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DREDGED MATERIAL RESEARCH PROGRAM

TECHNICAL REPORT D-77-43

CASE STUDIES AND COMPARATIVE ANALYSES OF ISSUES ASSOCIATED WITH PRODUCTIVE LAND USE AT DREDGED MATERIAL DISPOSAL SITES

Volume II: Appendices A-R

by

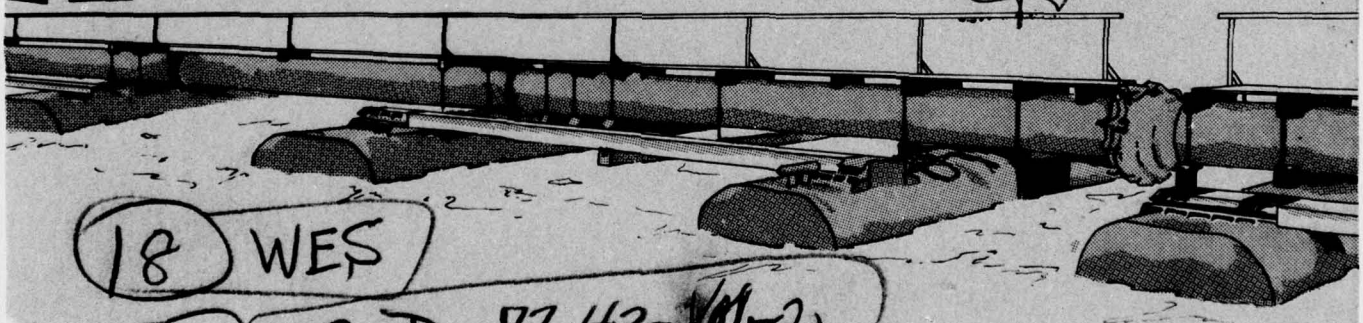
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December 1977

Final Report

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This volume contains synopses of twelve case studies located in Jacksonville and Crystal Bay, Fla.; Cleveland and Huron, Ohio; Green Bay, Wis.; San Diego, Calif.; Coos Bay, Oreg.; Anacortes and Hoquiam, Wash.; Philadelphia, Pa.; Memphis, Tenn.; and → (over)

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APPENDIX A: SYNOPSIS OF CASE STUDY NO. 1 - BLOUNT ISLAND - JACKSONVILLE, FLORIDA

Background Summary

Introduction

1. Blount Island (pronounced "blunt") is a 1660-acre man-made island in the St. Johns River at Jacksonville, Florida (Figure A1). Located about midway between Jacksonville's central business district 9 miles upstream and the Atlantic Ocean, the island was created in 1950 when dredged material from a Federal improvement project was deposited among several existing small and separate islands. The Federal project involved construction of a straight-line deep draft (34 feet) channel in the St. Johns along the southern perimeter of the island group. This channel, called the Fulton-Dame Point Cutoff, became the southern boundary of the new triangular land mass, which was bordered on the west, north, and east by the former main channel of the St. Johns.

2. In 1963 the Jacksonville Port Authority (JPA) was formed and given title to Blount Island with attendant responsibility to develop its port/industrial potential. During the period 1968-72 over $14 million was invested in the development of JPA port and related facilities on the southwest portion of the island. At the same time, in fulfilling its "local sponsor" duties of furnishing disposal sites to the Jacksonville District, JPA began providing selectively located confined areas (totalling nearly 500 acres) on the island's eastern half. This was done for the express purpose of increasing the island's appeal to industry.

3. In late 1971, specific plans for development of the eastern half of the island were announced by JPA and Offshore Power Systems, Inc. (OPS). These plans called for the construction of facilities necessary for the production of platform-mounted floating nuclear power plants (FNP). The plans included the use of up to 3.8 million cubic yards (MCY) of dredged material from an ongoing Federal project to deepen the harbor channel to 38 feet. The OPS plans also called for

the dredging and filling of another 12.5 MCY in and around Blount Island and for the transformation of Back River, a tidal bayou that bisected the island, into a deep draft construction channel.

Site description and regional context

4. Blount Island is roughly triangular in shape, spanning nearly 2.5 miles east to west along its southern border and about 1.5 miles north to south at its deepest point. Including all submerged land, marshland, and upland, the island contains about 1660 acres. When Blount Island was created in 1950 an oxbow-shaped stream that had meandered through the group of smaller islands was preserved. However, the stream's exit from the island group was filled in, turning the stream into a cul-de-sac having its only opening to the St. Johns River at the southeast corner of the new land mass. The cul-de-sac was named Back River (Figure A2).

5. Blount Island was zoned for industrial development in 1968 by the Jacksonville Area Planning Board (JAPB). At the time of planning the OPS project, only the southwestern portion of the island had been developed by the JPA. The JPA facilities consisted of two warehouses, a 45-ton container crane, and a 2600-foot bulkheaded dock. Plans existed to expand these port facilities by adding two gantry cranes (one 50-ton, one 100-ton), a pair of heavy duty roll-on/roll-off ramps, and an additional 1800 feet of docking length. The island had excellent access to both the mainland (via existing and planned vehicular bridges) and the Atlantic Ocean, had railway service, and had utilities. Also, in conjunction with Section 1 of the harbor deepening project, which included deepening the Fulton-Dame Point Cutoff from 34 to 38 feet, the southern and eastern undeveloped portions of the island had received dredged material in several confined areas.* This material was primarily composed of sand, shell, and rock, but some silt deposits were present as well. In general, Blount Island was very ripe for industrial development. In terms of the intended OPS use, it appears that the Back

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* Section 1 of the harbor deepening project went from the Atlantic Ocean to the western tip of Blount Island. Section 2 went the remaining distance to the Tallyrand Docks near downtown Jacksonville.

River channel was "tailor made" to the need for an FNP construction and testing area. Thus, the island's attractiveness for FNP production was substantial. The unique physical feature that made Blount Island interesting to OPS was access to the Atlantic Ocean via a 500-foot wide channel with no vertical obstructions.

6. The ecology of the Blount Island area and, more importantly, of Back River, is closely allied to that of the wider St. Johns River ecosystem. At the time of development planning in 1971, Back River was surrounded by extensive marshes that were traversed by many tidal creeks connected to the cul-de-sac. The Back River tidal bayou was subjected to several biological and engineering studies during the 1968-72 period and conflicting assessments as to its viability and importance to the ecosystem were obtained. In 1972 the total marshland acreage in the vicinity of Blount Island was estimated to be from 50,000 to 90,000 acres, while the total submerged and marshland acreage on the island was about 500 acres.

7. In 1968 the City of Jacksonville and Duval County were consolidated to form what is known as the Jacksonville-Duval Area or the Consolidated City of Jacksonville. The city is the largest urban complex in the northeast Florida/southeast Georgia area and is the major industrial and distribution center for an area extending over a radius of more than 125 miles. Jacksonville's economic base is quite diversified, spanning heavy and light industry, shipyards, insurance, banking, and railroads. The harbor facilities make Jacksonville a major port for deep draft ocean traffic, principally for receipts of petroleum products and shipments of phosphates, but there is also a growing volume of containerized cargo and automobiles.

8. Land uses in the Jacksonville-Duval County area span the full range from industrial, urban, and suburban to rural and natural open. The few developed areas immediately surrounding Blount Island have historically been devoted to suburban residential use. Almost all of the residential, industrial, and commercial development has occurred south and west of the island, leaving undeveloped the extensive areas of marsh bordering the St. Johns River to the north and east. In a 20-year

development plan completed in 1969 by the JAPB, called Plan 1990, Blount Island was shown as a waterfront industrial tract, while the marshlands of northeastern Jacksonville were represented as primarily open space with limited density residential and industrial development. During the disposal site planning and evaluation process for the 38-foot project, the JAPB had commented that filling in the Back River area of Blount Island was consistent with general development plans for the island.

Productive land use plan

9. In April 1972, after several months of negotiations with OPS, JPA applied for a Federal permit to conduct dredge and fill operations necessary for the industrial development of Blount Island by OPS. The proposed project called for the modification of about 950 of the island's 1660 acres, including 275 acres of Back River, in order to accommodate the development of facilities for the manufacture, assembly and non-nuclear testing of FNP's. The planned alterations to Blount Island included the following:

a. Construction of approximately 24,000 linear feet of bulkhead along the island's southern and northeastern shorelines, and along both sides of the Back River.

b. Removal by dredging of 8 MCY of material waterward of the bulkhead line to establish navigational depths.

c. Removal by dredging of 2 MCY of unsuitable material landward of the bulkhead line (includes Back River areas), and disposal of this material at an upland disposal area on the mainland north of Blount Island.

d. Filling of excavated and low elevation areas landward of the bulkhead line (including portions of Back River) using material dredged from (1) areas of St. Johns River and Fulton-Dame Point Cutoff adjacent to the new bulkhead and (2) Section 2 of the Jacksonville Harbor 38-foot project (estimated at up to 3.8 MCY).

10. The proposed OPS facility is illustrated in Figure A3. The complex can be subdivided into three major areas: production shops for the assembly and manufacture of FNP components and sub-assemblies; the construction slip, a 400-foot wide by half-mile long channel with 38-foot depth and seawall which will provide anchoring positions for the FNP's under construction; and the outfitting and testing berths used to

complete the non-nuclear functional testing of each FNP. Parking, secondary maintenance shops and other support facilities were also included in the plan. The plan illustrated in Figure A3 is for the construction of four FNP's per year. A more recent plan calls for initial construction to produce one FNP per year and consequently is smaller in scale than the plan illustrated. Productive use construction by OPS began in January 1974 and by March 1975 most of the major physical alterations to be made were completed as shown in the "before" and "after" photos of Figures A4 and A5.

Project Implementation

Chronology

11. Figure A6 presents a chronology of events in the process of implementing the OPS project. The chronology begins with the disposal planning activities of the Jacksonville District and the JPA prior to the start of negotiations between JPA and OPS in late 1971. It ends with the dismissal in early 1974 of the Florida Audubon Society's (FAS) court action challenging the adequacy of the Corps' EIS on the JPA's application for a Federal dredge and fill permit. It was within the State and Federal processes for regulating dredge and fill projects that the key events in this case occurred.

Participants

12. Important participants in the process of implementing the OPS productive use plan for Blount Island included the following:

a. Jacksonville District, Corps of Engineers.

b. Jacksonville Port Authority (JPA).

c. Offshore Power Systems, Inc. (OPS).

d. Florida Trustees of the Internal Improvement Trust Fund (TIITF).

e. U.S. Fish and Wildlife Service (FWS).

f. Florida Audubon Society (FAS).

13. Jacksonville District. The Corps' primary role was as the Federal agency with regulatory authority over dredging and filling

activities in navigable waterways. However, the Corps had secondary interests in that the JPA permit application provided for disposal in three diked areas on Blount Island of up to 3.8 MCY of material from Section 2 of the Federal harbor deepening project. Also, the Corps had previously approved and utilized four other diked disposal areas on what eventually became the site of the OPS project.

14. Jacksonville Port Authority. The JPA is the local sponsor for Federal dredging activity in Duval County and, as owner of Blount Island, was responsible for securing all necessary local, State, and Federal approvals and permits for the OPS project. In general, the JPA was committed to the industrial development of Blount Island and to whatever alterations of the island (including filling Back River) were necessary. On two occasions from 1968 to 1971, for both Sections 1 and 2 of the 38-foot project, the JPA disposal plans included proposals to fill in about 170 acres of Back River. In each instance the environmental objections were so strong that alternate upland areas on Blount Island were substituted. For the OPS development, the JPA submitted applications for the needed State (Chapter 253) and Federal (Section 10) permits in April 1972.

15. Offshore Power Systems, Inc. OPS was a joint venture of Westinghouse Electric Corp. and Tenneco, Inc. and was incorporated in April 1972. Tenneco has since terminated its involvement in the venture. Westinghouse had been developing the concept of FNP's since 1966 and, by the time OPS was formed, the choice of sites had been narrowed to Portsmouth, Virginia or Jacksonville. OPS initially approached the JPA about Blount Island in late 1971 and from the beginning was active in public relations work aimed at developing support for the project from local and State officials, trade organizations, the news media, and the Jacksonville citizenry as a whole.

16. Florida Trustees. The TIITF was the State permitting body for dredge and fill projects prior to a July 1975 reorganization of Florida's government. After a well-attended public hearing held in May 1972, the TIITF granted the State permit to JPA with conditions that (1) OPS commit in writing to development of the FNP manufacturing

facility and (2) OPS pay the State $1 per cubic yard for sovereign material deposited on any property subsequently sold to OPS by JPA.

17. U.S. Fish and Wildlife Service. The FWS was the primary resource management agency opposed to the OPS project. FWS formally opposed the JPA Section 10 permit in January 1973, about 5 months after public notice of the application, and again in March 1973. Following a May 1973 meeting at the Department of the Interior in Washington, D.C. involving high level administrators of several agencies, FWS agreed to remove its objection if OPS would commit to acquiring and placing into public trust 2 acres of comparable wetland for every 1 acre of wetland damaged or destroyed on Blount Island.

18. Florida Audubon Society. FAS was the principal environmental group objector to the proposed OPS project. On the day it was issued by the Corps in September 1973, FAS obtained a temporary restraining order against the JPA permit on the grounds that (1) the Corps' EIS was inadequate under NEPA and (2) a public hearing as required under PL 92-500 had not been held.

Major issues addressed during implementation

19. A variety of issues were addressed by various participants during the planning and review process for the OPS project. Table A1 summarizes the major concerns raised in the environmental, economic/financial, legal, and planning/implementation issue categories. The issues described in Table A1 were identified in this study as having a "major" impact on project implementation. The environmental issue of wetlands filling and the legal issues of EIS adequacy and public hearing requirements were the primary reasons for implementation delays.

Planning considerations affecting implementation

20. Physical planning elements assessed in terms of impact on project implementation have been grouped into two categories: (1) elements related to disposal facility planning and (2) elements related to productive land use planning. Table A2 summarizes the most important physical planning elements of the Blount Island project. In

terms of disposal planning, key considerations were that wetland areas were involved and that ecological characteristics would be altered (both exerting negative influence on implementation). With respect to land use planning, foundation conditions were a negative aspect, but shipping access and site size and configuration had a positive influence on the project.

21. The OPS plan for Blount Island contained both advantages and disadvantages in terms of land use planning. There were five primary advantages. First, the OPS facility was projected to have a tremendous favorable impact on local and State economies, largely as a result of additional jobs and increased tax revenues. Second, the water-dependent OPS plan was consistent with Jacksonville's 1970 Comprehensive Plan and was expected to be an impetus for development of other industrially-zoned areas in the northeast sector. Third, the market value of undeveloped areas on the JPA side of the island would be increased as a result of the OPS facility. Fourth, the FNP construction and testing operation would maximize the use of the island's unique physical and geographic conditions. Finally, the OPS operations would be essentially non-polluting.

22. There were three major disadvantages to the OPS plan. First, some adverse economic impacts on the community were predicted due to added demand for additional schools, roads, services, etc. Second, the induced growth of product-associated enterprises would place development pressures on adjacent wetland areas planned for open space and conservation. Finally, the dredging and filling of Back River would remove over 500 acres of wetland from the St. Johns River ecosystem.

Key factors affecting implementation

23. Key factors among the many considerations affecting the implementation of the OPS project are summarized in Table A3. Factors found to aid implementation (positive influence) as well as those that impeded the process (negative influence) are represented. Key positive factors included the technical coordination of disposal plans with productive use plans, the economic benefits of the planned use, and proposed site plan compatibility with the site. Key negative factors

were the ecological characteristics of the proposed disposal area location, the Corps' conformance with regulatory requirements, and the Corps' procedures for identifying and resolving objections. One factor, commitment to proposed land use, was found to be both a positive and negative infuence.

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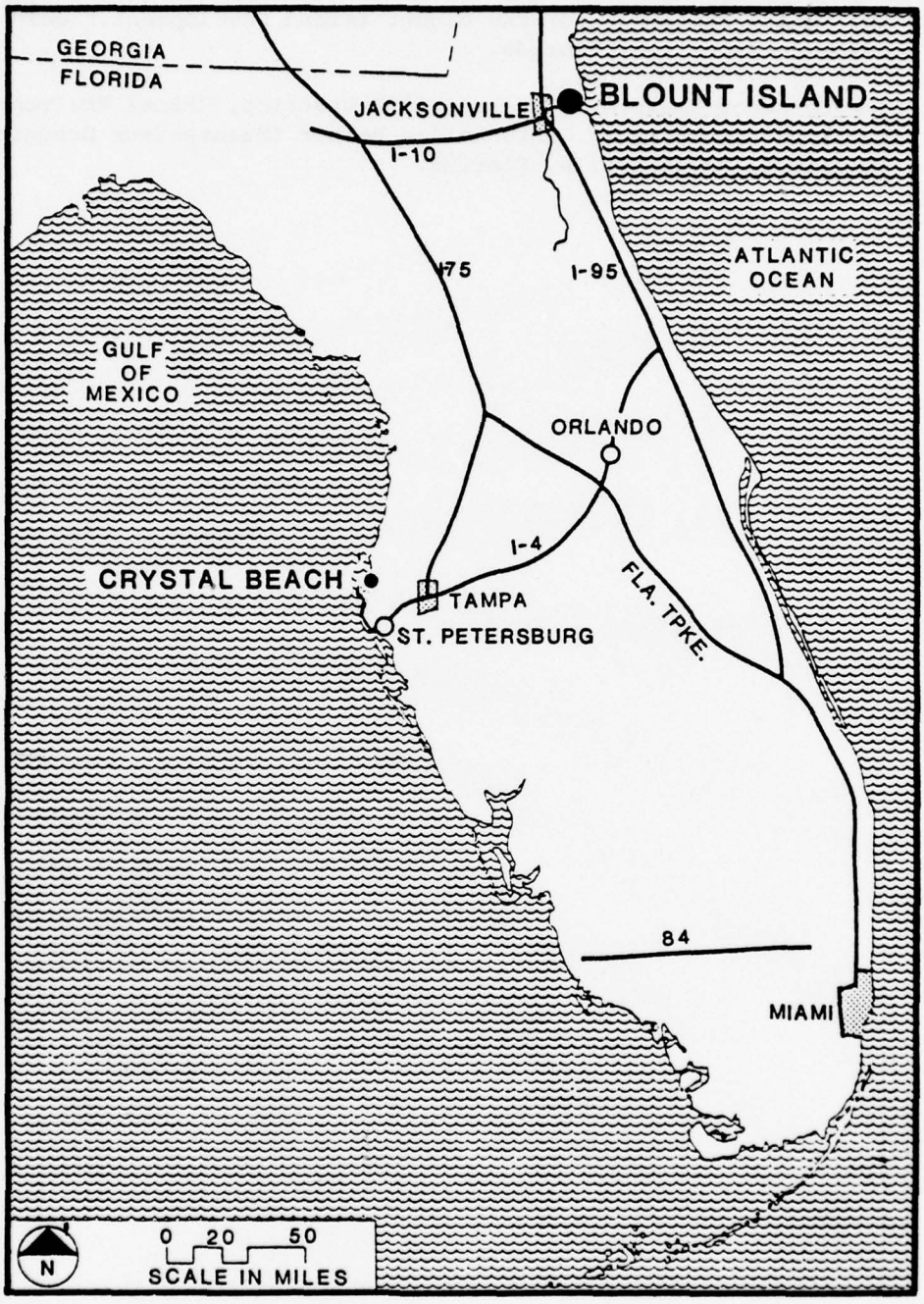


Figure A1. Location Map for Case Study No. 1 - Blount Island

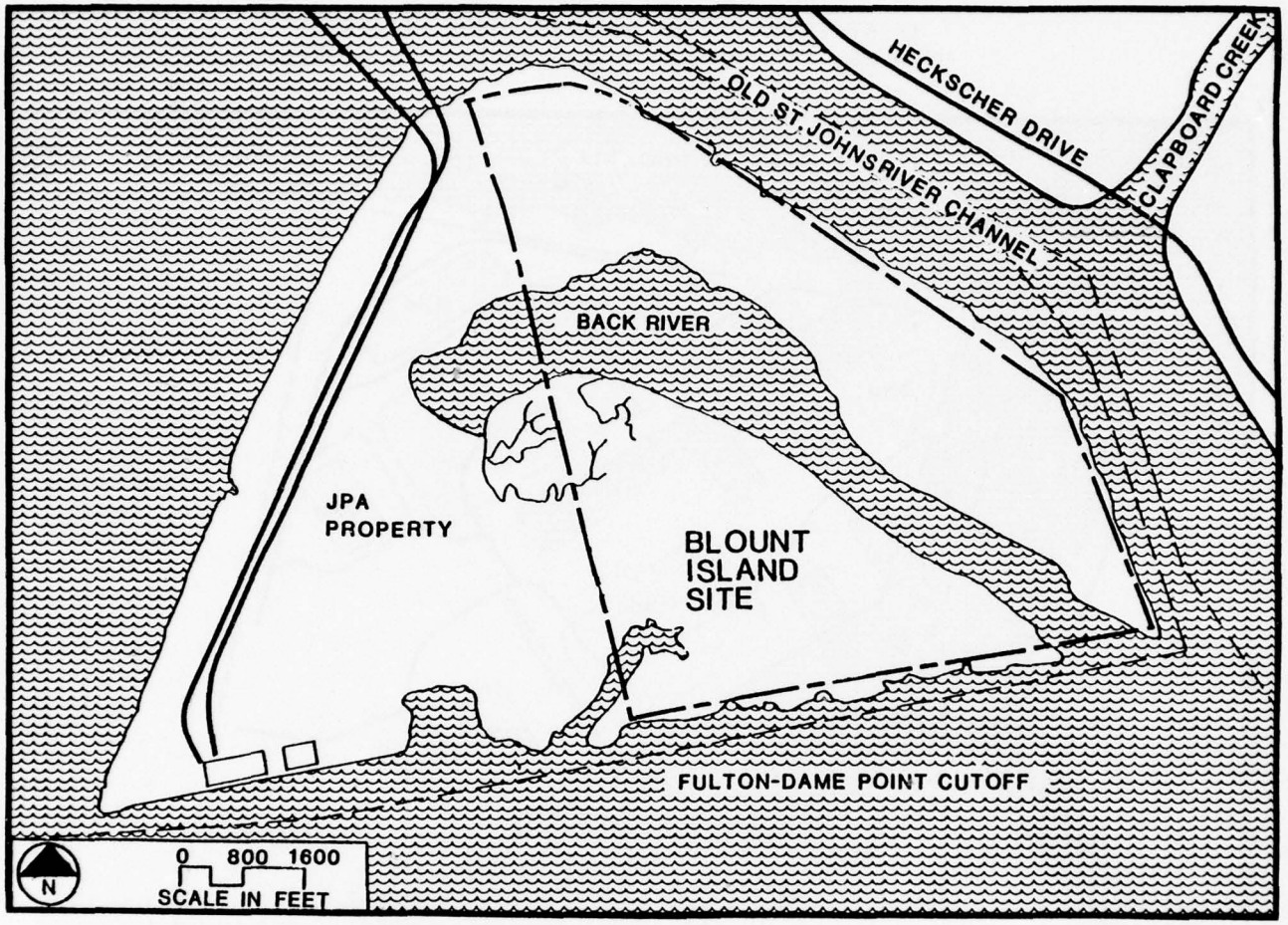


Figure A2. Blount Island Site Map

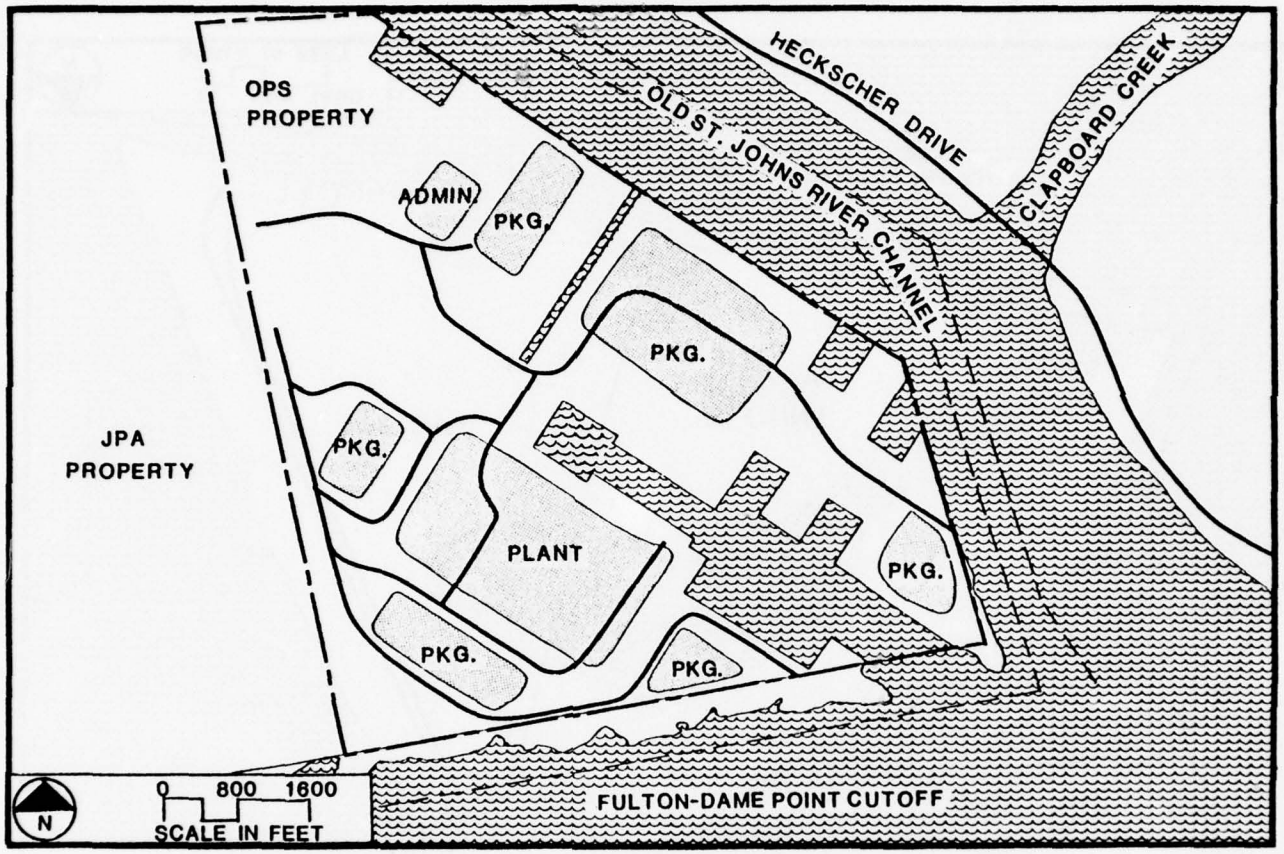


Figure A3. Blount Island Productive Use Plan
(Offshore Power Systems, Inc., April 1972)

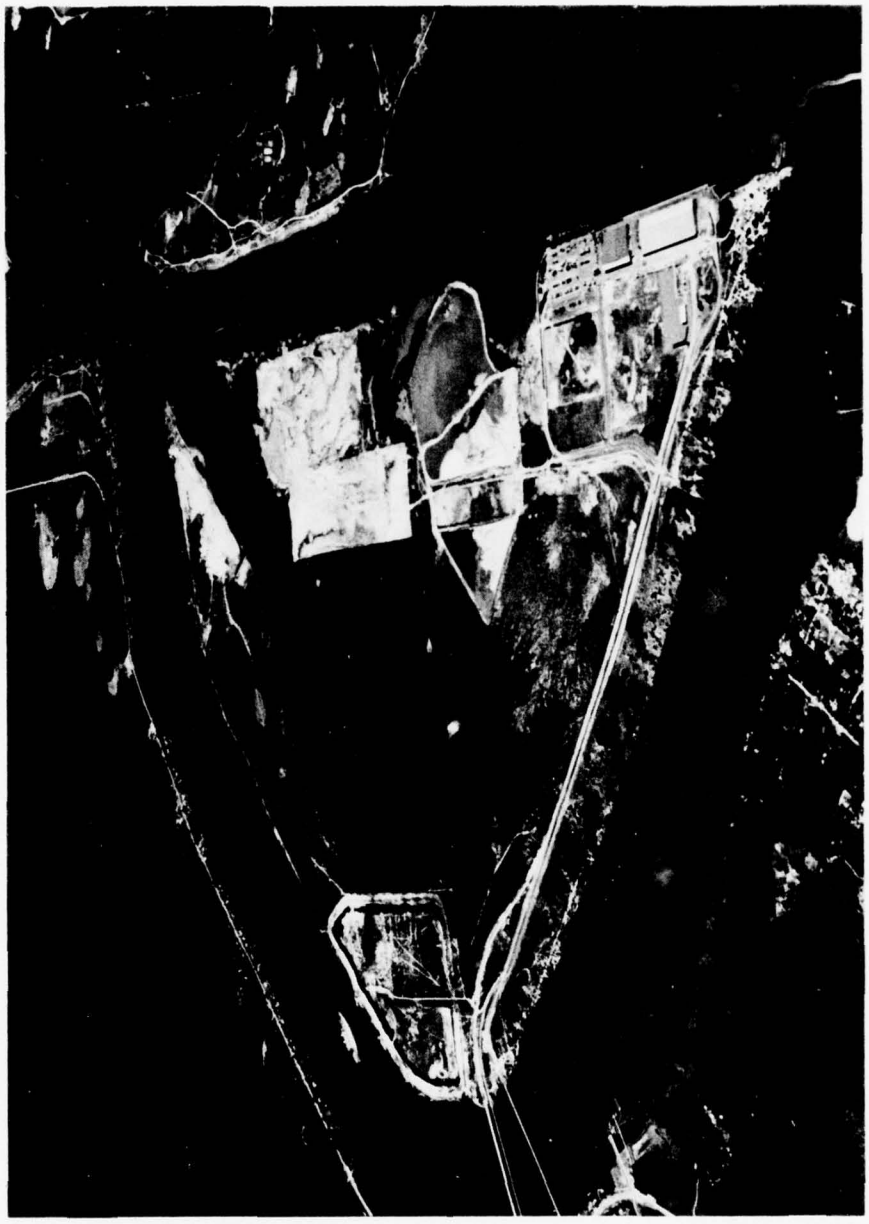


Figure A4. Photo of Blount Island before Start of OPS Disposal-Productive Use Project (October 1973)



Figure A5. Photo of Blount Island after Completion of Major Dredging and Filling Operations (March 1975)

Pre-1971	1971	1972	1973	1974
		5	10	
	1	6	11	
1	2	7	12	16
	3	8	13	
	4	9	14	
			15	

1. 69 - 71 - Corps holds multi-agency field visits and meetings to formulate 38-foot project disposal plans.
2. Feb. 71 - Five diked areas on Blount Island approved for Section 1 of 38-foot project.
3. Nov. 71 - Three diked areas on Blount Island approved for Section 2 of 38-foot project.
4. Dec. 71 - OPS and JPA begin discussions on development of eastern 900 acres of island.
5. Apr. 72 - JPA applies for local, State, and Federal dredge and fill permits; Corps begins writing EIS for JPA permit but delays public hearing decision until after Public Notice is issued.
6. May 72 - JPA-sponsored study predicts enormous economic benefits of OPS project; State permit granted on condition that OPS commit in writing to planned development.
7. Aug. 72 - Corps issues Public Notice of JPA Section 10 permit application; FWS calls data provided in notice insufficient for evaluation.
8. Sep. 72 - Draft EIS circulated for comment.
9. Nov. 72 - Florida Audubon formally objects to permit and questions EIS adequacy.
10. Jan. 73 - FWS recommends denial of Section 10 permit.
11. Jun. 73 - FWS withdraws objections to Section 10 permit after OPS agrees to replace wetlands on a 2-for-1 basis.
12. Aug. 73 - Final EIS submitted to CEQ.
13. Sep. 73 - Corps issues Section 10 permit to JPA; Florida Audubon obtains temporary restraining order by challenging adequacy of EIS and lack of public hearings; Corps suspends permit.
14. Oct. 73 - Corps holds public hearing on JPA Section 10 permit.
15. Dec. 73 - Florida Audubon motion for preliminary injunction denied.
16. Jan. 74 - Florida Audubon court action over adequacy of EIS is dismissed; OPS begins site development work on Blount Island.

Figure A6. Case Study No. 1 - Blount Island - Chronology of Events

Table A1

Case Study No. 1 - Blount Island: Major Issues Addressed During Implementation

Issue Categories	Issue Descriptions
Environmental	
1. Wetlands filling	Proposed development involved destruction of 525 acres of wetland. FWS opposed the project due to primary and secondary impacts on wetland resources and to lack of long-range Federal disposal plan. Florida Audubon Society (FAS) filed suit on grounds that EIS was deficient in evaluating the biological impacts of the project.
4. Regional ecosystem alteration	FWS, FAS, and others objected to the Corps' analysis of the contribution that the Back River area made to the total estuarine ecosystem.
Economic/Financial	
1. Economic or social benefits (costs) of the disposal-productive use project	Major selling point for project was estimated 10,000 jobs to be created. Several State agencies approved project saying economic benefits were only justification for wetlands destruction. Corps was criticized for not preparing independent economic impact study.
3. Fees on dredged material	State required certification that sovereign fill material eventually sold to private interests would be subject to lien of $1/ cubic yard in favor of the State.
Legal	
2. Adequacy of environmental impact statement	FAS sought injunction against Federal permit on grounds that Corps EIS did not fulfill NEPA requirements in evaluating economic and environmental impacts and in studying alternative sites. Evaluation of secondary development impacts associated with planned use was criticized by several participants because (1) project cost/benefit analysis neglected added need for goods and services, and (2) environmental impact study minimized effect of potential urban encroachment on wetland resources.
3. Conformance with public hearing requirements	FAS obtained temporary restraining order on Federal permit on grounds that Corps did not hold public hearing per PL 92-500.
Planning/Implementation	
9. Commitment to proposed land use plan	State water quality certification and State dredge and fill permit were conditioned upon written commitment to the proposed use by the developer.
10. Responsibility for economic impact assessment	FAS protested that Corps improperly included in EIS an economic impact assessment prepared by consultant to proposed developer.

Table A2

Case Study No. 1 - Blount Island
Physical Planning Elements Affecting Project Implementation

Physical Planning Elements	Influence	Element Descriptions
Elements Related to Disposal Facility Planning		
1. Pre-disposal site characteristics: wetland	Negative	Disposal plans developed during 1968-1971 for Jacksonville Harbor project included both upland and wetland areas of Blount Island. Two proposals to fill the Back River wetland area were opposed on environmental grounds and were subsequently dropped from consideration by the Corps.
2. Ecological characteristics	Negative	The OPS plan for the development of the site called for the destruction of 525 acres of wetland. Because this action would destroy important aquatic and terrestrial wildlife habitat, the FWS, FAS and others opposed the granting of a Corps dredge and fill permit to OPS.
Elements Related to Productive Land Use Planning		
1. Foundation conditions	Negative	Foundation conditions of the OPS site were considered to be poor. Foundation problems were complicated by the variation in subsurface conditions from one area of the site to another and by the variety of loading conditions included in the development. Extensive site preparation work by OPS was required to make the site developable.
2. Shipping and boat access	Positive	Blount Island's location adjacent to the St. Johns River channel, as well as the channel's depth, width, alignment, and vertical clearance were major factors in OPS choosing the site.
3. Site size and configuration	Positive	Blount Island offered an unusually large site (900-1000 acres) in a major metropolitan area, as required by OPS. The location of Back River coincided with the FNP construction channel to be constructed on the site.

Table A3

Case Study No. 1 - Blount Island: Key Factors Affecting Project Implementation

Factor Categories	Influence	Factor Descriptions
Environmental		
1. Ecological characteristics of proposed disposal area location	Negative	In 1968-1971, during formulation of disposal plans for Jacksonville Harbor deepening project, two proposals to fill Back River area of Blount Island were opposed on environmental grounds. Several biological surveys of Back River reached conflicting conclusions on its contribution to the wider St. Johns River ecosystem.
Technical		
3. Disposal facility design and operating characteristics	Negative	In its Federal permit application, port authority imprecisely defined dredge and fill limits, resulting in criticism of project and EIS.
5. Technical coordination of disposal plan with productive use plan	Positive	Corps coordinated its disposal operations on Blount Island with developer's site construction operations. Developer paid added disposal costs.
Economic/Financial		
1. Economic or social benefits (costs) of disposal-productive use project	Positive	Major factor assisting implementation. Resulted in political, business, and public support for project. Enabled potentially strong environmental objections to be overcome.
2. Engineering and construction costs	Negative	Site developer, Offshore Power Systems, Inc., had to pay about $9 M for site preparation due to poor foundation properties. Special compaction equipment had to be used.
Legal		
1. Conformance with regulatory requirements	Negative	Corps argued that State and local public hearings were sufficient to satisfy PL 92-500. Florida Audubon Society obtained temporary restraining order in part because no Federal public hearing had been held.

(Continued)

Table A3 (Concluded)

Factor Categories	Influence	Factor Descriptions
Institutional		
5. Procedures for identifying and resolving objections	Negative	Despite delay in receiving comments on Federal permit application from FWS, Corps continued internal processing without pursuing FWS opinions. When FWS and Florida Audubon were known as project objectors, Corps effort at resolution was initially deficient.
Planning/Implementation		
11. Proposed site plan compatibility with site physical features and user requirements	Positive	The proposed manufacturing/assembly facility for floating nuclear plants was ideally suited to the Blount Island site and access to the Atlantic via the St. Johns River was unobstructed.
12. Commitment to proposed land use	Positive/ Negative	The Jacksonville Port Authority, owner of Blount Island, was committed to its development for port-industrial use. Over $14 million in public funds were invested during 1968-1972 for port facilities and improvements in transportation facilities and utilities. JPA applied for State permit and certification without a firm development commitment from OPS. Both the permit and the water quality certification were granted on condition that OPS commit in writing to the proposed use plan.

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APPENDIX B: SYNOPSIS OF CASE STUDY NO. 2 - CLEVELAND SITE 14 - CLEVELAND, OHIO

Background Summary

Introduction

1. Site 14 is located on the shore of Lake Erie approximately 3.5 miles east of the mouth of the Cuyahoga River at the eastern extremity of Cleveland, Ohio (Figure B1). The site is bounded by the Village of Bratenahl to the east, Gordon Park to the south, and Lake Erie to the north and west. The 88-acre confined site is actually an extension to an existing city-owned solid waste landfill. The landfill, an 8-acre peninsula varying in width from 150 to 400 feet, was created in 1968 in an attempt to protect the adjacent Gordon Park Marina from wave action (Figures B2 and B3). Dike construction for Site 14 began in November 1976 and disposal operations should start in 1978.

2. Both the Cleveland-Cuyahoga County Port Authority (CPA) and the City of Cleveland were influential in the development of Site 14. The CPA had served as local sponsor for prior disposal projects in Cleveland Harbor and aided the development of Site 14 by coordinating meetings with local, regional, and State agencies and by providing engineering assistance during site design. The City of Cleveland was a prime mover in the implementation of the project since it was the city that first proposed the site. Site 14 offered the city an opportunity to escape legal liability as a result of pollution emanating from the landfill. Also, before the Site 14 proposal was developed, the city was under pressure from the Corps to contain the landfill by constructing a large bulkhead estimated to cost $8 million.

3. Site 14 was designed to provide 7-1/2 years disposal capacity, complementing the 2-1/2 year capacity Site 12 selected as a "stop gap" disposal site in response to the River and Harbor Act of 1970 (PL 91-611). Land use concepts associated with the site during the 1973-75 planning and review period were generally recreational, but in 1976 a more detailed multi-purpose recreational design was proposed by

the city. At this time there is no firm commitment to ultimate recreational use, and some city officials are interested in the site's potential for industrial development. Relative to other alternative sites, Site 14 offered several advantages, one of which was potential community benefits as a recreational area.

Site description and regional context

4. Site 14 is irregularly shaped and its 88 acres include 80 acres of Lake Erie surface area plus the 8-acre demolition waste landfill. The irregular shape is attributable to the following design considerations:

a. Minimize construction costs.

b. Provide 7-1/2 years disposal capacity.

c. Provide wave protection for nearby Gordon Park Marina.

d. Avoid interference with assimilation of thermal discharges of nearby power plant.

e. Avoid encroachment of Bratenahl village limits.

5. Construction plans for the facility included extending through the site the existing culverted outfall for Doan Brook. Numerous local groups were concerned that this would aggravate upstream flooding, but a Corps hydraulic survey revealed that upstream culverts of insufficient capacity were the cause of historical storm flow problems.

6. Dredged sediment to be confined in the site will originate from Cleveland Harbor as well as the lower 6 miles of the Cuyahoga River. The sediment, gray-black in color with an oily smell, is primarily silt with small clay and gravel fractions. The harbor sediment reflects the high level of industrial and shipping activity in the area and was classified as polluted by the EPA. Because of the high silt content, further engineering studies will have to be undertaken to establish foundation needs for site development.

7. Site 14, which is outside the East Breakwater in Cleveland Harbor, is situated in the littoral zone on the highly productive south shore of Lake Erie's central basin. This area is excellent for sport-fishing and serves as a breeding ground for a variety of

water-dependent fauna and fowl. The depth of the shoreline water in the general area is very shallow, ranging from 2 to 20 feet. However, wave activity during storms is often violent and shore erosion has been a problem.

8. The Cleveland metropolitan area's biggest asset is that it is capable of servicing the world via its port facilities. The port is critical in terms of regional employment, with about one-eighth of the region's employees involved in port-related operations and about one-fourth of the metropolitan area's payroll allocated to port-related employment. Land use plans indicate that regional growth will be related to industrial development, primarily water-oriented transportation. The local economic picture is similar to that of the region since Cleveland is predominantly an industrial city. Light and heavy manufacturing are the principal sources of employment.

9. It appears that Site 14 is destined to become the lake-oriented terminus of the Shaker Lakes Park system. This park system is recognized in both regional and local master plans. If destiny prevails, the 88 acres of new park land will be a welcome addition to the somewhat deficient acreage of recreational land and will also be totally consistent with the goals and objectives of all master plans.

10. Land uses surrounding the site are all under public control and consist of Gordon Park and the U.S. Navy Finance Center. Lake Erie bounds the site on three sides - southwest, northwest, and northeast. The Gordon Park municipal marina, which is no longer fully operational, is located directly adjacent to and southwest of the site. Development along the Cleveland shoreline includes water-oriented industrial transportation, Edgewater and Gordon Parks, and some residences. Inland uses include industrial, parkland, residential, and to a lesser degree, commercial.

Productive land use plan

11. When first proposed as a disposal-productive use project by the city in late 1973, four alternative site configurations were presented along with general concepts for eventual use. As implementation continued, two different land use plans were proposed. The first

plan was prepared in January 1975 by the Ohio Department of Natural Resources. Two objectives of this plan were to create a more natural site configuration and to maximize water-oriented receational opportunities via the creation of inlets and slips that would penetrate the interior of the site. This plan was infeasible due to the excessive diking required to form the lengthy undulating perimeter.

12. The second plan was prepared by a landscape architect staff member of the Cleveland Planning Board in July 1976 and is shown in Figure B4. It is seen to be intensive in nature and includes a variety of recreational facilities, including 5 baseball diamonds, 4 softball diamonds, 12 tennis courts, 2 soccer fields, picnic areas, fishing piers, a park and memorial garden, and vehicular parking and circulation, as well as pedestrian promenades. The program of facilities and activities for the proposed park is a reflection of the architect's assessment of recreation demands in this portion of the city. At the present time there is no firm commitment to ultimate recreational development of the site although it appears that the potential is there and the general public agrees to the concept.

Project Implementation

Chronology

13. A chronology of significant events in the implementation process for Site 14 is presented in Figure B5. In this case the chronology logically begins in 1968 with the demolition waste disposal activity of the City of Cleveland. A Corps permit for the landfill was obtained in 1971, but was conditioned upon complete containment of the facility. Site 14 subsequently became an attractive solution to the city's problems of (1) providing the Corps with a dredged material disposal site and (2) constructing a costly dike around the landfill. At an October 1973 public meeting, Cleveland officials first proposed Site 14 and initial Corps designs for the new alternative site created a need for approval from the village of Bratenahl. In April 1975 the site was redesigned to remove Bratenahl as a "local interest."

Participants

14. Key participants in the planning and implementation process for Site 14 included the following:

a. Buffalo District, Corps of Engineers.

b. Cleveland-Cuyahoga County Port Authority (CPA).

c. City of Cleveland.

d. Bratenahl Village.

e. Ohio Department of Natural Resources.

15. Buffalo District. The Corps initiated disposal planning for Cleveland Harbor in 1966 as part of their study of dredging and water quality in the Great Lakes. In 1968, after more than a year of coordination among local, State, and Federal agencies, Sites 9 and 13 in Cleveland were chosen for a pilot study of confined disposal. When PL 91-611 was enacted in 1970 (requiring sites with 10-years capacity) the Corps constructed Site 12, which had only 2-1/2 years capacity, for expediency. At that time it was expected that Site 1B, with 7-1/2 years capacity, would be approved and built while Site 12 was being filled. During an October 1973 public hearing to consider Site 1B, the city proposed Site 14 as a better alternative and the Corps agreed to investigate. After more than a year of study and interagency and public coordination, Site 14 was selected in April 1975.

16. Cleveland-Cuyahoga County Port Authority. Prior to their involvement in the Site 14 project, the CPA had established a good rapport with the Corps as local sponsor for the predecessor disposal area, Site 12. Thus, the Corps sought the CPA as local sponsor for Site 14. Although not officially assuming the title and responsibilities of local sponsor until 1975, the CPA was involved in the planning of Site 14 as early as 1972. CPA was instrumental in the early development of the project by (1) providing useful engineering assistance in site design to the city's engineers and (2) coordinating meetings with local, regional, and State agencies prior to the final selection of Site 14. As official local sponsor, the CPA obtained a 40-year renewable lease for the site in 1976. The lease is for disposal operations only and State approval will be needed for any construction on the site.

The current plan is for the CPA to assign the lease to the city after disposal is completed.

17. City of Cleveland. The city played an integral part in the development of Site 14. In fact, it was the city Department of Engineering and Construction that first proposed the site in October 1973. The major reason for the city's initiative regarding Site 14 was the estimated $8 million construction cost to bulkhead the demolition waste landfill near Gordon Park Marina as required in a 1971 permit issued to the city by the Corps. Site 14 represented a Federally-funded disposal project that would (1) eliminate pollution from the landfill, (2) allow the city to meet the landfill's permit condition, (3) provide sufficient protection to Gordon Park Marina from wave action, and (4) provide community benefits as a recreational facility. Also, Site 14 would not infringe on protected harbor surface area as was the case with alternative Site 1B.

18. Bratenahl Village. Bratenahl became a "local interest" in disposal planning for Site 14 in November 1973 because the preliminary Corps design placed part of the site within village limits. Following more than a year of design and evaluation of the project, the Corps initiated discussions with village officials and residents. A meeting in February 1975 was followed by a public hearing in March, at which village residents (by petition) and officials (by resolution) formally objected to the site. Odor from the site during its 7-year filling period was the primary issue, although residents were concerned that Corps planning was well along before their opinions were solicited. In April 1975 the facility design was altered to eliminate encroachment of the village boundary and Bratenahl's status changed from that of local interest (whose approval is needed according to Corps policy) to independent objector.

19. Ohio Department of Natural Resources. The Ohio DNR acted as coordinator for all State activities in the Site 14 project. During the 1972-73 period when a disposal site was being sought to complement Site 12, the DNR was coordinating State efforts to obtain sites for all Ohio harbors. Initially, DNR supported alternative Site 1B but

eventually, due to that site's inflexibility in terms of ultimate uses and in view of other opposition, changed its position and rallied behind the more versatile Site 14. Upon internal approval of Site 14, the agency undertook efforts to expedite the site's approval by other State and local interests. In addition, the DNR contacted several Senators and Congressmen in an effort to secure project funding.

Major issues
addressed during implementation

20. Primary issues raised during the planning and implementation of Site 14 were environmental, technical, and economic/financial in nature. Of the major issues listed in Table B1, only the environmental issue of odor and the technical issues of site configuration and utility relocation/connection were cause for project delay.

Planning considerations
affecting implementation

21. Table B2 summarizes the most important physical planning elements of the Site 14 project in terms of their impact on implementation. Significant disposal planning considerations included the opportunity for the facility to complete a previous disposal area and to buffer severe storm water conditions (both positive factors). Potential odor problems and extensive utility relocation/connection necessities were negative factors. Land use planning considerations included the site's size and configuration and the compatibility of the proposed site plan with the site features (both negative factors). Visual improvements from the park were a positive planning consideration.

22. Six aspects of the proposed use plan for Site 14 had positive implications. First, the proposed park will provide valuable additional lake-oriented recreational space in Cleveland. Second, the park will re-establish a successful lake terminus to the regional Rockefeller Park linear park system, which was destroyed by construction of Interstate 90. Third, the park will be highly accessible from the adjacent Interstate 90. Fourth, the park will dramatically improve the aesthetic "image" of this segment of Gordon Park. Fifth, the walls of the disposal facility and configuration of the park will serve to protect the

existing municipal marina from damaging wave action generated during storms. Finally, the proposed land use is consistent with regional and city master plans.

23. The sketch park plan for Site 14 has three major disadvantages or deficiencies. First, the active land uses proposed for the park are not dependent on the park's valuable water frontage and could more appropriately be located inland. Second, the configuration of the site and retaining wall construction are not entirely sympathetic with certain recreational uses, especially fishing. Third, the park plan does not fully explore the range of opportunities possible for Site 14. Alternative site plans should be developed to identify innovative water dependent recreational activities and facilities.

Key factors affecting implementation

24. Many considerations influenced the development of Site 14, most of which in some way assisted implementation. As seen in Table B3, the only significant negative factor was the disposal area design configuration, which led to delays while the approval of the village of Bratenahl was sought since the site encroached the village limits. Key positive factors in the case included the ecological characteristics of the site location, the environmental impacts of the project, interagency coordination, and political support. The compatibility of the proposed site plan with the area's physical features was a dual positive/negative consideration.

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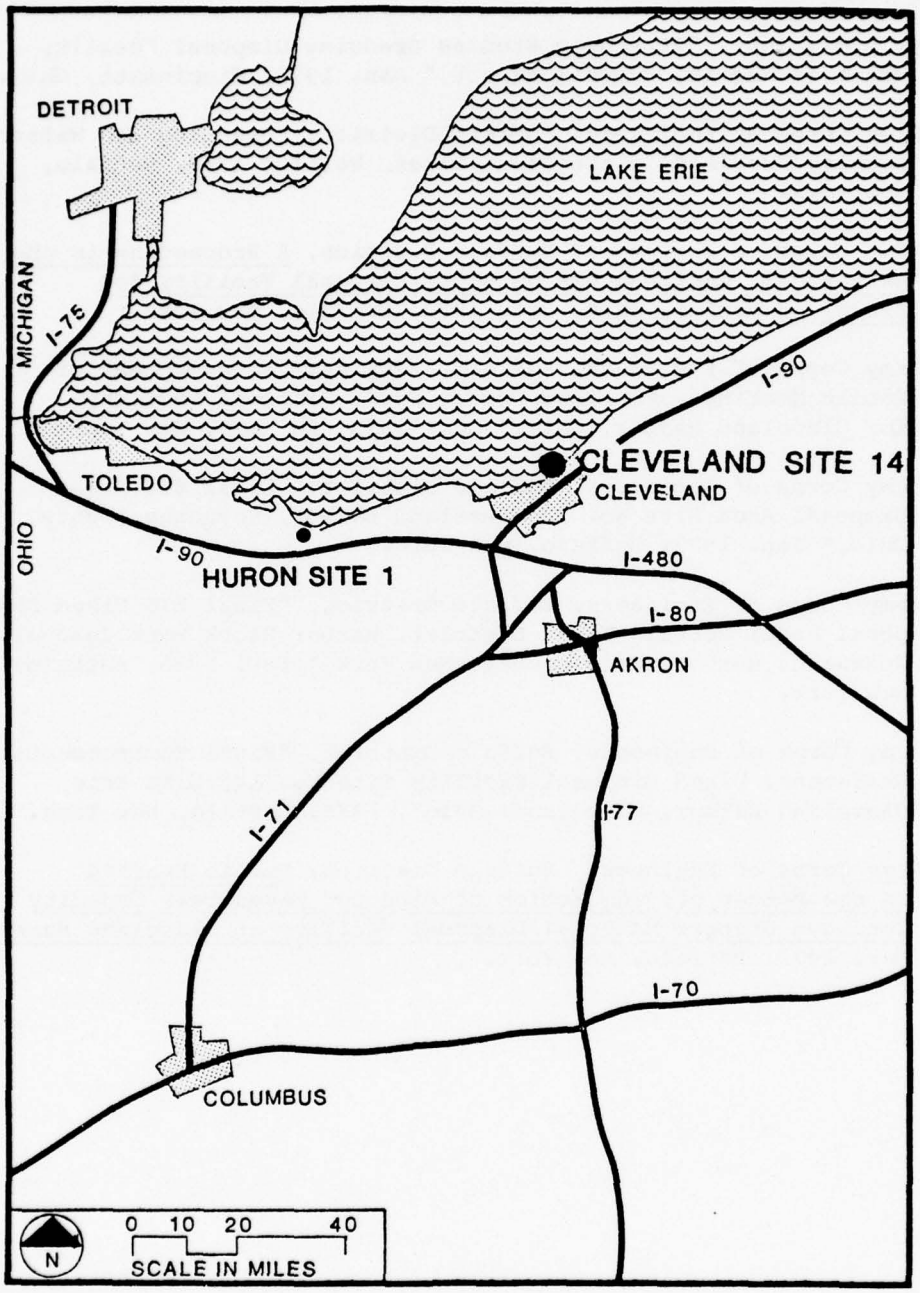


Figure B1. Location Map for Case Study No. 2 - Cleveland Site 14

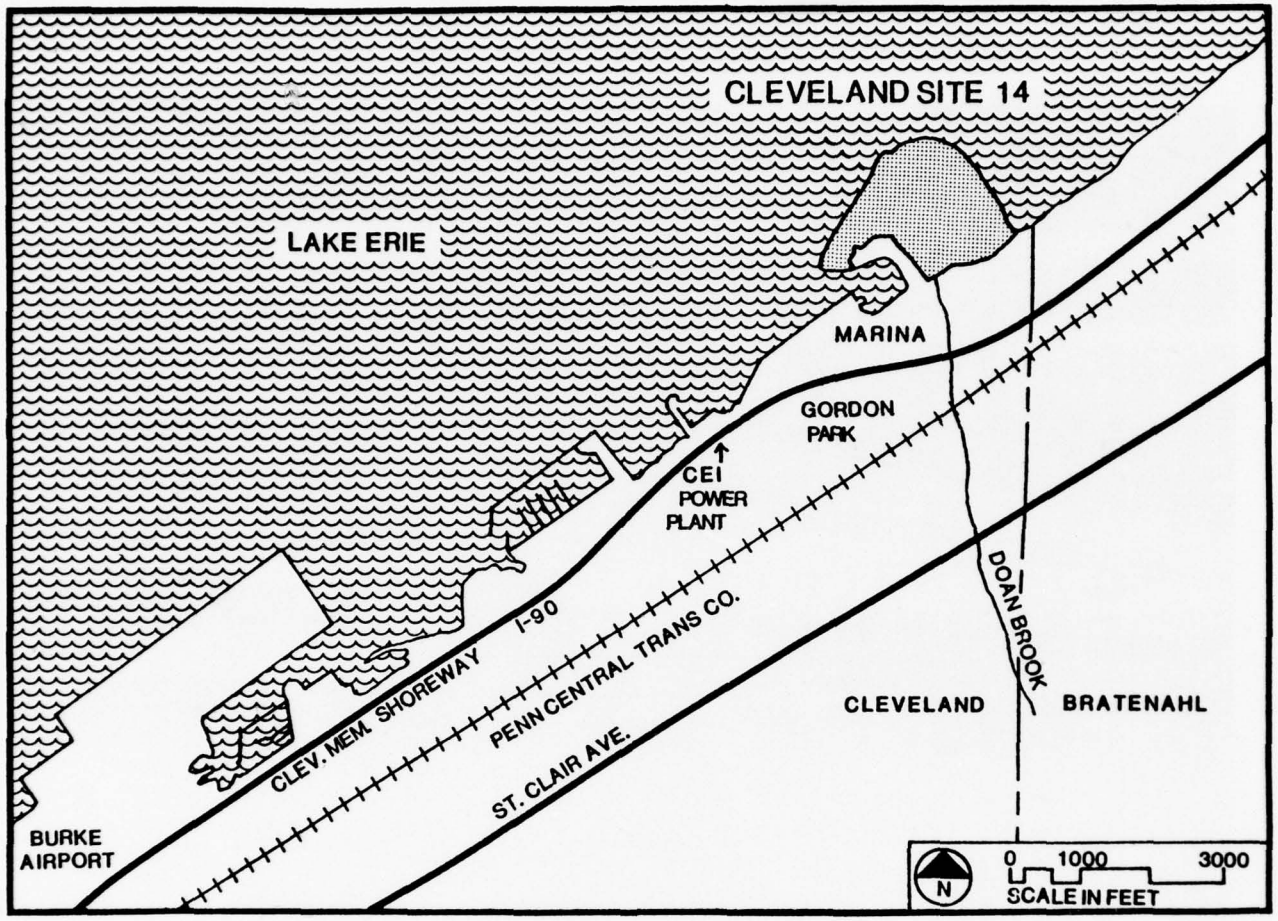


Figure B2. Cleveland 14 Site Map



Figure B3. Photo of City-Owned Landfill To Be Enclosed within Completed Cleveland Site 14 (November 1976)

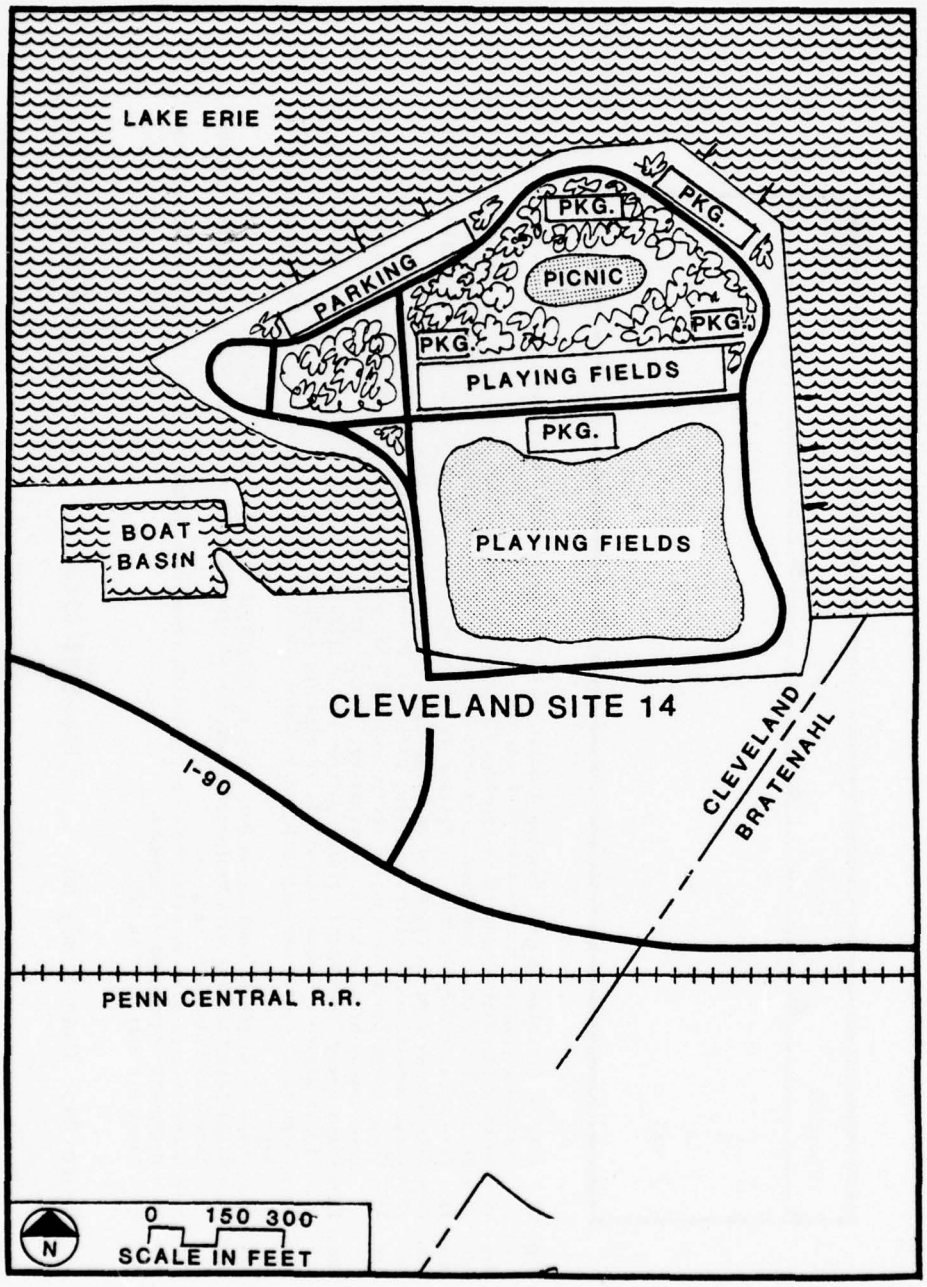
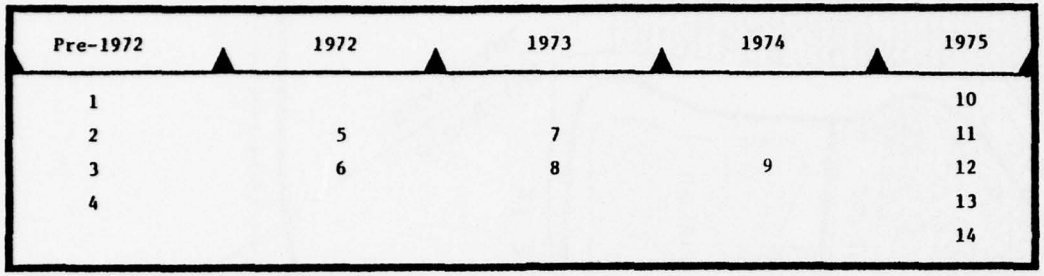


Figure B4. Cleveland Site 14 Productive Use Plan
(Cleveland Planning Board, July 1976)



1. Sep. 68 - City of Cleveland begins dumping demolition wastes in landfill near Gordon Park Marina. Landfill created to protect marina from wave action.
2. May 69 - Corps holds public meeting to consider Cleveland sites for Great Lakes confined disposal pilot study.
3. Dec. 70 - PL 91-611 enacted. Confined sites with 10-year capacity required in Cleveland Harbor.
4. May 71 - City obtains Corps permit for filling at Gordon Park landfill with condition that dike be built.
5. Feb. 72 - Site 12 selected in Cleveland as "stop gap" 2½-year disposal site.
6. Oct. 72 - Corps obtains court order requiring Cleveland to contain Gordon Park landfill.
7. Oct. 73 - Corps holds public meeting to obtain approval for proposed Site 1B. Cleveland proposes Site 14 development plan as better alternative. Corps agrees to investigate.
8. Nov. 73 - Corps design for Site 14 places portion of facility in village of Bratenahl. Village becomes a "local interest" whose approval is required by Corps policy.
9. Dec. 74 - Corps holds closed meeting with local, State, and Federal officials to describe advantages of Site 14.
10. Feb. 75 - Corps holds public meeting in Bratenahl to inform officials of Site 14 plans.
11. Mar. 75 - Corps holds meeting with Bratenahl residents to discuss odor problem. Village Council announces formal opposition to Site 14.
12. Apr. 75 - Corps selects Site 14 after dike configuration changed to eliminate need for Bratenahl approval.
13. Jul. 75 - Draft EIS circulated for comment.
14. Dec. 75 - Final EIS submitted to CEQ.

