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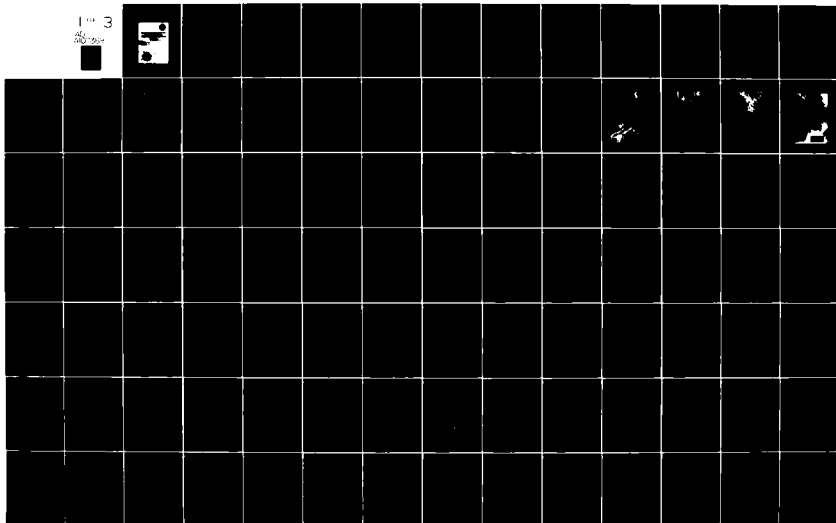
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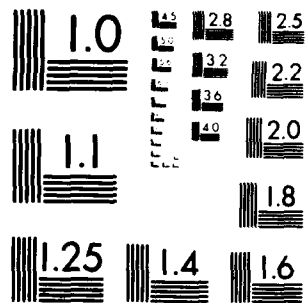
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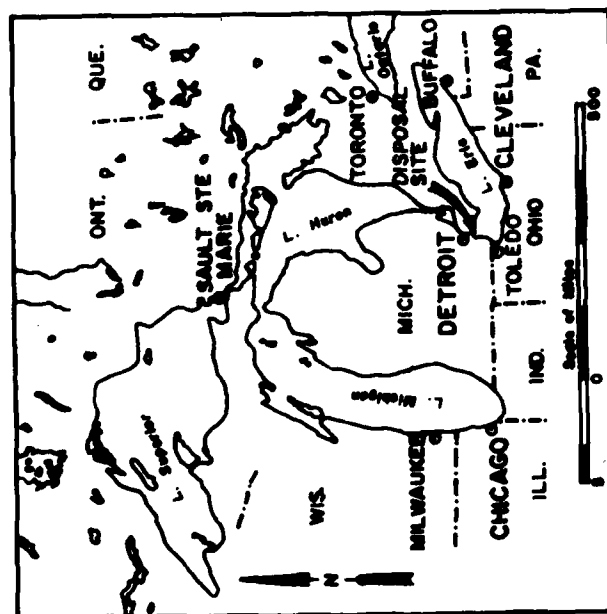
CONFINED DISPOSAL FACILITY
AT PONTE MOUILLEE
FOR DETROIT AND ROUGE RIVERS



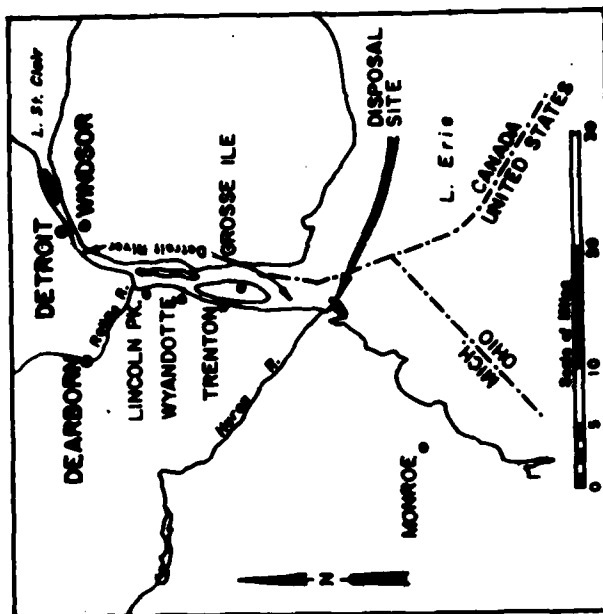
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VICINITY MAP



LOCATION MAP

DISPOSAL SITE
LOCATION PLANS
DETROIT AND ROUGE RIVERS
DETROIT, MICHIGAN

U. S. ARMY ENGINEER DISTRICT, DETROIT

FACE PLATE

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) Final Environmental Statement Confined disposal facility at Pointe Mouillee for Detroit and Rouge Rivers.		5. TYPE OF REPORT & PERIOD COVERED Final Report
7. AUTHOR(s) U.S. Army Engineer District Detroit		6. PERFORMING ORG. REPORT NUMBER
9. PERFORMING ORGANIZATION NAME AND ADDRESS Department of the Army U.S. Army Engineer District, Detroit P.O. Box 1027, Detroit, Michigan 48231		8. CONTRACT OR GRANT NUMBER(s)
10. CONTROLLING OFFICE NAME AND ADDRESS ST-1		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBER
11. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)		12. REPORT DATE March 1974
		13. NUMBER OF PAGES 251 (Various drawings)
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19. KEY WORDS (Continue on reverse side if necessary and identify by block number)		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number)		

Confined Disposal Facility At Pointe Mouillee, Michigan For Detroit and Rouge Rivers

(X) Final Environmental Statement

1. Name of Action: (X) Administrative () Legislative

3. a. Environmental Impacts: Containment of the polluted dredge spoil will remove it as a source of pollution to the open waters of the bay. The dikes will protect Pointe Mouillee Wildlife shoreland marshes from further erosion and create additional fishing habitat. Future development and management of the site and marshlands will optimize wildlife habitats and provide recreational potential for waterfowlers and naturalists.

b. Adverse Environmental Effects: The replacement of 700 acres of Lake Erie bottomland by the proposed structure may introduce an adverse esthetic impact on the natural landforms of the area. The dikes and management measures would create a secondary adverse impact on historical and biological relationships of the marsh to the lake. Although the structure will offer a protection against erosion from wave action, it will not prevent losses of vegetation from flooding. The function of the marsh as a spawning and feeding habitat for fish, as it existed in the 1930's, is now measurably reduced and would not resume behind the anticipated dikes. A lagoon situation behind the dikes, which would enhance conditions relative to spawning and feeding, is dependent on levels of turbidity and concentrations of pollutants that may result.

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4. Alternatives: *to the recommended plan includes: (1)*

a. ^{*but*} Resume open lake disposal which would return pollutants to the waterways. Such action is prohibited by request of the Governor of Michigan, ^{*because*} because of the polluted nature of the dredged material.

b. Discontinue dredging of polluted sediments which would reduce channel depths and curtail shipping, *and (3) Use*

c. Utilize another site for disposal. Seventeen sites were considered and rejected. The 18th alternative selected as a viable alternative, was rejected by the Office, Chief of Engineers at the request of the Michigan Department of Natural Resources after considerations extending thru filing of the Final Environmental Impact Statement with Office, Chief of Engineers.

5. Comments Requested: This draft environmental statement has been circulated to other government agencies for comment. Agencies considered for coordination are:

1. Great Lakes Basin Commission.
 2. Great Lakes Commission.
 3. Huron-Clinton Metropolitan Authority.
 4. Huron River Watershed Council.
 5. Michigan Department of Natural Resources.
 6. Office of Economic Opportunity.
 7. Southeast Michigan Council of Governments.
 8. U. S. Department of Agriculture Soil Conservation Service Forest Service.
 9. U.S. Department of Commerce National Oceanic and Atmospheric Administration Coast Guard.
 10. U.S. Department of Interior.
 11. U.S. Environmental Protection Agency.
-
6. Draft statement to CEO 11 January 1974.
 7. Final statement to CEO 5 April 1974.

CONFINED DISPOSAL FACILITY
AT POINTE MOUILLEE
FOR DETROIT AND ROUGE RIVERS

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SECTION I
PROJECT DESCRIPTION

A. GREAT LAKES NAVIGATION.

The confined area proposed at Pointe Mouillee is to contain dredge material to be taken from the Detroit and Rouge Rivers in the next ten year period. The Detroit River connecting channel consists of the following segments which connect Lake Erie with Lake St. Clair:

1. The East Outer Channel which extends approximately five miles into Lake Erie.
2. The Lower Livingstone Channel which extends from the north end of the outer east channel to the mouth of the Detroit River.
3. The Upper Livingstone Channel which is on the west side of Bois Blanc Island.
4. The Hackett, Amherstburg, and Limekiln Reaches which are on the east side of the Bois Blanc Island.
5. Ballards Reef Channel which connects the two separate channels, northeast of Stony Island.
6. Fighting Island Channel which passes west of Fighting Island.
7. The Detroit River from North of Fighting Island to the south of Belle Isle.
8. The Head of the Detroit River Channel which extends south of Belle Isle into Lake St. Clair.

In addition to this connecting channel, the Trenton Channel is located west of Grosse Ile.

The Rouge River Project consists of the Old Channel, Short Cut Canal and the Rouge River.

Sections of the connecting channel require dredging on periodic intervals to maintain the depths necessary for the vessels which use the waterway. In particular, the removal of approximately 800,000 cubic yards of dredge spoil per year is required for the Detroit River. In addition, 275,000 cubic yards of sediment from the Rouge River is required to be removed to maintain the authorized project depths.

Sediments, primarily silts and fine sands, are carried by the Detroit River in suspension. As the water from the Detroit River enters Lake Erie, the velocity decreases. This causes the fine particles to settle to the bottom and fill up the navigation channel. Most of the dredging for the Detroit River is done in the East Outer Channel and Lower Livingstone Channel where the above mentioned shoaling occurs.

In addition to the dredging done by the Federal Government in the authorized channels, permit dredging is performed. Permit dredging is dredging done by private concerns to maintain areas outside the main channels for docks, mooring areas and access to the main channel from private docks. From 1963 to 1967 annual permit dredging averaged 90,000 and 75,000 cubic yards for the Detroit River and Rouge River respectively.

Since 1967 no permits have been issued that involve open lake disposal and consequently the total amount of permit dredging performed in 1969 and 1970 decreased to 7,000 and 29,300 cubic yards for the Detroit and Rouge Rivers respectively. As the siltation of the channels occurs, the allowable draft of the vessels decreases and in turn the ships cannot be filled to capacity which increases the cost of transportation. This, in turn, must eventually be borne by the consumer and has an effect on the foreign commerce which uses the Detroit River.

The commerce on the Rouge River includes iron ore, bituminous coal, limestone, petroleum products, gypsum, and miscellaneous domestic and foreign goods.

Commerce on the Detroit River consists of metal products, limestone, sand, gravel, food, farm products, chemicals, forest products, and manufactured goods.

The annual quantities of tonnage shipped (excluding Canadian tonnage on the Detroit River) are listed below for recent years:

Table I - 1: Commerce on the Detroit River, 1962-1971. Annual quantities of tonnage shipped (excluding Canadian tonnage).

<u>Year</u>	<u>Rouge River</u>	<u>Detroit River</u>
1962	11,118,304	100,039,108
1963	11,501,515	107,193,679
1964	13,674,772	120,279,218
1965	13,420,201	124,458,327
1966	12,696,903	129,225,393
1967	11,209,868	118,487,449
1968	13,302,008	122,603,083
1969	11,922,798	122,853,907
1970	12,744,001	125,591,966
1971	11,985,048	115,741,978

B. REQUIREMENTS FOR DREDGING.

Dredging of the Detroit River, one of the Great Lakes Connecting Channels, was originally authorized by River and Harbor Acts of June 23, 1874, July 5, 1884, August 5, 1886, August 11, 1888, July 13, 1892, and March 3, 1899. Current authorizations are listed in Attachment No. 1.

Dredging of the Rouge River was originally authorized by the River and Harbor Act of August 11, 1888 (Annual Report for 1887, pp. 2275-2278; joint resolution of April 1, 1898, p. 2605), and the River and Harbor Act of March 2, 1907 (H. Doc. 289, 59th Cong., 1st Sess.). Current authorizations are contained in Attachment No. 1.

The necessity for maintenance dredging arises principally from natural shoaling of navigation channels due to transport of sediments by currents within the Great Lakes, their Connecting Channels, and other navigable waterways. Since a navigation channel, once dredged, tends to be deeper than the remainder of the waterway, sediments tend to be deposited within the channel. This deposition must be periodically removed in order to maintain the authorized depth of the channel.

The usable draft within a navigation channel is dictated by the highest shoal. An accretion of sediment anywhere in the channel may therefore render the channel unusable, even though the authorized depth may be maintained elsewhere in the channel.

Even a small reduction in available draft means a major reduction in cargo per vessel voyage. For example, a one-inch reduction in available draft reduces the effective cargo-carrying capacity of the average lake freighter by 100 tons.

Decreased efficiency of transportation results in increased costs and prices throughout the industrial, commercial, and household sectors of the economy. In addition, many goods which rely on inland navigation for transport are too heavy or too bulky to be efficiently transported by other means. The net effect of reductions in draft is a reduction in commerce and in the industrial activity dependent on commerce. The entire economy of the Great Lakes area is largely dependent, directly or indirectly, on the availability of efficient low-cost transport of raw materials and finished products by water.

It is for this reason that the United States Government has assumed the responsibility for the maintenance of inland waterways, particularly the Great Lakes and Connecting Channels, as embodied in the laws cited above.

C. REQUIREMENTS FOR DISPOSAL OF POLLUTED SPOIL.

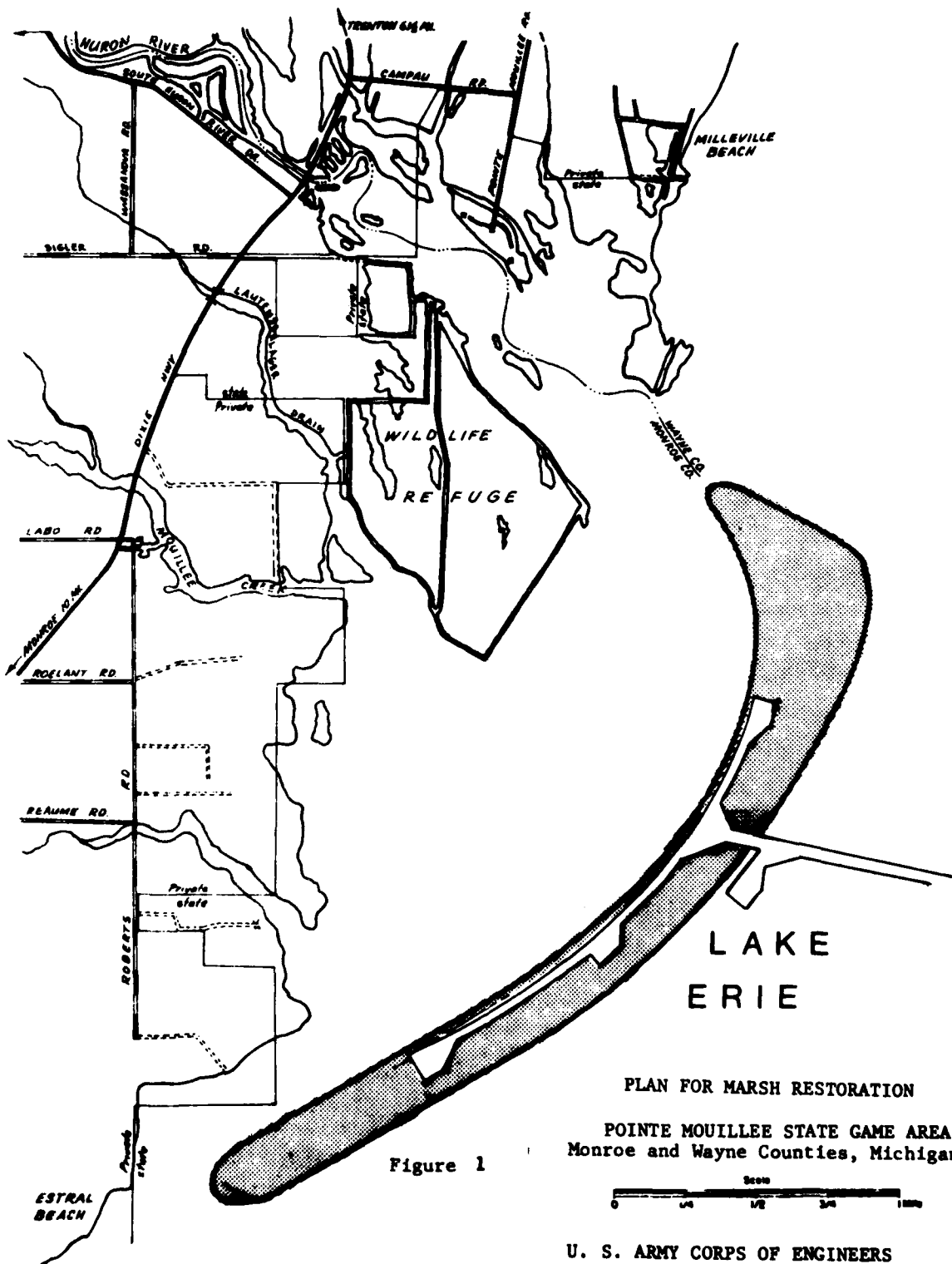
The authority for the construction of a contained spoil disposal facility is Section 123 of the River and Harbor Act of 1970 (Public Law 91-611). This authorizes the Secretary of the Army, acting through the Chief of Engineers, to construct, operate, and maintain, (subject to the provisions stated below) contained spoil disposal facilities with the concurrence of appropriate local governments.

Prior to construction of any such facility, the appropriate State or States, interstate agency, municipality, or other appropriate political subdivision of the State, shall agree in writing to: (1) furnish all lands, easements, and rights-of-way necessary for the construction, operation, and maintenance of the facility; (2) hold and save the United States free from damages due to construction, operation, and maintenance of the facility; and (3) maintain the facility after completion of its use for disposal purposes in a manner satisfactory to the Secretary of the Army.

The appropriate non-Federal interest or interests agree to contribute 25 per centum of the construction costs unless: (1) it is waived by the Secretary of the Army upon a finding by the Administrator of the Environmental Protection Agency that the area to which such contribution applies is meeting applicable water quality standards; and (2) the area to be dredged is a Great Lakes connecting channel.

The participating non-Federal interests retain title to all lands, easements, and rights-of-way furnished and may transfer title to it only after completion of the facility's use for disposal purposes and after satisfactory maintenance is assured.

Authorization is given for a comprehensive program of research, study, and experimentation relating to dredged spoil. (See Attachment No. 2 for complete text.)



D. PROPOSED SPOIL DISPOSAL FACILITY.

Section 123, River and Harbor Act of 1970 (Public Law 91-611), authorizes a program for construction of spoil disposal facilities at Federal Navigation Projects in the Great Lakes. In accordance with this act, it is proposed to establish a diked area for the containment of polluted dredged spoil in the immediate vicinity of Pointe Mouillee, Michigan.

Dredged material from the Detroit and Rouge Rivers is classified as polluted by the Environmental Protection Agency. Estimated annual dredging quantities are 672,000 cubic yards and 230,500 cubic yards for the Detroit and Rouge Rivers respectively. It is estimated that permit dredging will be 90,000 cubic yards annually for the Detroit River and 75,000 cubic yards annually for the Rouge River. The total estimated dredging requirement for the 10-year period is 18,000,000 cubic yards. All of this material is classified as polluted and requires containment. The proposed facility is located adjacent to the Pointe Mouillee State Game Area and immediately south of the mouth of the Huron River (Fig. 1). The landward dike is located approximately along the line of a previously existing barrier reef which has since been eroded by wind and wave action and high lake levels. The location and configuration of the facility is intended to provide a protective barrier against wind-generated wave action as the initial step to re-establish the Pointe Mouillee marsh and to prevent further destruction of the State Game Area.

The containment facility is designed to provide a disposal volume for a 10-year period for all maintenance and permit dredging in the Detroit and Rouge Rivers, together with a backlog accumulation anticipated before first use. In addition, capacity would be provided for approximately 33% of the access channel dredging, considered polluted based on analysis of test results shown in Tables II-5 to II-9, contained in Attachment 7. Estimated annual maintenance dredging of the access channel and total dredging requirements for the ten year period are as follows:

Table I-2 Estimated Disposal Quantities

Detroit River Maintenance (10-yr.)	6,720,000
Detroit River Maintenance Backlog (5 yr.)	5,000,000
Detroit River Permit (10 yr.)	900,000
Detroit River Permit Backlog (5 yr.)	450,000
Rouge River Maintenance (10 yr.)	2,305,000
Rouge River Permit (10 yr.)	750,000
Rouge River Permit Backlog (5 yr.)	375,000
Construction of Access Channel	750,000
Access Channel Maintenance (10 yr.)	<u>750,000</u>

TOTAL VOLUME: 18,000,000

A final fill of additional material, as a cover for polluted dredge material, is considered to be unnecessary. It is considered that at the end of the 10 years, containment may no longer be necessary due to intensive pollution abatement activities being required by Federal and State water resource managers. Dredged material from the access channel, identified as unpolluted, will be used in dike construction when determined suitable or disposed of in designated dumping areas of the lake.

The proposed containment facility would be crescent shaped, approximately 3-1/2 miles long and 1,400 feet wide, with its westerly limits along the edge of the previous natural marsh and barrier reef. The area enclosed by the dikes would contain approximately 700 acres and have an average depth of one foot below Low Water Datum (L.W.D.). Exterior lakeward dikes would be constructed to 14 feet above L.W.D. and would have a clay core with stone face on the lakeward side and top to minimize the effect of wave action on the dike. The landward or marsh-side dike would be constructed to 13 feet above L.W.D., would be stone-faced on the exterior side to five feet above L.W.D., with the balance of the dike constructed of clay. These dikes are normally considered to be impermeable, i.e., able to prevent leakage. Periodic inspections will be performed to insure the performance of these structures. In addition to the perimeter dikes, internal cross dikes along with mooring and pumpout facilities and weirs with oil skimmers would be necessary to control internal settling and effluent quality. The weirs will be adjustable so that retention time is regulated to allow

sedimentation before the effluent is returned to the eco-system. An access channel for the hopper dredge, 4 miles long, 200 feet wide and 16.5 feet in depth below L.W.D. would also be required from the shipping channel to the facility. For initial construction of the dikes, a gated causeway would be built out from the land near Roberts Road to the dike location, a distance of approximately 1,000 feet. The gate structure would be adjustable to allow for water flows in and out of the marsh.

The construction cost of the proposed containment facility is currently estimated at approximately \$35,500,000. Costs of dredging would also be increased due to increased cycle times required by more travel to the disposal site and increased pumpout time required to empty the dredge. Present costs of maintenance dredging are \$0.34 and \$0.87 per cubic yard for the Detroit and Rouge Rivers respectively. Under the proposed disposal method, costs of dredge and disposal would be increased to \$4.41 and \$5.75 per cubic yard for the Detroit and Rouge Rivers respectively.*

E. ASSOCIATED WATERFOWL HABITAT MANAGEMENT PLAN.

The Pointe Mouillee State Game Area was purchased with funds derived from hunting and fishing licenses and, as such, the major management emphasis is to provide hunting recreation and to a lesser extent fishing recreation. Management objectives beyond these providing for the basic needs of the waterfowl resource are directed at bringing Michigan's waterfowl hunters and the waterfowl resources together during the fall hunting season to provide hunters with the opportunities to harvest the annual surplus of ducks and geese. During the periods outside the fall hunting season, management efforts provide non-consumptive viewing opportunities for those people who want to look at or photograph birds and other marsh-associated wildlife.

*These costs include backlog of maintenance material from the Detroit River. Neglecting this backlog material, for comparison purposes with alternatives, the estimated construction cost is \$33,500,000.

As part of its obligation to provide residents of southeastern Michigan with hunting, viewing and other forms of wildlife and fisheries-oriented recreational activities, the Department of Natural Resources plans to enhance the wetlands habitat of the Pointe Mouillee State Game Area in conjunction with the construction of the barrier island by the U. S. Corps of Engineers (stated by letter of 10 August 1973, Attachment No. 3). To enhance the wetlands and marshes of the area, the Department of Natural Resources would develop a water level management program on as much of the Game Area as possible within the constraints of budgeting and engineering feasibility. This water level management program would be accomplished by diking and by the construction of pumping facilities to move water on or off any marsh unit. It is tentatively planned to compartmentalize the marsh into an as yet undecided number of units. This would permit intensive management of the habitat to restore the marsh and to maintain the marshes of the game area in a successional stage that is of high value for waterfowl and other wetlands-associated wildlife species.

The final product would be a controlled marsh, in terms of water levels and plant and animal species that would be present. This would be much different from the original marsh and its natural plant and animal communities. For example, when a unit is de-watered as part of a management program, exposed mud flats could be seeded to millet or smartweed. Although these plants may be a part of the natural plant community in the area, they are introduced as a food crop. The drawdown or dewatering of a marsh unit is a standard management practice to cause ecological change. This tool is used to advance or set back successional change in a marsh in a far shorter period of time and with a greater degree of precision than is possible under natural conditions such as those that occur under the lengthy water cycles in the estuaries of the Great Lakes.

The Pointe Mouillee marshes would be managed primarily for dabbling ducks with the emphasis on providing for the needs of nesting, moulting and migrant birds. Dabbling duck species of importance are the mallard, black duck, blue and green winged teal and baldpate. Diving ducks such as the ringneck, scaup, canvasback and redhead also fit into the management objectives of this area. The area lies within two major waterfowl migration corridors, one going to the east coast including New York, New Jersey and

the Chesapeake Bay area of Maryland, and the other corridor extending to the south terminating in Tennessee, Kentucky, Alabama, the Carolinas, and Florida. This area is of historical significance as a major stopover point for both fall and spring migrants. As such, it plays a part in the national harvest picture by providing a place for the birds to stop, feed and rest during the fall migration, and also provides a place where the hunting public can enjoy the sport of wildfowling. At other times of the year waterfowl use attracts many people who come to look at and enjoy the waterfowl resource in a natural setting.

Management would also provide ideal habitat conditions for other nesting migrant birds such as the coot, rail, gallinule and other marsh-oriented species. The shallow water marsh habitat maintained for dabbling ducks would greatly benefit muskrats and other marsh associated mammals.

Fish management may be included in the future management plans of the marsh. The diking of the marsh should exclude game fish species as well as noxious species such as the carp. One or more of the marsh units could be managed jointly as waterfowl habitat and also as a nursery area for sport fishes such as the walleye and northern pike.

With the compartmenting of the Pointe Mouillee marsh, it may become necessary to relocate and extend Mouillee Creek, Lautenschlager drain and Bathgate drain. If this occurs, it will be the responsibility of the Michigan Department of Natural Resources to satisfy the requirements of the Monroe County Drain Commission, navigation interests, and riparian owners fronting on these tributaries.

The marsh units would be managed to prevent outbreaks of type C botulism. This can be accomplished by manipulating water levels within the marsh units. If a botulism problem should occur in the barrier island during the period it is being filled with spoil, the Department of Natural Resources would embark on a hazing and sanitation program to minimize mortalities among ducks and other waterfowl.

Duck Viral Enteritis or "Duck Dutch Plague" is an exotic disease that has been identified in various places across the United States. It is

unlikely that such a disease would be a problem at Pointe Mouillee because D.V.E. is usually triggered during periods of water stress and no birds use the area during this period of the year. A continuous monitoring program and a contingency plan has been developed by the DNR and U. S. Dept. of the Interior. This plan should prevent an outbreak of the disease. If the disease should strike the waterfowl population while they are at Pointe Mouillee, the contingency plan is designed to control the disease and to prevent it from spreading to other areas.

When the barrier island is filled it would be turned over to the DNR and would become a part of the Pointe Mouillee State Game Area to be administered as part of the Game Area. This agreement is formally acknowledged by Mr. A. Gene Gazlay, Director of the Department of Natural Resources, in a letter to the Corps dated August 10, 1973 and included as Attachment 3 . The Department of Natural Resources tentatively plans to develop goose pastures on a large part of the island. This would be done by planting and maintaining a suitable high value grass cover and establishing a waterfowl refuge on part of the area. Public use of the barrier island would be restricted during the fall waterfowl hunting season but there would be limited areas along the lakeward side of the island where sport fishing would be permitted. During other times of the year the barrier island would be used for sport fishing along the lakeward side and would also provide a place where groups and individuals could view the marsh, migrant waterfowl and other migrating birds at close range.

The full effects of such waterfowl management, described above, will be dealt with in an environmental impact statement prepared at the time it is inaugurated by the Department of Natural Resources. Present planning is in conceptual stages.

SECTION II
ENVIRONMENTAL SETTING WITHOUT THE PROJECT

A. NATURAL ENVIRONMENT

1. Geography of the Area.

Introduction

The Pointe Mouillee marsh south of the Huron River has been subject to severe inundation and significant erosion by high water and seiches and wind-driven waves during the last four decades. The marsh within which the spit or barrier beach was located is the drowned mouth of the Huron River, which was drowned due to post-glacial uplift of the Niagaran escarpment at the other end of the lake, which tilted the lake bottom, raising the level of the eastern end relative to the western end. The protective land feature which eroded was a barrier beach which terminated to the south-westward in a curved spit. The beach, which permitted the development of marsh growth in the lagoon, has eroded by wave action and overtopping during the past four decades. The following description relates to the historical marsh at its full extent roughly four decades ago.

Topography

The Pointe Mouillee State Game Area was a marsh of approximately 2,600 acres, roughly 3 miles long by 1-1/2 miles wide, situated just below the mouth of the Detroit River. The Huron River meandered across the northern end for a distance of 1-3/4 miles, and the east and south sides of the marsh were bordered by Lake Erie, with a total shoreline of 4-1/2 miles. A sand barrier beach ran between the lake and the marsh, with the marsh bordered by low farmlands and wet meadows. The marsh was traversed by a number of channels, which widened out into an embayment on the south end of the marsh, opening into the lake. Several small creeks, Mouillee Creek, Bad Creek, Bondy Creek or Lautenschlager Drain, and Bathgate Drain, flowed into the west side of the marsh. The water level in the marsh is the same as that in Lake Erie, the lake level of which fluctuates. Several islands existed in the northern part of the marsh, rising from 3 to 6 feet above the water surface.



Figure II-2.



PTE. MOUILLEE STATE GAME AREA

May 16, 1957

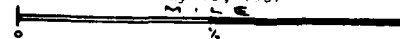


Figure II-3.



Figure II-4.



Figure II-5.

Pointe Mouillee is a French name meaning "Wet Point"; it was applied at least as early as 1749. "Dead Man's Point" was a twentieth century appellation for the barrier beach projection, applied because the currents setting in from the Detroit River occasionally brought in bodies.

Historical Geology

The Mouillee District is a part of the Huron-Erie Plain, formed by lacustrine clays laid down during the later stages of the Wisconsin glacial period. While the glacier was receding, the area was covered and uncovered by a series of glacial lake stages, and deposits of fine clays resulted. The surfaces of these clays are not even, but are in undulations or ridges, the higher of which formed the base for the islands which rose above the level of the marsh. These ridges in general run from northwest to southeast and probably represent ridges between early distributaries of the Detroit River. As Lake Erie declined in size and level, the Huron River extended its mouth across the newly exposed land, forming the channel it now fills. At two of the later stages the level of Lake Erie was considerably lower than at present. During that time the Huron River eroded its channel nearly to base level with a deltaic formation at its mouth. Later Lake Erie rose and the mouth of the river was drowned for four miles upriver. The sand of the old barrier beach came from a beach formed at the time of the lower stage of the lake.

The Mouillee marsh was formed by this rise in lake level as the Huron River wound through the area, with little current most of the time. Mouillee Creek was also drowned, and its old channel can be traced across the now open bay. It emptied into the lake through a gap in the old barrier beach. The barrier beach, which had been built up by the lake during the stages when it was at lower levels, reached approximately two feet above normal cyclical high water level, and was as much as fifty yards wide in places.

Soils

A total of 40 soil borings have been obtained in the vicinity of the proposed barrier dike. Thirty-two were obtained by the Corps of Engineers in 1973 and one in 1971. The Michigan Department of State Highways obtained seven of the 40 borings in 1973 during a

preliminary investigation. Logs of these borings are shown on Plate A-3 through Plate A-30. The location of the borings is shown on Plate No. 1. These are included as Attachment No. 4

The subsurface soils in this area consist of various strata of weak and organic soils overlying stiff to hard soils that rest on limestone rock of the Niagara Formation. The top strata vary between a fibrous peat, weak organic silts and clays, silty sands and sands. These top strata lie directly on various thin strata of soft silty clays, soft clay, fibrous peats, organic clays, sands, and organic silts. These different types of strata underlying the top strata are in various horizons and alternate in position. Directly under the above described strata are stiff to hard clays and sandy clays. The stiff to hard strata (known as hardpan) are overlying a limestone rock of the Niagara formation. The fibrous peat stratum is both directly over other soils or directly beneath them. The hardpan is in its existing state because of glacial pressure. The top of this stratum was the surface upon which the glacier rested approximately 10,000 years ago. All the material above the hardpan was deposited or formed in the post-glacial period.

The soils of the Mouillee District were mapped in detail by the Game Division of the Michigan Department of Conservation (now the Michigan Department of Natural Resources) in 1944. Seven soil types were identified in the Mouillee District, although the incidence of two of them was relatively minor.

The primary findings of the study, which relate to conditions 29 years ago, were as follows: The farmland on the inner side of the marsh consists of Brookston and Conover clay loams, fertile dark-colored soils underlain by clay. The original cover on these soils was hardwood forest, which is now represented by a few woodlots. Several islands in the marsh are also covered by Conover clay loam. Bordering these soils is a band of Clyde clay, with a much higher percentage of organic matter (sometimes even mucky) at the surface, underlain by clay; the original cover was hardwood forest or sedges and grasses. This clay also forms a band along the lake shore. The central area of the marsh is Houghton muck, dark

brown fibrous peat and muck, with a cover largely of cattail. The river is bordered by Griffin silty clay, an alluvial soil. On the river bank near the Game Area Headquarters there is a patch of Berrien loamy fine sand. The sand ridge along the beach consists of Eastport fine sand, loose sand containing large numbers of shells.

Some of the study's general observations were as follows: The area as a whole is a clay plain of heavy impervious to slightly pervious clay. This clay material has been subjected to heavy wave action, and a slight mounding up of heavy textured materials has occurred along the beach lines and along some lines formerly beaches but now some distance inland. In a few small isolated strips, sand material has been heaped up by waves and wind to form narrow and usually short sand dune ridges generally not over 3 to 5 feet of sand over clay. The Huron River entering Lake Erie at this point has caused the deposition of clay and silt over much of the area. Sheltered standing water inland from the main beach has been protected from strong wave action, and finely divided organic matter has settled on the bottom of most areas permanently or semi-permanently covered with water.

Prospects

Although most of the surface features of the marsh have been inundated and appear to have been destroyed, it is probable that most of the organic matter which originally formed the physical base for the living marsh remains in place, ready to serve as a substrate for the re-establishment of the marsh. The re-establishment of the marsh to the quality which existed in the 1930's is extremely problematical, however, if the area continues to be subject to the full force of Lake Erie storms without the protective shoreline it once possessed.

Climate

As this section of the State of Michigan lies in the pathway of the storms that sweep across the Lake States, the weather is characterized by frequent and rapid changes. Since the area is near the southern edge of Michigan, it has a warmer climate than does the State as a whole. The presence of the lake also modifies the local climate so that temperatures tend to be less extreme than at points thirty miles inland, and the frost-

free season tends to be a little longer. The frequent changes in water level delay or prevent the formation of solid ice over the marsh in the winter. Frequently several layers of thin ice are formed with air spaces in between. Thermal inputs to the Detroit River are carried south into this vicinity, and represent an additional ice-retarding factor.

At Monroe, Michigan, the mean annual precipitation of 30 inches is distributed fairly evenly throughout the year. Fifty-eight percent of the precipitation occurs during the months from April to September, inclusive. The average period between killing frosts is 169 days, from April 28 to October 14, but killing frosts have occurred as late as May 31 and as early as September 23. Snowfall averages 28.2 inches per year, the greatest snowfall occurring in January. The mean annual temperature is 50°F., and the extremes are 106° and -21°. The prevailing wind is southwest. Snow is apt to be melted by warm or rainy weather so that the ground is usually bare for a part of each winter.

Lake Erie

Lake Erie is comparatively shallow and, due to trend of its long axis, southwesterly or northeasterly strong winds and gales which sweep over it quickly raise dangerous seas. Its water temperature in the annual cycle fluctuates the most widely of all of the Great Lakes, ranging from 32°F. in the winter to greater than 75° F. in the late summer or fall.

The average elevation of the lake surface varies irregularly from year to year. During the course of each year the surface is subject to a consistent seasonal rise and fall, the lowest stages prevailing during the winter months and the highest stages during the summer months. In the 111 years from 1860-1970, the difference between the highest (572.76) and the lowest (567.49) monthly mean stages of the whole period was 5.27 feet; the greatest seasonal fluctuation from winter low to summer high monthly mean was 2.7 feet, and the least was 0.5 foot.

In addition to the seasonal fluctuation there are also oscillations of irregular amount and duration produced by storms. Some, with periods of a few minutes to a few hours, are the results of squall conditions, the

fluctuations being produced by a combination of winds and barometric pressure changes that accompany the squalls. At other times the lake level is affected for somewhat longer periods, such as many hours or a day, by strong winds of sustained speed and direction which drive the surface water forward to raise its level on one shore and lower it on the opposite shore. This type of fluctuation has a very pronounced effect on Lake Erie, because it is the shallowest of the Great Lakes and affords the least opportunity for the impelled upper water to return through reverse currents beneath the depth disturbed by storms. As a result, the water level near each end of the lake fluctuates markedly under the influence of the winds, varying with their direction, strength and persistence.

2. Drainage and Water Quality

Discussion of Huron River Drainage Basin

The Huron River Basin, of which Pointe Mouillee is a part, is located in the south-central portion of southeastern Michigan. The basin has a drainage area of approximately 908 square miles and includes parts of Jackson, Ingham, Washtenaw, Oakland, Livingston, Wayne and Monroe counties. The basin is bordered by the River Raisin, Stony Creek and Swan Creek basins to the south and by the Grand and Shiawassee River basins to the northwest. The Rouge and Clinton River basins form the northeastern boundary.

The land surface of the Huron River basin ranges from mostly hilly or moderately undulating in the northern and western parts to relatively flat terrain in the southeast. Interspersed in the northern and western parts are local areas of relatively flat terrain. Elevations in the headwater areas, to the north and west, generally range from between 900 to 1,100 feet above mean sea level. However, elevations approach 1,200 feet in several places. The flatter portions of the basin, generally in the southeast, approach 600 feet. The mouth of the Huron River is 572 feet above mean sea level. Dividing the two topographically differing areas is a series of ancient beaches which traverse the basin in a southwest to northeast direction. These beaches, formed by glacial lakes, are marked by a local steepening of the land surface.

The Huron River discharges into Lake Erie at Pointe Mouillee, approximately 5 miles below the mouth of the Detroit River. The Huron River rises at Big Lake in the west central portion of Oakland County and flows in a generally southerly direction for a distance of approximately 128 miles. The river has a fall of approximately 430 feet.

The northern part of the Pointe Mouillee marsh area trapped alluvial sediments resulting from the erosion of the drainage basin of the Huron River. Beginning about 1915, however, several hydroelectric dams were constructed along the Huron River. It is speculated that the construction of these facilities has resulted in the retention of large amounts of sediment that would have caused the delta to

replace material lost by wave action of Lake Erie. Investigations of this concept in 1969 by the Department of Agriculture, Soil Conservation Service revealed that 380,000 cubic yards of material were retained annually by the structures, although it is not clear that this amount of sediment would have reached the river mouth. At the present time, only the lower 50 square miles of the basin would be contributing sediment to the Pointe Mouillee area.

A comparison of the marsh between 1937 and 1973 indicates that the surface of the marsh has not changed: the marsh essentially has about a four foot thick stratum of peat over the soft clay. The peat is formed from decayed marsh growth. Since the surface has not been covered with other soils it can be concluded that the surface of the marsh is essentially stable. Any loss of marsh material appears to be replenished by growth that has decayed. Should the rate of growth exceed the loss the marsh would gradually re-appear. Similarly, if the rate of growth is less than the loss the marsh would gradually disappear. The soft clay has been deposited since the glacial periods. The clays have remained soft since there has been no loading of them. At the present time the littoral drift from the south at the south end of the proposed barrier diked area deposits sand between the marsh and deeper water. At the north end of the barrier diked area the littoral drift from the north deposits sand north of the mouth of the Huron River as far south as the proposed access channel but east of the marsh area.

Water Quality Discussion

Water quality in the vicinity of Pointe Mouillee is influenced considerably by both the Huron and Detroit Rivers. Sampling and monitoring of both rivers have provided data which indicate that excessive amounts of undesirable substances exist in both waterways.

The Huron River is a contributor of wastes high in coliform densities, phosphates and nitrogen compounds to the Pointe Mouillee area. These substances are introduced primarily by numerous waste treatment facilities located along the river.

The Huron River is to be protected for partial body contact according to the State of Michigan intrastate water quality standards. A water quality monitoring station 1.97 miles above the Huron River mouth (Table II-3) demonstrates that water contributed to the Pointe Mouillee area by the Huron River meets these standards. In view of the scheduled upgrading of domestic and industrial wastewater treatment systems, it is reasonable to expect that water quality in the Pointe Mouillee area will become greatly improved over the next 10-year period. (The containment facility will be completed and filled in 10 years.) The Lower Huron River water quality does not presently meet total body contact (TBC) standards, because fecal coliform counts are high. The TBC standard states that the geometric average of fecal coliform must not exceed 200 organisms per 100 ml of sample. The required upgrading of municipal waste water treatment systems should reduce the fecal counts so that this standard can be met.

Table II-3: Water quality collected over a 1 - 10 year period at a station 1.97 miles upstream from the mouth of the Huron River by the Michigan Bureau of Water Management.

<u>Parameter</u>	<u>Unit</u>	<u>Mean</u>	<u>Maximum</u>	<u>Minimum</u>	<u>Begin Year</u>	<u>End Year</u>
Temperature	°C	12.94	29.00	0.00	1963	1973
Flow	cfs	457.6	2540.0	68.00	1963	1971
Turbidity	JTU	18.8	48.0	2.1	1969	1973
Conductivity	Micro Mho	635.5	940.0	450.0	1963	1973
D.O.	ppm	10.03	16.60	5.00	1963	1973
BOD (5 day)	ppm	5.42	12.8	1.7	1963	1973
COD (5 day)	ppm	32.2	58.0	17.0	1963	1966
p ^H		8.23	9.0	7.6	1963	1973
Total Dissolved Solids	ppm	41.3	157.00	0.00	1963	1973
Volatile Solids	ppm	13.12	37.0	4.0	1963	1973
Org. Nitrog.	ppm	.92	1.8	0.00*	1968	1973
NH ₃	ppm	.40	1.89	0.00*	1963	1973
Nitrate	ppm	.49	2.2	0.00*	1963	1973
Phosphate	ppm	.32	.72	.1*	1968	1973
Dissolved Calcium	ppm	78.16	98.0	46.0	1963	1972
Chloride	ppm	43.8	86.0	16.0	1963	1973
Sulfate	ppm	96.93	170.0	46.0	1963	1972
Iron Dissolved	ug/l	56.5	100.0	13.0	1971	1972
Lead Dissolved	ug/l	.333	2.00	0.00*	1969	1972
Zinc Dissolved	ug/l	13.25	40.0	0.00*	1969	1972
Total HG	ug/l	.13	.20	0.00	1971	1972

<u>Parameter</u>	<u>Unit</u>	<u>Mean</u>	<u>Maximum</u>	<u>Minimum</u>	<u>Begin Year</u>	<u>End Year</u>
Total Coli (MFIM-LES)	100 orgs/ 100 ml	8883	60,000	200.0	1967	1973
Total Coli (MPN-CONF)	100 orgs/ 100 ml	14,745	240,000	91.000	1963	1966
Fecal Coli	100 orgs/ 100 ml	321	4,800	10.0	1967	1973
Phenols	ug/l	.19	2.00	0.00*	1964	1972

*questionable

3. Currents

The project area is highly responsive to the prevailing winds. Their effects are summarized below:

Direction Occurrence Fetch Wave Hgt. **

	<u>Percent</u>	<u>Miles</u>	<u>Feet</u>	<u>Effects</u>
SW	33	6	2	Water movement along the shore in the Swan Creek area is northerly, turning to the southeast in the vicinity of Pointe Mouillee. Drives water out of West Basin of Lake Erie, lowering water level temporarily in West Basin.
SE	6	26.5	5.5	A clockwise circulation pattern occurs in the Swan Creek area frequently as the wind intensity required to cause rotation is lower when the wind has a southerly component.
NW	5	--	--	Current patterns are south to south-westerly. Detroit River water moves south to Stony Point and possibly into Brest Bay (Raisin River).

** Wave heights based on 1 hr/yr frequency. Wind data from USWB local climatological summaries, Toledo (1950-1955).

Direction Occurrence Fetch Wave Hgt.

	<u>Percent</u>	<u>Miles</u>	<u>Feet</u>	<u>Effects</u>
S	17	23	7	Water is driven into Mouillee Creek, and Lautenschlager Drain and floods the
NE	6	3.6	3	marginal land in the marsh area. The movement of the water puts fines into suspension and, upon its return to the south and east, carries the fines back southward. These are deposited where the returning water loses its velocity. The net result is deposition and erosion of material in the drainage canals with some material returning to deep water.
E	7	11.7	3.5	
N	4	-	-	Little effect.
W	18	--	--	Water movement is south and easterly. Similar to SW wind effects.

Observations reveal that, along the beaches north of Swan Creek, two types of current patterns occur. Winds from the west, north and east occur approximately 50% of the time and water movement is southerly from the Detroit River. For all southerly winds, flow along shore is northerly. This northerly movement of currents along shore is part of a clockwise circulation pattern from shore to the West Outer Channel. Thus the flow in the project area is greatly influenced by the prevailing southerly winds. Longshore movement of soils is minimal in the vicinity of the proposed project. Examination of the site reveals that such shoreline obstructions as downed trees and protective structures show no evidence of deposits on either side. Littoral transport is lakeward of the site. A report on littoral drift at Pointe Mouillee was prepared by the Flood Control and Beach Erosion Section of the Engineering Division, Detroit District, Corps of Engineers.

Mouillee Creek, Lautenschlager Drain, and Bathgate Drain are three of the principal small streams which dissect the marsh and shore areas to the south of the Huron River. Although their drainage area is small and the gradient slight, currents are generated by storm run-off and seiche activity on Lake Erie. They constitute a basin for backwaters from Lake Erie during quasi-tidal conditions created by easterly winds. These currents are important to the movement of water and thus circulation which stimulates nutrient recycling.

Currents in and out of the marsh reflect wind-driven currents of Lake Erie. Water levels are subject to rapid and unpredictable changes for this reason.

4. Fish

Commercial Fish

Lake Erie is morphometrically divided into three distinct basins each having similar but differing biological communities. The western basin being shallow (mean depth 24 feet) is highly productive. Fishery workers consider it to have the most important fish spawning and nursery grounds in the entire lake, accounting for more than one-half of the total commercial fish production. Prior to 1966 the combined United States and Canadian commercial catch from Lake Erie was the greatest in the Great Lakes. After 1966 the total harvest from Lake Michigan occasionally exceeded that from Lake Erie, primarily because of unusually large catches of alewives.

Michigan exercises jurisdiction over only 16 percent of the area constituting the Western Basin. Development of commercial fisheries here began during the early years of settlement, at the time trade and military centers were established along the shores of Lake Erie and the Detroit River.

From 1879 through 1908, the total United States catch in Lake Erie averaged 46.0 million pounds, then declined during subsequent periods as follows: 1914-29, 37.7 million; 1930-39, 30.6 million; 1940-49, 26.3 million; 1950-59, 25.2 million; 1960-69, 15.2 million; and 1970-72, 9.8 million pounds.

Approximately one-half of the Michigan total catch during this period consisted of the high value coldwater species, lake trout, lake herring, lake whitefish and in addition, the blue pike (a variety of Walleye). By the middle 1940's catches of these species had peaked and their populations began a precipitous decline. Smaller catches of fish for each net set evoked a response from the fisherman of setting more nets thus hastening the end. Consequently there was a shift in species acceptance to the less valuable but more numerous yellow perch, white

bass, carp, sheepshead, and channel catfish, the important commercial species - at this time. Blue Pike and Lake Sturgeon are now classified as endangered species.

Walleye populations which began to decline somewhat later than the other high valued fish were near collapse by 1960. Discovery that walleyes (along with other species) were contaminated with mercury as a result of industrial pollution, caused a closure of this fishery in 1970. The species is now classified in Michigan as a sport fish and barring a change in management it will no longer be represented in the commercial catch.

Important factors contributing to the decline of choice coldwater species include man-induced changes in the watershed, nutrient loading, and introduction of new species. Extinction of the lake trout, for example, is considered as most likely due to loss of suitable environmental conditions for its survival.

Sport Fishing

The sport fishery of Michigan's waters in Lake Erie has only recently begun to be assessed since no sport fishing license was required on the Great Lakes until 1968. Historically, yellow perch, black bass, and walleyes were the most sought after species.

With the post-war development of dependable outboard engines for boats, and thus reduced danger of being caught by the weather, many more fishermen were able to utilize off-shore fishing areas and angler use has climbed steadily since that time.

Shoreline or bank fishing is extremely popular since it does not require a large investment to participate. Public access to these waters is severely restricted and where it is available intensity of use is great. The 1972 angling survey estimated there were 215,000 angler-days use in Michigan waters of Lake Erie, with a harvest of more than 2 million fish. Seventy-five percent of the fish taken were yellow perch, the remainder consisting primarily of walleye, black bass, white bass, panfish, and catfish. During 1970, of 182,000 days use at Pointe Mouillee, 14,560 (8%) were angler-days and 7,820 (4%) were archery fishing days. This probably represents near saturation use of the existing shoreline fishing area.

Recent introductions of Pacific salmon and the possible future introduction of striped bass have greatly stimulated interest in sports-fishing. Eventual development of the high population density Toledo-Detroit megalopolis will provide a large pool of potential users. However, as previously mentioned, poor access to shoreline fishing areas will remain a strong deterrent to increased angler-day use for those unable to afford the high cost of a sportfishing boat.

Fish Habitat, Food, and Use

A number of investigators have documented the almost complete alteration in composition of the benthic fauna in the Western Basin of Lake Erie during the twenty-year period from 1930 to 1950. Early studies showed the lake bottom was occupied by large populations of the burrowing mayfly Hexagenia, freshwater mussels (family Unionidae), the amphipod Gammarus, pollution intolerant midges (family Chironomidae) and various trichoptera (Caddisflies). All of these organisms are important in the diet of resident fish species, and even mussels were consumed by sturgeon and sheepshead.

More than 95 percent of the water entering the Western basin is contributed by the Detroit River. While passing through the highly industrialized Detroit metropolitan complex this river receives inadequately treated wastes containing large amounts of nutrients, oils, heavy metals and a huge variety of chemicals which have a large unsatisfied bio-chemical oxygen demand. This demand is eventually satisfied by reaction with and removal of oxygen which has dissolved in the receiving waters. Under conditions of hot, calm weather, this process eliminates virtually all of the dissolved oxygen (D.O.) from enriched bottom waters, killing animals intolerant of low dissolved oxygen levels.

By 1953 pollution intolerant benthos had been essentially eliminated from the Western basin to be replaced by sludge worms (Tubificidae), fingernail clams (Sphaeriidae) and tolerant midges. Of these, only midges make any significant contribution to the diet of most fishes.

From the foregoing it can be seen that the highly productive shallow water and marshy areas of the Lake Erie shoreline are vital food production zones for nearly all fish species present. In addition, most species are directly dependent upon such areas during some portion of their life cycle. Adult fish may move inshore to feed on aquatic invertebrates, terrestrial insects, minnows, or young and juveniles of other species. They may come in to spawn. Immature fish of most species occupy this habitat for varying periods of time. The water is well oxygenated and rich in phytophagous zooplankton and invertebrates; its shallowness deters marauding predators. It is the sanctum sanctorum of small fish.

Habitat conditions at Brest Bay and at the Pointe Mouillee area are considered to be very similar at the present time, due to high water levels, so that suitable approximations may be made based on samples taken at the former area. Consequently, fish studies conducted near the River Raisin for an environmental impact assessment of Detroit Edison's new power plant were reviewed. The northermost sampling station located in Brest Bay, approximately 11 airline miles to the south, was selected as most representative of conditions at Pointe Mouillee. The sample site is located in water 2 to 3 meters deep over a muck and sand bottom. In all, twenty fish species were collected. However, nine were most abundant. These ranked in order of greatest biomass are: carp, goldfish, yellow perch, gizzard shad, white bass, alewife, sheepshead, and emerald and spottail shiners. These species constituted 97 percent by numbers and 90 percent by weight of the collections. It was determined that this zone is an important nursery area for yellow perch, white bass, gizzard shad, and alewife. Young-of-the-year channel catfish, sheepshead, and shiners were also present.

