings and below the low tide level; this habitat type will be increased after construction and will provide essentially the same physical characteristics as the pilings. The new concrete surface is expected to be quickly colonized by the same invertebrate species as on the pilings, making the loss temporary. In addition, new pilings on the dock extensions will eventually create identical intertidal and subtidal habitat.

h. Fishes

Some temporary loss of fish habitat can be expected during project construction due to physical disturbance and suspended sediments. There will be a permanent loss of a portion of shaded piling habitat used by perch and similar species, although some of this habitat type will be replaced by the new dock extensions. Subtidal channel habitat often used by sharks and sculpins will be increased by the additional area created by dredging along the south pier extension. Impacts to the only listed threatened species in the project vicinity, the tidewater goby, are not expected because the dock site is not similar to preferred tidewater goby habitat. This species prefers low salinity (< 10ppt) waters (Swift et al. 1989), while the project area reflects levels similar to those at the entrance (34ppt). The reported locality of the tidewater goby in Humboldt Bay was the extreme northeast end of the Bay near the Arcata oxidation ponds (Swift et al. 1989), approximately six miles from the project site.

Cumulative Impacts:

The rehabilitation of the Eureka Small Boat Basin, Dock A, Fisherman's Dock, Landing Dock, will have little or no significant impact to biological resources if the projects maintain their existing facility footprint. There is the possibility of minor expansion or alteration to the footprint of some of the listed projects, but the impacts caused can be mitigated for by the creation of similar habitats or restoration of impacted areas.

The remaining listed proposed projects, Humboldt Bay Response Corporation Launch Ramp, Reconstruction of Dock A, Woodley Island Improvement Project, Eureka Inner Channel Public Berthing Facility and the Humboldt Harbor and Bar Deepening Project are currently within the environmental review or agency permit processes and are seeking approval based upon impact mitigation to offset project impacts or negative declaration of the project to its effects upon the environment. Cumulative effects are not expected to be significant.

The reconstruction of Dock B, to a Multi-Use Terminal is in the conceptual stage, as scope of the development has not been determined at this time. Biological resources impacts may vary significantly depending upon the scope of the project and a reasonable estimate of their effect is not possible. (See Cumulative Impacts, Section VI.C)

Overall Conclusion: Significant cumulative impacts, though improbable are possible.

3. <u>Mitigation</u>

(See Project Mitigation/Monitoring Program, Section V)

a. <u>Terrestrial Vegetation</u>

i) It is proposed to replant 0.9 acres of woody vegetation along the western border of the mitigation area in order to enhance the overall habitat values of the mitigation area and to replace vegetation removed by excavation of project mitigation site.

ii) It is proposed to create 0.28 acres of salt marsh habitat to reduce project impacts to less than significant. (See Mitigation/ Monitoring Program, Section V for details.)

b. Terrestrial and Avian Wildlife

Mitigation is not proposed as no significant adverse impacts are expected as a result of the proposed project.

c. Intertidal Vegetation

The mitigation for possible loss of 14,775 square feet of eelgrass will be reduced to a level of insignificance by the replanting of 30,000 square feet of eelgrass within the excavated mitigation area. (See Project Mitigation/Monitoring Program, Section V for measures proposed to reduce potentially significant impacts to less than significant.)

d. Intertidal Wildlife

Creation of 6.0 acres of unshaded intertidal mudflats will result in a more productive intertidal habitat area than the existing habitat areas beneath the dock. Loss of intertidal wildlife is expected to occur during construction and will be minimal and short term. It is expected that eventual recolonization and diversity of species within the project mitigation site will be greater than the area of the project. Indirect impacts, such as stormwater runoff, accidental spills, and debris deposition will be eliminated to less than significant by other mitigation measures such as NPDES permit requirements (Storm Water Pollution Prevention Plans, Waste Discharge Requirements), and Spill Contingency Plans. (See Project Mitigation/Monitoring Program, Section V for measures proposed to reduce potentially significant impacts to less than significant.)

e. Intertidal Benthic Organisms

Creation of 6.0 acres of unshaded, uncovered intertidal mudflat will be created to offset the loss of habitat resulting from the filling of the bulkhead area (See

Mitigation/Monitoring Program, Section V).

f. Subtidal Benthic Organisms

Due to the low value of the existing subtidal habitat as expressed by the low benthic diversity and density, no mitigation is being proposed for dredging of subtidal habitat. Dredging will alter the density and diversity of the subtidal area, but recolonization will occur over time. In addition, creation of high value intertidal mudflat and salt marsh is expected to increase the productivity of the mitigation site as compared to the existing conditions, and to mitigate for the loss of less valuable habitat.

g. Piling/Rock Organisms

Mitigation for the temporary loss of piling/rock organisms will be by the creation of rocky intertidal habitat along the entire shoreline of the project and mitigation areas. The bulkhead wall and pilings supporting the pier extensions are expected to quickly recolonize, offsetting the temporary losses from the removal of the existing structure.

h. Fishes

Mitigation is not necessary as no significant adverse impacts are expected as a result of the proposed project.

## F. Traffic and Circulation

The majority of information incorporated into this section was derived from ENSR (1993).

1. Environmental Setting

The proposed project will be served by marine vessels (offshore) and land transportation vehicles (onshore).

a. Marine Vessels

Marine vessel traffic enters Humboldt Bay with tug escort then utilize the North Bay Channel to the Samoa Channel to access the proposed project site. Marine traffic within the Bay typically consists of draft vessels, barges, commercial fishing boats, and pleasure boats. Lumber, petroleum products, chemicals, and general dry cargo products are the primary components of the cargo delivered to, and exported from the Humboldt Bay and Port. Approximately 200 deep draft vessels use the North Bay Channel each year, and approximately 500 commercial fishing vessels dock in Humboldt Bay. Commercial fishing traffic is seasonal and the number of fishing boats has declined in recent years. The number of recreation vessels has increased. (ENSR, 1993 and Humboldt Bay Harbor Safety Plan, Harbor Safety Committee, 1993)

According to the Harbor Safety Plan, a total of 203 vessels made trips to Humboldt Bay in 1990 and 227 in 1991. 193 of these were foreign cargo ships and 67 were cargo barges. The balance of 164 were transporting chemicals and petroleum and 6 were categorized as other. (Humboldt Bay Harbor Safety Plan, Harbor Safety Committee, 1993.)

Vessel traffic patterns are regulated by Rule 9 of the Inland Steering and Sailing Rules promulgated and enforced by the U.S. Coast Guard. (Humboldt Bay Harbor Safety Plan, 1993) Vessel traffic routing is restricted to existing channels without deviation. When vessels pass each other, an infrequent occurrence, the vessel with the more shallow draft will move to the outer edge of the channel and allow the deeper draft vessel to pass while it remains near the center of the channel.

Recreational sailing and fishing activities occasionally disrupt vessel traffic patterns and create potential hazards to safety of navigation of large commercial vessels. Rule 9 (ii)(b) requires a vessel of less than 20 meters in length or a sailing vessel shall not impede the passage of a vessel that can safely navigate only within a narrow channel or fairway. Rule 9 (ii)(c) requires a vessel engaged in fishing shall not impede the passage of any other vessel navigating within a narrow channel or fairway.

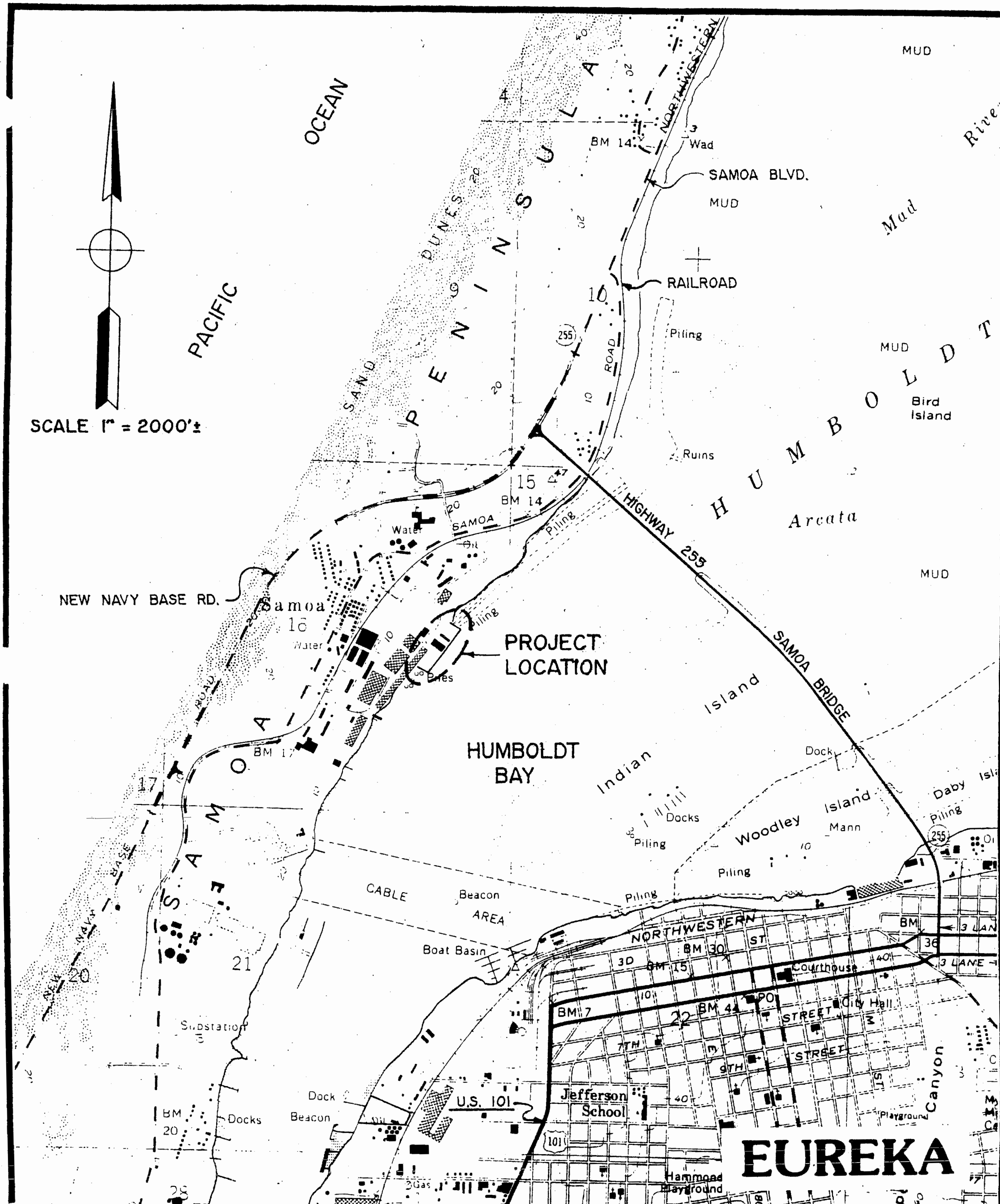
Marine vessels accessing the proposed project will be exporting timber products such as pulp and lumber. According to figures obtained from L-Ps Shipping Department, the existing dock receives up to 6 deep draft vessels per month during high market demand periods. An estimated average of 3 deep draft vessels per month can be anticipated over the course of one year for an annual average of 36. These estimates are based upon global market conditions, shipping company time schedules, off-shore weather conditions, mill productivity and other inter-related factors. The existing terminal (dock) exports roughly 200,000 tons of pulp annually depending on market demand for pulp. (Personal Communication, Jim Hill, L-P Shipping Department, December 1993.)

Chlorine, sodium chlorate, and sodium hydroxide are delivered by barge to the mill's chemical transfer dock (L-P Chip Loading Facility). The chemicals are then pumped to on-site storage tanks. Sulfuric acid, methanol, hydrogen peroxide, and lime are delivered by truck. (See F.1.b., Highway Traffic, below.) None of this material will be transferred to or from the proposed project site.

b. <u>Highway Traffic</u>

Highway traffic access to the project site is from U.S. Highway 101 via State Route 255 (Samoa Bridge and Samoa Boulevard). New Navy Base Road is the primary access road on the Samoa Peninsula and the project site. (See Figure III F.1.) State Route 255 is only 8.8 miles long and runs from Highway 101 in Eureka, across the Samoa Bridge to the North Spit, then north to Highway 101 in the City of Arcata.

According to the Final EIR for L-Ps Pollution Prevention Project, the highest traffic volume on New Navy Base Road occurs at the intersection with State Route 255. Beak Consultants (1992) estimated an annual average daily traffic figure of




TRAFFIC ACCESS

**FIGURE IIIF.1**

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7, 680 vehicles. Peak hour capacity for New Navy Base Road is 1,400 to 1,800 vehicles (see Table 2). The Beak 1992 traffic study was conducted as part of the environmental review for a proposed Simpson Mill improvement project. However, Simpson no longer intends to implement the project, and, in fact, is no longer operating its facility on the Samoa peninsula. (ENSR, 1993.)

According to the 1991 Traffic Volumes on California State Highways (Caltrans 1991), peak hour traffic north of the 255 intersection is 500 vehicles and south of the intersection is 730 vehicles, substantially below the peak hour capacity. The accident rate for the intersection is .66 accident/MVM (million of vehicle miles) and is well above the state expected accident rate of .33 accident/MVM.

The saw mill is served by approximately 15-20 trucks per day, during normal market conditions, exporting wood products from the site.
Sulfuric acid, methanol, hydrogen peroxide, and lime are delivered by truck. None of this material will be transferred to or from the proposed project site. Approximately 12-14 trucks per day transport raw pulp from the mill to on-site warehouses. To sustain an average production of 700 air dry tons of pulp per day, 117 truck loads of chips per day are required. (ENRS, 1993) Some pulp and wood products will be hauled on-site to the proposed project for export. Volume of truck traffic is a function of mill capacity and market conditions and is not affected significantly by the proposed project.

L-P has more than 475 total parking spaces and currently employs 161 people. (ENRS, 1993). Currently, the typical transfer of goods and material to waiting vessels involves between 8 and 16 employees. The employees operate on an on-call basis and arrive when a vessel arrives to load material. These employees most likely use the employee parking lot north of the existing dock facility with a capacity of 24 parking spaces with access off of Old Samoa Road.

**Reported and Projected Traffic Volumes on California State Route 255**

| Intersection with: | Peak Hour Traffic[1] | Projected Peak Hour Traffic[2] | Peak Hour Capacity[3] | Average Daily Traffic[1] | |
|---|---|---|---|---|---|
| | | | | Peak Month | Annual |
| Jct. Rte 101, Eureka | 840 | 910 | 1,400-1,800 | 8,400 | 7,700 |
| New Navy Base Road | | | | | |
| - North of Intersection | 500 | 570 | 1,400-1,800 | 4,950 | 4,550 |
| - South of Intersection | 730 | 800 | 1,400-1,800 | 7,300 | 6,700 |
| Jct. Rte 101, Arcata | 1,600 | 1,670 | 7,200 | 17,200 | 15,900 |

[1]Caltrans 1991.

[2]Based on the assumption of 70 construction-related vehicles traveling during peak hour.

[3]Beak Consultants 1992.

**TABLE 2**

c. Rail Transport

The pulp facility ships out less than one percent of its product by rail transport. The saw mill averages 2-3 rail cars per day carrying approximately 65,000 board feet each. These figures are dependant upon supply and demand, and interrelated market conditions. (Personal Communication, Jim Hill, L-P Shipping Department, December, 1993)

2. Impacts

Impact Significance Criteria for Traffic & Circulation:

- Increase in highway and adjacent route traffic.
- Possible cumulative effects.

Marine vessel volumes are likely to remain the same as a result of the proposed project. Currently, the existing dock is large enough to accommodate two vessels at a time though the condition of the facility limits docking to one vessel. The new dock would provide space for two vessels to load material simultaneously. The implementation of the proposed project will not increase marine traffic. L-P Samoa Mill capacity will be the limiting factor in marine vessel traffic volumes.

Similarly, highway traffic (transport trucks and employee vehicles) are not expected to increase as a result of the proposed project. The project is an improvement of an existing facility and will rely on current transport and employee traffic once implemented.

Construction of the proposed project will see a slight increase in transport and use of heavy construction equipment and construction workers. Number of construction workers is estimated to peak at 20-30 employees over a 9 month period. Proposed project construction would occur between 7:00am and 7:00pm, Monday through Friday. Assuming that all 30 construction workers drive their own personal vehicles, and travel to and from the project site during peak hour, peak hour traffic would potentially increase by 30 vehicles. Construction-related truck deliveries of fill, concrete, rebar, etc. are estimated at 10 each day during the construction period. If these deliveries were to all occur during peak hours, an unlikely scenario, the total peak hour traffic would increase by 40 vehicles.

All project-related traffic would use either State Route 255 from Highway 101 across Samoa Bridge to New Navy Base Road or 255 from Highway 101 in Arcata to New Navy Base Road. In both cases, traffic would pass through the intersection of 255 and New Navy Base Road, where peak hour traffic has been measure at 500 and 730 vehicles north and south of the intersection respectively (ENSR, 1993.)

Project-related traffic increases, using the assumptions described above, would see peak hour increases of 540 north and 770 south of the intersection, well below the capacity for New Navy Base Road of 1,400 and 1,800 vehicles respectively. Table 2 illustrates that peak hour capacity would not be exceeded by the proposed project.

Parking for construction workers personal vehicles would be provided by the 125 parking spaces along L-P drive.

Because the traffic and parking increases do not exceed existing capacity, and the construction activity is a short-term and temporary condition, no traffic-related impacts are expected as a result of the proposed project. Additional construction-related traffic could potentially increase the number of accidents occurring on area roadways. This potential is difficult to measure, and because the construction traffic is short-term, potentially higher accident rates are not considered to be significant.

Cumulative Impacts:

The L-P Samoa Terminal Reconstruction Project combined with the listed proposed projects should have little or no impact on traffic and circulation of local roadways. All listed proposed projects, with the exception of the Woodley Island Improvement Project, are located on the Eureka Waterfront and will be accessed through the city of Eureka. The Woodley Island Improvement Project will utilize a portion of Route 255 (Samoa Bridge) which is a travel route to and from the Samoa Peninsula and the L-P Samoa Terminal site. Significant increase of traffic is not expected (Woodley Island Improvement Project, Negative Declaration, Humboldt Bay Harbor, Recreation and Conservation District).

Vessel traffic within Humboldt Bay may increase by the construction and rehabilitation of the proposed marine vessel related projects. This may create the need for increased U.S. Coast Guard, Sheriff Department, and Department of Fish and Game monitoring as well as the institution of vessel safety plans and public information classes regarding harbor safety and navigational rules and laws.

3. Mitigation

No mitigation measures are necessary as there are no significant traffic and circulation impacts associated with the proposed project.

## G. Public Utilities & Services

1. Environmental Setting

a. Water

Water supply to the Samoa peninsula is provided by Humboldt Bay Municipal Water District, which obtains its water from the Mad River. The District provides untreated industrial water, wholesale treated potable water for municipalities and service districts, retail potable water to residents along the district's main freshwater pipeline and the Fairhaven area.

The L-P mill is within water supply District U-1, which was formed to finance and provide a more reliable water supply for the pulp mills. District U-1 is financed by the L-P pulp mill and totally separate from the other water system on the peninsula. (ENSR, 1993)

b. Electricity & Natural Gas

L-P acquires the majority of its power through cogeneration. If additional power is needed, electricity is supplied by Pacific Gas & Electric (PG&E). Natural gas is supplied by a 12 inch mainline from the Central Valley.

c. Solid Waste Disposal

Solid waste disposal service is predominantly provided by City Garbage Company of Eureka. The L-P mill produces approximately 330 tons of garbage per year. An additional 400 cubic yards per year of ash, soil, concrete, and other inert material is disposed of in the L-P Samoa pulp mill landfill.

2. Impacts

Impact Significance Criteria for Public Utilities:

- Major increase in use or major change in existing systems.
- Possible cumulative effects.

a. Water

Additional water supplies will not be needed for the construction or operation of the proposed project.

b. Electricity & Natural Gas

Cogeneration facilities owned and operated by L-P will continue to provide the majority of the electricity required to construct and operate the proposed project. If additional electricity is needed for operation, it will be supplied by PG & E. The amount of additional electricity needed for project operation will be relatively small in comparison to existing use and is not likely to adversely affect the regional supply of electricity.

No natural gas will be required to construct or operate the proposed project.

c. Solid Waste Disposal

The existing wood decking is pressure-treated and existing pilings treated with creosote. Both of these materials are classified as hazardous materials. Upon demolition, these materials will be sold as salvage or transported to a land fill site certified to handle hazardous materials. Concrete debris, and unsuitable underlying material will be removed in preparation for fill.

3. Mitigation

a. Water

No mitigation is necessary as there are no significant impacts to water supply associated with the proposed project.

b. Electricity & Natural Gas

No mitigation is necessary as there are no significant impacts to electricity or natural gas supplies associated with the proposed project.

c. Solid Waste Disposal

The demolition contractor will remove the demolition debris from the site and dispose of material in an approved manner. Pressure-treated and creosote treated material will be sold as salvage or disposed of at a certified land fill. Use of salvaged materials will be subject to State and Federal standards for handling and use of hazardous materials.

## H. Recreation & Aesthetics

1. Environmental Setting

The visual and aesthetic character of the west side of the Samoa Peninsula (North Spit) is dominated by rolling sand dunes, dune grasses and shrubs and associated wildlife, and views of the ocean and coastline. On the east side, the visual and aesthetic character is dominated by the Humboldt Bay and tidelands and views of Indian Island, Samoa Bridge, City of Eureka waterfront and surrounding industrial facilities of the L-P and Simpson pulp mills, L-P sawmill, North Coast Export, and Fairhaven Power Company. (ENSR, 1993)

The 300-acre Samoa Dunes Recreation Area is located approximately 3 miles south of the L-P Mill and project site. The area is managed by the Bureau of Land Management (BLM) and visitor use totalled 150,000 visitor days in 1991.

Additionally, people use the coastal side of the peninsula for hiking, fishing, surfing, diving, and off-road vehicle use. Aesthetic quality and recreation use of the area is affected by mill effluent, odor, and other conditions associated with industrial activity. In spite of the industrial nature of the project site and vicinity, an HSU study conducted in 1988 concluded that the Samoa Peninsula is an important recreation area. (ENSR, 1993)

The proposed project is within distant view from the Samoa Bridge as are the dredge spoils sites. The dredge spoils area cannot be seen from New Navy Base Road. The project site is not in a designated Coastal Scenic Area as set forth in the Local Coastal Plan Element of the Humboldt County General Plan.

Currently, there is no public access associated with the proposed project nor within the L-P Mill facility. The Coastal-Dependent Development designation of the HBAP and the Coastal-Dependent Industrial Development zoning classification provide priority to coastal-dependent developments over recreational uses.

2. Impacts

Impact Significance Criteria for Recreation & Aesthetics:

- Loss of open space or obstruction of public views or access.
- Possible cumulative effects.

The proposed project site is located on the east side of the peninsula and will not effect the ocean beach or dune environment. The new dock will replace an existing deteriorating wooden structure with one constructed of concrete further industrializing the aesthetic character of the setting but eliminating a "deteriorating" element from the visual setting. Similarly, the dredge spoils area offers limited visibility from Samoa Bridge.

The project will be sited and designed to be subordinate to the character of the setting as required in Section I (3)(a) for Coastal Scenic Areas and will not interfere with public views as required in Section I (5)(a) for Coastal View Areas of the Coastal Zoning regulations.

Construction of the proposed project will generate additional industrial-related activity during implementation. Once complete, the project will accommodate large deep draft vessels which some may find aesthetically pleasing if not interesting.

In summary, no public access exists nor is it required for the proposed project. Recreation use of the project area is restricted and the project will not result in loss of existing recreation opportunities. The project will improve the condition of the existing facility and is not expected to result in a decrease in over all aesthetic quality of the area. No additional odors, or discoloration of water beyond what presently exists will result from the proposed project. No significant adverse impacts on recreation and aesthetic resources are expected as a result of the proposed project.

Cumulative Impacts:

The listed projects may require upgrading of existing site utilities. This should not represent a significant increase or demand on public utility systems as the scope and use of the projects will not be substantially altered from that of past or present use. (See Section VI.C.)

3. Mitigation

No mitigation measures are necessary as there are no significant recreation and aesthetic impacts associated with the proposed project.

## I. Cultural/Archaeological Resources

### 1. Environmental Setting

The Humboldt Bay Area was once occupied by the Native American Wiyot tribe, which was part of the Algonkian family. The Wiyots utilized the resources of Humboldt Bay and their heritage is an important resource within the Humboldt Bay area. Prehistoric archaeological sites are situated on land adjacent to Humboldt Bay and marshlands, on coastal terraces, and in protected locations, such as the eastern side of Humboldt Bay. All site excavations, including the preparation of the mitigation site are located on tidal lands filled after 1870. The Humboldt County Natural Resources Division does list a site, No. 22, in the mill yard, north east quarter of Section 16 at Samoa, dated prior to 1850. The exact location is unknown. The position of the 1870's Mean High Water Line of this portion of the Samoa Peninsula was reestablished in 1983 by Winzler & Kelly Consulting Engineers from an analysis of the U.S. Coast Survey Hydrographic Map of 1870 and is described in stipulation and Order No. 59058, between the Humboldt Bay Harbor, Recreation and Conservation District and Louisiana Pacific Corporation. The project site is located on tidal lands, approximately 200 feet bayward of the 1870's High Water Line. Excavation of the mitigation site will remove historic fill placed predominantly after the 1950's (Humboldt County Photo Records, Humboldt County Natural Resources Department). According to the California Archaeological Inventory (CAI), prehistoric resources such as chert or obsidian flakes; projectile points, mortars, and pestles; and dark, friable soil containing shell and bone dietary debris, heat-affected rock, or human burials may exist on the project site. No recorded prehistoric or historic archaeological sites listed with the CAI. (ENSR, 1993)

Humboldt Bay was discovered in 1806 by Jonathan Winship. The Bay was one of the few good harbors between San Francisco and Puget Sound and has been used extensively for maritime trade. Early Euroamerican historic sites may exist within the area of the proposed project. Such sites may reveal stone or adobe foundations or walls of early mills or shipbuilding operations, structures and remains with square nails, and refuse deposits. (ENSR, 1993)

2. Impacts

Impact Significance Criteria for Cultural/Archeological Resources:

- Archeological or historical sites may be disturbed by construction excavation.

- Possible cumulative effects.

Potential impacts to archaeological and historical resources would be classified as significant under CEQA if construction of the proposed project would result in the loss of known archaeological or historical resources recorded by the Northwest Information Center of the California Archaeological Inventory. Significant impacts to known resources are not anticipated as a result of the proposed project.

Cumulative Impacts:

There is the potential for impact to Cultural or Archaeological Resources by the proposed projects. Review and study of recorded resource locations in relation to specific project sites and related construction activities can significantly reduce the potential adverse impact or disturbance to Cultural or Archaeological sites. If deemed necessary, on site archaeological consultants can be appointed during project excavation activities. (See Section VI.C)

3. Mitigation

The applicant will employ a qualified Archaeologist to observe site excavations. If an archaeological site is unearthed, activities will be postponed until the site can be properly evaluated, mapped and or recovered by trained personnel under the guidance of the site Archaeologist.

## J. Noise

1. Environmental Setting

Noise information generated in the ENSR (1993) study refers to noise level readings taken at locations near the facility boundaries and at areas in the mill near the loudest noise sources in 1988. Perimeter noise levels ranged from 54 to 71 decibels (dBA). Noise levels of 58 dBA were recorded along New Navy Base Road, 2000 feet from the L-P facility. The Humboldt County Noise standard for residential areas is 55 to 60 dBA. The nearest noise-sensitive receptor (residences in the town of Samoa) is over 1,000 feet away from the L-P facility and proposed project.

Noise related issues are also addressed in the noise element of the Local Coastal Plan (LCP). Coastal zone noise standards for industrial development are as follows:

> Residential Zones - all noise generating operations shall be buffered so that they do not exceed the exterior ambient noise level by more than 5 dBA.
>
> Non-Residential Zones - Mitigating measures shall be required where necessary to insure that noise generated by industrial operations does not exceed 70 dBA anywhere off the site premises.

2. <u>Impacts</u>

<u>Impact Significance Criteria for Noise</u>:

- Increased noise levels due to construction activities.
- Possible cumulative effects.

Sources of noise-related impacts are likely to result from construction activities and operation of the terminal. Current ambient noise levels of 54 to 71 dBA are around the perimeter of the L-P Mill property and project site. Table IIIJ.1 illustrates sound levels and human response for a range of noise generating activities. Activities associated with this project range from light auto traffic at 50 dBA (at 100 feet from source) to heavy truck traffic and pneumatic drilling at 90 dBA (at 50 feet from source).

SOUND LEVELS AND HUMAN RESPONSE

| ACTIVITY | SOUND LEVEL, dBA | RESPONSE | CONVERSATIONAL RELATIONSHIP |
|---|---|---|---|
| Carrier Deck Jet Operation | 140 | Threshold of Pain | |
| 50 HP Siren (100 feet) | 130 | | Limit amplified speech |
| Jet Take-off (200 feet) Auto Horn (3 feet) | 120 | | Maximum vocal effort |
| Riveting Machine, Chainsaw | 110 | | |
| Jet Take-off (2,000 feet) Lawn Mower, Power Tools (3 feet) Motorcycle (50 feet) | 100 | Hearing loss with continuous exposure | Shouting in ear |
| Farm Tractor (50 feet) Heavy Truck (50 feet) Food Blender Pneumatic Drill (50 feet) | 90 | Very annoying; hearing difficult; hearing damage (with 8 hour exposure) | Shouting at 2 feet |
| Garbage Disposal, car @ 65 mph (25 feet) | 80 | Annoying | Very loud conversation |
| Vacuum Cleaner (10 feet) Freeway Traffic (50 feet) | 70 | | Loud conversation at 2 feet |
| Large Store Air Conditioning Unit (20 feet) | 60 | Intrusive | Loud conversation at 4 feet |
| Light Auto Traffic (100 feet) Quiet Residential Area | 50 | Sleep interference | Normal conversation at 12 feet |
| Living Room/Bedroom Quiet Home | 40 | | |
| Library | 30 | | Soft whisper at 15 feet |
| Broadcasting Studio | 10 | | |
| | 0 | Threshold of hearing | |

Source: California Dept. of Health Services

**TABLE IIIJ.1**

During construction, there will be a temporary increase in noise levels expected to range from 70 - 90 dBA. Noise increases will result from the movement of construction equipment such as trucks and graders, and use of pile-drivers, jack hammers, and the hydraulic suction dredge. For both residential and non-residential zones, the ambient noise level could be exceeded by approximately 20 dBA during periods of construction. Residents of Samoa, 1,000 feet from the proposed project, may experience an increase in noise and vibration caused mainly by the driving of pile and movement of equipment.

Upon completion of construction, noise generated from operation of the terminal is not expected to exceed the ambient range of 54 to 71 dBA. The ENSR Study recorded ambient noise level of 58 dBA at Navy Base Road over 2,000 feet from the proposed project site. Noise will result from the movement of equipment during loading of cargo ships and approximately 12-14 trucks per day delivering raw pulp to on-site warehouses, 117 truck loads of chips per day to the mill, and approximately 8-16 employees involved in the transfer of goods and material to marine vessels. Volume of marine and vehicle traffic is a function of mill capacity and market conditions and is not affected by the proposed project.

Cumulative noise impacts are not expected to be significant as the Humboldt Bay shoreline is redeveloped for commercial and industrial purposes. Noise-related impacts may result from individual projects proposed for reconstruction or development. By and large, these projects are dispersed around the bay, and in areas of project concentration, e.g., Eureka Waterfront Redevelopment, will be site specific and limited in the extent of impacts.

3. <u>Mitigation</u>

Construction related noise will be partially mitigated by limiting the hours of construction to 7 AM to 7PM weekdays. Construction related noise may temporarily exceed ambient standards at certain periods of the day and cannot be mitigated.

Operation noise is not expected to increase and mitigation is not necessary as no significant impacts are expected from the project operation.

No cumulative impacts resulting from increase in noise are anticipated.

## K. Light and Glare

### 1. Environmental Setting

The L-P mill has extensive lighting necessary for operational safety and security and is part of the industrial character of the setting. Currently, the existing wooden dock has four light poles with mercury vapor lamps evenly spaced across the seaward side of the dock and one light pole near the landward edge near the shoreline. This lighting is necessary for safely loading and unloading of cargo at night. The proposed project will remove and replace the same number of poles along the seaward side of the dock and increase the number of light poles landward by two poles.

As noted in the noise section, the nearest residences are over 1,000 feet away from the L-P mill facility and the proposed project site and mill light is an existing element of the industrial character of the setting. At night time, facility lighting is visible from Woodley Island, Eureka waterfront and other areas in the vicinity.

### 2. Impacts

Impact Significance Criteria for Light and Glare

- Increase in light visible off site.
- Possible cumulative effects.

Humboldt County performance standards for Industrial Development that impacts non-residential zones has no restrictions on lighting. The U.S. Coast Guard only restricts lighting that may impede navigation.

Impacts for residential zones is not applicable to the proposed project. The nearest residence in Samoa is approximately 1,000 feet away from the project site and the nearest residence in Fairhaven, south of the Simpson Pulp Mill, is an estimated 1.4 miles from the project site.

Dock lighting can be shaded to reflect light downward so as not to produce off-site glare. However, the light will still be visible. The visibility of dock lighting is an aesthetic issue and aesthetic judgements, being highly subjective, will likely vary from person to person. It is highly unlikely that the addition of two additional light poles would noticeably affect the quality of the night-time visual environment, especially given the backdrop light of the L-P Mill. Project related impacts of light and glare are not expected to be significant.

Cumulative impacts of light and glare resulting from other proposed or anticipated industrial development projects around the shore of Humboldt Bay may be significant. Such developments will certainly increase the industrial character of the bay shore, including the night-time effects of light and glare. Whether or not these increases would constitute a significant impact depends on the design and extent of lighting for each project.

3. Mitigation

All lighting for the proposed dock reconstruction project will be installed with shades directing light downward and preventing escape off-site. Cumulative effects of night-time light and glare could be reduced to less than significant by a bay-wide policy requiring shaded lights for all projects within the Harbor District's jurisdiction.

## L. Tidal Hydrology

(See Appendix 5, Hydrology Study, Prepared by Mr. Mac McKee, Humboldt State University Natural Resources Engineering, 1994)

## 1. Environmental Setting

### Tidal Circulation

The volume of water entering and leaving Humboldt Bay on each tidal cycle is known as the tidal prism. This movement of water causes currents of varying magnitudes throughout the Bay. The currents affect the transport of materials in the Bay, including sediments.

Very little quantitative information is available about the details of tidal circulation and how it is affected by the Samoa Channel. Much is known, however, about the overall characteristics of the Arcata Bay and total volumes of water that pass through the Channel in a tidal cycle.

The Samoa Channel plays an important role in the tidal circulation of Humboldt Bay because a large fraction of the tidal prism of the Arcata Bay must pass through the Channel on both flood and ebb tide. Shapiro and Associates (1980) estimate that the Samoa Channel drains approximately 66 percent of the tidal volume of Arcata Bay.

### Sediment

Fresh water discharges into Humboldt Bay have only a minor influence on its hydrology and hydraulics (Shapiro and Associates, 1980). Because of the shallow depths of the sloughs and the large tidal prism in Humboldt Bay, the water columns are well mixed vertically and horizontally (Gingerich 1971).

Currents in Humboldt Bay cause erosion and siltation, requiring periodic maintenance of the interior channels for navigational purposes. The predominant source is inflow of sediment through the tidal inlet to the Bay. Thompson (1971) estimates the annual sediment load to the Bay through the inlet to be 540,000 to 670,000 cubic meters/year, whereas input from upland runoff are estimated to be only about 90,000 cubic meters/year.

Thompson (1971) reports that sediment distribution within the Bay correlates well with bottom morphology and appears to be predominantly controlled by tidal currents. In general, sediment grain size decreases with increased distance from the tidal inlet to the Bay, and with increased elevation. Coarse sediments generally occur in the channel bottoms and the finer sediments are found in the high mud flats and salt marshes.

Channel Hydraulic Characteristics

The hydraulic behavior of any channel is greatly influenced by the channel cross sectional geometry. The channel reach near the L.P. dock is wide and deep, and is maintained to accommodate docking and turning of sea-going vessels. The bottom of the Channel is relatively flat with steep side slopes to the approximate MLLW (Mean Lower Low Water) elevation, above which the channel widens considerably, generally in the range from MLLW to MHHW (Mean Higher High Water). In cross sections of this type, most of the flood and ebb tide flow will occur in the deep central portion of the channel. The shallow regions at the sides of the cross section will provide relatively little hydraulic conveyance capacity, and only a small amount of storage volume relative to the total channel. In the location of the dock, conveyance beneath the dock is further reduced due to the presence of pilings and dock structures. This means that, at present, almost all flood and ebb tide waters flowing past the dock are transported in the deep section of the channel. The principal hydraulic constraint on flows in the Samoa channel in comparison to the channel geometry at the L.P. dock is the constricted cross sectional area in the southern portion of the channel. South of the L.P. dock, the channel is narrower and its cross section is considerably reduced (where the Turning Basin meets the Samoa Channel). (Mac McKee, HSU, 1994)

2. Impacts

Impact Significance Criteria for Tidal Hydrology:

- Structure may effect tidal velocities and sedimentation rates of surrounding tidal area.

- Possible cumulative effects.

a. Channel Hydraulics

The proposed modifications at the L.P. dock will have the effect of slightly decreasing the channel cross section at the dock, but increasing it in the area of the south pier extension by dredging necessary for vessel moorage. Overall this will result in an increase in the average cross sectional area and hydraulic conveyance of the affected reach of the Samoa Channel by a very small amount. The minimal changes in channel hydraulic radius, cross sectional area, and hydraulic conveyance will have only a minor effect on the hydraulic behavior of the channel. Local velocities in the area immediately south of the dock might be reduced, but it is unlikely that the amount of the reduction could be measured with any confidence. Given that the southern reaches of the Samoa Channel will remain constricted, little if any discernible effect will be seen on overall channel velocities.

Cumulative Impacts:

Of the several Harbor projects with approved permits or within the agency permit process, all but one are small, and most involve reconstruction, rehabilitation, or improvement of existing facilities or facilities that have been used in the recent past. These consist of:

* Humboldt Bay Response Corporation Launch Ramp
* Dock A Reconstruction
* HBHR&CD Woodley Island Improvement Project
* City of Eureka Inner Reach Channel Berthing Facility
* Eureka Small Boat Basin Rehabilitation
* Fisherman's Marker/Farmer's Market & Dock Development
* Landing Dock Reconstruction
* Dock B Reconstruction

All of these projects are small, and much of the project activity--i.e., dredging, construction, and/or other improvements--will occur in the intertidal zone and will therefore generate negligible changes in tidal hydraulics. None of these projects is in the Samoa Channel, and should therefore not present any significant cumulative impact, when seen in combination with the proposed Samoa Terminal Reconstruction, on tidal circulation or sediment transport in the bay.

The only large project currently proposed is the Humboldt Bay Harbor Deepening Project. This project calls for the removal of up to 4,482,000 cubic yards of sediments from the Humboldt Bay Channel system. Approximately 414,000 cubic yards are to be removed from the Samoa Channel, with an additional 324,000 cubic yards to be removed from the Samoa Turning Basin. These activities will widen and slightly deepen both the channel and turning basin. This will increase the cross sectional area of the channel and turning basin and will likely have a minor effect--in the form of a reduction--on maximum tidal velocities in both the Samoa and Eureka Channels. In conjunction with the Samoa Terminal Reconstruction Project, this reduction in channel velocities will be very small, and, as a result, there should be no significant impact on circulation in the bay. The reduction in tidal velocities might have a minor impact on sediment scour and deposition in the channel. The on-going monitoring of sedimentation rates in the channel should be continued as mitigation measures to address these minimal impacts. (Mr. Mac McKee, HSU Natural Resources, May 1994)

b. <u>Tidal Circulation and Sediment Transport</u>

The constriction in the southern end of the channel will continue to provide the main control on the amount of water flowing through the channel. This means that only local and very minor changes in velocities will occur due to the proposed channel modifications. Overall this should have no effect on tidal circulation patterns and velocities in Humboldt Bay. (Mr. Mac McKee, HSU Natural Resources, May 1994)

Similarly, since only local and very small changes in velocities are expected to occur, only local changes in sediment transport patterns will result. This will most likely be seen in the area south of the L.P. dock that is to be dredged and widened. There might also be very localized scour and/or deposition in the immediate vicinity of the modified dock structure. Overall, no changes in sediment transport for Humboldt Bay should result. (Mr. Mac McKee, HSU Natural Resources, May 1994)

3. Mitigation

Sediment deposition and scour in the Samoa Channel should continue to be monitored as a regular part of ongoing maintenance of navigational capability. In particular, the area immediately south of the L.P. dock area should be monitored for deposition. (Mr. Mac McKee, HSU Natural Resources, May 1994)

## IV. ALTERNATIVE EVALUATION

CEQA Statutes and Guidelines (Title 14 of the California code of Regulations, Section 15126 [d]) requires consideration of a range of reasonable alternatives to the proposed project, or location of the project, that could feasibly attain the basic objectives of the project. Specifically, the EIR must address the effects of not constructing the project (no project) and discuss the alternatives capable of eliminating any significant adverse environmental effects or reducing them to a level of insignificance, even if these alternatives would impede, to some degree, the attainment of the project objectives, or would be more costly.

### A. Off-Site Alternatives

Off-site alternatives were studied for their possible use as break bulk transfer terminals. Of the sites listed below, the Simpson Paper Company site was the best off-site alternative on Humboldt Bay. Most listed sites were either to distant from the L-P Mill site for practical operations, or resulted in severe environmental damage and permanent loss concerning the modification or reconstruction necessary to meet the needs of the proposed transfer facility. All off-site alternatives left L-P with no means of exporting bulk goods from their Samoa Mill Facility. (See Figure IV.1)

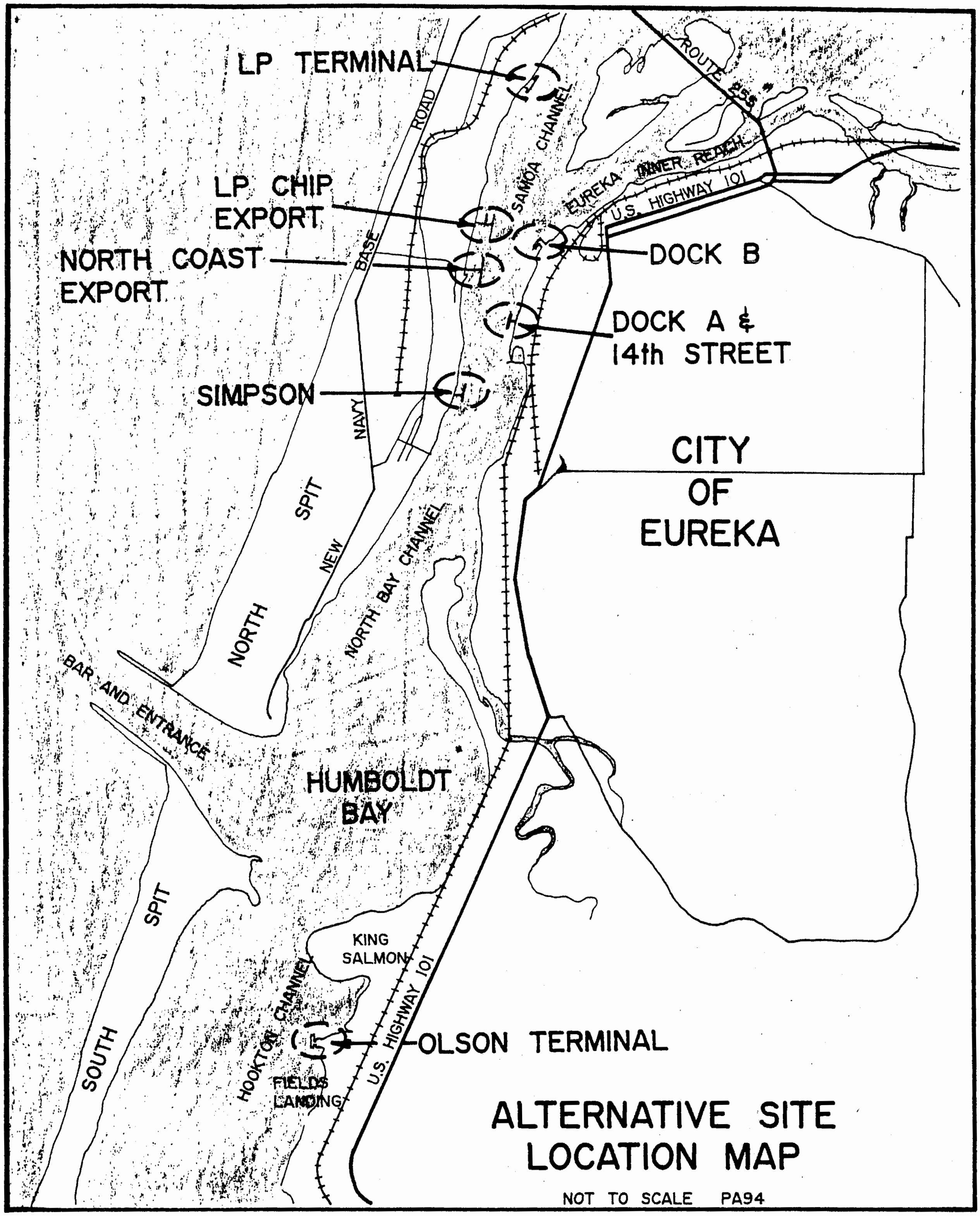
Alternative OF-1: Simpson Paper Co. Transfer Terminal

The Simpson Paper Co. Transfer Terminal, located at the mothballed Simpson Kraft Pulp Mill, Fairhaven, California was studied as an alternative to the project. The 500 foot long concrete capped wooden dock is the best maintained, most structurally sound, facility on Humboldt Bay. Simpson Paper Co. utilized the terminal for transfer of raw pulp and wood products to cargo vessels, until the Mill's closure in February of 1993. The privately owned facility, although in good condition, is limited by loading capacity (approximately 750 lbs./sq. ft.), narrow access gangway, and lack of raw goods storage area near the facility, aside from the pulp storage warehouses.

Break bulk goods, pulp, logs, lumber, etc..., currently exported from the L-P Samoa Terminal, would have to be hauled 1.25 miles across County maintained roads to the L-P Mill site. Bulk goods carriers and equipment utilized intersite by L-P are unlicensed, off-road vehicles that would require extensive modification or replacement if used for hauling materials over public roadways to the Simpson Terminal. The 1.25 mile one way haul would decrease the efficiency of transfer operations due to increased haul time and lack of bulk goods storage areas adjacent to the Simpson dock.

Modification of the structure would be necessary to withstand the anticipated loading requirements and additional ingress, egress needs to and from the dock. At a minimum, an additional gangway and additional dock support and enlargement would be required.

The privately owned Simpson Paper Company site is not for sale at this time, and its future return to production is uncertain (Arron Gettle, Simpson Paper Co. 1994). Leasing the transfer terminal dock and adjacent pulp storage warehouses is a possibility, but the chance of the Simpson Mill resuming operations, possibly as soon as 1996, would leave L-P without means for export of products, as their transfer terminal would continue to deteriorate in the interim.




SAMOA TERMINAL

ALTERNATIVE SITES

PACIFIC AFFILIATES
A CONSULTING ENGINEERING GROUP
835 THIRD ST · EUREKA · CALIF · 95501 · (707) 445-3001



FIGURE IV1

Alternative OF-1: Summary

In Summary, loading capacity limitations, structure modification, logistics problems (acquisition of ownership or lease and uncertainty of Simpson Paper Company's. return to production), and inefficiency of operations (hauling goods to the Simpson site, and lack of storage) all pose serious problems with this alternative. Even though some of the problems with this alternative can be addressed, (structural modifications and addition of additional storage) some problems cannot, (competitive uses and conflicting ownership) and those that cannot rendered this alternative infeasible.

Alternative OF-2: North Coast Export Chip Dock

North Coast Export is a privately owned and operated wood chip exporting facility located immediately south of the L-P Mill site. The 800 foot long, 30 foot wide wooden finger pier supporting the chip loading conveyor system is of similar configuration to that of Louisiana Pacific's chip loading facility (see On-Site Alternatives). The North Coast Export site would require complete reconstruction of the gangway and addition of several acres of dock space to facilitate the loading requirements, staging, ingress, and egress needs of the L-P break-bulk loading operations. The distance from the shoreline to the pierhead of 800 feet would require a 0.3 mile minimum round trip during loading operations. Filling and covering of productive tidal and subtidal habitat areas caused by the necessary reconstruction and modifications would cause extensive environmental damage and losses.

Alternative OF-2: Summary

Utilization of the North Coast Export Chip Loading Dock would result in the complete reconstruction of the existing facility to accommodate loading operations and access to and from the dock. The length of the pier leading from the shore to the dock makes for inefficient loading operations and increased maintenance on the facility. If the privately owned site could be modified and utilized, conflicts during loading operations and scheduling of vessels would undoubtedly arise. Due to substantial environmental loss and conflicting uses, this alternative was determined to be infeasible.

Alternative OF-3: Olson Terminal Dock, Fields Landing

The Olson Terminal Dock located in Fields Landing, currently owned and operated by Humboldt Bay Forest Products Incorporated, was determined to be an infeasible alternative for the following reasons. The shallow depth of the Hookton Channel, -26 feet Mean Lower Low Water, severely limits the size and cargo capacity of export vessels at the facility. This coupled with the sites distant location from the L-P mill site and lack of covered storage for raw pulp eliminated it from further consideration as a feasible alternative. The site is not currently for sale or lease. Increased truck traffic from the L-P Mill site to this facility, through the City of Eureka, would substantially impact local roadways.

Alternative OF-4: 14th Street Dock, Guynup Enterprise

The Guynup Enterprises facility located at the foot of 14th Street in Eureka, has recently been modified for export of wood chips. The privately owned, timber constructed, lumber and raw log export facility is of comparable structural condition as the existing L-P transfer terminal. Its distance of six miles from the L-P Mill site, through the City of Eureka, and the associated impacts of the increased truck traffic from the Samoa Mill to the Eureka site eliminated it from further review as a viable alternative.

Alternative OF-5: Dock "A" Washington St., Eureka

The Dock A property, formerly owned by L-P, and used as a lumber products export facility, was sold to a private party in 1992. The aging wooden dock,(Dock A) owned by the City of Eureka and leased to the current land owner has limited use due to its deteriorating condition. Permits for reconstruction in kind are being applied for by the land owner. The facility's distance of six miles from the L-P Mill site and resultant truck traffic impacts coupled with the dock's current condition eliminated this alternative from further review.

Alternative OF-6: Undeveloped Lands

Undeveloped parcels adjacent to Humboldt Bay were also considered but rejected as alternatives due to either their distance from the L-P mill site, substantial investment necessary to acquire and develop the land and the resultant environmental damage and losses that would result from the development. Increased truck traffic and its effect on local roadways and environment was also an alternative limiting factor.

Off-Site Alternative Summation

All dock facilities worthy of consideration, and listed above, would require extensive modification or upland development, and resultant unnecessary environmental damage to facilitate the multi-use needs of the Louisiana Pacific Industrial Complex in Samoa. Distance from the Project site also weighed heavily in the elimination of several alternatives considered along the eastern shore of Humboldt Bay. The Simpson Paper Company Dock and Kraft Pulp Mill site, the most favorable of the off-site alternatives, is in a state of uncertain future return to productivity, and would also require extensive modification to efficiently utilize this site. Undeveloped lands were further rejected as reasonable alternatives due to the unnecessary environmental damage and losses stemming from the resultant construction, and inefficiencies created by increased handling and transportation of goods and equipment.