Figure B5. Case Study No. 2 - Cleveland Site 14 - Chronology of Events

Table B1

Case Study No. 2 - Cleveland Site 14: Major Issues Addressed During Implementation

Issue Categories	Issue Descriptions
Environmental	
4. Regional ecosystem alteration	Local park conservation groups objected to Site 14 due to resultant impacts on waterfowl feeding and migration. Corps noted objection and said effort would be taken to mitigate such impacts. Conservation groups favored an alternate site.
5. Harbor surface area reduction	Local boaters opposed alternate sites which encroached on protected harbor water area. Site 14, which is outside the protected harbor, was favored.
7. Changes in flow patterns	Environmental groups feared that Doan Brook culvert extension through Site 14 would aggravate upstream flooding problems.
8. Odor	Most serious concern of residents of Bratenahl, village adjacent to Site 14. Several meetings held by Corps to convince residents that odor problems would be minimized.
Technical	
5. Disposal area size and configuration	Initial dike design placed part of facility in village of Bratenahl, making village a "local interest" whose approval was needed to construct the site. Dike was eventually redesigned to avoid encroachment of Bratenahl boundary.
7. Utility relocation/connection	Culverted brook outfall had to be extended through Site 14. Some local groups felt the extension unnecessary and liable to exacerbate upstream flooding problems during storm events.
Economic/Financial	
4. Utility relocation costs	Environmental group argued that riprap stream bed through Site 14 would be less expensive than culvert for Doan Brook outfall. Corps demonstrated culverted extension as least costly option.
5. Additional dredging or disposal costs	Corps offered city the option of more intricate facility design if city would pay added costs. Offer was rejected.

Table B2

Case Study No. 2 - Cleveland Site 14
Physical Planning Elements Affecting Project Implementation

Physical Planning Elements	Influence	Element Descriptions
Elements Related to Disposal Facility Planning		
1. Pre-disposal site characteristics: area of previous fill activity	Positive	Beginning in 1968 the City of Cleveland used Site 14 for disposal of solid waste in an effort to deter storm generated wave action on an adjacent Gordon Park marina. Late in 1974 the Corps of Engineers recommended Site 14 as a disposal site for maintenance dredging operations in the Cuyahoga River, partly because the new disposal plan would ameliorate operational problems associated with the solid waste facility.
7. Flood or tide conditions	Positive	Severe wave action during storms will require carefully engineered armor stone dike construction. When completed Site 14 will serve as as a breakwater for the adjacent marina, which was rendered inoperational due to wave disturbances.
8. Utility relocation/connection	Negative	Extensive controversy developed related to the effects of Site 14 on the Doan Brook storm sewer. Upstream flooding of Doan Brook has been a periodic but continuous problem and it was feared that Site 14 would amplify the situation.
10. Sensory factors (visual, odor, vibration, dust, smoke)	Negative	During the planning process for Site 14, early configurations of the site illustrated a location both in Cleveland and in the village of Bratenahl. Due primarily to Bratenahl's concern over possible odor problems, the Corps of Engineers redesigned the site to be located entirely in Cleveland, removing the need for Bratenahl approval.

(Continued)

Table B2 (Concluded)

Physical Planning Elements	Influence	Element Descriptions
Elements Related to Productive Land Use Planning		
3. Site size and configuration	Negative	Although the configuration of Site 14 reflected unalterable conditions including harborlines and maintenance of a flushing corridor for the Cleveland Electric Illuminating Company, the configuration was considered non-conducive to park design.
8. Site plan compatibility with site features and user requirements	Negative	The primary plan for Site 14 illustrates extensive active recreational facilities including softball diamonds, tennis courts and soccer fields. The facilities are non-water dependent and could be located at inland sites. The plan also illustrates an excessive road and parking system.
9. Sensory factors (visual, odor, vibration, dust, smoke)	Positive	Once viable Gordon Park was bisected by the construction of I-90 and has since been in poor condition. The proposed park will upgrade the waterfront area and will visually improve the Gordon Park area.

Table B3

Case Study No. 2 - Cleveland Site 14: Key Factors Affecting Project Implementation

Factor Categories	Influence	Factor Descriptions
Environmental		
1. Ecological characteristics of proposed disposal area location	Positive	City operated construction-demolition waste landfill, adjacent to public marina, was built in 1968 and was source of pollution. Site 14 provided means for removing the pollution source by enclosing the landfill within the dike.
2. Environmental impacts of disposal-productive use project	Positive	Existing public marina was subject to severe wave action and adjacent area was essentially an eyesore. Site 14 provided wave protection for the marina and promised to convert the area into an attractive park.
Technical		
3. Disposal facility design and operating characteristics	Negative	Original design encroached on Bratenahl village limits. Corps held several meetings trying to obtain village approval for project before finally redesigning to remove need for approval.
Economic/Financial		
2. Engineering and construction costs	Negative	Local planners favored more intricate design keyed to eventual site use, but city refused to pay added costs.
Institutional		
1. Public participation in planning	Positive	Early involvement of public in site planning and selection led to early identification and resolution of concerns.
4. Coordination with planning agencies	Positive	Planning bodies were involved in disposal planning for Cleveland Harbor from the outset, aiding in design and evaluation.
7. Political, business, public support	Positive	Site 14 enabled city to escape liability for pollution emanating from landfill adjacent to public marina and promised to enhance urban recreational options.
Planning/Implementation		
9. Proposed use compatibility with master plans	Positive	Local and regional land use plans showed the site area as recreational.
11. Proposed site plan compatibility with site physical features	Positive/ Negative	Multi-purpose recreational facility is consistent with both regional and city master plans as well as with community needs. However, the active land uses proposed for the park are not dependent on the available water frontage and could more appropriately be located inland.

APPENDIX C: SYNOPSIS OF CASE STUDY NO. 3 - BAY PORT - GREEN BAY, WISCONSIN

Background Summary

Introduction

1. The Bay Port confined disposal area is a municipally owned 400-acre site located on the shores of Green Bay, west of the Fox River, in Green Bay, Wisconsin (Figure C1). The site was originally offered in 1962 as an item of local cooperation for a Federal channel deepening project in Green Bay Harbor. The Federal project was designed to give Green Bay the capacity to be served by the large freighters that entered the Great Lakes through the St. Lawrence Seaway. The Bay Port area, which is known locally as "Atkinson's Marsh," has been used by the Corps to contain dredged materials since 1966.

2. The Brown County Board of Harbor Commissioners is the local sponsor for Corps dredging activities in Green Bay. When the channel deepening project was authorized in 1962, the county did not have any suitable land sites available for disposal of dredged material. However, the City of Green Bay proposed to acquire the marsh area west of the Fox River and to offer 400 acres for confined disposal. This would bring the low-lying land to an elevation above flood level. By 1976 the city had been committed to spend an estimated $2.5 million in preparing the site for potential industrial use.

3. As early as 1921 the city had planned that Atkinson's Marsh would be used for industrial development. The opportunity of acquiring the needed fill did not present itself until the Federal deepening project was authorized. The county produced a comprehensive plan in November 1967, showing the Bay Port area as a major industrial district. In March 1973 the county produced a development plan for a 600-acre industrial trans-shipment area on the shores of Green Bay. Two-thirds of this area is the Bay Port confined disposal site. Individual developers have not yet been identified and specific plans remain to be finalized.

Site description and regional context

4. As shown in Figures C2 and C3, Bay Port is a relatively flat, almost rectangular, 400-acre area directly adjacent to the waters of Green Bay. The water frontage, which is just over a mile, accounts for approximately 30 percent of the total length of the dike. The earthen dike that encloses the area is 7.0 to 9.0 feet above low water datum-576.8 International Great Lakes Datum (IGLD). The site will be filled no higher than 585 IGLD, which is just above the city's recommended minimum ground elevation. Prior to the filling operations, the site had been a low-lying marsh area whose richness depended upon the level of the lake. In 1966, when disposal operations began, Lake Michigan was very low and the marsh was dry.

5. The marsh area was zoned for industrial development in 1925. For many years, however, it was used for cattle grazing, duck hunting, and assorted agricultural purposes. With the exception of several hunter's shacks that were torn down long ago, the only development of any sort at the site was the construction of power transmission lines from the nearby Pulliam Plant of Wisconsin Public Service Corporation. Since the area has a full range of transportation facilities - water, rail, and highway - the Bay Port site is a unique resource to the Green Bay sub-region. The development of port-related industrial facilities at the Bay Port site will reinforce existing industrial development in the Green Bay area and adjacent industrial areas.

6. The Bay Port site lies a short distance west of the Fox River. There was a time when the mouth of the river was completely a marsh area. Much of this area has been built up and it is estimated that 85 percent of the west shore wetlands have been eliminated. The condition of the Atkinson Marsh itself depended partly on the uses to which the area was put over the years and partly on the water levels in the bay. Although there was little vegetation at the outset of the Bay Port project, the construction of the dike and the filling operations actually enhanced the vegetation for a while. This enhancement was shortlived, however, and continued filling operations reversed the trend. By 1975 only 30 of the 400 acres could even be considered

wetlands, and there was some question as to how rich that area was.

7. The City of Green Bay, with an estimated population of 87,809 in 1970, is the fourth largest city in Wisconsin. It serves as the hub of industrial and commercial development in the Green Bay sub-region of Lake Michigan. Major employers in the area produce paper products, dairy products, foundry products, and office equipment. There was an 11 percent increase (209 acres) in industrial land used in the metropolitan area between 1960 and 1965. Increases in heavy industry land use were greatest in west Green Bay during this period. The average annual tonnage moving through Green Bay Harbor is about 2,650,000 tons. Coal typically accounts for more than half of this total, with petroleum products a distant second.

8. Land uses in the area of the Bay Port site are primarily industrial, including the neighboring coal-fired Pulliam power plant. Other uses in the area are bulk storage and shipping, oil tank farms, and light manufacturing. The Chicago and Northwestern Railway Company (C&NW) owns almost all of the land to the southwest of the site. The nearest residential area is located almost one-half mile to the southwest. Although the Bay Port area is buffered from non-industrial uses by Green Bay to the north, the Fox River to the east, the C&NW to the south, and a sanitary landfill to the west, the site does have potential for a number of uses other than planned industrial use. These would include residential, commercial, and open space. However, the highest and best use for the site is considered to be port-related industrial use.

Productive land use plan

9. The City of Green Bay realized the advantages of using as much dredged material as possible to fill Atkinson's Marsh to a level where it could be developed. The city estimated that this would take 3.4 million cubic yards (MCY) of material. In 1966 the Corps was willing to provide 0.531 MCY which would be deposited in a 400-acre area of the marsh. The city eventually agreed to pay over $600,000 for the additional fill which the Corps would otherwise have dumped in open water. The area is expected to be filled to a developable

level (584.55 IGLD) in 1977. There have been three types of materials deposited in the site:

a. New work material, which was sandy, with quite a bit of clay.

b. Maintenance dredgings, which are fine grain sediment, with some organics.

c. Fly ash from the nearby coal-fired power plant.

10. The Bay Port site has the potential for a number of uses, including industrial, residential, commercial, and open space. The highest and best use of the site, as indicated in city plans since 1921, has been port-related industrial use. The confined disposal area is part of a larger, 600-acre area which is slated for industrial development. Approximately 60 acres will be devoted to marine-related industrial use, with the remaining 540 acres used for non-marine industrial purposes. The key feature of the plan is the availability of the three intermodal transportation elements (highway, rail, and water transportation), which makes a trans-shipment area possible.

Project Implementation

Chronology

11. Figure C4 presents a chronology of events in the process of implementing the Bay Port project. The chronology begins with the initial plan in 1921 to use the marsh area for industrial development. It ends with the final EIS for maintenance dredging, which was submitted to CEQ in November 1976.

Participants

12. Important participants in the process of implementing the Bay Port project included the following:

a. Chicago District, Corps of Engineers.

b. City of Green Bay.

c. Brown County.

d. U.S. Fish and Wildlife Service (FWS).

e. Wisconsin Department of Natural Resources (DNR).

13. Chicago District. The Corps' primary role in the project

was to carry out the new work channel deepening authorized by Congress, together with the periodic dredging needed to maintain those authorized depths. Since it had originally planned to deposit only 531,000 cubic yards of material on the site, the Corps did not become involved in the State/local negotiations in 1966, which determined the location of the dike considerably landward of the state pierhead-bulkhead line. The Corps later agreed to deposit over 3 MCY of new work material on the site, as well as maintenance dredgings through 1982. It was only in 1975 that the Corps became concerned about dike location and the final fill level of the site, which was reduced substantially by the city. The reduced fill level and the city's policy of allowing fly ash to be deposited on the site resulted in a severe capacity reduction which meant that the area would be filled in 1977 rather than 1982.

14. City of Green Bay. The city has owned the Bay Port site since 1969 and has been actively involved in planning the industrial development of the site. The city passed a resolution in July 1966, approving the deposition of dredged material on the marsh area. It was the city that specified in 1975 that the level of the filled area would be no higher than 584.55 IGLD, so that railroad spurs could be easily constructed for potential industrial tenants or future owners. This action reversed the city's 1972 position of concurrence with a Corps report attributing 10 years of disposal capacity to the site.

15. Brown County. The Brown County Board of Harbor Commissioners is the local sponsor of the Green Bay Navigation Project. The county was largely responsible for determining the dike location, and paid entirely for its construction. The Brown County Planning Commission has had primary responsibility for planning the productive use of the 600-acre Bay Port industrial trans-shipment area, which extends beyond the city limits of Green Bay.

16. U.S. Fish and Wildlife Service. Ironically, it was the FWS that recommended that the Corps place dredged materials on Atkinson's Marsh. The marsh was dry in 1966 and FWS was more concerned about the Corps' possibly filling other, richer areas. FWS requested in 1974 that the 30 remaining acres of wetland be preserved. The Corps refused this

request but did change the dredging schedule that year to protect a flock of rare forrester terns.

17. Wisconsin Department of Natural Resources. DNR was created in 1967 as a continuation of two former State agencies: the Public Service Commission (PSC) and the Conservation Department (CD). PSC approved the new pierhead-bulkhead line in August 1965, thereby forfeiting, in effect, its right or the right of its successor agency to comment on filling activities landward of that line. CD insisted that the area north and west of the marsh not be filled.

Major issues addressed during implementation

18. During the planning and implementation of the Bay Port project, primary issues raised were in the environmental, technical, and economic/financial issue categories. These are described in Table C1. The financial issue relating to additional dredged material disposal costs resulted in much delay in the new work disposal operations, while the technical issue of disposal area capacity has been important in relation to maintenance dredging operations.

Planning considerations affecting implementation

19. Table C2 summarizes the most important physical planning elements of the Bay Port project, assessed for their impact on project implementation according to two categories: (1) elements related to disposal facility planning and (2) elements related to productive land use planning. The natural pre-disposal change in site character from wetland to upland was a positive disposal planning element. The destruction of a unique wildlife habitat and the lack of adequate disposal site capacity were key negative considerations in terms of disposal planning. With respect to land use planning, foundation conditions were a negative aspect, and shipping access and site size were positive influences on the project.

20. There were a number of advantages and disadvantages associated with the city's development plan for Bay Port in terms of land use planning. There were five primary advantages. First, Project Bay Port

was expected to accentuate the position of Green Bay as a growth center in the region. Second, the proposed industrial development was projected to have a favorable effect on local economies, largely as a result of additional jobs and increased tax revenues. Third, the project would maximize the benefit received from existing and planned transportation and goods movement systems. Fourth, the reclamation of sections of the southwest shore of Green Bay for manufacturing was consistent with the land use objectives of the Brown County Planning Commission. Finally, the proposed Bay Port industrial location would take maximum advantage of existing public services in the area.

21. Three major disadvantages with the Bay Port plan were identified. First, the plan did not consider the opportunity for using the site as a recreation, wildlife, or open space resource for public use. Second, the diversion of Duck Creek by new channel and turning basin dredging would have major negative environmental effects. Third, while Project Bay Port offered future potential for port development, there existed a surplus of port facilities in Green Bay and therefore there was no justification for the development of new port facilities.

Key factors affecting implementation

22. There were several factors that either impeded or advanced the Bay Port project and these are described in Table C3. Key positive factors included the abnormally low lake levels in the mid-1960's, the organization of the State regulatory agencies at the time of project approval, and proposed use compatibility with the site physical features. Key negative factors were the disposal facility design and operating characteristics, the city's difficulty in assuming its financial responsibilities, and the non-exclusive rights to dispose at the site.

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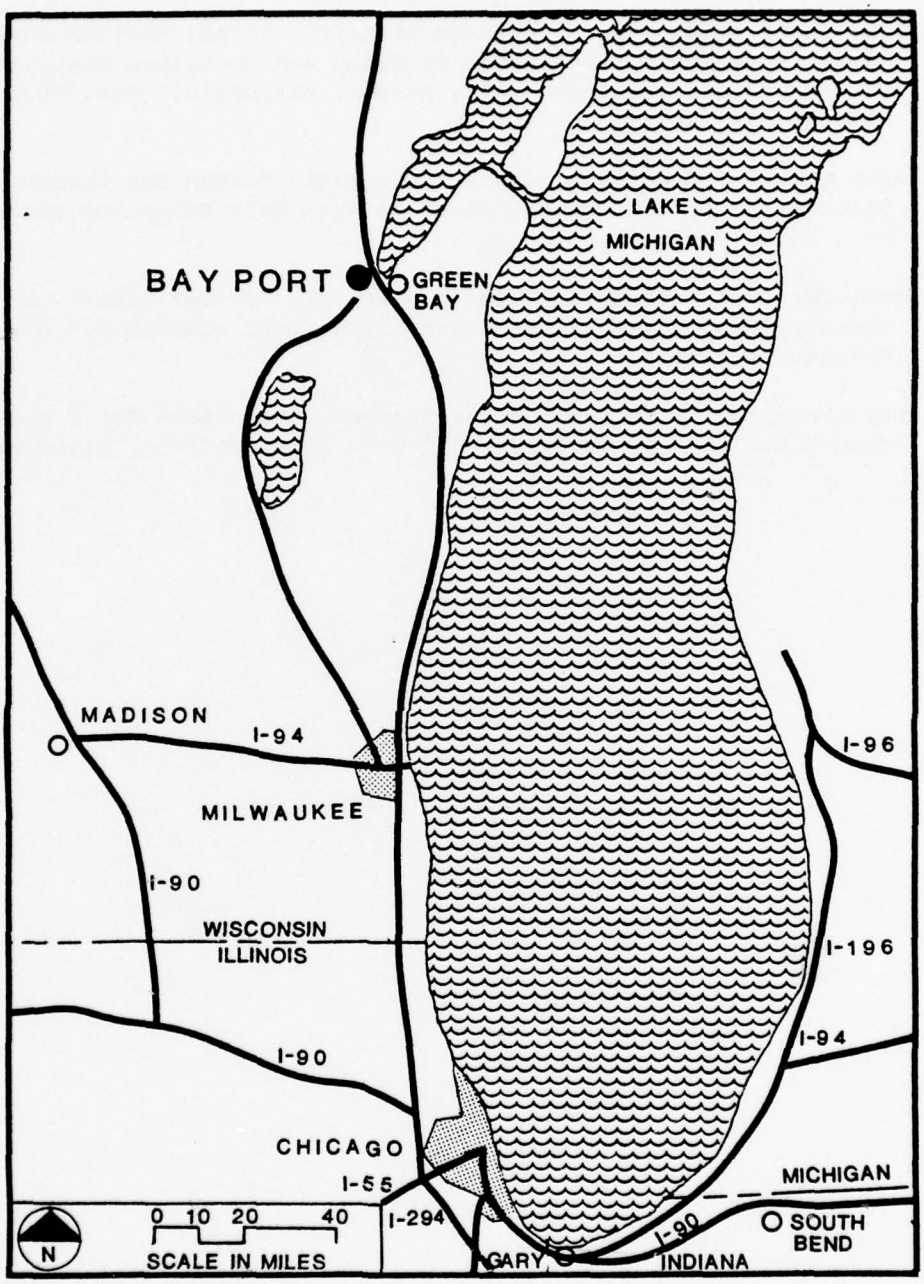


Figure C1. Location Map for Case Study No. 3 - Bay Port

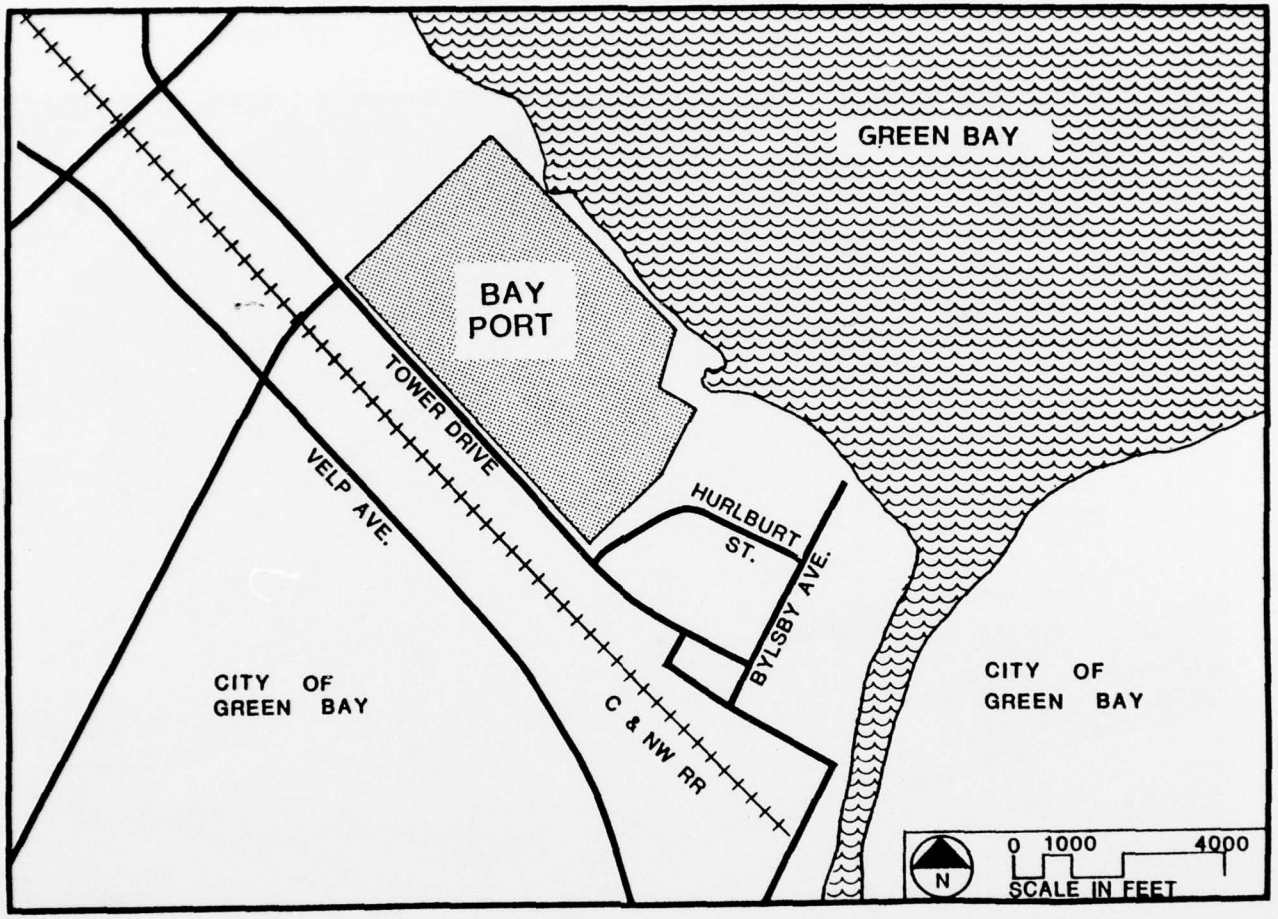


Figure C2. Bay Port Site Map

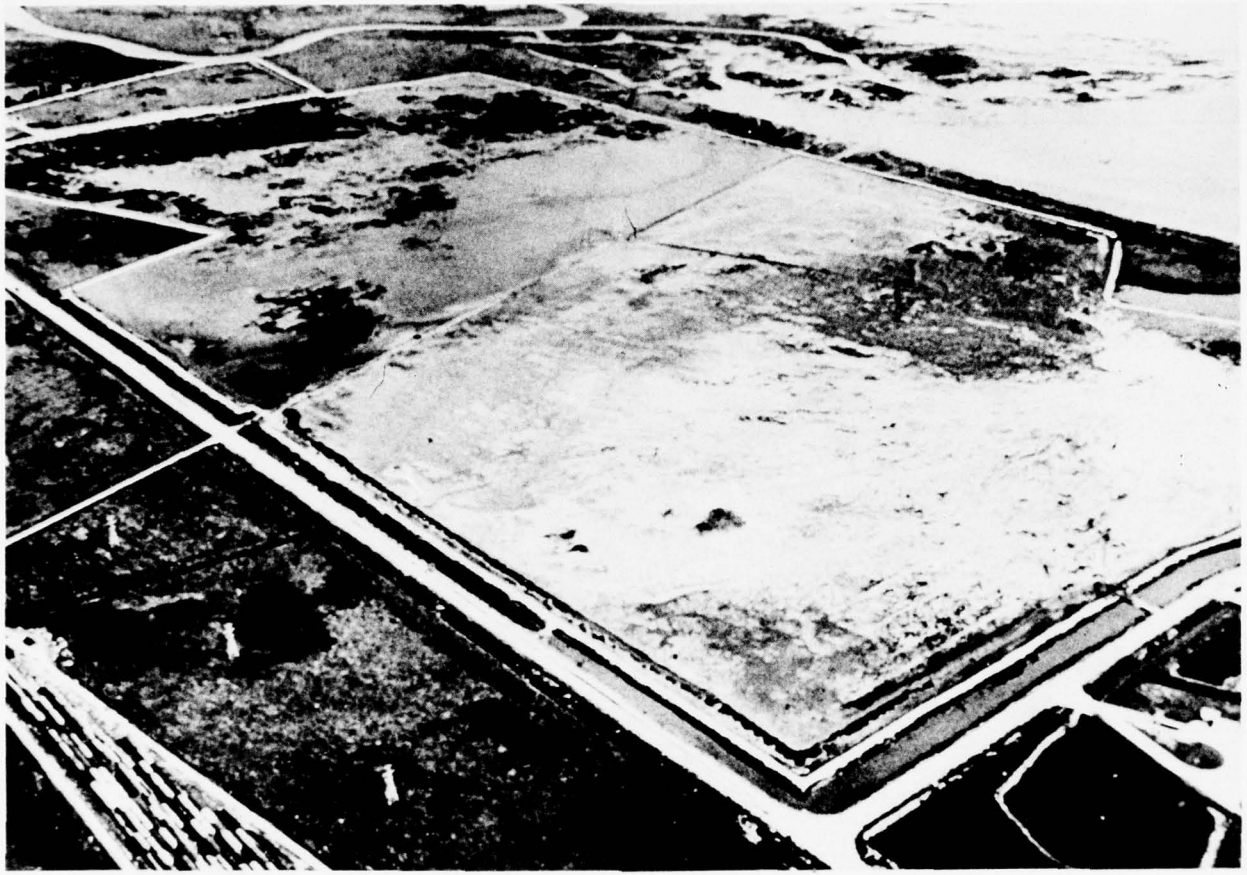
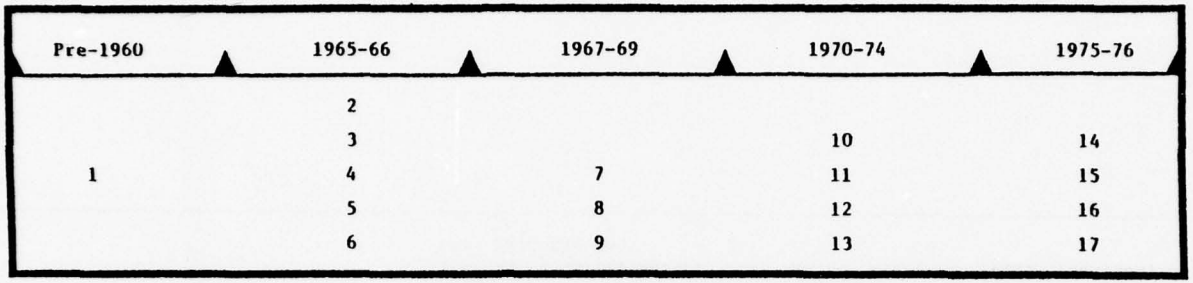


Figure C3. Photo of Bay Port Disposal Area (April 1975)



1. Nov. 25 - Atkinson's Marsh, later to become the Bay Port disposal site, is zoned industrial pursuant to 1921 City Development Plan.
2. Mar. 65 - Industrial Development Authority proposes Atkinson's Marsh as Corps disposal site.
3. Aug. 65 - Wisconsin Pub. Serv. Comm. establishes combined pierhead-bulkhead line in Green Bay, forfeiting review authority on Corps disposal actions at Bay Port.
4. Jan. 66 - Corps issues Public Notice of Green Bay channel deepening project.
5. Apr. 66 - Corps proposes disposal of 531,000 CY on Atkinson's Marsh. City tells Corps they want 3.4 MCY of material placed on the site.
6. May 66 - Corps estimates city's cost of additional material disposal at $808,000. City disputes estimate, which is revised by Corps to $580,000.
7. Jan. 68 - Brown County Comprehensive Plan shows Bay Port area as major industrial district.
8. Mar. 69 - City agrees to provide $620,000 to meet "local cooperator" duties.
9. May 69 - City purchases Atkinson's Marsh.
10. Aug. 70 - Corps proposes filling of site to 590 International Great Lakes Datum (IGLD). City, which has allowed power plant to dump flyash in site, has no objection.
11. Jul. 72 - Corps issues Green Bay Harbor Letter Report indicating estimated 10-year capacity of Bay Port site as required under Section 123 of PL 91-611.
12. Mar. 73 - Brown County and Green Bay adopt Project Bay Port study, a development plan for an industrial transshipment area.
13. Apr. 74 - FWS requests Corps alter disposal plans to save nesting rare forrester terns and to preserve remaining 30 acres of wetland. Corps complies with former request but denies the latter saying city will fill the area anyway.
14. Apr. 75 - Draft EIS for maintenance dredging circulated.
15. Jul. 75 - City informs Corps that fill level of 584.55 IGLD is desired. Corps asks city to reconsider but city remains firm. Corps says site will be filled to capacity in 1977 rather than 1982 as a result.
16. Mar. 76 - Corps holds public meeting to discuss disposal options for maintenance dredging. City opposes proposals to raise Bay Port site level.
17. Nov. 76 - Final EIS for maintenance dredging submitted to CEQ.

Figure C4. Case Study No. 3 - Bay Port - Chronology of Events

Table C1

Case Study No. 3 - Bay Port: Major Issues Addressed During Implementation

Issue Categories	Issue Descriptions
Environmental	
1. Wetlands filling	In April 1974, FWS recommended that Corps not fill the 30 acres of the Bay Port site that were still wetlands. Corps rejected this request on the grounds that the city was going to fill the site anyway, and it may as well be filled with dredged materials.
2. Wildlife habitat disturbance	FWS requested that the Corps change the dredging schedule in 1974 in order to protect a flock of rare forrester terns that had nested on the site. The Corps complied, but unfortunately the flock was virtually annihilated shortly thereafter by a hailstorm.
Technical	
4. Disposal area capacity	In 1972 the city offered the Bay Port site as a maintenance disposal area with a ten-year lifetime, as specified in Section 123 of PL 91-611. By 1975 the site was almost filled and the Corps was looking for ways of increasing its capacity. Corps' plans were thwarted by FWS, which didn't want a new dike built out closer to the pierhead-bulkhead line, and by the city, which wouldn't allow the level of the area to be raised.
Economic/Financial	
5. Additional dredging or disposal costs	The Corps determined that the city would have to pay for some of the material deposited in the Bay Port site. The fee ($620,000) was the difference in cost between dumping in the bay and land disposal. The city tried to enlist Congressional support for the claim that materials should be put on land instead of in the water. This did not alter the Corps' position, and the city paid the fee.

Table C2

Case Study No. 3 - Bay Port
Physical Planning Elements Affecting Project Implementation

Physical Planning Elements	Influence	Element Descriptions
Elements Related to Disposal Facility Planning		
1. Pre-disposal site characteristics: upland	Positive	In 1966, when the site was officially included among the planned disposal sites for the Green Bay Navigation Project, the water in Green Bay was extremely low (the levels in Lake Michigan regularly rise and fall). Because of this, the site, which at high water was a marsh, was dry and there was little opposition to filling the area.
2. Ecological characteristics	Negative	In the spring of 1974, a flock of forrester terns, a rare and endangered species, nested on the site. FWS subsequently requested that the Corps delay their dredging schedule to accomodate the birds, which were eventually destroyed by a hailstorm.
3. Disposal site capacity	Negative	The projected fill lifetime of the Bay Port site was 10 years; however, only 3 years after dredged material disposal began on the site, it was almost filled to capacity. The Corps' plans to increase the capacity of the site were thwarted by FWS, which didn't want a new dike built out closer to the pierhead-bulkhead line, and by the city, which wouldn't allow the level of the area to be raised.
Elements Related to Productive Land Use Planning		
1. Foundation conditions	Negative	Foundation conditions at the Bay Port site are expected to be poor. Extensive site preparation work and pile foundations for buildings will be required to make the site developable.
2. Shipping and boat access	Positive	The site's location adjacent to the Green Bay harbor channel and the potential for development of docking facilities along the bulkhead line was a major factor in the city's interest in the site for industrial use.
3. Site size and configuration	Positive	The unusually large Bay Port site (about 400 acres) had the attraction of being the largest potential industrial site in the Green Bay metropolitan area.

Table C3

Case Study No. 3 - Bay Port: Key Factors Affecting Project Implementation

Factor Categories	Influence	Factor Descriptions
Environmental		
1. Ecological characteristics of proposed disposal area location	Positive	Lake levels were abnormally low in the mid-1960's, and Atkinson's Marsh was dry. Ironically, it was FWS which suggested the use of the site for disposal (they were more concerned with saving other, richer areas).
Technical		
3. Disposal facility design and operating characteristics	Negative	The Corps was not involved in the original placement of the dike, which is some 200 feet landward from the bulkhead line. Also, the city, which had agreed to a filling level of 590 IGLD in 1970, changed its mind in 1975 and established a limit of 585 IGLD. As a result a 1972 Corps estimate of 10-year capacity was negated and site is expected to be filled to capacity in 1977.
Economic/Financial		
5. Project sponsor capability to assume financial responsibilities	Negative	The city requested that the Corps dispose of over 3.4 MCY of material at the site while the Corps intended to deposit only 531,000 CY. Additional disposal costs were $620,000 and city's inability to provide the funds delayed implementation.
Legal		
1. Conformance with regulatory requirements	Positive	The State DNR was not organized until 1967, after the project was begun. Once the pierhead-bulkhead line was established in 1965, the State had no regulatory authority with respect to filling operations landward of that line.
3. Disposal rights to the site	Negative	The city allowed Wisconsin Public Service Company to dump flyash from its nearby Pulliam powerplant in the site. This used up a considerable portion of the site capacity.
Planning/Implementation		
9. Proposed use compatibility with master plans	Positive	The city and county built their master plans around the already proposed plan for the industrial use of the site. The Bay Port area was first proposed for industrial use in 1921, and was zoned industrial in 1925.
11. Proposed site plan compatibility with site physical features	Positive	Proposed rail and highway facilities make the site ideal for a trans-shipment complex.

APPENDIX D: SYNOPSIS OF CASE STUDY NO. 4 - CRYSTAL BEACH - CRYSTAL BEACH, FLORIDA

Background Summary

Introduction

1. The proposed 128-acre Crystal Beach confined disposal site was situated on a peninsula in the unincorporated community of Crystal Beach, Florida, which is northwest of the Tampa-St. Petersburg area (Figure D1). The peninsula is located west of Palm Harbor and is bounded on the west by St. Joseph Sound, a coastal inlet of the Gulf of Mexico. Disposal planning leading to the Crystal Beach proposal was started in late 1971 when the Jacksonville District determined that shoaling of the St. Joseph Sound portion of the Intracoastal Waterway* would require that maintenance dredging be performed along the 100-foot wide channel. The Crystal Beach tract was selected for construction of a disposal site in early 1972 and alternative facility designs were evaluated until July 1974. In August 1974 the residents of Crystal Beach obtained a temporary restraining order against the project and in May 1975 a permanent injunction was obtained, both grounded in the Corps' failure to prepare an EIS for the project.

2. The local sponsor for this project was the West Coast Inland Navigation District (WCIND), a multi-county agency established to coordinate matters relating to the IWW-CRAR. The WCIND is responsible for providing disposal areas to the Corps for IWW channel maintenance. At Corps request in late 1971, WCIND began reviewing alternative disposal area locations and, after non-upland options were turned down by the Corps, initiated discussions with the landowners at Crystal Beach concerning the possibility of WCIND obtaining easements. Although WCIND has no land development authorities, its director recognized that the Crystal Beach disposal project would raise the elevation of the

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* The Intracoastal Waterway from Caloosahatchee River to Anclote River (IWW-CRAR) was authorized at a channel depth of 9 feet by the River and Harbor Act of 1945.

site to developable levels. Island in the Sun, Ltd., a land development firm with personal ties to WCIND's director, began acquiring the land at Crystal Beach in June 1972 and in early 1974 granted disposal area and pipeline easements to WCIND.

3. The residents of the Crystal Beach community adjacent to the proposed disposal site were not fully aware of the impending project until September 1973, at which time they formed the Save Crystal Beach Association (SCBA)* and retained legal counsel. By that time, the Corps had held two multi-agency field inspections to review disposal plans and facility designs had gone through several iterations. The SCBA was extremely opposed to the proposed use of Lake Chataqua, a 7.5-acre man-made lake, as a settling pond and to their lack of involvement in the planning process. Also, SCBA was concerned that the site would eventually be developed by Island in the Sun in a manner inconsistent with the existing character of the community. Public involvement in disposal planning was considered by the Corps to be the responsibility of WCIND. It is clear that a prime reason for the eventual failure of the project was inadequate coordination with both the public and the local planning agency for Pinellas County.

4. In an EA (environmental assessment) published in October 1973, the Corps concluded that no long-term adverse impacts on the environment would accrue from the project, that temporary adverse impacts would be offset by economic benefits, and that the project was not a major Federal action requiring preparation of an EIS. In August 1974, the attorney for SCBA made several attempts to have the project halted on legal grounds. These included (1) lack of a public hearing as required in Section 404 of PL 92-500, (2) lack of a fill permit from Pinellas County, and (3) a protest that a previously used disposal site, Honeymoon Island, was not properly considered as an alternative disposal area. The lawsuit initiated by SCBA against the Corps on grounds of non-compliance with NEPA provided the ultimate downfall to

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* The Crystal Beach Community Association (CBCA) had been formed several years earlier and the SCBA was formed solely to fight the disposal project.

the project. The Corps finally lost the Crystal Beach disposal site when the Middle Florida District Court issued a permanent injunction on May 1, 1975. In the conclusions of law, the Court stated that "the proposed project in St. Joseph Sound and Crystal Beach is a 'major' Federal action involving, as it does, a cost in excess of one million dollars." After an appeal was dismissed by the U.S. Fifth Circuit Court in October 1975, the Corps abandoned any future plans for disposing of dredged material on the Crystal Beach site.

5. Several comments and observations on the planning process for the Crystal Beach site can be made based on field interviews and a review of relevant documents. First, the Jacksonville District depended upon local officials and the WCIND to inform the public of the proposed action. Failure of these agencies to do a thorough job led to the Corps' misunderstanding the degree of local concern and involvement. The Corps tried to respond to the SCBA concerns, once they were known, by redesigning the disposal plan; however, by this time the environmental base of objection had expanded to include locating at an alternate site. Most of the planning for the site was done without the involvement of the local citizens. In fact, SCBA claimed they had great difficulty in even getting information on the project. It is likely that because the local community was not involved early in the process, greater opposition to the project was encountered later on. The public involvement that was carried out met the requirements of Corps policy and regulations but was clearly not sufficient in this case. Next, the site selection field trips held by the Corps were short and superficial reconnaissance efforts. Agency positions formed during these trips did not hold up under closer environmental analysis and several agencies changed their position as controversy over the site developed. The Corps' coordination process did not include important county agencies such as the Planning Department. Lack of coordination here led to the identification of objections to the project further along in the planning process than was necessary. Third, the site selection process did not adequately address the planning context of the proposed site. The location of a quiet

residential community adjacent to the site should have been an indication to the Corps that extra efforts were needed to communicate the proposed plan to the community. The planning process did not address the proposed productive use concept for the site. This was clearly a concern of SCBA and a major factor in the opposition to the project.

Site description and regional context

6. The Crystal Beach site had a limited history with respect to human or natural disturbances prior to its consideration as a confined disposal area. In late 1969 the then owner of the site expressed a desire to dredge, fill, and seawall marginal and submerged areas behind the established bulkhead line. Development plans included a mobile home park and marina, with a channel area to be dredged along the St. Joseph Sound frontage to permit small boat navigation. In 1970, approximately one-half of the property was cleared, presumably in preparation for development. At a public hearing held in early March 1971, opposition to the proposed project was heard from Crystal Beach residents, who objected to indiscriminate building and adverse ecological impacts. A county permit was denied by a vote of the Pinellas County Commissioners based upon adverse impacts to natural resources.

7. The Crystal Beach site was partially cleared land whose soils are largely sand, surrounding a pair of connected wetland areas (Ogden and Sutherland Bayous). The northwest corner of the area contains the small pond called Lake Chataqua. The variability of soils, relief, water bodies and vegetation have resulted in diverse habitats and several ecotones. The site includes well-drained fine, sandy soils and areas of tidal swampland consisting of mixtures of organic and sandy soils subject to tidal action. Small low-lying areas of tidal marsh are saturated with brackish or saline waters at high tide but are protected from strong wave action.

8. The Jacksonville District made several hand auger borings at the site to a 4 to 5 foot depth, revealing a sand suitable for support of dike structures. The dredged material that was proposed to be placed on the site consisted of a black mixture of silt, mud, clay and less than 10 percent sand. Corps analyses showed traces of contaminants

such as lead, zinc, and mercury and the Region IV EPA office in Atlanta ruled in 1972 that the material had to be placed in a contained upland site. An independent evaluation of the quality of the bottom sediments in St. Joseph Sound, made in 1973, found the material to be inadequate for bearing lateral and longitudinal loads. The site owners were aware of the poor quality of the material, but were of the opinion that it would be beneficial in terms of enhancing the site's development potential.

9. The site, characterized by three different physical areas - upland, shallow lake, and bayou - is horseshoe-shaped with the open end facing south toward Sutherland Bayou, and with the center of the horseshoe occupied by Ogden Bayou (Figures D2 and D3). Lake Chataqua, a shallow saltwater lake, is located northeast of Ogden Bayou through which it is fed and drained. Vegetation on the site consists of first-growth plant species on the upland areas and mangrove in Ogden Bayou and the wetland areas adjacent to Lake Chataqua. Upland vegetation consists of scrub brush and small pines. Some mature pines exist along the northern boundary of the site adjacent to the Crystal Beach residences.

10. The waters surrounding this site were classified as Class III (conservation) by the Florida Coastal Coordinating Council but Pinellas County personnel felt that a Class II (presevation) designation was more appropriate. Healthy marine grass beds are found in much of the shallow waters near this site. This small peninsula has open beaches, mangrove swamps, and tidal marshes all representative of the marine systems characteristic of the coastal zone and recognized as important to the overall health of the local physical and natural systems. The mangrove swamp and tidal marsh areas protect upland areas from storm surges, salt spray, and storm tides and function as nursery grounds, nutrient distributors, and silt collectors. The Crystal Beach community recognized the area as important to their "human environment" and utilized the area for recreation and open space appreciation.

11. The local economic setting for the Crystal Beach area can best be characterized on the county level. The economy of Pinellas County is a function of two major factors, a large retirement population

and tourism. Pinellas County had the highest number of social security recipients in the 14-county southwest Florida region in 1970 and had more tourist accommodations than any other area in southwest Florida. Hotels, motels, and enterprises supporting the tourist industry are reflected in the land use patterns throughout the county. The population of the community adjacent to the proposed disposal area reflects these county trends. The local population consists of a large retirement sector, seasonal occupancy by semi-retirees, and a small group of young families.

12. In July 1972, Pinellas County implemented a Red Flag Charette* as the first step toward the development of a comprehensive long-range environmental policy for the county. The first task completed by the Red Flag Advisory Team included a detailed inventory of areas of critical environmental concern within the county. Crystal Beach was identified as an alert area threatened with further encroachment, and Lake Chataqua as a sand pine ridge habitat alert area. The area was included as part of 6000 acres of priority county lands recommended to the State for acquisition for preservation. In March 1974 a County Land Use Plan became law in Pinellas County, and the Pinellas County Planning Council resolved in September 1974 that no residential, commercial, industrial or other use would be permitted on Crystal Beach not in conformance with its designation as a Green Area in the land use plan (environmentally endangered area).

13. Land uses adjacent to the site are of three types: single-family residential, open undeveloped land, or open water. Directly to the north is the residential community of Crystal Beach in which all homes are single-family units on one-quarter acre lots. There are many undeveloped lots available in the development and the community has a quiet, suburban character. To the east of the site is a small tract of upland with rather dense natural vegetation. To the south of the site is the mouth of the inlet known as Sutherland Bayou and both the

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* The Red Flag Charette is a short-term intensive land resource assessment sponsored by the American Society of Landscape Architects (ASLA).

southern and the western boundaries of the site are at water's edge. The western boundary is St. Joseph Sound, through which the IWW section to be dredged passes. Beyond the sound is Honeymoon Island, which had been previously used as a disposal site and which was felt by the Crystal Beach residents to be a better alternative.

Productive land use plan

14. At the time of project planning and review, the site owner, Island in the Sun, Ltd., did not make public any detailed plans for ultimate site development. However, Island in the Sun was a limited partnership whose purpose was "the acquisition and holding of real estate for investment purposes." In May 1972, the WCIND first contacted the previous owner of a large portion of the Crystal Beach tract to inquire as to the availability of his property for dredged material disposal. From June 1972 to February 1974, Island in the Sun acquired the entire tract from that prior owner and other owners of smaller individual lots. Zoning of the plotted tract was divided among single family residential and combination mobile home park, cottage and single family-household - all constrained by a specified low maximum density. Completion of the proposed disposal site would have brought the tract above the minimum required elevation for development. The adjacent Crystal Beach community feared the developer would propose moderate-to-high density residential use although the site was not zoned for such use.

Project Implementation

Chronology

15. Significant events relating to the Crystal Beach disposal project are shown chronologically in Figure D4. The first event listed is the CBCA's March 1971 opposition to a proposal by the owner of the Crystal Beach tract to construct a mobile home park on the site. Both the Corps and the WCIND failed to solicit the CBCA's comments on the Corps' subsequent plans to build a dredged material disposal site on the same tract. The chronology ends with the Corps' abandonment of the

project in October 1975 when an appeal of the court decision granting a permanent injunction was denied.

Participants

16. Primary participants in the implementation process for the Crystal Beach site included those listed below:

a. Jacksonville District, Corps of Engineers.

b. West Coast Inland Navigation District (WCIND).

c. Crystal Beach Community Association (CBCA) or Save Crystal Beach Association (SCBA).

d. Pinellas County (PC).

17. Jacksonville District. The District's desire to dredge in St. Joseph Sound to maintain an authorized channel depth of 9 feet created the need for disposal planning. During the period 1971-74, several multi-agency field inspections were organized by the Corps for alternative site evaluation and most agencies approved the Crystal Beach plan as the most environmentally acceptable alternative. Both EPA and FWS subsequently asked the Corps in June 1974 to reconsider the availability of the previously used Honeymoon Island site, reversing earlier decisions to approve the Crystal Beach site. Project implementation was, of course, hampered by the Corps' decisions to not write an EIS and not hold a public hearing. However, the Corps' reliance upon the WCIND to coordinate disposal plans with local residents and planning bodies was perhaps more significant in terms of eventual implementation difficulties.

18. West Coast Inland Navigation District. The WCIND is the local sponsor for Federal dredging activities in six western Florida counties, including Pinellas County. Although in 1972-74 the WCIND staff consisted only of an executive director and a part-time general counsel, the Jacksonville District considered local citizen and planning agency participation to be WCIND responsibility. WCIND initially proposed that the Corps use either Honeymoon Island or some other former "spoil islands" in St. Joseph Sound for disposal. The Corps, however, opted for upland alternatives including the Crystal Beach site. WCIND failed to solicit local citizen and planning agency review

of the Crystal Beach disposal plans and was not responsive to inquiries by the local residents. On the other hand, WCIND initiated a great deal of discussion with the owners of the Crystal Beach tract on such matters as disposal area size and securing temporary easements.

19. Save Crystal Beach Association. The SCBA was formed in September 1973 when the residents of Crystal Beach became aware of Corps plans to use the undeveloped area surrounding nearby Lake Chataqua as a disposal site. The primary SCBA objections to the project were that it was planned without their input, that productive use plans were unknown, and that the Corps and WCIND were unresponsive to requests for project details. With the help of an environmental lawyer, SCBA was able to stop the project on environmental grounds. In retrospective interviews, members of SCBA indicated that they would not have opposed an "openly planned and environmentally sound" disposal-productive use project provided that the existing character of the community (low density residential) was preserved. In similar discussions, Corps personnel were of the opinion that the Crystal Beach residents would oppose any type of additional development in their community. It appears that the Corps assumed that local opposition to the Crystal Beach project would be "routine" and not strong enough to evolve into the major controversy that resulted.

20. Pinellas County. Throughout the site review and facility planning phase (1972-74) of the project, all Corps/WCIND coordination with the county was carried on through the PC Engineering Division, which never objected to the project. On the other hand, the PC Planning Council, which was vigorously pursuing funding under a State program for the preservation of Florida's environmentally sensitive lands, was not aware of the proposed Crystal Beach disposal project until 1974. The Crystal Beach tract was identified in July 1972 as an environmentally valuable area by the volunteer Red Flag Advisory Team whose leader subsequently became the head of the PC Environmental Division formed in 1974. In September 1972 the PC Planning Council identified Crystal Beach as an area of environmental concern and in June 1973 the tract was included on a list of endangered areas submitted to the Florida

Department of Natural Resources for State purchase for preservation. In September 1974 the PC Planning Council resolved to make Crystal Beach a "Green Area" on the County Land Use Plan, thus only permitting development consistent with open space/recreational zones. This action finally laid to rest the problem of differing county opinions on the acceptability of the proposed disposal project. Lack of communication between WCIND, the PC Engineering Department, and the PC Planning Council prevented early identification of this situation. As with public participation, the Jacksonville District's policy of relying upon local sponsors for coordination with local/regional planning bodies was a severe drawback in this case.

Major issues
addressed during implementation

21. The controversy surrounding the planned disposal site at Crystal Beach grew out of several specific issues raised by the SCBA. Table D1 presents a summary of the major issues associated with the project, including the two legal issues - conformance with EIS requirements and public hearing requirements - upon which the SCBA court actions were based. Major issues in the institutional and planning/implementation categories related primarily to the interface between the residents of Crystal Beach and the Corps/WCIND. While the Corps' vulnerability in the legal areas resulted in abandonment of the project, the issues of public participation during planning, responsiveness to public comments, and evaluation of alternative disposal areas point out equally critical deficiencies in the process of planning the Crystal Beach project.

Planning considerations
affecting implementation

22. Significant physical planning elements of the Crystal Beach site are summarized in Table D2. These physical planning elements have been grouped into two categories: (1) elements related to disposal facility planning and (2) elements related to productive land use planning. Key considerations that exerted a negative influence on disposal planning were that adjacent wetland areas were involved and

that the area was classified as environmentally sensitive by the county. The key land use planning element, which exerted a negative influence on implementation, was the lack of a detailed site plan for the eventual productive use of the site.

23. The site owner did not make public any plans he might have had for eventual use of the Crystal Beach site. The lack of a public land use plan was a major disadvantage in terms of project implementation. By not making plans for the productive use of the site public, the site owner, a real estate investor/developer, triggered speculation by local citizens that the intended use was inconsistent with the character of their community, thus increasing their opposition to the project.

Key factors affecting implementation

24. The specific issues and planning elements described in Tables D1 and D2 illustrate the many negative aspects of the disposal planning process that contributed to the project's demise. These key factors, summarized in Table D3, extend over a variety of considerations, most of which were found to impede project implementation. Only one positive factor was identified, that being coordination with review/regulatory agencies. Particularly important among the many negative factors identified were the Corps' inadequate conformance with environmental requirements, public participation policies, procedures for identifying and resolving objections, and Corps and other participant attitudes.

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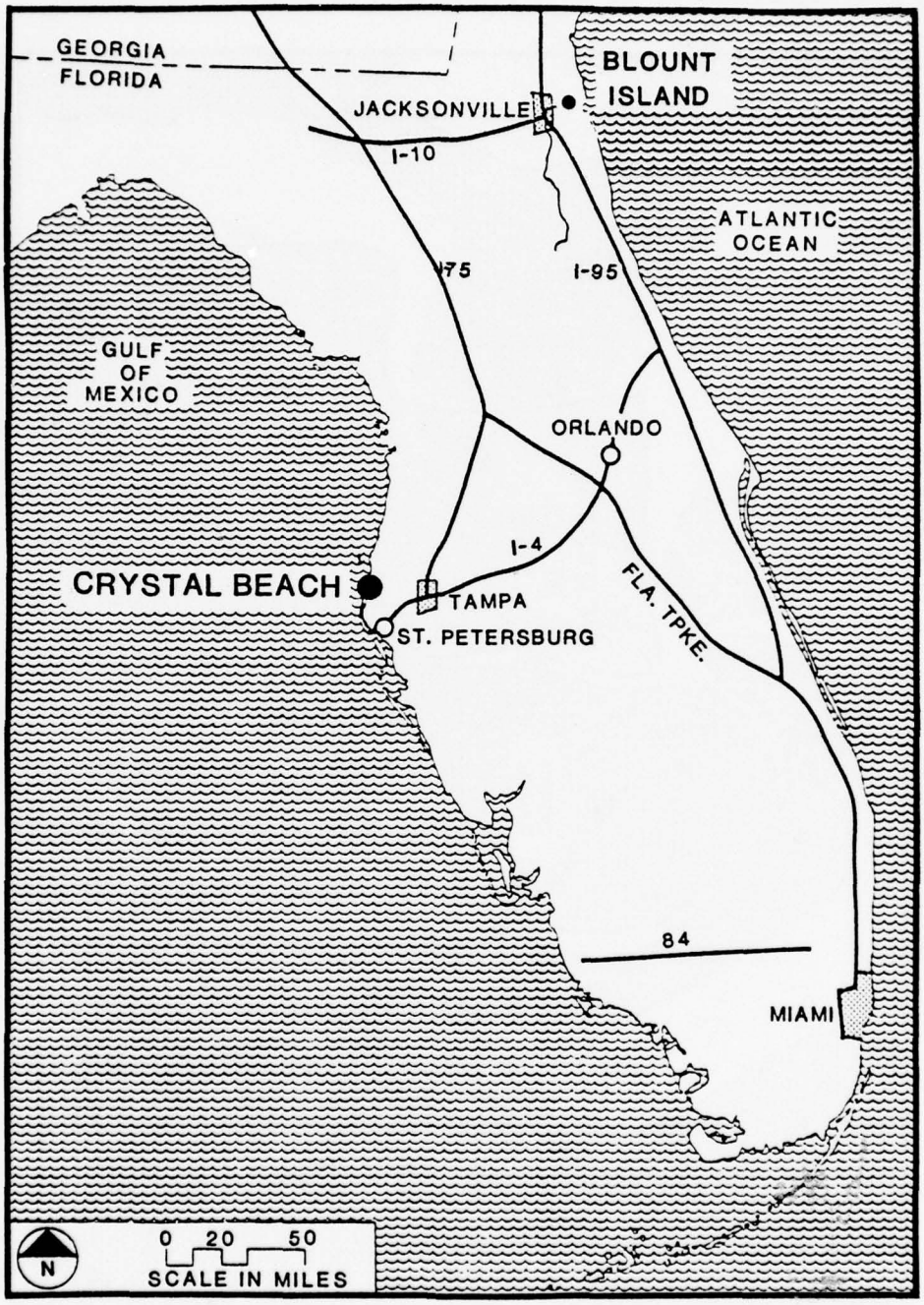


Figure D1. Location Map for Case Study No. 4 - Crystal Beach

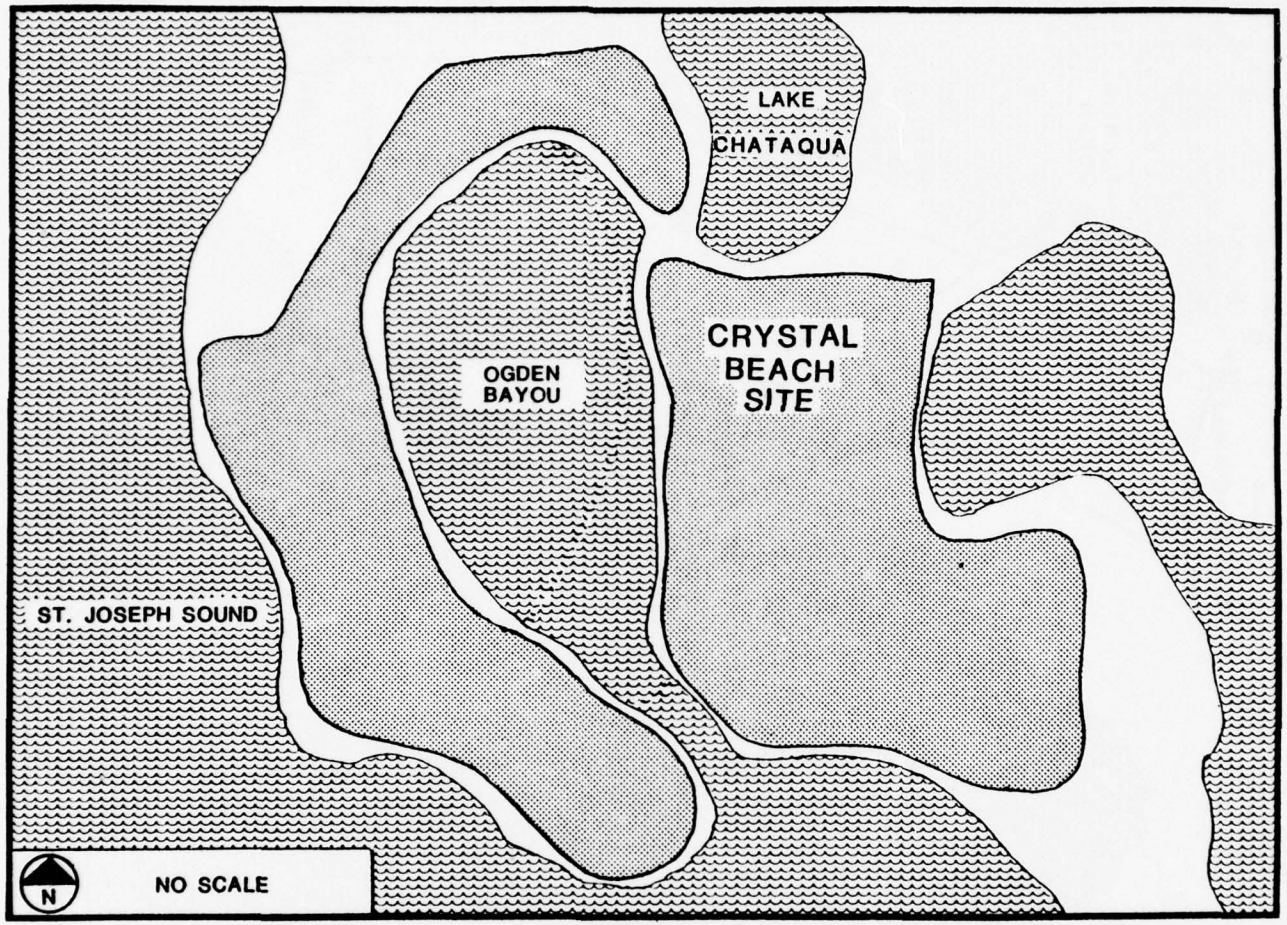
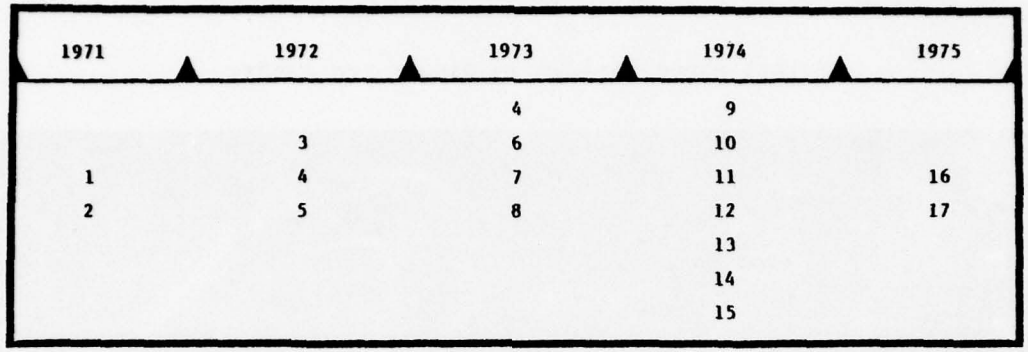


Figure D2. Crystal Beach Site Map



Figure D3. Photo of Crystal Beach (1973)



1. Mar. 71 - CBCA opposes county dredge and fill permit for mobile home park on Crystal Beach site.
2. Oct. 71 - Corps askes local sponsor, WCIND, to find disposal sites for St. Joseph Sound dredging.
3. 72 - 74 - Corps holds multi-agency field inspections of alternative disposal sites. (2/72, 7/73, 6/74).
4. Jan. 72 - Honeymoon Island rejected as disposal site due to owner litigation vs. Corps.
5. Jul. 72 - Crystal Beach on "Red Flag Charette" list of environmentally sensitive areas in Pinellas County.
6. Jul. 73 - Crystal Beach disposal site enlarged with Lake Chataqua shown as settling pond.
7. Sep. 73 - Save Crystal Beach Association formed when CBCA realizes advanced nature of project planning.
8. Oct. 73 - Corps issues environmental assessment and rules that EIS not warranted under NEPA.
9. Apr. 74 - Dredging contract worth over $1 million awarded.
10. May 74 - WCIND board meeting held in public to allow SCBA objections to be voiced.
11. Jun. 74 - Corps reluctantly holds public hearing at which EPA withdraws support for disposal plans.
12. Jul. 74 - Disposal area redesigned to exclude Lake Chataqua and EPA again supports project. FWS asks Corps to reconsider availability of Honeymoon Island site.
13. Aug. 74 - SCBA obtains temporary restraining order against project by questioning Corps' EIS decision.
14. Sep. 74 - County land use plan shows Crystal Beach as "Green Area" requiring development consistent with open space and recreation zones.
15. Oct. 74 - SCBA obtains preliminary injunction, posts $50,000 bond.
16. May 75 - SCBA obtains permanent injunction until Corps demonstrates compliance with NEPA.
17. Oct. 75 - Corps appeal is denied and Crystal Beach disposal project is abandoned.