Pointe Mouillee marsh contained many sinuous channels which provided interior drainage (1937). These furnished good though limited angling opportunity for largemouth bass, northern pike and a wide

variety of panfishes. As Lake Erie water levels gradually increased, waves began overtopping the beach ridge. More and more of the marsh became submerged, thus increasing reproductive and nursery grounds for fish but severely reducing its use for angling.

5. Wildlife and Vegetation

Wildlife

The Pointe Mouillee State Game Area represents a seasonal home or stopover on migration for 27 species of waterfowl (6 species nest regularly on the area). In addition, 39 species of water, marsh and shore birds have been observed using the area, plus 7 species of gulls and terns, many of which regularly nest and rear young on the area. Thus, the marsh provides a part and sometimes most of the habitat requirements for over 73 species of water-oriented birds. (See Attachment 5)

Most of the other groups or families of birds would be well represented in a list of transient visitors and many like the Belted Kingfisher, Marsh Hawk, Pheasant, Mourning Dove, Red-Wing Black Bird and Marsh Wren are common nesters.

Because of the wind tides flooding out nests the marsh has not been highly productive for reproduction in the recent past. The main function of the marsh for local nesting species has been to provide rearing cover, a concentration area for bachelor drakes during the summer, and a spring and fall migration stopover. As many as 16,000 puddle ducks have been counted in the fall and 75,000 diving ducks in the spring. All species of water birds migrate south following freezeup, usually about the first of the year, and the spring migration starts as the ice recedes. Of the waterfowl species commonly nesting on the marsh, the Black Duck usually starts nesting first, almost before the ice is gone, and the Blue Wing Teal is usually the last to arrive and nest.

Rearing of the young by the hen takes most of the summer while the males concentrate in bachelor groups during the period of flightlessness caused by molted flight feathers (as many as 2,500 bachelor male mallards

have been destroyed on the marsh).

The current high water cycle of Lake Erie has destroyed much of the emergent vegetation stands (cattail, sedges and bullrush) and in so doing has destroyed the marsh. By definition, marshes are essentially wet prairies in which dominant vegetation consists of reeds, sedges, grasses, and cattails. Much of the value of the marsh for waterfowl use has been lost with the drowning of large numbers of these plants. Scouring from wave action has caused additional losses. The waterfowl concentrations in fall of 1973 were less than half of those observed during the last three years. Without some type of protection, at the current rate it is predicted by marsh managers that almost all of the remaining marsh, consisting of only about 200 acres, will be destroyed in no more than three years. The present reduced size of the marsh makes it of questionable value in its traditional function of providing food, cover and refuge for waterfowl. (See Figures II-6 and II-7) The marsh manager

An inventory of the marsh environment made by photographic coverage in 1972 for the Michigan Department of Natural Resources and updated to 1973 identified vegetation, land, and water areas at Pointe Mouillee State Wildlife Area as follows:

		29 August 1972		April 1973		Percent	
		Acres	Percent of Area	Acres Lost	Percent of Total Area	Acres Left	Percent of Total Area
I. Total State Game Area:							
Emergent vegetation	260.1	9.1	92.5	35.6	3.2	167.6	
Upland Areas	229.2	8.0					
Trees	36.0	1.3				167.6	
Water	1,974.6	69.0					
Diked area	361.3	12.6					
Total	2,861.2						
II South of Huron River, State Game Area (includes all cattail islands)							
Emergent vegetation	199.8	7.87	69.7	34.9	2.75	120.1	
Upland Areas	129.0	5.09					
Trees	23.5	0.92					
Water	1,823.6	71.88					
Diked area	361.3	14.24					
Total	2,537.2						

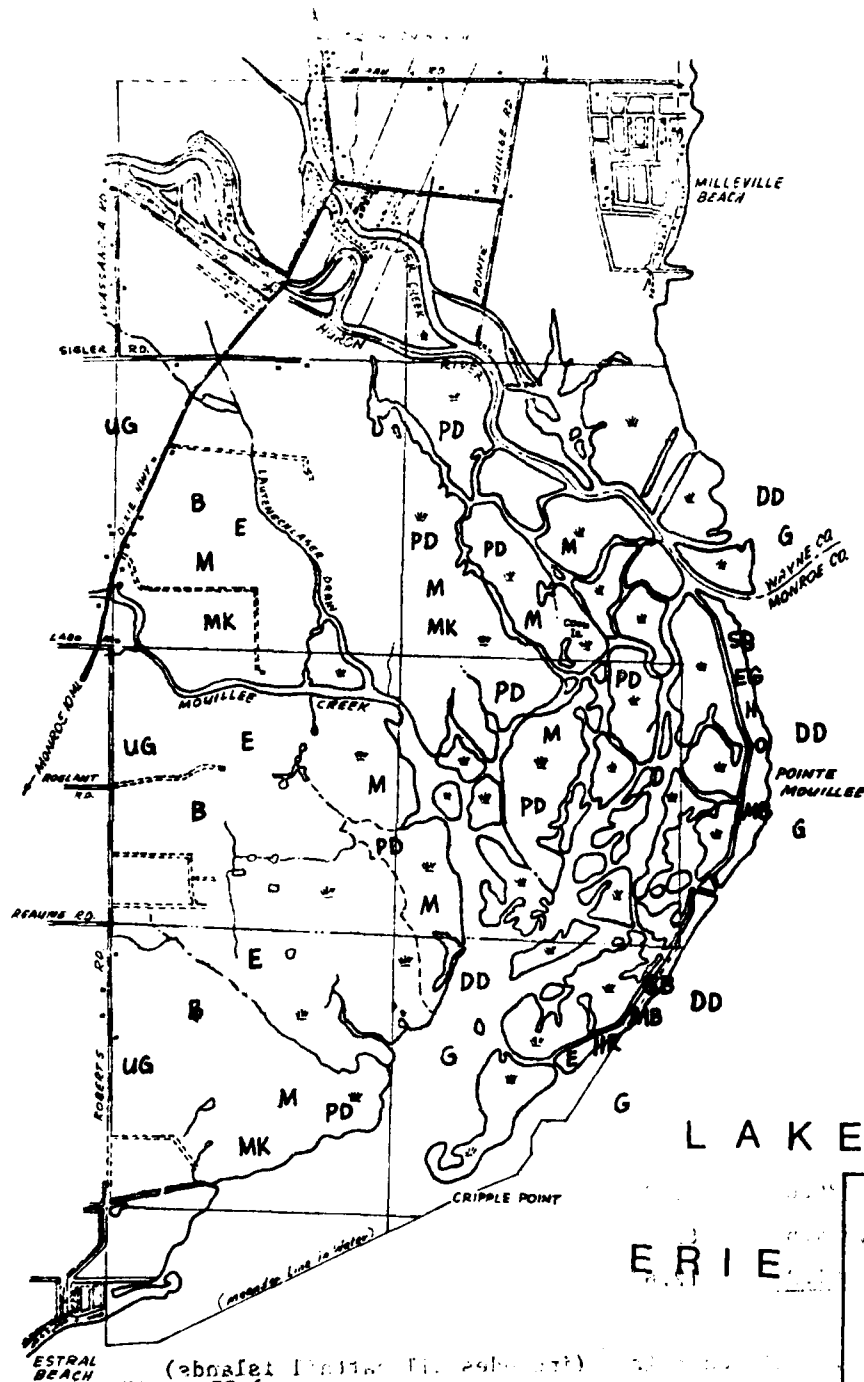
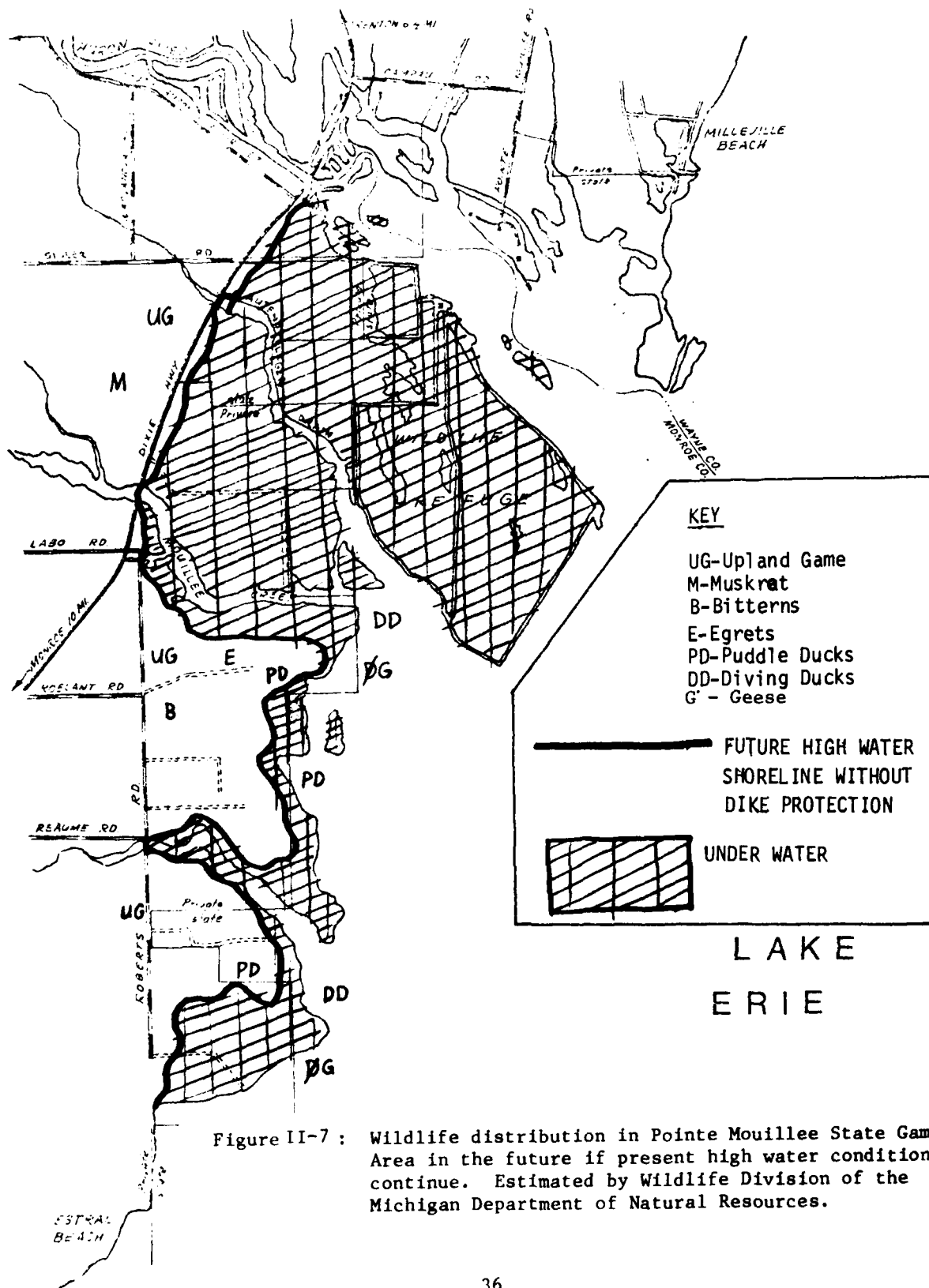


Figure II-6:

Wildlife distribution in Pointe Mouillee State Game Area in 1937 as estimated by the Wildlife Division of the Michigan Department of Natural Resources.

KEY

- M-Muskrat
- H-Hawk
- E-egrets
- HR-Herons
- MB-Migrating Song Birds
- EG-Eagle
- MK-Mink
- B-Bitterns
- DD-Diving Ducks
- G - Geese
- SB-Shore Birds
- UG-Upland Game
- PD-Puddle Ducks
- O-Osprey



In the past when the marsh covered over 2,600 acres of wetlands and water with a good variety of aquatic vegetation there were many more waterfowl using the area. The devastated marsh is now at a near low in waterfowl use rivaling only the lean years of the dustbowl period during the 30's when the record low water took most of the marsh out of productive use.

The future of the marsh and its related wildlife populations is contingent on lowering of water levels and restoring the protection formerly afforded by the barrier beach. The hoped for restoration of the marsh to its former lush cattail and bullrush stands depends on the whims of Lake Erie's water levels. Lower water, occurring naturally, will help, but the most efficient and surest way to restore and maintain the marsh would be to construct interior diking with water control capability. Proper water level is the most important factor in maintaining a desirable marsh habitat. By diking and controlling the water levels on a marsh the size of Pointe Mouillee a significant piece of waterfowl habitat can be replaced and maintained along the Lake Erie Shore, where destruction by both nature and man has depleted this valuable habitat so needed by waterfowl and other water oriented birds and animals.

Many mammals also use the marsh as part of their needed resource base. Fox, raccoon, skunk, opossum and mink hunt for food along the dikes and in the shallow water areas and rely on this area even though a major portion of their habitat is upland. Muskrats are completely dependent upon the marsh for food, shelter and breeding areas and leave the marsh only in the immature stage to establish new territories if crowding occurs.

Amphibians and reptiles are abundant in the marsh as well as invertebrates. These lower forms of life are important food sources for the many species of birds, fish, and mammals utilizing the marsh.

In addition to habitat for wildlife and importance to fisheries, marshes are vitally important for their water cleansing capabilities and their biological productivity. Marshes act as giant "sponges" able to assimilate significant quantities of nitrogen and phosphorus. High levels of nitrogen and phosphorus can cause unwanted blooms of algae in Lakes and streams. In this sense the Pointe Mouillee marsh assisted in buffering the western Lake Erie basin against incoming waters that might have been high in pollutants. Marshes are more productive than either the adjacent land or open water areas. A constant supply of nutrients is washed in from land and pushed in from the open lake. This constant flushing and recharge of the marsh area provides an abundant food supply for those organisms able to adapt to the constantly variable environment. For this reason marshes are highly productive and a valuable resource.

Vegetation

A survey of vegetation was made in the summer of 1972 by the Environmental Resources Branch, Corps of Engineers; James Foote, State Wildlife Biologist; and Robert Kilgore, Michigan Nature Association. Many of the species found on the land to the north of the Huron River were introduced species, not native to the area. (Attachment 6)

Also, to the north of the Huron River is an area known as the Blue Wing Hunt Club, presently owned by Huron-Clinton Metropolitan Authority and used by the Department of Natural Resources. Trees, such as bronze beech, mulberry, and apple, suggest the former human use of the area. A row of silver maple (Acer saccharinum) marked a former road on the lakeside land-strip. Other trees and bushes found here, which also occupy land areas behind marshlands to the south, include: cottonwood (Populus deltoides), willow (Salix), elm (Ulmus), hawthorne (Crataegus), sumac (Rhus), and ash (Fraxinus) in varying diversity throughout the area.

Very few of the gamelands to the south of the Huron River include diversified land-type vegetation. High water and severely damaging erosion have removed much vegetation, leaving reduced amounts of available land for trees, bushes and flowering plants and resulting in the dominance of cattails. Much of the present boundary of the game area is intersecting irregular jutting shoreline marshes and open water around them.

6. Nature of material to be confined.

EPA Criteria

As a result of concern over the possibility of adverse effects on water quality or aquatic organisms resulting from dredging and disposing of polluted material in open water, the Corps is investigating the feasibility of alternative spoil disposal methods. Because an assessment of the impact of open water disposal of polluted dredged materials will require a continuing study, contained disposal facilities for the deposition of these materials will be utilized. The facilities shall have sufficient capacity to handle polluted dredge spoil from the Detroit and Rouge Rivers for a 10 year period.

Criteria were developed as guidelines for EPA evaluation of proposals and applications to dredge sediments from fresh and saline waters. The decision whether to oppose plans for disposal of dredged spoil in U.S. waters is made on a case by case basis after considering all appropriate factors including the predicted long and short term effects on receiving water quality. Dredged material will be considered polluted and, therefore, unacceptable for open water disposal when concentrations, in sediments, of one or more of the following parameters exceed the limits expressed below.

Table II-4: EPA Criteria for Determining Acceptability of Dredged Spoils for Open Lake Disposal.

<u>Sediments</u>	<u>Concentration percent (dry wt. basis)</u>
Nutrients	
Total Kjeldahl Nitrogen	0.10
heavy metals	
mercury	0.0001
lead	0.005
zinc	0.005
oil & grease	0.15
volalite solids	6.0
C.O.D.	5.0

Other factors considered include volume, physical, chemical and biological character of material to be disposed; quality and use of water, depths and current, and number of disposal requests in an area; time of year, methods of disposal and alternatives.

EPA recommends that the volatile solids and C.O.D. analyses be made first. If the limits of these parameters are exceeded the sample is considered polluted and additional tests would not need to be made. Techniques for sample collection and analyses must be made in accordance with the current EPA manual on sediments.

Based on these criteria, material dredged from the Detroit and Rouge Rivers is considered polluted and must be disposed of in a containment facility.

Description of Sediments (For data, refer to Attachment 7)

1. In the Navigational Channels

a. Nutrients (Table II-5)

Presently, the only nutrient parameter included in the EPA mandatory list is Total Kjeldahl Nitrogen (TKN) as listed in Table II-5. In the future total phosphorus and total organic carbon (TOC) may be added to the mandatory list when sufficient experience with their interpretation is gained. Average Kjeldahl nitrogen concentrations in the sediments of the Detroit River exceed the EPA criterion in the Trenton, Amherstburg, and East outer channels. Sediment samples collected in 1968, in east outer channel, were within the criterion. Samples collected in the lower Rouge River met criterion for TKN.

b. Heavy metals (Table II-6)

This category includes mercury, lead and zinc (Table II-6). The EPA mercury criterion was exceeded in averages of all Detroit River samples taken on the U.S. side. Only four samples were available from channels on the Canadian side and all met the criterion. All samples taken in the Rouge River met the criterion.

Lead exceeded the criterion only in two East Outer channel samples taken near the Detroit River light. Zinc exceeded the criterion in all samples taken.

c. Oil and Grease (Table II-7)

All sample averages on the U. S. side of the Detroit River exceeded the criterion, while single samples taken in channels near the Canadian side were within the criterion. Nearly all of the samples taken in the Rouge River exceeded the criterion.

d. Volatile Solids (Table II-8)

Averages for all samples taken (Detroit and Rouge Rivers) exceeded the EPA criterion.

e. Chemical Oxygen Demand (Table II-9)

Averages for the Rouge River and Detroit River samples on the U. S. side, and a single sample from the Amherstburg channel on the Canadian side exceeded the criterion.

From the foregoing analyses it can be concluded that EPA criteria are exceeded for several parameters in all navigational channels including the Rouge River with the exception of the Ballard's Reef, Amherstburg, and Livingstone channels near the Canadian side of the Detroit River where little data was available.

2. Access Channels in Containment Area.

In December 1972, bottom sediment and core samples were taken in the access channel area of the alternative proposed containment facility north of the Huron River. The nature of bottom sediments in the proposed containment (barrier reef) area south of the Huron River was analyzed in the same manner. Results are included as Attachment 8.

The analyses of total sediments plus interstitial water samples taken closest to the present access channel site indicate that two or more parameters on the EPA mandatory list are exceeded. It is therefore almost certain, that the surface layers in the proposed access channel area will be characterized as polluted and will need to be contained.

Core borings taken near the northern limits of the present containment area show that the upper layers are contaminated according to the EPA criteria in two of the three cores taken. In three of 17 sections analyzed from the intermediate and lower layers of these two cores only total Kjeldahl nitrogen concentrations exceeded EPA criteria. All other parameters in these layers were within the EPA criteria. The third core sample revealed that C.O.D. and Total Kjeldahl Nitrogen exceeded the EPA criteria in the intermediate layers.

It is therefore possible that the lower layers to be dredged in the access channel to the proposed Pointe Mouillee facility can be used in the dike construction or can be disposed in open waters. Core samples have been taken during planning for construction activities so that proper disposition would be made of these dredged materials.

Source of Sediments and Contaminants

The major sources of sediments in the Detroit and Rouge Rivers are soil erosion, stormwater runoff from urban and industrial surfaces, and waste loadings from the municipal and industrial wastewater treatment facilities discharging to the water courses (Figures II-8-9).

Data quantifying amounts contributed by the various major groups of sources have never been developed. Since a portion of the materials measured to characterize wastewater quality is contributory to sediments, the following summary (page 48) of waste loadings to the Detroit River adds some perspective to the source of various materials.

Average daily waste loading to Detroit River
from measured Michigan sources, 1971. *

	Flow mgd	Pounds/day						
		P	BOD	TDS	SS	Fe	Phen.	Oil
Tributaries	72	64	1,450	112,000	10,300	--	--	--
Industries	3,141	484	--	--	712,472	26,995	91	21,330
Municipalities	815	37,699	521,560	--	919,768	--	1,516	151
Totals	4,028	38,247	523,010	112,000	1,642,540	26,995	1,607	21,481

* Based on monthly sampling of one tributary, monthly operating reports from 59 industries and 5 municipalities.

Further perspective on overall loading to the Detroit River is provided by comparison of Canadian versus U. S. contributions (Table II-10) which shows the U. S. contributing 96 percent of the total phosphorus and 98 percent of the suspended solids.

Table II-10: Detroit River, summary of waste loadings, 1971.

	Flow (cfs)	Total P (-----)	BOD ₅ (-----short tons per year-----)	TDS (-----)	SS (-----)	Total N (-----)
CANADA						
Tributaries			NONE			
Industrial	175	15	560	209,350	4,090	ND
Municipal	50	255	3,445	20,330	3,080	880
UNITED STATES						
Tributaries	110	10	265	20,500	1,885	ND
Industrial	4,870	90	ND	ND	130,380	ND
Municipal	1,260	6,900	35,445	ND	168,320	ND
TOTAL:	6,465	7,270	39,715*	250,180*	307,755	880*

* Incomplete information.

ND - No data.

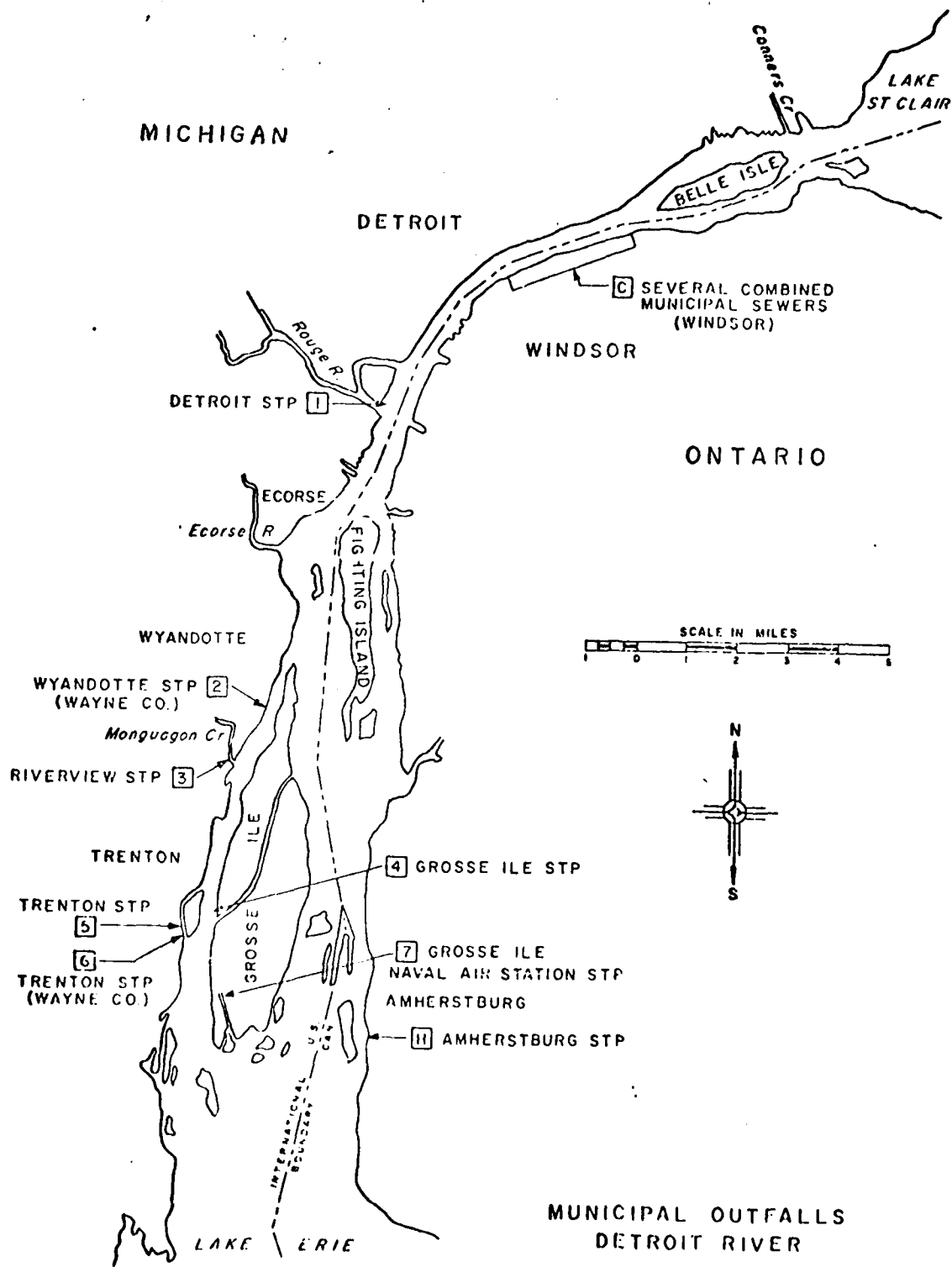


Figure II-8

MICHIGAN

LEGEND

- △ INDUSTRIAL OUTFALLS (U.S.)
- PUBLIC UTILITY OUTFALLS
- △ INDUSTRIAL OUTFALLS (CAN.)

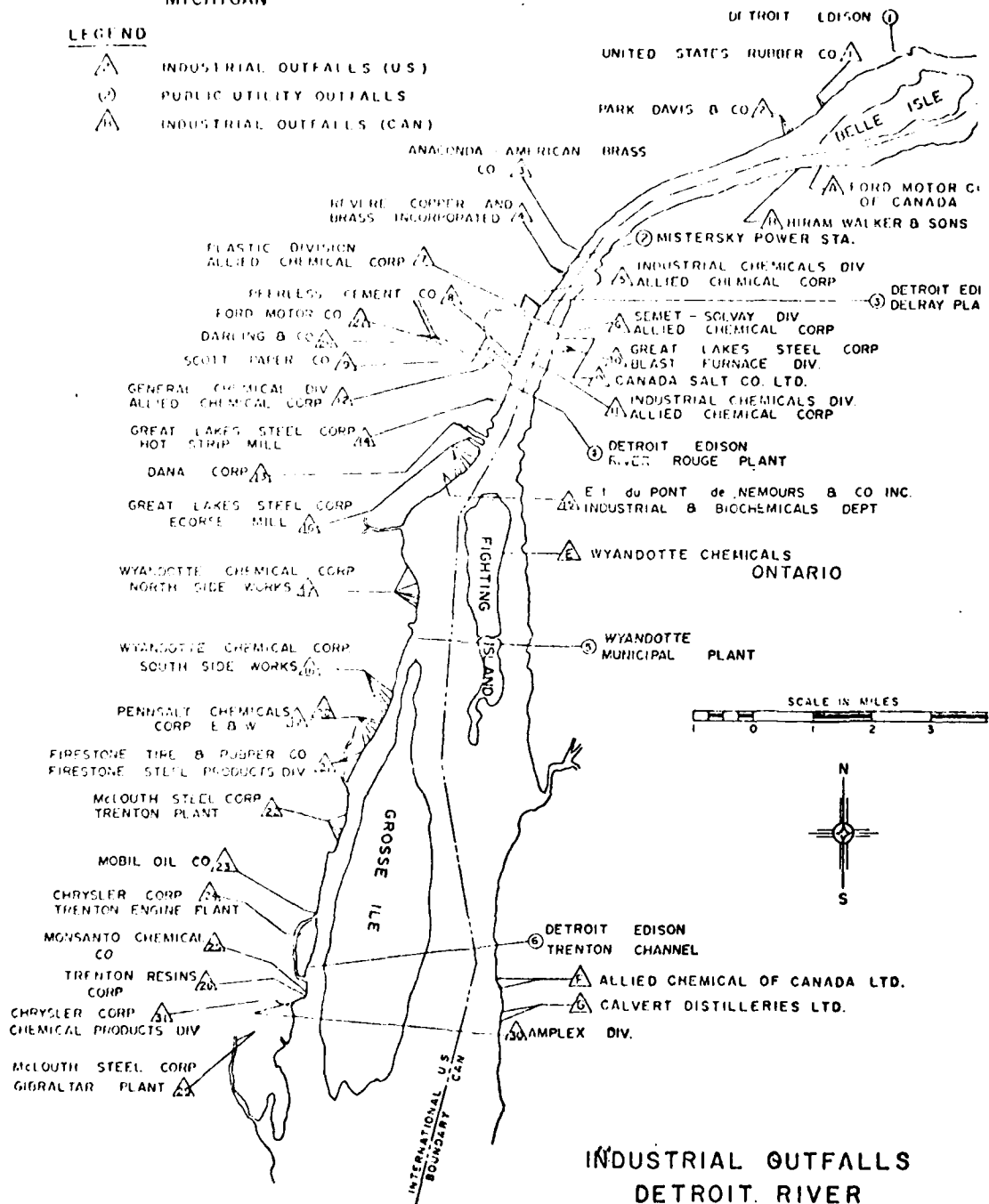


Figure II-9

Some effects of this loading are reflected by comparing mean water quality values derived from monthly sampling on cross river ranges at the head and mouth of the river which demonstrate increased contamination downstream.

TABLE II-11: Water quality characteristics, Detroit River, 1971.

	<u>Head</u>	<u>Mouth</u>
pH	8.2	8.1
Iron (Fe) mg/l	0.211	0.353
Phosphorus (P) mg/l	0.03	0.067
Total dissolved solids mg/l	128	154
Suspended solids mg/l	10	10

The Detroit River loading budget for 1971 (Table II-11) clearly shows that significant percentages of much material are unaccounted for at the mouth of the river, demonstrating retention within the system as sediments.

Retention is further demonstrated by EPA analyses of sediments from the Detroit River, which show that several of the criteria used in determining "polluted" sediments are exceeded (see Table II-4). Further evidence of retention is provided by a comparison of heavy metal concentrations in a series of sediment samples from the Lake St. Clair - Detroit River - Lake Erie system (1970) compared with background reference samples (1970) from stations in relatively uncontaminated streams throughout Michigan (Table II-12).

TABLE II-12: Comparison of heavy metals in sediments from the Detroit River system and those from statewide reference stations.

Source	Concentration in parts per million							
	As	Sb	Cu	Zn	Au	Cd	Hg	Cr
L. St. Clair, Detroit R., L. Erie System mean value	12.5	1.5	81	479	194	7.2	17	124
Background mean plus 2 std. dev.	2.0			53		11	0.3	3.9

Background values are exceeded by factors ranging between 1.5 and 32.

The source of contamination to such a degree cannot be explained by natural conditions and must be attributed to the industrial and municipal wastes and surface water runoff from the immediate watershed.

Remedial Action - Sources.

All Michigan industries on the Detroit River are subject to specific control programs as the result of a joint Federal - State Enforcement Conference initiated in 1965. All industries have complied with the remedial programs specified as a result of the conference, but the impact of these programs is not reflected fully in the reduced daily waste load being discharged to Lake Erie by the Detroit River (page 50) because construction was incomplete in 1971, the last year for which complete figures are available. Continuing evaluation of the outfalls indicates further action is necessary in some cases. Further remedial programs may be required contingent on the guidelines and requirements of the new Federal legislation and maintenance of State water quality standards.

DETROIT RIVER LOADING BUDGET FOR 1971

Canadian Sources

Parameter	Industrial	Municipal	Total
Tot. P. lb/day	65	900	965
Tot. N. lb/day	1,400	3,100	4,500
Diss. Sol. lb/day	11,000,000	72,000	11,072,000
Cl. lb/day	6,300,000	11,000	6,311,000
Tot. Fe. lb/day	1,500	----	1,500
Phenol lb/day	----	----	----
Flow mgd	----	----	----

LAKE ERIE

Parameter	Increase in River from Head---Mouth	Total Input Ac-counted For
Tot. P. lb/day	45,000	37,400
Tot. N. lb/day	136,000	8,800
Diss. Sol. lb/day	20,000,000	11,272,500
Cl. lb/day	10,000,000	8,464,000
Tot. Fe. lb/day	244,000	25,100
Phenol lb/day	980	2,430

DETROIT RIVER

Parameter	Industrial	Municipal	Rouge River	Total
Tot. P. lb/day	121	36,200	100	36,400
Tot. N. lb/day	3,330	----	970	4,300
Diss. Sol. lb/day	1,276,000	850,000	200,500	2,00,500
Cl. lb/day	23,200	----	26,900	2,153,000
Tot. Fe. lb/day	129	2,300	400	23,600
Phenol lb/day	2,400	891	131	2,430
Flow mgd	----	----	----	3,422

AMERICAN SOURCES

Detroit River Flow: 158,000 mgd

TRENDS IN WATER QUALITY -- THE DETROIT RIVER

Average lbs/day Passing Range D.T. 3.9 at the Mouth of the Detroit River

MATERIAL	1946-1948	1951	1966	1967	1968	1969	1970	1971	% Change 1966-1971
Phenol	5362	2802	7478	3072	2775	4528	4530	1180	-534.
Total Iron	----	----	454,000	833,000	742,000	662,000	589,000	417,000	-9.0
Chloride	----	----	32,400,000	30,100,000	29,700,000	26,400,000	21,200,000	25,300,000	-23.1
Soluble Ortho-P ₀₄ as Phosphorus	----	----	308,000	179,000	77,000	94,000	68,000	42,000	-633.
Total Phosphorus	----	----	----	----	198,000	163,000	147,000	79,000	-150.
Ammonia Nitrogen	----	----	269,000	175,000	143,000	214,000	184,000	175,000	-53.7
Nitrate Nitrogen	----	----	80,000	184,000	203,000	240,000	251,000	443,000	+454.
Dissolved Oxygen	----	----	9,500,000	7,700,000	8,600,000	9,600,000	8,400,000	9,400,000	-1.1
Flow	193,000	200,000	185,000	190,000	198,000	210,000	205,000	219,000	----

* % Change 1968 ~ 1971

The City of Detroit is under an Order of the Michigan Water Resources Commission to (in part) maintain continuous operation of their municipal wastewater treatment plant so that the discharge to the waters of the State :

Contain not more than 206,000 pounds per day of oxygen consuming substances as measured by the five-day biochemical oxygen demand test after November 1, 1973.

Contain not more than 324,000 pounds per day nor more than 50 mg/l of suspended solids after November 1, 1973.

Contain not more than 93 pounds per day of phenol after August 1, 1976.

Contain not more than 15 mg/l of oil after November 1, 1973.

Contain not more than 10% of the total phosphorus contained in the influent to the treatment facilities nor more than a monthly average of 4,750 pounds per day after December 31, 1975.

The City must also provide full secondary treatment by August 1, 1976. Compliance with the Order is behind schedule on biochemical oxygen demand and suspended solids but facilities to achieve compliance will be established by mid-1974. A bid proposing sludge composting was received and subsequently accepted in April 1973. Acceptance of this bid was predicated on the condition that the contractor would locate an acceptable disposal site. To date, an acceptable site has not been found due to severe local resistance to this project in each county investigated.

The waste budgets and loads discussed on page 49 did not include the significant contributions from stormwater overflows of the Detroit area sewage system. A program is underway to decrease the frequency and magnitude of overflows from the combined sewer system. This program entails the installation of additional flow control devices and installation of an expanded data gathering system to more effectively utilize the storage capacity of the system. This project is approximately 90 percent complete and is due to be in total service during the first quarter of 1974.

These three programs involving municipal wastewater, stormwater overflows and industrial wastewater will result in lower sediment loadings to the Detroit River. Whether future sediments will meet EPA criteria for "non-polluted" sediments is unknown. It is possible that new criteria will be developed as a result of the current Corps of Engineers (Vicksburg) study of the biological and chemical effects of sediments. A 1970 study (4) comparing contamination of reference station background sediments with those collected state-wide downstream of major municipal and industrial areas demonstrated that the latter sediments are consistently high in a variety of contaminants. Therefore it is doubtful that future sediments will be classed as "non-polluted" and eligible for disposal at open lake sites.

7. Recreation

Provision for present and future recreational needs of the 4.5 million persons in the five county Southeast Michigan Region has become a matter of increasing concern of local governmental agencies. Presently two-thirds of the Region's population is concentrated in Detroit and within five miles of its city limits. Regional population projections by the Southeast Michigan Council of Governments indicate a slight decrease in percentage of core city residents by 1990 but a continued growth trend to six million persons. This is further complicated by the maldistribution of existing recreational sites to centers of population density. The Huron-Clinton Metropolitan Authority (HCMA), a regional park agency, in its study of the need for a park and recreation center for the region recognized the critical need for sites having water activity orientation and access to either Lake Erie or the Detroit River.

The competition for shorelands has become more intense with time because of demands for development by residential, commercial, and industrial interests requiring water orientation.

At present eight miles of the Great Lakes shoreline in the Southeast Michigan region are available for all public uses.

The Pointe Mouillee State Game Area (the State of Michigan now owns 2,871 acres), which includes a managed 365-acre refuge, attracted an estimated 10,000 wildfowl at the opening of the 1971 hunting season. Species which numbered in the thousands were redheads, blue wing teal, black ducks, mallards, and widgeon. Others commonly seen on the flyway were pintails, common mergansers, lesser and greater scaup, canvasback, green wing teal, blue geese, and Canadian geese. Migrating birds pass through these marshes from the Mississippi, Central, and Atlantic flyways.

A detailed listing of fauna and flora found in the project area can be seen in Attachment 6.

The refuge is a diked area maintained in the interior of the marshland within which water is regulated to provide suitable habitat for plants such as millet and smartweed, which serve as a food source for migratory waterfowl in the fall. The area is reflooded on or about September 1st for the migratory birds which dive and dabble for the food

prepared for them. Hunting season is restricted to one or two months of the year. Hunting represents 7% of the use of the Game Area.

The refuge was formerly a natural area protected by the Barrier Beach on the eastern shore. In 1952, a devastating storm and record high water levels eroded large sections of emergent lands and supporting vegetation, sand beaches, and trees, leaving much of the area under water. The present wildlife refuge supplements the remaining natural feeding areas.

Small Boat Navigation Activities

There are three small craft mooring facilities and one boat livery in the Pointe Mouillee area. Two of the facilities are commercial marinas. Both are located about 1-3/5 miles upstream from the mouth of the Huron River. One is on the mainstream and one is on the Silver Creek tributary. The third mooring facility is operated by the Department of Natural Resources and is located on the Huron River about 4/5 mile upstream from the mouth. The boat livery is located on Mouillee Creek near Jefferson Avenue (River Road). The three marinas operating out of the Huron River can accommodate, in total, slightly in excess of one hundred moored craft. Each facility also provides launching accommodations. The total capacity of all three sites is approximately 100 auto-trailer units. The boat livery on Mouillee Creek maintains a fleet of about five to ten outboards, depending on lake levels.

In addition, private citizens who are riparians on Huron River and Silver Creek operate a fleet varying between 30 and 50 craft.

Under high water conditions, all small craft can traverse the river, roadstead and lake with ease. The outboards on Mouillee Creek also have little trouble. However, during the drought period of the 1930's, no craft could navigate Mouillee Creek and only rowboats and canoes could cross the shoal at the mouth of the Huron River.

B. SOCIAL AND ECONOMIC ENVIRONMENTS

1. Population

Pointe Mouillee lies in the northeast corner of Monroe County along Lake Erie. It encompasses approximately 1/3 the area of Berlin Township.

Monroe County, Michigan, is located between Detroit, Michigan, and Toledo, Ohio, in the heart of the midwestern industrial belt, and is, therefore, accessible to both of these population centers. The county occupies approximately 562 square miles (360,000 acres) of land. It is part of the Toledo, Ohio-Michigan Standard Metropolitan Statistical

Area (SMSA). A SMSA is a county or group of counties which contains at least one city of 50,000 or more, or "twin cities" with a combined population of at least 50,000.

Table II-13 Population figures for communities in the vicinity of the proposed project (including Monroe County) for the 1960 and 1970 censuses.

	<u>1970</u>	<u>1960</u>	<u>Percent Change</u>
Toledo-Michigan SMSA	692,571	630,647	
Monroe County	118,474	101,120	17.2
Berlin Township	5,510	4,459	23.6
Estral Beach	419	254	65.0
South Rockwood	1,477	1,337	10.5

Monroe County has shown a steady population increase since the 1900's. This is due to its location between the two industrial centers of Detroit and Toledo. The two communities in the immediate vicinity to Pointe Mouillee also increased in population during the 60's. The loss of population between ages 18 and 21 years is attributed to the limited employment opportunities and housing market.

In 1967 Parkins, Rogers and Associates made three projections as to future population for Monroe County-minimum (Estimate A) medium (Estimate B) and optimum (Estimate C).

MONROE COUNTY POPULATION PROJECTIONS ABC

	<u>A</u>	<u>B</u>	<u>C</u>
1980	180,000	200,000	250,000
1990	200,000	260,000	510,000
2000	240,000	350,000	800,000

From recent discussions with the county planning staff and based on present trends projection A seems to be the most accurate. The main assumption of Estimate A is that limited utility construction will take

place within the County in the next few decades. Local planners now believe that population growth will continue at its present rate. Due to the high water level of Lake Erie and the flooding problems in the county, growth will continue, but at a slow rate.

As Monroe County grows, its labor force will increase and change in composition. It is probable that basic employment groups, such as farming and manufacturing employees will decrease in number while various secondary or dependent occupations will make major employment gains. In 1970, the County's labor force totaled about 40 percent of the population. This proportion is not expected to change significantly in the future and is assumed as applicable through 1980.

As with other areas of the region, the county will become more urbanized, and farm employment will decrease. Some farm lands will be lost to urban development. Farm employees will continue to be attracted to higher paying occupations. The remaining farms will adopt additional labor saving methods and machinery.

Median income in Monroe County is \$11,398, with 5.7% of the population below the poverty line and 27.8% of the families with incomes of \$15,000 and over. The following table shows the breakdown of incomes in Berlin Township.

<u>INCOME</u>	<u>NO.</u>	<u>%</u>
<u>Of Families</u>		
Under \$2,000	43	3.0
\$2,000 - \$3,999	80	5.7
\$4,000 - \$6,999	154	11.0
\$7,000 - \$9,999	215	15.4
\$10,000 - \$14,999	514	36.8
\$15,000 - \$24,999	345	24.7
\$25,000 or more	44	3.1
<u>Of Unrel. Ind.</u>		
Under \$2,000	99	
\$2,000 - \$3,999	47	
\$4,000 - \$6,999	26	
\$7,000 - \$9,999	30	
\$10,000 - \$14,999	8	
\$15,000 - \$24,999	7	

In Berlin Township there is extensive long-distance commuting for employment purposes, shown by the following table:

<u>PLACE OF WORK</u>	
Total at work	1826
Within Monroe County	418
Outside Monroe County	1289
Toledo SMSA, Ohio	67
Wood County, Ohio	14
Detroit	81
Other Wayne County	1057
Oakland County	14
Macomb County	-
Washtenaw County	28
Lenawee County	-
Other	28
Not Reported	119

SECTION III
RELATIONSHIP OF THE PROPOSED ACTION TO LAND USE PLANS

A. REGIONAL LAND USE

A land use study conducted by Parkins Rogers and Associates in 1967 showed that agriculture is the predominant land use in Monroe County. In 1967 slightly over 10 percent of the County's land was built up totaling about 37,700 acres. The remaining area of 322,000 acres was used largely for agricultural purposes. A "windshield" survey and discussions with the County planning department showed that the predominant land use was still agricultural.

Residential development in 1967 accounted for 15,000 acres or approximately 40 percent of the built up area. Of the residential land, 78 percent was one-family in character, and the remainder was made up of multi-family dwellings and mobile homes.

Major residential development is found in the City of Monroe, Frenchtown, Monroe Township, and Bedford Township.

Berlin Township residential development is primarily found in Estral Beach, Newport and South Rockwood. Some scattered residential development is found along Swan Creek and the major arteries running through the township.

In 1972 a zoning ordinance for Berlin Township was adopted. The majority of the land is zoned for agricultural purposes with scattered pockets of residential areas at major intersections. The area bounded by I-75 expressway and the Detroit and Toledo Shoreline Railroad is zoned for industrial purposes. There is little industry in the area.

Berlin Township is relatively flat, particularly near the shore where a one percent slope exists for a distance of 20 miles inland. This has resulted in a large number of drains and streams necessary for handling surface run-off. Most of these waterways are relatively wide but are generally shallow. As a result, during peak run-off periods, adjacent low lands are subject to flooding.

The construction of the spoil disposal barrier island lakeward of and parallel to the old barrier would provide the protection needed to revitalize the Mouillee Marsh. It is highly improbable that the old barrier beach will ever again function as a reef to protect the marsh from the destructive forces of Lake Erie. Two water-level cycles have occurred since 1938, causing the destruction of the land forms serving as a reef and the continued loss of marsh habitat.

In 1972 the Coastal Zone Management Act (Public Law 92-583) provided a means for States to "exercise effectively their responsibilities in the coastal zone through the development and implementation of management programs to achieve wise use of the land and water resources of the coastal zone, giving full consideration to ecological, cultural, historic, and aesthetic values as well as to needs for economic development, and for all Federal agencies engaged in programs affecting the coastal zone to cooperate and participate with State and local governments and regional agencies in effectuating the purposes of this title. [Section 303 (a) and (b).]

Mr. A. Gene Gazlay, Director of the Michigan Department of Natural Resources described Michigan's position on this Act as of April 1973, related to spoil disposal sites:

(1) Regulation under this Act is not in force at this date. A State Management Plan has been submitted to the Governor, but as yet it has not been approved in accordance with the Federal act.

(2) Should proposed regulations become effective, construction and filling as planned for Pointe Mouillee. would be appropriate because these sites were properly reviewed by State and Federal agencies and would be in accordance with the State Management Plan.

The County's principal traffic routes are four north-south highways: U.S. 23, U.S. 24, U.S. 25 and I-75. Two of these routes, U.S. 23 and I-75 are divided, four-lane freeways. The County contains only two major east-west routes: M-50 and M-151. Both of these routes are two-lane highways.

Monroe County contains approximately 1,400 miles of streets and highways which can be divided into the following categories:

Federal and State Trunklines	124 miles
Primary County Roads	409 miles
Local County Roads	856 miles
Municipal Streets	91 miles

Monroe County is also penetrated by a significant amount of rail and highway "through traffic" which has neither origin nor destination within the County. All traffic between Detroit and Toledo as well as between Ann Arbor and Toledo passes through the County. In many locations through traffic is heavier than locally-generated traffic.

B. AREA LAND USE

The proposed project would be constructed on submerged shorelands belonging to the State of Michigan. The adjacent land, also belonging to the State, is zoned for recreational use by Berlin Township.

In 1970, the Michigan Legislature enacted "Great Lakes Shorelands Protection and Management Act". Act 245 directed the Michigan Department of Natural Resources to identify environmental and high risk erosion areas that needed protection. The environmental areas were defined as those areas of the Great Lakes and Great Lakes shorelands that are determined by the Department of Natural Resources as necessary for the maintenance and preservation of the fisheries and wildlife resources of the State of Michigan.

On the basis of a year-long study, the Department of Natural Resources identified and designated Great Lakes marshes and sensitive shoreland areas as environmental areas. Among those areas identified were the marshes at Pte. Mouillee.

SECTION IV

PROBABLE IMPACT OF THE PROPOSED ACTION ON THE ENVIRONMENT

A. NATURAL ENVIRONMENT

1. Geological Impacts of Placement of the Dikes

It is anticipated that during construction the dikes would displace the fibrous peat and organic clays and come to bear on the high strength soil below them. Settlements as high as 14 feet are expected to occur during construction with the minimum settlement to be not less than 4 feet. This will cause a balancing movement upward of the adjacent submerged land surface. The increase in elevation may amount to as much as 8 feet where there are deep deposits of organic material under the dikes. This rise will extend out from the base of the dikes, on either side, for a distance of approximately 65 feet, or half the bottom width of the dike. This will create a submerged "shelf" next to the dikes in the deeper stretches of the marsh; this could support vegetation, become mudflats during westerly wind seiches, provide a unique habitat, or redirect drainage. Long-term settlements are expected to be extremely small due to the lack of intermediate strength soils in the horizon. Long-term settlement would occur only if the soft organic clays and fibrous peat soil are trapped under the dikes. A design safety factor insures the stability of the dike.

The diked barrier reef will protect the water area inland from strong wave action and allow finely divided organic matter to settle over the bottom. This should provide a substrate for aquatic plants in which to become established again when water levels are lower. Sediment also has the adverse effect of smothering existing benthic plants and animals if amounts are excessive.

2. Impacts Resulting from Construction and Operation of the Proposed Facility:

Water Quality

Changes in water movement and circulation caused by construction of the facility could result in change of existing water quality. This depends on concentrations and rate of pollutant loading in waters entering the marsh, on the ability of marsh vegetation to assimilate materials, on the recovery capacity of the water system, and on the variability over time of these factors.

Enrichment materials are of value to the marsh; therefore, water quality as defined by EPA criteria has never been assessed in the marsh to provide background data for a later assessment of effects. Assimilation enriches the marsh, while over-abundance could create stagnation and related undesirable effects. However, seiche action in Lake Erie will cause flow into and out from the marsh area behind the dike, through north and south inlets. Flow is proportional to inlet areas and conditioned by winds, principally from the south and southeast. If marsh flow outwards brought degraded water southwards along the Estral Beach shoreline, it would be possible to close the south inlet at the causeway. The possibility of these conditions happening will not occur until after the entire dike is built. (Figures IV-10 and IV-17)

The flow of the Huron River through existing channels into Lake Erie will not be altered by the placement of the dike. The Huron River has shown little or no historic tendency to discharge into the area of Mouillee Creek mouth. Because the south inlet is somewhat narrower than the north inlet, any tendency for the Huron River to discharge through the south inlet with the dike in place should be even less than the historic tendency. The northern end of dike has been positioned to deflect lakeward littoral currents from the north. Therefore, no additional flows from these sources, considered polluted, should be entering the marsh after the dikes are constructed except under flood conditions.

Construction

Construction of the containment dikes would begin at the extreme southwesterly portion of the area and would require construction of a causeway to provide access for land-based equipment and material delivery. Construction of the perimeter dike would proceed with placement of smaller-size stone to a height of five feet above Low Water Datum to provide protection for placement of the clay core materials and to minimize turbidity and erosion in the area. The dike is constructed in sections approximately 100 feet long at a time. (Figure IV-13.)