B. **On-Site Alternatives** (Refer to Alternative Analysis Matrix, Table 3)

On-site project alternatives considered consist of several wharf and bulkhead configurations utilizing the existing facility, and the waterfront of the Louisiana Pacific Samoa property. Potential alternatives were screened to determine if they were substantially environmentally damaging, met current and future industrial needs, while allowing for the future modification of the facility work area. Alternatives that could not meet these requirements were eliminated. With the exception of the existing project area, and the L-P chip loading facility, the remaining waterfront and tidal areas of the Louisiana Pacific Mill site are unimproved tide lands containing substantially greater habitat value than the project site. Construction of a new facility on these lands would severely damage productive, environmentally sensitive habitat areas. As cited in the Project Biological Report, (Karen Theiss and Assoc. 1993) uncovered tidal areas adjacent to the existing transfer terminal were substantially more productive than those areas surveyed beneath the existing terminal dock. Impact to and loss of tidal and subtidal

# TABLE 3

## ALTERNATIVE IMPACTS AND MITIGATION MATRIX

for

LOUISIANA PACIFIC CORPORATION
SAMOA TERMINAL RECONSTRUCTION PROJECT

## RESOURCE: LAND USE

| ALTERNATIVE | IMPACT SIGNIFICANCE CRITERIA | IMPACTS AND CONCLUSIONS | MITIGATION |
|---|---|---|---|
| Project | Major change in land use. | No change in land use. | No mitigation necessary. |
| B:1 Concrete Dock | Major change in land use. | No change in land use. | No mitigation necessary. |
| B:2 Bulkhead & Fill of Entire Project Site | Major change in land use. | No change in land use. | No mitigation necessary. |
| No Project | Major change in land use. | No change in land use. | No mitigation necessary. |

## RESOURCE: SOILS & GEOLOGY

| ALTERNATIVE | IMPACT SIGNIFICANCE CRITERIA | IMPACTS AND CONCLUSIONS | MITIGATION |
|---|---|---|---|
| Project | The proposed design could be susceptible to damage from earthquake and liquefaction. | Bulkhead wall could be damaged from earth shaking or liquefaction of underlying soil.<br><br>Design based upon site soils report and findings and Basin Earthquake Zone Standards should reduce the risk of damage. | Plans and calculations will be reviewed and approved by the Humboldt County Building Dept.<br><br>Preliminary soils report and soils explorations will be conducted to aid proper design and materials. |
| | Placement of fill and installation of sheet pile wall may cause compaction and consolidation of underlying soils. | Possible minor change in submarine contours in the immediate project area (not a significant impact). | No mitigation proposed. |
| | New structure could be at risk from Tsunami run-up. | Tsunami run-up could damage the structure. | No mitigation proposed. |
| B:1 Concrete Dock | Driving of substantial number of piles could compact and consolidate underlying soils. | Underlying soils will be consolidated and compacted by driving of piles. This is not considered to be a significant impact. | No mitigation proposed. |
| | Structure could be damaged by earthquake and liquefaction. | Conclusion is the same as "Project". | Same as "Project". |
| | Structure could be at risk from Tsunami run-up. | Same as "Project". | Same as "Project". |

## RESOURCE: SOILS & GEOLOGY - Continued

| ALTERNATIVE | IMPACT SIGNIFICANCE CRITERIA | IMPACTS AND CONCLUSIONS | MITIGATION |
|---|---|---|---|
| B:2<br>1500 ft.<br>Bulkhead & Fill | The bulkhead wall could be susceptible to damage from an earthquake and liquefaction. | Bulkhead wall could sustain damage from earthquake, liquefaction of underlying soils. | Conformance with approved project plans by Humboldt County Building Dept. and incorporating findings of preliminary soils report and soils exploration in project design. |
| | Placement of fill and installation of sheet pile wall may cause compaction and consolidation of underlying soils. | Possible change in submarine contours in immediate project area (not a significant impact). | No mitigation proposed. |
| | Structure could be at risk from Tsunami run-up. | Tsunami run-up could damage structure. Not a significant impact. | No mitigation proposed. |
| No Project | No change from present condition. | No impact. | None. |

## RESOURCE: AIR QUALITY

| ALTERNATIVE | IMPACT SIGNIFICANCE CRITERIA | IMPACTS AND CONCLUSIONS | MITIGATION |
|---|---|---|---|
| Project | Fugitive dust and carbon monoxide may be generated by the construction process and associated vehicles. | Surrounding area may experience increased levels of particulates during the construction process and demolition. | Watering of areas and operations that may generate dust will be conducted. All equipment and machinery used during construction will be equipped with proper mufflers and pollution control devices. |
| B:1 Concrete Dock | Same as "Project". | Same as "Project". | Same as "Project". |
| B:2 1500 ft. Bulkhead & Fill | Same as "Project". | Same as "Project". | Same as "Project". |
| No Project | No change. | No impact. | None. |

## RESOURCE: WATER QUALITY

| ALTERNATIVE | IMPACT SIGNIFICANCE CRITERIA | IMPACTS AND CONCLUSIONS | MITIGATION |
|---|---|---|---|
| Project | Dredging, driving pile and filling bulkhead will cause a temporary increase in suspended solids. | Increased suspended solids will be generated during the construction. | Wastewater Discharge Plan, Monitoring and Sampling Program designed by the State Water Quality Control Board to control the amount of suspended solids from construction will be followed. |
| B:1 Concrete Dock | Driving of piling, dredging and excavation of tidal muds will cause temporary increased in suspended solids. | Excavation of tidal muds and disturbance from driving of piling can not be controlled or contained in regards to suspended solids. | Wastewater Discharge Permit will be obtained. Mitigation may be necessary for exceedence of discharge standards. |
| B:2 1500 ft. Bulkhead & Fill | Same as "Project". | Same as "Project". | Same as "Project". |
| No Project | Fuel spill could foul Humboldt Bay waters and sensitive habitats. | Fuel spill on work surface would enter Humboldt Bay. | Best management practices used to avoid industrial accidents. |

## RESOURCE: BIOLOGICAL RESOURCES

| ALTERNATIVE | IMPACT SIGNIFICANCE CRITERIA | IMPACTS AND CONCLUSIONS | MITIGATION |
|---|---|---|---|
| Project | South pier extension and gangway may shade eelgrass beds, causing thinning and possible loss of species within the shaded areas. | Possible loss of intertidal vegetation. | Creation of tidal habitat area, replanting, monitoring and continued scientific study will be conducted as per Mitigation / Monitoring Program. |
| | Loss of intertidal benthic organisms by filling of intertidal habitat area. | Although habitat abundance and diversity beneath the existing dock are low, this habitat will be permanently lost. | Creation of intertidal habitat and monitoring program will be incorporated to reduce impacts to less than significant. See Mitigation / Monitoring Program. |
| | Removal of piling and rocky intertidal habitats may result in temporary loss of species and habitat area. | Demolition of existing structure will result in temporary loss of pile and rocky habitat, species and abundance. | New structure will quickly recolonize. Rocky habitat will be created at project site and thruout the mitigation area. Sheet pile wall surface will provide habitat area. |
| | Possible loss of subtidal habitat and species abundance. | Dredging and filling will result in losses of subtidal benthic organisms and habitat area. Losses from dredging will be temporary. | Creation of more diverse, dissimilar habitat area. See Mitigation /Monitoring Program. |
| | There may be a temporary loss of fish species during construction, and permanent loss of a portion of shaded habitat by filling and removal of piling. | Dredging and other construction activities will cause a temporary reduction of species in the project area. Shaded habitat will be temporarily lost by removal of piling. | New structure will recolonize and support species that utilize shaded habitat (pier extensions). Permanent losses will be reduced to less than significant by project mitigation. See Mitigation / Monitoring Program. |

| ALTERNATIVE | IMPACT SIGNIFICANCE CRITERIA | IMPACTS AND CONCLUSIONS | MITIGATION |
|---|---|---|---|
| | South pier extension and gangway may shade eelgrass beds, causing thinning and possible loss of species within the shaded areas. | Same as "Project". | Same as "Project". |
| | Possible loss of intertidal benthic organisms by excavation, filling, driving of pile, and construction related activities. | The intertidal bench will be damaged by demolition, construction and related activities. Excavation of muds and fill by new structure will cause permanent loss of habitat and species. | Creation and intertidal habitat area. The extent of environmental loss or damage is not easily determinable. |
| B:1<br>Concrete Dock | Removal of existing facility will cause temporary loss of piling and rocky habitat and species. | Demolition of existing dock and excavation and fill necessitated by the new dock will cause temporary and permanent losses of habitat and species diversity and abundance. | Recolonization of new structure will off-set temporary losses.<br><br>Mitigation for permanent losses will be provided by habitat recreation. |
| | Loss of subtidal habitat due to the dredging and filling from piling. | Dredging will cause a temporary loss of subtidal benthic organisms. | Recreation of approved equal area of dissimilar habitat as mitigation. |
| | Temporary loss of fish species by demolition, construction and decreased water quality due to driving of piling, dredging, and excavations for substructure. | Dredging, excavaion, demolition and construction will create temporary losses of species by activities, vibration, uncontrollable water quality disruption and removal of shaded habitat. | Project area will recolonize following construction, no mitigation is proposed. |

## RESOURCE: BIOLOGICAL RESOURCES - Continued

| ALTERNATIVE | IMPACT SIGNIFICANCE CRITERIA | IMPACTS AND CONCLUSIONS | MITIGATION |
|---|---|---|---|
| B:2 1500 ft. Bulkhead & Fill | Loss of approximately 3.5 acres of eelgrass habitat area. | Significant loss of intertidal vegetation. | **Termination of the alternative** due to severe environmental loss. |
| No Project | Possible loss of species and damage of habitats from industrial accidents (petroleum spills). | Sensitive habitat areas of Humboldt Bay could be damaged from petroleum spills. | Spill Prevention Control and Countermeasure Plan. See Appendix 6. |

## RESOURCE: TRAFFIC & CIRCULATION

| ALTERNATIVE | IMPACT SIGNIFICANCE CRITERIA | IMPACTS AND CONCLUSIONS | MITIGATION |
|---|---|---|---|
| Project | Possible increased in highway and adjacent route traffic. | Highway traffic will increase temporarily during construction. Not a significant impact. | Increase determined to be insignificant. |
| B:1 Concrete Dock | Possible increased in highway and adjacent route traffic. | Highway and adjacent route will traffic will temporarily increase during construction. Not a significant impact. | Increase determined to be insignificant. |
| No Project | None. | None. | None. |

## RESOURCE: PUBLIC UTILITIES

| ALTERNATIVE | IMPACT SIGNIFICANCE CRITERIA | IMPACTS AND CONCLUSIONS | MITIGATION |
|---|---|---|---|
| Project <u>and</u> B:1 Concrete Dock | Alternative may result in significant demand for public utilities and services. | No significant impact. | None. |
| No Project | None. | None. | None. |

## RESOURCE: RECREATION & AESTHETICS

| ALTERNATIVE | IMPACT SIGNIFICANCE CRITERIA | IMPACTS AND CONCLUSIONS | MITIGATION |
|---|---|---|---|
| Project, <u>and</u> B:1 Concrete Dock | Recreation opportunities and areas may be reduced by project construction and expansion. | No significant impact. | None. |
| No Project | Dock deterioration may impact the view from Route 255 and Humboldt Bay. | No significant impact. | None. |

## RESOURCE: CULTURAL/ARCHAEOLOGICAL

| ALTERNATIVE | IMPACT SIGNIFICANCE CRITERIA | IMPACTS AND CONCLUSIONS | MITIGATION |
|---|---|---|---|
| Project, <u>and</u> B:1 Concrete Dock | Archaeological or historical sites may be disturbed or destroyed by construction activities. | Possible loss of artifacts or archaeological sites. | Project Archaeologist will be employed to oversee all construction activities, excavations and fills. |
| No Project | None. | None. | None. |

## RESOURCE: NOISE

| ALTERNATIVE | IMPACT SIGNIFICANCE CRITERIA | IMPACTS AND CONCLUSIONS | MITIGATION |
|---|---|---|---|
| Project | Increased noise levels due to construction activities. | Demolition of the existing structure and driving of pile will temporarily increase noise levels in the surrounding areas. | Operational hours during construction will be limited. No work on weekends or holidays. |
| B:1 Concrete Dock | Increased noise levels due to the driving of pile and demolition of the existing dock. | Temporary, noise increase during pile driving will last substantially longer than the project alternative. | Operational hours during construction will be limited. No work on weekends or holidays. |
| No Project | None. | None. | None. |

## RESOURCE: LIGHT & GLARE

| ALTERNATIVE | IMPACT SIGNIFICANCE CRITERIA | IMPACTS AND CONCLUSIONS | MITIGATION |
|---|---|---|---|
| Project, <u>and</u> B:1 Concrete Dock | Additional lighting may produce new light and glare along waterfront. | There will be a slight increase in amount of light necessary to continue safe night transfer operations. | Hooding or shielding lights and containing lighting to project site will not produce a significant amount of light and glare. |
| No Project | None. | None. | None. |

## RESOURCE: TIDAL HYDROLOGY

| ALTERNATIVE | IMPACT SIGNIFICANCE CRITERIA | IMPACTS AND CONCLUSIONS | MITIGATION |
|---|---|---|---|
| Project | Structure may effect tidal velocities and sedimentation rates of surrounding tidal area. | No significant impacts. | Monitoring of the surrounding area to record any effects or trends. |
| B:1 Concrete Dock | Structure may effect tidal velocities and sedimentation rates of surrounding tidal area. | No significant impacts. | Monitoring of the surrounding area to record any trend or effect. |
| No Project | None. | None. | None. |

## RESOURCE: SOCIOECONOMICS

| ALTERNATIVE | IMPACT SIGNIFICANCE CRITERIA | IMPACTS AND CONCLUSIONS | MITIGATION |
|---|---|---|---|
| Project | Project will employ an estimated 30 employees for a period of 9 - 12 months. | Temporary increase in housing demand. Not a significant impact. | None. |
| B:1 Concrete Dock | Project will employ an estimated 30 employees for a period of 12 - 18 months.<br><br>Cost of concrete dock would double the "Project Cost". | Temporary increase in housing. Not considered to be a significant impact.<br><br>Possible termination of the project. | None. |
| No Project | Lay-offs at mill or possible mill closure if current condition of terminal is not improved. | Loss of jobs and revenue to the local economy. | Public assistance. |

areas with greater benthic and vegetative habitat value than the existing project site was determined the most environmentally damaging of the on-site alternatives.

<u>Alternative B1: Concrete Dock</u>

This alternative proposes the replacement of the existing structure with a concrete pile supported dock and pier extensions, including dredging of the area between the west line of the Samoa Channel and the south pier extension. Configuration of the 1500 foot long facility would be the same as the proposed project. The concrete design is far stronger than the existing wooden facility achieving heavier loads while providing for more versatile work surface, however, concrete dock design will not accommodate the desired loads of a multi-use forest products transfer terminal. Construction would involve the removal of the existing wooden dock and piers and the excavation and filling of approximately 1.75 acres of intertidal mudflat to accommodate the shoreward substructure and decking. Pilings supporting the concrete dock and pier extensions would account for the filling of an additional 0.75 acres of intertidal and subtidal mudflats. Enlargement of the upland dredge disposal site would be necessitated, as suitable dredge materials would not be used in the design of the structure. Construction will be labor intensive, involving extensive design and resource utilization.

The existing intertidal and subtidal habitat that will be excavated or filled by the construction of the dock structure will be necessitated by the required thickness of the decking, beams, pilecaps, and driving of new piling needed to support the loads of export products that cross the dock facility. The actual amount of intertidal and subtidal habitats that will be impacted by construction activities cannot be quantified at this time, but it is expected that disturbance of the intertidal bench on which the existing structure rests could severely impact this low value habitat area by this removal of the existing dock, and wooden piles, pile driving operations associated with new construction, crane barge operations on the intertidal beach, excavations for poured in place concrete forms and their subsequent removal, uncontained construction debris, potential petroleum product spills into the bay, etc.

As proposed, the "project" has the potential for substantial increased habitat and species diversity, by offering the creation of 6.6 acres of historically filled uplands back to its pre-industrial intertidal habitat setting. The intertidal area beneath the existing dock is predominantly shaded (covered by wood planking) and of low benthic value and wildlife habitat value due to the lack of light and low clearance between the substructure and the muds (Karen Theiss, May 1994). Complete coverage of the intertidal area with a solid concrete dock, with support members and substructure extending lower than the existing structure, will further darken and lessen the habitat value of the existing low value of the underdock area.

Environmental effects of this alternative include the following:

Land Use

No change in land use or zoning designation.

Soils & Geology

Soils and geologic conditions that could effect the proposed alternative include potential liquefaction, differential compaction, or seismic settling and ground shaking, and potential of tsunami run-up.

All 110,000 cubic yards of dredge spoils will have to be placed in the dredge spoils disposal site, utilization of dredge spoils for fill as proposed for the bulkhead design will not be possible.

Mitigation:

> The design of the facility will be in conformance with the seismic standards for the Humboldt Bay Region, The Humboldt County Plan Geologic Hazards and Load Use Matrix and engineered design based upon findings generated in the project soils report and site soils investigations. Footings and foundation elements will be designed and constructed to account for potential liquefaction and ground shaking in accordance with the latest addition of the Uniform Building code for Seismic Zone 4.

Low lying coastal areas are subject to potential tsunami run-up. This is an infrequent unpredictable impact, and due to their infrequency and lack of damage from past events that have entered Humboldt Bay, however the potential impact is unavoidable.

Dikes of the primary and secondary dredge spoils disposal sites will have to be elevated by at least four (4) feet to accommodate the placement of the total amount, 110,000 cubic yards of dredge material.

Air Quality

Air quality impacts of Alternative B:1 include the generation of fugitive dust and carbon monoxide exhaust from construction vehicles and equipment. Fugitive dust will be generated by the demolition of the existing facility, consisting of saw dust and wood fiber from the removal of wooden decking and piles. The source will be temporary and is no expected to exceed emission standards for PM-10. The existing dock will be removed using standard equipment such as cranes, excavators and loaders to remove decking and extract piles.

Mitigation:

Fugitive dust will be controlled by the use of watering trucks in periods of dry weather and winds. Impacts from carbon monoxide exhaust can be minimized to a level of insignificance with the installation of appropriate mufflers and pollution control devices on construction vehicles and equipment, and by limiting the idling of unused vehicles and equipment.

Water Quality

Water quality impacts relating from Alternative B:1 will include temporary increases in suspended sediments and turbidity during removal of the existing structure, pile driving operations, dredging and dewatering of the dredge spoils site and excavations of intertidal muds to accommodate form work for construction of pilecaps and decking, temporary increase in surface water debris during demolition, reduced dissolved oxygen levels in the vicinity of the dredging activity. There is potential for petroleum product spills from construction equipment and vehicles into the open waters of Humboldt Bay.

The construction of the concrete pile supported dock and piers involves the driving of several thousand piles from a barge mounted crane operating from the Samoa Channel or the wide tidal bench on which the existing dock lies. The driving of piling and the associates movement of the barge over and on the tidal bench will cause displacement and disturbance of the mudflats and clouds of suspended sediments in and along the Samoa Channel project area. Although the impact from suspended sediments is of a temporary nature, it will be of greater magnitude than the proposed project due to the amount of uncontainable activity that will take place within the tidal area of the project. Excavation of muds from the shoreward portion of the tidal bench to accommodate the construction and eventual removal of forms for beams, pilecaps and decking will also cause disturbance and displacement of intertidal muds producing suspended sediments along the tidal bench and within the Samoa Channel. It would be difficult to control water quality at the project site and surrounding habitat areas.

Demolition of the existing structure, removal of decking, stringers, beams, piling, etc., may produce uncontained floating debris within the waters of the bay. floating debris could be contained by surrounding the existing dock with a barrier system. This type of containment device if fairly effective, but debris will escape the enclosure, necessitating the need for retrieval in open water and tidal areas.

Dredging will create temporary amounts of suspended solids and reduced dissolved oxygen levels in the immediate area of dredging activity. The effects will vary depending upon the composition of the material being dredged and the tidal current. Dewatering of the dredge spoils disposal area may cause minor increase in suspended solids in return water entering Humboldt Bay.

Mitigation:

Most floating debris can be contained by the employment of a barrier around the work area during demolition and construction. Periodic open water retrieval may also be necessary to prevent escaped floating debris from lettering the bay and causing hazards to boaters.

Temporary increases in suspended solids and decreased dissolved oxygen levels can be reduced by the use of a cutter suction dredge for sediment removal. Waste Discharge Requirements and monitoring of site dewatering and discharges will be formulated by the Regional Water Quality Control Board. Site monitoring and discharge water requirements will be established by the Regional Water Quality Control Board. Sampling and testing standards and results will also be utilized to modify construction activities to attain Waste Discharge Requirements.

Biological Resources

A. Habitats to be Filled

The demolition of the existing structure and the reconstruction of a concrete dock and pier extensions will result in the permanent filling of an estimated 1.75 acres of intertidal and 0.10 acres of subtidal habitat, a 20 foot wide band of rocky intertidal at the toe of the existing shoreline (0.20 acres) and approximately 100-200 square feet of degraded salt marsh dominated by Chilean cordgrass.

B. Habitats to be Shaded

The intertidal mudflat south of the wooden dock, at the site of proposed gangway construction and south pier extension is vegetated with a low to moderate cover of eelgrass. Construction of the pier extension and gangway will result in the shading of 14,775 square feet of eelgrass beds within the intertidal mudflat area. The combined non-vegetated intertidal and subtidal area to be shaded by the south pier extension is 16,975 square feet. The combined intertidal and subtidal area to be shaded by the north pier extension is 7,000 square feet.

C. Habitats to be Dredged

Six acres of deep subtidal habitat, immediately bayward of the bulkhead will be dredged in order to enlarge the berthing area to accommodate two vessels simultaneously. it is estimated that the dredging operation will generate 110,000 cubic yards of spoils material.

D. Impacts of Mitigation on Existing Conditions

Approximately 22,000 cubic yards of material will be excavated from the mitigation site to create a 1.75 acre intertidal habitat area. Debris removed during the excavation will be recycled, concrete will be utilized as structural fill in other areas of the L-P mill site or as needed for various projects within the Humboldt Bay area. Concrete may also be grounded and used as road base. Wood debris will be sorted and stockpiled at the L-P hog fuel yard and utilized for generation of power at the mill. Creosote-impregnated wood and scrap metal will be disposed of at an appropriate and approved waste disposal facility.

Removal of an estimated 7,200 square feet of salt marsh habitat along the existing shoreline due to mitigation site excavation will necessitate replacement of an equal area along the proposed mitigation shoreline. Approximately 0.4 acres of woody habitat would be removed by mitigation area excavation.

No impacts are anticipated to any of the sensitive species known or expected to utilize the mitigation site.

Mitigation:

Woody vegetation from the proposed mitigation area will be salvaged prior to excavation providing timing is appropriate. Cuttings or starts will be planted along the proposed mitigation shoreline to create a vegetative buffer for the habitat areas.

Intertidal mudflats of the "hump" will be excavated to provide habitat suitable for the replanting of the 14,775 square feet of eelgrass that will be shaded by the southern pier extension and for an equal amount of habitat area lost by the filling and excavation of the intertidal area below the dock.

The shoreline of the mitigation site will be protected with rock slope protection. The toe of the slope will originate at the +7.0 foot elevation and extend upward at a slope of 2 to 1 to the 12 to 14 foot elevation at the top of the slope.

<u>Traffic & Circulation</u>
Slight increase in traffic and parking requirements during construction.

<u>Public Utilities & Services</u>
No significant increases or changes to existing utilities or public services.

<u>Recreation & Aesthetics</u>
No significant impacts to recreation or aesthetics.

<u>Cultural/Archaeological Resources</u>
The concrete dock alternative will present the same needs for the protection of archaeological culture and historical resources. Employ of an on-site archaeologist for the observation of all excavation activities.

<u>Noise</u>
Significant increase in noise during construction due to extensive number of driven piling.

<u>Light & Glare</u>
The Concrete Dock alternative will demand the same lighting needs as the "project". Shielding or hooding of the project site lighting will reduce the impacts associated from increased light and glare to less than significant.

Tidal Hydrology

No measurable significant effect.

Socioeconomics

Temporary increase in housing demand during construction not expected to be significant.

**Alternative B2: Total Bulkhead and Fill**

This alternative involves the removal of the existing wooden facility and replacement with a 1500 foot long bulkheaded structure. Construction includes the demolition of the existing wooden dock, construction of the bulkhead wall and tie-back system, filling the eleven (11) acre bulkhead area, capping the fill with a suitable surface material, and dredging the area between the southern 450 feet of the structure and the west line of the Samoa Channel. Suitable dredge material will be utilized as fill behind the bulkhead wall. The bulkhead and fill of the existing dock area eliminates the need for future replacement of the facility, and reduces maintenance and repair associated with a wooden structure. Product storage capabilities on the work surface and transfer of goods and materials are virtually unlimited. Structurally, the bulkhead and tieback system is stronger and less subject to debilitating vessel damage. The concrete and earthen construction reduce the demand for fire suppression. The solid bulkhead work surface and containability of storm water run-off reduce the potential for environmental contamination from fuel or chemical spills.

Environmental effects of this alternative include the following:

Land Use

No land use-related impacts.

Soils & Geology

Consolidation of soils during construction and removal of subtidal sediments from dredging.

Air Quality

No air quality-related impacts.

Water Quality

Demolition,construction, dredging and dewatering of dredge spoils will cause increased suspended solids in Bay waters.

Biological Resources

Possible reduction of animal species during construction and in dredge spoils disposal area adjacent to project site; extensive loss of intertidal and subtidal benthic organism, vegetative and wildlife habitat areas due to extensive filling; loss of approximately two acres of eelgrass beds due to filling of unshaded intertidal mudflats; removal of upland vegetation and salt marsh north of the dock; permanent loss of pile related organisms; permanent loss of intertidal and subtidal habitat areas; temporary reduction of fish species during construction; permanent loss of shaded and subtidal habitat.

Traffic & Circulation

Slight increase in traffic and parking requirements during construction.

Public Utilities & Services

No significant increases or changes to existing utilities or public services.

Recreation & Aesthetics

Loss of tidal and subtidal open area by filling.

Cultural/Archaeological Resources

Possible disturbance of archaeological resources during construction.

Noise

Increase in noise during construction.

Light & Glare

No expected increases or changes in amount of light and glare.

Tidal Hydrology

No measurable significant effect.

Socioeconomics

Temporary increase in housing demand during construction not expected to be significant.

## C. No Project Alternative

The no project alternative consists of continued utilization of the existing wooden facility. Extensive repair and replacement of decking, beams and stringers would be required to fully utilize existing structure. Maintenance and repair would continue on an on-going basis. Subsequent patch work repair would further weaken the structure, limiting the efficiency and safety of the work environment and simply postponing the inevitable need for reconstruction. Eventual replacement of the substructure (piling, beams, joists) although less damaging than filling, will cause impact to the intertidal mudflat area beneath the existing dock. Wooden construction will not support the loading required for modern transfer operations and load capacities of transfer vehicles. Demand for fire protection and associated insurance expenditures will remain high. Possible contamination of the intertidal mudflat and surrounding areas in the event of a fuel spill or industrial accident remain a concern. Orchestrating repair and maintenance work while loading vessels and transferring cargo limits the efficiency of site operations.

The no-project alternative would quickly result in the closing of the facility, as its continuing deterioration will render it unsafe and unsuitable for continued transfer operations. Closure of the facility would leave Louisiana Pacific Corporation Samoa Mill without means of exporting pulp and forest products from their facility. The no-project alternative, although reviewed, was not considered a viable alternative.

Environmental effects of the No-Project Alternative include the following:

Land Use

No land use-related impacts.

Soils & Geology

No impact.

Air Quality

Eventual increase in carbon monoxide pollutants, as export materials produced at the Samoa Mill would require transport by truck to an alternate location (Alternate sites would require structural modification).

Water Quality

Potential for accidental fuel spills contaminating surrounding environmentally sensitive habitat areas of Humboldt Bay.

Biological Resources

No biological resource-related impacts.

Traffic & Circulation

Traffic on local highways and roads leading to and from the Samoa Mill site would increase due to eventual transfer of import and export materials to and from alternate sites.

Public Utilities & Services

No changes to existing public utilities or services.

Recreation & Aesthetics

Continued deterioration of structure will detract view from Route 255 and Humboldt Bay.

Cultural/Archaeological Resources

No archaeological resources would be disturbed.

Noise

No noise related impacts.

Light & Glare

No expected increases or changes in amount of light and glare.

Tidal Hydrology

No change.

Socioeconomics

If the terminal was unable to remain operable, export materials would require transport to alternate facilities for shipment abroad. The extra cost incurred by this task could jeopardize L-P's performance in the global market and result in the closure of the L-P Samoa Mill. The direct and indirect loss of jobs from closure of the Samoa Mill would devastate the fragile North Coast economy.

**Concrete Dock Design Considerations:**

Docks on Humboldt Bay have not kept up with the shipping industry on their ability to on and off load present day cargo. Shipping improvements such as deepening of the channel to 38 feet tend to draw larger ships to Humboldt Bay. Ships cranes and conveying equipment have greatly increased in size as well as the loads they handle. In most cases the dockside conveyance equipment weighs more than the loads conveyed. A facility built to present day loads will be obsolete in five years as cargo sizes and packaging in bulk continue to increase. Without a facility on Humboldt Bay able to accommodate the changing shipping industry Humboldt Bay will continue to be a port of the past.

Cargo vessels calling on Humboldt Bay have ships cranes capable of handling loads in the thirty ton range. Presently their cargo is conveyed to the ships hook in pieces (pallets of pulp) and then loaded as a unit. In order to be efficient the dockside equipment must be able to convey to the ships crane a unitized load equal to the cranes capacity. Design of any terminal should be made to accommodate equipment capable of delivering to the ships size loads equal to the ships loading capability. This efficiency is a must in present day shipping where ship's time is very expensive. There are also instances where special loads should be considered such as off or on loading heavy equipment or large assembled products.

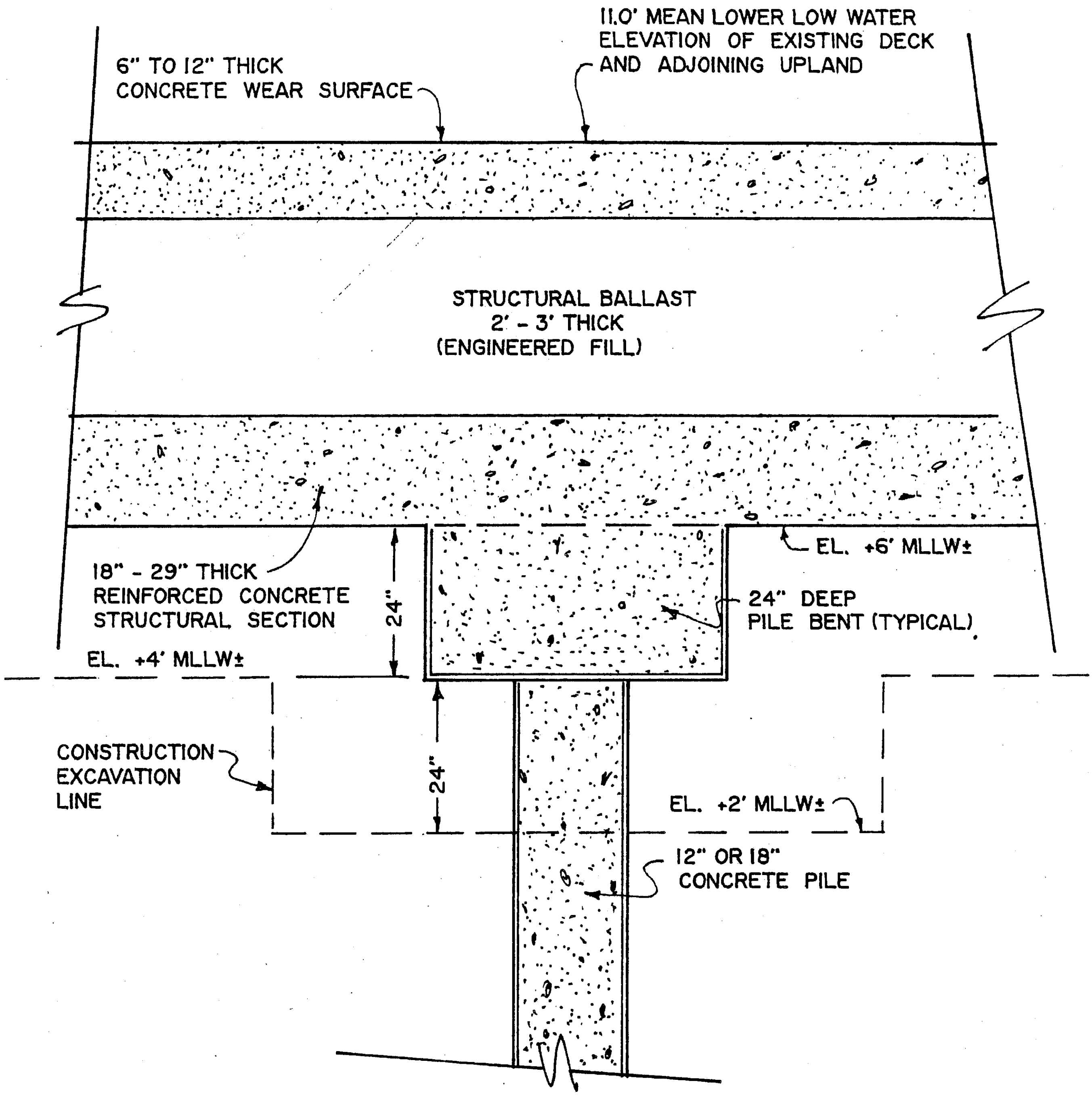
Design of the Samoa Terminal is proposed to accommodate a machine capable of transporting a thirty ton pay load (such as a La Tourneau or a Raygo L4-80 Loader). The front axle of one of these machines can achieve a load of 170,000 pounds on two seven foot diameter tires with a three foot by three foot contact area (for 80,000 pound pay load). The dock structure must be designed to carry these loads throughout since the machines are free moving (CH2M Report, Port of Sacramento, March 1989). Typical design of a concrete dock structure has the following components (Kurtis Ratcliffe, Chief Engineer, Port of Tacoma, Standard Details; Thomas Scheeler, Port of Sacramento); a wearing surface 6-12 inches thick consisting of asphalt or concrete. Structure ballast consisting of engineered fill 2-3 feet thick. Structural section of reinforced concrete 18-29 inches thick. The structural section is supported by pile bents usually 24 inches in depth. The pile bents or caps sit on top of the concrete piles. The total depth of the structure is from 6-8 feet (see Typical Section, Figure IV.2) with the thick section having greater load carrying and distributing capabilities. Wharves designed to lesser standards are common but if loads exceed design strength overstressing and failure can occur (failure of Wharves Six and Seven, Port of Sacramento, due to increased loads).

The top deck of the existing dock is at elevation 11.0 Mean Lower Low Water (MLLW). This is also the floor elevation of the existing buildings and landward portion of the site. This provides for a staging area (landward) and shipping area (dock) that is basically flat. Having all the area flat provides for the most efficient movement of cargo, using mobile movers. A transverse slope or ramp slope creates unstable loads for equipment moving heavy loads particularly if they are of any length. The upland portion of the site is already developed and it is not feasible to raise it without raising all the improvements. For these reasons the top of the new structure is dictated to that which currently exists, 11.0 MLLW.

The alternative of using a concrete supported dock has limited loading capabilities when compared to a bulkhead fill structure. From an environmental standpoint both have similar impacts to the intertidal area under the present dock. A concrete structure would have to be so massive to approach the intended loads that it would significantly encroach on the intertidal area. The construction of a concrete dock would involve a method of over-excavation to allow for falsework for the poured in place portion of the structure. Forming for the pile bents would entail excavation to elevation 2.0 $\pm$ Mean Lower Low Water (MLLW). (See Figure IV.3.) Since 90% of the site is above this elevation excavation would be necessary to construct virtually all the pile caps.

The construction process for a concrete dock would heavily impact the existing mud flats and a good portion of the structure will be in the intertidal range. Future maintenance of the structure would also continue to impact the intertidal area beneath the structure.

The selected alternative allows for both heavy and light loading. The requirement of capabilities for heavy loading is accomplished through the bulkhead structure constructed around the existing dock. The additional area for light loading is accomplished through the extension of the dock as a pile supported structure. The light load concrete dock will not have the depth section of a heavy load dock and consequently the environmental losses. The bulkhead will have impacts similar to a heavy duty dock but will allow for much larger loads and a terminal capable of meeting future shipping needs.

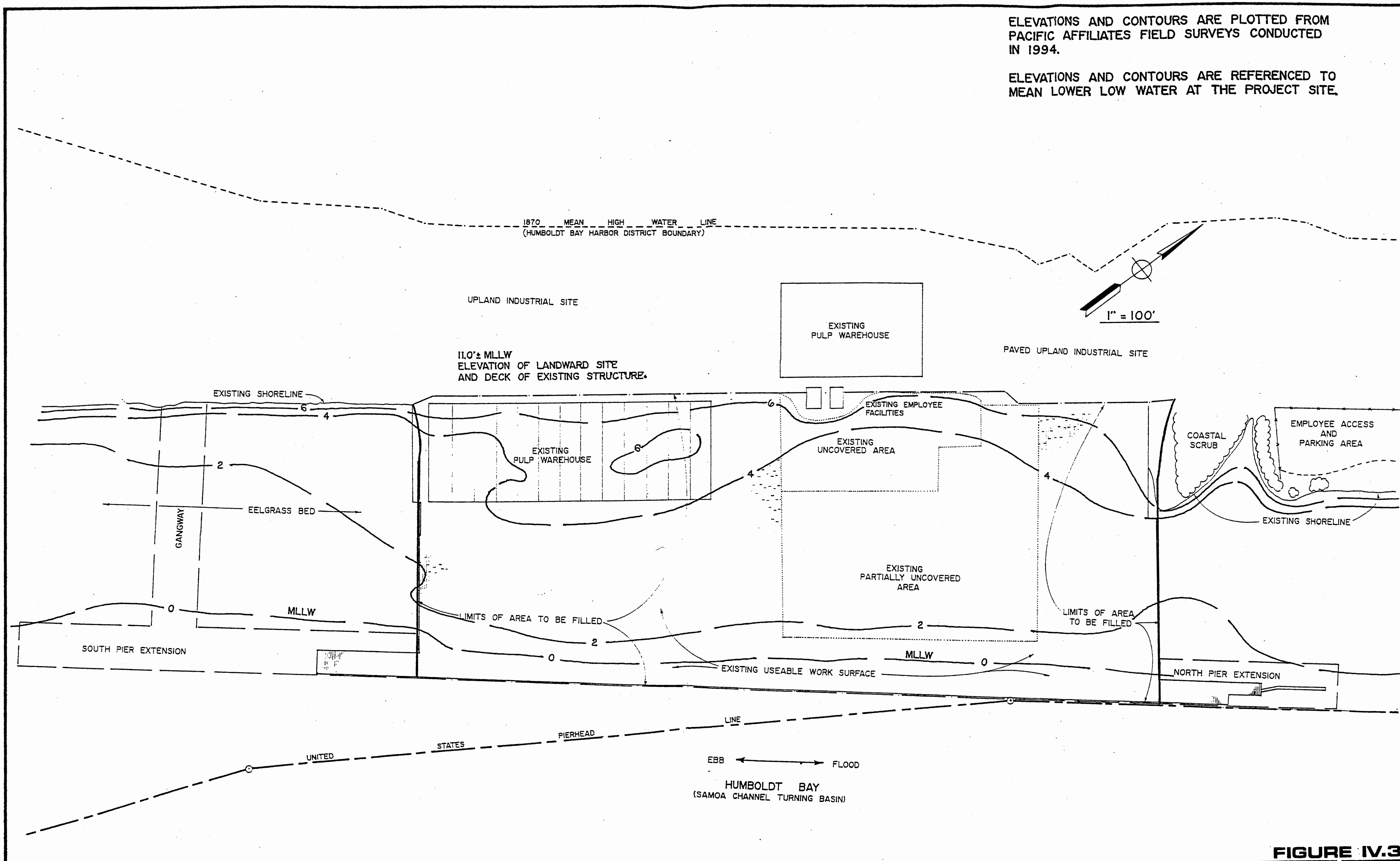



## STRUCTURAL SECTION
## CONCRETE DOCK

1/2" = 1'0"

**FIGURE IV.2**

| | | |
|---|---|---|
| L.P. SAMOA TERMINAL<br>TYPICAL DOCK SECTION | pa | PACIFIC AFFILIATES<br>A CONSULTING ENGINEERING GROUP<br>835 THIRD ST · EUREKA · CALIF · 95501 · (707) 445-3001 |


ELEVATIONS AND CONTOURS ARE PLOTTED FROM PACIFIC AFFILIATES FIELD SURVEYS CONDUCTED IN 1994.
ELEVATIONS AND CONTOURS ARE REFERENCED TO MEAN LOWER LOW WATER AT THE PROJECT SITE.
1870 MEAN HIGH WATER LINE
(HUMBOLDT BAY HARBOR DISTRICT BOUNDARY)
UPLAND INDUSTRIAL SITE
EXISTING PULP WAREHOUSE
1" = 100'
PAVED UPLAND INDUSTRIAL SITE
11.0'± MLLW
ELEVATION OF LANDWARD SITE
AND DECK OF EXISTING STRUCTURE.
EXISTING SHORELINE
EXISTING EMPLOYEE FACILITIES
EXISTING PULP WAREHOUSE
EXISTING UNCOVERED AREA
COASTAL SCRUB
EMPLOYEE ACCESS AND PARKING AREA
EELGRASS BED
GANGWAY
EXISTING SHORELINE
EXISTING PARTIALLY UNCOVERED AREA
MLLW
LIMITS OF AREA TO BE FILLED
LIMITS OF AREA TO BE FILLED
SOUTH PIER EXTENSION
MLLW
EXISTING USEABLE WORK SURFACE
NORTH PIER EXTENSION
UNITED STATES PIERHEAD LINE
EBB
FLOOD
HUMBOLDT BAY
(SAMOA CHANNEL TURNING BASIN)
FIGURE IV.3
EXISTING SITE CONTOURS
L.P. SAMOA TERMINAL
PACIFIC AFFILIATES
A CONSULTING ENGINEERING GROUP
835 THIRD ST · EUREKA · CALIF · 95501 · (707) 445-3001

## V. MITIGATION / MONITORING PROGRAM

| Resource: | Monitoring: |
|---|---|
| Land Use | No mitigation or monitoring necessary. |
| | Project Design parameters will be based upon project soils report findings and local seismic zone standards. |
| Soils & Geology | Project plans shall be approved by the Humboldt County Building Department. Construction inspection will be performed to ensure compliance with the approved project plans. |
| Air Quality | Visual inspection of site activities and anticipation of weather conditions. |
| | Adherence to equipment maintenance schedules and repair of malfunctioning equipment. |
| Water Quality | Daily sampling of sediments and monthly reports to the California Regional Water Quality Control Board. Compliance with Waste Discharge Requirements. Adjustment of construction activities to maintain compliance with Waste Discharge Requirements. |
| Biological Resources | Biological Mitigation & Monitoring Program. |
| Traffic & Circulation | No monitoring necessary. |

**MITIGATION / MONITORING PROGRAM** - Continued...

| **Resource**: | **Monitoring**: |
|---|---|
| Public Utilities | No monitoring necessary. |
| Recreation & Aesthetics | No monitoring necessary. |
| Cultural/Archaeological | On-site Archaeologist employed to observe construction and excavation activities and determine significance of any unearthed finds and their subsequent recovery. |
| Noise | Adherence to normal working hourse schedule. Regular maintenance of vehicles and equipment. |
| Light and Glare | Hooding and/or shielding of facility lighting. Containment of facility lighting to project site. |
| Tidal Hydrology | Annual hydrographic and land surveys of the project site. |
| Socioeconomics | No monitoring necessary. |

# Karen Theiss and Associates

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## MITIGATION AND MONITORING PLAN
## DOCK MODIFICATIONS
## LOUISIANA-PACIFIC CORPORATION
## SAMOA, CALIFORNIA

JUNE 1994


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# MITIGATION AND MONITORING PLAN FOR DOCK MODIFICATIONS
# LOUISIANA-PACIFIC CORPORATION, SAMOA, CALIFORNIA

JUNE 1994

## I PROJECT DESCRIPTION

Louisiana-Pacific Corporation has proposed to construct a multi-use marine terminal replacing the existing wooden cargo transfer dock at their Samoa, California Kraft Pulp Mill (Figure 1). The proposed project, located on the west side of Humboldt Bay at the north end of the Samoa Channel, involves the following elements, as shown on Figure 2:

- construction of a concrete sheet pile bulkhead wall and installation of backfill between the bulkhead wall and the existing shoreline;

- construction of new concrete surfaced, concrete piling supported pier extensions extending north and south of the bulkhead;

- construction of a concrete piling-supported gangway from the southern pier extension to the shore;

- placement of rock slope protection (RSP) from the bulkhead southerly to a point even with the south end of the south pier extension, and northerly to abut the RSP protecting the shoreline of the mitigation area;

- extension of the berthing area by dredging to a depth of -35 feet, Mean Lower Low Water (MLLW).

## II SUMMARY OF AREAS TO BE IMPACTED BY PROJECT

A. <u>Coastal Salt Marsh</u> - 100 to 200 square feet of degraded salt marsh will be filled as a result of placement of rock slope protection (RSP) and dock construction (see Figure 3).

B. <u>Rocky Intertidal</u> - Placement of RSP will fill 0.2 acres of rocky intertidal mudflat and shoreline. The lower half of RSP will be exposed to tidal action and will provide a hard substrate for encrustation by epibenthic organisms.

C. <u>Intertidal Mudflat</u> - A net area of 5.6 acres will be filled by dock, pier, and gangway construction. Most of the intertidal mudflat to be impacted is of low value and is located underneath the existing wooden dock. Dredging will result in the conversion

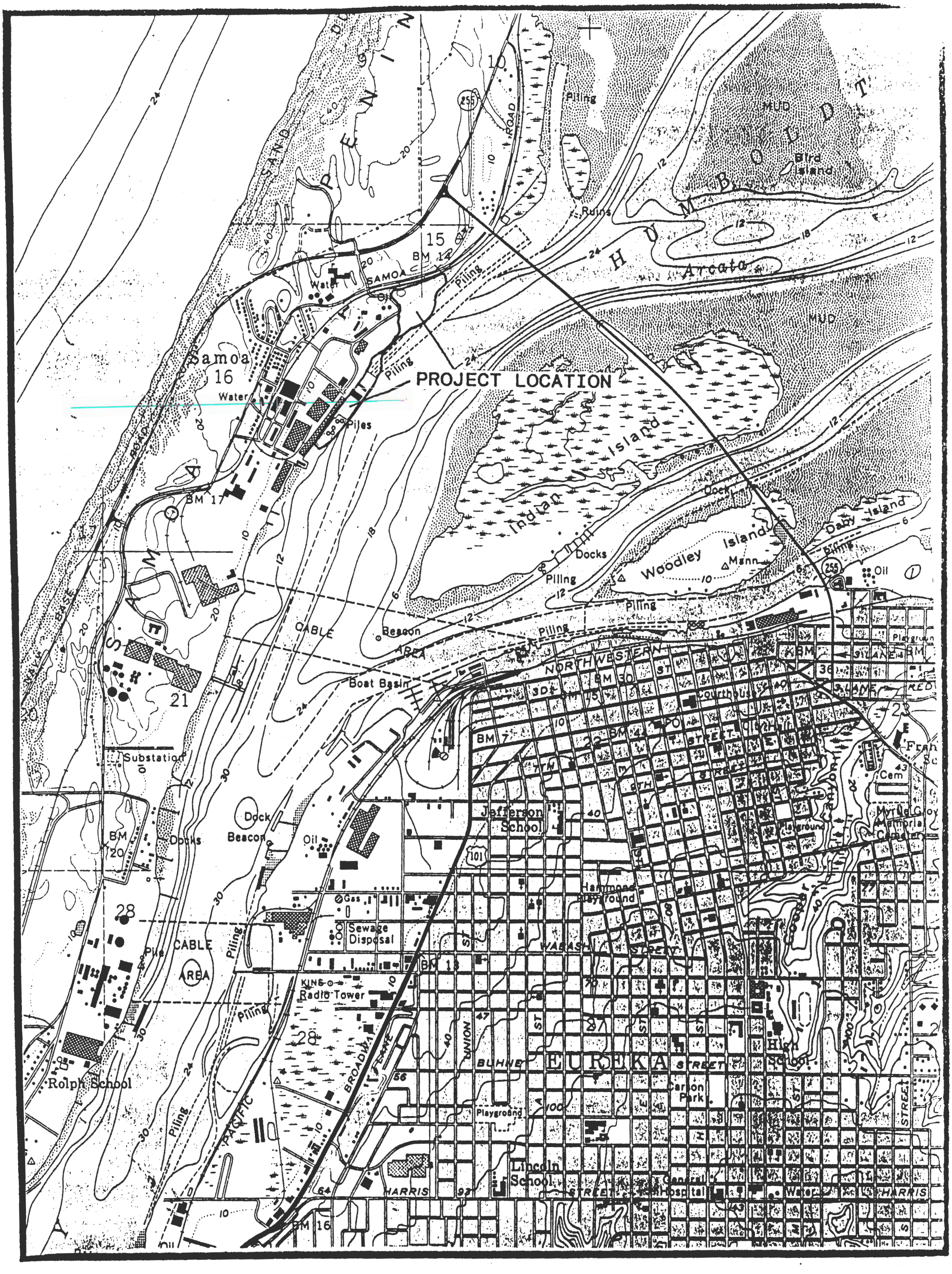



FIGURE 1
PROJECT LOCATION

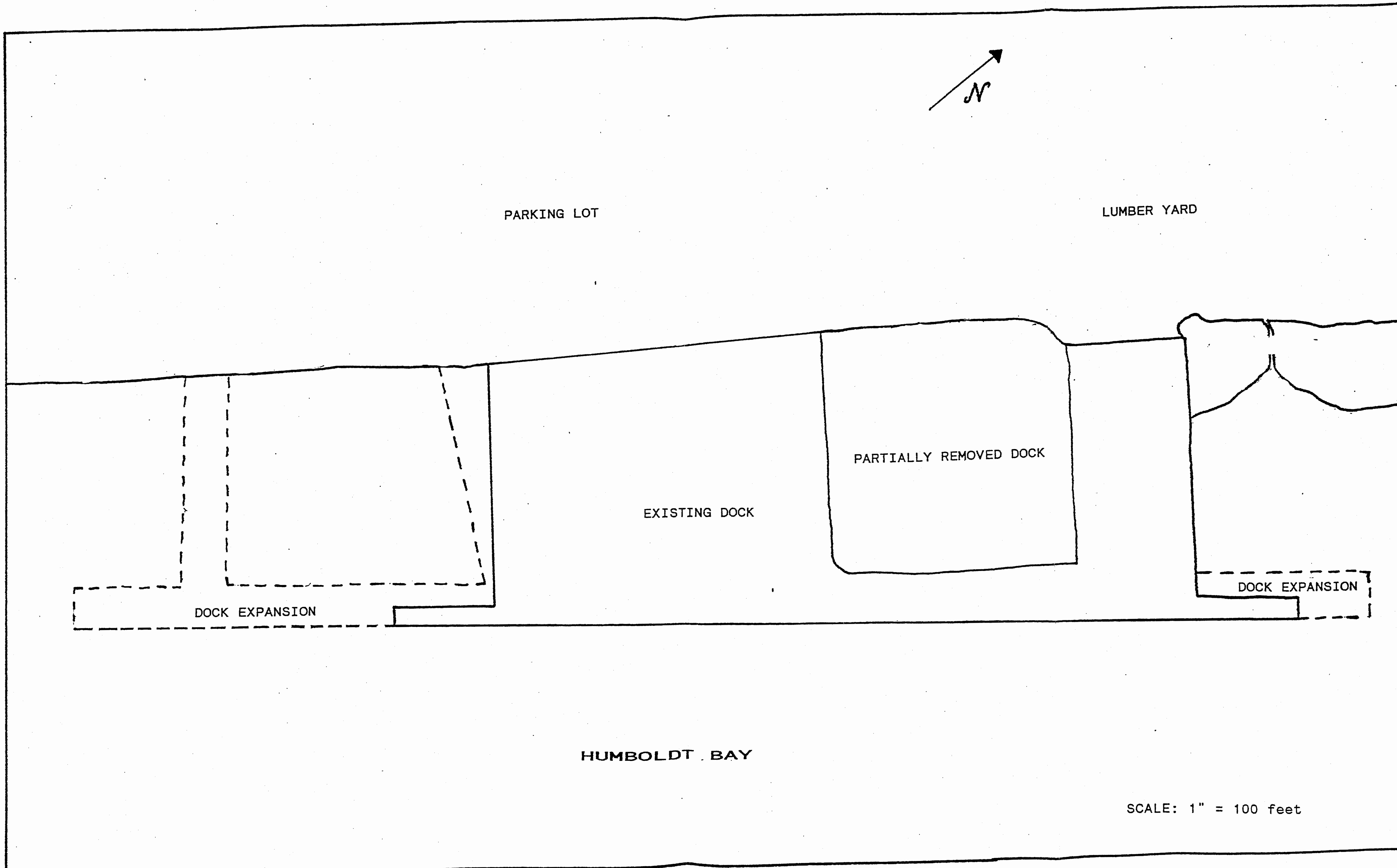



FIGURE 2
DOCK EXPANSION AREA

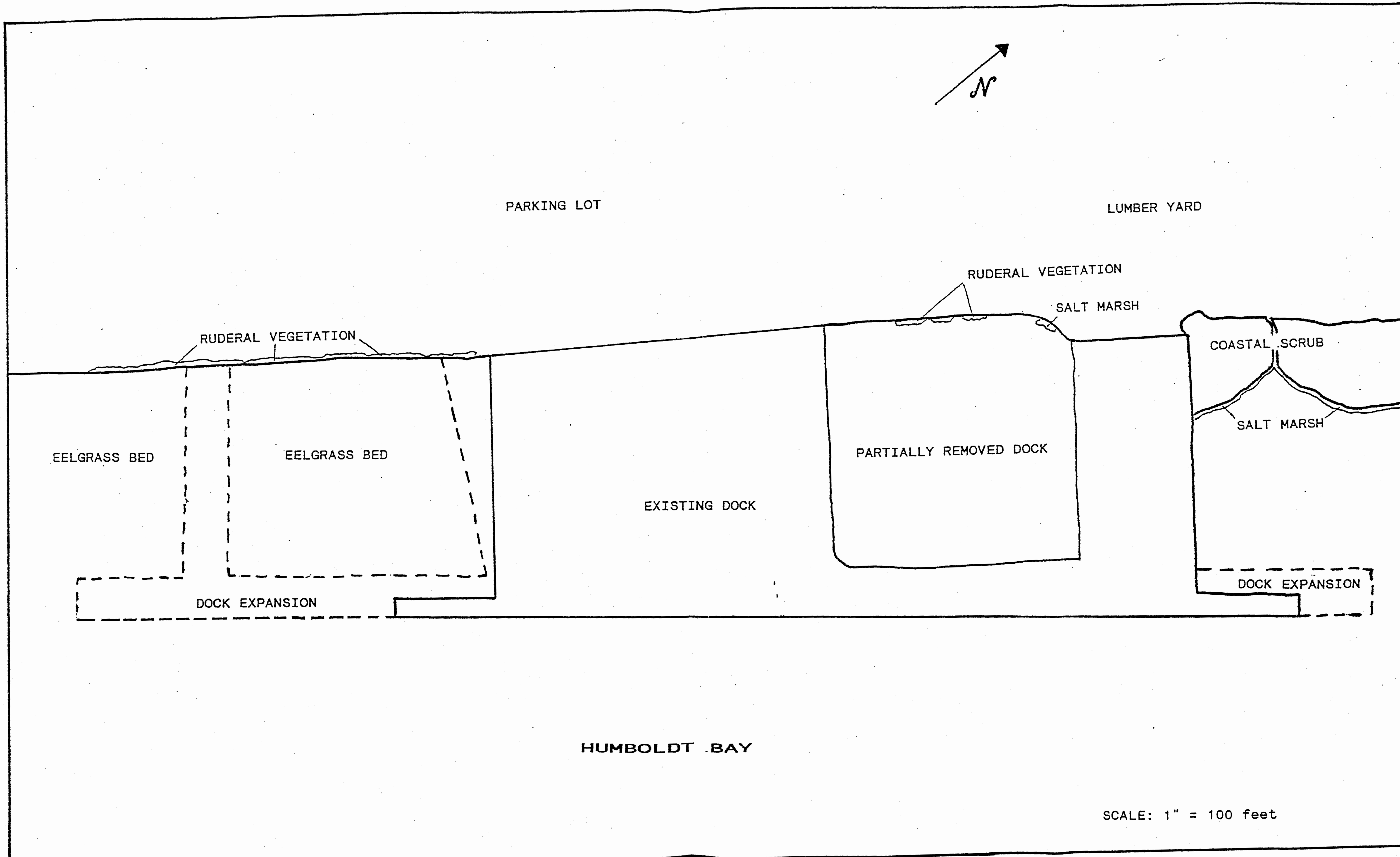



FIGURE 3
AREAS TO BE IMPACTED

of 0.38 acres of intertidal mudflat to shallow subtidal habitat. Thus, there will be a net loss of 5.98 acres of intertidal mudflat habitat.

D. Eelgrass Beds - 14,775 square feet of eelgrass will be shaded by the gangway and southerly pier extension.

E. Subtidal Habitat - Bulkhead construction will fill 0.6 acres of subtidal muds. About 1.1 acres of shallow subtidal habitat will be dredged to deep subtidal habitat, while 0.38 acres will be created by dredging intertidal mudflats; thus there will be a net loss of 0.72 acres of shallow subtidal habitat. There will be a net increase of 1.1 acres of deep subtidal habitat.

## III MITIGATION PLAN

### A. Goal and Objectives

The goal of the mitigation plan is to establish habitat of like value and acreage to those habitats impacted by the project. To this end, five objectives have been formulated:

1) excavation of historic fill in order to re-establish intertidal mudflat to compensate for the filling of intertidal and subtidal habitat for bulkhead construction;

2) establishment of eelgrass beds within the created intertidal area to mitigate for the potential loss of eelgrass beds due to shading from pier/gangway construction;

3) establishment of salt marsh habitat to compensate for removal of similar habitat at both the project and mitigation sites;

4) relocation of woody vegetation to the area of disturbed sands to compensate for removal from the mitigation area.

It is recognized by Louisiana-Pacific Corporation and its consultants that some aspects of the proposed mitigation plan are experimental at best, particularly the planting of eelgrass. While eelgrass planting has met varying degrees of success along the Pacific coast, past attempts in Humboldt Bay have not been successful. Because of this fact, staff of Karen Theiss and Associates has consulted extensively with both local and State agency personnel in the design of the mitigation plan in order to maximize the potential for success. Eelgrass planting will be undertaken from an experimental perspective, with a variety of techniques employed and subsequently monitored. In addition, it is proposed to monitor the eelgrass bed which will be shaded by the gangway/southerly pier extension in order to document the extent and rate of any decline to the population subsequent to construction.

B. Location

The area proposed for mitigation is an elongated piece of land, northeasterly of the construction location, which has been in industrial use for a number of years (Figure 4). Nearly the entire area to be restored as a result of the mitigation program is located bayward of the 1870 mean high water line, and thus has been subject to tidal action in historic times.

This site has been chosen for mitigation and restoration for the following reasons:

- the site is adjacent to the project area, thereby providing for "on-site" mitigation;

- the characteristics of the site and adjacent lands are such that in-kind mitigation is possible - good quality pickleweed salt marsh is present to the north, eelgrass beds are present both to the north and the south, woody vegetation grows on some upland areas;

- the site is protected from strong northwesterly and southwesterly winds and waves;

- the area is not subject, by virtue of its location, to strong tidal action.

## IV CHARACTERISTICS OF THE MITIGATION SITE

A. Substrate

The mitigation area has been filled over the years with varying amounts of industrial debris, leveled, and then covered with sand. A number of test pits were dug by Pacific Affiliates within the mitigation area and the area immediately adjacent (to the west) in late 1993. The logs of these pits revealed a mixture of sand, concrete rubble, rebar, metal pipes, cobbles, gravel, bark, wood waste, and miscellaneous scrap metal. One test pit, at the far northeasterly end, showed a thin layer of redwood bark (80%) mixed with fine soil in the top six inches, medium and fine sands to a depth of six feet, and a layer of silty clay (possibly the original bay muds) below a depth of six feet.