Figure D4. Case Study No. 4 - Crystal Beach - Chronology of Events

Table D1

Case Study No. 4 - Crystal Beach: Major Issues Addressed During Implementation

Issue Categories	Issue Descriptions
Environmental	
1. Wetlands filling	Local environmentalists were concerned that the Crystal Beach wetland habitat would be adversely affected, resulting in further diminishing of limited wetland resources in the area.
6. Dredging-disposal water quality impacts	Crystal Beach disposal plan was reviewed and approved twice by State Game and Fish Commission and by EPA. Environmentalists associated with local residents testified to adverse impacts the site would have on receiving waters due to poor sediment quality and facility design.
Technical	
6. Disposal area operating characteristics	Second disposal facility plan proposed by Corps included using existing lake (Lake Chataqua) as a settling pond. State agency objections led to development of a third design a year later.
Legal	
1. Conformance with EIS requirements	Corps decided that project would not have significant adverse impact on the human environment and so an environmental assessment rather than an EIS was prepared. Permanent injunction was sought and obtained on basis that the Corps decision was unreasonable.
3. Conformance with public hearing requirements	Temporary restraining order against project was granted in part because Corps proceeded with dredging contract without holding a public hearing as required under PL 92-500.
Institutional	
1. Public participation during planning	Project planning proceeded from late 1971 to late 1973 without any public involvement. Corps considers it the responsibility of project sponsor to ascertain public comments on proposed disposal plans. Corps failed to solicit public comment via public hearing. Local residents objected strongly to "closed-door" planning.
2. Responsiveness to public comments	In late 1973, local citizens became aware of advanced disposal plans for Crystal Beach. Citizens were unable to obtain project details from Corps or sponsor and were refused public hearing until matter was brought into court. Citizens felt Corps and sponsor were arrogant and indifferent to their concerns.

(Continued)

Table D1 (Concluded)

Issue Categories	Issue Descriptions
Planning/Implementation	
2. Dredging project need	Environmentalists questioned need for dredging in St. Joseph Sound. Corps responded that project was authorized in 1945.
4. Evaluation of alternative disposal areas	Local citizens charged that an available, previously used dike disposal site in the sound (Honeymoon Island) was a more acceptable alternative. Corps had rejected the site because the Corps and the site owner were involved in litigation as a result of prior disposal actions by the owner. The owner indicated the site was available since he desired to have it filled.
8. Proposed use compatibility with adjacent uses	Local citizens were unable to obtain information from the Corps or the project sponsor as to disposal details or eventual use plans. Their opposition to the project was fueled by speculation that a use inconsistent with the character of their community was planned. The site owner was a real estate investment-developer.

Table D2

Case Study No. 4 - Crystal Beach
Physical Planning Elements Affecting Project Implementation

Physical Planning Elements	Influence	Element Descriptions
Elements Related to Disposal Facility Planning		
1. Pre-disposal site characteristics: wetland	Negative	The disposal site was directly adjacent to wetland resources. Also, the initial disposal plan called for the use of nearby Lake Chataqua as a settling pond with discharge of water directly through the adjacent wetlands. Local environmentalists were convinced that this wetland habitat would be adversely affected.
2. Ecological characteristics	Negative	In mid-1972 Pinellas County planners identified Crystal Beach as an environmentally sensitive area and recommended the site for State purchase for preservation. Unfortunately, Pinellas County engineers were unaware of this and so did not object to the project.
Elements Related to Productive Land Use Planning		
8. Site plan compatibility with site features and user requirements	Negative	The failure to make site land use plans public led to speculation by local citizens that a use inconsistent with the character of their community was planned. The local citizens maintain that an environmentally sound low density residential use plan would have received their approval.

Table D3

Case Study No. 4 - Crystal Beach: Key Factors Affecting Project Implementation

Factor Categories	Influence	Factor Descriptions
Environmental		
1. Ecological characteristics of proposed disposal area location	Negative	Crystal Beach identified in mid-1972 as an environmentally sensitive land area by Pinellas County and is included on list of areas recommended for State purchase for preservation.
Technical		
3. Disposal facility design and operating characteristics	Negative	Disposal facility design had to be revised several times due to infringement on natural lake and uncertainty over boundary between upland and lowland areas.
Economic/Financial		
2. Engineering and construction costs	Negative	Citizens took significant action to halt project after dredging contract for over $1 million awarded in April 1974. Corps was liable for $100,000 breach of contract provision if project delayed more than 60 days. Also, court ruled that $1 million project was a "major Federal action" requiring an EIS.
Legal		
1. Conformance with regulatory requirements	Negative	Corps erred in ruling that EIS not required for St. Joseph Sound-Crystal Beach project and that public hearing was not necessary before proceeding.
2. Adequacy of environmental impact assessment	Negative	Corps concluded in brief assessment that no long-term adverse impacts would result from project. Court ruled the assessment inadequate under NEPA.

(Continued)

Table D3 (Concluded)

Factor Categories	Influence	Factor Descriptions
Institutional		
1. Public participation in disposal-productive use planning	Negative	Corps relied on project sponsor to determine local resident opinions during early planning. Sponsor did not and so Corps was unaware of opposition to be encountered. Over two years of planning was undertaken before public was notified of intended project.
3. Coordination with review/ regulatory agencies	Positive	Several multi-agency field trips were held during plan formulation and on-site comments were responded to by the Corps. Except for EPA, agency opinions were established during site visits.
4. Coordination with planning agencies	Negative	Corps dealt with county engineering division in soliciting county comments on Crystal Beach plan. Engineering division was unaware of county planning division's designation of the area as environmentally sensitive.
5. Procedures for identifying and resolving objections	Negative	Corps depended on project sponsor to anticipate public opposition. Sponsor failed to consider fact that in 1971 local residents successfully opposed prior site owner's attempt to build a mobile home park on the site. Crystal Beach residents felt that Corps and project sponsor deliberately failed to respond to requests for project details after citizens became aware of the project in late 1973.
6. Corps and other participant attitudes	Negative	Citizens commented that Corps and project sponsor were arrogant and rude in dealing with their objections. Corps and sponsor considered local residents to be "irrational objectors" who would oppose any project involving filling at Crystal Beach.
Planning/Implementation		
6. Evaluation of alternative disposal areas	Negative	Corps rejected a previously used disposal site, Honeymoon Island, because of ongoing litigation between the Corps and the island's owner. Objectors to the Crystal Beach plan eventually enlisted the financial support of Honeymoon Island's owner during their court proceedings against the Corps.
7. Impacts of disposal-productive use project on existing water uses	Negative	Local citizens frequently used Lake Chataqua for fishing. Corps proposed plan to use the lake as a settling pond was rejected.

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APPENDIX E: SYNOPSIS OF CASE STUDY NO. 5 - HURON SITE 1 - HURON, OHIO

Background Summary

Introduction

1. Site 1 is a 63-acre confined area immediately adjacent to the shoreline in the harbor of Huron, Ohio, which is located about 47 miles west of Cleveland (Figure E1). The planning and review process for Site 1 began in January 1968 when, as part of its study of dredging and water quality in the Great Lakes, the Corps informed Huron officials that a pilot confined disposal facility was to be built in Huron Harbor for polluted maintenance dredgings. Site 1 planning was greatly affected by the passage of both NEPA in 1969 and the River and Harbor Act of 1970 (PL 91-611), the latter requiring diked disposal sites with 10-year capacity in all Great Lakes harbors. Dike construction for the site began in August 1974, over 6-1/2 years after planning was initiated.

2. The City of Huron was the local sponsor for the project, but almost all site planning groundwork was delegated to the Huron Port Authority (HPA). During 1968 the HPA developed concepts for eight alternative sites using site selection criteria provided by the Buffalo District. Relevant agencies at all levels of government participated in alternatives evaluation and in early 1969 Site 1 was identified as the most acceptable option. The HPA initially favored alternate Site 2, which would have been constructed further offshore using a planned breakwater as one side of the retaining structure. Local boaters objected to Site 2 as a danger to navigation and Site 1, which had been suggested and favored by the Huron Park Board, emerged as the favored site of all participants. Primary advantages of Site 1 were minimal adverse environmental impacts and potential benefits as a public recreational facility.

3. Although informal agreement on Site 1 was reached in early 1969, further project implementation was slow, involving fulfillment of the new EIS requirements and completion of Corps engineering design

studies. The draft EIS for the project published by the Corps in October 1972 included a preliminary productive land use plan for the site prepared by an engineering consultant to the Corps. The plan called for a multi-purpose recreational facility, a use compatible with both local and regional master plans. The intent of the conceptual plan was to illustrate the anticipated future use of the site in soliciting support for the project. It is evident that a more refined planning effort, which will ideally include the assessment of alternatives, will be necessary as the site is filled and public use once again becomes the focus of attention. The destiny of Site 1 seems to be accepted in the community and is consistent with Ohio legislation requiring that State-owned submerged lands remain in public use.

Site description and regional context

4. Site 1 has a slightly elongated semi-circular configuration with its outer terminus about 2700 feet from the Lake Erie shoreline west of the Huron River and its inner terminus about 500 feet from the same point (Figures E2 and E3). The site is connected to the mainland by a stone pier, which is approximately 15 feet wide and projects 500 feet into Lake Erie from the shore. The material to be deposited in the facility has the general consistency of fine silt and the site will be filled to a height of approximately 15 feet above low water datum. Experimental data indicate that the silt composition will place definite limits on the site's loading capacity; if structures of any magnitude are built on it, pile foundations to bedrock will be needed. The physical shape of the site, although somewhat non-optimal in terms of the water perimeter provided, effectively shields the shore from severe wave action.

5. Because Site 1 is located in Lake Erie, no thought had been given to development planning for the area until the need for a confined disposal site arose. Soon after this need was revealed, local agencies took an interest in the development potential of a lake site. The location of the proposed park is excellent with respect to the Huron urban renewal area which will revitalize the river's edge from Route 2 to the Huron River/Lake Erie confluence. Access to the site is good

with the primary access problem being a need to pass through the edge of a nearby residential neighborhood. In order to facilitate optimum use of the site for the proposed park, however, both access to the park and parking facilities for park users will need to be resolved. The narrow structure of the existing west pier was not designed to accommodate vehicular access.

6. Assuming that traffic and parking problems could be alleviated, appropriate amendments could be made to the Ohio constitution, and suitable market economic conditions exist, alternative land use concepts (i.e., a mix of commercial and park/open space) could be incorporated into the development plan for Site 1. Additionally, assuming the above considerations, water-oriented industrial use might also be a viable land use alternative for the site. However, since there is a local and regional shortage of water-oriented recreational land, the proposed park use of Site 1 successfully works towards minimizing the deficit.

7. Geographically, Site 1 is situated at the western basin of Lake Erie, a locale considered by many recreational enthusiasts to be the playground of Lake Erie as it provides extensive opportunities for boating, fishing, and other water-borne activities. The western basin has also been noted as the lake's spawning and nursery grounds and as such is very crucial to sport and commercial fisheries. However, the shallowness of the basin (average depth $\leq$ 25 feet) makes it extremely vulnerable to change, i.e., pollution and eutrophication. Water depth after the completion of the project will be extended to 27 feet in the entrance channel and to between 23 and 28 feet at the jetties. At the lake's bottom lies a 1- to 3-foot layer of sandy silt, which blankets a secondary layer of soft clay. Polluted sediments have infiltrated the silt-sand-clay formation and constitute a large proportion of its composition.

8. Huron is in Erie County in north central Ohio, midway between the industrial centers of Toledo and Cleveland. The area is characterized by significant industrial development along the Lake Erie shore, and becomes very rural proceeding south from the lake. Sandusky, with a population of nearly 33,000, is the largest city in the region and is

10 miles from Huron. Huron has a population of less than 7,000. The economy of Erie County is primarily oriented to manufacturing. However, Huron Harbor serves as a deep draft commercial port with iron ore accounting for nearly three-fourths of total goods shipments. Huron is primarily a residential community supported by local industrial and commercial activity. Local industry is consolidated around Huron Harbor and southeast of the city's central business district. The majority of industries contiguous with the harbor are port users. During site planning from 1968 to 1974, new commercial developments, such as a shopping center and a motel-convention center complex were emerging in Huron. Also, Huron's 23-acre urban renewal area is adjacent to Site 1.

9. Land uses planned for the 23-acre parcel included a boat-oriented shopping plaza, a motel-convention complex, and a waterfront promenade designed for pedestrians. A marina, which is the focus and the prime water amenity for the project, had already been constructed. One objective of the urban renewal effort is to draw a larger segment of the total tourist market into the city. It is expected that a certain "spillover" from those attracted to the activities programmed for the new City Center will also enjoy the proposed park at Site 1.

Productive land use plan

10. To date only one conceptual land use plan has been prepared for Site 1. The plan illustrated in Figure E4 was prepared in July 1972 by a consulting firm under contract to the Buffalo District to develop engineering plans for the site. Facilities proposed for the Site 1 park include an amphitheater, a children's active play area, tennis courts, baseball and softball diamonds, comfort stations, boat docking facilities, and an extensive path system. It is anticipated that fishing from the dock will become an important recreational pastime since fishing in this general area, especially off the existing west pier, has always been popular with local sportsmen. This plan illustrates the site's recreational poential; however, there is no firm commitment on the part of the city to ultimate recreational development. Furthermore, no serious planning activity is expected to occur until the site approaches a settled utilizable structure.

Project Implementation

Chronology

11. Figure E5 presents a chronology of events in the process of implementing the Site 1 project. In January 1968 the Buffalo District informed the City of Huron of interest in developing a pilot confined site for the disposal of dredged materials in Huron Harbor. After a series of meetings attended by Federal, State, and local officials over 4 years, Site 1 was selected as the most acceptable of eight alternatives in January 1972. Actual construction of the dike began in August 1974 and disposal operations followed over a year later in November 1975. The site is currently being filled with dredged material from Huron Harbor and is expected to serve as a disposal facility until 1985.

Participants

12. Participants of note in the planning and evaluation process for Site 1 included the following:

a. Buffalo District, Corps of Engineers.

b. U.S. Environmental Protection Agency (EPA).

c. Ohio Department of Natural Resources (DNR).

d. Huron Joint Port Authority (HPA).

e. City of Huron.

f. Lake Captains Association (LCA).

13. Buffalo District. The Buffalo District initiated disposal site planning for Huron Harbor in late 1967 as part of the Great Lakes dredging and water quality study. The Corps wanted to develop pilot confined sites in several Great Lakes harbors to evaluate the feasibility of confined disposal as an alternative to open water disposal. Good coordination with all relevant agencies was established at the outset, helping to facilitate planning and review after NEPA was enacted in 1969 and PL 91-611 in 1970.

14. U.S. Environmental Protection Agency. EPA (formerly the FWPCA) was the most significant Federal review agency in the development of Site 1 and also provided a great deal of assistance to the port

authority in developing disposal site alternatives during 1968. EPA worked closely with the Corps during the new EIS review process, and in September 1971, after the eight alternative sites had been thoroughly investigated, EPA formally announced that it would accept Sites 1, 3, or 4 in that preference order. Two months later Site 1 emerged as the favored alternative of all participating agencies and groups.

15. Ohio Department of Natural Resources. The primary state agency for Huron Site 1 was the DNR. DNR coordinated meetings and planning activities with all other State agencies and supplied the District and port authority with the names of relevant agencies to be contacted during site planning and review. Although internal personnel problems at DNR during 1971 resulted in a delay in forwarding preliminary State agency comments to the Corps, the coordination activities undertaken by DNR helped expedite project review at the State level.

16. Huron Joint Port Authority. Although the City of Huron was technically the local sponsor for the Huron site, the HPA undertook most of the preliminary disposal planning responsibility for Huron Harbor and was given a free hand by the city to develop a list of alternative sites. Using site selection criteria outlined by the Corps, the HPA worked with the EPA to identify and select eight alternatives. Numerous planning and review meetings were arranged with the help of the HPA, including a closed-door interagency meeting in January 1969 when Site 1 was established as the preferred site. Their thorough coordination eliminated the need for a public hearing since there were no objections to the recommended site.

17. City of Huron. The City of Huron played a key role in the development of the Huron site not as the local sponsor for the project, but as a critical reviewer. After preliminary site requirements were discussed with the District and Site 1 was approved, the city obtained the lease from the State for the submerged land. Initially, the city was concerned about the possible escape of polluted materials from the site and resultant effects on a raw water intake west of the site. Later, the city objected to Corps plans to dump materials dredged in nearby Sandusky into the site. City officials also rejected a Corps

proposal to install and connect utilities to the site prior to dike construction and start of filling. Although utility connections will be costly to install after the site is filled, the city was unwilling to assume the additional construction expenses involved.

18. Lake Captains Association. The LCA is an independent group who voiced their opinions about site selection very early in the planning process. It was primarily as a result of LCA objections that the HPA shifted its support from Site 2 to Site 1. The LCA argued that the proposed harbor improvement that formed the basis for initial HPA support of Site 2 would present a navigation hazard to recreational and commercial boats. After voicing their concerns the LCA noted their preference for Site 1 and retained a low profile for the rest of the planning process.

Major issues
addressed during implementation

19. During the planning and review process for Huron Site 1 the primary issues raised were in the environmental, technical, and economic/financial issue categories. As can be seen from Table E1, boater concerns over reduced harbor surface area led to support for Site 1 over a previously favored alternative - Site 2. During facility design, city and Corps representatives discussed alternative designs and construction operations which would have enhanced the feasibility of eventual recreational use of the site. However, additional disposal costs associated with the alternatives were prohibitive for the city at that time. None of the issues in this case were particularly controversial or delay causing.

Planning considerations
affecting implementation

20. Physical planning elements associated with disposal-productive use projects fall into two categories: (1) elements related to disposal facility planning and (2) elements related to productive land use planning. Table E2 summarizes the most important physical planning elements of the Huron case, assessed in terms of impact on project implementation. Primary considerations exerting positive

influences during disposal planning included the fact that the site was below mean low water, thereby minimizing ecological problems, and the site's proximity to the channel being dredged. Visual impacts of the project generated negative concerns. Reflecting land use planning considerations, site size and configuration as well as vehicular circulation and traffic generation posed negative concerns.

21. The sketch plan prepared for the Huron site contained both advantages and shortcomings. There were two principal advantages. First, the proposed park will increase public water-oriented park and open space in the city and region. Second, the park will provide a desirable relationship to the Huron downtown urban renewal development project now in progress.

22. There are four disadvantages associated with the proposed park plan. First, the breakwater connecting the park to the mainland is not designed nor envisioned for automobile traffic and therefore only lengthy and inconvenient access to the park will be available. Second, the park and urban renewal area have been planned separately and there is an obvious planning need to study the relationships between the two projects as well as spaces between. Third, the city chose not to acquire utility tie-in capabilities during construction of the disposal facility. This decision will result in higher park development costs during construction. Fourth, the site configuration is not entirely sympathetic to an optimal waterfront park configuration. In conclusion, the plan illustrates one planning concept and should not be considered a fait accompli. Alternatives should be prepared illustrating uses which capitalize on the prime waterfront location of the park. These planning shortcomings were not addressed during the Huron Site 1 disposal planning process.

Key factors affecting implementation

23. Among the many considerations affecting the implementation of the Site 1 project, those factors found to assist implementation more than offset those that impeded the process. Key positive factors included the adequacy of the environmental impact assessment, the level of coordination with review/regulatory agencies, and the planned use

concept compatibility with master plans. Key negative factors were engineering and construction costs, the lack of exclusive rights to the disposal area, and uncertainty over Corps long-range disposal plans. The key factors in this case are described in Table E3.

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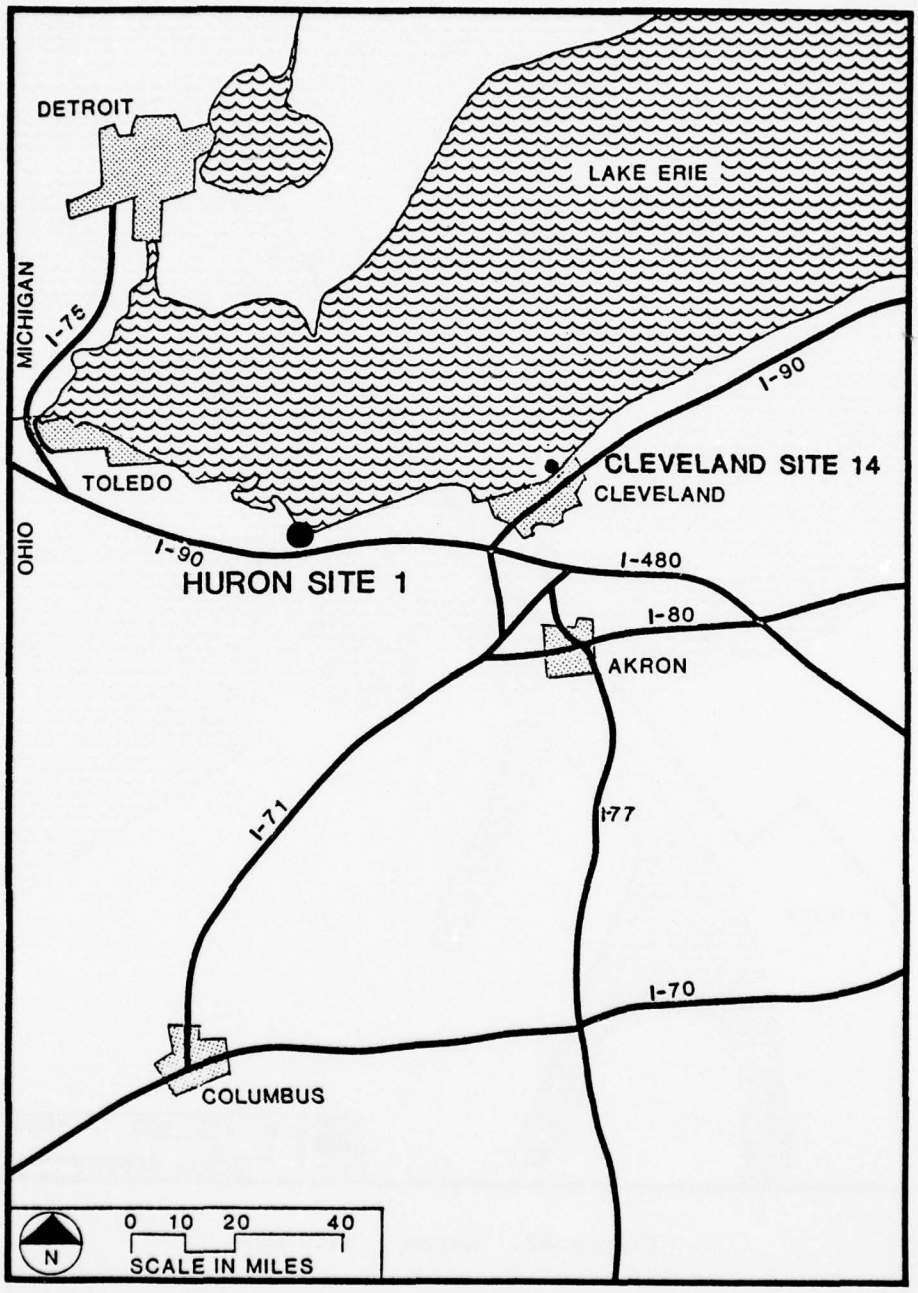


Figure E1. Location Map for Case Study No. 5 - Huron Site 1

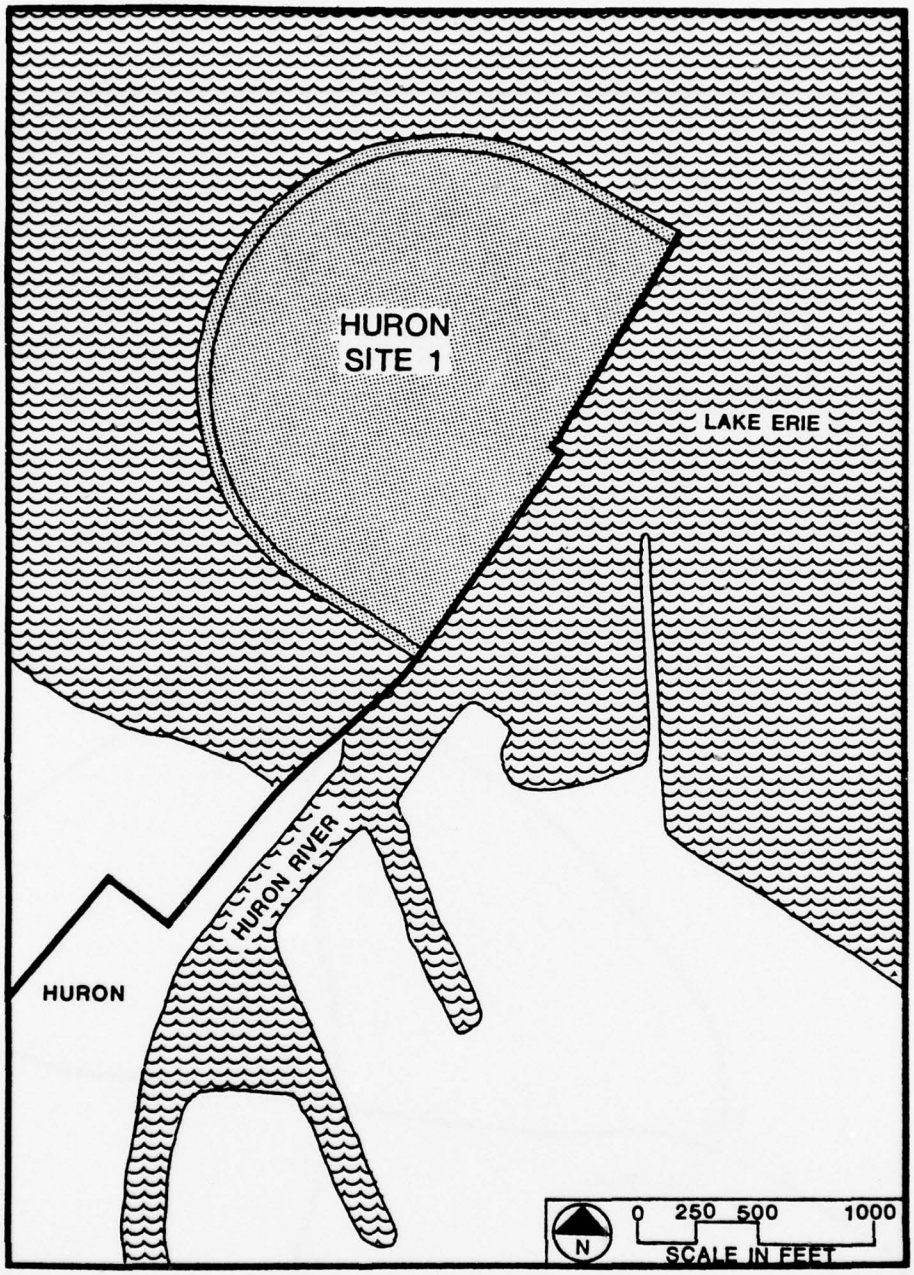


Figure E2. Huron 1 Site Map

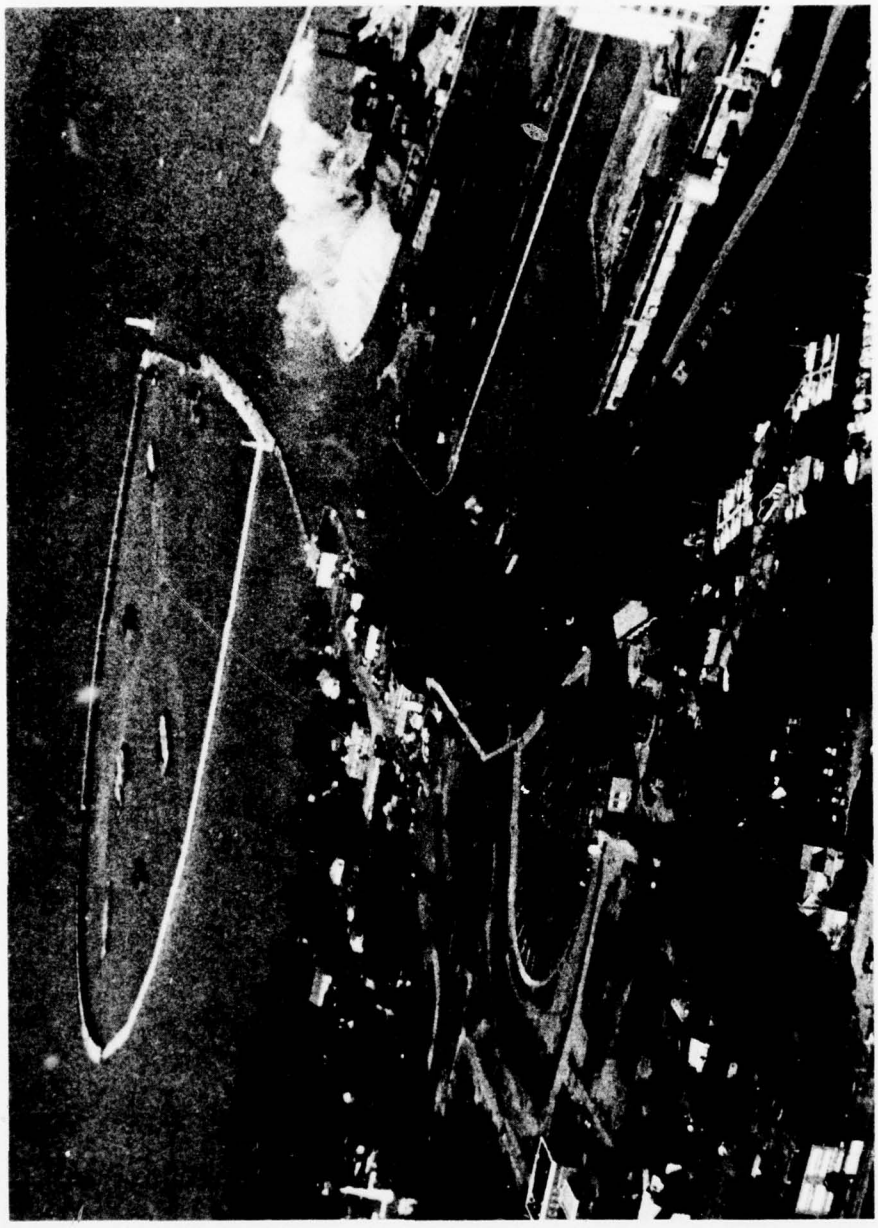


Figure E3. Photo of Huron Site 1 during Dike Construction (1974)

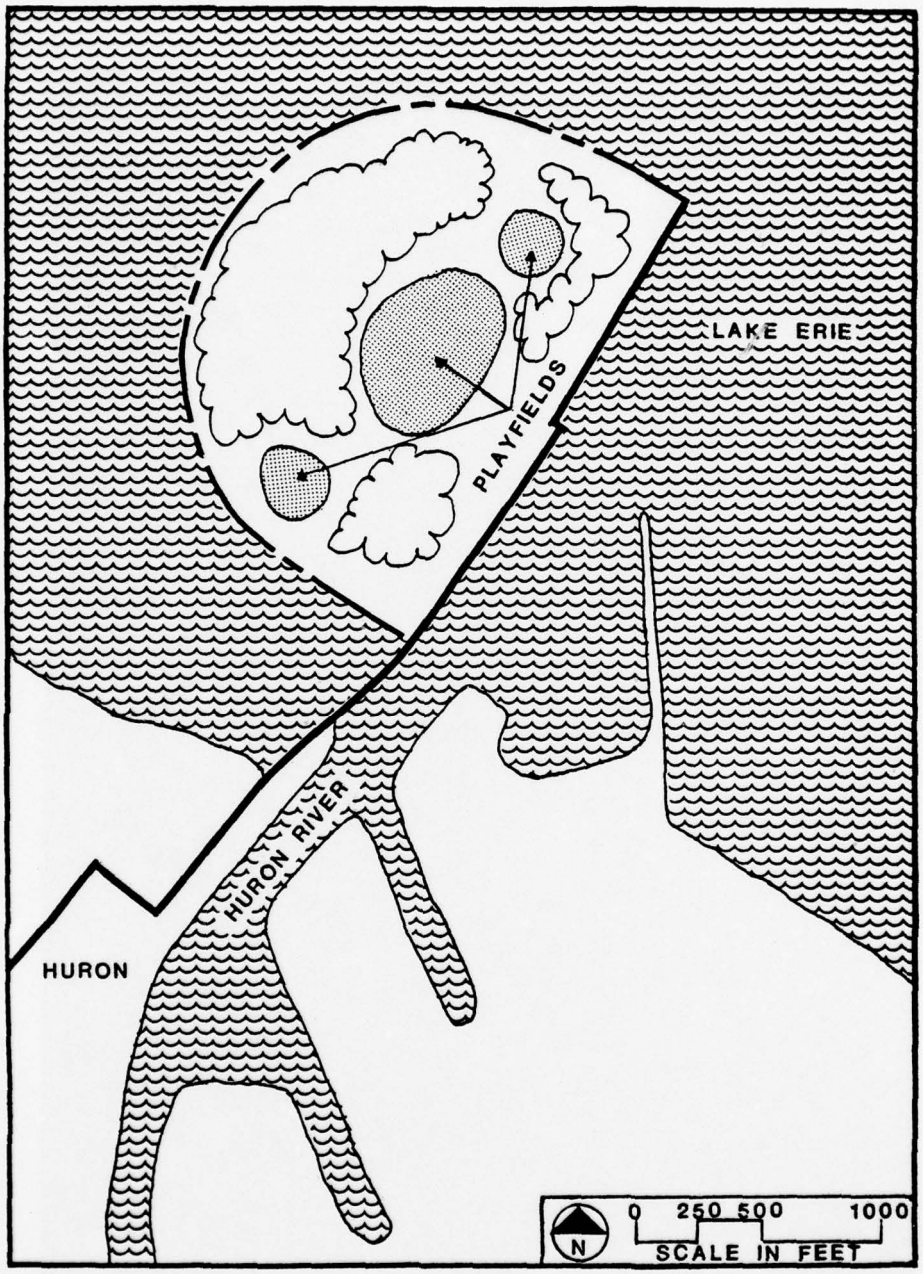
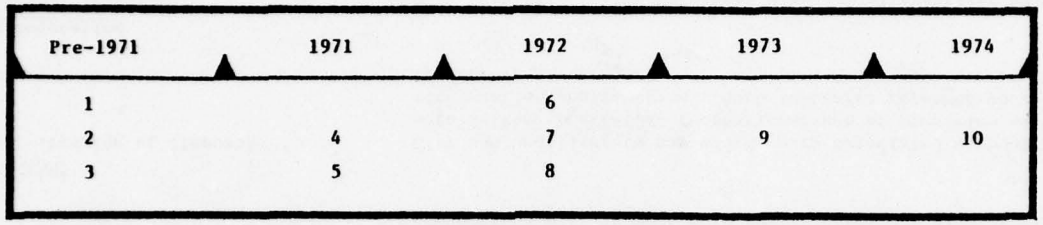


Figure E4. Huron Site 1 Conceptual Development Plan
(Buffalo District, Corps of Engineers, July 1972)



1. Jan. 68 - Corps informs Huron of desire for confined disposal pilot facility in Huron Harbor.
2. Jun. 68 - Huron Port Authority, FWS, and EPA develop 8 alternatives for disposal.
3. Dec. 70 - PL 91-611 enacted requiring confined site with 10-year capacity in Huron.
4. Mar. 71 - Corps approves disposal project for Huron and hires consultant to prepare engineering study. Preliminary land use plan is also developed.
5. Sep. 71 - EPA approves of Sites 1, 3, and 4 in order of preference.
6. Jan. 72 - Corps holds multi-agency meeting to discuss alternative sites. Site 1 selected.
7. Mar. 72 - Corps announces funding approval for Huron project.
8. Oct. 72 - Draft EIS circulated, includes preliminary land use plan.
9. Mar. 73 - Final EIS submitted to CEQ.
10. Aug. 74 - Site 14 dike construction started.

Figure E5. Case Study No. 5 - Huron Site 1 - Chronology of Events

Table E1

Case Study No. 5 - Huron Site 1: Major Issues Addressed During Implementation

Issue Categories	Issue Descriptions
Environmental	
5. Harbor surface area reduction	Local boaters association objected to initially proposed Site 2 as a navigation hazard and encouraged port authority to support Site 1.
6. Dredging-disposal water quality impacts	City of Huron concerned about polluted discharge from Site 1 and its effects on nearby raw water intake. State geologists questioned possible aggravation of slack water conditions near Site 1 with resultant water quality deterioration.
7. Changes in flow patterns	State geologists and local citizens concerned that Site 1 would aggravate beach erosion problems by blocking littoral drift. Port authority convinced them that Site 1 would help by offering protection from wave action.
Technical	
5. Disposal area configuration	City opted for most economical facility design, rejecting dike shape more suitable for recreational development due to higher costs.
7. Utility relocation/connection	Corps suggestion that utility connections to site be made during construction was rejected by city due to added costs involved. Utility connections will be much more costly after the site is filled.
Economic/Financial	
5. Additional dredging or disposal costs	City was unwilling to pay added costs associated with either dike design more suited to eventual recreational use or provision of utility services during construction. Both instances represented lost opportunity to improve the project.
Planning/Implementation	
4. Evaluation of alternative disposal areas	Port authority, which developed disposal alternatives with EPA, initially favored Site 2 because it was least expensive. When Site 2 was opposed by local boaters, it was decided to seek an alternative that would be most acceptable to all concerned.

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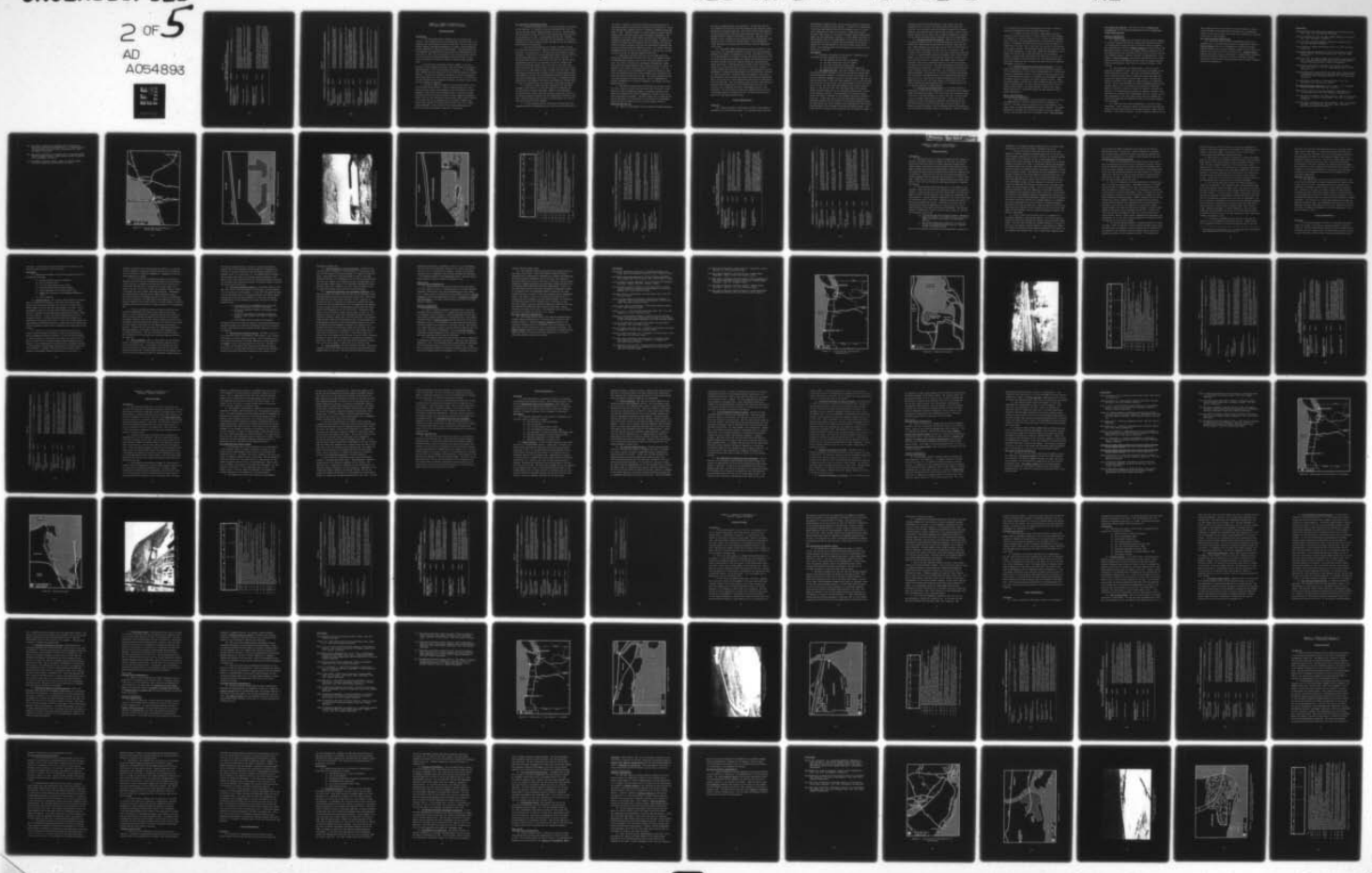


Table E2

Case Study No. 5 - Huron Site 1
Physical Planning Elements Affecting Project Implementation

Physical Planning Elements	Influence	Element Descriptions
Elements Related to Disposal Facility Planning		
1. Pre-disposal site characteristics: below mean low water	Positive	During early phases of disposal facility site selection, marsh and inland sites were explored but deemed to either have detrimental environmental impacts or to be economically unfeasible. The lake site was considered economically viable and less environmentally disturbing by EPA.
6. Disposal site location	Positive	Site 1 is immediately adjacent to the mouth of the Huron River where dredging activities are required.
10. Sensory factors (visual, odor, dust, smoke, etc.)	Negative	Preliminary site designs for the disposal facility extended the site onto the mainland but the adjacent residential neighborhood having lake views objected strongly. The site configuration was altered reflecting these concerns.
Elements Related to Productive Land Use Planning		
3. Site size and configuration	Negative	Huron decision makers expressed concerns that the site may be excessive in size and that the Corps will not fill the site to elevations usable for the proposed park. Also, the semi-circular site configuration may not be optimal for park design.
4. Vehicular circulation/traffic generation	Negative	Direct vehicular access to the park will not be possible since the breakwater link between Site 1 and the mainland is much too narrow. The preliminary park plan indicates only pedestrian access with parking provided elsewhere. This solution will result in inconvenient park access and increased parking pressures on the mainland.

Table E3

Case Study No. 5 - Huron Site 1: Key Factors Affecting Project Implementation

Factor Categories	Influence	Factor Descriptions
Technical		
5. Technical coordination of diposal plan with productive use plan	Negative	Site design based on least cost option rather than enhancement of recreational use potential by providing longer water perimeter. Site constructed without installing utilities due to extra cost.
Economic/Financial		
2. Engineering and construction costs	Negative	City rejected design and construction proposals that added costs but would have enhanced eventual productive development.
Legal		
1. Conformance with regulatory requirements	Positive	EIS procedures were new to participating agencies and EIS reviews and comments were extremely thorough.
2. Adequacy of environmental impact assessment	Positive	Project planning and evaluation was unusually thorough because Site 1 was one of first sites developed in Great Lakes under PL 91-611 and NEPA was enacted during early site planning.
3. Disposal rights to the site	Negative	City objected to Corps proposal to deposit material from a neighboring community in the Huron site. Corps asserted its right to decide what would be deposited in Site 1.
Institutional		
3. Coordination with review/regulatory agencies	Positive	Corps began advance planning in 1968 and review/regulatory agencies were involved early, leading to expedition of new EIS review process, plan approval, etc.
Planning/Implementation		
1. Long-range Corps disposal planning	Negative	City was concerned over lack of Corps commitment to actually fill the site to a developable level.
7. Impacts of disposal-productive project on existing water uses	Positive	Site 1 favored over alternatives which posed threat to recreational navigation.
9. Proposed use compatibility with master plans	Positive	Proposed recreational use compatible with local and regional plans, and will help reduce Huron's park area deficiency.

APPENDIX F: SYNOPSIS OF CASE STUDY NO. 6 - FIFTH AVENUE MARINA - SAN DIEGO, CALIFORNIA

Background Summary

Introduction

1. The Fifth Avenue Marina disposal area is a 22-acre site located in the northeast portion of San Diego Bay, directly south of the downtown area of San Diego, California (Figure F1). The site was one of several disposal alternatives proposed for a Federal channel deepening project authorized in 1968 for San Diego Harbor. Dike construction and the placement of dredged material were started and completed during the first half of 1976. The site consists of two curved peninsulas jutting into the bay and enclosing approximately 80 acres of water, an area which is expected to be used as a marina for some 250 small pleasure craft.

2. The San Diego Unified Port District (SDUPD) is the local sponsor for Corps dredging activities in San Diego Harbor and holds the bay bottomlands in trust for the State of California. In 1967 SDUPD first offered the Fifth Avenue site for the confined disposal of dredged material. The area was originally envisioned as a solid, rectangular site filling about 113 acres of the surface of the bay. In 1973-74 the size was reduced and the configuration altered, and SDUPD's offer of the site for disposal was approved.

3. Initially, SDUPD was planning to use the Fifth Avenue site as an off-loading marine terminal. When it became apparent that such a facility was not needed, the proposed site use was changed to a trade exhibition center and tourist information area. There was also some discussion of using the site for hotels or other commercial establishments. The U.S. Fish and Wildlife Service (FWS), among others, objected to non-public use of the completed site and refused to approve the project until assured by the Corps that the site would not be commercially developed. Current plans call for using the peninsulas for marina services and as natural areas open to the public.

Site description and regional context

4. The Fifth Avenue Marina site is located entirely in the waters of San Diego Bay. It consists of two boot-like peninsulas, with the tips of the boots almost touching (Figures F2 and F3). The peninsulas are nearly equal in size, and their total combined area covers 22 acres of the surface of the bay. At the present time the site is almost completely filled in and is relatively flat and deserted. The surface is sandy, with a rock revetment around the edges on both the channel and basin sides of the peninsulas.

5. The site's two peninsulas are commonly referred to as the north mole and the south mole. There had never been any construction in the area of the north mole. On the south mole the situation is quite different. A portion of this area has been occupied since the 1890's by the San Diego Rowing Club. Club members built their clubhouse - a wooden structure erected on pilings that are sunk into the bay bottom - approximately 250 feet out in the waters of the bay. Members also created an artificial island, which is now part of the south mole. While the Rowing Club may be allowed to occupy a portion of this area, there will be a large amount of space available for other uses. Hotels and shops along the bay water frontage on the two moles appear economically feasible, but the city and environmental agencies strongly oppose that type of development along the water's edge. A consensus has been formed within the community that these lands adjacent to the bay should be open to the general public and developed as open space/recreation.

6. Originally the San Diego Bay consisted of rich salt marsh tidelands, which served as an excellent habitat for waterfowl and various species of aquatic organisms. However, since 1900 about 21 percent of the initial half-tide bay water area has been filled in and the bay presently comprises only 16.6 square miles of water at half tide. Outlining the fringe of the bay are approximately 350 acres of salt marsh and 600 acres of mudflats.

7. In terms of water quality, the waters in the bay area have undergone several transformations since it was first monitored early in

the 1900's. Initially, the waters provided an excellent habitat for many aquatic species and there was an abundance of productivity. As the local economy grew, shipping activity increased and dredging operations began in 1940. Industrial wastes, from both onshore and marine vessels, became a major pollution source along with domestic wastewater. The degradation of the bay's water quality continued until 1963 when the discharge of municipal sewage into the bay was stopped. Presently, the waters of San Diego Bay are relatively free of pollution, and whatever pollution exists is primarily derived from human wastes discharged into the bay via fishing boats and commercial ships. As a result, although considerably less rich than it was a quarter of a century ago, the water quality in the bay has improved immensely since 1963.

8. Population statistics show that the San Diego region has experienced a steady rate of growth since 1900. The temperate climate and desirability of locale act as lures in attracting people to the area. As a result the labor pool has expanded tremendously, thereby facilitating the establishment of many industries within the county. In addition to the climate, the major reasons for the growth of the regional economy are (1) the development of industrial complexes located along the waterfront area and (2) the extremely large concentration of naval facilities situated along the bay. The revenue generated by Navy activities exceeds $1.2 billion annually. This is supplemented by tourism, manufacturing of electronic equipment, and research and development activities.

9. Land uses surrounding the Fifth Avenue site include a recreation area, a panel of vacant land that used to be the site of a ferry terminal, a small shipbuilding company, a wholesale and retail fish market and restaurant area, police headquarters, railway tracks, and a marina-residential development. The Fifth Avenue site is viewed by the City of San Diego as the key element for initiating its redevelopment project between San Diego Bay and the central business district.

Productive land use plan

10. There is a requirement that only unpolluted dredged materials

be placed in disposal areas in San Diego Bay. The material that had been scheduled to be used at the Fifth Avenue site was clean sand, which satisfied all regulatory agencies. What did not satisfy those agencies was the original size of the site, which would have filled 137 acres of bottomland and 113 acres of the surface of the bay. The plans were amended in 1973, changing the site configuration to two peninsulas which occupy a total of 22 acres of the bay surface. This configuration limits the types of planned productive uses that could be implemented at the site.

11. The present SDUPD design plans are shown in Figure F4. The filled area will be primarily passive in nature, utilizing landscaping aesthetics to beautify the openness of the area. The land will be open to the general public for viewing, fishing, and similar activities. The plan also includes the development of a marina with berthing facilities for about 250 small craft and a separate basin for the anchoring of larger work boats. Provisions may also be made to allow the San Diego Rowing Club to retain the use of a portion of the site. Although economic studies have indicated that there is great opportunity for the development of commercial establishments along the waterfront, including the site's filled area, the general public is opposed to such action. The residents of the city feel that the bay area should be preserved for public use and that only water-related facilities should be constructed along the shoreline. The city planning agency and other local officials agree with this concept and view the Fifth Avenue Marina site as a critical link in extending the city's redevelopment project to the waterfront. The city's plans indicate that commercial facilities will be developed inland of the marina and that the Fifth Avenue site will serve as an open space/recreation area.

Project Implementation

Chronology

12. Figure F5 presents a chronology of events in the process of implementing the Fifth Avenue project. The chronology begins with the

establishment of SDUPD in 1962, and its original plans for developing the site as a commercial marine terminal. In April 1967 a Corps report on San Diego Bay dredging showed the Fifth Avenue site as a 113-acre solid trapezoidal fill area to be used for a trade center/tourist facility. FWS concern over the lack of a master plan for harbor development was first expressed in mid-1972. In 1974, SDUPD transmitted to FWS conceptual plans for the development of the site and also hired a consulting firm to do an economic feasibility study for the marina. In January 1975, the FWS approval for the Fifth Avenue project was obtained. The chronology ends with the completion of the Corps' filling activities in June 1976.

Participants

13. Important participants in the process of implementing the Fifth Avenue project included the following:

a. Los Angeles District, Corps of Engineers.

b. San Diego Unified Port District (SDUPD).

c. U.S. Fish and Wildlife Service (FWS).

d. California Coastal Zone Conservation Commission.

14. Los Angeles District. The Corps' primary role in the Fifth Avenue Marina project has been to carry out the new work channel deepening authorized by Congress. The Corps first began to consider the site as a potential disposal facility in the early 1960's. When the new work was authorized in 1968, the Corps expected to fill a solid 113-acre area of the bay at Fifth Avenue. The unwillingness to alter the size of the fill area, when confronted with opposition, was a major source of delay. It was not until late 1973 that Corps plans for the project showed the Fifth Avenue site as two peninsulas occupying only 22 acres of the surface of the bay. Dike construction for the Fifth Avenue Marina site began in February 1976 and disposal operations concluded in June 1976. In the Corps' view, the Fifth Avenue Marina was merely a convenient disposal site for material from the harbor deepening project. The Corps had no real vested interest in the development of the site and thus considered it as one aspect of the overall Federal project. The Corps took this position in the controversy over the failure to obtain a

California Coastal Zone Permit pursuant to the Coastal Initiative ("Proposition 20") of 1972. The Corps stated that no permit was required, that the project had been coordinated closely with relevant State and local agencies and interest groups, and that it was the local sponsor (rather than the Corps) that is legally responsible for obtaining any permits associated with the disposal site and its development.

15. San Diego Unified Port District. SDUPD is the local sponsor for Federal dredging activity in the San Diego Harbor and has jurisdiction over lands around the bay below the historical mean high tide line. SDUPD prepared its first master plan of the Port of San Diego in the early 1960's and updated the plan in 1972. The section in the vicinity of the Fifth Avenue site was left blank, because the plans were in flux. In mid-1974 SDUPD transmitted conceptual plans for the development of the Fifth Avenue site to the FWS, which has, in effect, veto power over such projects. In October 1974, SDUPD hired an economic consulting firm to do a feasibility study for the Fifth Avenue Marina and adjacent land facilities. This study established the feasibility of proceeding with the project. In October 1975 planning consultants were hired to develop a plan for facilities to be constructed on the Fifth Avenue peninsulas. The Corps was not involved in planning the development of the site; the SDUPD actually did the engineering drawings for the fill and has a long history of mutual cooperation with the Corps. SDUPD did not get any of the usual Federal or State permits for this project because they have maintained that it is a Federal project and not, strictly speaking, an SDUPD project.

16. U.S. Fish and Wildlife Service. In 1972 FWS called for a moratorium on dredge and fill operations in San Diego Bay until adequate master plans had been produced. FWS did not have any strong objections to the use of the Fifth Avenue site itself; there were no major losses of fish or wildlife associated with the site. In fact, the use of riprap in the dike would provide a different and worthwhile habitat. What FWS did object to was the further loss of open bay water. The concern was that 85 percent of the tidal marshes and over 50 percent of the tidal flats were already filled in San Diego Bay. FWS also objected

to the excessive filling of bay bottomland and the lack of detailed plans for the productive use of the Fifth Avenue site.

17. In August 1973 FWS indicated it would approve the Fifth Avenue fill only if the project (1) did not affect the tidal exchange, (2) would be to the public benefit, and (3) involved a water-dependent use of the site. The Corps responded that the site was to be used as a marina. In February 1974 FWS told the Corps it would not remove its objections to the site until it was clear that the use of the site was in the public interest. FWS expressed concern that the site not be used for hotels, restaurants, or other such commercial establishments, and in August 1974 FWS once again asked the Corps for more information. Finally, in January 1975, FWS notified the Corps that it was not categorically opposed to the Fifth Avenue site. This decision was based upon verbal assurances from the Corps that there would be no commercial development on the site.

18. California Coastal Zone Conservation Commission. The San Diego Coast Regional Commission was the regional authority responsible for the implementation of the Coastal Zone Management Act, including the issuance of appropriate permits. The Commission took the position that the Fifth Avenue Marina project is a planned local development serving a non-Federal function, and that the project required a permit. SDUPD, with Corps support, claimed that it was a Federal project which did not require a State permit. The State Commission sought advice from the State Attorney General, who advised against litigation even though Federal projects for non-Federal purposes are not exempt from State permit requirements.

Major issues addressed
during project implementation

19. Issues addressed by various participants during the planning and implementation of the Fifth Avenue project are summarized in Table F1. The major concerns raised were in the environmental, technical, legal, and planning/implementation issue categories. The issues described in the table had a significant impact on project implementation. Most important were the environmental issue of bay bottomland

and surface area reduction, the technical issue of disposal area configuration, and the planning/implementation issue of planned use concept appropriateness.

Planning considerations affecting implementation

20. Table F2 summarizes the important physical planning elements of the Fifth Avenue Marina project, grouped into categories related to (1) disposal facility planning and (2) productive land use planning. Key considerations in terms of disposal planning were the filling of bay bottomland instead of wetland; the dredged material composition, which was unpolluted sand; and the location of the project in Centre City (all three elements exerted a positive influence on implementation). With respect to land use planning, site size and configuration and site plan compatibility with site features and user needs were primary elements affecting implementation (both exerting a positive influence on the project).

21. Both advantages and disadvantages in terms of land use planning are expected to result from the successful development of the Fifth Avenue Marina project. There were five primary advantages. First, the project would result in additional public open space and recreational opportunities at the bay edge. Second, the marina will provide an increase in the number of slips available to recreational boaters. Third, the development will generate employment opportunities and tax revenue to the city through the stimulation of additional commercial activity. Fourth, the project is expected to provide the impetus for a city-sponsored new residential community oriented to San Diego Bay and the Horton Plaza Redevelopment Project. Finally, circulation improvements in the Fifth Avenue Marina area will minimize the conflict of pedestrian and automobile traffic and increase transportation efficiency.

22. There were three major disadvantages to the Fifth Avenue Marina plan. First, ecological impacts to highly mobile organisms that inhabit the area and destruction of non-mobile species (clams, snails, starfish) in the areas of landfill. Second, cumulative reduction in the

water surface area of the bay resulting from the landfill. Finally, a small decrease in the tidal prism of the bay and a corresponding decrease in the tidal prism to bay volume ratio, resulting in a decrease in the rate of tidal flushing.

Key factors affecting implementation

23. Key factors among the many considerations affecting the implementation of the Fifth Avenue project are summarized in Table F3. Positive factors found to aid implementation included the dredged material quality, the financial soundness of SDUPD, and the planned use compatibility with the site and with master plans. Negative factors impeding the project were all institutional, including poor coordination with the Coastal Zone Commission, failure to communicate adequate information to FWS, and the delays associated with the Corps' refusal to alter site configuration.