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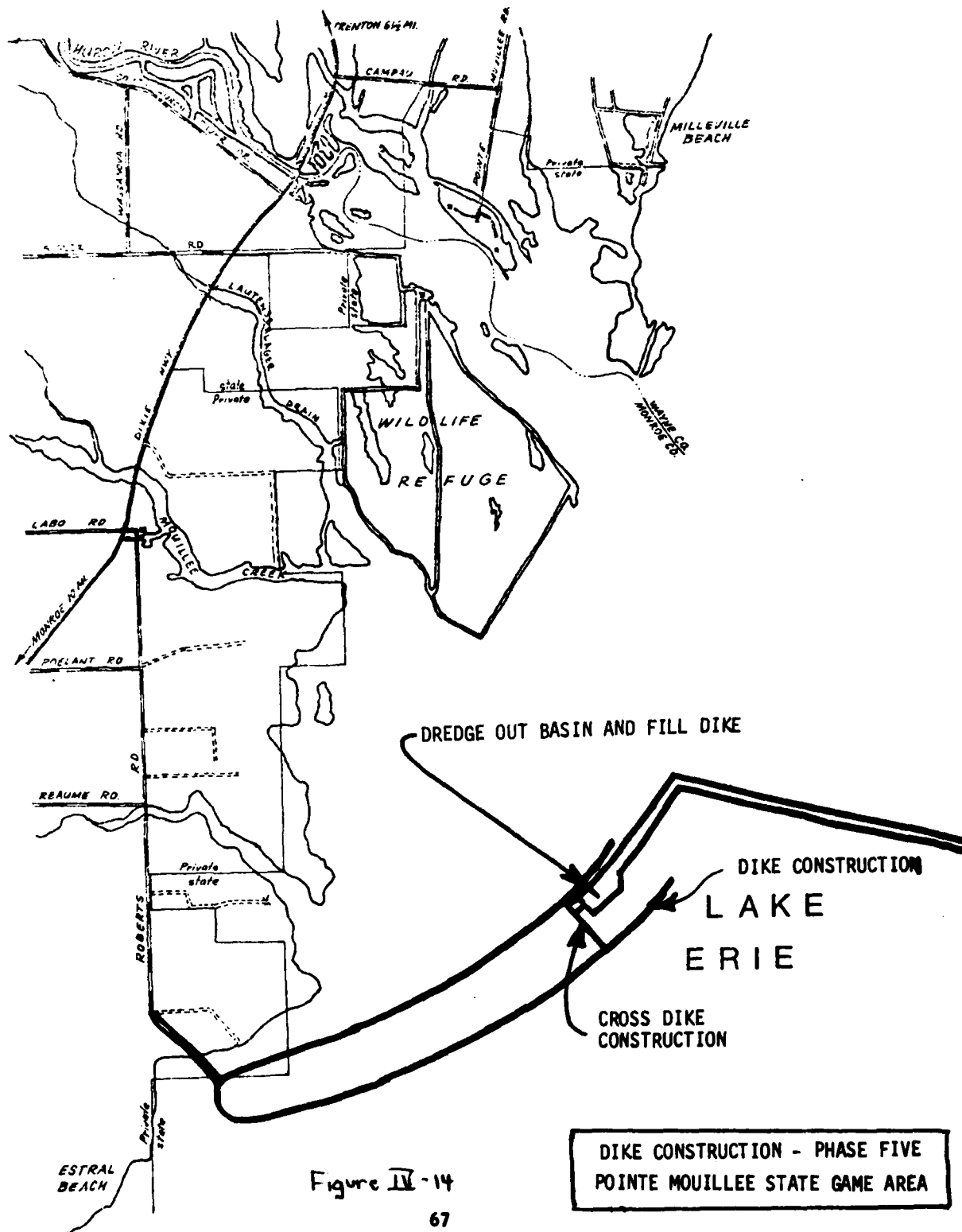


Figure IV-14

DIKE CONSTRUCTION - PHASE FIVE
 POINTE MOUILLEE STATE GAME AREA

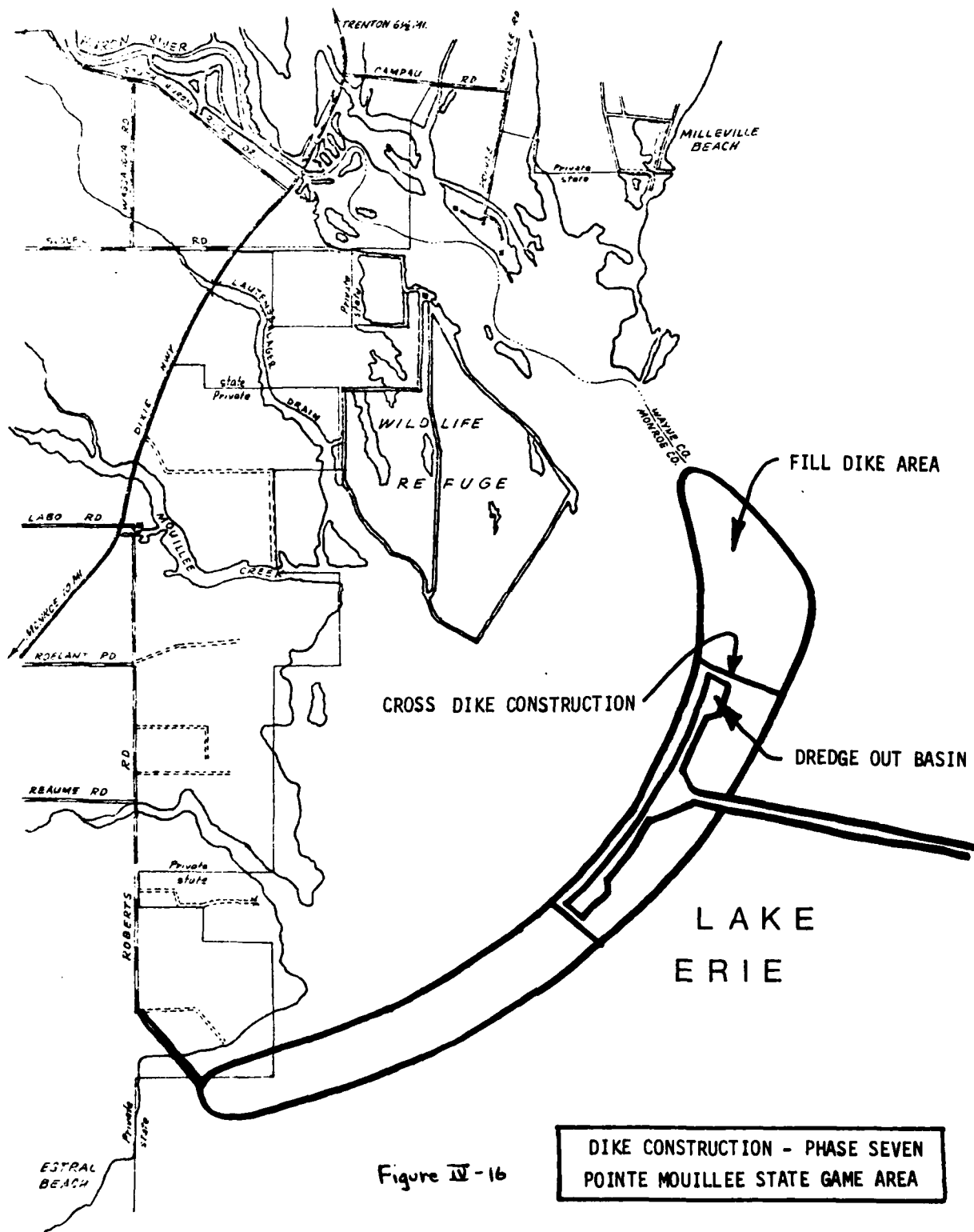


Figure IV-16

Quarry stone to be used for diking is available from quarries located in Michigan, Ohio and Indiana. The choice is made by the contractor subject to final approval by the Corps. Transport of these materials would bring heavy truck traffic over unimproved dirt roads near the project area. The contractor is responsible for securing all necessary permits and for complying with local laws. Road wear, noise and dust could reduce the quality of the rural environment for adjoining householders. These effects are considered short-term.

Construction of the dikes, causeway and access channel will be accompanied by turbidity and sedimentation in the marsh and the nearby lake area. This would significantly degrade the present water quality in the project area. Turbidity, primarily in the form of fine particulate silts, can be expected in the immediate area of dredging activities. Resuspension of these materials is normally associated with an increase in nutrient levels in the vicinity. It is known that dredging operations often separate pollutants from the inorganic materials being dredged. This process is termed elutriation and can be regarded as a form of washing, being associated primarily with hydraulic dredging. With the rise of suspended sediments, levels of dissolved nutrients can be expected to increase. A corresponding decrease in dissolved oxygen levels resulting from increases in BOD and COD can be anticipated, resulting from the initiation of bacterial attacks on the organic fraction of the sediments. The duration of these conditions can be expected to be contiguous with the duration of construction and maintenance operations. Construction of the facility would not be expected to influence the present quality of the Huron River proper.

Upon completion of the access channel, the remainder of the perimeter dike would proceed using marine plant for delivery of materials and completion of the mooring and pump-out facilities and weirs. It is considered that a 3-year construction period would be required to complete the containment facility. Loading of the marine plant would take place at an off-site commercial docking facility, reducing overland attrition in the area.

Cross-dikes and pump-out facilities would be provided at 4,000-foot intervals within the containment area to facilitate the discharge of dredged material. This permits complete filling and minimizing ponding inside the facility. Each compartment would contain a weir and oil skimmer to insure

a high quality effluent into the adjacent water. The weir is regulated manually to maintain a settling basin in the drainage area. Quality of the effluent would be monitored in accordance with EPA requirements. A comprehensive and systematic monitoring scheme would be worked out.

The dredged access channel and turning basins within the diked enclosure would provide a protected area for the dredge during pump-out operation. This operation takes place through a water-tight coupling between dredge boat and facility. Accidental spills are rare. Other environmental effects consist of low levels of noise and odors described at various times and places as "earthy" and "septic". Because of the isolation of this area, these effects are considered relatively insignificant.

Upon completion of the fill, the area will be graded and seeded to control erosion.

Operations

Questions regarding dredging operations are largely concerned with the net decrease in pollution to the lake as a result of depositing the dredge spoil within a diked enclosure rather than in the open waters. No conclusions can be reached without giving consideration to the various aspects of the entire disposal operation. When an area is to be dredged, the bottom sediments are sampled, appropriate tests are performed, and the spoil is judged to be polluted or unpolluted according to some criterion. However, during the dredging and disposal operation the dredge spoil is usually mixed several times with large quantities of ambient water, and the excess water is subsequently returned to the lake. For example, in the case of a hopper dredge, the spoil is combined with considerable amounts of water as it is removed from the bottom of the channel and deposited in the hopper of the dredge and, as the solids settle, the excess water sometimes overflows the dredge. Then, when the dredge pumps the spoil into the disposal area, the solids are again mixed with large quantities of ambient water and, after sufficient retention time to allow the solids to settle out of suspension, the excess water exits the disposal area through the overflow weir. On both of these occasions there is a tendency for elutriation to take place, and the resulting solids in the disposal area may have been sufficiently cleansed of pollutants that they could be deposited in the lake with no substantial adverse effects.

Based on the results from an extensive series of field and laboratory tests on dredge spoil and the associated water samples from a facility at Toledo, Ohio¹; it can be generally concluded that the disposal of polluted dredging wastes in containment areas is very effective in reducing the amount of pollutants that re-enter the lake waters; this is clearly demonstrated by comparing the data in Table IV-13 for the samples from the discharge pipe and from the overflow weir and noting the substantial decrease in the values of all pollutants tested. A further comparison of the concentrations of pollutants in the bottom sediments with those concentrations of the materials from the discharge pipe normalized with respect to the percent of total solids in the bottom sediments indicates that comparable values are essentially the same order of magnitude. Therefore, the disposal of dredgings within diked enclosures can be considered to effectively remove pollutants from the lake environment.

Results of several bacteriological tests showed that the total coliform count of samples taken from the discharge pipe was about the same as that of the water overflowing the weir; similarly, the total coliform count of the ambient river water was practically the same as that of the water overflowing the weir. Fecal coliform count showed a substantial decrease between the discharge pipe and the overflow weir.

The effect of diked disposal on the quality of groundwater was not as clear as the above. The extremely high counts of total coliform and fecal coliform in the stagnant mud suggests that the mud acts as a rich breeding agent for a relatively low fecal coliform count. Although the information is not complete, it appears that this disposal technique is effective in preventing bacteriological pollutants from entering the lake waters, but its effect on the deposited dredgings and the underlying groundwater is not clear.

1. Raymond J. Krizek, Gabor M. Karadi, Paul L. Hummel, Engineering Characteristics of Polluted Dredgings. EPA Grant, Techn. Report No.1, March 1973.

Table IV-14 Summary of Typical Values for Pollution Parameters,
Dredging Operations at Toledo Harbor, Penn 7 Diked
Disposal Facility, 1972.¹

Source of Sample	Total Solids (%)	Non-volatile Suspended Solids (%)	Volatile Suspended Solids (%)	Silica (%)	COD (mg/l)	BOD (mg/l)	pH	Metals (ppm)						
								Cd	Cr	Cu	Pb	Mn	Zn	Fe
Discharge pipe (actual)	17	12	1	10	20,000	350	6.9	4000	0.5	5	3000	10	75	150
Discharge pipe (normalized to volume of bottom sediment)	36	30	2	25	40,000	700		9000	1	10	6000	20	150	300
Overflow weir	0.05	0.04	0.01	0.005	150	3	6.5	150	< 0.1	1	5	< 2	2	5
River	0.02	0.02	0.005	0.01	125	2	6.8	75	< 0.3	7	10	< 7	< 3	10
Water sample from depth of 10 feet	0.1	0.03	0.02	0.04	110	8		150	< 0.3	< 7	60	< 7	3	10
Water sample from depth of 20 feet	0.1	0.04	0.005	0.04	90	< 1		200	< 0.3	< 7	40	< 7	3	20
Bottom sediment	36	35	1	30	30,000		6.7	7500	1	7	4000	15	125	125

Possible Impacts after Completion of the Projects.

The existence of the barrier may tend to restrict the flushing of the Pte. Mouillee area by periodic lake surges. However, there will be 10 years of project operation to determine whether this loss can be identified as significant to the marsh and to the lake.

Periodic maintenance of the access channel would also create impact characteristic of dredging operations (nutrients, DO, turbidity).

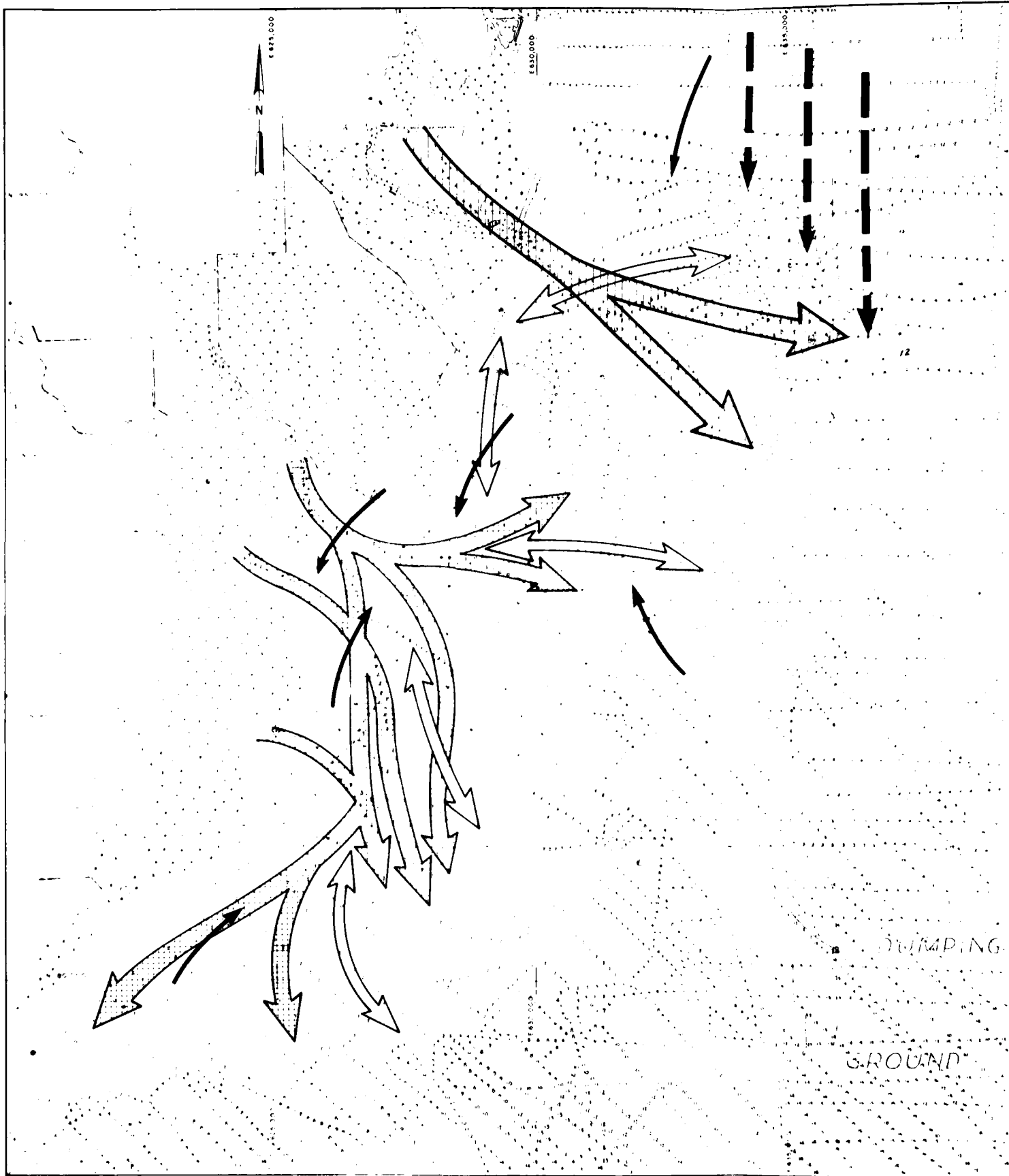
Benthic communities in the immediate vicinity of dredging operations, both during construction phases and the maintenance period, can be expected to be subjected to smothering from sedimentation which accumulates. Recolonization of these areas would generally be dependent on the species nature and mobility of organisms inhabiting the affected areas and the subsequent type of substrate.

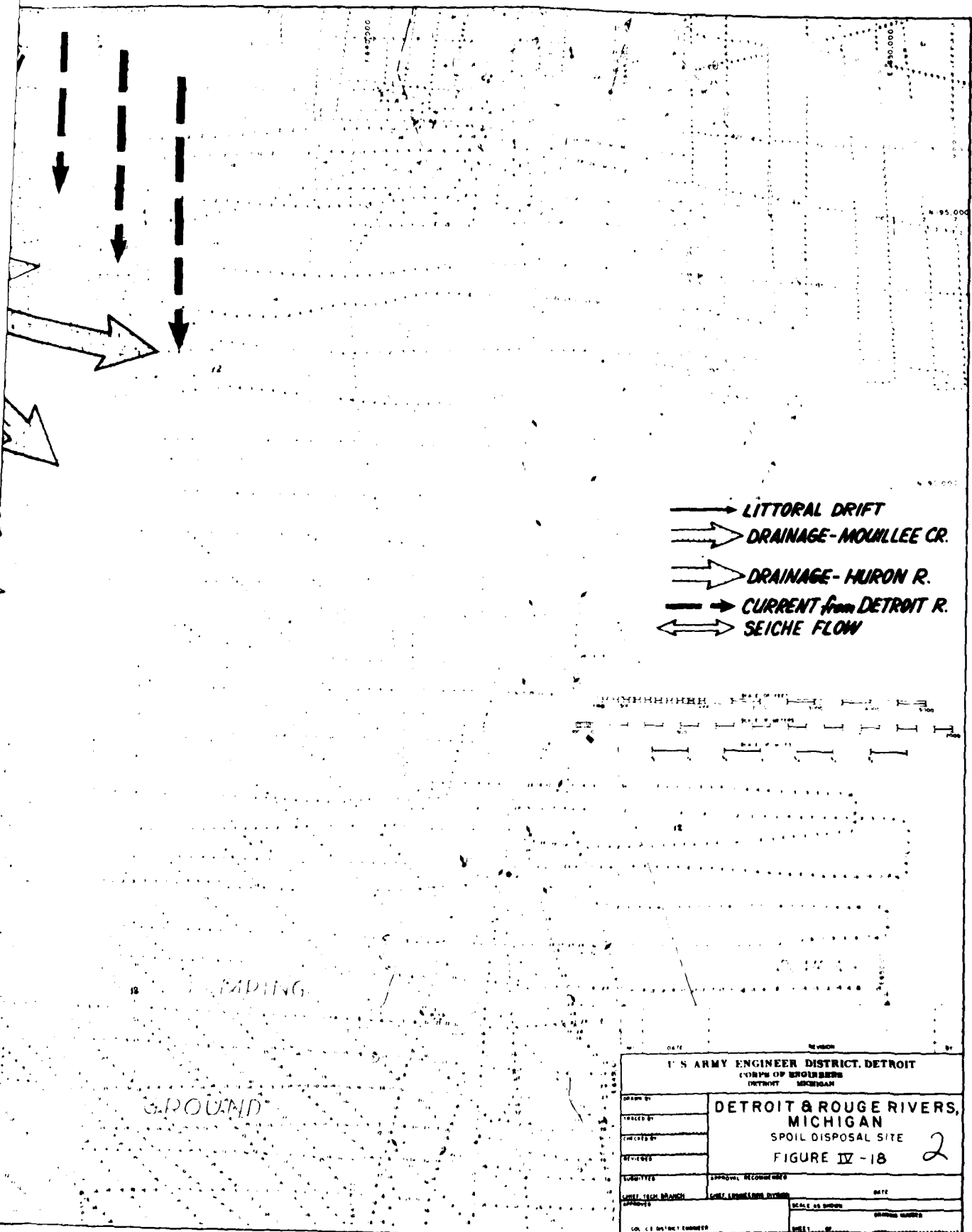
3. Drainage and currents

A comparison of drainage and currents in the project area, with and without the barrier dike, is shown in Figures IV-20 and IV-21. The effect of the structure is clearly seen as it buffers the marsh against seiche flows from the lake, particularly from south and southeast directions. The other major effect, the divergence of tributary flows from Mouillee Creek, Lautenschlager Drain, and Bathgate Drain, shows a southward drainage pattern through the south inlet. The distance of the dikes from the shore was extended to 1,000 feet in order to include a portion of the historical channel noted in Figure IV-20. Seiche action will continue to cause flow into and out from the marsh area behind the dike.

The Huron River has shown little or no historical tendency to discharge into the area of the Mouillee Creek. The south inlet would be somewhat narrower than the north inlet, and the tendency for the Huron River to discharge through the south inlet with the dike in place should be even less than the historic tendency except during flood conditions.

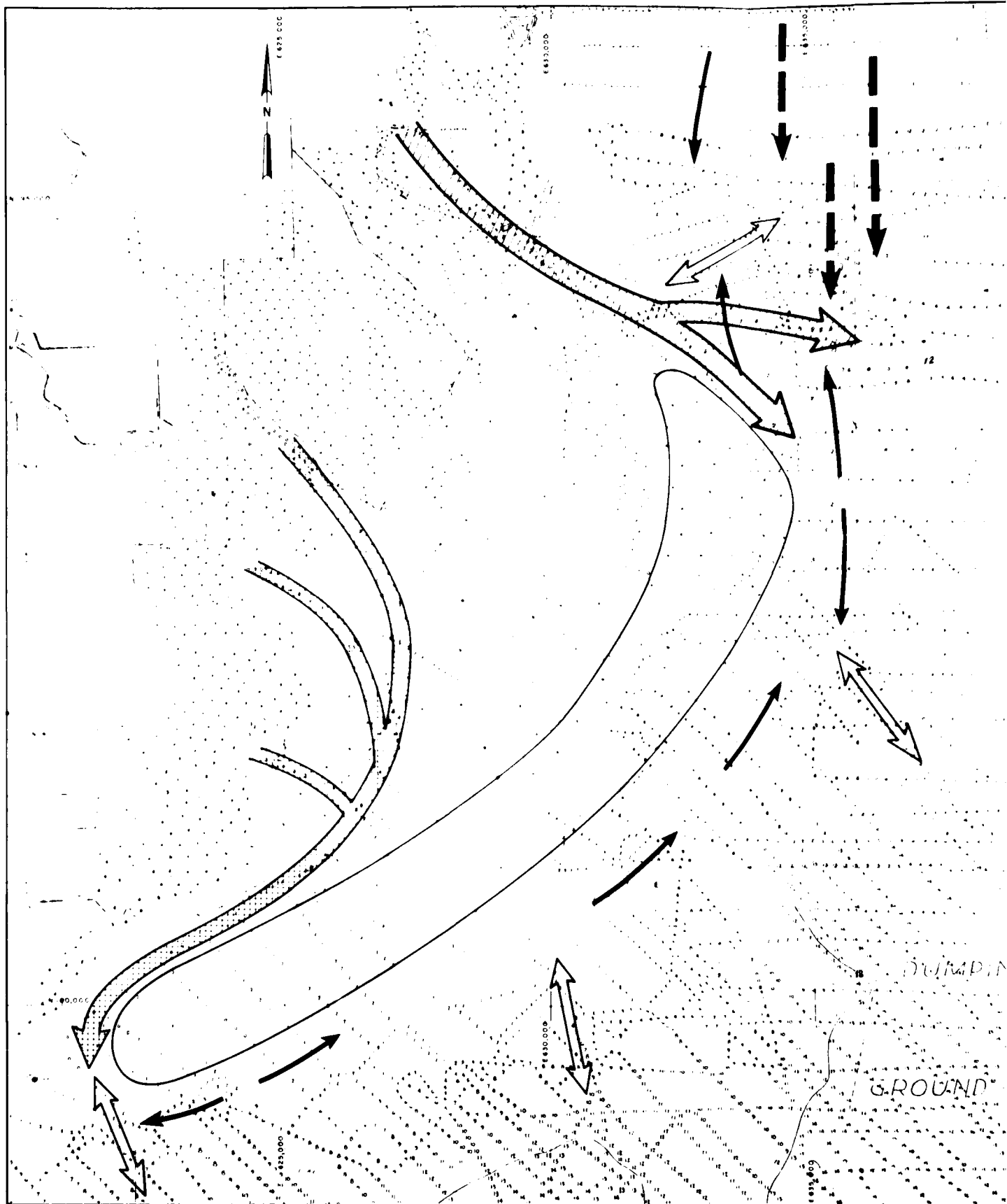
Until the dike is completed and closed (approximately three years), almost no discharge is expected through the south inlet. Littoral transport of approximately 4,000 cubic yards of sand a year from the south is expected to pass the south inlet, and deposition could occur lakeward of the causeway.

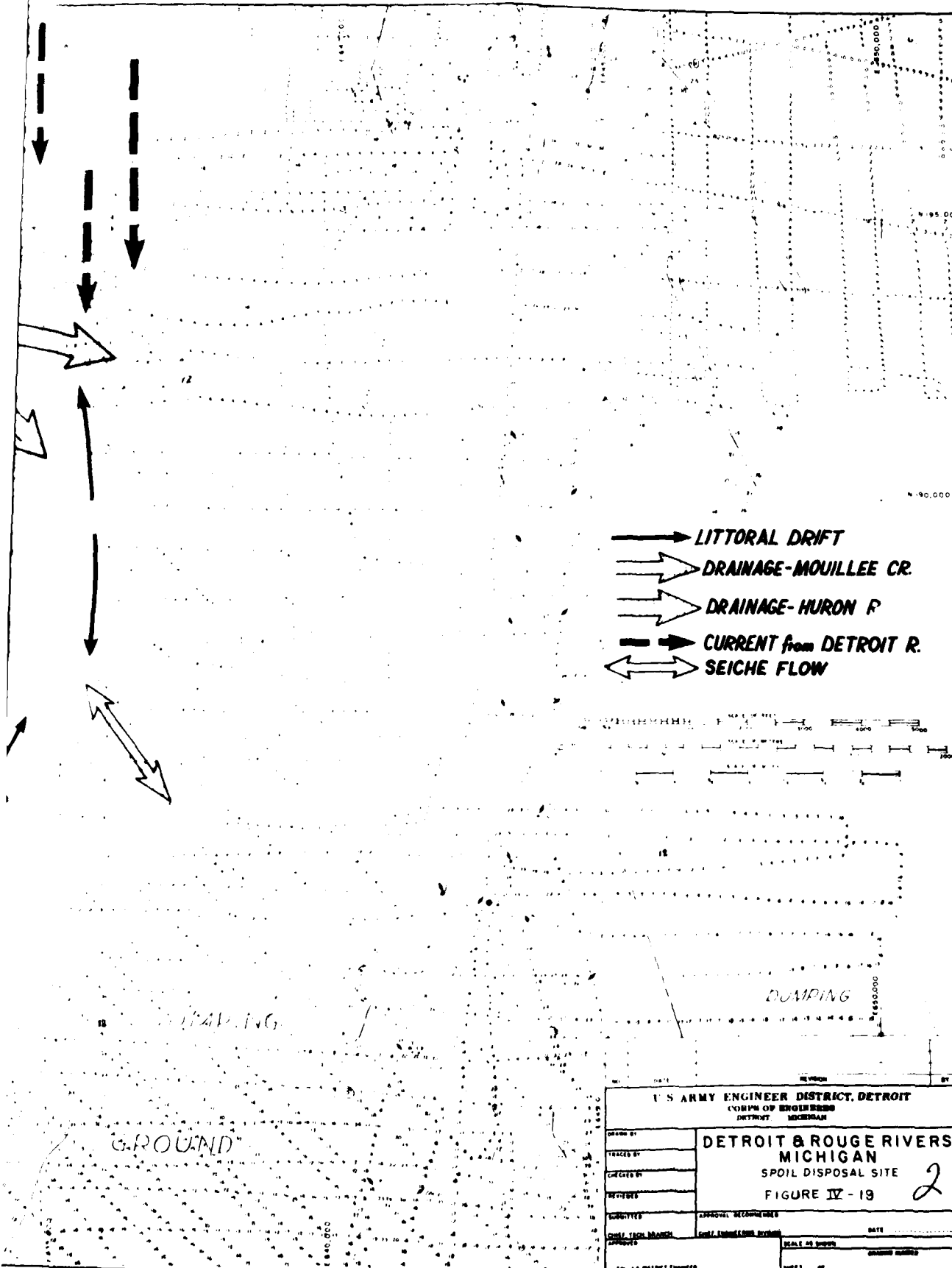




- LITTORAL DRIFT
- DRAINAGE-MOUILLEE CR.
- DRAINAGE-HURON R.
- CURRENT from DETROIT R.
- ↔ SEICHE FLOW

U.S. ARMY ENGINEER DISTRICT, DETROIT	
CORPS OF ENGINEERS	
DETROIT, MICHIGAN	
DRAWN BY:	DETROIT & ROUGE RIVERS, MICHIGAN
CHECKED BY:	SPOIL DISPOSAL SITE
REVISED BY:	FIGURE IV-18 2
REVIEWED BY:	
APPROVED:	DATE:
SCALE AS SHOWN:	DRAWING NUMBER:





When the center section of the dike is closed, a major alteration of flow patterns in the marsh will occur. The size of the opening in the south inlet is important in order to have a current velocity out of the south inlet great enough to scour shoaling and keep the passage open.

During construction, the south inlet would be crossed by a causeway which would be partially opened by culverts. The causeway could be left in place to allow public access to the dike after the disposal area has been filled. The south inlet would open naturally as a result of seiche flow if the constriction leaves sufficient area to allow a large enough volume of water (not predictable) to pass through during the seiche. If the south inlet were to be opened artificially after the dike is closed, the inlet's stability would depend on the relative strength of seiche scouring and the amount of littoral deposition.

Little effect would be expected from the day-to-day flow of Mouillee Creek on the stability of the inlet because, as littoral material was deposited in the inlet, Mouillee Creek would simply be diverted to the north inlet rather than backing up. The Creek could never achieve scouring velocities by itself in the south inlet because it could not back up enough to achieve the required head. Velocities throughout a narrow, artificially excavated channel in the south inlet would be great enough during a 2-foot or greater seiche to move fine to medium sand. Such a channel, if it had approximately the same area throughout as the total culvert area, would be expected to remain open under ordinary conditions. However, the smaller the channel in relation to littoral drift rates in the vicinity, the more likely would be complete closure due to occasional episodes of large drift rates. Occasional maintenance of the south inlet channel could, therefore, be necessary to prevent closure. If the marsh behind the dike were to be compartmentalized by the State, drainage from the southernmost compartments would pass most easily under the causeway; in this case, the causeway itself could be made a component of one of the compartments.

The project would be periodically monitored after construction is completed to determine whether channel maintenance is necessary, whether the south inlet and the area behind the dike is developing any nuisance conditions, and whether undesirable scour or depositional conditions are developing at the north inlet.

Flexibility provided through planning and design would make it possible to take appropriate mitigating actions, such as the following:

1. Provide more openings in the causeway. This would be feasible when construction vehicles no longer use the causeway.
2. Excavate a channel around the south end of the dike at the time construction of the dike would be complete.
3. Remove the causeway. This would be unlikely since the distance of the dike from the shore was increased to 1,000 feet.
4. Commence management procedures in the marsh, such as diking, by the Department of Natural Resources. Since any action would not be required for at least four years, the Department agrees that such action could be a feasible alternative. However, before a plan of action could be implemented, it would go through review processes required by NEPA and the State.

4. Impact on Fish

The proposed protective barrier island removes 700 acres of shoal waters which are viable fish habitat. The warm, shallow waters are highly productive areas for a great variety of plant and animal species important to the food chain. Fish find food and protection and raise their young in those areas. Elevating this land above lake level, would result in another kind of fish habitat. The perimeter of the external dike would require rock armour protection against wave action. That portion of the rock facing lying below water would provide an extremely productive substrate for fish food organisms, fish spawning activity, and shelter for fish. This habitat (7-1/2 miles) is not generally available in Michigan waters of the western basin.

Once the island is in place, protection of the marsh from erosive wave activity would be assured. The pattern of reestablishment of the marsh as it previously existed, however, is difficult to predict. Left to natural forces, it would undoubtedly be a function of lake water levels, establishment of emergent vegetative growth, and plant succession.

The marsh's naturally developed irregular shaped internal drainage channels have permitted free circulation of water in and out (depending upon wind action), promoting cycling of nutrients. This system was beneficial

for both fish and wildlife (refer to Attachment 5). It is uncertain whether these values could be reclaimed unless the project is structured to retain drainage similar to that which existed in the past.

The external dike offers potential for a substantial increase in angler use. This would be by new access to shoreline fishing which is in short supply.

A causeway or trestle connection from the mainland to the island is planned for initial construction and transport of rock revetment. If retained after completion of the project, it would assure vehicular access for fishermen generating 500,000 new angler-days of use annually as predicted by the Fisheries Division of the Department of Natural Resources. Bird watching and picnicking could provide additional recreational days. If only walk-in access were available, angler-use would be about 100,000 days.

As the exterior dike is developed and during construction of the access channel, areas of highly turbid water would occur, causing temporarily significant water quality degradation. This would be aesthetically displeasing and some angling effort may be temporarily disrupted. Some turbidity will continue to occur during construction and maintenance dredging of the access channel.

5. Impact on Wildlife and Vegetation

The Pointe Mouillee marsh historically was recognized as one of the finest and most productive marshes in the Great Lakes Region. The large area (2,000 acres) of cattail was interspersed with other aquatics and open water-oriented birds and animals. During the low water period of the 30's the marsh vegetation reached its maximum known extent. Since then, the marsh has expanded and contracted with the low and high water cycles of Lake Erie.

Currents in and out of the marsh at the present time, subject to wind-driven currents of Lake Erie, produce variable conditions detrimental to good duck nesting habitat. The proposed barrier would moderate these effects to some extent, thus creating more favorable conditions for a resident duck population, now minimal. Future management to control water levels, will extend these benefits.

Construction Period

During construction it would be necessary to move materials, trucks and manpower to the site. Access into the area would be from Jefferson Avenue, an improved hard-top, north-south road, approximately two miles west of Lake Erie. Secondary, unimproved gravel and dirt roads connect with Roberts Road to the east and run parallel to the Lake extending south to the boundary of the marsh. It will be necessary to reconstruct a road extending Roberts Road east to the shoreline, for construction of the causeway to the dike.

A small private road presently extends Roberts Road eastward. It is the access road for private property to the north and south of it which the Department of Natural Resources is presently negotiating to purchase. The road was built as a dike approximately 25 years ago to enclose channels for carp farming. Water levels were controlled from a pumphouse on the shore at the end of the access road. Land in the center was farmed. High water levels have prevented this for the last four years. None of the owners live on the land. The land to the north of the access road is used for duck hunting and is considered to be highly productive by the Pointe Mouillee Game Area Manager. At a point where the road curves to the south,

it will be necessary to clear an area east to the shoreline for extension of the road. This requires removal of some trees, mostly willows, and successional vegetation typical of the area's marshy shoreline, which make this a productive duck hunting area.

It will be necessary to widen and improve the entire private road. For this purpose, soil presently being farmed within the area could be used as borrow material.

An undetermined amount of upland habitat would be lost by the roadbuilding, removal of viable agricultural land, and other construction activities. Some agricultural land may be used for an extension of the ditch.

Waterfowl, shorebirds, and aquatic mammals now utilizing the remaining marsh might be temporarily disrupted by construction and filling of the dikes. The disturbance should be minimal. Most of the remaining marsh is further inland and remote from the proposed placement of the dikes. Rafts of ducks that may rest near the open-water dike area would shift temporarily to other areas during construction and dredging operations.

As filling of the cells of the dikes begins, shorebirds and waterfowl may find the dredged spoil within the dikes attractive for feeding and resting. This could continue for the 10-12 year period of filling. It is possible that pollutants within the spoil, such as heavy metals, may be ingested by these birds. Periodic checks will be conducted during construction by the Department of Natural Resources to determine heavy metal concentration in these birds. The potential for botulism is also present, since stagnant pools within the dikes could occur. Although this condition is always a problem with stagnant pools, this situation will be monitored for early detection by the Department of Natural Resources as a part of their existing management in the wildlife area.

Impacts on vegetation, other than some loss from the Roberts Road construction, would result from alterations to the existing marshland and adjacent areas where siltation and construction activities impinge on the aquatic communities.

Post Construction Period

After the dikes are completed, wave action on the interior would be reduced. With the destructive effect of the waves lessened and especially if lower water levels occur, the marsh will revegetate. The gradual growth of vegetation would directly benefit waterfowl, shorebirds, and aquatic mammals once abundant in the marsh. Further management of the interior by diking and water level control would increase the rate of marsh rejuvenation and in turn accelerate the rate of use of the marsh by wildlife. This would benefit wildlife and human users of the wildlife resource including hunters, bird watchers, and trappers. The interior diking would allow water level control, vegetation and wildlife management, and provide corridors of travel for mammals that feed in the marsh.

Secondary and Tertiary Impacts

The impacts and changes to geology, currents, water quality and other environmental parameters could have impacts on wildlife, fish and vegetation. As an example, the disposal area could cause changes in currents or water quality which in turn affect vegetation which would affect wildlife. Changes in water quality from the project could also affect vegetation development and in turn affect vegetation which would impact on wildlife.

The replacement of the destroyed barrier beach with a barrier spoil disposal island would protect the Pointe Mouillee Game Area from the damaging wave and ice forces of Lake Erie. While this would minimize these damaging forces, the revegetation of, and the size of the marsh is also controlled by the natural lake levels.

To rehabilitate that portion of Pointe Mouillee shoreward of the proposed barrier island would require the entire area be diked and pumping facilities be constructed. The marsh area would be protected from the ebb and flow of Lake Erie and diked marsh units could be managed to facilitate the rejuvenation of the marsh habitat. Water levels within each diked unit could be manipulated for the promotion of a natural marsh plant community that is of optimum value for waterfowl and other mesic wildlife species.

However, the expansions during low water have not been replacing the amounts of marsh lost during high water cycles. Compared to about 2,000 acres in the mid 30's the marsh today covers less than 200 acres plus 365 acres of diked refuge.

The progressive loss of a protective barrier beach since the mid 40's has resulted in an accelerated destruction of the marsh. Based on an inventory made in August of 1972, 35 percent of the marsh has been destroyed and almost no recovery was noted during the 1973 growing season.

The refuge area is dependent on a dike which is in serious jeopardy. The dike could easily be destroyed in the expected high water and spring storms of 1974 since it is exposed to the full brunt of easterly storms of Lake Erie.

Without the replacement of the barrier and with continued high water levels the existence of the Pte. Mouillee marsh could be a memory of the past. Instead of a marsh, a debris-strewn shoreline in the vicinity of River Road could result in a few years.

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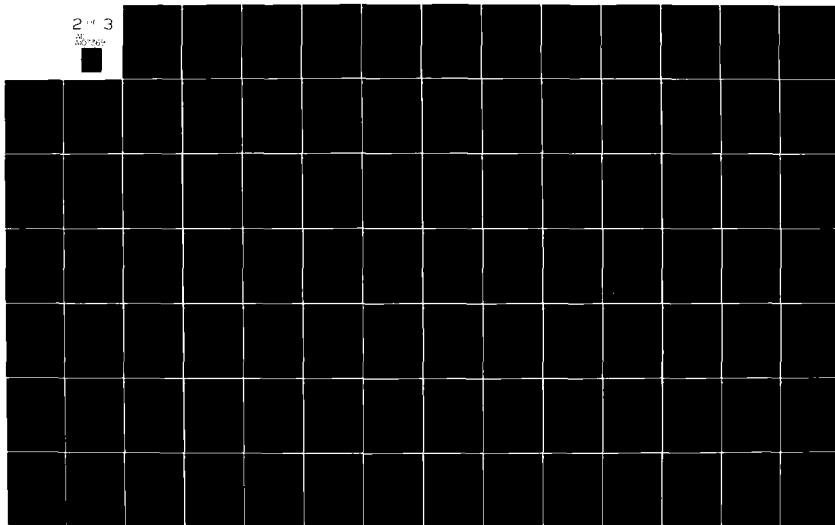
CORPS OF ENGINEERS DETROIT MI DETROIT DISTRICT
F/G 13/2
CONFINE DISPOSAL FACILITY AT POINTE MOUILLEE FOR DETROIT AND R--ETC(U)
MAR 74

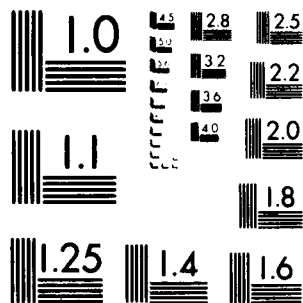
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MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

If the barrier protection were restored there would probably be a natural recovery by the emergent vegetation during lower water levels but continued high water would make recovery a slow and uncertain thing. However, the establishment of barrier protection would make possible the construction of a diked, water-controlled marsh and eventual restoration of the entire area. Such a marsh then would have an overall capacity for harboring, rearing and feeding waterfowl and other wildlife far in excess of the best conditions provided by the natural marsh.

6. Effects of Confined Material on Diked and Adjacent Areas

The primary environmental concern over sediments contaminated by toxic materials is the potential for movement of these materials from the sediments to the water and aquatic life. Rates of movement from sediment to water by dissolution is affected by the chemical and physical composition of the sediment, the chemical and physical characteristics of the water and the frequency with which sediments are resuspended. Frequent resuspension of sediments in shipping channels by propeller wash increases the opportunity for chemical exchange. Another route of sediment contaminants to water is by bacterial action. Movement of contaminants directly from sediments through food chain organisms to fish has also been demonstrated. Fish and other aquatic animals accumulate contaminants both from the water and through the food chain. The quantitative importance of either method of uptake varies with the species and the nature of the contaminant. A state-wide survey comparing heavy metals in fish from areas with contaminated sediments versus background level sediments, demonstrated that fish from areas designated as contaminated had higher concentrations of zinc, mercury, chromium and copper. Mercury was concentrated by predatory species while zinc, chromium, copper, manganese and nickel tended to be highest in bottom feeding fish.

The conclusion to be drawn from the foregoing phenomena is that removal of contaminated sediments from shipping channels is desirable from the environmental point of view.

Disposal of contaminated sediments into a confined area greatly reduces the opportunity for movement of the contaminants into the aquatic system. At time of dredging and during the actual disposal process, sediments are temporarily resuspended, but further contact with water is minimized as the sediments accumulate vertically in a localized portion of the contain-

ment structure. Supernatant water returned to Lake Erie during the disposal process would contain dissolved and suspended solids with a potential for causing contamination with toxic materials of the receiving waters and aquatic life. Because the discharge of supernatant water would be localized and of a long-term nature there is an increased chance there would be localized redeposition of a small portion of the sediments outside the containment area, depending on the effectiveness of weir in precluding passage of sediments. Such accumulations would be subject to wide distribution and dilution to harmless concentrations during periods of wave-induced turbulence.

Potential exists for movement of dissolved contaminants through the containment structure into the surrounding waters. The probability is very small that such movement through containment walls would be of sufficient volume or move at sufficient rate to have adverse environmental effects.

Another possible pathway for the escape of polluted sediments from the facility is through the food chain. Resident, rather than migrating species are of concern. Dredging operations limit the availability of this material through rapid changes in materials and changes from wet to dry conditions.

If contaminated sediments are left exposed and subject to erosion and dissolution by rainfall, the possibility for contaminated runoff exists. If such runoffs were directed landward, the possibility of environmental damage would be increased. If such runoff was to the lake side of the containment structure, the possibility would be reduced.

Grassy Island in the Detroit River has been used for many years as a containment structure site for disposal of dredged materials from the Detroit and Rouge Rivers. Adjacent area and site environmental effects experienced on Grassy Island should be similar to those which may occur at the proposed site:

Analysis of water quality measured during dredging operations showed no immediate or extended effect of dredging. Conductivity and pheral parameters were inconclusive in their values. Overflows from the hopper bins increased turbidity and surface oil behind the dredge and decreased dissolved oxygen levels. Iron, suspended solids, transparency, and BOD, all returned to near normal levels within one-half mile behind the dredge. The Federal Water Pollution Control Administration (1967) concluded that changes in the water quality of the Detroit River cannot be attributed either to dredging or to disposal operations. Observation showed no leakage of dredgings from the hopper bins during transit to Grassy Island nor during unloading operations. Seven wells along the dikes were used to determine the rate and quality of effluent seepage. The level of water in the wells remained near the elevation of the Detroit River. Seepage was low. Evidently, the Grassy Island disposal site served as a stabilization pond and settling basin. There was a decrease with time in BOD, CaO, total phosphates, and suspended solids. The quality of the water discharged periodically through the overflow pipe met effluent recommendations set by the Public Health Service and the Michigan State Water Resources Commission for discharges to the Detroit River.

The most clearly predictable water quality degradation impact of the project is an increase in turbidity caused by construction of the containment structure and initial dredging and subsequent maintenance of the access channel from the lake. Such conditions would be chronic during construction and then intermittent over the life of the project. Residents of Milleville Beach to the north and Estral Beach to the south may be able to discern the increased turbidity when current patterns bring discolored water to the shore. Lake Erie's ambient turbidity is high, especially so during the high water stages being experienced now, so that the lowered transparency would have lesser impact on aesthetics than if similar activities were undertaken on a clearwater lake. An increase in turbidity of the magnitude and extent anticipated should not have an impact on the Monroe water treatment processes.

7. Impacts on Recreation

Development of the proposed barrier would have possible effects on small craft navigation. Boat launching facilities are on the north side of the river upstream. It appears that there would be little additional shoal development or scour occurring at the mouth of the Huron River and periods of great or little small craft activity will continue to depend, almost exclusively, on the elevation of the water in Lake Erie.

The barrier would have a minor impact on boating in that it would, by its presence, reduce the size of the surf developed by winds from the south through east. This would, of course, make for safer navigation in the transition zone between river and lake. However, it would occupy 3.5 miles of frontage in this recreation area in which boating is a popular attraction. The rock armour protective facing could create a potentially dangerous situation for boats along its lakeward margin since there would be no safe landing sites or cross channels provided after the dike is closed.

During the period of time when the barrier would be filling with dredged spoil, a channel would be dredged and maintained between the 16 foot contour and Lake Erie and the disposal area. Although this channel could support small craft navigation, even under extreme low water conditions, little use is anticipated. The channel would terminate at a point which would have no attraction for the boater and navigation could even prove to be dangerous when the dredging equipment is operating.

The access channel would be identified by markers placed at the entrance, along the channel, and at the landward end by the U. S. Coast Guard.

According to the Fisheries and Wildlife Divisions of the Michigan Department of Natural Resources, uses of the Pointe Mouillee State Wildlife Area in 1970, and with the proposed project in place, are estimated below:

Table Present and Projected Recreational Uses of Pointe Mouillee Wildlife Area			
	Man-Day Use:	182,000 people	Projected Use
	Use of Facilities	1970	After Project Completion
	(Percentage)	Man-Day Use	Man-Day Use
Fishing		14,560	500,000 angler days/yr. ¹ 100,000 angler days/yr. ²
Hunting (1,2 mos./yr.)		12,740	20,000
Picnicking		38,220	50,000
Boating		59,840	75,000
Archery Fishing		7,280	10,000
Nature Study		10,920	50,000
Trapping		1,820	4,000
Trap-Shoot		20,020	55,000
Duck Tournaments		18,200	20,000

¹Prediction with vehicular access to the site

²Prediction with walk-in access to the site.

Seiche currents into the marsh could bring in debris from the lake where it could be trapped. This is particularly likely to happen in the south end when the dike is completed and the causeway concentrates swift currents near the openings. This would be aesthetically displeasing and potentially degrading to the marsh. Recreational use of the dike could also introduce litter into the lake and marsh.

8. Historical and archaeological sites

Confirmation of the absence of historical and archaeological sites in the area of the proposed project was received from the State Historical Preservation Officer, Mr. Samuel A. Milstein. His review also gave particular attention to shipwrecks on the Great Lakes bottomlands. Since the project would be on submerged lands, there are no prehistoric Indian sites known for the immediate area. A previous survey of the area conducted for the alternate site north of the Huron River identified no up-land sites of significant historical-archaeological interest to the State of Michigan.

The National Register of Historic Places was consulted as well as the State Historic Officer, Mr. James Bryant. The Michigan State-wide survey for the National Register has not been completed. The present listing identifies three categories: a) areas which have been accepted for the Registry; b) areas submitted for consideration; and c) areas identified as prospective sites. In the first category, the nearest sites are in Monroe County, in and near Monroe, Michigan, approximately 10 miles south of the project. These are: 1) Navarre-Anderson Trading Post, Monroe; 2) Gov. Robert McClelland House, Monroe; 3) Fix House, Sterling State Park, Monroe; and 4) Nims House, Monroe. In Wayne County, the nearest sites are: St. James Episcopal Church, Grosse Ile and the whole of Belle Isle, both in the Detroit River adjacent to Detroit, approximately 25 miles north. An area identified as a prospective site is on the Raisin River, 8 miles south, identifying the site of the Battle of the River Raisin of the War of 1812. (Refer to Attachment 8).

B. SOCIAL AND ECONOMIC IMPACTS

1. Description During Construction and Operation of the Project

The major effect upon the area would be during construction of the barrier reef. The existing road system might have to be upgraded to handle the weight of the trucks that would be handling construction material to the site. There could be some traffic congestion due to the amount of increased truck traffic but, it should not be of such an amount to be considered serious.

It is not anticipated that there would be a permanent increase in population during or after construction of the barrier reef. The labor force necessary for the project would come from either the City of Monroe, the Detroit area or the Toledo area and most likely the majority of workers would commute to the construction site.

Commercial establishments in the area such as hotels, motels, gas stations and restaurants would see an increase in business during construction of the barrier reef. This would not be enough to in itself stimulate new commercial enterprises.

The recreational potential of Pointe Mouillee would probably not be disturbed during construction of the barrier dike. This is based on the fact that there is minimal anticipated reduction in the fish or wildlife population during construction of the project. As the exterior dike is developed and during construction of the access channel, localized areas of highly turbid water would reduce aesthetic and fishing values. This is considered temporary.

2. A Description with the Project at the Conclusion of the 10 Years of Dredging.

There would be no significant social or economic effects attributable to the project. As to effects on the physical character of the area, the road system would be in either better or worse condition depending upon what would be done to improve the road system during construction of the project. If very little were done to upgrade the capabilities of the road network, upon completion of the project the roads could be in passable condition. If the road system were upgraded to sufficient standards the roads network would be in better shape than it presently is.

The recreational potential of the area depends basically on the policies of the Department of Natural Resources in managing Pte. Mouillee. Upon completion of the barrier reef the Department would assume control of

the island, bringing it into Pointe Mouillee State Wildlife Area. The proposed site increases the recreational potential of the area by supplementing and enhancing such "fringe benefits" as bird watching, hiking, and other activities related to hunting and fishing. Management plans call for increasing the hunting and fishing potential of the Game Area. Increasing the abundance of fish and wildlife (basically ducks) would attract additional fishermen and hunters to the area. As with all fishing and hunting areas, this increase would depend on the chances of shooting a duck or catching a fish. The better the chance, the more people.

If there were a significant increase in fishing and hunting, additional commercial enterprises dealing in hunting and fishing goods could spring up in the immediate area. Where these establishments would locate depends upon the Berlin Township zoning ordinance. The area immediately adjacent to Pointe Mouillee is presently zoned agriculture. Whether this area would be rezoned is difficult to predict at this time.

C. Summary of beneficial and adverse impacts of environmental changes, remedial, protective and mitigation measures which eliminate or compensate for adverse effects of the proposed action:

<u>Beneficial Impacts</u>	<u>Adverse Impacts</u>	<u>Mitigation</u>
a. Barrier dike protection for marsh against erosive wave action.	a. Removal of 685 acres of Lake Erie bottom lands.	a. Protection and enhancement of marsh area. Commitment of dry land area to future wildlife management.
b. Settlement of fine sediments in marsh protected area as a base for aquatic plants.	b. Loss of aquatic communities and habitats, replaced by dike.	b. Creation of new wildlife communities and habitats.
c. Sheltering of duck nesting areas with resultant increase in numbers.	c. Dike prevents interchange of waters between Lake Erie and the marsh, including flushing action.	c. North and south 1,000-foot wide inlets for maintenance of flow.
d. Creation of 7.5 miles of fish habitat in dike facing below water level.	d. Major changes in drainage patterns with blocking of historic outlets.	d. Causeway and gate across south inlet may be adjusted or removed when dikes are completed. 10-year life of project permits adjustments towards stability.
e. Increase in recreational fishing with dike as fishing pier.	e. Construction effects include loss of fishing and fish habitats from increased turbidity, sedimentation, decreased dissolved oxygen, and ingestion of suspended pollutants.	e. Construction effects are short-term and cannot be avoided.
f. Revegetation in protected areas, direct benefit to waterfowl, shorebird, and aquatic mammals once abundant in marsh.	f. Creation of favorable conditions for development of botulism on dikes or adjoining marshes.	f. Pump-out procedures and progressive filling of facility should minimize shallow ponding on dike.
g. Barrier dike, a basis for continuous marsh management by Department of Natural Resources after completion of project.		
h. Dredging and removal of polluted sediments from Lake Erie.		

