Long-Range Dredged Material Management Plan For the Intracoastal Waterway in Broward County, Florida

February 2002
(Revised March 2003)

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Prepared for:

FLORIDA INLAND NAVIGATION DISTRICT

by

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EXECUTIVE SUMMARY

The identification and permitting of suitable dredged material management areas for the Intracoastal Waterway in Florida has proven increasingly difficult. This has resulted from the nature of dredging, the requirements of handling and storing dredged material, and the environmental sensitivity and rapid development that characterizes Florida's coastal corridor through which the Waterway passes. In response to this situation, the Florida Inland Navigation District (FIND) initiated, in 1986, a program of long-range dredged material management. When fully implemented, this program will provide a permanent infrastructure of management facilities for all maintenance material dredged from the 405 miles of Intracoastal Waterway channel between Fernandina Harbor in Nassau County and southern Biscayne Bay in Miami-Dade County.

The FIND's program, executed in close cooperation with the Jacksonville District Corps of Engineers, comprises three main elements: (1) a two-phased plan development and property acquisition element, (2) a facility permitting and construction element, and (3) a facility operation element. Program execution begins with the development of long-range dredged material management plans for the Waterway on a county-by-county basis (Phase I of the planning and property acquisition process). Upon finalization of each plan, Phase II of the planning and property acquisition process begins with site boundary surveys. The process continues with detailed environmental site characterizations, soils testing, topographic surveys, preliminary facilities design and site plans, site operation and management plans, and a summary of expected costs for site development and operation. The FIND then uses all this information to support property acquisition and facilities permitting.

This report presents the Long-Range Dredged Material Management Plan for the Intracoastal Waterway in Broward County. Similar plan documents have been completed and approved for the Waterway in Nassau, Duval, St. Johns, Flagler, Volusia, Brevard, Indian River, St. Lucie, Martin, and Palm Beach Counties, as well as for the 15.11-mi segment of the Okeechobee Waterway in Martin County that lies seaward of the St. Lucie Lock. In addition, a comparable plan document for the Intracoastal Waterway in Miami-Dade County is in preparation. Phase II of the plan development and property acquisition program element will develop the site specific documentation described above for the recommended dredged material management sites. Barring unforeseen circumstances and/or changes in the governing conditions present at the time of this report, the FIND will then pursue acquisition of the recommended sites.

The methods used in the development of the long-range dredged material management plan for the Intracoastal Waterway in Broward County remain consistent with those used in the development of previous plan documents for the Waterway in the counties cited above. The major tasks performed as part of the present effort are as follows: (1) establishment of the 50-year material storage requirement within the Broward County project area based on historic maintenance dredging volumes and subsequent examination surveys; (2) evaluation of the remaining or potential storage capacity of existing easements and FIND-owned tracts within the project area; (3) development of a management concept or strategy appropriate to specific engineering and operational requirements, and environmental and land-use constraints; (4) identification of additional candidate sites consistent with the management concept; (5) evaluation of all candidate sites based on a standard set of criteria that reflect engineering, operational, environmental, and land-use considerations; and (6) selection of a set of primary (first-choice) and secondary (second-choice) dredged material management sites that best meet project requirements consistent with the established management concept.

This process began with a review of engineering records at the Jacksonville District Office, U.S. Army Corps of Engineers and an analysis of data from FIND's 1999 ICWW channel survey to develop estimates for the 50-year maintenance dredging and material storage requirements of the 25.0 miles of channel within the study area. The analysis showed a projected total storage requirement of 72,334 cubic yards of bulked material distributed over three channel reaches. Preliminary assessment was then made of the 56 tracts totaling almost 157 acres the FIND controls under perpetual easement or fee-simple ownership. This assessment revealed that seven sites, comprising nine existing easements or FIND-owned properties, met the most basic criteria of reasonable upland acreage and thereby showed potential for future dredged material management.

With the projected 50-year dredging and material storage requirement of the Waterway within the Broward County project area thus established, a management concept was then developed to guide the identification of alternative candidate sites consistent with the unique characteristics of the project area and the projected channel maintenance requirements. This approach allowed the elimination of unrealistic and impractical alternatives so that the evaluation of more reasonable alternatives could proceed logically. The principles of the management concept adopted for Broward County are as follows:

(1) Given the concentration of shoaling around Hillsborough Inlet and the documented presence of beach-quality sediments in this segment of the Waterway, beach placement, supplemented

by one or more upland material transfer or temporary storage sites, becomes the most appropriate management strategy for this channel segment.

(2) For the remainder of the project area beyond the inlet's influence, the small projected volume of shoaling supports mechanical dredging over the hydraulic dredging methods typically used for more extensive Waterway shoals. Under this approach, barges would transport the dredged material from the dredging site to small temporary storage/material transfer sites adjacent to the Waterway.

(3) The small size and limited capacity of potential storage sites on the Waterway dictate that these sites temporarily store only the material produced by a single maintenance operation. The material must then be removed for beneficial reuse or disposal off-site before the next scheduled maintenance operation. Should even temporary storage prove impractical, these sites would serve only as material transfer points. Under this scenario, after the barges are offloaded at the transfer site, the dredged material would then be trucked to a site(s) located west of the coastal corridor. Sized to provide dry storage only for a single maintenance operation, the inland site(s) would also require that the stored material be offloaded for beneficial reuse or alternate long-term storage before the next scheduled channel maintenance.

(4) All sites are to be operated and maintained as permanent dredged material management facilities.

Within this framework, 42 alternative candidate sites were identified. Each of the 42 alternative sites as well as the seven sites within existing easements or FIND-owned properties was then field inspected and evaluated under a standard set of criteria addressing engineering, operational, environmental, and land-use considerations. This process led to the selection of six sites to form a site bank of four primary (first-choice) options and two secondary alternatives. Three of the primary sites represent properties presently owned or held under easement by the FIND. The remaining primary site and both of the secondary alternatives represent newly identified properties neither owned nor currently held under easement by the FIND.

A vital element in the plan development process was the participation of key federal and state agency representatives, as well as representatives of local government and interested public citizens. At

critical points during Phase I of the project, a Technical Advisory Committee consisting of representatives from the FIND, the Florida Department of Environmental Protection (FDEP), the Florida Department of Community Affairs (FDCA) and the Jacksonville District, U.S. Army Corps of Engineers (USACE) met with the contractor to monitor work in progress and review technical decisions for the execution of future tasks. Continuing dialogue with key agency personnel supplemented these meetings. In addition, the Broward County Marine Advisory Committee, appointed by the Broward County Commission to serve as the project's Citizens' Advisory Committee, periodically reviewed the specific plan as it developed. Finally, at key stages in the plan development process, the results of all efforts to that point were presented at Public Information Workshops. At the workshops, held in various public locations throughout Broward County, comment was actively solicited from representatives of local government, civic groups, and interested citizens. Input and guidance received from all those who participated in the committee meetings and workshops proved invaluable to the successful completion of the project.

Experience gained from the earlier long-range dredged material management studies completed for the Waterway in the counties cited above has demonstrated the importance of systematic documentation of dredged material management alternatives and the basis upon which these alternatives are evaluated. This Phase I report provides such information for the long-range dredged material management plan for the Intracoastal Waterway in Broward County and documents all work performed under this contract. A companion set of 16 photobased engineering plan sheets summarizes pertinent channel and site information. Phase II of this project will develop all of the detailed engineering, environmental, and survey information necessary to design, permit, and construct permanent dredged material management facilities on each of the primary sites selected. Phase II will also address cost considerations associated with these actions and will develop detailed site operation and management plans. Chapter 5.0 of this report presents a detailed scope of work for Phase II of the project.

ACKNOWLEDGEMENTS

The authors wish to express their appreciation to Ms. E. Lynn Mosura-Bliss and Mr. Peter NeSmith of Water and Air Research, Inc. for their assistance in the performance of this project.

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1.0 INTRODUCTION

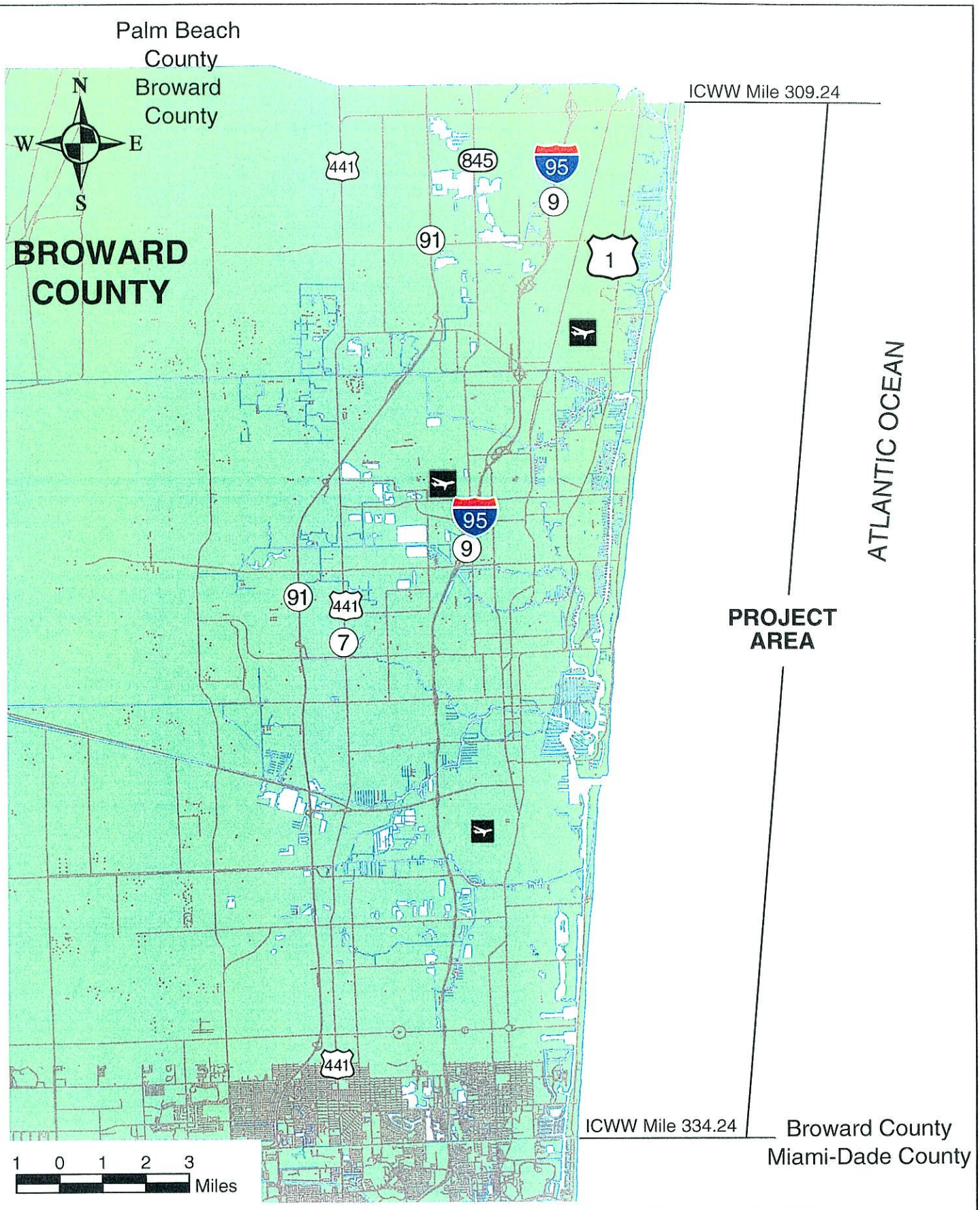
This report documents the first phase of a two-phased effort to develop a 50-year plan for the management of maintenance material dredged from the federally-authorized Intracoastal Waterway (ICWW or Waterway) channel in Broward County, Florida (Figure 1.1). Phase I, now completed, focused on the development of basic plan concepts, the definition of long-term dredging and material staorage requirements, and the identification of suitable management alternatives which satisfy preliminary environmental, engineering, and operational criteria. Phase II will focus on obtaining and documenting detailed site-specific information required for the preparation and submission of permit applications for the primary or first-choice sites identified in Phase I. In addition, Phase II will address the design of site facilities and will plan the construction and continuing operation and maintenance of these sites as permanent dredged material management facilities.

The methods used in the performance of the work reported herein derive from a study that addressed similar needs of the ICWW within Nassau and Duval Counties, Florida (Taylor and McFetridge, 1986). This earlier effort, performed under the sponsorship of the Florida Inland Navigation District (FIND), served as a pilot study for the FIND's 15-year Atlantic Intracoastal Waterway Dredged Material Management Program. The FIND's acquisition of seven upland sites has essentially completed Phase II of the Nassau-Duval study. With the construction of (to date) three dredged material management facilities intended to serve the needs of the ICWW within Nassau and Duval Counties for a minimum of 50 years, the FIND and the Jacksonville District, U.S. Army Corps of Engineers continue to implement the plan developed within the project's first phase.

In its continuing role of Engineer to the District, Taylor Engineering has applied the same method to the needs of the Waterway in St. Johns, Flagler, Volusia, Brevard, Indian River, St. Lucie, Martin and Palm Beach Counties, as well as to the 15.11-mi segment of the Okeechobee Waterway in Martin County that lies east (seaward) of the St. Lucie Lock. Experience gained from these earlier projects has demonstrated the importance of documenting the evaluation process used to identify management alternatives. This report provides such documentation for the long-range dredged material management plan for the ICWW in Broward County.

1.1 Background

Since its formation in 1927, the FIND has served as the local sponsor for the ICWW channel along Florida's east coast between Fernandina Harbor and Miami. As such, the FIND must provide the U.S. Army Corps of Engineers (USACE) with sites suitable for placing material dredged from the authorized federal navigation channel. Prior to the increased environmental awareness of the 1970's and



TAYLOR ENGINEERING INC. 9000 CYPRESS GREEN DRIVE, SUITE 200 JACKSONVILLE, FLORIDA 32256	Figure 1.1 Project Area Long Range Dredged Material Management Plan Intracoastal Waterway, Broward County, Florida	Project C2002-36B Revision Sheet Date Feb., 2003

the recognition by various federal and state regulatory agencies of the value of estuarine wetlands, a short-term economic approach guided management of dredged material. Engineering, cost, and operational considerations determined the design and execution of channel maintenance projects. To this end, the Trustees of the Internal Improvement Trust Fund granted to the FIND perpetual easements to significant acreage along the Waterway. A majority of these easements were located entirely within the sovereign waters of the state and included open water areas as well as expanses of pristine salt marsh in the more northern counties and mangrove wetlands in the more southern counties. Additionally, many landowners with holdings adjoining the Waterway sought to improve the development potential of wetlands by granting disposal easements and allowing the unconfined placement of maintenance material. This approach, combined with the desire of the dredging contractor to maximize operational efficiency, resulted in the loss of wetlands and the proliferation of numerous small spoil mounds and islands lining the Waterway.

Because of society's increased environmental awareness and the scientific knowledge supporting it, the unconfined placement of dredged material within wetland areas no longer represents a responsible approach to the maintenance of the ICWW. Neither is it a realistic approach given present-day, agency-imposed permitting constraints. Current state and federal legislation mandates that all dredging and dredged material management activities satisfy a spectrum of environmental requirements dealing with water quality, habitat protection, threatened and endangered species, and the filling of wetlands. Specific prohibitions against the unconfined placement of dredged material in wetlands are contained in Sections 301 and 404 of the Clean Water Act (33 U.S.C. 403) administered by the U.S. Environmental Protection Agency; Section 10 of the Rivers and Harbors Act administered by the U.S. Army Corps of Engineers; and Chapters 253, 258, and 403 Florida Statutes and Chapters 17-4, 18-20, and 18-21 of the Florida Administrative Code administered by the Florida Department of Environmental Protection. In addition, local county and municipal governments typically address dredge-and-fill issues in local comprehensive planning documents within state-established guidelines. The long-range implications of these constraints have become more apparent in the ensuing years as existing sites reach capacity and as the identification and permitting of dredged material management sites become increasingly difficult. Moreover, the intensive development pressure being experienced throughout coastal Florida has made the acquisition of additional sites an increasingly expensive proposition.

In order to secure its ability to maintain the ICWW within the existing framework of engineering, operational, and environmental constraints, the FIND initiated a 15-year program of long-term planning and site acquisition to provide a means to accommodate all maintenance material dredged from the Waterway during the next 50 years and beyond. The first program element addressed the needs of the

Waterway within Nassau and Duval Counties. The program continues, now guided by a prioritization of Waterway segments, county by county, based on each county's need for immediate channel maintenance, as well as on the difficulty of providing appropriate sites within each county. This prioritization, jointly decided upon by the FIND and the Jacksonville District, USACE, identified two counties — Broward and Miami-Dade — as the final elements within the 15-year program. This Phase I report documents the development of the long-range dredged material management plan for the Intracoastal Waterway in Broward County.

1.2 Project Overview

Phase I development of the long-range dredged material management plan for the ICWW in Broward County consists of six components: (1) establishment of the 50-year material storage requirement within the Broward County project area based on historic maintenance dredging volumes and subsequent examination surveys; (2) evaluation of the remaining or potential storage capacity of existing easements and FIND-owned tracts within the project area; (3) development of a management concept or strategy appropriate to specific engineering and operational requirements, and environmental and land-use constraints; (4) identification of additional candidate sites consistent with the management concept; (5) evaluation of all candidate sites based on a standard set of criteria that reflect engineering, operational, environmental, and land-use considerations; and (6) selection of a set of primary (first-choice) and secondary (second-choice) dredged material management sites that best meet project requirements consistent with the established management concept. This report documents each of these plan components.

1.2.1 Advisory Committees and Public Workshops

The execution of this project included, by design, a four-tiered involvement of outside reviewers and interested members of the public who commented on the long-range dredged material management plan as it developed. These four sources of input consisted of (1) a Technical Advisory Committee comprising representatives from the Florida Inland Navigation District staff, the Jacksonville District Corps of Engineers, the Florida Department of Environmental Protection, and the Florida Department of Community Affairs; (2) the Broward County Marine Advisory Committee, appointed by the Broward County Commission to serve as the project's Citizens' Advisory Committee; (3) the Board of Commissioners for the FIND; and (4) the interested public. The following paragraphs describe these groups' involvement in the plan development process.

The Technical Advisory Committee met with members of the Taylor Engineering staff a total of four times during the course of the project to monitor work in progress and review technical decisions for the execution of future tasks. The FIND held the first meeting of the Technical Advisory Committee on May 24, 2000, at the offices of the FDEP in Tallahassee. At this meeting, the Committee reviewed long-term Waterway requirements, the inventory of existing easements and their ability to meet these requirements, the development of the management concept, the preliminary identification of alternative candidate sites, the establishment of an initial site bank consisting of all existing easements that showed some potential for continued use and all newly identified alternative sites, and early impressions from the field inspection of all initial site bank sites. The second meeting of the Technical Advisory Committee, held August 30, 2001, at the Jacksonville District offices of the U.S. Army Corps of Engineers, reviewed the results of the site evaluation process as well as the preliminary site bank of primary and secondary alternatives for each reach of the project area derived from that evaluation. The third meeting, held January 18, 2002, also at the Jacksonville District, USACE, reviewed the first draft of the present report. Following the incorporation of several significant revisions to basic plan elements at the request of the FIND, the fourth and final meeting of the Technical Advisory Committee, *[not yet scheduled]* reviewed the report's final draft before its approval by the FIND Board of Commissioners. The plan presented in this report reflects the valued contribution of this group.

Each meeting of the Technical Advisory Committee was followed as closely as scheduling would allow by a meeting of the project's Citizens' Advisory Committee. Over the course of the project, FIND and Taylor Engineering staffs met with this committee five times to review project work. Each of these meetings were held at a public meeting hall within the Secret Woods Nature Center in Dania Beach. To begin, on October 7, 1999, FIND and Taylor Engineering staffs attended a regularly scheduled meeting of the Broward County Marine Advisory Committee (serving as our project's county-appointed Citizens' Advisory Committee) to inform the committee of the project's initiation and objectives, and to actively solicit their input and assistance. The material discussed and reviewed at subsequent meetings with this committee — on May 4, 2000; September 6, 2001; March 7, 2002; and *[not yet scheduled]* — paralleled the material covered in the corresponding Technical Advisory Committee meetings. The members of the Citizens' Advisory Committee provided additional input regarding the relative practicality and desirability of developing specific candidate sites as permanent dredged material management facilities. Through this process, the Committee provided valuable suggestions that, in many cases, led to the plan's improvement.

To inform the citizens of Broward County and to receive additional input, the FIND held three Public Information Workshops. The FIND advertised each of these workshops in the legal notice sections

of the *Ft. Lauderdale Sun-Sentinel* newspaper. Additionally, to distribute meeting notices and status reports the FIND initiated a mailing list that included government representatives in Broward County and other interested parties (Appendix F). Held at the Anne Kolb Nature Center at West Lake Park in Hollywood on May 4, 2000, the Pompano Beach Civic Center on October 18, 2001, and *[not yet scheduled]*, these workshops presented the work accomplished to date and set forth the direction of the plan. The information presented and discussed at the public workshops incorporated input received from both the Technical Advisory and Citizens' Advisory Committees.

Finally, progress made in the development of the Long-Range Dredged Material Management Plan for the Intracoastal Waterway in Broward County was discussed at the regularly scheduled public board meetings of the Florida Inland Navigation District. These public meetings are held monthly on a rotating basis in each of the 11 counties comprising the District. During Phase I of the Broward County project, progress reports and updates were presented and discussed by the FIND Board at over 15 public board meetings and workshops to date. The first draft report received Board approval at its meeting held January 25, 2002. Subsequent modifications of several plan concepts led to substantive revisions and submittal of a second, final draft report and Board approval of the revised plan *[not yet scheduled]*. The final report is scheduled to be formally adopted by the Board at its meeting of *[not yet determined]*.

The constructive and valuable input received from each of the above-described sources contributed greatly to the successful completion of the Long-Range Dredged Material Management Plan for the Intracoastal Waterway in Broward County.

1.3 Plan Document

The remainder of this report documents the entire planning process. Chapter 2.0 describes the establishment of 50-year material management requirements for various reaches of the Waterway. These projected requirements reflect historic dredging records, recent survey data, and comparison of projected dredging locations and material storage requirements with the capacities of existing disposal easements. Chapter 3.0 discusses the management concept, the identification of alternative sites, and the field inspection and initial evaluation of all candidate sites, comprising both existing easements and newly-identified candidate sites. Chapter 4.0 describes the final site evaluation process and includes the evaluation criteria used and the formation of the site bank of first- and second-choice options from the list of candidate sites. Finally, Chapter 5.0 presents a specific scope of work for plan implementation in Phase II.

2.0 50-YEAR MATERIAL STORAGE REQUIREMENT

2.1 Historic Analysis

2.1.1 Methodology

The first step in assessing the requirements of the project area estimated future dredging and material storage volumes from documented historic shoal volumes for the Broward County segment of the Intracoastal Waterway. Baseline shoal volumes, in turn, reflect two quantities: (1) the estimated volume of material removed from the Waterway channel in all maintenance dredging operations since construction of the channel to its present project depth, and (2) the estimated volume of shoaling presently within the authorized channel, based on sequential surveys (1996, 1999) of the entire Atlantic Intracoastal and Intracoastal Waterway in Florida, including the Broward County channel segment. The latter quantity represents the volume of shoaling which has occurred since the last maintenance operation or which has occurred in areas not previously maintained.

The first quantity, the volume of historic maintenance dredging, derives from a detailed analysis of Jacksonville District, U.S. Army Corps of Engineers (USACE) archival records — specifically, analysis of all engineering plans and supporting documents for channel maintenance performed in the Broward County segment of the ICWW since the channel was deepened to its present project depth. The authorized depth of the Intracoastal Waterway, St. Johns River to Miami Harbor is 12 ft below Mean Low Water (-12 ft MLW); however, from Ft. Pierce Harbor south to Miami Harbor financial considerations limited the channel's construction to –10 ft MLW. The USACE deepened the channel within Broward County to its present –10 ft MLW nominal project depth in 1965.

To ensure accuracy, consistency, and completeness, a comprehensive review of all available sources of dredging information held by the Jacksonville District, USACE, was used to estimate the volume of ICWW maintenance dredging since 1965. Relevant sources included the annual Office of the Chief of Engineers (OCE) Reports, previous USACE summaries of maintenance dredging within the project area, and interviews with USACE personnel. The primary sources of information, however, remained USACE archival maintenance plan documents and examination surveys.

The compilation and reduction of historic dredging information from the various preliminary sources proved to be a difficult task. No single source had complete information, and the resolution of inconsistencies among sources was necessary prior to locating dredging plans. With this task

accomplished, the records then had to be physically located under several filing systems within the district office archives and missing plans recalled from inter-division loan or from alternate storage at the Jacksonville District Dredge Depot. All relevant dredging information was verified by reference to the original plan sheets or microfiche versions of the original engineering drawings. Additional information contained in the dredging plans included shoaling areas and limits of planned dredging (referenced to the existing longitudinal stationing), the estimated dredging volume for each shoal and, in many cases, the location of material placement.

The archival records express the volume of material dredged in previous channel maintenance operations in two forms. The first is the pre-dredging estimate, or the design volume, of required dredging. This estimate reflects the comparison of the results of a detailed pre-dredging examination survey of the authorized channel to the project design depth, plus the required advanced maintenance or overdepth dredging. The plan for the dredging operation and the bids of the dredging contractors are based on this estimate. The second estimate represents the pay volume. This estimate determines the dollar amount the dredging contractor receives for the work and reflects the comparison of detailed pre- and post-dredging examination surveys, and therefore closely corresponds to the actual volume of material removed from the channel. Because of past contracting and recording procedures, pay volumes do not always link dredging quantities to specific dredging locations. In those maintenance operations for which the pay volume was unavailable, multiplying the design volume by a correction factor provides an estimate of the pay volume. Derived from all dredging records evaluated thus far in the FIND's long-range program, the correction factor of 1.19 represents the ratio of pay volume to design volume in those channel maintenance operations for which both quantities are known.

The analysis of historic dredging records established that the USACE performed no maintenance dredging within the Broward County segment of the ICWW since the 1965 deepening of the channel to its present –10 ft MLW nominal project depth. However, as discussed later in this section, the lack of maintenance dredging does not necessarily prove the absence of shoaling. Other factors unrelated to shoaling often determine the scheduling of channel maintenance. These include contracting procedures, the availability of funding and equipment and, most relevant to the present study, the availability of suitable dredged material management sites. As discussed in Section 2.3, Broward County has suffered from a lack of placement sites appropriate to receive dredged material under today's regulatory criteria.

To provide recent data on shoaling within the Broward County segment of the Waterway, in 1996 the FIND undertook a comprehensive survey of the Atlantic Intracoastal Waterway from Fernandina Harbor southward 22.31 mi to the St. Johns River and the Intracoastal Waterway from the St. Johns River

southward 348.43 mi to Miami Harbor, as well as the 15.11-mi segment of the Okeechobee Waterway in Martin County from its intersection with the ICWW to the St. Lucie Lock. Performed by Sea Systems, Inc. under the direction of Taylor Engineering, Inc., the triple sweep surveys encompassed the centerline of the authorized channel and two parallel offset lines to characterize the entire channel width. Horizontal and vertical control throughout the survey remained in accordance with USACE specifications. In December 1999, the Jacksonville District (USACE) replicated the earlier survey and extended the coverage from the Port of Miami an additional 35.0 mi southward to the Miami-Dade/Monroe County line. To evaluate the data from each survey, Taylor Engineering developed mathematical routines to integrate the three lines of survey data and calculate shoal volumes for the entire channel. The process identified shoal locations as those areas where the surveyed depths were less than the established project depth for that segment of the Waterway and calculated shoal volumes based on an additional one ft of overdepth dredging in accordance with USACE practice. The resulting volumes were taken as the *design volume* (the pre-dredging estimate) for which a corresponding *pay volume* (estimated quantity of material dredged that would reflect comparison of detailed pre-dredging and post-dredging examination surveys) was derived by the method described above.

In addition to documenting shoal volumes, the analysis of survey data revealed that, during or before the 1965 operation that established the present –10 ft project depth, much of the ICWW channel within Broward County was dredged deeper than the project depth. This was most likely done under the sponsorship of local interests to obtain fill for construction or development projects adjacent to the Waterway. However, research failed to locate accurate as-built surveys for the overdredged channel segments. Comparison of the 1996 and 1999 surveys could not provide a reasonable estimate of the shoaling rate within these areas, given the small changes in channel depth between the two surveys and the error inherent in large-scale hydrographic surveys of this type. As a result, the recent channel surveys of the Broward County project area can reliably represent only the volume of shoaling above the established –10 ft MLW project depth.

The development of plan elements which address the needs of the ICWW in Nassau, Duval, St. Johns, Volusia, Brevard, Indian River, St. Lucie, Martin and Palm Beach Counties demonstrated that a necessary first step in the analysis of dredging records and survey data is to establish an accurate and consistent system for cross-referencing a particular location along the ICWW to cut, station, and channel mile. Moreover, such a system must resolve inconsistencies between project descriptions found in older engineering records and those of more recent origin. Adopting current designations of channel cut and station and referencing them to ICWW channel mileage resolved these inconsistencies. The system derives from Jacksonville District control data, as well as the original navigation project record document

that accompanied the establishment of the 10-ft MLW project depths in Broward County in 1965. Measuring channel mileage from the southern boundary of the Jacksonville Harbor project (ICWW mile 0.0) maintained consistency with the previous plan elements.

Notably, the 1996 channel survey introduced a necessary correction to the framework of channel mileage used in all previous plan documents comprising the long-range dredged material management program. The survey provided, for the first time, an accurate measurement of an uncontrolled segment of the Waterway through St. Augustine in St. Johns County. This uncontrolled section, within which no authorized channel location was ever adopted, was previously estimated to be 18.80 miles in length as scaled from aerial photographs, NOAA nautical charts, and USGS topographic quadrangle maps. The 1996 channel survey determined the length of the uncontrolled section to be 19.62 miles, based on the present position of navigation aids through the uncontrolled section. The remainder of the study maintains this framework as referenced to the revised ICWW mileage. Accordingly, consistency with the revised ICWW mileage framework requires all locations south of St. Augustine in St. Johns County referenced to ICWW channel mile in previous plan documents completed before 1997 be increased by 0.82 miles.

The Broward County segment of the ICWW area extends 25.0 miles from its starting point approximately 650 ft south of the Palm Beach/Broward County line (ICWW mile 309.24; Cut BW-1, Station 0+00) to its endpoint approximately 530 ft south of the Broward/Miami-Dade County line (ICWW mile 334.24; Cut DA-1, Station 0+00). The county's northernmost 650 ft that lie within Cut P-91 are addressed as part of the long-range plan for the ICWW in Palm Beach County. Table 2.1 lists the 63 designated channel cuts (i.e., the straight line channel segments), cut lengths, and mileages measured from the northern boundary of the Broward County project area, as well as from the St. Johns River in Jacksonville (specifically, the southern edge of the Jacksonville Harbor Project, designated ICWW mile 0.0) and from Fernandina Beach (specifically, the southern edge of the Fernandina Harbor Project, designated AIWW mile 0.0).

2.1.2 Material Quantities and Locations

Table 2.2 presents the locations and calculated volumes of shoals identified in the 1999 survey of the Broward County segment of the Waterway channel. All shoal locations reference both to channel cut and station and to the revised framework of ICWW mileage presented in Table 2.1. Figure 2.1 depicts the shoal locations listed in Table 2.2.

Table 2.1. Intracoastal Waterway, Broward County

			Mileage		
Cut	**End Station (ft)**	**Length (mi)**	**0.0 @ Cut BW-1 Sta 0+00**	**ICWW Mileage 0.0 @ DU-1**	**0.0 @ FHP AIWW Cut 34**
BW-1	8 + 20.40	0.16	0.16	309.40	331.71
BW-2	15 + 75.60	0.30	0.45	309.69	332.00
BW-3	13 + 88.20	0.26	0.72	309.96	332.27
BW-4	12 + 80.10	0.24	0.96	310.20	332.51
BW-5	17 + 50.20	0.33	1.29	310.53	332.84
BW-6	28 + 12.50	0.53	1.82	311.06	333.37
BW-7	8 + 26.80	0.16	1.98	311.22	333.53
BW-8	9 + 64.50	0.18	2.16	311.40	333.71
BW-9	9 + 87.40	0.19	2.35	311.59	333.90
BW-10	19 + 08.60	0.36	2.71	311.95	334.26
BW-11	21 + 03.20	0.40	3.11	312.35	334.66
BW-12	12 + 29.30	0.23	3.34	312.58	334.89
BW-13	7 + 62.50	0.14	3.49	312.73	335.04
BW-14	6 + 09.40	0.12	3.60	312.84	335.15
BW-15	13 + 48.70	0.26	3.86	313.10	335.41
BW-16	4 + 17.20	0.08	3.94	313.18	335.49
BW-17	4 + 00.10	0.08	4.01	313.25	335.56
BW-18	4 + 20.60	0.08	4.09	313.33	335.64
BW-19	11 + 55.30	0.22	4.31	313.55	335.86
BW-20	9 + 04.30	0.17	4.48	313.72	336.03
BW-21	13 + 78.00	0.26	4.74	313.98	336.29
BW-22	29 + 75.20	0.56	5.31	314.55	336.86
BW-23	54 + 13.80	1.03	6.33	315.57	337.88
BW-24	32 + 33.80	0.61	6.94	316.18	338.49
BW-25	41 + 87.80	0.79	7.74	316.98	339.29
BW-26	14 + 42.10	0.27	8.01	317.25	339.56
BW-27	41 + 29.20	0.78	8.79	318.03	340.34
BW-28	53 + 81.60	1.02	9.81	319.05	341.36
BW-29	40 + 19.40	0.76	10.57	319.81	342.12
BW-30	45 + 11.70	0.85	11.43	320.67	342.98
BW-31	19 + 53.80	0.37	11.80	321.04	343.35
BW-32	15 + 25.20	0.29	12.09	321.33	343.64
BW-33	22 + 37.90	0.42	12.51	321.75	344.06
BW-34	12 + 34.60	0.23	12.74	321.98	344.29
BW-35	34 + 11.00	0.65	13.39	322.63	344.94
BW-36	6 + 35.60	0.12	13.51	322.75	345.06
BW-37	15 + 79.50	0.30	13.81	323.05	345.36

Table 2.1. Intracoastal Waterway, Broward County

Cut	End Station (ft)	Length (mi)	Mileage		
			0.0 @ Cut BW-1 Sta 0+00	ICWW Mileage 0.0 @ DU-1	0.0 @ FHP AIWW Cut 34
BW-38	14 + 55.00	0.28	14.09	323.33	345.64
BW-39	31 + 85.80	0.60	14.69	323.93	346.24
BW-40	4 + 00.00	0.08	14.76	324.00	346.31
BW-41	5 + 29.70	0.10	14.86	324.10	346.41
BW-42	4 + 00.00	0.08	14.94	324.18	346.49
BW-43	17 + 89.50	0.34	15.28	324.52	346.83
BW-44	4 + 56.00	0.09	15.37	324.61	346.92
BW-45	3 + 60.10	0.07	15.43	324.67	346.98
BW-46	3 + 60.10	0.07	15.50	324.74	347.05
BW-47	3 + 60.10	0.07	15.57	324.81	347.12
BW-48	4 + 56.00	0.09	15.66	324.90	347.21
BW-49	39 + 70.20	0.75	16.41	325.65	347.96
BW-50	39 + 84.70	0.75	17.16	326.40	348.71
BW-51	80 + 85.10	1.53	18.69	327.93	350.24
BW-52	38 + 72.00	0.73	19.43	328.67	350.98
BW-53	3 + 77.00	0.07	19.50	328.74	351.05
BW-54	24 + 42.00	0.46	19.96	329.20	351.51
BW-55	32 + 72.00	0.62	20.58	329.82	352.13
BW-56	47 + 14.20	0.89	21.47	330.71	353.02
BW-57	13 + 17.90	0.25	21.72	330.96	353.27
BW-58	39 + 77.30	0.75	22.48	331.72	354.03
BW-59	18 + 05.90	0.34	22.82	332.06	354.37
BW-60	11 + 00.00	0.21	23.03	332.27	354.58
BW-61	33 + 95.00	0.64	23.67	332.91	355.22
BW-62	11 + 91.10	0.23	23.90	333.14	355.45
BW-63	58 + 15.50	1.10	25.00	334.24	356.55

Table 2.2 Summary of Historic Maintenance Dredging/Recent Shoaling
Intracoastal Waterway, Broward County, 1964-2000

ICWW Mileage		Cut/Station		Length		Design Volume	Pay** Volume
From	To	From	To	(ft)	Year	(cy)	(cy)
309.24	309.28	BW-1/0+02	BW-1/1+89	187	2000*	461	*549*
309.57	309.66	BW-2/9+22	BW-2/13+63	441	2000*	508	*604*
310.36	310.36	BW-5/8+63	BW-5/8+63	-	2000*	34	*41*
310.51	310.52	BW-5/16+42	BW-5/16+74	32	2000*	106	*126*
310.78	310.82	BW-613+39	BW-6/15+11	172	2000*	1,479	*1,760*
311.12	311.14	BW-7/3+24	BW-7/4+07	83	2000*	543	*646*
311.30	311.34	BW-8/4+23	BW-8/6+17	194	2000*	741	*882*
312.28	312.30	BW-11/17+20	BW-11/18+29	109	2000*	248	*295*
312.35	312.35	BW-11/20+99	BW-11/20+99	-	2000*	62	*73*
312.63	312.64	BW-13/2+40	BW-13/2+97	57	2000*	168	*200*
312.69	312.84	BW-13/5+94	BW-14/5+60	728	2000*	4,259	*5,068*
313.25	313.30	BW-17/3+56	BW-18/2+40	284	2000*	2,089	*2,485*
313.49	313.51	BW-19/8+66	BW-19/9+72	106	2000*	99	*117*
313.56	313.72	BW-20/0+74	BW-20/8+80	806	2000*	4,835	*5,754*
313.76	313.77	BW-21/2+29	BW-21/2+47	18	2000*	68	*81*
313.84	313.85	BW-21/6+57	BW-21/6+77	20	2000*	163	*194*
313.95	313.95	BW-21/12+05	BW-21/12+05	-	2000*	32	*38*
314.03	314.13	BW-22/2+83	BW-22/7+77	494	2000*	1,777	*2,114*
314.17	314.23	BW-22/9+80	BW-22/13+20	340	2000*	424	*504*
314.31	314.37	BW-22/17+38	BW-22/20+77	339	2000*	452	*538*
315.57	315.60	BW-23/53+69	BW-24/1+50	194	2000*	671	*798*
316.56	316.56	BW-25/19+94	BW-25/19+94	-	2000*	32	*38*
322.14	322.16	BW-35/8+67	BW-35/9+64	97	2000*	222	*264*
322.98	322.99	BW-37/12+06	BW-37/12+92	86	2000*	163	*194*
323.77	323.79	BW-39/23+40	BW-39/24+10	70	2000*	86	*102*
328.89	328.89	BW-54/7+73	BW-54/7+73	-	2000*	37	*44*
331.60	331.60	BW-58/33+53	BW-58/33+53	-	2000*	34	*40*

Total Design Volume: 19,790

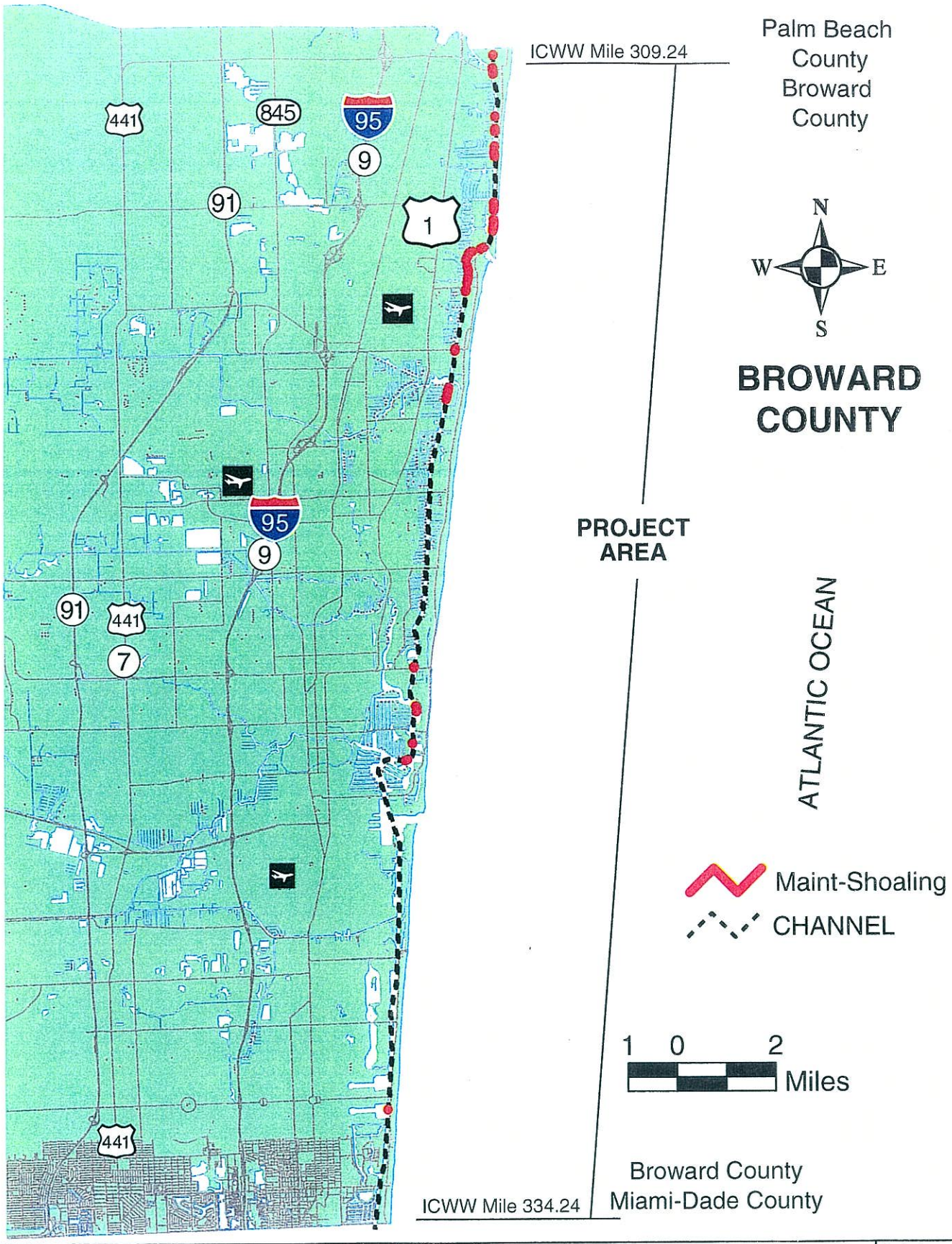
Total Pay Volume: 23,551

Dredging Volume/Year: 673

50-Yr Dredging Requirement: 33,644

50-yr Disposal Requirement: 72,334

* Data from 2000 channel survey performed by Sea Systems, Inc. for the Florida Inland Navigation District.
** Numbers in *italic* are based on the relationship: Pay Volume = 1.19 x Design Volume



TAYLOR ENGINEERING INC. 9000 CYPRESS GREEN DRIVE, SUITE 200 JACKSONVILLE, FLORIDA 32256	Figure 2.1 Resent Shoaling Long Range Dredged Material Management Plan Intracoastal Waterway, Broward County, Florida	Project C2002-36B Revision Sheet Date Feb., 2003

Inspection of Table 2.2 reveals that the total volume of shoaling (that is, the estimated pay volume) throughout the Broward County project area since the channel was deepened to its present depth is only 23,551 cubic yards (cy). Moreover, the relatively small volume of shoaling has been largely restricted to the northern section of Broward County. In fact, over 97% (22,907 cy) of the total shoal volume occurs within the project area's northernmost 7.4 miles in an area roughly centered about Hillsboro Inlet (ICWW mile 313.3). The greater portion of the shoaling in this area (56%) lies to the inlet's north, with almost every channel cut from the inlet to the northern limits of the project area exhibiting some degree of shoaling. Almost all of the remaining 44% of the inlet-centered shoaling lies within the 2.3-mi channel segment to the inlet's south. Continuing southward, the 5.6-mi channel segment extending from Cut BW-25, Station 19+94 (ICWW mile 316.56) through Cut BW-35, Station 8+67 (ICWW mile 322.14) — encompassing the area from Sea Ranch Lakes and Lauderdale-by-the-Sea through Hugh Taylor Birch State Park to the Middle River — contains no shoals above the –10-ft MLW project depth. As discussed in the preceding section, much of this area was previously dredged to depths well below the project depth, typically between –14 ft and –22 ft MLW. The remaining 3% (644 cy) of shoaling documented within the Broward County project area represents minimal shoals scattered through the project area's southernmost 12 miles. The majority of the remainder (604 cy) occurs in isolated and widely dispersed shoals north of Port Everglades (Cut BW-35, Station 8+67 to Cut BW-54, Station 7+73; ICWW mile 322.14 to mile 328.89). No shoaling was found within the ICWW channel segment that passes through Port Everglades, as the independent maintenance of the Port's access channels and turning basin removes the material that may enter through the Port's entrance. Finally, a minimal (40 cy) shoal lies just south of the Hollywood Boulevard Bridge (Cut BW-58, Station 33+53; ICWW mile 331.60). The project's southernmost 2.6 mi — opposite the Hollywood/Hallandale area — also contains no shoals above –10 ft MLW. This is largely attributable to much of this area having been previously dredged well beyond the project depth, with the depth in some channel segments exceeding –35 ft MLW.