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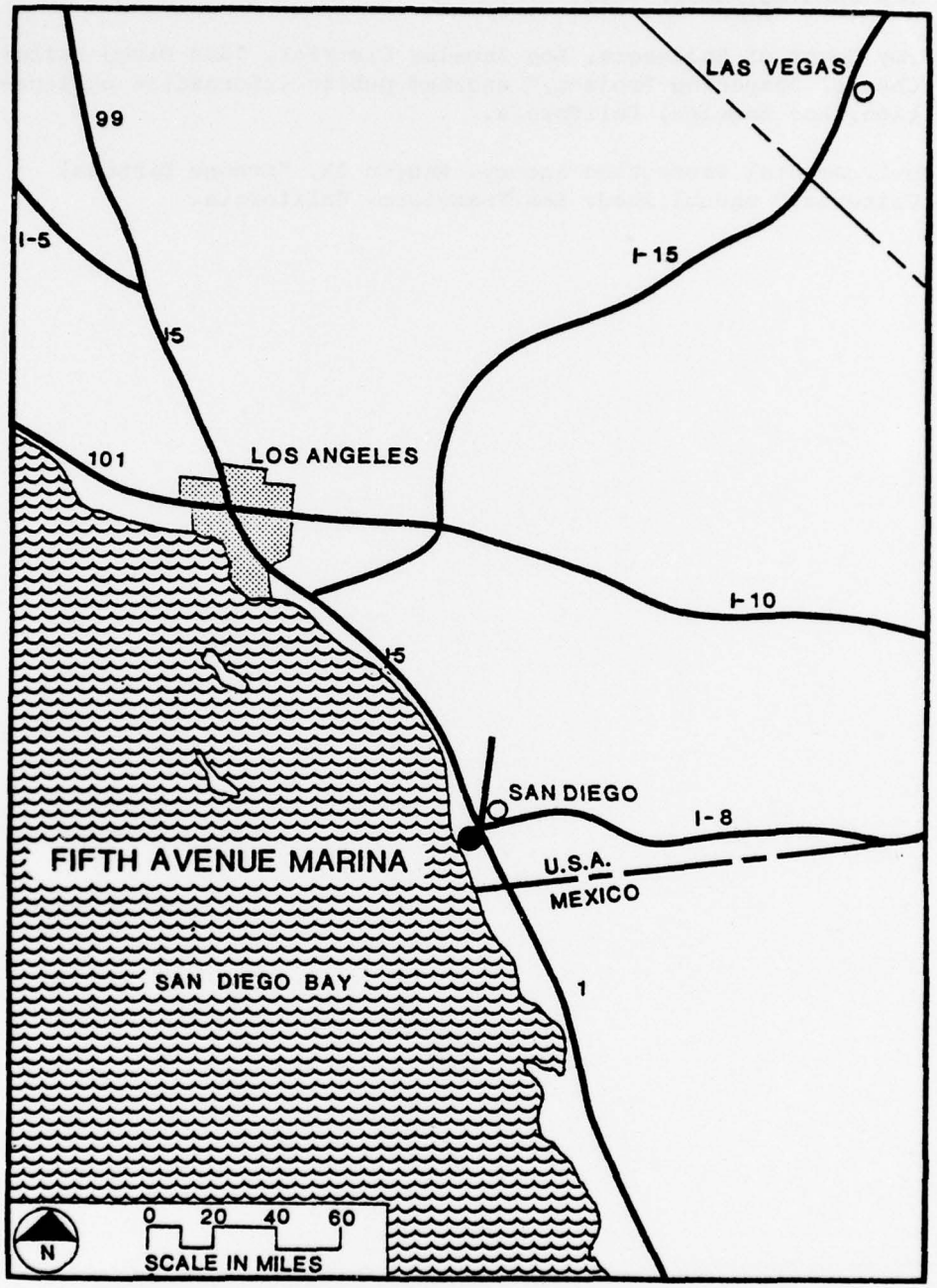


Figure F1. Location Map for Case Study No. 6 - Fifth Avenue Marina

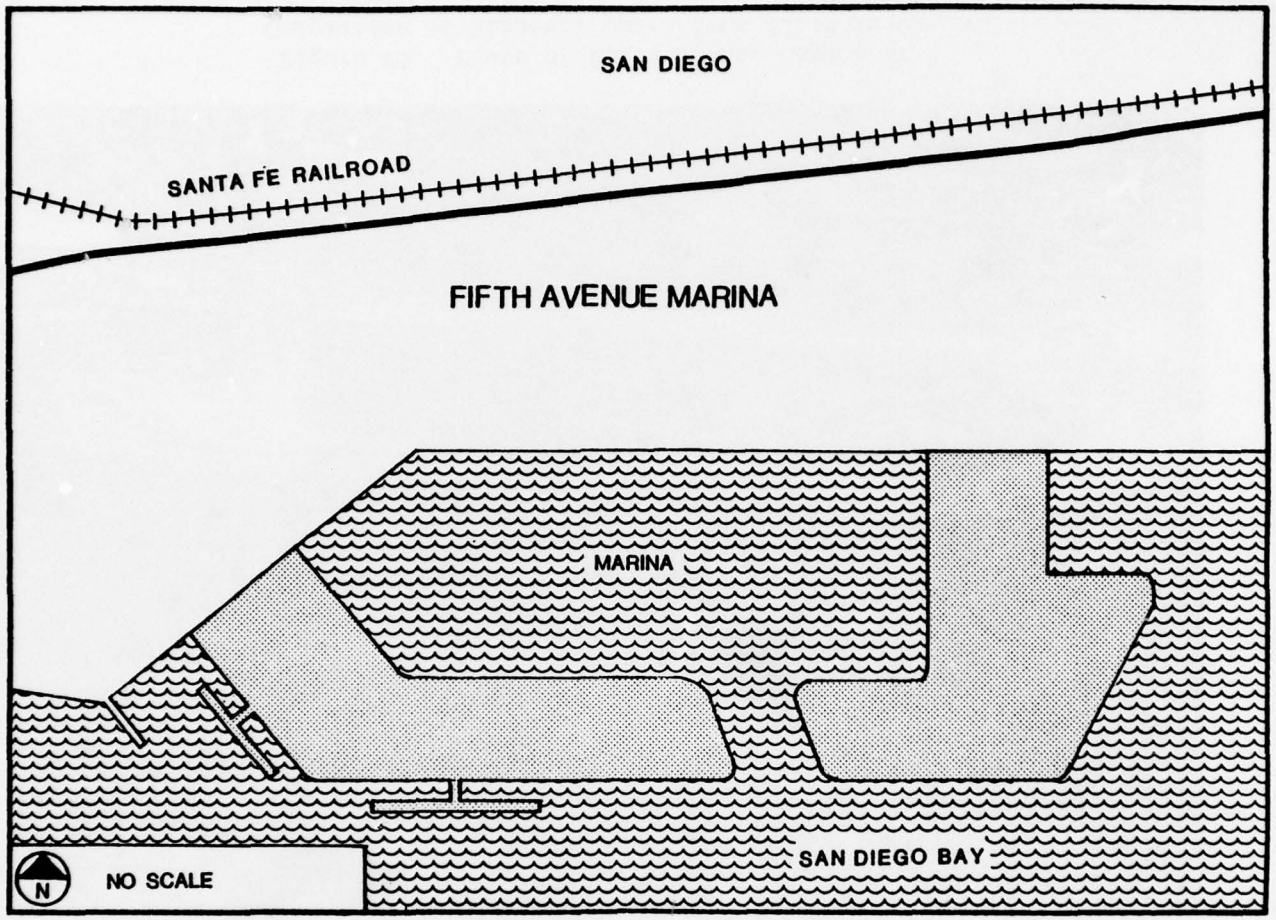


Figure F2. Fifth Avenue Marina Site Map

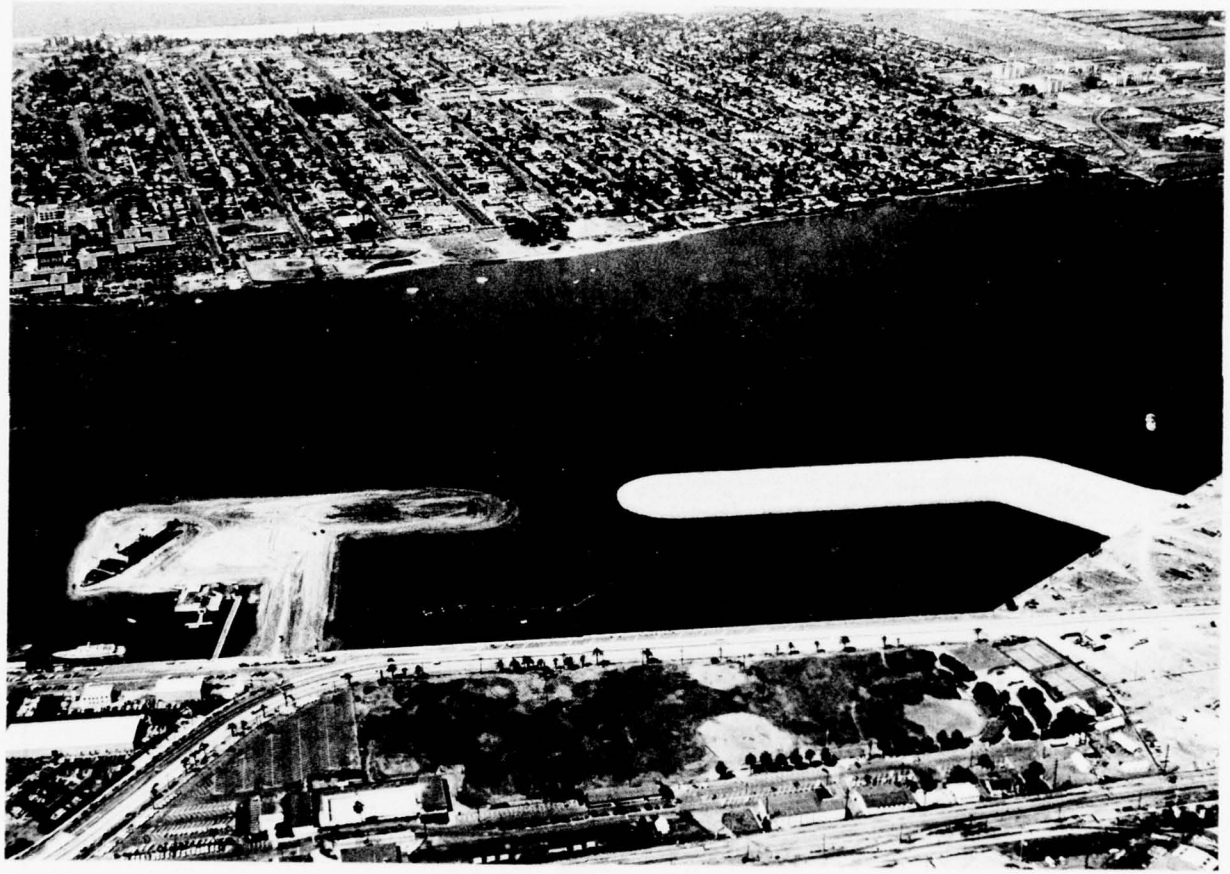


Figure F3. Photo of Fifth Avenue Marina at Completion of Disposal Operations (July 1976)

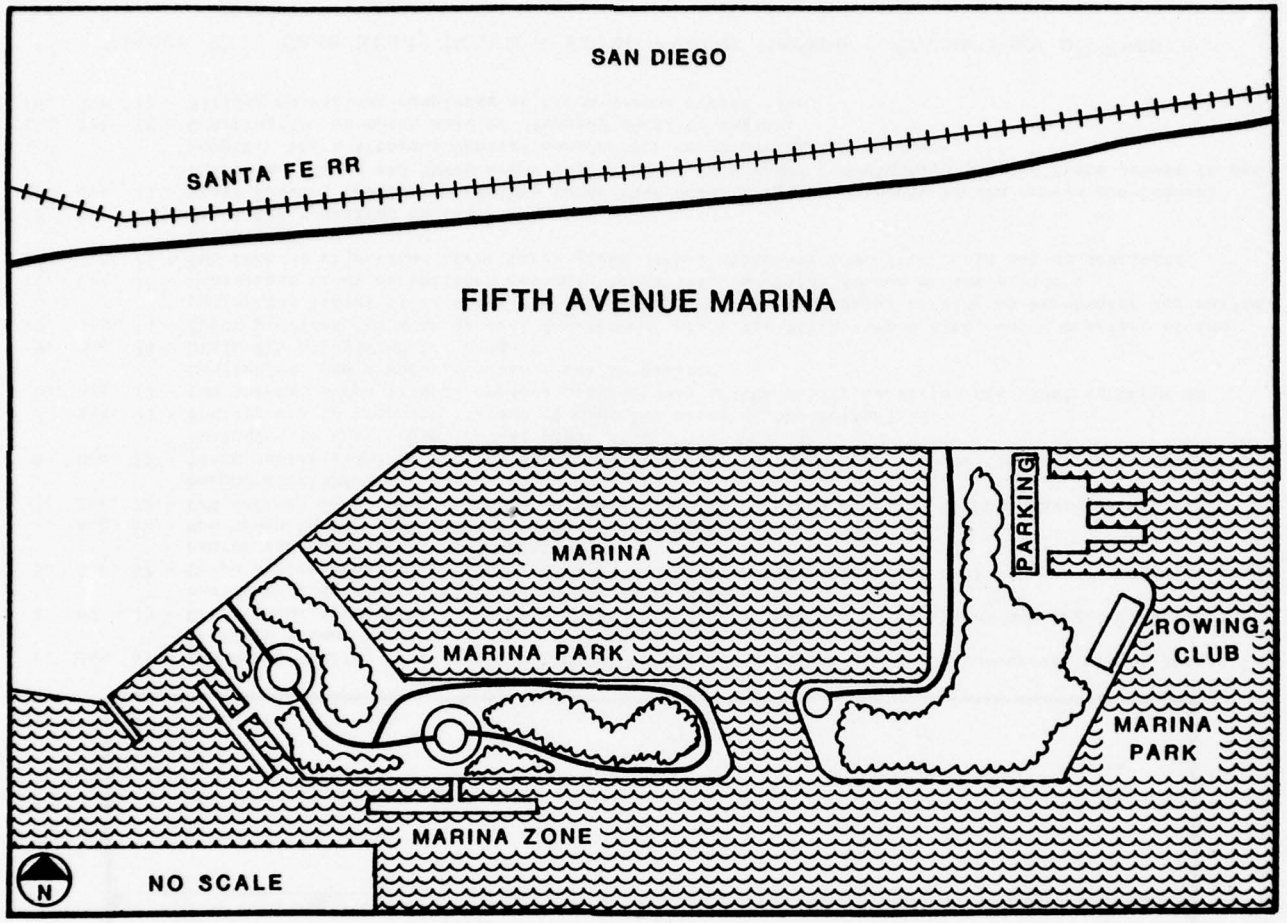
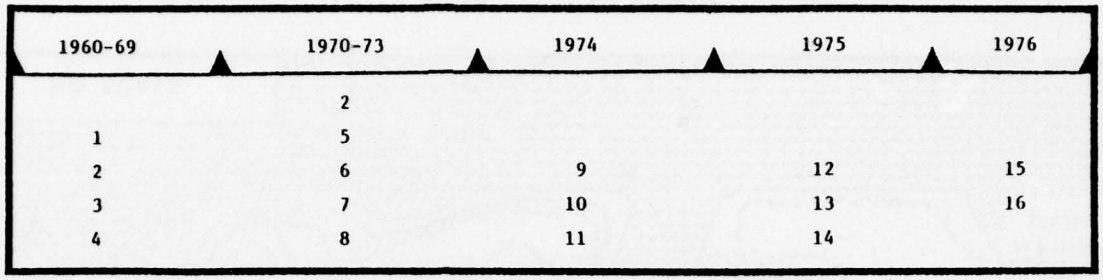


Figure F4. Fifth Avenue Marina Productive Use Plan
(San Diego Unified Port District, October 1975)



1. Jun. 62 - San Diego Unified Port District (SDUPD) formed and develops plans for commercial marine terminal at Fifth Avenue site.
2. 67 - 73 - Corps holds three public meetings (8/67, 5/68, 8/73) and one multi-agency meeting (2/72) to discuss dredge and fill operations in San Diego Harbor.
3. Apr. 67 - Corps report shows Fifth Avenue site as 100+ acre solid trapezoidal fill area to be used for trade center and tourist-oriented facilities.
4. Aug. 68 - San Diego Harbor improvements authorized by PL 90-483.
5. Jun. 72 - FWS informs Corps of moratorium on dredge and fill actions proposed without master plans for harbor development.
6. Dec. 72 - First master plan for Port of San Diego prepared. Fifth Avenue site omitted due to its possible inclusion in city urban renewal plan.
7. Feb. 73 - FWS objects to proposed filling of over 100 acres of bay bottomland.
8. Aug. 73 - FWS informs Corps it will approve project only if the public benefits, the tidal exchange is unaffected, and a water dependent use is assured.
9. May 74 - Draft EIS circulated for comment.
10. Jun. 74 - SDUPD provides FWS with general development plans for Fifth Avenue site, which consists of two peninsulas (total of 22 acres for disposal of dredged sediments) serving as breakwater for marina.
11. Oct. 74 - Consultant study establishes economic feasibility of Fifth Avenue Marina project.
12. Jan. 75 - FWS removes objections after Corps gives verbal assurance that site would not be developed commercially.
13. May 75 - Final EIS submitted to CEQ.
14. Jun. 75 - State Coastal Commission advises Corps that permit required because marina serves non-Federal function. Corps and SDUPD argue that project is a Federal navigation job and State permit is not sought. State Attorney General decides not to pursue matter in court.
15. Feb. 76 - Construction of north mole of disposal facility begins.
16. Jun. 76 - Filling operations completed at Fifth Avenue Marina site.

Figure F5. Case Study No. 6 - Fifth Avenue Marina - Chronology of Events

Table F1

Case Study No. 6 - Fifth Avenue Marina: Major Issues Addressed During Implementation

Issue Categories	Issue Descriptions
Environmental	
5. Bay bottomland and/or surface area reduction	FWS expressed concern about filling 137 acres of bay bottom and 100+ acres of surface area. This was reduced to 37 acres of bay bottom and 22 acres of surface area in final disposal plans.
7. Changes in flow patterns	The State Department of Fish and Game was concerned that the planned construction might reduce the tidal prism in the bay. The Corps responded that the reduction would only be 0.25 percent.
Technical	
5. Disposal area size and configuration	The site was originally planned as a 100+ acre solid filled area. Because of the objections mentioned above, and the change in planned use, the site was redesigned as two peninsulas encompassing 22 acres and enclosing about 80 acres of protected water area.
Legal	
5. State vs. federal permit jurisdiction	The State Coastal Zone Commission claimed that the local sponsor needed a coastal zone permit. The local sponsor, with Corps support, denied this and did not obtain the permit.
Planning/Implementation	
5. Adequacy of environmental data base	Project delayed for over one year while Corps conducted sampling and other field work to establish a data base at request of EPA.
6. Appropriateness of proposed use: public vs. private	Several agencies, especially FWS, objected to the project because initially the planned use concept was unspecified and they feared the site would be developed for commercial purposes. They insisted that the eventual use be specified and be "for the public benefit."

Table F2

Case Study No. 6 - Fifth Avenue Marina
Physical Planning Elements Affecting Project Implementation

Physical Planning Elements	Influence	Element Descriptions
Elements Related to Disposal Facility Planning		
1. Pre-disposal site characteristics: below mean low water	Positive	The filling of bay bottomland at the Fifth Avenue site was considered by all agencies as preferable to filling almost any other location in the bay.
5. Composition of dredged material	Positive	The dredged material, unpolluted sand, was considered by the Corps and EPA as highly suitable for confined or open water disposal.
6. Disposal site location	Positive	The site's location, adjacent to Centre City San Diego, and a city redevelopment area, was the basis for strong city support once a public use plan for the site was developed.
Elements Related to Productive Land Use Planning		
3. Site size and configuration	Positive	The original disposal plan called for 137 acres of bay bottom and 113 acres of surface area to be filled. Because of objections by environmental resource agencies, the Corps responded with a final plan that reduced the filling to 37 acres of bay bottom and 22 acres of surface areas.
8. Site plan compatibility with site features and user requirements	Positive	The original site plan called for a 100+ acre solid land fill area for unspecified development purposes. Public planning organizations expressed their concern that bay access be preserved for the general public, and that only water-related facilities be constructed at the water's edge. The site was redesigned as two peninsulas encompassing 22 acres and enclosing about 80 acres of protected water area for a marina.

Table F3

Case Study No. 6 - Fifth Avenue Marina: Key Factors Affecting Project Implementation

Factor Categories	Influence	Factor Descriptions
Environmental		
1. Ecological characteristics of proposed disposal area location	Positive	The portion of San Diego Bay near the marina site was considered by all agencies to be of such minor ecological significance that filling it would be preferable to filling almost any other area of the bay.
3. Dredged material chemical properties	Positive	Only good material could be used at the site, and the material available was unpolluted sand.
Economic/Financial		
5. Project sponsor capability to assume financial responsibilities	Positive	The San Diego Unified Port District (SDUPD) had no problem raising money for the project. The SDUPD can collect public taxes, but has never found the need to do so.
Legal		
4. Site ownership authorities (as related to productive use)	Positive	The SDUPD, the project sponsor, holds title to state owned submerged lands in San Diego Bay.
Institutional		
3. Coordination with review/ regulatory agencies	Negative	There was poor coordination with the Coastal Zone Commission and other agencies. The local sponsor initiated almost no contact with State agencies. FWS kept asking about the planned use of the site and was never given a detailed and specific answer, although SDUPD provided general concepts in 1974.
6. Corps and other participant attitudes	Negative	For several years, the District Engineer was unwilling to compromise on any aspect of the San Diego Project. This led to delays and mistrust when the plans were changed but not specified during the 1970's.
Planning/Implementation		
9. Proposed use compatibility with master plans	Positive	Once the city developed its urban renewal plan for the area adjacent to the disposal site, the plans for the site were seen to fit with the city's master plan.
11. Proposed site plan compatibility with site physical features and user requirements	Positive	The two-mole construction is most suited for recreational (marina) use. When this use was finally agreed upon, FWS withdrew objections.

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APPENDIX G: SYNOPSIS OF CASE STUDY NO. 7 - EASTSIDE SITE 14 - COOS BAY, OREGON

Background Summary

Introduction

1. Eastside Site 14 is a 135-acre confined facility located in the City of Eastside, Oregon and adjacent to Coos Bay. The Coos Bay estuary and tidal basin area is a highly urbanized industrial/port center 5 miles inland from the southern Oregon coast, about 110 miles west of Eugene and 225 miles south-southwest of Portland (Figure G1). The Corps first began using the Eastside tidal flats as a disposal site in the 1930's. Since that time, the site has served the maintenance dredging disposal needs of the upper bay at regular 3- to 4-year intervals. Areas that are now diked for disposal purposes were marsh areas prior to 1951, when the 30-foot Coos Bay channel adjacent to Eastside was dredged.

2. During 1959-60 the Portland District, at the request of the Congress, identified three plans for improving the Coos Bay navigation channel. A plan calling for an entrance channel depth of 45 feet and a depth of 35 feet for the remainder of the channel was recommended for authorization. A review report was completed by the Corps in early 1968 and an EIS was filed in late 1970. Congress authorized the project in the River and Harbor Act of 1970. According to this plan, sand and finer materials would be deposited at an ocean site as well as in confined areas at North Spit, North Bend, and Eastside. The Eastside capacity, estimated to be about 4.3 million cubic yards, will be used for two specific activities:

a. The Coos Bay deep draft navigation project, scheduled to deepen the channel in the summer of 1977, will utilize about 1.05 million cubic yards of the westernmost capacity.

b. The continued maintenance dredging of the upper bay channel for another estimated 8 years will complete filling of the Eastside site.

Much of the controversy surrounding the Coos Bay project involved the

assessment of environmental impacts associated with the channel deepening project and the future channel maintenance activities.

3. The Port of Coos Bay (PCB) owns Site 14 and is the local sponsor for Federal dredging and disposal operations in the bay area. During disposal planning and review for Coos Bay, the eventual development of Site 14 for industrial use was a prime consideration. In January 1972 a report prepared for PCB by the planning firm of Stevens, Thompson and Runyan, Inc. (STR), on long-range planning and management of dredged material in Coos Bay, identified potential disposal areas based on physical and chemical factors, biological conditions, and land use and economic factors. The Eastside site was recommended as a prime disposal location for both short-range and long-range activities. No definitive land use plan for Site 14 has ever been prepared, but a draft plan prepared for the site by PCB in 1966 illustrated an industrial development concept, railway connection to Coos Bay, and the location of required infrastructure including roads, railroads, water supply, and sewage disposal systems. Since 1970 general development plans and guidelines have been prepared by various planning agencies, all suggesting that industrial use be made of the site. The State Land Conservation and Development Commission recommended marine-industrial use; the Coos County Planning Department suggested both marine transport and storage facilities; and the city, through drafting of a comprehensive plan, identified Site 14 for non-specific industrial purposes. Additionally, PCB has indicated that a repair/construction facility for barges and other vessels is highly suitable for Site 14 and that other types of light industry, such as a plywood manufacturing facility, are potential candidates.

4. Prior to 1970, there had been little or no opposition to maintenance dredging in the Coos Bay channel. The Coos Bay area has historically been very unplanned and waterfront area has rapidly disappeared. With the advent of NEPA and increased awareness on the part of the public and cognizant resource agencies, a new perspective emerged with regard to planning and environmental management of the estuary and its marshland and tideland areas. This is particularly apparent when

one considers the number of meetings of the Corps and the resource agencies from 1970 to the present. Oregon has become a very conservation oriented State, and this attitude is certainly no different for the agencies responsible for the heavily industrialized Coos Bay area.

Site description and regional context

5. Site 14 is the largest of three diked areas on the northern end of the peninsula on which the City of Eastside is located. Site 14 forms the northwest half of the roughly 300-acre area bounded by Coos Bay to the north, Eastside to the south, the mouth of the Isthmus Slough to the west, and by Catching Slough to the east (Figure G2). Coos Bay itself is an inverted "U" shape 13 miles long with an average width of 1200 feet at low tide. Bay surface area is about 17 square miles at high tide and 9 square miles at low tide.

6. Site 14 is underlain by varying proportions of unconsolidated clay, silt, sand and grained shale. The dredged material to be deposited on the site is composed of silt, clay, sand, and organic fines. Since the material is inconsistent it will be necessary to consolidate the site prior to productive development. With a surcharge fill of good sandy material, the site will have the capability of supporting lightweight buildings on spread footings. However, assuming the site will be utilized for (light to medium) industrial purposes as envisioned by various planning agencies, pile foundations will likely be required if buildings of any size are to be supported. Existing water supply, sewage disposal, and electrical services are adequate to satisfy normal demands by industrial land use proposed for the site. Access to the site is by the major thoroughfare, Route 241, as well as the local street system. However, unless certain transportation improvements are implemented, it is clear that increased employment and vehicular traffic will amplify current traffic problems.

7. The Coos Bay estuary supports a tremendous diversity of flora and fauna. About 250 species of birds including waterfowl, shore birds, and marsh birds are residents or regular visitors of the Coos Bay area. The presence of the extensive amount of eelgrass beds in the bay is especially important to the migratory waterfowl. The eelgrass and

attached algae are utilized by waterfowl as sites for spawning and feeding. Other plant communities of the estuary are characterized by a variety of salt marsh types. Fish species of note in the estuary include commercially harvested salmon and herring.

8. Water quality in Coos Bay is variable by location and season. Parts of the estuary are considered polluted according to EPA standards. Water quality in the Isthmus Slough is heavily degraded, primarily as a result of lumber industry operations. The Coos Bay inner channel (channel mile 12 to mile 15 in the upper bay) is moderately polluted and bottom materials in the past have not met EPA standards for open water disposal.* Pollutants resulting from log-rafting on the rivers and in the upper bay do not create conditions as severe as in the Isthmus Slough. In the vicinity of the rivers, the primary causes of pollution are farming practices, log-rafting, and timberland management.

9. The Coos Bay urban area contains the largest aggregate of commercial, professional, and industrial firms, and the greatest population concentration, along the Oregon coast. The economy of the Coos Bay area is centered around the forest products industry and consists of two major sectors: (1) forest products (lumber, wood, paper, and pulp), agriculture, fisheries, food processing, and tourism and (2) trade and service, construction, transportation, utilities, and government. The port of Coos Bay is considered to be one of the most important deepwater ports between San Francisco and the Columbia River and is the world's largest exporter of wood products including lumber, logs, and wood chips. Regional development is closely dependent on both the forest industries and port-related facilities with the work force emanating principally from the cities of Coos Bay (population 14,130), North Bend (8,980), and Eastside (1,545).

10. Residential development flanks the site on the east and south, and is the predominant surrounding land use. Isthmus Slough and the Marshfield Channel of Coos Bay surround the site to the west

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* Note that the inner channel (i.e., the upper bay) near the Eastside site extends from mile 12 through mile 15.

and north. The Coos Bay central business district, including the new urban renewal development, is located less than one-third mile from Site 14 to the west, separated only by the Isthmus Slough (Figure G3). The juxtaposition of Site 14 to the deepwater Isthmus Slough is an important attribute of the site. The site is strategically located in proximity to Coos Bay's port facilities, a fact which contributes significantly to the site's potential for productive use development. More specifically, since valuable port-related waterfront property is at a premium in Coos Bay, the potential of the site as a port-oriented industrial site is important to both the City of Eastside and the surrounding communities.

Productive land use plan

11. The eventual use of Site 14 will be determined by the land use directives established in planning documents at the Federal, State, county, and local levels. The adopted 1975 Coos Bay Estuary Plan designated the Eastside disposal areas for future marine industrial use. According to the plan, the category would allow water-related industrial uses that specifically require location on the waterfront. The 1995 Comprehensive Plan for the City of Eastside (drafted in 1975), recommended the Eastside site as a waterfront area designated as planned industrial. This concept is to be used when determining the types of permitted industrial uses. The Comprehensive Plan points out that the standards ultimately established by the city will determine the particular types of industrial development that will be appropriate for the planned industrial areas.

Project Implementation

Chronology

12. The general sequence of events in the Eastside case study (within the context of the Coos Bay navigation project) is shown in Figure G4. The chronology begins in early 1960 when the Corps identified three plans for improving the Coos Bay navigation channel and ends in August 1976 when the final EIS for maintenance dredging was filed

with CEQ. It was within this time frame that the key events in the planning process relating to Site 14 occurred.

Participants

13. Important participants in the planning process for Site 14 included the following:

a. Portland District, Corps of Engineers.

b. Port of Coos Bay (PCB).

c. U.S. Fish and Wildlife Service (FWS).

d. National Marine Fisheries Service (NMFS).

e. Oregon Department of Fish and Wildlife (OFW).

f. Oregon Land Conservation and Development Commission (LCDC).

g. City of Eastside.

14. Portland District. The District began planning for improvements to navigation in Coos Bay in late 1959, and in early 1968 a design review report was published for a project to increase outer channel depth to 45 feet and inner channel depth to 35 feet. During development of plans for the deep draft navigation project, a high degree of coordination was achieved among participating Federal, State, and local agencies. In 1970, the Corps circulated an EIS for the navigation project. Although the EIS was brief and incomplete, no opposition to the project was voiced. In late 1970, at FWS request, the Corps delayed the Coos Bay project until several ongoing biological and resource management studies could be completed and incorporated into the project.

15. From 1971 to 1974, concern increased over the need to address long-term disposal scenarios for both the navigation project and the subsequent maintenance projects. In late 1971 the STR study of disposal options in Coos Bay was circulated, and in March 1972 and again in January 1973 the Corps held multi-agency disposal planning sessions. Also, Corps-sponsored engineering and environmental studies of the navigation and maintenance projects were in progress during the 1972-74 period. In October 1974 the Corps issued a Public Notice relative to maintenance dredging through mile 12 in Coos Bay. A

December 1974 meeting with resource agencies resulted in a consensus that the impacts of alternative disposal scenarios for the upper bay (miles 12 through 15) should be addressed in a supplement to the EIS being prepared by the Corps.

16. The draft EIS for the deepening project was released in February 1975 and in May 1975 another multi-agency meeting took place. At this meeting the suggestion was made that all port activities in Coos Bay be relocated out of the upper bay to areas closer to the mouth of the bay. This would resolve the long-range disposal problem in the upper bay due to channel maintenance dredging. Subsequently, the National Marine Fisheries Service (NMFS) requested a delay in the review period for the deepening project EIS until the maintenance EIS could be evaluated. The NMFS position was supported by the Oregon Wildlife Commission and the FWS; however, the Corps refused to delay the deepening project EIS, promising to expedite drafting of the maintenance EIS.

17. Most of the resource agencies contacted during the field interviews complimented the Corps on their superior coordination efforts. The EIS's prepared by the Portland District were characterized as the most detailed and complete that some had ever reviewed. The biggest complaint voiced by the resource agencies concerning Corps procedures in the Coos Bay project related to the timing of the preparation and issuance of the EIS's for the deepening and maintenance projects. The agencies felt that either one comprehensive EIS should have been prepared, or both EIS's should have been developed and released simultaneously. This was a particularly relevant issue in the consideration of the availability of long-term disposal options in the upper bay.

18. Port of Coos Bay. PCB, as local sponsor for the Coos Bay project, was responsible for providing alternative disposal sites to the Corps free of cost. In the case of the Eastside site, there was never a problem in obtaining easements since the site has been owned by PCB since 1960. PCB was highly visible during disposal planning and, with the Coos-Curry Council of Governments, commissioned the

STR study of disposal options. As part of a long-range planning program, PCB is now considering the development of a deepwater port facility at the mouth of Coos Bay, and the eventual phasing out of deepwater ports in the upper bay (i.e., the Eastside-Coos Bay region). This strategy, which grew out of disposal planning meetings, could impact Site 14 since most productive use concepts proposed for the site are contingent upon continued maintenance of channels capable of serving the existing port facilities.

19. U.S. Fish and Wildlife Service. The primary concern of the FWS, which was an active participant in the project, was the preservation of Coos Bay as a tidal estuary. In late 1970, FWS asked the Corps to delay the project until then ongoing biological and coastal management studies of Coos Bay were completed. In June 1971, FWS issued recommendations for the management of natural resources in Coos Bay suggesting that:

a. An integrated use and management plan for Coos Bay waters and adjacent shorelines be developed.

b. Filling of tidelands, wetlands, and submerged lands be avoided.

c. Structural encroachment in navigable waterways be limited to those purposes that require a waterfront location.

d. In-bay dredged material disposal be terminated.

FWS concerns about the ecological aspects of the Eastside project were expressed throughout the study and incorporated into various reports. All major FWS objections were resolved and their approval of Site 14 was obtained.

20. National Marine Fisheries Service. The NMFS, a division of the National Oceanic and Atmospheric Administration, was a routine participant in Coos Bay disposal planning. Of the coordinating agencies contacted in personal interviews, NMFS had the least regard for the manner in which the Corps handled its activities. Because of its concern for the impacts and disposition of long-range disposal alternatives in Coos Bay, NMFS declined to comment on the navigation project EIS without having prior knowledge of the contents of the

maintenance dredging EIS.

21. Oregon Department of Fish and Wildlife. The OFW was very concerned about the impacts of in-bay disposal on the estuarine habitat, and the problem of long-term disposal as it applied to upper bay sites. Representatives of OFW were present at most of the Corps-sponsored meetings. It is noteworthy that the OFW also indicated that they could not comment on the deepening project EIS supplement until the long-range disposal impacts from maintenance dredging were known. OFW went as far as to request (to no avail) that the Governor delay the deep draft project until both EIS's could be reviewed.

22. Oregon Land Conservation and Development Commission. The LCDC was created via Oregon's 1973 Land Use Act and directed to adopt Statewide planning goals and guidelines by January 1975. These goals and guidelines are used by State agencies, cities, counties, and special districts in preparing and implementing comprehensive plans. In addition, LCDC has responsibility for the preparation and implementation of Oregon's coastal zone management program under the Federal Coastal Zone Management Act of 1972 (PL 92-583). Accordingly, LCDC adopted a set of Statewide coastal planning goals on January 1, 1977. These were designed to guide local comprehensive planning related to estuarine, shoreland, beach, dune, and ocean resources. The estuarine resources goal indicates that permissible uses in areas managed for water-dependent activities, such as the Eastside disposal site, shall be navigation and water-dependent commercial and industrial uses. Another significant and far-reaching impact that this goal has on the Coos Bay area relates to the stipulation that, when dredge and fill activities are permitted in intertidal or tidal marsh areas, their effects shall be mitigated by the creation or area of similar biological potential to ensure that the integrity of the estuarine ecosystem is maintained. While this did not directly affect the Eastside disposal site, it has had an impact on other sites in the Coos Bay area.

23. City of Eastside. The city generally retained a low profile throughout most of the study and their concerns were relatively minor. Comments given by the city on the draft and final EIS's were generally

favorable, particularly in reference to Site 14. It is anticipated that the city will be much more involved in the future activities of the site, i.e., the productive use concept. As part of a citywide planning effort in compliance with the LCDC Statewide land use goals, in 1975 Eastside adopted a 1995 Comprehensive Plan. This plan designates the Site 14 area as suitable for industrial use.

Major issues
addressed during implementation

24. Issues raised by various participants during the planning and review process for Site 14 included concerns in the environmental, technical, institutional, and planning/implementation issue categories. Primary sources of delay were the environmental issue of wetlands filling and the planning/implementation issue of evaluation of disposal area alternatives. The major issues associated with Site 14 are summarized in Table G1.

Planning considerations
affecting implementation

25. Physical planning elements of Eastside Site 14 have been assessed from the perspective of (1) disposal facility planning and (2) productive land use planning. Table G2 summarizes the most important physical planning elements of the Eastside project. Key planning concerns related to disposal planning included the positive fact that, although the site is in an important salt marsh area, project-specific ecological impacts were minimal due to previous filling. The disposal site visual impact was a negative disposal planning component since the site abuts a residential neighborhood. Positive land use planning influences included shipping and boat access while traffic generation and visual ramifications had negative influences.

26. The industrial plans for Eastside Site 14 have a combination of beneficial and detrimental implications. There are three important advantages. First, the development would provide additional employment and an increased tax base to a relatively low income area. Second, Site 14 would provide additional shipping frontage in the Coos Bay area. Third, the proposed industrial development is in conformance with both

regional and local master plans.

27. Four important planning deficiencies were documented during the course of the study. First, port-related industrial plans at Eastside could be substantially influenced by a possible long-range plan by the Port District Commission, Port of Coos Bay, which advocates moving the entire port closer to the mouth of Coos Bay. Second, unless significant highway improvements are instituted, industrial traffic will be channeled through Eastside residential neighborhoods. Third, the port and industrial park interfaces a residential neighborhood located on an adjacent bluff, and desirable buffering between the two zones would be difficult to attain if the existing sketch plan is implemented. Fourth, rail access to the port will require the construction of a bridge across the one-quarter mile wide Isthmus Slough. In conclusion, the 1966 sketch plan for the industrial port is deficient in many functional aspects including circulation patterns, industrial lot sizes, and insufficient buffering between dissimilar land uses. However, considering the date of that plan, it is inevitable that a new development plan will surface for the site in the future.

Key factors affecting implementation

28. The various factors found to have affected implementation of disposal plans for Eastside Site 14 and Coos Bay in general are summarized in Table G3. Important positive influences related to the ecological characteristics of the Eastside tract, the adequacy of the Corps' EIS, and the coordination with review/regulatory agencies. Key negative factors related to the somewhat antagonistic attitudes existing between the Corps and certain other participants and to the lack of long-range disposal planning for Coos Bay.

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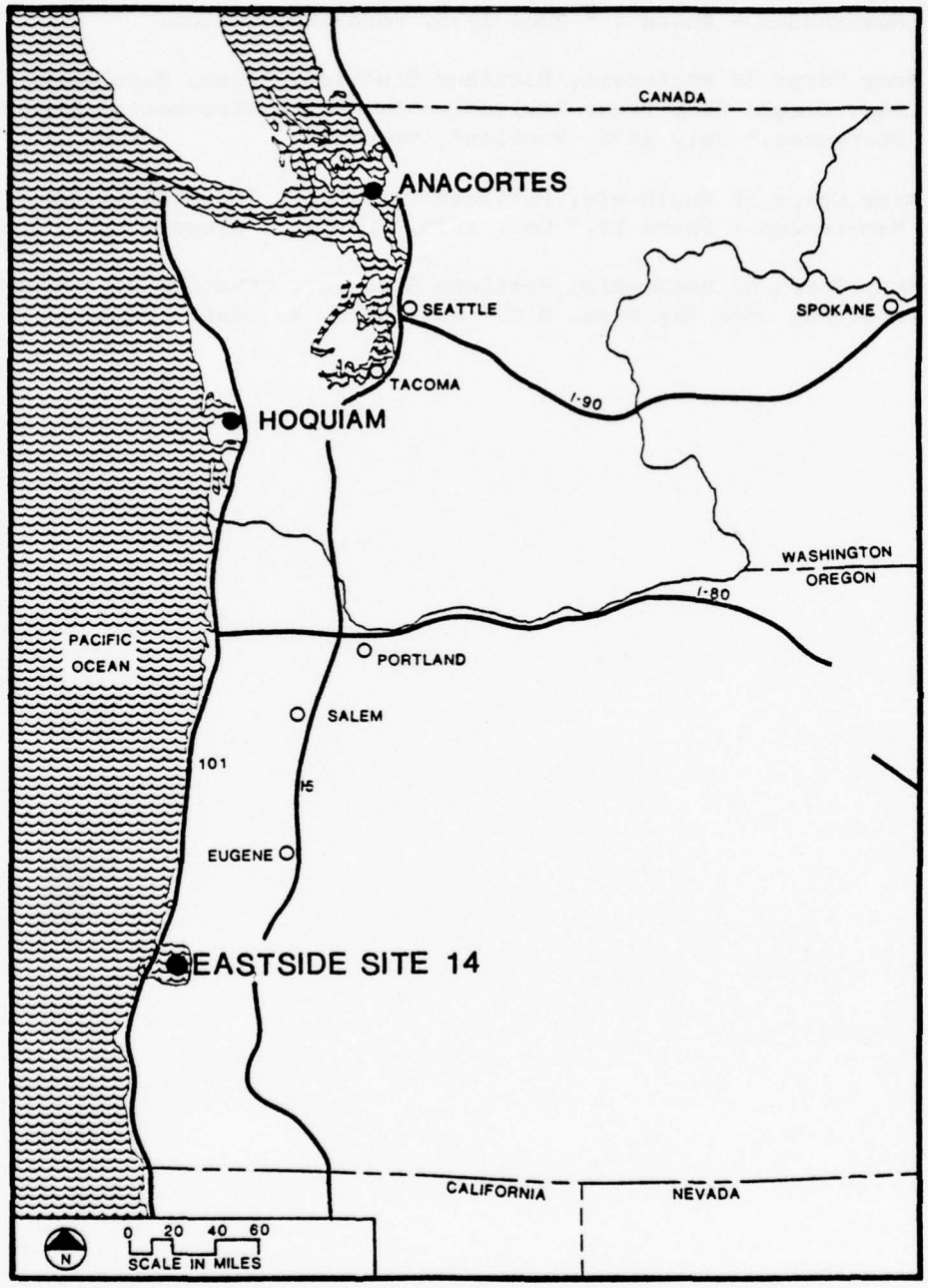


Figure G1. Location Map for Case Study No. 7 - Eastside Site 14

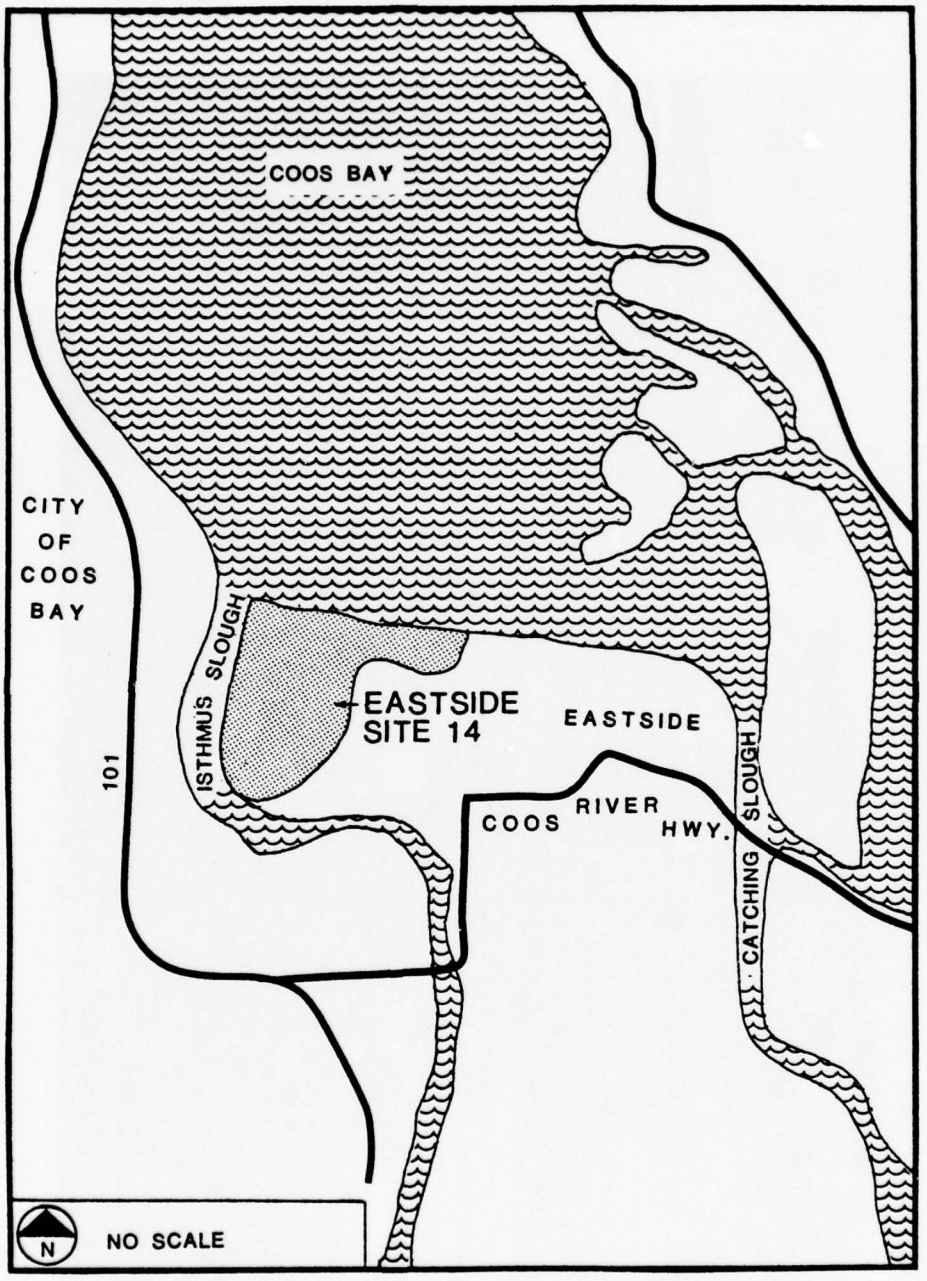
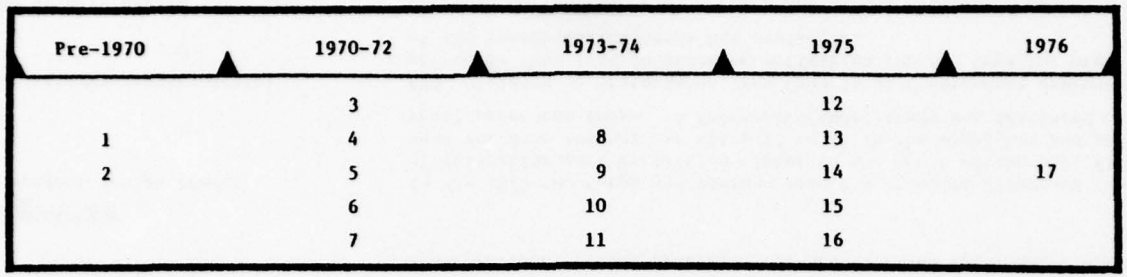


Figure G2. Eastside 14 Site Map



Figure G3. Photo of Eastside Site 14 (February 1977)



1. ~1960 - Corps proposes three alternative deep draft projects for Coos Bay.
2. Nov. 66 - Port of Coos Bay (PCB) issues report on Coos Bay development recommending industrial use for Eastside tract.
3. Dec. 70 - U.S. Department of Interior (DOI) asks Secretary of Army to delay deep draft project until on-going biological and coastal resource studies can be incorporated into harbor development.
4. Jun. 71 - DOI issues report on natural resources management in Coos Bay.
5. Dec. 71 - State and Federal agencies meet to review disposal alternatives.
6. Jan. 72 - Consultant to PCB issues report on management of dredged material in Coos Bay. Eastside site identified as prime disposal location.
7. Mar. 72 - Corps holds multi-agency meeting on Coos Bay disposal problems.
8. Jan. 73 - Corps holds multi-agency meeting on Coos Bay dredging and disposal.
9. Oct. 74 - Corps issues Public Notice of maintenance dredging and announces EIS plans.
10. Dec. 74 - Corps holds multi-agency workshop on disposal site selection.
11. Dec. 74 - State Land Conservation and Development Commission adopts coastal planning goals. Deepwater industrial use of Site 14 seen compatible.
12. Feb. 75 - Corps issues draft EIS for deep draft project.
13. May 75 - Corps holds multi-agency meeting to discuss maintenance EIS. National Marine Fisheries Service requests delay in review period for deep draft EIS until maintenance EIS is reviewed. Corps denies request although Oregon Wildlife Commission and FWS concurred with NMFS.
14. May 75 - Coos Bay County Estuary Plan recommends marine industrial use for Site 14.
15. Jul. 75 - Eastside 1995 Comprehensive Plan shows Site 14 as planned industrial area. Final EIS Supplement for deep draft project filed with CEQ.
16. Aug. 75 - Corps holds multi-agency field inspection of deep draft disposal areas.
17. Aug. 76 - Final EIS for maintenance dredging filed with CEQ.

Figure G4. Case Study No. 7 - Eastside Site 14 - Chronology of Events

Table G1

Case Study No. 7 - Eastside Site 14: Major Issues Addressed During Implementation

Issue Categories	Issue Descriptions
Environmental	
1. Wetlands filling	Corps' 1968 review report and 1970 deep draft project EIS were not objected to by FWS. However, in late 1970 the Secretary of DOI requested that Corps' reports on Coos Bay dredging be withheld pending completion of biological and coastal zone management studies in Coos Bay. In 1971, DOI issued guidelines for Coos Bay which recommended that all filling of tidelands, wetlands and submerged lands be avoided.
4. Regional ecosystem alteration	Several environmental groups opposed any disposal actions in the Coos Bay estuary, arguing that reduced tidal prism would adversely affect oxygen exchange, that oxygen deficient slack water areas would be created, and that biological productivity and nutrient transfer would be diminished. Corps responded by opting for upland disposal in the upper bay.
Technical	
1. Dike stability	Concerns over stability of retaining dike that had failed in 1974 were assuaged by Corps during various project meetings.
Institutional	
3. Coordination with review/ regulatory agencies	Although interagency coordination was excellent in this case, several State resource agency representatives expressed concern over not having been involving in early design of planning and implementation strategies by the Corps for the Coos Bay navigation project. Also, several agencies objected to non-coincident review processes for new work and maintenance dredging EIS's.
Planning/Implementation	
1. Dredging project design limits	In May 1975 the Corps and various resource agencies discussed the possibility of relocating port facilities closer to the mouth of the bay, eliminating need for deep channel for miles 12 to 15 in the upper bay and reducing disposal pressures there. A Federally-funded study was initiated.
3. Long-range waterway/environmental planning	FWS, Division of State Lands, and Council of Governments expressed desire to see Corps take lead in planning activities for the Coos Bay area because of the resources the Corps has available.
4. Evaluation of alternative disposal areas	National Marine Fisheries Service and Oregon Wildlife Commission refused to comment on new work EIS until long-term maintenance EIS could be fully evaluated, especially for disposal impacts.

Table G2

Case Study No. 7 - Eastside Site 14
Physical Planning Elements Affecting Project Implementation

Physical Planning Elements	Influence	Element Descriptions
Elements Related to Disposal Facility Planning		
1. Pre-disposal site characteristics: area of previous fill activity	Positive	Although the Coos Bay estuary is one of the most productive estuaries along the Oregon coast, Site 14 had been incrementally filled since 1937, and therefore recent filling was not considered environmentally damaging.
10. Sensory factors (visual, odor, dust, smoke, etc.)	Negative	The site is highly visible from a residential neighborhood overlooking Site 14. Since filling has occurred on an approximate 2- to 3-year interval, vegetation has not satisfactorily become established, and the site has often been observed as a mud flat.
Elements Related to Productive Land Use Planning		
2. Shipping and boat access	Positive	The additional waterfrontage created from the port at Eastside will increase the frontage inventory in the major Coos Bay shipping region.
4. Vehicular circulation/traffic generation	Negative	Unless significant highway improvements are made, industrial traffic will be channelled into the Coos River Highway - route 241. This highway penetrates residential zones, the alignment is circuitous, and traffic congestion is an existing problem. A preliminary plan has been prepared advocating a realignment of the route 241 corridor and a proposed corridor for the industrial road, but implementation is deemed to be remote at this time.
9. Sensory factors (visual, odor, vibration, dust, smoke)	Negative	Eastside topography will force the adjacent residential neighborhood to overlook the industrial and port facilities. Elevation differences between the two land uses result in buffering difficulties.

Table G3

Case Study No. 7 - Eastside Site 14: Key Factors Affecting Project Implementation

Factor Categories	Influence	Factor Descriptions
Environmental		
1. Ecological characteristics of proposed disposal area location	Positive	The Eastside site had been used as a disposal area as early as 1930 and periodically thereafter. The site was considered more valuable for industrial than ecological use.
Technical		
3. Disposal facility design and operating characteristics	Negative	Prior failures of the dike at Eastside resulted from Corps use of structurally inferior materials. After a 1974 failure, Corps was questioned as to dike integrity. Corps agreed to use structurally sound materials for future dikes.
Institutional		
1. Public participation in disposal-productive use planning	Positive	Corps has taken steps to inform the public in advance of its projects to provide opportunity for public comment.
3. Coordination with review/ regulatory agencies	Positive	Corps efforts at multi-agency coordination were praised by several participants. Many coordination meetings, workshops, and on-site inspections were held at Corps request.
6. Corps and other participant attitudes	Negative	Antagonistic attitudes between Corps and National Marine Fisheries Service personnel were expressed during interviews. Distrust over respective motives during project planning and review was noted.
Planning/Implementation		
1. Long-range Corps disposal planning	Negative	Objections over the non-coincident review processes for the new work and maintenance dredging EIS's impeded the implementation process.
6. Evaluation of alternative disposal areas	Positive	Corps disposal site selection relied heavily upon the coordination achieved with other participants. Internal Corps site selection procedures resulted in confrontation among Engineering, Environmental and Navigational staff. Although compromises were difficult, the Corps was better prepared to deal with resource agencies. Several participants had high praise for the Corps' project technical and environmental analysis. The Coos Bay EIS's were said to be the most complete that some had ever seen.

APPENDIX H: SYNOPSIS OF CASE STUDY NO. 8 - ANACORTES - ANACORTES, WASHINGTON

Background Summary

Introduction

1. The Anacortes disposal site is a 26-acre area located on the shore of Fidalgo Bay in Anacortes, Washington (Figure H1). The site was offered by the City of Anacortes as part of disposal plans for the construction of a shallow draft navigation channel under Section 107 of the River and Harbor Act of 1960. The city's 1966 Urban Renewal Plan initially called for a new water-oriented industrial park and the Corps began reviewing the project in July 1966. The navigation channel will be used for waterborne commerce serving the new industrial park, of which the disposal facility is an integral part. After more than 7 years of planning, construction of the retaining structure was completed in the fall of 1975.

2. Although the provision of disposal sites is usually the responsibility of the Port Authority, the City of Anacortes acted as local project sponsor in this case. This was a direct result of the city's desire to expand the attractiveness of the industrial district, which was planned for a 110-acre area just upland from the disposal site. Since the proposed industrial district was a HUD-financed urban renewal area, the city was able to meet its financial obligations as local sponsor by planning to include the 26-acre disposal site as part of an expanded 136-acre urban renewal project. HUD contributed three-fourths of the facility costs, which would otherwise have been borne entirely by the city.

3. The Anacortes site provides an example of a local project sponsor working simultaneously to provide needed disposal capacity and to create land for subsequent productive use. The barge channel created by the dredging project is designed to provide direct access to the industrial park, with the dredged material from the project providing additional industrial land in the project area. The barge

channel and industrial park project were dependent upon each other for the development of new water-oriented industrial capability at Anacortes. This is demonstrated by the fact that intensive marketing efforts for the industrial land were unsuccessful until there was a firm commitment by the Corps to construct the barge channel. At present, all of the land in the urban renewal area has either been sold or has been committed to industrial users.

4. State permits in Washington are applied for through the state Department of Ecology, which also serves as a clearinghouse for applications. The State Department of Natural Resources and the Department of Fisheries were actively involved in the Anacortes approval process. In addition, local residents were vocal. As a result of the State's environmental concerns relating to ecological disturbances during the dredging operations, a moratorium on dredging was enforced during the summer months of May, June, and July. State concern over the possible impedance of the movement of migratory fish species in the vicinity of the dike resulted in a technical design change to make the shape of the dike more closely approximate the natural shoreline. The resolution of these and other less troublesome issues took place over roughly a 5-year period and involved considerable cooperation between the Corps of Engineers, the city, and the State environmental agencies.

Site description and regional context

5. The Anacortes site, with the exception of a rounded seawall in the northeast corner, is roughly trapezoidal in shape, with the northern portion approximately twice as large as the southern part (Figures H2 and H3). At present, the site is mounded on the north as a result of clamshell disposal actions in this area. The site slopes off toward the southern end, since this area was a settling pond for the disposal operation and could not be filled completely. When the material is workable, these areas will be graded to approximately the same elevation, which will be 17 feet above mean lower low water. The seawall, which in 1974 was raised an additional 2 feet because of overspill problems, will be lowered to its original height.

6. The disposal site itself had a capacity of approximately

670,000 cubic yards of dredged material. About seven-eighths of the material has been dredged from the barge channel and pumped hydraulically onto the site. The remaining one-eighth of the material has been dredged from the berthing area and placed onto the site via clamshell dredging techniques. Originally, all of the material was to be dredged hydraulically; however, an unusually high material "bulking factor" caused an overfill and negated the use of pipes. This unpredicted action forced the Corps to deviate from their initial concept and utilize the clamshell method for dredging the remainder of the project area. Use of the clamshell technique caused some delay in filling the site since it is a much slower process, but the immediate problem of swelling and overfill was mitigated.

7. The entire Anacortes site is located on top of what was tidelands and bay bottom of Fidalgo Bay, known as Anacortes Tide Lands. No tidal wetlands exist within the immediate site area today. While the site is not subject to flood plain conditions, it is possible that portions of the site may be subject to flooding if storm wave conditions coincide with highest tide levels. This is due to the fact that the site is on the west side of Fidalgo Bay, and is exposed to wave attack from the north caused by infrequent high winds. At the time of project planning there was no development at the site, although some 200+ houses were displaced due to urban renewal just west of the diked area. The city owns most of the disposal area - all except the portion of the site which lies between the inner and outer harbor lines. This 9-acre portion is owned by the State and is leased to the city by the Washington Department of Natural Resources.

8. The economy of the Anacortes area is part of the overall economy of the upper Puget Sound region. Water-dependent industrial operations are a most important component of that economy. The Anacortes area is supported by industries such as wood products, oil refining, chemical production, and fish processing. Employment in the logging and fishing industries is seasonal, however, and the 1970 census data showed a steady decline in the population of young adults because of insufficient employment opportunities in the area. For most

industries adequate sites are available in the Puget Sound region until at least 1980. The 100+ acre Anacortes Industrial Park represents a significant upgrading of the city's attractiveness to industry and its contribution to the Puget Sound area in general.

9. Land uses in the area of the Anacortes disposal site include a staging area for machinery and equipment which is shipped to the north slope oil fields of Alaska, a spur line of the Burlington Northern Railroad, a radio transmission tower, a log processing plant, a wood pulp manufacturing plant, a major industrial arterial, and a low-density residential neighborhood. The barge channel created by the dredging project will provide direct access to the disposal site and adjacent areas. The Comprehensive Plan of Port Development, prepared by the Port of Anacortes in 1964, analyzed employment and industry data and projected that new industrial growth would be needed in Anacortes before 1988 in order to satisfy the increasing labor force. This is why the disposal site and adjacent areas are zoned for industrial use.

Productive land use plan

10. There are three firms whose facilities will be located on portions of the Anacortes site: Publishers Forest Products Company, Anacortes Lumber, and Pacific and Bering Sea Food Products Company. Publishers Forest, whose site extends south beyond the disposal area, intends to use its land in the disposal site for dry-land log storage. The Anacortes Lumber site extends west of the disposal area. Anacortes Lumber proposes to construct a facility for the manufacture of plywood, and they will use the disposal facility portion of their parcel for the importing and shipment of logs and finished lumber. Pacific and Bering Sea Products will use the northernmost portion of the disposal site. This firm intends to construct and operate a multi-purpose fish processing plant and related food freezing operations. No detailed site plans of these uses are available at this time.

Project Implementation

Chronology

11. Figure H4 presents a chronology of events in the process of implementing the Anacortes project. The chronology begins in 1964 with the Comprehensive Plan of Port Development, which identified the Anacortes site as necessary for industrial growth. It ends with the EPA's order to the Corps in March 1976 to shift from hydraulic dredging to clamshell dredging for the remainder of the project.

Participants

12. Important participants in the process of implementing the Anacortes project included the following:

a. Seattle District, Corps of Engineers.

b. City of Anacortes.

c. U.S. Fish and Wildlife Service (FWS).

d. U.S. Environmental Protection Agency (EPA).

e. U.S. Department of Housing and Urban Development (HUD).

f. Washington Department of Natural Resources (DNR).

g. Washington Department of Ecology (DOE).

h. Washington Department of Fisheries (DF).

13. Seattle District. In 1966 a Corps feasibility study showed the need for a shallow-draft channel in Fidalgo Bay. A Section 107 Project Study was begun that same year and the project was finally authorized in 1975. The Corps encountered several problems in this 9-year period, including the poor quality of the material and the inadequate capacity of the disposal area. Approximately 75 percent of the material to be dredged was of poor quality and not particularly suitable for fill. However, the Corps, through engineering soils analysis, determined that buildings could be constructed on the site with the use of pilings. The second major problem area was the capacity of the disposal site. Due to an uncalculated bulking factor of the dredged material and the Corps' decision to construct auxiliary dikes two feet lower than originally planned, the site was filled to overflowing. Corrective measures were taken by the Corps during

dredging operations, however, to prevent a massive spill from occurring. The Corps' coordination efforts with other agencies and organizations were excellent and included the Seattle District's first before-during-after environmental study of dredge and fill operations.

14. City of Anacortes. The city was the local sponsor for the Anacortes Barge Channel Navigation Project. The city presently owns most of the land in the disposal area, and has a long-term lease from the State for the rest of the site. The first interest in the area as an industrial site was shown in 1959, but it wasn't until March 1966 that the city officially entered into an urban renewal agreement with the U.S. Department of Housing and Urban Renewal. During the 4-year interval from 1966 to 1970 the city went through a difficult period in which they couldn't decide on the length and depth of the channel to be dredged. In fact, on two separate occasions (September 1968 and March 1969), the Corps almost terminated the project due to the city's indecisiveness on the engineering details of the proposed action. During this time span the city also encountered some difficulty in securing users for the new industrial area. It appeared that no industrial organization was willing to seriously consider locating in the area until disposal site plans were finalized. Finally in the early months of 1971 detailed design plans were drawn and the Corps and the city reached agreement in April 1971.

15. U.S. Fish and Wildlife Service. The FWS initially became involved in the Anacortes project in November 1967 when, in response to a Corps' inquiry, the bureau recommended hydraulic dredging and retaining dikes for the area. At that time, the FWS objected to the Anacortes project and did not withdraw the objection until 1973. There were several grounds for this objection, including (1) the lack of long-range waterway planning, (2) the desire to see that the dike, when built, would be impermeable, and (3) the insistence that a detailed biological study be conducted before, during, and after construction. The first and third grounds for objection were met; however, in response to the second objection, the city's consulting engineers insisted that an impermeable dike could not be built on the site. After FWS withdrew

its objection in 1973, a series of meetings were held with the Corps to develop and coordinate an acceptable ecological study plan for the dredging/disposal area. While a final plan was worked out, the purpose of the study is still in dispute. The Corps maintains that data are being gathered to determine what, if any, detrimental effects were caused by the dredging/disposal activities; FWS claims that the study is to determine the extent of later mitigation. Neither agency has showed any signs of changing its feeling on this matter.

16. U.S. Environmental Protection Agency. EPA was very much concerned about the design of the Anacortes site. They were worried about two aspects of site design: the capacity of the site and the ability of the site to retain solids. Both of these concerns turned out to be well founded. Even though EPA had serious doubts about the site, the Agency did approve with the stipulation that the Corps monitor the effluent from the area. The Corps agreed to this stipulation. However, EPA, in conjunction with FWS, decided to send scuba divers to evaluate the effects of the disposal operations on Fidalgo Bay and eventually ordered the Corps to change from hydraulic dredging to clamshell dredging. EPA feels that there could have been better coordination between themselves and the Corps in this case, particularly during the early planning stages. For example, EPA believes that the Corps should have more closely evaluated the Agency's suggestion of utilizing a three-celled system for the disposal facility to improve retention. As it turned out the Corps neglected this suggestion and opted for a two-celled process which wasn't enough to contain all of the dredged material.

17. U.S. Department of Housing and Urban Development. HUD was involved in the Anacortes project because the confined disposal site consists of approximately one-fifth of the HUD-sponsored urban renewal project in Anacortes. As early as 1964 HUD contacted the Corps and suggested that their activities be coordinated in an appropriate manner. This coordination was ongoing for 15 months when the city executed a Loan and Grant Contract with HUD for the urban renewal project. The Department has contributed three-fourths of the costs of this urban

renewal project. Although HUD would have liked to see the project proceed more quickly, the Department was pleased with the Corps' coordination efforts since the project served to expand the urban renewal area as well as increase the value of the project.

18. Washington Department of Natural Resources. DNR administers, in trust for the State, a portion of the Anacortes site. The Marine Land Management Division is the section of DNR which was actively involved in this site's planning and implementation process. The Management Division granted a renewable 30-year lease to the city on 30 December 1971. Prior to commencement of dredge and fill operations DNR went one step further and granted a perpetual easement to the city in April 1975. DNR's involvement in the Anacortes project also went beyond the management function of issuing a lease and easement as they became involved in site configuration and location. In 1969 the city presented a plan that requested that the seawall be changed to lie outside the outerharbor line. DNR refused the city's request on the grounds that specific plans for filling and building on the site did not justify the change. One other area of DNR involvement concerns the assessment of fees for using State bottomland as fill. DNR wanted to charge a fee for the State-owned material that was dredged, since the project was not specifically authorized by Federal legislation. The fee was not charged, however, since the city is a public agency which is exempt from payment.

19. Washington Department of Ecology. DOE administers the Shoreline Management Act and water pollution control laws for the State of Washington. The Department approves shoreline management permits and certifies water quality related to dredge and fill operations. The approval of the permits occurs only after DOE has reviewed and accepted a comprehensive plan, which includes the area involved. The shoreline management permit was approved by DOE on 21 April 1972. No difficulties were encountered with respect to obtaining water quality permits; however, DOE remains concerned about water quality impacts when industrial users occupy the site.