<u>Adverse Impacts</u>	<u>Mitigation</u>
g. Loss of boating in dike area, to and from Lake Erie.	g. Channels into tributaries having boaters to be kept open.
h. Diked structure 3.5 miles long may not conform esthetically to natural landforms in area.	h. This is a short-term loss. Revegetation of the structure as well as the marsh will occur naturally.
i. Debris and litter may be trapped in the marsh from lake seiches and human use of dike. Some debris is toxic, has oxygen demand.	

SECTION V

PROBABLE ADVERSE ENVIRONMENTAL EFFECTS WHICH CANNOT BE AVOIDED

The barrier dike would replace approximately 700 acres of Lake Erie open water and bottom lands. This area is a transition zone between open water and marsh habitat.

Aquatic life would tend to be isolated by the 3.5 mile structure. Migration and emigration would be curtailed in the more or less isolated community.

Large settlements expected during construction of the dikes would result in disruption of the bottomland adjacent to the dike. Disturbance of peat mats would make these areas subject to erosion.

Construction activity would cause increased turbidity in the immediate vicinity. This would adversely affect benthic organisms and temporarily displace fish. Maintenance dredging of the access channel would contribute additional turbidity throughout the operation of the facility.

Placement of the structure would change existing current and drainage patterns within the marsh. Construction of the causeway across the south inlet would complicate predictions of the effect of these changes. Mitigating measures for adverse effects which could occur could be provided during operation of the project so that normal functions in the area could be maintained. These could include: 1) increasing openings in the causeway; 2) removing the causeway; 3) dredging; or 4) initiation of diking and management of the marsh areas as proposed by the Department of Natural Resources.

The marsh, if diked and intensively managed for waterfowl, would not contribute measurably as a filter of nutrients or as a nursery for plant and animal life. Its function as a spawning and feeding habitat for fish, as it existed in the 1930's, is now measurably reduced and would not resume behind the anticipated dikes. However, the possibility exists that portions of the marsh could be managed to benefit both waterfowl and fish.

Land access for construction of the southwesterly portion of the dike would bring heavy truck traffic over the unimproved dirt roads in the area. Road wear, noise and dust would reduce the quality of the environment for adjoining householders. These effects are considered temporary.

Access to the lake would be changed for boaters along Pointe Mouillee Creek. Ingress and egress would be from the south inlet, a greater distance and subject to re-establishment of channels similar to those presently existing.

Most potentially adverse effects of the barrier dike structure would be averted by proper management of the interior by means of earth dikes. While this concept has formal commitment by the Department of Natural Resources, the planning, design, and authorization are futuristic. When the proposed waterfowl management plan is formulated, an environmental statement would be prepared by the Department of Natural Resources.

SECTION VI
ALTERNATIVES TO THE PROPOSED ACTION

A. EVALUATION OF MAJOR ALTERNATIVES

1. Take No Action.

To discontinue the dredging of the Detroit and Rouge River channels would result in the shoaling of the channels to the extent that the passage of waterborne commerce would be curtailed or reduced and those individuals and enterprises dependent on this mode of transport would suffer economically with consequent damage to the general public in the efficient and economical production of goods. Severe disruption of Great Lakes navigation could reasonably be expected to induce massive "structural" unemployment (dislocations and relocations of investment and job opportunities) and the irremediable social inequities that massive structural employment entails.

2. To Continue Previous Action.

Disposal of dredged materials into the open waters of Lake Erie, the previous maintenance dredging procedure, could be renewed. This is the most inexpensive procedure for maintaining the channels to the 27-ft. depth authorized by Congress. This alternative would accept the detrimental environmental impact of such procedures until pollution sources are controlled and dredged material is no longer significantly polluted. A group of consultants in reviewing the 1969 report by the Department of the Army, titled "Dredging and Water Quality Problems in the Great Lakes, Volume I, A Summary Report", concluded that the deposition of polluted dredge spoil in the Great Lakes is "presumptively undesirable", and that in the long run the ecology of the Great Lakes would be affected adversely if the practice were continued. Such action would also be contrary to the position of the Governor of Michigan, "that the disposal of polluted dredge spoil in the open lakes should be discontinued."

It is an obvious fact that open lake disposal has an adverse effect on aquatic systems. The turbidity alone caused by disposal of dredged materials directly into the water column is harmful to aquatic organisms in the water column, damaging to benthic organisms when the solids settle out, and contributes to the release of toxic materials and soluble materials present in the sediments. However, very little is known about the release of such materials or how much damage is caused by open lake dumping as compared to the dredging operation itself, which is accompanied by a large, observable increase in turbidity caused by the suction heads, passage of the vessel, and other phases of the operations. Commercial vessels also disrupt the bottom sediments as they pass through the channels exposing toxic and soluble materials to the water column. A quantified comparison of the ecological damage caused by vessel passages to the damage caused by dredging regardless of the disposal method has not been made and no good data exist to perform the analysis required to do so. Further, a comparison of the adverse effects of open lake dumping for this project to the adverse effects of the barrier dike containment facility and the high cost of construction of the facility has not been made. Since the effectiveness of containing polluted spoil is not known, it appears that this present proposal is motivated and demanded more by political necessity than by scientific determinations. In a report entitled: "Disposal of Polluted Dredgings from the Great Lakes Area" by Krisek and Karadi, this problem was discussed. They said:

"Despite ample evidence that many maintenance dredgings are highly polluted, there are no conclusive reports to indicate that the abandonment of open water disposal considerably improves the lake environment or substantially decreases the danger of further ecological deterioration. Although the banning of open water disposal appears at first impression to be an effective way of improving the quality of the lake

environment, a cursory evaluation of the relative improvement achieved and the cost thereof does not provide such a clear picture. For example, less than 10% (perhaps on the order of 2% to 5%) of the sediment deposited in the Great Lakes area is even affected by dredging operations, and, of the material dredged, less than one-half is judged to be polluted and deposited within diked containment areas. Hence, based on the assumption that the latter disposal method is completely effective in removing pollutants from the lake environment, less than 5% of these pollutants will be removed."

3. To Remove the Pollutants From the Dredged Material Prior to Open Lake Disposal.

This alternative was tested as part of the study reported above, and proved to be several times more expensive but no more effective than contained disposal sites. Continuing research on treatment and use of dredged spoil is being performed by the Corps of Engineers. Hopefully, long-range solutions to dredging problems will be forthcoming as a result of this research and the best methods for handling polluted bottom sediments will then be known.

4. To Provide a Diked Disposal Area for Containment of Polluted Dredged Material.

This alternative requires a site acceptable to concerned interests and meeting all the requirements of the authorizing law (Public Law 91-611).

The search for sites began with the Corps of Engineers' study of 1966. At that time, consideration was given for construction of an island, located to be between the East and West Outer Channels, approximately 3 miles south of the Detroit River Light for the dredgings from the Detroit River. Subsequent investigation revealed poor soil conditions that would make construction at this site extremely difficult and expensive. The same study proposed the expansion of Grassy Island for the dredgings from the Rouge River.

In 1967 the Corps of Engineers initiated a Pilot Program which culminated in a report on "Dredging and Water Quality Problems in the Great Lakes" in 1969. The report identified certain specific sites for disposal and analyzed their costs.

B. CONTAINED DISPOSAL SITES EXAMINED IN CANADA.

The sites discussed below are in Canada. In considering these sites several factors were weighed in addition to the environmental, engineering, and economic criteria generally applied to sites in the United States. Public Law 91-611, which authorized the Secretary of the Army to construct, operate, and maintain contained disposal areas, required that except for the Connecting Channels (including the Detroit River) the State or an appropriate subdivision thereof must provide all lands, easements, and rights-of-way and agree to maintain the filled facility in a manner acceptable to the Secretary of the Army after filling is complete. Thus, unless the State of Michigan would consider maintaining a disposal area other than for the Detroit River, another site would still have to be provided for Rouge River dredgings.

Based on experience gained during and prior to the construction of the Connecting Channels, obtaining an international agreement could require several years. Since the maintenance of the channels is critical to the economic well-being of the Great Lakes region, the possible delay for negotiation of an international agreement, in addition to a 2- or 3-year construction period, could result in an unacceptable length of time without maintenance of the channels.

1. A Quarry Four Miles East of the City of Windsor.

The lack of access of this quarry, proposed by the owner, would present difficulties in delivering the dredged material to the disposal site. A holding area would be required on or near shore where dredged material could be held for later transport either by pipeline or truck to the disposal site. Preliminary investigation indicated that the owner could not provide this requirement. A holding area needed for this type of disposal process is not readily available to the Corps of Engineers. These additional requirements could increase the cost of this alternative significantly. In addition, use of this below ground site might have possible adverse effects on the ground water quality.

2. Fighting Island.

Fighting Island is a large island located in the Detroit River opposite the mouth of the Rouge River. The use of Fighting Island was proposed by the owner. The capacity of the area is limited to less than 500,000 cubic yards as only a thin cover layer of about 1.5 feet would be desired by the owner. Fighting Island has been used as a disposal area by chemical companies in the lower Detroit River for disposal of waste chemicals. The operational problems of providing a thin layer, to the owner's specifications, over the relatively large area of previously deposited chemicals and the small capacity combine to make the site unattractive. Consideration was also given to combining this site with other small sites.

3. Small Area East of Fighting Island in Canada.

Six small parcels of land were offered by individual owners. These have a combined capacity of less than 1 million cubic yards which is inadequate. Consideration was given to combining these sites with other small sites.

4. Crystal Bay.

Crystal Bay, considered during the previously mentioned Pilot Study, is located in the Detroit River within the compensating dikes at the junction of the downbound Livingstone and the upbound Amherstburg Channels. The dikes were built either as cofferdams or compensation structures, and extend for a length of about 8,000 feet. They partly enclose the water area known locally as "Crystal Bay", of about 185 acres, having a depth of 4 to 6 feet below datum. The lower end of the triangle formed by the dikes is open to entrance by small boats. The area is mostly in Canadian waters with the International Boundary traversing the area on its westerly side. The area within the United States is only 21 acres. A dike could be built across the lower end at relatively low cost by hauling surplus materials from the existing compensating dikes. Other work would include the construction of two circular steel sheet piling mooring cells, a roadway dike to the cells, other dikes for pipeline installation, and effluent control and weirs. The response from the Canadian Government to a written request for approval was negative.

5. Areas Near Sugar Island.

These areas would use the west dike along the middle part of the Livingstone Channel as one side of the area and form a triangle with the apex at the end of the Sugar Island compensating dike. Construction in this location would probably have an adverse hydraulic effect on the Detroit River. Capacity at this site is also inadequate.

6. Area Near Amherstburg.

This area was suggested by a Canadian citizen who did not own the property. The owner indicated that the area would not be made available to the Corps of Engineers.

7. Area Below Bois Blanc Island.

This area would expand Bois Blanc Island using the west dike along the Amherstburg Channel as the east side of the area. Construction in this location would probably have an adverse hydraulic effect on the Detroit River.

8. Island Site in Canada.

Preliminary investigation of this island site indicated that it provided no clear advantages over the island site near the Detroit River Light discussed in paragraph 5C and had the disadvantage of being in Canada. Engineering and environmental considerations as well as cost are essentially the same as that of the Detroit River Light island site.

9. Grass Island.

Grass Island is located in Canada between Fighting Island and the Canadian mainland. The owner desires to fill a large shallow area in the Detroit River. The resultant large island is proposed to be used as a recreation area. The capacity of the site is approximately 4,000,000 cubic yards. The island would probably have an adverse hydraulic effect on the Detroit River. Although alone this site has inadequate capacity, consideration is given below to combining this site with other sites.

10. Inland Lake Near Windsor.

The lake is located in the suburbs of Windsor at the junction of Highway 401 and Walker Road. The area offered by the owner is 30 acres. Preliminary estimates indicate a capacity of approximately 2 million cubic yards. Access to the area through Windsor would be difficult. Transportation of the spoil to the area by truck or rail would require a suitable drying area which is not available to the Corps of Engineers.

11. Pêche Island.

Pêche Island is located at the head of the Detroit River at Lake St. Clair. Discussion was held with the former owner to fill north of the island to provide an expanded area for recreation purposes. The capacity at this site would be inadequate and adverse hydraulic effects upon the river would be probable. The haul distance to the pumpout location would be longer than for most other sites considered. In addition, the Canadian

Government now owns the island and is apparently not interested in offering this site.

12. Middle Sister Island.

This island is in western Lake Erie, just east of the Canadian-United States border. Mr. John Dupont is the owner of this 10.5-acre island located approximately 30 miles from the Detroit River project. The exposed location would require extensive protection. A preliminary construction cost estimate of about 50 million dollars is much higher than most other proposed alternatives.

13. Combination Area.

A combined area of Fighting Island, Grass Island, and the small area east of Fighting Island was considered. The combined capacity of the three areas is estimated at 5,500,000 cubic yards or less than seven years if only Detroit River dredgings were available for fill in these sites. The three areas are in the same general location. The disadvantages of each individual site are still appropriate. Total capacity is still not sufficient. Costs would be high as three separate mooring and pumpout facilities would have to be provided. There appears to be no real economic or engineering reason to prefer these three small sites.

C. CONTAINED DISPOSAL SITES EXAMINED IN THE UNITED STATES.

1. Mud Island.

Mud Island is an island in the Detroit River just north of the mouth of the Ecorse River and west of the northern tip of Fighting Island. This site was used for disposal of material dredged during construction of the Trenton Channel. Considered alone the volume is inadequate with a capacity estimated at about 900,000 cubic yards. The City of Ecorse is making application to dike this area.

2. Expansion of Grassy Island.

Grassy Island is an island in the Detroit River west of Fighting Island. Dikes were constructed on the island and disposal of dredged material from the Rouge River began in 1960. The dikes have subsequently

been raised. An estimated two years of capacity for Rouge River presently remains. Grassy Island is a U-shaped area that would allow a dike to be built across the open end of the U to form a new confined area of about 36 acres. However, the Department of the Interior (Fish and Wildlife Service) and the Michigan Department of Natural Resources are adamantly opposed to this plan as the area that would be included is a duck feeding ground. Offers by the District Office to build and maintain an elevated marsh on Grassy Island after the area was filled were refused by those agencies as the area is good spawning grounds for pickerel.

3. Mamajuda Island.

Mamajuda Island is in the Detroit River near the northern tip of Grosse Ile. It is part of the same National Wildlife Refuge which includes Grassy Island. Mamajuda Island was considered as a spoil disposal site but could not be utilized for the same reasons that expansion of Grassy Island was an unacceptable alternative.

4. Coast Guard Property on Grosse Ile.

Informal information received in June 1971 indicated that the Coast Guard might declare a 28-acre parcel on Grosse Ile as surplus property. The possibility that this property might be suitable for a disposal area was investigated. Capacity of the area was estimated at about 680,000 cubic yards. The navigation aids located on the property are still used and maintained by the Coast Guard and special features would be required to facilitate continued use of the lights, reducing capacity of the area. There is a significant possibility that adjacent property would be required, only available by use of the right of eminent domain, for stability of necessary dikes and drainage. A pumpout facility, usable only for this site, would be required. The Coast Guard was contacted as to the use of this area and they indicated that they are disposing of this property, but retaining an easement and right of access to maintain the range lights thereon.

5. Expansion of Stony Island. An expansion of Stony Island which is located in the Detroit River east of the middle of Grosse Ile, was considered. However, the State of Michigan has refused to allow the owner to proceed with a similar plan. Further, if this site were used the anticipated hydraulic effects on the Detroit River would be adverse.

6. Haul Material to Monroe

The possible use of several areas in Monroe was suggested at the public meeting in September 1971. The areas suggested would be inadequate in volume, which was estimated at approximately 4,000,000 cubic yards. To provide area adequate for the 10-year design period in Monroe, it would be necessary to fill a portion of Lake Erie. The resultant disposal area would have adverse environmental effects similar to those encountered at the site north of the Huron River. Engineering advantages and problems would also be roughly similar. In addition, there would be increased economic cost due to increased dredging time. An access channel is already available.

7. Sibley Quarry.

Detroit Edison, the owner of Sibley Quarry, was approached concerning the possible use of the quarry as a disposal site. Reaction to the request was negative. The quarry is located on the mainland side of the Trenton Channel between the cities of Riverview and Trenton. Presently an active quarry and also used by Detroit Edison for disposal of fly ash, Sibley Quarry could not be made available unless the right of eminent domain were used.

8. Salt Mines on Grosse Ile.

The possibility of using the salt mines on Grosse Ile was considered. There are a large number of undesirable effects which could occur. The site suggested is where the ground has sunk, forming large craters in areas where subterranean salt mining had been conducted. The structural integrity of this area is questionable. Further ground failures could be caused by the loading resulting from depositing dredged material into the existing craters. Effects of this on nearby residential and industrial areas could be severe. Subsurface containment of dredged material is questionable because of the previous extensive mining in the area. This could possibly result in contamination of Ground water.

9. Pump Inland from Trenton.

The possibility of pumping the dredged material to an inland disposal area was considered. Practical operation of this plan would require

a small disposal area located at a distance within the pumping capability of the hopper dredges (less than one mile) with a capacity adequate for about one year of dredging. In this small area the dredged material would be rehandled into the pipeline after large solids are removed. A large inland area is required at the terminal end of the pipeline where solids would settle out and excess water would be returned to the Detroit River through a separate pipeline. Preliminary investigation for a rehandling site that would not require an access channel identified an area of sufficient size near the City of Trenton and on the Trenton Channel. A 400-acre inland site approximately six miles inland was located and a preliminary cost estimate made. Construction costs were estimated at \$35,600,000 and annual charges would be above \$9,900,000. Further investigation revealed that what was thought to be a vacant 400-acre inland site was in fact being developed for private housing. Additional investigation of a small site for the near shore disposal area revealed the site considered was being used as a storage yard and would not be available.

10. An Inland Site North of Maple Beach.

A developer interested in several small parcels near Gibraltar suggested the possibility of consolidating several marsh areas for industrial development. Access to the area would require construction of an extremely costly access channel, because most of the material that would be removed would be rock requiring blasting. The developer did not initially make a firm offer of the site and further discussions resulted in the suggestion being withdrawn.

11. Land Site Near Gibraltar.

A large open area near Gibraltar, adjacent to the river channel, was considered as a disposal site. Use of this area would require construction of a long costly access channel through bedrock. The owner indicated disposal of dredged material on the site at this time would not be consistent with his future planned use of the land.

12. Island Site Between East and West Outer Channels.

This island site was first considered as part of the Pilot Study mentioned above. It is located approximately three miles south of the

Detroit River Light. When poor foundation conditions were recognized which would make construction difficult and costly, further consideration of this type of disposal area was continued at a location near the Detroit River Light where site conditions appeared more favorable.

13. Huron River Site.

A site north of the Huron River on land composed of Pointe Mouillee State Game area holdings and Huron-Clinton Metropolitan Authority property was studied and at one time was proposed for a containment facility. It was planned to use the facility as part of a regional park to be developed by the Huron-Clinton Metropolitan Authority.

The area proposed for the project encompassed approximately 508 acres, 60% of which was water. Bounded on the south by the Huron River, it extended approximately 3/4 mile east into Lake Erie. Proceeding northwest, in a line with the Detroit Light, the dike would have extended 5/6 mile, turning west to join the southern tip of Milleville Beach. The dike would then have proceeded west across Pointe Mouillee Road, then followed the creek behind the Michigan State Game Area headquarters, before rejoining the Huron River. Refer to Figure VI-20.

The dikes enclosing the area were to be constructed of earth in areas adjacent to land and were to be rock construction in areas adjacent to water. The dikes would have had a 10-foot top width and sloping sides. The dikes, approximately 13 feet above Low Water Datum and 6 feet above the adjoining land, were designed to prevent leakage of contaminated material and to be of sufficient height to prevent wave overtopping. After construction, the earth dikes were to be seeded to present a natural appearance and to prevent erosion. Existing trees and brush in the area would have been removed prior to filling.

An access channel 200 feet wide and 24.5 feet deep was to be provided for access to the mooring and pumpout area. A turning basin also 24.5 feet deep would have been provided at the western end of the access channel. This channel would have been subject to maintenance dredging and was to contribute 168,000 cubic yards annually to be disposed of within the confinement.

Extending from the pumpout station north, an earth dike would support the discharge pipe. This dike would have been 11 feet above Low Water Datum with a top width of 15 feet. An overflow weir would have been provided at the southeast corner of the enclosure to control the discharge of water after settling of suspended material had been accomplished. Oil was to be removed from the water prior to discharge into the open waters.

The most significant impact of this alternative was the impoundment of 365 acres of lands presently used for game management. This represented approximately 8% of the lands owned by the Michigan State Game Area at the present time.

The estimated construction cost was \$27,000,000.

Upon completion of the project, the area was to be designed and used as a recreation area. It was designed as an intensive-use area, including fishing, picnicking, pool swimming, games, golf, and boating. Alterations to the environment included the following:

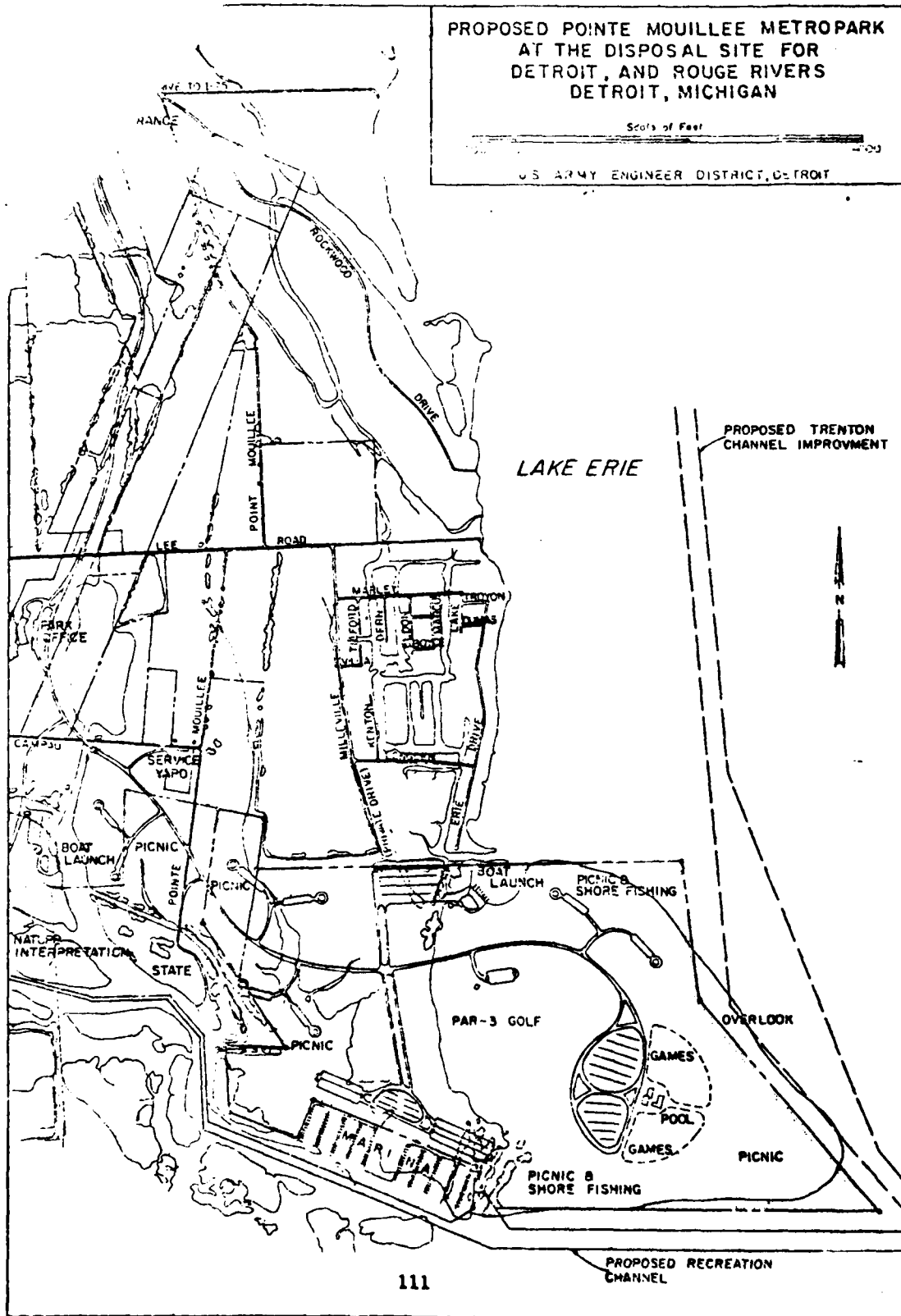
1. Alteration of ground cover, from marshlands, to wastelands, to landscaped and new recreational areas.
2. Surface changes from shaping the land, such as contouring and leveling.
3. Introduction of noise: from occasional use to intensive use including games, vehicles, and music.
4. Addition of recreational structures.
5. Addition of highways, bridges, and trails.
6. Addition of transmission lines.
7. Application of fertilizers, use of pesticides, introduction of litter.
8. Change in currents along the shoreline.

FIGURE VI-20

PROPOSED POINTE MOUILLEE METROPARK
AT THE DISPOSAL SITE FOR
DETROIT, AND ROUGE RIVERS
DETROIT, MICHIGAN

Scale of Feet

U.S. ARMY ENGINEER DISTRICT, DETROIT



This alternative was presented as a proposal in the Draft Environmental Statement of January 1972, and a Final Environmental Statement dated 4 August 1972 was sent to the Secretary of the Army on 15 March 1973. Not subsequently, considerable opposition was formed for the project. A combination of factors led to the adoption of the present barrier dike plan over this alternative. These factors included the sizable opposition to project from several citizen groups, efforts by the Bureau of Sport Fisheries and Wildlife of the U. S. Department of the Interior to develop a better alternative, and a resolution passed by the Michigan Legislature stating their opposition to the project.

14. Island Site Near Detroit Light (210 Acres).

This island site, which is located near the Detroit River Light on the west side of the navigation channels, was considered the most favorable site until the Huron-Clinton Metropolitan Authority and the Michigan Department of Natural Resources jointly suggested the site north of the Huron River in September 1971. In favoring the Huron River site, the Michigan Department of Natural Resources had indicated that this site would be "their second choice." The Environmental Protection Agency had indicated they would have no objection to use of this site. Cost of construction is estimated at \$36,000,000 with an annual charge of \$5,700,000.

15. Ottawa Silica Quarry.

Possible use of a portion of the Ottawa Silica Quarry was suggested by agents of the owners at a meeting on July 10, 1972 and was subsequently offered by the owner in writing. The quarry is located immediately adjacent to the Huron River approximately three miles upstream of the mouth. The quarry has been excavated about 80 feet below the existing ground into the aquifer which supplies potable water to wells in the area. Several plans were considered for delivery of the dredged material to the quarry. All included an access channel to the mouth of the Huron River. The plans considered were briefly: a channel for the hopper dredge up the Huron River; construction of a 3-year holding area at the mouth of the river and a pipeline for pumping the material to the quarry; a 3-year

holding area at the mouth of the river and trucking the material to the quarry; and a 1-year capacity area at the mouth of the river and a pipeline for pumping the material to the quarry. Preliminary cost estimates were based on two assumptions: first, that all rights-of-way required for the pipeline, channel, or trucks would be provided at no cost; and second, that tests on the aquifer would indicate that no site work would be required to prevent the seepage of pollutants into ground water. If either or both of these assumptions are incorrect, costs would be increased correspondingly and substantially.

At the present time preliminary estimates indicate that costs would be about the same as for the Huron River site. First costs are estimated at \$16,500,000 if the material were trucked, \$23,000,000 if pumped from a 3-year holding area at the mouth of the Huron River, \$23,000,000 if pumped from a 1-year holding area, and \$26,500,000 if a channel for the hopper dredge were dredged up the Huron River. Annual charges for the plans are estimated at \$5,000,000; \$4,400,000; \$4,600,000; and \$5,400,000; respectively. Although adequate volume is not presently available in the quarry for the 10-year program, the owner has indicated that sufficient volume would be available when needed.

16. Site Near Estral Beach.

This area is adjacent to the southern boundary of the State Game Area. A proposal was made to use a 168-acre site enclosed by existing 6-foot dikes. A preliminary estimate indicated that 1,600,000 cubic yards of dredged material could be deposited on the area. An access channel similar to the channel required for the Huron River site would be required. If confinement of the material dredged to form the access channel were

required, it would probably more than fill the proposed site. If mercury-polluted material from the Detroit River and the required non-mercury contaminated cover lay were used to fill the area, it is anticipated that filling of the area would extend over several dredging seasons. This would require maintenance of the access channel, thereby further reducing capacity needed for disposal of material from the Federal navigation projects.

17. Sites Near Stony Point.

Preliminary estimates indicated that this suggested area would be suitable for confining approximately 320,000 cubic yards of dredged material. Adjoining property would be required to provide proper drainage of the area. The adjoining areas appear to be available only through condemnation proceedings. This is an undesired method of site acquisition which would not be used unless other areas are unavailable. Portions of the area are immediately adjacent to residential property. These homeowners could be expected to object to use of this site. An access channel would be required which would pass through a prime netting area for fishermen.

18. Combination of Small Sites.

A plan to combine various small disposal sites was considered. The combined capacity of these sites, estimated at 7,500,000 cubic yards, is inadequate for the 10-year design period. Additional capacity would still be required and a section of one of the larger sites would be required to meet volume requirements. A possible grouping of combined sites could be the Coast Guard property on Grosse Ile, Mud Island, Monroe, Estral Beach, and Stony Point. Advantages and disadvantages of each individual site would still be valid if this alternative were considered. Each site would require a separate pumpout facility which, for smaller sites, could become a large part of the total cost. In addition, owners of potential large sites are not generally receptive to partial use of their areas. No real economic or engineering advantage is apparent from this arrangement of sites except a possible shorter haul distance since the sites are at different locations with respect to the project.

19. Alternative Concepts.

These included transport of the bulk of the dredged material away from the Pte. Mouillee Game Area while using some of the publicly owned area north of the Huron River as a rehandling area.

(a) Trucking Inland

A 400-acre site was found about 13 miles west of the State Game Area. This was the closest area of sufficient size to allow reasonably low dikes, about 19.5 feet above existing ground, that looked suitable for disposal of the dredged material. Preliminary estimates indicated that first cost would be about \$15,700,000. However, annual charges are estimated at \$7,400,000.

(b) Pumping Inland

When the high annual cost of trucking inland was recognized, the possibility of pumping the dredged material was considered. The pumping plan was similar to the plan for pumping inland from Trenton, discussed in paragraph B.9. above. Preliminary estimates indicated a first cost of \$40,200,000, with annual charges of \$8,700,000. These estimates did not include any purchase of easements or rights-of-way.

SECTION VII
THE RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES OF MAN'S ENVIRONMENT
AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

The barrier dike installation, in conjunction with the interior marsh management plan thereby made possible, would enhance the long-term productivity of the protected area for waterfowl management. If the area were wholly enclosed by interior dikes, the productivity of the area insofar as it would function as a marsh contributory to the Lake Erie ecosystem would be diminished relative to its historical function. The marsh would not be available as a spawning or feeding area for fish, either for carp or for more desirable fish species that might otherwise be re-introduced to the area with improvements in water quality. The rock exterior of the dike, in compensation, would provide good habitat for some fish species, as described in Section IV.

SECTION VIII
ANY IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF
RESOURCES WHICH WOULD BE INVOLVED IN THE
PROPOSED ACTION SHOULD IT BE IMPLEMENTED

The barrier dike plan would require a major commitment of labor, materials (principally rock), and energy.

The facility would occupy 700 acres of Lake Erie bottomland lakeward of the old shoreline. This bottomland would be permanently lost as aquatic habitat.

The interior dikes expected to be installed by the Game Division of the Michigan Department of Natural Resources for waterfowl management should not be regarded as irreversible in their impact on the marsh in any absolute sense, since selective removal of these dikes would be physically conceivable if changes in future conditions or in social values required it. It can be expected, however, that the vested interests of hunters and others concerned with waterfowl management would increase as the area became more productive, and would make any reversal of function of the area highly improbable.

SECTION IX

Coordination and Comment and Response

a. Public Participation

1. Public Meetings. Throughout the course of efforts to obtain a containment facility, several meetings and hearings have been held. Formal meetings began in 1971 with a public hearing on 28 September 1971.

The comments received pertained to early efforts to obtain a site for the facility. At that time the site north of the Huron River was being pursued. The following comments were received:

The Department of Natural Resources, State of Michigan representative read a statement endorsing the Pointe Mouillee extension site, pointing out that approximately 350 acres are involved in the land extension and another 350 acres of existing swamp land would be covered up by the dredged fill. There will be approximately 9,600 feet of frontage on the lake side and 1,300 feet of frontage on the Huron River side.

The Huron-Clinton Metropolitan Authority representative also read a statement endorsing the planned site.

The Planning Commission of Grosse Ile endorsed the planned site, pointing out that facilities such as water, sewer and police service would be available to serve the park when finally finished.

The Brownstown Township representative (1) opposed the land site as injurious to property owners, (2) stated that the project would eliminate part of the Mouillee area as a wild life refuge, and (3) claimed it would be injurious to wildlife propagation.

The Port of Monroe representative emphasized the availability of the Monroe Harbor and suggested that the Corps of Engineers extend the Monroe Channel and locate their contaminated fill in a diked area so that the land could be converted to industrial use.

The representative of the Audubon Society stated that the Society objected to the entire operation, asked what type of pollutants were contained in the fill material, and objected to the negative effects on wildlife propagation.

The Pointe Mouillee Waterfowl Association's two representatives stated that the Mouillee site was unacceptable to the group because of the loss of the marsh and lake area. Also, the question was asked as to what effect accidental spills from the dredge during movement in and out to the discharge point would have on contaminating the area and what type of pollution could be expected from such accidental spills.

An individual Sierra Club member stated that neither of the sites is acceptable and that no dumping or dredging operations should be done anywhere. He asked that the attitude of the local people be forwarded to the appropriate officials in Washington.

The Lake Carriers Association has expressed approval of the proposed facility pointing out the desirability of maintaining the channels at project depths.

A private citizen questioned the life of the steel sheet piling and asked what effects there might be if the steel sheet piling corroded out and subsequently released contaminated material into the water course. He emphasized the need for an environmental impact statement but ultimately endorsed the land site.

Another citizen asked about the water movement and possibility of pollutants escaping and about the possibility of another site where abandoned land could be used.

Another citizen condemned the filling of any area, the construction of the land, and its effect on reducing waterfowl propagation. He mentioned wild rice beds in the Pointe Mouillee area that have been considered for fill operations and the Pike spawning grounds that have been destroyed by past fill operations.

Another citizen questioned the shape of the project disposal site, but was informed that a square shape provided nearly maximum area for minimum cost.

A private citizen stated that nature interpretation areas are very much in demand for school children and questioned whether or not a people oriented type park, as would ultimately result from the Mouillee fill site, should replace the natural area. He stated that the natural conditions of the area, as exist now, have far greater potential for nature interpretation areas than would be provided through an artificial park development.

Other meetings were held at this time on the Huron River site.

A meeting, arranged through Henry F. Redman, Supervisor, Township of Brownstown, was held with the Township Board 27 March 1972 to discuss the project further. Comments made were responded to in a later communication, dated 25 April 1972, asking for additional studies be made, including the location of other sites before commencing on the project.

Concern expressed was for adverse effects of currents on Estral Beach to the south of the project area.

3. Public Involvement and Information Measures.

Throughout the efforts to obtain a site for disposal, continuing attempts have been made to get public input and keep interested parties informed. The widely distributed Draft Environmental Statement on the Huron River site provided much information. Information had been provided before that at all the informal and formal meetings. Close contact was kept throughout the entire time period by means of frequent telephone conversations, meetings between interested parties and other involved agencies, joint field trips, etc.. These measures will be continued throughout the course of the project.

b. Government agencies.

1. History of Agency Coordination.

Agency coordination has been an important factor in the progress of this project. The coordination has been extensive and has been a determining factor in arriving at the present proposal. Initially, coordination efforts were directed toward the Michigan Department of Natural Resources to find a suitable disposal site. In conjunction with the Huron-Clinton Metropolitan Authority, a site was made available north of the Huron River near the river mouth. This site was found to be unsuitable by the U. S. Department of the Interior, Bureau of Sport Fisheries and Wildlife, and the U. S. Environmental Protection Agency. The Barrier Dike plan was proposed following these coordination efforts and the adoption of a resolution by the Michigan Legislature in opposition to the project, north of the Huron River.

Close coordination has occurred with Michigan Department of Natural Resources throughout the project. Numerous meetings, work groups, discussions, and other means have been used in the development of the plans.

A joint Task Force of Michigan Department of Natural Resources and Corps of Engineers personnel was employed to help prepare the Draft Environmental Statement for the present proposal.

On 28 March 1972, a meeting was held in Gibraltar, Michigan, arranged by Mr. George Kadar of the Wayne County Sportsmen's Club and the Pointe Mouillee Waterfowler's Association. Representatives from Michigan United Sportsmen's Clubs, Department of Natural Resources, Waterways Commission and Huron Clinton Metropolitan Authority were present. A request was made for a delay in the project to permit additional public hearings to discuss extent of mercury pollution and danger to public health, value of fish and wildlife in area, and alternative solutions to the problem of dredging and filling in the project.

A small, informal neighborhood group met with members of the Corps at the home of Mr. and Mrs. Nelson Gomoll at East Rockwood, Michigan on 28 March 1972. Approximately ten persons from the Milleville Beach area discussed littoral drift, odor, noise, traffic patterns, and the possible danger to children.

A public meeting was held upon completion of the Draft Environmental Statement for the Huron River Site at Trenton High School Auditorium on 25 April 1972. At the hearing over 40 people representing themselves, governmental units, agencies, and organizations made comments or presented a statement. Colonel Myron D. Snoke, District Engineer, answered some of the questions as they arose. Many of the statements presented which represented views opposing the project raised questions regarding the environmental impacts of the project and the choice of the site selected among a number of other alternatives. In general, the hearing consisted mainly of the presentation of statements both for and against the proposed project. The proposed loss of natural marshland was a recurring concern of many individuals and groups.

Following these early efforts, the Huron River site was dropped from consideration and the present alternative was pursued. Informal public meetings have been held on this proposal.

2. Informal meetings and workshops.

A series of workshops were held in March 1972 on the Huron River site. These were informal meetings held to provide current information on the project to interested citizens and groups and to receive comments on the plan. Subsequently, the Huron River site was dropped from consideration and the Barrier Dike plan was adopted. Informal workshop meetings were held 28 and 30 January and 1 February 1974 on this proposal. The majority of those attending were favorable to the project.

2. Agencies receiving Draft Statement.

The following agencies received copies of the Draft Statement for comment:

1. Great Lakes Basin Commission.
2. Great Lakes Commission.
3. Huron-Clinton Metropolitan Authority.
4. Huron River Watershed Council.
5. Michigan Department of Natural Resources.
6. Office of Economic Opportunity.
7. Southeast Michigan Council of Governments.
8. U. S. Department of Agriculture Soil Conservation Service Forest Service.
9. U.S. Department of Commerce National Oceanic and Atmospheric Administration Coast Guard.
10. U.S. Department of Interior.
11. U.S. Environmental Protection Agency.

Comments received from the above agencies have been incorporated, or responded to, in the Final Statement.

c. Citizen Groups.

1. Concerns of Citizens and Groups.

Many groups have been involved in the project as it has developed. Concerns have varied but most seem to be oriented toward the possible effects of the project on wildlife habitat, destruction of a natural area, and loss of waterfowl. Comments on the present proposal have been received as a result of the coordination of this statement, the meetings held, and other written and informal communications.

2. Groups receiving Draft Environmental Statement.

The following groups received copies of the Draft Statement for comment:

1. American Association of University Women.
2. Detroit Audubon Society.
3. Ducks Unlimited, Inc.
4. Ford Yacht Club
5. Lake Erie Cleanup Committee.
6. League of Women Voters.
7. Michigan Duck Hunters Association.
8. Michigan United Conservation Clubs.
9. Michigan Waterfowl Decoy Association.
10. Monroe County Rod & Gun Club.
11. National Audubon Society.
12. National Wildlife Federation.
13. Pointe Mouillee Waterfowlers Association.
14. Sierra Club.
15. Wayne County Sportsmans Club.

Comments received from the above groups have been incorporated,
or responded to, in the Final Statement.

REFERENCES

- Applegate, V.C. and H.D. Van Meter. A brief history of commercial fishing in Lake Erie. U. S. Department of the Interior, Fishery Leaflet 630. 1970.
- Barbour, W. T., "A Story of Pointe Mouillee". An unpublished historical narrative by a member of Pte. Mouillee Shooting Club, owners of the marsh previous to Dept. of Natural Resources purchase. 1944.
- Conference in the Matter of Pollution of Lake Erie and its tributaries Proceedings. U.S. Dept. of the Interior. FWQA. 1970.
- Great Lakes Basin Framework Study, Limnology of Lakes and Embayments. Appendix #4, Draft #2. 1972.
- Fish. Appendix #8, Draft #2. 1972.
- Hartman, W.L. Effects of exploitation, environmental changes, and new species on the fish habitats and resources of Lake Erie. Great Lakes Fishery Commission, Technical Report No. 22. 1973.
- Hubbs, Carl L., and Lagler, Karl F. Fishes of the Great Lakes Region. Cranbrook Instit. Sci., Bull. 26. 1947.
- Hunt, George S., Causes of Mortality Among Ducks Wintering on the Lower Detroit River. PhD. Dissertation, University of Michigan, Ann Arbor. 1957.
- Huron River Basin Portion of Interim Water Quality Management Plan for S.E. Michigan Metro-Regional Area. Draft Environ. Stmt., EPA. 1973.
- Krizek, Raymond J., Karade, Gabor M., and Hummer, Paul L.. Engineering Characteristics of Polluted Dredgings, EPA Grant 15070-GCK and R-800948, Technical Report No. 1. Northwest University, Evanston, Ill. 1973.
- McDonald, Malcolm E. The Ecology of the Pointe Mouillee Marsh, Michigan, With Special Reference to the Biology of Cat-tail (Typha). PhD. Dissertation, University of Michigan, Ann Arbor. 1951.
- Michigan Dept. of Natural Resources, Lansing, Mich.:
A Plan for Michigan Shorelands. 1973.
Heavy Metals in Surface Waters, Sediments and Fish for Michigan. 1972.
Status of Selected Fish Stocks in Lake Erie and Recommendations for Commercial Harvest.
Trends in Water Quality - The Detroit River. 1972.
Unpublished Data. 1972
Professional staff members contributed a large amount of technical information relating to Pte. Mouillee Game Area and future management of the area in cooperation with the Corps' preparation of the Draft and Final Environmental Statements.
- Michigan State University, Inst. of Water Research. Unpublished data. 1973.

REFERENCES (Cont'd)

U.S. Army Corps of Engineers:

Dredging of Water Quality Problems in the Great Lakes. Appendix A6,
"Pilot Study of Rouge River Dredging". 1967.

S.E. Michigan Water Resources Study, Technical Paper No. 7: Gazetteer
of the Huron River Basin. 1972.

Vaughn, Richard D. and Harlow, George L.. Report on the Pollution of
the Detroit River, Michigan Waters of Lake Erie and their Tributaries.
U. S. Dept. of HEW. 1965.

ATTACHMENT 1

REQUIREMENTS FOR DREDGING

Authorizations, Documents, and Reports

REQUIREMENTS FOR DREDGING

<u>Acts</u>	<u>Work Authorized</u>	<u>Documents and Reports</u>
June 13, 1902 Mar. 3, 1905 June 25, 1910	Amherstburg Channel and Removal of Grosse Ile Shoal	H. Docs. 712, 56th Cong., 1st Sess.; 40, 58th Cong., 3d Sess.; and
Mar. 4, 1913	Fighting Island Channel	H. Doc. 17, 62d Cong., 1st Sess.
Mar. 2, 1907 June 25, 1910 Mar. 2, 1919	Livingstone Channel	H. Docs. 266, 59th Cong., 2d Sess.; 676 61st Cong., 2d Sess.; and 322, 65th Cong., 1st Sess.
July 3, 1930	Channel Depths of 26 and 25 Feet.	H. Doc. 253, 70th Cong., 1st Sess.
Aug. 30, 1935	Channel to Wyandotte 21 Feet Deep and 300 Feet Wide Through Middle Ground Opposite Head of Fighting Island.	Rivers and Harbors Committee Doc. 1, 72d Cong., 1st Session.
Aug. 26, 1937	Trenton Channel and Turning Basin (West of Grosse Ile)	H. Doc. 205, 75th Cong., 1st Sess.
Mar. 2, 1945	American Channel North of Belle Isle Between Windmill Point and Fairway Slip, Detroit	H. Doc. 734, 79th Cong., 2d Sess.

REQUIREMENTS FOR DREDGING (Contd)

July 24, 1946	Deepen Westerly 300 Feet of Amherst Channel and Ballards Reef Channel Below Livingstone Channel to 27 Feet to Provide Depths Adequate for 24-Foot Draft Navigation when Governing Lakes are at Datum, with Necessary Widening at Approaches and Bends and Construction of Necessary Compensating Works, Detroit River.	H. Doc. 335, 80th Cong., 1st Sess.
May 17, 1950	Extend Turning Basin in Trenton Channel 600 Feet, Dredge Through East Draw of Lower Grosse Ile Bridge, and Extend 300-Foot Width of Channel North of Lower Grosse Ile Bridge.	S. Doc. 30, 81st Cong., 1st Sess.
Mar. 21, 1956	Channel Depth of 28.5 Feet Throughout Downbound and Two-Way Channels, Except in Upper (27.7-Foot Depth) and Lower, (29-Foot Depth) Livingstone Channel; and in Upbound Channel, 27.5-Foot Depth in Ballards Reef Channel Below Junction with Livingstone Channel, 27.5-Foot Depth in Westerly 300-Foot Width of Limekiln Crossing and Amherstburg Reaches, and 28.5-Foot Depth in Westerly 300-Foot Width of Hackett Reach; with Necessary Compensation Works. Also 28.5-Foot Depth in Lake Erie from Detroit River to Pelee Passage Shoal, inclusive.	S. Doc. 71, 84th Cong., 1st Sess.

REQUIREMENTS FOR DREDGING (Contd)

July 14, 1960	Trenton Channel; Deepen to 27 Feet, Where Necessary, Wyandotte Reach from Detroit River to Upper Grosse Ile Bridge, About 5.5 Miles; Deepen to 28 Feet and Widen to 300 Feet Below Upper Grosse Ile Bridge to and Including a Turning Basin 28 Feet Deep and 15 Feet Acres in Area Outside Project Limits.	H. Doc. 319, 86th Cong., 2d Sess.
Aug. 13, 1968	Trenton Channel; deepen to 28 feet and widen to 300 feet from the upper turning basin at Gibraltar at a depth of 28 feet, width of 830 feet, and length of 1,500 feet; build compensating works to maintain water levels.*	H. Doc. 338, 90th Cong., 2d Sess.

Dredging of the Rouge River was originally authorized by the River and Harbor Act of August 11, 1888 (Annual Report for 1887, pp. 2275-2278); joint resolution of April 1, 1898, p. 2605), and the River and Harbor Act of March 2, 1907 (H. Doc. 289, 59th Cong., 1st Sess.). Current authorizations are contained in Attachment No. 1

<u>Acts</u>	<u>Work Authorized</u>	<u>Documents and Reports</u>
Aug. 8, 1917	21-Foot Channel via the Shortcut Canal.	H. Doc. 2063, 64th Cong., 2d Sess.

* This work has not been constructed; therefore, these depths and dimensions are not maintained.

REQUIREMENTS FOR DREDGING (Contd)

Aug. 30, 1935	25-Foot Channel at Mouth of Old Channel, 1,425 Feet Long and Adjacent to Latter, and 21-Foot Channel Extending from Junction of Old Channel and Shortcut Canal into Old Channel to Detroit, Toledo & Ironton R.R. Bridge.	
July 3, 1958	Old Channel; 100 Feet Wide from Peerless Cement Corp. to Junction with Shortcut Canal, Widened to 150 Feet at 2 Bends.	H. Doc. 135, 85th Cong., 1st Sess.
Oct. 23, 1962	25-Foot Channel Over Modified Limits from Detroit River to Jefferson Ave. (via Shortcut Canal).	H. Doc. 509, 87th Cong., 2d Sess.

ATTACHMENT 2

PUBLIC LAW 91-611, SECTION 123

Local Authority for the Construction
of a Contained Disposal Facility.

REQUIREMENTS FOR DISPOSAL OF POLLUTED SPOIL.

The local authority for the construction of a contained spoil disposal facility is Section 123 of the River and Harbor Act of 1970 (Public Law 91-611). Section 123 reads as follows:

Sec. 123. (a) The Secretary of the Army, acting through the Chief of Engineers, is authorized to construct, operate, and maintain, subject to the provisions of subsection (c), contained spoil disposal facilities of sufficient capacity for a period not to exceed ten years, to meet the requirements of this section. Before establishing each such facility, the Secretary of the Army shall obtain the concurrence of appropriate local governments and shall consider the views and recommendations of the Administrator of the Environmental Protection Agency and shall comply with requirements of section 21 of the Federal Water Pollution Control Act, and of the National Environmental Policy Act of 1969. Section 9 of the River and Harbor Act of 1899 shall not apply to any facility authorized by this section.

(b) The Secretary of the Army, acting through the Chief of Engineers, shall establish the contained spoil disposal facilities authorized in subsection (a) at the earliest practicable date, taking into consideration the views and recommendations of the Administrator of the Environmental Protection Agency as to those areas which, in the Administrator's judgment, are most urgently in need of such facilities and pursuant to the requirements of the National Environmental Policy Act of 1969 and the Federal Water Pollution Control Act.

(c) Prior to construction of any such facility, the appropriate State or States, interstate agency, municipality, or other appropriate political subdivision of the State shall agree in writing to (1) furnish all lands, easements, and

rights-of-way necessary for the construction, operation, and maintenance of the facility; (2) contribute to the United States 25 per centum of the construction costs, such amount to be payable either in cash prior to construction, installments during construction, or in installments, with interest at a rate to be determined by the Secretary of the Treasury, as of the beginning of the fiscal year in which construction is initiated, on the basis of the computed average interest rate payable by the Treasury upon its outstanding marketable public obligations, which are neither due or callable for redemption for fifteen years from date of issue; (3) hold and save the United States free from damages due to construction, operation, and maintenance of the facility; and (4) except as provided in subsection (f), maintain the facility after completion of its use for disposal purposes in a manner satisfactory to the Secretary of the Army.

(d) The requirement for appropriate non-Federal interest or interests to furnish an agreement to contribute 25 per centum of the construction costs as set forth in subsection (c) shall be waived by the Secretary of the Army upon a finding by the Administrator of the Environmental Protection Agency that for the area to which such construction applies, the State or States involved, interstate agency, municipality, and other appropriate political subdivision of the State and industrial concerns are participating in and in compliance with an approved plan for the general geographical area of the dredging activity for construction, modification, expansion, or rehabilitation of waste treatment facilities and the Administrator has found that applicable water quality standards are not being violated.

(e) Notwithstanding any other provision of law, all costs of disposal of dredged spoil from the project for the Great Lakes connecting channels, Michigan, shall be borne by the United States.

(f) The participating non-Federal interest or interests shall retain title to all lands, easements, and rights-of-way furnished by it pursuant to subsection (c). A spoil disposal facility owned by a non-Federal interest or interests may be conveyed to another party only after completion of the facility's use for disposal purposes and after the transferee agrees in writing to use or maintain the facility in a manner which the Secretary of the Army determines to be satisfactory.

(g) Any spoil disposal facilities constructed under the provisions of this section shall be made available to Federal licensees or permittees upon payment of an appropriate charge for such use. Twenty-five per centum of such charge shall be remitted to the participating non-Federal interest or interests except for those excused from contributing to the construction costs under subsections (d) and (e).

(h) This section, other than subsection (i), shall be applicable only to the Great Lakes and their connecting channels.

(i) The Chief of Engineers, under the direction of the Secretary of the Army, is hereby authorized to extend to all navigable waters, connecting channels, tributary streams, other waters of the United States and waters contiguous to the United States, a comprehensive program of research, study, and experimentation relating to dredged spoil. This program shall be carried out in cooperation with other Federal and State agencies, and shall include, but not be limited to, investigations on the characteristics of dredged spoil, and alternative methods of its disposal. To the extent that such study shall include the effects of such dredge spoil on water quality, the facilities and personnel of the Environmental Protection Agency shall be utilized.