The areas closest to the shoreline, particularly the "hump" and the area south of it, have been filled with large pieces of

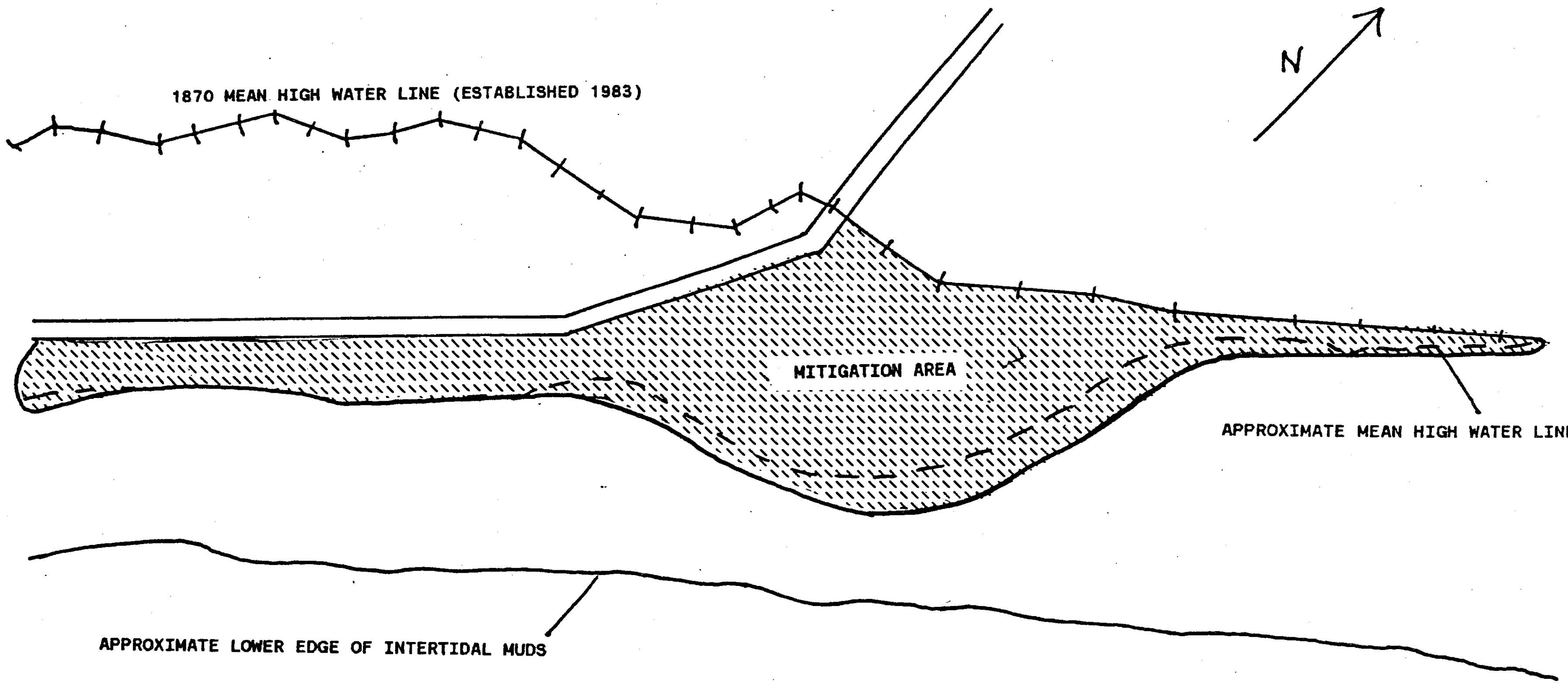



FIGURE 4
MITIGATION SITE LOCATION

SCALE: 1" = 200 feet

concrete rubble and other industrial waste. These areas have not been leveled nor covered.

B. Hydrology

Groundwater began seeping into the soils pits at various points between elevations 5.3 feet and 9.3 feet MLLW. The test pits were not open long enough for the water to stabilize or to estimate the depth to groundwater. A portion of the "hump" is used for intermittent disposal of wastewater (by sprinkling) from an adjoining yard. Some of the low-lying areas in the vicinity of the sprinkler are either saturated or support standing water, directly resulting from wastewater disposal.

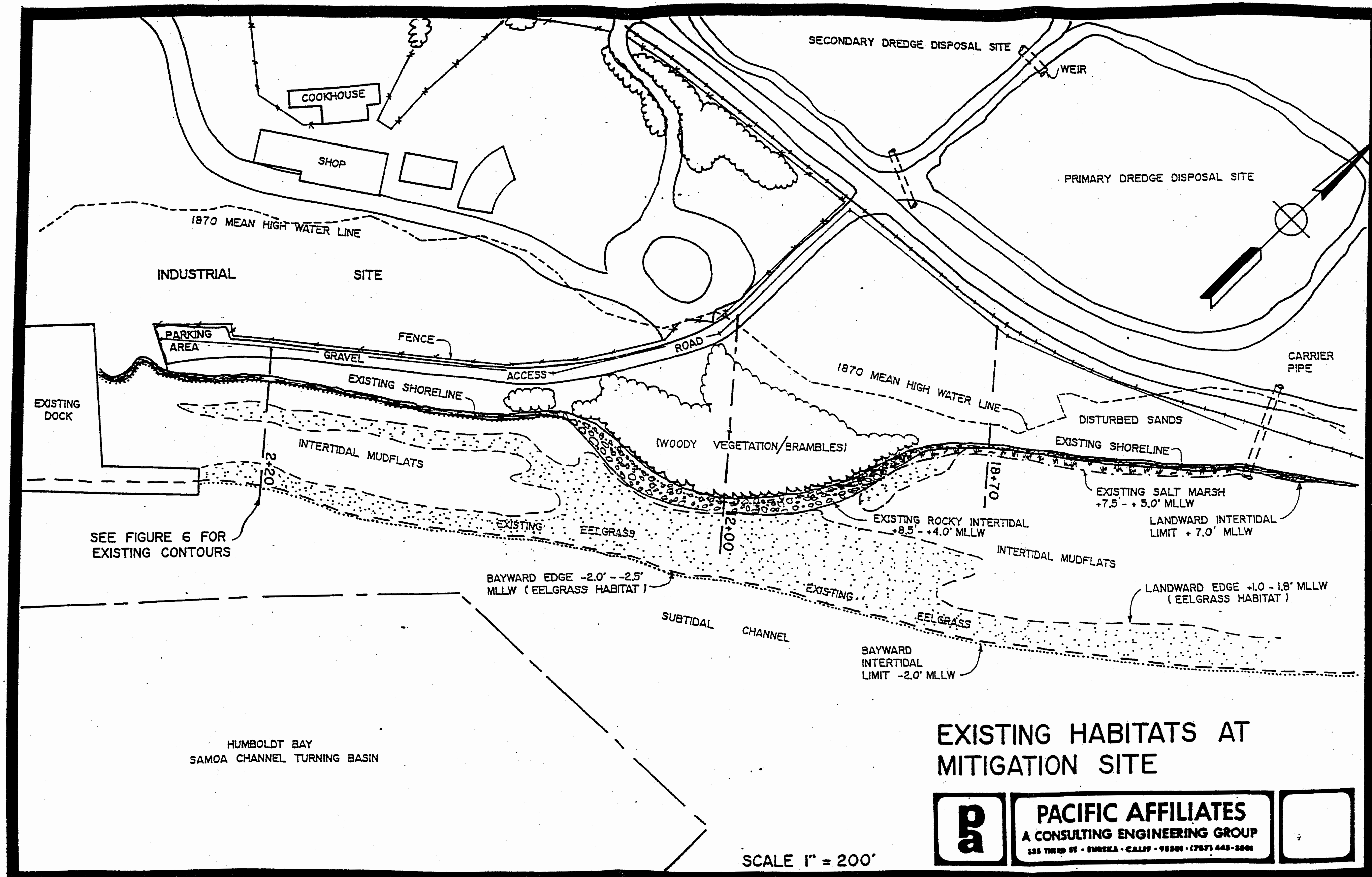
Bay waters are, of course, under tidal influence. The northerly portion of the mitigation site is bounded by a broad intertidal mudflat which is laced with narrow dendritic channels. This area extends about 400 feet from the shoreline before it descends into deeper water. Tidal waters flow transversely from the deeper portions of the bay into this area via these channels.

There is also a tidal bench in the southerly portion of the mitigation area, but it occurs offshore rather than descending directly from the shoreline. The shoreline in this southerly area is armored with rip-rap and old pilings. There is a shallow and somewhat narrow channel which runs longitudinally along the entire mitigation area; it is, however, deeper than the tidal bench elevations to both the south and the north of the hump. At the location of the hump itself, the channel is located directly bayward of the comparatively steep rocky intertidal zone. This zone has likely resulted from erosion of the old fill material.

C. Habitats

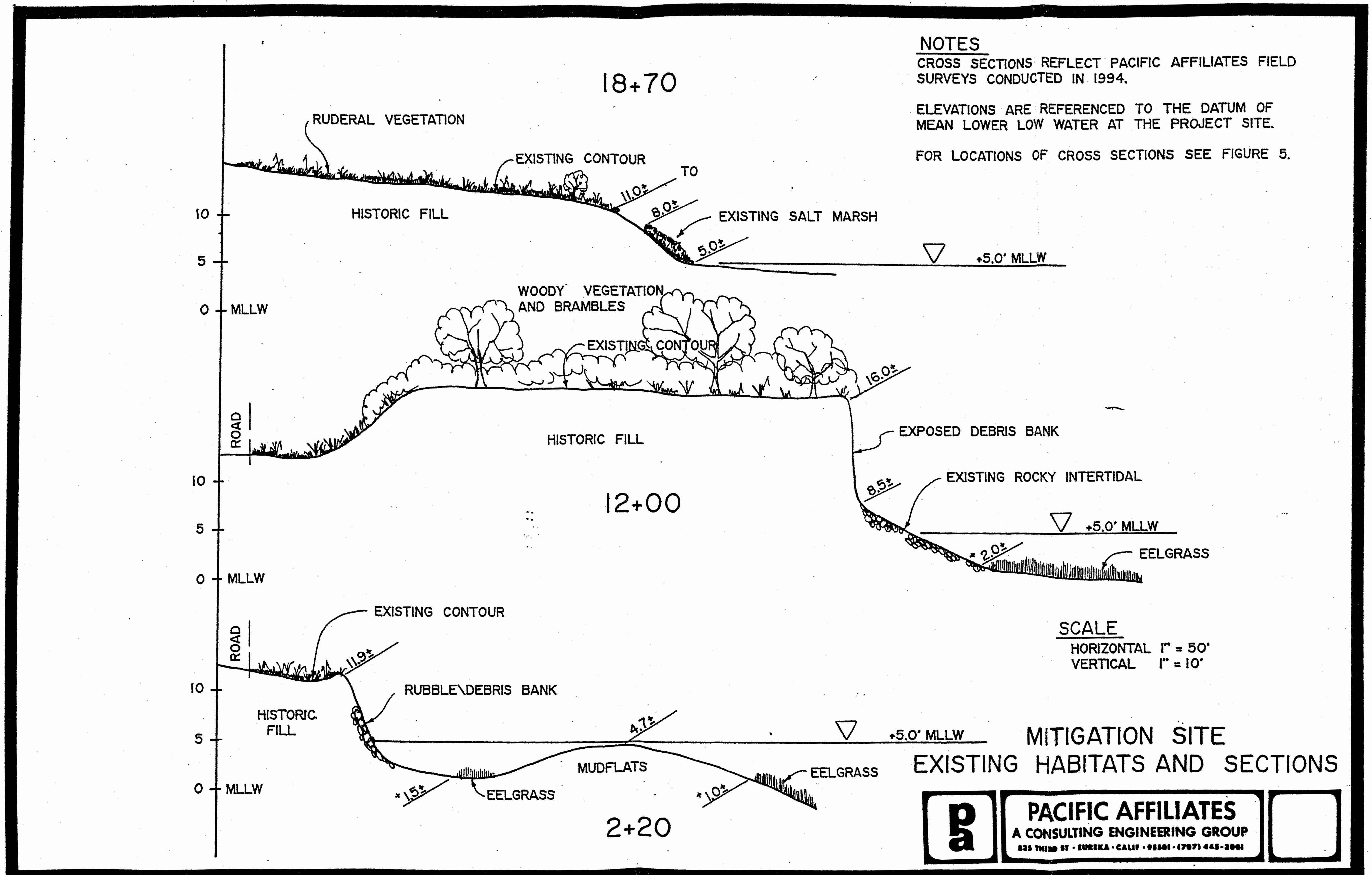
Those habitats to be directly impacted by implementation of the proposed mitigation include intertidal mudflat, rocky intertidal, coastal salt marsh, woody vegetation, disturbed sands, and exposed waste material. Figure 5 shows the habitats present in plan view, while Figure 6 shows the habitats present in cross-section.

1. Intertidal Mudflats - The intertidal mudflats, range in elevation from about 7.0 ft MLLW to -2.0 ft. MLLW. The broad intertidal bench north of the hump was observed on February 3, 1994 at about 10:00 AM (low tide of 1.8 ft at 10:11 AM) and again on March 14, 1994 at about 9:00 AM (low tide of 0.8 ft at 7:03 AM). This area is laced with dendritic channels, with a moderate (about 50%) sea lettuce coverage on the higher areas. The intertidal mudflat is much narrower at the hump and the southerly portion of the mitigation area, possibly due to dredging in the past and/or



SECONDARY DREDGE DISPOSAL SITE
WEIR
COOKHOUSE
SHOP
PRIMARY DREDGE DISPOSAL SITE
1870 MEAN HIGH WATER LINE
INDUSTRIAL SITE
PARKING AREA
FENCE
GRAVEL
ACCESS
ROAD
CARRIER PIPE
EXISTING DOCK
EXISTING SHORELINE
1870 MEAN HIGH WATER LINE
DISTURBED SANDS
(WOODY VEGETATION/BRAMBLES)
EXISTING SHORELINE
INTERTIDAL MUDFLATS
2+20
18+70
EXISTING SALT MARSH +7.5' - + 5.0' MLLW
LANDWARD INTERTIDAL LIMIT + 7.0' MLLW
EXISTING ROCKY INTERTIDAL +8.5' - +4.0' MLLW
SEE FIGURE 6 FOR EXISTING CONTOURS
EXISTING EELGRASS
12+00
INTERTIDAL MUDFLATS
BAYWARD EDGE -2.0' - -2.5' MLLW (EELGRASS HABITAT)
EXISTING
LANDWARD EDGE +1.0 - 1.8' MLLW (EELGRASS HABITAT)
SUBTIDAL CHANNEL
EELGRASS
BAYWARD INTERTIDAL LIMIT -2.0' MLLW
HUMBOLDT BAY
SAMOA CHANNEL TURNING BASIN
EXISTING HABITATS AT MITIGATION SITE
SCALE 1" = 200'
PACIFIC AFFILIATES
A CONSULTING ENGINEERING GROUP


FIGURE 5



NOTES
CROSS SECTIONS REFLECT PACIFIC AFFILIATES FIELD SURVEYS CONDUCTED IN 1994.
ELEVATIONS ARE REFERENCED TO THE DATUM OF MEAN LOWER LOW WATER AT THE PROJECT SITE.
FOR LOCATIONS OF CROSS SECTIONS SEE FIGURE 5.
18+70
RUDERAL VEGETATION
EXISTING CONTOUR
11.0±
TO
8.0±
EXISTING SALT MARSH
5.0±
+5.0' MLLW
HISTORIC FILL
10
5
0 MLLW
WOODY VEGETATION AND BRAMBLES
EXISTING CONTOUR
16.0±
ROAD
HISTORIC FILL
EXPOSED DEBRIS BANK
12+00
8.5±
EXISTING ROCKY INTERTIDAL
+5.0' MLLW
2.0±
EELGRASS
10
5
0 MLLW
EXISTING CONTOUR
ROAD
11.9±
SCALE
HORIZONTAL 1" = 50'
VERTICAL 1" = 10'
RUBBLE\DEBRIS BANK
HISTORIC FILL
4.7±
+5.0' MLLW
MUDFLATS
EELGRASS
1.5±
EELGRASS
1.0±
2+20
10
5
0 MLLW
MITIGATION SITE
EXISTING HABITATS AND SECTIONS
pa
PACIFIC AFFILIATES
A CONSULTING ENGINEERING GROUP


FIGURE 6

lack of sedimentation and/or erosional forces. A wide variety of avian species utilize the intertidal mudflats for feeding and some for resting. Birds characteristic of this habitat include waders, shorebirds, some waterfowl, gulls, and terns (Sterling, 1990). Several species were observed feeding in these mudflats during each visit during low tide, including Great Egret, Great Blue Heron, Marbled Godwit, and Short-billed Dowitcher.

Eelgrass was noted in many of the channels, which remain inundated longer than the "hummocks" and also at the outer (bayward) edge of the bench. Sparse eelgrass was also noted along upper (landward) edge of the bench; it spreads out toward the hump, coinciding with a decline in elevation of the tidal bench and the disappearance of the dendritic channels. A broad band of eelgrass lies offshore, as shown in Figure 5.

2. <u>Rocky Intertidal Zone</u> - This narrow zone ranges from 10 to 40 feet in width from the northerly portion of the mitigation area, to the southerly terminus of the hump. It is littered extensively with debris, including concrete, metal, old car parts, and wood debris. Concrete waste material has been placed as for shoreline protection to the south of the hump. While the rocky material and hard substrate has been partially colonized by barnacles and some marine algae, the extent of cover is very low. Although avian use of the rocky intertidal area is similar to that in the intertidal mudflats, no avian species were noted utilizing this area during any of the visits during low tide.

3. <u>Coastal Salt Marsh</u> - Immediately shoreward of the mudflats, in the northerly one-third of the mitigation area, is a strip of salt marsh vegetation ranging from 10 to 30 feet in width, lying between 7.5ft and 5.0ft MLLW. The botanical characteristics of this area were investigated by Anni Eicher of Botanica Northwest Associates, a local authority on salt marsh habitat; her report is included in its entirety in the Appendix. The salt marsh vegetation is underlain with a cobble/mud substrate (lying at the upper edge of the rocky intertidal), which precludes the development of prime salt marsh habitat. Vegetation provides a total cover estimated at 60%, with dense-flowered cord grass (*Spartina densiflora*), a non-native invasive species, comprising about 40% cover. About 15% cover is attributable to saltgrass (*Distichlis spicata*) and about 5% to perennial pickleweed (*Salicornia virginica*). Both of the latter are native species and were dormant at the time of field review.

Terrestrial wildlife use of salt marsh is relatively low in terms in numbers of individuals and numbers of species as compared with other habitats on the North Spit of Humboldt Bay (Theiss, 1992). Coastal salt marsh does, however, provide high habitat value for a wide variety of avian species which utilize it for foraging and resting. Terrestrial species commonly found in this habitat include California meadow mouse, house mouse, raccoon, and river otter. Avian species which forage and rest in this habitat include those associated with intertidal mudflats, specifically, waders, shorebirds, and gulls. Unidentified sparrows were observed foraging in the salt marsh vegetation.

4. <u>Woody Vegetation</u> - Woody vegetation characterized by wax myrtle (*Myrica californica*), coast willow (*Salix hookeriana*), arroyo willow (*Salix lasiolepis*), red alder (*Alnus rubra*), and coyote brush (*Baccharis pilularis*) is located in a narrow strip north of the "hump" and then broadens out on the hump itself. It is interspersed by very thick patches of Himalaya berry (*Rubus discolor*) on the hump and to the south of it. The total vegetated area of the "hump", as calculated from aerial photographs, is 2.5 acres. Woody species cover about 0.9 acres of the total. The substrate on the hump is largely characterized by waste material as previously discussed. The two willow species are concentrated in the lower-lying areas of the hump, and appear to be located directly in areas directly influenced by the wastewater sprinkling discussed above. In our opinion, this area does not meet the wetland criteria of either State or Federal agencies due to the absence of all required conditions, and the artificial introduction of water.

Theiss and Associates (1992) found that woody vegetation associated with riparian forests and woody hollows in the Humboldt beach and dunes area had a relatively high habitat. The stand of woody species at this site, while possessing value due to the age of the stand and the extent of cover, probably has less value than other areas due to its location near to industrial activity, the lack of readily available fresh water, and its proximity to habitats with very little cover or forage value.

5. <u>Disturbed Sands</u> - Much of the remainder of the area supports a mix of native and exotic herbaceous and shrubby species typical of disturbed upland areas in coastal dune habitat. Dominant species in the central area include bush lupine (*Lupinus arboreus*), pampas grass (*Cortaderia selloana*), dock (*Rumex crispus*), parentucellia (*Parentucellia viscosa*), velvet grass (*Holcus lanatus*), cat's ear (*Hypochaeris radicata*), yarrow (*Achillea millefolium*), red top (*Agrostis stolonifera*), and cudweed (*Gnaphaleum purpureum*). The vegetation in the northeasterly portion of the mitigation site (near soil test site #7) also supports young individuals of shore pine (*Pinus radicata*), wax myrtle, red alder, and coyote bush (*Baccharis pilularis*). The overall habitat value is fairly low due to the lack of cover. Terrestrial species which would be expected in this habitat include black-tailed jackrabbit, brush rabbit, California meadow mouse, deer mouse, vagrant shrew, western harvest mouse, and western

terrestrial garter snake. Avian species would consist primarily of a variety of sparrows, with some foraging by raptors. There is a small freshwater wetland within the larger disturbed dune area which will not be impacted by the mitigation activities, but whose vegetative structure and subsequent habitat value will be enhanced by planting of woody species.

6. Exposed Waste Material - Areas of exposed concrete rubble and metal debris support very little vegetation and have low habitat value. Raccoon, river otter, skunks, and rats might use this area on an intermittent basis; avian use is likely limited to transitory species.

D. Sensitive Species

A detailed discussion of sensitive species recognized by both State and Federal agencies is presented in the Biological Resources Investigation prepared by Theiss and Associates for this project (Theiss, 1994). Following is a summary of information presented:

- no protected fish species are expected to utilize the area due to lack of suitable habitat;

- protected avian species which potentially could utilize the mitigation site include the American peregrine falcon (*Falco peregrinus anatum*) foraging on shorebirds and waterfowl, the Northern harrier (*Circus cyaneus*) foraging in the disturbed sands, and the Long-billed curlew (*Numenius americanus*) foraging in the intertidal and coastal salt marsh habitats;

- no protected mammalian species are expected to utilize the mitigation area due to lack of suitable habitat;

- no protected plant species were observed during field observation nor are any expected due to the lack of preferred suitable habitat; the salt marsh was examined for protected species on May 17, 1994, and none were found.

E. Impacts of Mitigation on Existing Conditions

1. Substrate - Approximately 73,000 cubic yards of material will be excavated from the mitigation site. Sands recovered during the excavation can be used as part of the structural fill for the dock. Recovered concrete will be recycled either on Louisiana-Pacific property or within the Humboldt Bay area (e.g., under some circumstances, crushed concrete can be used as road base material). Woody debris will be burned by Louisiana-Pacific for the generation of power at the mill. Creosote-impregnated woody debris and scrap

metal will be disposed of at an appropriate and approved waste disposal facility.

2. Hydrology - Preliminary consultation and field investigation with Randy Klein, a local hydrologist, indicates that the local hydrologic regime should not be altered substantially by implementation of the mitigation program, provided the elevations and grades of the finished areas approximate the existing ones on adjacent areas. At the present time, there is an apparent shallow, longitudinal channel between the raised tidal bench and the in-shore intertidal muds and rocky intertidal. It is expected that such a channel will realign itself following construction. The major portion of flow, however, appears to be transverse, from shoreline to deep water.

3. Habitats to be Replaced - Implementation of the mitigation plan will result in the removal of about 12,000 square feet (0.275 acres) of salt marsh and 0.9 acres of woody vegetation, and conversion of 0.37 acres of low quality rocky intertidal habitat to intertidal mudflats.

4. Sensitive Species - No impacts are anticipated to any of the sensitive species known or expected to utilize the mitigation site.

## V MITIGATION DETAILS

### A. Salvage of Woody Vegetation

Woody vegetation will be salvaged from the hump as much as possible prior to excavation, providing the timing is appropriate. Two-foot cuttings may be taken from the willow (during the dormant season) and either planted directly into the replanting area or potted for future planting. Likewise, smaller individuals of other woody species may be either transplanted directly or potted for later planting. A more thorough discussion of techniques for planting of woody vegetation is below.

### B. Creation of Intertidal Mudflat

The mitigation area will be excavated to the elevation of the adjacent intertidal mudflats, and will slope from about 7.0 ft MLLW to -2.0 ft MLLW (see Figures 7 and 8). Prior to excavation, it is recommended that several trenches be excavated, particularly in the rocky intertidal zone of the hump, in order to determine the depth to native intertidal mud substrate.

The new intertidal mudflat in the northerly area will be of higher elevation, so as to interface with the existing tidal bench;

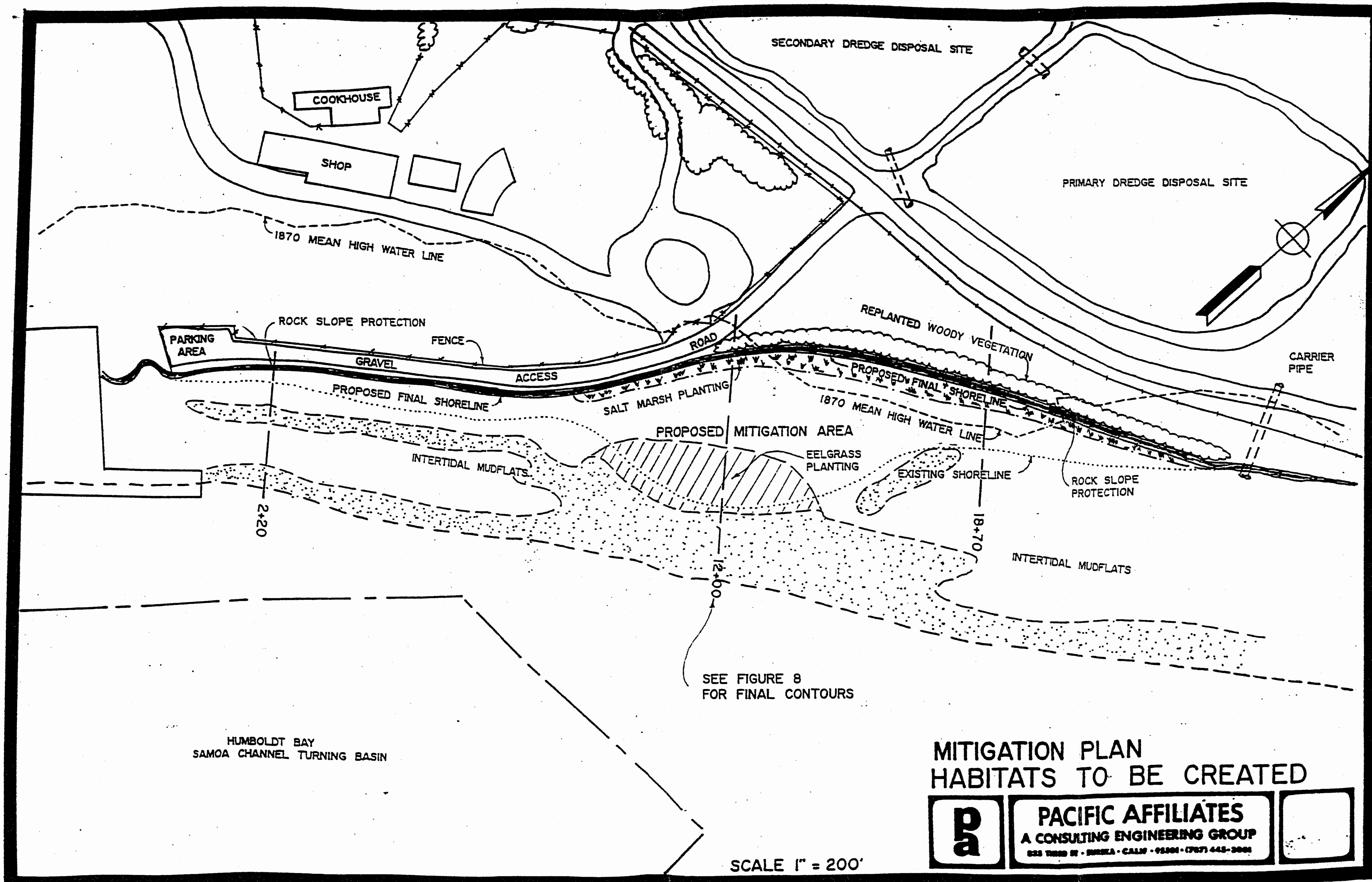
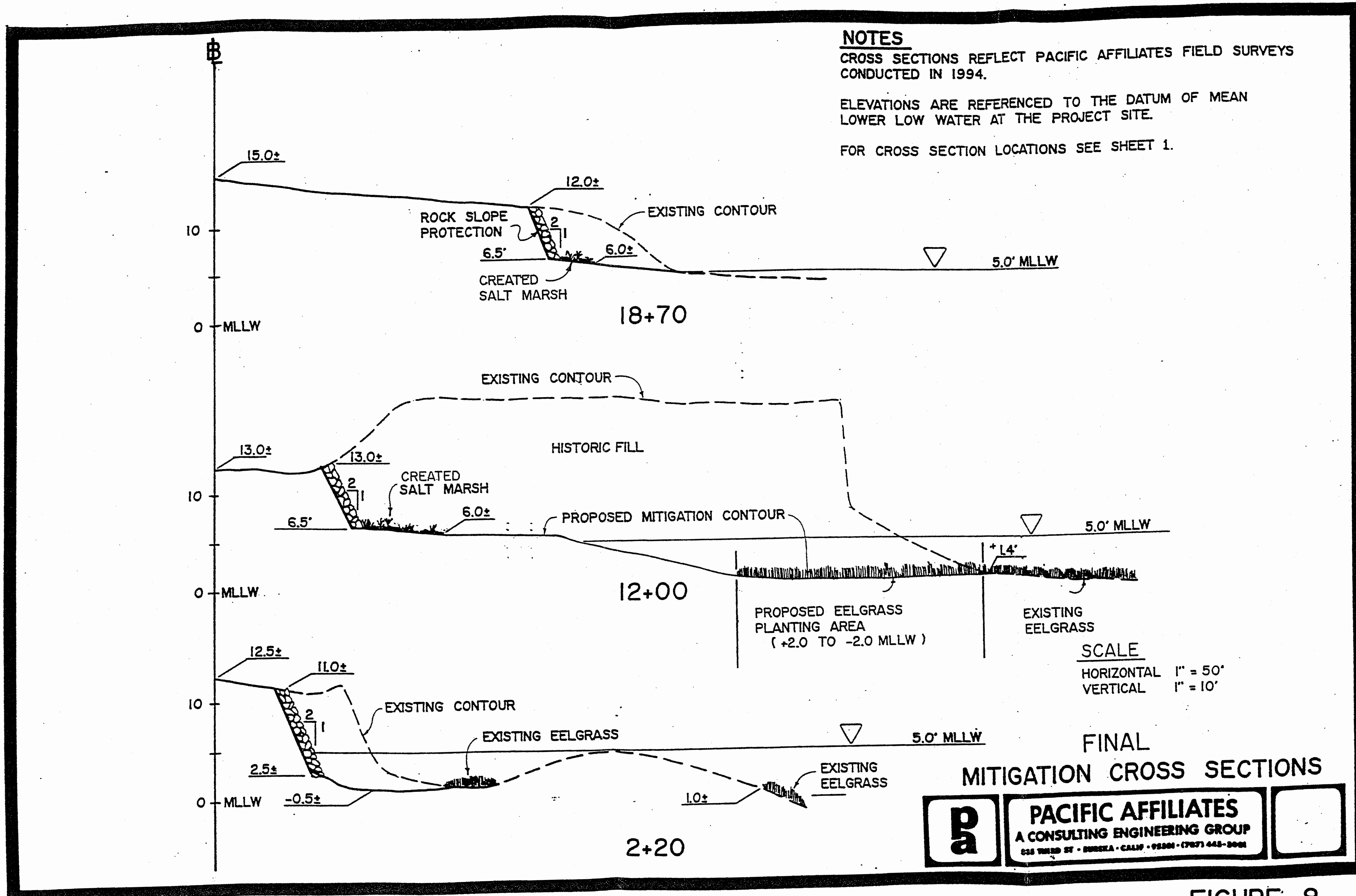

SECONDARY DREDGE DISPOSAL SITE
PRIMARY DREDGE DISPOSAL SITE
COOKHOUSE
SHOP
1870 MEAN HIGH WATER LINE
ROCK SLOPE PROTECTION
PARKING AREA
FENCE
GRAVEL
ACCESS
ROAD
REPLANTED WOODY VEGETATION
CARRIER PIPE
PROPOSED FINAL SHORELINE
SALT MARSH PLANTING
PROPOSED FINAL SHORELINE
1870 MEAN HIGH WATER LINE
PROPOSED MITIGATION AREA
EELGRASS PLANTING
EXISTING SHORELINE
ROCK SLOPE PROTECTION
INTERTIDAL MUDFLATS
2+20
12+00
18+70
INTERTIDAL MUDFLATS
SEE FIGURE 8
FOR FINAL CONTOURS
HUMBOLDT BAY
SAMOA CHANNEL TURNING BASIN
SCALE 1" = 200'
MITIGATION PLAN
HABITATS TO BE CREATED
pa
PACIFIC AFFILIATES
A CONSULTING ENGINEERING GROUP

FIGURE 7


NOTES
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ELEVATIONS ARE REFERENCED TO THE DATUM OF MEAN LOWER LOW WATER AT THE PROJECT SITE.
FOR CROSS SECTION LOCATIONS SEE SHEET 1.
15.0±
12.0±
ROCK SLOPE PROTECTION
EXISTING CONTOUR
10
6.5'
6.0±
5.0' MLLW
CREATED SALT MARSH
18+70
0 MLLW
EXISTING CONTOUR
HISTORIC FILL
13.0±
13.0±
CREATED SALT MARSH
10
6.5'
6.0±
PROPOSED MITIGATION CONTOUR
5.0' MLLW
1.4'
0 MLLW
12+00
PROPOSED EELGRASS PLANTING AREA ( +2.0 TO -2.0 MLLW )
EXISTING EELGRASS
SCALE
HORIZONTAL 1" = 50'
VERTICAL 1" = 10'
12.5±
11.0±
10
EXISTING CONTOUR
EXISTING EELGRASS
5.0' MLLW
2.5±
EXISTING EELGRASS
0 MLLW
-0.5±
1.0±
2+20
FINAL
MITIGATION CROSS SECTIONS
PACIFIC AFFILIATES
A CONSULTING ENGINEERING GROUP

FIGURE 8

the mudflats off the hump and the southerly part will probably have more of a slope in order to align with existing conditions and to provide suitable habitat for eelgrass planting. The existing shoreline will remain as a dike during the major portion of the excavation in order to minimize the dispersal of silt and other fines into bay waters. All materials excavated from the mitigation area will be removed and disposed of as previously discussed.

C. Installation of Rock Slope Protection (RSP)

RSP will be placed against the entire western shoreline, approximately 2165 lineal feet in order to protect it from erosional forces of tidal action. The elevation of the top of the slope will generally follow the 12 foot contour and drop to the intertidal zone at a slope of 2 to 1. The toe of the RSP will be between 6.7 and 7.0 ft. MLLW. The RSP will cover 25,000 square feet of substrate, and will provide a about 0.1 acres of rocky intertidal habitat along the lower portion for its entire length.

D. Removal of Old Shoreline

The material forming the old shoreline, which will have acted as a dike during excavation, will be removed after all of the above activities have been completed. Removal of this material will occur during low tide in order to facilitate excavation and to minimize impacts on the turbidity of bay waters by fines loosened during the excavation process.

E. Stabilization

The newly excavated intertidal area and the protected shoreline will be exposed to at least several months of tidal flow in order to stabilize. This period will allow for resalinization and oxygenation of the substrate and possible colonization by benthic micro-organisms and invertebrates. This period would also allow for localized "adjustment" in substrate topography due to tidal action, currents, and waves. Specific areas for eelgrass and salt marsh planting will be chosen after the stabilization period in order to assess more "natural" conditions and chose areas which have stabilized to elevations suitable for these two habitat types. Notes will also be made as to any apparent accretion, erosion, or subsidence of the substrate and to any natural recruitment by marine algae, salt marsh species, or eelgrass.

F. Planting of Eelgrass

Efforts at transplanting eelgrass on the Pacific Coast have been successful in the Pacific Northwest and in southern California, but to date have been unsuccessful in Humboldt Bay. Previous efforts in Humboldt Bay were at a variety of sites on the east side of the Bay and on Indian Island. These sites were chosen based on proximity to existing eelgrass beds and on apparent site conditions. While the transplanting efforts initially appeared successful, they eventually failed due to a combination of wave action and currents (Newton, 1988; Warner, pers. comm.; Tasto, pers. comm.).

Eelgrass growth is highly dependent upon environmental conditions. The following conditions, taken from Phillips (1984), are recommended to ensure a high potential for success of eelgrass transplantation:

1) temperature range of 10-20°C;

2) salinity range of 10-30 ppt (parts per thousand);

3) moderate current velocity, not exceeding 0.6-0.8 knots;

4) protection from direct and/or regular wave shock;

5) consolidated mud/sand substrate;

6) sufficient light penetration during winter months;

7) protection from desiccation.

The site chosen for eelgrass mitigation for the present project was selected based on the fact that there is eelgrass growing to the north, east, and south of the site. It can be deduced, therefore, that conditions 1) through 4) exist in the general and immediate vicinity. The conditions which need to be created by excavation, therefore, must be those which provide appropriate substrate as well as allow for sufficient light penetration and protection from desiccation during low tide.

Preliminary soil borings in the mitigation area indicate the presence of native material underlying the wood and concrete debris fill. Subsequent trenches recommended for excavation in the rocky intertidal of the hump should also reveal the depth to native materials. Should native material not be encountered uniformly at the lower limits of excavation, it is recommended to pump a sufficient quantity of dredge spoils (of appropriate grain size) into the excavated area in order to provide a suitable consolidated mud/sand substrate for eelgrass growth. Based on the elevation of the eelgrass meadows in the immediate vicinity of the project and mitigation sites, the recommended elevation range for planting is 1.0 to -2.0 ft MLLW. The elevations for excavation should range from 2.0 to -2.0 ft MLLW to allow for accretion and erosion during the stabilization period.

Recognizing that past local efforts have not met with success, all planting will be undertaken from an experimental perspective. It is proposed to salvage eelgrass turions from approved areas of dense eelgrass growth in the North Bay. These sites will be chosen with direct consultation from the biologists at the Eureka office of the Department of Fish and Game. Planting protocol will employ several sediment-free methods as well as the plug method, all of which are described in the literature (Phillips, 1980; Fonseca, 1982). Planting from seed is not recommended as the germination rate is very low. It is also recommended to collect from high current areas, if possible, because eelgrass in these areas tend to be lusher and have higher rhizome mat integrity which increases the collection efficiency (Fonseca, 1982).

It is recommended to utilize several sediment-free planting techniques in order to compare ultimate success rates: planting without anchors, planting with anchors, and planting with an inert mat (details and specifications are found in Phillips, 1980 and Fonseca, 1982). Sprigs will be collected with three to four shoots per rhizome and outplanted the same day of collection. It is necessary to keep the collected transplants moist, cool, and shaded until planting. Depending on the silt:sand ratio in the substrate, anchors may range from 8 to 12 inches in length.

Plugs will be obtained with the substrate intact from existing donor beds. The coring device will be utilized to obtain as well as plant the grass material, as described in Phillips (1980). As with the sprigs above, it is necessary to keep all material moist, cool, and shaded.

Collection and transplanting should be undertaken during the spring months. All work should be completed by mid-June at the latest in order to allow for sufficient vegetative growth prior to the next winter. It is recommended to vary the spacing of the transplants from between 1.0 and 2.5 feet on center.

G. <u>Creation of Salt Marsh Habitat</u>

Salt marsh habitat will be established at the interface between the upper intertidal mudflat and the shoreline. It is proposed to plant only perennial pickleweed, since it often occurs monotypically in low elevation, natural salt marshes, and is relatively tolerant of a wide range of environmental conditions. A thorough discussion of the methods and techniques for salt marsh creation are presented in Ms. Eicher's report in the Appendix. The critical components are as follow:

- the optimal habitat is between 6.2 - 6.5 ft. MLLW, with a maximum range of 6.0 - 6.9 ft. MLLW;

- a gentle slope from shore to intertidal mudflat of 1-2% is recommended so that water does not become impounded;

- the planting substrate will be comprised of native silty clays; should the material encountered after excavation not be suitable, it is recommended that some of the dredge spoils be utilized for the planting medium; if the underlying material is compacted, it should be loosened mechanically;

- the area will receive regular tidal inundation without excessive wave force or strong currents;

- perennial pickleweed cuttings will be collected in February-March, and will be propagated with a qualified horticulturist with experience in growing salt marsh plants;

- pickleweed cuttings will be collected from a well-established marsh, preferably close to the mitigation area;

- collection methods will ensure minimal trampling of the marsh vegetation and avoidance of over-collection in any one area;

- pickleweed plants will be outplanted on two-foot centers during the November following collection.

H. Relocation of Woody Vegetation

Woody vegetation will be planted on the upland areas in order to provide physical screening of the salt marsh and intertidal areas for enhanced habitat value and roosting areas for avian species. A mix of wax myrtle, shore pine, and coyote brush be planted in groups within these areas. It is expected that herbaceous species will colonize readily after planting. Due to the protected nature of the site from both southwesterly and northwesterly winds, no erosion control measures are proposed. Willow species and red alder will be planted in clumps adjacent to the small freshwater marsh in order to take advantage of the high water table. All plantings will be grouped so as to provide moderate to dense cover at maturity.

I. Subtidal Dredging

Mitigation for the dredging of subtidal lands has not been required in Humboldt Bay in the past. At the present time, the California Department of Fish and Game does not require mitigation for deepening of existing deep-water habitat. The US Fish and Wildlife Service (USFWS) is authorized to recommend mitigation for subtidal dredging under its Mitigation Policy as published in the Federal Register 46:15; January 23, 1981. Pursuant to this, the USFWS prepared the Draft Fish and Wildlife Coordination Act Report for the US Corps of Engineers Humboldt Harbor and Bay Deepening Project in February 1994 for public review; the comment period closed on April 31, 1994. The contents of this report, as it pertains to the Louisiana-Pacific project, are summarized and discussed below.

Under the USFWS Mitigation Policy, fish and wildlife habitat resources are assigned to one of four Resource Categories, with each category, in turn, having a specific mitigation planning goal. The Resource Categories and their respective planning goals are as follow:

Resource Category 1 - Habitat areas of high value which are unique and irreplaceable. Mitigation Goal - No loss of exiting habitat value.

Resource Category 2 - Habitat areas of high value which are either scarce or becoming scarce. Mitigation Goal - No net loss of in-kind habitat value.

Resource Category 3 - Habitat areas of high to medium value which are relatively abundant. Mitigation Goal - No net loss of habitat value, while minimizing loss of in-kind habitat value.

Resource Category 4 - Habitat areas of medium to low value. Mitigation Goal - Minimize loss of habitat value.

The subtidal area was sampled during the biological study for the project site, and was found to support a relatively low density and diversity of benthic organisms, and a relatively high quantity of particulate organic matter. Due to these factors, the subtidal area to be impacted as part of the project is of fairly low habitat value. The mitigation measures proposed for the project are designed to result in salt marsh and intertidal habitats with substantially higher potential value that those which will be impacted. The intertidal area, in particular, should support a notably higher diversity and density of benthic, epibenthic, and avian species by virtue of exposing the habitat rather than having it shadowed by a working dock. Because of the higher habitat values expected from implementation of the mitigation plan, mitigation for deepening of existing subtidal habitat is not proposed.

J. Summary of Acreage to be Filled and Created

1. Coastal Salt Marsh - RSP and dock construction will fill 100-200 square feet of degraded salt marsh and mitigation excavation will remove 0.275 acres, for a total of 0.28 acres. It is proposed to create 0.28 acres of salt marsh at the upper edge of the intertidal mudflat (a 10-foot wide swath, 1300 feet in length),

resulting in a 1:1 mitigation ratio. The salt marsh to be created will provide higher habitat value than the existing one because it will be dominated by perennial pickleweed, which provides the highest density and diversity of invertebrates of all marsh habitats in Humboldt Bay (see Eicher, Appendix A). The existing marsh is dominated by Chilean cordgrass, an invasive exotic with relatively lower value.

2. Rocky Intertidal - RSP placement will fill 0.2 acres and excavation for mitigation will result in the loss of 0.37 acres, for a total loss of 0.57 acres of rocky intertidal. The lower portion of the newly installed RSP will provide about 0.1 acres of hard substrate exposed to tidal action and available for encrustation. In addition, the entire intertidal face of the bulkhead will provide surface area for encrustation of marine organisms which, in turn, will provide foraging opportunities for fishes.

3. Intertidal Mudflats - A net area of 5.6 acres will be filled by dock, pier, and gangway construction and 0.38 acres will be lost due to dredging. It is proposed to excavate 6.0 acres to intertidal elevations to mitigate for filling and dredging of intertidal muds. The existing intertidal mudflats are, for the most part, covered by a wooden structure and, given the low density and diversity of organisms found, are considered to have low habitat value. The new intertidal mudflats will be open and therefore more readily available for plant colonization and shorebird foraging.

4. Eelgrass Beds - 14,775 square feet of eelgrass will be shaded by the gangway and southerly pier extension. Given the experimental nature of the eelgrass planting, it is proposed to plant an area of 30,000 square feet of eelgrass in order to allow for die-off, sedimentation, and accretion.

5. Subtidal Habitat - Due to the low existing values of subtidal habitat, as expressed by the low benthic diversity and density, no mitigation is being proposed for the dredging of subtidal habitat. While it is recognized that dredging will alter the benthic diversity and density of the subtidal area, it is expected that recolonization of subtidal habitat will occur over time. In addition, the creation of high value intertidal mudflat and salt marsh habitat is expected to increase the productivity of the mitigation site as compared to existing conditions, and to mitigate for the loss of less valuable habitat.

6. Woody Vegetation - Mitigation excavation will displace 0.9 acres of woody vegetation. It is proposed to plant 0.9 acres of woody vegetation on the westerly side of the mitigation area in order to enhance the overall habitat values of the area. The

addition of woody species to the disturbed sand area will create vertical structure available for foraging and roosting, which will enhance the overall habitat value of this area.

## V MITIGATION SCHEDULE

The sequence of events in creation of the mitigation area is as follows:

- salvage of woody species; depending on the time of year, small specimens may be planted directly or potted for future planting;

- excavation of the new intertidal mudflat to the appropriate elevation and removal and disposal of excavated material;

- placement of rock slope protection along the new shoreline;

- removal of dike created by old shoreline;

- stabilization period to allow for resalinization and settling of substrate, and possible colonization by micro-organisms and benthic fauna;

- planting of eelgrass, salt marsh, and woody vegetation; planting will be staggered to conform with recommendations for timing: eelgrass should be planted in May, salt marsh should be planted in November, and woody vegetation should be planted during the dormant period (winter months).

## VI MONITORING PROGRAM

A monitoring procedure shall be implemented to document the success of the mitigation program. At each field visit, notes shall be made of apparent hydrologic conditions, overall site conditions, and any factors which may contribute to or deter from the potential success of the mitigation program. Biological monitoring shall be qualitative in the early stages of the monitoring period, and quantitative in the later stages. A monitoring report/letter will be prepared following each site visit which will detail the results of the field review as well as address specific permit requirements. Recommendations will be made as necessary for changes that may be warranted to enhance the potential for success of the mitigation.

## VII SUCCESS STANDARDS

Standards of success for mitigation will be based on creation of a habitat similar to that impacted. Following are the minimum success standards proposed, based on existing conditions:

- establishment of 14,775 square feet of eelgrass, with an overall average density of 5.2 turions/0.1 square meter, to be measured quantitatively toward the end of the monitoring period; plants shall be healthy and well-established;

- establishment of 12,200 square feet (0.28 acres) of pickleweed with 40% cover, to be measured quantitatively toward the end of the monitoring period; plants shall be healthy and well-established;

- establishment of a total of 0.9 acres of cover by woody vegetation, to be measured quantitatively toward the end of the monitoring period; plants shall be healthy and well-established;

- establishment of 6.0 acres of intertidal mudflat, supporting epibenthic and benthic biota similar in composition to adjacent undisturbed areas; the epibenthic biota may be measured by direct quantitative methods while the epibenthic biota may be measured indirectly by censusing bird use and comparing with use on adjacent mudflats.

## VIII MONITORING SCHEDULE

### A. Construction and Planting Monitoring

Each phase of the mitigation procedure will be monitored by a qualified biologist familiar with construction and planting techniques. The biologist will be responsible for monitoring activities undertaken to create and restore habitats and associated values, and will not be responsible for general construction management or inspection as routinely undertaken by registered civil engineers and/or persons certified by the International Conference of Building Officials.

An initial monitoring report will be prepared following completion of each phase of the mitigation program. These reports will be submitted to Louisiana-Pacific Corporation, which will then forward them to the necessary permitting agencies. The initial reports will be completed and submitted within a short period of completion of each phase in order to demonstrate progress with the mitigation program as well as compliance with permit requirements.

An initial monitoring report will be prepared following the completion of each of the following activities:

1) salvage of woody vegetation to include species salvaged, quantities, and methods of transport or holding;

2) creation of intertidal mudflat to include methods, equipment and personnel employed and the disposition of waste material;

3) installation of rock slope protection to include methods, equipment, personnel employed as well as the type and size of material utilized;

4) removal of old shoreline to include timing with regard to the tidal cycle as well as methods, equipment and personnel used;

5) stabilization to include the period of time since completion of excavation, apparent accretion, erosion or subsidence, suitability for planting of eelgrass and/or pickleweed, and natural recruitment by marine algae, salt marsh species, or eelgrass;

6) planting of eelgrass to include equipment and personnel employed, source of material, method of gathering and transport, and methods of planting and securing, and planting elevations;

7) creation of salt marsh habitat to include equipment and personnel employed, source of material, methods of collection and propagation, methods of planting, and planting elevations;

8) relocation of woody vegetation to include equipment and personnel employed, source of material, methods of collection, methods of plantings and securing, and use of fertilizer and irrigation if appropriate.

B. Subsequent Monitoring

Each phase of the mitigation program shall be monitored once a year for five years following the completion. For those aspects of the mitigation program dealing with planting, the field investigation will be conducted during the growing season. The monitoring reports during the first few years will be qualitative in nature, addressing the apparent condition of the plants, the extent of growth, new species which have colonized, etc. Toward the end of the monitoring period the eelgrass, salt marsh, woody vegetation, and intertidal mudflats will be examined qualitatively and the results compared to similar habitats within the immediate project area. A qualitative examination will also be made at this time with regard to the apparent health of the habitat and any factors which may lend to or detract from the long-term success of the mitigation project.

## IX REMEDIAL ACTION

If the success standards are not met for one or more of the planting efforts at the end of the three-year monitoring program, alternative site(s) will be chosen within the Humboldt Bay area to plant for mitigation. Selection of the alternative site(s) will be made with consultation with personnel at the local Department of Fish and Game in an attempt to locate an area with high potential for success. Possibilities include the restoration of eelgrass beds on Mud Island in Northern Humboldt Bay and restoration of beds impacted by the commercial oyster industry.

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## XI PERSONS AND AGENCIES CONSULTED

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# APPENDIX A

## SALT MARSH MITIGATION PLAN
Anni L. Eicher, Botanica Northwest Associates

## SALT MARSH MITIGATION PLAN

Anni L. Eicher, Botanica Northwest Associates

### Existing Salt Marsh

Field reconnaissance of the salt marsh now occurring at the proposed mitigation site was conducted March 2, 1994, at low tide (9:21 a.m., 0.0 ft. MLLW). Observations were made regarding site conditions and plant species composition. The potential for salvaging plant material for transplanting was assessed.

The existing salt marsh occurs as a narrow strip, 10-30 feet wide, sloping upward between mudflat and upland. It extends only along the northern one-third of the fill site (Figure 5). Along the central outcrop section of the fill site, there is a gravelly, unvegetated slope between the mudflat and upland, a cut-bank with layers of wood debris exposed. Along the southern arm of the fill site, mudflat directly abuts a rock slope with remnants of an old wooden pier.

The substrate of the existing salt marsh is bay mud mixed with a high percentage of gravel. In some spots, thick deposits of wood chip debris were noticed. This gravelly substrate has precluded the development of prime salt marsh habitat. The main species growing there is Chilean cordgrass *(Spartina densiflora)*, a non-native invasive species. Chilean cordgrass has become a dominant component of salt marshes all around Humboldt Bay, and it often occurs in dense monotypic stands. At the mitigation site, the cordgrass occurs in scattered clumps, indicative of less-than-optimal growth conditions. In one spot, a few scattered clumps of perennial pickleweed *(Salicornia virginica)*, now dormant, were noted. Saltgrass *(Distichlis spicata)*, also dormant at this time, occurs in fairly thick mats on banks which are about one foot higher than the rest of the salt marsh. Overall, the total vegetation cover of the existing salt marsh is estimated to be 60%, with 40% attributable to Chilean cordgrass, 15% to saltgrass, and 5% to perennial pickleweed.

The option of salvaging plant material from this salt marsh for transplanting was considered but rejected. There is very little pickleweed available for transplanting. The Chilean cordgrass is not desirable for transplanting because it is non-native and it out-competes native species. The saltgrass would not be suitable for transplanting because the elevations planned for the new salt marsh will be too low to support saltgrass.

Objectives

The main objective of this component of the mitigation plan is to create a strip of salt marsh, 10 to 25 feet wide, along the entire upper margin of the newly created mudflat. This salt marsh will function as a transition zone between the mudflat and the upland. The salt marsh will abut a rock slope constructed to protect the adjacent upland.

The existing salt marsh does not represent prime salt marsh habitat and it is dominated by a non-native species, therefore, it is inappropriate to attempt to recreate the same type of salt marsh at the mitigation site. Rather, our objective is to create a salt marsh dominated by perennial pickleweed. Pickleweed marsh typically occurs at the lowest elevations of salt marsh in Humboldt Bay (Eicher 1987) and would be appropriate to create as a narrow border to mudflat at the mitigation site. Additionally, pickleweed marsh provides habitat for the highest density and diversity of invertebrates of all marsh types in Humboldt Bay (L. Bott, invertebrate biologist, pers. comm. 2/94). Invertebrates provide an important food source for shorebirds which will also be utilizing the newly created mudflats.

Site Preparation

1) Elevation - Salt marsh vegetation grows within a narrow range of intertidal elevations. At Humboldt Bay, salt marsh occurs from approximately 5.5 feet above Mean Lower Low Water (ft. MLLW) to 8.5 (10) ft. MLLW (Claycomb 1983; Eicher 1987). At Samoa, the relationship between MLLW and NGVD (which is approximately equal to mean sea level) is 4.0 feet (National Ocean Service 1981-1985). To convert MLLW elevations to NGVD elevations, subtract 4.0 feet.

Within the range of salt marsh, zonation of plant species associations is evident. The pattern of zonation is determined by a complex set of factors, but in general can be linked to tidal elevation. At Humboldt Bay, low-elevation marshes (5.5 - 6.9 ft. MLLW) are typically vegetated by mats of perennial pickleweed. Pickleweed also occurs at higher elevations in the salt marsh, but there it is joined by other plant species. At mid-elevations (6.9 - 7.3 ft. MLLW), dense stands of Chilean cordgrass commonly occur. At higher elevations (7.3 - 8.5 ft. MLLW), a more diverse group of plants occur (Eicher 1987).

As stated above, our objective at the mitigation site is to create pickleweed marsh. The first step is to provide intertidal elevations that will favor this plant association. The strip destined for salt marsh should be graded from 6.2 - 6.5 ft. MLLW, gently sloping downward from the rock slope to mudflat to promote good drainage. At lower elevations, it is more difficult for plants to establish because the frequency of inundation (and hence wave action) is greater. At higher elevations, the ability of Chilean cordgrass to out-compete perennial pickleweed is increased.

It can be difficult to grade to precise intertidal elevations because of the nature of the sediments and the influences of wave action. The above objective does allow for some leeway, but the final elevation of the salt marsh strip should not be lower than 6.0 ft. MLLW or higher than 6.9 ft. MLLW and it should provide a 1-2% slope (See following discussion). The elevations at the site should be re-surveyed soon before planting and modified if necessary (See timeline for project).

2) Slope - In addition to elevation, it is important to consider slope in providing suitable conditions for salt marsh. In naturally formed salt marshes, the topography is generally very mild, with marsh plains gently sloping downwards towards drainage channels. If an area is too flat or it is not graded to promote drainage, water may become impounded and inhibit vegetation growth. If a slope is too steep, the substrate may be too unstable to support plant growth. The maximum slope that can support salt marsh is unknown. In creating salt marsh, a slope of 1-2% is recommended (Zedler 1984). As indicated above, the grading plan for the mitigation site calls for a 0.3 foot drop in elevation from upland to mudflat. Over a 20-foot wide strip, this would create a 1.5% slope.

3) Substrate - Providing a substrate suitable for the growth of salt marsh plants is one of the most crucial factors in the success of marsh creation, and it is also one of the most problematic tasks. Following excavation, the suitability of the substrate at the project site will need to be assessed by project engineers in consultation with the project's biologist. The plan is to excavate the fill on the site down to the original bay mud. One problem may be that the area has subsided and that the bay mud has become compacted under the weight of the fill. The elevation may need to be brought back up by depositing fresh dredge spoils.

The substrate for the new salt marsh should be comprised of silty clays, the finest sediments in the bay, as is characteristic of natural Humboldt Bay salt marshes (Thompson 1971). Bulk density (the mass per unit bulk volume) should be sampled and modified if necessary to approximate natural conditions. Mechanical means can be used to loosen a compacted substrate.

The substrate should not contain any gravel, wood debris, toxic compounds, or any other foreign material. This may be difficult considering the history of the site and adjacent land uses, however, it is very important to the success of the project.

4) Hydrology - To create salt marsh at the mitigation site, the area should receive regular tidal inundation without excessive wave force or strong currents. These conditions should be achieved by grading the site to appropriate intertidal elevations. The suitability of hydrologic conditions following site modifications should be confirmed by the project hydrologist.

## Planting Recommendations

1) Species - The only species recommended for planting is perennial pickleweed. In natural salt marshes, pickleweed often occurs monotypically in mats at low elevations. Of all the salt marsh plant species growing in Humboldt Bay, it has the widest range of environmental tolerances. It is a highly productive plant (Rogers 1981). As pointed out earlier, pickleweed marsh supports a high number of invertebrates, which in turn provides food for a variety of birds.