To project the corresponding 50-year maintenance requirement for the Broward County project area, the total volume of documented shoaling (that is, its in situ pay volume) was then apportioned upward by linear extrapolation. The resulting projected dredging volume of 33,644 cy corresponds to the in situ or unbulked volume of dredging anticipated to be required throughout the county over the next 50 years. Translating the projected 50-year in situ volume of anticipated dredging into the volume of storage required to handle the dredged material must consider the bulking characteristics of the material. Bulking refers to the expansion of consolidated sediment that occurs through the dredging process. Hydraulic dredging leads to material bulking by increasing the water content of the dredged material compared to its in situ consolidated state. Mechanical dredging also leads to material bulking, but typically to a lesser degree. After dredging and placement for long-term storage, the dredged material will begin to

consolidate under its own weight. Given the appropriate conditions and sufficient time, the material may approach its original pre-dredging volume. The degree to which the material expands (bulks) depends on the physical characteristics of the sediment as well as its relative consolidation (i.e., its water content) prior to dredging. The present study uses a conservative factor of 2.0 to account for the increase in volume of the dredged material compared to its in situ volume. An additional allowance of 15 percent of the original in situ volume accounts for allowable or authorized overdredging. These conservative values reflect Jacksonville District, U.S. Army Corps of Engineers experience and recommendation. Multiplying the projected 50-year volume of shoaling by the effective bulking factor of 2.15 yields a projected 50-year material storage requirement of 72,334 cy for the Broward County project area.

Significantly, this projected 50-year material storage requirement represents the lowest projected storage requirement of any of the 12 coastal counties that comprise the FIND's long-ranged dredged material management program. St. Lucie County represented the previous low estimate. As revised by the results of the 1999 channel survey, the St. Lucie County segment of the ICWW is projected to require a material storage capacity of 156,324 cy over the next 50 years, a volume over twice that required by Broward County. For comparison, Volusia County represents the highest projected 50-year storage requirement among the counties that comprise the District. Again, as revised by the results of the 1999 channel survey, Volusia County is projected to require a material storage capacity of over 10.4 million cy, or over 140 times the requirement projected for Broward County.

2.1.3 Material Quality

In addition to projected material quantities, a dredged material management plan must also consider the chemical and physical properties of the sediment. Techniques employed to maintain water quality during dredging and dewatering operations depend on the material's chemistry and its physical characteristics (i.e., particle size, specific gravity, etc.). In addition, chemical and physical properties determine the dredged material's potential for reuse and, therefore, influence a dredged material management site's effective service life. In a procedure similar to that used to establish historic dredging volumes, Taylor Engineering reviewed available sediment chemistry and sediment physical data for the Broward County reaches of the ICWW. To augment the limited data on ICWW sediments, a program of sediment sampling and analysis was performed specifically for the present planning effort.

2.1.3.1 Sediment Data Collection

The Jacksonville District, USACE, provided historical sediment quality information for the Broward County segment of the ICWW. The 10 USACE sediment grab samples (Figure 2.2) were taken throughout the county in September 1999 without regard to potential contaminant sources. The samples were analyzed for metals, organochlorine pesticides and polychlorinated biphenyls, total organic carbon, total Kjeldahl nitrogen, and percent solids. The USACE data do not include grain size.

To supplement the USACE sediment data, Taylor Engineering staff collected 12 sediment samples on September 7 and September 8, 2000 from the ICWW channel throughout Broward County (Figure 2.2). Of the 12 sampling locations, the three northernmost sampling locations are within or near documented shoals (Figure 2.3). All 12 Taylor Engineering samples were analyzed for grain size. Eight of the twelve sediment samples were analyzed for metals, organochlorine pesticides and polychlorinated biphenyls (PCB), polycyclic aromatic hydrocarbons (PAH), total organic carbon, total Kjeldahl nitrogen (TKN), and total recoverable petroleum hydrocarbons (TRPH). Table 2.3 lists specific locations, along with the sample description and collection depth. Where possible, sediments for chemical analyses were collected from areas of expected fine-grained sediment accumulation near potential sources of contamination (heavily urbanized areas, marinas, New River). Sediment was collected with a stainless steel petite Ponar grab sampler and transferred to pre-cleaned containers with a stainless steel spatula. A sub-sample of each grab sample was placed in a separate container for grain size analysis. Columbia Analytical Laboratories, Inc. performed the chemical analyses; Ellis & Associates, Inc. performed the grain size analyses.

2.1.3.2 Sediment Physical Characteristics

This section focuses on the physical characteristics of Broward County channel sediments. Physical sediment characteristics influence dredged material handling and affect sediment chemical quality. Table 2.4 summarizes physical sediment data (mean grain size, United Soil Classification System size, silt and clay content, water content, and organic matter) from the samples collected by Taylor Engineering. Appendix E contains the laboratory data sheets for these samples.

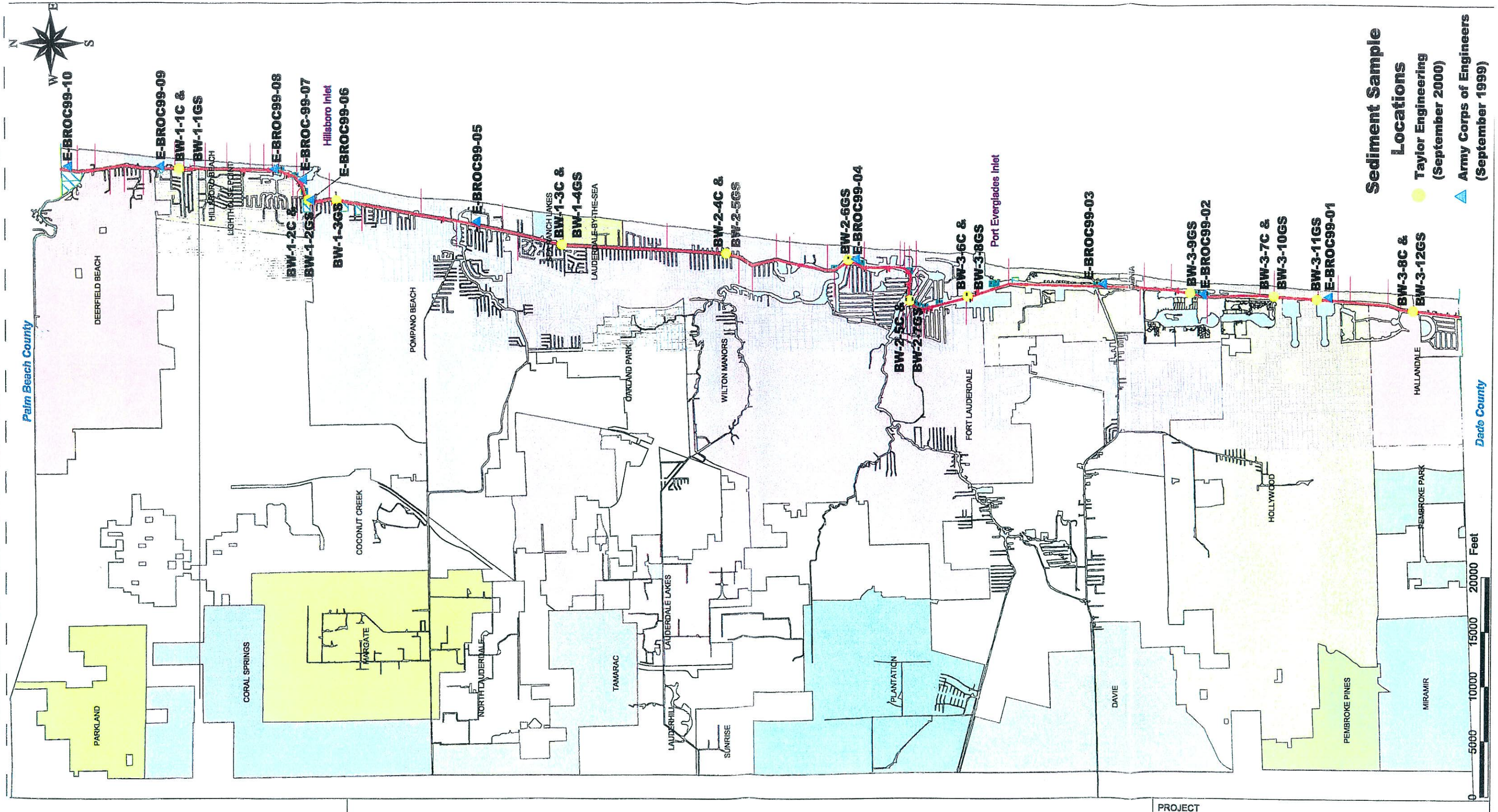


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Figure 2.2: Broward County ICWW Sediment Sampling Locations

PROJECT	C1999-020
REVISION	
SHEET	
DATE	December 2001

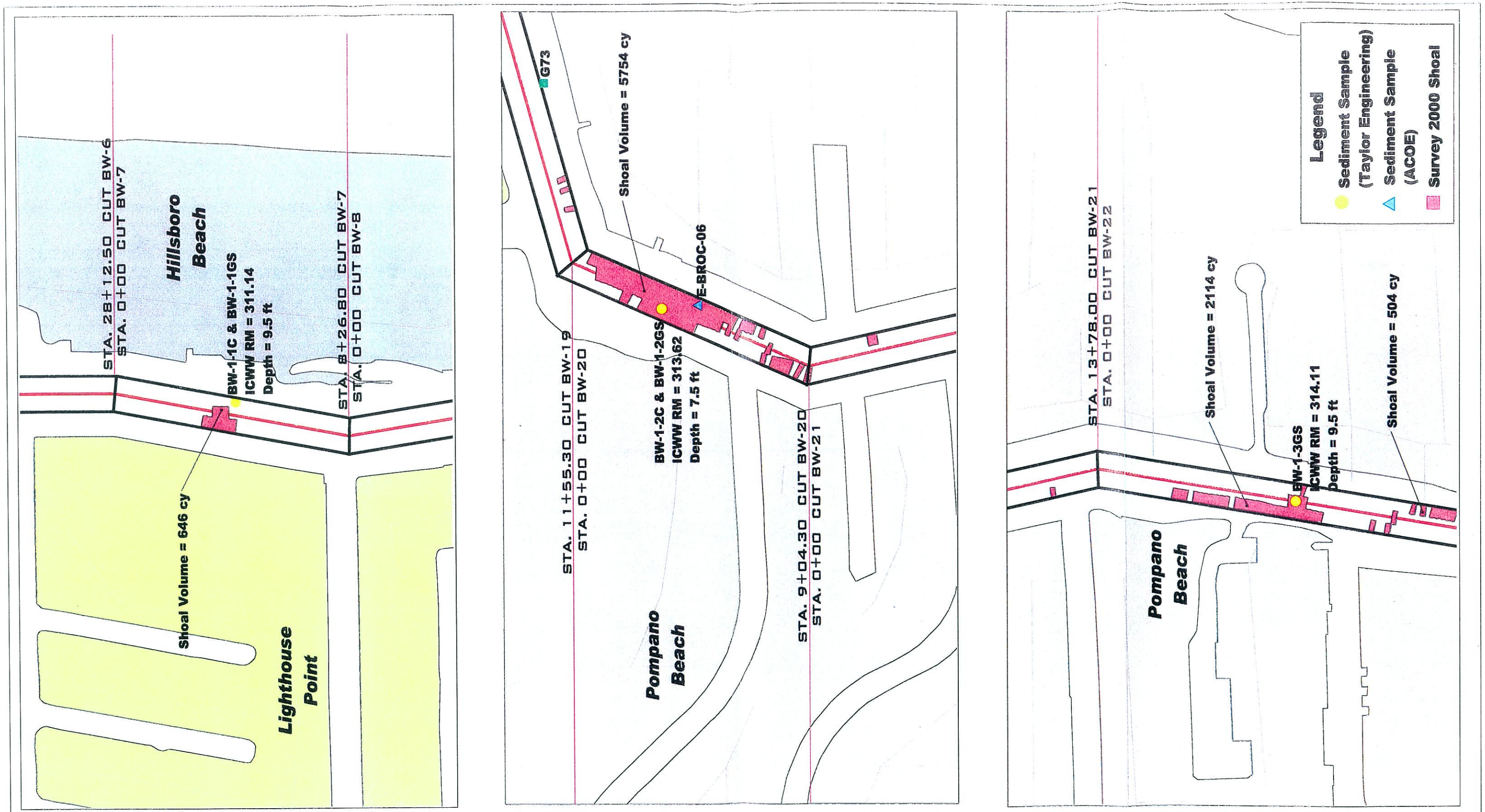

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Figure 2.3: Broward County ICWW Sediment Sampling Locations Located Within Survey 2000 Shoals

PROJECT	C1999-020
REVISION	
SHEET	
DATE	December 2001

Table 2.3 Broward County ICWW Sediment Sampling Locations, September 2000

Sample ID	*Date*	*Reach*	*Cut/ Station*	*ICWW RM*	*Latitude Longitude*	*Depth (ft)*	*Field Description*	*Location*
BW-1-1C & BW-1-1GS	9/7/00	BW-1	BW-7/ 4+12	311.14	26°17'28.6" 80°04'50.4"	9.5	Fine sand and shell	North of ΔR68[A]
BW-1-2C & BW-1-2GS	9/7/00	BW-1	BW-20/ 3+49	313.62	26°15'33.7" 80°05'22.9"	7.5	Sand	Adjacent to MSA726
BW-1-3GS	9/7/00	BW-2	BW-22/ 7+03	314.11	26°15'08.4" 80°05'23.3"	9.5	Sand	North of MSA727B
BW-1-3C & BW-1-4GS	9/7/00	BW-2	BW-27/ 40+45	318.02	26°11'48.8" 80°06'09.2"	18.0	Fine sand and silt	Southern Sea Ranch Lakes
BW-2-4C & BW-2-5GS	9/7/00	BW-2	BW-31/ 7+87	320.82	26°09'22.7" 80°06'19.5"	12.0	Fine sand and silt	North of Hugh Taylor Birch State Park
BW-2-6GS	9/7/00	BW-3	BW-37/ 15+68	323.05	26°07'32.8" 80°06'27.1"	10.5	Fine sand and silt	Adjacent to □G5[B]
BW-2-5C & BW-2-7GS	9/7/00	BW-3	BW-45/ 0+16	324.61	26°06'38.3" 80°07'06.5"	14.0	Sand and silt	Adjacent to □G19
BW-3-6C & BW-3-8GS	9/8/00	BW-3	BW-50/ 1+75	325.68	26°05'46.8" 80°07'03.2"	11.0	Sand and silt	Adjacent to □G29
BW-3-9GS	9/8/00	BW-3	BW-55/ 17+72	329.54	26°02'27.3" 80°07'00.2"	7.5	Sand and silt	Adjacent to West Lake Park
BW-3-7C & BW-3-10GS	9/8/00	BW-3	BW-58/ 0+02	330.96	26°01'13.1" 80°07'04.2"	9.5	Sand and silt	North of S Holland Park Cut-In
BW-3-11GS	9/8/00	BW-3	BW-58/ 38+89	331.70	26°00'34.6" 80°07'07.1"	11.0	Sand and shell	North of South Lake
BW-3-8C & BW-3-12GS	9/8/00	BW-3	BW-63/ 11+19	333.35	25°59'09.4" 80°07'18.8"	12.5	Sand	Under Hallandale Blvd Bridge

[A] Red channel marker, denotes left boundary of ICWW channel (heading north)
[B] Green channel marker, denotes right boundary of ICWW channel

Table 2.4 Physical Characteristics of Broward County ICWW Sediment Samples

Sample ID	*Mean Grain Size*		*USCS Size*[A]	*Silt + Clay*	*Water*	*Organic*
	(phi)	*(mm)*		*(%)*	*(%)*[B]	*Matter (%)*[C]
BW-1-1GS	1.00	0.499	Medium Sand	4.1	20.1	0.18
BW-1-2GS	1.97	0.256	Fine Sand	0.9	19.3	0.75
BW-1-3GS	1.45	0.366	Fine Sand	1.4	-	-[D]
BW-1-4GS	4.34	0.049	Silt	65.2	69.1	9.75
BW-2-5GS	2.72	0.152	Fine Sand	5.3	27.2	1.20
BW-2-6GS	1.19	0.437	Medium Sand	13.6	-	-
BW-2-7GS	2.22	0.214	Fine Sand	16.2	24.3	0.24
BW-3-8GS	2.35	0.196	Fine Sand	6.4	22.9	0.98
BW-3-9GS	2.49	0.177	Fine Sand	9.0	-	-
BW-3-10GS	2.68	0.156	Fine Sand	19.4	42.5	0.17
BW-3-11GS	1.26	0.417	Fine Sand	5.6	-	-
BW-3-12GS	1.47	0.360	Fine Sand	6.0	27.2	-

[A] USC = United Soil Classification System

[B] Water Content = 100 – Total Solids (%)

[C] Organic Matter = Total Organic Carbon * 2.5 (Trefry et al., 1990)

[D] "-" = Total solids and total organic carbon were not analyzed for these grain size samples

The mean grain sizes of the 12 samples range from 0.049 to 0.499 mm. Nine of the twelve samples were classified as fine sand under the Unified Soils Classification System (USCS) (i.e., possessing a mean grain diameter between 0.42 and 0.074 mm). Only one of the samples (BW-1-4GS) was classified as silt (i.e., possessing a mean grain diameter between 0.074 and 0.002 mm). Notably, this sample was obtained at a depth of –18 ft MLW in a location where the channel was previously dredged well below the established project depth. Three other samples classified as fine or medium sand (all in Reach BW-3) contained greater than 10% fine material.

Of particular interest in the ICWW is the distribution and composition of fine-grained, organic-carbon rich sediments. These sediments, commonly called muck, are of concern given their potential effects on water quality and benthic communities and their tendency to accumulate pollutants. Based on Trefry et al.'s (1990) definition of muck (> 60% silts and clays, > 50% water, and > 10% organic matter), none of these samples from the Broward County ICWW are classified as muck sediment.

2.1.3.3 Sediment Chemistry

This section focuses on the chemical characteristics of Broward County ICWW sediments. Chemical contaminants enter Broward County coastal waters from non-point (agricultural and urban stormwater runoff, atmospheric pollutant deposition, marine craft operation, etc.) and point (industrial and

municipal wastewater effluent, etc.) sources. Contaminants, over time, may accumulate in the underlying sediments. Sediment-associated contaminants prevalent in urbanized areas include metals (e.g., arsenic, cadmium, chromium, copper, lead, nickel, zinc, and mercury), pesticides, polycyclic aromatic hydrocarbons (PAHs), and polychlorinated biphenyls (PCBs).

Some sediment constituents, such as metals, are natural components of sediments and should only be considered contaminants when their concentrations exceed natural levels. Others, such as pesticides, PAHs, and PCBs that do not occur naturally, can be considered contaminants when present at any concentration. However, the presence of a contaminant does not necessarily indicate that it will cause adverse effects during dredging or dredged material placement. Expression of contaminant effects depends on a variety of factors, including the contaminant concentration and chemical properties and other sediment characteristics (e.g. type of sediment, grain size, organic content). In particular, fine-grained sediments have a tendency to adsorb hydrophobic contaminants and therefore are more likely to contain potentially toxic concentrations. As an initial screening process for the present plan development phase, sediment quality information was evaluated with interpretive tools developed by the FDEP. The objective of this screening was to determine whether Broward County ICWW sediments contain contaminants at levels that would require additional investigation or might necessitate special dredging and sediment handling procedures.

- Sediment Analytical Results

Metals

Nine sediment metals were analyzed by inductively coupled plasma spectroscopy following hydrofluoric acid sediment digestion. One of these metals (aluminum) is considered a major element and is naturally abundant in most geological formations. The other eight metals are considered trace elements and potential contaminants whose concentration may become enriched by human activities. Only when metal concentrations exceed natural levels should they be considered pollutants. The natural occurrence of metals at variable concentrations complicates the evaluation of metal values. However, the FDEP has described a method for determining natural ranges of metal concentration based on statistical relationships between metals and a common reference element, aluminum (Schropp and Windom, 1988). These relationships permit the calculation of metal enrichment ratios (i.e., the ratio of measured metal concentration to maximum predicted natural concentration), where enrichment ratios greater than one indicate that a metal exceeds the natural range.

Table 2.5 lists metal enrichment ratios for the Broward County ICWW sediments for the USACE and Taylor Engineering data. Most of the metal enrichment ratios in the tested samples were less than one, indicating that metals in these sediments fall within natural ranges. However, at 5 of the 18 sampling locations copper, lead, and zinc are above the natural range, with enrichment ratios ranging from 1.1 to 15.1. At three of the 18 stations, two of these metals exceeded the natural range. At four other stations, only one metal exceeded the natural range. Mercury was also found to be above the natural range at BW-1-3C with an enrichment ratio of 6.66.

Table 2.5 Metal Enrichment Ratios of Broward County ICWW Sediment Samples

Sample ID	*As*	*Cd*	*Cr*	*Cu*	*Pb*	*Hg*	*Ni*	*Zn*
Taylor Engineering								
BW-1-1C	0.38	<0.25[A]	0.04	**1.26**[B]	0.84	<0.43	0.18	**1.48**
BW-1-2C	0.34	<0.35	0.04	0.29	0.43	<0.43	0.03	**1.26**
BW-1-3C	0.39	0.62	0.50	**15.09**	**8.12**	**6.66**	0.54	**7.60**
BW-2-4C	0.24	<0.23	0.07	**1.89**	**1.83**	<0.43	0.13	**2.06**
BW-2-5C	0.43	<0.31	0.07	**3.00**	**2.87**	0.52	0.18	**5.69**
BW-3-6C	0.57	0.39	0.11	**1.56**	**1.30**	<0.43	0.21	0.70
BW-3-7C	0.69	<0.27	0.05	**2.85**	**1.47**	<0.43	0.28	**2.99**
BW-3-8C	0.44	<0.32	0.02	0.84	**2.14**	<0.43	0.14	**4.82**
AUSACE								
E-BROC99-01	0.09	0.34	0.05	0.31	0.61	0.24	0.09	0.52
E-BROC99-02	0.09	0.34	0.05	0.85	0.52	0.29	0.09	0.78
E-BROC99-03	0.07	0.17	0.03	**1.31**	0.20	0.24	0.09	0.38
E-BROC99-04	0.10	0.32	0.11	**1.67**	**1.18**	0.62	0.08	**1.14**
E-BROC99-05	0.03	0.16	0.02	0.71	0.26	0.24	0.08	0.34
E-BROC99-06	0.02	0.16	0.01	0.09	0.06	0.24	0.08	0.07
E-BROC99-07	0.06	0.16	0.03	0.16	**5.84**	0.24	0.08	0.15
E-BROC99-08	0.06	0.17	0.02	0.06	0.16	0.24	0.09	0.10
E-BROC99-09	0.07	0.16	0.02	0.51	0.26	0.24	0.08	0.34
E-BROC99-10	0.08	0.44	0.07	**1.55**	0.48	0.24	0.07	0.64

[A] Metal enrichment values were calculated with detection limit values

[B] Numbers in **BOLD** indicate values exceed natural range (natural range = 1.00)

Another approach to interpreting contaminant concentrations in coastal sediments is based on the likelihood of a contaminant causing adverse effects on aquatic organisms. To evaluate the potential for biological impact, the FDEP prepared biological effects-based sediment quality guidelines for several metals, pesticides, PAHs, and other compounds (MacDonald, 1995). The Threshold Effects Level (TEL) indicates a contaminant concentration below which adverse effects are unlikely. The Probable Effects Level (PEL) represents a concentration above which adverse effects are usually observed. Table 2.6 lists the PEL, TEL, and measured metal concentrations in the Broward County ICWW samples. Generally,

metal concentrations fell below the TEL, with the exception of copper, which was above the TEL at 9 of 18 sampling location (including 1 location above the PEL). One sample location, BW-1-3C, contained several metals in excess of the guidelines — arsenic and zinc above the TEL and copper, lead, and mercury above the PEL. Mercury exceeded the TEL at E-BROC99-04; lead exceeded the TEL at E-BROC99-07. Thus, based on metal enrichment ratios and the TEL/PEL evaluation, arsenic, copper, lead, zinc, and mercury are present in Broward County ICWW sediments at concentrations above FDEP screening guidance values. In particular, BW-1-3C exhibited relatively high metal enrichment ratios and concentrations of arsenic, copper, lead, mercury, and zinc above the TEL or PEL. Again, this sample was taken at a channel depth of –18 ft MLW in a channel segment unlikely to be affected by future channel maintenance.

Table 2.6 Metal Concentrations of Broward County ICWW Sediment Samples [ppm]

Sample ID	*Al*	*As*	*Cd*	*Cr*	*Cu*	*Pb*	*Hg*	*Ni*	*Zn*
Taylor Engineering									
BW-1-1C	2,025	4.68	<0.08[A]	0.99	11.7	3.72	<0.09	1.78	16.8
BW-1-2C	638	2.09	<0.08	0.56	1.57	0.83	<0.09	0.18	6.34
BW-1-3C	10,034	**13.2**[B]	0.31	29.0	**302**[C]	**114.0**	**1.399**	9.90	**270**
BW-2-4C	2,735	3.52	<0.08	2.07	**20.2**	10.0	<0.09	1.40	29.0
BW-2-5C	990	3.44	<0.08	1.13	**19.8**	7.59	0.110	1.32	39.1
BW-3-6C	987	4.51	0.10	1.73	10.3	3.42	<0.09	1.58	4.77
BW-3-7C	1,695	**7.63**	<0.08	1.14	**24.3**	5.71	<0.09	2.53	30.0
BW-3-8C	827	3.16	<0.08	0.30	5.09	4.97	<0.09	0.97	29.2
AUSACE									
E-BROC99-01	17,400	4.10	0.20	4.3	8.0	12.8	<0.050	<2.0	27.2
E-BROC99-02	17,500	4.40	0.20	4.1	**22.4**	10.9	0.060	<2.0	41.1
E-BROC99-03	16,000	3.00	<0.10	1.9	**32.8**	3.9	<0.050	<2.0	19.0
E-BROC99-04	20,700	5.50	0.20	9.8	**47.7**	28.0	**0.130**	<2.0	68.1
E-BROC99-05	21,500	1.40	<0.10	1.9	**20.7**	6.3	<0.050	<2.0	20.7
E-BROC99-06	22,500	1.00	<0.10	1.1	2.8	1.4	<0.050	<2.0	4.5
E-BROC99-07	21,700	3.20	<0.10	2.4	4.6	**144.0**	<0.050	<2.0	9.3
E-BROC99-08	16,000	2.70	<0.10	1.5	1.5	3.1	<0.050	<2.0	4.8
E-BROC99-09	22,300	3.70	<0.10	2.2	15.0	6.5	<0.050	<2.0	21.6
E-BROC99-10	29,200	5.20	0.30	7.5	**52.2**	14.7	<0.050	<2.0	48.7
TEL	-	7.24	0.676	52.3	18.7	30.2	0.130	15.9	124.0
PEL	-	41.60	4.210	160.0	108.0	112.0	0.696	42.8	271.0

[A] Numbers not detected at or above the method reporting limit

[B] Numbers in **BOLD** indicate values equal to or greater than TEL

[C] Numbers in **BOLD UNDERLINE** indicate values equal to or greater than PEL

Pesticides, PAHs, and PCBs

Both the USACE and Taylor Engineering sediment samples were analyzed for 26 individual chlorinated compounds (19 pesticides and 7 PCB analytes) by EPA Methods 3550/8081 and 3550/8082. Organochlorine pesticides and PCB concentrations fell below the practical quantification limit (reporting limit) in all samples. Appendix E lists the specific compounds analyzed and their reporting limits. The Taylor Engineering samples were also analyzed for PAHs by EPA Method 3550/8270. PAHs were detected in all of those samples. Table 2.7 summarizes the concentration of PAHs detected and the associated TEL and PEL (MacDonald, 1995).

Table 2.7 Polycyclic Aromatic Hydrocarbon (PAH)
Concentrations of Broward County ICWW Sediment Samples [ppb]

Analyte	*TEL / PEL*	*BW-1-1C*	*BW-1-2C*	*BW-1-3C*	*BW-2-4C*	*BW-2-5C*	*BW-3-6C*	*BW-3-7C*	*BW-3-8C*
Naphthalene	34.6 / 391	U[A]	U	6.6U[B]	U	U	U	6.6U	U
2-Methylnaphthalene	20.2 / 201	U	U	6.6U	U	U	U	6.6U	U
1-Methylnaphthalene	NG[C]	U	U	6.6U	U	U	U	6.6U	U
Acenaphthylene	5.87 / 128	U	U	**29**[D]	5.4	U	U	**6.9**	**6.8**
Acenaphthene	6.71 / 88.9	U	U	6.6U	U	U	U	6.6U	U
Fluorene	21.2 / 144	U	U	7.4	U	U	U	6.6U	U
Phenanthrene	86.7 / 544	12	U	**100**	25	5.6	6.4	29	24
Anthracene	46.9 / 245	3.7	U	**50**	11	U	U	14	9.5
Fluoranthene	113 / 1494	45	11	**640**	**140**	27	31	75	**140**
Pyrene	153 / 1398	40	9.4	**490**	130	23	29	69	110
Benz(a)anthracene	74.8 / 693	20	5.7	**280**	68	13	16	42	72
Chrysene	108 / 846	33	7.3	**470**	**110**	21	18	64	99
Benzo(b)fluoranthene	NG	36	8.1	790	140	30	24	69	120
Benzo(k)fluoranthene	NG	28	6.1	520	86	20	18	56	90
Benzo(a)pyrene	88.8 / 763	28	6.9	**560**	**99**	23	19	58	**100**
Indeno(1,2,3-cd)pyrene	NG	26	5.7	570	99	26	17	53	86
Dibenz(a,h)anthracene	6.22 / 135	5.8	U	**130**	**22**	6.1	4.7	**13**	**20**
Benzo(g,h,i)perylene	NG	25	6.5	560	99	29	19	54	86

[A] U = Not detected at or above the reporting limit of 3.3 ppb

[B] Number preceding "U" indicates elevated reporting limit due to low percentage solids in sample

[C] NG = No Guidelines. TEL & PEL sediment quality assessment guidelines have not been established by the FDEP

[D] Numbers in **BOLD** indicate values equal to or greater than TEL

Four sampling locations (BW-1-3C, BW-2-4C, BW-3-7C, BW-4-8C) exhibited two or more PAH concentrations above the TEL, the concentrations above which adverse biological effects may occur. The concentrations were, with the exception of benzo(a)pyrene and dibenz(a, h)anthracone at BW-1-3C, well below the PEL. According to MacDonald (1995), PAHs detected most frequently in coastal sediments include acenapthylene, anthracene, benz(a)anthracene, benzo(a)pyrene, chrysene, fluoranthene, phenanthrene, and pyrene. All of these were detected at concentrations above the TEL at BW-1-3C.

TOC, TKN, and TRPH

In addition to the chemicals discussed above, total organic carbon (TOC), total Kjeldahl nitrogen (TKN), and total recoverable petroleum hydrocarbons (TRPH) (EPA Method 3550/FL-PRO) were analyzed to determine whether the ICWW sediments in Broward County contain atypical concentrations of these chemicals. TOC and TKN were compared to the results of statewide sediment data collected by the FDEP from natural coastal sediment from 1984 to 1990. Figure 2.4 shows the results from Broward County ICWW sediments superimposed over the FDEP data. A regression equation and 95% confidence intervals were calculated for log-transformed FDEP data to establish typical ranges for organic carbon and nitrogen in Florida sediments. BW-1-3C, BW-2-4C, and BW-3-6C contained organic carbon and nitrogen concentrations within the expected range. BW-1-1C, BW-2-5C, and BW-3-7C, all located in areas of fine sediments, appeared enriched in nitrogen relative to carbon. TKN at BW-1-2C and TOC at BW-3-8C were below the method reportable limits (MRL) of 100 ppm and 500 ppm.

TRPH in sediments are primarily from pollutant origins. Currently there are no interpretive tools (i.e., enrichment ratios, TEL/PEL guidelines) available for TRPH. However, the FDEP's soil clean-up guidelines (Chapter 62-777, F.A.C.) for TRPH are 340 ppm and 2,500 ppm in residential and industrial areas. TRPH in all eight Broward County ICWW samples fell below the detection limits of 3.3 ppm (in some cases below 6.6 ppm due to low percentage of solids) and thus below the soil cleanup guidelines.

- Summary

The few sediment quality data available from the ICWW in Broward County indicate that the Broward County ICWW sediment contains higher concentrations of contaminant metals and PAHs than previously studied segments of the ICWW. The contaminants present in ICWW sediment reflect the level of urban development around the ICWW in Broward County.

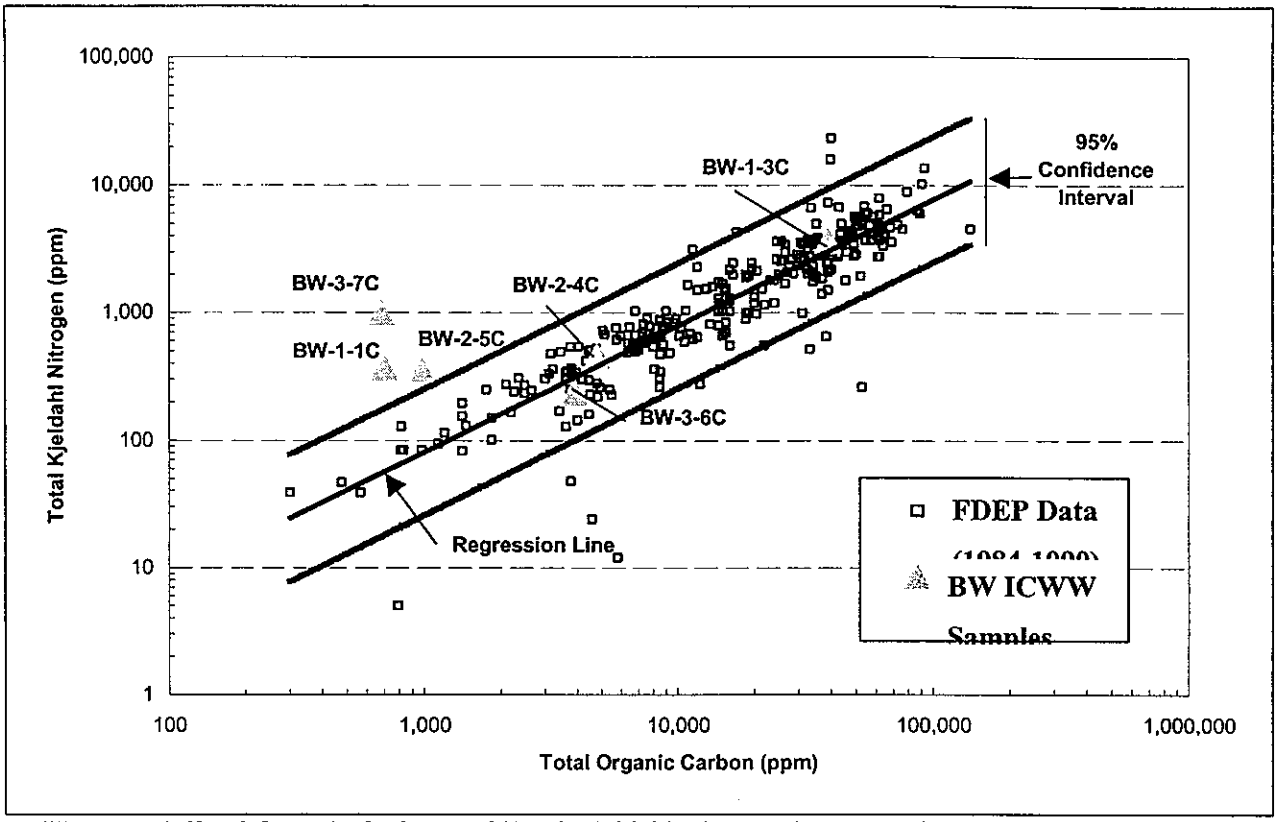


Figure 2.4 Total Organic Carbon and Total Kjeldahl Nitrogen in Broward County ICWW Sediment

Sediment contaminants were detected in various locations throughout the Broward County ICWW. Copper, lead, and zinc concentrations exceeded predicted natural ranges at several sample locations throughout the county. In addition, the measured metal concentrations exceeded the TEL for copper at nine of the 18 sampling locations throughout the ICWW in Broward County. BW-1-3C exhibited concentrations of arsenic and zinc above the TEL and of copper, lead, and mercury above the PEL. Four sampling locations (BW-1-3C, BW-2-4C, BW-3-7C, BW-4-8C) contained two or more PAH concentrations above the TEL. One sampling station, BW-1-3C, stands out for its relatively large number of metal and organic contaminants that exceed one or more guideline values. However, this station lies at a depth of –18 ft MLW and not within an area likely to require future maintenance dredging. No organochlorine pesticides or PCBs were detected above the laboratory-reporting limit in any of the sediments tested, including those sediment samples tested by the USACE. TRPH concentrations fell below the laboratory detection limits for all samples.