ATTACHMENT 3

Agreement by

Michigan Department of Natural Resources

- To provide the necessary local assurances
- To ownership, and
- To maintain the barrier island after completed
by the Corps of Engineers.

NATURAL RESOURCES COMMISSION

E. M. LAITALA
Chairman

CARL T. JOHNSON

HILARY F. SNELL

HARRY H. WHITELEY

CHARLES G. YOUNGLOVE

STATE OF MICHIGAN



WILLIAM G. MILLIKEN, Governor

DEPARTMENT OF NATURAL RESOURCES

STEVENS T. MASON BUILDING, LANSING, MICHIGAN 48926

A. GENE GAZLAY, Director

August 10, 1973

Colonel James E. Hays
District Engineer
U. S. Army Corps of Engineers
P. O. Box 1027
Detroit, Michigan 48231

Dear Colonel Hays:

By previous letter (June 1, 1973) a request was made to delay a decision on selecting a disposal site for containment of spoil to be removed from the Detroit and Rouge rivers. The site selected is to contain spoil resulting from maintenance dredging of navigational channels for a ten year period.

A 60-day study period was granted to develop a concept plan and more fully explore the possibilities of reestablishing the Pointe Mouillee marsh by construction of a dual-purpose structure -- a spoil disposal island which would serve also as a barrier reef.

Through the closely coordinated and diligent efforts of your staff and mine, we now have a workable alternate plan with similar cost estimates which can be recommended for more precise study.

You will recall that the Department of Natural Resources was to develop an environmental assessment and contact other public organizations which have shown strong interests in Detroit and Rouge rivers spoil disposal problem.

Attached is a copy of the "Environmental Assessment of Pointe Mouillee Barrier as an Alternative Disposal Site for Detroit and Rouge Rivers Dredge Spoil." This assessment is for transmittal with the structural design information you will forward to your superiors.

This barrier reef spoil disposal plan was presented to the Department of Natural Resources Commission and received full support. By this letter, we acknowledge our support and request favorable consideration by the U. S. Army Corps of Engineers.

We further wish to inform you that the Department of Natural Resources is prepared to provide the necessary local assurances and assume ownership



Colonel James E. Hays

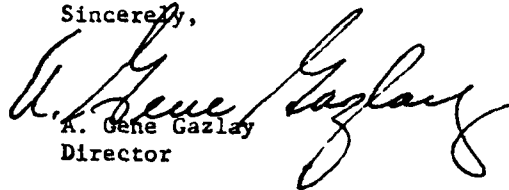
-2-

August 10, 1973

together with maintenance of the barrier island after the Corps of Engineers has completed the project.

As a new incumbent to the Detroit District, I want you to know that I am most pleased with the joint working relationship that we have enjoyed with your office. The developmnet of this new plan under tight time constraints serves as a good example of these fine cooperative working relations. If we can be of assistance in furthering this project, please feel free to contact our office.

Sincerely,


A. Gene Gazlay
Director

ATTACHMENT 4
SOIL INVESTIGATIONS

DESCRIPTION

FIELD INVESTIGATIONS

DESCRIPTION

LABORATORY TESTING

SOILS ANALYSIS

MATERIALS FOR CLAY DIKES

BORING LOGS

MSHD C7-73 & PM11-71

MSHD E5-73 & E1-73

MSHD B8-73 & D6-73

MSHD F2-73 & F4-73

PM 1-73 thru PM 22-73

CHEMICAL ANALYSIS OF ACCESS CHANNEL BORINGS
SEDIMENT ANALYSIS SHOWING CONCENTRATION LIMITS
SET BY EPA FOR LEAD, ZINC, PHOSPHOROUS AND COD

SOIL INVESTIGATIONS

1. FIELD INVESTIGATIONS

A total of 38 borings have been obtained to date for the proposed barrier dike plan. These consist of seven borings obtained by the Michigan State Highway Department in 1973 and 31 borings obtained by the Corps, one in 1971 and 30 in 1973. The location of the borings are shown on Plate 1 of the report and the logs of the borings are included in this Appendix.

2. DESCRIPTION

The subsurface material in the disposal area consists of various strata of weak soils overlying stiff to hard soils which lie directly above limestone rock of the Niagara formation. The subsurface soil materials within the disposal area are divided into two categories, one north of the access channel and one south of the access channel. Because of the anticipated higher settlements, which include mud-waving, during construction a more extensive investigation was made for the area north of the access channel. The average amount of mud waving including long term settlement for the area north of the access channel has been determined to be about 12 feet whereas the average amount of mud waving including long term settlement for the area south of the access channel has been determined to be an average of 4 feet.

Borings 15-73, 16-73, 17-73 and 1-73 were taken along the proposed outer dike north of the access channel. Borings 2-73, 3-73, 4-73 and 5-73 were taken along the proposed inner dike north of the access channel. At boring PM1-73 the weak soil including the organic soil, terminates at about 16 feet below LWD. At boring PM1A-73 220 feet east of PM1-73, the weak and organic soil ends approximately at the same depth below LWD as at PM1-73; but at boring PM1B-73 approximately 632 feet east of PM1-73 the subsurface soil was better. Except for some thin strata of weak soils, the material at this location is predominately a sandy soil overlaying a MEDIUM clay resting on a hard pan clay strata at about 15 feet below LWD.

At boring PM17-73 there is sandy material below the lake bottom (2' below LWD) to clay at about 10 feet below LWD. The clay at this point has a standard penetration resistance of 13 blows per foot. The clay material increases rapidly in strength with depth. Further to the south at boring PM15-73 the organic and soft clay extends from the lake bottom, 5.3 feet below LWD, to about 18 feet below LWD. At this point the clay begins to increase in strength. At 21 feet below LWD the soil has changed to a clay hard pan of very high strength. Two hundred (200)

feet east of boring PM15-73 boring PM15A-73 was taken. The soft clay and organic material at this location extends from the hard bottom to about 15.4 feet below LWD. Another boring, PM15B-73 was taken 400 feet east of PM15-73 but the depth of the soft clay and organic material is essentially the same as at boring PM15A-73 (about 15 feet below LWD). The soil at boring PM16-73 was found to be quite good, having a relatively thick strata of silty sand over clay and silt.

At boring 2A and 2C located between the inner dike and the outer dike, the material was weak to about 17 to 18 feet below LWD. At this depth (about 18' below LWD) a strata of clay hardpan begins.

South of the access channel, the soil was found to improve with an increase in distance south of the access channel. The 4-foot amount of mud waving and longer term settlement was confirmed by the 1973 borings. Some preliminary stability analysis have been made that indicated a stable dike can be obtained after the weak and organic soils are mud waved out from below the dike.

3. LABORATORY TESTING

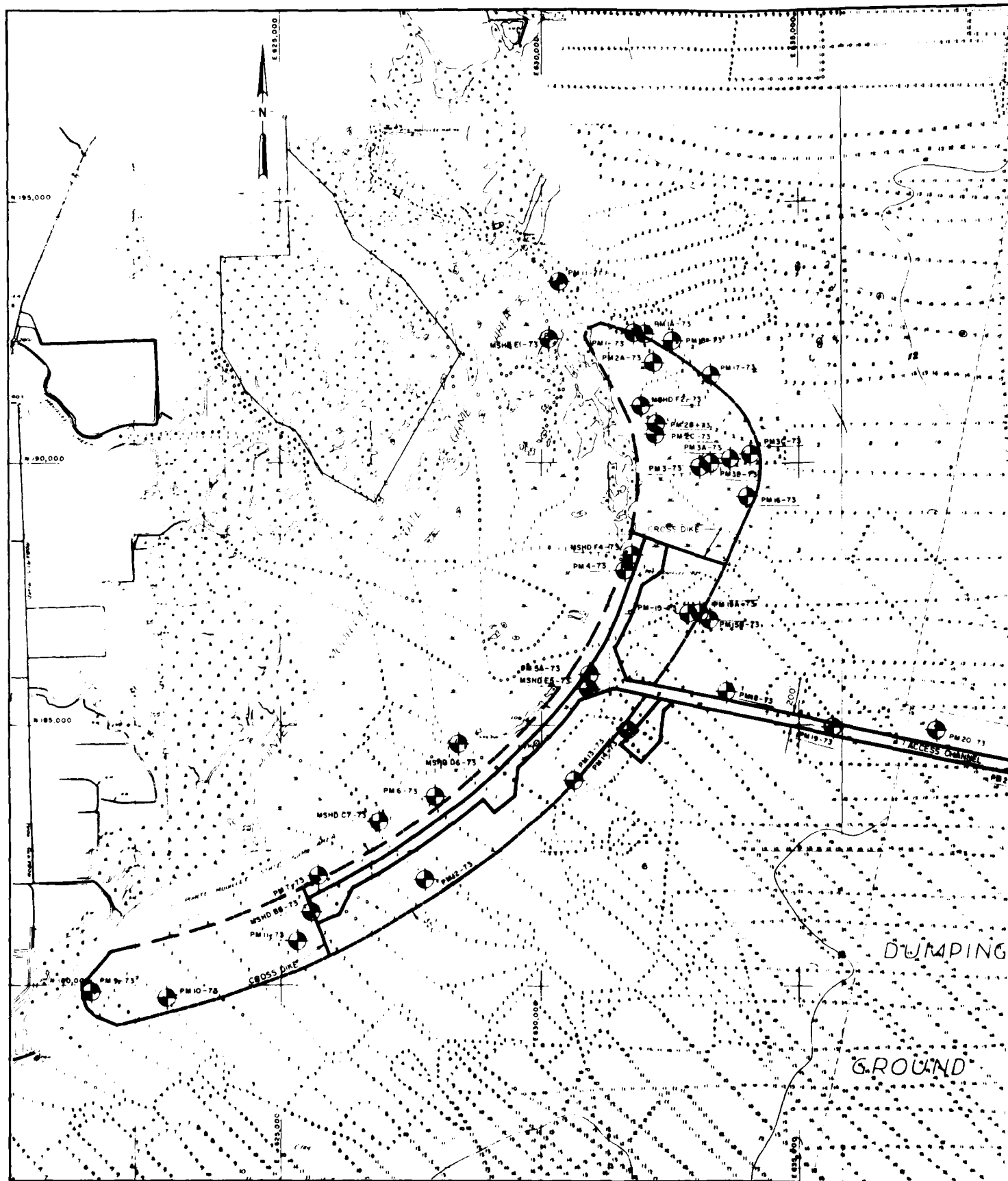
No laboratory tests to date have been made on the 1973 borings but laboratory tests will be made for the final dike designs. Except for boring PM18-73, only bottom samples were obtained in the access channel at the location of PM19, 20, 21 and 22-73. Sufficient borings have been taken so that final design can be accomplished as soon as the samples are tested in the laboratory.

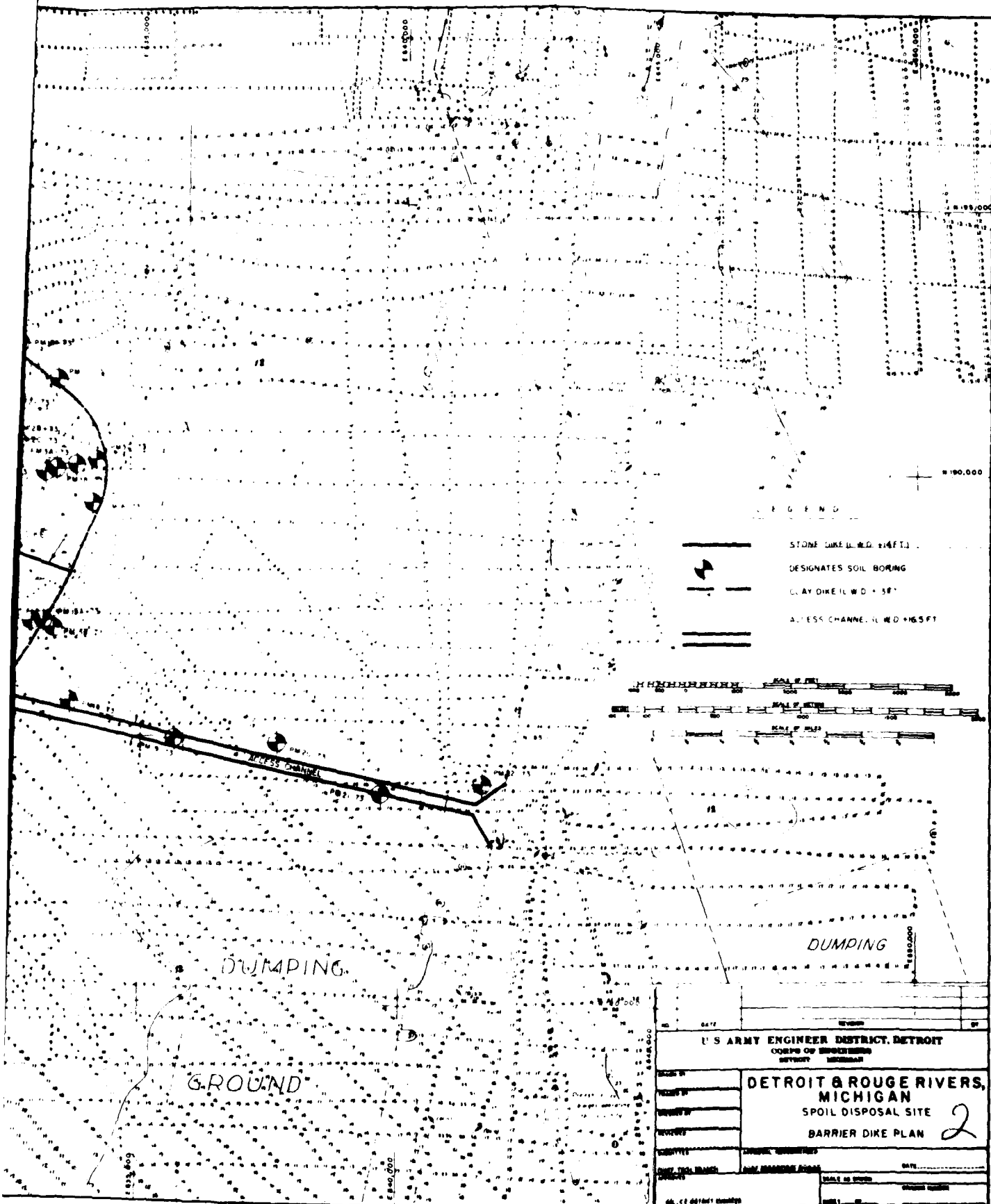
4. SOILS ANALYSIS

It is anticipated that during construction the dikes will displace the fibrous peat, organic soils and very soft clays and come to bear on the higher strength soil below them. The major portion of the settlements will be due to mud waving during construction. Long-term settlements are expected to be extremely small because of lack of intermediate strength soils in the horizon. Long-term settlements will only occur if the soft organic soils and fibrous peat are trapped under the dikes.

5. MATERIALS FOR CLAY DIKES

It is anticipated that the clay that will be excavated from the channel between the inner and outer dikes in the area south of the access channel will be suitable as dike construction material. The material that is recommended to be used as dike materials are medium to HARD clays and SANDY clays. The upper limits of the clay material are between 4 to 9 feet below LWD and the lower limit is below the proposed dredged depth.

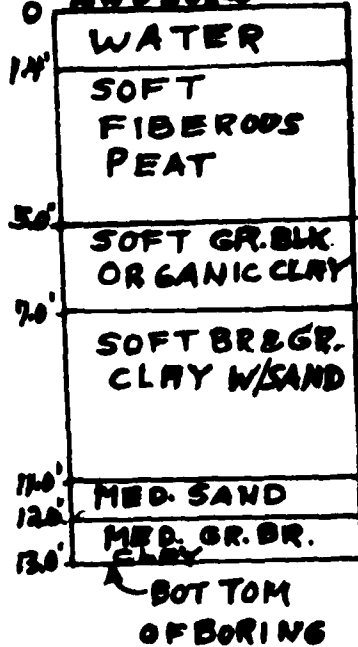




MD3HC1-73

7-3-73

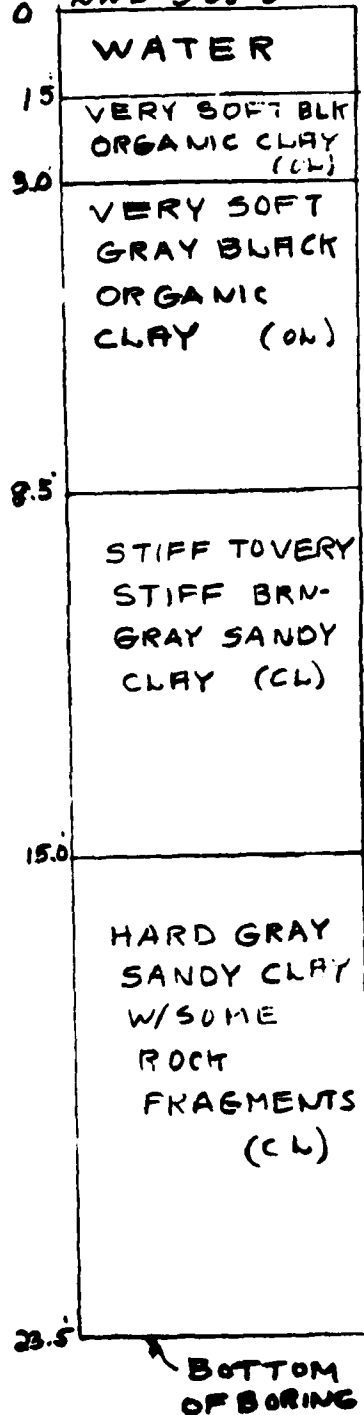
LWD 5686



PM 11-71

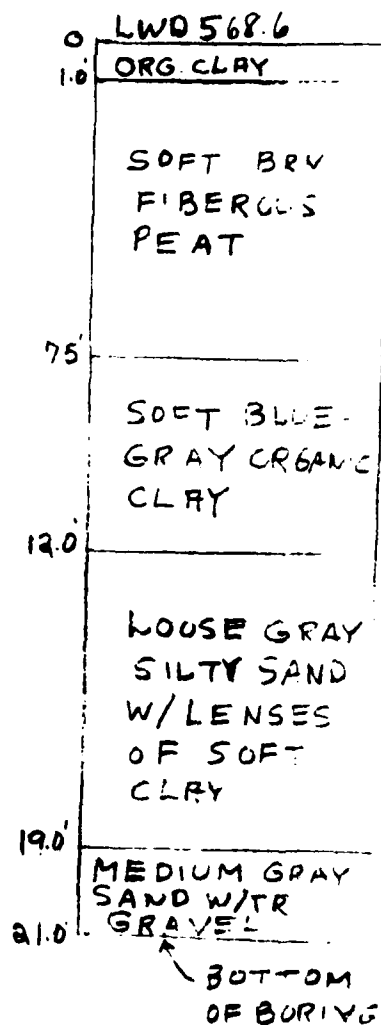
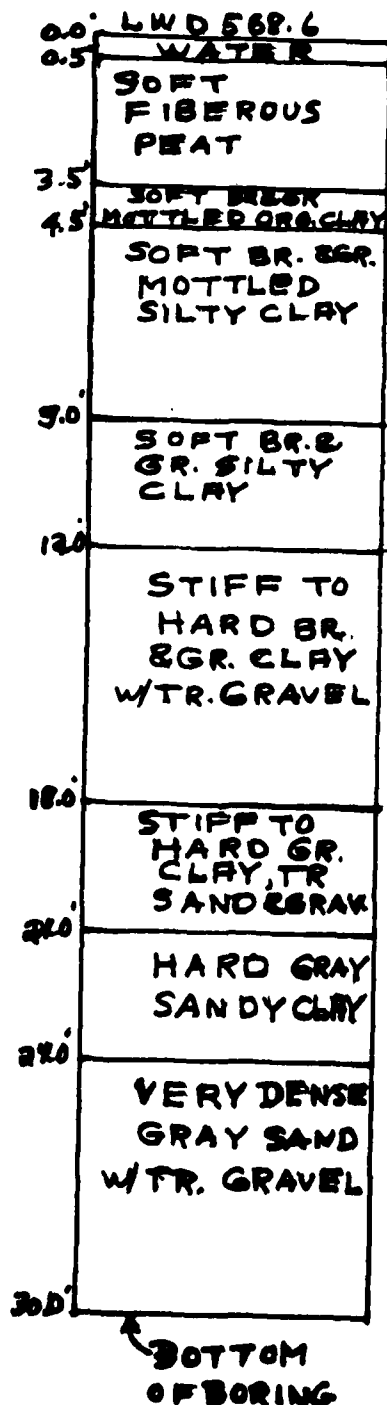
11-16-71

LWD 5686



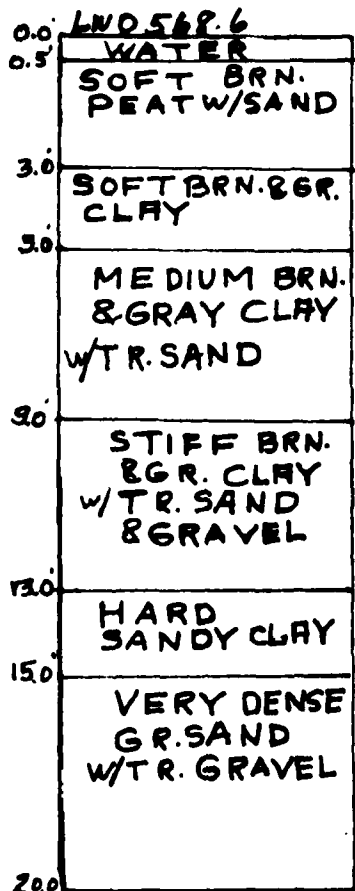
MSH, E 5-73
7-2-73

MSH D E 1-73
6-21-73



MDSH B8-73

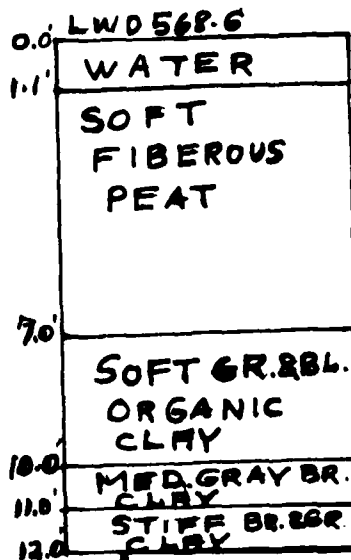
7-3-73



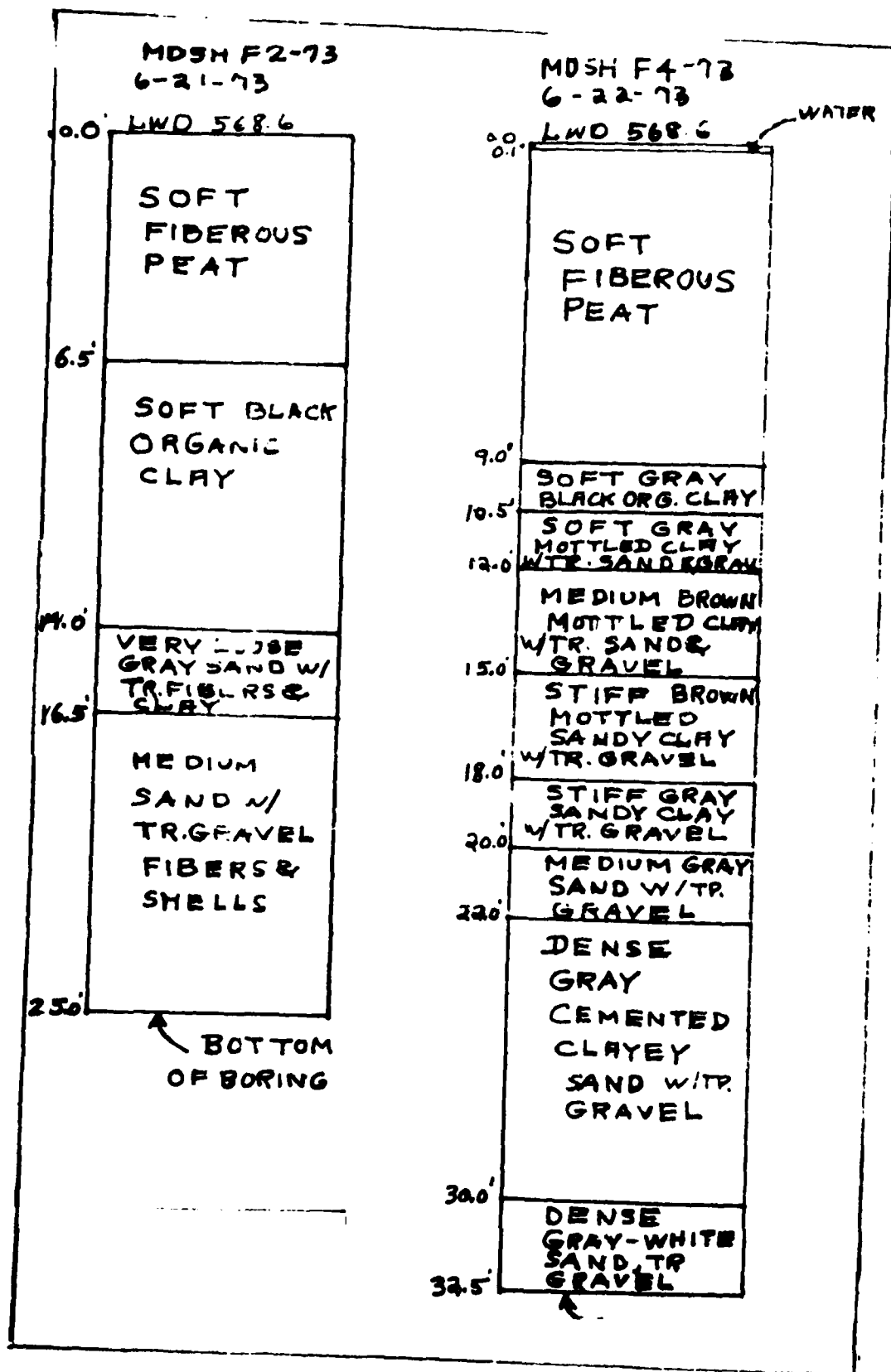
↑
BOTTOM
OF BORING

MDSH D6-73

6-26-73



↑
BOTTOM
OF BORING

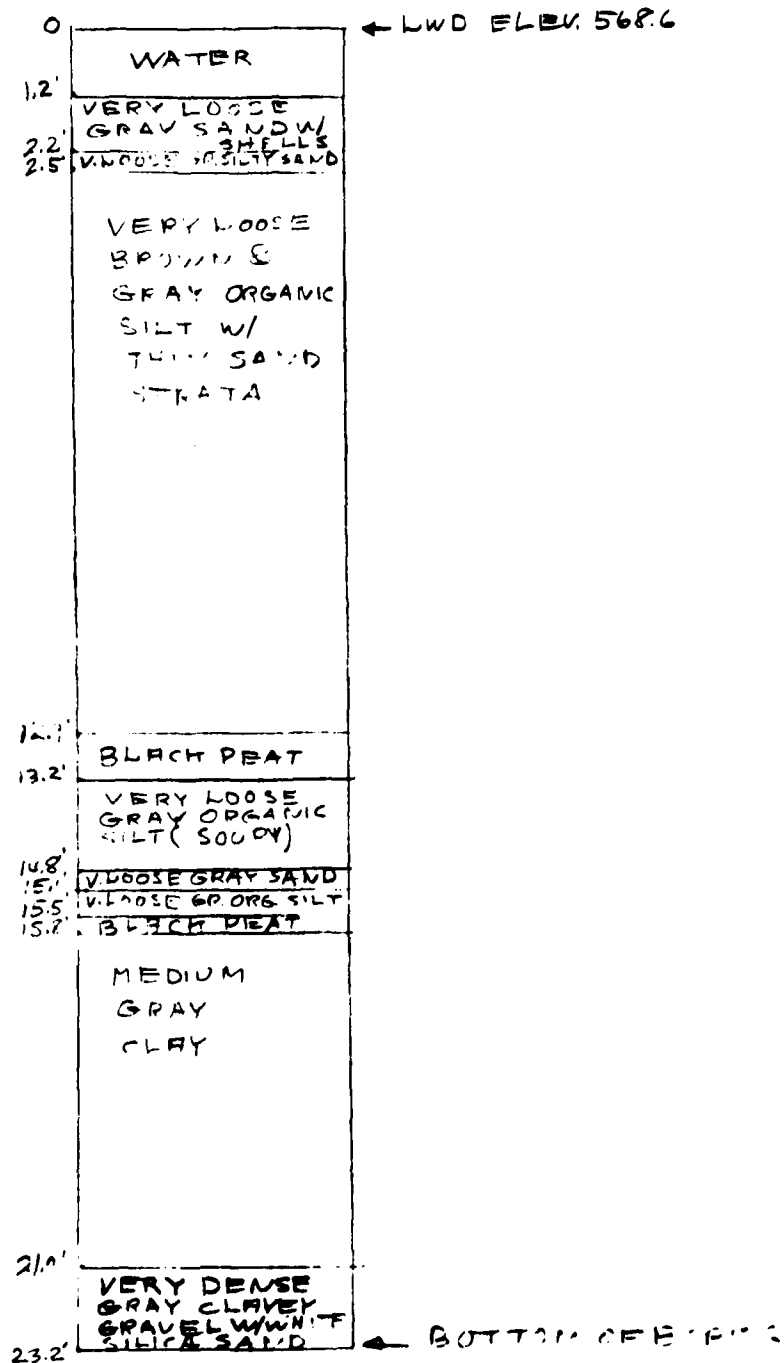


BORING NO. PM1-73

N 192,450.79

E 631.758.86

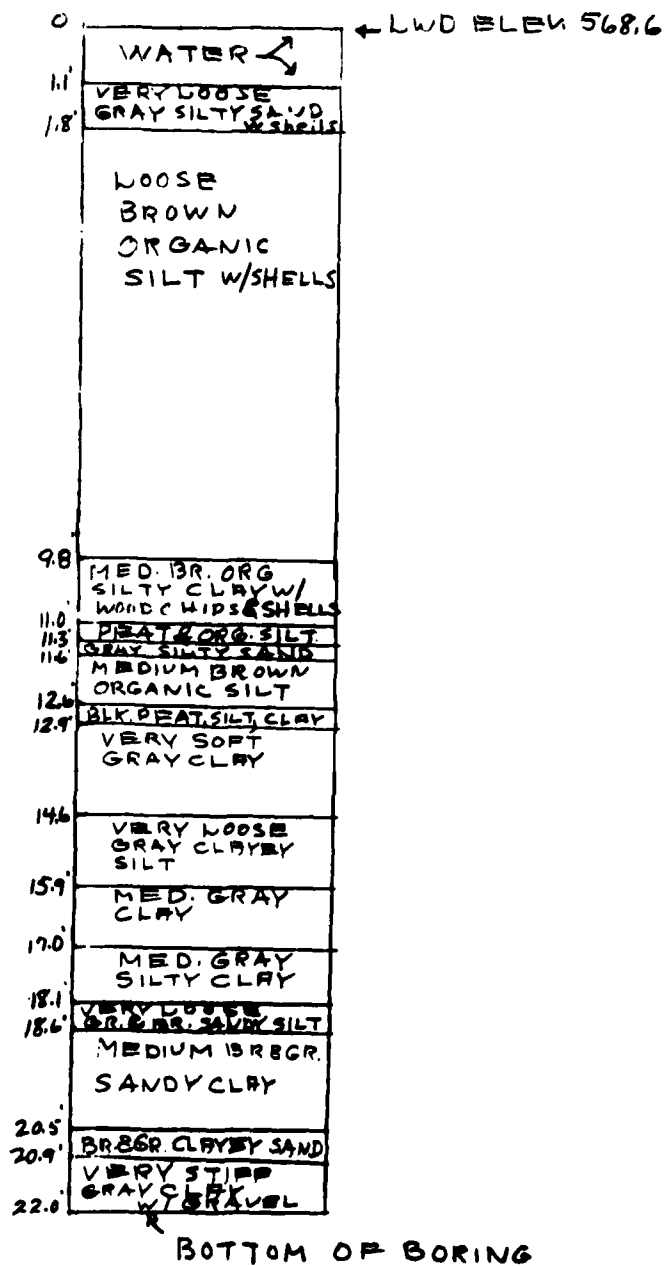
10 MARCH 1973



BORING NO. PM1A-73

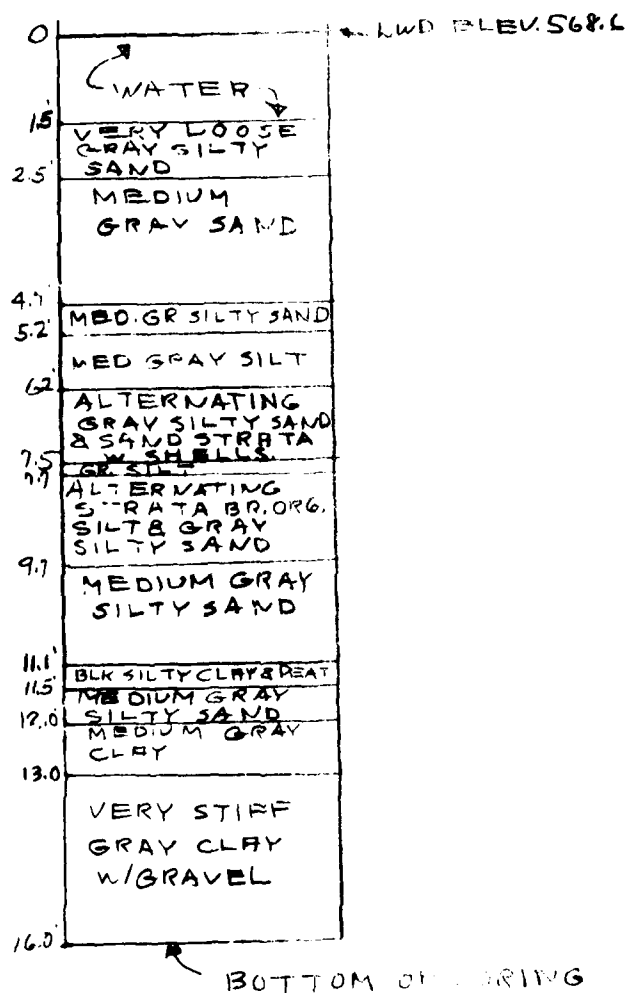
1192, 447.84 E 631, 985.69

1-12 NOVEMBER 1973



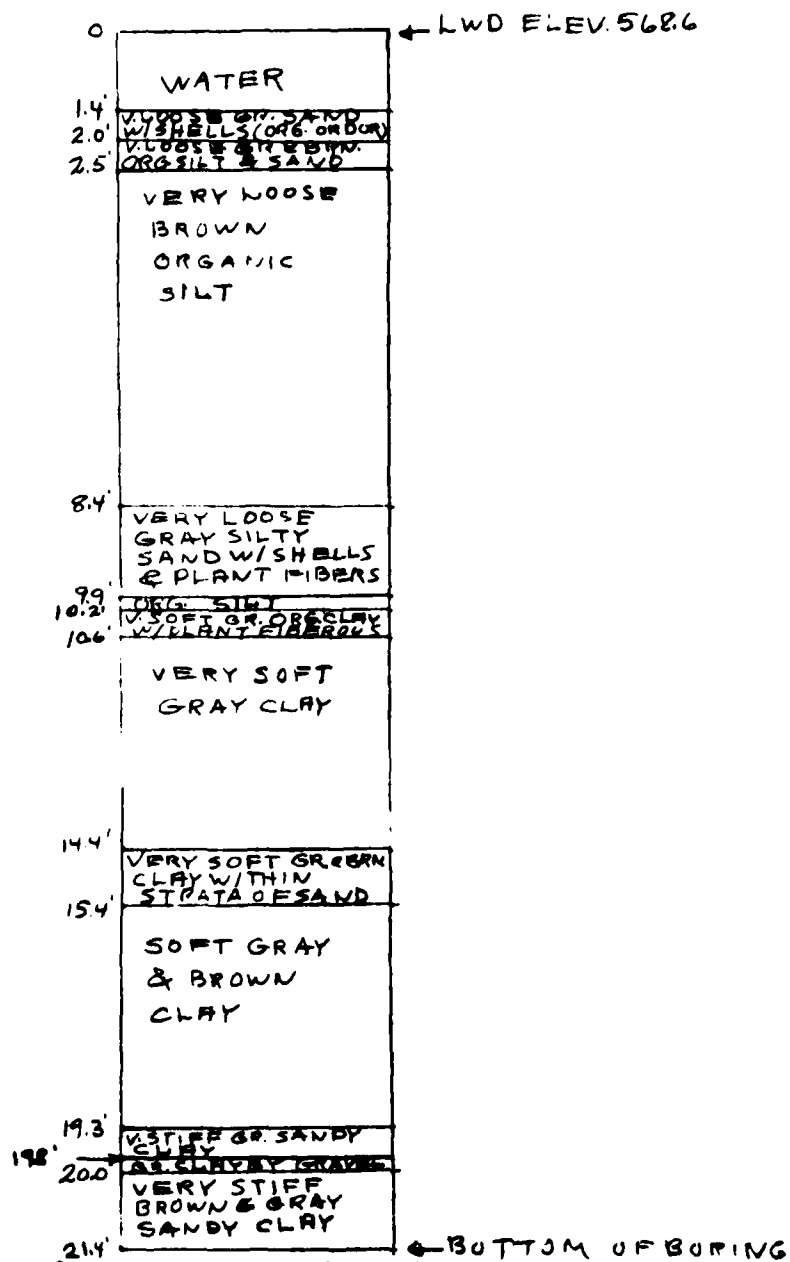
BORING PM 1B-73
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12 NOVEMBER 1973



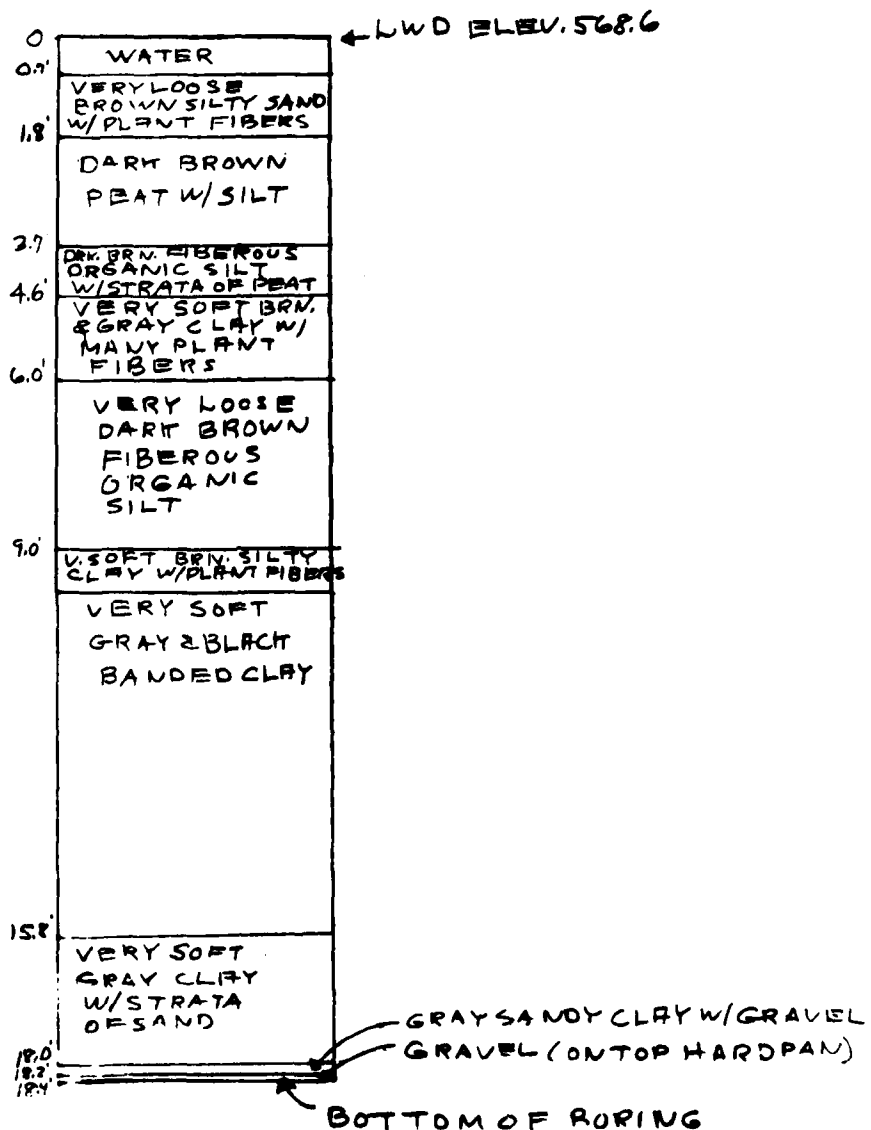
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 N 191, 907.53 E 632, 142.77

7-NOVEMBER-1973



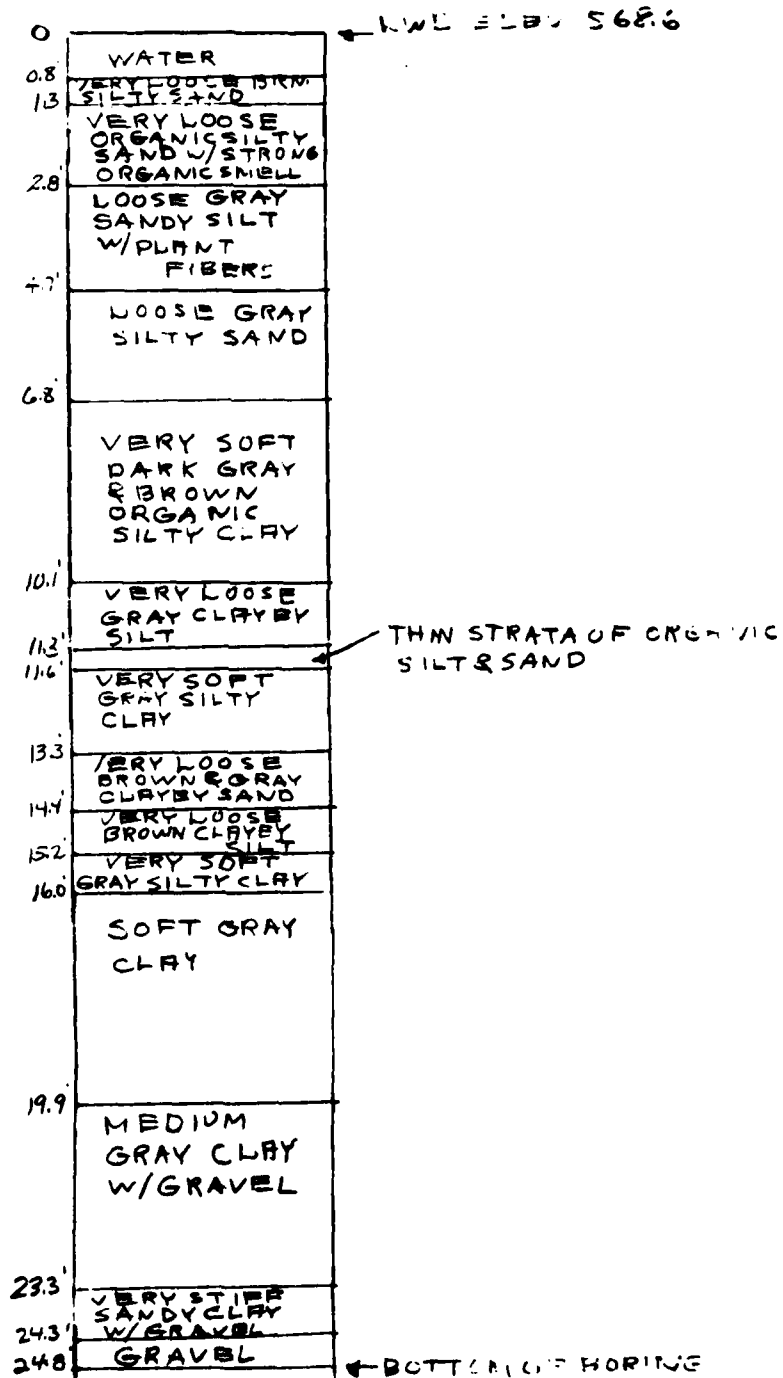
BORING NO. PM 2C-73
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12 DECEMBER - 1973



BORING PM 3-73
N 189, 989.74 E 633 049.47

13 NOVEMBER 1973



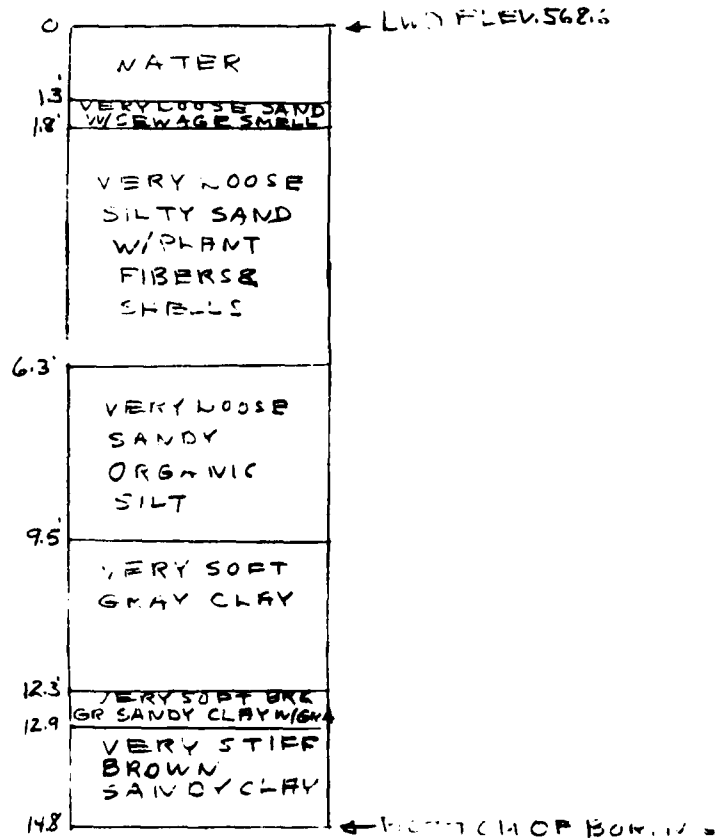
BORING NO. PM3A-73
 N192.031.68 E 633 217.27

13 & 14 NOVEMBER - 1973

0		NWD FLEV 568.6
0.8	WATER	
1.8	VERY LOOSE GRAY SILTY SAND W/ PLANT FIBERS	
2.6	LOOSE GRAY CLAYEY SAND W/ WOOD CHIPS	
6.5	LOOSE GRAY SILTY SAND W/ PLANT FIBERS	
7.5	VERY SOFT ORGANIC SILTY CLAY	
11.8	VERY LOOSE FIBEROUS SANDY ORGANIC SILT	
12.5	BRN FIBEROUS PEAT	
13.1	VERY LOOSE GRAY SAND	
13.4	VERY LOOSE GRAY CLAYEY SILT W/ SAND	
17.8	VERY LOOSE GRAY SANDY SILT (ALMOST LIQUID)	
19.5	VERY LOOSE GRAY SAND	
20.1	VERY LOOSE BRN CLAYEY SILT	
20.5	VERY LOOSE GRAY SAND W/ SILT	
21.4	MEDIUM GR. BRN CLAY	
22.3	BRN. GR SANDY CLAY	
22.8	GRAY SAND W/ SILT	
23.5	MEDIUM GRAY CLAYEY SAND/ CLAY STRATA	WHITE SILICA SANDSTONE
24.7		BOTTOM OF BORING

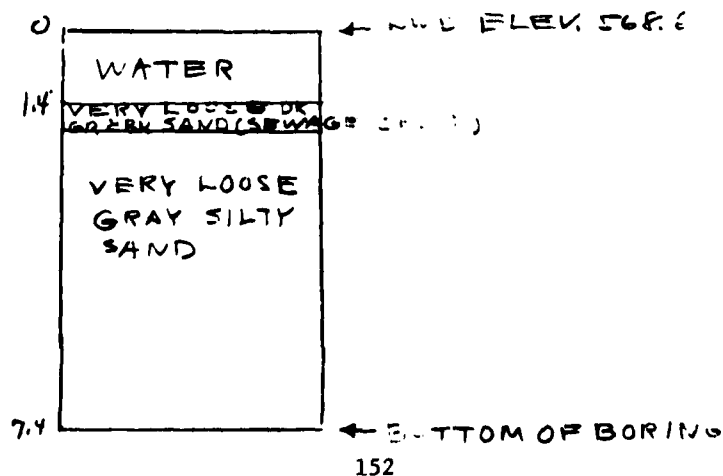
BORING NO. PM3B-73
11 E

17 NOVEMBER - 1973



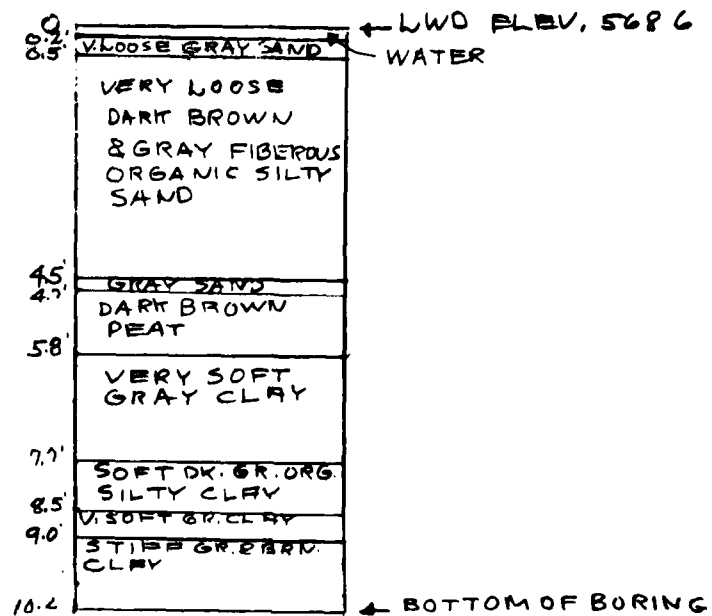
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14 NOVEMBER - 1973



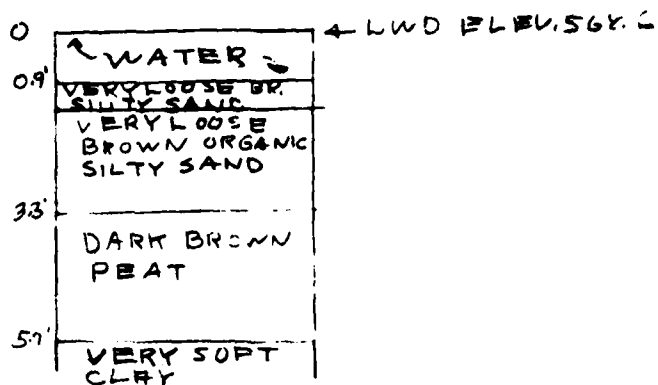
BORING NO. PM 473
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19 & 20 NOVEMBER 1973



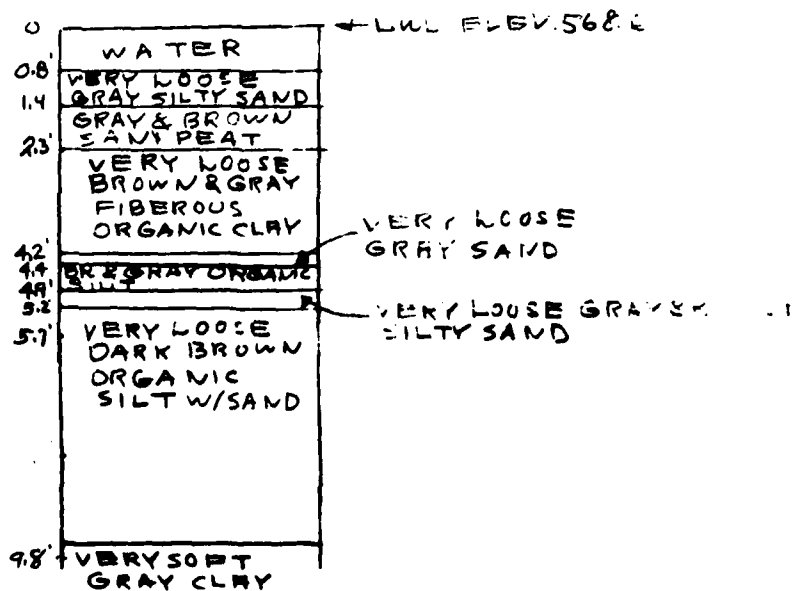
BORING NO. PM 5A-73
 N 185, 986.77 E 130, 932.20