2) Propagation - Perennial pickleweed is a perennial plant with creeping stems that root at the nodes. It has been propagated successfully by cuttings (D. Kelly, horticulturist, pers. comm., 2/94). For the mitigation project, pickleweed cuttings will be collected in February-March, 1995, and rooted in a sandy soil mixture. The plants will then be transplanted in the field the following November. The plants will be planted at a density of two feet on center.

The location of suitable collection sites is to be determined. One possible site is near the project site, just north of the Samoa bridge. There are pickleweed mats there (Eicher 1990) that would provide ample material for collection. Collecting will be done in a manner to minimize impacts to the collection site by looking for non-destructive access routes and by not over-collecting in any one area.

At this point, no measures for stabilization of the plantings, such as mats or netting, is recommended. This decision should be reconsidered after observing hydrologic conditions following site modifications.

## Timeline

The project's timeline is planned approximately as follows:

August-October 1994: The fill area will be excavated and graded to appropriate elevations for mudflat and salt marsh.

February-March 1995: Pickleweed cuttings will be collected at an off-site location. The plants will be grown under controlled conditions for one season.

August 1995: The proposed salt marsh area will be re-surveyed to determine if modifications are necessary to achieve the desired elevations. The substrate will have had almost a full year to stabilize. Has accretion, erosion, or subsidence occurred during that time? Are there any signs of natural recruitment by salt marsh species? If the site is further modified either by grading or depositing more sediment, can the new conditions be expected to be stable in light of the events of the previous year? What other measures can be taken to achieve stability?

November 1995: Pickleweed starts will be planted in the field.

## Natural Recruitment

Perennial pickleweed is a rapid colonizer, provided there is good seed availability in the area. As noted, pickleweed marsh occurs north of the Samoa Bridge and this may provide a seed source via bay currents. Pickleweed seedlings require two to three days without submergence to establish. If inundation is too frequent, the wave action washes away seeds and dislodges seedlings. Once a plant is established, frequent submergence does not inhibit growth. It is hopeful that natural recruitment by perennial pickleweed will augment transplants.

Chilean cordgrass is also a rapid colonizer and there is definitely a seed source in adjacent areas. Measures to improve the competitive abilities of pickleweed over cordgrass include keeping the elevation under 6.8 feet and planting pickleweed. Chilean cordgrass does tolerate elevations as low as 5.9 ft MLLW, however, pickleweed is favored below 6.9 ft MLLW (Eicher 1987).

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## VI. OTHER CEQA CONSIDERATIONS

### A. Significant Environmental Impacts

This EIR finds the following to be significant effects of the proposed project:

* Potential soil and geological stability, and tsunami risk problems.
* Temporary increase in debris on surface water during demolition.
* Potential water quality effects from de-watering of the bulkhead and dredge spoils areas.
* Loss of existing on-site biological resources.
* Noise, dust, and other factors deriving from construction activities.
* Possible disturbance of archaeological resources during construction.
* Introduction of exotic organisms through release of ballast water.

### B. Unavoidable Effects

* Temporary increases in suspended sediments and turbidity during dredging.
* Potential water quality effects from the dewatering of the bulkhead and dredge spoils areas.
* Loss of existing on-site biological resources.
* Noise, dust, and other factors deriving from construction activities.
* Possible disturbance of archaeological resources during construction.
* Tsunami exposure hazard.
* Introduction of exotic organisms through release of ballast water.

## C. Cumulative Impacts

The following section provides a listing and discussion of the reasonable past, present, or proposed related projects which may produce significant cumulative impacts. The information provided in this section has been accumulated from local planning documents, project environmental documents, project biological studies, permit applications and personal conversations with involved agency employees and project sponsors.

There have been several recent studies of the economic potential of Humboldt Bay Harbor that have produced a revitalized interest in the rehabilitation and development of the Port of Eureka and associated Bay Waterfront independent of the proposed Samoa Terminal reconstruction project. The City of Eureka has developed a list of "high priority" projects for the Eureka Waterfront most of which involve facility revitalization and reconstruction, and have entered a Memorandum of Understanding with the Humboldt Bay Harbor, Recreation and Conservation District to aid in the coordination and promotion of Harbor Development.

There have not been any reasonably recent past projects that would produce cumulative impacts. At present there are five Harbor projects either with approved permits or within the agency review and permit process. These projects are :

1) Humboldt Bay Response Corporation, Launch Ramp (Permits Pending)

2) David L. Schneider, Reconstruction of Dock A (Permits Pending)

3) Humboldt Bay Harbor, Recreation and Conservation District, Woodley Island Improvement Project, Dry Stack Storage, Launch Ramp and Work Dock Completion (Permits Acquired)

4) City of Eureka, Eureka Inner Reach Channel Berthing Facility (Permits Pending)

5) Humboldt Bay Harbor, Recreation and Conservation District and U.S. Army Corps of Engineers, Humboldt Bay Harbor Deepening Project (DEIS/EIR).

The following projects are currently in the pre-design or conceptual stages of development and are listed as follows:

6) City of Eureka, Rehabilitation of the Eureka Small Boat Basin

7) City of Eureka, Develop Fisherman's Market/Farmer's Market and Dock

8) City of Eureka, Reconstruct Landing Dock

9) City of Eureka and HBHR&CD, Reconstruct Dock B, Multi Use Marine Terminal

Projects Summarization

1. Humboldt Bay Response Corporation Launch Ramp

The launch ramp at the Corporation's Response Center will be utilized for the deployment of oil spill containment and recovery vessels and equipment on Humboldt Bay. Construction consists of filling a combined 5530 square feet of intertidal and subtidal habitat for the bed of the ramp. 4012 square feet of fill will be placed in the intertidal zone and 1518 square feet of fill within the subtidal zone. 1755 square feet of eelgrass habitat will be covered as a result of the fill placement. The project also includes the armoring of 475 lineal feet of shoreline to prevent erosion of the upland parcel. (Calif. Coastal Comm. Staff Report, Application #1-93-75). On-site mitigation for loss of eelgrass is proposed. Remaining subtidal and intertidal mitigation will be covered through the purchase of credits at the Coastal Conservancy's Bracut Marsh Enhancement Project at a ratio of 3:1 (CCC Staff Report, Application #1-93-75).

2. Dock A Reconstruction

The reconstruction of Dock A was necessitated following a barge collision in January of 1994, which destroyed the northern 200 feet of the wood pile supported structure. The dock, located southwest of the foot of Washington Street in Eureka, is utilized by the Humboldt Cooperative for mobilization of oil spill containment and recovery equipment and by Crowley Marine Services for moorage of tug boats and assist vessels (David L. Schnieder, Pers. Conv. 1994).

The reconstruction will involve complete replacement of the structure utilizing concrete piles and decking within the existing footprint. There will be no dredging or filling as a result of the project.

3. HBHR&CD Woodley Island Improvement Project (Dry Stack Storage)

The Humboldt Bay Harbor Recreation and Conservation District is proceeding with the Woodley Island Improvement Project. This phase of the project will include construction of a Dry Stack Storage facility with a capacity for 200 small vessels and additional work area, 2000 sq. ft. boat repair and retail sales building, additional parking, 2000 gallon above ground gasoline storage tank for vessel refueling, vessel launch ramp and dredging of 200 cubic yards of sediments, installation of J Dock with slips for 18 boats and staging area for launch ramp, floating debris deflector, construction of a 600 sq. ft. office for the U.S. Coast Guard within a fenced inclosure, addition of storage lockers within the existing work area, and completion of the existing work dock. Permits have been acquired for the work. The project is expected to have no significant effects (HBHR&CD Negative Declaration and Environmental Checklist).

4. City of Eureka Inner Reach Channel Public Berthing Facility

The City of Eureka Inner Reach Channel Public Berthing Facility is currently in the Public Review process and project design has begun (Pacific Affiliates 1994). The project consists of a narrow fixed pier and gangway attached to 200 feet of floating dock positioned along the west side of the Eureka Inner Reach Channel at the Adorni Waterfront Park. The facility will be utilized for moorage of "Museum Ships" and other shallow draft vessels of public interest. Negative Declaration has been declared for the project by the Lead Agency. Pacific Affiliates Records and Pers. Conv. Mr. Joel Canzoneri, City of Eureka, Planner).

5. Humboldt Harbor and Bay Deepening Project

The U.S. Army Corps of Engineers and the Humboldt Bay Harbor, Recreation and Conservation District have developed a plan in response to Resolution of the Committee on Public Works and Transportation of the U.S. House of Representatives , September 23,1982, to increase the depth of, and make other modifications with respect to the Humboldt Harbor and Bay Project, in the interest of navigation and related purposes. The plan calls for the removal of a maximum of 4,482,000 cubic yards of sediments from the Humboldt Bay Channel system. 4,456,000 yards of which will be disposed of at the Humboldt Open Ocean Disposal site (HOODS) and 26,000 cubic yards deposited in a suitable upland disposal area. (DEIS/EIR Humboldt Bay Deepening, Navigation Study, May 1994)

The following discussion of proposed projects is based upon information from preliminary planning documents, feasibility studies and personal conversations with project sponsors and staff members. The following discussion is made prior to final design selection, environmental reviews, and application of permits, and is somewhat generalized.

6. Rehabilitation of the Eureka Small Boat Basin

The current dock system at the Small Boat Basin is at the end of its useful life and is in dire need of repair and redesign. The proposal to rehabilitate the facility consists of redesign and rehabilitation of the existing dock system, new Wharfinger's office, new bathrooms and possible charter boat office space, seawall rehab and dredging and long term facilities for the Humboldt Bay Yacht Club. There is a possibility of expansion of the existing facility. The facility was last dredged in 1987 in conjunction with the Woodley Island Marina maintenance dredging project. (Eureka Waterfront revitalization Program Phase II Implementation, August 1993)

7. Fisherman's/Farmers Market and Dock

The proposal is for the development of a Fisherman's Market/Farmers Market Complex utilizing the existing building area and wharf space available between the foot of C Street and F Street in Old Town Eureka. The existing buildings and dock may be rehabilitated if structurally feasible or may be demolished and rebuilt to accommodate the market place tourist attraction. Although several options are available, no decision has been made as to the approach to be taken for the implementation of development or scope of work necessary to rehab the facility. (Eureka Waterfront Revitalization Program, Phase II Implementation, August 1993)

8. Landing Dock Reconstruction

Landing Dock, formerly Lazio's Seafoods, located at the foot of C Street in Eureka and adjacent to the Eureka Inner Reach Channel, is also proposed for reconstruction. The project could involve a footprint reconstruction or a slight enlargement of the dock area towards the shipping channel. (Pers. Conv. David Hull, City Utilities Dept. May 1994) The intended use will be primarily for the moorage of transient vessels and the moorage of "Museum Ships." Development could also be consistent with the Fisherman's Dock. (Eureka Waterfront Revitalization Program, Phase II Implementation, August 1993)

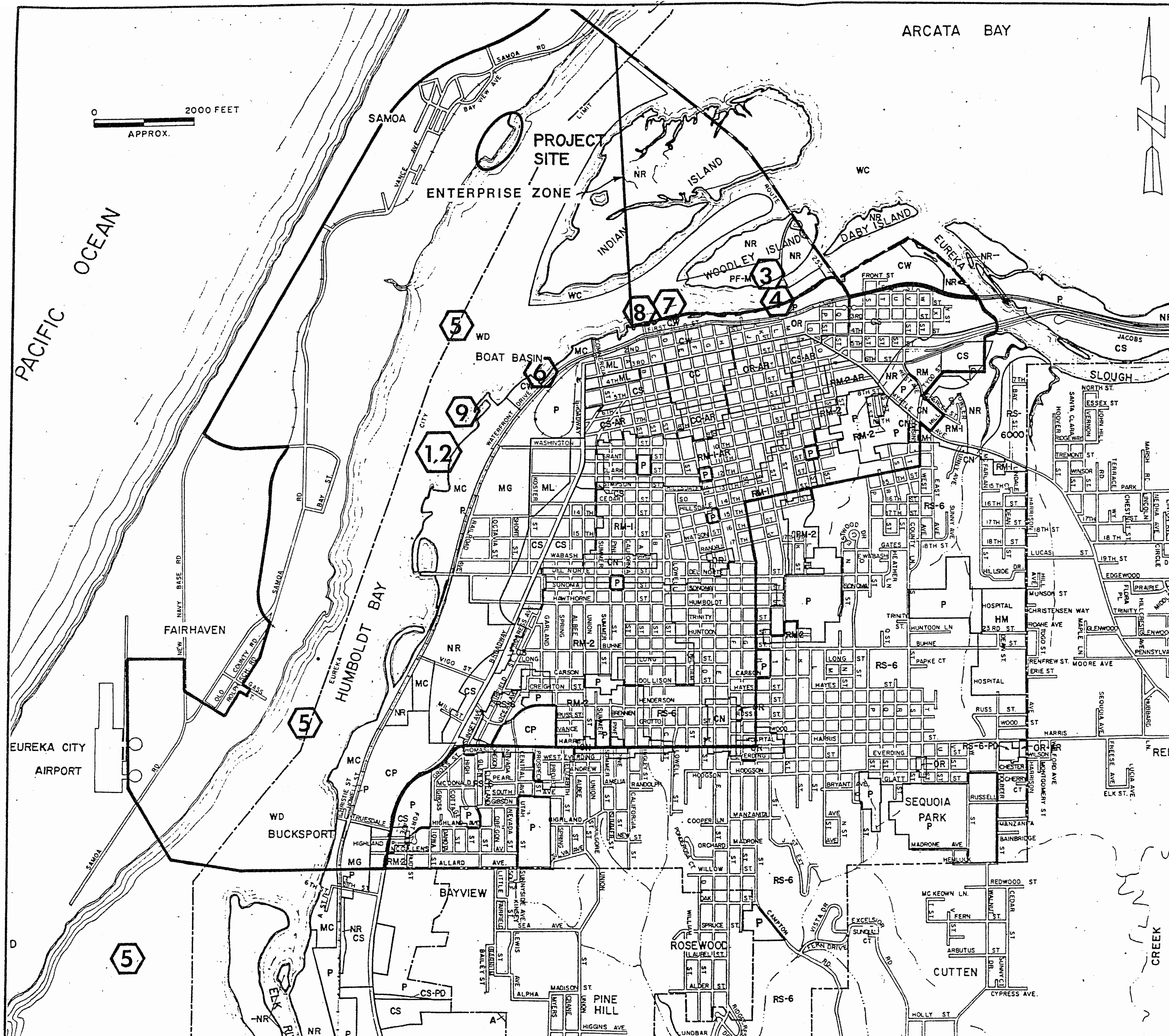
9. Dock B reconstruction/Multi Use Terminal

Dock B, owned by the City of Eureka, was ravaged by fire during the early 1980's and was left with approximately 40 percent of its pre-fire useable work surface. The City would like to see the dock rebuilt to its former size and condition prior to the fire and reestablish the utility that the dock once added to the local fishing community. (Eureka Waterfront Revitalization Program, Phase II, August 1993) Recently, in April 1994, the City of Eureka and the Humboldt Bay Harbor, Recreation and Conservation District engaged in a Memorandum of Understanding and are in the process of determining the best use of the Dock B site and ultimate development of the Port of Eureka. The consideration of a substantial marine terminal (1600 foot long bulkhead and fill) has been discussed by the two agencies following the results of a recently produced Public Terminal Implementation Plan for the Humboldt Bay Harbor, Recreation and Conservation District by the Firm of Vickerman, Zachery, Miller, February 1994 . This is an extremely divergent scope to the project than was originally proposed by the City of Eureka.

Project Cumulative Impacts

Land Use:

The listed proposed projects do not represent a significant change to land use, nor do they necessitate the modification of existing local zoning designations to accommodate their proposed uses. The rehabilitations of the Eureka Small Boat Basin, Landing Dock, Fisherman's Dock and the reconstruction of Dock A, are for the most part, overdue maintenance projects that will return worn facilities back to productive commercial, recreational and tourist facilities consistent with their past levels of utilization. The Eureka Inner Reach Channel Public Berthing Facility, Humboldt Bay Cooperative Launch Ramp, Humboldt Bay Harbor, Recreation and Conservation District Woodley Island Improvement Project, Humboldt Bay Harbor and Bay Deepening Project and the possible construction of Dock B to a Multi-use Marine Terminal are all projects that are consistent with the intended Land Use of their specific areas and zoning designations. (See Figure VIF.1)




# City of Eureka Zoning

## LEGEND

| | |
|---|---|
| (2) | PROPOSED HUMBOLDT HARBOR PROJECT. NUMBER REFERENCES KEYED TO CUMULATIVE IMPACTS SECTION. |
| A | AGRICULTURAL |
| AC | COASTAL AGRICULTURAL |
| CC | CENTRAL COMMERCIAL |
| CN | NEIGHBORHOOD COMMERCIAL |
| CP | PLANNED SHOPPING CENTER |
| CS | SERVICE COMMERCIAL |
| CW | WATERFRONT COMMERCIAL |
| F | FLOOD PLAIN |
| HM | HOSPITAL-MEDICAL |
| MG | GENERAL INDUSTRIAL |
| ML | LIMITED INDUSTRIAL |
| MC | COASTAL DEPENDENT INDUSTRIAL |
| OR | OFFICE AND MULTI-FAMILY RESIDENTIAL |
| RS-6000 | ONE-FAMILY RESIDENTIAL |
| RS-12000 | ONE-FAMILY RESIDENTIAL |
| RM-2500 | MULTI-FAMILY RESIDENTIAL |
| RM-1000 | MULTI-FAMILY RESIDENTIAL |
| P | PUBLIC |
| PF-M | PUBLIC FACILITIES- MARINA |
| WD | DEVELOPMENT WATER |
| WC | CONSERVATION WATER |
| NR | NATURAL RESOURCES |

**FIGURE VI F.1**

Soils and Geology:

The listed projects do not contain unique geologic features within their limits, nor will their rehabilitations or reconstructions significantly effect any adjacent unique geologic features.

All of the proposed projects are within areas that were formerly developed or impacted by similar historic developments. There maybe minor geologic effects or slight alterations at specific project sites, (dredging, filling, excavations, driving pile etc...) depending upon the scope of the individual proposed project, however, there are no foreseen cumulative impacts to soils and geology from the group of projects or in combination with the LP Samoa Terminal Reconstruction.

The projects may individually be effected by seismic related activities such as tsunamis, liquefaction, and ground shaking. These potential effects can be reduced by conforming to regional seismic design standards and incorporating findings from specific soils investigations into project design. Tsunamis are a concern to all developments in lowlying coastal areas, the potential effect is significant but unavoidable.

Air Quality:

All the projects analyzed have the potential to produce varying amounts of fugitive dust and carbon monoxide from construction activities and the use of vehicles and equipment. Construction practices such as, watering of exposed earthen areas during periods of dry weather and wind, limiting unnecessary idling of vehicles and equipment, conducting regular and needed maintenance of vehicles and equipment and equipping them with proper mufflers and pollution control devices will significantly reduce air quality impacts.

Water Quality:

All of the proposed projects, during construction, may cause increased suspended solids in the water column by driving of pile, dredging, filling, dewatering and other related activities. These activities are generally of short duration and should not produce significant cumulative effects to the water quality in Humboldt Bay. Dissolved oxygen levels in and around project sites may be temporarily reduced, dependant upon the composition of the sediments being disrupted, tidal circulation and activity duration. Proposed projects and their related activities will be of a temporary nature and of short duration in specific areas and should not significantly effect Humboldt Bay water quality.

Biological Resources:

The rehabilitation of the Eureka Small Boat Basin, Dock A, Fisherman's Dock, Landing Dock, will have little or no significant impact to biological resources if the projects maintain their existing facility footprint. There is the possibility of minor expansion or alteration to the footprint of some of the listed projects, but the impacts caused can be mitigated for by the creation of similar habitats or restoration of impacted areas.

The remaining listed projects, Humboldt Bay Cooperative Launch Ramp, Reconstruction of Dock A, Woodley Island improvement Project, Eureka Inner Channel Public Berthing Facility and the Humboldt Harbor and Bay Deepening Project are currently within the environmental review or agency permit processes and are seeking approval based upon impact mitigation to offset project impacts or negative declaration of the project relative to its effects upon the environment. If mitigation plans for the projects that produce significant impacts are successful, cumulative impacts will be insignificant.

The reconstruction of Dock B, to a Multi-Use Terminal is in the conceptual stage, and scope of the development has not been determined at this time. Biological Resources impacts may vary significantly depending upon the scope of the project and a reasonable estimate of their effect is not feasible. There may be a significant increase in the degree of introduction of exotic organisms by the addition of the Dock "B" project and possibly by the reconstruction of Dock "A".

Traffic and Circulation:

The LP Samoa Terminal Reconstruction Project combined with the listed proposed projects should have little or no impact on traffic and circulation of local roadways. All listed proposed projects, with the exception of the Woodley Island Improvement Project, are located on the Eureka Waterfront and will be accessed through the City of Eureka. The Woodley Island Improvement Project will utilize a portion of Route 255 (Samoa Bridge) which is a travel route to and from the Samoa Peninsula and the LP Samoa Terminal site. Significant increase of traffic is not expected (Woodley Island Improvement Project, Negative Declaration, H.B.H.R.&C.D.).

Vessel Traffic within Humboldt Bay may increase by the construction and rehabilitation of the various industrial, commercial and recreational marine dependant facilities. This may create the need for increased monitoring of vessel traffic by the various governing agencies (U.S. Coast Guard, Sheriff's Department, Dept. of Fish and Game, etc...) and public boater safety programs.

Public Utilities:

The listed projects may require upgrading of existing site utilities. This should not represent a significant increase or demand on public utility systems as the scope and use of the projects will not be substantially altered from that of past or present use.

Recreation and Aesthetics:

The Construction of The Eureka Inner Reach public Berthing Facility, Woodley Island Improvement Project, rehab of the Eureka Small Boat Basin, Fisherman's Dock, and Landing Dock, will all improve public recreational opportunities relating to Humboldt Bay. The remaining proposed projects, Humboldt Bay Deepening Project, Dock A Reconstruction, Humboldt Bay Cooperative Launch Ramp, of commercial nature should not significantly effect public recreational opportunities as they are improvements or reconstructions of existing facilities.

The effects on aesthetics is a subjective decision, and whether the projects will have an effect either negatively or positively is speculative at best.

Cultural/Archaeological Resources:

There is the slight potential for impact to Cultural or Archaeological Resources by the proposed projects. Review and study of recorded Resource locations in relation to specific project sites and related construction activities can significantly reduce the potential adverse impact or disturbance to Cultural or Archaeological sites. If deemed necessary, on site archaeological consultants can be appointed during project excavation activities.

Noise:

All the projects include constructions that have the potential to produce increases in noise levels in the vicinity of the project sites. These activities include: the movement of vehicles and equipment; the driving of piling; demolition of existing structures. The duration of these noise producing activities is short term and should not have significant cumulative effect.

Light and Glare:

All listed projects with the exception of the Humboldt Harbor and Bay Deepening, may produce increased levels of new light and glare along the Humboldt Bay Shoreline. The cumulative effect of the impact can be reduced significantly by hooding and shielding facility lights and by keeping lighting confined to the specific project site.

Tidal Hydrology:

Of the several projects with approved permits or within the agency permit process, all but one are small, and most involve the reconstruction, rehabilitation, or improvement of existing facilities that have been used in the recent past. These consist of:

Humboldt Bay Response Corporation Launch Ramp
Dock A Reconstruction
HBHR&CD Woodley Island Improvement Project
City of Eureka Inner Reach Channel Public Berthing Facility
Eureka Small Boat Basin Rehabilitation
Fisherman's Market/Farmer's Market and Dock Development
Landing Dock Reconstruction
Dock B Reconstruction

All of these projects are small and much of the project activity i.e., dredging, construction and/or other improvements will occur within the intertidal zone and will therefore generate negligible changes in tidal hydraulics. None of these projects are in the Samoa Channel, and should therefore not present any significant cumulative impact, in combination with the proposed Samoa Terminal Reconstruction, on the tidal circulation or sediment transport in the Bay.

The only large project currently proposed is the Humboldt Bay Harbor and Bay Deepening Project. This project calls for the removal of 4,482,000 cubic yards of sediments from the Humboldt Bay Channel system. Approximately 414,00 cubic yards of sediments are to be removed from the Samoa Channel, with an additional 324,000 cubic yards of sediments to be removed from the Samoa Channel Turning Basin. These activities will widen and slightly deepen both the channel and turning basin. This will increase the cross sectional area of the channel and turning basin and will likely have a minor effect in the form of a reduction on maximum tidal velocities in both the Samoa and Eureka Channels. In conjunction with the Samoa Terminal Reconstruction Project, this reduction in channel velocities will be very small, and, as a result there should be no significant impact on circulation in the Bay. The reduction in tidal velocities might have a minor impact on sediment scour and deposition in the channel. The on-going monitoring of sedimentation rates in the channel should be continued as mitigation measures to address these minimal impacts. (Mr. Mac McKee, Humboldt State University, Department of Environmental Resources Engineering, May 24, 1994)

## VII. REFERENCES

### A. Authors

| | |
|---|---|
| Paul Kraus | Project Engineer, Pacific Affiliates Consulting Engineers |
| Michael Sweeney | Consulting Project Environmental Planning, Pacific Affiliates |
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| Mr. Mac McKee | Consulting Hydrologist, Humboldt State University |
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### B. EIR Contributors

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| Mr. Jim Miller | Environmental Department, Louisiana Pacific Corporation |
| R. Chad Roberts, Phd. | Review Consultant, Humboldt Bay Harbor District |

### C. Persons/Organizations Consulted

| | |
|---|---|
| Lewis Klein | Redwood Regional Audobon Society |
| Bill Rodriguez | California State Regional Water Quality Control Board |
| Robert Merrill | California Coastal Commission |
| Herb Pierce | Biologist, California Department of Fish and Game |
| Ron Warner | Biologist, California Department of Fish and Game |
| Don Tuttle | Humboldt County Department of Public Works |
| Jack Alderson | Humboldt Bay Harbor, Recreation and Conservation District |
| Roger Goldan | U.S. Army Corps of Engineers |
| Bob Stevens | Chief of Construction, Manson Construction Company |
| John Tatum | Traffic Dept., California Department of Transportation |
| Robert Tasto | Environmental Specialist, California Dept. of Fish and Game |
| Darren Fong | U.S. Fish and Wildlife Service |
| Max Blodgett | Construction Operations, U. S. Army Corps of Engineers |
| Jay Phelps | State Lands Commission |
| Kay Strickland | Citizens for Port Development |

| | |
|---|---|
| Lucille Vinyard | Sierra Club |
| James Roscoe | Archaeologist Consultant |
| Linda Martinez | Public Land Manager, State Lands Commission |
| James Bybee | National Marine Fisheries Service |
| Mr. Sean Regan | U.S.C.G. MSO, San Francisco, Port Opts. Officer |
| Charles Gulbe | Star Shipping Company |
| Earl Mealins | West Coast Shipping Company |

D. **Literature Cited**


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9. EVS Consultants, Environmental Consultants. February 1993. Bioassays and Bioaccumulation Testing for Humboldt Harbor Deepening Project, Final Report. Prepared for the U.S. Army Corps of Engineers, San Francisco District.

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11. Geological and Geotechnical Setting and Feasibility Assessment, Samoa Terminal Reconstruction Project, Busch Geotechnical Consultants, June 3, 1994.

# APPENDIX 1

## WASTE DISCHARGE REQUIREMENTS



PACIFIC AFFILIATES
A CONSULTING ENGINEERING GROUP
835 THIRD ST · EUREKA · CALIF · 95501 · (707) 445-3001

William T. Rodriguez

California Regional Water Quality Control Board
North Coast Region

ORDER NO. 87-76
ID NO. 1B87018RHUM

WASTE DISCHARGE REQUIREMENTS

FOR

LOUISIANA-PACIFIC CORPORATION
SAMOA CARGO DOCK DREDGING

Humboldt County

The California Regional Water Quality Control Board, North Coast Region, finds that:

1. The Louisiana-Pacific Corporation submitted a Report of Waste Discharge dated March 25, 1987 describing the dredging of up to 66,000 cubic yards of sands and silts from their cargo dock at Samoa.

2. The dredge spoils will be excavated using a cutter suction dredge and pumped to two settling basins near the west abutment of the Samoa Bridge as shown on Figure 1, which is incorporated herein and made part of this Order. Clarified supernatant from the spoils disposal area will be discharged to Humboldt Bay.

3. The disposal area, which covers about 23 acres, is comprised primarily of dune sand and has historically been used as a dredge disposal site. The depth of fill will range from 0 to 4 feet and will average about 3 feet deep. There are no structures, drainage features nor significant vegetation within the disposal area.

3. The Regional Board adopted the Water Quality Control Plan for the North Coastal Basin on March 20, 1975 and has amended the plan from time to time as appropriate.

5. The beneficial uses of Humboldt Bay include:

   a. industrial water supply
   b. navigation
   c. water contact recreation
   d. non-water contact recreation
   e. ocean commercial and sport fishing
   f. cold freshwater habitat
   g. wildlife habitat
   h. preservation of rare and endangered species
   i. marine habitat
   j. fish migration
   k. fish spawning
   l. shellfish harvesting

6. A conditional use permit was approved by the County of Humboldt on May 22, 1987. The Regional Board finds that adverse impacts to water quality will not occur if the conditions of these waste discharge requirements are strictly adhered to.

7. The Board has notified the discharger and interested agencies and persons of its intent to prescribe waste discharge requirements for the discharge.

8. The Board, in a public meeting, heard and considered all comments pertaining to the discharge.

THEREFORE, IT IS HEREBY ORDERED that the Louisiana-Pacific Corporation shall comply with the following:

A. EFFLUENT LIMITATIONS

1. The discharge of wastewater from the dredger spoil disposal area shall not exceed the following limitations:

| Constituent | Units | 30-Day Average | Maximum at anytime |
|---|---|---|---|
| Suspended Solids (NFR) | mg/l | 30 | 60 |
| Settleable Solids | ml/l/hr | — | 1.0 |

B. RECEIVING WATER LIMITATIONS

1. The waste discharge shall not cause the turbidity of Humboldt Bay to be increased more than 20 percent above naturally occurring background levels.

2. The waste discharge shall not result in coloration of Humboldt Bay that causes nuisance or adversely affects beneficial uses.

3. The waste discharge shall not result in taste or odor-producing substances in Humboldt Bay in concentrations that impart undesirable tastes or odor to fish flesh or other edible products of aquatic origin, or that cause nuisance or adversely affect beneficial uses.

4. The waste discharge shall not result in floating material, including solids, liquids, foams, and scum in Humboldt Bay in concentrations that cause nuisance or adversely affect beneficial uses.

5. The waste discharge shall not result in suspended material in Humboldt Bay in concentrations that cause nuisance or adversely affect beneficial uses.

6. The waste discharge shall not result in substances in Humboldt Bay in concentrations that result in deposition of material that causes nuisance or adversely affect beneficial uses.

7. The waste discharge shall not result in oils, greases, waxes, or other materials in Humboldt Bay in concentrations that result in a visible film or coating on the surface of the water or on objects in the water, that cause nuisance or that otherwise adversely affect beneficial uses.

8. The waste discharge shall not cause toxic substances to be present in Humboldt Bay in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.

## C. PROVISIONS

1. Neither the treatment nor the disposal of waste shall cause a nuisance or pollution as defined in Section 13050 of the California Water Code.

2. In the event the discharger is unable to comply with any of the conditions of this Order due to:

   a. breakdown of waste treatment equipment;
   b. accidents caused by human error or negligence; or
   c. other causes such as acts of nature;

   the discharger shall notify the Executive Officer by telephone as soon as he or his agents have knowledge of the incident and confirm this notification in writing within two weeks of the telephone notification. The written notification shall include pertinent information explaining reasons for the noncompliance and shall indicate what steps were taken to correct the problem and the dates thereof, and what steps are being taken to prevent the problem from recurring.

3. This Board requires the discharger to file a report of waste discharge at least 120 days before making any material change or proposed change in the character, location, or volume of the discharge.

4. The discharger shall permit the Regional Board:

   a. entry upon premises in which an effluent source is located or in which any required records are kept;
   b. access to copy any records required to be kept under terms and conditions of this Order;
   c. inspection of monitoring equipment or records; and
   d. sampling of any discharge.

5. The discharger shall maintain in good working order and operate as efficiently as possible any facility or control system installed by the discharger to achieve compliance with the waste discharge requirements.

6. The requirements prescribed herein do not authorize the commission of any act causing injury to the property of another, nor protect the discharger from his liabilities under federal, state, or local law.

7. The discharger shall comply with the Contingency Planning and Notification Requirements, Order No. 74-151, Monitoring and Reporting Program No. 87-??, and the General Provisions for Monitoring and Reporting and any modifications to these documents as specified by the Executive Officer. Such documents are attached to this Order and incorporated herein.

Certification

I, Benjamin D. Kor, Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, North Coast Region, on June 24, 1987.

Benjamin D. Kor
Executive Officer

California Regional Water Quality Control Board
North Coast Region

MONITORING AND REPORTING PROGRAM ORDER NO. 87-76

FOR

LOUISIANA PACIFIC CORPORATION
SAMOA CARGO DOCK DREDGING

Humboldt County

## MONITORING

### Effluent Monitoring

Representative samples shall be collected at the point of discharge to Humboldt Bay. The following shall constitute the effluent monitoring program:

| Constituent | Units | Type of Sample | Sampling Frequency |
|---|---|---|---|
| Suspended Solids (NFR) | mg/l | grab | twice daily |
| Settleable Solids | ml/l/hr | grab | twice daily |
| Turbidity | NTU | grab | twice daily |

### Receiving Water Monitoring

Representative samples of Humboldt Bay shall be collected (a) within the immediate area of influence of the discharge, and (b) in waters unaffected by the discharge. The following shall constitute the receiving water monitoring program:

| Constituent | Units | Type of Sample | Sampling Frequency |
|---|---|---|---|
| Turbidity | NTU | grab | twice daily |

## REPORTING

Monthly monitoring reports shall be submitted to the Board for each month by the 15th day of the following month. In reporting the monitoring data, the discharger shall arrange the data in tabular form so that the date, the constituents, and the concentrations are readily discernible. The data shall be summarized in such a manner to illustrate clearly the compliance with waste discharge requirements. During periods of no discharge, the reports shall certify no discharge.

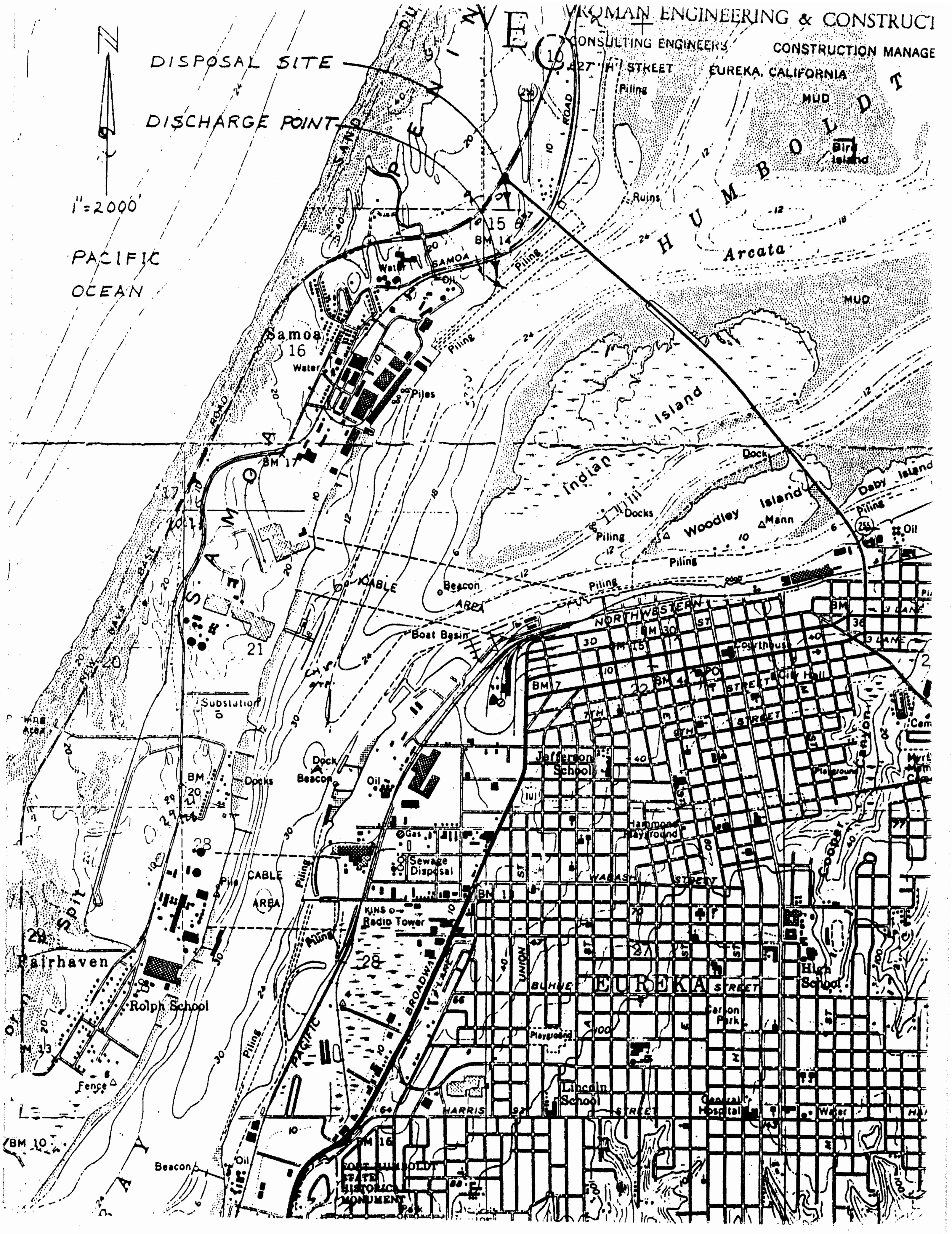
## COMPLIANCE

The discharger shall initiate this Monitoring and Reporting Program at the time of commencement of the proposed dredging operation but only when discharge to the Bay occurs.

Ordered by ______________________________

Benjamin D. Kor
Executive Officer

June 24, 1987



VROMAN ENGINEERING & CONSTRUCTI
CONSULTING ENGINEERS
CONSTRUCTION MANAGE
427 "H" STREET
EUREKA, CALIFORNIA
N
DISPOSAL SITE
DISCHARGE POINT
1"=2000'
PACIFIC
OCEAN
HUMBOLDT
BAY
Arcata
MUD
Bird Island
Ruins
Piling
Samoa
Water
Oil
Piles
Indian Island
Woodley Island
Daby Island
Dock
Docks
Mann
CABLE AREA
Beacon
Boat Basin
NORTHWESTERN
Courthouse
City Hall
Substation
Jefferson School
Hammond Playground
Gas
Sewage Disposal
KINS
Radio Tower
WABASH
STREET
Fairhaven
Rolph School
Fence
BROADWAY
PACIFIC
UNION
BUHNE
EUREKA
STREET
Carson Park
High School
Playground
Lincoln School
HARRIS
General Hospital
Water
FORT HUMBOLDT STATE HISTORICAL MONUMENT
Park
Samoa Spit
NEW NAVY BASE ROAD
SAMOA

California Regional Water Quality Control Board
North Coast Region

# GENERAL MONITORING AND REPORTING PROVISIONS

February 3, 1971
(Retyped July, 1982)

## GENERAL PROVISIONS FOR SAMPLING AND ANALYSIS

Unless otherwise noted, all sampling, sample preservation, and analyses shall be conducted in accordance with the current edition of "Standard Methods for the Examination of Water and Waste Water" or approved by the Executive Officer.

All analyses shall be performed in a laboratory certified to perform such analyses by the California State Department of Health or a laboratory approved by the Executive Officer.

All samples shall be representative of the waste discharge under the conditions of peak load.

## GENERAL PROVISIONS FOR REPORTING

For every item where the requirements are not met, the discharger shall submit a statement of the actions undertaken or proposed which will bring the discharge into full compliance with requirements at the earliest time and submit a timetable for correction.

By January 30 of each year, the discharger shall submit an annual report to the regional board. The report shall contain both tabular and graphical summaries of the monitoring data obtained during the previous year. In addition, the discharger shall discuss the compliance record and the corrective actions taken or planned which may be needed to bring the discharge into full compliance with the waste discharge requirements.

The discharger shall file a written report within 90 days after the average dry-weather flow for any month that equals or exceeds 75 percent of the design capacity of the waste treatment or disposal facilities. The report shall contain a schedule for studies, design, and other steps needed to provide additional capacity or limit the flow below the design capacity prior to the time when the waste flow rate equals the capacity of the present units.

California Regional Water Quality Control Board
North Coast Region

CONTINGENCY PLANNING AND NOTIFICATION REQUIREMENTS

FOR

ACCIDENTAL SPILLS AND DISCHARGES

ORDER NO. 74-151

The California Regional Water Quality Control Board, North Coast Region, finds that:

1. Section 13225 of the Porter-Cologne Water Quality Control Act requires the Regional Board to perform general duties to assure positive water quality control.

2. The Regional Board has been advised of situations in which preparations for, and response to accidental discharges and spills have been inadequate.

3. Persons discharging waste or conveying, supplying, storing, or managing wastes or hazardous materials have the primary responsibility for contingency planning, incident reporting and continuous and diligent action to abate the effects of such unintentional or accidental discharge.

THEREFORE, IT IS HEREBY ORDERED THAT:

I. All persons who discharge wastes or convey, supply, store, or otherwise manage wastes or other hazardous material shall:

   A. Prepare and submit to this Regional Board, according to a time schedule prescribed by the Executive Officer, a contingency plan defining the following:

      1. Potential locations and/or circumstances under which accidental discharge incidents might be expected to occur,

      2. Possible water quality effects of accidental discharges,

      3. The conceptual plan for cleanup and abatement of accidental discharge incidents, including:

         a. The individual who will be in charge of cleanup and abatement activities on behalf of the discharger,

         b. The equipment and manpower available to the discharger to implement the cleanup and abatement plans,

   B. Immediately report to the Regional Board any accidental discharge incidents. Such notification shall be made by telephone as soon as the responsible person or his agent has knowledge of the incident.

C. Immediately begin diligent and continuous action to cleanup and abate the effects of any unintentional or accidental discharge. Such action shall include temporary measures to abate the discharge prior to completing permanent repairs to damaged facilities.

D. Confirm the telephone notification in writing within two weeks of the telephone notification. The written notification shall include: reasons for the discharge, duration and volume of the discharge, steps taken to correct the problem and steps being taken to prevent the problem from recurring.

II. Upon original receipt of phone report (I.B), the Executive Officer shall immediately notify all affected agencies and known users of waters affected by the unintentional or accidental discharge.

III. Provide updated information to the Regional Board in the event of change of staff, size of the facility, or change of operating procedures which will affect the previously established contingency plan.

IV. The Executive Officer or his employees shall maintain liaison with the discharger and other affected agencies and persons to provide assistance in cleanup and abatement activities.

V. The Executive Officer shall transmit copies of this Order to all persons whose discharges of waste handling activities are governed by Waste Discharge Requirements or an NPDES Permit. Such transmittal shall include a current listing of telephone numbers of the Executive Officer and his key employees to facilitate compliance with Item I.B of this Order.

Ordered by Ben Kor
Benjamin D. Kor
Executive Officer

July 24, 1974
(Retyped January, 1986)

Your primary notification should be to the Regional Board office at Santa Rosa at (707) 576-2220. During off hours, you will be able to leave a recorded message at that number and, if you have a spill or discharge emergency, you will also be referred to the State Office of Emergency Services (OES) at (800) 852-7550. OES maintains a roster of key employees and will relay your notification to Regional Board staff.

# APPENDIX 2

## HBHR&CD ORDINANCE NO. 7



PACIFIC AFFILIATES
A CONSULTING ENGINEERING GROUP
835 THIRD ST · EUREKA · CALIF · 95501 · (707) 445-3001

HUMBOLDT BAY HARBOR, RECREATION,
AND CONSERVATION DISTRICT

ORDINANCE NO. 7

AN ORDINANCE IMPLEMENTING
CERTAIN PORTIONS OF THE
HUMBOLDT BAY MASTER PLAN

Section 19 of Appendix 2, as amended, of the Harbors and Navigation Code of the State of California provides that the Board of Commissioners of the Humboldt Bay Harbor, Recreation and Conservation District"...shall draft a master plan for harbor and port improvement and for the use of all the tidelands and submerged lands which shall be conveyed to the district..and other lands or areas subject to its jurisdiction". The plan herein set forth constitutes the Humboldt Bay Master Plan of the Humboldt Bay Harbor, Recreation and Conservation District.

THE BOARD OF COMMISSIONERS OF THE HUMBOLDT BAY HARBOR, RECREATION AND CONSERVATION DISTRICT, DOES HEREBY ORDAIN AS FOLLOWS:

ARTICLE I
GENERAL CONDITIONS

SECTION 1. The Planning and Development Policies adopted by the Board of Commissioners 13 June 1975, shall continue to serve as guides for planning and development decisions of the Board.

SECTION 2. The jurisdictional authority of the Humboldt Bay Harbor, Recreation and Conservation District for the implementation of this Master Plan for Humboldt Bay is limited to Humboldt Bay up to the mean higher high water level except for Indian, Woodley, and Daby Islands where the District jurisdiction is up to the mean high water level. Implementation of this Master Plan on the adjacent upland areas around Humboldt Bay will require cooperative efforts with other local jurisdictions.

SECTION 3. Uses that are in conflict with this Master Plan at the time of its adoption shall not be permitted to expand and shall be removed as the opportunity and ability to do so becomes available.

SECTION 4. This Master Plan shall be used to guide the decisions and actions of the Board of Commissioners of the District but should not be considered to be a rigid and unchangeable set of conditions. The process for making substantive changes to the planning objectives shall require formal action by the Board of Commissioners after a duly scheduled public hearing.

SECTION 5. The Board of Commissioners of the District shall promote industrial, commercial, and recreational developments in and around Humboldt Bay consistent with the Master Plan as adopted. In particular, areas designated as "Public Open Space" and "Agriculture" shall be maintained and protected in cooperation with other agencies.

## ARTICLE II
## DEFINITIONS

SECTION 1. GEOGRAPHIC AREAS

(a) Humboldt Bay. For planning purposes, Humboldt Bay shall include all waters within Humboldt Bay, County of Humboldt, State of California, as defined in Section 3. (f) of Appendix 2, as amended, of the Harbors and Navigation Code of the State of California.

(b) North Bay. North Bay shall include that part of Humboldt Bay and its tributaries north of the Eureka-Samoa Bridge inclusive of the Eureka Slough and its tributaries excepting the Eureka Channel and the adjacent uplands along the southerly shore from the Eureka-Samoa Bridge to the Highway 101 Bridge.

(c) Middle Bay. Middle Bay shall include that part of Humboldt Bay and its tributaries from and inclusive of the Eureka-Samoa Bridge and the Eureka Channel and the adjacent uplands along its southerly shore from the Eureka-Samoa Bridge to the Highway 101 Bridge thence south to and inclusive of the Entrance Channel east of a line drawn between the western limits of the north and south jetties and including the south jetty to its eastern limit and the improved and maintained portion of Hookton Channel to the northern boundary of the southwestern quarter of the southwestern quarter of the northwestern quarter of Section 20 of T. 4N and R. 1W., Humboldt Meridian.

(d) South Bay. South Bay shall include that part of Humboldt Bay and its tributaries south and west from and exclusive of the Entrance Channel and the south jetty to its eastern limit and the improved and maintained portions of Hookton Channel and the northern boundary of the southwestern quarter of the southwestern quarter of the northwestern quarter of Section 20 of T. 4N and R. 1W., Humboldt Meridian.

SECTION 2. WATER AND LAND USES

(a) Conservation Water. Use of Conservation Water areas shall generally be limited to natural resources habitat, wildlife refuges, mariculture, public access, and scenic vistas.

(b) Development Water. Use of Development Water areas shall generally be limited to access for commercial and industrial users and to improved and maintained channels.

(c) Public Open Space Land. Use of Public Open Space Land areas should generally be limited to natural resources habitat, wildlife refuges, recreation, public access, and scenic vistas.

(d) Agriculture Land. Use of Agriculture Land areas should generally be limited to crop and livestock production.

(e) Service/Commercial Land. Use of Service/Commercial Land should generally be limited to commercial activities that are dependent on proximity to the waterfront and might include enterprises such as restaurants and specialty shops.

(f) Port Related Industrial Land. Use of Port Related Industrial Land areas should generally be limited to waterfront developments requiring direct access to deepwater shipping channels.

(g) Water Related Industrial Land. Use of Water Related Industrial Land areas should generally be limited to waterfront developments requiring direct access for shallow draft vessels or requiring industrial cooling water.

(h) Nonwater Related Industrial Land. Use of Nonwater Related Industrial Land areas should generally be limited to waterfront developments dependent upon but not requiring direct access to the waterfront.

SECTION 3. AREAS OF REGULATORY JURISDICTION

(a) All tide, submerged and other lands granted to (Section 5.5 (a) of Appendix 2, as amended, of the Harbors and Navigation Code of the State of California) or owned by the District shall be within the jurisdiction of the District.

(b) All lands and overlying waters of Humboldt Bay including all rivers, sloughs, estuaries, and areas tributary to Humboldt Bay subject to tidal action (defined by the District as being the elevation of mean higher high water) as of 17 April 1973 (Section 5.5 (b) of Appendix 2, as amended, of the Harbors and Navigation Code of the State of California) shall be within the jurisdiction of the District in accordance with the following more specific designations:

1. those portions of Indian, Woodley, and Daby Islands bayward of the mean high tide line (Section 5.5 (b) of Appendix 2, as amended, of the Harbor and Navigation Code of the State of California).

2. bayward of any functional and authorized tidal gate or tidal control structure.

3. that portion of Jolly Giant Creek south of Fourth Street, Arcata.

4. that portion of Jacoby Creek west of Old Arcata Road.

5. that portion of Fay Slough west of Old Arcata Road.

6. that portion of Freshwater Slough west of Old Arcata Road.

7. that portion of Ryan Slough north of Myrtle Avenue, Eureka.

8. that portion of First Slough north of Myrtle Avenue, Eureka.

9. that portion of Second Slough north of Myrtle Avenue, Eureka.

10. that portion of Coopers Gulch Slough east of V Street, Eureka.

11. that portion of Swain Slough west of Pine Hill Road, Eureka.

12. that portion of Elk River north of Senestaro Ranch pumping station.

13. that portion of Salmon Creek west of Highway 101.

## ARTICLE III
## PLANNING DESIGNATIONS

SECTION 1. North Bay

(A) Water. The waters of North Bay shall be designated as follows:

1. "Conservation":

a) all waters of North Bay.

(B) Land. The adjacent uplands of North Bay should be designated as follows:

1. "Public Open Space":

a) all adjacent uplands (jointly designated as "Agriculture") excepting from and including the Highway 101 Bridge crossing Eureka Slough along the north side of Eureka Slough to and including Murray Field.

2. "Agriculture":

a) all adjacent uplands (jointly designated as "Public Open Space") excepting from and including the Highway 101 Bridge crossing Eureka Slough along the north side

2. "Agriculture" (continued)

of Eureka Slough to and including Murray Field.

3. "Non water Related Industrial":

a) from and including the Highway 101 Bridge crossing Eureka Slough along the north side of Eureka Slough to and including Murray Field.

SECTION 2. MIDDLE BAY

(A) Water. The waters of Middle Bay should be designated as follows:

1. "Conservation":

a) the area east of the improved and maintained channels from King Salmon north to and including Elk River.

b) the area around Indian Island shoreward of the Samoa and Arcata Channels.

2. "Development":

a) all areas of Middle Bay excepting those areas specifically designated as "Conservation".

(B) Land. The adjacent uplands of Middle Bay should be variously designated with the following designations:

1. "Public Open Space":

a) Indian Island.

b) the north westerly two-thirds of Woodley Island adjacent to the Arcata Channel.

c) the South Jetty and the North Spit from the Entrance Channel and the North Jetty north to the northern boundary of Section 32 of T. 5N and R. 1W, Humboldt Meridian (located north of the Samoa Boat Ramp).

d) north west of Buhne Drive, King Salmon.

e) the Elk River Spit from the Highway 101 Bridge south and west to the northern boundary of the southwestern quarter of the southwestern quarter of the southwestern quarter of Section 4 of T. 4N and R. 1W, Humboldt Meridian (located near Spruce Point).

2. "Agriculture":

a) from the northern boundary of the southeastern quarter of the southeastern quarter of the southeastern quarter of Section 5 of T. 4N and R. 1W, Humboldt Meridian (located near Spruce Point) southwest (toward King Salmon) to the northern boundary of the southeastern quarter of Section 8 of T. 4N and R. 1W, Humboldt Meridian.

3. "Service/Commercial":

a) King Salmon south and east of Buhne Drive to the northern boundary of the southwestern quarter of the northwestern quarter of the northwestern quarter of Section 17 of T. 4N and R. 1W, Humboldt Meridian (located at the north end of Fields Landing).

b) the south easterly one-third of Woodley Island adjacent to Eureka Channel.

4. "Nonwater Related Industrial":

a) from the northern boundary of the southwestern quarter of the southwestern quarter of Section 33 of T. 5N and R. 1W, Humboldt Meridian (located south of Bucksport) south to the Highway 101 Bridge crossing Elk River.

5. "Water Related Industrial":

a) from the Highway 101 Bridge crossing Eureka Slough west and south to the western boundary of the northeastern quarter of the northeastern quarter of the southeastern quarter of Section 21 of T. 5N and R. 1W, Humboldt Meridian (located southwest of the Eureka Boat Basin).

b) from the northern boundary of the southeastern quarter of Section 8 of T. 4N and R. 1W, Humboldt Meridian (located near Spruce Point) southwest to the north end of Buhne Drive, King Salmon.

6. "Port Related Industrial":

a) from the northern boundary of Section 32 of T. 5N and R. 1W, Humboldt Meridian (located north of the Samoa Boat Ramp) north to and including the Eureka-Samoa Bridge on the North Spit.

b) from the boundary of the northeastern quarter of the northeastern quarter of the southeastern quarter of Section 21 of T. 5N and R. 1W, Humboldt Meridian (located southwest of the Eureka Boat Basin) south to the northern boundary of the southwestern quarter of the southwestern quarter of Section 33 of T. 5N and R. 1W, Humboldt Meridian (located south of Bucksport).

c) from the northern boundary of the southwestern quarter of the northwestern quarter of the northwestern quarter of Section 17 of T. 4N and R. 1W, Humboldt Meridian, (located at the north end of Fields Landing) south to the northern boundary of the southwestern quarter of the southwestern quarter of the northwestern quarter of Section 20 of T. 4N and R. 1W, Humboldt Meridian, (located at the south end of Fields Landing).

SECTION 3. SOUTH BAY

(A) Water. The waters of South Bay shall be designated as follows:

1. "Conservation":

a) all waters of South Bay.

(B) Land. The adjacent uplands of South Bay should be designated as follows:

1. "Public Open Space":

a) all adjacent uplands (jointly designated as "Agriculture").

2. "Agriculture":

a) all adjacent uplands (jointly designated as "Public Open Space").

## ARTICLE IV
## OPERATIONAL POLICIES

SECTION 1. GENERAL PROPERTY AQUISITION AND USE POLICIES

(a) The District shall acquire uplands as they are available and the District is able to acquire them for the purposes of the proper development and management of Humboldt Bay.

(b) The District shall acquire tidelands and submerged lands within Humboldt Bay as they become available and the District is able to acquire them.

(c) The District shall negotiate with the Cities of Eureka and Arcata for the orderly transfer to the District of tidelands and submerged lands granted to the Cities.

(d) The District shall seek the definition of the boundaries of all properties granted to the District (Section 78 (i) of Appendix 2, as amended, of the Harbors and Navigation Code of the State of California), shall resolve all contested boundaries, and shall take appropriate action with respect to any identified trespassers on District property.

(e) Use of areas within the jurisdiction of the District shall be in accordance with the planning designations of this Master Plan except that less intensive and nonindustrial uses may be permitted in areas designated for more intensive and industrial uses but the reverse shall not be permitted.

(f) District properties may be leased to private interests so long as the leased properties are used consistent with the other elements of this Master Plan.

(g) To the extent that it is practicable, the leasing of District owned tide and submerged lands shall be limited to that which is directly bayward of properties owned or controlled by the lessee and shall have boundaries which are generally perpendicular to the shoreline.

SECTION 2. NAVIGATION

(a) Maintenance and improvement of existing navigational channels shall be supported and encouraged.

(b) Harbor pilotage and towage shall be regulated by the District.

(c) Non-commercial public use of navigational channels shall be ontrolled consistent with the need to minimize hazards to shipping activities.

SECTION 3. INDUSTRIAL ACTIVITIES AND DEVELOPMENTS

(a) Industrial developments that are related should be located in proximity to each other to the extent that it is possible and practicable.