The results of this initial sediment quality screening show that sediments in various parts of the Broward County ICWW channel contain one or more contaminants that exceed screening guideline concentrations. The presence of these contaminants reflects the urban and industrial development of the surrounding areas. Based on these results, additional sediment quality tests will be required prior to each

dredging operation to determine whether specific shoals contain contaminants at levels that would require special dredging or material handling techniques to comply with local state, and federal regulations. Such tests may include bulk sediment chemistry, elutriate chemistry, contaminant leachability, or sediment toxicity. Specific testing requirements will be determined in consultation with the appropriate regulatory agencies.

2.2 Existing Sites

Review of all relevant Jacksonville District USACE Real Estate and Control Data Maps and 1994 FIND blueline aerials (1 in.=200 ft) of the project area reveals that the FIND controls, either through perpetual easement or fee-simple ownership, 56 tracts within the Broward County project area. Table 2.8 summarizes the complete inventory of FIND-owned properties and existing easements within Broward County. Inspection of Table 2.8 reveals that 17 of the 56 tracts were originally intended for dredged material management as indicated by their MSA (Maintenance Spoil Area) designation. Of the remaining 39 tracts controlled by the FIND, 28 are public streets or other narrow upland strips that extend from the Waterway across the barrier island to the beach. Originally intended to provide pipeline access in support of beach placement, 17 of these 28 tracts carry a P/L (pipeline) designation.

The remaining 11 tracts controlled by the FIND are all residential canals that extend westward from the ICWW right-of-way. The original developers provided these canal tracts to the FIND in exchange for FIND's releasing easements on the uplands. While the easements on the canal tracts allow filling the canals with dredged material to a depth of –6 ft MLW, the neighboring homeowners would likely oppose this action. Moreover, filling these canals would not provide for long-term dredged material management. As a result, these 11 tracts received no further consideration.

Of the 17 tracts originally designated for dredged material management, consideration of the most basic site evaluation criteria eliminated all but nine from further consideration. Like the canal tracts discussed above, the eight tracts thus eliminated are all essentially open water areas. Included among these is MSA 791A, a tract that encompasses much of the open water/mangrove areas within West Lake Park and the Ann Kolb Nature Center. As discussed further in Chapter 3.0, this and the other open water tracts controlled by the FIND remain inappropriate for dredged material management.

With a total area of 61.5 acres, the remaining nine tracts combine to form seven separate sites that individually range from 2.3 acres to 15.4 acres in size (Figure 2.5). As primarily upland sites that directly front the Waterway, each appears potentially capable of supporting future channel maintenance

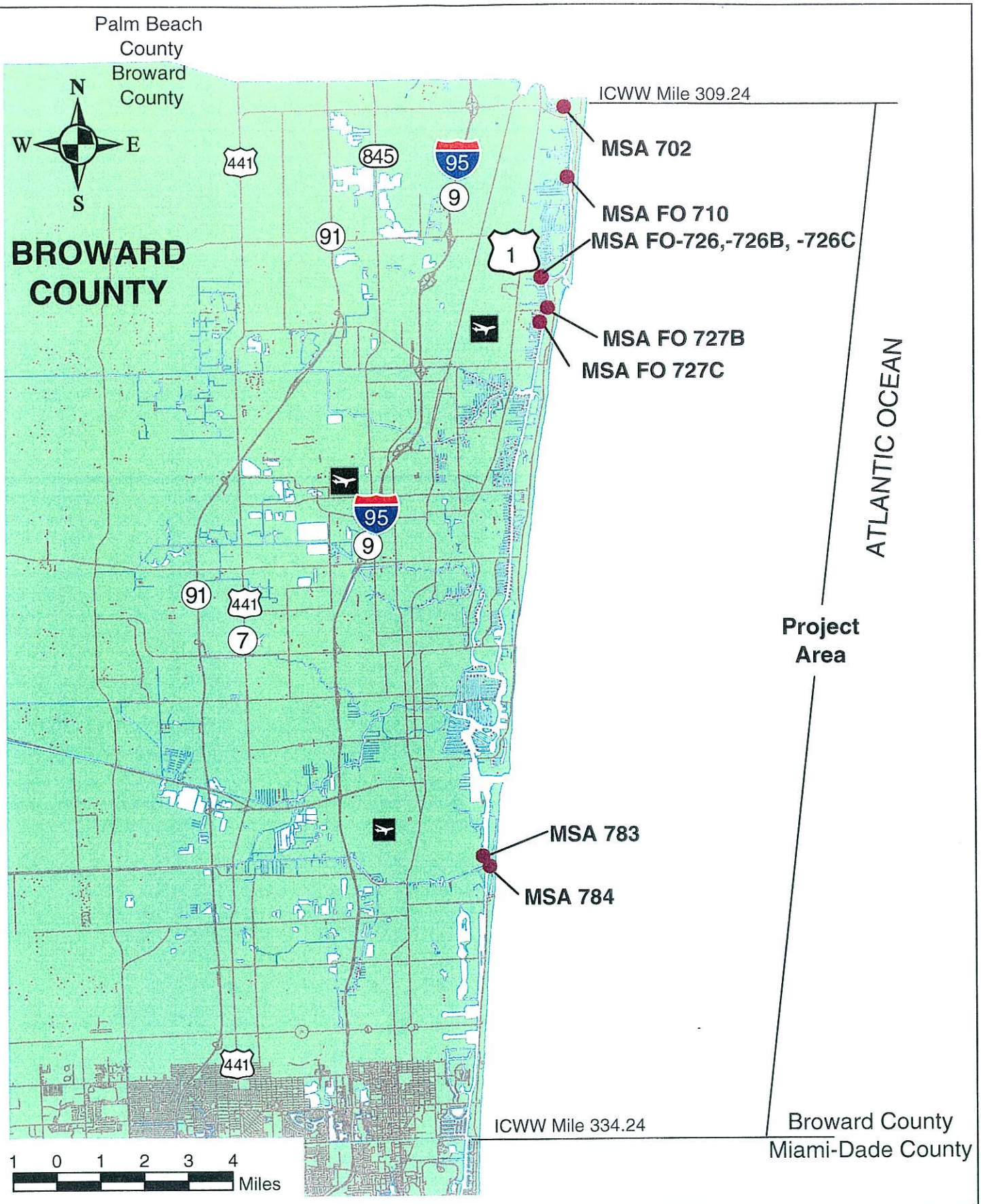
Table 2.8 Inventory of Disposal Easements/FIND-Owned Sites, Intracoastal Waterway, Broward County, Florida

FIND Designation	COE Tract No.	ICWW Mile	Total Acreage	Useable Upland Acreage	Containment Capacity (cy)	Comments
MSA 702		309.24 – 309.54	14.04*	14.04	61,902	Waterfront land
------	14401E-1	309.24 – 309.25	0.94			NE 7TH Street
------	14401E-2	309.55 – 309.56	1.97			NE 2ND Street
------	14600E-1	309.80 – 309.81	2.06			SE 2ND Street
------	14600E-2	309.93 – 309.94	2.00			SE 4TH Street
------	14600E-3	310.31 – 310.32	1.03			SE 10TH Street
MSA FO-710	977	310.89 – 310.97	3.00	3.00	3,612	Small waterfront land parcel
MSA FO-726	1004	313.46 – 313.75	5.14	3.20	58,258 (total)	Waterfront land parcel
MSA FO-726B	1005	313.46 – 313.75	9.50	9.50	inc. w/726	Upland parcel adjoining MSA FO-726
MSA FO-726C	J1035-E	313.46 – 313.75	0.77	0.77	inc. w/726	Small strip adjoining MSA FO-726B
MSA FO-727B	1018	313.27 – 314.40	11.00	11.00	N/A	Alsdorf Park; 3 boat ramps and parking lot
MSA FO-727C	1019	314.52 – 314.64	10.54	6.40	19,364	Harbor's Edge Park
MSA 728B	TJ1037-E	314.97 – 316.07	6.61*			Water
MSA 739	1043	316.24 – 316.30	3.26			Water
MSA 740	1042	316.30 – 316.33	0.59			Open water
------	16000E-1	320.00 – 320.02	3.41			Water; Rio Terese Rogel
------	16000E-2	320.07 – 320.09	3.30			Water/Canal
------	16001E-1	319.63 – 319.67	3.64			Water; Rio Catherine
------	16001E-2	319.72 – 319.75	2.03			Water; Rio Oda
------	16001E-3	319.79 – 319.81	2.46			Water; Rio Mary Rita
------	16001E-4	319.86 – 319.88	2.96			Water; Rio Dorothy
------	16001E-5	319.93 – 319.95	3.37			Water; Rio Florence Margaret
------	16100E-1	320.40 – 320.42	3.94*			Water; Rio Kinney
------	16100E-2	320.46 – 320.49	3.91*			Water; Rio Lorena
------	16100E-3	320.54 – 320.56	3.79*			Water; Rio Julia
------	16100E-4	320.62 – 320.64	3.70*			Water; Rio Lenora
MSA 777	1105	324.85 – 325.03	7.30			Shallow water
MSA 780A	12901E-1	326.58 – 326.70	3.99*			Water with some upland
MSA 781	1110	327.08 – 327.15	3.10			Mostly water

Table 2.8 (cont.) Inventory of Disposal Easements/FIND-Owned Sites, Intracoastal Waterway, Broward County, Florida

FIND Designation	COE Tract No.	ICWW Mile	Total Acreage	Useable Upland Acreage	Containment Capacity (cy)	Comments
MSA 783	1111	327.52 – 327.59	2.27	0.57	N/A	Water / Cargo loading dock
MSA 784	1115	328.00 – 328.09	5.20	<3.20	8,320	Waterfront land
MSA 786	1158	328.47 – 328.52	3.24			Water / Wetlands
MSA 791A	J1009-E	329.09 – 330.98				Water, one island and one peninsula
P/L 18B-1	J1015-E	329.82 – 329.83	1.66			Small strip of land
P/L 18B-2	J1016-E	329.54 – 329.55	1.32			Small strip of land
P/L 19B-1	J1017-E	329.32 – 329.33	1.37			Small strip of land
P/L 790	1187	328.96 – 328.97	0.91			Balboa Street
P/L 790	1194	329.17 – 329.20	1.09			Forty Second Street
P/L 790	1195	329.35 – 329.36	0.98			Thirty Ninth Street
P/L 790	1196	329.57 – 329.58	0.86			Thirty Fifth Street
P/L 790	1197	329.73 – 329.75	0.80			Thirty Second Street
P/L 790	1198	329.94 – 329.97	0.72			Twenty Eighth Street
P/L 16A-3	J1011-E	330.93 – 330.94	1.65			Small strip of land/water
P/L 16A-4	J1012-E	330.70 – 330.71	1.62			Small strip of land/water
P/L 17A-1	J1013-E	330.59 – 330.60	1.65			Small strip of land/water
P/L 17A-2	J1014-E	330.25 – 330.26	1.83			Small strip of land/water
P/L 790	1208	330.22 – 330.23	0.55			Sherman Street
P/L 790	1209	330.33 – 330.34	0.53			New Hampshire Street
P/L 790	1210	330.49 – 330.50	0.56			Coolidge Street
P/L 790	1211	330.65 – 330.66	0.60			Taft Street
P/L 790	1212	330.88 – 330.89	0.64			Cleveland Street
P/L 790	1213	331.11 – 331.12	0.68			Minnesota Street
P/L 790	1223	331.35 – 331.36	0.70			Pierce Street
P/L 790	1224	331.58 – 331.59	0.71			Tyler Street
P/L 790	1225	331.78 – 331.79	0.73			Van Buren Street.
P/L 790	1226	331.78 – 331.79	0.73			Madison Street.

* Easement acreage based on survey



TAYLOR ENGINEERING INC. 9000 CYPRESS GREEN DRIVE, SUITE 200 JACKSONVILLE, FLORIDA 32256	Figure 2.5 Existing FIND Easements/ FIND Owned Sites Long Range Dredged Material Management Plan Intracoastal Waterway, Broward County, Florida	Project C2002-36B Revision Sheet Date Feb., 2003

operations. Six of these seven sites currently serve as public parks with facilities ranging from trails and picnic tables to boat ramps, docks, and paved parking. The seventh site encompasses a portion of the bulkhead that fronts a container handling area within Port Everglades. The following paragraphs discuss each of these seven sites in turn.

The northernmost site, MSA 702, represents 14.04 acres of the 58.04-acre Deerfield Island Park (candidate Site B-1; Section 3.3). The 1994 FIND aerials suggest that the FIND holds the site under perpetual easement; however, discussions with FIND staff indicate that Site MSA 702 as well as the entire island park is owned by the FIND. The park is currently devoted to passive recreational use and nature observation with picnic areas, a marina area for small boat access, restrooms, trails, and a boardwalk. A ranger's residence and public pavilion adjoin the small boat basin. The island remains largely covered with native vegetation; significant portions, including MSA 702, show the effects of extensive restoration efforts including the removal of exotic vegetation and the reestablishment of native species. A significant portion of the overall park (11.59 acres) remains as mangrove swamp. Finally, as an island with no connection to adjacent mainland areas, the site lacks direct road access.

Continuing southward, the 3.0-ac MSA FO-710 lies within a residential neighborhood. Also known as DeGraff Park, the site includes unimproved parking, picnic areas, and a playground. Exotic vegetation, primarily Australian pine with an understory of introduced landscape plants, dominates the park site.

Also located in a residential neighborhood, the third site combines three contiguous easements — MSA FO-726, -726B, and -726C. Despite their FO (FIND-Owned) designation, only two of the four parcels comprising the three easements are owned by the FIND. The U.S. Department of the Interior, Bureau of Land Management, owns the remaining two. Together these four tracts form the 15.4-ac Exchange Club Park. Presently leased by the FIND to the Cities of Pompano Beach and Lighthouse Point, the site contains picnicking areas, restrooms, and trails, and includes a secured area that, at the time of the field inspection (April 2000; Section 3.4), was being used to store dredge pipeline. Australian pine with an understory of non-native vegetation dominates the park's wooded areas.

Located just south of Exchange Club Park, Site MSA FO-727B has been intensively developed for pubic recreation and other public uses. Also known as Alsdorf Park, the 11.0-ac site contains a bulkheaded shoreline, restrooms, paved parking, boat docks, a Florida Marine Patrol office and a Broward County Sheriff's Marine substation. Three double-width boat ramps offer boaters convenient access to the Waterway via Caliban canal.

The 10.54-ac Site MSA FO-727C, also known as Harbor's Edge Park, provides public parking, a small playground, and paved and unpaved trails. Although exotic vegetation dominates the park's upland portions (6.4 ac), a small shoreline restoration area vegetated with native species has been constructed at the park's northeastern corner near the intersection of the ICWW and a dredged canal that forms the park's northern boundary.

Almost 13 miles farther south, MSA 783 lies west of the ICWW and north of the Dania Canal on a wharf fronting a major container handling facility near the southern end of Port Everglades. Only approximately 0.57 acres of the easement's 2.27 acres lie landward of the bulkhead, astride the paved track for the facility's large, rubber-tired container handling cranes.

The seventh and southernmost easement, MSA FO-784, comprises 5.2 acres of the 309.26-acre John U. Lloyd Beach State Recreation Area (candidate site B-15; Section 3.3). Located on the barrier island immediately south of the Port Everglades entrance, the Recreation Area extends from the ICWW to the Atlantic Ocean. The easement contains approximately 3.2 acres of upland in a narrow strip surrounded by mangroves. In addition, North Ocean Drive bisects the easement's small upland area. This road provides access to much of the recreation area as well as a U.S. Coast Guard station, a U.S. Navy facility, and the Nova Oceanographic Laboratory located near the recreation area's northern end at the inlet.

2.3 Existing Storage Capacity

A preliminary evaluation of the seven sites controlled by the FIND that initially showed some potential for future dredged material management estimated each site's potential material storage capacity. At this preliminary level of the site evaluation process, two criteria were of primary consideration: (1) to the greatest extent possible, the placement of dredged material must be confined to upland areas, and (2) a site's capacity represents the capacity of an earthen basin constructed from on-site soils to receive, dewater and store the dredged material. However, as discussed in the development of the project's Management Concept presented in Chapter 3.0, such an approach may not represent a site's best use, or the most appropriate dredged material management strategy for the Broward County project area. However, at this preliminary stage of the evaluation, estimating a site's maximum capacity based on the criteria listed above still served as a useful screening tool.

In addition to the USACE Real Estate Maps and FIND aerial base maps, three other resources guided the evaluation. These include: (1) 1994 and 1995 color-infrared aerial photography from the

National High Altitude Photography (NHAP) Program of the U.S. Geological Survey (USGS) (1:24,000 scale); (2) USGS Topographic Quadrangle Maps, 7.5-minute series (1:24,000 scale); and (3) National Wetlands Inventory maps from the U.S. Department of the Interior, U.S. Fish and Wildlife Service (1:24,000 scale).

To begin the evaluation, the useable upland area of each site was first estimated by inspection of the 1994 FIND aerial basemaps (1 in. = 200 ft), guided by color-infrared photography, and USFWS wetland inventory maps. As discussed in Section 3.4, on-site inspection later refined this initial estimate of useable upland area. Further analysis then established whether the useable upland area could provide adequate material for dike construction and whether the resulting capacity within this area supported further consideration of the site. A set of relationships were developed (Appendix C) in which the required volume of dike material, the volume of dike material available on-site, and the resulting storage capacity are expressed in terms of a set of independent variables including dike crest elevation above grade, mean site elevation, depth of excavation, dike side slope, width of dike crest, and required minimum freeboard. For the purposes of this preliminary evaluation, a standard dike geometry was applied. Selected parameter values are within the range of standard practice for similar sites used for previous maintenance events. Given sufficient area, these include a 15-ft crest elevation above grade, a 1V:3H side slope, a 12-foot crest width, and a minimum freeboard plus ponding allowance of 4 ft. On smaller sites, such as the FIND-owned sites being evaluated here, dike height was typically limited to less than 15 ft by restricting the depth of excavation to less than 5 ft below grade.

The result of the preliminary capacity analysis, presented in Table 2.8, indicates that the maximum capacity achievable within the seven sites presently controlled by the FIND is 151,456 cy. Comparison of this potential capacity with the projected 50-year material storage requirement for the Broward County segment of the ICWW (72,334 cy, Table 2.2) shows that the existing capacity exceeds the long-term requirement. However, five of the seven sites, representing almost 95% of the existing capacity, fall within the project's northernmost 5.5 miles. Additionally, with the exception of the site formed by the combination of MSA FO-726, 726B, and 726C (Exchange Club Park), each site's use for conventional containment basin construction and long-term material storage is limited by the following considerations: in the case of MSA FO-727B (Alsdorf Park), permanent public facilities that would make containment basin construction both difficult and expensive; in the case of MSA FO-710, MSA FO-727C (Harbor's Edge Park), and MSA 784 (within John U. Lloyd State Recreation Area), insufficient area to provide a reasonable storage capacity; in the case of MSA 702 (Deerfield Island Park), the lack of road access and the presence of valued and protected habitat; and in the case of MSA 783, the site's small

upland area and its location on the paved tracks of the large cranes that serve a major container-handling facility within Port Everglades make containment basin construction impractical..

The lack of appropriate available storage capacity within the county suggests the need to identify and evaluate additional alternative sites. The characteristics of the most appropriate long-term dredged material management strategy for the Broward County project area, in turn, dictate the criteria by which these sites are identified and evaluated. The following chapter develops the characteristics of this plan — the project's *Management Concept*.

3.0 DREDGED MATERIAL MANAGEMENT ALTERNATIVES

3.1 Management Concept

Within every maintenance dredging operation lies a set of guiding principles that reflect the attitudes and constraints of the project sponsor, the project engineer, and the contractor. Historically, the operation's participants have not explicitly stated these principles (i.e., the *Management Concept*), but rather have allowed them to evolve primarily through the need to quickly address a critical shoaling problem and the desire to maximize operational efficiency and short-term economy. Thus, before the initiation of the FIND's Long-Range Dredged Material Management Program in 1986, long-term goals such as environmental stewardship received little serious consideration. Within Florida, as the dredging contractors sought to place material as close as possible to the dredging area, this approach resulted in the loss of wetlands and the proliferation of numerous small mounds and islands that now line portions of the ICWW. Owners of wetlands fronting the Waterway were often eager to receive material from local dredging projects and thereby render their land more developable and valuable. For the extensive mangrove-estuarine system that once characterized the Intracoastal Waterway corridor in Southeast Florida, including Broward County, this approach often led to the unconfined placement of dredged material within mangroves, temporary degradation of local water quality, and permanent loss of estuarine habitat.

With increased scientific knowledge and environmental awareness, this approach no longer appears responsible, nor even possible, given present-day agency reviews and permitting requirements. Concerns about water quality have led to the placement of dredged material within diked areas to increase retention time and ensure that return water quality meets established standards. Modern society now recognizes wetlands, particularly mangrove swamps, as among the most biologically productive ecosystems and resources that justify conservation. However, accommodating wetland preservation within a dredged material management plan typically requires the use of upland properties for development as dredged material management facilities. In the high growth, intensively developed ICWW corridor within Broward County, developmental pressures and land-use conflicts make such acquisitions both difficult and expensive. As has become increasingly apparent through the implementation of the FIND's dredged material management program, these conflicts can only be resolved through long-range planning and the development of a dredged material management concept that addresses environmental and socioeconomic (land-use) constraints, as well as engineering and operational requirements. As such, the management concept constitutes the foundation that underlies the resulting management plan.

3.1.1 Management Alternatives for Broward County

The central issue guiding the development of a management concept for the ICWW in Broward County is the selection of the most appropriate material management strategy. Four basic alternatives are available for consideration:

- Ocean Disposal
- Open Water Placement (Spoil Island Creation)
- Beach Placement
- Centralized Upland Storage

The following paragraphs discuss each of these alternatives with respect to its applicability to Broward County's unique requirements.

Ocean disposal of material dredged from the ICWW remains an unrealistic option for the Broward County project area. Ocean disposal requires the transport of dredged material from the dredging site to an authorized offshore disposal area. For the Broward County project area, this condition would result in a very inefficient and thus costly operation for the following reasons. The dredge (hydraulic or mechanical) must first load the material into a hopper barge capable of transiting the relatively shallow depths of the ICWW. Within Broward County, the channel's -10 ft MLW controlling depth would place severe limits on the barge's draft and thereby on its capacity. Regulatory restrictions on overflowing the barge during filling would likely limit its effective capacity even further. Once filled to its (draft-limited) capacity, the contractor must then haul the barge to an appropriate point at which to transfer the material to a deep-draft seagoing barge for transport to an authorized offshore placement site. A review of offshore disposal areas currently authorized by the U.S. Environmental Protection Agency to receive dredged material identified an approved offshore placement site 1.5 nautical miles east of Port Everglades (the only deep-water port within the project area). Thus, given the concentration of shoaling in the County's northernmost 7.4 miles centered around Hillsborough Inlet, material transfer at Port Everglades would require hauling each partially-filled, shallow-draft barge an average one-way distance of 13 channel miles to Port Everglades, then transferring the material to a deep-draft barge for the final 1.5 miles to the offshore placement site. The relatively small dredging volume projected for the Broward County project area cannot justify the inefficiency and resulting cost of this type of operation.

In addition to cost, present and future regulatory restrictions suggest that ocean disposal may be an inappropriate dredged material management strategy for the Waterway in Broward County. Presently, regulation limits the use of ocean disposal to those projects for which no other feasible management alternative can be identified. As the remainder of this report documents, such is not the case for the

Broward County project area. Given the likely increase in future regulatory restrictions on the use of ocean disposal as well as the certain increase in the cost of obtaining the required permits, reliance on ocean disposal remains an inappropriate strategy for the long-term maintenance of the Waterway.

Open water placement represents a second alternative management strategy for material dredged from the Broward County segment of the ICWW. This particular method of material disposition was perhaps the most widely used approach before the growth of today's environmental regulatory programs that address wetland and benthic habitat protection. Today, under the guise of wetland or habitat creation, open water placement has found favor in areas (coastal Louisiana, Chesapeake Bay) that have experienced severe losses of similar wetland habitats. However, in Florida, open water placement as a dredged material management strategy has not gained regulatory support. Discussions with representatives of the relevant regulatory agencies have repeatedly confirmed their opinion that open water placement within Florida's Intracoastal Waterway carries unacceptable environmental impacts in terms of the destruction or degradation of shallow-water or benthic habitat.

Open water placement or wetland creation also remains inconsistent with a basic principle of the FIND's dredged material management program: to provide a permanent infrastructure of material management facilities that can support the long-term maintenance of the Waterway without relying on changeable regulatory attitudes. Even if the initial placement operation could receive the necessary permits, the creation or expansion of open water islands represents a one-time opportunity for material placement. Successive placement operations would require the filling of additional open water areas, a process that would only lead to increased regulatory scrutiny. As a result, open water placement represents an unacceptable dredged material management strategy for Broward County.

Beach placement represents the third material management alternative considered for Broward County. Beach placement — that is, placing within a designated placement site dredged material compatible with the native beach sands — constitutes an approach to dredged material management that the State of Florida actively encourages. The FIND also regards this approach as an essential part of dredged material management for channel reaches which, based on historic data, are likely to contain beach quality sediments. These conditions are most typically encountered immediately adjacent to tidal inlets where Waterway shoals are formed primarily by sand driven through the inlet by waves and tides. Such conditions are present within the Waterway near Hillsborough Inlet. As discussed in Section 2.1.3, available sediment data suggests that shoal material in this channel segment comprises predominantly fine to medium sand with a relatively minor (<5%) component of silts and clays. Analysis has not yet quantified the degree of compatibility between the shoal material and the native beach sands. However, a high degree of compatibility is anticipated, consistent with the assumption that these shoals derive from

littoral material driven through the inlet. Thus, beach placement will likely constitute the primary dredged material management strategy for the channel segment adjacent to Hillsborough Inlet.

In contrast, sediment data from the remainder of the project channel suggests greater variability in the quality of channel sediments with increasing distance from Hillsborough Inlet. At Port Everglades, roughly centered within the southern one-half of the Broward County project area, the greater depths within the Harbor Project's turning basin likely act as a sediment trap and limit the deposition of sand introduced though the inlet in the adjacent ICWW channel. North and south of the port, sediments are generally categorized as fine sand, but typically contain >5% finer material and thus appear less appropriate for beach placement. The inlet's restricted impact as a source of ICWW shoal material suggest that most ICWW shoal material in the southern portion of the project area likely derives from upland sources introduced through the discharge of the many canals and channelized tributaries to the Waterway or the redistribution of sediment already within the Waterway. As a result, the future compatibility of material dredged from the southern portion of the Broward County project area with native beach sands remains uncertain. Prudence dictates that, except for the channel segment adjacent to Hillsborough Inlet, beach placement should not form the primary dredged material management strategy. However, should event-specific analysis document that ICWW shoal material is suitable for beach placement, the FIND will cooperate with local interests in placing that material on the beach.

For all areas of the Broward County segment of the Waterway beyond the sedimentary influence of Hillsborough Inlet, centralized upland storage remains the preferred method of dredged material management. However, the specific conditions of Broward County dictate a modified form of the strategy of centralized upland storage compared to that previously developed for and applied to the Waterway in the other counties that comprise the Florida Inland Navigation District. Previous plans assumed the use of hydraulic dredging techniques as dictated by the relatively large volumes of dredging required, and the availability of relatively large sites within a reasonable distance of the Waterway. Upland storage, as previously applied, refers to the use of a diked containment area with appropriate outlet flow control structures. Under this approach, a hydraulic dredge pumps the dredged material in a sediment-water slurry to one end of the containment area, which thus serves as a settling basin within which the dredged sediment settles out of the transporting water. The basin outlet structure and pipeline then return the residual, clarified water to the Waterway. The dewatered sediment remains in the basin until, after multiple maintenance operations, the basin nears its design capacity. Ideally, given enough available acreage, each basin's design provides sufficient capacity for the full 50-year projected storage requirement for the reach that basin is designated to serve. At or before the point at which the basin nears

its design capacity, the material is removed from the basin for reuse or permanent storage elsewhere, and the basin's capacity is restored for continued use.

Such a strategy does not appear appropriate to the conditions within the Broward County project area. Outside of the influence of Hillsborough Inlet, the very small volumes of shoaling documented within the Waterway channel may not justify the use of a hydraulic dredge. Moreover, the intensive development throughout the Waterway corridor and the relative lack of vacant land within a reasonable distance of the Waterway channel precludes the dedication of sufficient acreage for the construction of a conventional containment basin of sufficient capacity to dewater and store material produced from multiple dredging operations.

However, the availability of numerous small parcels directly fronting the Waterway, most notably the FIND-owned properties and existing easements that lie opposite Hillsborough Inlet, suggest a modified upland storage strategy. Although possessing inadequate area for the construction of a multiple-use containment basin as needed to support hydraulic dredging, these sites can provide sufficient area for the offloading, short-term storage (in some cases), and eventual transfer of material produced by a single mechanical dredging operation. Under this strategy, a mechanical dredge (i.e., clamshell) would excavate the shoal material and place the sediments into an adjacent barge. Upon reaching its capacity, the barge would then be hauled the relatively short distance to the offloading/storage site. Given deep-water access and an improved (bulkheaded) shoreline, a clamshell or backhoe would then transfer the relatively dry material to trucks or to a temporary stockpile on site. Such use would require only a minimal area for barge offloading and temporary material storage. Lacking deep-water access and an improved shoreline, slightly larger sites (i.e., >5 acres) could support the construction of a single-use containment basin that would allow the barge to be moored nearby and the sediment to be re-slurried and offloaded hydraulically. Implicit in either strategy is the need to remove the material off-site for beneficial reuse or disposal at a landfill before the next channel maintenance operation.

Should even temporary storage prove impractical or locally unacceptable, these small sites fronting the Waterway would serve only as material transfer points. Under this alternative scenario, the dredged material, after being offloaded from the barges at the transfer site, would then be trucked to a temporary storage site located farther west. The likely high per-acre cost of acquiring property located even well west of the coastal corridor dictates that the inland site(s) also be sized to provide storage only for a single maintenance operation. As a result, like the small waterfront storage sites, the inland site(s) would also require that the stored material be offloaded before the next scheduled channel maintenance.

Notably, several other factors argue against the use of inland storage sites. In addition to the potential for unacceptably high acquisition costs, development costs for the inland storage sites would also be quite high. Given the level of regulatory protection afforded the Biscayne Aquifer that underlies much of Broward and Miami-Dade Counties, permitting conditions would likely require lining each site to prevent saline leachate from the stored sediment from contaminating local groundwater supplies. Similar concerns would also dictate that each site provides a system to control and collect the saline stormwater runoff from the stored material as well as its leachate. Absent adjacent tidal or marine waters, the saline discharge (leachate or runoff) from each site would have to be treated to reduce its chloride content before release to existing ditches or canals would be allowed. Conversely, preserving the sediment's salt content by covering the stockpiled material would likely render the material unsuitable for most beneficial reuse applications (e.g., construction fill, agricultural applications, etc.). Thus, the cost of acquiring suitable inland storage sites and the complexity of developing and operating these sites consistent with likely permitting constraints suggest that, to the greatest extent possible, temporary storage be restricted to waterfront sites presently owned or held under easement by the FIND.

Near Hillsborough Inlet, the existing waterfront sites will also serve an essential complementary role to the primary strategy of beach placement. Several reasons dictate the need for such complementary upland staging areas. First, the feasibility of beach placement depends highly on the quality of the sediment. Although sediment near Hillsborough Inlet will likely continue to be primarily sand and thus suitable for beach placement, future unforeseen circumstances could temporarily alter that trend. Extreme storms or other unanticipated mechanisms of uncontrolled runoff could form isolated shoals that contain sufficient fine-grained sediment to render the material unsuited for beach placement. Second, regulatory review may impose seasonal restrictions on beach placement related to protected species (e.g., sea turtles) or other habitat concerns coincident with critical shoaling. The refusal of the local community at large or of specific upland property owners to accept additional beach fill material or provide temporary easements could also produce unforeseen delays. For these reasons, prudence dictates the inclusion of an upland material transfer/temporary storage capability as an essential part of a beach placement strategy.

3.1.2 Management Concept for Broward County

The preceding discussion leads to the following definition of the most appropriate dredged material management concept for the Intracoastal Waterway in Broward County:

(1) Given the concentration of shoaling around Hillsborough Inlet and the documented presence of beach-quality sediments in this segment of the Waterway, beach placement, supplemented by one

or more upland material transfer or temporary storage sites, becomes the most appropriate management strategy for this channel segment.

(2) For the remainder of the project area beyond the inlet's influence, the small projected volume of shoaling supports mechanical dredging over the hydraulic dredging methods typically used for more extensive Waterway shoals. Under this approach, barges would transport the dredged material from the dredging site to small temporary storage sites fronting the Waterway.

(3) The small size and limited capacity of potential storage sites on the Waterway dictate that these sites temporarily store only the material produced by a single maintenance operation. The material must then be removed for beneficial reuse or disposal off-site before the next scheduled maintenance operation. Should even temporary storage prove impractical, these sites would serve only as material transfer points. Under this scenario, after the barges are offloaded at the transfer site, the dredged material would then be trucked to site(s) located west of the coastal corridor. Sized to provide dry storage only for a single maintenance operation, the inland site(s) would also require that the stored material be offloaded for beneficial reuse or alternate storage before the next scheduled channel maintenance operation.

(4) All sites are to be operated and maintained as permanent dredged material management facilities.

The dredged material management concept, defined above, provides an essential focus to the planning process by establishing minimum standards and criteria for the identification and evaluation of candidate dredged material management sites.

3.1.3 Beneficial Use of Dredged Material

The beneficial use of the material dredged from the ICWW channel will complement, but not replace, the need to secure and develop dedicated, permanent upland facilities as described above. Typically, beneficial use of dredged material provides for only a single disposition of the material and thus does not replace the need for a permanent management facility. Moreover, such beneficial uses typically first require processing (that is, dewatering and drying) the dredged material in a containment facility or by other means. Examples of one-time beneficial use options include the creation or restoration of wetland or upland (i.e., spoil island) habitat. An example of the beneficial use of dredged material specific to the Broward County project area is the planned expansion of the Ft. Lauderdale-Hollywood International Airport. Preliminary expansion plans include the use of up to 330,000 cy of material

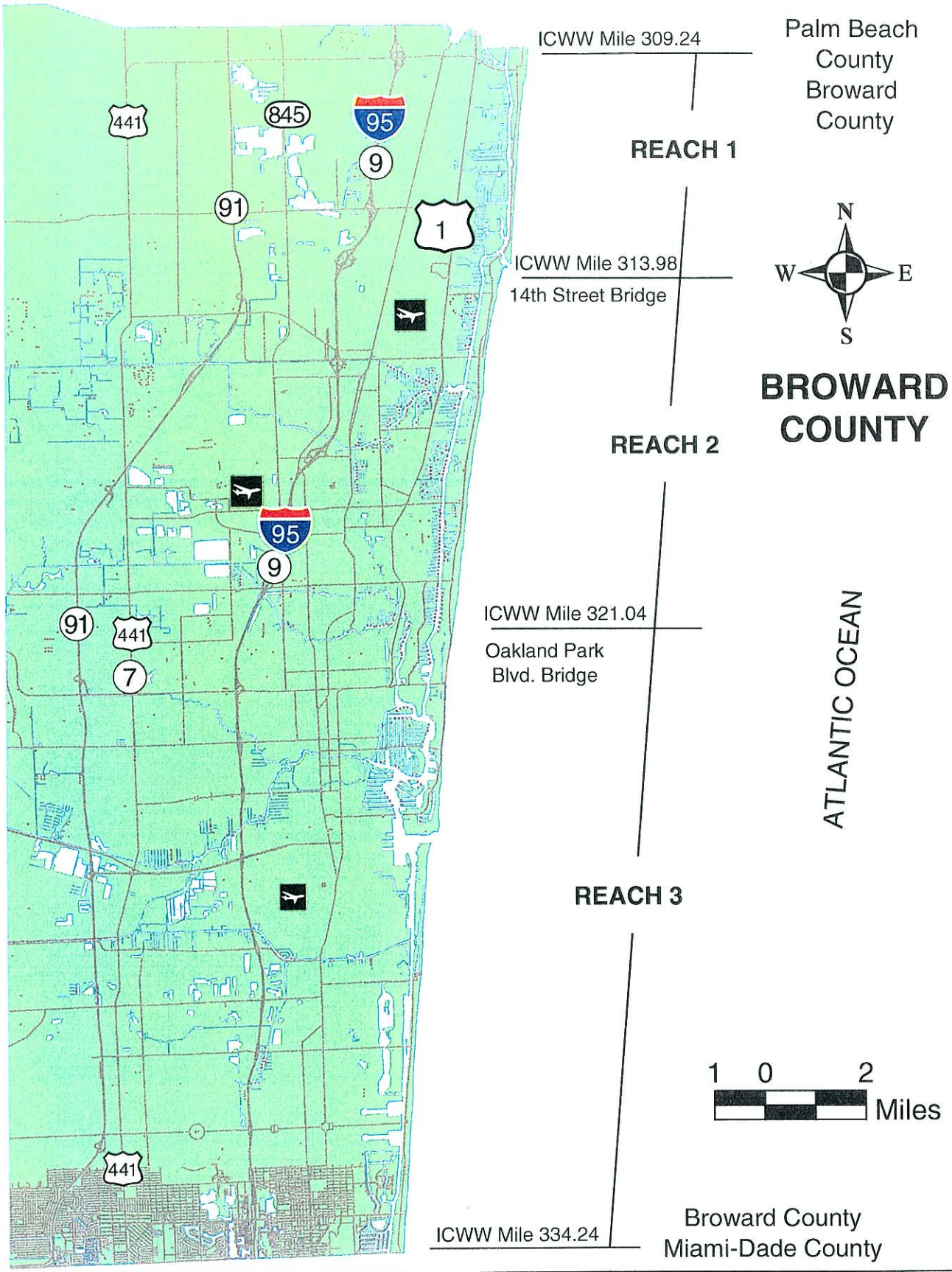
dredged from the ICWW. This volume of material would result from deepening the Waterway beyond its present –10 ft MLW depth — a project proposed and supported by local interests — not from maintenance of the channel at its present depth. The FIND encourages the approved reuse of the material stored in its containment facilities. Indeed, the reuse of dredged material directly benefits the FIND by restoring capacity and thereby extending the design service life of its storage facilities. However, the maintenance requirements of the Waterway will likely continue long after the completion of any single construction project. As a result, the beneficial reuse of dredged material cannot, in itself, provide the needed long-term management capability for the ICWW and does not eliminate the need for the FIND to secure a permanent, dedicated dredged material management capability.

3.2 Delineation of Channel Reaches

The preceding dredged material management concept enabled the logical delineation of operational channel reaches within the Broward County segment of the Waterway. The resulting delineation reflects consideration of fundamental criteria embodied in the management concept — historic shoaling patterns, sediment quality, projected material transfer and storage requirements, area demographics, and site availability. When considered collectively, the individual constraints imposed by each of these factors dictated the logical segmentation of the channel for the management of dredged material as discussed below. Ideally, operational reaches are defined such that one or at most two sites will serve each reach's management requirement consistent with its specified management strategy.