20 NOVEMBER - 1973



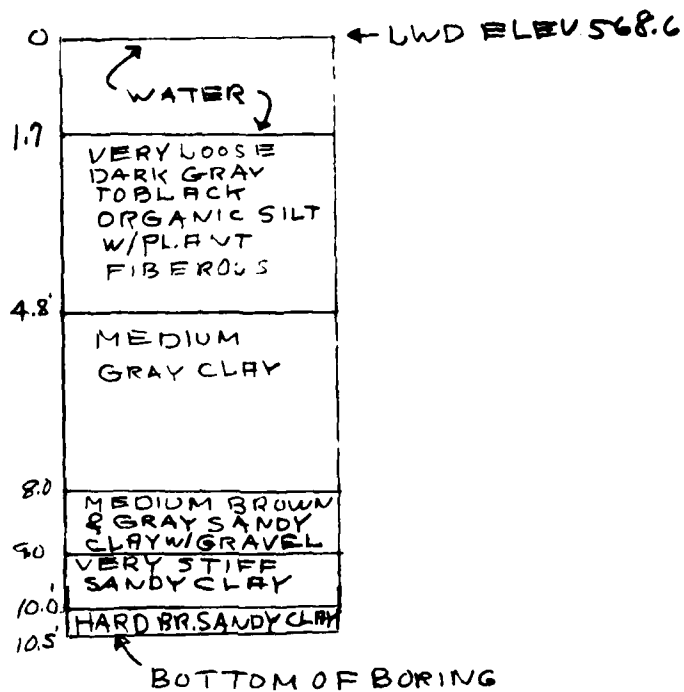
BORING NO. PM 12B-73
 N 140, 762.72 E 632, 22.29

12 DECEMBER 1974



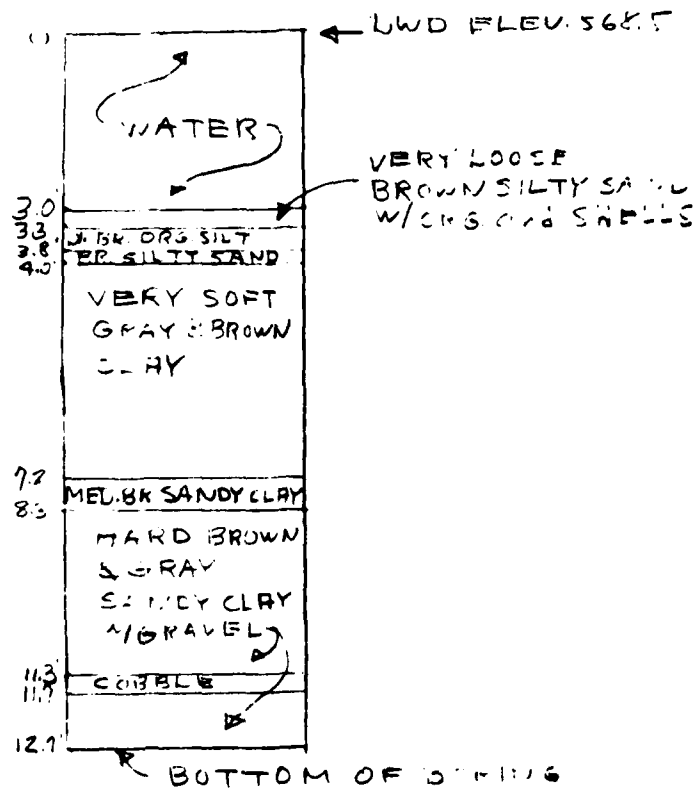
BORING NO. PM 6-73
N 183,636.70 E 627,979.74

7 DECEMBER - 1973



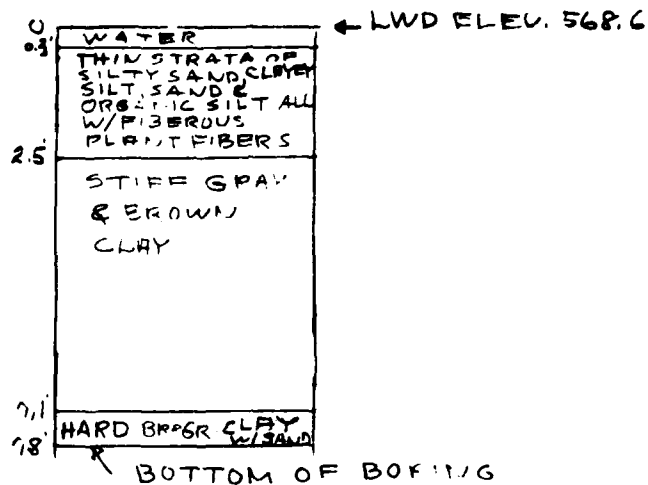
BOHRING NO 7-73
182,095.04 E 625,025.12

7 DECEMBER 1973



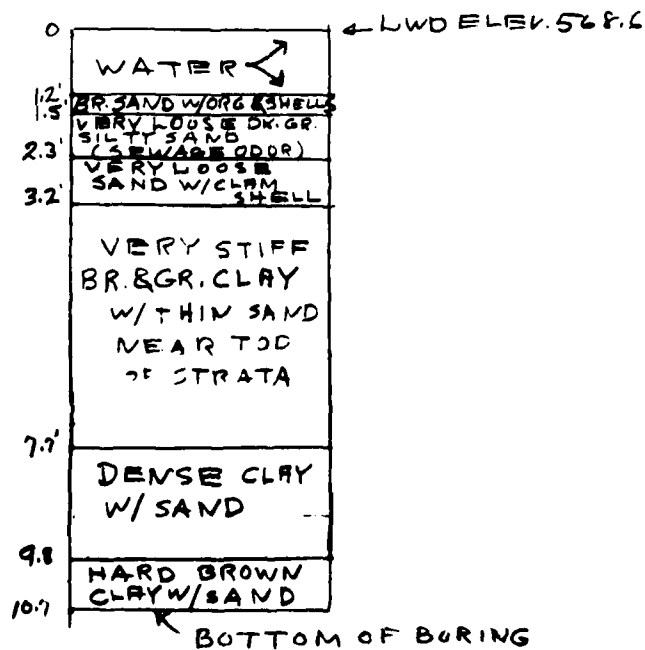
BORING NO PM9-73
N 179° 53.55' E 621, 397.65

12 DECEMBER

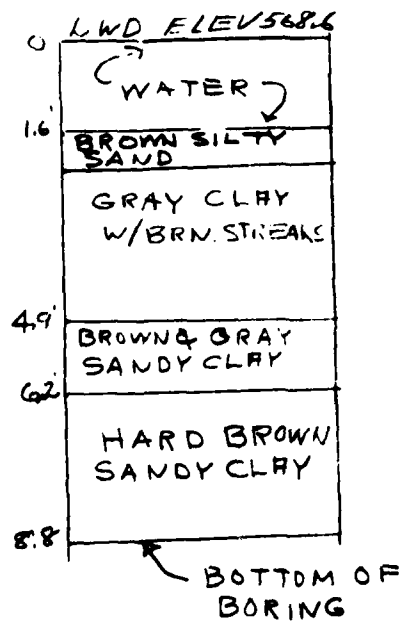


BORING NO 10-73
N 179, 773.35 E 622 806.40

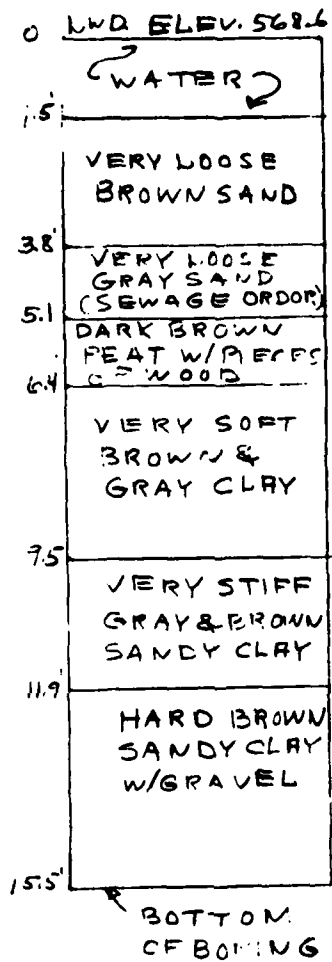
7 DECEMBER - 1973



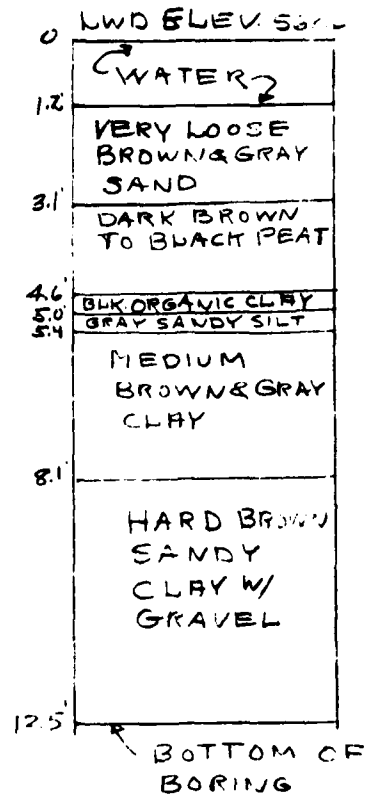
BORING PM 11-73
N 180, 88' 1.77 E 625, 334.99
12 DECEMBER - 1973



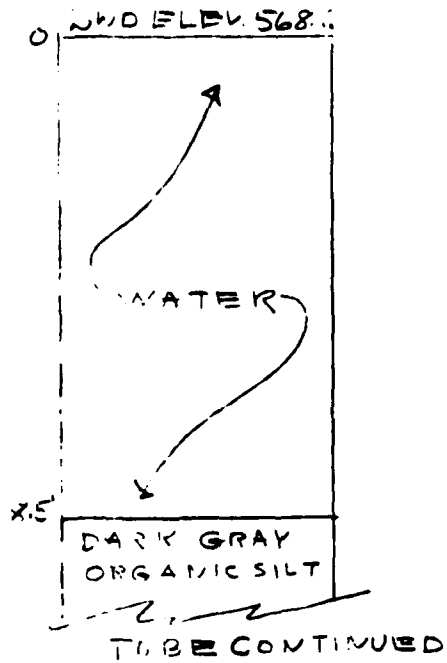
BORING PM 12-73
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9 DECEMBER - 1973



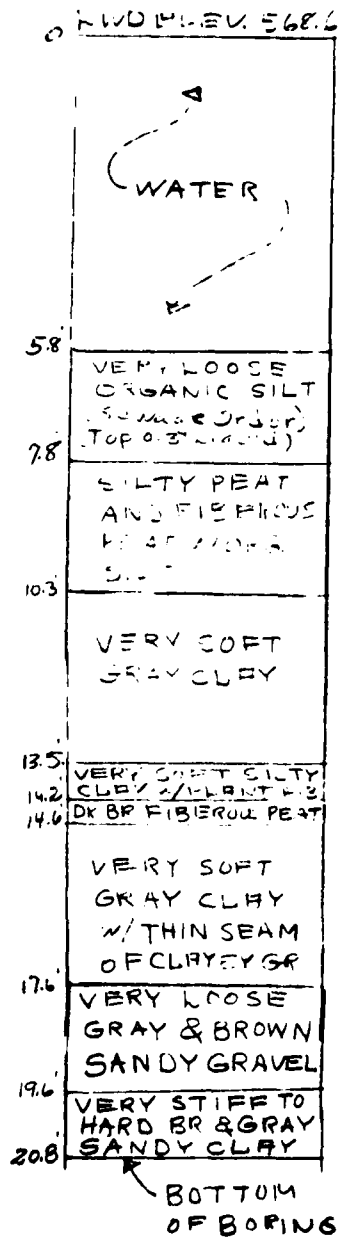
BORING NO PM13-73
N 183,937.00 E 630,608.67
8 DECEMBER - 1963



BORING NO. PM 14-73 (BOTTOM SAMPLE ONLY)
N 184,903 E 631,663
5 DECEMBER 1973

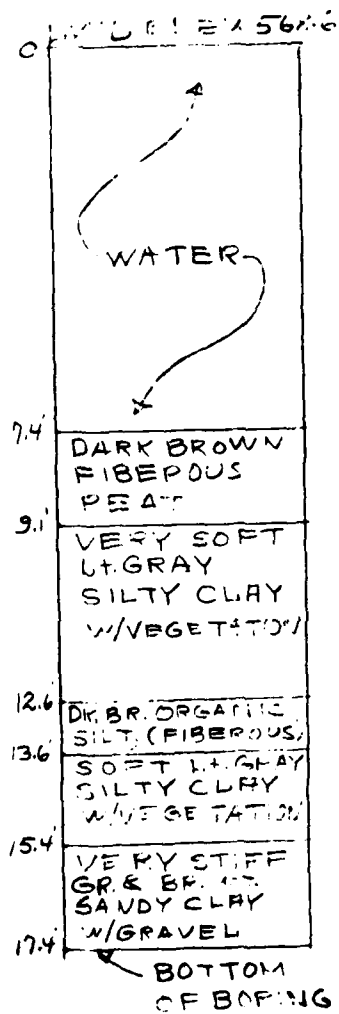


BORING NO. 15-73
 N 187, 151.10 E 632, 830.20
 17 NOVEMBER - 1973



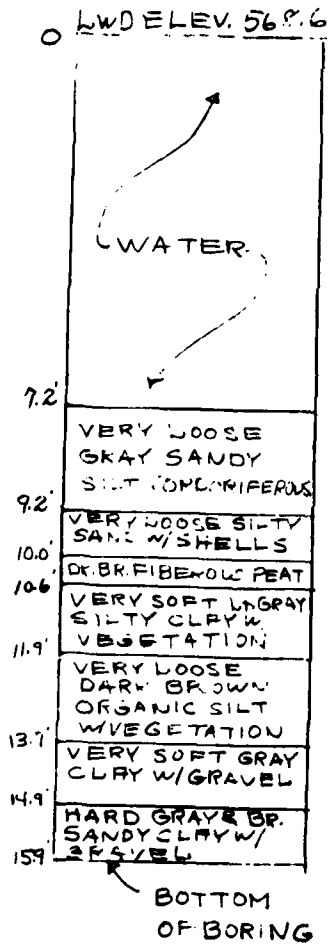
BORING NO. PM 15A-73
1127, 150.41 E 633,040.75

19 NOVEMBER - 1973



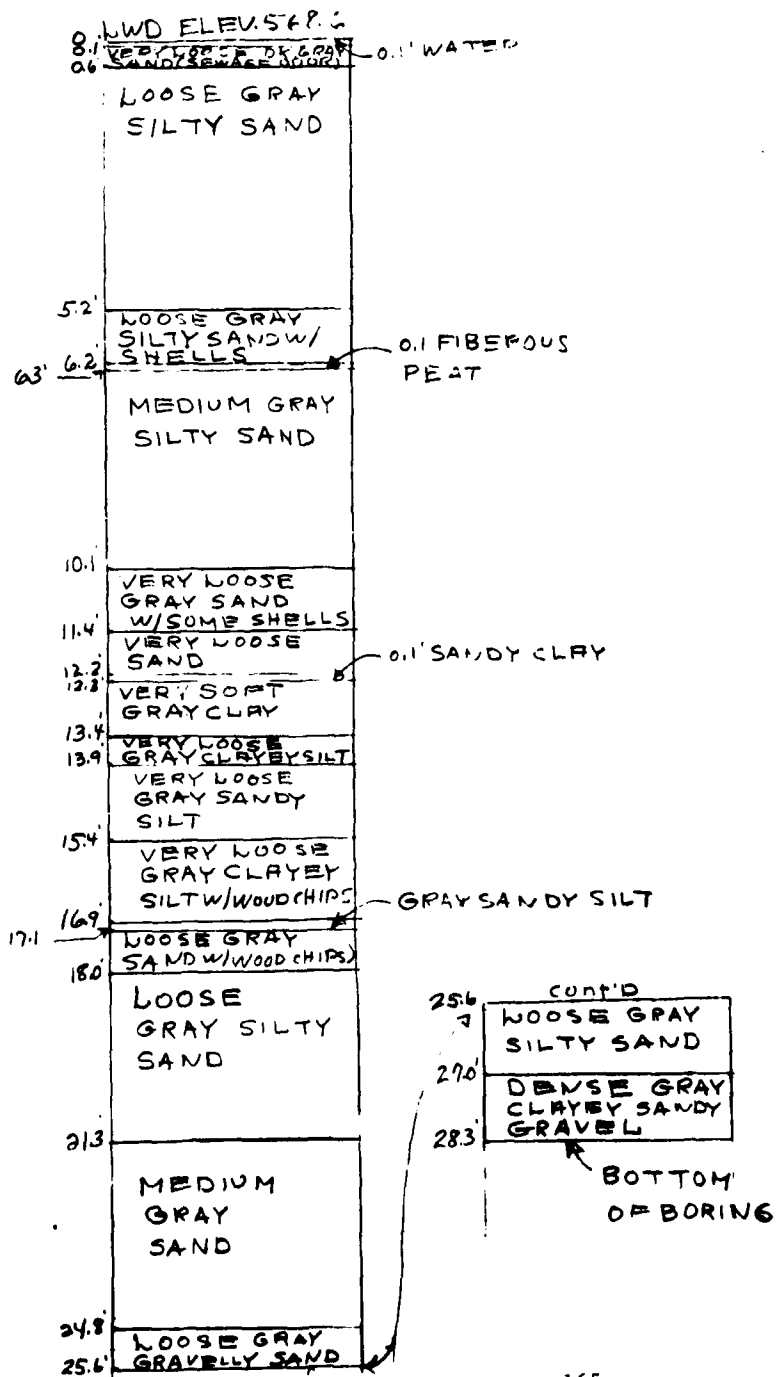
BORING NO. PM15B-73
N 187, 202.35 E 633, 233.74

11 NOVEMBER 1966



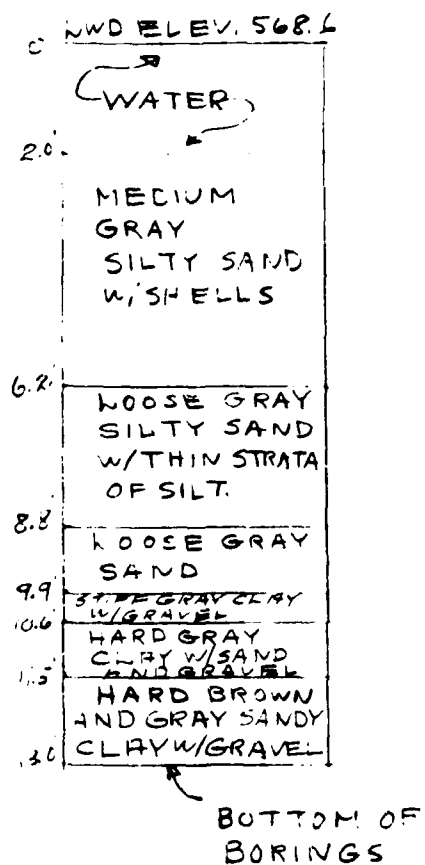
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N189,404.96 E633,986.95

9 NOVEMBER - 1973



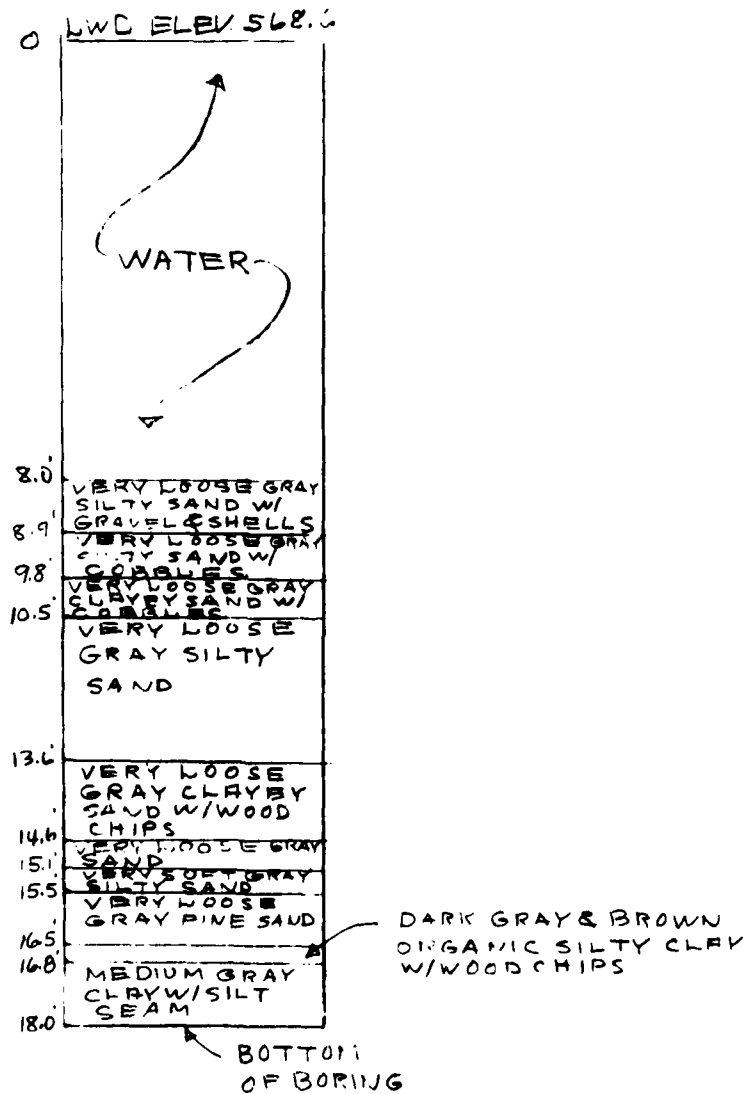
BORING NO PM17-73
N 191, 690.58 E 633, 219.37

17 NOVEMBER - 1973

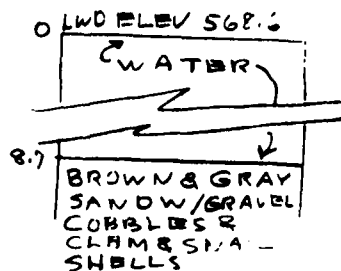


BORING NO. PM18-73
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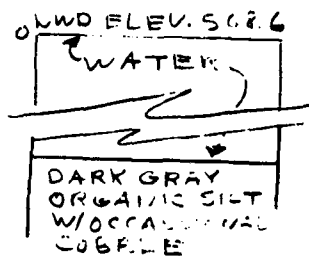
27 NOVEMBER - 1973



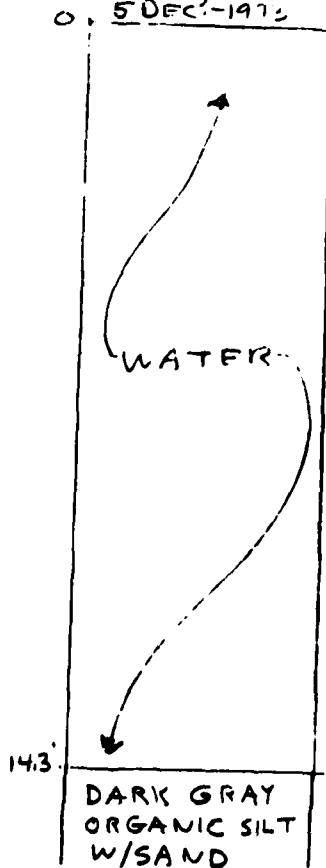
BORING NO. PM 19-73
 N 184, 969.46
 E 635, 680.37
 5 DECEMBER - 1973



BORING NO. PM 20-73
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 E 637, 663.74
 5 DECEMBER - 1973

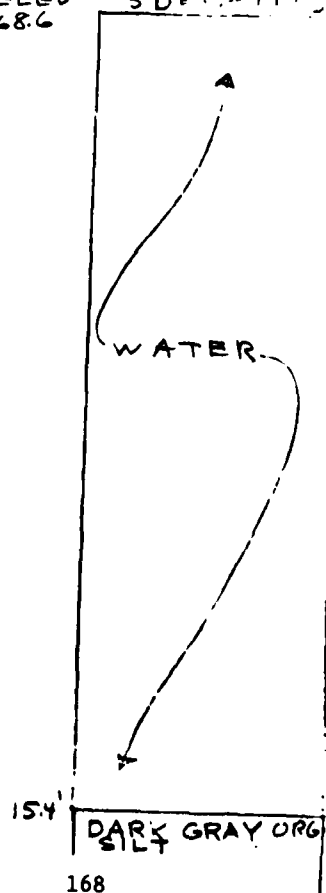


BORING NO. PM 21-73
 N 183, 959.38
 E 639, 636.68
 5 DEC - 1973



LWD. ELEV
 568.6

BORING NO. PM 22-73
 N 184, 149.13
 E 641, 583.00
 5 DEC - 1973

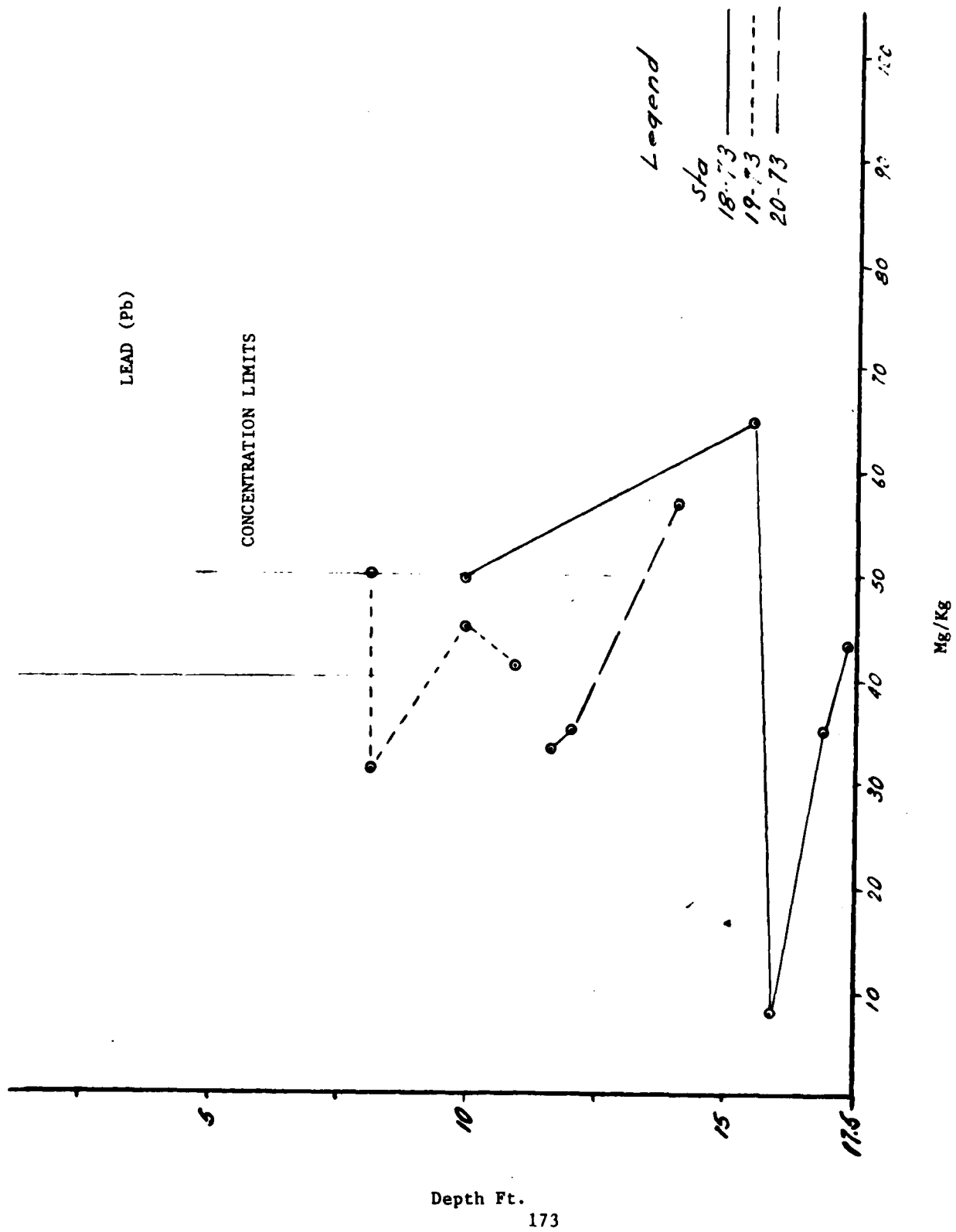


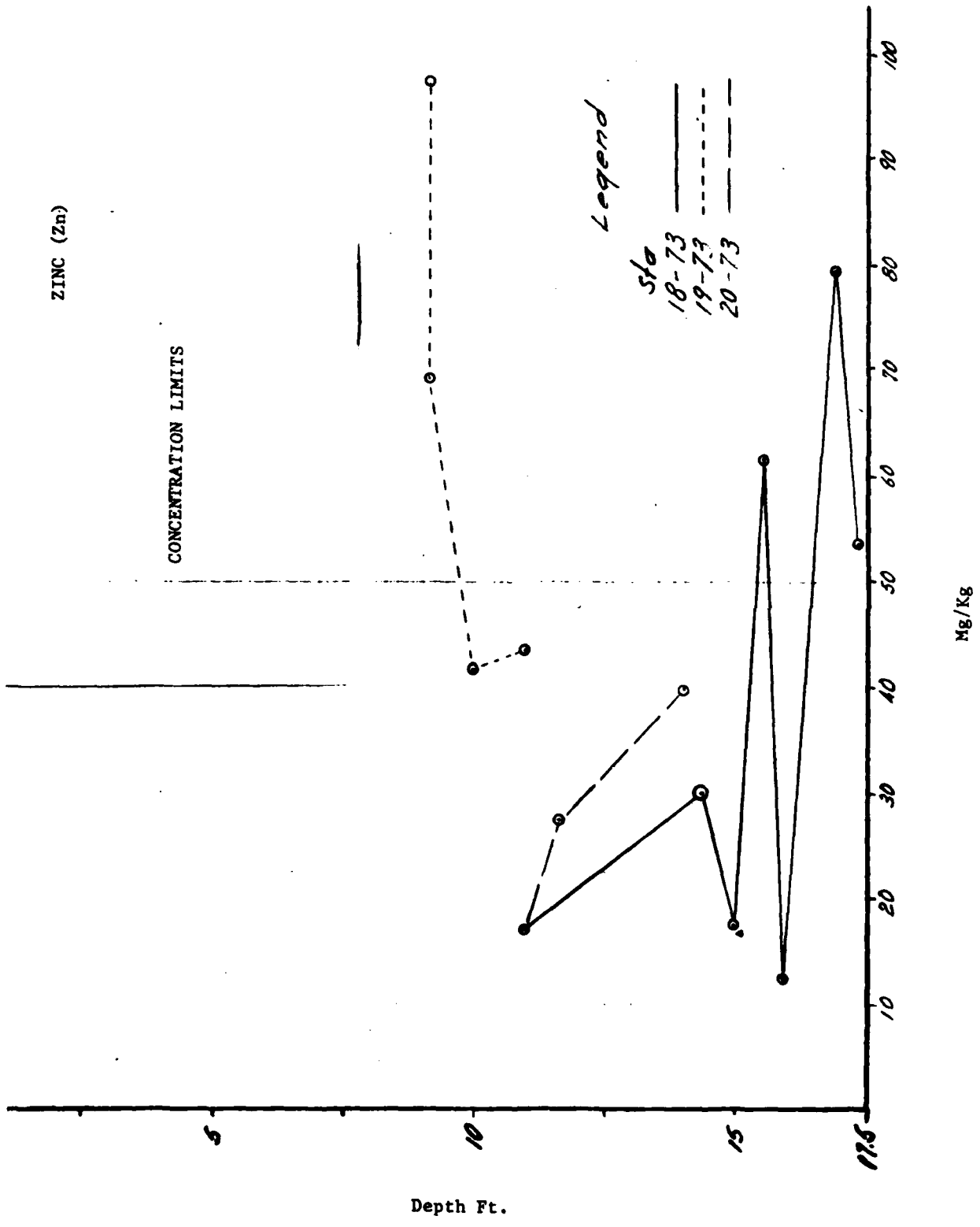
LAB NO.	E.P.A. STAND.	UNITS	19	20	21	22	23	24
STATION			6-73	5A-73	12-73	12-73	12-73	12-73
SAMPLE			5	4	1	3	5	7
DEPTH(FROM)			5.0	3.4	1.5	4.0	5.2	6.4
DEPTH(TO)			5.1	4.8	1.7	4.3	5.6	6.7
C.O.D.	5	%Carbon	0.7	15.5	0.4	<0.4	39.7	0.5
Mg		Mg/Kg	3900	3650	2900	5450	3400	4600
Ni		Mg/Kg	25	11	13	11	15	18
Cd		Mg/Kg	<10	<10	<10	<10	<10	<10
As, Inorganic		Mg/Kg	<5	<5	<5	<5	<5	<5
Cu, Total		Mg/Kg	<10	<10	<10	<10	<10	<10
Cr, Total		Mg/Kg	<10	10	<10	<10	<10	<10
Fe, Total	30,000	Mg/Kg	4000	5110	2905	2885	5250	3750
Pb, Total	50	Mg/Kg	13	11	14	20	15	<10
Hg, Total	1	Mg/Kg	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Zn, Total	50	Mg/Kg	72	44	65	51	45	53
NH ₃		%	.02	.02	.01	<.01	.03	.01
N, KJEL	0.1	%	.08	.95	.40	.31	1.5	.10
Oil-Grease	0.15	%			0.02	0.02		
P, Total	500	Mg/Kg	545	625	420	495	490	530
Solids, T. Vol.	6	%	44	28.4	0.9	0.8	51.4	3.8
Moisture		%	1.7	34.8	2.1	0.2	38.2	1.5

LAB NO.	E.P.A. STAND.	UNITS	13	14	15	16	17	18
STATION			15-73	18-73	18-73	18-73	18-73	6-13
SAMPLE			10	11	12	14	15	2
DEPTH(FROM)			14.6	15.1-	15.5-	16.5-	16.9-	1.7-
DEPTH(TO)			14.9	15.5	15.8	16.8	17.3	2.1
C.O.D.	5	% Carbon	<0.4	3.7	0.5	12.2	0.6	6.4
Mg		Mg/kg	11,050	14,000	6,600	12,200	9900	12,600
Ni		Mg/Kg	13	22	<10	12	11	15
Cd		Mg/kg	<10	<10	<10	<10	<10	<10
As, Inorganic		Mg/Kg	<5	<5	<5	<5	<5	<5
Cu, Total		Mg/Kg	<10	<10	<10	<10	<10	13
Cr, Total		Mg/Kg	<10	<10	<10	<10	<10	14
Fe, Total	30,000	Mg/kg	3475	6115	3155	8860	3535	4900
Pb, Total	50	Mg/kg	49	65	<10	35	43	50
Hg, Total	1	Mg/Kg	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Zn, Total	50	Mg/Kg	16	62	12	79	53	110
NH ₃		%	.01	.02	<.01	.03	.01	.01
N, KJEL	0.1	%	<.02	.20	.02	.38	.05	.41
Oil-Grease	0.15	%						
P, Total	500	Mg/Kg	210	475	205	775	565	670
Solids, T. Vol.	6	%	1.4	7.1	1.0	39.0	3.2	11.2
Moisture		%	0.2	17.0	0.3	13.8	0.8	23.9

LAB NO.	E.P.A. STAND.	UNITS	1	2	3	4	5	6
STATION			19 A 73	19 A 73	19-73	19-73	20 A 73	20 A 73
SAMPLE			1	2	1A	1	5	1
DEPTH (FROM)			8.4 -	10.0 -	8.7	8.7	13.2 -	11.2 -
DEPTH (TO)			9.9	10.9	9.1	9.1	14.0	11.6
C.O.D.	5	% Carbon	0.6	1.0	0.7	0.4	1.6	0.5
Mg		Mg/Kg	11,100	9,700	5,550	5,700	11,550	9,800
Ni		Mg/Kg	13	13	14	16	14	<10
Cd		Mg/Kg	<10	<10	<10	<10	<10	<10
As, Inorganic		Mg/Kg	<5	<5	<5	<5	<5	<5
Cu, Total		Mg/Kg	<10	<10	<10	<10	<10	<10
Cr, Total		Mg/Kg	<10	<10	<10	<10	<10	<10
Fe, Total	30000	Mg/Kg	4445	3775	2310	1410	2795	3200
Pb, Total	50	Mg/Kg	44	41	31	50	57	33
Hg, Total	1	Mg/Kg	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Zn, Total	50	Mg/Kg	42	43	72	100	40	28
NH ₃		%	.01	.01	<.01	<.01	.01	.01
N, KJEL	0.1%	%	.04	.09	.04	.07	.06	.03
Oil-Grease	0.15	%	<.01	<.01	<.01		<.01	<.01
P, Total	500	Mg/Kg	335	520	1355	800	480	1615
Solids, T. Vol.	6	%	2.5	2.8	1.1	2.1	2.6	1.6
Moisture		%	15.8	16.9	12.1	17.2	18.6	9.6

LAB NO.	E.P.A. STAND.	UNITS	7	8	9	10	11	12
STATION			20473	4-73	4-73	4-73	18-73	18-73
SAMPLE			2	3	4	6	4	9
DEPTH (FROM)			11.6-	0.5-	5.3-	5.8-	10.6-	14.3-
DEPTH (TO)			12.0	0.6	5.4	5.9	10.9	14.6
C.O.D.	5	% Carbon	<0.4	3.0	53.6	61.4	<0.4	1.3
Mg		Mg/Kg	10,850	11,950	5700	4400	6800	10,650
Ni		Mg/Kg	<10	14	14	<10	<10	10
Cd		Mg/Kg	<10	<10	<10	<10	<10	<10
As, Inorganic		Mg/Kg	<5	<5	<5	<5	<5	<5
Cu, Total		Mg/Kg	<10	<10	<10	<10	<10	<10
Cr, Total		Mg/Kg	40	<10	12	<10	<10	<10
Fe, Total	30 000	Mg/Kg	2990	4445	7810	4500	1840	5000
Pb, Total	50	Mg/Kg	35	42	29	50	42	50
Hg, Total	1	Mg/Kg	<0.2	<0.2	<0.2	0.26	<0.2	<0.2
Zn, Total	60	Mg/Kg	18	43	24	58	17	30
NH ₃		%	.01	<.01	.02	.03	.01	.01
N, KJEL	0.1	%	.04	.15	2.3	2.3	<.02	.04
Oil-Grease	0.15	%	<.01					
P, Total	500	Mg/Kg	165	405	600	405	160	275
Solids, T. Vol.	6	%	1.4	31.9	54.1	71.2	0.9	3.0
Moisture		%	6.0	49.5	79.3	81.2	0.2	1.6





CHEMICAL OXYGEN DEMAND (COD)

CONCENTRATION LIMITS

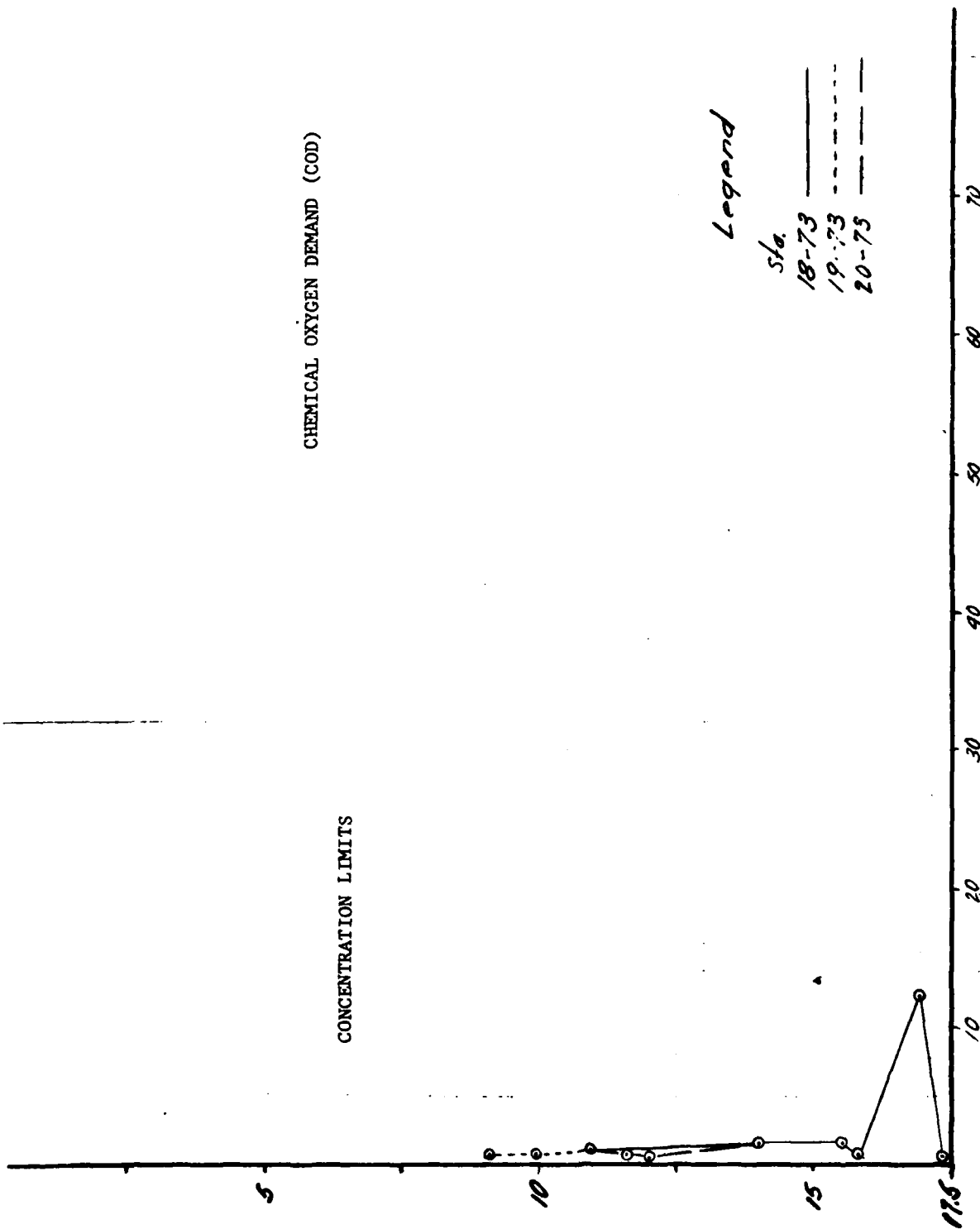
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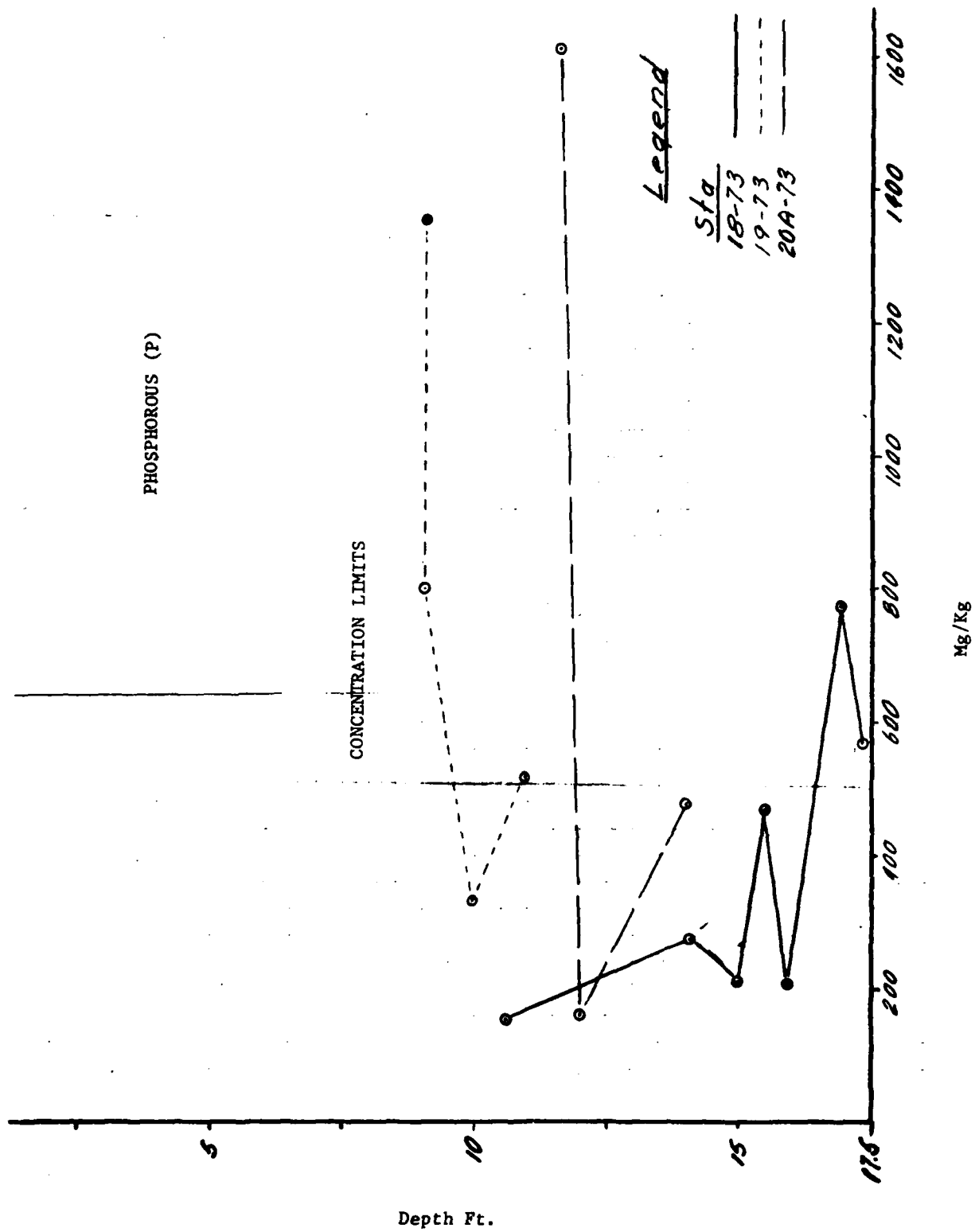
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Percent

Depth Ft.

175





ATTACHMENT 5

WATERFOWL IDENTIFIED IN
POINTE MOUILLEE WILDLIFE AREA

WATERFOWL IDENTIFIED IN
POINTE MOUILLEE WILDLIFE AREA

1. Whistling Swan (Olor columbianus)
2. Canada Goose* (Branta canadensis)
3. Blue Goose (Chen caerulescens)
4. Snow Goose (Chen hyperborea)
5. Black Duck* (Anas rubripes)
6. Mallard* (Anas platyrhynchos)
7. American Widgeon (Mareca americana)
8. Gadwal* (Anas strepera)
9. Blue Wing Teal* (Anas acuta)
10. Green Wing Teal (Anas carolinensis)
11. Pintail (Anas acuta)
12. Wood Duck* (Aix sponsa)
13. Shoveler (Spatula clypeata)
14. Greater Scaup (Aythya marila)
15. Lesser Scaup (Aythya affinis)
16. Canvasback (Aythya valisineria)
17. Redhead (Aythya americana)
18. Ringneck Duck (Aythya collaris)
19. Bufflehead (Bucephala albeola)
20. Old Squaw (Clangula hyemalis)
21. Common Merganser (Mergus merganser)
22. Ruddy Duck (Oxyura jamaicensis)
23. Common Scoter (Oidemia nigra)
24. White-winged Scoter (Melanitta deglandi)
25. Surf Scoter (Melanitta perspicillata)
26. Hooded Merganser (Lophodytes cucullatus)
27. Red-breasted Merganser (Mergus serrator)

*Common nesting birds on Pointe Mouillee State Game Area.
Observations made by Resident Wildlife Biologist.

WATER, MARSH AND SHORE BIRDS

1. Common Loon (Gavia immer)
2. Pied-billed Grebe (Podilymbus podiceps)
3. Horned Grebe (Podiceps auritus)
4. Double-crested Cormorant (Phalacrocorax auritus)
5. Black-crowned Night Heron (Nycticorax nycticorax)
6. Great Blue Heron (Ardea herodias)
7. Green Heron* (Butorides viroscens)
8. Common Egret (Casmerodius albus)
9. American Bittern* (Botaurus lentiginosus)
10. Least Bittern* (Ixobrychus exilis)
11. King Rail* (Rallus elegans)
12. Virginia Rail* (Rallus limicola)
13. Sora Rail* (Porzana carolina)
14. American Coot* (Fulica americana)
15. Killdeer* (Charadrius vociferus)
16. Common Gallinule* (Gallinula chloropus)
17. Ruddy Turnstone (Arenaria interpres)
18. Semipalmated Plover (Charadrius semipalmatus)
19. Piping Plover (Charadrius melodus)
20. Black-bellied Plover (Squatarola squatarola)
21. Marsh Wren (Telmatodytes palustris iliacus)
22. American Golden Plover (Pluvialis dominica)
23. American Woodcock* (Philohela minor)
24. Common Snipe* (Capella gallinago)
25. Long-billed Dowitcher (Limnodromus scolopaceus)
26. Short-billed Dowitcher (Limnodromus griseus)
27. Wimbrel (Numenius phaeopus)
28. American Avocet (Recurvirostra americana)
29. Willet (Catoptrophorus semipalmatus)
30. Greater Yellow Legs (Totanus melanoleucus)
31. Lesser Yellow Legs (Totanus flavipes)
32. Spotted Sandpiper (Actitis macularia)
33. Solitary Sandpiper (Tringa solitaria)
34. Dunlin (Erolia alpina)
35. Sanderling (Crocethia alba)
36. White-rumped Sandpiper (Erolia fuscicollis)
37. Knot (Calidris canutus)
38. Pectoral Sandpiper (Erolia melanotos)
39. Wilson Phalarope (Steganopus tricolor)

*Common nesting birds on Pointe Mouillee State Game Area.
Observations made by Resident Wildlife Biologist.

AD-A107 369

CORPS OF ENGINEERS DETROIT MI DETROIT DISTRICT
CONFINED DISPOSAL FACILITY AT POINTE MOUILLEE FOR DETROIT AND R--ETC(U)
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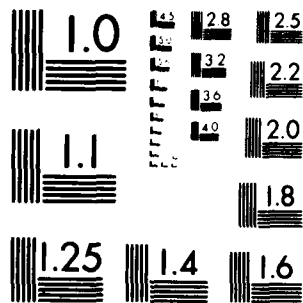
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MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

GULLS AND TERNS

1. Great Black-backed Gull (Larus marinus)
2. Ring-billed Gull (Larus delawarensis)
3. Bonaparte's Gull (Larus philadelphia)
4. Herring Gull (Larus argentatus)
5. Common Tern (Sterna hirundo hirundo)
6. Caspian Tern (Hydroprogne caspia)
7. Black Tern (Chlidonias nigra surinamensis)

Bald Eagle and Osprey formerly common along the barrier beach are only transient visitors today.

MAMMALS OBSERVED AT POINTE MOUILLEE

1. Raccoon (Procyon lotor)
2. Opossum (Didelphis marsupialis)
3. Fox (Vulpes fulva)
4. Mink (Mustela vison)
5. Muskrat (Ondatra zibethica)
6. Deer (Odocoileus virginianus)
7. Woodchuck (Marmota monax)
8. Skunk (Mephitis mephitis)

ATTACHMENT 6

Survey of Vegetation - 31 July 1972

AQUATIC PLANTS

FLOWERING PLANTS

WOODY PLANTS

Survey of Vegetation at Pointe Mouillee State Game Area
31 July 1972

Aquatic Plants

<u>Plants</u>	<u>Dominants</u>
Phragmites	
Cutgrass (Leersia)	
Blue joint grass (Calamagrostis)	
Cattails (Typha latifolis)	x
Sago pondweed (potamogeton pectinatus)	x
Floating leaf pondweed (Potamogeton natans)	x
Flowering rush (Butomus umbellatus)	
Smartweed (Polygonum)	x
Duckweed (Lemna)	x
Wild Oatgrass (Avena)	
Sedge (Scirpus)	
Sedge (Carex)	
Water Plantain (Alisma)	
Bladderwort (Utricularia)	
Coontail (Ceratophyllum)	
Myrophyllum	x
Green Algae, Filamentous (Cladophora)	
Bur-reed (Sparganium)	

Flowering Plants

Milkweed (Asclepias incarnata)	none
Butterfly weed (Asclepias tuberosa)	
Ironweed (Veronia noveboracensis)	
Sweet clover (Melilotus sp)	
Queen Anne's Lace (Daucus carota)	
Blue Vervain (Verbena hastata)	
Dock (Rumex, sp)	
Burdock (Arctium)	
Swamp Thistle (Cirsium muticum)	
Canadian thistle (Cirsium arvense)	
Golden Glow (Rudbeckia laciniata)	
Horsetail rush (Equisetum fluviatile)	
Skullcap (Scutellaria sp)	
Water lily, white (Nymphaea)	
Boneset (Eupatorium perfoliatum)	
Water lily, yellow (Nuphar)	
Marsh (cord) grass (Spartina)	
Morning-glory (Convolvulus arvensis)	
Dodder (Cuscuta)	
Silverleaf Cinquefoil (Potentilla)	
Nightshade (Solanum)	
Sow Thistle (Sonchus)	
Goldenrod (Solidago)	
Jewelweed (Impatiens)	
Cypress spurge (Euphorbia)	

Flowering Plants

<u>Plants</u>	<u>Dominants</u>
Plantain (Plantago)	none
Mint (Labiatae)	
False nettle (boehmeria)	
Nettle (Urtica)	
Knotweed (Polygonum)	
Smartweed (Polygonum)	
Four O'Clock (Mirabilis)	
Indian hemp (Apocynum)	
Loosestrife (Lythrum)	
Loosestrife (Lysimachia)	

Woody Plants

<u>Bushes</u>	<u>Dominants</u>
Black raspberries (Rubus, sp)	none
Red osier dogwood (Cornus stolonifera)	
Elderberry (Sambucus)	
Grape (Vitus)	
Virginia creeper (Parthenocissus)	
Hibiscus or mallow (Hibiscus)	

Trees

Silver Maple (Acer saccharinum)	none
Box Elder (Acer negundo)	
Apple (Malus)	
Peach (Prunus persica)	
Mulberry (Morus)	
Bronze Beech (Fagus)	
Black birch (Betula nigra)	
Cottonwood (Populus deltoides)	
Black Willow (Salix nigra)	
Hawthorne (Crataegus)	
Elm (Ulmus)	
Staghorn sumac (Rhus typhina)	
Ash (Fraxinus)	

ATTACHMENT 7

Concentration of Pollutants in
Bottom Sediments of Detroit and
Rouge Rivers - 1971.