(b) Efforts to introduce and develop new industries, particularly those that manufacture wood products, shall be encouraged and supported.

(c) The feasibility of establishing a Foreign Trade Zone at Humboldt Bay shall be studied.

(d) Fossil fuel storage facilities shall be restricted to areas designated as "Port Related Industrial".

(e) Industries using bay water as a source of cooling water or discharging heated waters into the bay shall be located in areas designated as "Water Related Industrial".

(f) Efforts to improve and diversify the fishing industry shall be supported and encouraged.

(g) Efforts to satisfy berthing facility requirements of fishing essels shall be encouraged and supported.

(h) Improvement of transportation capabilities including shipping, rail, highway, and air carriers shall be encouraged and supported.

SECTION 4. PUBLIC ACCESS

(a) Public access to the bay including launching ramps, recreational sites, scenic vistas, and fishing piers shall be maintained, acquired, and encouraged.

(b) Obstructions shall not be permitted to be placed bayward of public right-of-ways that extend to the shoreline.

(c) Vehicles shall be restricted to designated roads and areas.

SECTION 5. RECREATION AND TOURISM

(a) Efforts to improve and expand facilities and services for tourists and recreationists including motels, hotels, restaurants, recreational vehicle parks, campgrounds, picnic sites, historical and archaeological sites, scenic vistas, fishing piers, launching ramps, and berthing for recreational boats shall be encouraged and supported.

(b) The improvement of the appearance and utility of bay front developments shall be encouraged and supported.

(c) Development of the Humboldt Bay National Wildlife Refuge to include adequate and reasonable facilities and provisions for recreational use shall be encouraged.

SECTION 6. MARICULTURE

(a) The use of Humboldt Bay for mariculture shall be encouraged.

(b) Environmental conditions required for mariculture shall be maintained to the extent that they are consistent with other requirements and conditions.

SECTION 7. EDUCATION AND RESEARCH

(a) The use of Humboldt Bay for education and research shall be permitted and encouraged.

SECTION 8. DREDGING, DIKING, AND FILLING

(a) Diking, exclusive of the maintenance and repair of existing dikes, and filling shall be avoided whenever and wherever possible and only permitted after full consideration of potential damages and benefits nd alternative methods of accomplishing the project objectives has determined the proposed diking and filling is essential.

(b) Dredging shall be limited to maintenance and improvement of navigational channels and areas designated for water related developments.

(c) Disposal of dredge spoils from within the jurisdiction of the District shall be regulated by the District.

SECTION 19. ENVIRONMENTAL QUALITY

(a) Maintenance and improvement of environmental quality shall be primary objectives for the use and development of all areas of Humboldt Bay and not just those areas designated as "Conservation Water" and "Public Open Space Lands".

(b) The discharge of physical, biological, or chemical pollutants that are detrimental to the natural environment of Humboldt Bay shall be eliminated and prohibited.

(c) Studies of the Humboldt Bay environment and of existing potential sources of pollution in Humboldt Bay shall be encouraged and supported.

(d) Efforts to provide facilities for the removal of bilge water, sewage, and other potential pollutants from boats shall be encouraged and supported.

(e) Transfers of petroleum products that might increase the danger of spills shall be limited to the extent that it is possible and practicable.

(f) Signs and related structures, other than those that are necessary and approved by the District for navigational, public safety, resource management and identification purposes shall be eliminated and prohibited from the tidal and submerged lands within the jurisdiction of the District.

(g) Advantage shall be taken of every opportunity to remove debris, rubbish, and other hazardous and unsightly materials and structures from Humboldt Bay and the shoreline of the bay in order to restore the natural state of the bay to the extent that it is practicable and possible.

THIS ORDINANCE PASSED AND ADOPTED THIS 16 DAY OF September , 1976, BY THE BOARD OF HARBOR COMMISSIONERS OF THE HUMBODLT BAY HARBOR, RECREATION AND CONSERVATION DISTRICT BY THE FOLLOWING POLLED VOTE:

AYES: Commissioner Davenport
Commissioner Startare
Commissioner Ridenhour

ABSENT: Commissioner Gast
Commissioner Christensen

WILLIAM J. STARTARE, President

ATTEST:

RICHARD L. RIDENHOUR, Secretary

CERTIFICATE OF SECRETARY

The undersigned, duly qualified and acting Secretary of the Humboldt Bay Harbor, Recreation, and Conservation District, does hereby certify: That the attached Ordinance is a true and correct copy of Ordinance No. 7, entitled "AN ORDINANCE IMPLEMENTING CERTAIN PORTIONS OF THE HUMBOLDT BAY MASTER PLAN" as regularly adopted at the legally convened meeting of the Board of Commissioners of the Humboldt Bay Harbor, Recreation, and Conservation District, duly held on the 16th day of September 1976; further, that such Ordinance has been duly recorded in the journal of proceedings in my office and is in full force and effect.

In witness whereof, I have hereunder set my hand this 16th day of September, 1976.

Richard L. Ridenhour

RICHARD L. RIDENHOUR, Secretary
Board of Commissioners

(Seal)

HUMBOLDT BAY HARBOR, RECREATION
AND CONSERVATION DISTRICT

* * *

AMENDMENT TO ORDINANCE NO. 7

THE BOARD OF COMMISSIONERS OF THE HUMBOLDT BAY HARBOR, RECREATION AND CONSERVATION DISTRICT, DOES HEREBY AMEND ARTICLE III, SECTION 2. MIDDLE BAY, (B) LAND., L. "PUBLIC OPEN SPACE"; C TO READ AS FOLLOWS:

c) the South Jetty and the North Spit from the Entrance Channel and the North Jetty north to a line equidistant between the northern and southern boundaries of Section 32 of T. 5N and R. 1W, Humboldt Meridian (located north of the Samoa Boat Ramp).

PASSED AND ADOPTED THIS 9TH DAY OF JUNE, 1983, BY THE BOARD OF COMMISSIONERS OF THE HUMBOLDT BAY HARBOR, RECREATION, AND CONSERVATION DISTRICT BY THE FOLLOWING POLLED VOTE:

AYES: Commissioner Davenport, Commissioner Storre, Commissioner Gast, Commissioner Blumer, Commissioner Hardison

NOES:

ABSENT:

JAMES A. GAST, President
Board of Commissioners

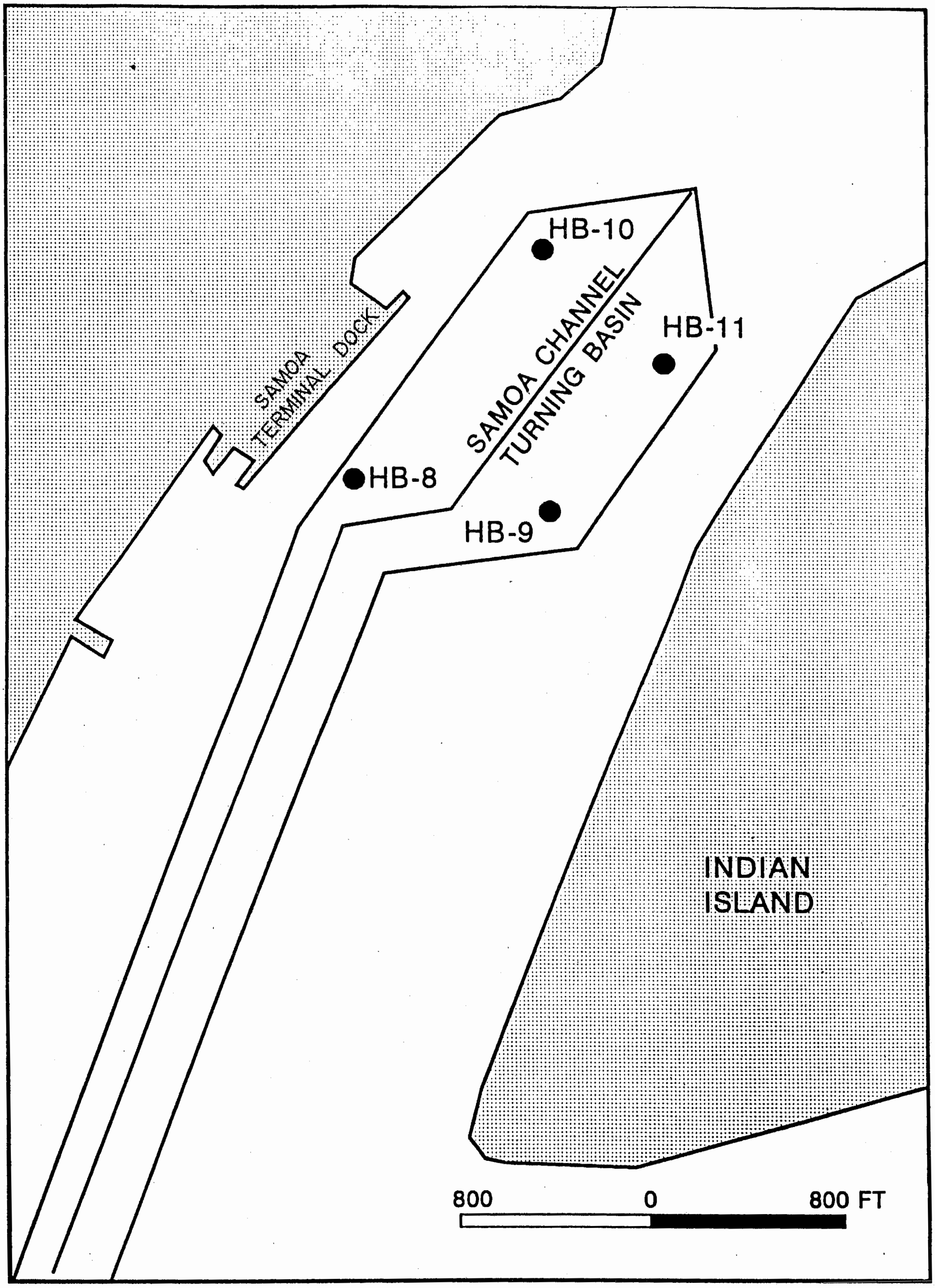
ATTEST:

ROBERT E. DAVENPORT, Secretary
Board of Commissioners

# APPENDIX 3

## SEDIMENT SAMPLING RESULTS

# SEDIMENT DIOXIN AND FURAN DATA




SAMOA CHANNEL

SEDIMENT SAMPLE LOCATIONS

pa

PACIFIC AFFILIATES

A CONSULTING ENGINEERING GROUP

835 THIRD ST · EUREKA · CALIF · 95501 · (707) 445-3001

ANALYSIS REPORT

POLYCHLORINATED DIBENZODIOXINS AND DIBENZOFURANS

HIGH RESOLUTION GC/MS

Client: EVS Environment Consultants

Our File: 2581

Sample ID: ACOE Humboldt 4/274.12.5
West Beach Control Dec. 3/91

Axys ID: 2581-03

Sample Weight: 12.27 g dry

Date: January 30, 1992

| Dioxins | Concentration pg/g | (SDL) | Furans | Concentration pg/g | (SDL) |
|---|---|---|---|---|---|
| $T_4CDD$ - Total | ND | 0.2 | $T_4CDF$ - Total | ND | 0.1 |
| 2,3,7,8 | ND | 0.2 | 2,3,7,8 | NDR(0.4) | 0.1 |
| $P_5CDD$ - Total | ND | 0.2 | $P_5CDF$ - Total | ND | 0.1 |
| 1,2,3,7,8 | ND | 0.2 | 1,2,3,7,8 | ND | 0.1 |
| | | | 2,3,4,7,8 | ND | 0.1 |
| $H_6CDD$ - Total | ND | 0.4 | | | |
| 1,2,3,4,7,8 | ND | 0.4 | $H_6CDF$ - Total | ND | 0.3 |
| 1,2,3,6,7,8 | ND | 0.4 | 1,2,3,4,7,8 | ND | 0.3 |
| 1,2,3,7,8,9 | ND | 0.4 | 1,2,3,6,7,8 | ND | 0.3 |
| | | | 2,3,4,6,7,8 | ND | 0.3 |
| $H_7CDD$ - Total | ND | 0.4 | 1,2,3,7,8,9 | ND | 0.3 |
| 1,2,3,4,6,7,8 | NDR(0.6) | 0.4 | | | |
| | | | $H_7CDF$ - Total | ND | 0.1 |
| $O_8CDD$ | 4.5 | 0.5 | 1,2,3,4,6,7,8 | ND | 0.1 |
| | | | 1,2,3,4,7,8,9 | ND | 0.1 |
| | | | $O_8CDF$ | ND | 0.5 |

SDL = Sample detection limit
ND = Not detected
NDR = Peak detected but did not meet quantification criteria

| Surrogate Standard Recovery | (%) |
|---|---|
| $^{13}C$-$T_4CDD$: | 78 |
| $^{13}C$-$T_4CDF$: | 64 |
| $^{13}C$-$P_5CDD$: | 72 |
| $^{13}C$-$H_6CDD$: | 82 |
| $^{13}C$-$H_7CDD$: | 88 |
| $^{13}C$-$O_8CDD$: | 73 |

Approved by: MCHamilton
M. Coreen Hamilton
A. Dale Hoover

## ANALYSIS REPORT

## POLYCHLORINATED DIBENZODIOXINS AND DIBENZOFURANS

## HIGH RESOLUTION GC/MS

**Client:** EVS Environment Consultants — **Our File:** 2581

**Sample ID:** ACOE Humboldt 4/274.12.5 Reference Dec. 6-11/91 — **Axys ID:** 2581-01A

**Sample Weight:** 10.77 g dry — **Date:** January 30, 1992

| Dioxins | Concentration pg/g | (SDL) |
|---|---|---|
| $T_4CDD$ - Total | ND | 0.2 |
| 2,3,7,8 | ND | 0.2 |
| $P_5CDD$ - Total | ND | 0.2 |
| 1,2,3,7,8 | ND | 0.2 |
| $H_6CDD$ - Total | ND | 0.2 |
| 1,2,3,4,7,8 | ND | 0.2 |
| 1,2,3,6,7,8 | NDR(0.5) | 0.2 |
| 1,2,3,7,8,9 | NDR(0.4) | 0.2 |
| $H_7CDD$ - Total | 3.0 | 0.3 |
| 1,2,3,4,6,7,8 | 1.6 | 0.3 |
| $O_8CDD$ | 7.2 | 0.3 |

| Furans | Concentration pg/g | (SDL) |
|---|---|---|
| $T_4CDF$ - Total | 0.4 | 0.1 |
| 2,3,7,8 | NDR(0.4) | 0.1 |
| $P_5CDF$ - Total | ND | 0.2 |
| 1,2,3,7,8 | ND | 0.2 |
| 2,3,4,7,8 | ND | 0.2 |
| $H_6CDF$ - Total | ND | 0.2 |
| 1,2,3,4,7,8 | ND | 0.2 |
| 1,2,3,6,7,8 | ND | 0.2 |
| 2,3,4,6,7,8 | ND | 0.2 |
| 1,2,3,7,8,9 | ND | 0.2 |
| $H_7CDF$ - Total | ND | 0.2 |
| 1,2,3,4,6,7,8 | ND | 0.2 |
| 1,2,3,4,7,8,9 | ND | 0.2 |
| $O_8CDF$ | ND | 0.3 |

SDL = Sample detection limit
ND = Not detected
NDR = Peak detected but did not meet quantification criteria

| Surrogate Standard Recovery | (%) |
|---|---|
| $^{13}C$-$T_4CDD$: | 82 |
| $^{13}C$-$T_4CDF$: | 68 |
| $^{13}C$-$P_5CDD$: | 72 |
| $^{13}C$-$H_6CDD$: | 72 |
| $^{13}C$-$H_7CDD$: | 81 |
| $^{13}C$-$O_8CDD$: | 76 |

Approved by: MCHamilton

M. Coreen Hamilton
A. Dale Hoover

# ANALYSIS REPORT

## POLYCHLORINATED DIBENZODIOXINS AND DIBENZOFURANS

## HIGH RESOLUTION GC/MS

**Client:** EVS Environment Consultants — **Our File:** 2581

**Sample ID:** ACOE Humboldt 4/274.12.5 Reference Dec. 6-11/91 Duplicate — **Axys ID:** 2581-01B

**Sample Weight:** 10.80 g dry — **Date:** January 30, 1992

| Dioxins | Concentration pg/g | (SDL) | Furans | Concentration pg/g | (SDL) |
|---|---|---|---|---|---|
| $T_4CDD$ - Total | ND | 0.5 | $T_4CDF$ - Total | 0.3 | 0.3 |
| 2,3,7,8 | ND | 0.5 | 2,3,7,8 | NDR(0.8) | 0.3 |
| $P_5CDD$ - Total | ND | 0.7 | $P_5CDF$ - Total | ND | 0.4 |
| 1,2,3,7,8 | ND | 0.7 | 1,2,3,7,8 | ND | 0.4 |
| | | | 2,3,4,7,8 | ND | 0.4 |
| $H_6CDD$ - Total | ND | 1.2 | | | |
| 1,2,3,4,7,8 | ND | 1.2 | $H_6CDF$ - Total | ND | 1.2 |
| 1,2,3,6,7,8 | ND | 1.2 | 1,2,3,4,7,8 | ND | 1.2 |
| 1,2,3,7,8,9 | ND | 1.2 | 1,2,3,6,7,8 | ND | 1.2 |
| | | | 2,3,4,6,7,8 | ND | 1.2 |
| $H_7CDD$ - Total | ND | 2.4 | 1,2,3,7,8,9 | ND | 1.2 |
| 1,2,3,4,6,7,8 | ND | 2.4 | | | |
| | | | $H_7CDF$ - Total | ND | 0.5 |
| $O_8CDD$ | 11 | 2.0 | 1,2,3,4,6,7,8 | ND | 0.5 |
| | | | 1,2,3,4,7,8,9 | ND | 0.5 |
| | | | $O_8CDF$ | ND | 2.2 |

SDL = Sample detection limit
ND = Not detected
NDR = Peak detected but did not meet quantification criteria

| Surrogate Standard Recovery | (%) |
|---|---|
| $^{13}C$-$T_4CDD$: | 46 |
| $^{13}C$-$T_4CDF$: | 48 |
| $^{13}C$-$P_5CDD$: | 45 |
| $^{13}C$-$H_6CDD$: | 45 |
| $^{13}C$-$H_7CDD$: | 43 |
| $^{13}C$-$O_8CDD$: | 41 |

Approved by: MCHamill

M. Coreen Hamilton
A. Dale Hoover

ANALYSIS REPORT

POLYCHLORINATED DIBENZODIOXINS AND DIBENZOFURANS

HIGH RESOLUTION GC/MS

Client: EVS Environment Consultants

Our File: 2581

Sample ID: ACOE Humboldt 4/274.12.5
HB-8 Dec. 4/91

Axys ID: 2581-04

Sample Weight: 12.81 g dry

Date: January 29, 19[illegible]

| Dioxins | Concentration pg/g | (SDL) |
|---|---|---|
| $T_4CDD$ - Total | 2.6 | 0.2 |
| 2,3,7,8 | 0.3 | 0.2 |
| $P_5CDD$ - Total | 3.2 | 0.1 |
| 1,2,3,7,8 | 0.4 | 0.1 |
| $H_6CDD$ - Total | 26 | 0.3 |
| 1,2,3,4,7,8 | ND | 0.3 |
| 1,2,3,6,7,8 | 3.5 | 0.3 |
| 1,2,3,7,8,9 | 1.5 | 0.3 |
| $H_7CDD$ - Total | 36 | 0.3 |
| 1,2,3,4,6,7,8 | 15 | 0.3 |
| $O_8CDD$ | 79 | 0.3 |

| Furans | Concentration pg/g | (SDL) |
|---|---|---|
| $T_4CDF$ - Total | 7.0 | 0.1 |
| 2,3,7,8 | 1.6 | 0.1 |
| $P_5CDF$ - Total | 2.6 | 0.2 |
| 1,2,3,7,8 | ND | 0.2 |
| 2,3,4,7,8 | ND | 0.2 |
| $H_6CDF$ - Total | 5.4 | 0.4 |
| 1,2,3,4,7,8 | ND | 0.4 |
| 1,2,3,6,7,8 | 0.6 | 0.4 |
| 2,3,4,6,7,8 | ND | 0.4 |
| 1,2,3,7,8,9 | ND | 0.4 |
| $H_7CDF$ - Total | 2.2 | 0.2 |
| 1,2,3,4,6,7,8 | 0.9 | 0.2 |
| 1,2,3,4,7,8,9 | ND | 0.2 |
| $O_8CDF$ | 6.0 | 0.3 |

SDL = Sample detection limit
ND = Not detected
NDR = Peak detected but did not meet quantification criteria

| Surrogate Standard Recovery | (%) |
|---|---|
| $^{13}C$-$T_4CDD$: | 89 |
| $^{13}C$-$T_4CDF$: | 72 |
| $^{13}C$-$P_5CDD$: | 85 |
| $^{13}C$-$H_6CDD$: | 84 |
| $^{13}C$-$H_7CDD$: | 98 |
| $^{13}C$-$O_8CDD$: | 86 |

Approved by: McHamill

M. Coreen Hamilton
A. Dale Hoover

ANALYSIS REPORT

POLYCHLORINATED DIBENZODIOXINS AND DIBENZOFURANS

HIGH RESOLUTION GC/MS

Client: EVS Environment Consultants | Our File: 2581

Sample ID: ACOE Humboldt 9/274.13.5 HB-9 Dec. 4/91 | Axys ID: 2581-02

Sample Weight: 11.30 g dry | Date: January 29, 19

| Dioxins | Concentration pg/g | (SDL) |
|---|---|---|
| $T_4CDD$ - Total | ND | 0.2 |
| 2,3,7,8 | ND | 0.2 |
| $P_5CDD$ - Total | ND | 0.2 |
| 1,2,3,7,8 | ND | 0.2 |
| $H_6CDD$ - Total | ND | 0.3 |
| 1,2,3,4,7,8 | ND | 0.3 |
| 1,2,3,6,7,8 | ND | 0.3 |
| 1,2,3,7,8,9 | ND | 0.3 |
| $H_7CDD$ - Total | ND | 0.4 |
| 1,2,3,4,6,7,8 | NDR(0.7) | 0.4 |
| $O_8CDD$ | 2.2 | 0.5 |

| Furans | Concentration pg/g | (SDL) |
|---|---|---|
| $T_4CDF$ - Total | 0.4 | 0.2 |
| 2,3,7,8 | ND | 0.2 |
| $P_5CDF$ - Total | ND | 0.1 |
| 1,2,3,7,8 | ND | 0.1 |
| 2,3,4,7,8 | ND | 0.1 |
| $H_6CDF$ - Total | ND | 0.2 |
| 1,2,3,4,7,8 | ND | 0.2 |
| 1,2,3,6,7,8 | ND | 0.2 |
| 2,3,4,6,7,8 | ND | 0.2 |
| 1,2,3,7,8,9 | ND | 0.2 |
| $H_7CDF$ - Total | ND | 0.1 |
| 1,2,3,4,6,7,8 | ND | 0.1 |
| 1,2,3,4,7,8,9 | ND | 0.1 |
| $O_8CDF$ | ND | 0.5 |

SDL = Sample detection limit
ND = Not detected
NDR = Peak detected but did not meet quantification criteria

| Surrogate Standard Recovery | (%) |
|---|---|
| $^{13}C-T_4CDD$: | 81 |
| $^{13}C-T_4CDF$: | 65 |
| $^{13}C-P_5CDD$: | 74 |
| $^{13}C-H_6CDD$: | 71 |
| $^{13}C-H_7CDD$: | 88 |
| $^{13}C-O_8CDD$: | 83 |

Approved by: MCHamilton

M. Coreen Hamilton
A. Dale Hoover

# SEDIMENT INORGANIC CHEMISTRY DATA

ABRIDGED DATA SUMMARY - Dry Weight Basis　　File No. 9829B

| | | Minimum Conc. | Maximum Conc. | Mean Conc. | Standard Deviation |
|---|---|---|---|---|---|
| **Total Metals** | | | | | |
| Arsenic | T-As | 6.77 | 7.71 | 7.20 | 0.43 |
| Chromium | T-Cr | 202 | 224 | 211 | 2.50 |
| Copper | T-Cu | 25.5 | 28.5 | 27.4 | 1.13 |
| Lead | T-Pb | 5.6 | 6.5 | 6.0 | 0.4 |
| Mercury | T-Hg | 0.079 | 0.096 | 0.084 | 0.005 |
| Nickel | T-Ni | 111 | 117 | 113 | 1.50 |
| Selenium | T-Se | <0.15 | 0.16 | 0.16 | 0.01 |
| Zinc | T-Zn | 64.7 | 68.5 | 67.0 | 0.40 |
| **Polyaromatic Hydrocarbons** | | | | | |
| Fluorene | | <0.007 | 0.009 | 0.008 | 0.001 |
| Phenanthrene | | <0.007 | 0.017 | 0.014 | 0.004 |
| **Acid Extractables** | | | | | |
| Phenol | | <0.030 | 0.039 | 0.034 | 0.004 |
| Total Phenols | | <0.030 | 0.039 | 0.034 | 0.004 |
| **ther Tests** | | | | | |
| Total Organic Carbon C % | | 0.73 | 0.75 | 0.75 | 0.01 |

Results are expressed as milligrams per dry kilogram except where noted.
< = Less than the detection limit indicated.

Note: data summaries represent only those parameters detected for HB-8 and HB-9

| | | HB-8 Wet Dec04/91 | HB-8 Wet/Dup. Dec04/91 | HB-9 Wet Dec04/91 |
|---|---|---|---|---|
| **Physical Tests** | | | | |
| Moisture | % | 25.0 | - | 19.6 |
| **Total Metals** | | | | |
| Arsenic | T-As | 5.63 | 5.76 | 5.44 |
| Cadmium | T-Cd | <0.10 | <0.10 | <0.10 |
| Chromium | T-Cr | 167 | 151 | 167 |
| Copper | T-Cu | 19.1 | 20.1 | 22.9 |
| Lead | T-Pb | 4.9 | 4.8 | 4.5 |
| Mercury | T-Hg | 0.072 | 0.062 | 0.064 |
| Nickel | T-Ni | 82.6 | 87.6 | 89.0 |
| Selenium | T-Se | 0.11 | <0.10 | 0.13 |
| Silver | T-Ag | <0.10 | <0.10 | <0.10 |
| Zinc | T-Zn | 51.2 | 48.4 | 54.2 |

| | | Ref. Wet Dec06/91 | Control Wet Dec03/91 |
|---|---|---|---|
| **Physical Tests** | | | |
| Moisture | % | 28.6 | 18.4 |
| **Total Metals** | | | |
| Arsenic | T-As | 3.20 | 1.73 |
| Cadmium | T-Cd | <0.10 | <0.10 |
| Chromium | T-Cr | 130 | 60.7 |
| Copper | T-Cu | 8.50 | 4.98 |
| Lead | T-Pb | 3.4 | 1.0 |
| Mercury | T-Hg | 0.048 | <0.010 |
| Nickel | T-Ni | 53.3 | 25.3 |
| Selenium | T-Se | <0.10 | <0.10 |
| Silver | T-Ag | <0.10 | <0.10 |
| Zinc | T-Zn | 35.4 | 20.6 |

Results are expressed as milligrams per wet kilogram except where noted.
< = Less than the detection limit indicated.
Dup. = Duplicate.

RESULTS OF ANALYSIS - Dry Weight Basis File No.9829B

| | | HB-8 Dry Dec04/91 | HB-8 Dry/Dup. Dec04/91 | HB-9 Dry Dec04/91 |
|---|---|---|---|---|
| **Total Metals** | | | | |
| Arsenic | T-As | 7.53 | 7.71 | 6.77 |
| Cadmium | T-Cd | <0.15 | <0.15 | <0.15 |
| Chromium | T-Cr | 224 | 202 | 208 |
| Copper | T-Cu | 25.5 | 27.0 | 28.5 |
| Lead | T-Pb | 6.5 | 6.4 | 5.6 |
| Mercury | T-Hg | 0.096 | 0.082 | 0.079 |
| Nickel | T-Ni | 111 | 117 | 111 |
| Selenium | T-Se | 0.15 | <0.15 | 0.16 |
| Silver | T-Ag | <0.15 | <0.15 | <0.15 |
| Zinc | T-Zn | 68.5 | 64.7 | 67.4 |

| | | Ref. Dry Dec06/91 | Control Dry Dec03/91 |
|---|---|---|---|
| **Total Metals** | | | |
| Arsenic | T-As | 4.39 | 2.10 |
| Cadmium | T-Cd | <0.15 | <0.15 |
| Chromium | T-Cr | 178 | 74.0 |
| Copper | T-Cu | 11.7 | 6.07 |
| Lead | T-Pb | 4.7 | 1.2 |
| Mercury | T-Hg | 0.066 | <0.015 |
| Nickel | T-Ni | 73.3 | 30.9 |
| Selenium | T-Se | <0.15 | <0.15 |
| Silver | T-Ag | <0.15 | <0.15 |
| Zinc | T-Zn | 48.7 | 25.1 |

Results are expressed as milligrams per dry kilogram except where noted.
< = Less than the detection limit indicated.
Dup. = Duplicate.

# ANALYSIS REPORT

**Client: EVS Environment Consultants**

**Our File: 2581**
**January 22, 1992**

**(Concentration in ng/g)**
**Dry Weight Basis**

| **Sample I.D.** | **Client I.D.** | **Tributyltin** | **Dibutyltin** | **Butyltin** |
|---|---|---|---|---|
| 2581-01 | ACOE Humboldt 4/274.12.5 Reference Dec. 6-11/91 | ND (0.2) | ND (0.2) | ND (0.2) |
| 2581-02A | ACOE Humboldt 9/274.13.5 HB-9 Dec. 4/91 | ND (0.2) | ND (0.2) | ND (0.2) |
| 2581-02B | Duplicate | ND (0.2) | ND (0.3) | ND (0.2) |
| 2581-03 | ACOE Humboldt 4/274.12.5 West Beach Control Dec. 3/91 | ND (0.1) | ND (0.3) | ND (0.2) |
| 2581-04 | ACOE Humboldt 4/274.12.5 HB-8 Dec. 4/91 | NDR(0.2)(0.1) | ND (0.3) | 0.3 (0.1) |

Detection limits are given in brackets
ND = Not detected
NDR = Peak detected but did not meet quantification criteria

Approved by: Dale Hoover
M. Coreen Hamilton
A. Dale Hoover

# SEDIMENT ORGANIC CHEMISTRY DATA

RESULTS OF ANALYSIS - Wet Weight Basis File No. 9829B

| | HB-8 Wet Dec04/91 | HB-8 Wet/Dup. Dec04/91 | HB-9 Wet Dec04/91 |
|---|---|---|---|
| **Polyaromatic Hydrocarbons** | | | |
| Acenaphthene | <0.005 | <0.005 | <0.005 |
| Acenaphthylene | <0.005 | <0.005 | <0.005 |
| Anthracene | <0.005 | <0.005 | <0.005 |
| Benzo(a)anthracene | <0.010 | <0.010 | <0.010 |
| Benzo(a)pyrene | <0.020 | <0.020 | <0.020 |
| Benzo(b)fluoranthene | <0.020 | <0.020 | <0.020 |
| Benzo(ghi)perylene | <0.020 | <0.020 | <0.020 |
| Benzo(k)fluoranthene | <0.020 | <0.020 | <0.020 |
| Chrysene | <0.010 | <0.010 | <0.010 |
| Dibenzo(a,h)anthracene | <0.020 | <0.020 | <0.020 |
| Fluoranthene | <0.010 | <0.010 | <0.010 |
| Fluorene | 0.007 | 0.007 | <0.005 |
| Indeno(1,2,3-cd)pyrene | <0.020 | <0.020 | <0.020 |
| Naphthalene | <0.020 | <0.020 | <0.020 |
| Phenanthrene | <0.005 | 0.010 | 0.014 |
| Pyrene | <0.010 | <0.010 | <0.010 |

| | Ref. Wet Dec06/91 | Control Wet Dec03/91 |
|---|---|---|
| **Polyaromatic Hydrocarbons** | | |
| Acenaphthene | <0.005 | <0.005 |
| Acenaphthylene | <0.005 | <0.005 |
| Anthracene | <0.005 | <0.005 |
| Benzo(a)anthracene | <0.010 | <0.010 |
| Benzo(a)pyrene | <0.020 | <0.020 |
| Benzo(b)fluoranthene | <0.020 | <0.020 |
| Benzo(ghi)perylene | <0.020 | <0.020 |
| Benzo(k)fluoranthene | <0.020 | <0.020 |
| Chrysene | <0.010 | <0.010 |
| Dibenzo(a,h)anthracene | <0.020 | <0.020 |
| Fluoranthene | <0.010 | <0.010 |
| Fluorene | <0.005 | <0.005 |
| Indeno(1,2,3-cd)pyrene | <0.020 | <0.020 |
| Naphthalene | <0.020 | <0.020 |
| Phenanthrene | 0.007 | <0.005 |
| Pyrene | <0.010 | <0.010 |

Results are expressed as milligrams per wet kilogram except where noted.
< = Less than the detection limit indicated.
Dup. = Duplicate.

RESULTS OF ANALYSIS - Wet Weight Basis File No. 9829B

| | HB-8<br>Wet<br>Dec04/91 | HB-8<br>Wet/Dup.<br>Dec04/91 | HB-9<br>Wet<br>Dec04/91 |
|---|---|---|---|
| **Organochloride Pesticides** | | | |
| alpha-BHC | <0.001 | <0.001 | <0.001 |
| beta-BHC | <0.001 | <0.001 | <0.001 |
| gamma-BHC (Lindane) | <0.001 | <0.001 | <0.001 |
| delta-BHC | <0.001 | <0.001 | <0.001 |
| cis-Chlordane (alpha) | <0.005 | <0.005 | <0.005 |
| trans-Chlordane (gamma) | <0.005 | <0.005 | <0.005 |
| 4,4'-DDD | <0.001 | <0.001 | <0.001 |
| 4,4'-DDE | <0.0005 | <0.0005 | <0.0005 |
| 4,4'-DDT | <0.001 | <0.001 | <0.001 |
| Dieldrin | <0.0005 | <0.0005 | <0.0005 |
| Endosulfan I | <0.002 | <0.002 | <0.002 |
| Endosulfan II | <0.0005 | <0.0005 | <0.0005 |
| Endosulfan Sulfate | <0.010 | <0.010 | <0.010 |
| Endrin | <0.0005 | <0.0005 | <0.0005 |
| Heptachlor | <0.0005 | <0.0005 | <0.0005 |
| Heptachlor Epoxide | <0.010 | <0.010 | <0.010 |
| Toxaphene | <0.030 | <0.030 | <0.030 |
| **Polychlorinated Biphenyls** | | | |
| PCB 1242 | <0.020 | <0.020 | <0.020 |
| PCB 1248 | <0.020 | <0.020 | <0.020 |
| PCB 1254 | <0.020 | <0.020 | <0.020 |
| PCB 1260 | <0.020 | <0.020 | <0.020 |
| Total Polychlorinated Biphenyls | <0.020 | <0.020 | <0.020 |

Results are expressed as milligrams per wet kilogram except where noted.
< = Less than the detection limit indicated.
Dup. = Duplicate.

RESULTS OF ANALYSIS - Wet Weight Basis File No. 9829B

| | Ref. Wet Dec06/91 | Ref. Wet/Dup. Dec06/91 | Control Wet Dec03/91 |
|---|---|---|---|
| **Organochloride Pesticides** | | | |
| alpha-BHC | <0.001 | <0.001 | <0.001 |
| beta-BHC | <0.001 | <0.001 | <0.001 |
| gamma-BHC (Lindane) | <0.001 | <0.001 | <0.001 |
| delta-BHC | <0.001 | <0.001 | <0.001 |
| cis-Chlordane (alpha) | <0.005 | <0.005 | <0.005 |
| trans-Chlordane (gamma) | <0.005 | <0.005 | <0.005 |
| 4,4'-DDD | <0.001 | <0.001 | <0.001 |
| 4,4'-DDE | <0.0005 | <0.0005 | <0.0005 |
| 4,4'-DDT | <0.001 | <0.001 | <0.001 |
| Dieldrin | <0.0005 | <0.0005 | <0.0005 |
| Endosulfan I | <0.002 | <0.002 | <0.002 |
| Endosulfan II | <0.0005 | <0.0005 | <0.0005 |
| Endosulfan Sulfate | <0.010 | <0.010 | <0.010 |
| Endrin | <0.0005 | <0.0005 | <0.0005 |
| Heptachlor | <0.0005 | <0.0005 | <0.0005 |
| Heptachlor Epoxide | <0.010 | <0.010 | <0.010 |
| Toxaphene | <0.030 | <0.030 | <0.030 |
| **Polychlorinated Biphenyls** | | | |
| PCB 1242 | <0.020 | <0.020 | <0.020 |
| PCB 1248 | <0.020 | <0.020 | <0.020 |
| PCB 1254 | <0.020 | <0.020 | <0.020 |
| PCB 1260 | <0.020 | <0.020 | <0.020 |
| Total Polychlorinated Biphenyls | <0.020 | <0.020 | <0.020 |

Results are expressed as milligrams per wet kilogram except where noted.
< = Less than the detection limit indicated.
Dup. = Duplicate.

RESULTS OF ANALYSIS - Wet Weight Basis File No. 9829B

| | HB-8 Wet Dec04/91 | HB-8 Wet/Dup. Dec04/91 | HB-9 Wet Dec04/91 |
|---|---|---|---|
| **Chlorinated Phenols** | | | |
| 2,4-Dichlorophenol | <0.020 | <0.020 | <0.020 |
| 2,3,4-Trichlorophenol | <0.020 | <0.020 | <0.020 |
| 2,3,5-Trichlorophenol | <0.020 | <0.020 | <0.020 |
| 2,4,5-Trichlorophenol | <0.020 | <0.020 | <0.020 |
| 2,4,6-Trichlorophenol | <0.020 | <0.020 | <0.020 |
| 2,3,4,5-Tetrachlorophenol | <0.020 | <0.020 | <0.020 |
| 2,3,4,6-Tetrachlorophenol | <0.020 | <0.020 | <0.020 |
| 2,3,5,6-Tetrachlorophenol | <0.020 | <0.020 | <0.020 |
| Pentachlorophenol | <0.020 | <0.020 | <0.020 |
| Total Chlorinated Phenols | <0.020 | <0.020 | <0.020 |
| **Acid Extractables** | | | |
| 2,4-Dimethylphenol | <0.020 | <0.020 | <0.020 |
| Phenol | 0.028 | 0.029 | <0.020 |
| Total Phenols | 0.028 | 0.029 | <0.020 |

| | Ref. Wet Dec06/91 | Ref. Wet/Dup. Dec06/91 | Control Wet Dec03/91 |
|---|---|---|---|
| **Chlorinated Phenols** | | | |
| 2,4-Dichlorophenol | <0.020 | <0.020 | <0.020 |
| 2,3,4-Trichlorophenol | <0.020 | <0.020 | <0.020 |
| 2,3,5-Trichlorophenol | <0.020 | <0.020 | <0.020 |
| 2,4,5-Trichlorophenol | <0.020 | <0.020 | <0.020 |
| 2,4,6-Trichlorophenol | <0.020 | <0.020 | <0.020 |
| 2,3,4,5-Tetrachlorophenol | <0.020 | <0.020 | <0.020 |
| 2,3,4,6-Tetrachlorophenol | <0.020 | <0.020 | <0.020 |
| 2,3,5,6-Tetrachlorophenol | <0.020 | <0.020 | <0.020 |
| Pentachlorophenol | <0.020 | <0.020 | <0.020 |
| Total Chlorinated Phenols | <0.020 | <0.020 | <0.020 |
| **Acid Extractables** | | | |
| 2,4-Dimethylphenol | <0.020 | <0.020 | <0.020 |
| Phenol | <0.020 | <0.020 | <0.020 |
| Total Phenols | <0.020 | <0.020 | <0.020 |

Results are expressed as milligrams per wet kilogram except where noted.
< = Less than the detection limit indicated.
Dup. = Duplicate.

RESULTS OF ANALYSIS - Wet Weight Basis File No. 9829B

| | | HB-8 Wet Dec04/91 | HB-8 Wet/Dup. Dec04/91 | HB-9 Wet Dec04/91 |
|---|---|---|---|---|
| **Extractables** | | | | |
| Oil & Grease | | <50 | <50 | <50 |
| Total Petroleum Hydrocarbons | | <50 | <50 | <50 |
| **Other Tests** | | | | |
| Total Organic Carbon | C % | 0.55 | 0.56 | 0.60 |

| | | Ref. Wet Dec06/91 | Ref. Wet/Dup. Dec06/91 | Control Wet Dec03/91 |
|---|---|---|---|---|
| **Extractables** | | | | |
| Oil & Grease | | <50 | <50 | <50 |
| Total Petroleum Hydrocarbons | | <50 | <50 | <50 |
| **Other Tests** | | | | |
| Total Organic Carbon | C % | 0.18 | 0.16 | 0.09 |

Results are expressed as milligrams per wet kilogram except where noted.
< = Less than the detection limit indicated.
Dup. = Duplicate.

RESULTS OF ANALYSIS - Dry Weight Basis File No.9829B

| | HB-8 Dry Dec04/91 | HB-8 Dry/Dup. Dec04/91 | HB-9 Dry Dec04/91 |
|---|---|---|---|
| <u>Polyaromatic Hydrocarbons</u> | | | |
| Acenaphthene | <0.007 | <0.007 | <0.007 |
| Acenaphthylene | <0.007 | <0.007 | <0.007 |
| Anthracene | <0.007 | <0.007 | <0.007 |
| Benzo(a)anthracene | <0.015 | <0.015 | <0.015 |
| Benzo(a)pyrene | <0.030 | <0.030 | <0.030 |
| Benzo(b)fluoranthene | <0.030 | <0.030 | <0.030 |
| Benzo(ghi)perylene | <0.030 | <0.030 | <0.030 |
| Benzo(k)fluoranthene | <0.030 | <0.030 | <0.030 |
| Chrysene | <0.015 | <0.015 | <0.015 |
| Dibenzo(a,h)anthracene | <0.030 | <0.030 | <0.030 |
| Fluoranthene | <0.015 | <0.015 | <0.015 |
| Fluorene | 0.009 | 0.009 | <0.007 |
| Indeno(1,2,3-cd)pyrene | <0.030 | <0.030 | <0.030 |
| Naphthalene | <0.030 | <0.030 | <0.030 |
| Phenanthrene | <0.007 | 0.013 | 0.017 |
| Pyrene | <0.015 | <0.015 | <0.015 |

| | Ref. Dry Dec06/91 | Control Dry Dec03/91 |
|---|---|---|
| <u>Polyaromatic Hydrocarbons</u> | | |
| Acenaphthene | <0.007 | <0.007 |
| Acenaphthylene | <0.007 | <0.007 |
| Anthracene | <0.007 | <0.007 |
| Benzo(a)anthracene | <0.015 | <0.015 |
| Benzo(a)pyrene | <0.030 | <0.030 |
| Benzo(b)fluoranthene | <0.030 | <0.030 |
| Benzo(ghi)perylene | <0.030 | <0.030 |
| Benzo(k)fluoranthene | <0.030 | <0.030 |
| Chrysene | <0.015 | <0.015 |
| Dibenzo(a,h)anthracene | <0.030 | <0.030 |
| Fluoranthene | <0.015 | <0.015 |
| Fluorene | <0.007 | <0.007 |
| Indeno(1,2,3-cd)pyrene | <0.030 | <0.030 |
| Naphthalene | <0.030 | <0.030 |
| Phenanthrene | 0.010 | <0.007 |
| Pyrene | <0.015 | <0.015 |

Results are expressed as milligrams per dry kilogram except where noted.
< = Less than the detection limit indicated.
Dup. = Duplicate.

RESULTS OF ANALYSIS - Dry Weight Basis File No.9829B

| | HB-8 Dry Dec04/91 | HB-8 Dry/Dup. Dec04/91 | HB-9 Dry Dec04/91 |
|---|---|---|---|
| **Organochloride Pesticides** | | | |
| alpha-BHC | <0.001 | <0.001 | <0.001 |
| beta-BHC | <0.001 | <0.001 | <0.001 |
| gamma-BHC (Lindane) | <0.001 | <0.001 | <0.001 |
| delta-BHC | <0.001 | <0.001 | <0.001 |
| cis-Chlordane (alpha) | <0.007 | <0.007 | <0.007 |
| trans-Chlordane (gamma) | <0.007 | <0.007 | <0.007 |
| 4,4'-DDD | <0.001 | <0.001 | <0.001 |
| 4,4'-DDE | <0.0007 | <0.0007 | <0.0007 |
| 4,4'-DDT | <0.001 | <0.001 | <0.001 |
| Dieldrin | <0.0007 | <0.0007 | <0.0007 |
| Endosulfan I | <0.003 | <0.003 | <0.003 |
| Endosulfan II | <0.0007 | <0.0007 | <0.0007 |
| Endosulfan Sulfate | <0.015 | <0.015 | <0.015 |
| Endrin | <0.0007 | <0.0007 | <0.0007 |
| Heptachlor | <0.0007 | <0.0007 | <0.0007 |
| Heptachlor Epoxide | <0.015 | <0.015 | <0.015 |
| Toxaphene | <0.045 | <0.045 | <0.045 |
| **Polychlorinated Biphenyls** | | | |
| PCB 1242 | <0.030 | <0.030 | <0.030 |
| PCB 1248 | <0.030 | <0.030 | <0.030 |
| PCB 1254 | <0.030 | <0.030 | <0.030 |
| PCB 1260 | <0.030 | <0.030 | <0.030 |
| Total Polychlorinated Biphenyls | <0.030 | <0.030 | <0.030 |

Results are expressed as milligrams per dry kilogram except where noted.
< = Less than the detection limit indicated.
Dup. = Duplicate.

RESULTS OF ANALYSIS - Dry Weight Basis File No.9829B

| | Ref. Dry Dec06/91 | Ref. Dry/Dup. Dec06/91 | Control Dry Dec03/91 |
|---|---|---|---|
| **Organochloride Pesticides** | | | |
| alpha-BHC | <0.001 | <0.001 | <0.001 |
| beta-BHC | <0.001 | <0.001 | <0.001 |
| gamma-BHC (Lindane) | <0.001 | <0.001 | <0.001 |
| delta-BHC | <0.001 | <0.001 | <0.001 |
| cis-Chlordane (alpha) | <0.007 | <0.007 | <0.007 |
| trans-Chlordane (gamma) | <0.007 | <0.007 | <0.007 |
| 4,4'-DDD | <0.001 | <0.001 | <0.001 |
| 4,4'-DDE | <0.0007 | <0.0007 | <0.0007 |
| 4,4'-DDT | <0.001 | <0.001 | <0.001 |
| Dieldrin | <0.0007 | <0.0007 | <0.0007 |
| Endosulfan I | <0.003 | <0.003 | <0.003 |
| Endosulfan II | <0.0007 | <0.0007 | <0.0007 |
| Endosulfan Sulfate | <0.015 | <0.015 | <0.015 |
| Endrin | <0.0007 | <0.0007 | <0.0007 |
| Heptachlor | <0.0007 | <0.0007 | <0.0007 |
| Heptachlor Epoxide | <0.015 | <0.015 | <0.015 |
| Toxaphene | <0.045 | <0.045 | <0.045 |
| **Polychlorinated Biphenyls** | | | |
| PCB 1242 | <0.030 | <0.030 | <0.030 |
| PCB 1248 | <0.030 | <0.030 | <0.030 |
| PCB 1254 | <0.030 | <0.030 | <0.030 |
| PCB 1260 | <0.030 | <0.030 | <0.030 |
| Total Polychlorinated Biphenyls | <0.030 | <0.030 | <0.030 |

Results are expressed as milligrams per dry kilogram except where noted.
< = Less than the detection limit indicated.
Dup. = Duplicate.

RESULTS OF ANALYSIS - Dry Weight Basis File No.9829B

| | HB-8 Dry Dec04/91 | HB-8 Dry/Dup. Dec04/91 | HB-9 Dry Dec04/91 |
|---|---|---|---|
| **Chlorinated Phenols** | | | |
| 2,4-Dichlorophenol | <0.030 | <0.030 | <0.030 |
| 2,3,4-Trichlorophenol | <0.030 | <0.030 | <0.030 |
| 2,3,5-Trichlorophenol | <0.030 | <0.030 | <0.030 |
| 2,4,5-Trichlorophenol | <0.030 | <0.030 | <0.030 |
| 2,4,6-Trichlorophenol | <0.030 | <0.030 | <0.030 |
| 2,3,4,5-Tetrachlorophenol | <0.030 | <0.030 | <0.030 |
| 2,3,4,6-Tetrachlorophenol | <0.030 | <0.030 | <0.030 |
| 2,3,5,6-Tetrachlorophenol | <0.030 | <0.030 | <0.030 |
| Pentachlorophenol | <0.030 | <0.030 | <0.030 |
| Total Chlorinated Phenols | <0.030 | <0.030 | <0.030 |
| **Acid Extractables** | | | |
| 2,4-Dimethylphenol | <0.030 | <0.030 | <0.030 |
| Phenol | 0.038 | 0.039 | <0.030 |
| Total Phenols | 0.038 | 0.039 | <0.030 |

| | Ref. Dry Dec06/91 | Ref. Dry/Dup. Dec06/91 | Control Dry Dec03/91 |
|---|---|---|---|
| **Chlorinated Phenols** | | | |
| 2,4-Dichlorophenol | <0.030 | <0.030 | <0.030 |
| 2,3,4-Trichlorophenol | <0.030 | <0.030 | <0.030 |
| 2,3,5-Trichlorophenol | <0.030 | <0.030 | <0.030 |
| 2,4,5-Trichlorophenol | <0.030 | <0.030 | <0.030 |
| 2,4,6-Trichlorophenol | <0.030 | <0.030 | <0.030 |
| 2,3,4,5-Tetrachlorophenol | <0.030 | <0.030 | <0.030 |
| 2,3,4,6-Tetrachlorophenol | <0.030 | <0.030 | <0.030 |
| 2,3,5,6-Tetrachlorophenol | <0.030 | <0.030 | <0.030 |
| Pentachlorophenol | <0.030 | <0.030 | <0.030 |
| Total Chlorinated Phenols | <0.030 | <0.030 | <0.030 |
| **Acid Extractables** | | | |
| 2,4-Dimethylphenol | <0.030 | <0.030 | <0.030 |
| Phenol | <0.030 | <0.030 | <0.030 |
| Total Phenols | <0.030 | <0.030 | <0.030 |

Results are expressed as milligrams per dry kilogram except where noted.
< = Less than the detection limit indicated.
Dup. = Duplicate.

**RESULTS OF ANALYSIS - Dry Weight Basis** **File No.9829B**

| | | HB-8 Dry Dec04/91 | HB-8 Dry/Dup. Dec04/91 | HB-9 Dry Dec04/91 |
|---|---|---|---|---|
| **Extractables** | | | | |
| Oil & Grease | | <75 | <75 | <75 |
| Total Petroleum Hydrocarbons | | <75 | <75 | <75 |
| **Other Tests** | | | | |
| Total Organic Carbon | C % | 0.73 | 0.75 | 0.75 |

| | | Ref. Dry Dec06/91 | Ref. Dry/Dup. Dec06/91 | Control Dry Dec03/91 |
|---|---|---|---|---|
| **Extractables** | | | | |
| Oil & Grease | | <75 | <75 | <75 |
| Total Petroleum Hydrocarbons | | <75 | <75 | <75 |
| **Other Tests** | | | | |
| Total Organic Carbon | C % | 0.25 | 0.22 | 0.11 |

Results are expressed as milligrams per dry kilogram except where noted.
< = Less than the detection limit indicated.
Dup. = Duplicate.

# APPENDIX 4

## BIOLOGICAL RESOURCES
## AND
## REPORT



PACIFIC AFFILIATES
A CONSULTING ENGINEERING GROUP
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# BIOLOGICAL RESOURCES INVESTIGATION
# LOUISIANA-PACIFIC DOCK MODIFICATIONS
# SAMOA, CALIFORNIA

MAY 1994

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# INVESTIGATION OF BIOLOGICAL RESOURCES
# PROPOSED LOUISIANA-PACIFIC DOCK MODIFICATIONS
# SAMOA, CALIFORNIA

MAY 1994

## I SCOPE OF WORK

An investigation of the biological resources at the Louisiana-Pacific Dock and at the dredge spoil disposal ponds was undertaken in order to 1) inventory the aquatic, subtidal, intertidal, and terrestrial resources of the project area and its immediate vicinity and 2) assess the potential impact of dredging, filling, and construction on these resources. Mitigation of potential impacts and alternative design will not be addressed as part of this report. Previous reports resulting from this investigation were printed in July 1993 and March 1994. The present report has been prepared in order to address changes in the original survey area and refinement of previous area calculations, to include an assessment of the dredge spoil disposal ponds, and to incorporate a separate short report on protected plant and animal species which may occur within the area. Hydrographic work completed subsequent to the issue of the initial report was used to further define the extent of eelgrass beds, and to quantify the area to be impacted by project implementation.

## II PROJECT LOCATION

The primary study area is located on the Bay side of the Samoa peninsula, in an area which has been in industrial use for a number of years. The dredge spoil disposal area is located northerly of the dock, between New Navy Base Road and Samoa Road, just west of the Samoa Bridge (US 255). This permitted area has been used for spoil disposal in conjunction with past projects. Both areas are shown on Figure 1.

## III PROJECT DESCRIPTION

The proposed project will include construction of a bulkhead, placement of fill behind the bulkhead, extension of concrete piers on pilings to the north and south of the dock, construction of a new gangway (on the south), and dredging of the area between the bulkhead and the main channel.

The dredge spoil disposal site contains a primary dewatering area, a secondary dewatering area, a decant water return, and a

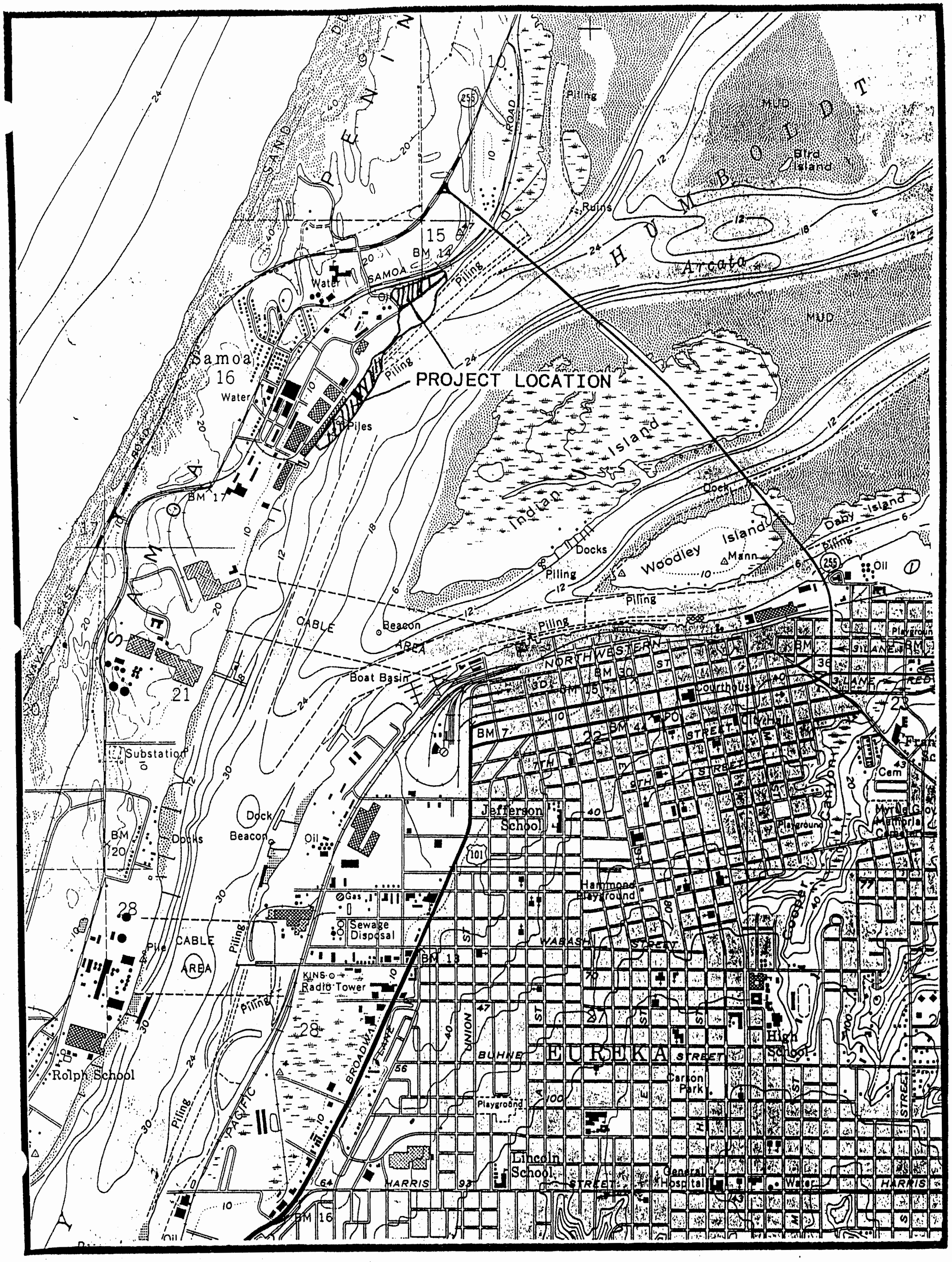


FIGURE 1
PROJECT LOCATION

carrier pipe to discharge the decant water into the bay. In past operations the dredge spoils have been pumped to a central location in the primary dewatering area, where the major portion of the heavier and larger-grained spoils and fines settle out; the residual water is discharged to the secondary dewatering area, immediately to the west. Final sedimentation occurs in the secondary dewatering area, with the residual water flowing then through the decant water return and ultimately discharging into Humboldt Bay.