As discussed above, beach placement will form the core management strategy for the northern one-half of the county where almost all of the documented shoaling lies and beach-quality sediments likely dominate. Best use of the available upland sites as required to supplement the beach placement strategy suggests further dividing this channel segment into at least two operational reaches. A single upland material transfer or short-term storage site can then serve the county's southern one-half, given its minimal projected dredging and material storage requirement. One or at most two additional inland sites will also be selected to provide the needed long-term storage requirement as discussed above.

The above considerations led to the definition of three reaches, ranging from 4.74 miles to 13.20 miles in length, within the Broward County project area. Figure 3.1 presents the resulting delineation also summarized in Table 3.1. Figure 3.2 presents the locations of previous maintenance dredging and documented shoals by channel reach. Table 3.2 organizes by channel reach the previous summary of recent shoaling as presented in Table 2.2. Table 3.2 also presents the projected maintenance dredging volumes and the corresponding 50-year material storage requirements for each reach. As an indication of



TAYLOR ENGINEERING INC. 9000 CYPRESS GREEN DRIVE, SUITE 200 JACKSONVILLE, FLORIDA 32256	Figure 3.1 Dredged Material Management Channel Reaches Intracoastal Waterway, Broward County, Florida	Project C2002-36B Revision Sheet Date Feb., 2003

Table 3.1 Delineation of Operational Channel Reaches, Intracoastal Waterway, Broward County

Reach	From	To	Length (mi)	50-year Storage Requirement (cy)	Projected Maintenance Interval (yrs)	Storage Requirement/ Operation (cy)
I	ICWW Mile 309.24, Cut BW-1/Sta. 0+00 (650 ft south of Palm Beach/Broward Co. line)	ICWW Mile 313.98,Cut BW-22/Sta. 0+00 (1,600 ft north of 14th St. Bridge)	4.74	58,092	20	23,237
II	ICWW Mile 313.98,Cut BW-22/Sta. 0+00 (1,600 ft north of 14th St. Bridge)	ICWW Mile 321.04, Cut BW-32/Sta. 0+00 (5,100 south of Oakland Park Blvd. Bridge)	7.06	12,262	20	4,905
III	ICWW Mile 321.04, Cut BW-32/Sta. 0+00 (5,100 south of Oakland Park Blvd. Bridge)	ICWW Mile 334.24, Cut DA-1/Sta. 0+00 (530 ft south of Broward/Dade County line)	13.20	1,980	20	792
		Total	**25.00**	**72,334**		**28,934**

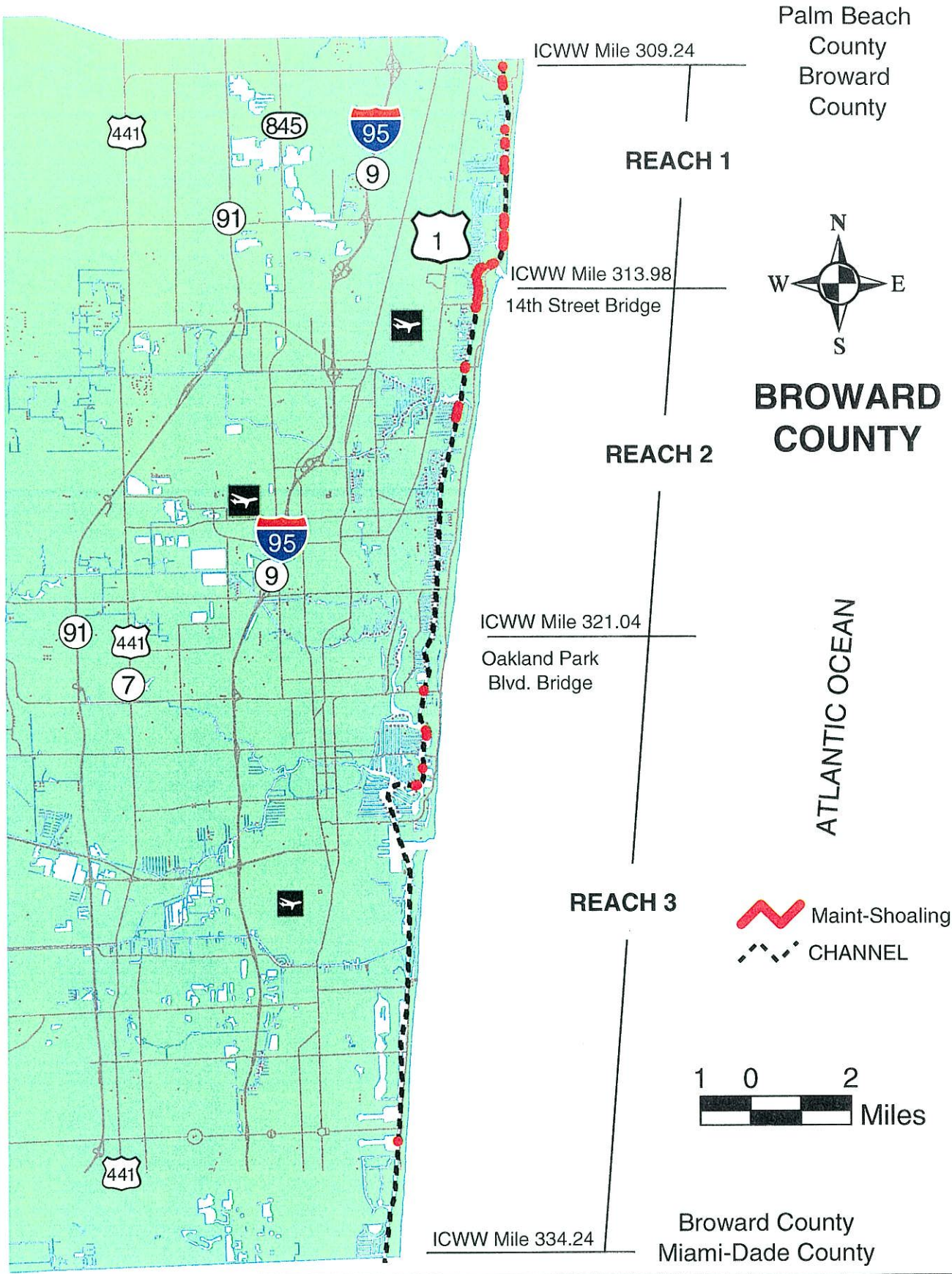


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Figure 3.2
Areas of Historic Maintenance Dredging/
Recent Shoaling by Channel Reach
Long Range Dredgeed Material Management Plan
Intracoastal Waterway, Broward County, Florida

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Sheet	
Date	Feb., 2003

Table 3.2. Summary of Historical Maintenance Dredging/Recent Shoaling by Channel Reach, Intracoastal Waterway, Broward County, 1964-1999

Reach	Previous Maintenance/Recent Shoaling								Reach Summary				
	ICWW Mileage		Cut/Station		Length (ft)	Year	Design Vol. (cy)	Pay Vol. (cy)	Total Vol. (cy)	Vol/Yr (cy)	Vol/Yr/Mi (cy)	50-Year Unbulked Vol. (cy)	50-Year Storage Requirement (cy)
	From	To	From	To									
I: 650 ft south of Palm Beach /Broward County line to 1,600 ft north of 14th St. Bridge, ICWW mile 309.24 to 313.98	309.24	309.28	BW-1/0+02	BW-1/1+89	187	1999*	461	*549*					
	309.57	309.66	BW-2/9+22	BW-2/13+63	441	1999*	508	*604*					
	310.36	310.36	BW-5/8+63	BW-5/8+63	-	1999*	34	*41*					
	310.51	310.52	BW-5/16+42	BW-5/16+74	32	1999*	106	*126*					
	310.78	310.82	BW-613+39	BW-6/15+11	172	1999*	1,479	*1,760*					
	311.12	311.14	BW-7/3+24	BW-7/4+07	83	1999*	543	*646*					
	311.30	311.34	BW-8/4+23	BW-8/6+17	194	1999*	741	*882*					
	312.28	312.30	BW-11/17+20	BW-11/18+29	109	1999*	248	*295*					
	312.35	312.35	BW-11/20+99	BW-11/20+99	-	1999*	62	*73*					
	312.63	312.64	BW-13/2+40	BW-13/2+97	57	1999*	168	*200*					
	312.69	312.84	BW-13/5+94	BW-14/5+60	728	1999*	4,259	*5,068*					
	313.25	313.30	BW-17/3+56	BW-18/2+40	284	1999*	2,089	*2,485*					
	313.49	313.51	BW-19/8+66	BW-19/9+72	106	1999*	99	*117*					
	313.56	313.72	BW-20/0+74	BW-20/8+80	806	1999*	4,835	*5,754*					
	313.76	313.77	BW-21/2+29	BW-21/2+47	18	1999*	68	*81*					
	313.84	313.85	BW-21/6+57	BW-21/6+77	20	1999*	163	*194*					
	313.95	313.95	BW-21/12+05	BW-21/12+05	-	1999*	32	*38*	18,914	540	58	27,020	**58,092**
II: 1,600 ft north of 14th St. Bridge to 5,100 ft south of Oakland Park Blvd. Bridge, ICWW mile 313.98 to 321.04	314.03	314.13	BW-22/2+83	BW-22/7+77	494	1999*	1,777	*2,114*					
	314.17	314.23	BW-22/9+80	BW-22/13+20	340	1999*	424	*504*					
	314.31	314.37	BW-22/17+38	BW-22/20+77	339	1999*	452	*538*					
	315.57	315.60	BW-23/53+69	BW-24/1+50	194	1999*	671	*798*					
	316.56	316.56	BW-25/19+94	BW-25/19+94	-	1999*	32	*38*	3,992	114	12	5,703	**12,262**
III: 5,100 ft south of Oakland Park Blvd. Bridge to 530 ft south of Broward/Dade County line, ICWW mile 321.04 to 334.24	322.14	322.16	BW-35/8+67	BW-35/9+64	97	1999*	222	*264*					
	322.98	322.99	BW-37/12+06	BW-37/12+92	86	1999*	163	*194*					
	323.77	323.79	BW-39/23+40	BW-39/24+10	70	1999*	86	*102*					
	328.89	328.89	BW-54/7+73	BW-54/7+73	-	1999*	37	*44*					
	331.60	331.60	BW-58/33+53	BW-58/33+53	-	1999*	34	*40*	645	18	1.2	921	**1,980**

*based on three-line survey performed in December 1999

the relative shoaling rate within each reach, the mean volume of maintenance dredging required annually per channel mile is also included.

Reach I, the northernmost reach, extends from a point 650 ft south of the Palm Beach/Broward County line (ICWW mile 309.24; Cut BW-1, station 0+00) southward 4.74 miles to a point just south of Hillsborough Inlet (ICWW mile 313.98; Cut BW-22, station 0+00), approximately 1,600 ft north of the 14th Street Bridge. The projected 50-year material storage capacity for this reach, 58,092 cy, represents over 80% of the projected requirement for the entire Broward County project area. Five of the nine existing easements or FIND-owned properties, representing three of the seven within FIND's inventory of presently available sites, fall within this reach. As anticipated, available sediment data confirm that channel sediments within this reach consist primarily of beach-quality material. Given the small volume of shoaling since the channel was deepened to its present –10 ft MLW, future maintenance is projected to be required no more than once every 10 – 20 years. Based on a 20-year maintenance interval, each operation should require an average storage volume of 23,237 cy.

Reach II extends southward 7.06 miles from the end of Reach I to a point approximately one mile south of the Oakland Park Blvd. Bridge (ICWW mile 321.04; Cut BW-32, station 0+00). The projected 50-year storage requirement for this reach, 12,262 cy, represents less than 17% of the total requirement for the project area. Two of the nine existing easements or FIND-owned properties determined to have some dredged material management potential fall within this reach. Available sediment data confirm that channel sediments within the reach's northern one-half (nearest Hillsborough Inlet) consist primarily of beach quality material. Notably, all shoals documented within Reach II lie within this northern segment. Continuing southward, however, the fine-grained component of the channel sediments increases with increasing distance from the inlet and thus appears less appropriate for beach placement. Similar to Reach I, the minimal shoaling since 1965 suggests that future channel maintenance will be required no more frequently than every 10 – 20 years. Based on a 20-year maintenance interval, each operation should require an average storage volume of 4,905 cy.

Reach III extends from the southern end of Reach II southward 13.20 miles to the Broward/Miami-Dade County line (ICWW mile 334.24; Cut DA-1, station 0+00). The projected 50-year storage requirement for this reach, less than 2,000 cy, suggests the likely requirement of only a minimal dredged material management site. Two of the existing easements or FIND-owned properties with some potential for future use lies within this reach. Available data indicate that channel sediments within this reach consist of a mix of fine sand and silt and thus appear unsuitable for beach placement. Again, based

on a 20-year maintenance interval, each operation should require an average storage volume of only 792 cy.

3.3 Identification of Candidate Sites

Defining the management concept and delineating logical channel reaches provided the means to evaluate existing easements with respect to the long-term needs of the Waterway in Broward County. As discussed in Section 2.3, the maximum storage capacity within the existing easements and FIND-owned properties (151,456 cy; Table 2.8) exceeds the projected 50-year storage requirement of the Broward County project area (72,334 cy; Table 2.2). However, the development of these alternatives may not represent the most operationally efficient and cost effective strategy to meet the needs of future Waterway maintenance. Moreover, the use of up to seven small storage areas along the Waterway clearly remains inconsistent with the Management Concept of centralized storage established in Section 3.1. Therefore, meeting these established criteria dictated the identification and evaluation of additional alternative sites.

Given the primary strategy of beach placement within the project area's northern 11.8 mi, the search for additional candidate sites first focused on the identification of suitable temporary storage/ material transfer sites needed to complement the beach placement strategy. Guided by the established Management Concept, the process next sought appropriate upland sites within a reasonable distance of the Waterway that appeared capable of providing the minimal short-term storage or material transfer capability required by the project area's southern 13.2 mi. Lastly, the process sought to identify additional potential storage tracts located west of the coastal corridor but east of the Everglades Wildlife Management Area. As described in the Management Concept, this last group would provide the one, or at most two, sites needed to provide for the storage of material transferred from the smaller sites located nearer the Waterway, should storage at the latter sites prove impractical.

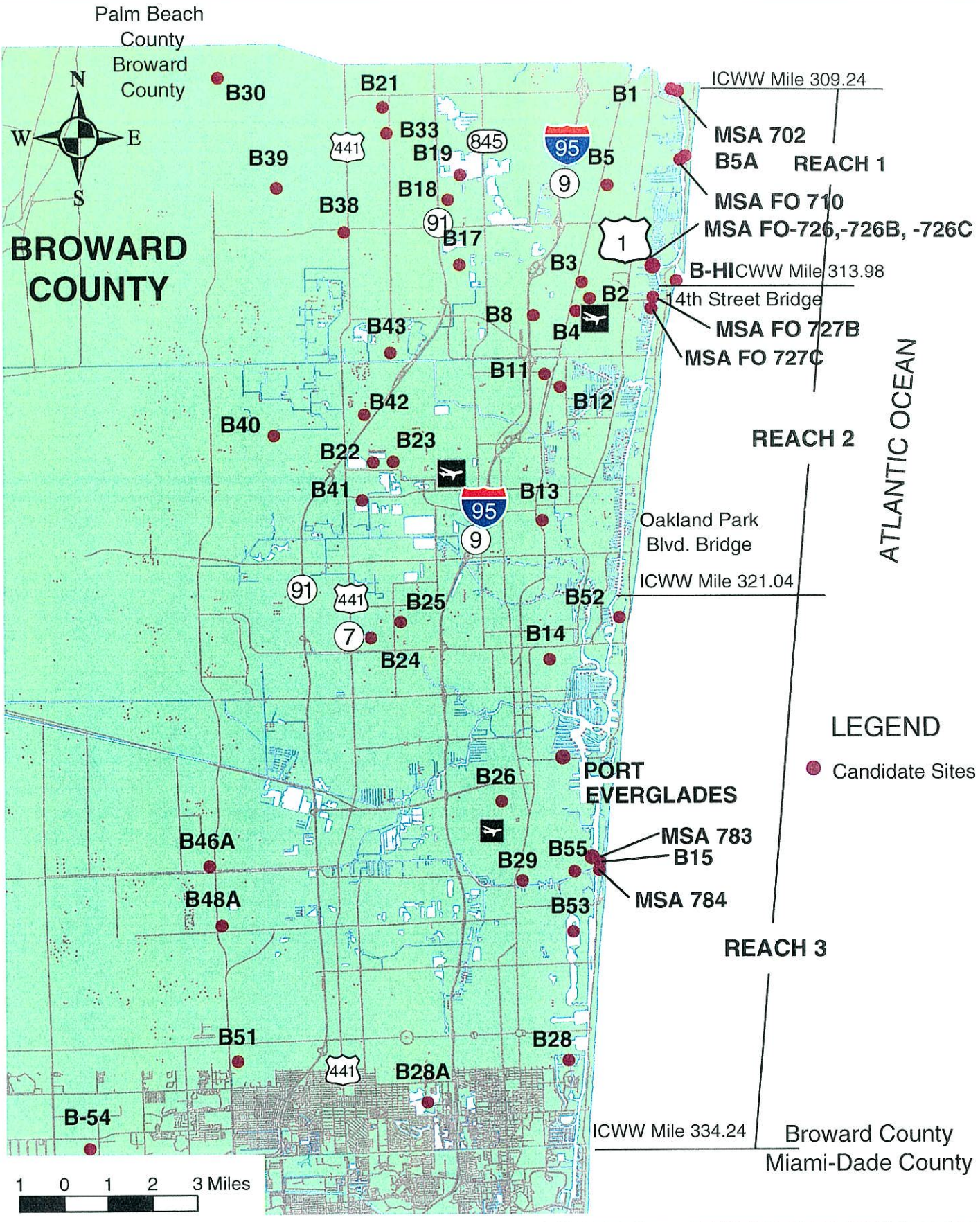
The paucity of undeveloped or otherwise vacant sites near the Waterway prevented the site identification process from initially discriminating among sites based on their designated land-use or that of adjacent properties. In this region, existing or adjacent land-use was considered only later in the evaluation process to establish a site's suitability relative to other sites in the same category. However, existing and adjacent land-use did constitute an important screening tool in the identification of storage sites west of the coastal corridor. Here, tracts designated for industrial, commercial, or agricultural uses were initially judged more suitable than those with residential, conservation, or other public use designations. Also considered was the degree to which land clearing, logging, agriculture, or mining had previously disturbed or degraded a site's environmental quality. However, initial site identification deferred consideration of other environmental factors such as the quality of existing habitat or the diversity of vegetation to the final site evaluation process as discussed in Section 4.1.

An office review of all available resource materials began the site identification process. Reference materials included 1994 and 1995 NHAP/NAPP color-IR aerial photography (1:24,000), USGS 7.5-minute topographic quadrangle maps (1:24,000), 1994 FIND blueline aerials (1:2,400), county and municipal Comprehensive Plan Future Land Use maps (various scales), U.S. Department of the Interior, U.S. Fish and Wildlife Service Wetland Inventory maps (1:24,000) and U.S. Soil Conservation Service maps (1:20,000). This process identified 56 additional candidate sites. Given the pace of development within Broward County, current (1999) Broward County tax aerials were then obtained for each candidate site used to update each site's present land use. Review of these aerials eliminated 14 candidate sites with obvious land use conflicts (i.e., recent development) not shown in the 1994 aerials. This process yielded 42 alternative candidate sites, or between 12 and 16 for each reach. Figure 3.3 locates all 42 alternative candidate sites as well as the seven sites within nine existing easements with potential for continued use as discussed in Section 2.2. The following section describes the next step in the identification and evaluation of alternative candidate sites — site inspection.

3.4 Site Inspections

Field inspection of all candidate sites, including the seven sites presently available to the FIND and the 42 newly identified sites, was conducted April 10 – 27, 2000. A team consisting of one engineer and one biologist inspected each site to determine existing and adjacent land use, to characterize and preliminarily delineate and quantify on-site vegetation communities, most notably wetland habitat and associated environmental liabilities, and to assess the general suitability of each site for development as permanent dredged material management facilities. Also noted during the site inspections were site topography, general soil conditions, existing or potential road access, possible pipeline routes, and obvious archeological features, if present. In addition, a video and/or still photography recorded significant features of each site and documented the on-site and adjacent land-use at the time of the inspection.

Within each site, the inspection team assessed ecological conditions by combined photogrammetry and ground-truthing as necessary to identify and map vegetation communities. The 1999 Broward County tax aerials (1"=200 ft) and the 1994 FIND aerials (1"=200 ft) served as the primary field mapping resource. Vegetation associations and other salient site features were mapped in the field by drawing on the blueline aerials. However, all other resource materials discussed previously were available for reference and often checked to aid in the interpretation of site conditions. The inspections also noted observations of significant wildlife species when encountered on-site, including the presence or sign of



TAYLOR ENGINEERING INC. 9000 CYPRESS GREEN DRIVE, SUITE 200 JACKSONVILLE, FLORIDA 32256	Figure 3.3 Candidate Sites Long Range Dredged Material Management Plan Intracoastal Waterway, Broward County, Florida	Project C2002-36B Revision Sheet Date Feb., 2003

wildlife species protected by the state or federal government. The aerial photography, on-site photography, and field notes then guided mapping the land use and vegetation communities on each site to Level 3 of the Florida Land-Use and Cover and Forms Classification System (FLUCS) (FDOT, 1985). The individual site maps, in turn, guided each candidate site's capacity analysis and evaluation under the full standard set of engineering, operational, environmental, socioeconomic, and land-use criteria. Table 3.3 summarizes the results of each candidate site's capacity analysis as well as other pertinent site parameters. Chapter 4.0 presents the full set of evaluation criteria as well as the recommended dredged material management sites derived from the evaluation process.

Table 3.3 Candidate Sites, Intracoastal Waterway, Broward County

Reach	Site	Designated Use	ICWW Mileage	Mapped Area (ac)	Containment Area (ac)	Impacted Area (ac)	Buffer Area (ac)	Total Site Area (ac)	Storage Capacity (cy)	Wetlands W/I Mapped Area (ac)	Comprehensive Plan Designation	Comment
BW-1	B-30	Multi-Reach Inland Storage	308.99	532.94	N/A	5.60	27.57	33.17	72,600	0.00	E	Large agricultural site with home
	B-1 / MSA 702	Dewatering & Long-Term Storage (Multiple Operation)	309.22	58.04	7.86	10.42	23.17	33.59	80,342	11.59	R&O, CON	Deerfield Island Park
	B-21	Multi-Reach Inland Storage	309.66	102.49	N/A	5.60	27.18	32.78	72,600	0.81	EC	Predominantly undeveloped land
	B-33	Multi-Reach Inland Storage	310.25	87.56	N/A	Insufficient Area	N/A	N/A	N/A	11.75	C	Bisected by Sawgrass Boulevard
	MSA FO 710	Material Rehandling (Barge Offloading)	310.7	2.87	N/A	0.87	1.74	2.61	N/A	0.00	R&O	DeGraff Park
	B-5A	Material Rehandling (Barge Offloading)	310.74	5.67	N/A	2.90	2.77	5.67	N/A	0.00	H, M	Posted as a construction site
	B-19	Multi-Reach Inland Storage	311.18	166.10	N/A	5.60	27.18	32.78	72,600	0.00	I	Adjacent to FL Turnpike
	B-5	Multi-Reach Inland Storage	311.38	45.56	N/A	5.60	27.51	33.11	72,600	0.00	I	Precast Specialty, Inc.
	B-39	Multi-Reach Inland Storage	311.47	26.61	N/A	Insufficient Area	N/A	N/A	N/A	1.67	C	Land surrounding entrance to gated community

Table 3.3 Candidate Sites, Intracoastal Waterway, Broward County

Reach	Site	Designated Use	ICWW Mileage	Mapped Area (ac)	Containment Area (ac)	Impacted Area (ac)	Buffer Area (ac)	Total Site Area (ac)	Storage Capacity (cy)	Wetlands W/I Mapped Area (ac)	Comprehensive Plan Designation	Comment
BW-1 Cont.	B-18	Multi-Reach Inland Storage	311.75	306.36	N/A	5.60	27.18	32.78	72,600	0.00	I	Broward County Landfill
	B-38	Multi-Reach Inland Storage	312.47	37.65	N/A	5.60	28.46	34.06	72,600	0.28	H,C	Posted as a construction site
	B-17	Multi-Reach Inland Storage	313.33	38.24	N/A	5.60	15.91	21.51	72,600	4.24	I	Paved streets and drainage infrastructure present
	MSA FO 726, 726B, 726C	Dewatering & Short-Term Storage (Single Operation)	313.37	14.18	4.27	6.61	6.14	12.75	26,907	0.34	R&O	Exchange Club Park
	B-3	Dewatering & Short-Term Storage (Single Operation)	313.85	23.81	Insufficient Area	N/A	N/A	N/A	N/A	0.00	R&O	Pompano Beach Airport
	B-HI	Beach Placement	313.98	0.00	N/A	N/A	N/A	N/A	N/A	0.00	N/A	Undesignated beach placement site south of Hillsborough Inlet
BW-2	MSA FO 727B	Material Rehandling (Barge Offloading)	314.16	9.68	N/A	5.16	4.50	9.66	N/A	0.04	R&O	Alsdorf Park
	B-2	Dewatering & Short-Term Storage (Single Operation)	314.24	12.41	Insufficient Area	N/A	N/A	N/A	N/A	0.00	R&O	Pompano Beach Airport

Table 3.3 Candidate Sites, Intracoastal Waterway, Broward County

Reach	Site	Designated Use	ICWW Mileage	Mapped Area (ac)	Containment Area (ac)	Impacted Area (ac)	Buffer Area (ac)	Total Site Area (ac)	Storage Capacity (cy)	Wetlands W/I Mapped Area (ac)	Comprehensive Plan Designation	Comment
BW-2 Cont.	MSA FO 727C	Material Rehandling (Barge Offloading)	314.49	7.74	N/A	2.58	3.78	6.36	N/A	0.72	R&O	Harbor's Edge Park
	B-4	Dewatering & Short-Term Storage (Single Operation)	314.54	50.33	5.64	8.79	7.86	16.65	31,436	0.00	R&O	Pompano Beach Airport
	B-8	Multi-Reach Inland Storage	314.64	18.76	N/A	Insufficient Area	N/A	N/A	N/A	0.00	M	Posted as a construction site
	B-43	Multi-Reach Inland Storage	315.5	23.22	N/A	Insufficient Area	N/A	N/A	N/A	7.35	C	Former agricultural area with mixed wetland hardwoods
	B-11	Multi-Reach Inland Storage	315.98	12.46	N/A	Insufficient Area	N/A	N/A	N/A	0.00	CF, C, MH	Insufficient area for 350-ft setback
	B-12	Multi-Reach Inland Storage	316.29	34.96	N/A	5.60	29.36	34.96	72,600	1.20	C	35-acre shopping center
	B-42	Multi-Reach Inland Storage	316.9	60.31	N/A	Insufficient Area	N/A	N/A	N/A	0.36	CF	Queen of Heaven Catholic Cemetery
	B-40	Multi-Reach Inland Storage	317.39	103.90	N/A	5.60	27.18	32.78	72,600	0.00	I	Large agricultural area
	B-23	Multi-Reach Inland Storage	318.01	103.19	N/A	5.60	27.18	32.78	72,600	0.00	T	Fort Lauderdale Executive Airport

Table 3.3 Candidate Sites, Intracoastal Waterway, Broward County

Reach	Site	Designated Use	ICWW Mileage	Mapped Area (ac)	Containment Area (ac)	Impacted Area (ac)	Buffer Area (ac)	Total Site Area (ac)	Storage Capacity (cy)	Wetlands W/I Mapped Area (ac)	Comprehensive Plan Designation	Comment
BW-2 Cont.	B-22	Multi-Reach Inland Storage	318.02	163.99	N/A	5.60	19.31	24.91	72,600	0.00	R&O	Municipal Well Field
	B-41	Multi-Reach Inland Storage	318.89	72.84	N/A	Insufficient Area	N/A	N/A	N/A	0.00	CR	Westminster Academy Sports Complex
	B-13	Multi-Reach Inland Storage	319.34	22.41	N/A	5.60	16.81	22.41	72,600	0.00	C	Adjacent to Old Dixie Highway
BW-3	B-52	Dewatering & Long-Term Storage (Multiple Operation)	321.4	178.97	8.70	11.76	6.40	18.16	89,339	23.38	CON	Hugh Taylor Birch State Park
	B-25	Multi-Reach Inland Storage	321.68	99.32	N/A	5.60	31.35	37.95	72,600	1.56	C	U.S. EPA Superfund site
	B-24	Multi-Reach Inland Storage	322.03	120.65	N/A	5.60	27.18	32.78	72,600	0.00	I	Transmission tower farm
	B-14	Multi-Reach Inland Storage	322.53	87.23	N/A	5.60	27.18	32.78	72,600	0.00	R&O	Holiday Park
	MSA-783/ Port Everglades	Material Rehandling (Barge Offloading)	325.4	N/A	N/A	N/A	N/A	N/A	N/A	0.00	T, U	FIND held easement within Port Everglades
	B-26	Multi-Reach Inland Storage	326.4	90.27	N/A	5.60	27.79	33.39	72,600	0.00	CON, R&O	Snyder Park

Table 3.3 Candidate Sites, Intracoastal Waterway, Broward County

Reach	Site	Designated Use	ICWW Mileage	Mapped Area (ac)	Containment Area (ac)	Impacted Area (ac)	Buffer Area (ac)	Total Site Area (ac)	Storage Capacity (cy)	Wetlands W/I Mapped Area (ac)	Comprehensive Plan Designation	Comment
BW-3 Cont.	B-15 / MSA 784	Dewatering & Short-Term Storage (Single Operation)	327.74	309.26	Insufficient Area	N/A	N/A	N/A	N/A	86.55	R&O	John U. Lloyd Beach State Recreation Area
	B-46A	Multi-Reach Inland Storage	327.82	40.38	N/A	Insufficient Area	N/A	N/A	N/A	15.83	None Designated	Insufficient area due to wetlands and adjacent residential areas
	B-55	Dewatering & Long-Term Storage (Multiple Operation)	327.97	382.69	10.00	13.26	28.58	41.84	76,600	7.95	T	Adjacent to Port Everglades container storage area port facility
	B-29	Dewatering & Long-Term Storage (Multiple Operation)	328.17	81.74	10.00	13.63	29.47	43.10	75,840	0.00	EC, T	Wholesale tree farm and nursery
	B-48A	Multi-Reach Inland Storage	329.17	57.28	N/A	5.60	27.18	32.78	72,600	0.00	C	Improved pasture and palm tree nursery
	B-53N	Dewatering & Short-Term Storage (Single Operation)	329.31	399.10	Insufficient Area	N/A	N/A	N/A	N/A	361.24	CON	West Lake Park
	B-53S	Dewatering & Short-Term Storage (Single Operation)	329.31	151.66	Insufficient Area	N/A	N/A	N/A	N/A	131.95	CON	West Lake Park
	B-51	Multi-Reach Inland Storage	332.22	649.01	N/A	5.60	30.21	35.81	72,600	0.00	T	North Perry Airport

Table 3.3 Candidate Sites, Intracoastal Waterway, Broward County

Reach	Site	Designated Use	ICWW Mileage	Mapped Area (ac)	Containment Area (ac)	Impacted Area (ac)	Buffer Area (ac)	Total Site Area (ac)	Storage Capacity (cy)	Wetlands W/I Mapped Area (ac)	Comprehensive Plan Designation	Comment
	B-28	Dewatering & Short-Term Storage (Single Operation)	332.26	50.11	2.59	4.47	5.15	9.62	11,066	3.08	CM, R&O	Harbor Isles Boat Marina
BW-3 Cont.	B-28A	Multi-Reach Inland Storage	333.16	233.59	N/A	76.33	0.0	76.33	1,847,193	0.00	I	76.33-acre holding pond within industrial park
	B-54	Multi-Reach Inland Storage	334.11	573.21	N/A	5.60	27.18	32.78	72,600	116.32	RAC	Transmission line corridor running through site

4.0 ESTABLISHMENT OF SITE BANK

This chapter documents the final evaluation of the full set of 47 candidate sites, including the seven sites within existing easements or FIND-owned properties, and the 42 newly identified sites (two of which represent expansions of existing easements). The evaluation of each site assessed its ability to satisfy a standard set of evaluation criteria. This process led to the selection of six sites to form a site bank serving the three reaches of the Intracoastal Waterway channel within the Broward County project area. The site bank consists of four primary (first-choice) sites and two secondary (second-choice) alternatives for the long-term management of dredged material removed from ICWW channels consistent with the project's established Management Concept.

4.1 Evaluation Criteria

The final site evaluation process employed a standard set of criteria. Developed as part of the pilot project that addressed the needs of the Waterway in the Nassau and Duval Counties, and refined through the course of the next nine program elements completed to date, these criteria predominantly reflect a dredged material management strategy that relies on the use of conventional containment basins and, where appropriate, beach placement. That is, with the exception of those reaches for which beach placement remains the most appropriate management strategy, the specific requirements and conditions within those counties led to the selection and evaluation of sites that could support the construction of containment basins to receive and dewater a dredged material slurry produced by hydraulic dredging as well as to provide the required long-term storage of the dewatered material.

However, this approach appears inappropriate for the specific conditions encountered in the Broward County project area. As discussed in the preceding chapter, the intensive development within Broward County's coastal corridor and the low projected dredging requirement suggested an alternative approach. Outside of the vicinity of Hillsborough Inlet where beach placement will remain the primary management strategy, the appropriate strategy will rely on small material temporary storage sites adjacent to the Waterway. Should even temporary storage of dredged material on these sites prove unworkable, the material will be transferred to a site(s) located farther inland for temporary storage until the next scheduled channel maintenance. However, despite these fundamental differences, many of the same evaluation criteria developed for sites intended for the development of a conventional containment facility remain appropriate to the small waterfront temporary storage/transfer sites as well as the inland temporary storage sites. The discussion of the specific evaluation criteria that follows notes those criteria within the standard set that are inappropriate to these different roles. Following this discussion, the remainder of this chapter describes the site evaluation and the final bank of primary and secondary sites compiled via this procedure.

Each site was evaluated by its ability to satisfy criteria in three broad areas:

- Engineering/Operational Considerations
- Environmental Considerations
- Socioeconomic or Cultural Considerations

Individual criteria considered in each of these areas are described below.

4.1.1 Engineering/Operational Considerations

- Capacity — The potential material storage capacity of a site remains a fundamental site evaluation criterion despite the reduced storage objectives. Typically, Phase I identifies suitable dredged material management sites capable of providing the projected 50-year material storage requirements of the Waterway reach each site is intended to serve. However, as discussed in Chapter 3, the limited available acreage near the Waterway and the likelihood of high site acquisition costs dictate that a realistic plan for the Broward County project area must reduce the desired storage from the full 50-year requirement to the volume produced by a single maintenance operation based on historic averages and/or recent surveys.

- Adequate Dike Material — Closely related to site capacity is the on-site availability of adequate dike material to construct the containment basin as employed in the preliminary capacity analysis (Appendix C). This criterion remains appropriate to the small sites adjacent to the Waterway that lack deep-water access necessary for offloading a barge mechanically, but that possess sufficient area (>10 acres) to allow the construction of a temporary containment basin needed to offload a barge hydraulically. It does not apply to the inland sites that will receive the relatively dry material transferred from a smaller waterfront site. As discussed in Section 2.3, small upland acreage or low mean grade elevation may limit the excavation depth and thus the dike's height and the basin's capacity. Trucking in additional material from off-site sources can overcome an insufficient on-site supply of dike material, although adding significantly to the operation's cost.

- Pumping Distance — Pumping distance from the area to be dredged to the area of placement affects a site's suitability only in those instances where a site is required to support a hydraulic dredging operation. Although material within Broward County Reaches I and II destined for beach placement may be dredged hydraulically, the location of the beach placement site (to be determined in Phase II) will reflect the analysis of the sediment budget within the vicinity of Hillsborough Inlet and the documented need for beach fill, and only indirectly the desire to limit pumping distance. Although booster pumps can significantly extend pumping distance, the

increase is achieved only through a significant reduction in dredging efficiency and a corresponding increase in operating costs. In discussions with representatives of the Jacksonville District, USACE, a pumping distance of three to six miles was determined to be a preferred limit for efficient operation. However, should extraordinary circumstances require increased distances, 10 miles was established as the absolute maximum pumping distance acceptable to the USACE.

- Pipeline Access — A site affording the greatest ease of pipeline access from the Waterway, as well as the return of effluent to the Waterway, is also preferred. Apart from the potential for environmental impacts to sensitive mangrove or other wetlands (discussed in Section 4.1.2), difficult pipeline access adds to mobilization-demobilization costs and reduces operating efficiency. Examples of pipeline access difficulties include extensive crossings through mangroves or shallow sea grass stands, significant elevation changes, or the crossing of road or railroad rights-of-way. Moreover, pipeline access through upland property may require the costly acquisition of additional pipeline easements. This criterion was relevant only to those sites that could support hydraulically offloading barges.

- Upland Access — The management strategy developed for the Broward County project area relies on the transfer, either immediately after dredging or prior to the next maintenance operation, of dredged material first offloaded to small sites adjacent to the Waterway. As a result, existing or potential upland road access was an essential criterion for the evaluation of existing easements or FIND-owned properties and a prerequisite in the identification of new candidate sites.

- Soil Properties — On-site soil properties (e.g., load bearing capacity, resistance to piping, etc.) and the depth of the water table below grade are additional factors included as criteria for site evaluation. However, these determinations require field testing not included in the initial phase of the project. Therefore, data supporting on-site soil properties and geohydrology will be obtained during Phase II. Observations made during Phase I field inspections revealed no obvious areas of concern in those sites forming the final site bank.

4.1.2 Environmental Considerations

The environmental criteria used for site evaluation are intended to minimize the environmental permitting constraints of site development by minimizing adverse impacts to sensitive habitats, while providing suitable sites to serve the needs of the Waterway. The resulting criteria may be organized under two categories reflecting FIND's management principle of restricting the placement and storage of dredged material to upland areas: (1) criteria for the avoidance of wetland areas to the greatest extent possible and (2) criteria for minimizing unavoidable impacts to upland habitats.

- Wetland Impacts — Avoidance of wetlands, a primary consideration throughout the site selection process, has largely been achieved by use of USFWS Wetlands Inventory maps and color-infrared photography, augmented by field verification and preliminary delineation of on-site wetlands. However, where a question remained or where avoidance of isolated or transitional wetland areas would have precluded the use of a site, several specific criteria were used to weigh the relative success in minimizing wetland impacts.

  Mangroves and other wetland areas exhibiting salt water characteristics, clearly indicative of tidal wetlands contiguous with state waters, are recognized by all state and federal agencies to be an extremely valuable and biologically productive habitat. Therefore, the degree to which a site's development could be accomplished while avoiding impacts to mangrove areas is obviously a crucial criterion in site selection. Closely related to this is the sometimes unavoidable impact related to accessing the site via pipeline. If no other avenue is available (e.g., floating the pipeline in a tidal creek), crossing mangroves or submerged aquatic vegetation may be required. This practice, a necessary consideration in site selection, was minimized wherever possible.

  Isolated freshwater wetlands, also a valuable biological community, typically provide a system of filtering runoff and recharging groundwater supplies. Nevertheless, such wetlands receive less protection under FDEP permitting criteria. However, such wetlands are under the jurisdiction of the USACE and the South Florida Water Management District (SFWMD). The presence of these isolated wetlands was considered in the evaluation of a particular site, and their disruption was avoided wherever possible. Experience gained in previous plan development efforts suggests that the sacrifice of small, isolated areas possessing wetland vegetation may be acceptable if required to provide an adequate containment area. However, mitigation may be required to offset such impacts, if incurred. Somewhat independent of the extent of an interior wetland is the habitat quality it may afford or the unusual vegetation it may support. Thus, the quality of impacted wetlands was also a criterion of site selection and will affect any mitigation which may be required.

- Upland Impacts — The use of uplands for the development of dredged material management areas minimizes impacts to wetlands. However, upland site development requires the removal of existing upland vegetation and habitat within the footprint of the material transfer and/or storage area. Again, the quality of the impacted uplands can vary widely, and therefore assessments of the relative ecological value of the existing upland communities are useful site evaluation criteria. Specific assessments include the quality of habitat; the presence or potential presence of threatened or endangered species; the uniqueness, maturity, and aesthetic quality of the existing

vegetation (e.g., mature hardwood canopy vs. second-growth saplings); and the extent to which a site was disturbed by previous human activities (e.g., clearing, logging, drainage, etc.).

- Buffer Area — Site evaluation also considered the site's ability to provide a buffer of undisturbed vegetation to separate the facility and its operations from adjacent properties. Primarily, the buffer is intended as a visual barrier. However, other potential benefits include the preservation of areas of particular environmental value such as maritime hammock, coastal scrub, or transitional wetlands that could otherwise fall to development. Moreover, the preservation of a buffer region within a dedicated conservation easement may facilitate the permitting required for site construction by mitigating the impacts of site development.