Kjeldahl Nitrogen

Phosphorus

Mercury

Lead

Zinc

Oil and Grease

Volatile Solids

Chemical Oxygen Demand

Table II-5 : Concentration of Nutrients in Bottom Sediments Expressed in Percent Dry Weight. Only Total Kjeldahl Nitrogen is on the EPA Mandatory List of Parameters.

	Date	Number of Samples	Average value % dry wt.	Range in value % dry wt.	% values exceeding EPA criteria
Total Kjeldahl Nitrogen (EPA Criterion 0.10 Percent Dry Wt. Basis)					
Area sampled					
<u>Detroit River:</u>					
Detroit River-L. Erie (East Outer Channel)	7-8-68	10	.017	.0085-.027	0
Trenton Channel	5-70	3	<u>.146</u> ¹	.079-.265	33
Ballards Reed Channel	5-70	1	.079	-	-
Amherstburg Channel	5-70	1	<u>.109</u>	-	-
East Outer Channel	5-70	8	<u>.176</u>	.150-.210	100
<u>Rouge River:</u>					
Rouge River	7-67	14	.014	.0016-.038	0
Rouge River (Old Channel Cutoff)	7-67	10	.0068	.0038-.015	0
<u>Total Phosphate Phosphorus - (No criteria developed)</u>					
<u>Detroit River:</u>					
Detroit River-L. Erie (East Outer Channel)	7-68	11	.18	.11-.29	
<u>Rouge River:</u>					
Rouge River	9-68	5	.412	.23-.71	

¹ Underscored values exceed the EPA criterion.

Nutrients (Cont'd)		(EPA Criterion 0.11 Percent Dry Wt. Basis)		
Area sampled				
	Date	Number of Samples	Average value % dry wt.	Range in value % dry wt. EPA criteria
<u>Total Phosphate Phosphorus (Cont'd)</u>				
Rouge River	7-67	14	.272	.025-.50
Rouge River (Old Channel Cutoff)	7-67	12	.112	.019-.140
<u>Total Phosphorus -</u>	(No criteria developed)			
<u>Detroit River:</u>				
Trenton Channel	5-70	3	.181	.094-.33
Ballards Reef Channel	5-70	1	0.36	
Livingstone Channel	5-70	1	.054	
Amherstburg Channel	5-70	1	.025	
East Outer Channel	5-70	8	.154	.110-.230

¹Underscored values exceed the EPA criterion.

Table II-6 : Concentrations of Heavy Metals in Bottom Sediments,
Expressed in Percent Dry Weight, Included in the
EPA Mandatory Criteria.

Area sampled		Number Date of Samples	Average value % dry wt.	Range in value % dry wt.	% values exceeding EPA criteria
Mercury (EPA Criterion 0.0001 Percent Dry Wt. Basis)					
<u>Detroit River:</u>					
Lower Detroit River (Below Mouth of Rouge River - Excluding Trenton Channel)	3-4-70	5	<u>.0002</u>	.00006- .00044	80
Trenton Channel Area		29	<u>.00143</u>	.00008- .0086	97
Upper Detroit River (Upstream from Rouge River)		5	<u>.00011</u>	.00007- .00014	60
Ballards Reef Channel		1	.00004	-	-
Livingstone Channel		2	.0001	-	0
Amherstburg Channel		1	.00003	-	-
East Outer Channel		8	<u>.00018</u>	.00011- .00026	100
(Near Detroit River Light)		2	<u>.00022</u>	.00014- .00029	100
Upper Detroit River (Michigan WRC) (Upstream from Rouge River)	4-5-70	3	<u>.00014</u>	.000009- .00039	33
Detroit River (Below Mouth of Rouge River Excluding Trenton Channel)		9	<u>.0021</u>	.00011- .0059	100
Trenton Channel		5	<u>.0066</u>	.00015- .0211	100

¹ Underscored values exceed the EPA criterion.

Area sampled		Number Date of Samples	Average value % dry wt.	Range in value % dry wt.	% values exceeding EPA criteria
<u>Mercury (Cont'd)</u> (EPA Criterion 0.0001 Percent Dry Wt. Basis)					
<u>Rouge River:</u>					
(Near Mouth)		1	.00008	-	-
(From Mouth -3.1 Miles Upstream)	3-4-70	6	.0001	.00005- .0001	0
<u>Lake Erie:</u>					
(Near Mouth of Huron River)	4-70	2	<u>.00018</u>	.00018- .00018	100
<u>Lead - (EPA Criterion 0.005 % Dry Wt. Basis)</u>					
<u>Detroit River:</u>					
Michigan WRC (Upstream from Rouge River)	4-5-70	3	.00023	.00001- .0006	0
Detroit River (Below Mouth of Rouge River Excluding Trenton Channel)	4-5-70	8	.00074	.00004- .0003	0
Trenton Channel	4-5-70	5	.00023	.00008- .00039	0
East Outer Channel (Near Detroit River Light)	4-5-70	2	<u>.011</u>	.0059- .016	100
<u>Rouge River:</u>					
(Near Mouth)	4-5-70	1	.00069	-	-

¹ Underscored values exceed the EPA criterion.

Area sampled	Date	Number of Samples	Average value % dry wt.	Range in value % dry wt.	% values exceeding EPA criteria
Zinc - (EPA Criterion 0.005 Percent Dry Wt. Basis)					
<u>Detroit River:</u>					
Michigan WRC (Upstream from Rouge River)	4-5-70	3	<u>.050</u> ¹	.0028- .144	33
Lower Detroit River (Below Mouth of Rouge River Excluding Trenton Channel)	4-5-70	8	<u>.063</u>	.0082- .114	100
Trenton Channel	4-5-70	5	<u>.069</u>	.0045- .1132	80
East Outer Channel (Near Detroit River Light)	4-5-70	2	.0375	.015- .06	100
<u>Rouge River:</u>					
(Near Mouth)	4-5-70	1	<u>.169</u>	-	-

¹ Underscored values exceed the EPA criterion

Table II-7 : Concentrations of Oil and Grease in Bottom Sediments
Expressed in Percent on Dry Weight Basis.

Area sampled	Date	Number of Samples	Average value % dry wt.	Range in value % dry wt.	% values exceeding EPA criteria
(EPA Criterion 0.15 Percent Dry Wt. Basis)					
<u>Detroit River:</u>					
Detroit River-L. Erie (East Outer Channel)	7-9-68	16	<u>0.84</u>	.062- 1.70	93.7
Trenton Channel	5-70	3	<u>0.95</u>	0.13- 2.5	66
Ballards Reef Channel	5-70	1	.021	-	-
Livingstone Channel	5-70	1	.085	-	-
Amherstburg Channel	5-70	1	.036	-	-
East Outer Channel	5-70	8	<u>0.59</u>	0.39- 0.84	100
<u>Rouge River:</u>					
Rouge River	9-68	5	<u>7.58</u>	-	100
Rouge River	7-67	14	<u>3.49</u>	0.10- 6.0	92.9
Rouge River (Old Channel Cutoff)	7-67	12	<u>1.73</u>	0.10- 6.0	91.7

Table II-8: Concentrations of Volatile Solids in Bottom Sediments
Expressed in Percent on a Dry Weight Basis

Area sampled	Number Average Range in % values				
	Date	of	value	value	% values exceeding
	Samples		% dry wt.	% dry wt.	EPA criteria
(EPA Criterion 6 percent Dry Wt. Basis)					
<u>Detroit River:</u>					
Detroit River-L. Erie (East Outer Channel)	7-8-68	16	<u>7.1</u>	2.1 - 13.0	56.3
<u>Rouge River:</u>					
Rouge River	7-67	14	<u>17</u>	6 - 20	92.9
Rouge River (Old Channel Cutoff)	7-67	12	<u>16.2</u>	10 - 35	100

Table II-9: Chemical Oxygen Demand (COD), in bottom sediments, expressed in percent on a dry weight basis.

Area sampled	Date	Number of Samples	Average value % dry wt.	Range in value % dry wt.	% values exceeding EPA criteria
(EPA Criterion 5 Percent Dry Wt. Basis)					
<u>Detroit River:</u>					
Detroit River-L. Erie (East Outer Channel)	7-8-68	16	<u>5.15</u>	3.1-6.6	56.3
Trenton Channel	5-70	3	<u>12.36</u>	6.6-21.0	100
Ballards Reef Channel	5-70	1	2.3	-	-
Livingstone Channel	5-70	2	3.8	3.3-4.3	100
Amherstburg Channel	5-70	1	<u>6.7</u>	-	-
East Outer Channel	5-70	8	<u>9.69</u>	7.8-10.0	100
<u>Rouge River:</u>					
Rouge River	9-68	5	<u>9.6</u>	10.0-17.0	100

ATTACHMENT 8

Historical and
Archaeological Review

STATE OF MICHIGAN

NATURAL RESOURCES COMMISSION

E. M. LAITALA
Chairman
ROBERT M. BOUDEMAN
CARL T. JOHNSON
HILARY F. SNELL
HARRY H. WHITELEY
JOAN L. WOLFE
CHARLES G. YOUNGLOVE



WILLIAM G. MILLIKEN, Governor

DEPARTMENT OF NATURAL RESOURCES

STEVENS T. MASON BUILDING, LANSING, MICHIGAN 48926

A. GENE GAZLAY, Director

March 5, 1974

Colonel James E. Hays
District Engineer
U. S. Army Corps of Engineers
P. O. Box 1027
Detroit, Michigan 48231

Dear Colonel Hays:

The Draft Environmental Statement dated December 1973 for the Confined Disposal Facility at Pointe Mouillee for Detroit and Rouge Rivers has been reviewed as to impact on the historic resources of the State of Michigan, with particular regard to the shipwrecks on the Great Lakes bottomlands.

It does not appear at this time that the proposed project will adversely affect the historic resources of the State of Michigan.

Sincerely,

A handwritten signature in cursive script, reading "Samuel A. Milstein".

Samuel A. Milstein, Chief
Bureau of Recreation
and
State Historic Preservation
Officer

cc: T. Black
H. Miller





Interstate 71 and 17th Avenue

Ohio Historical Society / Ohio Historical Center / Columbus, Ohio 43211 / Telephone (614) 466-4803
466-5347

January 2, 1974

Major Thomas J. Woodall
Acting District Engineer
Detroit District
Army Corps of Engineers
P.O. Box 1027
Detroit, Michigan 48231

Dear Major Woodall:

While we appreciate receiving the enclosed draft EIS, I do not think the project will have any affect on archaeological sites in Ohio. I would suggest, however, that you inform Dr. James Fitting, State Archaeologist, Michigan Division of History, Dept. of State, Lansing, Michigan 48918. He would know of any prehistoric Indian sites in the Pointe Mouillee vicinity.

Sincerely,

Martha Potter Otto
Associate Curator of Archaeology

MPO/sl

Enclosure

MICHIGAN STATE UNIVERSITY

THE MUSEUM

EAST LANSING • MICHIGAN • 48824

January 16, 1974

Mr. Thomas J. Woodall
Major, Corps of Engineers
Department of the Army
Detroit District Corps of Engineers
P.O. Box 1027
Detroit, Michigan 48231

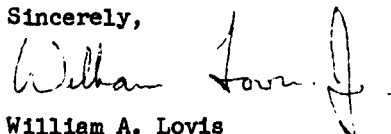
Dear Sir:

This is in reference to your December 28 transmittal of a Draft Environment Statement titled Confined Disposal Facility at Pointe Mouillee for Detroit and Rouge Rivers.

As I understand the proposed construction project, the majority of work will be performed offshore in Lake Erie with the exception consisting of a single causeway from Roberts Rd. to the dike construction area. Shoreline erosion will not increase during construction, while upon completion the dike will inhibit shoreline erosion. In light of the information contained in the draft, I find that the possibility of destruction of archaeological resources during the construction is minimal. It is my considered opinion, therefore, that no survey of the effected area is necessary.

Thank you for the opportunity you have provided to comment on this project during planning stages.

Sincerely,



William A. Lovis
Curator of Great Lakes Archaeology
Responding for the Conference on Michigan Archaeology

WL/cw

ATTACHMENT 9

COMMENTS AND RESPONSES

Responses to questions and comments contained in correspondence were incorporated into the body of the Final Statement. Reference is made to the appropriate response by noting in the margin of each letter the Section and page number in which it has been incorporated. The following is given as an example:

Comments: Consultation with the State Historic Preservation Officer should be confirmed in the statement Page 204
Reference: IV 8 91
Response:

Section IV, Subsection 8, on page 91, states that confirmation of the absence of historical and archaeological sites was received from the State Historic Preservation Officer.

Responses which cannot be incorporated into context are included as footnotes on the letter making the comment. If a comment is not responded to, it was considered to be supplementary or not in conflict with information already contained in the text, or was considered to be not germane to the subject discussed in this Final Statement and to be, therefore, outside the purview of the Statement.

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE
NORTHEASTERN AREA, STATE AND PRIVATE FORESTRY
6816 MARKET STREET, UPPER DARBY, PA. 19082
TELEPHONE (215) 382-5800

8400
January 28, 1974



Major Thomas J. Woodall
Acting District Engineer
Detroit District, Corps of Engineers
P.O. Box 1027
Detroit, Michigan 48231

Refer to:NCEED-ER

Dear Major Woodall:

Reference is made to your circular of December 28 transmitting two copies of the Draft Environmental Statement for a Confined Disposal Facility at Pointe Mouille for Detroit and Rouge Rivers.

Att 3 135

We note from the transmittal memo that the statement was prepared in cooperation with the Michigan Department of Natural Resources and assume that this indicates that the proposed action has the approval of that Department. If the Draft specifies such approval, we missed it.

IV A5 82-83

As you know, our interest centers in the impact which the proposal may have on forested areas. The only indication we note of any such impact is the final statement under Impact on Wildlife and Vegetation that "no impact on vegetation other than some loss from the Roberts Road construction would result." We believe it would be helpful if the final statement described the nature and extent of this loss.

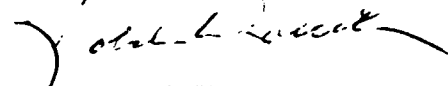
II A6 49

Since Project Description indicates that channel dredging, as a solution to the problem of sedimentation, is a never-ending job, and since the channels are filled up with "sediments, primarily silts and fine sands, -- carried by the Detroit (and we assume the Rouge) River in suspension," we suggest that intensification of conservation programs to hold the silts and fine sands on the land might reduce the amount and frequency of dredging and searching every ten years for a place to dispose of the dredged material.* We assume that the dredging itself, as well as the disposal of the dredged material, is covered by an Environmental Statement. If so, we do not have a record of this. **

IV A2 72-73

We appreciate the opportunity to review and comment on the draft.

Sincerely,


ROBERT D. RAISCH
Director

* This is true. Reduction of pollutant's at the source would also help.

** No environmental statement has yet been written on the dredging itself.



UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION V
1 NORTH WACKER DRIVE
CHICAGO, ILLINOIS 60606

Major Thomas J. Woodall
Acting District Engineer
U.S. Army Corps of Engineers, Detroit District
P. O. Box 1027
Detroit, Michigan 48231

MAR 5 1974

Dear Major Woodall:

We have completed our review of the Draft Environmental Impact Statement (EIS) for the Confined Disposal Facility at Pointe Mouillee for dredged spoil from Detroit and Rouge Rivers in Monroe County, Michigan, as requested in your letter dated December 28, 1973. We have classified our comments as Category LO-2. Specifically, this means we have no objections to the project based upon the information presented; we believe, however, that additional information is required to assess the total project impact.

The classification and the date of our comments will be published in the Federal Register in accordance with our responsibility to inform the public of our views on proposed Federal actions under Section 309 of the Clean Air Act.

As you are aware, we have had considerable involvement in the Pointe Mouillee Diked Disposal Project through the review of the first Draft EIS on April 7, 1972 and previous and subsequent meetings. Our previous principal concerns were water quality impacts, wetland impacts and the consideration of more environmentally-compatible alternatives. With the exception of additional information required on water quality, we believe that these points have been satisfactorily explored and resolved. We offer the following comments on this Draft EIS:

Project Description

The location of overflow weirs for the facility should be noted. Discharges from overflow weirs in the dikes of the facility should be periodically monitored for general water quality parameters, especially toxic metals such as mercury, lead, cadmium and zinc; oil-grease; phosphorus; nitrogen; dissolved and suspended solids; turbidity; pH and alkalinity. If monitoring reveals violation of water quality standards (WQS), abatement measures will have to be implemented to correct and minimize potential pollution problems. Certain areas around the site should also be monitored for basic water quality parameters before, during and after construction of the project. When a monitoring program plan is developed, we request the opportunity to review it. *

IV A2 71-72

* The EPA will be requested to assist in the development of the monitoring program.

If necessary, to further reduce the concentrations of dissolved and suspended solids, turbidity and heavy metals, we recommend the incorporation of an internal diking and ponding system. The utilization of two or more pond areas for successive settling periods will increase settling time prior to discharge through the weir and filter. Although this method would require more planning than normal dredge disposal, it would produce a higher quality effluent. Internal dike materials could be obtained from access channels assessed as polluted or marginal but capable of providing suitable ponding dikes. If WQS are violated, flocculating or precipitating agents would be used to further enhance the weir effluent.

IV A2 71

IV A6 88

The removal of oil and its disposition in the disposal area requires a detailed explanation. This same point was brought up previously on the original proposal.

IV A2 71-72

Environmental Setting

Page 23 of the EIS indicates that coliform densities are introduced primarily by waste treatment facilities. It should also be noted that these densities are contributed in part by feedlot or agricultural sources. According to a research study on "Indicators and Pathogens in the Huron River" (R. Smith, R. Twedt) that was funded by EPA (published in November, 1971 Water Pollution Control Federation Journal), of 11 sampling sites on the upper Huron River, 7 exhibited fecal coliform: fecal streptococci (FC:FS) ratios of less than 0.7. A FC:FS ratio of 0.7 or less is characteristic of animal source pollution, not human pollution (Geldreich and Kenner). On the lower Huron River, 4 of 9 sampling sites exhibited FC:FS ratios equal to or less than 0.7.

II A2 24

With regard to available water quality data in the project area, it would be desirable to point out those parameters exceeding State water quality standards.

II A2 26

On page 23, the concept pertaining to the rate of growth versus loss of marsh material needs clarification. One would normally assume that if the rate of marsh growth exceeded its loss, the net result would be that more marsh would appear. It would not disappear as stated.

II A2 24

Environmental Impact

Although it was mentioned at the January 28, 1974 workshop on the project, the effects that the dike configuration will have upon littoral drift, shoals and beach zones (particularly the Estral Beach area) should also be addressed in the EIS. It was indicated in the EIS that the project will greatly reduce the interchange of nutrients and mixing of water between Lake Erie and the marsh and could cause stagnation of certain areas during low water periods. These conditions could degrade local water quality by not allowing adequate mixing. The EIS should include a discussion on the potential water quality impacts of defecting Huron River waters southward between the facility and the shore, and then conveying them and drainage from other small creeks through the causeway culverts along the shoreline of Estral Beach. Consideration should be given to gated culvert structures that could be opened or closed when desired.

IV A3 78-79

IV A3 75-79

IV A2 62

IV A2 62

IV A3 78-79

The EIS points out that while the ingestion of dredged material and associate organisms by birds would not cause mortality, the potential for botulism outbreaks in stagnant pools exists. The EIS (page 14) mentions that botulism will be prevented in marsh units in the potentially managed marsh area outside the disposal area. Yet, the EIS fails to mention what precautions will be taken to prevent the occurrence of botulism in the containment facility. Therefore, a description of the abatement measures to be implemented for botulism control should be presented.

IV A2 71

I E 11-12

IV A5 83

The Relationship Between Short Term uses of Man's Environment and the Maintenance and Enhancement of Long Term Productivity

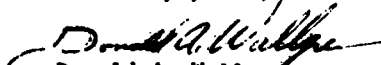
Since one of the major benefits of this project proposal will be to help preserve the Pointe Mouillee, it would be desirable to obtain a firm commitment from Michigan Department of Natural Resources that a marsh restoration program for 2000 acres at Pointe Mouillee will be developed and implemented before project completion (10 years).

I E 12

Att 3 134

We appreciate the opportunity to review this Draft EIS.

Sincerely yours,



Donald A. Wallgren
Chief, Federal Activities Branch



**DEPARTMENT OF TRANSPORTATION
UNITED STATES COAST GUARD**

MAILING ADDRESS:
U.S. COAST GUARD (G-WS/73)
400 SEVENTH STREET SW.
WASHINGTON, D.C. 20590
PHONE: (202) 426-2262

31 174

Major Thomas J. Woodall
Acting District Engineer
Detroit District, Corps of Engineers
P. O. Box 1027
Detroit, Michigan 48231

Dear Major Woodall:

This is in response to your letter of 28 December 1973 concerning the draft environmental impact statement for a confined disposal facility for containment of dredged material from the Detroit and Rouge Rivers.

The concerned operating administrations and staff of the Department of Transportation have reviewed the material submitted. The Coast Guard commented as follows:

IV A7 89 "As the proposed diked disposal area will create a navigation barrier to the south of the Huron River, it will be necessary for arrangements to be made with CCGD9(oan) to provide aids to navigation to mark the dike and approach channels.

VI C 106 "The Coast Guard is disposing of the Grosse Ile site, but retaining an easement and right of access to maintain the range lights thereon. In essence, the DEIS comments on the suitability of this site are correct, except for the statement that the Coast Guard was undecided.

IV A3 78-79 "The DEIS mentions possible stagnation behind the barrier island but does not address the possibility of installing drainage culverts (with or without a navigational clearance) through the access road to the diked area at the southwestern terminus. Such culverts, with or without provision for closure, should have been considered, and ought to be mentioned in the DEIS."

The Department of Transportation has no other comments to offer nor do we have any objection to the project. However, the concern of the Coast Guard should be addressed in the final environmental impact statement. In this regard it is

suggested that you contact the Coast Guard field office directly as follows:

Commander, Ninth Coast Guard District
1240 East 9th Street
Cleveland, Ohio 44199

The opportunity for the Department of Transportation to review this project is appreciated.

Sincerely,



W. R. RIESEL

Acting Deputy Chief, Office of Marine
Environment and Systems
By direction of the Commandant



(ER-74/17)

United States Department of the Interior

OFFICE OF THE SECRETARY

NORTH CENTRAL REGION

536 SOUTH CLARK STREET

CHICAGO, ILLINOIS 60605

February 11, 1974

Col. James E. Hays
District Engineer
U. S. Army Engineer District
Detroit
P.O. Box 1027
Detroit, Michigan 48231

Dear Col. Hays:

This is in response to the request of December 28, 1973, for a Department of the Interior review of the draft environmental statement for the proposed Confined Disposal Facility at Pointe Mouillee for Detroit and Rouge Rivers, Michigan.

On the basis of our review of the statement in areas of our jurisdiction and expertise we believe that the following comments should be addressed in the final statement:

General

Mineral resources in the vicinity of Pointe Mouillee appear to be limited to sand and gravel, peat of marginal quantity, lacustrine clays, and salt. Lacustrine clays generally have little economic value because of a high silt-sand fraction. Except for not describing salt deposits, which probably underlie the area and are most likely thin and non-commercial, the statement adequately describes the mineral resources of the area.

IV A8 91 Consultation with the State Historic Preservation Officer, Mr. Samuel Milstein, Deputy Director, Recreation, Department of Natural Resources, Mason Building, Lansing 48926 should be clearly confirmed in the statement.

Throughout the statement, the eroded barrier beach is referred to in varying ways, i.e. natural beach, barrier, barrier reef, beach ridge, and reef. Since a barrier beach refers to a very specific water-land interface, we suggest that it be referred to as either a barrier beach or a bar.

Specific

SECTION I. PROJECT DESCRIPTION

D. PROPOSED SPOIL DISPOSAL FACILITY.

The discussion on page 14 of the relocation of Mouillee Creek and Lautenschlager drain should be expanded to more specifically indicate diversion routes and outlets. There also should be an assessment of the impact on existing recreational use as a result of the channel diversions.

IV A3 75-79

IV A7 89

SECTION II. ENVIRONMENTAL SETTING WITHOUT THE PROJECT

A. NATURAL ENVIRONMENT.

2. Drainage and Water Quality--We suggest that the second paragraph on page 23 be rewritten to improve readability. The fourth and fifth sentences of this paragraph describe the delicate balance which must exist between the rates of production and loss of marsh material in order to maintain a marsh ecosystem. We believe this description could be improved by explaining that marshes "disappear" when they are converted to either terrestrial habitat or open water as a result of disturbances to the above equilibrium.

II A2 24

3. Currents--Maps of current patterns in the project area would strengthen the narrative on page 26.

IV A3 76-77

4. Fish--This section provides a general assessment of sport fishing in Lake Erie but does not adequately describe sport fishing in the project area (page 29). Specific references to the Pointe Mouillee area and the "Beaudrais Hole" area offshore should be discussed. *

II A4 30-31

Pointe Mouillee, page 31--Since specific fish-use data for the Pointe Mouillee Marsh are not available, it may be presumptuous to state that fish use in the project area does not differ "significantly" in comparison with other along-shore reaches. It is possible that fish studies conducted near the River Raisin could produce differing results than fish studies at Pointe Mouillee. Sampling fish at the project area would strengthen this section.

II A4 32

* The Beaudrais hole area is distant from the site of the project as reformulated.

- 11 A5 37 5. Wildlife and Vegetation--It is inaccurate to say "Muskrats are completely dependent upon the marsh for food, shelter . . ." (second sentence, first paragraph, page 34). Muskrats commonly live and breed outside of marsh habitats.

SECTION IV. PROBABLE IMPACT OF THE PROPOSED ACTION ON THE ENVIRONMENT

IV A3 71-72 Although this section is generally adequate, we suggest the following additions:

- a. A description should be given of the type and source of construction materials and of the impacts associated with their quarrying and transport to the project site.
- b. Impacts accompanying the transporting and unloading of the polluted dredge spoils should be discussed.
- c. Impacts resulting from weir construction, pollution abatement facilities, and pumping facilities should be discussed.

IV A3 75-79 3. Impact on Currents--Although page 61 points out that the proposed dike could cause changes in currents within the protected marsh area, we suggest that possible effects on currents within the main lake also be discussed. The practicability of manipulating currents for marsh management purposes through dike design likewise should be investigated.

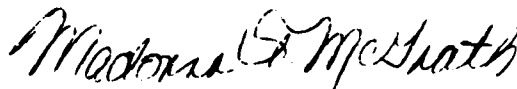
IV A4 80-81 4. Impact on Fish--Although construction of the proposed dike as discussed on page 62 will add fish habitat variability, this section also should recognize the impact of filling 685 acres of shoal waters which are vital food production zones for fish.

IV A6 86-87 6. Effects of Confined Material on Diked and Adjacent Areas--It is stated on page 72, second paragraph, that "removal of contaminated sediments from shipping channels is desirable from an environmental point of view." This section also should point out that dredging of the shipping channels, while removing much of the polluted sediment, also disturbs pollutants in the sediment which were essentially buried and lost to the aquatic biological system. By disrupting the bottom of the channels, these pollutants again are made available to the aquatic environment; therefore, the conclusion that stirring up contaminated sediments is environmentally beneficial is debatable.

SECTION V. PROBABLE ADVERSE ENVIRONMENTAL EFFECTS WHICH CANNOT BE AVOIDED

This section should include the adverse effect of disturbing bottom IV A6 86-87 sediment by dredging, thereby making pollutants again available to the aquatic system.

Sincerely,

A handwritten signature in cursive script, reading "Madonna F. McGrath".

Madonna F. McGrath
Staff Assistant to the
Secretary



United States Department of the Interior

BUREAU OF OUTDOOR RECREATION

LAKE CENTRAL REGION
3853 RESEARCH PARK DRIVE
ANN ARBOR, MICHIGAN 48104

IN REPLY REFER TO:

G26 Mich.

December 26, 1973

Projects 26 - 00246
26 - 00511

District Engineer
U.S. Army Engineer District,
Detroit
P.O. Box 1027
Detroit, Michigan 48231

Dear Sir:

An article which appeared in the Ann Arbor News on December 16, 1973, indicated that the Corps of Engineers has approved the concept of a plan which provides a safe place for dumping polluted river dredgings in the area of the Pointe Mouillee marshes. We understand that your office will let contracts in June for construction of a barrier reef off the mouth of the Huron River and your office is presently preparing an environmental impact statement for the project.

IV A5 81-82 We have an interest in the Pointe Mouillee area in that federal assistance has been made available for the acquisition of land under the Land and Water Conservation Fund program. These acquisitions were funded under Projects 26 - 00246 and 26 - 00511. Consequently, we would appreciate being informed of any formal meetings pertaining to your Pointe Mouillee project. We would also appreciate being placed on your list of federal agencies that receive draft copies of the environmental impact statement for review and comments.

Sincerely yours,

JOHN D. CHERRY
Regional Director

By: *Frederick J. Bender*
Frederick J. Bender
Acting



OFFICE OF THE ASSISTANT SECRETARY OF COMMERCE
Washington, D.C. 20230

February 28, 1974

Major Thomas J. Woodall
Acting District Engineer
Detroit District, Corps of Engineers
P. O. Box 1027
Detroit, Michigan 48231

Dear Major Woodall:

The draft environmental impact statement for the proposed "Confined Disposal Facility at Pointe Mouillee for Detroit and Rouge Rivers," which accompanied your letter of December 28, 1973, has been received by the Department of Commerce for review and comment.

The statement has been reviewed and the following comments are offered for your consideration.

Summary Section 4(B) Adverse Environmental Effects

The last statement in this paragraph declares that "The function of the marsh as a spawning and feeding habitat for fish . . . will not resume behind proposed dikes." However, from the main body of the report (pages 13-14), one may conclude that the fish spawning and feeding function of the marsh ^{V 96} will be reduced, but that the extent of this reduction will depend on the management plan selected by the state. We suggest, therefore, that this sentence be modified to reflect the possibility that portions of the marsh could be managed to benefit fish and wildlife.

Section II. Environmental Setting Without The Project

- A. Natural Environment
- 4. Fish, Commercial Fish

Page 28. The last sentence of the first paragraph, which emphasizes the importance of the Lake Erie commercial catch, tends to mislead the reader; therefore, we suggest that it be

II A4 29 amended to indicate that prior of 1966, the combined United States and Canadian commercial catch from Lake Erie was the largest in the Great Lakes. After 1966, the total annual commercial harvest from Lake Michigan occasionally exceeded that from Lake Erie, primarily because of the unusually large catches of alewives in those years.

Page 28-29. With regard to the discussion of historical fishery statistics, a recent literature survey compiled by the Statistics and Market News section of the National Marine Fisheries Service indicated that 1872 was the earliest date on record for fishery statistics pertaining to the U.S. Great Lakes. It would be helpful for the environmental statement to reveal the source of the information for the more than 100 years of commercial statistics referred to in this section. In this regard, we are providing for possible inclusion in the final statement the following information: From 1879 through 1908, the total United States catch in Lake Erie averaged 46.0 million pounds, then declined during subsequent periods as follows: 1914-29, 37.7 million; 1930-39, 30.6 million; 1940-49, 26.3 million; 1950-59, 25.2 million; 1960-69, 15.2 million; and 1970-72, 9.8 million pounds.

The historical significance of the catches of lake herring and whitefish made in the Detroit River during the period 1885-1891 also should be noted. In Lake Erie, lake herring and blue pike constituted well over 50 percent of the total U.S. landings during this early period. In 1928, the abundance of lake herring began to decline, recovered in the mid-1940's and subsequently became vanishingly small. The last significant catch of blue pike occurred in 1957; since that time, this species has almost vanished. Based on 1972 figures, six species (carp, catfish, sheepshead, suckers, white bass, and yellow perch) account for 97 percent of the entire U.S. lake production; carp, sheepshead, and sucker landings make up 55 percent of this total. In this Michigan portion of the lake, there is only test netting and no formal commercial fishery (because of the mercury contamination problem mentioned on page 29).

The statement that "Smaller catches of fish for each net set evoked a response from the fisherman of setting more nets thus hastening the end" seems too simplistic. Although exploitation by commercial fishermen may have been main cause for the decline of the choice coldwater species, Hartman (1973)¹ points out that

man-induced changes in the watershed, nutrient loading, and introduction of new species were also important factors contributing to this decline. With regard to the lake trout, for example, Applegate and Van Meter (1970:10)² state that "The disappearance of the lake trout unquestionably will remain a matter of speculation, although the theory that it became commercially extinct through overfishing is most logical . . . The ultimate disappearance, or biological extinction, of the lake trout was, on the other hand, most likely due to the loss of suitable environmental conditions for its survival. Enrichment of the lake with the ever-increasing wastes of the growing population along its shores and the accelerated aging of the lake that this enrichment produced undoubtedly destroyed the last semblance of suitable habitat for the species." 11 A4 30

Section IV. Probable Impact Of The Proposed Action On The Environment

3. Impact on Currents

Page 61. This section should discuss the possible effect the structure may have on the circulation of western Lake Erie as a result of changes in Huron and Detroit River circulation patterns.

IV A3 76-78

Considering the intricate problem of disposal polluted dredge spoil, it appears that Detroit District, Corps of Engineers jointly with Department of Natural Resources, State of Michigan found a reasonable solution. They proposed to place the dredge spoil from Detroit and Rouge Rivers in a diked containment in Lake Erie which will restore and protect the natural marshland area presently managed by the State of Michigan primarily for waterfowl.

It is suggested that a gap be left open between the shore and the southern end of disposal area. This will induce water circulation in the enclosed area and as a result will reduce adverse effects of water stagnation. If needed the disposal area could be enlarged by one or more fingerlike extensions in the northwest direction from the proposed disposal area. The dikes for these extensions would require minimum protection against waves and currents.

IV A3 76-80

II A3 27-29

Waves coming from south into the diked area are listed as to reach 8-foot height. This value seems to be high considering the shallow water in that vicinity. The shallow water slows down the incoming waves and forces their breaking. More detailed investigation will be required before using the 8-foot high waves for dike design purpose. In the Toledo Bay area the maximum recorded waves were from east and reached 6-foot height.

Thank you for giving us an opportunity to provide these comments which we hope will be of assistance to you. We would appreciate receiving a copy of the final statement.

Sincerely,



Sidney R. Galler
Deputy Assistant Secretary
for Environmental Affairs

Literature Cited

1. Hartman, W.L. 1973. Effects of exploitation, environmental changes, and new species on the fish habitats and resources of Lake Erie. Great Lakes Fishery Commission, Technical Report No. 22.
2. Applegate, V.C. and H.D. Van Meter 1970. A brief history of commercial fishing in Lake Erie. U.S. Department of the Interior, Fishery Leaflet 630. 28 pages.

UNITED STATES DEPARTMENT OF AGRICULTURE

SOIL CONSERVATION SERVICE Room 101, 1405 South Harrison Road
East Lansing, Michigan 48823

February 12, 1974

Major Thomas J. Woodall
Corps of Engineers
Acting District Engineer
Department of the Army
Detroit District
P.O. Box 1027
Detroit, Michigan 48231

Dear Major Woodall:

The draft environmental statement for the Confined Disposal Facility at Pointe Mouillee for Detroit and Rouge Rivers, that was sent to the U.S. Department of Agriculture, Office of the Secretary, on December 28, 1973 was referred to the Soil Conservation Service for review and comment.

The following comments are for your consideration:

- 1) The soils information on pages 18 and 19 has been updated. The quoted information was from a 1944 survey by the Michigan Department of Natural Resources. The Soil Conservation Service and the Michigan Agricultural Experiment Station completed a modern survey of this area in 1973. This material is on file at our Westland, Michigan Field Office.
- II A5 34 2) The statement should acknowledge the loss to vegetation from flooding of existing marshes.
- IV A2 62, 71 3) The construction periods were discussed on pages 68 and 69. Methods of erosion control to be used during each period should also be outlined.

We appreciate the opportunity to review and comment on this proposed project.

Sincerely yours,

Arthur H. Cratty

Arthur H. Cratty
State Conservationist

cc: Council on Environmental Quality, Washington, D.C.
Kenneth E. Grant, Administrator, SCS, Washington, D.C.
Fred H. Tschirley, Acting Coord. of Env. Quality Activities,
Washington, D.C.



STATE OF MICHIGAN

NATURAL RESOURCES COMMISSION

E. M. LAITALA
Chairman
ROBERT M. BOUDEMAN
CARL T. JOHNSON
HILARY F. SNELL
HARRY H. WHITELEY
JOAN L. WOLFE
CHARLES G. YOUNGLOVE



WILLIAM G. MILLIKEN, Governor

DEPARTMENT OF NATURAL RESOURCES

STEVENS T. MASON BUILDING, LANSING, MICHIGAN 48926

A. GENE GAZLAY, Director

February 25, 1974

Major Thomas J. Woodall
Detroit District, Corps of
Engineers
P.O. Box 1027
Detroit, Michigan 48231

NCEED-ER

Dear Major Woodall:

You are to be complimented on an effective presentation of the environmental effects of a most necessary project, the "Confined Disposal Facility at Pointe Mouillee for Detroit and Rouge Rivers". We were pleased to be able to work with you in this project and would hope that it is able to proceed with a minimum of delay.

In general, the Draft Environmental Statement contains sufficient information to convey the major impacts that would result from the proposed project. However, there are some areas in the statement where more information would provide a clearer description of the environmental interactions. These are summarized below. We are also enclosing a more detailed list of comments, with reference to page and paragraph for your convenience. Many of these are editorial in nature and need no further discussion.

Some of the major headings contain material that is not relevant to the particular topic being discussed. Such material should either be included under the appropriate heading, or deleted, to promote clarity. As an example, the angling survey data on pages 64-67 should be included in the environmental description in Section II instead of under impacts. II A4 29

We suggest that lengthy supporting material that breaks up the continuity of the text should be placed in an appendix. Examples are the animal and plant species lists and Section 123 of the Rivers and Harbors Act of 1970. Conversely, other material that would enhance the clarity of some segments could well be added. One such example is the material which we provided during our earlier discussions regarding pollution sources and remedial action. Other examples might be a map of patterns of currents, and a map of waterfowl species distribution. Att 2, 5, 6
II A6 39
IV A3 76-77
II A5 37

In some cases, more data would be desirable to substantiate conclusions.

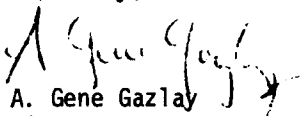


February 25, 1974

For example, the statement that water quality in the Pointe Mouillee area is degraded needs support. Such data should be provided or the statement deleted or modified. This is particularly true in those segments dealing with hydrological features of the area and the impacts upon currents that would result from the placement of the facility. The secondary impacts of the resultant current patterns upon the distribution of sediments and on water levels behind the proposed barrier as affected by currents and surface drainage do not seem to be adequately described. Consequently, there is no clear picture as to the course of events that are most likely to occur with the establishment of a barrier structure. We also suggest a careful check of references throughout the statement for consistent relationships of former marsh functions, predictive marsh regeneration, and future marsh interaction with the surrounding Lake Erie environment.

Again I restate our approval of the entire project and hope that it can proceed at an early date, not only to provide proper and safe disposal of polluted spoil and continued navigation in the Detroit River, but to enable restoration of a significant waterfowl management unit.

Sincerely,


A. Gene Gazlay
Director

January 11, 1974

Thomas J. Woodall
Major, Corps of Engineers
Acting District Engineer
Detroit District Corps of Engineers
P.O. Box 1027
Detroit, Michigan 48231

OhioEPA

John J. Gilligan
Governor
Ra L. Whitman
Director

RE: NCEED - ER

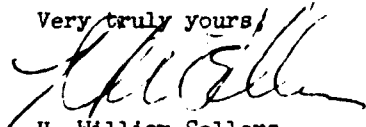
Dear Major Woodall,

This is to acknowledge the reception, on January 4 of the draft environmental impact statement prepared by the Detroit District Corps of Engineers on the combined disposal facility plan at Pointe Mouillee. The Plan Review and Assessment Section of the Division of Planning, Ohio Environmental Protection Agency is charged with the responsibility of coordinating an evaluation of submitted impact reports. This evaluation, a composite of interdisciplinary opinions representing a number of State agencies, is forwarded to the Director's office, where an appraisal of the document is made.

Our reviewers have been furnished copies of the draft statement and are now in the process of formulating their evaluation. We expect to have our comments back to your office within 45 days as allotted by law.

Thank you for this opportunity to comment on the proposed combined disposal facility plan.

Very truly yours,



H. William Sellers
Chief, Division of Planning

HWS/ckf

February 20, 1974

RE: NCEED - ER Draft Environmental Impact
Statement Pointe Mouillee Confined
Disposal Facility

Major Thomas J. Woodall
Corps of Engineers
Acting District Engineer
Detroit District Corps of Engineers
P.O. Box 1027
Detroit, Michigan 48231



John J. Gilligan
Governor
Dr. Ira L. Whitman
Director

Dear Major Woodall:

The Ohio Environmental Protection Agency has been charged, by the Governor, with lead agency and review coordination responsibilities for the State on Federal Environmental Impact Statements. The above referenced Draft Environmental Impact Statement has been submitted for review by sections of this agency and the Ohio Department of Natural Resources. The following comments constitute those received and have been coordinated under the auspices of the State Clearinghouse.

IV A6 88 Although the proposed action involving containment of dredge material
IV A2 73 appears to be the only realistic alternative available, several
IV A6 86 questions remain to be answered in the Final Statement. What effect
will the proposed structure have on the overall water quality as the
water moves southward along the shore toward Ohio? What effect *
would the higher concentrations of pollutants beyond the barrier
structure have on other habitats? Furthermore, it is stated on page
62 that "Interchanging of nutrients and mixing of water between Lake
IV A3 75, 78 Erie and the marsh which presently takes place would be reduced
greatly by the proposed placement of the barrier." What effect on nu-
trient cycling, a vital component of a marsh ecosystem, will this
interruption have? This question is alluded to in the passage taken
from page 77 below, but instead of being assuasive, it further causes
concern for the future viability of the marsh.

V 97

"The interior dikes and other management measures which
would avert most potentially adverse impacts would create
in their turn, a secondary adverse impact on the historical
relationship of the marsh to the lake. The marsh, if diked
and intensively managed for waterfowl, would not contribute
measurably as a filter of nutrients or as a nursery for plant

* The structure will not contribute objectionable effluent to
ambient water.

Major Thomas J. Woodall
February 20, 1974
Page 2

and animal life. Its function as a spawning and feeding habitat for fish, now measurably reduced due to water quality degradation as well as inundation, would not resume behind the anticipated dikes."

Passages such as this one should give the responsible Federal and State of Michigan Agencies cause for concern.

V 97

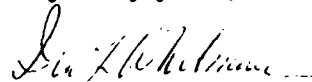
Att 3 134

The Disposal of dredge material will continue to be a major problem to the Corps and the States. We, therefore, encourage the continuing research on treatment and use of dredged spoil.

The Ohio Environmental Protection Agency appreciates the value natural wetlands have in nutrient cycling, purifying wastes, and providing unique habitats. We are concerned that the benefits claimed - protection from bank erosion and decrease in water level fluxuation - will not necessarily off-set the possible stagnation and interference with nutrient cycling mentioned above.

The Ohio Environmental Protection Agency would like to thank you for the opportunity to comment on this Draft Environmental Impact Statement. We look forward to the reception of the Final Statement.

Very truly yours,



Ira L. Whitman
Director

ILW/jcw

House of Representatives



LANSING, MICHIGAN 48901

52ND DISTRICT
RAYMOND J. SMIT
BOX 119
LANSING, MICHIGAN 48901
PHONE:
AREA 517-373-1792

MEMBER OF COMMITTEES ON
CONSERVATION AND RECREATION
ROADS AND BRIDGES
STATE AFFAIRS

January 30, 1974

Col. James D. Hayes, District Engineer
Detroit District U.S. Army Corps of Engineers
P. O. Box 1027
Detroit, Michigan 48231

Dear Colonel Hayes:

As part of the hearing record on the proposed Pointe Mouillee dredge fill in Monroe County, I would respectfully request that this letter be made part of the record.

I would like to thank you for your efforts on the new proposal for dredge fill at Pointe Mouillee. The work that has been done by both the Department of Natural Resources and the Army Corps of Engineers will pay dividends to Michigan's populace, wildlife and environment. I support your efforts wholeheartedly.

In particular, it should be noted the receptiveness of the Department of Natural Resources and the Army Corps in listening to the views and complaints of Michigan citizens on the original proposal. In May of 1973 I discussed with the Natural Resources Commission at Gaylord the difficulties of building the originally proposed project. I am additionally pleased that my comments and suggestions have been incorporated in this revised project. Through your work we have changed what, in my view, would have been an environmental disaster into a project that will instead greatly enhance our state's environment.

The original proposal would have filled with dredge spoil 270 acres of Great Lakes bottomland for a public park facility. The interface of the park and the wildlife refuge could have jeopardized the integrity of the refuge. Now, however, by reestablishing the old barrier reef and thus providing protection to Pt. Mouillee Marsh, this will permit the Michigan Department of Natural Resources to develop a complete program for the revitalization of the marsh area.

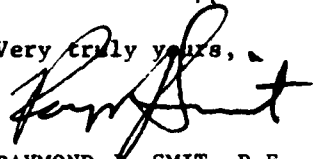
Our wetlands in this state are dwindling at an alarming rate. Our efforts to preserve those remaining areas should be strengthened, especially in and around our urban areas and Great Lakes. Your present proposal does, in fact, do just that.

Instead of losing the few holdings we have in the area, we will be protecting it and once again restoring one of the fine wildlife sanctuaries in the country.

Such a project can demonstrate to future projects that environmental protection and meeting our future economic needs are not mutually exclusive concepts. Rather, through new and innovative ideas we as a state can attain both.

I again add my support to your new project and am grateful to you for providing me with this opportunity to express my views.

Very truly yours,

A handwritten signature in dark ink, appearing to read 'Ray Smit', written over the closing 'yours,'.

RAYMOND J. SMIT, P.E.
State Representative

RJS:w

CC - A. Gene Gazlay, Director
Department of Natural Resources

HIGHWAY COMMISSION
E. V. ERICKSON
CHAIRMAN
CHARLES H. HEWITT
VICE CHAIRMAN
PETER B. FLETCHER
CARL V. PELLONPAA

STATE OF MICHIGAN



WILLIAM G. MILLIKEN, GOVERNOR

DEPARTMENT OF STATE HIGHWAYS AND TRANSPORTATION

STATE HIGHWAYS BUILDING - POST OFFICE DRAWER K - LANSING, MICHIGAN 48904

JOHN P. WOODFORD, DIRECTOR

January 29, 1974

Major Thomas J. Woodall
Acting District Engineer
Department of the Army
Detroit District, Corps of Engineers
P. O. Box 1027
Detroit, Michigan 48231

Dear Major Woodall:

This is in response to your request of December 28, 1973 for the Michigan Department of State Highways and Transportation to review and comment on the Draft Environmental Statement for the proposed confined disposal facility at Pointe Mouillee for Detroit and Rouge Rivers. We believe that the Draft Environmental Statement does not contain sufficient information to fully assess the environmental impact of the proposed project. However, from the information submitted, we have no objections to the proposed action, as described. The following comments pertain to this project:

A. Environmental Setting Without The Project

1. Natural Environment:

A confusing issue arises when reference is made to the "marsh" and how it has decreased in size due to the erosive effects of Lake Erie. The natural emergent vegetation of the marsh has decreased in size to approximately 200 acres (page 33). However, the organic peat that makes up the marsh surface and rooting zone for marsh type vegetation has remained stable from 1937 to 1973 (page 23). From this one visualizes a 2,000 acre marsh surface of which 200 acres are vegetated with natural emergent marsh vegetation. To clarify this issue, you need to state actual acreages for various categories.

11 A5 34

- a. Acres of natural emergent vegetation - 200 acres;
- b. Acres of stable marsh surface (organic peat over clay);
- c. Acres of eroded wetlands - lost and not recoverable. *

* The above visualization is correct. In general, the eroded wetlands could recover behind the barrier dike.



January 29, 1974

2. Fish Habitat, Food, and Use:

You have stated that the benthic fauna has completely been changed due to water pollution of the Western Basin. The present benthic fauna consists of three pollution tolerant groups of which only one is important to fish diet. The marsh area also contains this polluted water and, if the proposed dike is built, will contain an even higher concentration of pollutants; thus a great reduction in fish food. Therefore, how could this be a productive fishery area? * If the area behind the proposed dike can be freed from pollutants, it may be expected that it again would become a highly productive fish food zone. II A4 31
IV A4 80

3. Pointe Mouillee - Fish Sampling:

Fish sampling was conducted at Brest Bay, 11 airline miles south of Pointe Mouillee, which was considered representative of the test site conditions. Who determined that this assumption was correct? No scientific data was used to support this assumption. Is the aquatic environment the same in both locations? By this I mean water depth over muck. According to other statements within the Draft, the project area has only one-foot of water over muck. No mention of actual water depth behind the diked area is recorded in the report. Thus, this becomes a confusing issue. Ref 126 124
IV A3 76-77

4. Wildlife and Vegetation - Wildlife:

As of 1973 there was only about 200 acres of the original 2,000 acre marsh remaining. Does this mean marsh vegetation or marsh surface? You state it is expected that within three years these remaining 200 acres will also be destroyed if no action to prevent this is taken. This means by the end of 1976 there will no longer be a marsh. You state that this is a ten year project after the plan has been accepted. When do you expect construction to start? The reason I ask is that it seems by the time the project gets off the ground there will no longer be a marsh to protect. II A5 34
IV A4 80

It is well known that lakeshore marshes act as "sponges" in assimilating chemicals such as nitrogen and phosphorus as you state. However, this assimilation can only take

* A marsh differs from a lake basin in terms of its response to an increase in the supply of nutrients.

January 29, 1974

IV A3 78 place by repeated flushing of marsh areas. The proposed construction would eliminate this flushing cycle or mixing of waters, so that high concentrations of pollutants would build-up in the area behind the dike.

IV A3 72 In order to prevent this pollution build-up, it might be suggested that free water passage through the dike be considered. This may be accomplished through the proper placement of several culverts. This would benefit water circulation and flushing of the marsh area. This approach should be considered, since the dike is not a flood control device.

B. Probable Impact of the Proposed Action on the Environment

1. Impacts on Water Quality Resulting from Dike Placement - Water Quality:

II A2 25 It is stated that the pollution contribution of the Huron River cannot be determined until the Detroit River is cleaned up. What is the projected date that the river will be free of pollutants? When will the water management plan for the Huron River Basin be available?

a. Construction:

IV A2 75 It is stated that there will be a rise in suspended sediments, levels of dissolved nutrients, BOD and COD, with a decrease in dissolved oxygen. The duration of these conditions will be contiguous with the construction operation. How will these changes affect the existing fisheries and other aquatic fauna? No mention of these effects are described.

IV A4 81

b. Possible Impacts After Completion of the Structure:

IV A3 76-77 From the statements presented here, you have no idea of current patterns after the dike is completed. It is felt that the Corps would be able to accurately predict how the current will be changed, and these new current patterns should be stated.

II A2 24, 25 The problem of mixing Huron River discharge with Lake Erie water proper should be considered in more detail.