## IV PROJECT TEAM

The biological investigation was jointly undertaken by Karen Theiss and Associates (KTA) of McKinleyville and Thomas Payne and Associates (TPA) of Arcata. Karen Theiss was the project manager and coordinator. KTA conducted the inventory of terrestrial and aquatic vegetation and terrestrial and avian wildlife, as well as the assessment of the project impacts on these resources. TPA undertook the aquatic, intertidal, and subtidal inventory, analysis, and assessment of potential impacts on these resources.

## V METHODOLOGY

The identification of biological resources and the assessment of potential impacts was based on field survey, literature review, and consultation with agency personnel and other knowledgeable individuals. Terrestrial and intertidal vegetation was surveyed on the morning of June 4, 1993 in order to correspond with the low tide level of -1.6 feet. Terrestrial vegetation was identified and mapped as to habitat type and species composition. Eelgrass density was determined by establishing three transects, each being 100 feet long and parallel to the shore. The transects were located at the upper edge of the intertidal zone, at 100 feet into the intertidal zone, and at 200 feet into the intertidal. They were located to include the site of the new gangway, plus 25 feet on either side. Ten plots, each 0.1 square meter in size, were sampled for eelgrass turions at ten foot intervals along each transect.

The identification of terrestrial and avian wildlife species which utilize the project area was based on recently published literature. Primary among these was Amphibians, Reptiles and Mammals of the Beach and Dune Area, prepared by KTA for the Humboldt County Planning Department in January 1992, and Birds of the Coastal Dunes Study Area, prepared by John Sterling for the Humboldt County Planning Department in 1990.

The species composition, distribution, and relative abundance of marine invertebrate species associated with the proposed project were assessed through a combination of quantitative and qualitative field sampling. Three primary marine habitat types were found to be present: intertidal mudflat, subtidal habitat, and piling/rock substrate. The mudflat habitats were sampled along transect lines with a quantitative core sampler while the piling/rock habitat was thoroughly examined for specimens. Divers were utilized to sample subtidal habitat and piling/rock habitats. Sampling occurred during a minus tide cycle on June 4, 1993.

Identification of invertebrates was to the species level where facilitated by readily identifiable characteristics. Species which required dissection or detailed microscopic examination for unequivocal results were identified to genus or family level only. These latter individuals were retained for future processing if necessary. Description of fish species potentially affected by the proposed project was conducted through a literature review of existing reports in agency files and Humboldt State University archives, including Masters Degree research.

## VI LEGAL CONSIDERATIONS

### A. Protected Species

1. Federal Government - The Federal Government has two designations for sensitive species, Endangered and Threatened. Additionally, some species are Candidates for listing, and are included in one of the following categories:

Category 1 = taxa for which the Service has on file enough substantial information on biological vulnerability and threat(s) to support proposals to list them as endangered or threatened species;

Category 2 = taxa for which there is some evidence of vulnerability, but for which there are not enough data to support listing proposals; further research on these taxa should push them into Category 1 or Category 3;

Category 3 = taxa that once were considered for listing as threatened or endangered but are no longer under consideration; these species are not candidates for listing, but remain on the list in the event that conditions change;

3a. - taxa for which the Service has persuasive evidence of extinction;

3b. - names which do not represent distinct taxa meeting the Act's definition of "species";

3c. - taxa that have proven to be more abundant or widespread than previously believed and/or those that are not subject to any identifiable threat.

An additional category is the "Recommended" status. This applies to those species which have been recommended by US Fish and Wildlife Service to be added to any of the categories included in the Candidate lists.

2. State Government - The State of California lists sensitive species with one of three designations: Endangered, Threatened, and Rare. The State also maintains lists of Special Plants and of Special Animals, which include species, subspecies, or varieties which fall into one or more of the following categories:

- officially listed by California or the Federal government;

- candidates for State of Federal listing;

- taxa which meet the criteria for listing, even if not currently included on any list, as described in Section 15380 of the CEQA Guidelines;

- Bureau of Land management, US Fish and Wildlife Service, or US Forest Service Sensitive Species;

- taxa listed in the Inventory of Rare and Endangered Vascular Plants of California, published by the California Native Plant Society;

- taxa listed on the California Department of Fish and Game Species of special Concern;

- taxa that are biologically rare, very restricted in distribution or declining throughout their range, but not currently threatened with extirpation;

- population(s) in California that may be peripheral to the major portion of a taxon's range but are threatened with extirpation in California;

- taxa associated with a habitat that is declining in California at an alarming rate.

B. Sensitive Habitats

The US Army Corps of Engineers (COE) has permit jurisdiction over the entire project area below Mean High Water (elevation 6.39 feet Mean Lower Low Water [MLLW])). This includes the lower portion of the rock slope protection and all bayward habitats. The COE regulates the placement of fill and all activities within the waters of the United States below MHW, under Section 10 of the Rivers and Harbors Act. Similarly, the COE regulates the placement of fill within the waters of the United States above MHW under Section 404 of the Clean Water Act.

The Department of Fish and Game is also concerned with activities and fill placed in wetlands and deep-water habitats. While the agency does not have permitting authority over projects such as this, it will be a commenting agency during the environmental review process to be undertaken by the Harbor District, and will also comment directly to the California Coastal Commission.

Both agencies aim to ensure no net loss of wetlands as a result of project implementation. They are also concerned with the potential disturbance of eelgrass beds, due to their high habitat value. Fill of intertidal and subtidal habitats as well as the disruption and/or fill of eelgrass beds will require mitigation by these agencies.

## VII DESCRIPTION OF HABITAT TYPES

A. Upland

1. Vegetation - Terrestrial vegetation at the Louisiana-Pacific Dock is very sparse, due to the industrial nature of the area. There are strips of ruderal (weedy) vegetation along the edge of the southerly paved area and also along the westerly edge of the dock. Species characteristic of these ruderal strips include California blackberry (*Rubus ursinus*), velvet grass (*Holcus lanatus*), cat's ear (*Hypochaeris radicata*), and butterweed (*Senecio* sp.). A more extensive area of disturbed coastal scrub vegetation is located north of the existing dock, and is characterized by wax myrtle (*Myrica californica*), coastal willow (*Salix hookeriana*), coyote brush (*Baccharis pilularis*), bush lupine (*Lupinus arboreus*), fireweed (*Epilobium angustifolium* ssp. *circumvagum*), perennial ryegrass (*Lolium perenne*), and ripgut brome (*Bromus diandrus*). A small drainage course runs through this area, discharging into the bay. Salt rush (*Juncus leseurii*) is the dominant species in the drainage. A listing of vegetative species noted in the project area is included in Appendix A.

The primary dewatering pond at the dredge spoil disposal area is surrounded by a berm approximately 30 feet in height. The bottom of this dewatering area was characterized by deep fissures at the time of field investigation (October 1, 1993), indicative of the high clay content of the spoils material. This area supports extremely sparse vegetation with scattered individual perennial pickleweed (*Salicornia virginica*) and clumps of dogtail (*Cynosurus echinatus*). The secondary dewatering area is surrounded by a berm about five feet in height and is characterized by a much more extensive vegetative area. The major portion of the area is vegetated by pickleweed, with a cover of 50% to 75%. Incidental species noted include pampas grass (*Cortaderia selloana*), willow herb (*Epilobium* sp.), velvet grass (*Holcus lanatus*), coyote brush (*Baccharis pilularis*), and yarrow (*Achillea millefolium*). A compiled list of species noted during field review is included in Appendix A. The far westerly portion of the secondary area had much less vegetative cover, while the easterly portion (which appears somewhat higher in elevation) had up to 100% cover. Pickleweed was extremely sparse to absent in this easterly portion.

The outer slopes of both the primary and secondary dewatering areas supported primarily ruderal (weedy) vegetation, with the following species being readily evident: bush lupine, Himalaya berry (*Rubus discolor*), pampas grass, sea fig (*Carpobrotus edulis*), velvet grass, yarrow, Chilean aster (*Aster chilensis*), field mustard (*Brassica rapa*), and common butterweed (*Senecio vulgaris*).

The decant water return ditch adjacent to the secondary dewatering area supported sparsely spaced individuals of pickleweed and virtually no other vegetation. The substrate was deeply cracked as in the primary dewatering area. The return ditch adjacent to the primary dewatering area supported ruderal vegetation similar to that on the outer slopes, as described above.

Pickleweed, a plant most commonly associated with salt marsh habitat, is found in varying densities throughout the dredge spoil disposal area, from sparse to moderately dense (<5-75%) cover. Dense-flowered cord grass (*Spartina densiflora*), an invasive, exotic salt marsh species, is found very sparsely in the secondary dewatering area. These two species likely survive in this area due to the high water-holding capacity and high salt content of the dredge spoils. This area is not a functioning salt marsh due to the lack of appropriate tidal hydrology, the presence of numerous plant species not associated with the salt marsh community, and the absence of foraging avian species normally associated with salt marsh habitat.

2. Wildlife - The extent of development and activity at the L-P Dock, as well very restricted upland vegetation, act to minimize the diversity and numbers of wildlife species occurring in this area. What wildlife activity exists is likely confined to the upland area north of the existing parking area, and is probably comprised of small reptiles, mammals, and birds. Species which would be expected in the upland area include gophers, snakes, and frogs. Appendix B presents a listing of common and uncommon avian species which would be expected within the various habitats within the project area, as excerpted from Sterling (1990). Appendix C includes a listing of wildlife species which might be encountered within the project area, as excerpted from Theiss (1992).

Upland wildlife habitat values for avian species are expected to be fairly low at the dredge spoil disposal ponds, primarily due to a lack of trees and woody shrubs and a concurrent scarcity of roosting and nesting areas. Some ground-dwelling mammals probably utilize the general area for foraging and nesting. Verbal consultation with local wildlife biologist Ron LeValley confirmed that wildlife habitat value for this site is fairly low.

B. Salt Marsh

Several very small patches of low quality salt marsh were noted in the transition area between the upper intertidal and upland vegetation. These are characterized by dense-flowered cord grass and perennial pickleweed. These patches are so small that it is very unlikely that they are used for foraging by species normally associated with salt marsh habitat. The locations of the patches of vegetation around the existing facility are noted on Figure 2.

C. Intertidal Mudflats

1. Vegetation - Intertidal vegetation included sparse individuals of two green algae, sea lettuce (*Ulva* sp.) and *Enteromorpha intestinalis*, and eelgrass (*Zostera marina*), a marine flowering plant. The algae was located primarily on cobbles (rocky intertidal mudflat) at the upper edge of the mudflat, just bayward of the shoreline. The eelgrass bed was located in a bed south of the existing dock, as shown on Figure 2.

Eelgrass beds constitute a special habitat within the wetland complex of the bay. They perform a variety of functions important to the biological health and diversity of the bay, including 1) a source of food for waterfowl and other species which graze directly on the plants or on the associated microfauna, 2) shelter for juvenile shellfish and finfish in the water column, 3) substrate for encrusting organisms, 4) stabilization of water-borne sediments, and 5) shelter for benthic invertebrates. Eelgrass beds have high habitat value as a result of the diversity of avian, aquatic, and benthic faunal species associated with them. The presence of eelgrass on intertidal muds increases the habitat value of the muds by increasing the epibenthic fauna and foraging use by shorebirds.

Eelgrass density, as measured along three transects, was fairly variable, ranging from 0 to 13 turions/0.1 square meter with an overall average of 5.2 turions/0.1 square meter (see Appendix D). The mean density was highest (7.5 turions/0.1 square meter) along Transect 1, located about 200 feet from the upper edge of the intertidal zone, and lowest along Transect 2 (3.3 turions/0.1 square meter), located approximately 100 feet from the upper edge of the intertidal. Transect 1 was located bayward of the pilings, Transect 2 was located within the pilings, and Transect 3 was located at the upper (westerly) edge. It is possible that the lower values obtained along Transects 2 and 3 may reflect the influences of partial shading by the pilings.

Eelgrass densities, production, and extent of growth can vary greatly from year to year and from season to season (Keller, 1963; Waddell, 1964; Bixler, 1982; Phillips, 1984). Density and growth are usually at their highest during mid-summer months and lowest during mid-winter months. Table 1 lists the eelgrass densities reported from other areas in Humboldt Bay (Theiss, 1990) as well as the results from the present study. Eelgrass density at the LP Dock is next to the lowest of all site reported, and is substantially less than the dense eelgrass beds sampled in South Bay and at Fields Landing.

2. <u>Wildlife</u> - A wide variety of avian species utilize the intertidal mudflats for feeding and some for resting. Birds characteristic of this habitat include waders, shorebirds, some waterfowl, gulls, and terns (Sterling, 1990). The habitat value of exposed intertidal muds is expected to be moderate to moderately high due to the presence of the eelgrass beds. The potential value may be somewhat lessened by adjacent industrial activity. The habitat value of the intertidal muds underneath the dock is low, due to the absence of sunlight, the low clearance between the dock substructure and the muds, and the low density and diversity of benthic organisms serving as food (see section 3 below).

TABLE 1

EELGRASS DENSITIES IN HUMBOLDT BAY

| Location | Mean # Turions per square meter | Sampling Date | Source |
|---|---|---|---|
| South Bay | 200 | 1962 | Keller, 1963 |
| Arcata Bay | 31 | 1962 | Keller, 1963 |
| Fields Landing | 164 | Oct/Nov, 1987 | Newton, 1988 |
| Fields Landing | 68 | Oct/Nov, 1987 | Newton, 1988 |
| Eureka Small Boat Basin | 71 | Feb, 1986 | Roberts, 1986 |
| Eureka Forest Products | 109 | Aug, 1990 | Theiss, 1990 |
| Del Norte Pier | 63 | Feb/Apr, 1991 | Botanica NW, 1991 |
| LP Dock, Samoa | 52 | June, 1993 | present study |

3. <u>Benthic Organisms</u> - Fifteen intertidal mudflat core samples were obtained from the project area (see Figure 3). Two samples were taken to the north (MF1, MF2) and south (MF11, MF12) of the existing main dock, another eight (two transects of four each, MF3 to MF10) were taken under the existing dock, and a final three (MF13 to MF15) were taken on a transect line extending out from shore 200 feet south of the dock.

A large amount of each core sample consisted of undecayed wood fiber, which probably originated as sawdust and bark from the nearby mill. The combination of this particulate matter, shade from the decking over the dock, and hydrocarbons from industrial activity are the most likely contributing factors to a general lack of species abundance and diversity in the project intertidal area. Only a few species (19) and low numbers (11 per sample) of polychaete worms, gammerid amphipods, clams, and crabs were identified within all of the samples (Appendix E). These numbers compare to 71 different species and over 200 individuals per sample in similar intertidal mudflat habitat near Fields Landing, a few miles from this site (Newton, 1988). Fewer individuals per sample on average were identified within the dock

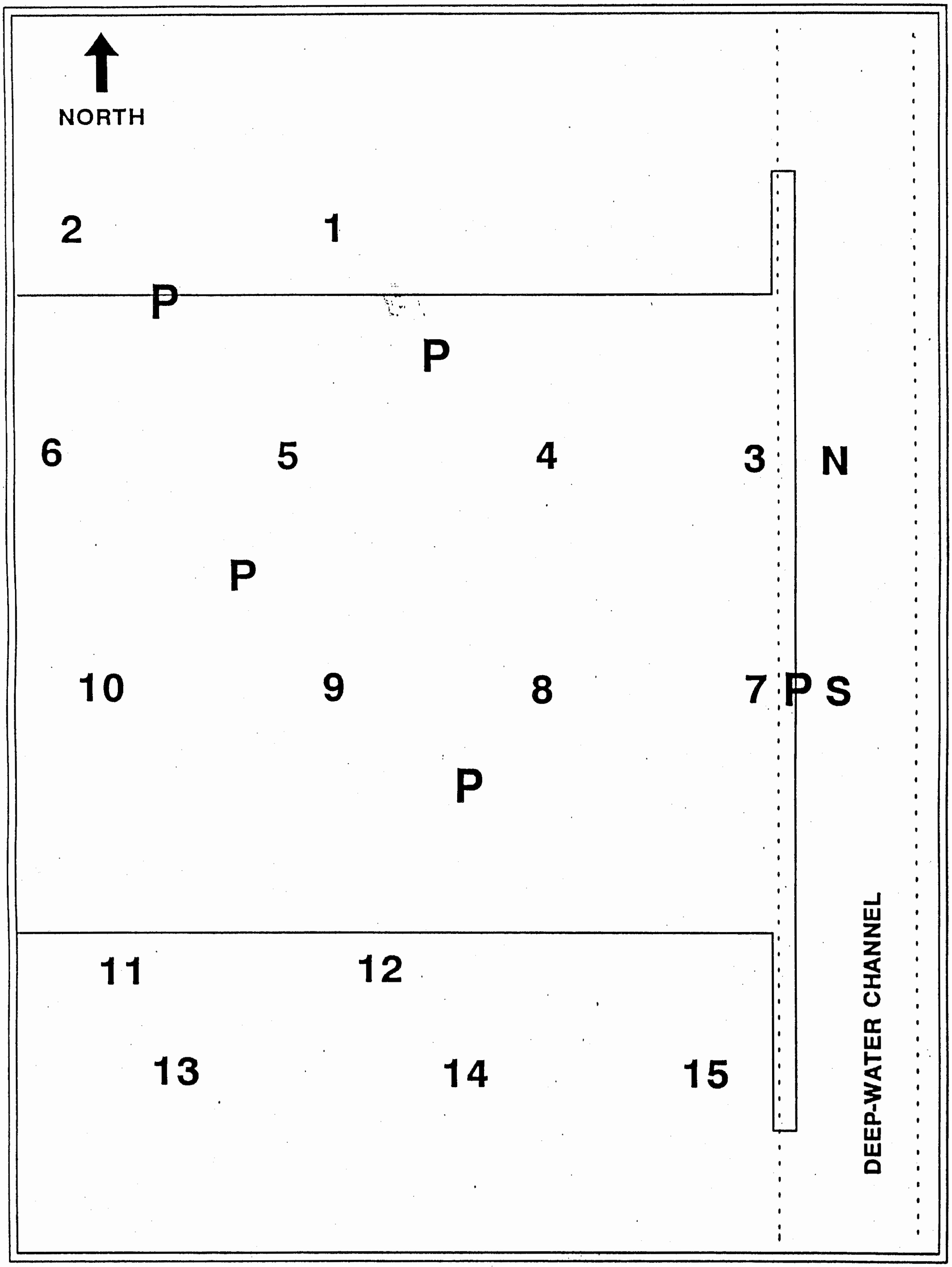


Figure 3. Invertebrate sampling sites for LP Dock Project, 4 June 1993. Sites 1-15 represent shallow mudflat sample areas; piling sample sites designated by "P"; deep-water sites designated by N (north site) and S (south site).

boundary (9) than outside the boundary (14). Biomass amounted to only a few grams of live organic matter per liter sample.

D. Piling/Rock

Sparse marine algae occurs on the pilings and outer piers of the wooden dock, as well as on the exposed pilings. Invertebrate species abundance and distribution on pilings and rocks in the project area was stratified by tidal influence and contact with the substrate. Subtidal piling areas contained more species and individuals, as did ropes and ladders hanging from the dock which did not allow access to predators such as starfish. Intertidal pilings under the dock typically supported only scattered small barnacles. Twenty-six species were found on pilings and rocks which did not occur on the mudflats, including sponges, anemones, hydra, barnacles, caprellid amphipods, crabs, clams, snails, bryozoans, starfish, tunicates, and algaes (Appendix E). The primary factor in the difference between species on piling/rock habitat and on mudflat habitat is the hardness of the substrate which would allow attachment and suspension in the water column. Subtidal or hanging surfaces were often completely covered by various species, often in several layers with some species using others as additional substrate.

E. Subtidal Habitat

Two samples (DWN, DWS) of subtidal muds were obtained by divers from the dredge channel before strong tidal currents precluded further activity. These samples also contained particulate organic matter, although not as much as intertidal areas. An additional 9 species were identified from the deeper water, including 5 polychaetes, 2 crustaceans, and 2 clams (Appendix E). An average of 30 individuals was counted in the samples, with polychaete worms and a cumacean accounting for most of the higher number. Biomass per sample remained at a few grams.

F. Open Waters

Avian species regularly encountered foraging in the open waters include cormorants, loons, grebes, ducks, gulls, and brown pelicans. Mammalian species which may be regularly observed include the harbor seal (*Phoca vitulina*) and the California sea lion (*Zalophus californianus*).

Sampling for fisheries resources was not attempted due to anticipated difficulties in capture and high seasonal and tidal variation in species occurrence and abundance. Fish species most common to Humboldt bay and therefore likely to utilize the project area include Pacific herring, northern anchovy, Pacific tomcod, shiner perch, walleye surfperch, white surfperch, bay goby, Pacific staghorn sculpin, speckled sanddab, and English sole. A list of fish species potentially occupying the waters of the project area to varying degrees was compiled from a review of existing literature (Appendix F).

## VIII PROTECTED SPECIES WHICH MAY OCCUR IN THE PROJECT AREA

### A. Tidewater Goby (*Eucyclogobius newberryi*)

This species is listed as endangered by the Federal government, and is on the California Department of Fish and Game list of Species of Special Concern. This species prefers low salinity (<10 ppt) waters (Swift et al. 1989); the dock is relatively close to the bay entrance and is typically highly saline (34 ppt; Barnhart et al. 1992). The reported locality of the tidewater goby in Humboldt Bay was the extreme northeast end of the bay near the Arcata oxidation ponds (Swift et al. 1989), about six miles from the project. It is unlikely that this species would occur in the project area because of its preference for low salinity waters.

### B. Green Sturgeon (*Acipenser medirostris*)

This species has been recommended for Category 2 status by the US Fish and Wildlife Service; at this time it has no State standing. A letter report addressing this species as well as the longfin smelt was prepared by Thomas Payne and Associates and is included in Appendix G. In that letter, Mr. Payne states: "While green sturgeon may migrate and feed in the ship channel off the L-P Dock, the benthic habitat of the project area is generally degraded and contains few potential food sources. Active use of the project area by green sturgeon should be considered unlikely."

### C. Longfin Smelt (*Spirinchus thalcichthys*)

This species has been recommended for as a Candidate for Category 2 status by the US Fish and Wildlife Service, but has no State standing. According to Mr. Payne, this species has been reported as being abundant historically in Humboldt Bay, but has very recently declined dramatically and may no longer be present. In his letter Mr. Payne states: "Active use of the project area by longfin smelt should also be considered unlikely, due to its reported disappearance from Humboldt Bay and localized degraded habitat quality and a scarcity of potential food organisms near the L-P Dock."

D. California Brown Pelican (*Pelecanus occidentalis californicus*)

This species is listed as Endangered by both the Federal and State governments. It is a summer resident which forages for fish in the open waters of the bay and ocean, and likely uses the waters directly off of the L-P Dock. It would also be expected to roost on the pilings in the immediate vicinity of the project and mitigation areas, particularly during periods of low human and vehicular activity.

E. Aleutian Canada Goose (*Branta canadensis leucopareia*)

This species is listed as Threatened by the Federal Government and as a Special Animal by the State of California. This species passes through the Humboldt Bay area on its northerly migration in the spring. Due to lack of suitable habitat, this species is not expected to forage or rest in the project area; it may possibly be observed as a "fly-over" during the migratory season.

F. American Peregrine Falcon (*Falco peregrinus anatum*)

This species is listed as Endangered by both the Federal and State governments. It migrates through the area and may winter near the Bay. The Peregrine Falcon preys on shorebirds, waterfowl, and other birds, and thus may forage in suitable habitat at the project site. It may also potentially be observed as a "fly-over" at the dredge spoil disposal site and at the mitigation site.

G. Northern Harrier (*Circus cyaneus*)

This bird is a Species of Special Concern with no Federal designation. It is a year-round resident which regularly forages in the open habitats around the Bay, particularly on the north spit. It was noted at the dredge spoil disposal site during field review in January 1994.

H. California Clapper Rail (*Rallus longirostris obsoletus*)

This species, listed as Endangered by both the Federal and State governments, is a resident species dependent upon coastal saltmarsh habitat. According to Roberts (1993), the species has been recorded from Indian Island. Records at the Eureka office of the Department of Fish and Game indicate that specimens of this species were taken from the Humboldt Bay area earlier in the century (1930's); there were unconfirmed (and possibly speculative) sightings of this species until 1966 (Karen Kovacs, pers. comm.).

I. Long-billed Curlew (*Numenius americanus*)

This species is a Federal Category 2 Candidate and a State Species of Special Concern. It forages in marshes, mudflats, and beaches, and would be expected to utilize the extensive intertidal mudflats in the project area. It is regularly present in the Humboldt Bay area from September through April, although occasional non-breeders may be observed later in the year (Kovacs, pers. comm.).

J. Marbled Murrelet (*Brachyramphus marmoratus*)

This species is listed as Threatened by the Federal government as Endangered by the State government. While it nests in mature coniferous forests away from the project site, it does forage for fish in near-shore waters of the Bay as well as the ocean, and thus potentially may be found using the waters at the project site.

K. Townsend's Western Big-eared Bat (*Plecotus townsendii townsendii*)

This species is a Federal Category 2 Candidate and is on the California list of Species of Special Concern. The buildings on the dock were investigated by Ron LeValley, a local wildlife biologist, for the presence of this species; his report is included in the Appendix G. Mr. LeValley found no evidence of present or past use of the structures by bats. Given the high level of activity in and around the buildings and the sensitivity of Townsend's Western Big-eared Bat to disturbance, it is highly improbable that this species would use the structures.

L. Humboldt Bay owl's-clover (*Castilleja ambigua* ssp. *humboldtiensis*)

This salt marsh species is listed as Federal Candidate for Category 2 and on the California list of Special Plants. It is an annual plant normally encountered in upper elevation salt marsh. No evidence of this plant was located at the project site. The salt marsh habitat present at the project site is fragmented, very small (total combined area of less than 200 square feet), and at low elevation; it is highly unlikely that this species would be present (Eicher, 1990).

M. Pt. Reyes bird's-beak (*Cordylanthus maritimus* ssp. *palustris*)

This salt marsh species is also listed as Federal Candidate for Category 2 and on the California list of Special Plants. As with the owl's-clover, it is an annual plant normally encountered in upper elevation salt marsh. No evidence of this plant was located at the project site. As with the previous species, it is highly unlikely that this species would be present due to the small size and low elevation of the salt marsh patches.

N. <u>Menzies wallflower (*Erysimum menziesii* ssp. *eurekense*)</u>

This species is listed as Endangered by both the Federal and State governments. It is associated with dune mat habitat, but may also occurs in lower densities along the borders of lupine scrub and herbaceous hollows (Duebendorfer 1992). No evidence of this species was found in the project area nor would it be expected due to the extent of vegetative cover.

O. <u>Beach layia (*Layia carnosa*)</u>

This species is also listed as Endangered by both the Federal and State governments. As with the previous species, the preferred habitat is open, semi-stable sands supporting fairly sparse dune mat vegetation. This plant is a short-lived annual and is believed to be an early successional species. There was no evidence of beach layia at the project site, not would it be expected due to the lack of suitable habitat.

P. <u>Pink sand verbena (*Abronia umbellata* ssp. *breviflora*)</u>

This species is a Federal Candidate for Category 2 listing and is also on the California list of Special Plants. As with the preceding two species, it is associated with open sands supporting dune mat vegetation. This species was not noted during field investigation, nor would it be expected due to the stabilized nature of the sandy environment and the extensive vegetative cover.

## IX DISCUSSION OF POTENTIAL IMPACTS

### A. Upland

1. <u>Vegetation</u> - All vegetation at the dock will be removed as part of project implementation. Since much of the vegetation is ruderal in nature and restricted in its distribution, the impacts are expected to be minimal or negligible, and should not require mitigation.

The primary impact of renewed use of the permitted dredge spoil disposal area will be the covering of vegetation, all of which has established since the previous placement of spoils several years ago (1987). The dredge spoils will come from the same part of the bay as the previous material, specifically the shipping channel adjacent to the LP dock. It is expected that the dewatering areas will again support the same vegetative complex within a few years of disposal. Mitigation should not be required since this area is designated by both Federal and State areas as an active dredge spoil disposal area.

2. Wildlife - The impacts of project implementation on terrestrial wildlife resources are expected to be minimal to negligible in and around the existing dock facility, due to the low wildlife use at present. The impacts may be somewhat more at the disposal site since this area is farther removed from human activity and has a more diverse vegetative component. This area, however, has been so severely degraded that further impacts are not expected to impact the overall wildlife resources of the general area substantially. Mitigation should not be required since this area is designated by both Federal and State areas as an active dredge spoil disposal area.

B. Salt Marsh - The small patches of degraded salt marsh, with a combined total area between 100 and 200 square feet, will be removed as part of project implementation. The patches are so small that they provide minimal habitat value. Mitigation may be required by State and/or Federal agencies for removal of this vegetation.

C. Intertidal Mudflats

1. Vegetation - Construction of the southerly pier extension and attached new gangway of the dock will shade about 14,775 square feet (0.34 acres) of eelgrass. Eelgrass is important to a variety of species, as discussed above, and has been in a decline statewide over recent years. Both State and Federal agencies will require mitigation near to the project site for this disturbance.

2. Wildlife - Avian species which utilize the exposed mudflats will be displaced during construction, as a result of noise and human activity, but are expected to return following completion of construction. Since there is little to no avian use of the intertidal area beneath the dock, no wildlife impacts are anticipated in this area. The overall habitat value of the exposed mudflat, and thus the density and diversity of species utilizing this area, may decline as a result of increased human and equipment activity associated with the improved dock facilities. Indirect impacts, such as stormwater runoff, accidental spills, and debris deposition, are expected to be less than at present due to the proposed design of the bulkhead for spill containment and treatment.

3. Benthic Organisms - Construction of a perimeter bulkhead and installation of new pilings to support the pier extensions and the gangway will cause the permanent net loss of 5.6 acres of intertidal mudflats. The invertebrate species presently occupying the substrate will not be able to recolonize the new concrete structure. Both Federal and State agencies will require mitigation for the loss of intertidal habitat. Dredging associated with the dock expansion and construction will convert 16,500 square feet (0.38 acres) of intertidal mudflat to shallow subtidal habitat. It is anticipated that both Federal and State agencies will require mitigation for the conversion of intertidal habitat to shallow subtidal habitat.

The proposed extension of the piers to the north and south plus the addition of the gangway from the shore will increase the amount of shaded intertidal mudflat, which may result in a moderate decline in species abundance and diversity. Because of the current low quality of the intertidal mudflat habitat and associated lack of species abundance and diversity, these impacts are not expected to be significant.

D. Piling/Rock

Removal of all existing pilings and rocks and replacement with a concrete perimeter bulkhead will cause a temporary loss of the species presently living on those habitats. The majority of species abundance and diversity was found on the perimeter pilings and below the low tide level. The total available surface area of this habitat type (hard substrate) will be increased after construction and will provide essentially the same physical characteristics as the pilings. The new concrete surface is expected to be quickly colonized by the same invertebrate species as on the pilings, making the loss temporary. In addition, new pilings on the dock extensions will eventually create identical intertidal and subtidal areas available for colonization. The long-term impact, therefore, is a net increase in hard substrate available for encrusting organisms.

E. Subtidal Habitat

The dredging proposed adjacent to the expanded facility will increase the total area of subtidal habitat. About 1.1 acres of shallow subtidal habitat (<-20ft MLLW) will be dredged to deep subtidal habitat (>-20ft MLLW), and 4.6 acres of deep subtidal will be deepened further. While dredging will destroy the existing benthic fauna, it is expected that the area will recolonize to a similar density and diversity as the surrounding area. The existing subtidal habitat is of relatively low quality due to a high percentage of particulate organic matter. State agencies may require mitigation for conversion of shallow-water to deep-water habitat. Federal agencies may require mitigation for all subtidal dredging.

F. <u>Open Waters</u>

The use of adjacent waters by foraging birds and mammals is expected to decline during construction and dredging activities, but should return to its present level following the completion of the project. Some temporary loss of fish habitat can be expected during project construction due to physical disturbance and suspended sediments. There will be a permanent loss of a portion of shaded piling habitat (under the existing dock) used by perch and similar species; some of this habitat type, however, will be replaced by the new dock extensions. The total area of deep subtidal channel habitat often used by sharks and sculpins will be increased by the dredging activity.

G. <u>Protected Species</u>

All of the protected avian species discussed above may potentially use the project site for foraging and/or roosting, or may be observed as a "fly over", with the exception of the California Clapper Rail, which hasn't been recorded in the Humboldt Bay Area for a number of decades. The project site and its immediate environs does not support habitat which is particularly unique or critical for any of these species, nor habitat which is not readily available in other area of the Bay. None of these species should be impacted significantly as a result of this project. There will, however, be some temporary displacement due to the level of human activity and noise associated with project construction.

H. <u>Summary of Area to be Impacted</u>

1. <u>Coastal Salt Marsh</u> - 100 to 200 square feet of degraded salt marsh will be filled as a result of placement of rock slope protection (RSP) and dock construction.

2. <u>Rocky Intertidal Mudflat</u> - Placement of RSP will fill 0.2 acres of rocky intertidal mudflat and shoreline. The lower half of RSP will be exposed to tidal action and will provide a hard substrate for encrustation by epibenthic organisms.

3. <u>Intertidal Mudflats</u> - A net area of 5.6 acres will be filled by dock, pier, and gangway construction. Most of the intertidal mudflat to be impacted is of low value and is located underneath the existing wooden dock. Dredging will result in the conversion of 0.38 acres of intertidal mudflat to shallow subtidal

habitat. Thus, there will be a net loss of 5.98 acres of intertidal mudflat habitat.

4. Eelgrass Beds - 14,775 square feet of eelgrass will be shaded by the gangway and southerly pier extension.

5. Subtidal Habitat - Bulkhead construction will fill 0.6 acres of subtidal muds. About 1.1 acres of shallow subtidal habitat will be dredged to deep subtidal habitat, while 0.38 acres will be created by dredging intertidal mudflats; thus there will be a net loss of 0.72 acres of shallow subtidal habitat. There will be a net increase of 1.1 acres of deep subtidal habitat.

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# APPENDICES

# APPENDIX A: TERRESTRIAL VEGETATION

## LP DOCK

| Scientific Name | Common Name |
|---|---|
| *Anthoxanthum oderatum* | sweet vernal grass |
| *Baccharis pilularis* | coyote brush |
| *Brassica rapa* | field mustard |
| *Briza maxima* | big quaking grass |
| *Briza minor* | little quaking grass |
| *Bromus diandrus* | ripgut brome |
| *Bromus mollis* | soft chess |
| *Cakile maritima* | sea rocket |
| *Cortaderia selloana* | pampas grass |
| *Cynosurus cristatus* | crested dogtail |
| *Distichlis spicata* | salt grass |
| *Epilobium angustifolium* ssp. *circumvagum* | fireweed |
| *Geranium dissectum* | cutleaf geranium |
| *Gnaphaleum purpureum* | cudweed |
| *Holcus lanatus* | velvet grass |
| *Hypochaeris radicata* | cat's ears |
| *Lolium perenne* | perennial ryegrass |
| *Lupinus arboreus* | yellow bush lupine |
| *Lupinus* sp. | lupine |
| *Myrica californica* | wax myrtle |
| *Rubus ursinus* | California blackberry |
| *Rumex crispus* | curly dock |
| *Salix hookeriana* | coastal willow |
| *Senecio* sp. | butterweed |
| *Stellaria media* | chickweed |
| *Trifolium repens* | white lawn clover |
| *Vicia americana* var. *americana* | American vetch |

## DREDGE SPOIL DISPOSAL SITE

| Scientific Name | Common Name |
|---|---|
| *Achillea millefolium* | yarrow |
| *Alnus rubra* | red alder |
| *Baccharis pilularis* | coyote brush |
| *Caprobrotus chilensis* | sea fig |
| *Cirsium* sp. | thistle |
| *Cortaderia selloana* | pampas grass |
| *Cynosurus echinatus* | dogtail |

APPENDIX A: TERRESTRIAL VEGETATION

DREDGE SPOIL DISPOSAL SITE
(continued)

| Scientific Name | Common Name |
|---|---|
| *Epilobium* sp. | willow herb |
| *Festuca rubra* | red fescue |
| *Gnaphaleum purpureum* | cudweed |
| *Holcus lanatus* | velvet grass |
| *Hypochaeris* sp. | cat's paw |
| *Lotus corniculatus* | bird's foot trefoil |
| *Lupinus arboreus* | yellow bush lupine |
| *Myrica californica* | wax myrtle |
| *Parentucellia viscosa* | parentucellia |
| *Raphanus sativus* | wild radish |
| *Rubus ursinus* | California blackberry |
| *Rumex acetocella* | sheep's sorrel |
| *Salicornia virginica* | pickleweed |
| *Spartina densiflora* | cord grass |

## APPENDIX B: AVIAN SPECIES

Following is a list of avian species taken from Sterling (1990) which are common and uncommon in the habitats found in the project area. Rare and accidental species are not included.

| Species | Habitat |
|---|---|
| Great-blue heron | intertidal; f/w marsh |
| Great egret | intertidal; f/w marsh |
| Snowy egret | intertidal; f/w marsh |
| Green-backed heron | f/w marsh |
| Black-crowned night heron | intertidal; f/w marsh |
| Canada goose | intertidal |
| Green-winged teal | intertidal |
| Mallard | intertidal |
| Northern pintail | intertidal |
| American widgeon | intertidal |
| Red-breasted merganser | intertidal |
| Turkey vulture | all |
| Black-shouldered kite | woodland; f/w marsh; disturbed |
| Northern harrier | woodland; f/w marsh; disturbed |
| Red-tailed hawk | woodland; f/w marsh; disturbed |
| Rough-legged hawk | woodland; f/w marsh; disturbed |
| American kestrel | woodland; f/w marsh; disturbed |
| Peregrine falcon | intertidal; flyover |
| California quail | woodland |
| Black-bellied plover | intertidal |
| Snowy plover | intertidal |
| Semipalmated plover | intertidal |
| American avocet | intertidal |
| Greater yellowlegs | intertidal |
| Lesser yellowlegs | intertidal |
| Willet | intertidal |
| Spotted sandpiper | intertidal |
| Whimbrel | intertidal |
| Long-billed curlew | intertidal |
| Marbled godwit | intertidal |
| Ruddy turnstone | intertidal |
| Black turnstone | intertidal |
| Red knot | intertidal |

Habitat Types:

- Disturbed - disturbed upland at dredge spoil disposal site
- F/w marsh - freshwater marsh at the dredge spoil disposal site
- Intertidal - mudflats north and south of the existing facility
- Scrub - coastal scrub near existing dock
- Woodland - mixed woodland at dredge spoil disposal site

APPENDIX B: AVIAN SPECIES (continued)

| Species | Habitat |
|---|---|
| Sanderling | intertidal |
| Western sandpiper | intertidal |
| Least sandpiper | intertidal |
| Dunlin | intertidal |
| Short-billed dowitcher | intertidal |
| Long-billed dowitcher | intertidal |
| Mew gull | intertidal |
| Ring-billed gull | intertidal |
| California gull | intertidal |
| Herring gull | intertidal |
| Glaucous-winged gull | intertidal |
| Caspian tern | intertidal |
| Elegant tern | intertidal |
| Forster's tern | intertidal |
| Mourning dove | woodland; f/w marsh; disturbed |
| Short-eared owl | woodland; f/w marsh; disturbed |
| Common nighthawk | aerial |
| Vaux's swift | aerial |
| Belted kingfisher | intertidal |
| Northern flicker | woodland; f/w marsh; disturbed |
| Black phoebe | woodland; f/w marsh; disturbed |
| Tree swallow | aerial |
| Violet-green swallow | aerial |
| Northern rough-winged swallow | aerial |
| Cliff swallow | aerial |
| Barn swallow | aerial |
| Common raven | all |
| Bushtit | woodland; disturbed; scrub |
| Bewick's wren | woodland; disturbed; scrub |
| Winter wren | woodland; disturbed; scrub |
| Marsh wren | f/w marsh |
| Swainson's thrush | woodland; disturbed; scrub |
| American robin | woodland; disturbed; scrub |
| Wrentit | woodland; disturbed; scrub |
| Yellow-rumped warbler | woodland; scrub |
| Savannah sparrow | woodland; scrub; disturbed |
| Fox sparrow | woodland; scrub; disturbed |

Habitat Types:

Disturbed - disturbed upland at dredge spoil disposal site
F/w marsh - freshwater marsh at the dredge spoil disposal site
Intertidal - mudflats north and south of the existing facility
Scrub - coastal scrub near existing dock
Woodland - mixed woodland at dredge spoil disposal site

APPENDIX B: AVIAN SPECIES (continued)

| Species | Habitat |
|---|---|
| Song sparrow | woodland; scrub; disturbed |
| Lincoln's sparrow | woodland; scrub; disturbed |
| Golden-crowned sparrow | woodland; scrub; disturbed |
| White-crowned sparrow | woodland; scrub; disturbed |
| Dark-eyed junco | woodland; scrub; disturbed |
| Red-winged blackbird | f/w marsh |
| Western meadowlark | scrub; disturbed |
| Brewer's blackbird | scrub; disturbed |
| Brown-headed cowbird | scrub; disturbed |
| House finch | scrub |
| American goldfinch | scrub; disturbed |

Habitat Types:

Disturbed - disturbed upland at dredge spoil disposal site
F/w marsh - freshwater marsh at the dredge spoil disposal site
Intertidal - mudflats north and south of the existing facility
Scrub - coastal scrub near existing dock
Woodland - mixed woodland at dredge spoil disposal site

## APPENDIX C: WILDLIFE SPECIES

Following is a list of non-avian terrestrial vertebrates taken from Theiss (1992) which are commonly encountered in the habitats in the project area.

| Species | Habitat |
|---|---|
| Black Rat | f/w marsh |
| Black-tailed Jackrabbit | scrub; disturbed |
| Brush Rabbit | scrub; disturbed |
| California Meadow Mouse | scrub; disturbed |
| California Red-sided Garter Snake | scrub; disturbed |
| Deer Mouse | scrub; disturbed |
| Northwestern Salamander | f/w marsh |
| Pacific Tree Frog | woodland; f/w marsh |
| Porcupine | scrub; disturbed |
| Raccoon | scrub; disturbed |
| Rough-skinned Newt | f/w marsh |
| Striped Skunk | scrub; disturbed |
| Vagrant Shrew | scrub; disturbed |
| Western Harvest Mouse | scrub; disturbed |
| Western Terrestrial Garter Snake | scrub; disturbed |

Habitat Types:

Disturbed - disturbed upland at dredge spoil disposal site
F/w marsh - freshwater marsh at the dredge spoil disposal site
Intertidal - mudflats north and south of the existing facility
Scrub - coastal scrub near existing dock
Woodland - mixed woodland at dredge spoil disposal site

APPENDIX D: EELGRASS DENSITY
Turions /0.1 square meter

| PLOT # | TRANSECT 1 | TRANSECT 2 | TRANSECT 3 |
|---|---|---|---|
| A | 7 | 7 | 9 |
| B | 12 | 4 | 10 |
| C | 3 | 5 | 3 |
| D | 8 | 4 | 4 |
| E | 7 | 1 | 0 |
| F | 8 | 0 | 13 |
| G | 12 | 3 | 1 |
| H | 8 | 0 | 5 |
| I | 5 | 8 | 0 |
| J | 5 | 1 | 3 |
| Sum | 75 | 33 | 48 |
| # Plots | 10 | 10 | 10 |
| Mean | 7.5 | 3.3 | 4.8 |
| Median | 7.5 | 3.5 | 3.5 |

Sum of all plots = 156 turions
Total # plots = 30
Mean = 5.2 turions/0.1 square meter

# APPENDIX E: INVERTEBRATE SPECIES

| SPECIES | SITES 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | N | S | P |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Porifera | | | | | | | | | | | | | | | | | | |
| *Haliclona* sp. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | + |
| Cnidaria | | | | | | | | | | | | | | | | | | |
| Anthozoa | | | | | | | | | | | | | | | | | | |
| *Metridium senile* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | + |
| Hydrozoa | | | | | | | | | | | | | | | | | | |
| *Obelia* sp. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | + |
| Sipuncula | | | | | | | | | | | | | | | | | | |
| *Golfingia hespera* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | + |
| Annelida | | | | | | | | | | | | | | | | | | |
| Polychaeta | | | | | | | | | | | | | | | | | | |
| *Ammotrypane aulogaster** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| *Ampharete arctica* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| *Arabella iricolor** | 0 | 0 | 3 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 2 | 3 | 0 |
| *Capitella capitata* | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *Heteromastus filobranchus* | 2 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | + |
| *Drilonereis falcata* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| *Genetyllis castanea* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | + |
| *Glycinde polygnatha* | 0 | 0 | 0 | 1 | 0 | 0 | 2 | 1 | 0 | 1 | 2 | 0 | 0 | 0 | 1 | 2 | 6 | 0 |
| *Halosdyna brevisetosa* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | + |
| *Haploscoloplos elongatus* | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 4 | 3 | 0 | 0 | 1 | 0 |
| *Mediomastus californiensis* | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 3 | 3 | 0 |
| *Nephtys* sp. | 3 | 0 | 0 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *Nereis* sp. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 |
| *Owenia collaris* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| Unknown Syllidae | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| Unknown spp. | 1 | 0 | 3 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 1 | 0 | 0 |
| Arthropoda | | | | | | | | | | | | | | | | | | |
| Crustacea, Cirripedia | | | | | | | | | | | | | | | | | | |
| *Balanus nubilus* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | + |
| Crustacea, Malacostraca | | | | | | | | | | | | | | | | | | |
| Cumacea | | | | | | | | | | | | | | | | | | |
| *Cumella vulgaris* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 8 | 0 |
| Tanaidacea | | | | | | | | | | | | | | | | | | |
| *Leptochelia dubia* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| Amphipoda, Gammeridea | | | | | | | | | | | | | | | | | | |
| *Corophium stimpsoni* | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 1 | 0 |
| *Grandidierella japonica* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 9 | 3 | 3 | 0 | 1 | 0 | 5 | 0 |
| *Photis brevipes* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 |
| *Pontogeneia* sp. | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 |
| Unknown Stenothoidae | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 1 | 0 | 0 |
| Amphipoda, Caprellidea | | | | | | | | | | | | | | | | | | |
| *Caprella equilibra* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | + |
| *Caprella laeviuscula* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | + |
| *Metacaprella anomala* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | + |
| Eucarida, Decapoda | | | | | | | | | | | | | | | | | | |
| *Hemigrapsus oregonensis* | 0 | 0 | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 |
| *Cancer atennarius* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | + |
| *Pagurus* spp. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | + |
| *Pachygrapsus crassipes* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | + |

NOTE:

Columns 1-15 refer to shallow mudflat benthic sample sites
Columns N and s refer to north or south deep-water cahnnel benthic sample sites
Column P is a piling sample site
+ = present

## APPENDIX E: INVERTEBRATE SPECIES (continued)

| SPECIES | SITES 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | N | S | P |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mollusca | | | | | | | | | | | | | | | | | | |
| Bivalvia | | | | | | | | | | | | | | | | | | |
| *Crassostrea gigas* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | + |
| *Lyonsia californica* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 5 | 0 |
| *Macoma* sp. | 7 | 1 | 2 | 8 | 1 | 0 | 3 | 0 | 1 | 0 | 3 | 2 | 0 | 3 | 5 | 2 | 4 | 0 |
| *Mytilus edulis* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | + |
| *Pododesmus cepio* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | + |
| *Protothaca staminea* | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 3 | 0 | 0 | 9 | 2 | 1 | 0 | 1 | 0 | 0 |
| *Saxidomus nuttalli* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| *Siliqua patula* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 |
| *Tresus capax* | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 9 | 0 | 0 | 0 |
| Gastropoda | | | | | | | | | | | | | | | | | | |
| *Collisella* sp. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | + |
| *Littorina* sp. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | + |
| Opisthobranchia | | | | | | | | | | | | | | | | | | |
| Unknown Nudibranchia | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | + |
| Ectoprocta | | | | | | | | | | | | | | | | | | |
| *Bugula neritina* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | + |
| Echinodermata | | | | | | | | | | | | | | | | | | |
| *Pisaster ochraceus* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | + |
| Urochordata | | | | | | | | | | | | | | | | | | |
| *Archidistoma* sp. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | + |
| Unknown Ascidiacea | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | + |
| Algae | | | | | | | | | | | | | | | | | | |
| *Enteromorpha* sp. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | + |
| *Mastocarpus papillata* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | + |
| *Ulva* sp. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | + |
| TOTALS: | 15 | 1 | 18 | 12 | 7 | 3 | 12 | 5 | 5 | 1 | 15 | 26 | 14 | 8 | 22 | 14 | 47 | |

NOTE:

Columns 1-15 refer to shallow mudflat benthic sample sites
Columns N and s refer to north or south deep-water cahnnel benthic sample sites
Column P is a piling sample site
+ = present

APPENDIX F: LIST OF FISHES FROM HUMBOLDT BAY
Adapted from Barnhart, et. al. (1992).

| SPECIES | COMMON NAME | ABUNDANCE |
|---|---|---|
| Petromyzontidae | | |
| *Lampetra tridentata* | Pacific lamprey | C |
| Hexanchidae | | |
| *Notorynchus maculatus* | Sevengill shark | C |
| Carcharhinidae | | |
| *Mustelus henlei* | Brown smoothhound | C |
| *Triakis semifasciata* | Leopard shark | C |
| Squalidae | | |
| *Squalus acanthias* | Spiny dogfish | O |
| Rajidae | | |
| *Raja binoculata* | Big skate | O |
| Myliobatidae | | |
| *Myliobatis californica* | Bat ray | C |
| Acipenseridae | | |
| *Acipenser medirostris* | Green sturgeon | O |
| Ophichthidae | | |
| *Ophichthus zophochir* | Yellow snake eel | O |
| Clupeidae | | |
| *Alosa sapidissima* | American shad | O |
| *Clupea harengus pallasi* | Pacific herring | A |
| *Dorosoma petenense* | Threadfin shad | O |
| Engraulidae | | |
| *Engraulis mordax* | Northern anchovy | A |
| Salmonidae | | |
| *Oncorhynchus clarki* | Cutthroat trout | O |
| *Oncorhynchus kisutch* | Coho salmon | C |
| *Oncorhynchus mykiss* | Rainbow trout | C |
| *Oncorhynchus tshawytscha* | Chinook salmon | C |
| Osameridae | | |
| *Allosmerus elongatus* | Whitebait smelt | O |
| *Hypomesus pretiosus* | Surf smelt | C |
| *Spirinchus starksi* | Night smelt | C |
| *Spirinchus thaleichthys* | Longfin smelt | A |
| *Thaleichthys pacificus* | Eulachon | O |
| Myctophidae | | |
| *Stenobrachius leucopsarus* | Northern lampfish | O |
| *Tarletonbeania crenularis* | Blue lanternfish | O |

ABUNDANCE RATINGS:

A = Abundant
C = Common
O = Occassional

APPENDIX F: LIST OF FISHES FROM HUMBOLDT BAY (continued)
Adapted from Barnhart, et. al. (1992).

| SPECIES | COMMON NAME | ABUNDANCE |
|---|---|---|
| Gadidae | | |
| *Microgadus proximus* | Pacific tomcod | A |
| Ophidiidae | | |
| *Chilara taylori* | Spotted cusk-eel | O |
| Atherinidae | | |
| *Atherinops affinis* | Topsmelt | C |
| *Atherinopsis californiensis* | Jacksmelt | C |
| Gasterosteidae | | |
| *Aulorhynchus flavidus* | Tube-snout | C |
| *Gasterosteus aculeatus* | Threespine stickleback | C |
| Syngnathidae | | |
| *Syngnathus leptorhynchus* | Bay pipefish | C |
| Sciaenidae | | |
| *Atractoscion nobilis* | White seabass | O |
| *Genyonemus lineatus* | White croaker | O |
| Embiotocidae | | |
| *Amphistichus koelzi* | Calico surfperch | O |
| *Amphistichus rhodoterus* | Redtail surfperch | C |
| *Cymatogaster aggregata* | Shiner perch | A |
| *Embiotoca lateralis* | Striped seaperch | C |
| *Hyperprosopon argenteum* | Walleye surfperch | A |
| *Hyperprosopon ellipticum* | Silver surfperch | C |
| *Phanerodon furcatus* | White seaperch | A |
| *Rhacochilus vacca* | Pile perch | C |
| Trichodontidae | | |
| *Trichodon trichodon* | Pacific sandfish | O |
| Stichaeidae | | |
| *Anoplarchus purpurenscens* | High cockscomb | O |
| *Lumpenus sagitta* | Snake prickleback | O |
| Pholidae | | |
| *Apodichithys flavidus* | Penpoint gunnel | C |
| *Pholis ornata* | Saddleback gunnel | C |
| Cryptancanthodidae | | |
| *Delolepsis gigantea* | Giant wrymouth | O |
| Ammodytidae | | |
| *Ammodytes hexapterus* | Pacific sandlance | C |

ABUNDANCE RATINGS:

A = Abundant
C = Common
O = Occassional

APPENDIX F: LIST OF FISHES FROM HUMBOLDT BAY (continued)
Adapted from Barnhart, et. al. (1992).

| SPECIES | COMMON NAME | ABUNDANCE |
|---|---|---|
| Gobiidae | | |
| *Clevelandia ios* | Arrow goby | C |
| *Coryphopterus nicholsi* | Blackeye goby | O |
| *Eucyclogobius newberryi* | Tidewater goby | O |
| *Lepidogobius lepidus* | Bay goby | A |
| Luvaridae | | |
| *Luvarus imperialis* | Louvar | O |
| Stromateidae | | |
| *Icichthys lockingtoni* | Medusafish | O |
| *Peprilus simillimus* | Pacific pompano | O |
| Scorpaenidae | | |
| *Sebastes auriculatus* | Brown rockfish | C |
| *Sebastes caurinus* | Copper rockfish | C |
| *Sebastes flavidus* | Yellowtail rockfish | O |
| *Sebastes melanops* | Black rockfish | C |
| *Sebastes miniatus* | Vermilion rockfish | O |
| *Sebastes mystinus* | Blue rockfish | O |
| *Sebastes paucispinis* | Bocaccio | O |
| *Sebastes rastrelliger* | Grass rockfish | C |
| Hexagrammidae | | |
| *Hexagrammos decagrammus* | Kelp greenling | C |
| *Hexagrammos lagocephalus* | Rock greenling | O |
| *Ophiodon elongatus* | Lingcod | C |
| *Oxylebius pictus* | Painted greenling | C |
| Cottidae | | |
| *Artedius fenestralis* | Padded sculpin | C |
| *Artedius harringtoni* | Scalyhead sculpin | O |
| *Ascelichthys rhodorus* | Rosylip sculpin | O |
| *Cottus asper* | Prickly sculpin | O |
| *Enophyrys bison* | Buffalo sculpin | C |
| *Hemilepidotus hemilepidotus* | Red Irish lord | C |
| *Hemilepidotus spinosus* | Brown Irish lord | C |
| *Leptocottus armatus* | Pacific staghorn sculpin | A |
| *Nautichthys oculofasciatus* | Sailfin sculpin | O |
| *Scorpaenichthys marmoratus* | Cabezon | C |
| Agonidae | | |
| *Odontopyxix trispinosa* | Pygmy poacher | O |
| *Stellerina xyosterna* | Pricklebreast poacher | O |

ABUNDANCE RATINGS:
A = Abundant
C = Common
O = Occassional

APPENDIX F: LIST OF FISHES FROM HUMBOLDT BAY
Adapted from Barnhart, et. al. (1992).

| SPECIES | COMMON NAME | ABUNDANCE |
|---|---|---|
| Cyclopteridae | | |
| *Liparis fucensis* | Slipskin snailfish | O |
| Bothidae | | |
| *Citharichthys sordidus* | Pacific sanddab | O |
| *Citharichthys stigmaeus* | Speckled sanddab | A |
| Pleuronectidae | | |
| *Isopsetta isolepis* | Butter sole | O |
| *Microstomus pacificus* | Dover sole | O |
| *Parophrys vetulus* | English sole | A |
| *Platichthys stellatus* | Starry flounder | C |
| *Pleuronichthys coenosus* | C-O sole | O |
| *Pleuronichthys decurrens* | Curlfin sole | O |
| *Psettichthys melanostictus* | Sand sole | O |
| Cynoglossidae | | |
| *Symphurus atricauda* | California tonguefish | O |
| Molidae | | |
| *Mola mola* | Ocean sunfish | O |

ABUNDANCE RATINGS:

A = Abundant
C = Common
O = Occassional

# LETTERS REGARDING PROTECTED SPECIES

**_THOMAS R. PAYNE & ASSOCIATES_**
**_FISHERIES CONSULTANTS_**
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850 G Street, Suite J
Arcata, California 95521
(707) 822-8478
FAX (707) 822-8842

March 9, 1994

Ms. Karen Theiss
Karen Theiss & Associates
P.O. Box 3005
McKinleyville, California 95521

RE: Threatened or Endangered Fish Species, L-P Dock Project, Eureka, Calif.