20. Washington Department of Fisheries. DF, in conjunction with

the Department of Game, issues permits for any hydraulic activity within the wetted perimeter of the State's waters. The hydraulic permit for Anacortes was issued in 1973. Prior to this, in 1970, DF became concerned about the design of the Anacortes site when it was determined that the dike would interfere with fish spawning. The Department recommended a rounded seawall, which was adopted in the final design. In August 1971, DF published a document entitled "Criteria Governing Design of Bulkheads, Landfills and Marinas," which is used by local governments in establishing their comprehensive plans. Shoreline management permits must be consistent with these plans.

Major issues
addressed during implementation

21. During the process of implementing the Anacortes disposal-productive use plan, significant concerns were raised in the environmental, technical, and planning/implementation issue categories. These are summarized in Table H1. EPA and FWS concerns about dredging-disposal water quality impacts resulted in a Corps before-during-after environmental study. Major technical issues related to disposal area capacity and disposal area operating characteristics, both of which relate to the site capacity problem arising from an underestimated bulking factor. With respect to planning/implementation, the issue of dredging project design limits, which the city had to specify, took over 5 years to resolve.

Planning considerations
affecting implementation

22. For assessment purposes, physical planning elements have been grouped into two categories: (1) elements related to disposal facility planning, and (2) elements related to productive land use planning. A summary of the most important physical planning elements of the Anacortes project, assessed in terms of their impact on project implementation, is contained in Table H2. In terms of disposal planning, key considerations were that wetland areas were involved, there was a lack of adequate site disposal capacity, and there were high potential adverse impacts on the ecology of Fidalgo Bay. All of the

above aspects exerted negative influence on implementation. Poor foundation conditions and lack of a firm development plan were negative aspects with respect to land use planning. Shipping access to the site, created by the dredging project, had a positive influence on the project.

23. The Anacortes barge channel and disposal site had both advantages and disadvantages in terms of land use planning. There were three key advantages to the plan. First, the disposal site added 31.5 acres of industrial zoned land to the urban renewal area, increasing the development feasibility of the urban renewal project. Second, the barge channel and fill site provided direct barge access to the urban renewal area, greatly increasing the marketability of the land within the industrial park. Finally, the development of water-oriented industry on the site would provide some relief from persistent unemployment in the area.

24. There were three primary disadvantages to the Anacortes plan. First, the increased industrial development of the shoreline, coupled with increased commercial navigation traffic would reduce the quality and amount of shorebird and migratory waterfowl habitat. Second, the plan required the destruction of the intertidal community in those areas of dredged material disposal. Third, the aesthetics of the bay would be altered by additional industrial development. The increased industrial activity as a result of this project may eventually reduce recreational use of Fidalgo Bay as a result of the changing aesthetic quality.

Key factors affecting implementation

25. In Table H3 the key factors affecting the Anacortes project are summarized. Key positive factors included the economic benefits of the project, the financial support from HUD, the Corps' open planning procedures, and the planned use compatibility with the site and with master plans. Key negative factors were the dredged material structural properties, the disposal facility design and operating characteristics, and ineffective Corps/sponsor interaction early in the planning phase.

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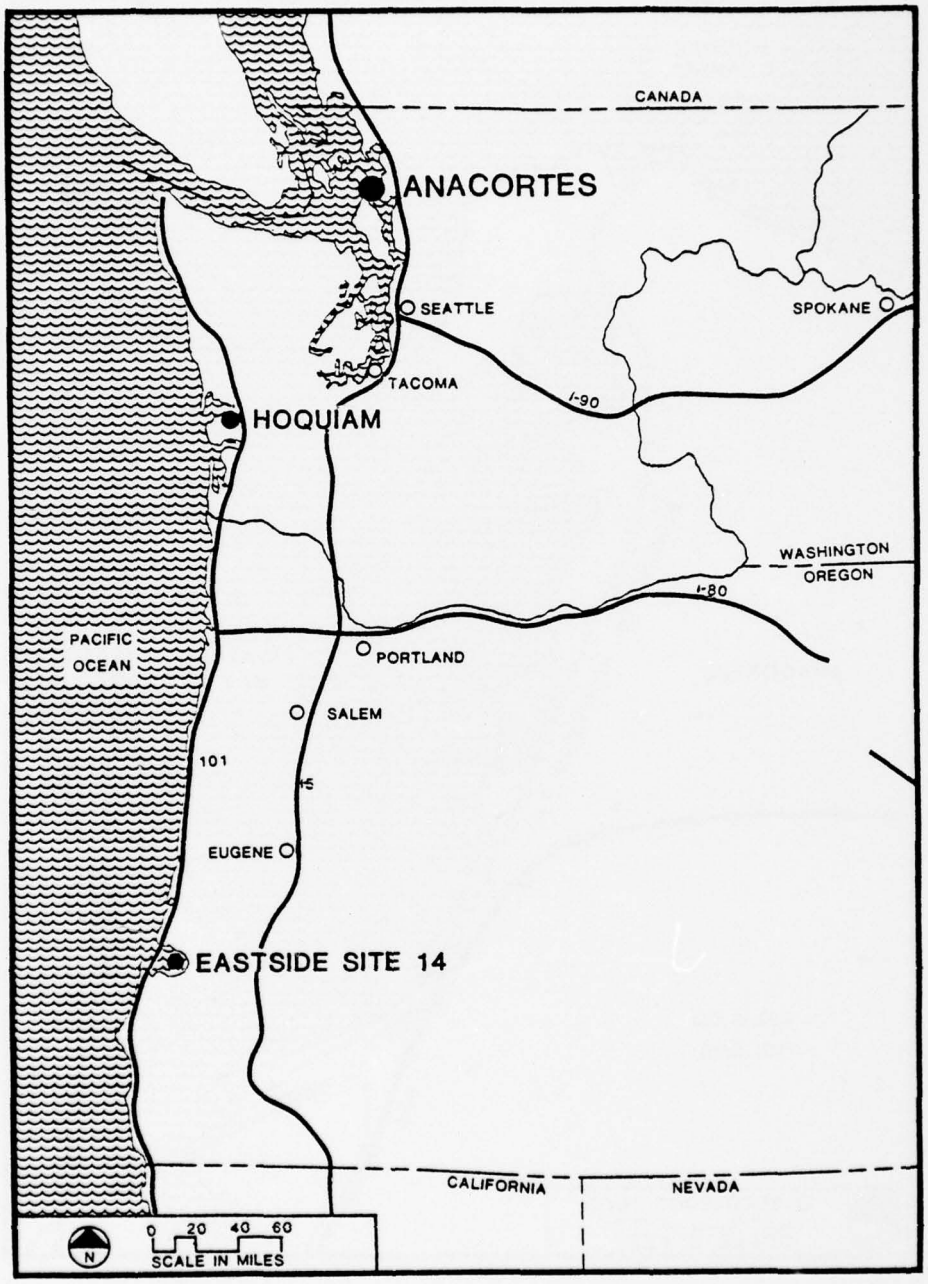


Figure H1. Location Map for Case Study No. 8 - Anacortes

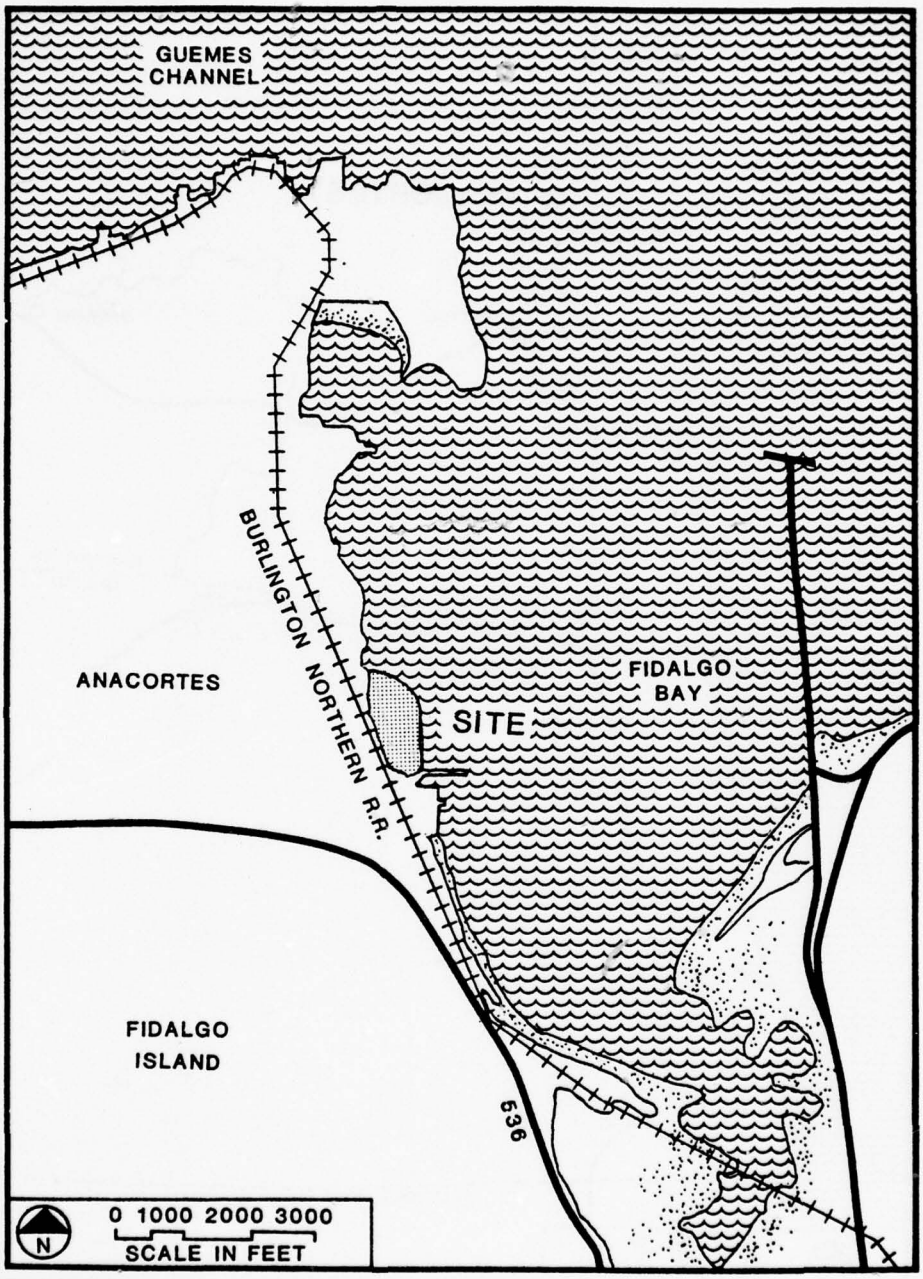


Figure H2. Anacortes Site Map



Figure H3. Photo of Anacortes Disposal Area (1975)

1960-66	1967-69	1970-71	1972-74	1975-76
1		9		
2		10	14	
3	6	11	15	18
4	7	12	16	19
5	8	13	17	20

1. Apr. 64 - Comprehensive Plan of Port Development identifies Anacortes site as necessary for industrial growth.
2. Jan. 66 - Anacortes Urban Renewal Plan calls for new water-oriented industrial park, including the disposal site.
3. Jan. 66 - Corps feasibility report establishes need for shallow draft channel.
4. Mar. 66 - City executes Loan and Grant Contract with U.S. Dept. of Housing and Urban Development (HUD). HUD agrees to pay 75 percent of urban renewal costs.
5. Jul. 66 - Corps authorizes Anacortes Harbor study under Section 107 of River and Harbor Act of 1960.
6. Feb. 68 - Corps defers Section 107 study due to city's indecision over project details such as dredging limits, channel depth, and disposal area design.
7. Mar. 69 - Corps, city and HUD officials meet. Corps inform city that project will be terminated by May 1969 if city's plans are not delineated.
8. Dec. 69 - Corps' Section 107 study again deferred. City's disposal planning called inadequate and city is unable to generate site user interest without detailed project design.
9. Feb. 70 - City redesigns disposal facility to comply with FWS request that smelt spawning habitat be protected.
10. Nov. 70 - City presents two-celled disposal plan and informs FWS that impermeable dike not feasible.
11. Dec. 70 - Industry adjacent to Anacortes site informs city it has no expansion plans and will not contribute to costs of deeper, longer channel.
12. Apr. 71 - City presents disposal site plan sufficient for entire project and finally specifies length and depth of channel.
13. Oct. 71 - Corps issues Federal dredge and fill permit 29 months after initial application.
14. Sep. 72 - FWS objects to project due to lack of long-term maintenance dredging and harbor development plans. Also wants before-during-after biological study of project.
15. Dec. 72 - Corps, city, and FWS meet to resolve latter's objections.
16. Sep. 73 - HUD pays 75 percent of $610,000 dike construction costs.
17. Aug. 74 - Final EIS submitted to CEQ.
18. Mar. 75 - Corps and FWS meet to develop ecological studies plan.
19. Dec. 75 - Corps advises city that site is filled to capacity but only two-thirds of dredging has been done. The bulking factor has been miscalculated.
20. Mar. 76 - FWS and EPA call for halt to hydraulic dredging and shift to clamshell dredge for remainder of project.

Figure H4. Case Study No. 8 - Anacortes - Chronology of Events

Table H1

Case Study No. 8 - Anacortes: Major Issues Addressed During Implementation

Issue Categories	Issue Descriptions
Environmental	
3. Aquatic habitat disturbance	The State Department of Fisheries was concerned about smelt spawning near the site. The site configuration was altered to protect the fish spawning areas.
6. Dredging-disposal water quality impacts	Both EPA and FWS were concerned about the deterioration of water quality. At FWS prompting the Corps agreed to conduct before-during-and-after environmental studies.
Technical	
1. Dike stability	FWS initially wanted an impermeable dike to be built, but the city's consulting engineers said that this could not be done.
2. Site foundation conditions (for planned use)	During early site planning, city and public representatives were concerned that poor quality of dredged sediments would preclude site development unless further investments were made to improve foundation conditions.
3. Dredging technique	FWS asked for hydraulic dredging; this was done until the contained material overflowed due to the high bulking factor for hydraulically dredged sediments and EPA ordered a change to clamshell dredging.
4. Disposal area capacity	EPA was concerned that the site might not have adequate capacity, as was the Corps. However, none of the involved agencies correctly assessed the bulking factor for the hydraulic dredging operation and the design capacity proved inadequate.
6. Disposal area operating characteristics	EPA suggested a three-cell interior diking system; the Corps opted for a two-cell design. EPA later claimed that a three-cell system would have enabled the material swelling problem to be reduced, although not eliminated.
Planning/Implementation	
1. Dredging project design limits	The city wanted a longer and deeper channel than the Corps thought necessary. The matter took almost five years to resolve. Resolution was obtained only because a local industry told the city that it would not expand its operations, did not need the longer, deeper channel, and would not contribute to the costs of the longer channel.

Table H2

Case Study No. 8 - Anacortes
Physical Planning Elements Affecting Project Implementation

Physical Planning Elements	Influence	Element Descriptions
Elements Related to Disposal Facility Planning		
1. Pre-disposal site characteristics: wetland	Negative	The Washington Bureau of Fish and Wildlife objected to the piecemeal destruction of tidal areas and requested the project be deferred pending completion of a comprehensive management plan for Fidalgo Bay.
2. Ecological characteristics	Negative	EPA and FWS were concerned about the ecological and biological impact of the project on Fidalgo Bay. FWS removed its objection to the project after the Corps agreed to conduct detailed biological-oceanographic studies before, during, and after construction.
3. Disposal site capacity	Negative	None of the involved agencies correctly assessed the bulking factor for the hydraulic dredging operation and the site was filled to capacity with one-third of the dredging remaining to be done.
Elements Related to Productive Land Use Planning		
1. Foundation conditions	Negative	City and public representatives were concerned that the poor quality of dredged material would preclude site development. Engineering studies showed that while site foundation conditions were poor, development would be feasible.
2. Shipping and boat access	Positive	Without the construction of the new channel, the Anacortes urban renewal project would have been jeopardized.
8. Site plan compatibility with site features and user requirements	Negative	Between 1966 and 1969, the Anacortes Urban Renewal Authority proposed four different alternatives for navigation improvement and industrial park fill areas. As a result of this lack of a firm plan, the Corps deferred further work on the channel study from late 1969 to April 1970.

Table H3

Case Study No. 8 - Anacortes: Key Factors Affecting Project Implementation

Factor Categories	Influence	Factor Descriptions
Technical		
1. Dredged material structural properties	Negative	The Corps openly admitted in 1970 that the material was not particularly good for fill. Disposal plans had to be devised to handle the worst material first.
3. Disposal facility design and operating characteristics	Negative	Concern over the capacity of the site were justified when, with one-third of the dredging left to be done, the site was filled. Dredging technique had to be changed from hydraulic to clamshell.
5. Technical coordination of disposal plan with productive use plan	Positive	The filling of the site made the urban renewal area larger. The progress of the project also encouraged potential users of the dry land areas of the renewal project.
Economic/Financial		
1. Economic or social benefits (costs) of disposal-productive use project	Positive	The city was in a recession and jobs associated with the industrial park were anxiously awaited.
5. Project sponsor capability to assume financial responsibilities	Positive	HUD paid three-fourths of the costs of the urban renewal project, including those costs at the disposal site which would otherwise have been borne entirely by the city.
Institutional		
1. Public participation in disposal-productive use planning	Positive	There were three editions of a public brochure and four public meetings designed to keep the public informed of the project.
2. Coordination with project sponsor	Negative	Although there were many Corps-sponsor meetings, there was not much success in reaching agreement. The Corps pressured the city to define the dredging limits and the disposal plan, and twice threatened to terminate the project.
3. Coordination with review/ regulatory agencies	Positive	The Corps practiced "fishbowl planning," in which everyone knew where the project stood. There was good coordination.

(Continued)

Table H3 (Concluded)

Factor Categories	Influence	Factor Descriptions
Planning/Implementation		
9. Proposed use compatibility with master plans	Positive	The city had planned for industrial growth in this area as early as 1961, when comprehensive plans were prepared.
12. Commitment to proposed land use	Positive	Without the disposal site, the Anacortes urban renewal project would have been jeopardized.

APPENDIX I: SYNOPSIS OF CASE STUDY NO. 9 - HOQUIAM - HOQUIAM, WASHINGTON

Background Summary

Introduction

1. The Hoquiam disposal area is a 45-acre site located in the City of Hoquiam, Washington, on the west bank of the mouth of the Hoquiam River in Grays Harbor (Figure I1). In 1974 the site was offered to the Corps by the Port of Grays Harbor (PGH) as a disposal area. PGH had planned to develop the Hoquiam tract for industrial use for several years, and consideration of the planned use was a most important aspect of the site planning and approval process in this case. PGH obtained a Federal dredge and fill permit for the project in August 1976 and a retaining dike was built by January 1977. Filling of the site began in February 1977.

2. PGH is the local sponsor for federal dredging activities in the harbor. In 1963 PGH acquired the Hoquiam site and designated it as Industrial Development District No. 1 the following year. The Port waited a dozen years for the right tenant to come along before making any effort to fill the site and prepare it for industrial use. When a seemingly suitable tenant was found, PGH offered the site as a disposal area and applied for a Corps Section 10/404 permit and appropriate State of Washington permits and certifications. The first Federal permit application was filed in February 1975.

3. At the time of the permit application, PGH had an agreement with a potential tenant for development of the site, which would have included a sawmill, log lifting station, and a lumber storage yard. When this proposed use of the low-lying estuarine tract met strong opposition, the prospective tenant found a site elsewhere. PGH then revised its permit application in August 1975, inserting Kaiser Steel Corporation as co-applicant. The Kaiser land use plan called for (1) the contained disposal of 289,000 cubic yards of sand and silt from Corps maintenance dredging in Grays Harbor and (2) the construction of

buildings and facilities for the manufacture and assembly of offshore drilling platforms for the exploration and extraction of oil and natural gas deposits on the Northern Gulf of Alaska. This energy-related water-dependent use of the site did not face the same kind of opposition as the original planned productive use had faced. However, several environmental agencies pushed for a permit condition requiring that Kaiser guarantee that the "water-dependent" facility would be built on the filled site. There was much concern that the planned land use being used as justification for the destruction of wetlands would never be realized. The Corps did not attach a "guaranteed development" condition to the permit and Kaiser still has only a lease option on the site from PGH.

Site description and regional context

4. The Hoquiam site is approximately the shape of a quarter circle, with the western and northern boundaries being straight lines and the southern and eastern portions of the dike conforming more or less to the west bank of the Hoquiam River where it enters Grays Harbor (Figures I2 and I3). The site is surrounded by a quarry rock dike with a weir in the eastern side, by the Hoquiam River. Filling operations, by hydraulic dredge, began in the southwest corner of the site and moved steadily northward and eastward. The site will be finished to grade at 16 feet above mean lower low water.

5. The Hoquiam disposal site has been used for disposal purposes several times during the past two decades by the Corps and PGH. Prior industrial structures on portions of the site included a sawmill, a small coal-fired power plant, and a cylindrical brick burner. As part of the Corps' 1964 maintenance dredging activities, the northeast corner of the site received dredged material. In 1967, PGH raised the elevation of the site during a borrow operation in a potential deepwater berth near the mouth of the Hoquiam River adjacent to the site. The physical character of the site was changed from mud- and tidal-flat to salt marsh as a result of the borrow project. In 1969, PGH diked and filled along the northern perimeter of the tract, and, in 1970, western portions were filled with borrow and dredged material containing a high

percentage of cellulosic wastes.

6. The Grays Harbor watershed drains over 2500 square miles with tributary headwaters in the mountains of seven surrounding counties. Grays Harbor is a receiving area for sediments transported via both river and ocean, and water quality in the estuary has been a major concern for over 40 years. Wetlands in Grays Harbor occupy zones from intertidal lands to areas inundated only a few times per year by non-flood waters. The Hoquiam disposal site includes both upland and littoral zones, with 36 of the site's 45 acres classified as wetlands. The site contained a narrow strip of high marsh which merged with plant communities of dense saltwater sedge and arrowgrass. The 6 acres of the site, which extend into the littoral zone, supported only a limited plant community. Although eelgrass covers almost 42 percent of the harbor's tideflats, its production at the Hoquiam site was limited by low salinity from nearby fresh water inflows and turbidity associated with log rafting activities. The major adverse environmental impact of the Hoquiam disposal-productive use project is the elimination of about 36 acres of wetland from the estuary.

7. By far the most important economic activity in Grays Harbor County is the forest products industry. Over 1.33 million acres of land in counties tributary to Grays Harbor are classified as commercial forest land and are estimated to contain 6.2 billion cubic feet of softwood saw timber. Shipping supports the region's forest industry and, as such, is a key to the socioeconomic structure of the area. The Port of Grays Harbor, which was formed in 1911, offers low-cost water transportation to the forest products industry, so that local firms can compete with Canadian and southern United States forest products producers. Since employment levels for timber-based jobs have been predicted by the U.S. Forest Service to decrease 33 percent by the year 2020, the Grays Harbor area, which already has a high unemployment rate, badly needs diversity in its industrial make-up.

8. All of the land immediately adjacent to the fill site has been developed or annexed for industrial use. To the north are the Burlington Northern Railroad yards, depot, and roundhouse. The

Anderson-Middleton Company, a forestry products firm, has a dry-land log storage and sorting area adjacent to the western boundary of the site. The central business district of the City of Hoquiam and an ITT Rayonier pulp mill are also nearby. The site's proximity to the main navigation channel, the railroad line, and rapidly industrializing areas makes its development for industrial use ideal.

Productive land use plan

9. After the site has been filled and finished to grade by PGH, Kaiser Steel is expected to establish a facility for the manufacture and assembly of offshore drilling platforms for the exploration and extraction of oil and natural gas deposits on the continental shelf of Alaska's Northern Gulf. Figure I4 shows the development of the site to include a marine launchway and a pile-supported barge terminal extending into navigable waters, as well as facilities to be constructed on the site itself.

10. Dimensions of the marine launchway will be approximately 650 feet long by 233 feet wide, extending about 130 feet into estuarine waters. The launchway face will be 20 feet back from the outer harbor line (U.S. Pierhead Line) along most of its length, but will touch that line at the southeastern corner. The barge terminal's dimensions have been finalized at 500 feet long by 100 feet wide. The terminal face will be approximately 100 feet landward from the pierhead line. On the site proper, facilities to be constructed include a railroad siding, a parking area, an office building, miscellaneous service buildings, and utility lines. All buildings will be steel frame-concrete slab-sheet metal structures and total buildings' area will be about 30,000 square feet. The existing storm sewer outfall from the city pump station on the site's north side will be relocated to run easterly along the north perimeter.

Project Implementation

Chronology

11. Figure I5 presents a chronology of events in the process of

implementing the Hoquiam project. The chronology begins with the project sponsor's acquisition of the site in 1963 and designation of it as Industrial Development District No. 1 in 1964. It ends with the dike construction between October 1976 and January 1977.

Participants

12. Important participants in the process of implementing the Hoquiam site included the following:

a. Seattle District, Corps of Engineers.

b. Port of Grays Harbor (PGH).

c. Kaiser Steel Corporation.

d. U.S. Senator Henry M. Jackson.

e. U.S. Environmental Protection Agency (EPA).

f. U.S. Fish and Wildlife Service (FWS).

g. Washington Department of Ecology (DOE).

h. Washington Department of Natural Resources (DNR).

i. Environmental groups.

13. Seattle District. In the early 1960's, the Corps used the Hoquiam site for the unconfined disposal of a small amount of maintenance dredged material from the Grays Harbor navigation channel. Because of growing concern about the further filling of wetlands, the Hoquiam site was not even included in the Corps' general EIS for Grays Harbor disposal areas, which was issued in June 1975. However, shortly afterwards it was suggested that the Hoquiam site be considered one of the potential disposal areas. As a result of the suggestion, the District Engineer conducted a public meeting in January 1976 to determine whether or not an EIS would be required for the site. Over the objections of PGH, the District Engineer decided that an EIS was required, and he ordered one to be prepared as expeditiously as possible. The final EIS was filed with CEQ on 30 July 1976. One month later, on 30 August, the Corps issued a Section 10/404 permit to PGH. This cleared the way for dike construction and fill operations at the site.

14. Port of Grays Harbor. PGH is the local sponsor for dredging operations in Grays Harbor. The Port has owned the Hoquiam site since 1963 and designated the site as Industrial Development District No. 1 in

1964. Ten years later, the Port offered the site as a disposal area for maintenance dredging. PGH first filed a Corps permit application in February 1975. This application was subsequently amended twice, with the last change being filed in August 1975. The last amendment involved a change in the planned productive use of the site from a sawmill to a plant for the construction and assembly of offshore drilling platforms. At the behest of environmental agencies, PGH adopted a resolution in December 1975 guaranteeing the water-dependent use of the site, and pledging to work toward a comprehensive plan for the entire estuary. The plan was to be prepared by the newly organized planning agency called Grays Harbor Estuary Planning Task Force, chaired by the Planning Director of PGH. After the final EIS was prepared by the Corps and reviewed successfully, the PGH was granted the necessary dredge and fill permit. In September 1976, one month after permit issuance, the Port began dike construction. The dike was completed in January 1977.

15. Kaiser Steel Corporation. Kaiser Steel had been interested in finding a site suitable for the construction of offshore drilling platforms that could be manufactured in the State of Washington and shipped to Alaska. The firm became attracted to the Hoquiam site in 1975 and in early 1977 signed its third 6-month lease option to occupy the area after it has been prepared by PGH. The Hoquiam site is only about half as large as the optimum size site for this planned use, but the site meets all of Kaiser's other qualifications. Kaiser is presently awaiting its first contract to build an offshore platform for use in Alaska.

16. U.S. Senator Henry Jackson. Senator Jackson is a good friend of the General Manager of PGH, who had waited for years to find the right opportunity to develop the Hoquiam site for industrial use. The coincidence of the energy shortage and Kaiser's planned use of the site, which was energy-related and water-dependent, prompted the Port Manager to enlist the aid of Senator Jackson to help to remove the objections that had been presented by Federal environmental agencies. Senator Jackson complied and was instrumental in clearing the way for the construction and fill activities at the Hoquiam site.

17. U.S. Environmental Protection Agency. In May 1975 EPA objected to granting PGH a permit to fill the Hoquiam site, primarily because the originally proposed use, a sawmill and attendant facilities, was not water-dependent. The Regional Administrator of EPA was surprised to receive a June 1975 letter from Senator Jackson, rather than from the Corps or PGH, asking why EPA was opposed to the energy-related water-dependent use proposed for the site. Since a sawmill would not fit that description, the Senator's letter was the first indication to EPA that plans for the eventual use of the site had been changed! At a July 1975 meeting among representatives of Senator Jackson's staff and officials of EPA Region X, the U.S. Fish and Wildlife Service, PGH, and Kaiser Steel, it was disclosed that the site would be used for construction of offshore drilling rigs. EPA tried unsuccessfully to find an alternative site for the Kaiser facility, which the Agency feared would not be built in Hoquiam even after the site was filled. In the meantime EPA was under pressure to approve plans for constructing an energy-related industrial facility, at a time when there was an acute public awareness of the energy crisis. They were being forced to make a trade-off: loss of a salt marsh for increased domestic oil production. There was some concern, however, that even this might not occur since Kaiser only had a lease option. Furthermore, EPA realized that there was no way that they could force PGH to obtain a solid commitment from Kaiser. So, when PGH signed Resolution No. 1673 guaranteeing a water-dependent use for the site, EPA had lost its grounds for witholding approval. In December 1975 EPA sent a letter to the Corps formally withdrawing its objection to the permit.

18. U.S. Fish and Wildlife Service. As early as 1973 FWS was objecting to the piecemeal filling of the Grays Harbor estuary. When PGH applied for a Corps permit to fill the Hoquiam site to build a sawmill, FWS objected, partly because there was no comprehensive plan of the area and partly because an alternative site was already available for a sawmill. The FWS situation matches the EPA situation, with both agencies receiving Congressional inquiries from Senator Jackson and attending the meeting of July 1975. At the meeting, the FWS suggested

that a comprehensive plan be drawn up for the Grays Harbor estuary. PGH agreed that such a plan was needed and in December 1975 the Grays Harbor Estuary Planning Task Force was established in order to develop a comprehensive plan for future filling of the estuary. FWS officially withdrew its objection in December 1975.

19. Washington Department of Ecology. DOE administers the Shoreline Management Act and water pollution control laws for the State of Washington. The Department approves shoreline management permits and certifies water quality related to dredge and fill operations. The approval of shoreline management permits occurs only after DOE has reviewed and accepted a comprehensive plan which includes the area involved. In May 1975, the City of Hoquiam issued a shoreline management permit to PGH. DOE did not approve and appealed to the Shoreline Hearing Board. One problem was that the city had not yet approved its own comprehensive plan. There were other problems, including water quality and the use of the site. A conference, rather than a hearing, was held on DOE's appeal in September 1975. Later that same year DOE sent a letter to PGH stating that in order to get water quality certification the Port must agree to (1) use maintenance dredged material, (2) monitor DO and SS, and (3) make sure that the site is adequately diked and weired. PGH agreed to all three conditions and in December 1975 water quality cerfication was granted.

20. Washington Department of Natural Resources. DNR is the Washington State agency with management responsibility for State-owned shorelands and bottomlands. As established in the State constitution, DNR holds in trust all of the bottomlands below extreme low tide. PGH has applied for a Harbor Area Lease from DNR, since the dike abuts the harbor line and use of the facilities requires the lease. This lease has not yet been granted, but there do not appear to be any difficulties associated with the application. The lease, when granted, will be for 30 years, commencing August 1976. Ordinarily, DNR would also require an easement and a permit to purchase valuable material, but these are not required in this case since the fill is from maintenance dredging of a Federally authorized channel.

21. Environmental groups. Environmental groups, such as Friends of the Earth, the Sierra Club, and the Washington Environmental Council were very much upset about the filling of the Hoquiam site. The environmentalists were concerned about the loss of wetlands in the area and wanted very much to see the project halted. However, since it became clear that they would not be successful in stopping the project, they adopted a new position: if a permit is to be granted, then make sure that the site will be utilized for energy-related water-dependent purposes. This would be consistent with the EIS, which is clearly directed toward Kaiser's use of the site. The environmentalists felt that if the trade-off was going to be loss of some wetlands for reduced national dependence upon foreign fuels, then the terms of the trade-off should be specified in the permit, and PGH should not be allowed to fill the site and then change the use. Incidentally, these environmental groups were extremely active in the successful attempt to convince the District Engineer that an EIS was needed for this project.

Major issues addressed during implementation

22. Table I1 briefly describes the issues addressed by participants during the planning of the Hoquiam project. The major concerns raised were in the environmental, legal, and planning/implementation issue categories. The legal issue of conformance with EIS requirements and the planning issues of commitment to proposed land use plan and appropriateness of proposed use were principal reasons for the brief delays encountered.

Planning considerations affecting implementation

23. Table I2 summarizes the most significant physical planning elements of the Hoquiam project, assessed in terms of their impact on project implementation. For physical planning elements related to disposal facility planning, two key considerations exerting negative influence on implementation were that a rare wetland area would be destroyed and that the ecological characteristics of Grays Harbor would be altered. On the other hand, the site location had a positive

influence on disposal planning. For physical planning elements related to productive land use planning, two aspects were negative influences - foundation conditions and site size. Shipping access, however, had a real positive influence on the project.

24. There were three primary benefits anticipated from the successful development of the Hoquiam site by Kaiser Steel. First, the expected long-term economic benefits included an estimated 200 to 500 new permanent jobs in an industry that would help diversify the economic base of the region. Second, the proposed land use would take maximum advantage of the site's location adjacent to a deepwater, unobstructed channel to the open ocean. Third, the proposed use was related to achievement of the national energy goal of reduced dependence on imported oil.

25. There were three major disadvantages associated with the project in terms of land use planning. First, the disposal of dredged material on the site would destroy a highly productive and rare wetland. Second, the implementation of the project would eliminate the only potential waterfront park site in the urban area of Hoquiam. Finally, the project required the destruction of the historic wood burner located on the site.

Key factors affecting implementation

26. The most important factors among the many considerations affecting the Hoquiam project are summarized in Table I3. Among the positive factors assisting implementation were the economic benefits of the project, political support, and site plan compatibility with the site. Key negative factors were the inadequacy of the EA, the lack of comprehensive harbor planning, and the lack of a serious evaluation of alternative sites.

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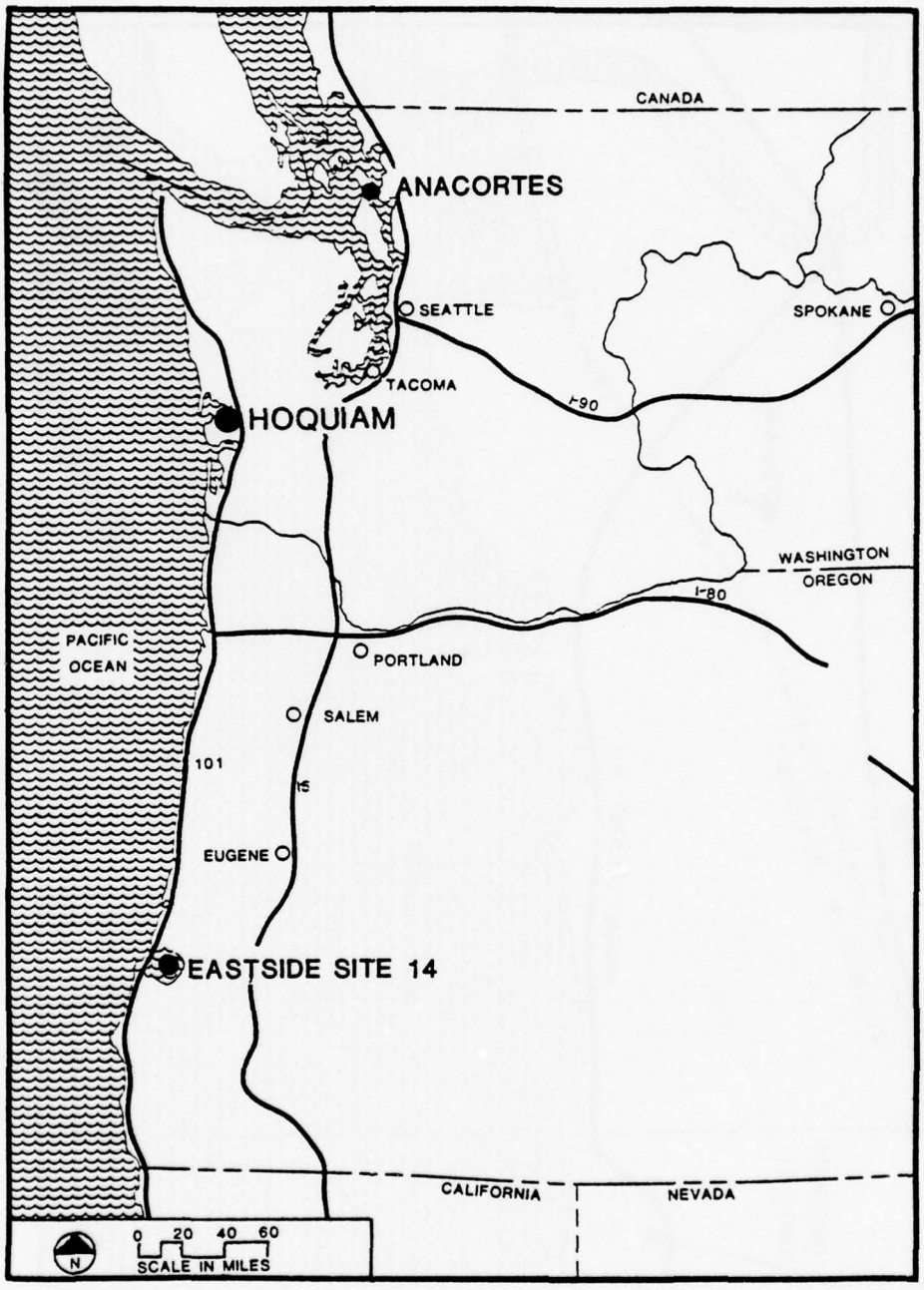


Figure I1. Location Map for Case Study No. 9 - Hoquiam

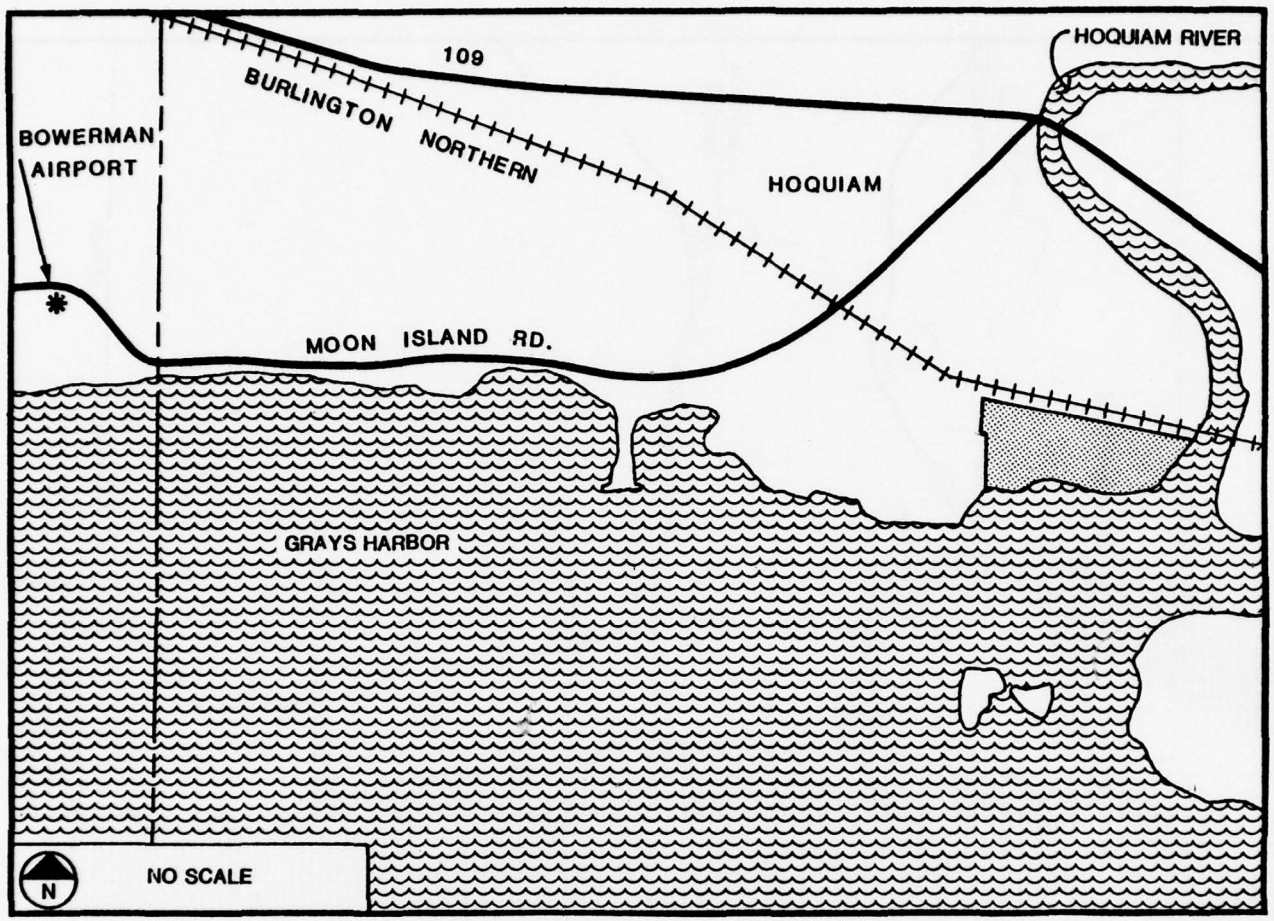


Figure I2. Hoquiam Site Map



Figure I3. Photo of Hoquiam Site at End of Dike Construction (January 1977)

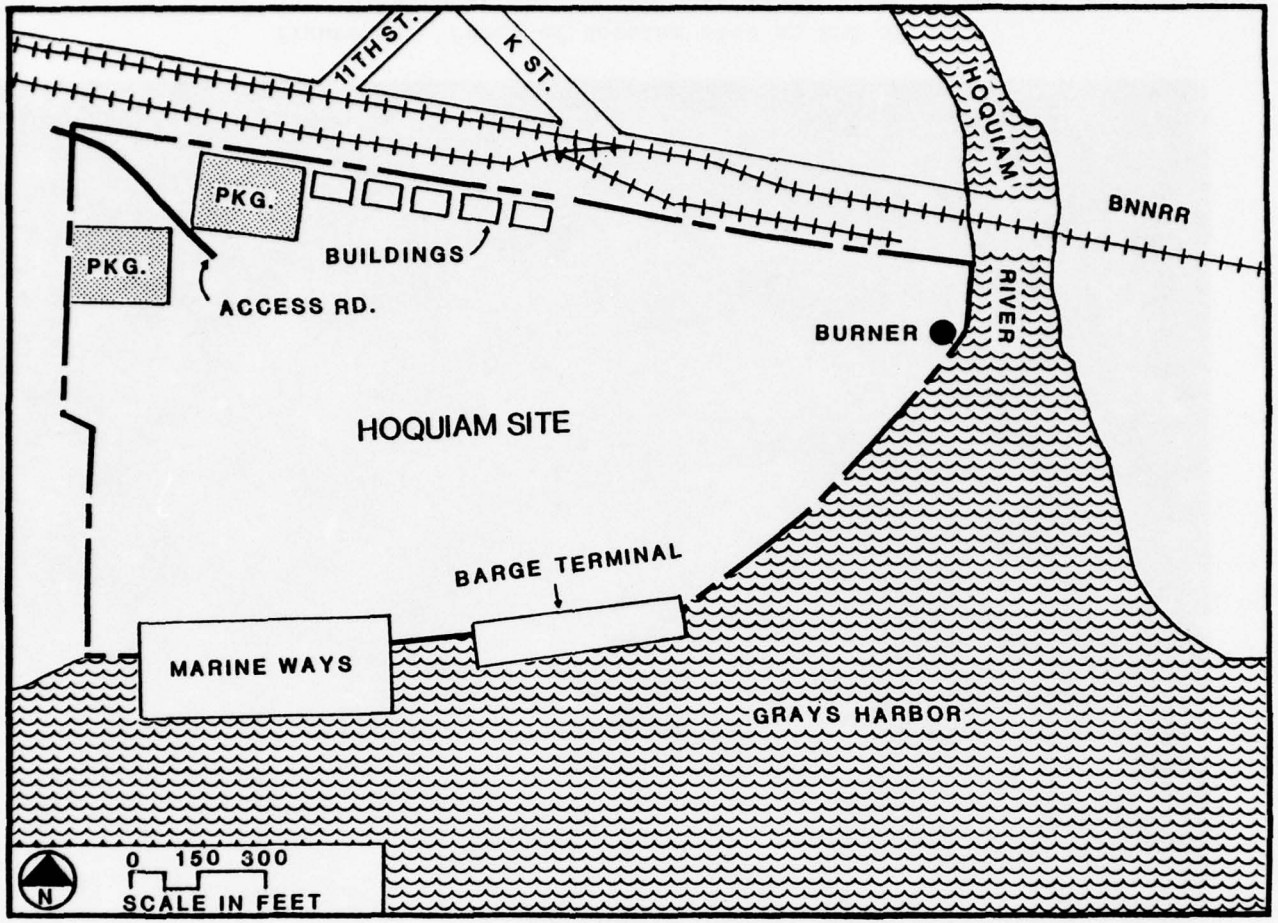


Figure I4. Hoquiam Productive Use Plan (Kaiser Steel Corporation, August 1975)

Pre-1975	1975	1975 (Cont.)	1976
1	5	9	13
2	6	10	14
3	7	11	15
4	8	12	

1. 63 - 64 - Port of Grays Harbor (PGH) acquires Hoquiam site (1963) and designates it as Industrial Development District #1 (1964).
2. Feb. 63 - Grays Harbor Area Comprehensive Plan shows Hoquiam site as industrial.
3. 63 - 65 - Corps occasionally uses site for maintenance dredging disposal.
4. Dec. 74 - PGH asks Corps to include Hoquiam site in 1975 dredging plan.
5. Feb. 75 - PGH applies for Federal Section 10/404 permit with planned use shown as sawmill, lumber storage, log lifting area, and deep port.
6. May 75 - EPA and FWS request permit denial. FWS cites lack of comprehensive planning, possible site use for waterfront recreation, and other available sawmill sites.
7. Jul. 75 - At the request of Senator Henry Jackson, a meeting was held to resolve EPA and FWS objections. Representatives of Senator Jackson and Senator Warren Magnuson attended the meeting, along with officials of PGH, EPA, FWS, and the Kaiser Steel Corporation. The Corps was not invited.
8. Aug. 75 - PGH submits revised Section 10/404 application with Kaiser Steel as co-applicant and planned use changed to manufacturing/assembly yard for offshore oil drilling platforms. Corps Engineering Division calls for EIS.
9. Sep. 75 - Corps accepts PGH offer to use Hoquiam site for maintenance disposal.
10. Oct. 75 - EPA outlines requirements for permit approval including permit conditioned on water dependent use of site.
11. Nov. 75 - FWS outlines requirements for permit approval, including EIS preparation, overriding national emergency, and a comprehensive plan of area development.
12. Dec. 75 - EPA and FWS withdraw objections to permit after PGH Resolution #1673 guarantees water dependent use and development of comprehensive estuary plan. Grays Harbor Estuary Planning Task Force is established.
13. Jan. 76 - Corps holds public meeting to consider need for EIS. Despite PGH objections EIS preparation is ordered. Draft EIS circulated May 1976, final EIS filed July 1976.
14. Aug. 76 - Corps issues Section 10/404 permit to PGH alone, specifying that if planned use described in application is not realized then revised development plan will be submitted for Corps review.
15. Oct. 76 - Dike construction begins at Hoquiam site (completed Jan. 1977).

Figure I5. Case Study No. 9 - Hoquiam - Chronology of Events

Table I1

Case Study No. 9 - Hoquiam: Major Issues Addressed During Implementation

Issue Categories	Issue Descriptions
Environmental	
1. Wetlands filling	Part of the Hoquiam site was a rare kind of marsh. Numerous environmental groups objected to its being filled.
Legal	
1. Conformance with EIS requirements	It was unclear whether or not an EIS was required for the project. EPA and others objected to the adequacy an environmental assessment prepared by the project sponsor - the Port of Grays Harbor (PGH). A public meeting was held and the District Engineer ordered that an EIS be prepared.
2. Adequacy of environmental impact assessment	PGH prepared an EA that was widely denounced as being essentially just a checklist of impact areas. Corps eventually decided, after all other major objections were resolved, to prepare an EIS.
Planning/Implementation	
1. Dredging project design limits	The proposed project included dredging below authorized depths to obtain sufficient quantities of fill material. Environmental groups opposed so-called "advanced dredging" to fill the site.
3. Long-range waterway/environmental planning	At the insistence of FWS and EPA the Grays Harbor Estuary Planning Task Force was established to develop an estuary-wide development plan. Formation of the Task Force helped assuage EPA/FWS objections.
4. Evaluation of alternative disposal areas	Several agencies and groups tried to get PGH and the Corps to consider alternative sites for the proposed Kaiser facility land use. No serious effort was made to locate other sites, however.
7. Appropriateness of proposed use: water dependent	The initially proposed planned use was a sawmill against which there were many objections. The present planned use is unquestionably water dependent, a characteristic felt to be essential by environmental groups and agencies.
9. Commitment to proposed land use plan	The present plan calls for the site to be used by Kaiser Steel Corporation. There is widespread doubt about whether or not Kaiser will, in fact, use the site after it is filled. Also, the Federal dredge and fill permit, although applied for jointly by PGH and Kaiser, was issued only to PGH.

Table I2

Case Study No. 9 - Hoquiam

Physical Planning Elements Affecting Project Implementation

Physical Planning Elements	Influence	Element Descriptions
Elements Related to Disposal Facility Planning		
1. Pre-disposal site characteristics: wetland	Negative	Numerous environmental groups objected to the filling of the Hoquiam site because of the loss of more than 35 acres of wetland from the Grays Harbor Estuary.
2. Ecological characteristics	Negative	FWS and EPA were concerned about the piecemeal destruction of the environmentally sensitive Grays Harbor Estuary as a result of wetland filling. At the insistence of these groups, the Grays Harbor Estuary Planning Task Force was established to develop an estuary-wide development plan which would balance ecological considerations with economic development needs.
6. Disposal site location	Positive	The disposal site is located adjacent to the Grays Harbor Navigation Channel and within a prime industrial area of the City of Hoquiam. This made use of the site for industrial development highly attractive. Thus, there was strong local support for the project based on the potential economic benefits of the proposed productive use concept.
Elements Related to Productive Land Use Planning		
1. Foundation conditions	Negative	Building foundation conditions at the site were expected to be poor, requiring considerable site preparation and foundation costs. An initial potential developer of a sawmill facility chose an alternate site primarily because of the expected high foundation costs.
2. Shipping and boat access	Positive	The combination of the site access to Grays Harbor Navigation Channel and the proposed water-dependent use were primary factors aiding implementation.
3. Site size and configuration	Negative	Although the site had many desirable characteristics, it was considered to be very small for the proposed Kaiser Steel facility. As a result of this problem, Kaiser Steel maintained options on another larger site in Puget Sound, and a firm commitment to develop the Hoquiam site was never made.

Table I3

Case Study No. 9 - Hoquiam: Key Factors Affecting Project Implementation

Factor Categories	Influence	Factor Descriptions
Economic/Financial		
1. Economic or social benefits (costs) of disposal-productive use project	Positive	The proposed use was seen as important in terms of U.S. energy independence efforts. Also, the project would add jobs in the area.
Legal		
2. Adequacy of environmental impact assessment	Negative	At request of FWS, the Corps reassessed its EA and decided to prepare an EIS after the Section 10/404 permit had been issued.
5. Land-use restrictions	Negative	Various agencies objected to the original proposed use of the site as a sawmill and related facilities. It was required that the site be restricted to water-dependent use.
Institutional		
3. Coordination with review/regulatory agencies	Positive	The coordination took the form of political pressure, without which the project would not have been given approval by EPA and FWS.
7. Political, business, and public support	Positive	There was public support for the project, but the single most important factor in the implementation process was the political pressure applied by Senator Henry Jackson.
Planning/Implementation		
2. Long-range waterway/environmental planning	Negative	Several agencies objected to the lack of harbor planning. The Grays Harbor Estuary Planning Task Force was the direct result of the FWS request for a comprehensive plan.
6. Evaluation of alternative disposal areas	Negative	No serious effort was made to evaluate alternative sites for the Kaiser project even though the Hoquiam site had already been informally rejected by the Corps. The site was not even mentioned in the Corps' areawide general EIS on potential disposal sites published in April 1975.
11. Proposed site plan compatibility with site physical features and user requirements	Positive	The proposed use for the site is water-dependent, as required by State and Federal agencies. One problem, however, is that the site is only 45 acres, and Kaiser steel claims to ideally need 100 acres for its facility.
12. Commitment to proposed land use plan	Positive	The Hoquiam tract had been earmarked for industrial use ever since acquired by PGH in 1963.

APPENDIX J: SYNOPSIS OF CASE STUDY NO. 10 - FORT MIFFLIN - PHILADELPHIA, PENNSYLVANIA

Background Summary

Introduction

1. The Fort Mifflin disposal area is located at the confluence of the Delaware and Schuylkill Rivers in the City of Philadelphia, Pennsylvania (Figure J1). The 298-acre site is part of a larger tract of land called the Fort Mifflin Reservation, which is approximately 450 acres in size. The majority of land on the Reservation is under the ownership of the U.S. Government except for 42 acres of land at the southern end owned by the city and preserved as a historic site. The Fort Mifflin site has been utilized for containing dredged material from the Delaware and Schuylkill Rivers since the early 1800's. Its location near extremely active shoaling areas make it particularly advantageous for use as a disposal facility.

2. The Philadelphia District anticipates using the Fort Mifflin disposal site for containing material dredged from the Schuylkill and Delaware Rivers until the year 2000. Their plan, proposed in 1974, called for diking the entire 298-acre site to a height of 40 feet, 13 feet higher than existing dikes. This proposal has stirred much controversy, with several agencies and organizations openly opposed. The general consensus reached by most objectors to the Corps' plan is that continuous disposal of dredged material onto the Fort Mifflin site until the year 2000 will remove any opportunity to develop the site for marine-industrial use, a use for which the site is ideal. The City of Philadelphia, the Philadelphia Port Corporation, and the Philadelphia Industrial Development Corporation (PIDC) have recommended using an alternative disposal area, downstream of the Fort Mifflin site, called Hog Island. They contend that Hog Island could adequately replace the capacity remaining at Fort Mifflin (if diked to 40 feet) and is more environmentally acceptable. The Corps has previously investigated the Hog Island alternative, but strong local opposition

induced its rejection as a long-term disposal facility.

Site description and regional context

3. The Fort Mifflin site is an irregular-shaped tract of land bordered by the Schuylkill and Delaware Rivers to the north and east and south, and by a very large tract of industrial land to the west (Figure J2). Presently, the facility is diked in three distinct sections, known as Sections I, II, and III. Sections I and II (shown in Figure J3) combined total 139 acres while Section III contains 159 acres. Sections I and II are contained by a 27-foot dike and are filled to a level of 22 feet. Section III was recently constructed, a 20-foot dike being built in January 1977, and filled to a level of 10 feet.

4. Dredged material deposited onto these areas is typically highly organic silt and clay material with a high water content. Its poor drainage characteristics make it difficult to reuse as supportive fill material. The artificial 35-foot channel maintained by the Corps in the Schuylkill River generates approximately 500,000 cubic yards of dredged material annually for deposition at Fort Mifflin. In addition to receiving dredgings from the Schuylkill River, the Fort Mifflin site is also utilized as a containment facility for material dredged from the Delaware River. The waterways bordering the site are heavily used deep draft shipping lanes and major shoaling areas are located just to the north and south of the site. The sediment characteristics reflect the heavy industrial use of the water, both for transportation and for wastewater disposal. The unique orientation of the Fort Mifflin site, adjacent to both the Delaware and Schuylkill Rivers, has afforded low-cost disposal as part of an active maintenance dredging project.

5. The physical character of the site is dominated by an abundance of unvegetated ground dispersed with a few trees and cattails. A minor amount of terrestrial wildlife has been observed in the area. Several types of waterfowl are attracted to the marsh areas of the site, since these areas provide excellent nesting and feeding habitats for a variety of species. A diverse collection of fish and other aquatic organisms are supported in the waterways of the adjacent Delaware and

Schuylkill Rivers. However, the fish population has declined rapidly during the past decade due to degraded water quality resulting from the discharge of industrial and municipal wastes.

6. Economically, the Delaware River is critical to the Delaware Valley for shipping commercial products to and from the region. Shipping in the Delaware River has increased by more than 35 million short-tons in the last quarter century. Another indication of the importance of this waterway is the fact that 70 percent of all oil delivered to the east coast is transported via the Delaware Bay and River. In order to capitalize on its unique geographical situation, the region has established one of the most extensive conglomerations of active ports in the world. In fact, ports of the Delaware River lead the nation in total international commerce and rank second nationally and third internationally in total water-borne commerce. The largest industries in the Philadelphia area, which depend very heavily on deep draft shipping, are the oil and steel industries. These two activities alone have generated more than $2 billion per year to the area's economy.

7. The Fort Mifflin disposal site is, therefore, in the midst of a highly active industrial, commercial, transportation, and port area and is less than 5 miles from the busy commercial sectors of Philadelphia. Other properties immediately adjacent to the site include the Philadelphia International Airport to the southwest, a city-owned sewage disposal plant located on the large tract of industrial land along the northwestern perimeter, and a branch of the Penn Central Railroad along the immediate western edge. All types of major transportation access are quite abundant in the vicinity of the site. Interstate Route 95, Pennsylvania State Route 291, and a host of local transportation arteries, offer a variety of alternative routes which provide easy and quick access to the site.

Productive land use plan

8. There is no firm commitment at this time by any party, agency, or individual to productively develop the site (or any section thereof) after filling operations have ceased. The Corps has stated

that they are not particularly concerned with the ultimate use of the site, but rather their solicitude is in retaining the site until it is filled to its capacity (approximately by the year 2000 if dikes are raised to 40 feet and by 1985 as presently diked). However, the site has many characteristics that make it attractive in terms of a number of productive land use concepts. Perhaps the principal opportunity that exists is developing the filled site for industrial use. The site is large, is served by a variety of transportation facilities, has extensive frontage on both the Delaware and Schuylkill Rivers, and is situated in an industrial district, all of which make it almost perfect for industrial development. On the other hand, recreation parkland is extremely scarce, particularly in this vicinity of the City of Philadelphia, and it appears that the Fort Mifflin area could be developed as a valuable and useful recreational resource.

9. In 1975, at the request of the U.S. Department of the Interior, the Corps prepared a draft conceptual development plan of the Fort Mifflin area, roughly sketching one alternative design for use of the completed area. This plan, shown in Figure J4, was prepared in coordination with the Departments of Interior and Commerce, and with the National Marine Fisheries Service and envisions the area as open space and vegetated, accommodating interim public and wildlife land uses. Facilities which could be provided include camping areas, equestrian trails, bicycle paths, swimming pools, etc. A second preliminary productive use plan was prepared by the PIDC in February 1974. This plan depicts the area as an intensively developed industrial park supporting marine-related facilities and identifies several variations relating to the design of finished grades, storm water drainage and road patterns.

Project Implementation

Chronology

10. The process of implementing the Fort Mifflin project actually began over 100 years ago when the Corps first utilized the

site as a disposal area. However, for this study we will focus on a time span from 1960 to the present, the period in which the existing 298-acre Fort Mifflin disposal site has been under the complete control of the Corps of Engineers. The chronology of significant events is presented in Figure J5.

Participants

11. Important participants in the process of implementing the Fort Mifflin site included the following:

a. Philadelphia District, Corps of Engineers.

b. City of Philadelphia.

c. Philadelphia Industrial Development Corporation (PIDC).

d. Philadelphia Port Corporation.

e. U.S. Fish and Wildlife Service (FWS).

f. Environmental groups.

12. Philadelphia District. In 1969-70 the Corps developed preliminary plans for expansion of the Fort Mifflin site to extend its active life. These plans initially consisted simply of an area expansion (i.e., construction of Section III) but, during 1970-74, the option of raising the 27-foot Section I and II dikes to 40 feet was developed. In September 1974, the Corps issued a Public Notice and draft EIS describing the use of Fort Mifflin in relation to maintenance dredging operations in the Delaware and Schuylkill Rivers. Six months later, following a series of interagency meetings, the Corps released a revised draft EIS on the continuing maintenance activities associated with the Delaware River and adjacent waterways. At the request of the city, the Corps held a public hearing on 25 June 1975 to discuss the draft EIS, but particularly to debate the planned expansion of the Fort Mifflin disposal project in light of the city's desire to develop the site for industry as soon as possible. The public hearing was the first of several interagency coordination meetings held by the Corps to attempt to resolve the Fort Mifflin disposal-productive use dilemma. In late 1975 the Corps proposed a site development concept for implementation after the site is filled to capacity under the 40-foot dike plan. The Corps' concept shows the Fort Mifflin

site as an open-space, natural area with recreational facilities for public use. In 1976, at the city's request, the Corps ceased disposing in Sections I and II of the site and in January 1977 completed diking Section III. Disposal operations in Section III began in February 1977.

13. The City of Philadelphia. The city became highly involved in the Fort Mifflin project after receiving the initial draft EIS from the Corps in September 1974. City officials felt that the EIS failed to adequately address issues such as the adverse environmental and economic impacts of the plan to use the Fort Mifflin site as a long-term disposal facility. The city also felt that the EIS inadequately addressed alternative disposal sites and, therefore, requested a public hearing. At the June 1975 hearing, city officials openly expressed their view that long-term disposal of dredged material at the Fort Mifflin site is "totally unacceptable since it represents an irretrievable commitment of valuable land resources." The city took the position that the Fort Mifflin site, with its considerable size and locational advantages, should be developed for industry as soon as possible following suspension of disposal operations in Sections I and II. At the present time, the city is undertaking its own study of the use of Hog Island as an alternative disposal site to serve the needs of the Delaware and Schuylkill River area.

14. Philadelphia Industrial Development Corporation. In 1973 the PIDC commissioned the consulting firm Barton and Martin to prepare an engineering and planning study of the industrial development potential of the Fort Mifflin site. PIDC had been interested in the Fort Mifflin area for several years and, predictably, was very strongly opposed to the Corps' plan to extend the site's disposal life to the year 2000. PIDC officials have joined with the city in opposing the Corps' plan and supporting the industrial development plan.

15. Philadelphia Port Corporation. The primary function of the Port Corporation is to promote the improvement of existing ports and assist in developing new ones. Since the early 1970's, the Port has claimed that a new marine terminal is needed along the Delaware

River to handle increasing shipping volumes. They have identified the Fort Mifflin area as the best available site for constructing such facilities. The Port Corporation, like the city and the PIDC, feels that the action proposed by the Corps (diking to 40-foot height) would prohibit industrial development of the site, and is totally opposed to the continuing use of Fort Mifflin as a disposal facility.