January 29, 1974

This presents an additional problem as to the area behind the containment because it may become a sink for pollutants, and these high concentrations may change the entire ecological balance of the marsh area, including vegetation, organic material, fisheries, and potential waterfowl use. IV A2 61

2. Impact on Currents:

IV A3 78

Stagnation of water behind the barrier dike will occur when low water exists. What effect will this have on aquatic biotic and microorganisms of the protected area? When high water is encountered, how will this change existing vegetation patterns along established channels? IV A2 75
IV A3 78
IV A6 86

3. Impact on Fish:

The re-establishment pattern of emergent vegetation of the marsh is difficult to predict. However, you state that DNR will manage the area for waterfowl by planting and maintaining vegetation favorable for this objective. Therefore, this proposed waterfowl management plan should be exemplified and addressed to in an additional statement. I E 9-13

The problem of water circulation is again encountered; thus, emphasizing the fact that consideration should be given to this problem. IV A3 75-80

4. Impact on Wildlife and Vegetation - Construction Period:

Pollutants of spoil being ingested by birds - you say it is "doubtful" that the pollutant levels within the spoils would be sufficient to contaminate the flesh of waterfowl. This is an assumption and should have some documentation of these facts. A definite statement concerning this problem should be stated. IV A5 83
IV A6 86-87

5. Post Construction Period:

After the dike is completed, the immediate effect would be marsh vegetation. However, on page 63, it is stated that the re-establishment of the marsh is difficult to predict. Vegetation re-establishment would be dependent

January 29, 1974

IV A5 84, 86 upon natural lake levels. Therefore, a quick return to natural wetland vegetation for the benefit of wildlife is dependent upon future management of the area; not the presence of the barrier dike. *

6. Secondary and Tertiary Impacts:

IV A5 84, 85 Should elaborate on these effects. What detrimental
IV A3 75, 78 and/or beneficial effects would be caused by current changes, since it is evident that they will be changed?
II A5 34 How will this affect vegetation, water quality, micro-fauna and, in turn, wildlife?

7. Vegetation:

II A5 34 It is stated that at present the marsh covers 200 acres. Does this refer to marsh vegetation, marsh surface or inundated organic peat? This is very confusing.**

8. Effects of Confined Material on Diked and Adjacent Areas:

IV A6 86, 87 When the supernate water is returned to Lake Erie, it will contain some dissolved and suspended materials causing contamination of the receiving waters and aquatic life. What and how would this affect aquatic life, since this of a long-term nature? Elaborate and explain in more detail.
IV A2 73, 74, 75

IV A6 88 One should not be so optimistic about the neighboring people of the lake shore. Lake Erie water is turbid when lake levels are high; however, a resident may be able to notice higher turbidity or less transparency much more easily than you expect. Therefore, do not be so naive about the public's reaction to muddy waters.

9. Description with the Project at the Conclusion of Ten Years of Dredging:

IV A2 71 Physical character of area and road system would be in either better or worse condition, depending upon what would be done to improve the road system during construction of retaining wall. Examination of this area should be more complete. A definite statement is needed here. Will the road system be improved or not improved?

* It is dependent upon both.

** It refers to marsh vegetation.

C. Probable Adverse Environmental Effects Which Cannot be Avoided

1. (Last sentence). Its function as a spawning and feeding habitat for fish, now measurably reduced due to water quality degradation, as well as inundation, would not resume behind the anticipated dikes. However, on the preceding page, you state that there would be an increasing abundance of fish. How could there be an increase in fish population and a decrease in spawning and feeding habitat? IV A4 80

D. Alternatives to the Proposed Action

This section contains many alternatives which, in fact, are not alternatives because several have already been considered inadequate, or have been dropped from consideration. It is suggested that two separate lists be made: one stating those alternatives which have real potential as disposal sites, and a second listing of those that were considered, but eventually dropped from consideration. Another choice would be to just list those sites which have positive attraction as disposal sites.

Alternatives which do not have real potential as disposal sites:

1. Disposal Sites in Canada

- a. A quarry four miles east of the City of Windsor
- b. Areas near Sugar Island
- c. Area near Amherstburg
- d. Area below Bois Blanc Island
- e. Grass Island
- f. Inland lake near Windsor
- g. Peche Island

2. Potential Contained Disposal Sites in the United States

- a. Expansion of Grass Island
- b. Mamajuda Island
- c. Coast Guard property on Grosse Ile
- d. Expansion of Stony Island
- e. Sibley Quarry
- f. Salt mines on Grosse Ile

January 29, 1974

- g. Pump inland from Trenton
- h. An island site north of Maple Beach
- i. Land site near Gibraltar
- j. Island site between East and West Outer Channels
- k. Huron River site
- l. Site near Stoney Point
- m. Ottawa Silica Quarry has too many assumptions to be considered as a real potential disposal site. Should look close at groundwater supplies and check to see if seepage of pollutants would occur. If this is evident, some type of clay cap may be desirable to prevent seepage of pollutants into the groundwater supply.

E. Conclusion:

It should be stated more clearly throughout the Draft Environmental Statement, as stated in the introduction, that the benefits due to the proposed containment barriers are to: (1) contain polluted spoil from dredging activities of the Detroit and Rouge Rivers which are currently being disposed of in the main lake; and (2) to stop erosion of the existing marsh by protection against lake forces. This barrier, as a secondary but direct effect, would then make it possible for DNR to plan management units for wildlife habitat enhancement. Without DNR's interior marsh management plan, all other benefits alluded to in this Statement (increase waterfowl usage, improvement of wildlife habitat, re-establishment of marsh or wetland vegetation, increase public usage for naturalist and bird watchers) are very questionable. Therefore, this project would only provide for protection of existing shoreline and remaining marsh without the assistance of DNR. Contacts with DNR should be more definite. Is this plan on the drawing boards and, if so, what are the projected dates involved with this project?

IV C 94

IV A5 82

IV A5 84

IV A4 80

V 97

Att 3 134

Sincerely,



G. Robert Adams
Public Hearings Executive



water resources program—the university of michigan

college of engineering-ann arbor-michigan-48104-(313) 763-1464

Franklin L. Snitz

764-6488

14 Feb 1974

Dr. Mary Ann Cooper
Detroit District, Corps of Engineers
PO Box 1027
Detroit, Mich. 48231

Dear Dr. Cooper:

It was a pleasure to meet you again since our last meeting which included Prof. Weber and Dr. Posner at the public meeting held by the Detroit District in Monroe Feb. 1, 1974. I would like to take the opportunity to put down some thoughts on the Pointe Mouillee Confined Disposal Facility. At the same time I have looked over the draft of the current environmental impact statement in order to relate it to written comments.

My experience and concern is in the area of heavy metals: which are frequently found in high concentrations in the aquatic phase of dredged sediments. The impact statement gives no information on construction details, especially in regard to preventing percolation through the diked disposal area. Perhaps this information was given at the public meeting, but it is difficult to either verbally present or listen to all the engineering aspects in that type of forum. The information should be presented in an appendix to the impact statement. IV A2 62-72

In trying to recall specific subjects from the Monroe meeting there was some mention of an overflow feature to spill out excess water from dredgings. It was brought out that this water would be of higher quality than the receiving water because it would be clarified to a greater extent. As we all know, what we do not see can hurt us even more. Att 10 257
One such example of an invisible hazardous substance is soluble lead which, in our laboratory, we have found in harbor sediment slurry water in concentrations ranging from 10 to 320 pph (based on wet slurry weight) depending on the particular Great Lakes Harbor. It is conceivable that soluble lead and other heavy metals may reach excessive levels in dredge spoil water from the Rouge and Detroit Rivers on an intermittent basis. A contingency plan should be developed for the occasional need to subject metal loaded dredge spoil to heavy metal removal by chemical waste water treatment. This would prevent a possible shutdown of this imaginatively conceived project which is based on the timely concept of converting waste to resource.

Thank you for your consideration of these comments.

Yours truly,

Frank Snitz

DONALD W. BURTON
MONROE COUNTY DRAIN COMMISSIONER
COUNTY AGENCY

29 Washington Street
MONROE, MICHIGAN 48161
Telephone 1-313-241-9469

February 8, 1974

Department of the Army
Detroit District, Corps of Engineers
P.O. Box 1027
Detroit, Michigan 48231

Attention: Thomas J. Woodall, Major, Corps of Engineers Acting District
Engineer

Re: Confined Disposal Facility at Point
Mouillee.

Sir,

This office has reviewed the environmental statement for the above referenced project and offer the following comments:

The Laudenschlager and Mouillee Drains are dedicated county drains and come under the control of this office. Since both drains extend inland a considerable distance they provide needed drainage for many acres of valuable agricultural land in Berlin Township.

I E 11 It will be necessary to provide detailed plans for relocating these drains to insure that drainage comparable to, or better than the existing drainage would be maintained before, during and after construction of the dike.

I E 11 Additionally, this office would have to be provided with a discription of the relocation, the course and grade of the relocated portion and be granted a permanent maintenace Easement of 99 feet centered on the relocated section of the drain.

IV A2 71 The high volumn of heavy construction equipment on the roads in this area could possibly make it necessary to replace (rebuild) various Culverts and bridges providing drainage under county roads. This work would involve the Monroe County Road Commission.

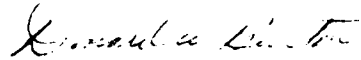
IV A3 75 It was noted in the environmental statement that the Bathgate Drain was not mentioned. The effect of the proposed dike on this drain should also be considered.

Department of the Army
Detroit District, Corps of Engineers
Attn: Thomas J. Woodall, Major, Acting District Engineer
Page Two
February 8, 1974

One final comment concerns the affect of the proposed dike during periods of high water levels in Lake Erie. Would the dike alter the existing flood plain to an extent that it would have adverse effect on adjacent lands, for instance, Estral Beach?

We have tried to comment on items which may have not been considered in this draft. We hope these comments will be of some assistance in preparing the final environmental statement for this project.

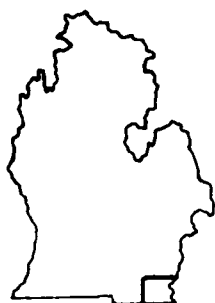
Respectfully yours,



Donald W. Burton
Drain Commissioner - County Agency

DWB/MHW/ds

* Not known.



GREATER MONROE CHAMBER OF COMMERCE

758 S. Monroe St.
Monroe, Michigan 48161
Ph: (313) 242-3366

January 24, 1974

U.S. Army Corps of Engineers, Detroit District
PO Box 1027
Detroit, Michigan 48231
Attn: Major Thomas J. Woodall

Dear Major Woodall:

The Greater Monroe Chamber of Commerce views the recreational potential of northern Monroe County as enhanced by the barrier reef construction proposed by the U.S. Army Corps of Engineers, Detroit District, at Pointe Mouillee. The astounding rate of growth in the Detroit - Toledo corridor is evidenced by a continuing expansion of highway networks and suburban developments. Industrial activity continues at a high pace in the Downriver Detroit area and will plan an important role in the Great Lakes Basin for many years to come because of the available fresh water resource of the region. Considering that 65% of Michigan's population lives in the so called "Daily Urban System" encompassing Detroit and all of Southeastern Michigan, it is not too difficult to predict a severe scarcity of land open for recreational pursuits.

Competition will likely be keen for alternative land use requirements with top priority being given to such pursuits as agriculture, power generation and waste recycling processes occasioned by increased residential and industrial stress. If the energy crisis persists, people in the "Daily Urban System" will have little choice but to recreate closer to home. The only open space suitable for meeting these recreational demands in a close proximity to Detroit and Toledo remains in Monroe County.

Why is Monroe County the most likely area to witness this recreation boom? The answer is Lake Erie? With the current and future emphasis on water quality maintenance, the western shore of Lake Erie, 95% of which is in Monroe County, will regain its former prominence in the sphere of water oriented recreational activity. Fishing and swimming will make up much of the low energy consumption activities. Areas such as the Port of Monroe, Sterling State Park, Pointe Mouillee, Bolles Harbor and the Woodtick Peninsula at Erie will increase in popularity. Where the physical features of the shoreline are not amenable to human needs they will have to be created or altered to suit these needs as long as they add to the environmental scheme and do not detract from it. The confined disposal facility proposed for Pointe Mouillee to contain dredged spoils from the Rouge and Detroit Rivers reflects the basis elements of environmental engineering and indicates the ability of man to reclaim values lost through ill defined geological and hydrological process.

The Greater Monroe Chamber of Commerce offers its support to the U.S. Army Corps of Engineers and the Michigan Department of Natural Resources in this unique project which sets the pace for enlightened use of our valuable Lake Erie shoreline. The sooner we recognize the worth of Lake Erie to this densely populated region, the sooner we shall realize the rich rewards this great body of fresh water offers. Little encouragement was offered for the survival of Lake Erie just a few years ago but that was before it was generally understood that the total volume of water in the Lake turns over once every three years as opposed to the 100 year cycle in Lake Michigan. The future for Monroe County looks bright and projects that tend to enhance the environment such as those offered here by the Corps indicate a willingness to invest in that future.

Cordially,


Robert Johnson
Executive Vice President

cc: Monroe County Board of Commissioners
Monroe County Planning Commission
Berlin Township
Monroe Evening News



Monroe County Planning Commission

COUNTY COURT HOUSE • MONROE, MICHIGAN • 48161

AREA CODE 313 PHONE 241-6066

February 8, 1974

U.S. Army Engineer District
P.O. Box 1027
Detroit, Michigan 48231

Dear Sir:

We are pleased to report to you our assessment of your environmental statement relative to the proposed confined disposal facility at Pointe Mouillee.

The Monroe County Planning Commission at its meeting of February 7, 1974 have instructed me to advise you that it finds the draft environmental statement for the development of a Confined Disposal Facility at Pointe Mouillee resulting in the development of a barrier island off Pointe Mouillee satisfactorily addresses the implications of this work as it relates to Monroe County and further concurs with the proposed disposal facility as contributing to the achievement of desirable county development goals. Our memorandum of staff review and analysis is recommended to you for your consideration.

Thank you for the opportunity to participate in this effort.

Sincerely,

A handwritten signature in dark ink, appearing to read "Ronald F. Nino".

Ronald F. Nino

RFN:si
Enclosure

c.c. Department of Natural Resources
Attention: Division Shorelands Protection



Monroe County Planning Commission

COUNTY COURT HOUSE • MONROE, MICHIGAN • 48161

AREA CODE 313 PHONE 241-6066

DATE: January 17, 1974

MEMORANDUM

TO: The Monroe County Planning Commission

FROM: Ronald Nino

SUBJECT: Review of Environmental Assessment for The Pointe
Mouillee Proposed Barrier Island And Restoration
Program

Project Area And Description

Pointe Mouillee is situated entirely within Berlin Township and includes some 2900 acres of upland and marsh areas. The U.S. Corps of Engineers have proposed to redeposit dredge spoils from its program of maintaining the depth of navigation channels in Lake Erie and at the mouth of the Detroit River into a confined area off of Pointe Mouillee. This confinement will act as a barrier island and will upon completion prevent the inundation of the original marsh area at Pointe Mouillee. The U.S. Corps of Engineers acting in conjunction with the Michigan Department of Natural Resources have established the design parameters for the proposed barrier island so as to permit the DNR to regulate the level of water in the original marsh area which is now inundated to depths which have destroyed its ecological significance as a marsh. Upon completion of the barrier island the level of water in the former marsh area will be lowered so as to permit the earlier marsh environment to reconstitute itself. (see attached plan).

Draft Environmental Assessment

In response to federal laws which require a federal agency to assess the environmental impact of its proposed program the U.S. Corps of Engineers has prepared a draft environmental assessment, evaluating the environmental effects of its proposed action on water quality, water management, ecological significance, land use, and other factors. Because of the relationship of this program to that of the Michigan DNR's program of marsh restoration it is suggested, that to some extent this environmental assessment transcends the proposed barrier island construction and includes the program of the DNR.

Further to federal mandate the environmental assessment must be circulated to interested and affected agencies for review and comment.

Staff Analysis

Staff is of the opinion that its assessment of the draft environmental assessment should be restricted to matters purely within the Concern of the county planning commission. These concerns it is further suggested therefore should be limited to the relationship of the project to adopted county development plans primarily land use - transportation concerns. Questions of water management, water quality and hydrologic concerns should be adequately covered under state law, which staff views as being in the interest of Monroe County residents and more rightly within the expertise of the DNR.

In the opinion of staff the total project (i.e. the barrier island and marsh restoration program) is of concern to Monroe County primarily from three points of view (i) recreational values and related concerns, (ii) transportation values and related concerns and (iii) the effect of the total project on existing communities.

Recreational Values And Related Concerns

Particularly in the highly urbanized Southeast Michigan community only a few communities are fortunate enough to have water recreation possibilities which Monroe County residents enjoy. However, this potential does not mean very much unless it is developed or man made modifications are instituted to expand the potential of this resource to satisfy a comprehensive recreational program. The environmental draft assessment implicitly recognizes this point in discussing the hunting, fishing and naturalist opportunities that will be made available by the marsh restoration and development of the barrier island. There can be little doubt that the availability of this kind of recreation resource is extremely limited in the southeast Michigan community. Indeed Pointe Mouillee is a singular opportunity and therefore should be preserved for its special recreation significance. Likewise, its regional importance means that visitorship and use will transcend Monroe County residents. This fact should not adversely affect Monroe County or Berlin Township provided that transportation improvements uniquely the result of improvements and maintenance to Pointe Mouillee does not totally fall upon the taxpayers of Monroe County. No discussion of this consideration is given in the draft environmental assessment and constitutes its major shortcoming relative to the concerns of Monroe County.

IV B1 92
IV B2 92

It is staff's opinion that Berlin Township is not economically disadvantaged because of the large public ownership of the Pointe Mouillee area (i.e. approximately 2900 acres). In large part the area is flood prone and therefore this fact alone justifies prohibition of urban uses under normal conditions. The flood prone situation is due to the elevation of this area relative to Lake Erie and because of the drains and tributaries which flow into the lake through the Pointe Mouillee area. The barrier island will only regulate inundation due to wave action but will have no effect on flooding due to high runoff. For these reasons the Township and County are not losing any property tax base if reasonable and necessary flood-plain regulations were involved. On the other hand the high visitor use that may be expected when the area is comprehensively developed will have an ancillary effect on nearby privately held lands and encourage supportive type commercial development which would be of taxable benefit to Berlin Township and Monroe County. The effect of the ancillary commercial development cannot be quantified at this time, however, studies by the DNR have shown that recreation developments have a positive cost-benefit aspect.

Transportation Values And Related Concerns

A causeway extension of Roberts Road is expected to provide pedestrian and/or vehicular access to the barrier island. The area of the Pointe Mouillee State Game Area has considerable frontage on Roberts Road as a result of recent property acquisition, the Dixie Highway, Sigler Road and Campau Road. Highway 75 is the principal interstate freeway serving Monroe County and Pointe Mouillee. Highway exits at S. Rockwood and Newport are generally eight and six mile respectively from the boundary of Pointe Mouillee. Travel on county roads to Pointe Mouillee will be considerable and their physical conditions are not suitable for high traffic useage. While this issue may not be necessarily related to the development of the barrier island IV A5 82 nonetheless a supporting transportation plan will be necessary for the Pointe Mouillee Development Program and needs immediate attention by the State of Michigan. One of the immediate IV B2 92 advantages of the barrier island is said to be its shore fishing potential and will contribute to increased useage on this account to Pointe Mouillee. The State of Michigan should be addressing the transportation access question concurrent with the development of the barrier island. It is staff's opinion that the Michigan Department of State Highways should assume responsibility for improving a route from both interchanges to Pointe Mouillee and share with Monroe County to their long term maintenance.

Land Use And Related Concerns

In part this question has been considered in assessing the recreation values attendant development of the Pointe Mouillee State Game Preserve and its floodprone relationship. It is the opinion of staff that the proposed use of the Pointe Mouillee Area as enlarged by the barrier island is the most suitable use of the land in this area. Further, this opinion is consistent with the county comprehensive plan of 1968. In this regard it is staff opinion that the county plan is still relevant. Adjacent development is rural and the increased use intensity of Pointe Mouillee is generally predating any extensive urban development in parts of Berlin Township that would otherwise be affected by the increased useage of Pointe Mouillee.

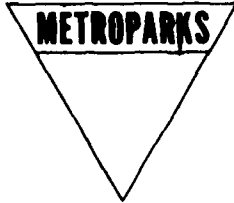
Conclusion

Without regard to alternatives for disposing of dredge spoils it is the opinion of the staff that the environmental assessment adequately explores the ecological and environmental significance to the development of the proposed barrier island. Generally, it is our opinion that the ecological and environmental communities both in and adjacent to the Pointe Mouillee will be enhanced by the development of the barrier island. The restoration of the historic marshland is definitely a positive value to Monroe County for the reasons discussed above. Staff cannot conclude that the project will result in greater degregation of the area both ecologically and environmentally and this action is seen as a positive action to regain the former natural functions of the Pointe Mouillee area. The proposed containment of dredge spoils appears to be satisfactorily resolved so that contamination of the waters in the shoreline environment will not occur except that the flushing action which historical cleaned the marsh area will be forfeited by this proposed action. On the other hand long term and immediate pollution standards have reduced significantly the amount of marsh and shoreline pollution which resulted from tributaries and drains flowing into the Pointe Mouillee area. In any event it appears as though there is no alternative if reconstituting the marshland environment is a major goal.

Recommendation

It is recommended that the Monroe County Planning Commission finds the draft environmental assessment for development of a Confined Disposal Facility at Pointe Mouillee resulting in the development of a barrier island off Pointe Mouillee satisfactorily addresses the implications of this work as it relates to Monroe County and further concurs with the proposed disposal facility as contributing to the achievement of desirable county development goals.

DAVID O. LAIDLAW, *Director*
JAMES J. POMPO, *Deputy Director*
EDWARD S. DOWNEY, *Controller*
ROBERT L. BRYAN, *Secretary*



January 28, 1974

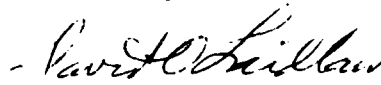
Department of the Army
Corps of Engineers
Detroit District
P. O. Box 1027
Detroit, Michigan 48231

Gentlemen:

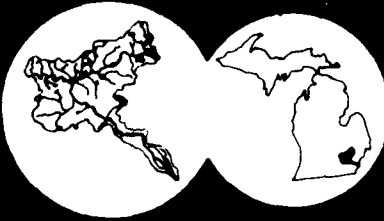
The Huron-Clinton Metropolitan Authority is a regional park agency operating in the five southeastern Michigan counties of Livingston, Macomb, Oakland, Washtenaw and Wayne. The proposal for a confined dredge spoil disposal facility which would protect and restore the marsh at the Pointe Mouillee State Game Area was sent to the Authority for review at an earlier date. On September 13, 1973, the Board of Commissioners of the Authority, by motion and vote, formally supported the proposal. They believe that the Pointe Mouillee marsh is a valuable natural feature and resource that should be protected and restored and that this action will turn the necessary spoil disposal facility into an asset.

The Commission also expressed their belief that there is an ever increasing need for recreational access to the waters of Lake Erie for the four and a half million residents of the Authority's district. This need should at some future time result in a Metro-park on the Lake Erie shore to serve the people.

Sincerely,


David O. Laidlaw
Director

DOL:bjj



HURON RIVER WATERSHED COUNCIL

415 WEST WASHINGTON STREET
ANN ARBOR MICHIGAN 48103
313 665 0514

February 12, 1974

Colonel James E. Hays
District Engineer
U. S. Army Corps of Engineers
P. O. Box 1027
Detroit, Michigan 48231

Dear Colonel Hays:

We have received and examined the Draft Environmental Impact Statement entitled "Confined Disposal Facility at Pointe Mouillee for Detroit and Rouge Rivers", dated 28 December 1973. We appreciate the opportunity to evaluate this proposal and hope that our comments contribute to the information base necessary for sound decision-making on this project.

The Huron River Watershed Council is an intergovernmental agency organized and currently operating under authority of Michigan Public Act 253 of 1964, the "Local River Management Act." The Council is composed of representatives of local units of government within the drainage basin of the Huron River, from its headwaters northwest of Pontiac to its mouth on Lake Erie at Pointe Mouillee. The Council has a responsibility, under Act 253, to review, analyze, and comment upon issues and problems which affect the water and related land resources of the watershed, and to inform member units of government and the general public concerning these questions. Through this mandate the Huron River Watershed Council has played an active role in water resource planning for southeastern Michigan.

Because of our extensive involvement in commenting upon the previous proposal for a disposal facility at Pointe Mouillee, and because the area has traditionally been considered a part of the Huron River drainage basin, we have a primary interest in the present proposal to create a diked disposal facility immediately south of the Huron River mouth and adjacent to Pointe Mouillee marshland. Our comments below on the impact statement address both overall policy considerations and treatment of specific points in the text.

I. Overall Policy Considerations. The current proposal as outlined in the draft environmental impact statement calls for a $3\frac{1}{2}$ mile, banana-shaped, diked containment facility which will handle polluted dredge spoil dumping needs for 10-15 years. In addition, when completed, the man-made island will be readily convertible into a nesting and feeding area for waterfowl and other wildlife. The proposal has a great deal of merit in that it provides a potentially safe means of storing polluted dredge spoil while at the same time contributing a protective barrier which will allow for the regeneration of marshland and restoration of wildlife habitat. One of our major objections to the previous proposal for Pointe Mouillee centered around its destructiveness to marshland and potential for alteration of the natural river mouth. We do not see these problems arising with the current proposal.

The proposed dike and restored marsh area could eventually serve not only a variety of recreational pursuits, but also serve as a demonstration of marsh restoration techniques and management practices. In addition, the current proposal serves as a good example of the integration of needs and cooperation between different units (and levels) of government in the furtherance of water resource management objectives. The Huron River Watershed Council has always been extremely supportive of decisions to terminate open lake dumping and in summary we find this proposal to be a generally good one and certainly a preferred alternative to open lake dumping. Our comments must, however, be tempered by several additional considerations.

First, and we would hope this is obvious to all, review of this proposal must be accomplished with the realization that in the long run point-source control of sediments and industrial contaminants will be necessary. Such programs will not only cut down on the frequency of dredging needed to keep channels at authorized depth, but will also eliminate the need for constructing diked containment facilities for storage of polluted spoil. We would hope at that time to see some rearrangement of priorities whereby a portion of the astronomical costs spent on dredging up and storing polluted sediments in the interest of navigation enhancement could be redirected to activities of more direct benefit to a larger segment of the population in the watershed (e.g. additional flood plain activities particularly flood plain delineation studies). II A6 48

Secondly, while questions on the destruction of valuable and increasingly rare marshland and on the alteration of the river mouth may be mitigated by the current proposal, there remain basic questions as to the wisdom of removing mercury-contaminated bottom sediments and as to environmental consequences of such removal. As the Watershed Council noted in its comments on the earlier proposal (dated March 2, 1972), the dredging process results in additional exposure of mercury to bacteria and molds, with the resuspension thereby increasing the dissolution of toxic methyl mercury into the water. The concerns for human health, fish, and wildlife remain. There is in fact probably no way of handling polluted spoil of this sort which does not have any environmental threat involved. But given the decision to remove such contaminated material it would be useful for the impact statement to summarize the state-of-the-art with IV A6 86-88

IV A6 86-88 regard to alternate spoil disposal methods. What, for example, are the latest findings and conclusions of the Corps of Engineers Dredged Material Research Program? Are the best methods known for handling polluted bottom sediments — in terms of potentially detrimental environmental consequences — in fact the same as those being contemplated in the current Pointe Mouillee proposal? How far away are we from a better solution and could it have relevance for the current situation?

II. Specific Points-at-Issue

IV A2 72-74 1. In the context of the above concern for dredge removal of bottom sediments contaminated by toxic materials, and the possible environmental consequences, the draft impact statement is unacceptably vague. Corps of Engineers "Guidelines for the Assessment of Economic, Social, and Environmental Effects of Civil Works Projects" stipulate that a full analysis of "With Project" conditions be made. The impact statement focuses almost entirely on project-caused environmental effects occurring at the point of spoil disposal, thereby rendering a rather narrow interpretation of the "project" and the "affected area". We well realize the administrative practicality of separating discussion of environmental impact at the spoil removal point from that at the spoil disposal point, and of focusing on the latter in this draft EIS. But we must question the wisdom of such an approach if indeed this is to be a comprehensive assessment of environmental conditions with the project. Obviously dredging of spoil and its deposition represent separate operations, yet they also represent interdependent and inseparable parts of a whole project and neither would be possible, or viable, without the other.

IV A6 86-87 The EIS does note briefly on page 72 that "...removal of contaminated sediments from shipping channels is desirable from the environmental point of view." This is both a debatable and a self-oriented statement. Whether such removal is beneficial from an environmental point of view (as opposed to leaving the material undisturbed) depends on the rate of movement of toxic materials from sediment to water under normal conditions (i.e. including shipping), the types of fish and other aquatic animals involved, the nature of the food chain, etc. Rate of movement of toxic materials from sediment to water, in turn, is dependent on more than frequency of sediment resuspension.

In short, regardless of the impact statement's primary focus on the spoil disposal facility and its localized effects, the statement has made an initial commitment, as noted above, toward evaluating the project-caused effects at the point of spoil removal. It has concluded the removal of such spoil is environmentally desirable. The Watershed Council feels that documentation supporting this conclusion is lacking; specifically, the impact statement fails to provide any detailed information on the movement of toxic materials from sediments to water and

aquatic life at the spoil removal point. Nor does the impact statement devote equal time to the examination of potentially adverse effects of dredging on receiving water quality and aquatic life at the spoil removal point.

2. Although discussed at a Corps Workshop, the question of polluted dredgings from the containment facility access channel is hardly considered in the draft impact statement. The EIS merely indicates that surface layers of such sediments are probably polluted and will need to be contained. Plans for disposal of this material should be fully explained in the statement. IV A2 62-72

The Watershed Council also feels very strongly that, as a matter of Corps policy, the non-polluted, lower layer dredged material from the access channel should not be open-lake dumped. If quantities of this material cannot be used in dike construction, then land disposal opportunities should be fully explored in lieu of open-lake dumping. Att 2 131

3. A potentially serious problem which is very inadequately treated in the impact statement concerns the water returned to Lake Erie during the disposal process. Assuming the dredged spoil will be pumped in as slurry, water will then have to be extracted and pumped out of the containment facility if the material is to dry out and settle. The EIS indicates that this water will be returned to Lake Erie "...with a potential for causing contamination with toxic materials of the receiving waters and aquatic life." Granted that calculations on the probability of such contamination, its amount, and effects can only be predictive, it would nevertheless be useful for the impact statement to elaborate with such calculations. Further, a comprehensive and systematic monitoring scheme should be worked out with the Environmental Protection Agency (EPA) and included as part of project operation and included in the impact statement. IV A2 71-73
What will be monitored? How often? How often will the results be published? EPA monitoring was alluded to at a Corps Workshop in general terms, but no such information was included in the impact statement as assurance that potential contamination would be monitored. IV A2 73
IV A2 72

4. It is not clear from the impact statement whether a last-stage surface covering of mercury-free material will be required on the completed dike. Regardless of whether such a covering is technically required, its use should be considered in the plan as a desirable precautionary measure. Perhaps a means can be found to utilize unpolluted, lower layer dredgings from the access channel which are not used in basic construction of the dike. I D 8
I E 10, 12
I D 8
IV A2 72

5. The draft environmental impact statement notes on page 60 that a water quality management plan is being formulated for the Huron River Basin in southeast Michigan and that this plan would subsequently reduce nutrient concentrations, phosphates, and nitrogen compounds now being contributed to the Pointe Mouillee vicinity. Several points need elaboration in the impact statement if potential benefits for this project are to be properly evaluated.

a. Is the referenced water quality management plan that involving an interceptor sewer and a large treatment plant at the mouth of the Huron River? *

b. If so, what might the effects be of effluent from this plant on the marsh area. Would concentrations be reduced as noted in the impact statement? Granted that marshes may utilize high levels of nutrients, could the treatment plant under certain conditions provide unassimilated levels of waste loadings to the marsh area?

II A2 25
II A2 61-62

IV A3 75-80 In short, more information is needed on the probability of, and
II A2 25 conditions under which, Huron River Treatment Plant effluent might
adversely affect this marsh area, given the dike's role in retarding
flushing action and water inter-change, and in curtailing the
dilution factor.

6. With regard to the Huron River, the impact statement notes on page 62 that with the existence of high waters and flood conditions in the marsh, flows to the north through the Huron would occur. This flow would create new channels and change existing patterns of vegetation. The Huron River Watershed Council deems it vitally
IV A2 75 important that, in the interest of life and property in the
extreme downriver region, the Corps further elaborate on such
IV A3 78 potential adverse consequences, and outline mitigating measures
IV A3 79 which would have to be taken and who would have the physical and
financial responsibility for taking them.

7. The draft environmental impact statement indicates that this project has two primary and highly visible benefits. One is creation of a containment area for polluted dredge spoil; the second is creation of a protective barrier which will allow marshland to regenerate behind the structure. With regard to documentation of the second benefit, the EIS provides insufficient and at times contradictory information, and in other cases attempts to "sell" the project based on this benefit. There is a major policy issue involved here, and one that can be illustrated by specific references from the impact statement.

* Not necessarily.

The major issue is that the second benefit as noted above depends very heavily for its realization not on mere placement and use of the diked facility by the Corps of Engineers, but on what comes afterward in terms of management plans and implementation by the Michigan DNR. The dike will provide protection necessary for marsh regeneration but will not in and of itself cause the marsh to regenerate. The successful regeneration and functioning of the marshland behind the dike will depend on the sufficiency and success of a water-level management program which will manipulate both water levels and ecological succession. In short, major benefits claimed for the project are in fact dependent upon a second agency's actions for their fruition. Yet we find precious little information in the impact statement, of any detail, regarding engineering feasibility of the compartmentalization scheme, the very strong role which might be played by budgetary constraints, the time frame involved in the DNR scheme and the costs over time, or the environmental impacts involved.² Indeed, were one to examine in sequence the footnoted quotes from pages 36, 63, and 77, the picture becomes rather muddled regarding the physical and ecological situation which may result.

Att 3 135
Att 3 134
IV A3 79
I E 9-12

1. For example, see page 36: "a constant supply of nutrients are washed in from land and pushed in from the open lake. This constant flushing and recharge of the marsh area provides an abundant food supply.... For this reason marshes are highly productive and a valuable resource." Page 61: "the existence of the barrier may tend to restrict the flushing of the Pointe Mouillee area by periodic lake surges." Page 62: "Interchange of nutrients and mixing of water between Lake Erie and the marsh which presently takes place would be reduced greatly by the...barrier." Page 63: "It is unlikely that those values (free circulation of water — cycling of nutrients — high fish and wildlife production) could be reclaimed unless the project is structured to retain drainage similar to that which existed in the past."
2. For example, see page 59: "This (barrier island and auxiliary dikes for water-level control) would make it possible for the area to be maintained and managed as a viable marsh habitat for the enhancement of the wild-life and fisheries resources of western Lake Erie." Contrast with page 61: "...waters from the Huron River may be inhibited in their mixing processes with Lake Erie proper, possibly resulting in a higher concentration of pollutants beyond the barrier structure than would exist in its absence." (emphasis added). Also contrast with page 77: "The interior dikes and other management measures...would create a secondary impact on the historical relationship of the marsh to the lake. The marsh, if diked...would not contribute measurably as a filter of nutrients or as a nursery for plant and animal life. Its function as a spawning and feeding habitat for fish...would not resume behind the anticipated dikes."

In summary, the Watershed Council feels there is an obligation, even if unwritten, for the draft environmental impact statement to include an elaboration of DNR plans and a useful (for decision-making) analysis of the feasibility and impact of such plans. A major benefit of the diked disposal facility will be no benefit at all if subsequent actions are entirely lacking, insufficient, or environmentally unsound. More assurances are needed in terms of engineering feasibility, costs versus budgetary constraints, environmental consequences (particularly with regard to water inter-change, nutrient cycling or lack of it, and effects thereof), and recreational use-management plans. We feel confident that such information can and should be provided; ultimately it will help assure the preservation of Pointe Mouillee marshland and its protection by federal/state statutes.

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Sincerely,



Owen C. Jansson
Executive Secretary

OCJ/r

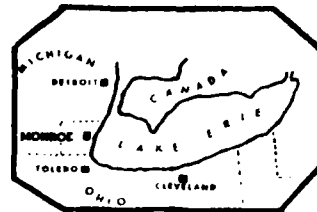
cc: Russell W. Peterson, Chairman
Council on Environmental Quality
Washington, D. C. 20006

Russell E. Train, Administrator
Environmental Protection Agency
Washington, D. C. 20460

A. Gene Gazlay, Director
Michigan Department of Natural Resources
Lansing, Michigan 48926

Lake Erie Advisory Committee

DEDICATED TO THE PRESERVATION OF LAKE ERIE, ITS WATERS, FISH AND WILDLIFE



JAN 30 1974

Subject: Confined Disposal Facility At Pointe Mouillee
For Detroit and Rouge Rivers

To: Department of the Army
Detroit District, Corps of Engineers
P.O. Box 1027
Detroit, Michigan 48231

Dear Sir:

The Lake Erie Advisory Committee (LEAC), a provisional body of conservation organizations in Southeastern Michigan and Northwestern Ohio, recognizes the damaging effects of polluted materials in waterways connecting with Lake Erie. Open lake dumping of such materials cannot be condoned. Alternatives for disposal of such polluted spoils are limited. New and innovative environmental engineering concepts must be addressed in the use of dredged spoils. The confined disposal facility plan for Pointe Mouillee is such a concept. Conventional fills as proposed for the Toledo Harbor must be abandoned! Due to attrition of natural values along the west shore of Lake Erie which is attributable to the synergistic effects of protracted development, dredged materials should be utilized in projects that tend to enhance the environment rather than degrade it.

The Lake Erie Advisory Committee regards the thrust of the proposed confined disposal facility at Pointe Mouillee as a positive influence on the western basin of Lake Erie. As a matter of comparison, the total lack of inspiration evident in the Toledo Harbor plan for Maumee Bay suggests perpetuating the school of "despoil with no regrets". The Lake Erie Advisory Committee expresses grave concern over the obvious disparity in these two localized projects. The Mouillee plan mitigates admirably, yet the Toledo Harbor plan offers no mitigation in fact it would destroy a large portion of Maumee Bay and alter natural movement of currents. The environmental impact statements for these two projects are totally dissimilar and in no way should they be treated in kind even though the western basin of Lake Erie remains as the common denominator. Under no circumstances should the Mouillee plan be used to condone the effects of the Toledo Harbor proposal. The Mouillee Plan is self mitigating. It should not encompass other projects in the western basin unless those projects are designed to enhance the environment and could act as a positive synergistic force to upgrade the total integrity of the shoreline environment.


THE LAKE ERIE ADVISORY COMMITTEE
1216 Riverview
Monroe, Michigan 48161

Copies to:

Senator Griffin
Congressman Esch
Congressman Dingell
State Representative Kehres
MUCC

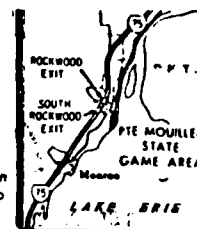


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Secretary:
RONALD GORSKI
29277 Lund, Apt. 11
Warren, Michigan 48093
TELEPHONE: 755-5937



FEB 1 1974



Subject: Confined Disposal Facility At Pointe Mouillee
For Detroit and Rouge Rivers

To: Department of the Army
Detroit District, Corps of Engineers
P.O. Box 1027
Detroit, Michigan 48231

Dear Sir:

The Pointe Mouillee Waterfowlers Association (PMWA), an affiliate of the Michigan United Conservation Clubs (MUCC), appreciates the opportunity to comment on the proposed confined disposal facility plan at Pointe Mouillee for containment of dredged material from the Detroit and Rouge Rivers.

Historically, the waterfowlers advocated the construction of an artificial offshore barrier to protect the valuable Mouillee marshes dating back to the celebrated Trenton Channel plan. This position has not changed! The Draft Environmental Statement, dated December, 1973, prepared by the U.S. Army Corps of Engineers in cooperation with the Michigan Department of Natural Resources addresses the concept of an artificial barrier which is consistent with Corps policy on environmental enhancement. The draft statement adequately describes existing conditions at the mouth of the Huron River where it debouches into Lake Erie. Man made structures upstream on the Huron have interfered with the natural processes in the delta. No amount of compensating effort could ever recover values now lost at Pointe Mouillee if left to the vagaries of nature. Therefore a totally controlled wetlands environment at Pointe Mouillee could most effectively mitigate environmental losses in a fraction of the time that would be required for unpredictable natural recovery.

The Waterfowlers have witnessed the decline of the Mouillee marshes over the past twelve years and the final blow came during 1973 when Lake Erie flood waters claimed the protective barrier beach. Since then, the area has assumed the character of an open bay and wave action continues to scour every remaining pocket of vegetation. The confined disposal facility promises to check the destructive forces of Lake Erie and to reclaim definite wetlands values under controlled conditions which offer better advantages for waterfowl than most open marshes. Controlled marshes can reduce the threat of avian botulism which killed thousands of ducks in the fall of 1964. Waterfowl need all of the help they can get to survive wanton habitat destruction all along their migratory routes especially in the immediate vicinity of the Urban Detroit Area.

The Pointe Mouillee Waterfowlers Association wholeheartedly endorses the concept of marsh restoration at Pointe Mouillee as occasioned by the proposed construction of a confined disposal facility for dredged spoils from the Detroit and Rouge Rivers!

Copies to:

Senator Griffin
Congressman Eash
Congressman Dingell
State Representative Kehres
MUCC

248

Sincerely,

Richard G. Micka
Richard G. Micka, V.F.
1216 Riverview
Monroe, Michigan 48161

Devoted to the preservation of our natural resources, our soil and minerals, our forests, waters and wildlife.

The Wayne County Sportman's Club



Subject: Confined Disposal
Facility at Pointe Mouillee

P.O. BOX 5338 — TELEFORD STATION
DEARBORN, MICHIGAN — 48128
CLUB PARK 941-2025

To: Department of the Army
Detroit District, Corps of Engineers
P.O. Box 1027
Detroit, Michigan 48231

Dear Sir:

The Wayne County Sportsmens Club, affiliated with the Michigan United Conservation Clubs, would like to comment on the proposed confined disposal facility. The offshore barrier containment would replace the original barrier beach which did protect and contain the marsh vegetation securely. The dike containment would help in the rebuilding of the mouillee marsh, from the Lake Erie wind and waves actions and erosion.

The confined disposal facility would help in a quick recovery of the marsh. Therefore a controlled wetlands environment at Pointe Mouillee, would effectively mitigate environmental losses in part of the time, that would be required for unpredictable natural recovery of the wetlands. Waterfowl would also stay in the sheltered lee side of the barrier for protection.

The marsh had practically disappeared and it is now part of Lake Erie, submerged and covered with water. The disposal containment would save the waterfowl refuge whose confined dike was nearly destroyed on the east, southeast walls from the angry waves of Lake Erie.

The Wayne County Sportsmens Club wholeheartedly endorsed the concept of marsh restoration at Pointe Mouillee as proposed by the construction of confined disposal facilities for dredge spoils from the Rouge and Detroit Rivers.

River Rouge dredging the most polluted, if confined in compartments, would not pollute and despoil the surrounding waters.

Sincerely,

Ron Toth, President
13530 Blackstone
Detroit, Michigan 48223

Wayne County Sportman's Club means, "We Can Serve Conservation."
Affiliated with Michigan United Conservation Clubs — "Statewide."

Michigan Duck Hunters Association



Feb. 1, 1974

Mr. P. McCallister:
Chief Eng. Division
Dept. of the Army
P.O. BOX 1027
Detroit, Mich. 48231

Mr. McCallister:

You will find our statement enclosed, on the disposal facility at Pointe Mouillee for Detroit and Rouge Rivers dredging material.

I was planning to come to the Feb. 1, 1974 public review meeting, but the weather was too bad to drive that far. I hope you can include this statement in the Final Environmental Impact Statement.

I would like to thank you for sending all the information on the proposed site to me.

I have a question on another subject.

Has the final impact statement on the Dickerson Island disposal site in Lake St. Clair been made yet? And if not what is going to be done out there?

Sincerely Yours:

William C. Trojan
William C. Trojan
Michigan Duck Hunters Asso
1738 Cresthill
Royal Oak, Mich. 48073

P.S. Could you send me the booklet entitled "Water Resources Development" for Michigan. Also your guidelines concerning the protection of wetlands.

Michigan Duck Hunters Association

Gentlemen:

My name is William Trojan, I am here representing the Michigan Duck Hunters Association, with 500 plus membership.

We think the plan to replace the old barrier beach with a diked containment facility to dispose of polluted dredge spoils from the Detroit and Rouge Rivers is the best plan to be presented to date.

It will save a valuable waterfowl and other wildlife area, and put the polluted dredge spoils to good use.

In the future when another disposal site is needed, we should look for an area where it could benefit wildlife and man alike. We think this project makes a point, that is everything can be put to a good use (polluted dredge spoils included) if we put our minds to it.

We also think the proposed plans by the Michigan Department of Natural Resources to dike and control water levels in the marsh should be implemented, to take full advantage of the diked disposal facility.

Sincerely


William Trojan
Chairman of the Board

1216 Riverview
Monroe, Michigan 48161
January 28, 1974

U.S. Army Corps of Engineers, Detroit District
P.O. Box 1027
Detroit, Michigan 48231

Dear Sir:

My name is Richard Micks. I am a member of the Monroe County Planning Commission and on January 11, 1974, I was appointed to serve on the Michigan Shorelands Advisory Council by the Natural Resources Commission. I appreciate the opportunity to participate in the professionals and planners workshop on the proposed confined disposal facility at Pointe Mouillee for the Detroit and Rouge Rivers. The "draft" environmental impact statement on the project clearly defines an attempt to regain valuable wetlands in the delta region at the mouth of the Huron River in Monroe County, Michigan. Should this attempt succeed and withstand the test of time, a valuable contribution will have been made in perpetuating the continental reserve of waterfowl notably those species of diving ducks and swans that frequent the Chesapeake Bay migration corridor. The plan could be the key to their survival.

When projecting one's thoughts to the future, the year 2000 is not so far away. The Greek architect and planner, Constantinos A. Doxiadis, has forecast a developing Great Lakes Megalopolis for the year 2000 and beyond. He has gone to great lengths in devising a computerized plan for the "Daily Urban System" which engulfs all of southeastern Michigan, northwestern Ohio and southwestern Ontario. Yet what is planned for the intricate balance of the natural eco system in the same region? Even Doxiadis has tempered his concept of "Ekistics" by suggesting "a marriage of Ecumenopolis and Ecumenokepos, the global city and global garden." (Ref. International Wildlife magazine - Jan...Feb. '74, pg. 10)

The restoration of the Mouillee marshes is just a beginning but it is a beginning and a re-awakening of the human spirit. Our common concern for the well being of inarticulate forms is a manifestation of our doubts about our own ultimate ability to survive. The threats of the technological monoculture to the existence of biological variability are real and in widespread evidence even in the polar regions of the globe as described by the famous marine explorer, Jacques Cousteau. If we are to acquire the means to perpetuate our way of life, we must carefully assume the husbandry of all our resources, renewable and non-renewable.

Whether or not the proposed construction at Pointe Mouillee achieves the intended purpose, the significance of a new attitude toward the environment has already been realized. This may well herald a turning point in our relationship with our surroundings. The timing seems opportune in this era of "Pre - Megalopolis". By the time Detroit is swallowed up in the predicted Great Lakes Megalopolis, those who follow in our footsteps may be glad that some thought was given to preservation of the primal elements that make up the "other world" which contradicts the artificial creations of men. For Mouillee, God speed! For man, God grant us the wisdom to do what is right!

Sincerely yours,

Richard G. Micks
Richard G. Micks

Dear Sir:-

I received your letter, on
the plan for marsh restoration,
Point Mouillee State Game Area.

I read in the paper that
Gov. Millikin has ordered to stop
all ships from dumping refuse waste
into the rivers & Great Lakes.

I hope this dike you are
about to build will not become a
refuge dump for industrial waste
or ships to use it for there refuse
dumping ground being this is
Federal waters,

Any improvement is better
then dumping the waste in open
rivers or lakes.

Anthony Skotis

1428 Mill

Lincoln Park
Mich.

Statement- Lake Erie Basin Committee
Western Basin - League of Women Voters
on
Confined Disposal Facility - Pointe Mouillee

The draft environmental statement on the Pointe Mouillee confined disposal facility is very well done. The information about the living systems, both plant and animal, which the biologist calls life support systems are well described. We have not had this information from any other source.

The Leagues have followed closely the problems of spoil disposal in this region, both before and after the passage of PL 90-611, which we supported. We have stated our purpose in the leaflet honoring our tenth anniversary. "It is to preserve and restore Lake Erie and its tributaries through pollution control, abatement and prevention, and improved planning and management of water and related land resources." Through the persistence and persuasion of all of the citizens groups in this area we think that improved planning has been or is being achieved for the restoration of the Lake. The restoration of the Lake is vital to the lives of so many as both water supply and a job supportive industry. It is impossible to restore the lake to pristine condition, but increasing deterioration must be stopped.

We know that the characteristic of the western shore historically, has been marsh land. The building of the barrier reef would seem to be the most compatible way to restore both the water and land resource. The basic philosophy we must adopt, seems to me to be contained in an editorial in the magazine of the AAAS "Science" of November 2 '73, by W.R. Broecker. Entitled "Environmental Priorities, it says, "Billions of dollars are being spent on facilities designed to stem the flow of pollutants into our continental waters. Tens of millions are being spent on research aimed at matching existing technology with national needs. Almost nothing is being spent on research devoted to understanding of the ecosystems we seek to save." In conclusion it says "It is to be hoped that the scientific community will work to correct this problem lest another decade pass and we only then begin to discover how naive our approach has been to the very difficult problem of managing our waters." With the type of cooperation that will be necessary in monitoring the streams continuously and restoring the marsh, the opportunity can be seized to do a baseline study of the ecosystem.

The so-called energy crisis is really an environmental crisis, with special emphasis on the problems of economic management of a finite resource, fossil fuels. Other shortages will undoubtedly result. The environmentalist is quite aware of the need for both jobs and quality in the environment. It looks very much as though we need to work towards a no growth policy and develop an advanced technology based on solar energy and the recycling of materials. We have no idea how we are going to get there. However, the Pointe Mouillee project contains some of the necessary elements ~~xxxxxxxxx~~. More knowledge about the marsh ecosystem and constant monitoring and the right attitude may help to solve some of the problems we face in management of our water resources.

Mrs. Neil Waterbury
3 Ginger Hill Lane
Toledo Ohio 43623

274 .. Engineering, UM
Ann Arbor, MI 48104
Feb. 13, 1974

Mr. Phil McCallister
Chief, Engineering Division
Detroit District, Corps of Engineers
PO Box 1027
Detroit, MI 48231

Re: Draft Environmental Impact Statement, Confined Disposal
Facility at Pointe Mouillee

Dear Mr. McCallister:

I have reviewed the Draft EIS for the proposed Pte.
Mouillee project. Given the essential assumption that dredging
will be done and considering the array of alternatives presented,
I agree that the proposed project is the appropriate choice.

I urge you, however, to consider the following comments
in preparation of the final EIS.

The EIS makes an indistinct definition of the scope of
the project. Apparently, this project is restricted to
"disposal" since the adverse environmental effects discussed
are virtually limited to the construction of the containment
dikes. Yet benefits from "dredging" and "navigation" are used *IV D 7*
in order to help justify the project.

At the very least, the EIS should consider the effects, *IV A2 72*
during dredging, of the mixing of polluted interstitial water
and escaped sediments with overlying waters. Ideally, an
analysis should consider the allocation of social, economic,
and environmental benefits and costs of the entire system *IV B 4*
of Great Lakes navigation.

The allegation on p. 7b that disruption of Great Lakes
navigation would be most detrimental to disadvantaged people is
inappropriate without mention of disproportionate taxation
and lack of decision-making influence among those same people.*

Benefits from a rehabilitated marsh are claimed and such
rehabilitation is a worthy objective. Yet it is far from clear *IV A5 84, 85*
that the marsh can be recreated. A complex, poorly understood,
condition of water, nutrient, and sediment movement is required
to maintain a marsh. It is not evident that this project will

* Deleted

Feb. 13, 1974

result in the flexible controls needed to provide these conditions. Furthermore, such management is beyond the scope of this project since it will be performed by another agency.

IV A6 86, 87
IV A2 72-74

Inadequate attention is given to the fate and effect of supernatant water. The claim made in public meetings that "EPA will shut us down" if water quality standards are violated begs the question. Environmental degradation should be prevented by anticipation, not policing.

In conclusion, I commend you for a laudable effort at involving the public and honestly assessing the impacts of the project.

Sincerely,

Bob Anderson

Bob Anderson

END

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