Dear Karen:

The following is submitted in response to your request for additional information regarding potential effects of the L-P Dock Project on green sturgeon and longfin smelt:

Green sturgeon are reported to occur occasionally in Humboldt Bay but are found most frequently in the lower reaches of large rivers of California such as the Sacramento and San Joaquin and the Eel, Mad, Klamath, Trinity, and Smith on the north coast (Barnhart et al. 1992; Moyle 1976; Moyle et al. 1992). They have been captured in salt water from Ensenada, Mexico, to the Bering Sea and Japan (Miller and Lea 1972). Adult green sturgeon feed on benthic organisms and small fish, including opossum shrimp, amphipods, sand lances, anchovies, and clams (Moyle et al. 1992). While green sturgeon may migrate through and feed in the ship channel off the L-P Dock, the benthic habitat of the project area is generally degraded and contains few potential food sources. Active use of the project area by green stugeon should be considered unlikely.

Longfin smelt typically have occurred in estuaries along the Pacific Coast of North America from Prince William Sound, Alaska, to the Sacramento-San Joaquin Estuary (Moyle 1976). They have been reported as historically abundant in Humboldt Bay, feeding in tidal channels and spawning in freshwater tributaries (Barnhart et al. 1992). More recently, however, abundance has dropped dramatically, to the point where they may no longer be present in Humboldt Bay (USFWS 1994). The U.S. Fish and Wildlife Service found on January 6, 1994, that listing of the species as threatened was not warranted, because the species does not appear to be threatened throughout all or a significant portion of its range (USFWS 1994). Active use of the project area by longfin smelt should also be considered unlikely, due to its reported disappearance from Humboldt Bay and localized degraded habitat quality and a scarcity of potential food organisms near the L-P Dock.

Please let me know if you have any questions or require additional details.

Sincerely,

Tom Payne

Thomas R. Payne
Principal Associate

Literature Cited


Barnhart, R.A., M.J. Boyd, and J.E. Pequegnat. 1992. The ecology of Humboldt Bay, California: an estuarine profile. U.S. Fish and Wildlife Service Biological Report 1. 121 pp.

Miller, D.J., and R.N. Lea. 1972. Guide to the coastal marine fishes of California. California Department of Fish and Game, Fish Bulletin 157. 235pp.

Moyle, P.B. 1976. Inland fishes of California. University of California Press, Berkeley, California. 405pp.

Moyle, P.B., P.J. Foley, and R.M. Yoshiyama. 1992. Status of green sturgeon, *Acipenser medirostris*, in California. Department of Wildlife and Fisheries Biology, University of California, Davis. Final report to National Marine Fisheries Service, Terminal Island, California. 11pp.

USFWS. 1994. Endangered and Threatened Wildlife and Plants; Notice of 1-Year Finding on a Petition to List the Longfin Smelt. U.S. Fish and Wildlife Serice, Department of Interior. Federal Register 59(4):869-871.

MAD RIVER BIOLOGISTS
1696 Ocean Dr. • McKinleyville CA 95521
Voice: 707/839-8134 • Fax: 707/839-4656

March 14, 1994

Karen Theiss
1933 Central Ave. Suite C
McKinleyville CA
95521

Dear Karen,

At your request I visited the site of the proposed dock construction on Louisiana Pacific property near Samoa. I visited the site on 13 March 1994 and inspected the buildings to assess their potential for providing habitat for Townsend's Big-eared Bats.

The two buildings at the site are large structures used for storing packaged pulp prior to shipping. Both building under question are of single-walled construction so that there are no potential roosting sites within the walls. The southernmost building has a complicated ceiling structure that could potentially provide hiding/roosting sites for a small number of bats. The northernmost building does not have concealed sites for bats in the ceiling.

During inspection I found no evidence of either present or past use of bats. The only animal droppings encountered were those of feral cats.

Given the is regular activity in the building, including the stacking of packaged pulp tall enough to necessarily disrupt roosting bats throughout the building, and, given the sensitive and easily disturbed nature of Townsend's Big-eared Bats, it is my opinion that these structures are not of use to this species.

Sincerely,

Ron LeValley

Ron LeValley

- population(s) in California that may be peripheral to the major portion of a taxon's range but are threatened with extirpation in California;

- taxa associated with a habitat that is declining in California at an alarming rate.

## III SENSITIVE SPECIES

### A. Fish

1. Tidewater Goby (*Euclyclogobius newberryi*) - This species is listed as endangered by the Federal government, and is on the California Department of Fish and Game list of Species of Special Concern. This species was specifically addressed in the Biological Resources Investigation prepared for the project by Karen Theiss and Associates (1993). It is unlikely that this species would occur in the project area because it prefers low salinity waters.

2. Green Sturgeon (*Acipenser medirostris*) - This species has been recommended for Category 2 status by the US Fish and Wildlife Service; at this time it has no State standing. A letter report addressing this species as well as the longfin smelt was prepared by Thomas Payne and Associates and is included in Appendix A. In that letter, Mr. Payne states: "While green sturgeon may migrate and feed in the ship channel off the L-P Dock, the benthic habitat of the project area is generally degraded and contains few potential food sources. Active use of the project area by green sturgeon should be considered unlikely."

3. Longfin Smelt (*Spirinchus thalcichthys*) - This species has been recommended for as a Candidate for Category 2 status by the US Fish and Wildlife Service, but has no State standing. According to Mr. Payne, this species has been reported as being abundant historically in Humboldt Bay, but has very recently declined dramatically and may no longer be present. In his letter Mr. Payne states: "Active use of the project area by longfin smelt should also be considered unlikely, due to its reported disappearance from Humboldt Bay and localized degraded habitat quality and a scarcity of potential food organisms near the L-P Dock."

### B. Birds

1. California Brown Pelican (*Pelecanus occidentalis californicus*) - This species is listed as Endangered by both the Federal and State governments. It is a summer resident which forages for fish in the open waters of the bay and ocean, and likely uses the waters directly off of the LP dock. It would also be expected to roost on the pilings in the immediate vicinity of the project and mitigation areas.

2. Aleutian Canada Goose (*Branta canadensis leucopareia*) - This species is listed as Threatened by the Federal Government and as a Special Animal by the State of California. This species passes through the Humboldt Bay area on its northerly migration in the spring. Due to lack of suitable habitat, this species is not expected to forage or rest in the project or mitigation areas; it may, however, be observed as a "fly-over" during the migratory season.

3. American Peregrine Falcon (*Falco peregrinus anatum*) - This species is listed as Endangered by both the Federal and State governments. It migrates through the area, and may winter near the Bay. The peregrine falcon preys on shorebirds, waterfowl, and other birds, and thus may forage in suitable habitat at both the project and mitigation sites. It may also potentially be observed as a "fly-over" at the dredge spoil disposal site and at the mitigation site.

4. Northern Harrier (*Circus cyaneus*) - This bird is a Species of Special Concern with no Federal designation. It is a year-round resident which regularly forages in the open habitats around the Bay, particularly on the north spit. It was noted during field review in January 1994.

5. California Clapper Rail (*Rallus longirostris obsoletus*) - This species, listed as Endangered by both the Federal and State governments, is a resident species dependent upon coastal saltmarsh habitat. According to Roberts (1993), the species has been recorded from Indian Island. According to Karen Kovacs, wildlife biologist with the Eureka office of the Department of Fish and Game, specimens of this species were taken from the Humboldt Bay area earlier in the century (1930's), and there were unconfirmed (and possibly speculative) sightings of this species until 1966.

6. Long-billed Curlew (*Numenius americanus*) - This species is a Federal Category 2 Candidate and a State Species of Special Concern. It forages in marshes, mudflats, and beaches, and would be expected to utilize the extensive intertidal mudflats in the project area. It is regularly present in the Humboldt Bay area from September through April, although occasional non-breeders may be observed later in the year (Kovacs, pers. comm.).

7. Marbled Murrelet (*Brachyramphus marmoratus*) - This species is listed as Threatened by the Federal government as Endangered by the State government. While it nests in mature coniferous forests away from the project and mitigation sites, it does forage for fish in near-shore waters of the Bay as well as the ocean, and thus potentially may be found using the waters at the project site.

C. Mammals - Townsend's Western Big-eared Bat *Plecotus townsendii townsendii* - This species is a Federal Category 2

Candidate and is on the California list of Species of Special Concern. The buildings on the dock were investigated by Ron LeValley, a local wildlife biologist, for the presence of this species; his report is included in the Appendix. Mr. LeValley found no evidence of present or past use of the structures by bats. Given the high level of activity in and around the buildings and the sensitivity of Townsend's Western Big-eared Bat to disturbance, it is highly improbable that this species would use the structures.

D. Plants

1. Humboldt Bay owl's-clover (*Castilleja ambigua* ssp. *humboldtiensis*) - This salt marsh species is listed as Federal Candidate for Category 2 and on the California list of Special Plants. It is an annual plant normally encountered in upper elevation salt marsh. No evidence of this plant was located at either the project site or at the mitigation site. The salt marsh habitat present at the project and mitigation sites are low elevation, and therefore not likely areas to support this species (Eicher, 1990). It is recommended that the saltmarsh be revisited in May in order to determine absolutely whether the owl's-clover is present or not.

2. Pt. Reyes bird's-beak (*Cordylanthus maritimus* ssp. *palustris*) - This salt marsh species is also listed as Federal Candidate for Category 2 and on the California list of Special Plants. As with the owl's-clover, it is an annual plant normally encountered in upper elevation salt marsh. No evidence of this plant was located at either the project site or at the mitigation site. The salt marsh habitat present at the project and mitigation sites are low elevation, and therefore not likely areas to support this species (Eicher, 1990). As with the owl's-clover, it is recommended that the saltmarsh be revisited in May in order to determine absolutely whether the bird's-beak is present or not.

3. Menzies wallflower (*Erysimum menziesii* ssp. *eurekense*) - This species is listed as Endangered by both the Federal and State governments. It is associated with dune mat habitat, but may also occurs in lower densities along the borders of lupine scrub and herbaceous hollows (Duebendorfer 1992). No evidence of this species was found in the project or mitigation sites, nor would it be expected due to the extent of vegetative cover.

4. Beach layia (*Layia carnosa*) - This species is also listed as Endangered by both the Federal and State governments. As with the previous species, the preferred habitat is open, semi-stable sands supporting fairly sparse dune mat vegetation. This plant is a short-lived annual and is believed to be an early successional species. There was no evidence of beach layia at either the project or mitigation sites, not would it be expected due to the lack of suitable habitat.

5. Pink sand verbena (*Abronia umbellata* ssp. *breviflora*) - This species is a Federal Candidate for Category 2 listing and is also on the California list of Special Plants. As with the preceding two species, it is associated with open sands supporting dune mat vegetation. This species also was not noted during field investigation, nor would it be expected due to the stabilized nature of the sandy environment and the extensive vegetative cover.

## IV POTENTIAL IMPACTS ON SENSITIVE SPECIES AND HABITATS

A. Fish - None of the sensitive fish species discussed above are expected to use the project area actively due to degradation of habitat (green sturgeon and longfin smelt) and lack of sufficient freshwater influence (tidewater goby).

B. Birds - None of the sensitive bird species will be impacted significantly as a result of implementation of this project or creation of the mitigation area. There may be some temporary displacement due to the level of human activity and noise associated with the project.

C. Mammals - No sensitive mammalian species will be impacted as a result of project implementation.

D. Plants - Since none of the three species of sensitive species were found within either the project or mitigation areas, there will be no impact on these species resulting from project implementation or mitigation. Since the two salt marsh species were not observed nor are they expected to occur due to the low elevation, it will be assumed that there will be no impacts on any individuals of either species. The marsh will be re-examined in May during the blooming season to verify this assumption. Should any individuals be discovered, mitigation measures will be developed to address adverse impacts.

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## VI PERSONS AND AGENCIES CONTACTED

Kovacs, Karen, California Department of Fish and Game, Eureka, CA.

# APPENDIX A

## FISHERIES REPORT
## THOMAS R. PAYNE AND ASSOCIATES

**THOMAS R. PAYNE & ASSOCIATES**
**FISHERIES CONSULTANTS**
P.O. Box 4678
850 G Street, Suite J
Arcata, California 95521
(707) 822-8478
FAX (707) 822-8842

March 9, 1994

Ms. Karen Theiss
Karen Theiss & Associates
P.O. Box 3005
McKinleyville, California 95521

RE: Threatened or Endangered Fish Species, L-P Dock Project, Eureka, Calif.

Dear Karen:

The following is submitted in response to your request for additional information regarding potential effects of the L-P Dock Project on green sturgeon and longfin smelt:

Green sturgeon are reported to occur occasionally in Humboldt Bay but are found most frequently in the lower reaches of large rivers of California such as the Sacramento and San Joaquin and the Eel, Mad, Klamath, Trinity, and Smith on the north coast (Barnhart et al. 1992; Moyle 1976; Moyle et al. 1992). They have been captured in salt water from Ensenada, Mexico, to the Bering Sea and Japan (Miller and Lea 1972). Adult green sturgeon feed on benthic organisms and small fish, including opossum shrimp, amphipods, sand lances, anchovies, and clams (Moyle et al. 1992). While green sturgeon may migrate through and feed in the ship channel off the L-P Dock, the benthic habitat of the project area is generally degraded and contains few potential food sources. Active use of the project area by green stugeon should be considered unlikely.

Longfin smelt typically have occurred in estuaries along the Pacific Coast of North America from Prince William Sound, Alaska, to the Sacramento-San Joaquin Estuary (Moyle 1976). They have been reported as historically abundant in Humboldt Bay, feeding in tidal channels and spawning in freshwater tributaries (Barnhart et al. 1992). More recently, however, abundance has dropped dramatically, to the point where they may no longer be present in Humboldt Bay (USFWS 1994). The U.S. Fish and Wildlife Service found on January 6, 1994, that listing of the species as threatened was not warranted, because the species does not appear to be threatened throughout all or a significant portion of its range (USFWS 1994). Active use of the project area by longfin smelt should also be considered unlikely, due to its reported disappearance from Humboldt Bay and localized degraded habitat quality and a scarcity of potential food organisms near the L-P Dock.

Please let me know if you have any questions or require additional details.

Sincerely,

Tom Payne

Thomas R. Payne
Principal Associate

## Literature Cited


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APPENDIX B

BAT REPORT
RON LEVALLEY
MAD RIVER BIOLOGISTS

MAD RIVER BIOLOGISTS
1696 Ocean Dr. • McKinleyville CA 95521
Voice: 707/839-8134 • Fax: 707/839-4656

March 14, 1994

Karen Theiss
1933 Central Ave. Suite C
McKinleyville CA
95521

Dear Karen,

At your request I visited the site of the proposed dock construction on Louisiana Pacific property near Samoa. I visited the site on 13 March 1994 and inspected the buildings to assess their potential for providing habitat for Townsend's Big-eared Bats.

The two buildings at the site are large structures used for storing packaged pulp prior to shipping. Both building under question are of single-walled construction so that there are no potential roosting sites within the walls. The southernmost building has a complicated ceiling structure that could potentially provide hiding/roosting sites for a small number of bats. The northernmost building does not have concealed sites for bats in the ceiling.

During inspection I found no evidence of either present or past use of bats. The only animal droppings encountered were those of feral cats.

Given the is regular activity in the building, including the stacking of packaged pulp tall enough to necessarily disrupt roosting bats throughout the building, and, given the sensitive and easily disturbed nature of Townsend's Big-eared Bats, it is my opinion that these structures are not of use to this species.

Sincerely,

Ron LeValley

Ron LeValley

# APPENDIX 5

## HYDROLOGY STUDY



PACIFIC AFFILIATES
A CONSULTING ENGINEERING GROUP
835 THIRD ST · EUREKA · CALIF · 95501 · (707) 445-3001

# HYDRAULIC ANALYSIS OF THE PROPOSED
# LOUISIANA PACIFIC CORPORATION DOCK MODIFICATIONS

January, 1994

Prepared by:

Mac McKee
Professor of Environmental Resources
Environmental Resources Engineering
Humboldt State University
Arcata, California

February 23, 1994

# HYDRAULIC ANALYSIS OF THE PROPOSED LOUISIANA PACIFIC DOCK MODIFICATIONS

## 1. PURPOSE

The purpose of this report is to describe existing hydraulic, circulation, and sediment conditions relative to the Samoa Channel, and to evaluate the hydraulic impacts of the proposed modifications and their implications toward circulation and sedimentation in Humboldt Bay.

## 2. SETTING

### 2.1 Tidal Circulation

The volume of water entering and leaving Humboldt Bay on each tidal cycle is known as the tidal prism. This movement of water causes currents of varying magnitudes throughout the Bay. The currents affect transport of materials in the Bay, including sediment.

Patterns of tidal circulation in the Bay--largely limited to qualitative descriptions of general flood and ebb tide directions of flow in the main channels of the Bay--were described by Gast and Skeesick (1964). These qualitative descriptions were reported again by Shapiro and Associates (1980).

Very little quantitative information is available about the details of tidal circulation and how it is affected by the Samoa Channel. Much is known, however, about the overall characteristics of Arcata Bay and total volumes of water that pass through the Channel in a tidal cycle.

Estimates of the surface area and water volume of Arcata Bay are given in Table 1. These numbers imply an Arcata Bay tidal prism of about $3.71 \times 10^7 m^3$. Approximately 44 percent of Arcata Bay water is replaced in each lunar day (PG&E, 1961). Estimates of flushing time for Arcata Bay range from 7.1 tidal cycles (Casebeir and Toimil, 1973) to 15 tidal cycles (Gast and Skeesick, 1964). Data reported by PG&E (1961) would provide an estimate of flushing time of about 14 tidal cycles (Shapiro and Associates, 1980).

Table 1: Estimates of Arcata Bay Surface Area and Volume*

| water level | Area (acres) | Volume ($10^7 m^3$) |
|---|---|---|
| MLLW | 2,940 | 4.80 |
| MHW | 8,520 | 8.51 |

*from Shapiro and Associates (1980)

The Samoa Channel plays an important role in the tidal circulation of Humboldt Bay because a large fraction of the tidal prism of Arcata Bay must pass through the channel on both flood and ebb tide. Shapiro and Associates (1980) estimate that the Samoa Channel drains approximately 66 percent of the tidal volume of Arcata Bay.

Fresh water discharges into Humboldt Bay have only a minor influence on its hydrology and hydraulics (Shapiro and Associates, 1980). Because of the shallow depths of the sloughs and the large tidal prism in Humboldt Bay, the water columns are well-mixed vertically and horizontally (Gingerich, 1971).

## 2.2 Sediment

Currents in Humboldt Bay cause erosion and siltation, requiring a periodic maintenance of the interior channels for navigational purposes. The principal sources of sediments in Humboldt Bay are (U.S. Army Corps of Engineers, 1977): (1) sediments, including some sand, from creeks and rivers that enter the Bay, (2) sand and gravel that have been exposed by dredging and which are carried by tidal currents, and (3) silt and clay, and presumably sand, that enter the Bay on flood tides from offshore sources, largely from the Mad and Eel Rivers. Thompson (1971) also recognizes biological activity as another sediment source in the Bay. The predominant source is inflow of sediment through the tidal inlet to the Bay. Thompson (1971) estimates the annual sediment load to the bay from tidal inflows to be 540,000 to 670,000 $m^3$/year, whereas inputs from upland runoff are estimated at only about 90,000 $m^3$/year.

Sediment transport in Humboldt Bay is largely driven by conditions in the ocean nearshore area (U.S. Army Corps of Engineers, 1977). Littoral drift in the nearshore area on the western side of the spit is predominantly north to south.

The Humboldt jetties act as littoral barriers, and the littoral transport of sediment ceases at the north jetty until enough material accumulates to extend the shoreline seaward and littoral drift material can move around the barrier. As this happens, the littoral transport processes form a sand bar off the tip of the jetties. Materials then move inside the entrance channel to Humboldt Bay and are transported into and distributed within the Bay on flood tides.

Thompson (1971) reports that sediment distribution within the Bay correlates well with bottom morphology and appears to be predominantly controlled by tidal currents. In general, sediment grain size decreases with increased distance from the tidal inlet to Humboldt Bay and with increased elevation. Coarse sediment generally occur in the channel bottoms, which often contain a well-sorted medium-to-fine sand (Gast and Skeesick, 1964). Fine sediments are found in the high mud flats and salt marshes. This distribution of sediment particles is a function of waning tidal current velocity in an up-bay direction (Thompson, 1971).

## 2.3 Channel Hydraulic Characteristics

### 2.3.1 Tidal Elevations and Velocities

The range in tidal water surface elevations reported for the Samoa Channel is summarized in Table 2. Surface velocities in the channel reach bout one knot (Shapiro and Associates, 1980). Ebb and flood tide velocities in the channel have been estimated as a function of water surface elevation. These estimates are summarized in Table 3.

Table 2: Samoa Channel Tidal Elevations*

| Condition | Elevation |
|---|---|
| MHHW | 7.20 |
| MHW | 6.50 |
| MTL | 3.85 |
| MLW | 1.20 |
| diurnal range | 7.20 |

*from Shapiro and Associates (1980)

Table 3: Samoa Channel Water Surface Elevations and Velocities*

| Tide Type | Water Elevation (ft MLLW) | Channel Velocity (Knots) Hours After Slack Tide 1 | 3 | 5 |
|---|---|---|---|---|
| Flood Tide | 3 | 0.5 | 1.0 | 0.5 |
| | 5 | 0.7 | 1.4 | 0.7 |
| | 7 | 0.9 | 1.7 | 0.9 |
| | 9 | -- | -- | -- |
| Ebb Tide | 3 | 0.6 | 1.0 | 0.6 |
| | 5 | 0.6 | 1.2 | 0.6 |
| | 7 | 0.7 | 1.4 | 0.7 |
| | 9 | 0.9 | 1.7 | 0.9 |

*from Humboldt Bay Oil Spill Cooperative Contingency Plan (1989)

### 2.3.2 Samoa Channel Cross Sections

The hydraulic behavior of any channel is greatly influenced by the channel cross sectional geometry. Figures A through E illustrate several cross sections of the Samoa Channel in the vicinity of the Louisiana Pacific (L.P.) dock area. These cross sections were taken at approximately 400-foot intervals. (Data for these figures was obtained from bathymetric surveys taken in 1991 by Pacific Affiliates.) The channel reach near the L.P. dock is wide and deep, and is maintained to accommodate navigation requirements, including docking and turning of sea-going vessels. South of the L.P. dock, the channel is narrower and its cross section is considerably reduced.

### 2.3.3. Channel Flow Conditions

Referring again to Figures A through E note that the channel bottom is relatively flat. Also, the channel has steep sides up to approximately the

MLLW elevation, above which the channel widens considerably, generally in the range from MLLW to MHHW. In cross sections of this type, most of the flood and ebb tide flow will occur in the deep, central portion. The shallow regions at the sides of the cross section will provide relatively little hydraulic conveyance capacity, and only a small amount of storage volume relative to the total channel. Also, at the location of the existing dock facilities, conveyance beneath the dock is further reduced due to the presence of pilings and dock structures. This means that, at present, almost all flood and ebb tide waters flowing past the dock are transported in the deep section of the channel.

The principal hydraulic constraint on flows in the Samoa Channel, at least in comparison to the channel geometry at the L.P. dock, is constricted cross sectional area in the southern portion of the channel.

### 2.3.4. Channel Hydraulic Conveyance

If flows in the channel are assumed to be well-mixed (Gingerich, 1971) and if they occur principally in a longitudinal direction, equations describing these flows can be written (French, 1985) as

$$\frac{\partial H}{\partial t} + \frac{1}{B}\frac{\partial Q}{\partial x} = 0 \qquad \ldots[1]$$

$$\frac{\partial Q}{\partial t} + \frac{\partial}{\partial x}\left(\frac{\beta\, Q^2}{A}\right) + g\,A\,\frac{\partial H}{\partial x} + g\,A\,s_f = 0 \qquad \ldots[2]$$

where:

| | |
|---|---|
| H | is the water surface elevation above datum |
| Q | is volumetric flow rate |
| B | is channel top width |
| $\beta$ | is a momentum correction factor |
| g | is the gravitational acceleration constant |
| A | is the channel cross sectional area |
| $s_f$ | is the friction slope |
| x and t | are, respectively, the space and time dimensions |

(Equations [1] and [2] are the so-called de St. Venant equations, and have been used by hydraulic engineers in studying open channel flow for more than 100 years.) The friction slope, sf, is generally represented by the Manning equation,

$$s_f = \frac{Q\,|Q|}{K^2} \qquad \ldots[3]$$

where K is the channel hydraulic conveyance, and is computed as

$$K = \frac{\eta\, A\ R^{2/3}}{n} \qquad \ldots[4]$$

where A is the channel cross sectional area, R is the hydraulic radius, n is "Manning's n", and $\eta$ is equal to 1 for S.I. units or 1.486 for English units.

Data describing existing channel cross sections and reported velocities (see Figures A through E and Table 3) were nalyzed to estimate average values for several channel hydraulic parameters under existing conditions. These are reported in Table 4.

Table 4: Summary of Average Channel Hydraulic Conveyance Characteristics under Present Conditions

| Tidal Condition | water surface elevation, H (ft) | velocity (knots) | hydraulic radius, R (ft) | area, A ($10^3 ft^2$) | conveyance, K ($10^3 ft^3/sec$) |
|---|---|---|---|---|---|
| flood tide | 3 | 0.5<br>1.0 | 27.7 | 52.2 | 44.1<br>88.1 |
| | 5 | 0.7<br>1.4 | 28.0 | 56.0 | 66.3<br>132.7 |
| | 7 | 0.9<br>1.7 | 29.4 | 60.0 | 91.0<br>172.6 |
| ebb tide | 3 | 0.6<br>1.0 | 27.7 | 52.2 | 53.0<br>88.1 |
| | 5 | 0.6<br>1.2 | 28.0 | 56.0 | 56.9<br>117.5 |
| | 7 | 0.7<br>1.4 | 29.4 | 60.0 | 71.0<br>142.0 |
| | 9 | 0.9<br>1.7 | 31.3 | 64.0 | 97.2<br>184.1 |

# 3. IMPACTS

## 3.1 Channel Hydraulics

The proposed modifications at the L.P. Docks will have the effect of slightly decreasing the channel cross section at the dock, but increasing it in the area immediately south of the dock. Overall, this will result in an increase in the average cross sectional area and hydraulic conveyance of the affected reach of the Samoa Channel by a very small amount. Table 5 provides a summary of anticipated values of average hydraulic parameters for the reach of the channel in the vicinity of the dock and their percentage changes from present conditions.

As can be seen from the data in the table, the average hydraulic conveyance in the affected reach of the channel will change by only a few percent. Given the measurement error inherent in hydraulic data, these changes are insignificant.

Table 5: Summary of Anticipated Average Channel Hydraulic Conveyance Characteristics

| | | Proposed Conditions | | | | Percent Change from Present | | |
|---|---|---|---|---|---|---|---|---|
| Tide | water elev., H (ft) | velocity (knots) | hyd. radius, R (ft) | area, A ($10^3 ft^2$) | conveyance K ($10^3 ft^2/sec$) | hyd. radius, R | area, A | conveyance K |
| Flood | 3 | 0.5<br>1.0 | 28.7 | 52.6 | 45.5<br>90.0 | 3.6 | 0.8 | 3.2<br>2.2 |
| | 5 | 0.7<br>1.4 | 29.5 | 56.3 | 69.0<br>138.2 | 5.4 | 0.5 | 4.1<br>0.8 |
| | 7 | 0.9<br>1.7 | 31.1 | 60.0 | 94.4<br>179.4 | 5.8 | 0 | 3.7<br>3.9 |
| Ebb | 3 | 0.6<br>1.0 | 28.7 | 52.6 | 54.7 | 3.6 | 0.8 | 3.2<br>3.2 |
| | 5 | 0.6<br>1.2 | 29.5 | 56.3 | 59.2<br>118.2 | 5.4 | 0.5 | 4.0<br>0.6 |
| | 7 | 0.7<br>1.4 | 31.1 | 60.0 | 73.7<br>147.3 | 5.8 | 0 | 3.8<br>3.7 |
| | 9 | 0.9<br>1.7 | 33.0 | 63.7 | 98.9<br>189.8 | 5.4 | -0.5 | 1.8<br>3.1 |

The minimal changes in channel hydraulic radius, cross sectional area, and hydraulic conveyance will have only a very minor effect on the hydraulic behavior of the channel. Local velocities in the area immediately south of the dock might be reduced, but it is unlikely that the amount of this reduction could be measured with any confidence. Given that the southern reaches of the Samoa Channel will remain constricted, little if any discernible effect will be seen overall channel velocities.

### 3.2 Tidal Circulation and Sediment Transport

The constriction in the southern end of the channel will continue to provide the main control on the amount of water flowing through the channel. This means that only local and very minor changes in velocities will occur due to the proposed channel modifications. Overall, this should have no effect on tidal circulation patterns and velocities in Humboldt Bay.

Similarly, since only local and very small changes in velocities are expected to occur, only local changes is sediment transport patterns will result. This will most likely be seen in the area south of the L.P. dock that is to be dredged and widened. There might also be very localized scour and/or deposition in the immediate vicinity of the modified dock structure. Overall, no changes in sediment transport for Humboldt Bay should result.

## 4. MITIGATION

Sediment deposition and scour in the Samoa Channel should continue to be monitored as a regular part of ongoing maintenance of navigational capability. In particular, the area immediately south of the L.P. dock area should be monitored for deposition.

# APPENDIX 6

## N.O.P. RESPONSES



PACIFIC AFFILIATES
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**UNITED STATES DEPARTMENT OF COMMERCE**
**National Oceanic and Atmospheric Administration**
NATIONAL MARINE FISHERIES SERVICE
Southwest Region
501 West Ocean Boulevard, Suite 4200
Long Beach, California 90802-4213
TEL (310) 980-4000; FAX (310) 980-4018

February 22, 1994 F/SWO22:DMM

Mr. Jack B. Alderson
Humboldt Bay Harbor, Recreation,
and Conservation District
P.O. Box 1030
Eureka, CA 95502-1030

Dear Mr. Alderson:

Thank you for the opportunity to comment on the Notice of Preparation of a Draft Environmental Impact Report titled **"Louisiana Pacific Dock Reconstruction and Rehabilitation"**.

The purpose of the project is to increase dock load capacity. The project consists of reconstructing the existing wooden transfer facility (wharf) into a combination bulkhead with fill and the addition of concrete surfaced pier extensions supported by concrete piles. The fill area will involve approximately 6.1 acres of tidal and intertidal mudflat and approximately 0.34 acres of extension & gangway. Additionally, dredging approximately 6 acres to a depth of -35 feet Mean Lower Low Water will occur outboard of the bulkhead to facilitate moorage and safe movement of vessels.

On February 9, 1994, at the San Francisco Corps District Interagency meeting, Pacific Affiliates gave a project presentation, discussed project impacts to the environment, and proposed a 1:1 on-site, in-kind mitigation to create/restore approximately 6 acres of historical intertidal habitat.

The National Marine Fisheries Service (NMFS) is responsible for protecting and restoring marine and anadromous fish and the habitats that support these species. Of particular concern are salmon and steelhead habitats. NMFS is presently reviewing a petition to list coho salmon under provisions of the Endangered Species Act. Humboldt Bay is host to a number of anadromous and estuarine species that use eelgrass for nursery and forging habitat; therefore, any project impact to eelgrass NMFS would consider significant. Proposed mitigation should include the impacts caused by fill, pier extensions, and new dredging. Mudflat and intertidal creation has a poor record of success, particularly matters concerning eelgrass. Therefore, a ratio of mitigation could be greater than 1:1. The mitigation program should also include success criteria and contingency plans should the initial restoration/creation habitat fail.

Bear in mind that federal agencies are guided by the National Environmental Policy Act (NEPA) and mitigation (40 CFR § 1508.20) includes avoiding, minimizing, rectifying, reducing, and compensation for the impact. It is NMFS policy to evaluate mitigation in this order of priority. Furthermore, a fully developed mitigation program must be evaluated as part of the alternative, not simply listed.

If you have questions concerning these comments please contact Mr. David Mattens at: National Marine Fisheries Service, 777 Sonoma Avenue, Room 325, Santa Rosa, California 95404; telephone (707) 578-7513.

Sincerely,

James R. Bybee

James R. Bybee
Northern Area Coordinator

cc: EPA, C. Morris
FWS, W. White
CDFG, J. Turner

PLANNING DIVISION
OF THE PLANNING AND BUILDING DEPARTMENT
**COUNTY OF HUMBOLDT**
3015 H STREET
EUREKA, CALIF. 95501-4484 PHONE (707) 445-7541

February 9, 1994

PAUL KRAUS
PACIFIC AFFILIATES
835 THIRD STREET
EUREKA CA 95501

Subject: Initial Comments on Louisiana-Pacific Corporation, Samoa-Marine Terminal Reconstruction Project.

This response is to a "Notice of Preparation of a Draft Environmental Impact Report" (DEIR) for the Louisiana-Pacific Dock Reconstruction and Rehabilitation project received December 27, 1993 and is intended to provide the Humboldt Bay Harbor , Recreation and Conservation District, and Pacific Affiliates Environmental Engineers Inc. (consultant) and Louisiana-Pacific Corporation with: 1) a select listing of the content of the DEIR and 2) the informational content of a Conditional Use Permit application.

1. The project as described will require a Conditional Use Permit (CUP) from the Humboldt County Planning Commission. The project may also require a Coastal Development Permit, Special Permit and/or a Variance. The necessity for any of these other discretionary permits may be established by the consultant in the course of the zoning analyze and/or by the Planning Division upon receipt of a complete CUP application.

2. The Draft EIR should include the following information.

   a) Provide graphic overlays of the proposed project (dock, excavation area(s), disposal areas) on the following base maps:

      1) Humboldt Area Plan Map
      2) Humboldt Bay Resources Protection Map
      3) Zone Map
      4) Coastal Development Permit Jurisdiction Map
      5) Assessor Map(s)

   b) As a background section of the report, provide a comprehensive description of the existing mill and production process. Provide current and projected quantitative information on items such as: employees, traffic (truck, ship, barge, rail, other), raw materials, processing materials, water, energy finished products, etc. Include a description of the plant site.

c) Provide a traffic study to assess the on-site and off-site effects of the project on the various transportation systems (truck, ship, barge, rail, other).

d) Provide information demonstrating conformance with applicable policies of the Humboldt County General Plan- Volume I (Framework Plan); and the Humboldt Bay Area Plan (HBAP). Include and analysis all applicable General Plan policies. Focus on the following policy sections of the HBAP:

- Public Works (Section 3.12)
- Coastal Dependent Development (Section 3.13)
- Industrial (Section 3.14)
- Recreational and Visitor Serving Area (Section 3.15)
- Hazards (Section 3.16)
- Archaeological and Paleontological Resource (Section 3.18)
- Natural Resource Protection Policies and Standards (Section 3.30)
- Circulation Element (Section 4200) of the Framework Plan

e) Zoning Ordinance

Provide information demonstrating compliance with applicable requirements of the Humboldt County Coastal Zoning Regulations including:

- Industrial Performance Standards.
- Coastal Dependent Industrial Development (Section A314-5) (The "Industrial Siting Study" sent to consultant under separate cover represents the "alternative sites - from the Humboldt County Planning Department.")
- Dredge Spoils Disposal (Section A314-13)
- Solid Waste Disposal (Section A314-34)

f) California Coastal Zone

Provide information demonstrating conformance with applicable policies and requirements of the California Coastal Act as administered by the California Coastal Commission and as reiterated by the Humboldt Bay Area Plan.

g) Alternatives to the Project

Provide comparative impact analysis of the alternatives to the project. A "NO PROJECT" alternative should also be addressed in the EIR.

h) Cumulative Impacts

Provide analysis of cumulative project impacts with other similar pending and/or potential projects in the mid-Humboldt Bay area.

i) Other CEQA requirements

Include all other required CEQA analysis (e.g., unavoidable impacts, long-term vs. short-term, etc.). Include mitigation monitoring program per AB 3180.

j) Agency Coordination

List all agencies contacted, contact person and comments received if any,.

k) Include the major applicable conservation and development policies of the Humboldt Bay Harbor, Recreation and Conservation District.

3) Provide the Planning Division with twenty-five (25) copies of the Draft EIR and twenty-five (25) copies of the Final EIR for distribution to the Humboldt County Planning Commission, staff and agencies.

4) The consultant is encouraged to conduct at least one (1) public workshop within 3 to 4 weeks of the release of the Draft EIR.

5) Optimum processing time for CUP's with associated EIR's is estimated at 5 to 6 months.

6) The consultant is again encouraged, with the consent of the lead agency, to convene an agency workshop to better ensure a timely, efficient and effective multi-agency project review process.

Sincerely,
HUMBOLDT COUNTY PLANNING DEPARTMENT

R. London

Robert London
Planner II

TDC:RL:vn
cc: Steve Werner
JACK ALDERSON
Tunny Jaegel

STATE OF CALIFORNIA PETE WILSON, *Governor*

**STATE LANDS COMMISSION**

LEO T. McCARTHY, *Lieutenant Governor*
'RAY DAVIS, *Controller*
.HOMAS W. HAYES, *Director of Finance*

**EXECUTIVE OFFICE**
**1807 - 13th Street**
**Sacramento, CA 95814**

**CHARLES WARREN**
**Executive Officer**

February 1, 1994

File Ref.: SD 93-12-28.2

Mr. David L. Schneider
Pacific Affiliates Environmental
Engineering
835 Third Street
Eureka, CA 95501

Subject: Notice of Application to the Harbor District by Pacific Affiliates Environmental Engineering for the construction of a vessel and equipment launching facility.

Dear Mr. Schneider:

Staff of the State Lands Commission (SLC) has reviewed the subject document. Under the California Environmental Quality Act (CEQA), the District is the Lead Agency and the SLC is a Responsible and/or Trustee Agency for any and all projects which could directly or indirectly affect sovereign lands and their accompanying Public Trust resources or uses.

The State acquired sovereign ownership of all tidelands and submerged lands and beds of navigable waterways upon its admission to the United States in 1850. The State holds these lands for the benefit of all the people of the State for statewide Public Trust purposes which include waterborne commerce, navigation, fisheries, water-related recreation, habitat preservation, and open space. The landward boundaries of the State's sovereign interests are often based upon the ordinary high water marks of these waterways as they last naturally existed. Thus, such boundaries may not be readily apparent from present day site inspections.

The SLC also has certain residual and review authority for tide and submerged lands legislatively granted in trust to local jurisdictions (Public Resources Code sections 6301 and 6306).

The proposed project will be located adjacent to Humboldt Bay. California holds a fee ownership in the bed of the bay between the two ordinary high water marks. In addition, the entire bay is subject to a Public Trust Easement.

This is to advise you that any sovereign interest the State may have in Humboldt Bay, adjacent to the proposed project has been granted in trust by the Legislature to the City of Eureka, pursuant to Chapter 225, Statutes of 1945, and as amended. Therefore, the proposed project will not require SLC authorization. The District should, however, apply to all other agencies having approval authority, including the City of Eureka.

This letter does not constitute, nor should it be construed as, a waiver or limitation of any right, title or interest of the State of California in any lands under its jurisdiction.

If you have any questions, please contact me at (916) 322-6375.

Sincerely,

Linda Martinez

Linda Martinez
Public Land Manager

cc: Humboldt Bay Harbor, Recreation, and Conservation District
P. O. Box 1030
Eureka, CA 95502-1030

City of Eureka

United States Department of the Interior

TAKE PRIDE IN AMERICA

FISH AND WILDLIFE SERVICE
**Ecological Services**
**Sacramento Field Office**
**2800 Cottage Way, Room E-1803**
**Sacramento, California 95825-1846**

**In Reply Refer To:**
PPN 1445

January 31, 1994

Jack B. Alderson
Humboldt Bay Harbor, Recreation,
and Conservation District
P.O. Box 1030
Eureka, California 95502-1030

Subject: Notice of Preparation of a Draft Environmental Impact Report; Louisiana Pacific Dock Reconstruction and Rehabilitation Project, Humboldt Harbor, Eureka, Humboldt County, California

Dear Mr. Alderson:

The U.S. Fish and Wildlife Service (Service) has reviewed the Notice of Preparation of a Draft Environmental Impact Report for the Louisiana Pacific Dock Reconstruction and Rehabilitation Project, which includes the dredging of the Samoa Channel of Humboldt Bay. These comments are intended to assist you in your review of the proposal, and will not take the place of any formal comments that may be required under the provisions of the Fish and Wildlife Coordination Act.

Enclosure A provides a list of sensitive species that may occur in the county of the project area and general survey guidelines. Enclosure B recommends general guidelines for identifying and mitigating project impacts to fish, wildlife, and their habitats. We encourage you to use these guidelines to develop a comprehensive environmental document that addresses these needs.

If you have any questions regarding these comments, please contact Darren Fong at (916) 978-5408 (Ext. 348).

Sincerely,

Cay C. Goudy
for Dale A. Pierce
Acting Field Supervisor

Enclosures

cc: Reg. Dir., (ARD-ES)
FWS-HC, Section 7
Dir., CDFG, Sacramento, CA
Reg. Mgr., CDFG, Reg. III, Yountville

**ENCLOSURE A**

**Endangered Species.** This attachment identifies those listed, proposed, and/or candidate species that may occur in the proposed project area. Information and maps concerning candidate species in California may be obtained from the California Natural Diversity Data Base, a program administered by the California Department of Fish and Game. Requests for information should be addressed to the Marketing Manager, California Department of Fish and Game, Natural Diversity Data Base, 1416 Ninth Street, Sacramento, California 95814. The marketing manager may be contacted by calling (916) 324-0562. You may request additional information from the Chief, California Department of Fish and Game, Non-Game Heritage Program, at (916) 324-8348.

Listed species are fully protected under the mandates of the Endangered Species Act (Act), as amended. Section 9 of the Act and its implementing regulations prohibit the "take" of a federally listed fish and wildlife species by any person, as defined by the Act. Take is defined by the Act "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect" any such species. Take may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or shelter (50 CFR § 17.3).

Take incidental to an otherwise lawful activity may be authorized by one of two procedures. If a Federal agency is involved with the permitting, funding, or carrying out of this project, initiation of formal consultation is required between that agency and the Service pursuant to Section 7 of the Act if it is determined that the proposed project may affect a federally listed species. Federal agencies must confer if they determine that the continued existence of a proposed species may be jeopardized by the project. Such consultation or conference could result in a biological opinion that addresses anticipated effects of the project to listed and proposed species. The biological opinion may authorize a limited level of incidental take for federally listed species.

If a Federal agency is not involved with the project, and federally listed species may be taken as part of the project, then an "incidental take" permit pursuant to Section 10(a) of the Act should be obtained. The Service may issue such a permit upon completion by the permit applicant of a satisfactory conservation plan for the listed species that may be affected by the project.

We recommend that appropriately designed surveys for listed, proposed, or candidate species be undertaken by qualified biologists. Surveys for plants should not be restricted to the identified species; instead, a complete botanical inventory of the project site should be conducted. Botanical surveys should be conducted at intervals throughout the spring and summer, in order to maximize the likelihood of encountering each species during the season most appropriate for accurate identification. Surveys should be based on field inspection, and not on prediction of occurrence based on habitat or physical features of the site. Guidelines for conducting adequate botanical surveys are available from the Natural Heritage Division of the California Department of Fish and Game at (916) 322-2493.

The results of all biological surveys should be published in the environmental impact report. The report should include a brief discussion of survey methods (including sampling methods and timing of surveys), results (including a list of all species encountered as well as maps of vegetation types, populations of plant species, and breeding, nesting or burrowing sites or other habitat components important to animal species), and conclusions. If it is concluded that a given sensitive species is not present, the justification for this conclusion should be fully explained.

Should these surveys determine that listed, proposed, or candidate species may be affected by the proposed project, the Service recommends that the project proponent, in consultation with this office and the California Department of Fish and Game, develop a plan that mitigates for the project's direct and indirect impacts to these species and compensates for project-related loss of habitat. The mitigation plan also should be included in the environmental impact report.

One of the benefits of considering candidate species as well as listed and proposed species early in the planning process is that by exploring alternatives, it may be possible to avoid conflicts that could develop, should a candidate species become listed before the project is complete. In addition, in instances where the Service addresses proposed projects under its Fish and Wildlife Coordination Act authority, we must also analyze the impacts on candidate species and make recommendations to mitigate any adverse effects.

mitigation planning process. Accordingly, we maintain that the best way to mitigate for adverse biological impacts is to avoid them altogether.

The document should describe all measures proposed to avoid, minimize, or compensate for impacts to fish and wildlife and their habitats. The measures should be presented in as much detail as possible to allow us to evaluate their probable effectiveness.

Because of their very high value to migratory birds, and their ever-increasing scarcity in California, our mitigation goal for wetlands (including riparian and riverine wetlands) is no net loss of in-kind habitat value or acreage (whichever is greater).

For unavoidable impacts, to determine the mitigation credits available for a given mitigation project, we evaluate what conditions would exist on the mitigation site in the future in the absence of the mitigation actions, and compare those conditions to the conditions we would expect to develop on the site with implementation of the mitigation plan.

Mitigation habitat should be equal to or exceed the quality of the habitat to be affected by the project. Baseline information would need to be gathered at the impact site to be able to quantify this goal in terms of plant species diversity, shrub and tree canopy cover, stems/acre, tree height, etc. The ultimate success of the project should be judged according to these same measurements at the mitigation site.

Criteria should be developed for assessing the progress of the project during its developmental stages as well. Assessment criteria should include rates of plant growth, plant health, and evidence of natural reproduction. Success criteria should be geared toward equaling or exceeding the quality of the highest quality habitat to be affected. In other words, the mitigation effort would be deemed a success in relation to this goal if the mitigation site met or exceeded habitat measurements at a "model" site (plant cover, density, species diversity, etc.).

The plan should present the proposed ground elevations at the mitigation site, along with elevations in the adjacent areas. A comparison of the soils of the proposed mitigation and adjacent areas should also be included in the plan, and a determination made as to the suitability of the soils to support habitats consistent with the mitigation goals.

Because wetland ecosystems are driven by suitable hydrological conditions, additional information must be developed on the predicted hydrology of the mitigation site. The plan should describe the depth of the water table, and the frequency, duration, areal extent, and depth of flooding which would occur on the site. The hydrologic information should include an analysis of extreme conditions (drought, flooding) as well as typical conditions.

The plan must include a time frame for implementing the mitigation in relation to the proposed project. We recommend that mitigation be initiated prior to the onset of construction. If there will be a substantial time lag between project construction and completion of the mitigation, a net loss of habitat values would result, and more mitigation would be required to offset this loss.

Generally, monitoring of the mitigation site should occur annually for at least the first five years, biennially for years 6 through 11, and every five years thereafter until the mitigation has met all success criteria. Remediation efforts and additional monitoring should occur if success criteria are not met during the first five years. Some projects will require monitoring throughout the life of the project. Reports should be prepared after each monitoring session.

The plan should require the preparation of "as-built" plans. Such plans provide valuable information, especially if the mitigation effort fails. Similarly, a "time-zero" report should be mandated. This report would describe exactly what was done during the construction of the mitigation project, what problems were encountered, and what corrections or modifications to the plans were undertaken.

The plan should detail how the site is to be maintained during the mitigation establishment period, and how long the establishment period will be. It will also be important to note what entity will perform the maintenance activities, and what entity will untimately own and manage the site. In addition, a mechanism to fund the maintenance and management of the site should be established and identified. A permanent easement should be placed on the property used for the mitigation that would preclude incompatible activities on the site in perpetuity.

Finally, in some cases, a performance bond may be required as part of the mitigation plan. The amount of the bond should be sufficient to cover the costs of designing and implementing an adequate mitigation plan (and purchasing land if needed) should the proposed plan not succeed.

Reference

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deepwater habitats of the United States. FWS/OBS-79/31. U.S. Fish and Wildlife Service, Washington, D.C. 103 pp.

ENCLOSURE A

# LISTED AND PROPOSED ENDANGERED AND THREATENED SPECIES AND CANDIDATE SPECIES THAT MAY OCCUR IN THE AREA OF HUMBOLDT COUNTY, CALIFORNIA
(1-1-94-TA-478, JANUARY 27, 1994)

## Listed Species

**Birds**

American peregrine falcon, *Falco peregrinus anatum* (E)
California brown pelican, *Pelecanus occidentalis californicus* (E)
bald eagle, *Haliaeetus leucocephalus* (E)
Aleutian Canada goose, *Branta canadensis leucopareia* (T)
northern spotted owl, *Strix occidentalis caurina* (T)
marbled murrelet, *Brachyramphus marmoratus* (T)
western snowy plover, coastal population, *Charadrius alexandrinus nivosus* (T)

**Plants**

Menzies' wallflower, *Erysimum menziesii* (E)
beach layia, *Layia carnosa* (E)

## Proposed Species

**Fish**

tidewater goby, *Euclyclogobius newberryi* (PE)

**Plants**

western lily, *Lilium occidentale* (PE)

## Candidate Species

**Fish**

green sturgeon, *Acipenser medirostris* (2R)
longfin smelt, *Spirinchus thaleichthys* (2R)

**Amphibians**

foothill yellow-legged frog, *Rana boylii* (2)
northern red-legged frog, *Rana aurora aurora* (2)
Del Norte salamander, *Plethodon elongatus* (2)
tailed frog, *Ascaphus truei* (2R)

**Reptiles**

northwestern pond turtle, *Clemmys marmorata marmorata* (2)

**Birds**

northern goshawk, *Accipiter gentilis* (2)
long-billed curlew, *Numenius americanus* (2)
California horned lark, *Eremophila alpestris actia* (2)

Humboldt County continued

**Mammals**

Pacific western big-eared bat, *Plecotus townsendii townsendii* (2)
white-footed vole, *Arborimus albipes* (2)
California wolverine, *Gulo gulo luteus* (2)
Pacific fisher, *Martes pennanti pacifica* (2)

**Invertebrates**

Karok Indian snail, *Vespericola karokorum* (1)
Humboldt ground beetle, *Scaphinotus longiceps* (2R)

**Plants**

northcoast sand-verbena, *Abronia umbellata* ssp. *breviflora* (2)
Humboldt milk-vetch, *Astragalus agnicidus* (1)
bensoniella, *Bensoniella oregona* (2)
Thurber's reedgrass, *Calamagrostis crassiglumis* (2)
Humboldt Bay owl's-clover, *Castilleja ambigua* ssp. *humboldtiensis* (2)
northcoast bird's-beak, *Cordylanthus maritimus* ssp. *palustris* (2)
clustered lady's-slipper, *Cypripedium fasciculatum* (2)
Oregon fireweed, *Epilobium oreganum* (2)
Mendocino gentian, *Gentiana plurisetosa* (2)
Mendocino gentian, *Gentiana setigera* (2)
Humboldt Bay gumplant, *Grindelia stricta* ssp. *blakei* (2)
glandular dwarf-flax, *Hesperolinon adenophyllum* (2)
two-flowered lathyrus, *Lathyrus biflorus* (1)
Howell's lewisia, *Lewisia cotyledon* var. *howellii* (2)
The Lassics lupine, *Lupinus constancei* (2)
Wolf's evening-primrose, *Oenothera wolfii* (1)
Columbia yellow-cress, *Rorippa columbiae* (2)
Tracy's sanicle, *Sanicula tracyi* (2)
No Common Name , *Sidalcea malvaeflora* ssp. *patula* (2)
Kneeland Prairie penny-cress, *Thlaspi montanum* var. *californicum* (1)

(E)--Endangered (T)--Threatened (P)--Proposed (CH)--Critical Habitat
(1)--Category 1: Taxa for which the Fish and Wildlife Service has sufficient biological information to support a proposal to list as endangered or threatened.
(2)--Category 2: Taxa for which existing information indicated may warrant listing, but for which substantial biological information to support a proposed rule is lacking.
(1R)-Recommended for Category 1 status.
(2R)-Recommended for Category 2 status.
(■)--Listing petitioned.
(*)--Possibly extinct.
(#)--Published 1 year petition finding indicates that taxon warrants listing.

RECEIVED JAN 2 5 1994

STATE OF CALIFORNIA—THE RESOURCES AGENCY PETE WILSON, *Governor*

DEPARTMENT OF FISH AND GAME
1416 NINTH STREET
.O. BOX 944209
SACRAMENTO, CA 94244-2090

January 19, 1994

SEND COPY TO KAREN

Mr. Jack B. Alderson
Chief Executive Officer
Humboldt Bay Harbor, Recreation
and Conservation District
Post Office Box 1030
Eureka, California 95502-1030

Dear Mr. Alderson:

The Department of Fish and Game (DFG) has reviewed your Notice of Preparation (NOP) to prepare a draft Environmental Impact Report (DEIR) for a proposed project by Louisiana Pacific Corporation to reconstruct an existing wooden transfer facility in Humboldt Bay. Reconstruction activities will include installation of a concrete sheetpile bulkhead, removal of the existing dock structure, placement of solid fill into the area that presently encompasses the dock work surface, construction of concrete pile and surfaced pier extensions, and dredging of the area between the south pier extension and the Samoa Channel. Dredging will take place to -35 feet Mean Lower Low water (MLLW), with spoils proposed for disposal at an upland location on Louisiana Pacific property. Project impacts will include the loss of approximately 6.1 acres of intertidal and shallow subtidal habitat due to fill and an unspecified amount of similar habitat due to dredging. Additionally, eelgrass is known to be found at the project site.

The primary objective of the DFG's review of environmental documents is to be able to provide the project sponsor with recommendations for avoiding or minimizing negative impacts to fish and wildlife resources, their use and users. In attempting to meet this objective, our attention usually is focused on potential habitat damages or losses, acute or chronic effects to fish and wildlife from changes in habitat quality, and possible use conflicts. The DFG is a responsible agency in terms of the California Environmental Quality Act.

In our review of your DEIR, we will need to be able to identify and evaluate all activities in both the construction and operational phases of the project which may impact fish and wildlife populations or their habitats, energy supplies, and reproductive requirements. We will also need to be aware of how and where the project would modify opportunities for use and enjoyment of those living resources by the people of the State.

Existing fish and wildlife populations, habitat uses and types, and human uses such as fishing, clamming, or nature study in and adjacent to the project area and dredged material disposal site should be identified and described. The DEIR should contain complete descriptions and maps of these habitats, including acreages. The presence of vegetated (eelgrass) intertidal and subtidal areas at the project site is of particular concern to the DFG. Any potential impacts which relate to these resource values should also be thoroughly described, and discussed in conjunction with compensation for unavoidable, project-induced losses. It is the policy of the DFG that a project should cause no net loss of wetland acreage or wetland habitat value. Compensation for direct impacts to fish and wildlife habitat (e.g., fill) should be proposed in the form of habitat replacement, restoration, and improvement.

We are also concerned with any potential for excessive turbidity or siltation. Shoreline erosion conditions before, during, and after construction and the fate of eroded materials should be studied and discussed. Your report should address any erosion which might be caused by deflected wave or water current energy or other forces influenced by structures proposed to be placed in the water. We need to be able to consider any influences on water currents, flushing, sedimentation, and normal sediment transport.

Where a seawall, bulkhead, or riprap are proposed, construction materials should be identified and impacts discussed. Generally, the DFG favors riprap rather than wood, concrete, or metal for such structures. Where riprap or rubble is to be used, materials should be considered for use which are of suitable diameter to approximate natural rock habitat.

Potential water quality problems which should be addressed include sewage, litter, petroleum products, cleaning agents and wash down waters, fertilizers, heavy metals, pesticides, and other toxic or oxidizable materials which may enter the water. Your agency should also be aware that the DFG will not approve the placement of creosote-treated pilings in waters of the State.

Special consideration must be given in the DEIR to adverse impacts which may occur to rare, threatened, or endangered species. Information regarding these species, and potential impacts, can be procured from the appropriate Federal (U.S. Fish and Wildlife Service and National Marine Fisheries Service) and State (DFG) resource agencies.

As always, DFG personnel are available to discuss our concerns in greater detail. To arrange for discussion, please contact Mr. Robert N. Tasto, Environmental Specialist, Department of Fish and Game, Marine Resources Laboratory, 411 Burgess Drive, Menlo Park, California 94025, telephone (415) 688-6360.