- Archeological Value — While not strictly an environmental consideration, the relative archeological value of each site was an evaluation criterion. Phase I of the project does not include a formal archeological survey of each candidate site. However, during the preliminary inspection of each candidate site, obvious evidence of early habitation or other cultural resources (e.g., shell middens) was noted. The presence of a documented archeological site will be investigated only for the final site bank of primary and secondary alternatives. To identify potential conflicts, an early task within Phase II includes submitting to the Division of Historical Resources, Florida Department of State, a request for a records search of the Florida Master File of historical and archeological sites and the National Register of Historical Places. The presence of a verified archeological or historical site may necessitate a formal site survey or documentation effort prior to containment area construction. However, the discovery of such a site does not necessarily preclude the use of an otherwise viable management area.

- Groundwater Conditions — The final environmental evaluation criterion, groundwater conditions, addresses the possibility that site development and operation may directly impact local groundwater supplies. Before each future dredging operation, sediment within the shoals to be dredged will undergo further analysis, including elutriate testing. Should analysis identify elevated levels of contaminants, permitting procedures will require appropriate measures to ensure these contaminants remain sequestered with the dredged material. Therefore, contamination of local groundwater by materials contained in channel sediments is not anticipated.

The primary source of potential impacts to local groundwater is salt — specifically, saltwater mixed with the sediment and pumped from the Waterway to the site. This consideration applies only to those temporary storage sites that could support the construction of a containment basin to allow a barge to be offloaded hydraulically. In such cases, the containment area will hold saltwater only during the relatively short and infrequent periods of active dredging and

dewatering. Mechanically offloading the dredged material from a barge directly to trucks will obviously eliminate any serious threat of saltwater contamination. Nevertheless, specific safeguards against the occurrence of saltwater contamination of the local shallow aquifer are an essential part of the design and operation of each site. In addition, each site will include a comprehensive program of groundwater monitoring before, during, and after each dredging operation. These safeguards, addressed in detail in the site-specific documentation developed during Phase II, minimize the possibility of saltwater contamination.

4.1.3 Socioeconomic or Cultural Considerations

- Land Use — The third major category of site evaluation criteria considers the socioeconomic issues of on-site or adjacent land use, current comprehensive plan and zoning designations, local governmental jurisdictions, and site ownership. Every effort was made during the initial identification of new candidate sites to select areas of suitable existing on-site land use. For obvious reasons, areas of minimal development were preferred. Moreover, areas previously disturbed by clearing, excavation, timber harvesting, or drainage were given priority because of their reduced environmental value. Managed timberlands or other agricultural areas were not excluded from consideration, however. Similarly, existing adjacent land use was an important consideration. The objective was to select areas isolated from existing residential or, in some cases, commercial or retail development.

  Because of the rapid pace of development in some areas, available aerial photography often did not accurately depict current on-site or adjacent land use. In several cases, field inspections revealed on-site residential or commercial development which required site reconfiguration or abandonment. Adjacent land-use conflicts were not so easily resolved, and in areas with limited upland acreage, such conflicts may remain. To the maximum extent possible, these conflicts were reduced by a buffer zone to separate the site's active storage or material transfer areas from residential or commercial development.

- Zoning and Comprehensive Plans — In addition to field inspection of each site, on-site and adjacent land use was also investigated through the determination of existing zoning (county or municipal) and comprehensive plan future land-use designations. The present long-range planning effort, because it is being performed in support of a federal navigation project, is not subject to local zoning regulations. Moreover, the provision for dredged material management areas has not been addressed in local comprehensive plans. In many cases, comprehensive plans have not even recognized pre-existing dredged material disposal easements. Legislation has since attempted to correct this oversight. The FIND intends to recognize and address community concerns embodied

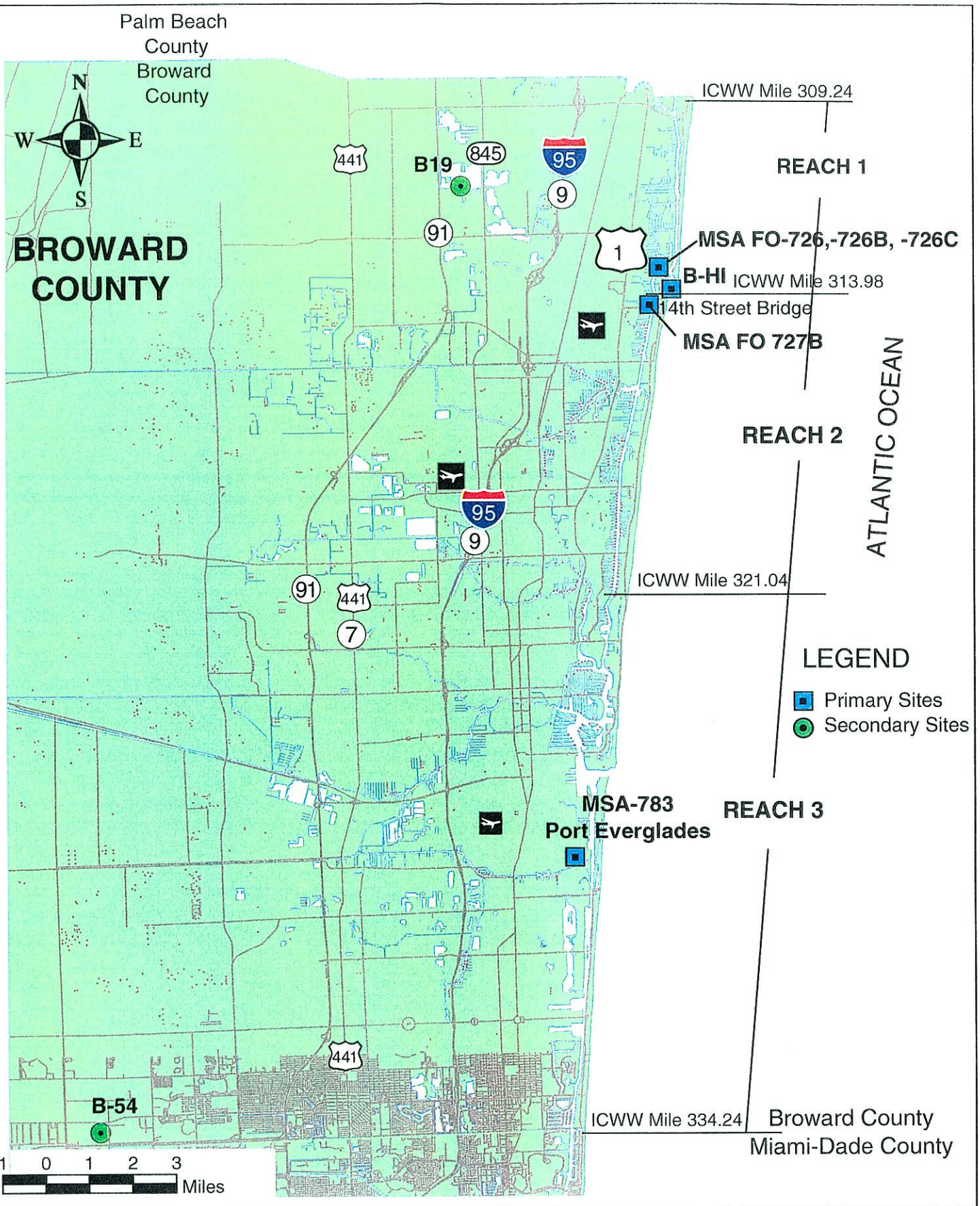
in zoning and comprehensive planning laws. Thus, in the identification of new sites and the evaluation of existing easements, those areas designated for industrial or agricultural uses received priority.

- Property ownership — Phase I also included establishing the ownership of all primary and secondary sites as necessary to obtain authorized access for the more detailed Phase II surveys and investigations. Phase II will also consider site ownership and recorded parcel boundaries to establish site boundaries and, when appropriate, to reduce the number of individual property owners involved. Appendix D presents property ownership information for all primary and secondary sites.

4.2 Site Bank

The final evaluation of all candidate sites led to the selection of six sites to serve the three reaches of the Intracoastal Waterway channel within the Broward County project area. Of these, four sites — three small waterfront sites and one beach placement site — represent primary or first-choice options. The remaining two sites — both inland from the Waterway — provide secondary storage alternatives should even temporary storage of material at one or more of the waterfront sites prove unworkable. As their names imply, these six sites represent the four best and two second-best alternatives after consideration of all engineering, operational, environmental, and socioeconomic factors influencing site selection. Figure 4.1 shows the resulting site bank. Table 4.1 summarizes key features of each site with respect to its designated use.

Each of the three channel reaches within the Broward County project area has been assigned at least one primary and one secondary site, consistent with the management strategy established for each reach. In each case, both the primary and secondary sites are well suited to serve the requirements of their designated channel reach. Given the likely predominance of beach-quality sediments near Hillsborough Inlet, one site — Site B-HI, the designated beach placement site south of the inlet — serves a primary role for both Reaches I and II. As a necessary complement to beach placement, the waterfront sites within Reaches I and II provide a temporary storage/material staging capability, should direct beach placement prove impractical. Notably, the three waterfront sites within the site bank, each already owned or held under easement by the FIND, serve an essential role in both the primary and secondary management strategies. As stated above, in their primary role the waterfront sites provide barge offloading points as well as temporary storage of the offloaded material. Under the secondary management strategy, the waterfront sites are still needed to offload dredged material from barges before trucks transfer the material



TAYLOR ENGINEERING INC. 9000 CYPRESS GREEN DRIVE, SUITE 200 JACKSONVILLE, FLORIDA 32256	Figure 4.1 Site Bank Long Range Dredged Material Management Plan Intracoastal Waterway, Broward County, Florida	Project C2002-36B Revision Sheet Date Feb., 2003

Table 4.1 Preliminary Site Bank, Long-Range Dredged Material Management Plan, Intracoastal Waterway, Broward County

Reach	Site	Designated Use	ICWW Mileage	Initial Mapped Area (ac)	Containment/ Storage Area (ac)	Total Required Area (ac)	Storage Capacity (cy)	Maximum Pumping/ Barging Distance (mi)	Comp. Plan Designation	Comment
I	**B-HI Primary**	Beach Placement	314.20	N/A	N/A	N/A	N/A	5.74	N/A	Unspecified beach placement area south of Hillsborough Inlet, location and fill template to be determined in Phase II
	MSA FO 726, 726B, 726C Primary	Dewatering/Temporary Storage/Material Transfer (Single Operation)	313.37	14.18	4.27	12.75	29,465	4.90	Recreation and Open Space	Exchange Club Park, passive recreation (playground, picnic tables, walking trails)
	B-19 Secondary	Multi-Reach Inland Storage (Single Operation)	311.18	166.10	2.11	6.90	34,232	N/A	Industrial	Adjacent to Florida Turnpike, eastern 1/3 developed (Pavex Construction Co.), western 2/3 undeveloped
II	**B-HI Primary**	Beach Placement	314.20	N/A	N/A	N/A	N/A	7.47	N/A	Unspecified beach placement area south of Hillsborough Inlet, location and fill template to be determined in Phase II
	MSA FO 727B Primary	Barge Offloading Material Transfer	314.16	9.68	N/A	9.68	N/A	7.49	Recreation and Open Space	Alsdorf Park, bulkheaded waterfront, paved parking, boat ramps, Marine Patrol, County Sheriff's Marine Substation
	MSA FO 726, 726B, 726C Primary	Temporary Storage (Single Operation)	313.37	14.18	2.11	6.90	34,232	7.67	Recreation and Open Space	Exchange Club Park, passive recreation (playground, picnic tables, walking trails)
	B-19 Secondary	Multi-Reach Inland Storage (Single Operation)	311.18	166.10	2.11	6.90	34,232	N/A	Industrial	Adjacent to Florida Turnpike, eastern 1/3 developed (Pavex Construction Co.), western 2/3 undeveloped
III	**MSA-783/ Port Everglades Primary**	Barge Offloading Material Transfer	325.40	992.27	N/A	N/A	N/A	13.05	Transportation and Utilities	FIND held easement within deepwater multipurpose port facility north of the Dania Canal
	B-54 Secondary	Multi-Reach Inland Storage (Single Operation)	332.96	573.21	8.68	16.97	139,452	N/A	Regional Activity Center	Portion of site developing business park, powerline transmission corridor through site, wetland mitigation area

to the inland sites for temporary storage. As a result, the inland secondary sites only complement, but do not replace, the waterfront primary sites.

Appendix A presents detailed information for each primary and secondary site in the site bank. For each site, a data summary sheet outlines significant information on site location and reach parameters, as well as other site characteristics including acreage requirements, preliminary site capacity, and additional considerations such as access easement requirements and land use designations. In addition, Appendix A presents a map of each site showing the initial site boundaries (tied to geographic landmarks) and major on-site vegetation communities and land-use categories under the FLUCFCS (Florida Land Use, Cover and Forms Classification System, Florida Department of Transportation, 1985) as verified by field inspection. Tables within each map present approximate acreages of each vegetation and land-use category identified on site. In each case, the site map (and its acreages tabulated by vegetation and land-use category) corresponds to the initial site acreage listed in Table 4.1.

Table 4.1 also lists the total required area for each site. The total required area, in the case of the secondary inland storage sites only a small portion of the initial site area, represents a preliminary estimate of the acreage actually needed for each site to serve its designated role. As described earlier, one of the two primary sites designated for material transfer only (i.e., no on-site storage) — Site MSA FO-727B (Alsdorf Park) — requires only sufficient area for a truck pass-through and a minimal material stockpile surrounded by a 100-ft buffer on its three landward sides, but with no buffer on its water side. The second primary site designated for material transfer only — Site MSA 783/Port Everglades — requires only the easement's 0.57 upland acres to offload barges directly to trucks, consistent with Port operations. The one primary site appropriate for dewatering and short-term storage — Site MSA FO-726, 726B, 726C (Exchange Club Park) — requires sufficient area to construct a containment basin of adequate capacity plus a 150-ft buffer area surrounding the containment basin. In its alternative primary role of providing temporary storage of material first offloaded at Site MSA FO-727B (Alsdorf Park), Site MSA 726, 726B, 726C requires an area sufficient for the dry storage of the site's required capacity, separated from adjacent residential property by a 100-ft buffer. Similarly, the two secondary sites designated for inland storage — Site B-19 and Site B-54 — require an area sufficient for the dry storage of the site's required capacity, separated from adjacent industrial, commercial, or agricultural property by a 100-ft buffer. Finally, narratives accompanying each site summarize pertinent site characteristics including general physiographic and environmental conditions, vegetative communities, and observed plant species typical of these communities.

Appendix B presents similar information for the candidate sites not selected for the site bank. However, for this latter group of sites the listed site capacities and acreage requirements represent each site's maximum use without attempting to bring these values into line with specific reach requirements.

The remainder of this section discusses the key factors that led to the selection of the individual sites comprising the site bank, as well as the considerations that influenced the designation of the selected sites as either primary or secondary alternatives.

Within Reach I, beach placement at a yet unspecified beach placement site (designated B-HI) south of Hillsborough Inlet will provide the primary dredged material management strategy. Figure 4.2 preliminarily locates the beach placement site; however, during Phase II detailed evaluation of the sediment budget for Hillsborough Inlet, the state-approved inlet management plan, and the sand transfer operations of the Hillsborough Inlet District will determine the final location and typical fill template for the designated beach placement site. The objective of this evaluation will be to insure that the placed fill will provide the greatest benefit to area beaches while minimizing the likelihood of its return to the interior channels. A second primary site, MSA FO-726, 726B, 726C, will provide the required complementary temporary storage capability should, for whatever reason, beach placement of the dredged material prove unfeasible. Located at Reach I's southern end, this site — also known as Exchange Club Park — is presently leased by the Cities of Pompano Beach and Lighthouse Point for use as a passive-use park. Although lacking the deep-water access and improved waterfront required to mechanically offload dredged material from a barge directly to trucks, this site possesses sufficient area for the construction of a single-use containment basin and thus will support a hydraulic barge-offloading operation. The site's acreage requirement (12.75 ac) and capacity (29,465 cy) listed in Table 4.1 and the first of the site's two Data Summary Sheets (Appendix A) reflects the combined bulked storage volume required to support a single channel maintenance operation in Reaches I and II, based on a projected 20-year maintenance interval. Development of the site for dredged material management would likely encompass some minimal park infrastructure (picnic and play areas, trails), but would avoid the major park improvements, either existing (recreational facilities, parking areas) or planned (restrooms), in the site's northeast corner. Given the projected infrequency of required dredging, this site could return to its present role as a passive-use park between each use.

Four other sites identified within Reach I initially appeared capable of providing single use dewatering capacity or short-term upland storage. Of these, three — Site MSA 710 (aka DeGraff Park), Site B-1/MSA 702 (aka Deerfield Island Park), and Site B-5A — fronted the Waterway and thus might serve for barge offloading/material transfer as well as dewatering and short-term storage. However,

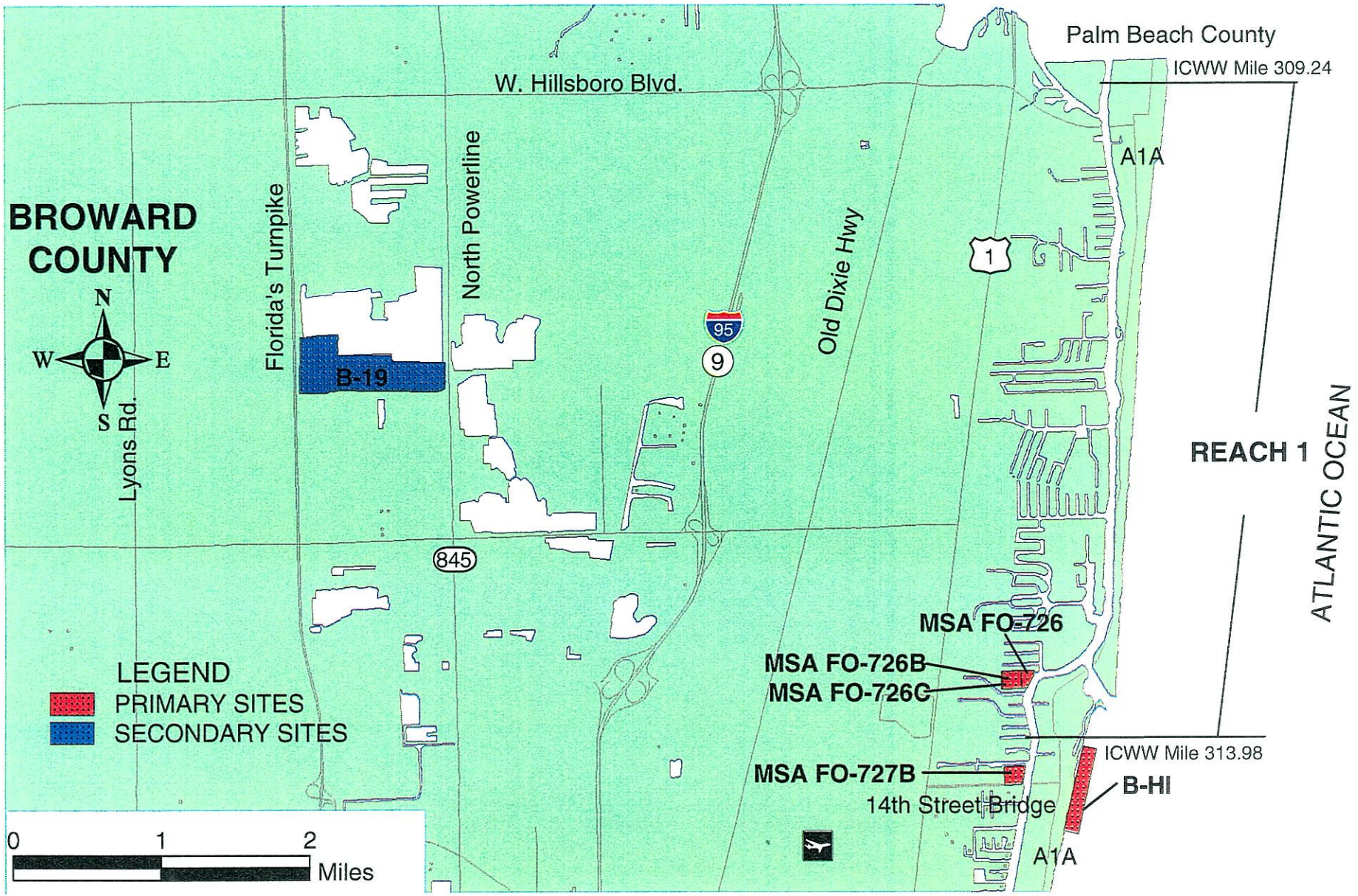


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Figure 4.2
Channel Reach 1
Long Range Dredged Material Management Plan
Intracoastal Waterway,
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inspection of these sites eliminated each from further consideration. First, as an island site, Site B-1/MSA 702 does not provide roadway access as required for subsequent transfer of the dewatered material to a western site. Second, Site MSA 710 possesses insufficient area for economical or efficient use. Initially identified as open land, the third site, Site B-5A, appeared slated for imminent development. Located adjacent to the Pompano Beach Airport, the fourth site, Site B-3, was found to possess insufficient dewatering capacity as well as a difficult route to access the site via pipeline.

Of the nine candidate sites evaluated with respect to providing inland storage, four — Site B-5, B-17, B-18, and B-19 — were designated for industrial development and thus appeared most compatible with the FIND's intended use. Of these, Site B-19, a large industrial site located west of Interstate 95, became the primary alternative to temporarily store material initially placed in the Exchange Club Park site. Moreover, its size and potential capacity allow this site to provide temporary storage for Reach II as well. Site B-19's listed capacity (34,232 cy; Table 4.1, Appendix A) reflects 120% of the combined bulked storage volume required to support a single channel maintenance operation in Reaches I and II based on a projected 20-year maintenance interval. The site's acreage requirement (6.9 ac) reflects the dry storage area (maximum height – 15 ft above grade) surrounded by a 100 ft buffer. The storage area will include an integral interior stormwater retention basin as necessary to meet likely permitting requirements. Figure 4.2 shows the location of this site as well as its relation to Exchange Club Park.

For Reach II, beach placement will also provide the primary management strategy, and the beach placement site selected for Reach I (Site B-HI, see above) will also serve Reach II (Figure 4.3). A second FIND-owned site located at the reach's northern end, MSA FO-727B (aka Alsdorf Park), will serve a primary complementary role to Site B-HI should beach placement prove temporarily infeasible. However, as a small, fully-developed and largely bulkheaded park, this site will serve only as a barge offloading or material transfer point in support of a mechanical (clamshell) dredging operation. Given the reach's very low projected dredging requirement in terms of both volume and frequency, such a role should minimally impact the park's continued public use.

Site MSA FO-726, 726B, 726C (Exchange Club Park) will serve as the primary option to provide temporary storage for the material initially offloaded at Site MSA FO-727B. By only providing dry storage, the portion of Exchange Club Park needed for dredged material management is reduced from the 12.75 ac needed to construct a containment basin to only 6.9 ac as described above for Site B-19. The capacity listed in Table 4.1 and in the second of the site's two Data Summary Sheets (34,232 cy) represents 120% of the combined bulked storage volume required to support a single channel maintenance operation in Reaches I and II based on a projected 20-year maintenance interval. Site B-19

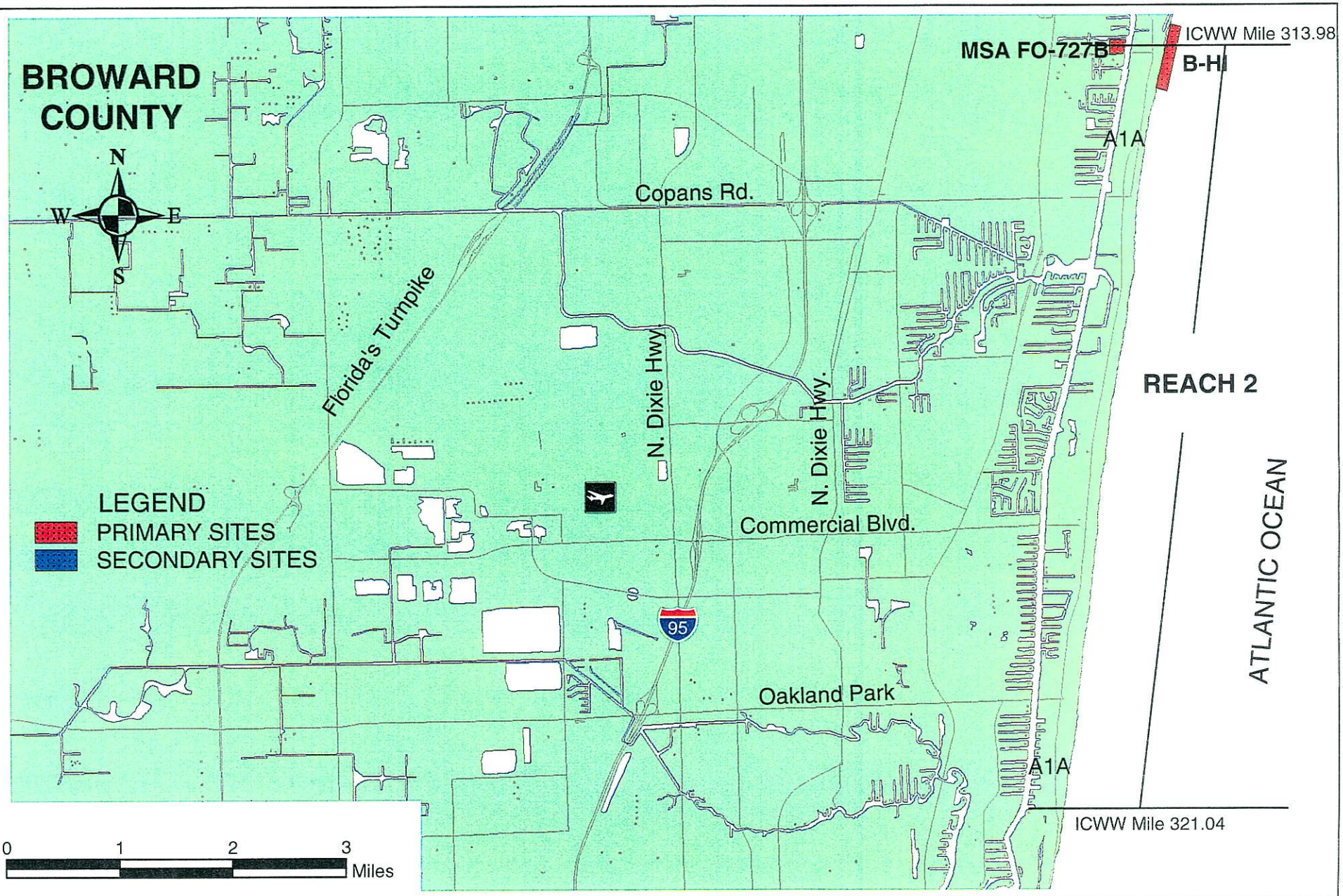

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Figure 4.3
Channel Reach 2
Long Range Dredged Material Management Plan
Intracoastal Waterway,
Broward County, Florida

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will also serve as the secondary option to provide storage for material moving through Site MSA FO-727B. With only 6.4 ac of useable upland, a second FIND-owned waterfront site, MSA FO-727C, possesses insufficient storage capacity to serve both Reaches I and II. Moreover, unlike Site MSA FO-727B, its use as a barge transfer site would require significant shoreline improvements.

The primary management strategy selected for Reach III will use an existing perpetual easement, MSA 783, located within the intermodal facilities of Port Everglades (Figure 4.4), to mechanically offload dredged material from barges and transfer the material directly to trucks. Under this scenario, dredged material will be treated like any other bulk cargo handled by the Port. As noted in Section 2.2, MSA 783, a 2.27-ac perpetual easement, lies about 2,300 ft north of the Dania Canal. Partly open water, the easement also encompasses about 0.57 ac of the bulkheaded shoreline of a container-handling facility including a portion of the paved track that accommodates three large, rubber-tired, container handling cranes. Notably, FIND's use of this existing easement to offload barges may temporarily constrain normal container handling operations in its immediate vicinity. The Port may find it advantageous to work with the FIND to relocate its offloading operations to areas of the Port better equipped to handle bulk cargo.

The use of Port property was first evaluated with respect to Site B-55, an undeveloped Port Everglades out parcel fronting the Dania Canal's northern shoreline. Possessing sufficient area to provide for the storage requirements of the entire Broward County project area, this site was first considered for the construction of a conventional containment basin to dewater and store material hydraulically offloaded from barges. However, given the Port's plans to develop this property, the reach's minimal projected dredging and material storage requirement could not justify the cost of contesting the Port's development plans or negotiating a long-term agreement with the Port for joint use of a common dredged material management facility. Similar considerations, plus a more difficult barge access, ruled out the use of Site B-29, a second candidate site on the Dania Canal that possess sufficient area for the construction of a conventional containment basin.

Site B-54 will serve as the secondary storage option within Reach III should temporary storage of dredged material at the Port prove impractical and immediate transfer of the material for beneficial reuse prove unfeasible. Located over 11 miles west of the ICWW and immediately north of the Broward/Miami-Dade County line, the site lies just east of Flamingo Road (S.R. 823) and both north and south of the Miramar Parkway. A major electrical transmission corridor that extends northeast southwest through both the site's northern and southern portions further bisects the site. The site's southern portion includes a partially developed business/industrial park, and a large wetland mitigation area, while the northern portion comprises a mix of improved pasture, areas of cultivated row crops (field corn and sugar

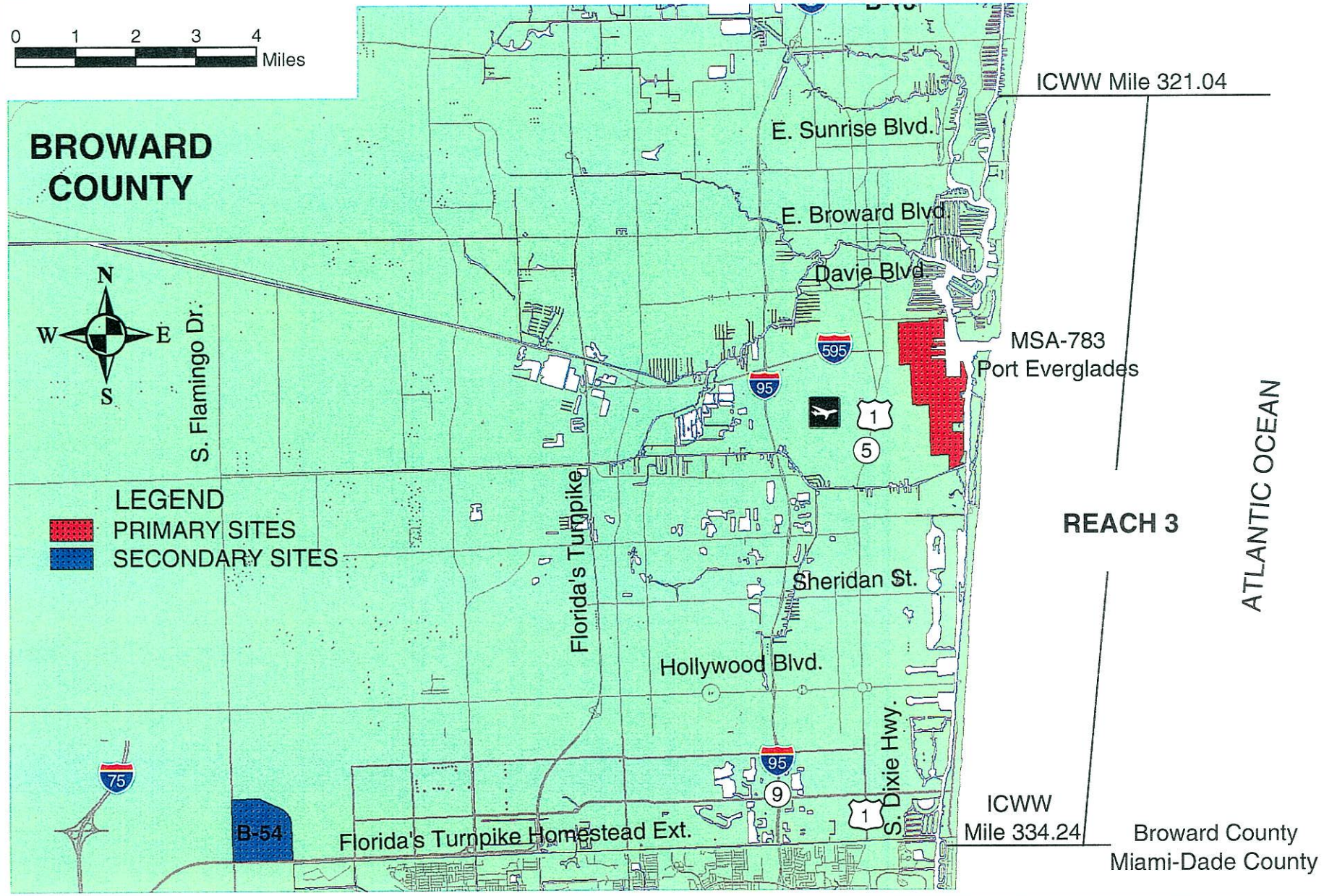

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Figure 4.4
Channel Reach 3
Long Range Dredged Material Management Plan
Intracoastal Waterway,
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cane) and fallow cropland, and otherwise disturbed areas. As such, the northern portion of the site appears more appropriate for material storage.

Given Reach III's minimal projected 50-year storage requirement, the FIND would likely acquire Site B-54 to provide temporary dredged material storage not only Broward Reach III, but also for the northern portion of Miami-Dade County. A separate report that presents the long-ranged dredged material plan for the Intracoastal Waterway in Miami-Dade County (Taylor et al., 2003) identifies Site B-54 as the secondary storage option for that county's northern four reaches. The site's capacity listed in Table 4.1 (139,452 cy) reflects 120% of the combined storage requirement for a single maintenance operation in all five reaches. The corresponding acreage requirement (16.97 ac) for Site B-54 represents a site plan similar to that previously described for Site B-19 (i.e., 15 ft maximum stockpile height, 100 ft buffer, integral stormwater basin). Figure 4.4 shows the location of the primary and secondary options for Reach III with respect to the reach's limits.

Table 4.1 summarizes preliminary acreage requirements, storage capacities, and operational factors for each site in the site bank. The more detailed site evaluation and documentation that comprises the project's second phase will determine the final values of these parameters. However, the preliminary estimates presented here appear both realistic and conservative. In each case, material management capabilities of both the primary sites and secondary options are sufficient to meet the project requirements consistent with the established Management Concept for Broward County.

The primary site acreage required to serve the 25.0 miles of Waterway channel within the Broward County project area totals approximately 29.1 acres, not including the yet undefined beach placement site. Of this total, approximately 22.4 acres represents property presently controlled by the FIND. Implementation of the primary dredged material management strategy will not require the FIND to acquire any additional property not presently under its control. Should temporary storage of dredged material at the small waterfront sites prove unworkable, securing the secondary inland storage sites would require the FIND to acquire an additional 23.9 acres.

5.0 RECOMMENDED SCOPE OF WORK: PHASE II — Broward and Miami-Dade Counties

Task I: Revise, Finalize Phase I Documents

Revise the original Phase I site banks for both Broward and Miami-Dade County project areas to include primary (first-choice) and secondary (second-choice) site recommendations, based on revised multi-reach inland storage site selection and evaluation criteria. These revisions reflect the significantly reduced required acreage and storage capacity of the multi-reach inland storage sites based on a single maintenance operation requirement. Following the completion of the site bank reevaluation, Taylor Engineering will:

A. Present the revised site banks for Broward and Miami-Dade Counties to the projects' Advisory Committees and the interested public.
B. Prepare revised Final Draft Reports for Broward and Miami-Dade Counties to incorporate the revised site banks, as well as the methods and results from all the previous tasks.
C. Prepare and distribute revised Final Reports following the receipt and incorporation of comments from FIND.
D. Make all corresponding revisions to the project Plan Book.

Task II: Preparatory Documentation

The purpose of this task is to obtain all of the information and authorizations necessary to facilitate the detailed documentation of site conditions and facilities design in Task III and to document public record information concerning land use and zoning restrictions, taxes and assessed values, easements, and property ownership. This will be done for all primary and secondary sites subject to property acquisition proceedings. Specific subtasks are outlined below.

A. Public Information — From county tax rolls and related public records verify and update, as necessary, site ownership and tax information including parcel size, boundaries, and assessed value. This information will be provided to the FIND at the earliest possible date to facilitate the FIND obtaining from all relevant property owners appropriate written permission as required for site access, survey work, field testing, and data collection.
B. Zoning — Verify and update, as necessary, existing zoning classification and permitted uses under that classification.

C. Other Site Encumbrances — Identify other restrictions, which may limit the use of the site such as local or regional planning constraints, rights-of-way, easements, adjacent property constraints, or potential damages to adjacent properties.

D. Site Reconfiguration — Modify site boundaries, as necessary. Eliminate unusable or unnecessary acreage and finalize site configuration for performance of boundary survey.

Task III: Site Conditions

Obtain necessary engineering and environmental site information required for preliminary engineering design and permitting of *primary sites only* as modified by results of Task II. Task A, B, C, and D below are not applicable to the beach placement area designated to serve Reach I and II of Broward County and Reach II of Miami-Dade County.

A. Boundary Survey — Provide boundary survey of each primary site. Provide boundary surveys for additional pipeline and road access easements as required. Document results of each survey in sufficient detail to support legal and engineering actions required for acquisition of the site, as well as acquisition of additional easements under consideration by the FIND, and for site development for the purposes of dredged material management. Provide final boundary survey drawings, written legal descriptions, and other supporting documents to the FIND for each site. Reference boundary information for each site and any additional easements to the Florida State Plane Coordinate System.

B. Engineering Topographic Survey — Provide site topographic information necessary for site planning, permitting, and design purposes. Reference horizontal and vertical control of data to established bench marks and reference all elevations to NGVD.

C. Subsurface and Soils Survey — This task will be performed by the Jacksonville District, U.S. Army Corps of Engineers.

1. Soils Survey — By means of core borings and analysis, document site soil characteristics including boring logs, grain size distributions, specific gravity, organic content, Atterberg limits (where appropriate), shear strength, compaction, and consolidation.
2. Groundwater — Obtain groundwater table elevations at a sufficient number of locations to provide estimates of on-site water table, potential surface elevations referenced to NGVD.

D. Environmental Survey — Perform field survey and data collection efforts to provide the following:

1. Detailed documentation of site vegetation communities, including species frequencies of occurrence, and the delineation of wetlands and transitional areas using state approved methods.
2. Detailed documentation of on-site animal species, including endangered or threatened species, and pertinent habitat information.
3. Documentation of existing vegetation communities and species habitats along proposed pipeline access and return drainage routes.
4. Documentation for a Phase I Site Environmental Assessment for concerns related to hazardous waste.

E. Beach Placement Area (Reach I & II Broward County and Reach II Miami-Dade County) — Obtain necessary engineering and environmental site information required for preliminary engineering design and permitting. No boundary survey will be provided for the project area. Work elements within this task will include the following:

1. Analyze existing beach profile data obtained Jacksonville District, U.S. Army Corps of Engineers and Florida DNR, Division of Beaches and Shores to evaluate historic beach profile geometry and background erosion rates.
2. Define beach placement project area.
3. Perform preliminary material compatibility analysis using newly acquired samples of native beach material and existing data on historic shoal material in Reach I & II Broward County and Reach II Miami-Dade County Waterway channels.
4. Locate and characterize all existing public access points, bulkheads, revetments, and stormwater outfalls within the project area.
5. Perform field survey and data collection to provide documentation of environmental condition (species present, frequency of occurrence, pertinent habitat information, endangered or threatened species) within the project area, adjacent nearshore regions, and along proposed pipeline routes.
6. Review existing information to determine possible impact of project on sea turtle nesting.

Task IV: Preliminary Design and Analysis

With data obtained from Task III, develop site documentation and complete preliminary design necessary to prepare permit drawings. Task IV-A and IV-B below are not applicable to the beach placement area designated to serve Reach I & II Broward County and Reach II Miami-Dade County. Specific requirements of this site are addressed in sub-task IV-C.

A. Environmental — With information obtained from Task III-D, prepare the following:

1. Detailed site maps showing vegetation communities, species locations and habitats, revised usable boundaries, and wetland areas.
2. Detailed written text supporting (1) above.
3. Specific mitigation measures as required.
4. Archeological site locations as recorded in published records available from the Division of Historical Resources, Florida Department of State.
5. Recommended pipeline access and return water routes, as required.
6. Phase I Site Environmental Assessment Report.