16. U.S. Fish and Wildlife Service. In November 1974 the FWS sent a letter to the Corps recommending that "no material be placed on freshwater marsh areas within the proposed Section III of the Fort Mifflin disposal area." However, once the Corps responded that it was not feasible to separately dike each marsh area, FWS requested that the Corps plan to eventually develop the site as a wildlife sanctuary. The Corps agreed to prepare a master plan for the area, and the two agencies, working under the management of the Environmental Branch of the Philadelphia District, drafted a conceptual open-space development plan in December 1974. At this point in time FWS has no objection to the Corps' proposed action of utilizing the site as a disposal facility until the year 2000.

17. Environmental Groups. Environmentalists such as the Concerned Area Residents for the Preservation of Tinicum Marsh, Philadelphia Conservationists, Inc., and the Shackamaxon Society, Inc. have independently approached the Corps with the request that the Fort Mifflin site be used as a natural area, specifically a park or wildlife habitat. Each group was represented at the 1975 public hearing and has since been actively involved in trying to get the area developed as a recreational resource. They are not against the proposal to dike the site to elevation 40 feet; however, they would like to prevent Fort Mifflin from being used for industrial purposes.

Major issues addressed during implementation

18. Several different types of issues were raised by various participants during planning and implementation of the Fort Mifflin project. The principal reason for earlier delays in the implementation process was the legal issue of the adequacy of environmental impact

assessment. More recently, most of the controversy, resulting in the non-filling of portions of the site, stems from the technical issue of disposal area operating characteristics and the planning/implementation issue of commitment to planned use. Brief descriptions of all major issues associated with the Fort Mifflin case are given in Table J1.

Planning considerations affecting implementation

19. The most important physical planning elements of the Fort Mifflin project are summarized in Table J2, which asseses them in terms of their impact on project implementation, from the perspectives of (1) disposal facility planning and (2) productive land use planning. With respect to disposal planning a key consideration exerting negative influence in this case was that the disposal site location created strong interest in the site for industrial use by the City of Philadelphia. A positive element of disposal planning was the disposal site capacity (i.e., the availability of a large unfilled area for disposal), which permitted a temporary resolution of the Corps/city conflict with disposal plans. With respect to land use planning, foundation conditions were a negative element, while shipping access and excellent potential vehicular access were positive influences.

20. The two conceptual development plans that have been prepared for the Fort Mifflin site by the Corps and the PIDC contain both advantages and disadvantages in terms of land use planning. There are three major advantages. First, use of the site for industrial development and port terminal facilities (the PIDC plan) would maximize existing transportation and goods movement facilities. Second, industrial development of the site would increase the city's tax base and provide new employment opportunities. Finally, wildlife preservation and recreational use of the site (the Corps' plan) would provide for enhancement of regional open space resources.

21. There are three primary disadvantages to the plans. First, the negative air quality and noise impacts of the airport runway approach and I-95 severely detracts from the use of the site as proposed by the Corps. Second, development of the site for industrial

use of the site would require the development of an alternate dredged material disposal site to replace for the capacity lost as a result of not filling the Fort Mifflin site to its fullest, either with dikes of 27-(existing) or 40-(proposed) foot height.

Key factors affecting implementation

22. Table J3 summarizes the most important factors which affected (either positively or negatively) the implementation of the Fort Mifflin project. The single positive factor which has most significantly aided in the implementation of the industrial use plan for the site is the economic benefits of the proposed use concept. Among the factors which have negatively influenced the progress of the project are the dredged material structural properties and the Corps' evaluation of alternative disposal areas. Two other factors have had both a negative and positive effect on project implementation - facility design and operating characteristics and site size and configuration.

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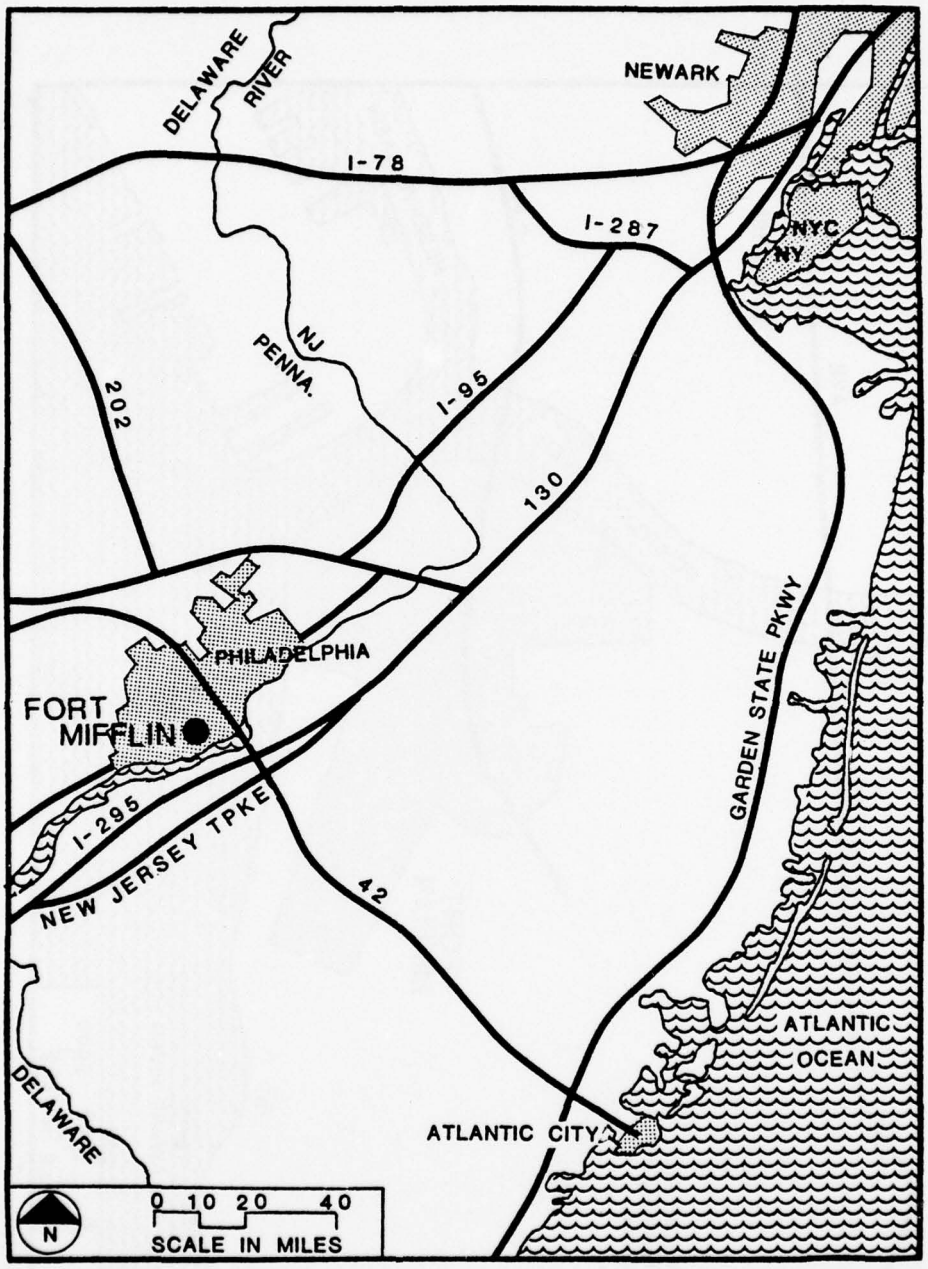


Figure J1. Location Map for Case Study No. 10 - Fort Mifflin

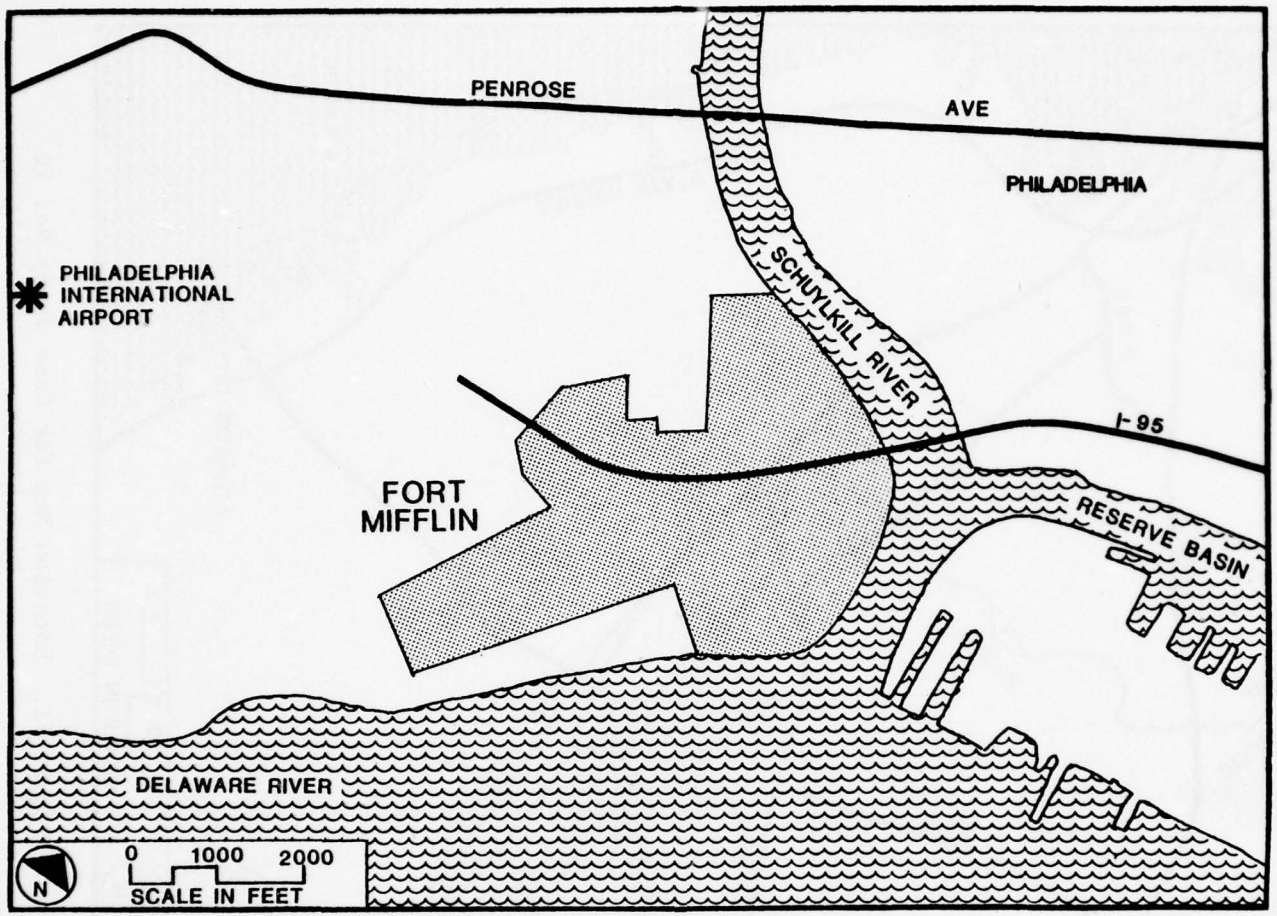


Figure J2. Fort Mifflin Site Map



Figure J3. Photo of Fort Mifflin Area,
Sections I and II (1976)

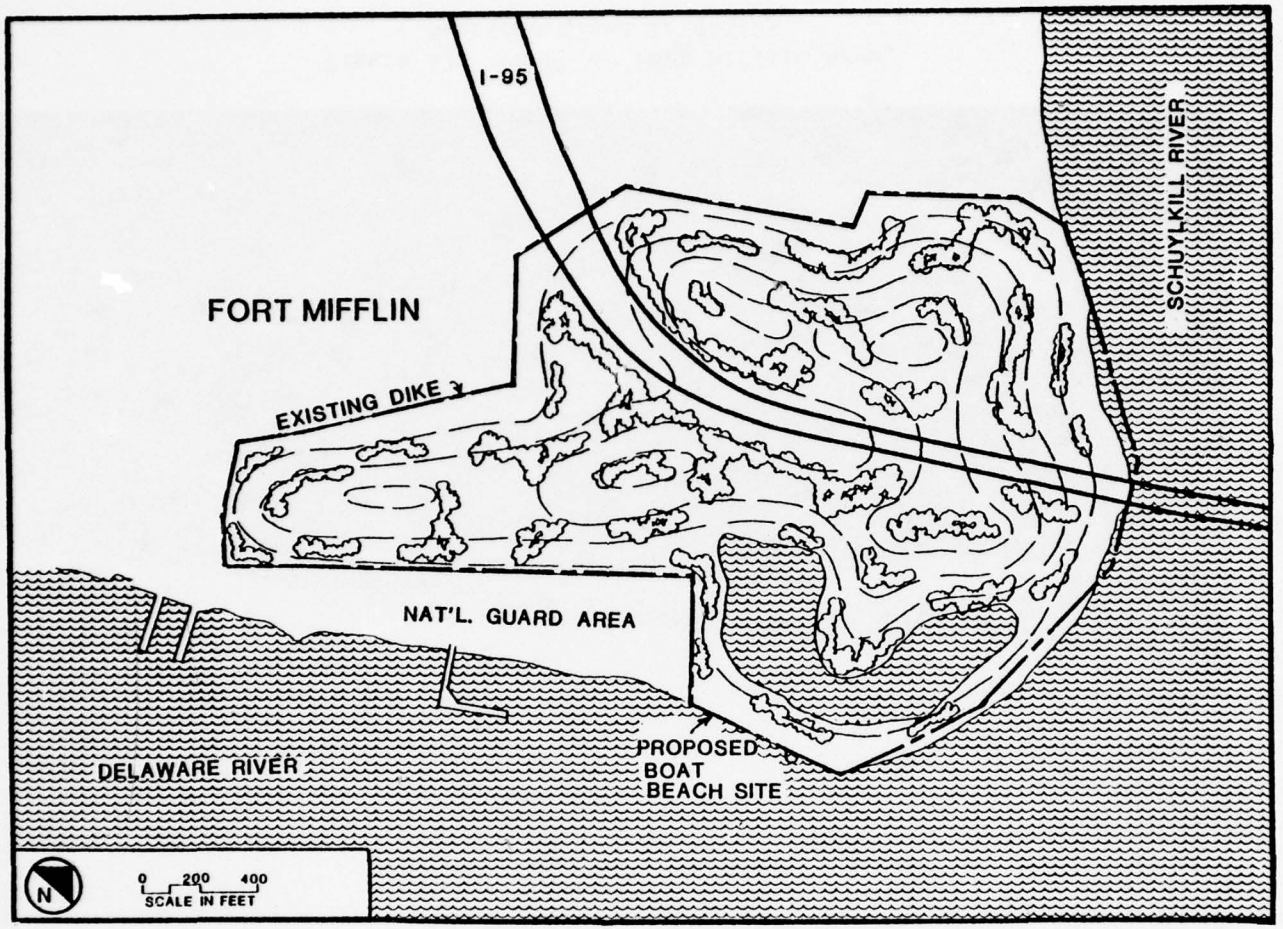


Figure J4. Fort Mifflin Conceptual Development Plan (Philadelphia District, Corps of Engineers, December 1975)

Pre-1974	1974	1975	1975 (Cont.)	1976-77
		5	10	
	2	6	11	14
1	3	7	12	15
	4	8	13	
		9		

1. 1960 - U.S. Navy abandons ammunition depot at Fort Mifflin and transfers land to the Corps. This parcel eventually becomes part of the Fort Mifflin disposal area.
2. Feb. 74 - An engineering study on the Fort Mifflin site recommends that it be developed as an industrial complex.
3. Sep. 74 - Corps issues Public Notice regarding maintenance dredging of the Delaware River - Philadelphia to the Sea Navigation Project. Draft EIS circulated for comment.
4. Oct. 74 - The City of Philadelphia requests a public hearing on the grounds that Corps DEIS inadequately addressed (1) alternative disposal sites, and (2) regional economic and environmental impacts.
5. Jan. 75 - Corps holds coordination meeting with FWS, EPA, Dept. of Commerce and NMFS to discuss their concerns relative to the Fort Mifflin area. Corps agrees to develop a management plan for the area.
6. Apr. 75 - Corps holds meeting with city and Port Corporation. Both the city and Port desire the Fort Mifflin area for a third marine terminal, and express willingness to build an alternative disposal area for Corps use behind Tinicum Island in exchange for the Fort Mifflin site.
7. Apr. 75 - Corps releases revised draft EIS for comment.
8. Apr. 75 - City again requests a formal public hearing on the draft EIS.
9. Jun. 75 - Public hearing held. The city, Port Corporation, and the Industrial Development Commission strongly oppose the Corps' continuing use of the Fort Mifflin site as a disposal facility, saying it is now ripe for industrial development. Environmental groups recommend that the area be used as open space and not converted to industrial or commercial use.
10. Jun. 75 - In-house Corps correspondence states that disposal at Fort Mifflin site meets a valid public requirement. However, there is a real obligation on the Corps' part to satisfy FWS objectives in developing a management plan for the area.
11. Sep. 75 - City requests that Corps cease filling Sections I and II of the Fort Mifflin disposal area. City is not opposed to filling Section III, providing it is not filled to a height which precludes reuse of the area.
12. Oct. 75 - Corps responds to the city's request by suspending filling activities in Sections I and II.
13. Dec. 75 - Corps prepares a draft conceptual development plan which shows the anticipated use of the Fort Mifflin area as recreational.
14. Jan. 77 - Corps concludes diking Section III of the disposal area and disposal begins shortly thereafter.
15. Apr. 77 - Corps informs Delaware Valley Council that there are no environmentally acceptable and economically feasible disposal sites available in the Fort Mifflin area to replace existing disposal facilities. Corps intends to maximize remaining life of existing disposal areas.

Figure J5. Case Study No. 10 - Fort Mifflin - Chronology of Events

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CASE STUDIES AND COMPARATIVE ANALYSES OF ISSUES ASSOCIATED WITH--ETC(U)
DEC 77 J J GUSHUE, K M KREUTZIGER DACW39-76-C-0127
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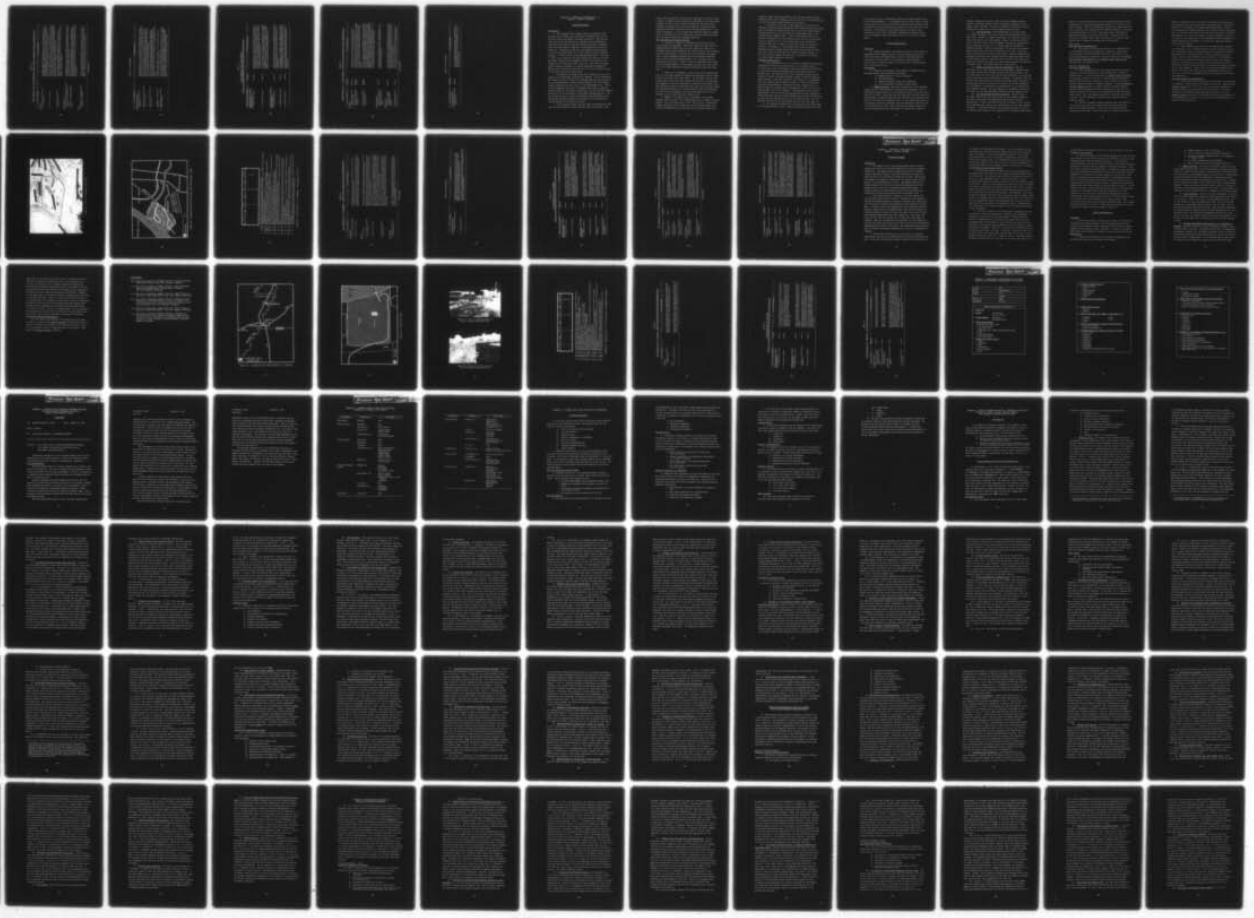


Table J1

Case Study No. 10 - Fort Mifflin: Major Issues Addressed During Implementation

Issue Categories	Issue Descriptions
Technical	
2. Site foundation conditions (for planned use)	The dredged sediments being deposited in the site are of poor quality, consisting primarily of silty-clay particles. The Philadelphia Industrial Development Commission (PIDC) is very concerned about the structural character of the material and believes that it will present a problem for productive site development, especially if the use is industrial.
4. Disposal area capacity	Officials of the city, the Port Corp., and the PIDC feel that continued use of the Fort Mifflin site for disposal will preclude industrial development for at least the next 25 years. They contend also that the proposed filling height of 40 feet will make future development virtually impossible, and will adversely affect development of adjacent tracts.
6. Disposal area operating characteristics	The FWS and several environmental groups desired to use part of the site as a wildlife refuge while the Corps deposited material onto other portions. The Corps refused on the basis that such use would interfere with dredging and disposal operations.
Economic/Financial	
1. Economic or social benefits (costs) of the disposal-productive use project	A PIDC-sponsored study by Barton and Martin Consulting Engineers found that if developed for industry, the site would provide $5M annual tax revenue to the city as well as over 14,000 new jobs.
5. Additional dredging or disposal costs	The Corps has persistently questioned the city as to responsibility for added costs of using any alternative site for disposal of dredged material from the Delaware and Schuylkill Rivers. The city has agreed to pay a portion of any extra costs, but feels that a 50/50 cost sharing with the Corps is appropriate.
Legal	
2. Adequacy of environmental impact assessment or statement	The city requested a public hearing on the basis that the Corps' draft EIS did not adequately address the issues of (1) environmental and economic impacts of the action on the Delaware region, and (2) disposal site alternatives. As of June 1977 these issues have not been resolved.

(Continued)

Table J1 (Concluded)

Issue Categories	Issue Descriptions
Planning/Implementation	
4. Evaluation of alternative disposal areas	The Corps insists there are no feasible alternative disposal areas along the Delaware River. The city feels that all options have not been fully evaluated and has undertaken its own study of disposal area alternatives.
6. Appropriateness of proposed use: public vs. private	There is great disagreement as to the appropriate site use. The city favors a 1974 marine terminal concept (near-term development) while the Corps favors a 1975 natural, open space concept based on continued disposal for another 20 years (long-term development).
8. Planned use compatibility with adjacent uses	The city's industrial use plan has much political and business support since the site is located away from residential areas, is adjacent to existing industrial areas, and is serviced by all major transportation modes. The Corps' recreational use concept is less appealing for the same reasons.
9. Commitment to proposed land use plan	City/Corps disagreement over the use of the site and when it would be used is the major issue in this case.
10. Responsibility for economic impact assessment	To date, only one economic impact analysis of industrial use of the site has been performed, that sponsored by the PIDC. The Port Corp. suggested that the Corps do a cost-benefit comparison of industrial development (marine terminal) vs. added costs of disposing at an alternative downstream site. The Corps' draft EIS did not address this issue.

Table J2

Case Study No. 10 - Fort Mifflin
Physical Planning Elements Affecting Project Implementation

Physical Planning Elements	Influence	Element Descriptions
Elements Related to Disposal Facility Planning		
3. Disposal site capacity	Positive	The availability of a large area (Section III) within the Fort Mifflin Reservation that had not yet been used for disposal was the primary reason the Corps agreed to cease filling operations in Sections I and II. This enabled the resolution of the site use conflict to be pursued at a moderate pace without disruption of waterway maintenance activities.
6. Disposal site location	Negative	The site's location, in the City of Philadelphia and in the heart of the city's river, rail, vehicular, and air service corridor, has generated very strong interest in its industrial development potential. This interest is, of course, counter to the Corps' desire to use the site as a long-term disposal facility.
Elements Related to Productive Land Use Planning		
1. Foundation conditions	Negative	Foundation conditions of the site are considered to be poor and would be worsened by the continued filling proposed by the Corps. Extensive site preparation work will be required to make the site buildable.
2. Shipping and boat access	Positive	The Philadelphia Port Corporation has recognized that the site's location adjacent to the Delaware River deepwater channel makes it an ideal candidate site for a third port terminal facility.
4. Vehicular circulation	Positive	The site has excellent potential vehicular circulation via I-95. This excellent access improves the site's attractiveness for industrial use.

Table J3

Case Study No. 10 - Fort Mifflin: Key Factors Affecting Project Implementation

Factor Categories	Influence	Factor Descriptions
Technical		
1. Dredged material structural properties	Negative	The poor quality of the fill will necessitate pile-supported foundations if the site is developed for heavy industry.
3. Disposal facility design and operating characteristics	Positive/ Negative	The Fort Mifflin site would have its useful disposal life extended by over 20 years under a Corps plan to dike and fill to a height of 40 feet. Conversely, continued and long-term disposal will certainly delay, and perhaps preclude, productive development of the site.
4. Site size and configuration (as related to productive use)	Positive/ Negative	The site's location, size and orientation to adjacent waters make it ideal for dredged material disposal and the Corps would like to use it for disposal for another 20 years. However, various city officials, especially the PIDC, feel the site is ideal for near-term industrial development. Also, they feel that long-term use of the site for disposal will negate a major opportunity for economic advancement. The FWS and several environmental groups feel the site should be developed as an open-space area since it serves as a feeding and nesting ground for migratory waterfowl.
Economic/Financial		
1. Economic or social benefits (costs) of the disposal-productive use project	Positive	Economic benefits estimated to accompany site development as a marine terminal include $5M tax revenue and $150M personal income per year, and 14,000 new jobs.
Institutional		
5. Procedures for identifying and resolving objections to the project	Negative	The Corps has viewed the Fort Mifflin site with the idea of using it to serve maintenance dredging disposal needs until the year 2000. These plans have not been well-publicized, with the result that the site use controversy was not faced as early as it could have been and is still unresolved.
7. Political, business and public support	Positive	Local political and business interests are highly supportive of the city plan to develop the site as a major marine terminal.

(Continued)

Table J3 (Concluded)

Factor Categories	Influence	Factor Descriptions
Planning/Implementation		
6. Evaluation of alternative disposal areas	Negative	The city contended that the Corps failed to investigate all potential disposal sites along the Delaware River. A public hearing was requested and the city eventually undertook its own alternate site review.

APPENDIX K: SYNOPSIS OF CASE STUDY NO. 11 - RIVERGATE - MEMPHIS, TENNESSEE

Background Summary

Introduction

1. The Rivergate diked disposal area is a privately owned 425-acre tract located on the east shore of McKellar Lake, in the southwest section of Memphis, Tennessee (Figure K1). The site was first used in the late 1950's as a disposal area for maintenance dredged material from the Federally authorized channel in McKellar Lake, which was formed in 1946 when a Mississippi River chute was sealed off. Beginning in 1958, the Corps deposited approximately 1 million cubic yards (MCY) on the site during 15 years of periodic dredging. In 1973 the site owner requested permission to construct a 1-mile long by 600-feet wide canal through the center of the site. This canal (Figure K2) was dredged in 1974-75 and resulted in the placement of an additional 6 MCY on the site. The owner has subsequently requested permission to perform supplemental dredging in McKellar Lake in order to bring the site to its final elevation above the 100-year flood level (227.9 feet).

2. The Memphis and Shelby County Port Commission is the local sponsor for Corps dredging activities in Memphis. The Port Commission was founded in 1946, one year after Congress approved the sealing off of the Tennessee Chute, thereby creating McKellar Lake and a harbor channel protected from the currents of the Mississippi River. While the Port Commission was able to accommodate the Corps in supplying disposal areas for the channel construction, they did not have adequate facilities for the containment of maintenance dredged material. The Port sought the aid of a private developer, Belz Enterprises, which offered the adjacent Rivergate site and paid for the construction and maintenance of the dikes at the site.

3. The Rivergate property was once zoned for agricultural land uses, but was rezoned for heavy industrial use in the 1950's. The

current land use plan for the area, which was drawn up in 1975, shows a number of industrial sites served by a combination of railroad spurs, roadways, and the 3 miles of water frontage that the area offers. Rivergate is expected to be the only flood-free, river-rail-truck, completely developed industrial site on the Mississippi River in the State of Tennessee. As yet unidentified individual owners or tenants of water frontage sites will develop their own facilities and handle their own barge loading and unloading operations.

Site description and regional context

4. As shown in Figure K2, Rivergate has relatively flat to mildly undulating topography. Since the property has been used as a dredged material disposal site for years, early fill areas in the northwest portion have revegetated into dense shrub and tree thickets, while the more recently filled sections of the property are unvegetated. Steep embankments separate the water surfaces of McKellar Lake and the mile-long Rivergate Harbor (i.e., the canal) and the upland areas of the site. However, since the Mississipi River elevation varies approximately 50 feet between low water and flood conditions, the grade differential changes considerably with river elevation.

5. There was no development of any sort on the Rivergate site prior to the Corps' disposal of maintenance dredgings on the northwest section of the site in the late 1950's. As the Corps' activity continued, maps in the early 1960's showed that area as a tailings pond. The remainder of the site continued to be shown as flood plain, with some sections as much as 15 feet below the level of the 100-year flood. The intensified filling of the site during the 1970's has eliminated the area from the floodplain, with the lowest portion of the site expected to be 1.6 feet above the 100-year flood.

6. Memphis, the largest city in Tennessee, is the second largest inland river port on the Mississippi River in terms of freight handled - over 12 million tons in 1976. The city has a diversified economic structure, with a large share of total gross product originating from manufacturing industries such as textiles, lumber and

furniture, paper and allied products, and food and kindred products. Indications are that the Memphis area will continue to play its historic role as the primary economic center for the region.

7. Land uses in the area of the Rivergate site include an oil refinery to the north across Nonconnah Creek, open low-lying land to the east, the Johnston Railyard and the main line of the Illinois Central Gulf Railroad to the east and south, and a State-owned park to the southwest beyond Cypress Creek. Since the surrounding area is not limited to industrial use, the Rivergate site, which had little potential for productive use in its original state in the floodplain, could have been put to other uses had it been diked and filled differently. For example, a 1966 transportation study considered a proposed greenbelt parkway system that would have bisected the Rivergate site. Once the mile-long canal had been dredged, however, it was clear that the highest and best use for the site would involve only port-related industrial activities.

Productive land use plan

8. Belz Enterprises, in the mid-1950's, recognized the potential advantages of filling the Rivergate site to a developable level. For this reason, Belz volunteered to build and maintain the dikes used to contain the maintenance dredgings from the Federal channel in McKellar Lake. By the early 1970's Belz' development plans had progressed to include a man-made deepwater channel to provide industrial water frontage. Also, Belz wanted the site brought to a developable level more rapidly than the Corps was doing it. Both of these needs were met by the dredging of the mile-long harbor through the site, which tripled the available water frontage from 1 mile to 3 miles and provided some 6 MCY of fill material. Unfortunately, even this was insufficient to fill the site and so permission has been requested to obtain additional material from the McKellar Lake channel and shoreline in order to bring the entire site up to the desired level. The fill material used thus far has been mostly silt and clay, with some sand.

9. As indicated in Figure K3, the Rivergate site has some roads and utilities already in place. These and other facilities, which will

will be put in place, are designed solely for the heavy industrial use of the Rivergate Harbor. It is expected that all of the firms to occupy portions of the site will either directly need the water access or else be ancillary firms providing goods and services to the firms with water frontage. A key feature of the overall plan for the area is the availability of the three intermodal transportation elements (water, rail, and highway), which make industrial use of the site most appropriate.

Project Implementation

Chronology

10. Figure K4 presents a chronology of events in the process of implementing the Rivergate project. The chronology begins with the authorization for the Memphis Harbor project in 1946 and ends with the special conditions that will be attached to the developer's latest permit to conduct dredge and fill activities in McKellar Lake and on the Rivergate site.

Participants

11. Important participants in the process of implementing the Rivergate project have included the following:

a. Memphis District, Corps of Engineers.

b. Belz Enterprises.

c. Memphis and Shelby County Port Commission.

d. U.S. Environmental Protection Agency (EPA).

12. Memphis District. The Corps' primary role in the Rivergate project prior to 1974 consisted of depositing approximately 1 MCY of maintenance dredged material on the northwest portion of the site over a period of 15 years. Since that time the Corps has issued two permits to the developer to perform dredge and fill activities, involving more than 6 MCY, on the site and in McKellar Lake. A third permit application is now pending, which will apparently allow the developer to fill the site to the desired final level. While the Corps has worked closely with both the developer and the local sponsor to satisfy their needs for

expanded industrial facilities, this has left the Memphis District without a long-term disposal area for maintenance dredgings in the Federal harbor channels. The Corps is presently working with the Port Commission to secure such a site on nearby Treasure Island.

13. Belz Enterprises. Belz Enterprises, one of the largest real estate developers in the south, has owned the Rivergate site for many years. Because of economic uncertainty, the firm did not feel the need to develop the site very rapidly. However, by the early 1970's, when it was clear that the Port of Memphis was greatly increasing its annual tonnage and running out of suitable space for expansion, a decision was made to obtain a Corps permit to construct the Rivergate Harbor and fill the site with an expected 6.5 to 7 MCY. Since the harbor construction fell short of that amount, additional dredging was performed in McKellar Lake, somewhat below the authorized depth of the 12-foot Federal channel. When this still did not fill the site, Belz applied for another Corps permit to dredge along the water frontage area on McKellar Lake. This permit should be issued shortly.

14. Memphis and Shelby County Port Commission. The Port Commission, as the local sponsor of Corps activities in Memphis Harbor, has worked closely with the Corps and with Belz over the years. The Port knew about Belz' low-lying land and was instrumental in getting the firm to offer the site for maintenance dredgings. Furthermore, when the decision was made by Belz to increase the available water frontage by constructing a canal in the site, the Director of the Port Commission was instrumental in determining the configuration of the harbor which was ultimately dredged. The Port Commission is presently working with the Corps to find a new maintenance disposal area near McKellar Lake.

15. U.S. Environmental Protection Agency. The EPA reviews the Public Notices that the Corps issues for each Federal dredge and fill permit application and commented several times on the Belz applications. In April 1974 EPA pointed out the danger of silt buildup and recommended that a barrier be installed early in the canal dredging operation. In 1975 EPA objected to the proposed dredging for fill in the McKellar Lake channel on the grounds that it was public water bottom

being used for private benefit, and that the dredging schedule didn't correspond with the regular maintenance dredging, so it was not in the public interest. After a conversation with the Corps, EPA dropped the latter objection, but insisted that the dredging operation not go below the authorized depth of 12 feet. The Corps permit allowed Belz to dredge approximately 8 feet below that level. When Belz asked for permission to dredge 20 feet lower to get better fill material, EPA objected and the additional dredging did not take place.

Major issues
addressed during implementation

16. The primary issues that were raised in the implementation of the Rivergate project are summarized in Table K1. While these include issues in the environmental, technical, institutional, and planning/implementation categories, the major issues were the disposal area operating characteristics and dredging project design limits questions that were raised by EPA.

Planning considerations
affecting implementation

17. Table K2 summarizes the most important physical planning elements of the Rivergate project, with an assessment of impact on implementation. Of critical importance in disposal facility planning was the prime location of the site in terms of required dredging in McKellar Lake (a positive influence). Flood conditions represent a potential negative element in disposal planning. The prime productive land use planning elements include Rivergate's excellent shipping and boat access complementing nearby existing port facilities, its highly functional site plan, and its transportation modal advantages offering port, rail, and highway opportunities (all positive planning factors). The poor foundation conditions are a negative land use planning factor.

18. The Belz Investment Company prepared a port and industrial plan that had both local and regional planning implications with positive and negative effects. There were four positive effects generated from the plan. First, the site will satisfy port facility

demands in Memphis during a period when the Memphis and Shelby County Port Commission will lack port-oriented industrial space. Second, the dredging of a new harbor at Rivergate added approximately 2 miles of port frontage to the Memphis shipping area. Third, the plan illustrates the use of three on-site modes of goods movement desirable in industrial development: rail, port, and highway. Fourth, Rivergate is generally in accord with the objectives of the Comprehensive Plan for Memphis and Shelby Counties and is expected to increase both employment opportunities and tax revenues.

19. Three negative land use planning conditions have resulted from Rivergate. First, although the port facility complies with local and county planning goals it impedes efforts to implement the McKellar Lake segment of an open space/park corridor along Nonconnah Creek. Second, the port also conflicts with the objective of implementing a parkway, which was generally aligned to pass through the Rivergate property. And finally, very little public plan review has occurred during the Rivergate planning process. The subdivision approval process has not been necessary to date, which would provide opportunities for public plan review, and roads have been incrementally dedicated with little or no review by the Memphis Shelby County Planning and Development Commission.

Key factors affecting implementation

20. There were several key factors which affected the activities at Rivergate. These factors are displayed in Table K3. Among the many positive factors were (1) the high level of technical coordination between disposal plans and productive use plans, and (2) the Port Commission's long-range waterway development planning. The only negative factors concerned the relatively poor structural properties of the dredged material and the low level of project coordination with cognizant planning agencies.

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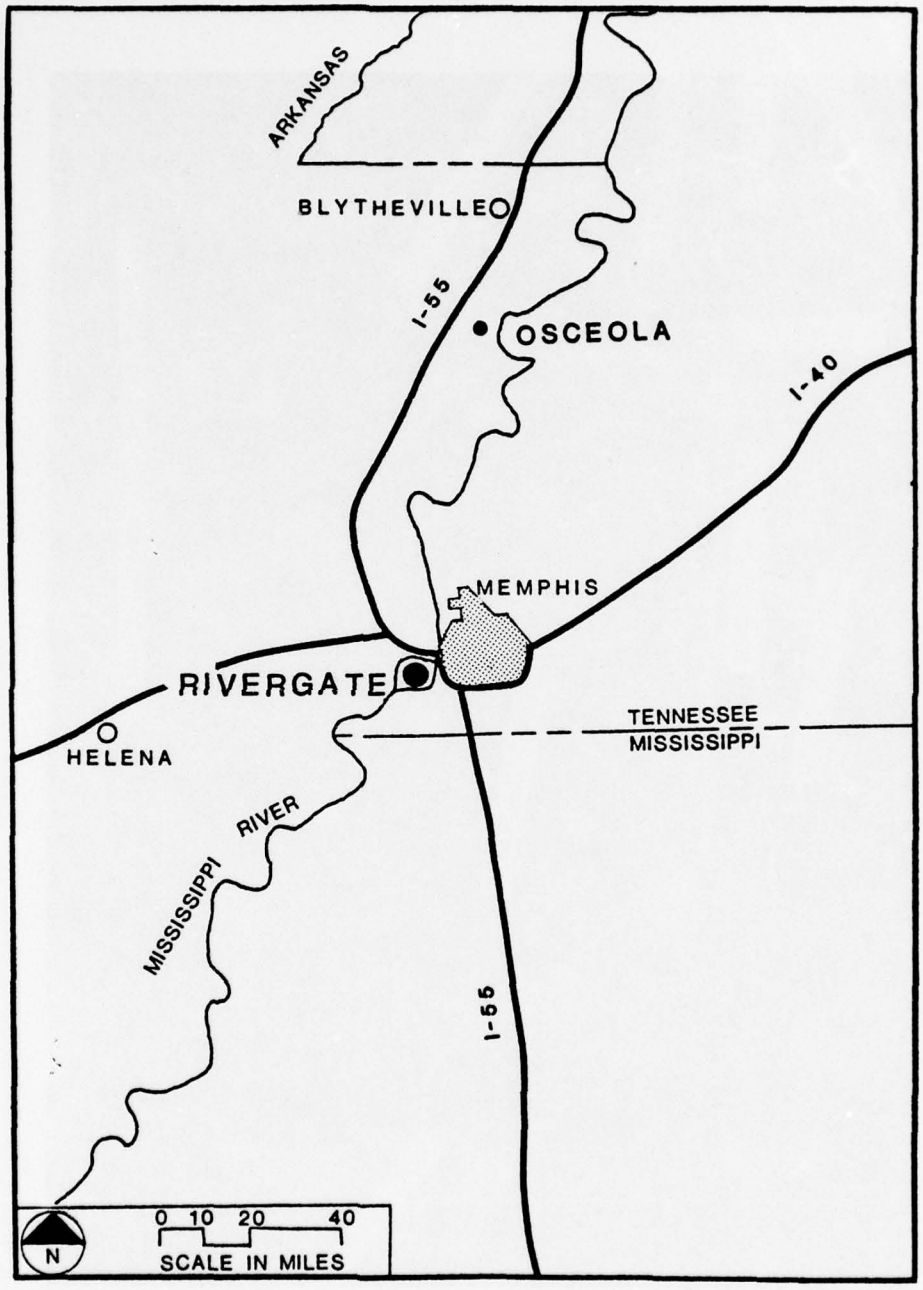


Figure K1. Location Map for Case Study No. 11 - Rivergate

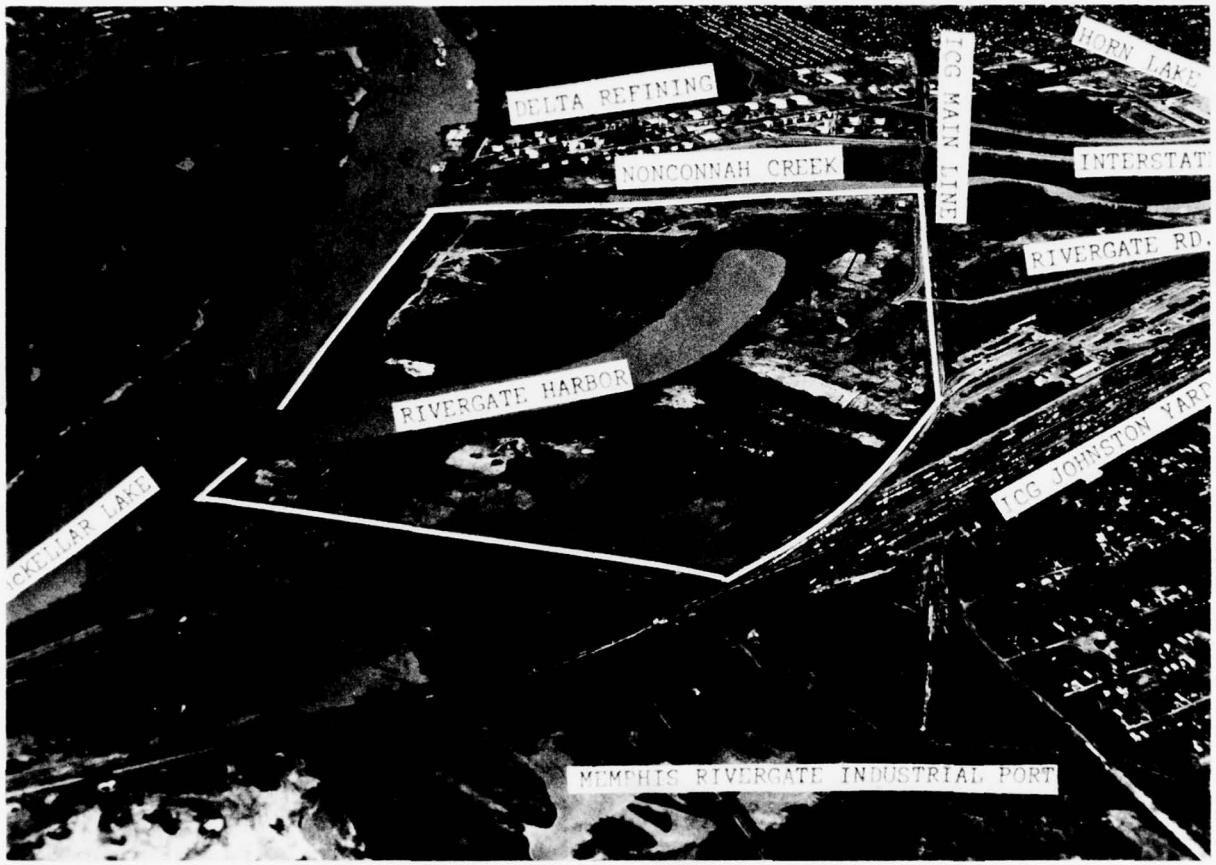


Figure K2. Photo of Rivergate Area (1975)

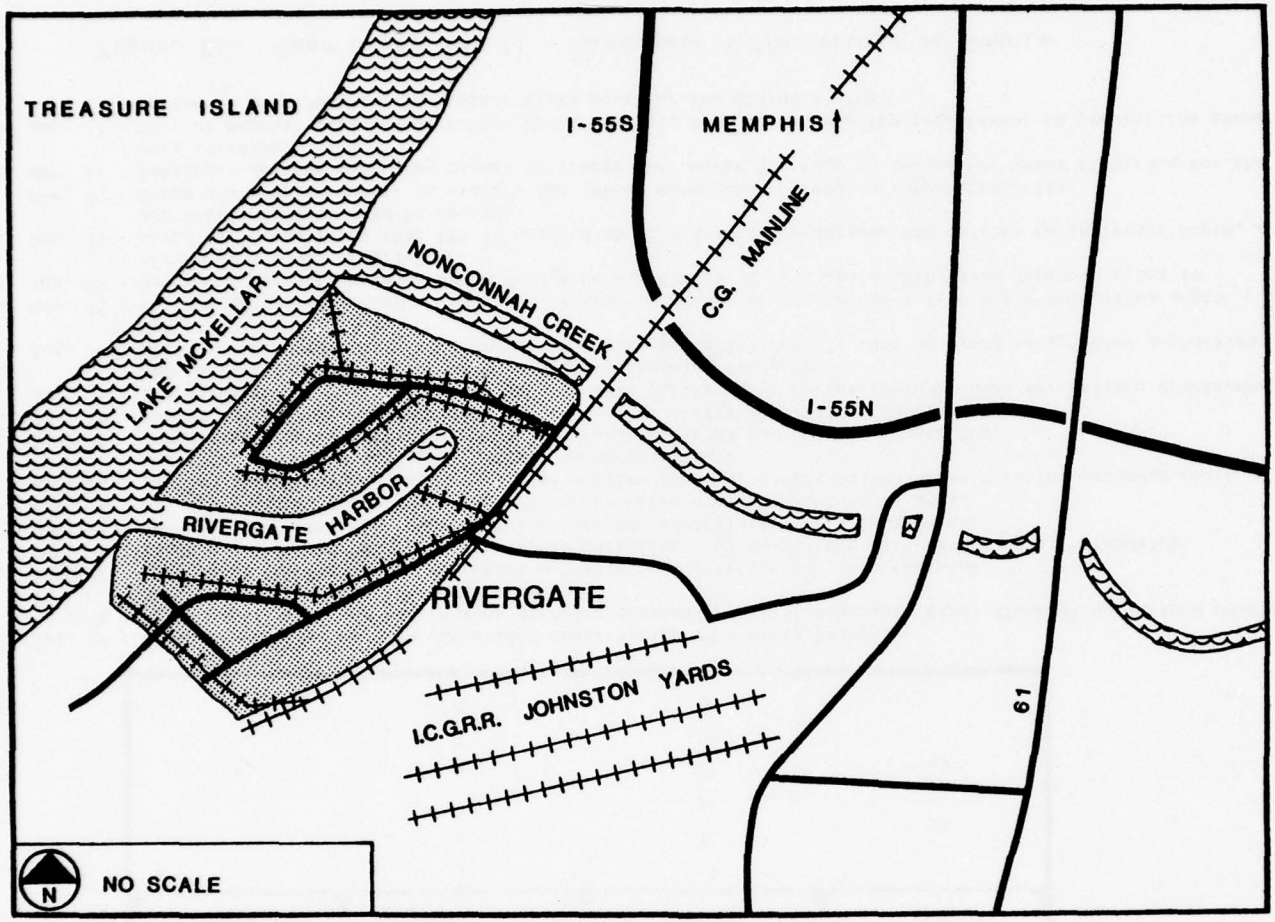
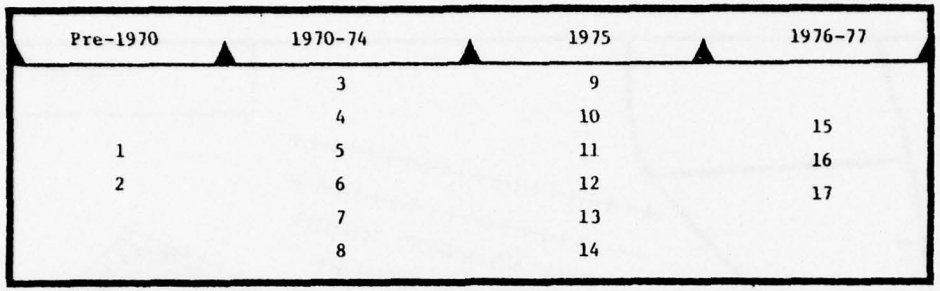


Figure K3. Rivergate Productive Use Plan (Belz Enterprises, 1976)



1. Jul. 46 - Flood Control Act of 1946 authorized construction of Memphis Harbor.
2. ~ 1958 - Dike construction and maintenance dredging disposal begin at Rivergate site; disposal operations continue throughout the 1960's and early 1970's.
3. 1970-71 - Site developer decides to construct a 1-mile by 600-foot canal into the site.
4. Feb. 74 - Tennessee Dept. of Public Health issues Certificate of Compliance with Water Quality Standards.
5. Feb. 74 - EPA approves canal construction but recommends installation of silt barrier.
6. Feb. 74 - FWS approves project but warns about future water quality problems in area.
7. Mar. 74 - Section 10/404 permit issued for canal construction; developer was to leave room for greenway north of the site, and avoid siltation buildup in McKellar Lake.
8. Apr. 74 - Corps visits canal site; recommended siltation barrier had not been installed.
9. Jun. 75 - Public Notice for developer's permit request to dredge for fill in McKellar Lake.
10. Jul. 75 - EPA objects to permit request on grounds that public water bottom would be used for private development and that timing did not fit with regularly scheduled dredging.
11. Aug. 75 - After Corps intervention EPA removes objection but still doesn't want dredging to go below authorized depths.
12. Sep. 75 - Section 10 permit issued, allowing developer to dredge approximately 8 feet below authorized depth.
13. Nov. 75 - Developer requests permission to dredge an additional 30 feet below authorized depth in order to obtain less silty material.
14. Dec. 75 - Corps tells developer that EPA is worried about anaerobic conditions and objects to increased depth; a new Public Notice would be required.
15. Mar. 76 - Corps and developer meet to clarify the Corps' maintenance dredging responsibilities.
16. Mar. 77 - Developer applies for Corps permit to dredge near water frontage to insure low water flotation for the port facility.
17. Jun. 77 - City of Memphis Division of Public Works requests that permit specify requirement to prevent the accumulation of silt deposits in Cypress Creek south of the disposal site.

Figure K4. Case Study No. 11 - Rivergate - Chronology of Events

Table K1

Case Study No. 11 - Rivergate: Major Issues Addressed During Implementation

Issue Categories	Issue Descriptions
Environmental	
3. Aquatic habitat disturbance	EPA expressed concern that deep dredging in McKellar Lake would disrupt the anaerobic conditions in the lake.
7. Changes in flow patterns	A large part of the area was in the floodplain, with some parts as much as 15 feet below the level of the 100 year flood. The filling of the site is expected to alter the flow of nearby Nonconnah Creek during flood stage.
Technical	
1. Dike stability	There was a brief period of dike failure on the south side of the site near Cypress Creek. This had to be repaired for filling to continue.
2. Site foundation conditions (for planned use)	The northwestern part of the site was filled with structurally sound sandy material, but much of the southern portion of the site was filled with a mixture of silt and sand, which is less desirable as a foundation for any kind of heavy industrial construction.
4. Disposal area capacity	The Corps had been using the site for discontinuous maintenance dredging for about 15 years. This only amounted to approximately 1 million cubic yards (MCY). The developer, who wanted to fill the site more rapidly, obtained a permit in 1974 to dredge a canal into the site and fill the site with an additional 6.5 MCY. The site still wasn't filled so an application has been made to obtain more material from Lake McKellar.
6. Disposal area operating characteristics	EPA recommended that a silt barrier be installed along the site's southern boundary. The City of Memphis DPW has asked that a special condition be attached to the developer's latest Section 10/404 permit, specifying that steps be taken to prevent the accumulation of silt deposits at the mouth of Cypress Creek.
Institutional	
3. Coordination with review/ regulatory agencies	The Memphis Shelby County Planning and Development Commission favors the proposed use of the Rivergate site, but they feel that they have been presented with a *fait accompli* with respect to such matters as street dedications within the site.

(Continued)

Table K1 (Concluded)

Issue Categories	Issue Descriptions
Planning/Implementation	
1. Dredging project design limits	The developer wanted better material than the mixture of silt and sand available within the authorized dredging limits of the channel in Lake McKellar. EPA objected to dredging below authorized limits to obtain higher quality material and such dredging never did occur.
2. Dredging project need	EPA also objected to dredging activities which would not be conducted during the regular maintenance dredging schedule, since such dredging would not be shown to be in the public interest.

Table K2

Case Study No. 11 - Rivergate
Physical Planning Elements Affecting Project Implementation

Physical Planning Elements	Influence	Element Description
Elements Related to Disposal Facility Planning		
6. Disposal site location	Positive	The Corps of Engineers was granted permission from the owner, the Belz Investment Company, to dispose of dredged material on land adjacent to McKellar Lake. The privately owned property was immediately adjacent to the channel being dredged.
7. Flood or tide conditions	Negative	Concern over possible future upstream flooding due to filling floodplain and diking in proximity to Nonconnah Creek was expressed by the Memphis Shelby County Office of Planning and Development. Primary concern was the possible restriction of upstream floodwater from draining into McKellar Lake.
Elements Related to Productive Use Planning		
1. Foundation conditions	Negative	Although fill deposited on the site is primarily of relatively high quality, certain areas have been filled with inferior material with high silt content. This may increase structural foundation costs.
2. Shipping and boat access	Positive	Intelligent site land use planning incorporating a dredged shipping harbor, Rivergate Harbor, has resulted in nearly three miles of port frontage. The additional shipping facilities are advocated by the Memphis and Shelby County Port Commission.
4. Vehicular circulation/traffic generation	Positive	Choice of goods movement tranportation modes including highway, rail and port are available at Rivergate. Traffic generation demands will be satisfied by a new industrial access road leading directly to a nearby Interstate 55 interchange.
8. Site plan compatibility with site features and user requirements	Positive	The site plan being implemented is functionally efficient and allows desirable flexibility to accommodate a range of industrial and port uses.

Table K3

Case Study No. 11 - Rivergate: Key Factors Affecting Project Implementation

Factor Categories	Influence	Factor Descriptions
Technical		
1. Dredged material structural properties	Negative	Some of the dredged material was very silty. The site owner wanted deeper dredging in McKellar Lake in order to obtain better material. EPA objected to this.
3. Disposal facility design and operating characteristics	Positive	The Rivergate site was large enough to contain some 15 years worth of fill from Corps maintenance dredging, as well as 6.5 MCY of material from the canal which the developer dredged in the middle of the site.
5. Technical coordination of disposal plan with productive use plan	Positive	The owner of the site is a private developer who wanted the site filled to a height suitable for use as a port industrial area. Corps disposal operations have been conducted in a manner consistent with the owner's wishes.
Economic/Financial		
1. Economic or social benefits (costs) of disposal-productive use project	Positive	The use of the Rivergate site will increase barge traffic on the main stem of the Mississippi and will fill the need for expanded industrial facilities in the port area of Memphis. The development of the site is considered to be important by the Port Commission, which presently has very little land left to continue the expansion of activities in the port.
5. Project sponsor capability to assume financial responsibilities	Positive	The developer of the Rivergate site is Belz Enterprises, which is one of the largest real estate developers in the south.

(Continued)

Table K3 (Concluded)

Factor Categories	Influence	Factor Descriptions
Institutional		
2. Coordination with project sponsor	Positive	The Memphis and Shelby County Port Commission is the local sponsor for Corps activities in Memphis. The officers of Belz Enterprises have worked closely with the Port Commission and the Corps for approximately 20 years.
3. Coordination with review/ regulatory agencies	Positive	The Corps was responsible for interagency coordination, which was carried out smoothly for all dredge and fill operations associated with the Rivergate site.
4. Coordination with planning agencies	Negative	The Memphis Shelby County Planning Commission originally had plans for a scenic highway through part of the Rivergate site. These plans had to be abandoned while plans for an extensive "green belt" area on both sides of Nonconnah Creek had to be modified because site filling was not carried out with planning agency review.
6. Corps and other participant attitudes	Positive	The developer thought that the permit procedure took longer than it should have. In fact, it seems that the extensive coordination required was handled as expeditiously as possible. There was unanimous agreement among the participants that the proposed productive use of the site is the highest and best use of that area.
Planning/Implementation		
2. Long-range waterway/ environmental planning	Positive	The Port Commission has almost no land presently available for expansion of port facilities. While some land is expected to be available in several years, the Rivergate site is the only area that will allow the port to meet the expected increase in demand for port activities during the next 17 years.
8. Proposed use compatibility with adjacent land uses	Positive	The site is zoned for heavy industry. Port related activity is concentrated in the area and this is clearly the best use of the site.
12. Commitment to proposed land use	Positive	The site owner has had plans for some kind of industrial port facilities for the Rivergate area since the late 1950's.

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APPENDIX L: SYNOPSIS OF CASE STUDY NO. 12 - OSCEOLA - OSCEOLA, ARKANSAS

Background Summary

Introduction

1. The Osceola site is a municipally-owned 40-acre confined disposal area located on the Mississippi River at Osceola, Arkansas (Figure L1). The disposal area was proposed as part of a Federal channel construction project, which was authorized in October 1971 under Section 107 of the River and Harbor Act of 1960. This project was designed to re-open the historic port of Osceola by providing a channel in an old bendway in the river. Development plans for the Osceola disposal site actually crystallized concurrently with the dredging plan as part of an overall port improvement project. A retaining dike was constructed during 1973-74 and the channel was dredged and the site filled during October and November 1974.

2. The Osceola Riverport Authority is the local sponsor for Corps dredging activities in the area. The Authority was created in 1965 for the express purpose of planning, financing, and constructing port and harbor facilities and overseeing related industrial development. In order to meet this responsibility and concurrently obtain a suitable disposal area for dredged material from the new channel, the Authority obtained 40 acres of land on the water side of the 170-mile long Arkansas Mississippi River levee (Figure L2). This levee runs along the west bank of the river for virtually the entire State of Arkansas. Thus far over $800,000 have been spent on land acquisition and port facilities construction at the site, with the city contributing approximately one-third of this total. The remainder has been obtained from the Economic Development Administration of the U.S. Department of Commerce.

3. The Osceola harbor site is in an area that is primarily agricultural, but due to the availability of slack water areas near the site, it was felt to be the most logical location for the construction

of industrial trans-shipment facilities. In the late 1960's the site was rezoned for industrial use and roadway access across the adjacent levee was obtained. A dock and warehouse (Figure L3) have already been constructed on the site and work is underway on a grain belt conveyor and loading tower. The completed port facility is expected to attract new industry to the area, as well as to serve industrial and agricultural firms that are already located in the vicinity of Osceola.

Site description and regional context

4. As Figure L4 shows, the Osceola site is a relatively flat rectangular area that abuts the river levee and extends outward toward the river chute. The site has been filled to an elevation of 250 feet, which is at the approximate level of the 50-year flood. This is 40.5 feet above average low water, but some 12 feet lower than the crown of the levee. There is little vegetation on the site, with no revegetation having occurred near the ongoing construction activities. Approximately 25 acres of the 40-acre site had been privately owned and were only rarely used for agricultural purposes. The remainder of the land, the portion abutting the river levee, was owned by the St. Francis Levee District of Arkansas, which had not developed the land. The entire site is on the unprotected side of the Mississippi River levee and, until diked and filled, was subject to infrequent flooding. The dredge and fill operations in the area were deemed to have no significant effects on the environment.

5. The City of Osceola is the county seat of Mississippi County and serves as the hub of agricultural, industrial, and commercial development in the county and adjoining areas. The Osceola harbor project is expected to aid in providing much needed new jobs in the non-agricultural sector because it will offer new and existing firms easy access to such major ports as Kansas City, New Orleans, St. Louis, Cincinnati, and Memphis. Land uses in the area of the Osceola site are exclusively agricultural and open. The nearest residential area is on the other side of the levee, about one-half mile to the north, on the southern outskirts of the city. A branch of the St. Louis-San Francisco Railroad runs two-thirds of a mile west of the levee, but there are no

present plans for extending a spur line up over the levee to the site.

Productive land use plan

6. The site selected as the confined disposal area would not have been suitable for agricultural uses after it had been filled with sandy dredged materials from the channel construction. City officials decided, however, that the site would be ideal to serve as the waterward section of a new port area with adjacent industrial facilities. Under the overall industrial development plan, a 75-acre area inside the levee was to be converted from agricultural use in order to provide the land needed for the industrial activities expected to use the port. This part of the plan has not yet been realized; all development actions taken to date have involved the 40-acre diked area, with some of the necessary port facilities already in place. A public dock and mooring dolphins have been constructed on the eastern edge of the site. In the middle of the area a large warehouse has been built on a concrete pad (Figure L3). The major piece of ongoing construction is in the southeast section of the site, where piles have been driven for a loading tower and stanchions have been built for a belt conveyor system in conjunction with the construction of a grain facility. Some utilities, such as water, electricity and telephone lines, are in place, while sewers remain to be built. Additional road construction will be required for trucks to have easy access to the site.

Project Implementation

Chronology

7. Figure L5 presents a chronology of events in the process of implementing the Osceola project. The chronology starts with the creation of the Osceola Riverport Authority in 1965, with the express purpose of making Osceola a port city again. It ends with a permit application (still pending) to construct a grain facility on the site.

Participants

8. Important participants in the process of implementing the Osceola harbor project have included the following:

a. Memphis District, Corps of Engineers.

b. City of Osceola and Osceola Riverport Authority.

c. Economic Development Administration, U.S. Department of Commerce (EDA).

d. St. Francis Levee District of Arkansas.

e. East Arkansas Planning and Development District.