Sincerely,

Peter T. Phillips for

John L. Turner, Chief
Environmental Services Division

cc: The Honorable Douglas P. Wheeler
Secretary for Resources
Resources Agency
Sacramento, California

Mr. Robert N. Tasto
Department of Fish and Game
Menlo Park, California

DEPARTMENT OF THE ARMY
SAN FRANCISCO DISTRICT, CORPS OF ENGINEERS
211 MAIN STREET
SAN FRANCISCO, CALIFORNIA 94105-1905

JAN 28 1994

Regulatory Branch

SUBJECT: File No. 20420N21

Louisiana Pacific Corporation
c/o Pacific Affiliates
835 Third Street
Eureka, California 95501
Attn: Paul Kraus

Dear Mr. Kraus:

We are responding to your letter of September 8, 1993 regarding your client's proposal to reconstruct their pulp and lumber dock at Samoa, Humboldt County. You mentioned you would like to meet with us prior to submitting a permit application. We suggest you present your project at the Interagency Meeting held the first Wednesday of each month at our office in San Francisco. You may contact Craig Vassel (at 415-744-3324 Ext. 240) to reserve a space on the agenda.

All proposed work and/or structures extending bayward or seaward of the line on shore reached by: (1) mean high water (MHW) in tidal waters, or (2) ordinary high water in non-tidal waters designated as navigable waters of the United States, must be authorized by the Corps of Engineers pursuant to Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403). Additionally, all work and structures proposed in unfilled portions of the interior of diked areas below former MHW must be authorized under Section 10 of the same statute.

All proposed discharges of dredged or fill material into waters of the United States must be authorized by the Corps of Engineers pursuant to Section 404 of the Clean Water Act (CWA) (33 U.S.C. 1344). Waters of the United States generally include tidal waters, lakes, ponds, rivers, streams (including intermittent streams), and their adjacent wetlands.

Your proposed work appears to be within our jurisdiction and a permit may be required. Application for Corps authorization should be made to this office using the application form in the enclosed pamphlet. To avoid delays it is essential that you enter the file number at the top of this letter into Item No. 1. The application must include plans showing the location, extent and character of the proposed activity, prepared in accordance with the requirements contained in this pamphlet. You should note, in planning your work, that upon receipt of a properly completed application and plans, it may be necessary to advertise the proposed work by issuing a public notice for a period of 30 days.

Since an individual permit is required, it will be necessary for you to demonstrate to the Corps that your proposed fill is necessary because there are no practicable alternatives, as outlined in the U.S. Environmental Protection Agency's Section 404(b)(1) Guidelines. A copy is enclosed to aid you in preparation of this alternative analysis. Be aware that failure to satisfy the 404(b)(1) Guidelines will require denial of your application for a Corps permit.

If you have any questions, please call Eric Behn of our Regulatory Branch (telephone 415-744-3318 Ext. 227). Please address correspondence to the District Engineer, Attention: Regulatory Branch, and refer to the file number at the head of this letter.

Sincerely,

for

Max R. Blodgett
Acting Chief, Construction-Operations
Division

Enclosure

Copy furnished

Humboldt Bay Harbor,
Recreation, and
Conservation District

# APPENDIX 7

## SPILL PREVENTION CONTROL AND COUNTERMEASURE PLAN



PACIFIC AFFILIATES
A CONSULTING ENGINEERING GROUP
835 THIRD ST · EUREKA · CALIF · 95501 · (707) 445-3001

LOUISIANA-PACIFIC CORPORATION

WESTERN DIVISION - PULP

SAMOA, CALIFORNIA

# SPILL PREVENTION CONTROL

# AND

# COUNTERMEASURE PLAN

REVISED: October 24, 1991

# SPILL PREVENTION CONTROL AND COUNTERMEASURE PLAN

## TABLE OF CONTENTS



/mff
10/24/91

# SPILL PREVENTION CONTROL AND COUNTERMEASURE PLAN

## STATEMENT OF PURPOSE

### PURPOSE OF PLAN

The primary purpose of a spill plan is to prevent the opportunity for a spill to occur by proper planning and awareness. This is accomplished by designing a spill plan that reviews all hazardous materials and petroleum storage and handling practices to heighten awareness of potential hazards.

The second function of a spill plan is to provide a preplanned response in the event a spill does occur. There are no rigid procedures that will always fit the unexpected; however, common sense and proper immediate response will minimize the effect of any spill.

### SPILL RESPONSE

Stop the spill at the source if possible. If the spill cannot be stopped and material will escape from the containment structure, follow the Emergency Spill Procedure. Call your supervisor for any assistance necessary to control the spill.

/mff
10/24/91

# SPILL PREVENTION CONTROL AND COUNTERMEASURE PLAN

## GENERAL RESPONSE FOR ALL OPERATIONS

USE COMMON SENSE

ACT QUICKLY

In the event of a spill of any chemical or petroleum product at the mill, the following steps are to be taken **immediately**:

1. **Locate source** of spill and try to stop the spill where it originates.

2. **Contain the spill** by plugging drains or ditches or damage to a berm. Build temporary berms where necessary to contain the spill until it can be cleaned up.

3. **Place sorbent materials** in drainage courses, if necessary, to further contain the spill.

4. **Notify the mill supervisor** and plant manager.

If possible, all the above tasks should take place at the same time. Speed is of the essence in controlling any spill.

The department supervisor should direct containment and cleanup operations until relieved by the mill manager.

Don't dilute spilled materials by hosing down with water. This makes cleanup more difficult and may spread the spilled material over an even larger area.

Dispose of spilled materials, including any material used to soak up the spill, only as directed by the Environmental Department located in Samoa.

/mff
10/24/91

# SPILL PREVENT CONTROL AND COUNTERMEASURE PLAN

## GENERAL INFORMATION

| | |
|---|---|
| 1. Facility Name.................. | Louisiana-Pacific Corporation<br>Samoa Complex |
| 2. Facility Operation............. | Pulp Mill, Sawmill, Planer and Dock |
| 3. Facility Location.............. | Humboldt County, California<br>#1 LP Drive<br>Samoa, California 95564 |
| 4. Facility Operator.............. | Louisiana-Pacific Corporation<br>P. O. Box 158<br>Samoa, California 95564 |
| 5. Facility Contacts.............. | Fred Martin, Pulp Mill Manager<br>Greg Richardson, Sawmill Manager |
| 6. SPCC Plan Location............. | Mill Offices at Samoa<br>Main Security Gate<br>Environmental Department, Samoa |

/mff
10/24/91

## APPROVAL

The following SPCC Plan has been prepared by:

Signature: ____________________

Name: Elizabeth T. Smith
Environmental Manager

Date: ____________________

## MANAGEMENT APPROVAL

This SPCC Plan will be implemented as described herein.

Signature: Fred R. Martin

Name: Fred R. Martin
Mill Manager

Date: FEB. 18, 1992

Signature: Gregory S. Richardson

Name: Greg S. Richardson
Plant Manager

Date: 2/18/92

Signature: ____________________

Name: Joe W. Wheeler, Jr.
General Manager

Date: ____________________

## CERTIFICATION

I certify I am familiar with this facility and the provisions of 40 CFR, Part 112, and attest that this plan has been prepared in accordance with good engineering practices.

REGISTERED PROFESSIONAL ENGINEER
JOHN R. SELVAGE
No C21099
Exp 9/30/93
CIVIL
STATE OF CALIFORNIA

Signature: John R Selvage

Name: John R. Selvage

Registration No. 21099 State Calif

## SPILL PREVENTION CONTROL AND COUNTERMEASURE PLAN

## SPILL NOTIFICATION PROCEDURE

Immediately report all facts to the Mill Manager and the Environmental Department at Samoa.

| **Sawmill: 443-7511** | | **Residence** |
|---|---|---|
| Greg Richardson, Plant Manager | Ext. 320, 300 | (707) 839-3410 |
| *Wayne Bozarth, Maint. Super. | Ext. 241, 300 | (707) 442-5445 |
| *Rex Bones | Ext. 400 | (707) 444-9108 |
| *Ray Craig | Ext. 304 | (707) 443-7258 |
| **Pulp Mill: 443-7511** | | |
| Fred Martin, Mill Manager | Ext. 246 | (707) 443-0072 |
| Jim Miller, Environmental Engineer | Ext. 429 | (707) 442-7545 |
| *Jessie Sterling | Ext. 305 | (707) 445-9443 |
| *Byron Wilson | Ext. 351 | (707) 444-3294 |
| John Nepote | Ext. 353 | (707) 668-4294 |

* May be reached by radio - extension 406, Sawmill or extension 407, Pulp Mill.

**SAWMILL PERSONNEL SHOULD NOTIFY THE PULP MILL OF SPILLS THAT ENTER THE PULP MILL EFFLUENT SYSTEM.**

If none of the above can be reached, call one of the following at Samoa, (707) 443-7511 or:

| | |
|---|---|
| Elizabeth Smith, Environmental Manager | (707) 442-4804 |
| Sergei Sherbin, Sawmill Operations Manager | (707) 444-3680 |
| Joe Wheeler, General Manager | (707) 839-0363 |

**Note:**

If none of the above can be reached and the spill will reach Humboldt Bay, call:

| | |
|---|---|
| Regional Water Quality Control Board | (707) 576-2220 |
| California Spill Notification Center | (800) 852-7550 |

Report Only Known Facts:

A. Nature of Spill
B. Estimated Quantity
C. Location
D. Time Spill Occurred
E. Your Name

Obtain the name of the individual to whom you report the spill and write it down.

**/mff**
**10/24/91**

# SPILL PREVENTION CONTROL AND COUNTERMEASURE PLAN

## WRITTEN REPORT

When cleanup operations are completed, the Mill Manager will make a detailed written report of all known facts about the spill to the Division Manager and the Environmental Department. Describe the events leading to the spill as much as they are known, the consequences of the spill, and future preventative measures to be taken.

/mff
10/24/91

SPILL PREVENTION CONTROL AND COUNTERMEASURE PLAN

## EMERGENCY SPILL PROCEDURE

**A NOTICE IS TO BE POSTED AT ALL STORAGE FACILITIES AND POTENTIAL HAZARDOUS MATERIAL SPILL AREAS.**

**CONTAIN SPILL — CALL 911 — FOLLOW SPILL PLAN**

**A COPY OF THE SPILL PREVENTION CONTROL AND COUNTERMEASURE PLAN IS LOCATED:**

1) Shift Superintendent's Office
2) Main Security Gate
3) Technical Department

**CALL ONE OF THE FOLLOWING AT 443-7511:**

| Pulp Mill | | Residence |
|---|---|---|
| Fred Martin | Ext. 246 | (707) 443-0072 |
| Jim Miller | Ext. 429 | (707) 442-7545 |
| *Jessie Sterling | Ext. 305 | (707) 445-9443 |
| *Byron Wilson | Ext. 351 | (707) 444-3294 |
| John Nepote | Ext. 353 | (707) 668-4294 |

* May be reached by radio - extension 407, Pulp Mill.

**IF UNABLE TO REACH ANY OF THE ABOVE, CALL SAMOA: 443-7511 or**

| | |
|---|---|
| Elizabeth Smith, Environmental Manager-Solid Wood | (707) 442-4804 |
| Sergei Sherbin, Sawmill Operations Manager | (707) 444-3680 |
| Joe Wheeler, General Manager | (707) 839-0363 |

Report Only Known Facts:

A. Nature of spill.
B. Your name and location of spill.
C. Estimated quantity of discharge.
D. Get the name of the person to whom you are reporting and write it down.

If you can't contact any of the above, call:

**CALIFORNIA OFFICE OF EMERGENCY SERVICES - (800) 852-7550**
**OR**
**ENVIRONMENTAL PROTECTION AGENCY - (800) 424-8802**

If none of the above can be reached and the spill will reach Humboldt Bay, call:

Regional Water Quality Control Board - (707) 576-2220

**/mff**
**10/24/91**

## EMERGENCY SPILL PROCEDURE

**THIS NOTICE IS TO BE POSTED AT ALL OIL STORAGE FACILITIES**

**CONTAIN SPILL    CALL 911    FOLLOW SPILL PLAN**

**A COPY OF THE SPILL PREVENTION CONTROL AND COUNTERMEASURE PLAN IS LOCATED:**

1) The Mill Offices
2) Main Security Gate

**CALL ONE OF THE FOLLOWING AT 443-7511:**

| SAWMILL | | Residence |
|---|---|---|
| Greg Richardson | Ext. 320, 300 | (707) 839-3410 |
| Wayne Bozarth* | Ext. 241, 300 | (707) 442-5445 |
| Rex Bones* | Ext. 400 | (707) 444-9108 |
| Ray Craig* | Ext. 304 | (707) 443-7258 |
| PULP MILL | | |
| Fred Martin | Ext. 246 | (707) 443-0072 |
| Jim Miller | Ext. 429 | (707) 442-7545 |
| Jessie Sterling* | Ext. 305 | (707) 445-9443 |
| Byron Wilson* | Ext. 351 | (707) 444-3294 |
| John Nepote | Ext. 353 | (707) 668-4294 |

*May be reached by radio - Ext. 406/Sawmill or Ext. 407/Pulp Mill

**IF UNABLE TO REACH ANY OF THE ABOVE, CALL SAMOA: 443-7511 or**

| | |
|---|---|
| Elizabeth Smith, Environmental Manager | (707) 442-4804 |
| Sergei Sherbin, Sawmill Operations Manager | (707) 444-3680 |
| Joe Wheeler, General Manager | (707) 839-0363 |

**SAWMILL PERSONNEL SHOULD NOTIFY THE PULP MILL OF SPILLS THAT MAY ENTER THE PULP MILL EFFLUENT SYSTEM.**

**NOTE:**

If none of the above can be reached and the spill will reach Humboldt Bay, call:

Regional Water Quality Control Board    (707) 576-2220

REPORT ONLY KNOWN FACTS:

A. Nature of spill

B. Your name and location of spill

C. Estimate of quantity of discharge

D. Get the name of the person to whom you are reporting, and write it down.

If you can't contact any of the above, call:

**CALIFORNIA OFFICE OF EMERGENCY SERVICES (800) 852-7550**

**OR**

# SPILL PREVENTION CONTROL AND COUNTERMEASURE PLAN

## GENERAL TANK INFORMATION

### Potential Sources of Spills

Tanks have secondary containment. Failure could occur if the tank were ruptured and the berm breached at the same time or a hose broke during filling and the check valves failed.

| Tank Capacity | Contents | Location |
|---|---|---|
| 50,000 Gallons | Diesel | Fuel Tank Near Lime Kiln (J) |
| 1,500 Gallons | Diesel | Fuel Tank at Chip Dump (K) |
| 550 Gallons | Diesel | Fuel Tank at Chip Dock (L) |
| 1,000 Gallons | Diesel | Pulp Mill Fueling Station (G) |
| 1,000 Gallons | Gasoline | Pulp Mill Fueling Station (G) |
| 1,000 Gallons | Waste Oil | Pulp Mill Fueling Station (G) |
| 300 Gallons | Diesel | Emergency Fire Pump-Pulp Mill (I) |
| 12,000 Gallons | Diesel | Log Yard/Power House Area (F) |
| 10,000 Gallons | Diesel | North End Sawmill Site (A) |
| 10,000 Gallons | Diesel | North End Sawmill Site (A) |
| 3,000 Gallons | Diesel | Bay Side of Sawmill Behind Maintenance Shop (B) |
| 2,000 Gallons | Gasoline | Bay Side of Sawmill Behind Maintenance Shop (B) |
| 2,000 Gallons | Waste Oil | North End Sawmill Site at Roundhouse (A) |
| 1,200 Gallons | Hydraulic Oil | Sawmill Floor Near Headrig (C) |
| 1,000 Gallons | Diesel | West of Old Sawmill Building (E) |
| 500 Gallons | Diesel | West of Old Sawmill Building (E) |
| 300 Gallons | Antistain | Sawmill Planer (D) |

All aboveground tanks have secondary containment at least adequate to contain any spill. A spill from any other tank could possibly reach Humboldt Bay. The 50,000 gallon pulp mill fuel tank also has the potential to enter the ocean via the mill sewer systems.

Any spill from the antistain system would remain inside the sawmill building.

A spill cleanup trailer is maintained at the Samoa Redwood Dock for emergency response and may be obtained by calling the main gate. The trailer is equipped with sorbent booms, materials and equipment for containing oil spills.

/mff
10/24/91

# SPILL PREVENTION CONTROL AND COUNTERMEASURE PLAN

## DESIGN INFORMATION

**Bulk Storage Tanks** (See Site Plan)

The Samoa complex is located on a sand peninsula between Humboldt Bay and the Pacific Ocean. All tanks are bermed; however, the sand allows rainwater to percolate out of the berm. No provision is made to drain the contained area since water does not accumulate. A separate document has been prepared and is available at the pulp mill for chemical spills.

**Truck Fueling Station** (A)

The fueling station is located at the extreme north end of the Samoa complex. The actual fueling station is on a concrete pad which drains through an oil skimmer. Two 10,000 gallon steel tanks of diesel fuel are located adjacent to the fuel station within a common uncovered concrete containment structure of 12,500 gallon capacity. The bypass valve is kept sealed and locked with appropriate personnel having a key. This containment area is drained of stormwater when necessary, and a log is kept as to the amount and disposition of the stormwater. A spill would flow south to a drainage ditch near the tanks. This ditch is equipped with a skimmer. A spill at the truck fueling station would flow across the concrete pad to the oil skimmer which discharges to the ditch. Waste oil is stored at the fueling station in a 2,000 gallon tank near the roundhouse. A spill from the waste oil tank would remain within the concrete containment area.

**Vehicle Fueling Station** (B)

Two tanks are located at the east of the sawmill maintenance shop. The 3,000 gallon diesel and 2,000 gallon gasoline tanks are contained in an adequately sized uncovered concrete structure. The bypass valve is kept sealed and locked with appropriate sawmill personnel having a key. This concrete containment area is drained of stormwater when necessary and appropriate logs kept of amount and disposition of the stormwater. A spill outside the containment area would be directed over a paved area to the large oil skimmer that collects most of the sawmill east side drainage and discharges it to the pulp mill effluent discharge system. The oil skimmer contains booms to absorb spilled oil or fuel.

**Sawmill** (C)

A 1,200 gallon tank of hydraulic oil is stored inside the sawmill within a concerete containment area. any leak of hydraulic oil would stay within the building.

**Antistain Tank** (D)

Located under the planer in the sawmill is a 300 gallon stainless steel tank containing copper 8 quinolinolate. The area around the tank is paved and located within a concrete containment structure.

SPILL PREVENTION CONTROL AND COUNTERMEASURE PLAN

DESIGN INFORMATION (Continued)

**Chip Reman Yard (E)**

A 1,000 gallon diesel tank and a 500 gallon diesel tank are contained within a concrete containment structure. The tanks are located at the northwest corner of the old sawmill building and are plumbed so that they are connected. A pump left on could conceivably drain both tanks. Spillage outside the containment structure will stay on pavement and flow towards the east side of the old sawmill building. A bypass valve is kept sealed and locked with appropriate personnel having a key.

**Log Yard/Power House Fuel Tank (F)**

A 12,000 gallon diesel tank is located at the eastern boundary of the log yard by the sawmill. The tank sits vertically at the top of a knoll. The tank is located within a concrete containment structure. It is unlikely that a spill would enter a drainage system because of its proximity to water.

**Pulp Mill Fueling Station (G)**

The vehicle fueling station is located on the north side of the mill. Within a concrete containment structure of 3,800 gallon capacity are two 1,000 gallon steel tanks. One contains diesel and one unleaded gasoline. A third 1,000 gallon waste oil tank is contained within its own concrete containment structure of adequate holding capacity. Any spill would flow into the storm drain toward the bay to the east. On the paved area, a spill would flow to the east to the first catch basin where it would enter a subsurface drainage system and finally through a skimmer at the northeastern boundary of the facility.

**Drum Storage Area (H)**

Opposite the pulp mill vehicle fueling station is the storage area for drums of lubricants. These 55 gallon drums (approximately 50) of various oils and greases are stored horizontally in metal racks above a concrete pad sloped toward a drain which contains an oil skimmer. Stormwater runoff from the concrete pad drains through this skimmer to the ocean. The skimmer is inspected and cleaned as needed.

**Emergency Fire Pump Tank (I)**

This steel tank is located 200 yards southeast of the 50,000 gallon diesel tank near the lime kiln (recovery boiler end) and stores diesel fuel to operate the emergency fire system pressurization pump. The tank contains 300 gallons of diesel fuel and is located within a concrete containment structure. Any spill would remain in the area due to the topography of the area.

## SPILL PREVENTION CONTROL AND COUNTERMEASURE PLAN

### DESIGN INFORMATION (Continued)

**Recovery Boiler Diesel Tank (J)**

This insulated 50,000 gallon steel tank is the source of fuel for firing the recovery boilers from a cold start-up. It is full contained by a concrete containment structure.

**Chip Dump Fuel Tank (K)**

This tank is a 1,500 gallon steel tank within a 3,000 gallon capacity concrete containment structure. Any spill would be absorbed by the sand around the tank. All drainage in the chip storage area enters a ditch along the north edge of the area. A spill could possibly enter this ditch, which is over 20 feet wide. The ditch is blocked near the bay where there is a large skimmer. Pumps with subsurface inlets transfer the rainwater to the pulp mill effluent system.

**Chip Pile Fuel Tank (L)**

An elevated 550 gallon diesel tank is located on the north side of the chip piles near the chip dump. This tank is used for fueling the tractors working on the chip piles. The tank is located within a concrete containment structure. Drainage of surface water, or fuel, in the event of a spill would flow in the direction of the road and across sand before entering a ditch with a skimmer system. A spill would be absorbed by the sand. It is unlikely that a spill would enter the ditch.

/mff
10/24/91

## SPILL PREVENTION CONTROL AND COUNTERMEASURE PLAN

## EMERGENCY SPILL RESPONSE

### Diesel Fuel Station (A)

At the storage tanks, a spill would be contained within the concrete structure. Stop the leak at the source if possible. If this cannot be done and there is a possibility of draining one of the 10,000 gallon tanks, call for the pumper truck to suck up the excess diesel fuel. In the event the concrete containment structure around the tanks is breached, follow the same procedure necessary to contain a spill at the pump (see below). When the spill is stopped, the backhoe will be needed to remove the contaminated sand for proper disposal.

A spill around the diesel pumps will flow across the concrete pad to the oil skimmer on the southwest corner then discharge into the drainage ditch. Stop the spill at the source. Check the oil skimmer for adequate capacity. If needed, call for the pumper truck to pump out the skimmer. If oil is overflowing the skimmer or entering the drainage ditch from the storage tanks, use the truck to pump out the ditch. Check the backup skimmer in the ditch on the east side of the road. Pump out this skimmer as necessary.

Call the main gate for the spill trailer and place sorbent booms in the ditch as needed to prevent oil from entering the bay. Leave these in place until all cleanup and required repairs are completed.

### Vehicle Fuel Station (B)

A spill at the vehicle fuel station east of the sawmill maintenance shop should be contained within the concrete containment area. Attempt to stop the leak at its source is the first course of action. Contact personnel at the sawmill and use the pumper truck, if necessary, to transfer fuel or oil out of the leaking tank. If the concrete containment structure is damaged or leaking, call the main gate for the spill trailer. Use trailer sorbent material to confine the spill to as small an area as possible and prevent the spill from entering the skimmer and drainage ditch. Call the pulp mill main gate (extension 410) if any material (fuel or oil) enters the skimmer/ditch system at this location. This notification is **very important** for pulp mill effluent chemical balance. Turn off the pump that transfers water to Manhole #5. Put any contaminated spill in clean drums for proper disposal. Pump out the ditch using the pumper truck.

### Sawmill (C)

A spill of the hydraulic oil within the sawmill would stay within the building. The tank has secondary containment so a spill is likely to be contained. Absorb spilled fluid with "kitty litter", stored in the adjacent maintenance shop, or pump it out of the containment area into another vessel if possible. Check interior drains and plug with sorbent pads to reduce spread if the containment area is breached. Use sorbent material from the spill trailer to clean up the spill. Place cleanup material in drums for proper disposal.

SPILL PREVENTION CONTROL AND COUNTERMEASURE PLAN

EMERGENCY SPILL RESPONSE (Continued)

**Antistain Tank (D)**

The entire floor of the sawmill is paved with concrete. A spill at the antistain system would remain within the building on the concrete floor where it could be absorbed. There is a concrete trough in the floor which is plugged with concrete near the east wall of the mill. If antistain enters this trough, it will be contained and can be pumped out for reuse or disposal. Sorbent material is stored in drums by the antistain system for this purpose.

Sawdust, shavings or hog fuel can be used to construct temporary berms to contain a spill. This material will absorb spilled antistain, however, it is not as effective as the special sorbent in the drums.

**Chip Reman Yard (E)**

A spill within the fueling station containment area should be stopped immediately by locating the source of the spill and taking corrective action. Pump the spilled fuel within the containment area into a tanker truck or another vessel for temporary storage. Absorb remaining fuel with sorbent pads and booms and leave in the containment until all repairs are made and then dispose of these materials using proper disposal practices.

A breach of the concrete containment structure for the chip reman yard fueling area should be immediately reported to the main gate so the spill trailer may be secured. In the meantime, use hogged fuel, sawdust or soil in the immediate vicinity to prevent the spill from spreading. No drainage way or skimmer would be impacted by a spill at this location, but all spill material needs to be cleaned up and removed from the area for the proper disposal.

**Log Yard/Power House Fuel Tank (F)**

Spill response would require stopping the spill and pumping out remaining fuel into a tight container if needed. Sand or any other material that comes in contact with the fuel would require removal for proper disposal.

**Pulp Mill Fuel Station (G)**

A spill in this area would be absorbed by the sand within the concrete containment structure. Spill response would require stopping the spill and pumping out the storage tank if necessary. Material absorbed by the sand would need to be removed with the backhoe for proper disposal.

A failure of a hose at the pumps or spill onto the asphalt near the pumps would flow east across the pavement toward the catch basins where the oil skimmers would remove the oil. Cleanup would require pumping out the skimmers as required. If conditions, such as heavy rains, could carry a spill beyond a catch basin, call for the spill trailer and use sorbent booms and pads as necessary to absorb the spill.

SPILL PREVENTION CONTROL AND COUNTERMEASURE PLAN

EMERGENCY RESPONSE (Continued)

**Drum Storage Area (H)**

Opposite the fuel pumps is the rack holding drums of petroleum products. In the event a drum is ruptured, the contents would spill on the concrete pad which slopes toward the truck shop catch basin/oil skimmer. Spill containment and cleanup would be as above.

**Emergency Fire Pump Tank (I)**

This small tank is situated on the north side of the building within a concrete containment structure. If monitoring showed the tank to be leaking, cleanup would consist of removing the contaminated sand after the tank had been pumped out.

**Diesel Fuel Tank (J)**

This tank is contained within a circular concrete containment structure of adequate size to contain the tank contents. Spill response would consist of stopping the leak, if possible, and monitoring the containment structure to be sure no diesel escaped. If diesel appeared beyond the containment structure, it would flow across the surrounding pavement. Temporary sand or chip dikes would confine the spill.

There is a possibility a spill could enter the mill sewer system. Plug the sewer with sand and chips. This will cause a backup of the alkaline sewer which will overflow onto the pavement. Temporary sand dikes would be installed to exclude diesel from the sewer so it can be cleaned and reopened to flow as soon as possible. Cleanup of the paved surface would require spreading sand, chips or pads on the diesel and placing in containers for proper disposal.

**Chip Dump Fuel Tank (K)**

The leak should be stopped if possible. Due to the proximity of the tank to the main drainage ditch, diesel could enter the ditch should the concrete containment structure be breached. This might be prevented by placing sorbent materials on the spill. Call for the pumper truck, if necessary, to empty the tank. Diesel that entered the ditch would accumulate at the oil skimmer just upstream of the pump intakes. Use the pumper truck to remove floating oil for proper disposal.

**Chip Pile Fuel Tank (L)**

A leak in the tank will be confined to the concrete containment area. The pumper truck should be used to pump out any fuel so that it can be transferred to another container. Use sorbent materials from the spill trailer (call the main gate) to clean up spilled fuel. leave all sorbent material in the containment until the leak is completely corrected. Because of the hazard with the chip piles, contact pulp mill personnel.

If the containment structure is breached, attempt to prevent the spill from crossing the roadway and entering the sand banks or drainage ditch by immediately placing sand or other material parallel to the road. Clean up all sorbent material and contaminated chips and dispose of them properly.

/mff
10/24/91

SPILL PREVENTION CONTROL AND COUNTERMEASURE PLAN

## TRAINING

Employees are made aware of the potential for spills, and the actions required in the event a spill occurs, at monthly safety meetings periodically. Procedures are reviewed by supervisors on a regular basis.

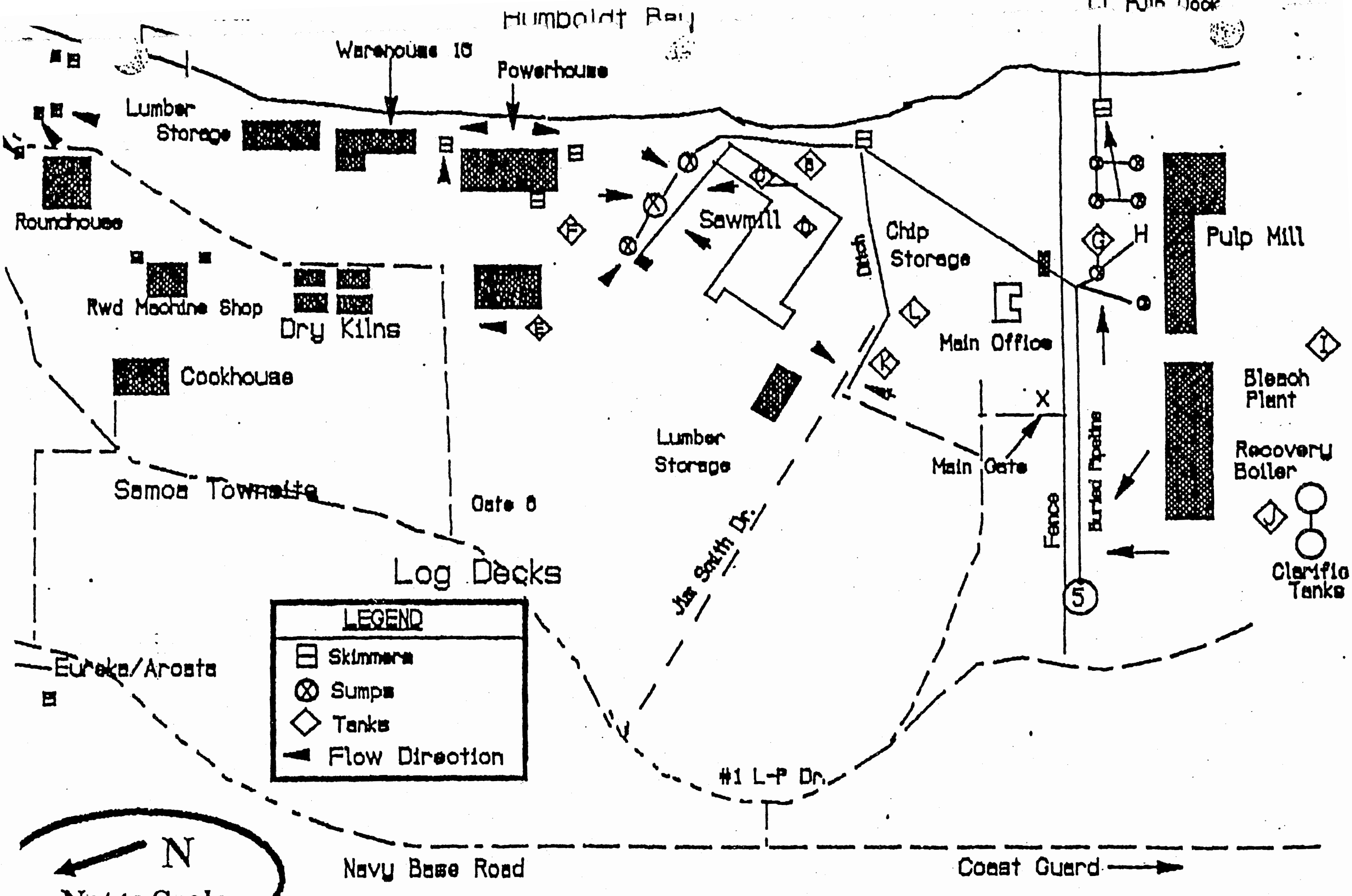
## EQUIPMENT

Sorbent Oil Booms
Front End Loader
Shavings, Sawdust, Hog Fuel
Sorbent Oil Pillows
Bags of Sorbent
Pumper Truck (Water Truck)
Portable Pumps
Dump Trucks

**Emergency Spill Trailer at Redwood Dock**
**Call Main Gate, Extension 410**
**Average Contents:**

| | |
|---|---|
| 8 | - Sorbent Booms |
| 6 Bags | - Sorbent Pads |
| 4 | - Shovels |
| 2 Bags | - Absorball |
| 2 | - Life Jackets |
| 2 | - Brooms |
| 100' | - ¼" Rope |

/mff
10/24/91




Dunes

**SAMOA COMPLEX - SITE PLAN**

## *EMERGENCY SPILL PROCEDURE*

*THIS NOTICE IS TO BE POSED AT ALL OIL STORAGE FACILITIES*

*CONTAIN SPILL* *FOLLOW SPILL PLAN*

*A COPY OF THE SPILL PREVENTION CONTROL AND COUNTERMEASURE PLAN IS LOCATED:*

*1) The mill offices*

*2) Main Security Gate*

***Call one of the following at 443-7511:***

| *Sawmill* | | *Residence* |
|---|---|---|
| *Greg Richardson** | *Ext.320, 300* | *(707) 839-3410* |
| *Jim Ottoboni** | *Ext. 312, 300* | *(707) 839-4911* |
| *Wayne Bozarth** | *Ext. 241, 300* | *(707) 442-5445* |
| *Rex Bones** | *Ext. 400* | *(707) 444-9108* |
| *Ray Craig** | *Ext. 304* | *(707) 443-7258* |
| *Pulp Mill* | | |
| *Fred Martin* | *Ext. 246* | *(707) 443-0072* |
| *Jim Miller* | *Ext. 429* | *(707) 442-7545* |
| *Jessie Sterling** | *Ext. 305* | *(707) 445-9443* |
| *Byron Wilson** | *Ext. 351* | *(707) 444-3294* |
| *John Nepote* | *Ext. 353* | *(707) 668-4294* |

**May be reached by radio - ext. 406/Sawmill or Ext. 407 Pulp Mill*

***IF UNABLE TO REACH ANY OF THE ABOVE, CALL SAMOA: 443-7511 or***

| | |
|---|---|
| *Elizabeth Smith, Environmental Manager* | *(707) 442-4804* |
| *Serge Sherbin, Sawmill Operations Manager* | *(707) 444-3680* |
| *Joe Wheeler, General Manager* | *(707) 839-0363* |

***Sawmill Personnel should notify the pulp mill of spills that may enter the pulp mill effluent system.***

***NOTE: IF NONE OF THE ABOVE CAN BE REACHED AND SPILL WILL REACH HUMBOLDT BAY, CALL:***

***REGIONAL WATER QUALITY CONTROL BOARD (707) 756-2220***

*Report only known facts:*

*A. Nature of spill*

*B. Your name and location of spill*

*C. Estimate of quantity of discharge*

*D. Get the name of the person to whom you are reporting, and write it down.*

*If you can't contact any of the above, call:*

*CALIFORNIA OFFICE OF EMERGENCY SERVICES (800) 852-7550*

*OR*

*EPA (800) 424-8802*

# END OF DOCUMENT



pa
PACIFIC AFFILIATES
A CONSULTING ENGINEERING GROUP
835 THIRD ST · EUREKA · CALIF · 95501 · (707) 445-3001

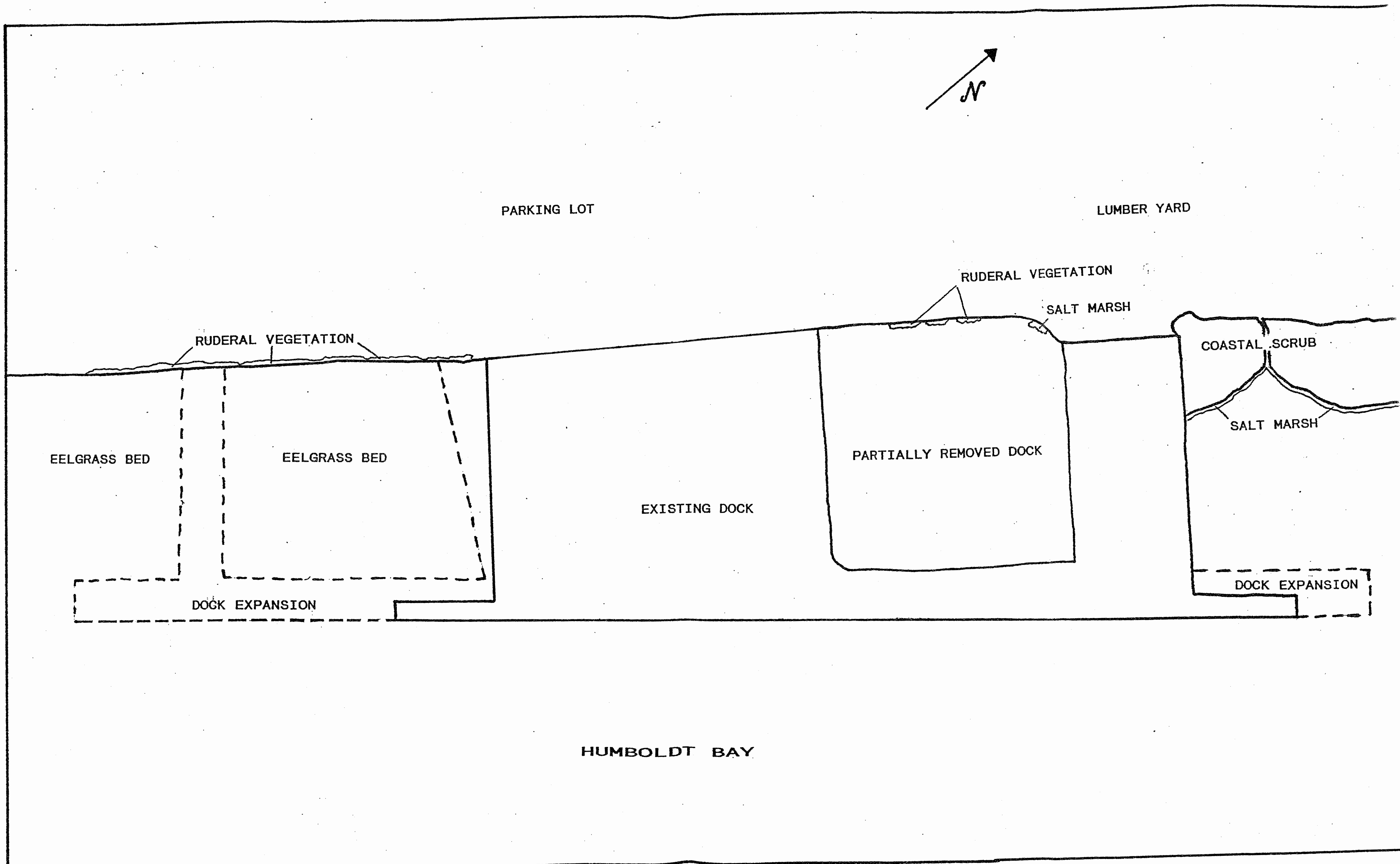
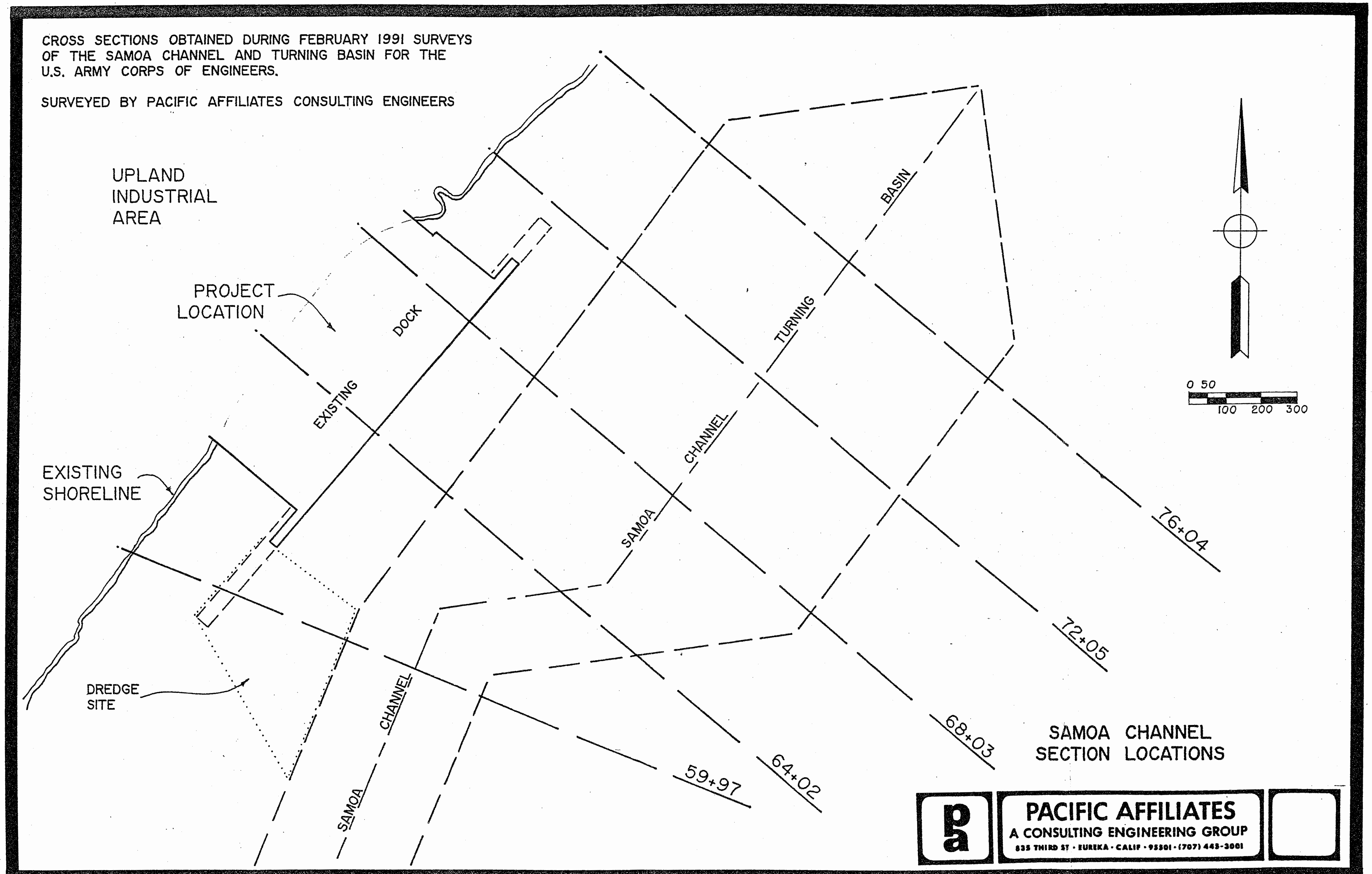
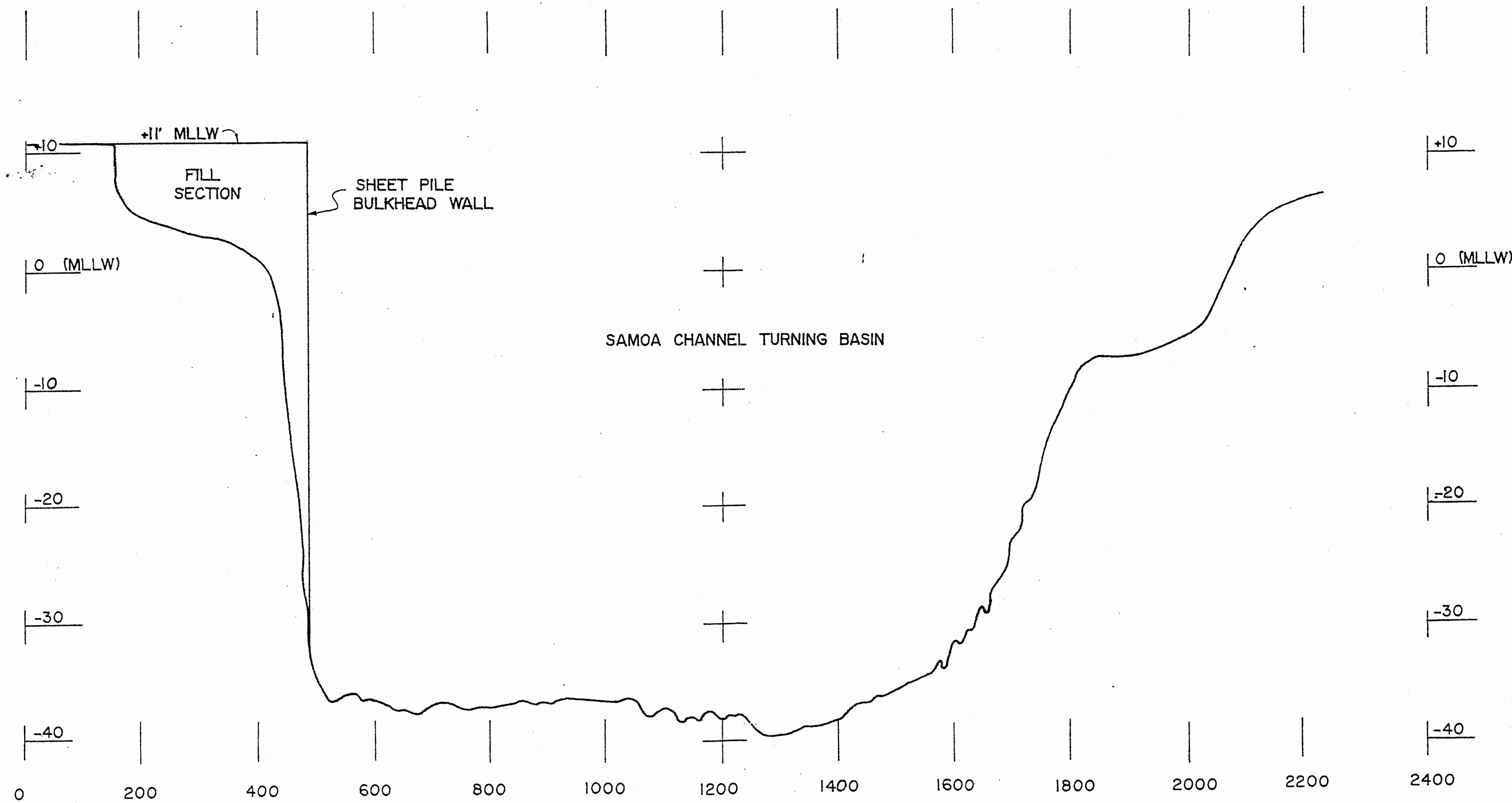



FIGURE 2
DOCK EXPANSION AREA



CROSS SECTIONS OBTAINED DURING FEBRUARY 1991 SURVEYS OF THE SAMOA CHANNEL AND TURNING BASIN FOR THE U.S. ARMY CORPS OF ENGINEERS.
SURVEYED BY PACIFIC AFFILIATES CONSULTING ENGINEERS
UPLAND INDUSTRIAL AREA
PROJECT LOCATION
EXISTING DOCK
EXISTING SHORELINE
DREDGE SITE
SAMOA CHANNEL
SAMOA CHANNEL
TURNING BASIN
76+04
72+05
68+03
64+02
59+97
0 50
100 200 300
SAMOA CHANNEL SECTION LOCATIONS
PACIFIC AFFILIATES
A CONSULTING ENGINEERING GROUP




68+03

CROSS SECTIONS OBTAINED DURING FEBRUARY 1991 SURVEYS OF THE SAMOA CHANNEL AND TURNING BASIN FOR THE U.S. ARMY CORPS OF ENGINEERS.

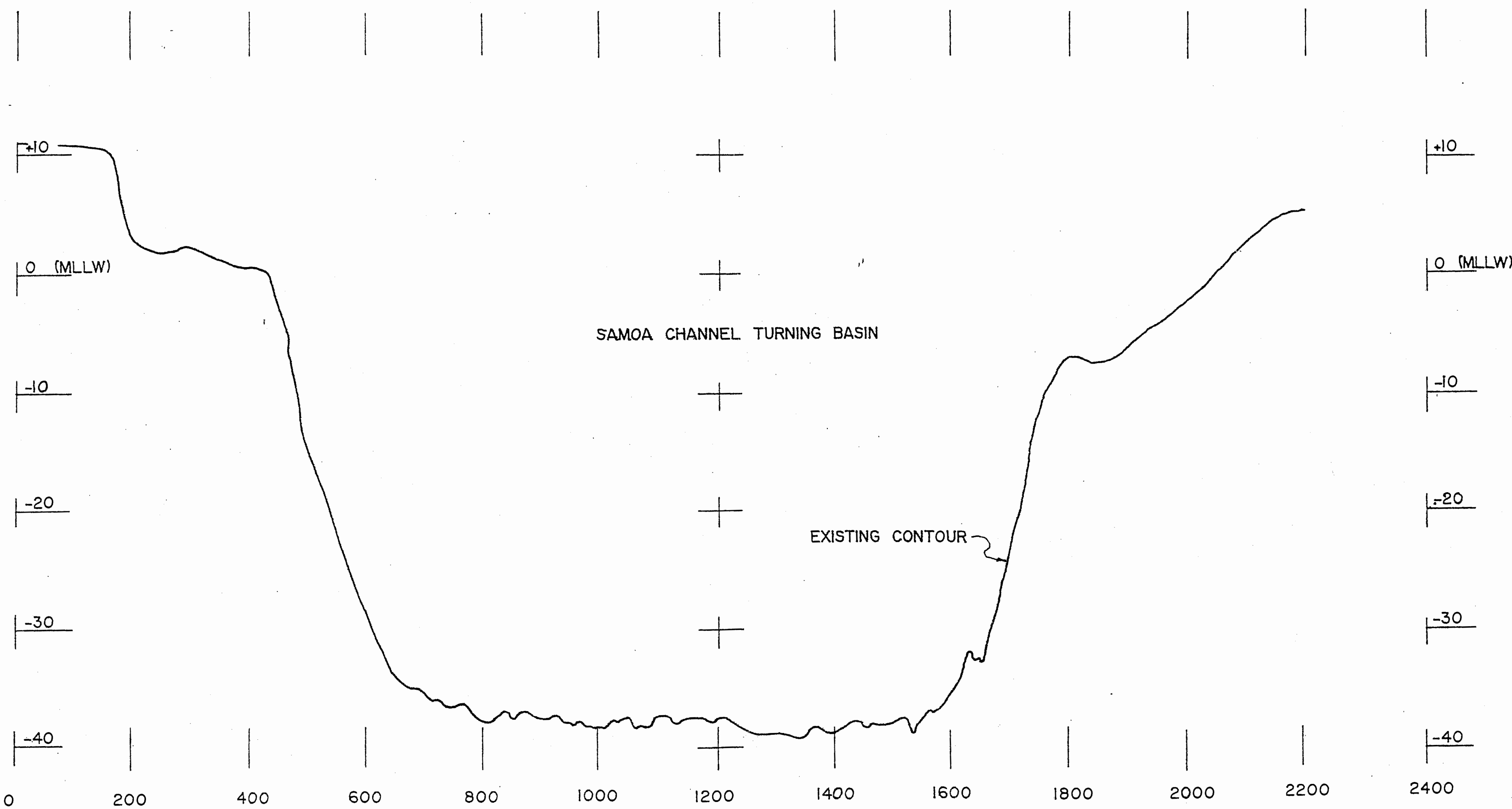
DATUM IS REFERENCED TO MEAN LOWER LOW WATER

HORIZONTALL SCALE 1"= 200'     VERTICAL SCALE 1"= 10'

FIGURE C

PACIFIC AFFILIATES
A CONSULTING ENGINEERING GROUP
835 THIRD ST · EUREKA · CALIF · 95501 · (707) 445-3001

C




CROSS SECTIONS OBTAINED DURING FEBRUARY 1991 SURVEYS OF THE SAMOA CHANNEL AND TURNING BASIN FOR THE U.S. ARMY CORPS OF ENGINEERS.

72+06

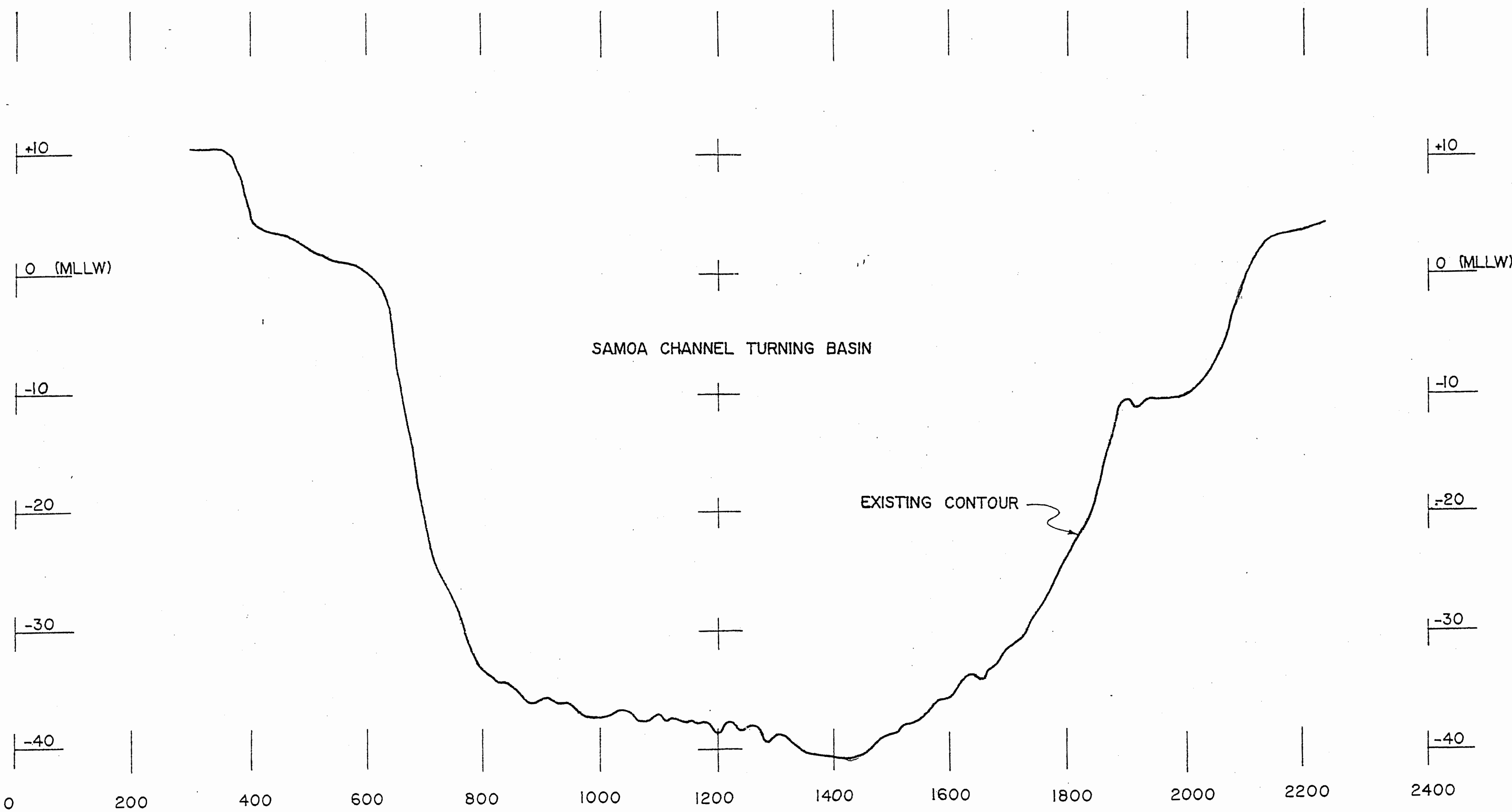
DATUM IS REFERENCED TO MEAN LOWER LOW WATER

HORIZONTALL SCALE 1"= 200' VERTICAL SCALE 1"= 10'

FIGURE D

PACIFIC AFFILIATES
A CONSULTING ENGINEERING GROUP
835 THIRD ST · EUREKA · CALIF · 95501 · (707) 445-3001

D




CROSS SECTIONS OBTAINED DURING FEBRUARY 1991 SURVEYS OF THE SAMOA CHANNEL AND TURNING BASIN FOR THE U.S. ARMY CORPS OF ENGINEERS.

DATUM IS REFERENCED TO MEAN LOWER LOW WATER

HORIZONTALL SCALE 1"= 200' VERTICAL SCALE 1"= 10'

76+04

FIGURE E

PACIFIC AFFILIATES
A CONSULTING ENGINEERING GROUP
835 THIRD ST · EUREKA · CALIF · 95501 · (707) 445-3001

E