B. Engineering — With information obtained in Task III and subject to the specific requirements of each site's intended use, prepare the following:

1. Site Capacity Analysis — Recalculate estimated site capacity and earthwork requirements, as necessary.
2. Site Topographic Map.
3. Engineering Report on Subsurface and Soils Conditions — Prepared by Jacksonville District, U. S. Army Corps of Engineers.
4. Preliminary design calculations and permit drawings of:
   a. Location/Reach Map Site Plan
   b. Pipeline Access and Return Routes, as required
   c. Outlet Works, as required
   d. Dike Section, as required
   e. Internal Structures
   f. Equipment Ingress and Egress Features
   g. Vegetation and Buffer Area Plan

h. Site Drainage Plans

i. Detailed written text supporting (1) — (4) above.

C. Beach Placement Area (Reach I & II Broward County and Reach II Miami-Dade County)

1. Environmental — With information obtained in sub-task III-D, prepare the following:
   a. Evaluation of environmental conditions within beach placement project area, adjacent nearshore areas, and along proposed pipeline routes.
   b. Evaluation of project impacts on beach and nearshore habitats, with special emphasis on sea turtle nesting.
   c. Detailed maps of project area, adjacent nearshore regions, and proposed pipeline routes showing species and habitat location, vegetation communities, rock outcroppings, documented turtle nesting sties and other pertinent habitat information.
   d. Detailed written text in support of (a) — (c) above.
2. Engineering — With information obtained in sub-task III-E, prepare the following:
   a. Preliminary design calculations and permit drawings of:
      - Location Map
      - Site Plan
      - Typical Sections
      - Pipeline Access Routes
      - Locations of Public Access, Bulkheads, Revetments, and Outfalls
   b. Compatibility analysis of fill with native beach material.
   c. Projected performance of beach fill.
   d. Detailed written support of (a) — (c) above.

D. Agency Coordination — Obtain from pertinent state and federal agencies a preliminary statement on the acceptability of the proposed site plans based on the site engineering narrative, permit drawings, environmental report, and preliminary delineation of agency jurisdiction.

Task V: Site Management Plans

Prepare a site management plan for each primary site in the Site Bank as modified by Task II. Tasks A, B, and C below are not applicable to the beach placement area designed to serve Reach I & II Broward County and Reach II Miami-Dade County. Each plan will address the following:

A. Design Features — Brief description of all site design features as they relate to the long-term operation of the site and the management of dredged material.

1. During-Dredging Procedures
2. Outlet Operations, if required
3. Inlet Operations, if required
4. Ponding Depth, if appropriate
5. Barge Operations, as required
6. Material Distribution
7. Monitoring

B. Post-Dredging Procedures

1. Material Dewatering and/or Stockpiling
2. Surface Water Management
3. Material Handling/Transfer/Reuse
4. Monitoring

C. Beach Placement Area (Reach I & II Broward County and Reach II Miami-Dade County) — The site management plan for the beach placement area will address the long-range implication of the site — and the continuing modifications in project design and operational criteria in response to project performance.

Task VI: Cost Considerations

For all primary sites, evaluate the following cost considerations:

A. Site Improvement Costs
B. Site Operation Costs
C. Site Maintenance Costs

Task VII: Documents and Deliverables

Prepare and submit the following project documents for each primary site:

A. Site boundary survey with legal description, with additional boundary surveys of pipeline and road access easements as required.

B. Site topographic survey, with additional topographic surveys of pipeline and road access easements as required.

C. Permit drawings and accompanying engineering narrative.

D. Subsurface and soils report prepared by Jacksonville District, U. S. Army Corps of Engineers (not applicable to beach placement area, Reach I & II Broward County and Reach II Miami-Dade County).

E. Environmental Report.

F. Phase I Site Environmental Assessment Report.

G. Site Management Plan.

H. Cost Report.

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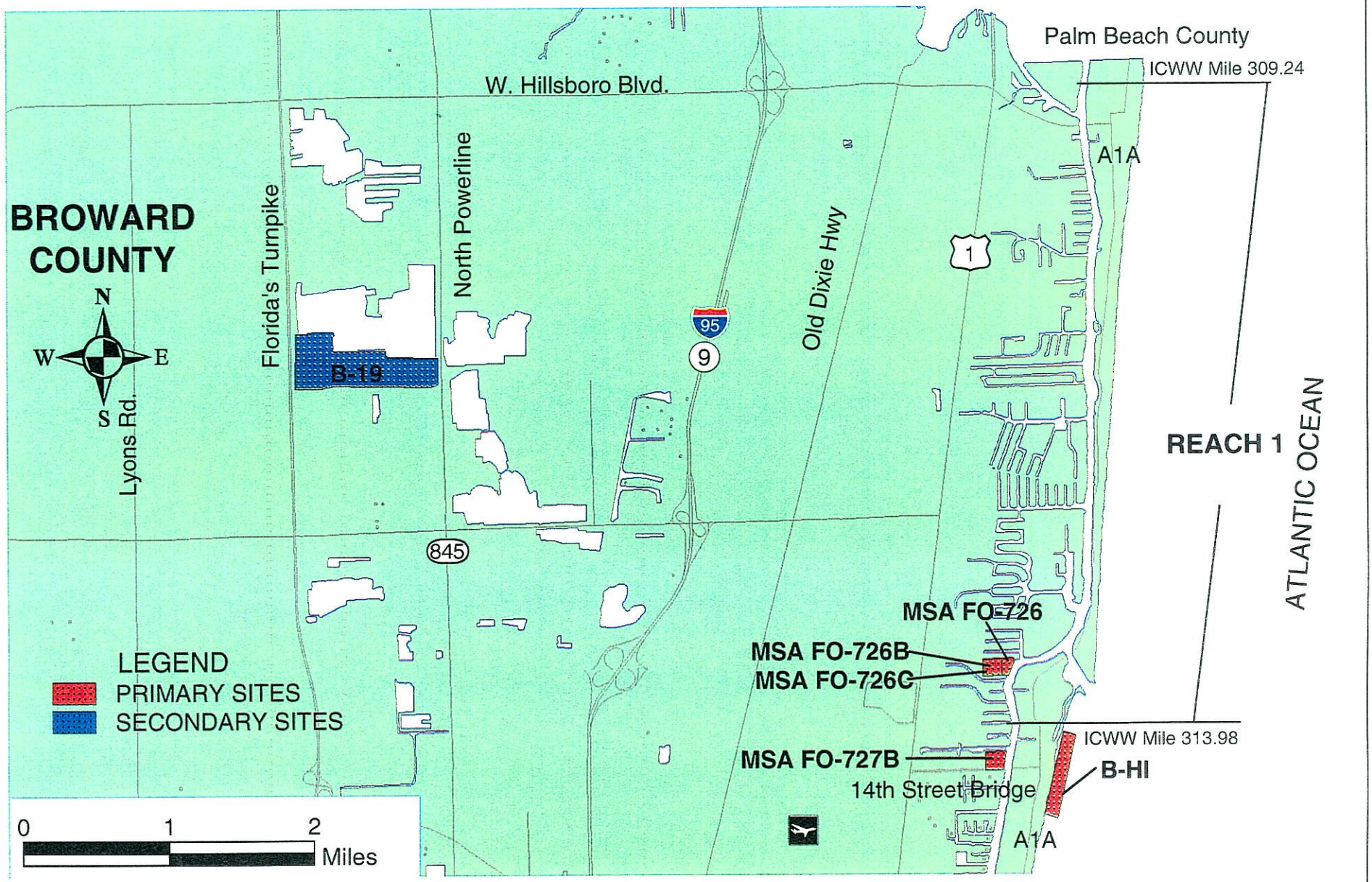
APPENDIX A

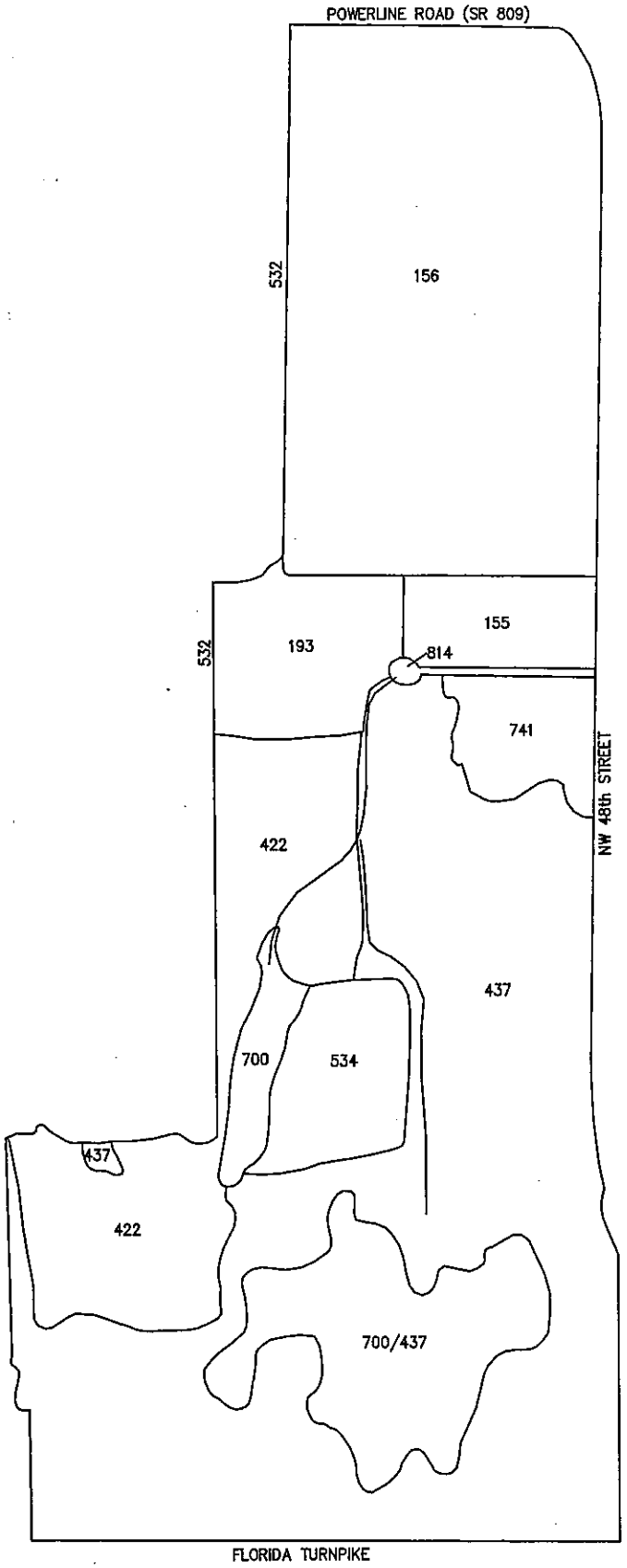
Site Bank (Primary and Secondary Sites)



TAYLOR ENGINEERING INC.
9000 CYPRESS GREEN DRIVE, SUITE 200
JACKSONVILLE, FLORIDA 32256

Figure A-1
Channel Reach 1
Long Range Dredged Material Management Plan
Intracoastal Waterway,
Broward County, Florida

Project	C2002-36B
Revision	
Sheet	
Date	Dec., 2002



	LEGEND B–19	ACRES
155	OTHER LIGHT INDUSTRIAL	4.75
156	OTHER HEAVY INDUSTRIAL	45.59
193	URBAN LAND IN TRANSITION	7.58
422	BRAZILIAN PEPPER	19.59
437	AUSTRALIAN PINE	61.90
534	RESERVOIRS LESS THAN 10 ACRES	6.12
700	BARREN LAND	2.54
700/437	BARREN LAND/AUSTRALIAN PINE	12.98
741	RURAL LAND IN TRANSITION	4.50
814	ROADS AND HIGHWAYS	.55
	TOTAL ACRES	166.10

OTHER COVER TYPES SHOWN

532 RESERVOIRS LARGER THAN 100 ACRES, BUT LESS THAN 500 ACRES

835 SOLID WASTE DISPOSAL

——— ROADS

N

GRAPHIC SCALE

0 150 300 600

SCALE IN FEET

LAND USE AND VEGETATION OF CANDIDATE SITE B–19, BROWARD COUNTY, FLORIDA

TAYLOR ENGINEERING INC.
9000 CYPRESS GREEN DRIVE, SUITE 200
JACKSONVILLE, FLORIDA 32256

Figure A–2
Land Use and Vegetation
of Candidate Site B–19
Broward County, Florida

PROJECT C9920
REVISION
SHEET
DATE Sept., 2000

SITE DATA SUMMARY SHEET

Name: B-19

AKA:

Site Use: Multi-Reach Inland Storage

Comment: Developed parcels (Pavex Construction Company) in the eastern one-third and undeveloped lands in western

LOCATION

County:	Broward	**ICWW Reach Mileage:**	311.18
Municipality:	Unincorporated	**East/West of**	West
Section/Township/Range:	9/48/42	**Receiving Waterbody:**	N/A
		FDEP	N/A

REACH

Reach Designation:	BW-1			**Projected Dredging Frequency (yr):**	10
Reach Length (mi):	4.74			**50-yr Dredging Requirement (cy):**	27,020
ICWW Mileage:	309.24	**to**	313.98	**50-yr Storage Requirement (cy):**	58,092
Cut/Station:	BW-1/0+00	**to**	BW-22/0+00		
Geographic: (FDEP Classification)	650 ft south of Palm Beach/Broward County (III) to 1,600 ft north of 14th St. Bridge (S.R. 844) (III)				

SITE PARAMETERS

Mapped Area (ac):	166.1	**Storage Capacity (cy):**	34,232
Containment Area (ac):	N/A	**Dike Height (ft):**	N/A
Impacted Area (ac):	2.68	**Excavation Depth (ft):**	N/A
Buffer Area (ac):	4.22	**Existing Mean Site Elevation (ft):**	10.0
N Buffer Width (ft):	100	**Dike Volume (cy):**	N/A
S Buffer Width (ft):	100	**Max. Pumping Distance (mi):**	N/A
E Buffer Width (ft):	100	**Max. Barging Distance (mi):**	N/A
W Buffer Width (ft):	100	**Min. Distance from Waterway (mi):**	4.97
Total Site Area (ac):	6.90		

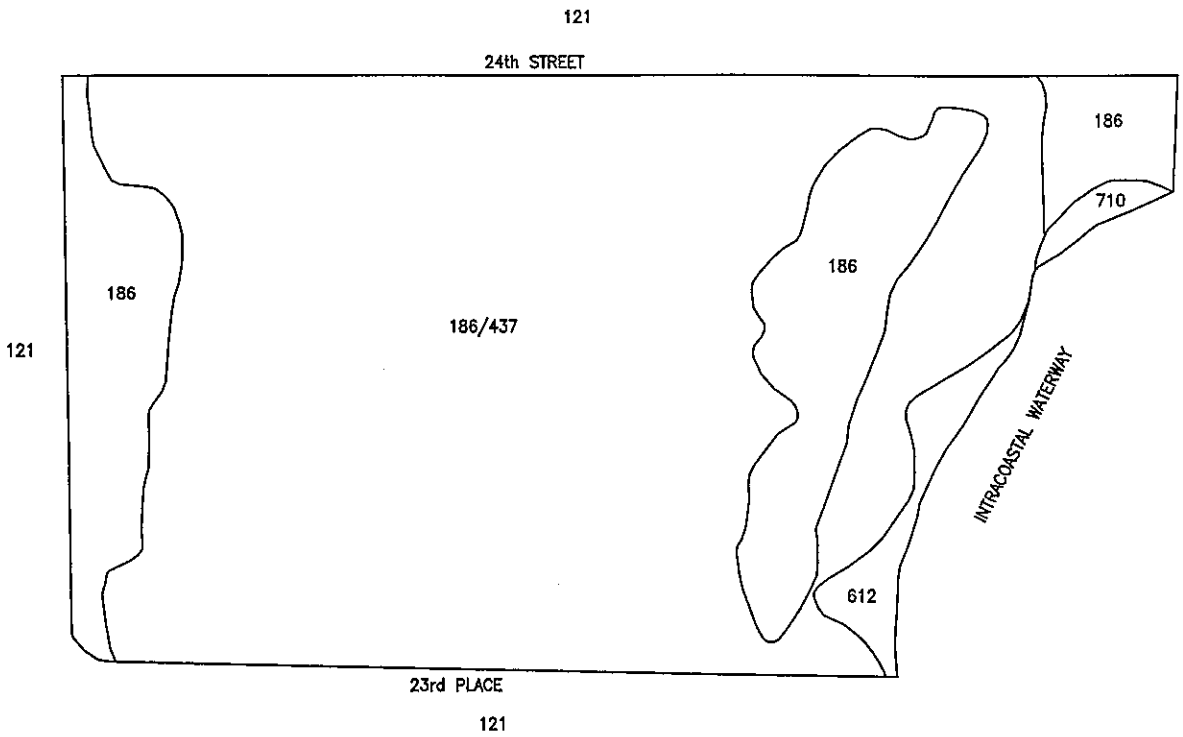
SITE

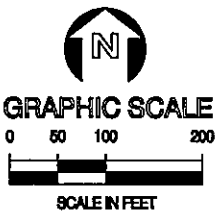
Public Access:	Powerline Rd, NW 48th St, FL Turnpike	**Comprehensive Plan Designation:**	I
		Adjacent Land Use:	Reservoir (N); Powerline Rd (E); Landfill (S); Florida Turnpike (W)
Road Easement (ft):	350		
Pipeline Easement (ft):	N/A	**Land Use of Impacted Area:**	Brazilian Pepper, Australian Pine, Rural land in transition, Barren Land
Deep Draft Access:	N/A		
		Wetlands W/I Mapped Area (ac):	0.00
		Wetlands Impacted (ac):	0.00

Site Narrative:

Site B-19, a 166-acre region adjoining Site B-18 to the north, is comprised of developed parcels on its eastern third and undeveloped parcels on the western two-thirds. The developed portion of the site consists of a construction firm (Pavex Company) classified as heavy industrial land (156) and light industrial use (155). The site's undeveloped portion contains a small water-filled borrow pit classified as a reservoir (534) and various vegetation communities that are typical of disturbed lands. The area, including the borrow pits, may be the remnants of limerock extraction operations that occurred in this area. To the north, the site lies adjacent to a larger reservoir, also a likely consequence of the limerock mining. The area, partially vegetated following the disturbance, contains communities of Brazilian pepper (422) and Australian pine (437). One small area of the site is mostly barren due to recent clearing on the parcel (741). Some areas, only partially vegetated from previous disturbance, are mapped as a combination of vegetated and barren (700/437). All dirt roads entering the site were blocked off. An area classified as urban land in transition (193) adjacent to the existing development, had been recently cleared but its intended use was not evident.

Adjacent land uses include a reservoir to the north, Powerline Road to the east, a landfill to the south, and the Florida Turnpike to the west.





LEGEND MSA FO 726, 726B, 726C

		ACRES
186	COMMUNITY RECREATIONAL FACILITIES	2.76
186/437	COMMUNITY RECREATIONAL FACILITIES/ AUSTRALIAN PINE	10.98
612	MANGROVE SWAMPS	.34
710	BEACHES OTHER THAN SWIMMING	.10
	TOTAL ACRES	14.18

OTHER COVER TYPES SHOWN

121	FIXED SINGLE FAMILY UNITS

LAND USE AND VEGETATION OF CANDIDATE SITE MSA FO 726, 726B, 726C, BROWARD COUNTY, FLORIDA

TAYLOR ENGINEERING INC.
9000 CYPRESS GREEN DRIVE, SUITE 200
JACKSONVILLE, FLORIDA 32256

Figure A-3
Land Use and Vegetation
of Candidate Site
MSA FO 726, 726B, 726C
Broward County, Florida

PROJECT C9920
REVISION
SHEET
DATE Oct., 2000

SITE DATA SUMMARY SHEET

Name: MSA FO 726, 726B, 726C

AKA: Exchange Club Park

Site Use: Dewatering & Short-Term Storage (Reach I and II)

Comment: Recreational Use -- Playground, Picnic Tables, and Trails

LOCATION

County:	Broward	**ICWW Reach Mileage:**	313.37
Municipality:	Pompano Beach	**East/West of**	West
Section/Township/Range:	30/48/43	**Receiving Waterbody:**	ICWW
		FDEP	(III)

REACH

Reach Designation:	BW-1			**Projected Dredging Frequency (yr):**	10
Reach Length (mi):	4.74			**50-yr Dredging Requirement (cy):**	27,020
ICWW Mileage:	309.24	**to**	313.98	**50-yr Storage Requirement (cy):**	58,092
Cut/Station:	BW-1/0+00	**to**	BW-22/0+00		
Geographic: (FDEP Classification)	650 ft south of Palm Beach/Broward County (III) to 1,600 ft north of 14th St. Bridge (S.R. 844) (III)				

SITE PARAMETERS

Mapped Area (ac):	14.18	**Storage Capacity (cy):**	29,465
Containment Area (ac):	4.27	**Dike Height (ft):**	7.5
Impacted Area (ac):	6.61	**Excavation Depth (ft):**	5.25
Buffer Area (ac):	6.14	**Existing Mean Site Elevation (ft):**	5.0
N Buffer Width (ft):	150	**Dike Volume (cy):**	16,221
S Buffer Width (ft):	150	**Max. Pumping Distance (mi):**	4.9
E Buffer Width (ft):	150	**Max. Barging Distance (mi):**	N/A
W Buffer Width (ft):	150	**Min. Distance from Waterway (mi):**	N/A
Total Site Area (ac):	12.75		

SITE

Public Access:	24th St., 23rd Place	**Comprehensive Plan Designation:**	R&O
		Adjacent Land Use:	
Road Easement (ft):	Not Required	Fixed single-family residences (N, S, W); ICWW (E)	
Pipeline Easement (ft):	Not Required	**Land Use of Impacted Area:**	
Deep Draft Access:	N/A	Community Recreation Facilities, Australian Pine	
		Wetlands W/I Mapped Area (ac):	0.34
		Wetlands Impacted (ac):	0.00

Site Narrative:

Site MSA FO 726, 726B, 726C a 14-acre park located adjacent to the ICWW, is better known as Exchange Club Park. A dense canopy of Australian pine (437) vegetates most of the property. The forest groundcover includes sword fern (*Nephrolepsis* sp.), wild coffee (*Psychotria nervosa*), and oyster plant (*Rhoeo discolor*). The open grassed areas of the park, mapped as community recreation (186), provide playground and picnicking areas. A restroom facility lies near the parking lot at the north end of the park. A trail network weaves throughout the areas vegetated by Australian pine (*Casuarina equisetifolia*). A large, vegetated dredge material mound with trails crossing it occupies the center of the park. Along the ICWW, the shoreline drops off steeply to the water and contains scattered mangrove, seagrape (*Coccoloba uvifera*), and other trees. The northeastern part of the park contains a grassed area adjacent to a sandy shoreline. A fence around this part of the park prohibits public entry to an area used to store dredging pipe.

Adjacent land uses include fixed single-family residential to the north, south, and west. The ICWW borders the site on the east.

SITE DATA SUMMARY SHEET

Name: MSA FO 726, 726B, 726C

AKA: Exchange Club Park

Site Use: Multi-Reach Storage (Reach I and II)

Comment: Recreational Use -- Playground, Picnic Tables, and Trails

LOCATION

County:	Broward	**ICWW Reach Mileage:**	313.37
Municipality:	Pompano Beach	**East/West of**	West
Section/Township/Range:	30/48/43	**Receiving Waterbody:**	ICWW
		FDEP	(III)

REACH

Reach Designation:	BW-2	**Projected Dredging Frequency (yr):**	20
Reach Length (mi):	7.06	**50-yr Dredging Requirement (cy):**	5,703
ICWW Mileage:	313.98 to 321.04	**50-yr Storage Requirement (cy):**	12,262
Cut/Station:	BW-22/0+00 to BW-32/0+00		
Geographic: (FDEP Classification)	1,600 ft north of 14th St. Bridge (S.R. 844) to 5,100 ft south of Oakland Park Blvd. Bridge	(III) to (III)	

SITE PARAMETERS

Mapped Area (ac):	14.18	**Storage Capacity (cy):**	34,232
Containment Area (ac):	N/A	**Dike Height (ft):**	N/A
Impacted Area (ac):	2.68	**Excavation Depth (ft):**	N/A
Buffer Area (ac):	4.22	**Existing Mean Site Elevation (ft):**	10.0
N Buffer Width (ft):	100	**Dike Volume (cy):**	N/A
S Buffer Width (ft):	100	**Max. Pumping Distance (mi):**	N/A
E Buffer Width (ft):	100	**Max. Barging Distance (mi):**	7.67
W Buffer Width (ft):	100	**Min. Distance from Waterway (mi):**	N/A
Total Site Area (ac):	6.90		

SITE

Public Access:	24th St., 23rd Place	**Comprehensive Plan Designation:**	R&O
		Adjacent Land Use:	
Road Easement (ft):	Not Required	Fixed single-family residences (N, S, W); ICWW (E)	
Pipeline Easement (ft):	Not Required		
		Land Use of Impacted Area:	
Deep Draft Access:	N/A	Community Recreation Facilities, Australian Pine	
		Wetlands W/I Mapped Area (ac):	0.34
		Wetlands Impacted (ac):	0.00

Site Narrative:

Site MSA FO 726, 726B, 726C a 14-acre park located adjacent to the ICWW, is better known as Exchange Club Park. A dense canopy of Australian pine (437) vegetates most of the property. The forest groundcover includes sword fern (*Nephrolepsis* sp.), wild coffee (*Psychotria nervosa*), and oyster plant (*Rhoeo discolor*). The open grassed areas of the park, mapped as community recreation (186), provide playground and picnicking areas. A restroom facility lies near the parking lot at the north end of the park. A trail network weaves throughout the areas vegetated by Australian pine (*Casuarina equisetifolia*). A large, vegetated dredge material mound with trails crossing it occupies the center of the park. Along the ICWW, the shoreline drops off steeply to the water and contains scattered mangrove, seagrape (*Coccoloba uvifera*), and other trees. The northeastern part of the park contains a grassed area adjacent to a sandy shoreline. A fence around this part of the park prohibits public entry to an area used to store dredging pipe.

Adjacent land uses include fixed single-family residential to the north, south, and west. The ICWW borders the site on the east.

SITE DATA SUMMARY SHEET

Name: B-HI

AKA:

Site Use: Beach Placement

Comment: Specific location not yet determined

LOCATION

County:	Broward	**ICWW Reach Mileage:**	314.20
Municipality:	Pompano Beach	**East/West of**	East
Section/Township/Range:	29,31/48/43 & 5/49/43	**Receiving Waterbody:**	N/A
		FDEP	N/A

REACH

Reach Designation:	BW-1			**Projected Dredging Frequency (yr):**	10
Reach Length (mi):	4.74			**50-yr Dredging Requirement (cy):**	27,020
ICWW Mileage:	309.24	**to**	313.98	**50-yr Storage Requirement (cy):**	58,092
Cut/Station:	BW-1/0+00	**to**	BW-22/0+00		
Geographic: (FDEP Classification)	650 ft south of Palm Beach/Broward County (III) to 1,600 ft north of 14th St. Bridge (S.R. 844) (III)				

SITE PARAMETERS

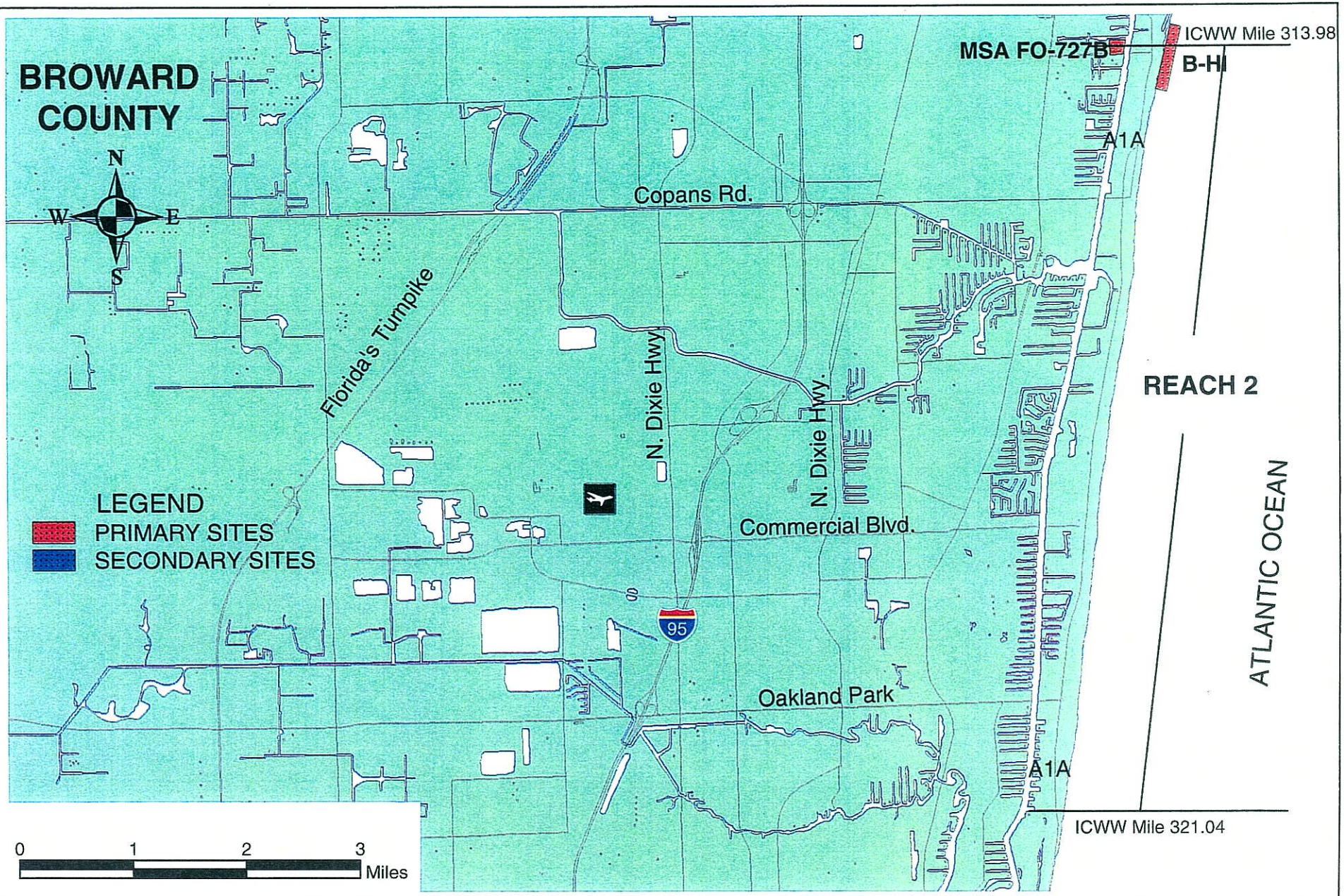
Mapped Area (ac):	0	**Storage Capacity (cy):**	N/A
Containment Area (ac):	N/A	**Dike Height (ft):**	N/A
Impacted Area (ac):	N/A	**Excavation Depth (ft):**	N/A
Buffer Area (ac):	N/A	**Existing Mean Site Elevation (ft):**	N/A
N Buffer Width (ft):	N/A	**Dike Volume (cy):**	N/A
S Buffer Width (ft):	N/A	**Max. Pumping Distance (mi):**	7.47
E Buffer Width (ft):	N/A	**Max. Barging Distance (mi):**	N/A
W Buffer Width (ft):	N/A	**Min. Distance from Waterway (mi):**	N/A
Total Site Area (ac):	N/A		

SITE

Public Access:	SR A1A	**Comprehensive Plan Designation:**	N/A
		Adjacent Land Use:	
Road Easement (ft):	N/A	Single and multi-family residential area (W)	
Pipeline Easement (ft):	N/A	**Land Use of Impacted Area:**	
Deep Draft Access:	N/A	Recreational beach	
		Wetlands W/I Mapped Area (ac):	0.00
		Wetlands Impacted (ac):	0.00

Site Narrative:

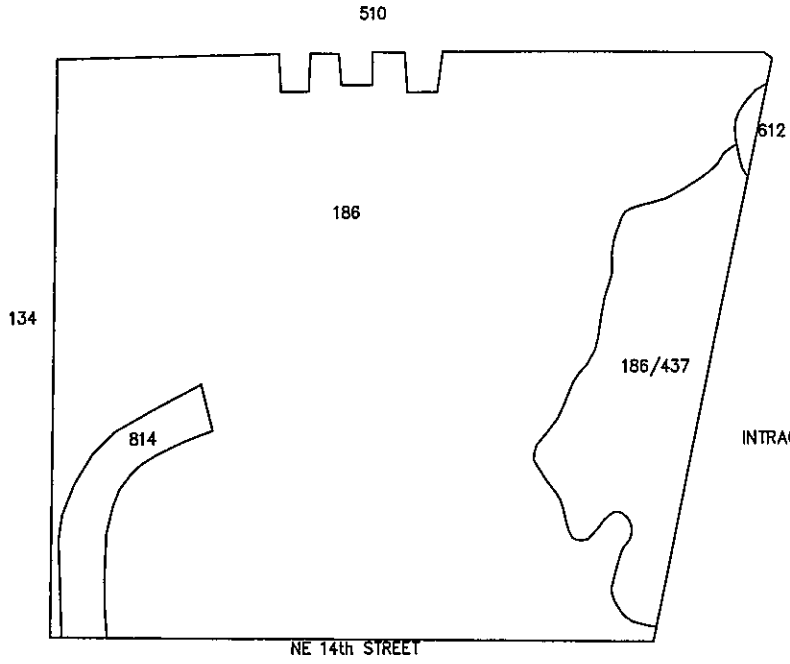
Site B-HI is an undesignated beach placement site located south of the Hillsboro Inlet. Final site placement and beach fill template will be determined in Phase II.



TAYLOR ENGINEERING INC.
9000 CYPRESS GREEN DRIVE, SUITE 200
JACKSONVILLE, FLORIDA 32256

Figure A-4
Channel Reach 2
Long Range Dredged Material Management Plan
Intracoastal Waterway,
Broward County, Florida

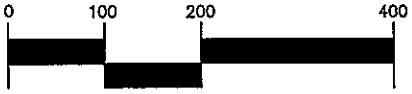
Project	C2002-36B
Revision	
Sheet	
Date	Dec., 2002



	LEGEND MSA FO 727B	ACRES
186	COMMUNITY RECREATIONAL FACILITIES	8.11
186/437	COMMUNITY RECREATIONAL FACILITIES/ AUSTRALIAN PINE	1.21
612	MANGROVE SWAMPS	.04
814	ROADS AND HIGHWAYS	.32
	TOTAL ACRES	9.68

OTHER COVER TYPES SHOWN

134	MULTIPLE DWELLING UNITS, HIGH RISE
510	STREAMS AND WATERWAYS



LAND USE AND VEGETATION OF CANDIDATE SITE MSA FO 727B, BROWARD COUNTY, FLORIDA

TAYLOR ENGINEERING INC.
9000 CYPRESS GREEN DRIVE, SUITE 200
JACKSONVILLE, FLORIDA 32256

Figure A-5
Land Use and Vegetation
of Candidate Site MSA FO 727B
Broward County, Florida

PROJECT	C9920
REVISION	
SHEET	
DATE	Oct., 2000

SITE DATA SUMMARY SHEET

Name: MSA FO 727B

AKA: Alsdorf Park

Site Use: Material Rehandling (Barge Offloading)

Comment: Recreational Use -- Boat Ramps, Boat Docks, Florida Marine Patrol, and BW Sheriff's Marine Substation

LOCATION

County:	Broward	**ICWW Reach Mileage:**	314.16
Municipality:	Pompano Beach	**East/West of**	West
Section/Township/Range:	30/48/43	**Receiving Waterbody:**	ICWW
		FDEP	(III)

REACH

Reach Designation:	BW-2	**Projected Dredging Frequency (yr):**	20
Reach Length (mi):	7.06	**50-yr Dredging Requirement (cy):**	5,703
ICWW Mileage:	313.98 to 321.04	**50-yr Storage Requirement (cy):**	12,262
Cut/Station:	BW-22/0+00 to BW-32/0+00		
Geographic: (FDEP Classification)	1,600 ft north of 14th St. Bridge (S.R. 844) (III) to 5,100 ft south of Oakland Park Blvd. Bridge (III)		

SITE PARAMETERS

Mapped Area (ac):	9.68	**Storage Capacity (cy):**	N/A
Containment Area (ac):	N/A	**Dike Height (ft):**	N/A
Impacted Area (ac):	5.16	**Excavation Depth (ft):**	N/A
Buffer Area (ac):	4.50	**Existing Mean Site Elevation (ft):**	5.0
N Buffer Width (ft):	100	**Dike Volume (cy):**	N/A
S Buffer Width (ft):	100	**Max. Pumping Distance (mi):**	N/A
E Buffer Width (ft):	0	**Max. Barging Distance (mi):**	7.49
W Buffer Width (ft):	100	**Min. Distance from Waterway (mi):**	N/A
Total Site Area (ac):	9.66		

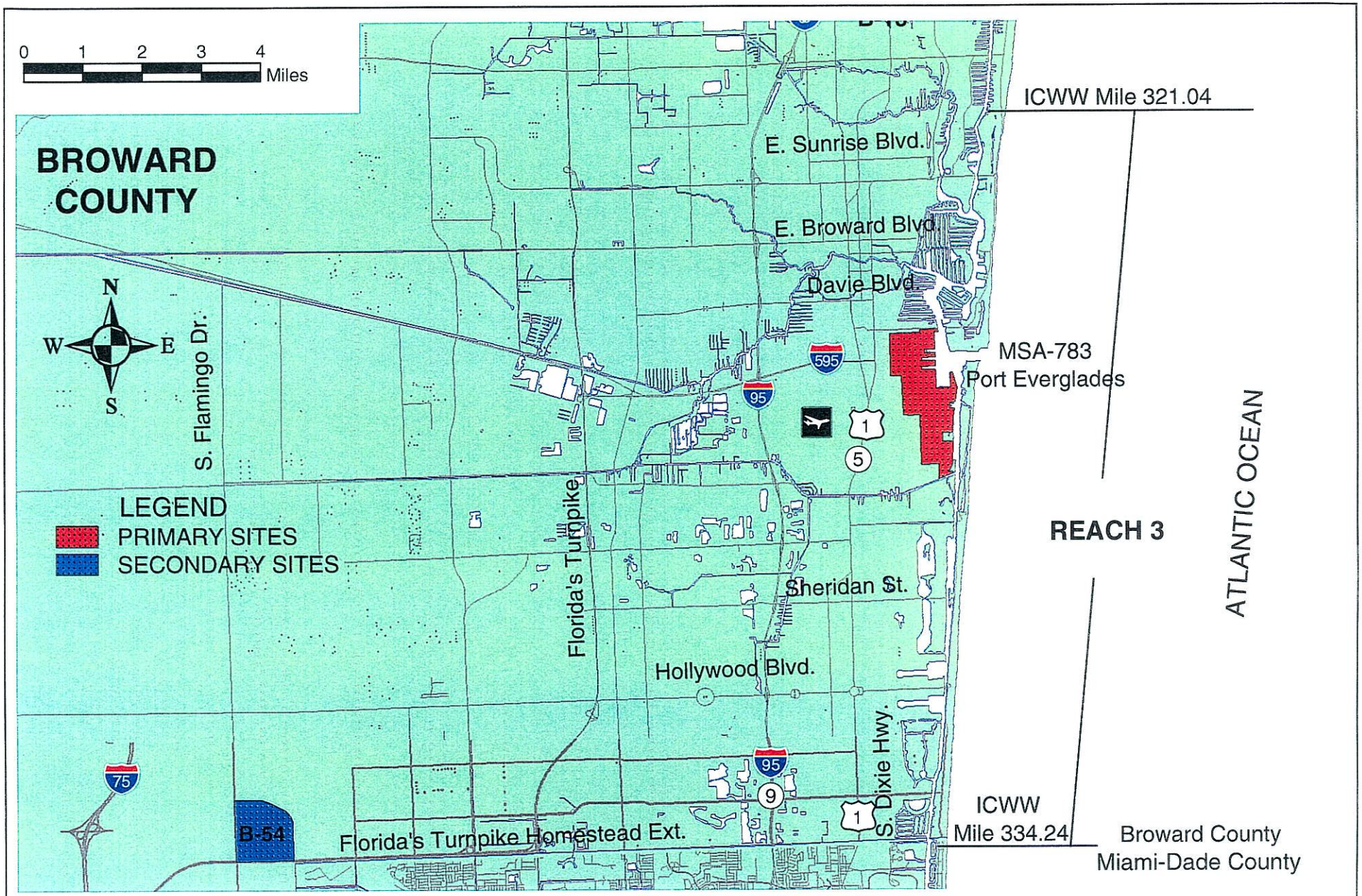
SITE

Public Access:	NE 14th St.	**Comprehensive Plan Designation:**	R&O
		Adjacent Land Use:	Canal (N), NE 14th St (S); High-rise multi-family housing (W); ICWW (E)
Road Easement (ft):	Not Required		
Pipeline Easement (ft):	N/A	**Land Use of Impacted Area:**	Community Recreation Facilities, Australian Pine
Deep Draft Access:	Yes		
		Wetlands W/I Mapped Area (ac):	0.04
		Wetlands Impacted (ac):	0.00

Site Narrative:

Site MSA FO 727B is a 10-acre developed community recreational facility (186) known as Alsdorf Park. The park allows convenient deep draft access to the ICWW via three boat ramps on Caliban canal. Beside the boat ramps, the site also provides public restrooms, boat docks, picnic facilities, a small office in the northern part of the park for the Florida Marine Patrol, and Broward County Sheriff's Marine substation. N.E. 14th Street provides direct access to both parking for vehicles and boat trailers and the three boat ramps. The west side of the park contains an open grassed and landscaped area. Parking and paved access occur in the central part of the park and a small stand of Australian pine (*Casuarina equisetifolia*) occupies the area adjacent to the ICWW (186/437). This shaded area also contains a few scattered picnic tables.