9. Memphis District. The Corps first became actively involved in the Osceola project when the Division Engineer authorized the preparation of a Detailed Project Report in October 1966. An EIS was filed with the Council on Environmental Quality in March 1971, 5 months before the Detailed Project Report was issued and 7 months before the new channel construction project was authorized in October 1971. Dredging did not begin on the channel until October 1974, and it lasted through November. During this period the Corps issued a permit to Osceola to construct a pier and housing dolphins at the site. A second permit, to construct the grain handling facility, is expected to be issued shortly.

10. City of Osceola. The City of Osceola determined in the mid-1960's that the community's economic survival depended upon two things: (1) the revival of the city's role as a Mississippi River port; and (2) the creation of new, non-agricultural jobs. This could only be achieved by a coordinated effort among the city, the Corps, and the Economic Development Administration (EDA), with the Corps responsible for constructing the shipping channel and EDA supplementing the city's available funds. The city made the appropriate guarantees to each agency, such that the channel construction project was approved in 1971 and the first EDA grant for the acquisition of the site was obtained in 1973.

11. Economic Development Administration, U.S. Department of Commerce. EDA gave Osceola the financial assistance needed to bring the port plans to fruition. The Administration held a pre-application conference in October 1971, attended by officials of the city and the East Arkansas Planning and Development District. After this, the city formally filed its application. In 1973 EDA awarded its first grant to Osceola, for the purpose of gaining title to the 40-acre tract

and making preliminary improvements at the site. The total estimated cost of this work was $548,000, of which 60 percent ($329,000) was supplied by EDA. The city raised the remaining $219,000 by issuing general obligation bonds. In 1976 EDA awarded a second grant to Osceola for the construction of the port terminal warehouses. Once again, EDA supplied 60 percent ($162,000) of the total cost, but the city only had to raise 20 percent ($54,000). The remaining 20 percent ($54,000) was given as a matching grant by the Ozark Regional Commission. At this writing, the city is hoping for a third EDA grant, to improve road access to the project.

12. St. Francis Levee District of Arkansas. The District, which was established in 1893, includes among its responsibilities the maintenance of the flood levee on the western bank of the Mississippi River in Arkansas. This often involves close cooperation with the Corps, as specified in Arkansas Act 249 in 1949. In the Osceola harbor project the District's active involvement began in 1973, when the Osceola Port Authority was granted permission to construct, operate, and maintain a roadway across the levee, thereby gaining road access to the proposed harbor site. The District also issued a quitclaim deed to Osceola for 16.6 acres of the site which had been in the District's control. Since utilities needed at the site would also have to be brought across the levee, in 1976 the District granted permission to the Osceola Municipal Light and Power Plant to bring water and power lines across the levee. Similar permission was granted to Southwestern Bell Telephone Company in 1977.

13. East Arkansas Planning and Development District. This is the regional planning office that oversees and participates in city and county planning efforts. Staff members worked closely with Osceola officials as they sought financial aid from EDA. This was especially useful because the regional planners have had much more experience than the city officials have had in working with Federal agencies. Thus far, the District has helped Osceola to obtain two EDA grants.

Major issues
addressed during implementation

14. The issues that were raised in the implementation of the Osceola Harbor project are shown in Table L1. As this table shows, the project did not encounter much opposition. The site ownership authorities legal issue was primarily one of the timing involved in obtaining the appropriate legal assurances. The only other issues concerned disposal area operating characteristics. In this case the St. Francis Levee District's concerns were satisfied, but there were some temporary erosion problems at the outfall on the fourth day of dredging.

Planning considerations
affecting implementation

15. Physical planning elements have been assessed in light of their relation to, first, disposal facility planning, and second, productive land use planning. Table L2 summarizes the most important physical planning elements of the Osceola project. Two important positive elements related to disposal facility planning were the port's location adjacent to the existing Osceola industrial area and potential slack-water advantages of the site. Also, no important ecological ramifications resulted from disposal site filling. Shipping and boat access had positive land use planning implications, while flood conditions and traffic generation affect land use planning negatively.

16. Four principal advantages were identified from the Osceola waterfront terminal plan. First, the plan conforms to public development planning, objectives and policies on the local and regional scale. Second, the port will provide additional employment diversity in a region with a primarily agricultural base. Third, the port has the potential of becoming a slackwater terminal if two proposed upstream dams are constructed. Finally, property suitable for port or industrial park expansion is available to the north, south, and west if improved by increasing existing elevations, where required, to grades above flood levels.

17. The Osceola port has five important disadvantages. First,

due in part to the size of the 40-acre port in relation to the fill material available for dredging, the port is not protected from 25-, 50-, or 100-year floods. Second, property well-suited for a flood-protected industrial development west of the primary levee was not purchased by the Port Authority at the time the port acreage was purchased, and land values have increased significantly. Purchase of this prime site is, therefore, becoming increasingly more difficult for the Port Authority. Third, rail access directly to the port is not feasible due to the elevation of the levee. Fourth, no comprehensive plan for the port and its surroundings has been prepared and therefore little coordination has occurred reflecting other plans in the port vicinity. Fifth, if a highway segment is not constructed with provision for truck access to Interstate 55, truck traffic may be forced to flow through a residential neighborhood of Osceola.

Key factors affecting implementation

18. Key factors that affected the Osceola project are shown in Table L3. Among the key positive factors identified were the high level of interagency coordination, the financial assistance of EDA, and the projected increase in employment due to the project. There were no key negative factors identified.

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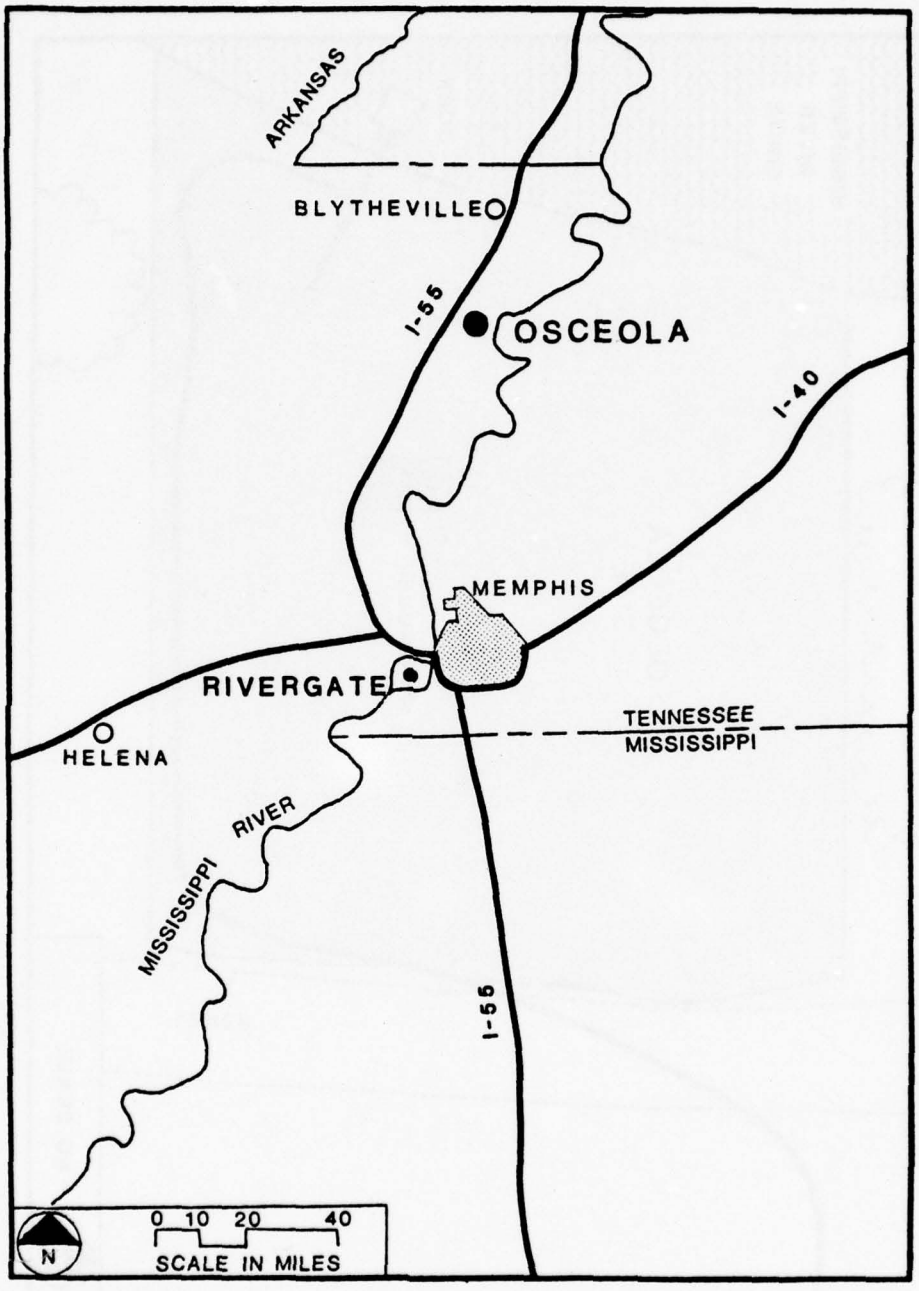


Figure L1. Location Map for Case Study No. 12 - Osceola

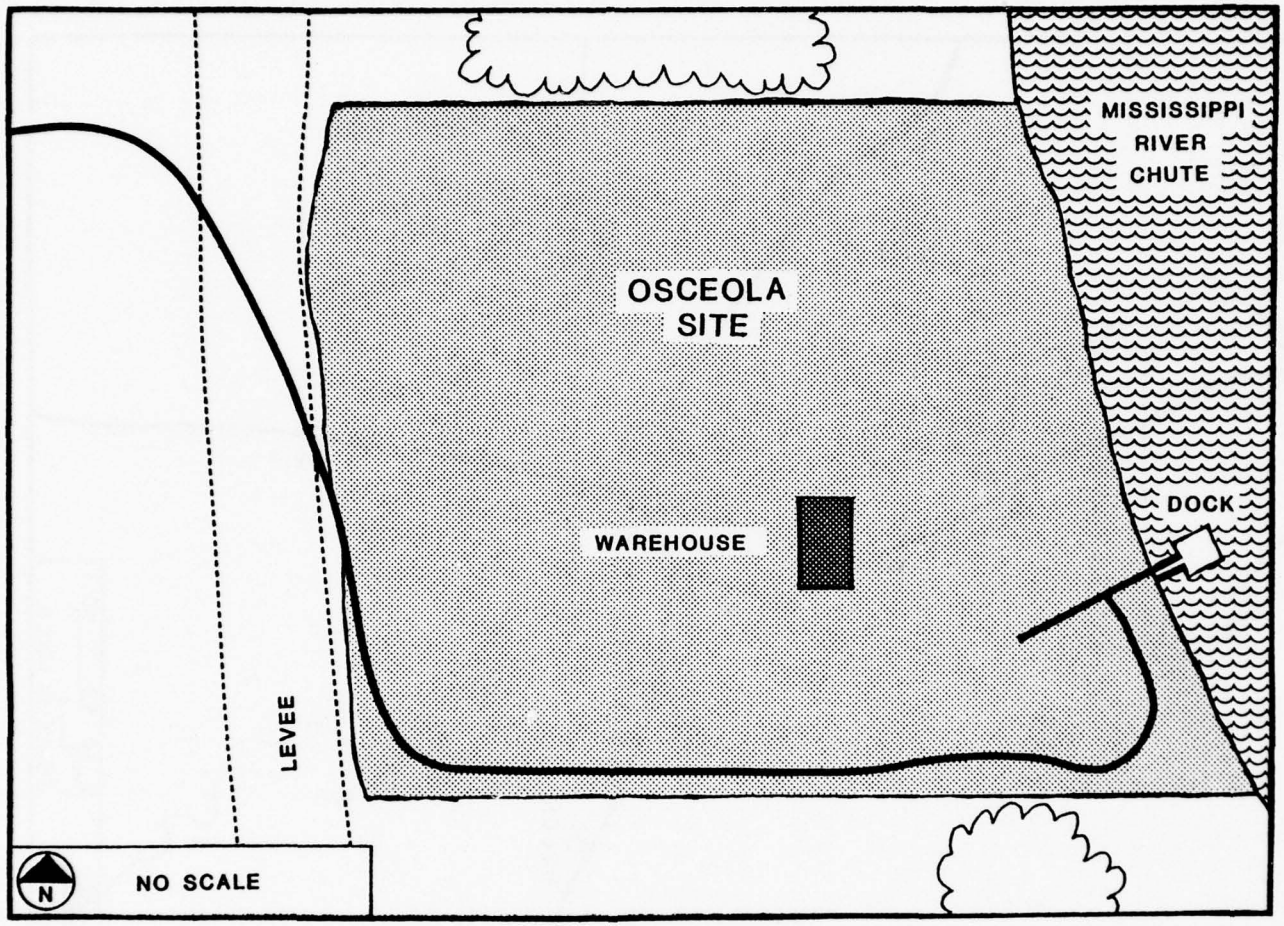


Figure L2. Osceola Site Map



Figure L3. Photo of Warehouse Built on Osceola Disposal Area (June 1977)



Figure L4. Photo of Eastern Section of Osceola Disposal Area (June 1977)

Pre-1970	1971-72	1973-74	1976-77
1	5	10	15
2	6	11	16
3	7	12	17
4	8	13	18
	9	14	

1. May 65 - Osceola Riverport Authority (ORA) created by Ordinance No. 369 adopted by City Council.
2. Oct. 66 - Detailed Project Report authorized by Division Engineer.
3. May 69 - Osceola requests grant of $1.7M from Economic Development Administration (EDA).
4. May 69 - Osceola project given "A" priority by regional planning agency.
5. Aug. 71 - Corps issues Detailed Project Report.
6. Oct. 71 - Project authorized under Section 107 of River and Harbor Act of 1960.
7. Feb. 72 - Osceola applies for EDA grant and loan of $1.5M for harbor facilities.
8. Feb. 72 - Local banks give ORA interim loans totalling $225,000.
9. Mar. 72 - Environmental Impact Assessment filed with EDA by ORA.
10. 1973 - EDA gives Osceola grant of $329,000.
11. Sep. 73 - St. Francis Levee District agrees to let ORA operate and maintain a road across the levee and gives quitclaim deed for 16.6 acres of site.
12. 1973-74 - Site acquisition and dike construction.
13. Nov. 74 - Dredging activities conducted 20 Oct. - 13 Nov.; serious erosion at outfall on 24 October.
14. Oct. 74 - Corps permit issued to construct pier and mooring dolphins.
15. 1976 - EDA ($162,000) and Ozark Regional Commission ($54,000) give Osceola grants for construction of terminal building.
16. Nov. 76 - St. Francis Levee District allows water and power lines brought over levee.
17. Apr. 77 - ORA requests Corps permit to construct loading tower and belt conveyor.
18. Apr. 77 - St. Francis Levee District allows telephone company to bury cable leading to the site.

Figure L5. Case Study No. 12 - Osceola Harbor - Chronology of Events

Table L1

Case Study No. 12 - Osceola: Major Issues Addressed During Implementation

Issue Categories	Issue Descriptions
Technical	
6. Disposal area operating characteristics	The St. Francis Levee District of Arkansas insisted that the Osceola site have adequate drainage, to prevent wet dredged material from causing any damage to the adjacent levee. Appropriate precautions were taken.
Legal	
4. Site ownership authorities	The City of Osceola did not own or have right to any of the 40 acres of the disposal site. The city had to secure agreements that the lots could be obtained before they could get a grant to actually gain title to the land.

Table L2

Case Study No. 12 - Osceola
Physical Planning Elements Affecting Project Implementation

Physical Planning Elements	Influence	Element Description
Elements Related to Disposal Facility Planning		
2. Ecological characteristics	Positive	No severe detrimental ecological impacts were projected from filling the diked retaining facility. The site is along the banks of a river chute in an upland flood plain.
6. Disposal site location	Positive	The disposal site is immediately adjacent to the port's dredged turning basin, and the location of the disposal site in a chute of the Mississippi River provides opportunities for slack water conditions. Also, the site is adjacent to the existing Osceola industrial district.
Elements Related to Productive Land Use Planning		
2. Shipping and boat access	Positive	The port will re-establish Osceola as a port area and will significantly contribute to the economies of Osceola and surrounding communities through increased employment opportunities and tax revenues.
4. Vehicular circulation/traffic generation	Negative	To efficiently obtain access to Interstate 55 from the port, a new highway connector linking routes 239 and 140 is needed. Until or unless this linkage highway is constructed, port generated traffic will be forced onto the Osceola residential road network.
7. Flood or tide conditions	Negative	Elevations of the protective dike surrounding the 40-acre port on three of its four sides are below the established 25-year flood elevation, rendering the port vulnerable to major floods. The 25-year flood elevation is 251.2 and the dike elevation is 250.0 (typical).

Table L3

Case Study No. 12 - Osceola: Key Factors Affecting Project Implementation

Factor Categories	Influence	Factor Descriptions
Economic/Financial		
1. Economic or social benefits (costs) of the disposal-productive use project	Positive	The industrial port is expected to provide much needed non-agricultural employment opportunities in the Osceola area.
5. Project sponsor capability to assume financial responsibilities	Positive	The City of Osceola has received grants from the U.S. Department of Commerce, Economic Development Administration (EDA), which have provided the funds for construction of the port area.
Institutional		
4. Coordination with planning agencies	Positive	The City of Osceola received invaluable aid from the East Arkansas Planning and Development District, especially in obtaining grants from EDA. The development of the Osceola project was the result of two federal activities: (1) the construction of the navigation channel under Section 107 of the River and Harbor Act of 1960, and (2) the EDA grant to construct industrial port facilities. Each of these activities depended on the other and they were coordinated in order to facilitate project implementation.
6. Corps and other participant attitudes	Positive	There was widespread support for the Osceola project, including the backing of Congressman Bill Alexander.

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APPENDIX M: PRELIMINARY CHARACTERIZATION OF CONFINED DISPOSAL SITES NOMINATED AS CANDIDATES FOR CASE STUDY

DIVISION:	DATE:
DISTRICT:	FORM COMPLETED BY:
ADDRESS:	TITLE:
	DIVISION:
MAIN TEL. NO.:	BRANCH:
ERCO CONTACT:	TEL. EXT.:

INFORMATION REQUESTED FOR EACH CANDIDATE SITE

1. NAME OF SITE

2. LOCATION
   City and State:
   County (or Parish):

3. PHYSICAL DIMENSIONS
   Area (Acres):
   Average Depth (Feet):

4. NATURE OF DREDGED MATERIAL
   - ___ Mud, clay, silt, topsoil, shale
   - ___ Silt and sand mixtures
   - ___ Sand, gravel, shell
   - ___ Organic muck, peat, sludge, municipal/industrial waste
   - ___ Mixed
   - ___ Fine grained material
   - ___ Coarse grained material

5. DISPOSAL PROJECT SPONSOR (IDENTIFY)
   - ___ County
   - ___ Municipality
   - ___ State
   - ___ Port Authority
   - ___ Corps of Engineers
   - ___ Other

6. DISPOSAL SITE OWNERSHIP (IDENTIFY)
   ___ Dredging contractor
   ___ State
   ___ Federal government
   ___ Private citizen
   ___ Corporation
   ___ Other

7. DREDGING CONTRACTOR (NAME AND ADDRESS)

8. DISPOSAL TECHNIQUE (DESCRIBE)
   ___ Hydraulic
   ___ Mechanical

9. AQUATIC SETTING (IDENTIFY BAYS, HARBORS, ISLANDS, MARSHES, ETC.)
   ___ Lacustrine
   ___ Estuarine
   ___ Coastal
   ___ Other
   ___ None

10. PROXIMITY OF WATER RESOURCES TO DISPOSAL SITE (ATTACH SITE MAP)
   ___ Percent water frontage
   ___ Distance from waterway (ft)

11. DEVELOPMENT CHARACTERISTICS ADJACENT TO DISPOSAL SITE (DESCRIBE)
   ___ Urban or rural
   ___ Residential
   ___ Commercial
   ___ Institutional
   ___ Industrial
   ___ Agricultural
   ___ Recreational
   ___ Natural/open
   ___ Estimated value of adjacent properties ($/acre)

12. CURRENT STATUS OF DISPOSAL OPERATIONS AT SITE (DESCRIBE AND DATE)

___ Complete
___ Incomplete but continuing
___ Incomplete but suspended

13. CURRENT STATUS OF SITE DEVELOPMENT FOR PRODUCTIVE USE (DESCRIBE)

___ Productive use known/unknown
___ Construction activity not started, ongoing, suspended, complete
___ Site now being productively used (For how long?)
___ Other (e.g., only part of site being productively used)

14. PLANNED OR ACTUAL SITE PRODUCTIVE USE (DESCRIBE)

___ Planned or actual
___ Residential
___ Commercial
___ Institutional
___ Industrial
___ Agricultural
___ Recreational
___ Natural/open

15. CHRONOLOGY OF SITE DEVELOPMENT (INDICATE MONTHS AND/OR YEARS OF EVENT)

___ Planning and site selection
___ Site acquisition
___ Dike construction start/completion
___ Disposal operation start/completion
___ Planning for productive use start/completion
___ Public hearings held
___ Construction for productive use start/completion
___ Other significant events (e.g., court injunctions, EIS preparation, dike failures, etc.)

16. EXISTENCE OF PROJECT DOCUMENTATION (YES, NO, UNKNOWN)

___ Design plans

___ Environmental assessments or EIS

___ Permit applications

___ Inspection field notes

___ Public hearing notices

___ Public hearing transcripts

___ Interagency correspondence

___ University reports/theses

___ Other

17. SOURCES OF CONTROVERSY OR ISSUES ADDRESSED DURING PROCESS OF SITE DEVELOPMENT

	MAJOR	MINOR	NONE
___ Economic			
• site ownership			
• site acquisition financing			
• property value alterations			
• tax rate alterations			
• taxes on dredged material			
• other (describe)			
___ Institutional			
• site acquisition process			
• site management procedures			
• regulatory requirements			
• public participation process			
• regulatory agency coordination			
• other (describe)			
___ Public Policy			
• incorporation of public opinion into planning			
• equitable selection of productive use alternative			
• distribution of anticipated benefits			
• political attitudes			
• other (describe)			

	MAJOR	MINOR	NONE

___ Environmental

- induced ecological changes
- induced physical alterations
- public health
- odor
- mosquito, flies
- dust
- aesthetics
- other (describe)

___ Land Use

- development concept
- development procedures
- long- vs. short-term alternatives
- influence on property values and/or tax base
- coordination with existing land use patterns
- impacts on adjacent land uses
- secondary development impacts
- other (describe)

___ Technical

- disposal site structural integrity
- confined material quality
- operation/maintenance needs and practices
- design specifications
- other (describe)

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APPENDIX N: EXAMPLE OF SITE DESCRIPTION MEMORANDA DEVELOPED FOLLOWING SECONDARY INFORMATION COLLECTION PHASE OF SITE SELECTION SURVEY

Memorandum

To: ERCO/SA Vicksburg I Staff Date: October 12, 1976

From: J. Gushue

Re: Case Study Candidate: LOS ANGELES DISTRICT

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Contacts: R.P. Young, Chief, Construction-Operations Division
W.H. Mahoney, Construction-Operations Division
John McVey, Navigation Branch

Preliminary information for one confined disposal area has been provided by the Los Angeles District. This site is called the Fifth Avenue Marina site and is located in San Diego Bay, California:

Fifth Avenue Marina

The Fifth Avenue Marina is a 22-acre disposal site located on the shore of San Diego Bay. The site is owned by the Port Authority, which is also the sponsor of the project development. The site is adjacent to an industrial and recreational urban area where the estimated value of land is $71,500 per acre.

Disposal operations have been completed at the site, but construction of the planned recreational areas has not yet begun. Several major problems have arisen in connection with this project. Some of these involve regulatory requirements and public opinion. Others include the planned land use and its impacts on adjacent areas. Minor technical and environmental problems have also been involved in the site development process.

The Fifth Avenue Marina site is one of the five diposal areas

acquired by the San Diego Unified Port District for the disposal of dredged material in conjunction with a harbor deepening project. The Port District is typically the local sponsor for dredging activities in San Diego Bay. The Port District selected the site with the idea of developing a small boat basin and with the intention of building attendant facilities on the peninsulas formed by the disposal areas. The north peninsula is slated for strictly recreational development, while the south peninsula development includes a rowing club building (around and under which dredged material was placed) and boating surface facilities.

The development of the Fifth Avenue Marina area was part of the Port District's Master Plan for that portion of the bay. The Marina is located in the Centre City area of San Diego, an area slated for extensive urban renewal by the San Diego Redevelopment Agency. The Port District's desire to develop the recreational potential of the Marina area coincided nicely with the need for dredged material disposal sites and the site was offered as a disposal area to the Corps. Mr. Jack Lebman, Chief Engineer of the Port District, pointed out that a considerable amount of coordination between the Corps, the Port District, and the Redevelopment Agency led to the selection of the Marina as a disposal site.

To obtain approval for the project, State permits had to be obtained from the San Diego Coastal Zone Commission (a body which will become regional in January of 1977) and the Regional Water Quality Control Board. The EIS for the proposed harbor deepening project first came out in mid-1972 and there were objections to various aspects of the overall project from the California Fish and Game Department, the U.S. Fish and Wildlife Service, the National Marine Fisheries Service, the San Diego Audubon Society, the Environmental Action Council, and the Citizens Coordination for Century Three.

The most significant concerns relating to the project were

expressed by the U.S. Fish and Wildlife Service. Basically, FWS approval of the disposal plan was withheld until assurance was obtained that recreational use would result from the project. They felt that the Port District's Master Plan was not specific enough and that the EIS should explicitly state the planned recreational use. Bob Folker of FWS noted that FWS is not in the business of filling in bay areas for commercial development. The California Fish and Game Department and the National Marine Fisheries Service were concerned over the loss of open water area in the bay and wanted assurance that the water ecosystem existing after the disposal project was completed would be more productive than the displaced one.

Considerable documentation of the events which took place in developing the Marine site is available at the Corps of Engineers in Los Angeles (John McVey, 213-688-5606), the California Fish and Game in Long Beach (Rolf Mall, 213-590-5177), the U.S. Fish and Wildlife in Laguna Niguel (Bob Folker, 714-831-4270) and the San Diego Port District (Jack Lebman, 714-291-3900). Copies of the EIS and of public hearing transcripts have been requested from the Corps in Los Angeles.

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APPENDIX O: COMPLETE LISTING OF CASE STUDY CANDIDATES IDENTIFIED IN DISTRICT OFFICE SURVEY

Divisions	Districts	Site Names
New England	Waltham	None
North Atlantic	Baltimore	None
	New York (1)	Shoal Harbor
	Norfolk (2)	Craney Island Quinby Creek
	Philadelphia (2)	Fort Mifflin Artificial Island
South Atlantic	Charleston	None
	Wilmington	None
	Savannah	None
	Jacksonville (6)	Buck & Buck Tract 2 Municipal Slips Virginia Key Dodge Island Crystal Beach Blount Island
	Mobile (2)	McDuffie Island Pinto Island
Lower Mississippi Valley	Memphis (4)	Osceola Rivergate Mud Island Presidents Island
	New Orleans (4)	Devil's Swamp Devil's Elbow Mississippi River - Gulf Outlet Centroport
	St. Louis	None
	Vicksburg (3)	Rosedale Greenville Vicksburg
Ohio River	Louisville	None

Divisions	Districts	Site Names
North Central	Buffalo (5)	Times Beach Huron Site 1 Buffalo Site 4 Cleveland Site 12 Cleveland Site 14
	Detroit	None (no response)
	Chicago (3)	Manitowoc Milwaukee Bay Port
	Rock Island (3)	Fort Madison Northeast Missouri Sunset Marina
	St. Paul	None
Southwestern	Galveston (3)	Pelican Island Sabine Lake North and South
South Pacific	Los Angeles (1)	Fifth Avenue Marina
	Sacramento	None
	San Francisco (3)	Alameda Creek Bay Farm Island Redwood Shores
North Pacific	Portland (7)	Baker Bay Tillamook Bay Vancouver Chinook Boat Basin Pony Slough Eastside Site 14 Christianson Ranch
	Seattle (4)	South Shore DNR-Snohomish Anacortes Hoquiam

APPENDIX P: CRITERIA USED DURING CASE STUDY SITE SELECTION

Criteria Description

1. After all potential case study sites had been identified and sufficiently characterized, they were then screened using the site selection criteria listed below:

a. Status of productive land use plans.

b. Data availability.

c. Interest rating.

d. Degree of completion or commitment.

e. Land use variety.

f. Success of implementation.

g. Confined disposal site size.

h. Urban category.

2. Numerical rating scales (1 to 4) were established for the first four criteria and ratings were subjectively assigned to each candidate, after review of available data, by all members of the project staff. In this manner ratings were uniformly applied to all candidate sites, with the more desirable sites receiving the higher ratings. The scoring values for and rationales behind the quantified criteria are discussed below.

Status of productive land use plans

3. Candidate sites still in the planning stages in terms of productive land use were scored to reflect their relative planned use status. The following scoring system was used:

4 - Productive development plan proposed for entire site.

3 - Productive development plan proposed for portion of site.

2 - Alternative productive development plans proposed for all or part of site.

1 - No productive use plan proposed for the site.

Data availability

4. The availability of good documentation of the project history

was recognized as a key to successful issues analysis during case study preparation. Candidate sites were rated for data availability as follows, based on whether or not design reports, EIS's, public hearing transcripts, interagency correspondence, etc. would be accessible during field work:

4 - Well documented.

3 - Adequately documented.

2 - Partially documented.

1 - Inadequately documented.

Interest rating

5. Preliminary characterizations of candidate sites included information indicative of the level of interest associated with each site. To reflect the desire to select for case study those projects involving multiagency coordination and public participation during the resolution of issues and/or controversies, the following interest rating scale was established:

4 - Major issues and/or controversies associated with the project.

3 - Project considered to be moderately controversial or of special interest.

2 - Minor issues and/or controversies associated with the project.

1 - No issues and/or controversies associated with the project.

Degree of completion or commitment

6. Candidate sites considered to be most desirable for case study were those for which the process of implementing a productive use concept had proceeded to the point of actual use. Using this as an indication of the best that could be expected, the following scale of commitment was applied:

4 - Site partially or entirely developed for productive use.

3 - Site under construction for productive use.

2 - Productive use planned and funded.

1 - Productive use planned but unfunded.

7. The next four site selection criteria were descriptive in nature and not intended to numerically measure the relative merits of one candidate site versus another per se. Rather, they were used to guide site selection so that the 12 site sample included sufficient variety along each of the dimensions discussed next.

Land use variety

8. To provide an adequate basis for analysis of the implications of particular types of productive land use concepts, it was felt that the 12 site sample should include the following types of land uses:

I - Industrial.

C - Commercial.

RS - Residential.

RC - Recreational.

Success of implementation

9. To adequately screen the candidate sites it was necessary to consider the degree of success attained in implementing proposed productive land use concepts. Project success was represented as follows:

I - Productive use concept implemented.

P - Implementation process proceeding.

O - Implementation process obstructed.

A - Disposal-productive use project abandoned.

Disposal site size

10. While problems and controversy in project implementation are not necessarily highly correlated with disposal site size, size is an important consideration with respect to productive use planning. The following categories were established as a means of representing site size in the candidate screening matrix:

VL - >1000 acres (very large).

L - 101 to 1000 acres (large).

M - 20 to 100 acres (medium).

S - <20 acres (small).

Urban category

11. Case study candidate sites located in both urban and non-urban areas were identified and categorized as follows:

HU - Highly urban.

U - Urban.

S - Suburban.

R - Rural.

12. The eight site selection criteria were applied to more than 50 candidate sites for which preliminary data had been developed. The results of this process are shown in Table 3 of Volume I for the 12 sites eventually chosen for case study analysis. An additional factor taken into account during site selection was the distribution of the 12 site sample geographically and in terms of the Corps District Offices represented.

APPENDIX Q: DETAILED COMPARATIVE ANALYSIS, PRESENTING CASE-SPECIFIC EXAMPLES OF ISSUES, PHYSICAL PLANNING ELEMENTS, AND FEATURES OF PROPOSED LAND USE PLANS

Introduction

1. The comparative analyses presented in this appendix illustrate, using selected case-specific examples, the manner in which the following aspects of disposal-productive use project planning and implementation were represented in the 12 case study projects:

a. Issues addressed during project planning and review.

b. Physical planning elements affecting disposal facility and productive land use planning.

c. Features of proposed land use plans, considered in terms of the 10 planning principles identified in this study.

The issues, physical planning elements, and land use planning principles constitute the findings of this study and their overall implications for future disposal-productive use projects are discussed in Part III of Volume I of this report.

Issues Addressed During Project Implementation

2. Participants in the 12 case study projects were found to raise issues falling within six general categories: (1) ENVIRONMENTAL; (2) TECHNICAL; (3) ECONOMIC AND FINANCIAL; (4) LEGAL; (5) INSTITUTIONAL; and (6) PLANNING AND IMPLEMENTATION. Under these categories are a total of 39 sub-categories representing a broad range of issues associated with confined site productive use. The issues are listed in Table Q1, which also presents the staff assessments of their impacts on implementation for each of the 12 case study projects. Except as noted in the text, the case-specific examples provided below are all instances in which the particular issue was rated as having had a major impact on implementation (indicated with a ■ in Table Q1).

Environmental issues

3. All environmental issues associated with the 12 case study

projects are represented in the nine categories listed below:*

a. Wetlands filling.

b. Wildlife habitat disturbance.

c. Aquatic habitat disturbance.

d. Regional ecosystem alteration.

e. Bay bottomland and/or surface area reduction.

f. Dredging-disposal water quality impacts.

g. Changes in flow patterns.

h. Odor.

i. Secondary impacts of the planned use.

4. Wetlands filling. Not surprisingly, the most significant environmental concern addressed in the 12 case studies was the impact of dredged material disposal and site development filling in wetland areas. The issue was raised in seven cases, five times having a major impact on the implementation process. Wetlands were not involved in the other five cases. The manner in which the wetlands filling issue was introduced and resolved in the seven case study projects was very site-specific. In No. 1 - Blount Island, both the U.S. Fish and Wildlife Service (FWS) and the Florida Audubon Society strongly opposed the proposed Offshore Power Systems (OPS) development because it involved the destruction of about 525 acres of wetland. The FWS, after criticizing the Corps' August 1972 Public Notice of a Section 10 permit application for lack of data, recommended denial of the permit four months later due to primary and secondary project impacts on wetland resources and to the lack of a long-range Federal disposal plan for Jacksonville Harbor. The strong FWS objections were not resolved until June 1973 following a series of high-level meetings held at the Department of the Interior in Washington, D.C. Resolution was obtained only after OPS agreed to purchase and place into public trust 2 acres of undisturbed wetland for every 1 acre destroyed by the project. Despite the fact that FWS had, during 1968-71, opposed two previous proposals to

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* Issues relating to interpretation and fulfillment of environmental requirements are discussed in the legal issue category.

fill wetlands on Blount Island, the Jacksonville District neither consulted with FWS as the project was planned nor actively pursued the tardy FWS comments on the Section 10 permit application. However, once the FWS position was formally known, the Corps was instrumental in bringing the opposing parties together to work out a satisfactory solution.

5. The Florida Audubon Society formally noted its objection to the Section 10 permit application in November 1972 while also questioning the adequacy of the Corps' September 1972 draft EIS. Nearly a year later, in September 1973, on the same day the permit was issued, Florida Audubon obtained a temporary restraining order, charging that the EIS was deficient in its evaluation of the biological impacts of the OPS project and that a public hearing was required under Public Law (PL) 92-500. The hearing was held in October 1973, two months after the permit had been issued, but in January 1974 the Florida Audubon court action against the EIS was dismissed. The Corps made no effort from November 1972 to August 1973 to meet with Florida Audubon and discuss their objections. Instead, Florida Audubon complaints were routinely noted and given cursory responses in the final EIS. As with FWS, Florida Audubon had a history of opposition to proposed filling activities in the wetland areas of Blount Island.

6. In No. 4 - Crystal Beach, also in the Jacksonville District, local environmental professionals supportive of the residents of Crystal Beach (i.e., the Save Crystal Beach Association), opposed the Corps' disposal plan on the basis of adverse impacts on the area's already diminishing wetland resources. The Corps had held three multi-agency field inspections during 1972-74 as the disposal plan was formulated, and both State and Federal agencies were in approval. The Corps coordination efforts, however, did not include the Pinellas County Planning Council, which had identified the Crystal Beach site as environmentally endangered in June 1973,* nor the residents of Crystal Beach, who

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* The Planning Council recommended the site for purchase by the Florida Department of Natural Resources for preservation.

obtained a permanent injunction against the project in May 1975. The injunction was sought on the grounds that the Corps' ruling that an EIS was not required for the disposal project was inappropriate. The Jacksonville District relied upon the local sponsor, the West Coast Inland Navigation District, for project coordination with both the local residents and Pinellas County. The sponsor's failure to adequately carry out this responsibility resulted in the Corps being unaware of the serious environmental opposition to the project until after a dredging contract had been awarded. Also, the Crystal Beach residents had successfully opposed a 1971 plan by the tract's previous owner to fill and build on the site.

7. Wetlands filling was important in Case Study No. 7 - Eastside 14 because of the FWS' late 1970 request that Corps disposal planning be suspended until biological and coastal zone management studies in Coos Bay were completed. The FWS had offered, on two earlier occasions, no objections to the Corps' deep draft project EIS. However, the lack of long-range disposal and waterway development plans eventually precipitated the planning delay while the Coos Bay environmental studies were completed. As it turned out, the Eastside site, which had been used as a disposal area intermittently for over 30 years, was judged to be more valuable as an industrial site than as a wetland resource.

8. Habitat disturbances. Specific environmental concerns due to project-associated disturbances of terrestrial and aquatic habitats were noted in 7 of the 12 case studies, but in only three instances were the concerns significant. In Case Study No. 3 - Bay Port, the FWS requested in April 1974 that the Corps alter its disposal operations at the site to protect a flock of rare forrester terns that had nested there. The Corps complied but, unfortunately, the flock was virtually annihilated shortly thereafter by a hailstorm. The only other case in which a wildlife habitat disturbance issue was raised was No. 4 - Crystal Beach. However, unlike the Bay Port case, which had few issues associated with it, the Crystal Beach case involved several issues that were more significant than those related to an altered terrestrial habitat. Thus,

this type issue was minor in the Crystal Beach case but was one of the more interesting points of concern in the Bay Port case.

9. Aquatic habitat disturbances* were addressed as issues in 6 of the 12 case study projects, twice significantly. In Case Study No. 8 - Anacortes, the configuration of the disposal area retaining structure was altered to more closely approximate the natural shoreline. This was done in response to Washington Department of Fisheries' concern over smelt spawning activities near the site. In No. 11 - Rivergate, the U.S. Environmental Protection Agency (EPA) objected to proposed "advanced dredging" (i.e., dredging to a greater depth than authorized to obtain additional fill material) because of possible disruption of the natural anaerobic conditions in the substrate of McKellar Lake.

10. Regional ecosystem alteration. Issues relating to the impacts of disposal-productive use projects on the wider ecosystems involved were of major importance in three cases, and of minor concern in two. In No. 1 - Blount Island, the two primary objectors, the FWS and Florida Audubon, were in strong disagreement with the Corps' analysis of the biological contribution that the Back River area of Blount Island made to the overall St. Johns River estuarine ecosystem. Although several biological studies performed during the period 1968-72 had reached conflicting conclusions on this matter, the Corps' EIS adopted the position that the loss of the biological productivity of Back River and its adjacent wetlands would not adversely affect the estuary. The Corps' analysis was criticized because it (1) was based largely on a comparison of the 525 acres of lost wetland to the approximately 90,000 acres of wetland within the estuary, and (2) minimized the effect of urban encroachment and other development pressures on the region's wetland resources. Florida Audubon's court actions against the Blount Island project were grounded, in part, on this issue.

11. In No. 7 - Eastside 14, the issue of regional ecosystem change actually enhanced the acceptability of the site for confined

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* Note that dredging-disposal water quality impacts are covered in a separate environmental issue sub-category discussed below.

disposal. Environmental constituencies were opposed to any disposal actions in the Coos Bay estuary, arguing that a reduced tidal prism would (1) lower oxygen exchange rates, creating oxygen-deficient slack water areas, and (2) lower biological productivity and nutrient transfer. The Corps' response was to opt for upland disposal areas in the upper bay. In Case Study No. 2 - Cleveland 14, the regional ecosystem issue was raised by local conservation groups who felt that waterfowl feeding and migration patterns would be impaired if the disposal area were built.

12. Bay bottomland and/or surface area reduction. Concerns of this type were expressed in three cases, each time having a significant impact on project implementation. In both No. 2 - Cleveland 14 and No. 5 - Huron 1, the issue of harbor surface area reduction was raised in public proceedings held by the Buffalo District during disposal site selection and planning. In each instance local boaters opposed disposal alternatives which they felt would result in an improper use of limited protected harbor water area or in a hazard to navigation. The boaters were in favor of the two sites eventually selected.

13. In Case Study No. 6 - Fifth Avenue Marina, disposal plans formulated in 1967 called for the filling of 137 acres of bottomland (113 acres of surface area) in San Diego Bay. In June 1972, the FWS informed the Los Angeles District that they would not approve any dredge and fill projects in San Diego Bay until a master plan for harbor development was available. A master plan approved in December 1972 did not include the Fifth Avenue site because of the site's connection with a city urban renewal plan. In February 1973, the FWS formally objected to the filling of 137 acres of bay bottomland and, in August 1973, informed the Corps that they would approve the Fifth Avenue project only if the proposed site use were water-dependent and for public benefit. The Corps, which had been adamant in refusing to alter the original disposal plan, finally acquiesced and a May 1974 draft EIS showed the site as it was eventually built (i.e., as two peninsulas, covering 22 acres, serving as a breakwater for a marina). The FWS, however, did not approve the project until January 1975 when the Corps gave

assurances that the site would not be developed commercially.

14. Dredging-disposal water quality impacts. The water quality impacts of dredging and disposal operations were at issue in eight case studies, three times as a major concern. In No. 4 - Crystal Beach, local environmentalists testified in court proceedings that the proposed disposal facility would adversely affect receiving waters due to a combination of poor sediment quality and improper facility design. This testimony was very damaging to the Corps' defense of its decision that an EIS was not needed for the project. In No. 5 - Huron 1, two agencies expressed concern over water quality impacts. The City of Huron feared that polluted discharges from the site would reach a nearby public water supply intake and geologists for the State of Ohio were concerned that the site would exacerbate slack water conditions in the area with a resultant water quality degradation. In each instance the Corps satisfactorily resolved the issue in cooperative discussions.

15. In Case Study No. 8 - Anacortes, both FWS and EPA were concerned about the possible deterioration of water quality associated with the project. The FWS objected to the project when it was first proposed in late 1967, calling for a long-range waterway development plan and for a before-during-after biological study of the project. The FWS objections were not removed until early 1973 when the Seattle District agreed to participate in the requested biological monitoring study.

16. Changes in flow patterns. In five of the case study projects, issues related to changes in existing water flow patterns were expressed, in three instances strongly enough to warrant Corps action in response. In No. 2 - Cleveland 14, the issue grew out of the fact that the facility design included extending an existing brook-end culvert through the site to a terminus in Lake Erie. Environmental groups felt that the culvert extension would aggravate upstream flooding problems of Doan Brook. The Buffalo District conducted a hydraulic survey that pointed to inadequate upstream storm drainage capacity as the reason for flooding. In No. 5 - Huron 1, the concern was that nearby beach erosion problems would be aggravated by the site through blockage of littoral

drift. The Corps and the Huron Port Authority resolved this complaint by demonstrating that the proposed site would actually improve the situation by offering protection from wave action. In No. 6 - Fifth Avenue Marina, the California Fish and Game Department expressed concern that the project would reduce the tidal prism in San Diego Bay. The Corps responded that a reduction of less than 0.25 percent was involved and the matter was dropped.

17. Odor. Potential odor problems were a major issue only in Case Study No. 2 - Cleveland 14. The site was originally designed such that a portion of it was located within the village of Bratenahl, Ohio. Village residents were fearful of a 7-year odor problem while the site was being filled and, from November 1973 to March 1974, the Corps held several private and public meetings attempting to obtain Bratenahl's approval. In April 1975, the disposal facility was redesigned to obviate the need for that approval and Bratenahl's status in the case was changed from "local interest" to independent objector.

18. Secondary impacts of the planned use. In two cases the issue of secondary environmental impacts associated with the planned productive use was raised. In both instances, No. 1 - Blount Island and No. 9 - Hoquiam, the issue was minor in relation to other concerns. However, there is a clear implication that, in cases where productive use and disposal facility planning are conducted simultaneously, the indirect and long-term environmental impacts could form the basis for strong project opposition.

Technical issues

19. Technical issues raised in conjunction with the 12 case study projects were found to relate to the following areas of concern:

a. Dike stability.

b. Site foundation conditions (for planned use).

c. Dredging technique.

d. Disposal area capacity.

e. Disposal area size and configuration.

f. Disposal area operating characteristics.

g. Utility relocation and/or connection.

20. Dike stability. This issue was noted in 4 of the 12 case studies, three times as a major issue. In two instances, No. 7 - Eastside 14 and No. 11 - Rivergate, prior retaining structure failures were brought up during disposal plan formulation. The Corps assured the objectors in the former case that more suitable diking material was being used. In the latter case, the Corps supervised dike repair operations conducted by the site's owner. In Case Study No. 8 - Anacortes, the FWS requested in 1967 that disposal plans include an impermeable retaining structure. This request was reiterated in late 1972, at which time the City of Anacortes made public an engineering study concluding that an impermeable dike was not feasible.

21. Site foundation conditions (for planned use). Disposal site foundation conditions, viewed from a land use planning standpoint, were at issue in 6 of the 12 case study projects, three times in a major way. During early site planning in Case Study No. 8 - Anacortes, both city officials and potential site users were concerned that the poor structural quality of the dredged sediments would preclude timely site development unless substantial investments were made to improve foundation conditions. Subsequent engineering studies concluded that, although foundation conditions would be poor, development would be economically feasible.

22. In No. 10 - Fort Mifflin, the dredged sediments deposited on the site over the years consisted primarily of silty-clay particles, with the result that extensive site preparation work will be needed to accommodate the heavy marine-industrial use proposed for the site by the Philadelphia Industrial Development Corporation (PIDC). The Corps' proposal to extend the active life of the disposal facility to the year 2000 would, according to the PIDC, preclude industrial use of the site, primarily because of the foundation requirements. In No. 11 - Rivergate, a large portion of the site had received structurally inferior material from Corps maintenance dredging. The site owner, Belz Enterprises, subsequently asked the Corps to dredge to a greater depth than authorized in order to fill the site with sandy material. The Corps agreed to this advanced dredging, although not to the additional

20-foot depth requested.

23. Dredging technique. The dredging technique to be used was an issue only in Case Study No. 8 - Anacortes. The FWS, in its comments on the project in late 1967, requested that hydraulic dredging be performed. This technique was used until December 1975, when with only two-thirds of the dredging completed, the site was filled to overflowing. The "bulking factor" of the dredged material had been miscalculated by the Corps and the city, a problem added to by the fact that the Corps had constructed a dike that was 2 feet lower than originally designed. After a joint FWS/EPA underwater survey of the project area in March 1976, EPA ordered the project completed with a clamshell dredge.

24. Disposal area capacity. The capacity of the disposal facility was observed to be an issue in seven case studies, in four instances as a major point of concern. In No. 3 - Bay Port, the capacity issue was perhaps the most significant issue involved. A 1972 Corps report attributing 10 years disposal capacity to the site was concurred with by the City of Green Bay. Subsequently, the city decided to restrict the level of the filled area to a lower elevation than the Corps had planned on in order to facilitate railroad spur line construction for potential industrial tenants. Also, the city had allowed fly ash from an adjacent electric power plant to be dumped on the site. When the Chicago District became concerned over the site's remaining capacity in mid-1975, the city informed the Corps of the lowered final elevation, which meant that the site would be filled to capacity in 1977, 5 years earlier than planned. A subsequent Corps proposal to raise the fill level was strongly opposed by the city and an alternative disposal site for maintenance dredging is still being sought.

25. In Case Study No. 8 - Anacortes, the capacity issue was first raised by the EPA in 1970 when EPA proposed a three-celled design for the facility in order to improve retention characteristics. A two-celled design was eventually used and, when capacity problems were encountered in late 1975 as a result of a miscalculated bulking factor, EPA maintained that its proposed design would have helped avoid the

problem.

26. In No. 10 - Fort Mifflin, the capacity issue involves the Corps' 1974 proposal to raise the retaining structure from 27 to 40 feet in order to extend the facility's active disposal life to the year 2000. The City of Philadelphia strongly opposed the plan and, in September 1975, requested that the Corps cease all filling in Sections I and II of the site. The Corps complied with this request since an addition to the facility, Section III, was under construction. At this time the site capacity issue is still unresolved. In No. 11 - Rivergate, the capacity issue grew out of the Corps' inability to fill the site quickly enough to suit the site's owner. Over 15 years of Corps disposal had placed only 1 million cubic yards (MCY) on the site. In 1974, the owner obtained a Federal permit to dredge a 1-mile-long by 600-foot-wide canal through the site, increasing the available water frontage from 1 mile to 3 miles and providing 6 MCY of fill. The site still was not filled to the desired elevation, however, and the owner asked the Corps to do some advanced dredging in McKellar Lake to provide the needed material.

27. Disposal area size and configuration. Closely related to, but in many cases different from capacity issues, are those issues having to do with the general size and configuration of disposal facilities. Issues of this type were addressed in six of the case study projects, three times as major concerns. In Case Study No. 2 - Cleveland 14, the original site design placed part of the facility across Cleveland's city limit into Bratenahl Village. According to Corps policy this meant that the village's approval had to be obtained since the village had become a "local interest." The village residents were fearful of odor problems and over 18 months of negotiating by the Buffalo District failed to ease their objections. The site was subsequently redesigned so as not to encroach the village limits.

28. In No. 5 - Huron 1, the site configuration issue was tied to productive use considerations. During initial site conceptual design in 1970-71, several alternative configurations more suitable to ultimate recreational development were considered. However, the City of Huron opted for the most economical facility design concept (semi-circular),

being unwilling to pay for added diking expenses associated with more intricate dike shapes. In No. 6 - Fifth Avenue Marina, in response to FWS objections, the facility design was changed from a 113-acre solid trapezoidal area to a 22-acre double peninsula shape enclosing about 80 acres of protected water area.

29. Disposal area operating characteristics. Issues concerning the operating features of the disposal facility were raised in five of the case study projects, four times with a major impact on project implementation. In No. 4 - Crystal Beach, a second-generation Corps disposal plan, developed in July 1973 when it became necessary to enlarge the proposed facility, involved using the 7.5 acre Lake Chataqua as a settling pond. This plan was informally approved during field inspections by all appropriate State and Federal agencies. The Crystal Beach residents were appalled when they learned of the plan, since they regularly used the lake for fishing and passive recreation. At a June 1974 public hearing, the EPA withdrew its support for the project and, although a dredging contract had already been awarded, the Jacksonville District once again redesigned the facility to exclude the lake. The viability of the lake was subsequently established in testimony given at court proceedings initiated by the local residents.

30. In Case Study No. 10 - Fort Mifflin, the operating issue was triggered by an FWS request that Sections I and II of the site be used as a wildlife refuge while the Corps continued disposal operations in Section III. The Corps refused on the basis of anticipated interference with the disposal operations. In No. 11 - Rivergate, the operating issue involved an April 1974 EPA recommendation that a silt barrier be installed along the site's southern boundary to prevent a silt buildup in McKellar Lake during the dredging of a private channel through the site. The barrier was not installed, but there was no evidence of a silt problem. In No. 12 - Osceola, the St. Francis Levee District of Arkansas insisted that the disposal facility have adequate drainage so as to prevent wet dredged material from causing any damage to the adjacent Mississippi River levee. All appropriate precautions were taken.

31. Utility relocation and/or connection. The last technical issue noted in the 12 case study projects was related to the relocation or connection of utilities in conjunction with disposal facility construction. This was an issue in three cases, twice as a major concern. In No. 2 - Cleveland 14, the issue was the extension of the culverted outfall for Doan Brook through the disposal area. Environmental groups opposed the extension for fear of aggravating upstream flooding during storm events. In No. 5 - Huron 1, the issue was quite differently represented. In this case the Corps suggested that utility connections to the site be made during site construction. The City of Huron rejected the suggestion due to the added costs involved, despite the fact that making the connections will be much more costly once the site is filled.

Economic and financial issues

32. Five types of issues appropriately grouped in the category of economic and financial concerns were observed in the 12 case studies:

a. Economic or social benefits (costs) of the disposal-productive use project.

b. Economic or social impacts of secondary development.

c. Fees or taxes on dredged material.

d. Utility relocation costs.

e. Additional dredging or disposal costs.

33. Economic or social benefits (costs) of the disposal-productive use project. Issues related to the socioeconomic costs and benefits of proposed projects were raised in eight cases, twice with a major impact on project implementation. In Case Study No. 1 - Blount Island, the principal selling point for the OPS development was the estimated 10,000 new jobs to be provided when the floating nuclear power plant manufacturing facility is at full production (originally expected to be 1982). Several Florida regulatory and resource management agencies approved the project with the qualification that the only justification for the destruction of 525 wetland acres was the tremendous economic benefit associated with the project. Interestingly enough, the only economic benefit study prepared for the project was a two-week

effort by a consultant to the developer, OPS. This study was completed just prior to a public hearing held in May 1972 to consider a State dredge and fill permit application. The Florida Audubon Society's September 1973 court action against the project was based in part on the contention that the Corps was negligent in not preparing an independent economic impact analysis. This claim was not upheld in the courts.

34. In Case Study No. 10 - Fort Mifflin, the Philadelphia Industrial Development Corporation commissioned a 1973 engineering-economic feasibility study of the use of the site for a marine-industrial terminal. The study concluded that the proposed industrial development would provide over 14,000 new jobs in the Philadelphia area. This "benefit" of the city's industrial use plan has been cited as a "cost" of the Corps' continued disposal plan.

35. Two situations were represented in the six cases in which issues of socioeconomic benefits and costs were minor issues. In No. 4 - Crystal Beach, No. 6 - Fifth Avenue Marina, and No. 9 - Hoquiam, the issues revolved around trade-offs between private benefits and public costs of proposed and potential non-public land uses. In No. 3 - Bay Port, No. 7 - Eastside 14, and No. 8 - Anacortes, there were simply general feelings among most project participants that the industrial growth to be achieved through the projects would benefit all concerned.

36. Economic or social impacts of secondary development. Concern over secondary socioeconomic impacts was raised in only two cases, both times with minor impact on project implementation. In No. 1 - Blount Island, the economic costs associated with spin-off industrial growth and increased demand for public goods and services were felt by many to be inadequately considered in the project's economic impact report. In No. 6 - Fifth Avenue Marina, the FWS as well as San Diego city officials expressed a desire to see the 22 acres of filled area developed for public uses that would serve to make the nearby urban redevelopment area of San Diego more attractive to potential commercial users.

37. Fees or taxes on dredged material. The issue of a proposed site developer or project sponsor paying a fee or tax on dredged material was raised only in Case Study No. 1 - Blount Island. A State

dredge and fill permit granted to the Jacksonville Port Authority in May 1972 included a condition to the effect that any State-owned material deposited on Blount Island and eventually sold to the proposed developer would be subject to a lien of $1 per cubic yard in favor of the State of Florida. Offshore Power Systems eventually had to pay about $800,000 to the State as a result of the condition.

38. Utility relocation costs. In four of the case study projects, the issue of who should pay for utility relocation costs was raised. Only in No. 2 - Cleveland 14 was the issue a major one. The issue arose over the Corps' proposal to extend the culverted Doan Brook outfall through the disposal facility. An environmental group argued that a riprap stream bed through the site would be less expensive than the extended culvert, a claim that was disproved by an engineering cost analysis prepared in response by the Buffalo District.

39. Additional dredging or disposal costs. The question of liability for any additional dredging or disposal costs associated with disposal site productive use was addressed in six of the case study projects. In four cases the issue was rated as major. In both No. 2 - Cleveland 14 and No. 5 - Huron 1, the issue was manifested early in disposal planning when preliminary facility designs more suited to eventual recreational use were proposed. City officials in each case rejected the ideas since any associated costs over and above a least-cost design would have to have been paid with city funds.

40. In Case Study No. 3 - Bay Port, the Chicago District proposed in 1966 to deposit 531,000 cubic yards of material on the Bay Port site. The City of Green Bay, however, wanted more than 3.4 MCY of fill material placed on the site. The Corps agreed to forego the less expensive open-water disposal option available at that time, and thus provide a total of about 3 MCY of fill, if the city would pay an estimated $808,000 in added dredging-disposal costs. The city disputed the added cost estimate, which was recalculated by the Corps to $580,000 in May 1966. It took the city 3 years to meet their financial responsibilities.

41. In No. 10 - Fort Mifflin, the Corps has persistently

questioned the City of Philadelphia as to liability for added costs associated with using any alternative site for disposal of dredged material from the Delaware and Schuylkill Rivers. The city has agreed that they should assume a portion of any extra costs, but feels that a 50/50 cost sharing arrangement with the Corps is appropriate.

Legal issues

42. The legal issues found to be associated with disposal-productive use projects are covered in the five legal sub-categories listed below:

a. Conformance with EIS requirements.

b. Adequacy of environmental impact assessment or statement.

c. Conformance with public hearing requirements.

d. Site ownership authorities.

e. State vs. Federal permit jurisdiction.

43. Conformance with EIS requirements. Disagreement as to whether or not an EIS was required under the provisions of NEPA had a major impact on the implementation of two case study projects. In one case, No. 4 - Crystal Beach, the Corps had ruled early in project planning that an EIS was not necessary. In the other, No. 9 - Hoquiam, the Corps decided to write an EIS after major EPA and FWS objections to a Section 10 permit were resolved.

44. In No. 4 - Crystal Beach, the Jacksonville District Engineer's October 1973 ruling that an EIS was not required was based on the opinion that the project (1) was not a major Federal action, and (2) would not have significant adverse impact on the human environment. In August 1974, 3 months after a $1 million dredging contract was awarded, the residents of Crystal Beach obtained a temporary restraining order against the project by questioning the Corps' EIS decision. In May 1975, a permanent injunction was granted and the accompanying conclusions of law and findings of fact noted that the proposed project was a major Federal action, involving, as it did, a cost in excess of $1 million, and that there were significant adverse impacts on the human environment at Crystal Beach.

45. In No. 9 - Hoquiam, the Seattle District's Engineering Division called for preparation of an EIS in August 1975 when a revised Section 10/404 permit application was submitted by the Port of Grays Harbor. However, the decision to prepare the EIS was not made until after a public hearing held in January 1976 to consider the need for an EIS. This hearing was held after 5 months of negotiating between the Corps and the Port on one hand and the FWS and EPA on the other to resolve the latter's objections to the Federal permit. The Port of Grays Harbor objected to the further project delays associated with the EIS preparation and review process. However, only 6 months later in July 1976 the final EIS was filed with the Council on Environmental Quality (CEQ).

46. The Seattle District's handling of this matter contrasts sharply with the Jacksonville District's approach in Case Study No. 1 - Blount Island. In that case the decision to prepare an EIS on the Jacksonville Port Authority's Section 10 permit application was actually made during pre-application meetings. However, the application was not given public notice until the EIS was completed 4 months later. The difference between the two cases is that for the Hoquiam project the EIS was prepared after all significant objections had been identified and resolved, while for the Blount Island project the major objections were not known until several months after the draft EIS was circulated. Resolution of those objections was not obtained for over 2 years.

47. Adequacy of environmental impact assessment or statement. The above discussion of the Jacksonville District's handling of the EIS preparation and review process for the Blount Island project carries an important implication, which is that closed-door Corps planning activities can lead to serious implementation difficulties and strained interagency relationships. Even after the FWS objections to wetlands filling on Blount Island were resolved in June 1973 and the final EIS had been filed with CEQ, the Corps still had to deal with the Florida Audubon Society's September 1973 challenge of the EIS. Florida Audubon sought an injunction against the Section 10 permit on the grounds that the EIS failed to fulfill NEPA requirements in evaluating economic and

environmental impacts and in studying alternative sites. Florida Audubon did obtain a temporary restraining order, primarily because the Corps had not held a public hearing on the permit application per PL 92-500, but the permanent injunction was denied in January 1974 and the EIS was ruled adequate for the purposes of NEPA.

48. In only one other case, No. 10 - Fort Mifflin, was the adequacy of an EIS challenged. In this instance the City of Philadelphia requested a public hearing on the Corps' September 1974 draft EIS for maintenance dredging in the Delaware River. Disposal plans associated with this EIS included the Corps' proposal to use the Fort Mifflin site until the year 2000. The city maintained that the EIS did not adequately address (1) the economic and environmental impacts of the Fort Mifflin disposal plan, and (2) alternative disposal sites. The basis for the city's opposition was, of course, a strong desire to develop the Fort Mifflin site for industry as soon as possible. As of this writing these issues have not been resolved.

49. In one case, No. 9 - Hoquiam, the adequacy of a project environmental assessment (EA) was challenged. The Port of Grays Harbor had prepared the EA in September 1975, but it was widely criticized as being essentially just a checklist of impact areas. As described above, the Corps eventually decided that a full-scale EIS was needed.

50. Conformance with public hearing requirements. Issues having to do with public hearing requirements were raised in two cases, both with a major impact on project implementation. In No. 1 - Blount Island, the Jacksonville District did not hold a public hearing to consider the JPA Section 10/404 permit application as required under PL 92-500. The District Engineer had decided that the public had been given sufficient opportunity to comment on the proposed project during public hearings held by the State of Florida as part of the State permit process. The Florida Audubon Society obtained a temporary restraining order against the Federal permit primarily because no Federal public hearing had been held. In No. 4 - Crystal Beach, the situation was very similar, although in this instance no State public hearings were held since the project was a Federal action, and thus exempt from State

permit requirements. The SCBA obtained a temporary restraining order in August 1974, in part because the Corps did not hold a public hearing. A hearing was subsequently held in October 1974, much too late to serve its purpose.

51. Site ownership authorities. Issues of this type, which relate to the authority of a public agency to acquire land or to sell/lease land to private individuals or corporations, were raised in five cases. In No. 12 - Osceola, a major issue was that the City of Osceola originally did not own or have rights to any of the 40 acres proposed as a disposal site. Prior to being eligible for a Department of Commerce Economic Development Administration grant, the city had to secure agreements that the needed lots would be available. Site ownership authorities were a minor issue in four cases. In No. 5 - Huron 1 and No. 2 - Cleveland 14, the site productive use was constrained under Ohio law to be public since the sites were publicly owned. In No. 1 - Blount Island and No. 6 - Fifth Avenue Marina, the disposal areas were owned by port authorities who held marketable titles to the land and could thus sell or lease the completed sites as desired.