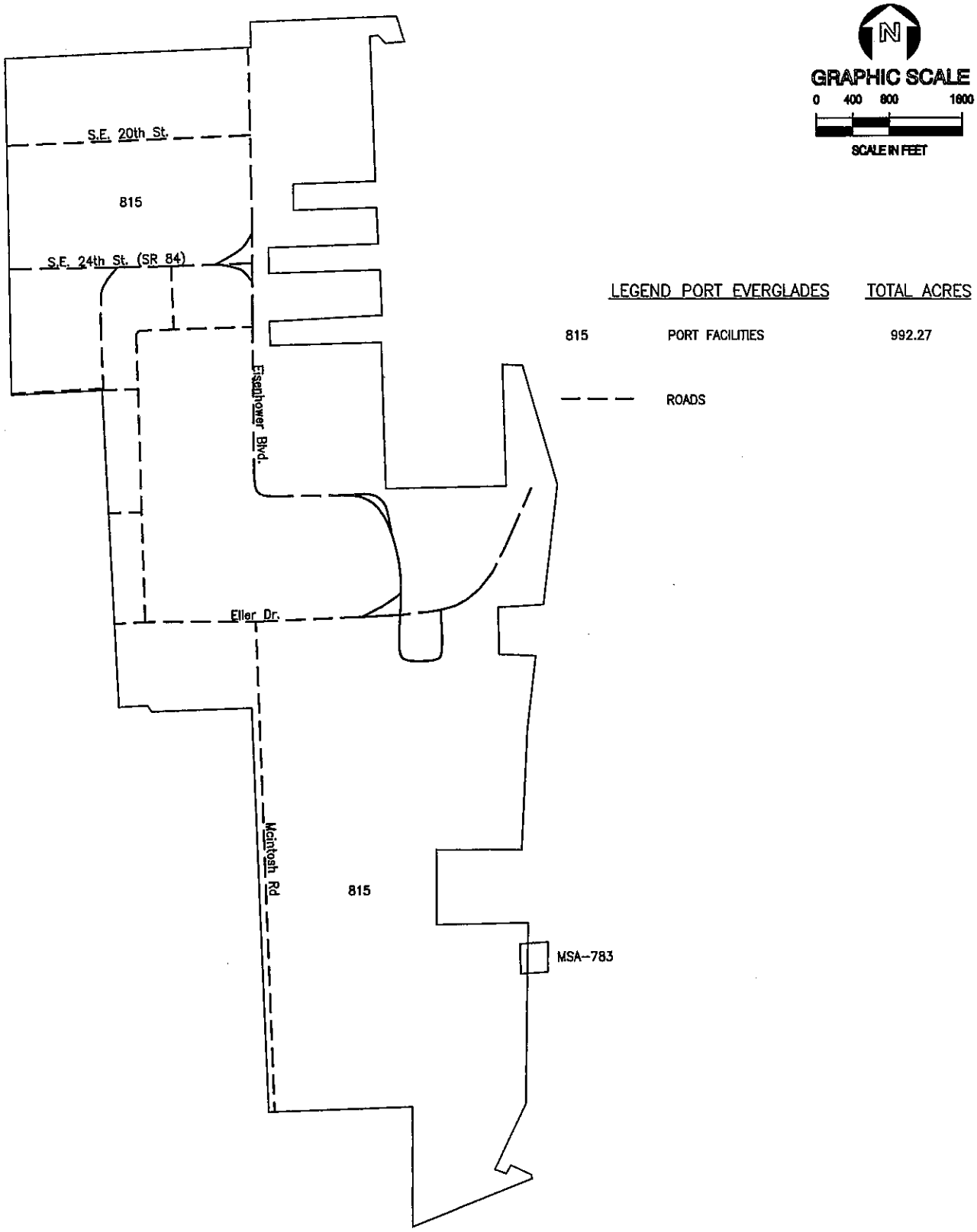
Adjacent land uses include Caliban canal to the north, the ICWW to the east, NE 14th Street to the south, and high-rise multifamily housing to the east.



TAYLOR ENGINEERING INC.
9000 CYPRESS GREEN DRIVE, SUITE 200
JACKSONVILLE, FLORIDA 32256

Figure A-6
Channel Reach 3
Long Range Dredged Material Management Plan
Intracoastal Waterway,
Broward County, Florida

Project	C2002-36B
Revision	
Sheet	
Date	Feb., 2003



LAND USE AND VEGETATION OF CANDIDATE SITE PORT EVERGLADES, BROWARD COUNTY, FLORIDA

TAYLOR ENGINEERING INC. 9000 CYPRESS GREEN DRIVE, SUITE 200 JACKSONVILLE, FLORIDA 32256	Figure A-7 Land Use & Vegetation of Candidate Site MSA-783/Port Everglades Broward County, Florida	PROJECT C9920 REVISION SHEET DATE Feb., 2003

SITE DATA SUMMARY SHEET

Name: MSA-783/Port Everglades

AKA:

Site Use: Material Rehandling (Barge Offloading)

Comment: FIND Easement within Port Facilities

LOCATION

County:	Broward	**ICWW Reach Mileage:**	325.40
Municipality:	Hollywood	**East/West of**	West
Section/Township/Range:	13/50/42, 14/50/42, 24/50/42 & 25/50/42	**Receiving Waterbody:**	N/A
		FDEP	(III)

REACH

Reach Designation:	BW-3			**Projected Dredging Frequency (yr):**	20
Reach Length (mi):	13.2			**50-yr Dredging Requirement (cy):**	921
ICWW Mileage:	321.04	**to**	334.24	**50-yr Storage Requirement (cy):**	1,980
Cut/Station:	BW-32/0+00	**to**	DA-1/0+00		
Geographic: (FDEP Classification)	5,100 ft south of Oakland Park Blvd. Bridge (III) to 530 ft south of Broward/Dade County Line (III)				

SITE PARAMETERS

Mapped Area (ac):	992.27	**Storage Capacity (cy):**	N/A
Containment Area (ac):	N/A	**Dike Height (ft):**	N/A
Impacted Area (ac):	N/A	**Excavation Depth (ft):**	N/A
Buffer Area (ac):	N/A	**Existing Mean Site Elevation (ft):**	5.0
N Buffer Width (ft):	N/A	**Dike Volume (cy):**	N/A
S Buffer Width (ft):	N/A	**Max. Pumping Distance (mi):**	N/A
E Buffer Width (ft):	N/A	**Max. Barging Distance (mi):**	13.05
W Buffer Width (ft):	N/A	**Min. Distance from Waterway (mi):**	0.09
Total Site Area (ac):	N/A		

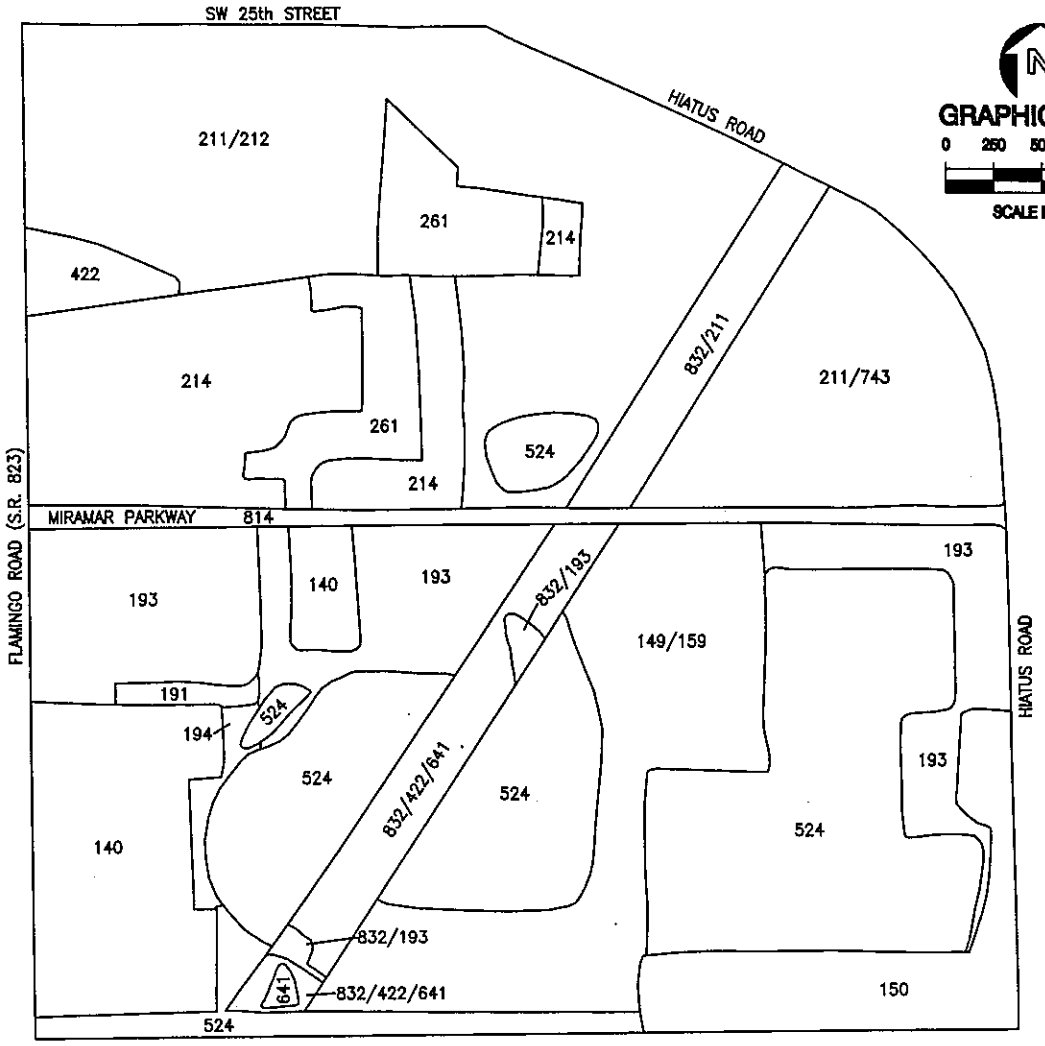
SITE

Public Access:	NE 7th Ave	**Comprehensive Plan Designation:**	T & U
		Adjacent Land Use:	
Road Easement (ft):	Not Required	Port facility	
Pipeline Easement (ft):	N/A		
		Land Use of Impacted Area:	
Deep Draft Access:	Yes	Port facility	
		Wetlands W/I Mapped Area (ac):	0.00
		Wetlands Impacted (ac):	0.00

Site Narrative:

Port Everglades is a multipurpose deepwater port. FIND holds a 2.27-ac easement within the developed portion of Port Everglades, designated MSA 783. This easement lies about 2,300 ft north of the Dania Canal and includes approximately 0.57 ac of the bulkheaded shoreline of a container-handling facility, specifically the track for the large container cranes. The land use and vegetation of candidate site figure (Figure A-7) is based on a general port facilities map that provides the location and layout of Port Everglades.

The port can be accessed from the mainland via Highway US 1 (814) to SE 17th Street, SE 24th Street (State Road 84), or Eller Drive. The Intracoastal Waterway lies just east of Port Everglades, with Dania Canal to the south.



	LEGEND B-54	ACRES
140	COMMERCIAL AND SERVICES	38.82
149/159	COMMERCIAL AND SERVICES UNDER CONSTRUCTION/INDUSTRIAL UNDER CONSTRUCTION	51.12
150	INDUSTRIAL	24.87
191	UNDEVELOPED LAND IN TRANSITION	1.93
193	URBAN LAND IN TRANSITION	58.72
194	OTHER OPEN LAND	2.64
211/212	IMPROVED PASTURES/UNIMPROVED PASTURES	109.57
211/743	IMPROVED PASTURES/SPOIL AREAS	46.62
214	ROW CROPS	50.13
261	FALLOW CROP LAND	22.73
422	BRAZILIAN PEPPER	5.46
524	LAKES LESS THAN 10 ACRES WHICH ARE DOMINANT FEATURES	115.68
641	FRESHWATER MARSHES	.64
814	ROADS AND HIGHWAYS	10.82
832/193	ELECTRICAL POWER TRANSMISSION LINES/ URBAN LAND IN TRANSITION	1.73
832/211	ELECTRICAL POWER TRANSMISSION LINES/ IMPROVED PASTURES	13.04
832/422/641	ELECTRICAL POWER TRANSMISSION LINES/ BRAZILIAN PEPPER/FRESHWATER MARSHES	18.69
	TOTAL ACRES	573.21

LAND USE AND VEGETATION FOR CANDIDATE SITE B-54, BROWARD COUNTY, FLORIDA

TAYLOR ENGINEERING INC.
9000 CYPRESS GREEN DRIVE, SUITE 200
JACKSONVILLE, FLORIDA 32256

Figure A-8
Land Use and Vegetation
for Candidate Site B-54
Broward County, Florida

PROJECT C9920
REVISION
SHEET
DATE Aug., 2000

SITE DATA SUMMARY SHEET

Name: B-54

AKA:

Site Use: Multi-Reach Inland Storage

Comment: Large transmission line corridor running through site

LOCATION

County:	Broward	**ICWW Reach Mileage:**	332.96
Municipality:	Unincorporated	**East/West of**	West
Section/Township/Range:	24/51/40 & 25/51/40	**Receiving Waterbody:**	N/A
		FDEP	N/A

REACH

Reach Designation:	BW-3			**Projected Dredging Frequency (yr):**	20
Reach Length (mi):	13.2			**50-yr Dredging Requirement (cy):**	921
ICWW Mileage:	321.04	**to**	334.24	**50-yr Storage Requirement (cy):**	1,980
Cut/Station:	BW-32/0+00	**to**	DA-1/0+00		
Geographic: (FDEP Classification)	5,100 ft south of Oakland Park Blvd. Bridge (III) **to** 530 ft south of Broward/Dade County Line (III)				

SITE PARAMETERS

Mapped Area (ac):	573.21	**Storage Capacity (cy):**	139,500
Containment Area (ac):	N/A	**Dike Height (ft):**	N/A
Impacted Area (ac):	9.83	**Excavation Depth (ft):**	N/A
Buffer Area (ac):	7.14	**Existing Mean Site Elevation (ft):**	5.0
N Buffer Width (ft):	100	**Dike Volume (cy):**	N/A
S Buffer Width (ft):	100	**Max. Pumping Distance (mi):**	N/A
E Buffer Width (ft):	100	**Max. Barging Distance (mi):**	N/A
W Buffer Width (ft):	100	**Min. Distance from Waterway (mi):**	11.48
Total Site Area (ac):	16.97		

SITE

Public Access:	Flamingo Rd, SW 25th St, Hiatus Rd, SW 41st St	**Comprehensive Plan Designation:**	RAC
		Adjacent Land Use:	
Road Easement (ft):	Not Required	SW 25th St & Hiatus Rd (N); Hiatus Rd (E); SW 41st St (S); Flamingo Rd/SR 823 (W)	
Pipeline Easement (ft):	N/A	**Land Use of Impacted Area:**	
Deep Draft Access:	N/A	Improved pastures, Fallow crop land, Row crops, Brazilian Pepper	
		Wetlands W/I Mapped Area (ac):	116.32
		Wetlands Impacted (ac):	0.00

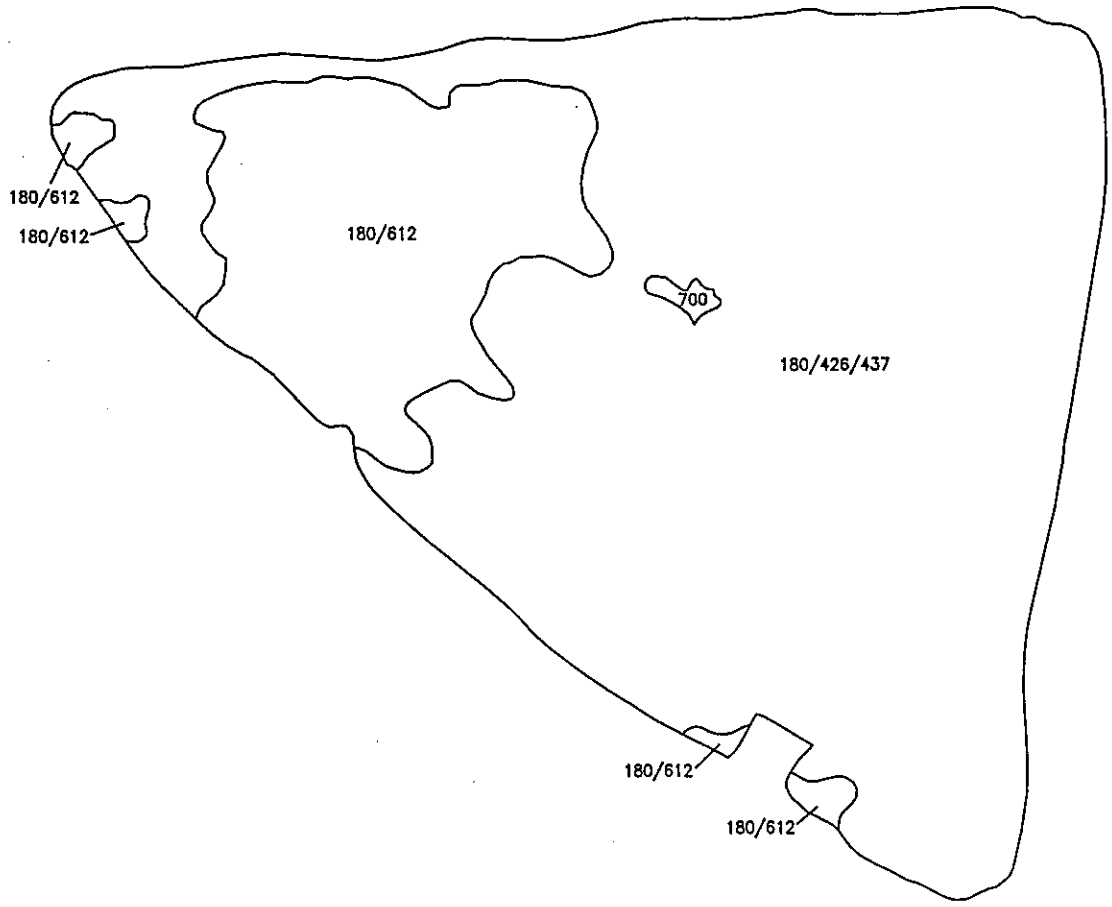
Site Narrative:

This 573-acre site consists of a primarily undeveloped northern portion that contains improved and unimproved pastureland (211/212), row crops such as corn and sugarcane (214), fallow cropland (261), a borrow pit type pond (524), and a transmission line corridor that is also maintained as improved pastureland (832/211). Miramar Parkway (814) bisects the southern and northern portions of the site. The southern portion of the site is primarily commercial (140), industrial (150), and commercial/industrial under construction (149/159). It also contains several large borrow pit ponds (524) and a large transmission line/Brazilian pepper/freshwater marsh (832/422/641) corridor. The eastern side contains an area of urban land in transition without positive indicators of intended activity (193).

The entire site is bounded on the north by SW 25th Street and Hiatus Road (814), on the east by Hiatus Road (814), on the south partially by SW 41st Street (814) and an abandoned portion of the same street, and on the west by Flamingo Road/SR 823 (814).

APPENDIX B

Other Candidate Sites



	LEGEND B-1/MSA	ACRES
180/426/437	RECREATIONAL/TROPICAL HARDWOODS/AUSTRALIAN PINE	46.28
180/612	RECREATIONAL/ MANGROVE SWAMPS	11.59
700	BARREN LAND	.17
	TOTAL ACRES	58.04

N

GRAPHIC SCALE

0 100 200 400

SCALE IN FEET

LAND USE AND VEGETATION OF CANDIDATE SITE B-1/MSA 702, BROWARD COUNTY, FLORIDA

TAYLOR ENGINEERING INC. 9000 CYPRESS GREEN DRIVE, SUITE 200 JACKSONVILLE, FLORIDA 32256	Figure B-1 Land Use and Vegetation of Candidate Site B-1/MSA 702 Broward County, Florida	PROJECT C9920 REVISION SHEET DATE Sept., 2000

SITE DATA SUMMARY SHEET

Name: B-1 /MSA 702

AKA: Deerfield Island Park

Site Use: Dewatering & Long-Term Storage (Multiple Operation)

Comment: Recreational Use – Small Boat Access, Trails, and Boardwalk

LOCATION

County:	Broward	**ICWW Reach Mileage:**	309.22
Municipality:	Deerfield Beach	**East/West of**	West
Section/Township/Range:	5/48/43	**Receiving Waterbody:**	ICWW
		FDEP	[III]

REACH

Reach Designation:	BW-1			**Projected Dredging Frequency (yr):**	10
Reach Length (mi):	4.74			**50-yr Dredging Requirement (cy):**	27,020
ICWW Mileage:	309.24	to	313.98	**50-yr Storage Requirement (cy):**	58,092
Cut/Station:	BW-1/0+00	to	BW-22/0+00		
Geographic: (FDEP Classification)	650 ft south of Palm Beach/Broward County (III) to 1,600 ft north of 14th St. Bridge (S.R. 844) (III)				

SITE PARAMETERS

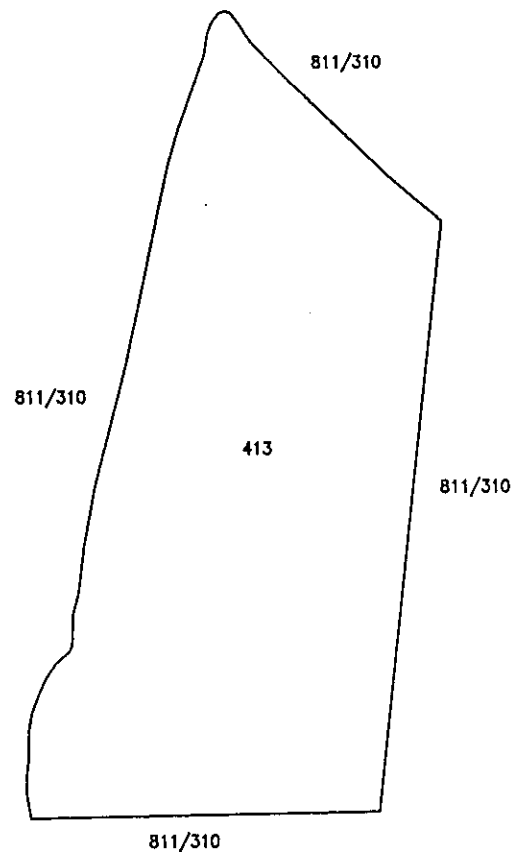
Mapped Area (ac):	58.04	**Storage Capacity (cy):**	80,342
Containment Area (ac):	7.86	**Dike Height (ft):**	10
Impacted Area (ac):	10.42	**Excavation Depth (ft):**	5.60
Buffer Area (ac):	23.17	**Existing Mean Site Elevation (ft):**	15.0
N Buffer Width (ft):	350	**Dike Volume (cy):**	35,262
S Buffer Width (ft):	350	**Max. Pumping Distance (mi):**	4.76
E Buffer Width (ft):	200	**Max. Barging Distance (mi):**	N/A
W Buffer Width (ft):	350	**Min. Distance from Waterway (mi):**	N/A
Total Site Area (ac):	33.59		

SITE

Public Access:	None	**Comprehensive Plan Designation:**	R&O, CON
		Adjacent Land Use:	
Road Easement (ft):	Not Possible	Canals (N, S, SW); ICWW (E)	
Pipeline Easement (ft):	Not Required		
		Land Use of Impacted Area:	
Deep Draft Access:	N/A	Recreation, Tropical Hardwoods, Australian Pine	
		Wetlands W/I Mapped Area (ac):	11.59
		Wetlands Impacted (ac):	0.00

Site Narrative:

Site B-1/MSA 702, a 58-acre dredged material island known as Deerfield Island Park, is located on the west side of the ICWW. The property, devoted to passive recreation uses (180), contains picnic areas, a marina area for small boat access, restrooms, trails, and a boardwalk. The island is mostly vegetated with a tropical hardwood hammock combined with an Australian pine forest (426/437). The Broward County Park staff is working to restore the vegetation communities on the island by actively eliminating the dense Australian pine (*Casuarina equisetifolia*) canopy that once covered the upland portions of the island. As a result, the Australian pine canopy covers significantly less area than it once did based on the 1994 aerial photography used to map the vegetation. The emerging tropical hardwood community contains Broadleaf blolly (*Guapira obtusata*), gumbo-limbo (*Bursera simaruba*), live oak (*Quercus virginiana*), wild coffee (*Psychotria nervosa*), pigeon plum (*Coccoloba diversifolia*), sea grape (*Coccoloba uvifera*), strangler fig (*Ficus aurea*), cabbage palm (*Sabal palmetto*), twinberry (*Myrcianthes fragrans*), and white stopper (*Eugenia axillaris*). A boardwalk provides entry to a mangrove swamp (612), located on the northwest part of the island. The forest contains red mangrove (*Rhizophora mangle*), black mangrove (*Avicennia germinans*), and some white mangrove (*Laguncularia racemosa*). Migrating warblers were plentiful in both the upland and wetland tree canopy. The island is surrounded by the ICWW on the east and canals on the north, west, and southwest.



LAND USE AND VEGETATION OF CANDIDATE SITE B-2, BROWARD COUNTY, FLORIDA

TAYLOR ENGINEERING INC. 9000 CYPRESS GREEN DRIVE, SUITE 200 JACKSONVILLE, FLORIDA 32256	Figure B-2 Land Use and Vegetation of Candidate Site B-2 Broward County, Florida	PROJECT C9920 REVISION SHEET DATE Aug., 2000

SITE DATA SUMMARY SHEET

Name: B-2

AKA: Pompano Beach Airport

Site Use: Dewatering & Short-Term Storage (Single Operation)

Comment:

LOCATION

County:	Broward	**ICWW Reach Mileage:**	314.24
Municipality:	Pompano Beach	**East/West of**	West
Section/Township/Range:	25/48/42	**Receiving Waterbody:**	ICWW
		FDEP	(III)

REACH

Reach Designation:	BW-2			**Projected Dredging Frequency (yr):**	20
Reach Length (mi):	7.06			**50-yr Dredging Requirement (cy):**	5,703
ICWW Mileage:	313.98	to	321.04	**50-yr Storage Requirement (cy):**	12,262
Cut/Station:	BW-22/0+00	to	BW-32/0+00		
Geographic: (FDEP Classification)	1,600 ft north of 14th St. Bridge (S.R. 844) (III) to 5,100 ft south of Oakland Park Blvd. Bridge (III)				

SITE PARAMETERS

Mapped Area (ac):	12.41	**Storage Capacity (cy):**	N/A
Containment Area (ac):	Insufficient Area	**Dike Height (ft):**	N/A
Impacted Area (ac):	N/A	**Excavation Depth (ft):**	N/A
Buffer Area (ac):	N/A	**Existing Mean Site Elevation (ft):**	15.0
N Buffer Width (ft):	N/A	**Dike Volume (cy):**	N/A
S Buffer Width (ft):	N/A	**Max. Pumping Distance (mi):**	8.31
E Buffer Width (ft):	N/A	**Max. Barging Distance (mi):**	N/A
W Buffer Width (ft):	N/A	**Min. Distance from Waterway (mi):**	N/A
Total Site Area (ac):	N/A		

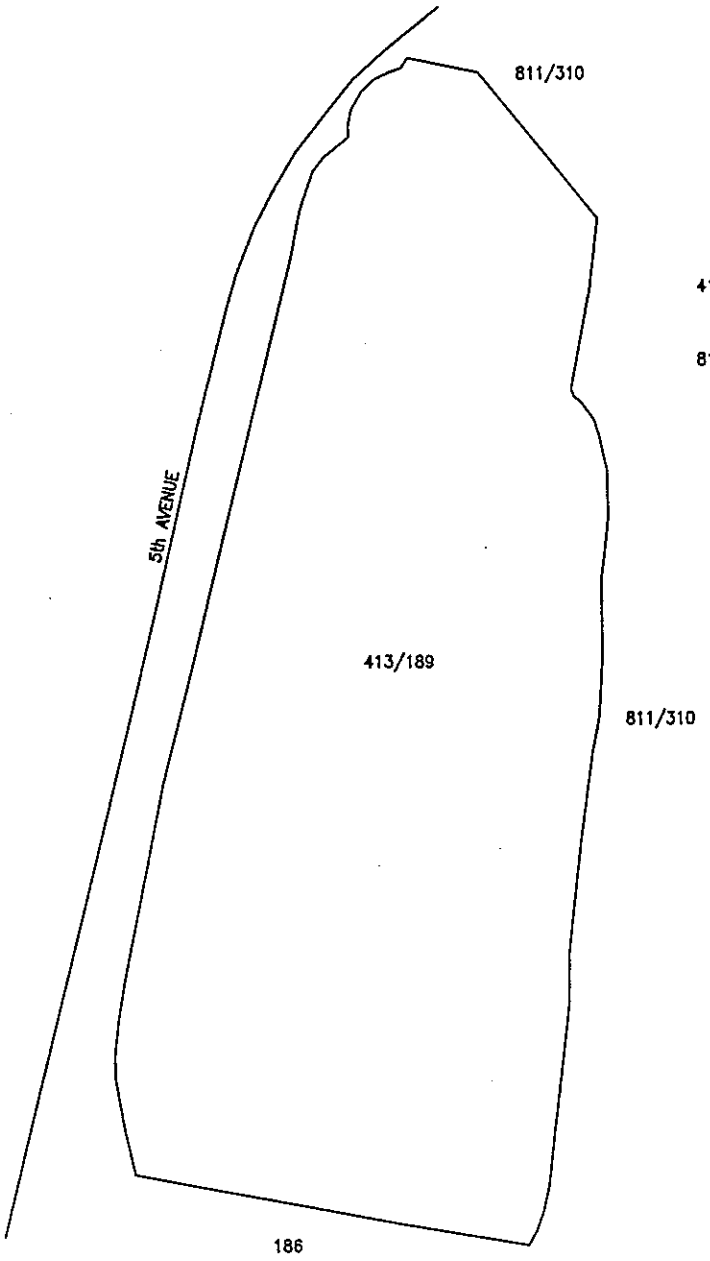
SITE

Public Access:	16th St	**Comprehensive Plan Designation:**	R&O
		Adjacent Land Use:	
Road Easement (ft):	Not Required	Airport Property -- Runways (E); Open grassland (N); Open grass and sand pine (W); Blimp base (S)	
Pipeline Easement (ft):	7,900	**Land Use of Impacted Area:**	
Deep Draft Access:	N/A	N/A	
		Wetlands W/I Mapped Area (ac):	0.00
		Wetlands Impacted (ac):	0.00

Site Narrative:

Site B-2 is one of three sites located on the western side of the Pompano Beach Airport facilities. The site consists entirely of an isolated stand of sand pine forest (413). The 12-acre site is completely forested with dominant vegetation of sand pine (*Pinus clausa*), saw palmetto (*Serenoa repens*), and Chapman's oak (*Quercus chapmanii*). Some of the sand pine trees have recently died. Brazilian pepper (*Schinus terebinthifolius*), an invasive exotic plant, is also prevalent on the site. On all sides of the site, land adjacent to the sand pine stand was regularly mowed as part of the airport site management.

Adjacent land uses include airport property on all sides with runways to the east, open grassland to the north, open grass and sand pine (Site B-3) to the west, and a blimp base (Site B-4) to the south.



N

GRAPHIC SCALE

0 75 150 300

SCALE IN FEET

LEGEND B-3

413/189 SAND PINE/OTHER RECREATIONAL 23.81 ACRES

OTHER COVER TYPES SHOWN

186 COMMUNITY RECREATIONAL FACILITIES

811/310 AIRPORTS/HERBACEOUS

LAND USE AND VEGETATION OF CANDIDATE SITE B-3, BROWARD COUNTY, FLORIDA

TAYLOR ENGINEERING INC. 9000 CYPRESS GREEN DRIVE, SUITE 200 JACKSONVILLE, FLORIDA 32256	Figure B-3 Land Use and Vegetation of Candidate Site B-3 Broward County, Florida	PROJECT C9920 REVISION SHEET DATE Aug., 2000

SITE DATA SUMMARY SHEET

Name: B-3

AKA: Pompano Beach Airport

Site Use: Dewatering & Short-Term Storage (Single Operation)

Comment: North of Sand and Spurs Equestrian Park

LOCATION

County:	Broward	**ICWW Reach Mileage:**	313.85
Municipality:	Pompano Beach	**East/West of**	West
Section/Township/Range:	25/48/42	**Receiving Waterbody:**	ICWW
		FDEP	(III)

REACH

Reach Designation:	BW-1			**Projected Dredging Frequency (yr):**	10
Reach Length (mi):	4.74			**50-yr Dredging Requirement (cy):**	27,020
ICWW Mileage:	309.24	**to**	313.98	**50-yr Storage Requirement (cy):**	58,092
Cut/Station:	BW-1/0+00	**to**	BW-22/0+00		
Geographic: (FDEP Classification)	650 ft south of Palm Beach/Broward County (III) to 1,600 ft north of 14th St. Bridge (S.R. 844) (III)				

SITE PARAMETERS

Mapped Area (ac):	23.81	**Storage Capacity (cy):**	N/A
Containment Area (ac):	Insufficient Area	**Dike Height (ft):**	N/A
Impacted Area (ac):	N/A	**Excavation Depth (ft):**	N/A
Buffer Area (ac):	N/A	**Existing Mean Site Elevation (ft):**	15.0
N Buffer Width (ft):	N/A	**Dike Volume (cy):**	N/A
S Buffer Width (ft):	N/A	**Max. Pumping Distance (mi):**	6.54
E Buffer Width (ft):	N/A	**Max. Barging Distance (mi):**	N/A
W Buffer Width (ft):	N/A	**Min. Distance from Waterway (mi):**	N/A
Total Site Area (ac):	N/A		

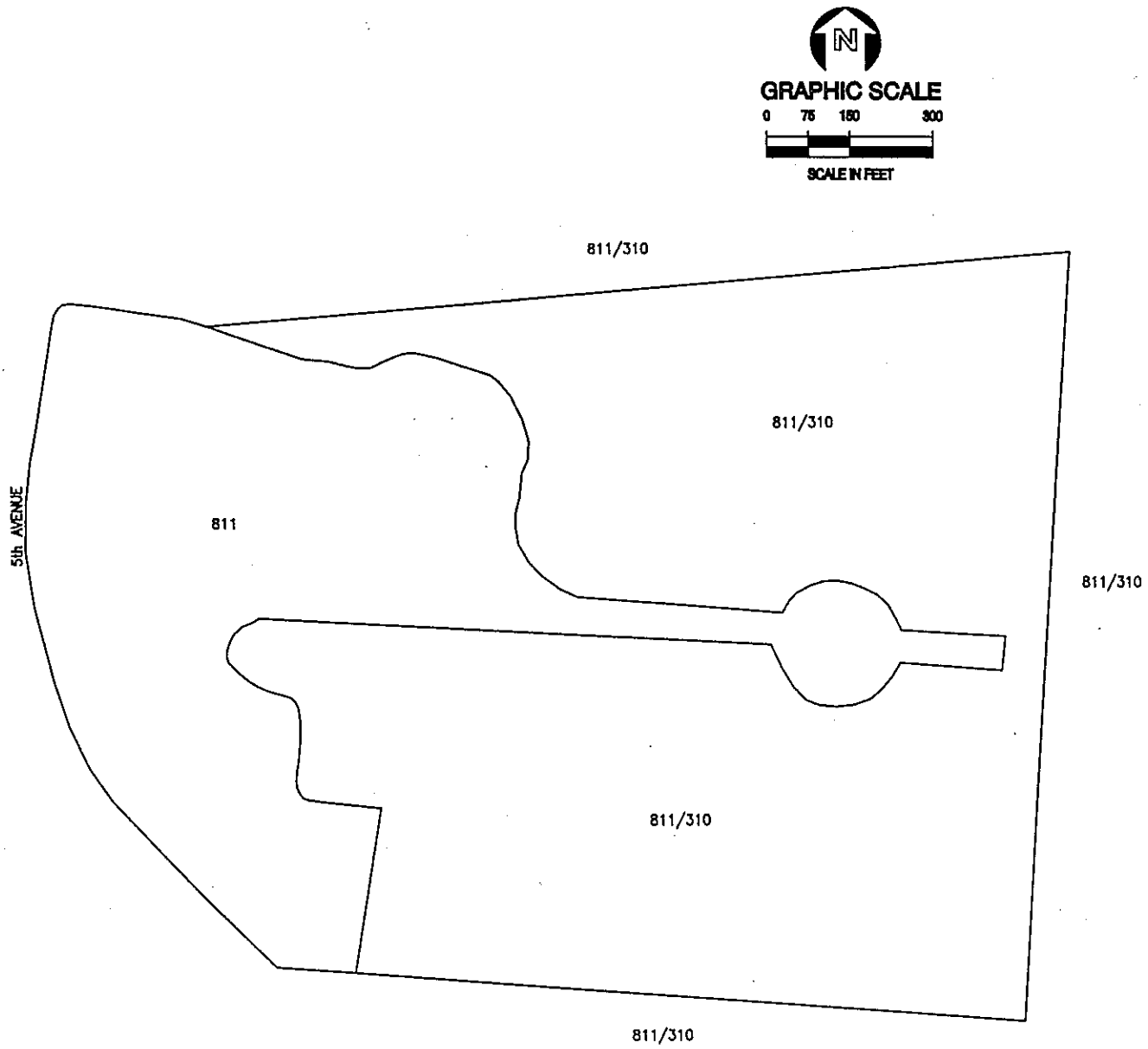
SITE

Public Access:	5th Ave	**Comprehensive Plan Designation:**	R&O
		Adjacent Land Use:	Airport Property (N, E); City recreational park (S); 5th Avenue (W)
Road Easement (ft):	Not Required		
Pipeline Easement (ft):	7,800	**Land Use of Impacted Area:**	N/A
Deep Draft Access:	N/A		
		Wetlands W/I Mapped Area (ac):	0.00
		Wetlands Impacted (ac):	0.00

Site Narrative:

Site B-3, a 24-acre site, is one of three sites located on the western side of the Pompano Beach Airport facilities. Like Site B-2, Site B-3 consists of a sand pine forest. Although the property appears to be part of the airport property, it is also used in conjunction with a county recreational facility located immediately south of the site. The Sand and Spurs Equestrian Park uses Site B-3 to provide a series of wooded trails to park visitors; therefore, the site was mapped as sand pine/other recreation (413/189). Dominant vegetation includes sand pine (*Pinus clausa*), saw palmetto (*Serenoa repens*), and myrtle oak (*Quercus myrtifolia*). A variety of exotic plants including Brazilian pepper (*Schinus terebinthifolius*), Australian umbrella tree (*Schefflera actinophylla*), and mother in laws tongue (*Sansevieria hyacinthoides*) has invaded the site. Wildlife observed on the site included a variety of passerine birds, red fox, and gopher tortoise, which is listed as a State of Florida Species of Special Concern.

Adjacent land uses include airport property to the north and east, a city recreational park to the south, and 5th Avenue to the west.