52. State vs. Federal permit jurisdiction. Surprisingly enough, this issue was raised in only one case, No. 6 - Fifth Avenue Marina. The California Coastal Zone Commission claimed in June 1975 that the San Diego Port District had to obtain a permit for the marina project since the marina would serve a non-Federal function. The Corps and the Port District argued that the project was part of a Federal navigation project and therefore not subject to State permit requirements. The California Attorney General looked into the matter but decided not to seek judicial relief.

Institutional issues*

53. Three institutional issues were raised by participants in the 12 case study projects:

a. Public participation during project planning.

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* Institutional issues are those related to participant responsibilities, roles, and interactions in disposal-productive use project planning and development.

b. Responsiveness to public comments.

c. Coordination with review/regulatory agencies.

The first two were major institutional issues as a result of the Jacksonville District's handling of the planning and review process for Case Study No. 4 - Crystal Beach. The third issue in this category was raised in two separate cases as a major concern.

54. Public participation during project planning. Criticism over the lack of public involvement during project planning was heard in Cases No. 4 - Crystal Beach and No. 6 - Fifth Avenue Marina. In the latter instance, the issue was not pursued and was rather insignificant. In the former, however, there was very strong opposition to the Jacksonville District's planning procedures. Disposal planning for Crystal Beach proceeded from late 1971 to late 1973 without any public involvement whatsoever. The Jacksonville District considered the task of ascertaining adjacent resident and public-at-large opinions on proposed disposal plans to be the responsibility of local project sponsors. In this case the sponsor was the West Coast Inland Navigation District (WCIND), which consisted only of an executive director and a part-time general counsel. The WCIND did not make any attempt to canvass the Crystal Beach residents concerning the project. As a result, the Corps' disposal planning activities, which involved considerable interagency coordination, did not take into account the existence of an active community association.* In 1970, this association had strongly opposed a dredge and fill project proposed for the same site by a previous owner.

55. In September 1973, when the residents of Crystal Beach became aware of the advanced nature of the planning process, they formed the

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* The WCIND was also responsible for assuring that the disposal project met with the approval of Pinellas County officials. The Pinellas County Engineering Division was informed of the project and had no objection. Unfortunately, the Pinellas County Planning Council was not informed, and so the Corps was unaware that the Crystal Beach tract had been classified as an "environmentally sensitive" area in July 1972 and then recommended for State purchase for preservation in June 1973.

Save Crystal Beach Association (SCBA). The SCBA began an intensive campaign to obtain the details of the proposed project so that their opinions could be voiced. They strongly resented what they perceived to be closed-door planning on the part of the Corps and requested a public hearing. The Corps, which had previously felt no need for a public hearing, refused the SCBA request. In retrospective interviews, Jacksonville District personnel indicated that the SCBA was (and still is) perceived as a group opposed to any and all development in the vicinity of their homes.

56. Although not without difficulty, the SCBA gradually learned the details of the project, including the fact that the land proposed as the disposal site had been systematically purchased by Island in the Sun, Ltd., a real estate investment and development firm. They also learned that the director of the WCIND was instrumental in Island in the Sun investing in the land, which would have been raised to a developable elevation as a result of the project. Since no productive land use plan had been proposed for the site, the SCBA became fearful that a land use inconsistent with their low-density residential community was envisioned. In retrospective interviews, the SCBA stated that they were not categorically opposed to development of the Crystal Beach tract, provided that an environmentally sound plan involving a use compatible with the existing community character was proposed.

57. In April 1974, when the Corps awarded a $1 million dredging contract, the SCBA retained legal counsel. Shortly thereafter both the Corps and the WCIND held public hearings which, according to the SCBA, were conducted with outward contempt and arrogance toward members of the public who were in opposition to the project. At the Corps' public hearing, the FWS and the EPA withdrew their earlier positions of approval of the project. The FWS asked the Corps to reconsider the availability of alternative sites and EPA ordered the site redesigned to eliminate using Lake Chataqua as a settling pond. The Corps complied with these requests and the project was once again approved by FWS and EPA. In August 1974, the SCBA obtained a temporary restraining order against the project on the grounds that the Corps' ruling that an EIS

was not necessary was in violation of NEPA.

58. Responsiveness to public comments. Complaints about the Corps' responsiveness to the concerns of the public were made in three cases, but were a major concern only in the Crystal Beach case. As discussed above, the residents of Crystal Beach feel that the Corps and the WCIND were arrogant and indifferent to their objections. From September 1973 to April 1974, the SCBA continually made requests for information concerning the project. Both the Corps and the WCIND were, according to SCBA, very uncooperative, even after the SCBA legal counsel became involved.

59. Coordination with review/regulatory agencies. In 3 of the 12 case study projects, complaints about the Corps' coordination efforts with review/regulatory agencies were voiced, twice as a major issue. In No. 7 - Eastside 14, representatives of State resource management agencies expressed some concern over not having been involved in early planning for the Coos Bay navigation project. However, interagency coordination during subsequent plan review and revision was praised highly overall. In No. 11 - Rivergate, the Memphis Shelby County Planning and Development Commission, although supportive of the project, felt that they should have been consulted as initial productive use construction activities took place. In effect, the Commission was presented with a fait accompli with respect to matters such as street dedications.

Planning and implementation issues

60. In the 12 case studies, 10 issues common to the overall process of planning and implementing disposal-productive use projects were documented:

a. Dredging project design limits.
b. Dredging project need.
c. Long-range waterway and/or environmental planning.
d. Evaluation of alternative disposal areas.
e. Adequacy of environmental data base.
f. Appropriateness of proposed use: public vs. private.
g. Appropriateness of proposed use: water-dependent.

h. Proposed use compatibility with adjacent uses.

i. Commitment to proposed land use plan.

j. Responsibility for economic impact assessment.

61. Dredging project design limits. Issues associated with the specification of the dredging operation itself were addressed in five case study projects, four times with a major impact in implementation. In No. 7 - Eastside 14, the issue centered on the possibility, first discussed in May 1975, of relocating the port facilities of Coos Bay closer to the mouth of the bay. This would eliminate the need for a deep draft channel in the upper bay (i.e., near Eastside) and reduce disposal pressures there. This issue, still unresolved, is important because all land use concepts discussed for the site are dependent upon the availability of deepwater port facilities. In No. 8 - Anacortes, the city initially requested, in early 1966, a longer and deeper channel than the Seattle District thought necessary. This matter was not resolved until 5 years later when a potential industrial tenant informed the city that it did not need the deeper, longer channel and would not help pay for it. On three occasions, the Corps deferred its project design report due to the city's indecision, threatening twice to terminate the project. In two cases, No. 9 - Hoquiam and No. 11 - Rivergate, the dredging project design issue was whether or not dredging below authorized depths would be allowed. In both instances, some of this so-called advanced dredging was performed despite opposition from environmental groups and agencies.

62. Dredging project need. The need for the proposed dredging was challenged in four cases, twice as a major objection to the project involved. In No. 4 - Crystal Beach, local residents argued that maintenance dredging in St. Joseph Sound was ludicrous since only small pleasure craft use it. The Corps responded that the dredging had been authorized by Congress (in 1945) and that the question of need for a 9-foot depth had already been decided. In No. 11 - Rivergate, some of the associated Corps maintenance dredging was to be performed outside the normal dredging schedule. The EPA objected, saying that such dredging could not be shown to be in the public interest.

63. Long-range waterway and/or environmental planning. Issues of this type were documented in seven cases, but were of significant concern in only two. In No. 7 - Eastside 14, the FWS and several State agencies expressed a desire to see the Portland District assume the lead role in environmental planning for Coos Bay. The District's Environmental Division is highly regarded and the Coos Bay EIS's drew considerable praise as the best that some had ever reviewed. The Corps subsequently became involved in a study of possible port facilities relocation toward the mouth of Coos Bay. In No. 9 - Hoquiam, the FWS cited the absence of a comprehensive development plan for the Grays Harbor estuary as a principal reason for their opposition to the Kaiser Steel project. Less than a year later, the multi-agency Grays Harbor Estuary Planning Task Force was established to develop an estuary-wide development plan.

64. Evaluation of alternative disposal areas. Not surprisingly, this issue was brought up in seven of the case study projects, five times with a major impact on project implementation. In No. 4 - Crystal Beach, the local citizens charged that an available, previously used diked disposal site in St. Joseph Sound (Honeymoon Island) was a more acceptable alternative than Crystal Beach. The Jacksonville District had rejected the island because the Corps and the island's owner were involved in litigation related to prior disposal actions. The island's owner said the site was available and eventually provided financial support to the residents of Crystal Beach during court proceedings. Note that it is quite conceivable that the Crystal Beach site was the best available alternative environmentally from the viewpoint of the Jacksonville District. None of the State and Federal agencies involved in disposal plan formulation opposed the project until public pressure was brought to bear. In No. 5 - Huron 1, the Huron Port Authority initially favored the alternative Site 2 because it would be less expensive. When local boaters opposed Site 2 as a navigation hazard, Site 1 became favored.

65. In No. 7 - Eastside 14, the alternative site issue was tied to the Portland District's decision to go through a separate EIS process

for the channel construction project and for the channel maintenance. The National Marine Fisheries Service and the Oregon Fish and Wildlife Department refused to comment on the new work EIS until the long-term maintenance EIS could be fully reviewed, particularly for disposal impacts. In No. 9 - Hoquiam, pressure was applied by environmental interests in an effort to get the Port of Grays Harbor and the Seattle District to consider alternative locations for the proposed Kaiser facility. No serious effort was made to find another site. In No. 10 - Fort Mifflin, the City of Philadelphia and the Philadelphia District disagree over the availability of feasible alternative disposal areas along the Delaware River. The city maintains that the Corps' EIS did not fully consider all options and has undertaken an independent study of alternative sites.

66. Adequacy of environmental data base. Questions concerning the availability of sufficient environmental data to allow project environmental impacts to be properly evaluated were raised in five cases. Only in No. 6 - Fifth Avenue Marina was the issue significant, resulting in an implementation delay while the Los Angeles District, at the request of the EPA, conducted field work to establish a data base.

67. Appropriateness of proposed use: public vs. private. In 6 of the 12 case studies, the issue of public vs. private land use was raised, twice as a major concern. In No. 6 - Fifth Avenue Marina, several agencies, including FWS, objected to the project because the proposed use was initially unspecified and they feared the site would be developed for commercial use. The FWS insisted that the eventual site use be specified and be for the public benefit. Their approval was not obtained until the Los Angeles District gave assurances that a commercial use would not result. In No. 10 - Fort Mifflin, there is still great disagreement as to the appropriate site use. The City of Philadelphia is committed to a 1974 marine terminal concept while the Philadelphia District favors a 1975 natural open-space concept based on an extended active disposal life for the site.

68. Appropriateness of proposed use: water-dependent. In six cases the issue of whether or not the proposed use should be water-

dependent was raised, once as a major issue. In No. 9 - Hoquiam, the land use initially proposed for the site in February 1975 was a sawmill and log storage facility. This concept met with almost unanimous opposition from environmental agencies who said that, if the site was to be developed, a water-dependent use was essential.

69. Proposed use compatibility with adjacent uses. Land use compatibility is unquestionably an important productive use planning consideration. In two case studies the compatibility of the proposed use with adjacent uses was a major issue. In No. 4 - Crystal Beach, the local residents, who were unable to obtain information from the Jacksonville District or the project sponsor as to disposal details or eventual use plans, had their opposition to the project fueled by speculation that a use inconsistent with the character of their community was planned. In No. 10 - Fort Mifflin, the City of Philadelphia's industrial use plan is favored by many since the site is located away from residential areas and adjacent to existing industrial tracts. The Corps' recreational use plan is less appealing for the same reasons.

70. Commitment to proposed land use plan. Concerns related to the degree of commitment to proposed land use plans were found to be significant in three instances and of lesser import in two others. In Case Study No. 1 - Blount Island, both the State water quality certification and State dredge and fill permit obtained for the project were conditioned upon written commitment to the proposed use by the developer. In No. 9 - Hoquiam, several environmental agencies lobbied for a permit condition requiring Kaiser Steel to guarantee that the proposed facility would actually be built. As in the Blount Island case, there was concern that the planned use being used as justification for the destruction of wetlands would never be realized. The Seattle District did not attach a guaranteed development condition to the Federal Section 10 permit, which although jointly applied for by Kaiser Steel and the Port of Grays Harbor, was issued only to the Port. However, the Corps did specify in granting the permit that any plans to develop the site for a use other than the one proposed in the application would be subject to Corps review. In No. 10 - Fort Mifflin, the city/Corps

disagreement over the use of the site and when it will be used is the central conflict.

71. Responsibility for economic impact assessment. In two instances, major project objections based on this issue were noted. In No. 1 - Blount Island, the Florida Audubon Society protested that the Jacksonville District improperly included in the project EIS an economic impact analysis prepared by a consultant to the proposed developer. In subsequent court action, it was ruled that the Corps was not negligent in not conducting its own analysis. In No. 10 - Fort Mifflin, the Philadelphia Port Corporation suggested that the Corps do a cost-benefit comparison of industrial development (marine terminal) vs. the added costs of disposing at an alternative downstream site.

Physical Planning Elements Affecting Disposal Facility and Productive Land Use Planning

72. The important physical planning elements to be dealt with in both disposal facility and productive land use planning are identified in Table Q2. The assessments of Table Q indicate the influence (i.e., enhanced or constrained) that each physical planning element was judged to have had on project implementation in the 12 case studies. Although grouped into two separate categories, the elements listed in Table Q2 should be used simultaneously as a planning tool since the success of a planned productive use is often dependent upon elements that must be addressed during disposal facility planning. In the case-specific examples provided below for each element, the influence assessments given in Table Q2 are repeated in parentheses after each case study citation.

Physical planning elements related to disposal facility planning

73. Ten physical elements were identified during this study as important disposal facility planning considerations:

a. Pre-disposal site characteristics.

b. Ecological characteristics.

c. Disposal area capacity.

d. Sub-surface soil conditions.

e. Composition of dredged material.

f. Disposal area location.

g. Flood or tide conditions.

h. Utility relocation/connection.

i. Dredging equipment access.

j. Sensory factors.

74. Pre-disposal site characteristics. The physical conditions and characteristics of proposed disposal area sites are, of course, key considerations during disposal facility planning. In general, a site which has been previously altered by man is preferable to a site in natural condition. In addition, environmental agencies generally prefer disposal sites on upland areas, hoping to minimize environmental damage. Three of the case study sites, No. 3 - Bay Port (o), No. 4 - Crystal Beach (o), and No. 9 - Hoquiam (o), were upland sites. In the Crystal Beach case, the total site area included upland, a tidal lake, and bayous. While initial disposal plans called for the diked area to be limited to upland, a revised plan included use of the lake as a settling pond with final discharge of the water through one of the bayous. The FWS and EPA as well as the local residents objected to the revised plan at a June 1974 public hearing due to potential damage to these sensitive areas and because of the loss of the transition area between the bayou and the upland. The Crystal Beach case illustrates that the use of upland disposal areas is not in itself sufficient to avoid environmental damage but that action must also be taken in disposal site design to protect adjacent sensitive areas. Development of confined disposal sites on areas of previous fill activity was a positive influence on implementation in four cases due to reduced potential for environmental damage. The filling of wetlands was the most controversial issue addressed in the 12 case studies (Table Q1), and was a negative influence on disposal planning in five cases.

75. Ecological characteristics. Without question the most

important physical element to consider during early disposal planning is the potential for disruption of existing ecological characteristics of proposed sites. In 6 of the 12 case study projects, the ecological characteristics of and near the sites were valuable enough to result in negative influence. In two cases, the ecological settings were actually positive influences. These were No. 7 - Eastside 14 (o), which was a previous disposal site valued more for its industrial use potential, and No. 12 - Osceola (o), which, although not ecologically degraded, was not particularly significant either.

76. Disposal area capacity. Disposal area capacity was an influential physical element in 7 of the 12 case study projects. In four instances the influence was negative. In No. 3 - Bay Port (●), the site's disposal capacity was projected at 10 years in 1972 by the Chicago District. In 1975, it was learned that the site would be filled to capacity in 1977 because the City of Green Bay had decided to limit the final fill level to a much lower elevation than the Corps had anticipated. In No. 4 - Crystal Beach (●), the disposal plan initially involved two separate sites. When the other site became unavailable, the Crystal Beach disposal plan was modified to provide the added capacity at a single location. Unfortunately, the revised plan included using Lake Chataqua as a settling pond, resulting in strong opposition later as plans became publicly known. In No. 5 - Huron 1 (●), the City of Huron was concerned that the site designed by the Buffalo District was too large relative to expected dredged material volumes. The city feared that the site would not be filled to capacity and, therefore, would remain unusable for the proposed public recreational use. In No. 8 - Anacortes (●), none of the agencies involved in disposal planning correctly assessed the bulking factor for the hydraulic dredging operation and the site was subsequently filled to capacity with one-third of the planned dredging still to be accomplished.

77. Sub-surface soil conditions. The existing soils of the area proposed as a disposal facility primarily affect dike foundation design. This physical element was a negative influence in four of the case study projects, but was not found to be one of the more important

components of overall disposal planning. Of course, if foundation conditions for dikes are inadequate, the weight and mass of the dike construction material will cause displacement, which could eventually result in dike failure. This problem occurred in Case Study No. 7 - Eastside 14 (o). Generally, through the application of proper engineering techniques, this problem is avoidable.

78. Composition of dredged material. Dredged material characteristics which were found to be of significance in the 12 case studies were the presence of pollutants, odor producing elements, and expansive clay material. Conflicts between State and Federal resource agency policy and Corps desires with regard to the disposal of polluted dredged material caused delays in the evaluation of alternatives in No. 4 - Crystal Beach (●). In No. 6 - Fifth Avenue Marina (o), the fact that the material was not polluted increased the acceptability of the disposal project. In No. 2 - Cleveland 14 (●), the potential disruption to adjacent residential zones due to possible odor from the dredged material was a negative influence. In No. 8 - Anacortes (●), expansion of the dredged material (expansive clays) was greater than originally calculated, making the site capacity inadequate. This miscalculation of soil property delayed the schedule of the project, although not significantly.

79. Disposal area location. The close proximity of a disposal area to the channel being dredged results in higher efficiency of the dredge and fill operation and offers significant cost advantages. Disposal area location was, in nine of the cases studied, a positive influence on project implementation. In several instances, the locational advantage was dual. For example, the disposal site for No. 12 - Osceola (o), was immediately adjacent to the channel and the turning basin being constructed, thereby optimizing the efficiency of the fill operation. Furthermore, the site was considered a prime location for the productive land use contemplated by the Osceola Riverport Authority. In two cases the location of the disposal facility was a negative influence. In No. 10 - Fort Mifflin (●), the site was (and is) so attractive to the City of Philadelphia for industrial use that the

Corps' plan to use the site until the year 2000 was strongly opposed.

80. Flood or tide conditions. Wave action generated from high winds demands special engineering considerations during planning phases of a disposal facility. Also, flooding conditions caused by heavy rains and runoff must be included as part of the design program for certain sites, especially those along rivers prone to flooding, such as the Mississippi River. In two cases, No. 11 - Rivergate (●) and No. 12 - Osceola (●), special considerations related to dike elevations were important aspects of the planning process since the Mississippi River has elevation differences of approximately 50 feet. In No. 2 - Cleveland (o), use of the disposal site as a breakwater for an existing municipal marina had a positive influence on project implementation.

81. Utility relocation/connection. Existing utility mains such as water supply and drainage culverts located in the disposal site area typically require plans for extension or removal. This planning element can be controversial, especially if it is felt that relocating the utility could create a problem or increase the severity of an existing problem. The need to relocate or provide special accommodations for existing utility lines on disposal site areas had a negative influence in four cases. Generally, these considerations are remedied by relatively simple technical procedures, but at increased costs to project sponsors. In Case Study No. 2 - Cleveland 14 (●), the utility relocation plan proposed by the Corps met with strong opposition, but not due to cost. Existing upstream flooding along Doan Brook caused many citizens to fear that the relocation of the Doan Brook culvert during disposal facility construction would aggravate the problem. A Corps hydraulic survey identified the real flooding problem as insufficient upstream sewer and storm drain capacity.

82. Dredging equipment access. Generally, access to the site for dredging equipment was not a severe problem. However, in three of the cases, a special channel was required to provide such access, resulting in additional project costs.

83. Sensory factors (visual, odor, dust, smoke, etc.). Questions asked by the public concerning proposed disposal facilities often

include those related to items such as obnoxious odors, dust generated after the dredged material dries, and visual impacts. Although these items were not particularly influential in terms of implementation in the majority of cases, they did impose negative impacts on four case study projects. In No. 2 - Cleveland 14 (●), the nearby Village of Bratenahl objected to the disposal facility, using as a point of argument the potential odors that might result from the dredged material. A criticism in No. 7 - Eastside 14 (●) was the fact that dredged material was deposited every three or four years and vegetation valuable in controlling dust would just begin its growth process when new dredged material would destroy all plant life and begin the cycle once again.

Physical planning elements related to productive land use planning

84. Nine physical planning elements were documented in the 12 case study projects as having particular influence in terms of productive land use planning:

a. Foundation conditions.

b. Shipping and boat access.

c. Site size and configuration.

d. Vehicular circulation/traffic generation.

e. Rail access.

f. Utility availability and capacity.

g. Flood or tide conditions.

h. Site plan compatibility with site features and user requirements.

i. Sensory factors.

85. Foundation conditions. Foundation costs are an important part of the cost of developing a dredged material disposal site for productive purposes. This is especially true when heavy industrial uses are desired. It is not inconceivable that foundations costs could render an otherwise feasible project uneconomical, or even necessitate a developer's move to an alternative, less costly location. Due to the structural properties of the dredged material associated with them, 9 of the 12 case study projects were adversely influenced by foundation

conditions. In only one case, No. 6 - Fifth Avenue Marina (o), were foundation conditions a positive influence (the dredged material was clean sand).

86. Often, foundation conditions were found to be as dependent on the sub-surface conditions of the site prior to disposal as on the quality of the dredged material. In many cases, the foundation conditions required for productive use included special building, utility, or road foundation treatment. Typically, prospective users were aware of the special site foundation or site preparation requirements. They were willing to accept additional site development costs because of prime site location characteristics. An excellent example of this relationship is No. 1 - Blount Island (●), where the site developer, Offshore Power Systems, was willing to pay unusually high site preparation and foundation costs because the site met very specific development requirements such as channel access, depth, width, vertical clearance to the ocean, and regional labor market needs. The project sponsor in No. 9 - Hoquiam (●) reported that the initial proposed site user, a log sorting yard and sawmill operator, withdrew interest in the disposal site due to high site development costs. The developer located the facility on an inland site, also owned by the project sponsor, that did not have the foundation costs associated with the Hoquiam site. Kaiser Steel, a subsequent proposed developer of the Hoquiam site, requires access to the deep draft channel in Grays Harbor and so appears willing and able to pay the additional foundation costs.

87. Shipping and boat access. In 8 of the 12 case study projects, shipping and boat access to the site was a major positive physical consideration in land use planning. Disposal sites are usually near or adjacent to existing shipping channels and there is generally a lack of available land with such access. Thus, land created through confined dredged material disposal serves to replenish a very scarce resource. The eight case study projects in which shipping and boat access was a positive influence all involved industrial land use concepts dependent on direct access to major shipping channels.

88. Site size and configuration. Conflicts between the site

size and configuration planning element and the proposed land use plans were serious in 4 of the 12 case study projects. In five cases site size and configuration were evaluated as having had a positive influence on proposed land use implementation. In No. 1 - Blount Island (o), the unusually large site of about 900 acres was perfectly matched to the developer's site selection criteria. Also, the orientation of Back River was tailor-made for alteration into the floating nuclear power plant construction and testing channel. In No. 6 - Fifth Avenue Marina (o), the initial site design calling for 113 surface acres to be filled was met with strong opposition from environmental agencies. After the site was redesignd to consist of two peninsulas, totaling 22 acres and providing 80 acres of protected water, the approval process accelerated considerably. In No. 2 - Cleveland 14 (●), site configuration was a negative consideration; there was no attempt made to coordinate che retaining structure design with the proposed park plan. It is now apparent that while the function of the disposal facility would have been preserved, a far better recreational use plan would have resulted. In No. 9 - Hoquiam (●), the site was considered small for the proposed offshore oil and gas rig manufacturing facility. Consequently, Kaiser Steel refused to make a firm commitment to develop the Hoquiam site as proposed, a situation which fueled opposition to the project.

89. Vehicular circulation/traffic generation. Traffic generation associated with proposed land uses and the goods movement capabilities of available roadway networks were influential planning elements in 11 out of 12 cases. In both No. 10 - Fort Mifflin (o) and No. 11 - Rivergate (o), the sites are served by highway, rail, and water transportation, an attractive situation in terms of industrial use. In No. 5 - Huron 1 (●), direct vehicular access to the proposed park will not be possible, meaning not only that park access will be inconvenient, but also that parking pressures on the mainland will be increased. In No. 7 - Eastside 14 (●), the only currently available highway to the site penetrates residential zones, is circuitous, and has an existing congestion problem.

90. Rail access. Heavy industrial land uses associated with

port facilities often rely on rail transportation to move goods inland from the waterfront area. Rail access is therefore a major attribute of a site being planned for industrial uses. In 7 of the 12 cases studied, rail access had a positive influence on project implementation and only in No. 7 - Eastside 14 was rail access thought to be a negative influence. The capability of a port site to provide rail access as well as highways and nearby air transport facilities results in the site appealing to a wider industrial market than sites lacking rail service.

91. Utility availability and capacity. The availability and capacity of existing utilities to serve a proposed land use on a disposal facility is also an important site asset. If construction of utility lines such as water, sewer, electricity, gas, or drainage is required over significant distances, development costs will rise and will be reflected in higher land costs to a tenant or buyer. This added cost could conceivably result in a project which is financially infeasible. In 7 of the 12 case studies the availability of utilities was found to positively influence implementation. Nearby utilities was an important site attribute for developments proposed in No. 8 - Anacortes (o) and No. 9 - Hoquiam (o). In No. 2 - Cleveland 14 (●), the provision of utilities, especially sewage disposal mains required for the proposed park, will be a costly item during park construction. In No. 5 - Huron 1 (●), although adequate utilities were available, connections to the disposal facility were not included during facility construction, and unnecessary high costs will be paid to service the proposed park in the future.

92. Flood or tide conditions. The effects of flood waters due to rainfall or flooding as the result of tidal conditions can have a significant impact on land uses being planned for a disposal site. In two case studies, No. 11 - Rivergate (●) and No. 12 - Osceola (●), land uses were required to be constructed at elevations that would either protect them from major storms (as in Rivergate) or from yearly flooding (as in Osceola). Raising the elevation of site topography to prevent flooding is another cost element that can affect the implementation of a disposal-productive use project.

93. Site plan compatibility with site features and user requirements. For obvious reasons, detailed site plans for proposed productive land uses should reflect optimal compatibility with site features and user requirements. In four of the case studies this was not the case, effecting a negative influence on project implementation. In No. 4 - Crystal Beach (●), a site land use plan was not made public, leading to speculation that a use inconsistent with the character of the area was imminent. In No. 2 - Cleveland 14 (●), the proposed use plan illustrates recreational facilities that are not water-dependent and could be located at inland sites. In No. 8 - Anacortes (●), the road layout constructed according to the subdivision plan became a hinderance to use of the site by the industries that located there because the industrial tracts were divided by unnecessary roads. In No. 6 - Fifth Avenue Marina (o), the final site design is ideally suited to the features of the area as well as to recreational boating.

94. Sensory factors. Construction of a productive land use can have both beneficial and detrimental effects on surrounding residential neighborhoods or other types of land uses. For example, in No. 2 - Cleveland 14 (o), the solid waste disposal site being used by the city was a visual blight on the landscape and therefore use of the site for dredged material disposal in order to develop a park will improve the visual aspects of the area immensely. In No. 5 - Huron 1 (o), the land use proposed, a public park, was considered to be visually acceptable by residents residing along the waterfront overlooking the site. An industrial land use proposed for the same site would have undoubtedly been more controversial. In two cases, No. 4 - Crystal Beach (●) and No. 7 - Eastside 14 (●), negative influences on implementation were attributed to sensory factors. The Eastside site was located below residential land located on the crest of an adjacent bluff. Therefore, the proposed industrial development will be difficult to screen and will be visually apparent from residences along the edge of the industrial/residential interface.

Features of Proposed Land Use Plans (In Terms of 10 Planning Principles)

95. For a majority of the disposal-productive use projects examined in this study, interesting correlations were observed to exist between project implementation and the planning characteristics of the proposed land use concepts. In examining the impacts of the various productive use plans on the overall process of implementation, 10 land use planning characteristics were identified as being indicators of project feasibility. These characteristics represent planning standards or "principles" against which the corresponding features of proposed productive use plans can be evaluated to point out plan deficiencies. In Table Q3, the proposed development plans of the 12 case studies are evaluated, according to these important planning principles, for their effect on project implementation. For conceptual and evaluative purposes the 10 principles are grouped into two categories: (1) those which relate the proposed use plan to the physical surroundings; and (2) those which relate the proposed use plan to the objectives, plans, or policies established in the community. Satisfying, or least addressing, both groups of planning principles is important to the success of proposed productive land use plans. In the case-specific examples provided below for each planning principle, the influence assessments given in Table Q3 are repeated in parentheses after each case study citation.

Planning principles: relationship to physical surroundings

96. The five planning principles addressing the relationship between the plan and the physical surroundings of the site are:

a. Compatibility with existing and surrounding land uses.

b. Utilization of existing transportation systems and infrastructure.

c. Utilization of waterfront location.

d. Compatibility with site size and configuration.

e. Site physical characteristics and their impact on the trade-off between site development costs and the

benefits of the planned use.

97. Compatibility with existing and surrounding land uses. It was found during investigation of the 12 case study projects that a direct correlation often exists between the compatibility of a proposed project to its surrounding environment and the magnitude of controversy generated from the project. In most of the case studies, either the proposed land uses were consistent with those in the immediate surroundings, or were acceptable to surrounding landowners because they were consistent with existing zoning. With the exception of land uses envisioned for No. 1 - Blount Island (●) and No. 4 - Crystal Beach (●), the uses proposed for the case study sites provided a positive influence in project acceptability up to the time of the study.

98. In No. 3. - Bay Port (o) the site was compatible with its surroundings to the degree that the city and county both incorporated plans for the site into their respective master plans. No. 1 - Blount Island (●) is an interesting exception and one where the proposed use was felt by many to be incompatible with surrounding uses. Although the proposed industrial land use was consistent with adjacent industrial uses on the island itself, the Florida Audubon Society and certain citizen groups felt that industrial development of the wetlands on the island would trigger other industrial growth that would eventually transform large areas of existing adjacent wetlands into industrial uses. Similarly, the residential development that adjacent residents suspected might occur in No. 4 - Crystal Beach (●), although consistent with the general type of surrounding land uses, was of a different character and higher density. The expected use was, therefore, dissimilar to and a clear departure from the surrounding low-density, single family residential neighborhood. Moreover, although the suspected residential use concept did not comply with the approved master plan it was, however, in compliance with existing zoning.

99. Utilization of existing transportation systems and infrastructure. In 7 of the 12 sites studied, the proposed land uses successfully utilized existing highways, rail lines or shipping channels for goods movements and seemingly adequate utility services were

available. In five of the seven sites, the ability to utilize existing transportation and utility systems, without expensive modifications, played a paramount role in gaining private and public project support. This was a clear asset in determining overall project feasibility.

100. The disposal site in No. 10 - Fort Mifflin (o) is located in a prime river, rail, vehicular, and air service area of Philadelphia with excellent utility services. These are extremely important attributes of a port terminal. In No. 11 - Rivergate (o), an existing industrial road will connect to an interstate highway and deepwater docking, rail access, and air service are either on site or in the immediate area. Conversely, inadequate highway access for goods movements projected to be generated by the proposed industrial use had a negative influence in No. 7 - Eastside 14 (●). The existing highway which would serve the future industrial development is disjointed and traverses residential neighborhoods. Traffic has been an increasingly serious problem without the proposed industrial project. To avoid these future conflicts, a bypass highway has been planned that would both serve the proposed industrial use and avoid amplification of existing residential traffic problems. Although traffic generation was viewed as negatively influencing project feasibility, the bypass highway should mitigate the adverse traffic impact which would result from reliance on the existing highway. In No. 12 - Osceola (●), existing highways that might service the port facility are inadequate and will necessitate using residential streets. To avoid this problem the city is applying for funds for construction of a new industrial road which will provide access to the nearby interstate highway.

101. Utilization of waterfront location. Appropriately, all of the sites investigated had plans for uses which, at least in part, advantageously utilized their unique locations and, therefore, the use/location relationship was an important positive influence on project implementation. Certain proposed land uses programmed for the 12 case study sites, however, did not fully utilize important site amenities. This is especially true in cases such as in No. 2 - Cleveland 14 (o); the peninsula park planned for the disposal area includes as part of its

program a variety of recreational uses which are not water-dependent such as softball, baseball, and/or tennis. The same type of recreational program/site compatibility problem exists in No. 5 - Huron 1 (o), where softball fields and other uses that could function as well inland were programmed for the proposed park. All of the industrial land uses proposed for disposal sites with deepwater access were documented as taking full advantage of this locational asset. In some cases a site may be viewed as being appropriate for more than one water-related use. For example, in No. 6 - Fifth Avenue Marina (o), the site is immediately adjacent to a deepwater channel, a railroad spur, good highway access, and adequate utilities. If economic and market demands were greater than the need for public open space on the bay, water-dependent industrial land uses could have been appropriate for the site.

102. Compatibility with site size and configuration. During preparation of the 12 case studies, it became evident that conflicts sometimes existed between the size and/or configuration of the disposal facility and the functional requirements of the proposed land use. Although the final design and constructed form of the disposal facility presumably optimized the prime function of the facility (i.e., containing dredged material), the form or type of construction did not always effectively satisfy the needs of land uses advocated or projected for the site. A continual and highly coordinated planning process involving both the disposal facility and the proposed land use could significantly bypass this problem in future planning efforts. An example of this dilemma is the conflict that will no doubt occur when the No. 2 - Cleveland 14 (●) site is completed. Fishing is an important recreational sport in the specific area surrounding Cleveland Site 14 since warm water discharged from a nearby electrical generating plant attracts comparatively large numbers of game fish. However, the proposed armor stone construction of the disposal facility will continually snag fishing lines and discourage full use of the otherwise unique locational advantage of the facility.

103. Conflicts between disposal site size and configuration and

proposed land use plans were also observed in cases No. 5 - Huron 1 (o), No. 6 - Fifth Avenue Marina (●), and No. 9 - Hoquiam (●). Initial disposal facility configurations aroused much opposition in Huron due to neighborhood complaints related to potential loss of water views or water frontage by adjacent residents. Early site configuration plans clearly generated a negative influence on project feasibility. However, in response to those objections the disposal facility plan was altered and the adjusted plan was approved by nearby residents. Early configurations of both the Fifth Avenue Marina site and the Hoquiam site also generated negative reaction in early phases of project feasibility. In the Fifth Avenue Marina case, the initial facility configuration did not include plans for the construction of the marina which was included in the final plan. In the Hoquiam case, the site was smaller than the acreage required for the industrial land use. However, in Hoquiam, developers of the industrial land use tailored their program to the site and the use was accommodated on the available land area.

104. Site physical characteristics: planned use benefits vs. development costs. Dredged material physical characteristics often require the use of special construction methods for either structural development or infrastructure improvements. High costs associated with unstable or generally inferior sub-surface soil conditions could conceivably place a serious financial burden on the productive use developer, possibly to the extent of rendering the site uneconomical to develop. In most cases, however, unique advantages offered by a disposal site, such as the ability to accommodate the tailored specific requirements of an industrial use, coupled with the otherwise general lack of a range of alternate suitable sites, can result in the overall development being a viable investment despite high development costs. This was exactly the situation in Case Study No. 1 - Blount Island (o). Because of the preliminary nature of most plans prepared for the 12 disposal sites evaluated, the correlation between the development costs generated from special disposal site characteristics and the willingness of the developer to pay (or economic viability of the project) was not known.

105. In the Blount Island case, Offshore Power Systems used special compaction equipment and spent about $9 million for site preparation work required to render the site suitable for development. This was due in part to the variation in sub-surface conditions, which had a direct correlation with the types of foundations required for the proposed structures. In No. 9 - Hoquiam (o), an early sawmill developer decided against the use of the site due to poor foundation conditions and anticipated higher than usual development costs. Kaiser Steel then became interested in the site. However, in both cases, even though site improvement costs were higher than those which might be realized on an upland site, specific site characteristics and the magnitude of the overall investment overshadowed the higher development costs. The extra cost increment, therefore, in the final analysis did not influence project economic feasibility in either instance.

Planning principles: relationship to established community objectives, plans, or policies

106. The five planning principles addressing the relationship between the proposed land use plan and the established community objectives, plans, or policies are:

a. Contribution to established community land use needs.

b. Maintenance or enhancement of community image.

c. Consistency with master plans.

d. Provision of community benefits.

e. Minimization of induced adverse impacts (traffic, spin-off development, etc.).

107. Contribution to established community land use needs. Community needs were discussed during interviews with sponsors of the case study projects and with State, regional, and municipal planners. In all but one case, No. 4 - Crystal Beach (●), the proposed productive land use was singularly the most desirable use for the specific site in the opinion of those interviewed. In selected other cases, such as No. 2 - Cleveland 14 (o), No. 6 - Fifth Avenue Marina (o), and No. 9 - Hoquiam (o), it was observed that although the proposed land use was

appropriate, an alternative use might also be in the public's interest. In the Cleveland 14 case, there are conflicting strategies among public officials as to the most appropriate use of the disposal site. Ohio legislation mandates that submerged land areas in the Great Lakes must remain in public hands for public use; the Cleveland disposal site, in compliance with this legislation, will likely be developed as a public park. Preliminary recreational plans for the park have been prepared and supported by most city officials. In contrast, other city officials concerned with stimulating the economy of the city view the site as having important industrial or commercial land use potential. These officials are in full recognition that it would be necessary to introduce a bill to the Ohio legislature to obtain authority for private use of the site.

108. In No. 6 - Fifth Avenue Marina (o), it was recognized that there is great economic potential for hotels and shops along the bay frontage on the two site peninsulas, and that these uses would contribute to San Diego's land use needs. However, public environmental groups opposed private development along the water's edge and advocated uses open to the public such as parks and marinas. Once a sound development program was formulated that clearly demonstrated an effort to help satisfy community needs, public attitudes changed and the project was accepted. The community needs that the proposed productive land use partially satisfied included (1) waterfront park space on San Diego Bay, (2) public access to the water, and (3) enhancement of the adjacent downtown urban renewal project. For a third example, the industrial facilities projected for No. 9 - Hoquiam (o) met with the approval of or were enthusiastically promoted by local officials and the project sponsor. However, State planning representatives recognized the serious lack of water-oriented recreational or park space in Hoquiam and stated that the site would also be appropriate for such use.

109. Case No. 4 - Crystal Beach (●) was the only clear example where the proposed land use was diametrically opposed to established community land use needs. Pinellas County had declared the site as being environmentally sensitive in 1972 and in 1973 placed the site on a

list of areas recommended for acquisition by the State for preservation. The reasons for concern by the citizens over the proposed use of Crystal Beach as a disposal site have been presented throughout the previous discussions. In addition, the adjacent Crystal Beach community was apprehensive that the developer would pursue a rezoning designation allowing moderate-to-high density residential uses on the site. Reaction by both public agencies and the public at large to proposed additional housing for the Crystal Beach site was negative and therefore the expected type of land use, although not made explicit, was a significant factor in the eventual defeat of the plan.

110. Maintenance or enhancement of community image. A proposed use that is compatible with an existing community image (i.e., the collage of various land uses which gives a community its identity) is often more acceptable to the public than a land use which might detrimentally alter the established image. In 9 of the 12 case studies, public attitudes toward probable changes in community image as a result of the proposed use were a positive influence on implementation. For example, in No. 2 - Cleveland 14 (o) the disposal location was a city-owned demolition waste landfill and a visual and environmental blight to the community. The public participants in project planning and review recognized that the proposed park would beautify the site, and enhance and add acreage to a run-down adjacent park. In contrast, No. 4 - Crystal Beach (●) involved a combination of attractive wetlands and uplands, and the public was opposed to destroying those community image resources for a potential high-density housing development. Interestingly, the creation of a park in No. 5 - Huron 1 (o) was not a significant component in enhancing the community image since the previous views over Lake Erie were attractive and an asset to land values. In No. 9 - Hoquiam (-) no firm sense of the value of community image was apparent. Resource agencies advocated preservation of the existing wetlands on the site, and the project sponsor advocated development.

111. Consistency with master plans. The case study analyses of land use considerations demonstrate that planned land use consistency with, and reinforcement of, local, regional, and State master plans is a

noteworthy, positive impetus in project acceptability. All but one case, No. 4 - Crystal Beach (●), had planned or contemplated uses consistent with local comprehensive plans. In Crystal Beach, the planning conflict provided much support for arguments against the project by local objectors. In interviews with members of the community adjacent to the proposed disposal site, it was indicated that an environmentally sound disposal project with a productive use plan consistent with local plans and in sympathy with the character of the existing community would have been acceptable. Although the industrial land uses proposed for No. 11 - Rivergate (o) were generally consistent with master plans, certain master plan objectives, including the construction of a river-oriented parkway and a linear open space system along nearby Nonconnah Creek, were forfeited for the project.

112. Provision of community benefits. Industrial land uses were proposed in 8 of the 12 cases investigated, and generally, industrial growth in a community or a region has been traditionally recognized as an asset to a municipal tax base. Park uses such as those planned for No. 6 - Fifth Avenue Marina (o), No. 2 - Cleveland 14 (o), and No. 5 - Huron 1 (o) provide community benefits in a non-monetary way by creating valuable waterfront recreational land. In the eight industrial use case studies, projected favorable economics resulting from the proposed development played an important role in obtaining general community and/or agency acceptance. For example, the port development in No. 12 - Osceola (o) would help to diversify a primarily agricultural labor market, generate regional trade advantages, and provide facilities for industries which would otherwise choose alternate locations to Osceola. Case No. 4 - Crystal Beach (-) is an interesting exception; since the owners of the site never made their specific development plans explicit, the projected economic impact on the community from the project remained an unknown component. Because of this lack of information, economics were not a part of the general project discussion and therefore had only a negligible influence on the feasibility of the proposed development.

113. Minimization of induced adverse impacts. In 6 of the

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12 sites analyzed, induced adverse impacts projected to be generated by the proposed development were significant in influencing negative attitudes towards the project. For example, the proposed industrial development of No. 7 - Eastside 14 (●) would increase traffic volumes and turning movements on the existing adjacent highway which penetrates a residential neighborhood. Since the proposed development was recognized as a traffic generating land use, the proposal was instrumental in initiating plans for a new bypass highway. Although the increased traffic had a negative influence in public acceptance, the bypass plan helped to mitigate the negative sentiments. A second example where suspected spin-off development proved to create a negative influence on overall project feasibility was No. 4 - Crystal Beach (●), where the public envisioned increased development in the immediate wetland area to be triggered by the Crystal Beach development. Except for the possibility of generating increases in traffic, the two multi-use park cases, No. 2 - Cleveland 14 and No. 5 - Huron 1, cannot be meaningfully evaluated in terms of adverse impacts which might be related to spin-off development. The nature of the developments, park use, alone tends to minimize induced secondary development.

Table Q1

Issues Associated with the 12 Case Studies: Impact Assessments

Issue Categories	East Coast: Blount Island (1)	East Coast: Fort Mifflin (10)	Gulf Coast: Crystal Beach (4)	Mississippi River: Rivergate (11)	Mississippi River: Osceola (12)	Great Lakes: Cleveland Site 14 (2)	Great Lakes: Bay Port (3)	Great Lakes: Huron Site 1 (5)	West Coast: Fifth Ave. Marina (6)	West Coast: Eastside Site 14 (7)	West Coast: Anacortes (8)	West Coast: Hoquiam (9)	Totals: Major (■)	Totals: Minor (□)	Totals: No Impact (—)
ENVIRONMENTAL															
1. Wetlands filling	■	□	■	—	—	—	■	—	—	■	□	■	5	2	5
2. Wildlife habitat disturbance	—	—	□	—	—	—	■	—	—	—	—	—	1	1	10
3. Aquatic habitat disturbance	□	—	□	■	—	—	—	—	□	—	■	□	2	4	6
4. Regional ecosystem alteration	■	—	—	—	—	■	—	—	—	■	□	□	3	2	7
5. Bay bottomland and/or surface area reduction	—	—	—	—	—	■	—	■	■	—	—	—	3	0	9
6. Dredging-disposal water quality impacts	□	—	■	□	—	□	—	■	□	□	■	—	3	5	4
7. Changes in flow patterns	—	—	—	□	—	■	—	■	■	□	—	—	3	2	7
8. Odor	—	—	—	—	—	■	—	□	—	—	—	—	1	1	10
9. Secondary impacts of the planned use	□	—	—	—	—	—	—	—	—	—	—	□	0	2	10
TECHNICAL															
1. Dike stability	—	—	—	■	□	—	—	—	—	■	■	—	3	1	8
2. Site foundation conditions (for planned use)	□	■	□	■	—	—	—	—	—	—	■	□	3	3	6
3. Dredging technique	—	—	—	—	—	—	—	—	—	—	■	—	1	0	11
4. Disposal area capacity	□	■	□	■	—	—	■	□	—	—	■	—	4	3	5
5. Disposal area size and configuration	□	—	□	—	—	■	—	■	■	—	□	—	3	3	6
6. Disposal area operating characteristics	—	■	■	■	■	—	—	—	—	—	□	—	4	1	7
7. Utility relocation/connection	—	—	—	—	—	■	—	■	□	—	—	—	2	1	9

* Key: ■ major; □ minor; — no impact on implementation.

(Continued)

Table Q1 (Continued)

Issue Categories	East Coast: Blount Island (1)	East Coast: Fort Mifflin (10)	Gulf Coast: Crystal Beach (4)	Mississippi River: Rivergate (11)	Mississippi River: Osceola (12)	Great Lakes: Cleveland Site 14 (2)	Great Lakes: Bay Port (3)	Great Lakes: Huron Site 1 (5)	West Coast: Fifth Ave. Marina (6)	West Coast: Eastside Site 14 (7)	West Coast: Anacortes (8)	West Coast: Hoquiam (9)	Totals: Major (■)	Totals: Minor (□)	Totals: No Impact (—)
ECONOMIC/FINANCIAL															
1. Economic or social benefits (costs) of the disposal-productive use project	■	■	□	—	—	—	□	—	□	□	□	□	2	6	4
2. Economic or social impacts of secondary development	□	—	—	—	—	—	—	—	□	—	—	—	0	2	10
3. Fees or taxes on dredged material	■	—	—	—	—	—	—	—	—	—	—	—	1	0	11
4. Utility relocation costs	—	—	—	—	—	■	□	□	□	—	—	—	1	3	8
5. Additional dredging or disposal costs	□	■	—	—	—	■	■	■	—	—	□	—	4	2	6
LEGAL															
1. Conformance with EIS requirements	—	—	■	—	—	—	—	—	—	—	—	■	2	0	10
2. Adequacy of environmental impact assessment or statement	■	■	□	—	—	—	—	—	—	—	—	■	3	1	8
3. Conformance with public hearing requirements	■	—	■	—	—	—	—	—	—	—	—	—	2	0	10
4. Site ownership authorities	□	—	—	—	■	□	—	□	□	—	—	—	1	4	7
5. State vs. Federal permit jurisdiction	—	—	—	—	—	—	—	—	■	—	—	—	1	0	11
INSTITUTIONAL															
1. Public participation during project planning	—	—	■	—	—	—	—	—	□	—	—	—	1	1	10
2. Responsiveness to public comments	—	—	■	—	—	□	—	□	—	—	—	—	1	2	9
3. Coordination with review/regulatory agencies	—	—	—	■	—	—	—	—	□	■	—	—	2	1	9

*Key: ■ major; □ minor; — no impact on implementation.

(Continued)

Table Q1 (Concluded)

Issue Categories	East Coast: Blount Island	East Coast: Fort Mifflin	Gulf Coast: Crystal Beach	Mississippi River: Rivergate	Mississippi River: Osceola	Great Lakes: Cleveland Site 14	Great Lakes: Bay Port	Great Lakes: Huron Site 1	West Coast: Fifth Ave. Marina	West Coast: Eastside Site 14	West Coast: Anacortes	West Coast: Hoquiam	Totals: Major	Totals: Minor	Totals: No Impact
	1	10	4	11	12	2	3	5	6	7	8	9	■	□	—
PLANNING/IMPLEMENTATION															
1. Dredging project design limits	—	—	□	■	—	—	—	—	—	■	■	■	4	1	7
2. Dredging project need	□	—	■	■	—	—	—	—	—	—	□	—	2	2	8
3. Long-range waterway/environmental planning	□	□	—	—	—	□	—	—	□	■	□	■	2	5	5
4. Evaluation of alternative disposal areas	—	■	■	—	—	□	—	■	—	■	□	■	5	2	5
5. Adequacy of environmental data base	□	—	□	—	—	—	—	—	■	—	□	□	1	4	7
6. Appropriateness of proposed use: public vs. private	□	■	—	—	—	□	—	□	■	—	—	□	2	4	6
7. Appropriateness of proposed use: water dependent	□	□	—	—	—	—	□	—	□	—	□	■	1	5	6
8. Proposed use compatibility with adjacent uses	—	■	■	—	—	□	—	—	□	—	—	—	2	2	8
9. Commitment to proposed land use plan	■	■	—	—	—	—	—	—	□	—	□	■	3	2	7
10. Responsibility for economic impact assessment	■	■	—	—	—	—	—	—	—	—	—	—	2	0	10

*Key: ■ major; □ minor; — no impact on implementation.

Table Q2

Physical Planning Elements of the 12 Case Studies: Influence Assessments

	East Coast		Gulf Coast	Mississippi River		Great Lakes			West Coast				Totals			
Physical Planning Elements	Blount Island	Fort Mifflin	Crystal Beach	Rivergate	Osceola	Cleveland Site 14	Bay Port	Huron Site 1	Fifth Ave. Marina	Eastside Site 14	Anacortes	Hoquiam	Negative	Positive	No Influence	Not Applicable
	1	10	4	11	12	2	3	5	6	7	8	9	●	○	—	na
ELEMENTS RELATED TO DISPOSAL FACILITY PLANNING																
1. Pre-disposal site characteristics																
a. below mean low water	na	na	na	na	na	—	na	○	○	na	na	na	0	2	1	9
b. wetland	●	na	●	na	na	na	●	na	na	—	●	●	5	0	1	6
c. upland	—	—	○	na	—	na	○	na	na	na	na	○	0	3	3	6
d. area of previous fill activity	○	—	na	○	na	○	na	na	na	○	na	—	0	4	2	6
2. Ecological characteristics	●	—	●	—	○	—	●	●	—	○	●	●	6	2	4	0
3. Disposal area capacity	—	○	●	○	—	—	●	●	○	—	●	—	4	3	5	0
4. Sub-surface soil conditions	—	—	—	—	—	●	—	●	—	●	●	—	4	0	8	0
5. Composition of dredged material	—	—	●	●	—	●	—	—	○	—	●	—	4	1	7	0
6. Disposal area location	○	●	●	○	○	—	○	○	○	○	○	○	2	9	1	0
7. Flood or tide conditions	—	—	—	●	●	○	—	—	—	—	—	—	2	1	9	0
8. Utility relocation/connection	—	—	—	—	—	●	●	—	●	●	—	—	4	0	8	0
9. Dredging equipment access	—	—	—	—	—	●	—	●	—	●	—	—	3	0	9	0
10. Sensory factors (visual, odor, dust, smoke, etc.)	—	—	●	—	—	●	—	●	—	●	—	—	4	0	8	0

*Key: ●negative; ○positive; — no influence on implementation; na not applicable.

(Continued)

Table Q2 (Concluded)

Physical Planning Elements	East Coast: Blount Island (1)	East Coast: Fort Mifflin (10)	Gulf Coast: Crystal Beach (4)	Mississippi River: Rivergate (11)	Mississippi River: Osceola (12)	Great Lakes: Cleveland Site 14 (2)	Great Lakes: Bay Port (3)	Great Lakes: Huron Site 1 (5)	West Coast: Fifth Ave. Marina (6)	West Coast: Eastside Site 14 (7)	West Coast: Anacortes (8)	West Coast: Hoquiam (9)	Totals: Negative (●)	Totals: Positive (○)	Totals: No Influence (—)	Totals: Not Applicable (na)
ELEMENTS RELATED TO PRODUCTIVE LAND USE PLANNING																
1. Foundation conditions	●	●	—	●	—	●	●	●	○	●	●	●	9	1	2	0
2. Shipping and boat access	○	○	—	○	○	—	○	—	—	○	○	○	0	8	4	0
3. Site size and configuration	○	○	—	○	—	●	○	●	○	●	—	●	4	5	3	0
4. Vehicular circulation/traffic generation	●	○	—	○	●	●	○	●	○	●	○	●	6	5	1	0
5. Rail access	○	○	—	○	○	—	○	—	—	●	○	○	1	7	4	0
6. Utility availability and capacity	●	○	—	○	○	●	○	●	○	●	○	○	4	7	1	0
7. Flood or tide conditions	—	—	○	●	●	○	—	—	—	—	—	—	2	2	8	0
8. Site plan compatibility with site features and user requirements	○	—	●	○	—	●	●	—	○	—	●	—	4	3	5	0
9. Sensory factors (visual, odor, vibration, dust, smoke, etc.)	—	—	●	—	—	○	—	○	○	●	—	—	2	3	7	0

*Key: ● negative; ○ positive; — no influence on implementation; na not applicable.

Table Q3

Proposed Land Use Plans of the 12 Case Studies: Influence Assessments Based on Ten Planning Principles

	East Coast		Gulf Coast	Mississippi River		Great Lakes			West Coast				Totals			
	Blount Island	Fort Mifflin	Crystal Beach	Rivergate	Osceola	Cleveland Site 14	Bay Port	Huron Site 1	Fifth Ave. Marina	Eastside Site 14	Anacortes	Hoquiam	Negative	Positive	No Influence	Unknown
Land Use Planning Principles	1	10	4	11	12	2	3	5	6	7	8	9	●	○	—	un
RELATIONSHIP TO PHYSICAL SURROUNDINGS																
1. Compatibility with adjacent and surrounding land uses	●	○	●	○	—	○	○	○	○	○	○	○	2	9	1	0
2. Utilization of existing transportation systems and infrastructure	●	○	—	○	●	○	○	—	●	●	○	●	5	5	2	0
3. Utilization of waterfront location	○	○	○	○	○	○	○	○	○	○	○	○	0	12	0	0
4. Compatibility with site size and configuration	○	—	—	○	○	●	○	●	●	○	—	●	4	5	3	0
5. Site physical characteristics: planned use benefits vs. development costs	○	●	un	○	un	un	un	un	—	un	—	○	1	3	2	6
RELATIONSHIP TO ESTABLISHED COMMUNITY OBJECTIVES, PLANS, OR POLICIES																
1. Contribution to established community land use needs	○	○	●	○	○	○	○	○	○	○	○	○	1	11	0	0
2. Maintenance or enhancement of community image	○	○	●	○	○	○	○	—	○	○	○	—	1	9	2	0
3. Consistency with master plans	○	○	●	○	○	○	○	○	○	○	○	○	1	11	0	0
4. Provision of community benefits	○	○	—	○	○	○	○	○	○	○	○	○	0	11	1	0
5. Minimization of induced adverse impacts (traffic, spin-off development, etc.)	●	—	●	○	—	—	●	—	—	●	●	●	6	1	5	0

*Key: ● negative; ○ positive; — little or no influence on project implementation (in terms of stated planning principles); un unknown.

APPENDIX R: SUBJECTIVE ASSESSMENT MATRIX FOR FACTORS AFFECTING DISPOSAL-PRODUCTIVE USE PROJECT IMPLEMENTATION

Introduction

1. Disposal-productive use project implementation is influenced by: (1) items found to form the basis for specific issues; (2) project planning and review processes; and (3) disposal facility and land use planning practices. These considerations have been utilized in this study to forge an overall set of "factors affecting implementation." These implementation factors are listed in Table R1, which also presents staff assessments of the influence that each factor was felt to have had on each case study project. The subjective influence assessments provided in Table R1 are based on the full set of details associated with each case study. These details will not be presented here; however, many of the relevant facts are described in the comparative analyses of Appendix Q. The reader is also referred to the case study synopses of Appendices A through L, which contain in tabular format, brief descriptions of the facts relevant to the most important, or "key," factors affecting implementation in each case.

Table R1

Factors Affecting Implementation in the 12 Case Studies: Influence Assessments

Factor Categories	East Coast: Blount Island (1)	East Coast: Fort Mifflin (10)	Gulf Coast: Crystal Beach (4)	Mississippi River: Rivergate (11)	Mississippi River: Osceola (12)	Great Lakes: Cleveland Site 14 (2)	Great Lakes: Bay Port (3)	Great Lakes: Huron Site 1 (5)	West Coast: Fifth Ave. Marina (6)	West Coast: Eastside Site 14 (7)	West Coast: Anacortes (8)	West Coast: Hoquiam (9)	Totals: Negative (●)	Totals: Positive (○)	Totals: No Influence (—)
ENVIRONMENTAL															
1. Ecological characteristics of proposed disposal area location	●	○	●	○	—	○	○	—	○	○	—	○	2	7	3
2. Environmental impacts of disposal-productive use project	●	—	●	—	—	○	○	—	○	○	—	○	2	5	5
3. Dredged material pollution properties	—	—	●	—	—	●	—	●	○	—	●	—	4	1	7
TECHNICAL															
1. Dredged material structural properties	—	●	—	●	—	—	—	—	—	—	●	—	3	1	8
2. Disposal area sub-surface conditions	●	●	—	●	—	●	●	●	—	●	●	●	9	0	3
3. Disposal facility design and operating characteristics	●	○/●	●	○	—	●	●	○	—	●	●	●	8	3	2
4. Site size and configuration (as related to productive use)	○	○/●	—	○	—	●	○	●	○	●	—	●	5	5	3
5. Technical coordination of disposal plan with productive use plan	○	●	—	○	○	●	—	●	—	—	○	—	3	4	5
ECONOMIC/FINANCIAL															
1. Economic or social benefits (costs) of the disposal-productive use project	○	○	—	○	○	—	○	—	○	○	○	○	0	9	3
2. Engineering and construction costs	●	●	●	—	—	●	—	●	—	—	—	—	5	0	7
3. Dredged material transport costs	—	●	—	○	○	—	●	—	—	○	—	—	2	3	7
4. Fees or taxes on dredged material	●	—	—	—	—	—	—	—	—	—	—	—	1	0	11
5. Project sponsor capability to assume financial responsibilities	—	○	●	○	○	●	●	●	○	—	○	○	4	6	2

*Key: ● negative; ○ positive; — no influence on implementation.

(Continued)

R2

Table R1 (Continued)

Factor Categories	East Coast: Blount Island	East Coast: Fort Mifflin	Gulf Coast: Crystal Beach	Mississippi River: Rivergate	Mississippi River: Osceola	Great Lakes: Cleveland Site 14	Great Lakes: Bay Port	Great Lakes: Huron Site 1	West Coast: Fifth Ave. Marina	West Coast: Eastside Site 14	West Coast: Anacortes	West Coast: Hoquiam	Totals: Negative	Totals: Positive	Totals: No Influence
	1	10	4	11	12	2	3	5	6	7	8	9	●	○	—
LEGAL															
1. Conformance with regulatory requirements	●	○	●	—	—	—	○	○	●	—	●	●	5	3	4
2. Adequacy of environmental impact assessment or statement	●	●	●	—	—	—	—	○	—	○	—	●	4	2	6
3. Disposal rights to the site	—	—	—	—	—	—	●	●	—	—	—	—	2	0	10
4. Site ownership authorities (as related to productive use)	○	—	—	—	—	—	—	—	○	—	—	—	0	2	10
5. Land use restrictions	—	—	—	—	—	○	—	—	●	—	—	●	2	1	9
INSTITUTIONAL															
1. Public participation in disposal-productive use planning	—	○	●	—	—	○	—	○	●	○	○	○	2	6	4
2. Coordination with project sponsor	○	—	●	○	—	○	○	○	—	○	●	○	2	7	3
3. Coordination with review/regulatory agencies	○	○	●	○	—	○	—	○	●	○	○	○	2	8	2
4. Coordination with planning agencies	—	○	●	●	○	○	○	○	●	○	—	○	3	7	2
5. Procedures for identifying and resolving objections to the project	●	●	●	—	—	○	—	○	—	—	○	○	3	4	3
6. Corps and other participant attitudes	—	●	●	○	○	○	—	○	●	●	—	—	4	4	4
7. Political, business and public support	○	○	●	○	○	○	○	—	○	○	○	○	1	10	1

*Key: ● negative; ○ positive; — no influence on implementation.

(Continued)

Table R1 (Concluded)

Factor Categories	East Coast: Blount Island 1	East Coast: Fort Mifflin 10	Gulf Coast: Crystal Beach 4	Mississippi River: Rivergate 11	Mississippi River: Osceola 12	Great Lakes: Cleveland Site 14 2	Great Lakes: Bay Port 3	Great Lakes: Huron Site 1 5	West Coast: Fifth Ave. Marina 6	West Coast: Eastside Site 14 7	West Coast: Anacortes 8	West Coast: Hoquiam 9	Totals: Negative ●	Totals: Positive ○	Totals: No Influence —
PLANNING/IMPLEMENTATION															
1. Long-range Corps disposal planning	●	●	—	—	—	—	—	●	—	●	●	●	6	0	6
2. Long-range waterway/environmental planning	○	○	●	○	—	—	○	—	○	○	○	●	2	7	3
3. Dredging project specification	—	—	●	—	—	—	—	—	—	●	●	—	3	0	9
4. Temporal coordination of disposal plan with productive use plan	○	●	—	●	○	●	●	●	○	—	○	○	5	5	2
5. Availability of environmental data	●	—	●	—	—	—	—	—	●	○	●	○	4	2	6
6. Evaluation of alternative disposal areas	○	●	●	—	—	○	—	○	—	○	—	●	3	4	5
7. Impacts of disposal-productive use project on existing water uses	—	—	●	—	○	●	—	○	—	—	—	—	2	2	8
8. Proposed use compatibility with adjacent land uses	●	○	●	○	—	○	○	○	○	○	○	○	2	9	1
9. Proposed use compatibility with master plans	○	○	●	○	○	○	○	○	○	○	○	○	1	11	0
10. Proposed use compatibility with available transportation systems and infrastructure	●	○	—	○	●	○	○	—	●	●	○	●	5	5	2
11. Proposed site plan compatibility with site physical features and user requirements	○	—	●	○	—	◔	○	—	○	—	●	○	3	6	4
12. Commitment to proposed land use plan	◔	◔	—	○	—	—	—	—	●	—	○	○	3	5	6

*Key: ● negative; ○ positive; — no influence on implementation.

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7 June 1978

Errata Sheet

No. 1

CASE STUDIES AND COMPARATIVE ANALYSES OF ISSUES ASSOCIATED WITH PRODUCTIVE LAND USE AT DREDGED MATERIAL DISPOSAL SITES

Technical Report D-77-43
Volume II: Appendices A-R

1. On cover of report, Susaki Associates Inc. should read:

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