LEGEND B-4

		ACRES
811	AIRPORTS	17.09
811/310	AIRPORTS/HERBACEOUS	33.24
	TOTAL ACRES	50.33

LAND USE AND VEGETATION OF CANDIDATE SITE B-4, BROWARD COUNTY, FLORIDA

TAYLOR ENGINEERING INC. 9000 CYPRESS GREEN DRIVE, SUITE 200 JACKSONVILLE, FLORIDA 32256	Figure B-4 Land Use and Vegetation of Candidate Site B-4 Broward County, Florida	PROJECT C9920 REVISION SHEET DATE Aug., 2000

SITE DATA SUMMARY SHEET

Name: B-4

AKA: Pompano Beach Airport

Site Use: Dewatering & Short-Term Storage (Single Operation)

Comment: Blimp Base Operations

LOCATION

County:	Broward	**ICWW Reach Mileage:**	314.54
Municipality:	Pompano Beach	**East/West of**	West
Section/Township/Range:	25/48/42 & 26/48/42	**Receiving Waterbody:**	ICWW
		FDEP	(III)

REACH

Reach Designation:	BW-2			**Projected Dredging Frequency (yr):**	20
Reach Length (mi):	7.06			**50-yr Dredging Requirement (cy):**	5,703
ICWW Mileage:	313.98	**to**	321.04	**50-yr Storage Requirement (cy):**	12,262
Cut/Station:	BW-22/0+00	**to**	BW-32/0+00		
Geographic: (FDEP Classification)	1,600 ft north of 14th St. Bridge (S.R. 844) (III) to 5,100 ft south of Oakland Park Blvd. Bridge (III)				

SITE PARAMETERS

Mapped Area (ac):	50.33	**Storage Capacity (cy):**	31,436
Containment Area (ac):	5.64	**Dike Height (ft):**	6.5
Impacted Area (ac):	8.79	**Excavation Depth (ft):**	4.56
Buffer Area (ac):	7.86	**Existing Mean Site Elevation (ft):**	15.0
N Buffer Width (ft):	150	**Dike Volume (cy):**	19,041
S Buffer Width (ft):	150	**Max. Pumping Distance (mi):**	8.28
E Buffer Width (ft):	150	**Max. Barging Distance (mi):**	N/A
W Buffer Width (ft):	150	**Min. Distance from Waterway (mi):**	N/A
Total Site Area (ac):	16.65		

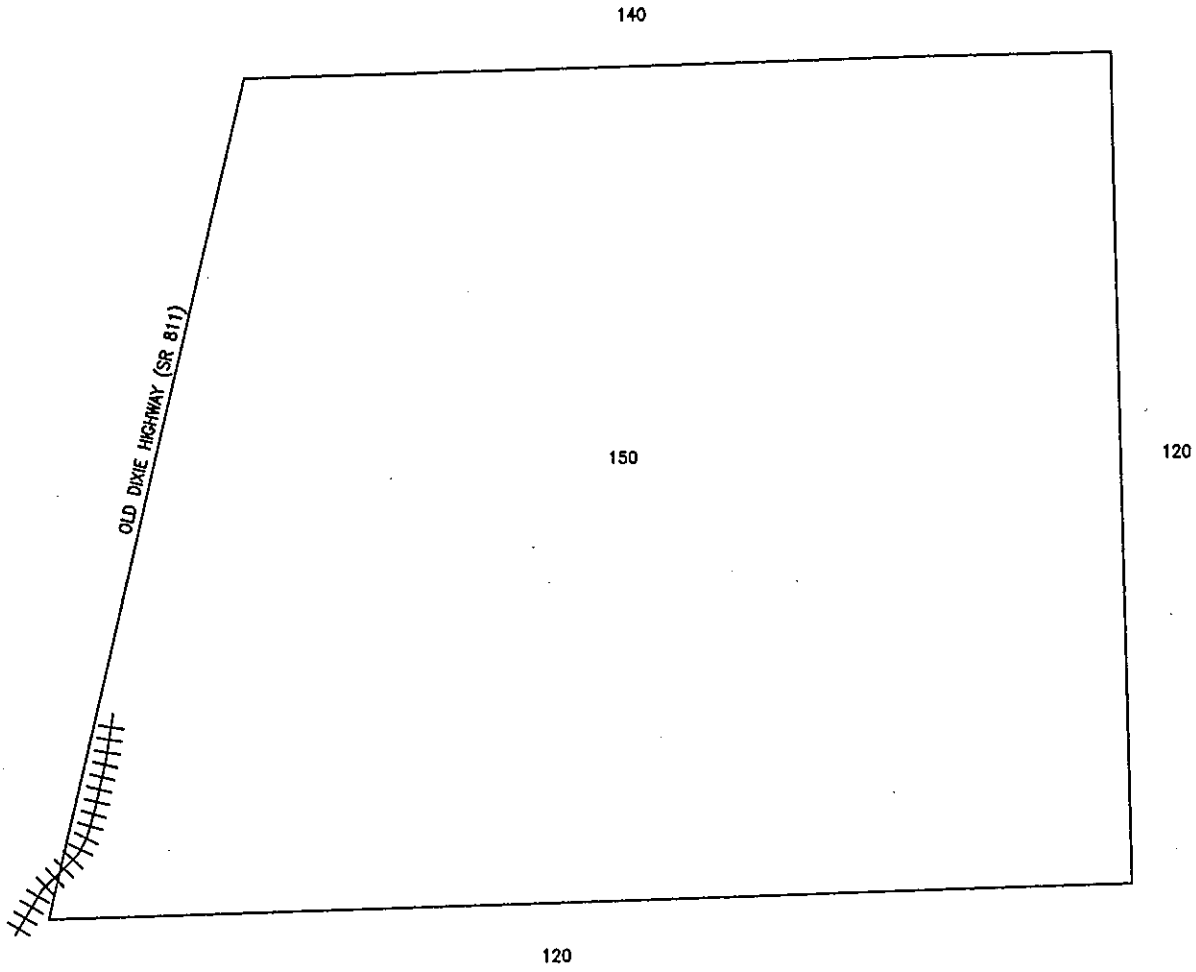
SITE

Public Access:	5th Ave	**Comprehensive Plan Designation:**	R&O
		Adjacent Land Use:	
Road Easement (ft):	350	Community recreation & open, grassy airport lands (N); Airport runways (E, S); 5th Avenue (W, SW)	
Pipeline Easement (ft):	8,000	**Land Use of Impacted Area:**	
Deep Draft Access:	N/A	Open, grassy airport lands	
		Wetlands W/I Mapped Area (ac):	0.00
		Wetlands Impacted (ac):	0.00

Site Narrative:

Site B-4, a 50-acre site, is one of three sites located on the western side of the Pompano Beach Airport facilities. The western and southwestern portions of the site — mapped as airport (811) — consist of buildings and a hangar associated with the blimp operations. A paved pathway and blimp landing area on the site's central and eastern side is also mapped as airport (811). Other areas to the north and south of this paved area are mapped as airport/herbaceous to denote the open, mowed grassy area associated with airport lands. Vegetation in the herbaceous area includes Bahia grass (*Paspalum notatum*), fingergrass (*Eustachys* sp.), and gopher apple (*Licania michauxii*).

Adjacent land uses include community recreation and open, grassy airport lands to the north, airport runways to the east and south, and 5th Avenue to the west and southwest.



LEGEND B-5

150 INDUSTRIAL 45.56 ACRES

OTHER COVER TYPES SHOWN

120 RESIDENTIAL, MEDIUM DENSITY
140 COMMERCIAL AND SERVICES

RAILROAD

N

GRAPHIC SCALE

0 75 150 300

SCALE IN FEET

LAND USE AND VEGETATION OF CANDIDATE SITE B-5, BROWARD COUNTY, FLORIDA

TAYLOR ENGINEERING INC. 9000 CYPRESS GREEN DRIVE, SUITE 200 JACKSONVILLE, FLORIDA 32256	Figure B-5 Land Use and Vegetation of Candidate Site B-5 Broward County, Florida	PROJECT C9920 REVISION SHEET DATE Aug., 2000

SITE DATA SUMMARY SHEET

Name: B-5

AKA: Precast Specialty, Inc.

Site Use: Multi-Reach Inland Storage

Comment: Industrial Use – Concrete Stockpile Area

LOCATION

County:	Broward	**ICWW Reach Mileage:**	311.38
Municipality:	Unincorporated	**East/West of**	West
Section/Township/Range:	13/48/42	**Receiving Waterbody:**	N/A
		FDEP	N/A

REACH

Reach Designation:	BW-1			**Projected Dredging Frequency (yr):**	10
Reach Length (mi):	4.74			**50-yr Dredging Requirement (cy):**	27,020
ICWW Mileage:	309.24	**to**	313.98	**50-yr Storage Requirement (cy):**	58,092
Cut/Station:	BW-1/0+00	**to**	BW-22/0+00		
Geographic: (FDEP Classification)	650 ft south of Palm Beach/Broward County (III) to 1,600 ft north of 14th St. Bridge (S.R. 844) (III)				

SITE PARAMETERS

Mapped Area (ac):	45.56	**Storage Capacity (cy):**	72,600
Containment Area (ac):	N/A	**Dike Height (ft):**	N/A
Impacted Area (ac):	5.60	**Excavation Depth (ft):**	N/A
Buffer Area (ac):	27.51	**Existing Mean Site Elevation (ft):**	15.0
N Buffer Width (ft):	350	**Dike Volume (cy):**	N/A
S Buffer Width (ft):	350	**Max. Pumping Distance (mi):**	N/A
E Buffer Width (ft):	350	**Max. Barging Distance (mi):**	N/A
W Buffer Width (ft):	350	**Min. Distance from Waterway (mi):**	1.72
Total Site Area (ac):	33.11		

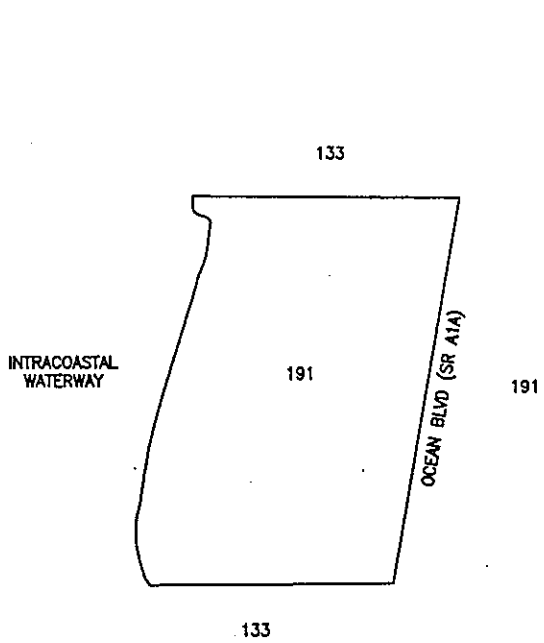
SITE

Public Access:	NE 48th, 14th Ave., Old Dixie Hwy	**Comprehensive Plan Designation:**	I
		Adjacent Land Use:	Commercial & Services (N); Fixed single-family residences (E, S); Old Dixie Hwy (W)
Road Easement (ft):	Not Required		
Pipeline Easement (ft):	N/A	**Land Use of Impacted Area:**	Industrial
Deep Draft Access:	N/A		
		Wetlands W/I Mapped Area (ac):	0.00
		Wetlands Impacted (ac):	0.00

Site Narrative:

Site B-5 is a 46-acre industrial site (150) associated with Precast Specialty Inc. Most of the site is covered with stockpiled concrete pilings. Buildings associated with the operation are located in the north central part of the property. A railroad loading area is located in the northwestern corner. Little vegetation persists on the property except for a few exotic Australian pines (*Casuarina equisetifolia*) along the southern perimeter and scattered, low-growing weeds. A railroad spur line enters the site from the southwest corner.

Adjacent land uses include commercial and services to the north, fixed single-family residential units to the east and south, and Old Dixie Highway to the west.



LEGEND B-5A

191 UNDEVELOPED LAND WITHIN URBAN AREAS 5.67 ACRES

OTHER COVER TYPES SHOWN
133 MULTIPLE DWELLING UNITS, LOW RISE

LAND USE AND VEGETATION OF CANDIDATE SITE B-5A, BROWARD COUNTY, FLORIDA

TAYLOR ENGINEERING INC.
9000 CYPRESS GREEN DRIVE, SUITE 200
JACKSONVILLE, FLORIDA 32256

Figure B-6
Land Use and Vegetation
of Candidate Site B-5A
Broward County, Florida

PROJECT	C9920
REVISION	
SHEET	
DATE	Aug., 2000

SITE DATA SUMMARY SHEET

Name: B-5A

AKA:

Site Use: Material Rehandling (Barge Offloading)

Comment: Posted as a construction site

LOCATION

County:	Broward	**ICWW Reach Mileage:**	310.74
Municipality:	Hillsboro Beach	**East/West of**	East
Section/Township/Range:	8/48/43	**Receiving Waterbody:**	ICWW
		FDEP	(III)

REACH

Reach Designation:	BW-1	**Projected Dredging Frequency (yr):**	10
Reach Length (mi):	4.74	**50-yr Dredging Requirement (cy):**	27,020
ICWW Mileage:	309.24 to 313.98	**50-yr Storage Requirement (cy):**	58,092
Cut/Station:	BW-1/0+00 to BW-22/0+00		
Geographic: (FDEP Classification)	650 ft south of Palm Beach/Broward County (III) to 1,600 ft north of 14th St. Bridge (S.R. 844) (III)		

SITE PARAMETERS

Mapped Area (ac):	5.67	**Storage Capacity (cy):**	N/A
Containment Area (ac):	N/A	**Dike Height (ft):**	N/A
Impacted Area (ac):	2.90	**Excavation Depth (ft):**	N/A
Buffer Area (ac):	2.77	**Existing Mean Site Elevation (ft):**	10.0
N Buffer Width (ft):	100	**Dike Volume (cy):**	N/A
S Buffer Width (ft):	100	**Max. Pumping Distance (mi):**	N/A
E Buffer Width (ft):	100	**Max. Barging Distance (mi):**	3.24
W Buffer Width (ft):	0	**Min. Distance from Waterway (mi):**	N/A
Total Site Area (ac):	5.67		

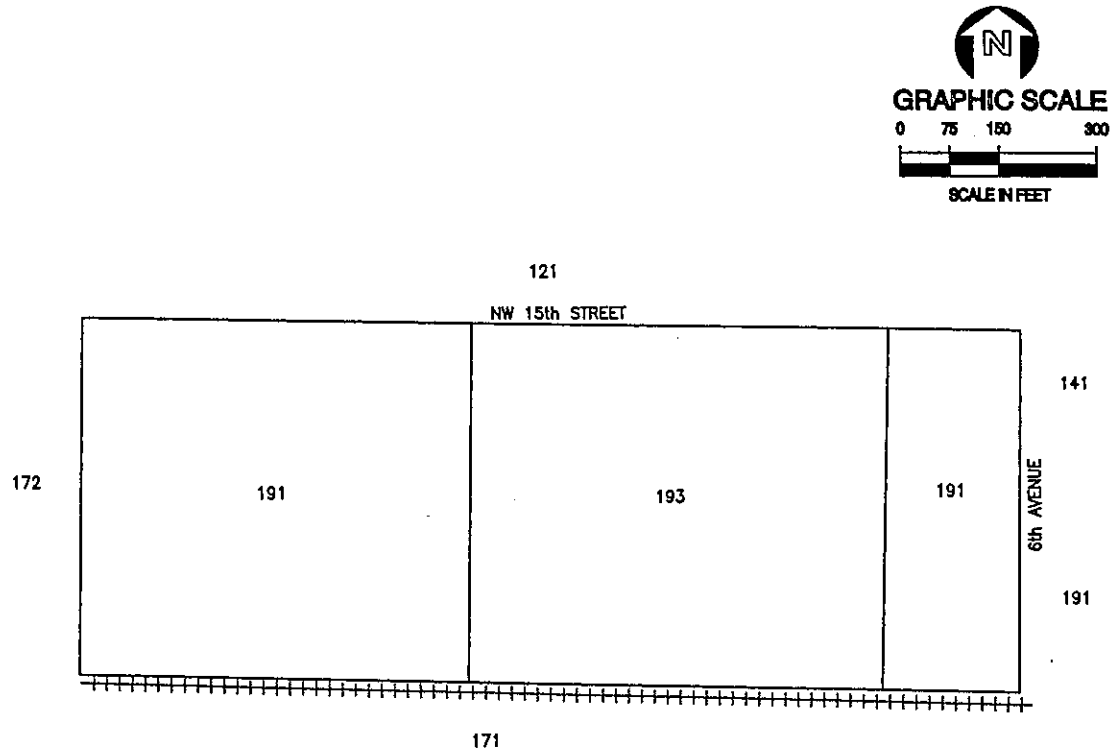
SITE

Public Access:	Ocean Blvd (SR A1A)	**Comprehensive Plan Designation:**	H, M
		Adjacent Land Use:	
Road Easement (ft):	Not Required	Low-rise apartments (N, S); Ocean Blvd (E); ICWW (W)	
Pipeline Easement (ft):	N/A		
		Land Use of Impacted Area:	
Deep Draft Access:	Yes	Undeveloped land within Urban Areas	
		Wetlands W/I Mapped Area (ac):	0.00
		Wetlands Impacted (ac):	0.00

Site Narrative:

Site B-5A is a small parcel located on a barrier island fronting Ocean Boulevard (SR A1A). The nearly 6-acre undeveloped site had been completely cleared of trees and contains several piles of rubble. The site was mapped as undeveloped land within urban areas (191) and was posted as a construction site. While this suggests imminent development, no obvious construction activity was underway. Vegetation was generally low growing, herbaceous species including rose natalgrass (*Rhynchelytrum repens*), beggarticks (*Bidens alba*), sand spur (*Cenchrus* sp.), and beach sunflower (*Helianthus debilis*). A few scattered trees and shrubs occur on the property including Brazilian pepper (*Schinus terebinthifolius*), cabbage palm (*Sabal palmetto*), and Australian pine (*Casuarina equisetifolia*). The portion of the ICWW shoreline along the northern end of the property dropped off steeply to the waterway. Along the southern part of the property, the land sloped gradually to the water's edge.

Adjacent land uses include low-rise apartments to the north and south, Ocean Boulevard to the east, and the ICWW to the west. Site MSA FO 710 is located directly across the ICWW from Site B-5A.



LEGEND B-8

		ACRES
191	UNDEVELOPED LAND WITHIN URBAN AREAS	10.43
193	URBAN LAND IN TRANSITION	8.33
	TOTAL ACRES	18.76

OTHER COVER TYPES SHOWN

121	FIXED SINGLE FAMILY UNITS
141	RETAIL SALES AND SERVICES
171	EDUCATIONAL FACILITIES
172	RELIGIOUS

LAND USE AND VEGETATION OF CANDIDATE SITE B-8, BROWARD COUNTY, FLORIDA

TAYLOR ENGINEERING INC.
9000 CYPRESS GREEN DRIVE, SUITE 200
JACKSONVILLE, FLORIDA 32256

Figure B-7
Land Use and Vegetation
of Candidate Site B-8
Broward County, Florida

PROJECT C9920
REVISION
SHEET
DATE Aug., 2000

SITE DATA SUMMARY SHEET

Name: B-8

AKA:

Site Use: Multi-Reach Inland Storage

Comment: "Building Site under Construction" sign in the central part of the site. Burrowing Owl Observed

LOCATION

County:	Broward	**ICWW Reach Mileage:**	314.64
Municipality:	Pompano Beach	**East/West of**	West
Section/Township/Range:	26/48/42 & 35/48/42	**Receiving Waterbody:**	N/A
		FDEP	N/A

REACH

Reach Designation:	BW-2	**Projected Dredging Frequency (yr):**	20
Reach Length (mi):	7.06	**50-yr Dredging Requirement (cy):**	5,703
ICWW Mileage:	313.98 to 321.04	**50-yr Storage Requirement (cy):**	12,262
Cut/Station:	BW-22/0+00 to BW-32/0+00		
Geographic: (FDEP Classification)	1,600 ft north of 14th St. Bridge (S.R. 844) to 5,100 ft south of Oakland Park Blvd. Bridge	(III) to (III)	

SITE PARAMETERS

Mapped Area (ac):	18.76	**Storage Capacity (cy):**	N/A
Containment Area (ac):	N/A	**Dike Height (ft):**	N/A
Impacted Area (ac):	Insufficient Area	**Excavation Depth (ft):**	N/A
Buffer Area (ac):	N/A	**Existing Mean Site Elevation (ft):**	10.0
N Buffer Width (ft):	N/A	**Dike Volume (cy):**	N/A
S Buffer Width (ft):	N/A	**Max. Pumping Distance (mi):**	N/A
E Buffer Width (ft):	N/A	**Max. Barging Distance (mi):**	N/A
W Buffer Width (ft):	N/A	**Min. Distance from Waterway (mi):**	2.72
Total Site Area (ac):	N/A		

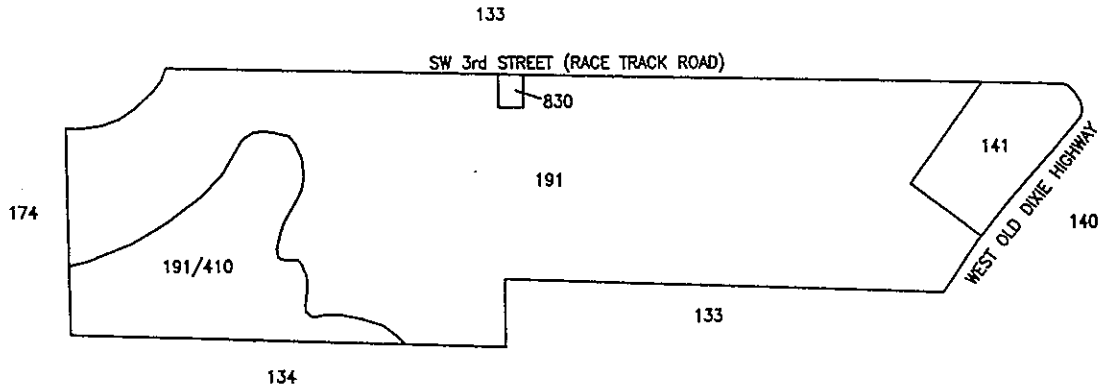
SITE

Public Access:	NW 15th St, 6th Ave	**Comprehensive Plan Designation:**	M
		Adjacent Land Use:	
Road Easement (ft):	Not Required	Fixed single-family units (N); Retail & Services and Undeveloped Land (E); School (S); Church (W)	
Pipeline Easement (ft):	N/A	**Land Use of Impacted Area:**	
Deep Draft Access:	N/A	N/A	
		Wetlands W/I Mapped Area (ac):	0.00
		Wetlands Impacted (ac):	0.00

Site Narrative:

Site B-8 is a 19-acre site at the southwest corner of NW 15th Street and 6th Avenue. The property has a building site under construction sign in the central part of the site; however, no recent building activity appears to have taken place. This area was mapped as urban land in transition (193) because the intended use of the property was unapparent. Undeveloped areas to the east and west of this building site were mapped as undeveloped urban land within urban areas (191). Vegetation on the property consisted of low-growing herbaceous species and grasses such as Bermuda grass (*Cynodon dactylon*), broom sedge (*Andropogon* sp.), and matchheads (*Phyla nodiflora*). The site appears to receive occasional mowing. Few trees or shrubs occurred on Site B-8 except for some cabbage palm (*Sabal palmetto*) and Brazilian pepper *(Schinus terebinthifolius*) growing near the railroad track along the southern border. A burrowing owl at its burrow was observed on the western side of the property. The State of Florida lists this species of owl as a Species of Special Concern.

Adjacent land uses include fixed single-family units to the north, retail sales and services, and undeveloped land to the east, a school located just south of the railroad track, and a church located to the west.



	LEGEND B-11	ACRES
141	RETAIL SALES AND SERVICES	.82
191	UNDEVELOPED LAND WITHIN URBAN AREAS	9.72
191/410	UNDEVELOPED LAND WITHIN URBAN AREAS/ UPLAND CONIFEROUS FORESTS	1.87
830	UTILITIES	.05
	TOTAL ACRES	12.46

	OTHER COVER TYPES SHOWN
133	MULTIPLE DWELLING UNITS, LOW RISE
134	MULTIPLE DWELLING UNITS, HIGH RISE
140	COMMERCIAL AND SERVICES
174	MEDICAL AND HEALTH CARE

N

GRAPHIC SCALE

0 75 150 300

SCALE IN FEET

LAND USE AND VEGETATION OF CANDIDATE SITE B-11, BROWARD COUNTY, FLORIDA

TAYLOR ENGINEERING INC.
9000 CYPRESS GREEN DRIVE, SUITE 200
JACKSONVILLE, FLORIDA 32256

Figure B-8
Land Use and Vegetation
of Candidate Site B-11
Broward County, Florida

PROJECT C9920
REVISION
SHEET
DATE Aug., 2000

SITE DATA SUMMARY SHEET

Name: B-11

AKA:

Site Use: Multi-Reach Inland Storage

Comment: Narrow piece of land with insufficient area for 350-ft setback

LOCATION

County:	Broward	**ICWW Reach Mileage:**	315.98
Municipality:	Pompano Beach	**East/West of**	West
Section/Township/Range:	2/49/42	**Receiving Waterbody:**	N/A
		FDEP	N/A

REACH

Reach Designation:	BW-2			**Projected Dredging Frequency (yr):**	20
Reach Length (mi):	7.06			**50-yr Dredging Requirement (cy):**	5,703
ICWW Mileage:	313.98	to	321.04	**50-yr Storage Requirement (cy):**	12,262
Cut/Station:	BW-22/0+00	to	BW-32/0+00		
Geographic: (FDEP Classification)	1,600 ft north of 14th St. Bridge (S.R. 844)		(III) to		
	5,100 ft south of Oakland Park Blvd. Bridge		(III)		

SITE PARAMETERS

Mapped Area (ac):	12.46	**Storage Capacity (cy):**	N/A
Containment Area (ac):	N/A	**Dike Height (ft):**	N/A
Impacted Area (ac):	Insufficient Area	**Excavation Depth (ft):**	N/A
Buffer Area (ac):	N/A	**Existing Mean Site Elevation (ft):**	10.0
N Buffer Width (ft):	N/A	**Dike Volume (cy):**	N/A
S Buffer Width (ft):	N/A	**Max. Pumping Distance (mi):**	N/A
E Buffer Width (ft):	N/A	**Max. Barging Distance (mi):**	N/A
W Buffer Width (ft):	N/A	**Min. Distance from Waterway (mi):**	2.24
Total Site Area (ac):	N/A		

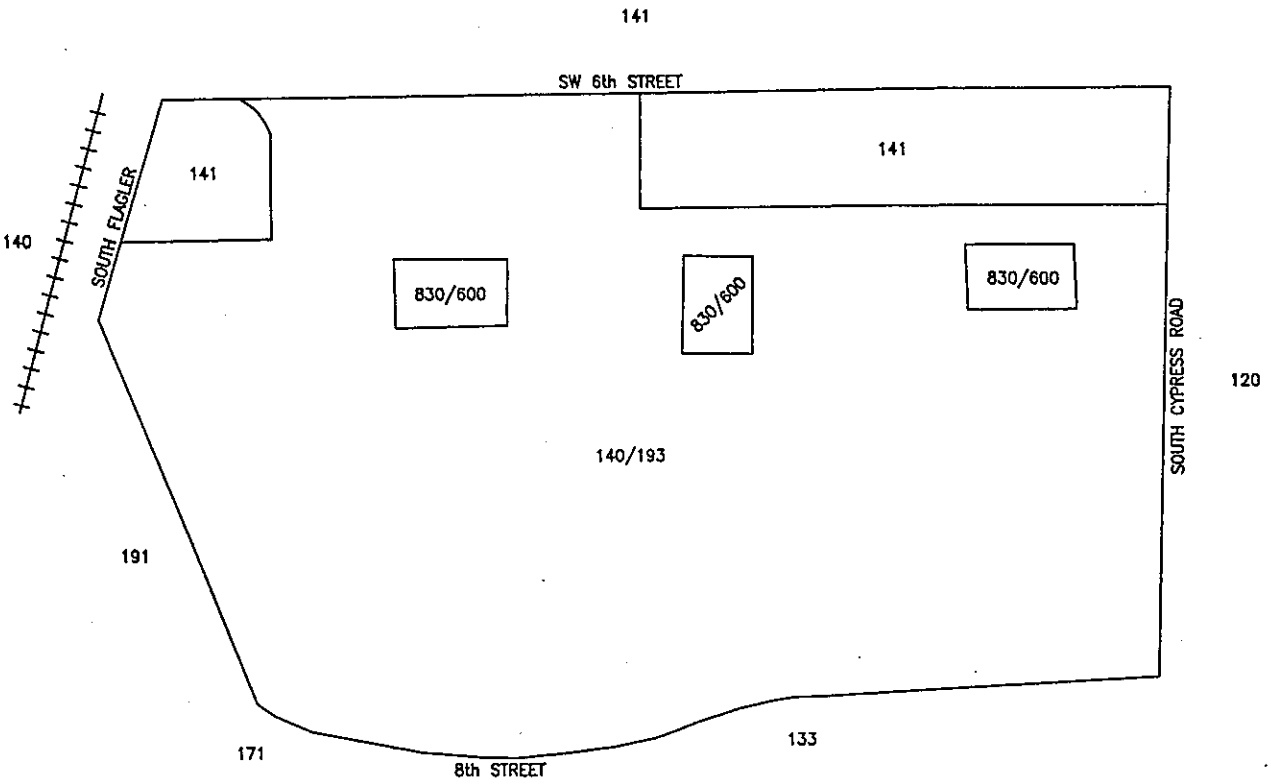
SITE

Public Access:	SW 3rd St, W Old Dixie Hwy	**Comprehensive Plan Designation:**	CF, C, MH
		Adjacent Land Use:	
Road Easement (ft):	Not Required	Low-rise apartments (N); Commercial property (E); Low & High-rise apartments (S); Medical Facility (W)	
Pipeline Easement (ft):	N/A	**Land Use of Impacted Area:**	
Deep Draft Access:	N/A	N/A	
		Wetlands W/I Mapped Area (ac):	0.00
		Wetlands Impacted (ac):	0.00

Site Narrative:

Site B-11, a 12-acre parcel located south of Race Track Road, was primarily mapped as undeveloped land within urban areas (191). The regularly mowed, grassy site contains small clumps of trees including young live oak (*Quercus virginiana*), cabbage palm (*Sabal palmetto*), and Brazilian pepper (*Schinus terebinthifolius*). The low grass ground cover includes St. Augustine grass (*Stenotaphrum secundatum*), finger grass (*Eustachys* sp.), and Bahia grass (*Paspalum notatum*). A small area adjacent to Race Track Road was designated as utilities (830) given the large pipes and valves protruding from a concrete slab. The southwest corner of the property, with a tall, mature slash pine overstory, was mapped as undeveloped land within urban areas/upland coniferous forest (191/410). A small restaurant and another commercial establishment occur on the northeast corner of the property.

Adjacent land uses include low-rise apartments to the north across Race Track Road, commercial property to the east, low-rise and high-rise apartments to the south, and a medical and health care facility to the west.



N

GRAPHIC SCALE

0 75 150 300

SCALE IN FEET

LEGEND B-12

		ACRES
140/193	COMMERCIAL AND SERVICES/ URBAN LAND IN TRANSITION	29.33
141	RETAIL SALES AND SERVICES	4.43
830/600	UTILITIES/WETLANDS	1.20
	TOTAL ACRES	34.96

OTHER COVER TYPES SHOWN

120	RESIDENTIAL, MEDIUM DENSITY
133	MULTIPLE DWELLING UNITS, LOW RISE
171	EDUCATIONAL FACILITIES
191	UNDEVELOPED LAND WITHIN URBAN AREAS

LAND USE AND VEGETATION OF CANDIDATE SITE B-12, BROWARD COUNTY, FLORIDA

TAYLOR ENGINEERING INC.
9000 CYPRESS GREEN DRIVE, SUITE 200
JACKSONVILLE, FLORIDA 32256

Figure B-9
Land Use and Vegetation
of Candidate Site B-12
Broward County, Florida

PROJECT C9920
REVISION
SHEET
DATE Aug., 2000

SITE DATA SUMMARY SHEET

Name: B-12

AKA:

Site Use: Multi-Reach Inland Storage

Comment: Commercial Use – 35-acre shopping center in state of decline

LOCATION

County:	Broward	**ICWW Reach Mileage:**	316.29
Municipality:	Pompano Beach	**East/West of**	West
Section/Township/Range:	2/49/42	**Receiving Waterbody:**	N/A
		FDEP	N/A

REACH

Reach Designation:	BW-2	**Projected Dredging Frequency (yr):**	20
Reach Length (mi):	7.06	**50-yr Dredging Requirement (cy):**	5,703
ICWW Mileage:	313.98 to 321.04	**50-yr Storage Requirement (cy):**	12,262
Cut/Station:	BW-22/0+00 to BW-32/0+00		
Geographic: (FDEP Classification)	1,600 ft north of 14th St. Bridge (S.R. 844) (III) to 5,100 ft south of Oakland Park Blvd. Bridge (III)		

SITE PARAMETERS

Mapped Area (ac):	34.96	**Storage Capacity (cy):**	72,600
Containment Area (ac):	N/A	**Dike Height (ft):**	N/A
Impacted Area (ac):	5.60	**Excavation Depth (ft):**	N/A
Buffer Area (ac):	29.36	**Existing Mean Site Elevation (ft):**	5.0
N Buffer Width (ft):	100	**Dike Volume (cy):**	N/A
S Buffer Width (ft):	350	**Max. Pumping Distance (mi):**	N/A
E Buffer Width (ft):	350	**Max. Barging Distance (mi):**	N/A
W Buffer Width (ft):	200	**Min. Distance from Waterway (mi):**	1.83
Total Site Area (ac):	34.96		

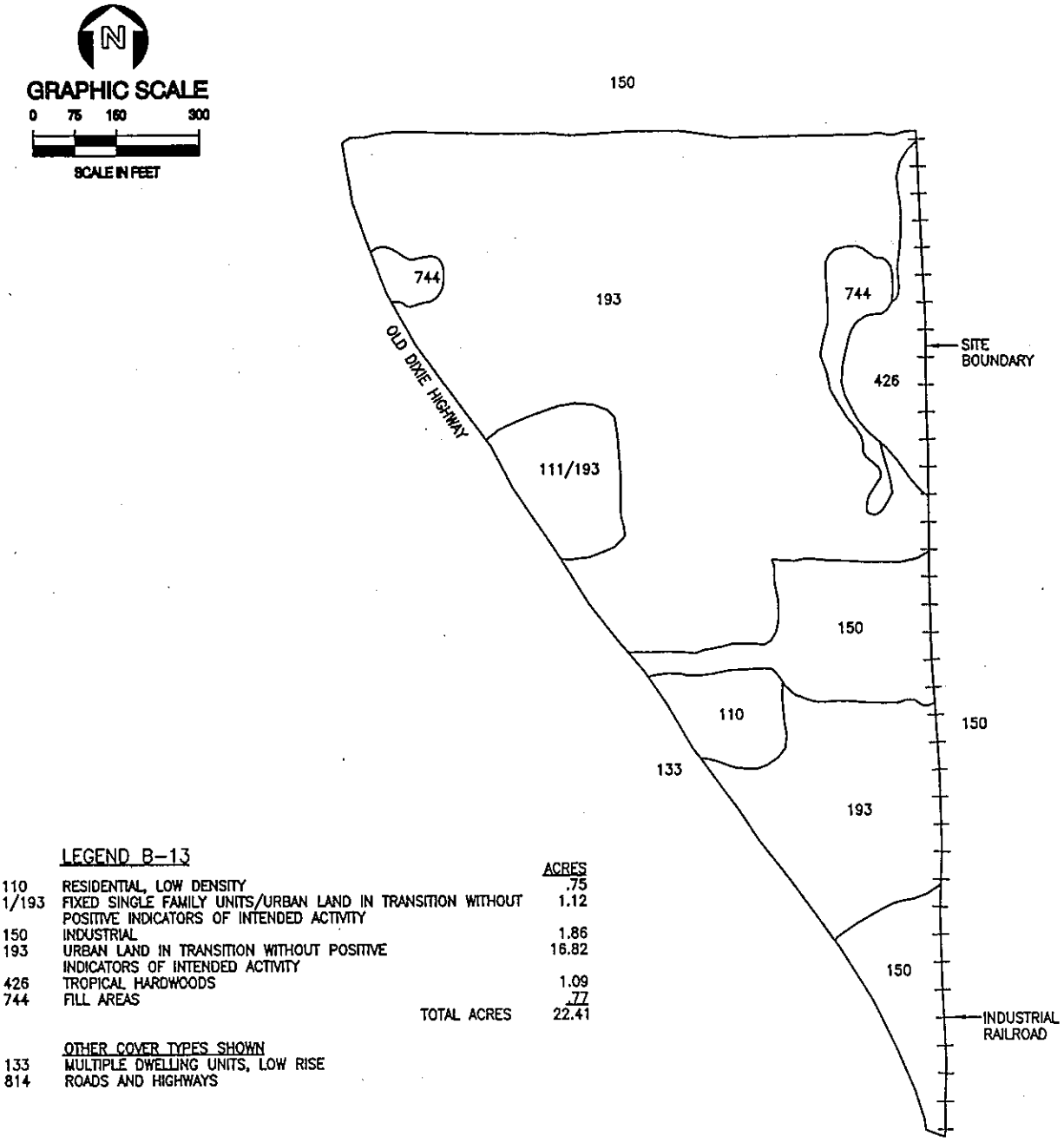
SITE

Public Access:	S Flagler, SW 8th St, S Cypress Rd	**Comprehensive Plan Designation:**	C
		Adjacent Land Use:	Retail & Services (N); Residential (E); Apartments & School (S); Undeveloped Land (SW); Railroad (W)
Road Easement (ft):	Not Required		
Pipeline Easement (ft):	N/A	**Land Use of Impacted Area:**	Commercial & Services; Utilities/Wetlands
Deep Draft Access:	N/A		
		Wetlands W/I Mapped Area (ac):	1.20
		Wetlands Impacted (ac):	0.75

Site Narrative:

Site B-12, a 35-acre shopping center in a state of decline, had only a few occupied stores. This portion of the site was mapped as commercial and services and urban land in transition (140/193). Posted notices included a "for sale" sign, a notice of zoning change, and a sign advertising a new "yachting center coming." Three stormwater retention ponds were located in the parking lot. Mapped as utilities/wetland (830/600), the ponds were vegetated with Carolina willow (*Salix caroliniana*) and cattail (*Typha* sp.). The retail sales and services (141) occurred along SW 6th Avenue in front of the shopping center.

Adjacent land uses include retail sales and services to the north, residential to the east, apartments and a school to the south, undeveloped land to the southwest, and a railroad and South Flagler Avenue to the west.



LEGEND B-13

		ACRES
110	RESIDENTIAL, LOW DENSITY	.75
111/193	FIXED SINGLE FAMILY UNITS/URBAN LAND IN TRANSITION WITHOUT POSITIVE INDICATORS OF INTENDED ACTIVITY	1.12
150	INDUSTRIAL	1.86
193	URBAN LAND IN TRANSITION WITHOUT POSITIVE INDICATORS OF INTENDED ACTIVITY	16.82
426	TROPICAL HARDWOODS	1.09
744	FILL AREAS	.77
	TOTAL ACRES	22.41

OTHER COVER TYPES SHOWN

133	MULTIPLE DWELLING UNITS, LOW RISE
814	ROADS AND HIGHWAYS

LAND USE AND VEGETATION OF CANDIDATE SITE B-13, BROWARD COUNTY, FLORIDA

TAYLOR ENGINEERING INC.
9000 CYPRESS GREEN DRIVE, SUITE 200
JACKSONVILLE, FLORIDA 32256

Figure B-10
Land Use and Vegetation
of Candidate Site B-13
Broward County, Florida

PROJECT C9920
REVISION
SHEET
DATE Aug., 2000

SITE DATA SUMMARY SHEET

Name: B-13

AKA:

Site Use: Multi-Reach Inland Storage

Comment: Combination of urban, disturbed land, and vegetation communities

LOCATION

County:	Broward	**ICWW Reach Mileage:**	319.34
Municipality:	Oakland Park	**East/West of**	West
Section/Township/Range:	23/49/42	**Receiving Waterbody:**	N/A
		FDEP	N/A

REACH

Reach Designation:	BW-2			**Projected Dredging Frequency (yr):**	20
Reach Length (mi):	7.06			**50-yr Dredging Requirement (cy):**	5,703
ICWW Mileage:	313.98	**to**	321.04	**50-yr Storage Requirement (cy):**	12,262
Cut/Station:	BW-22/0+00	**to**	BW-32/0+00		
Geographic: (FDEP Classification)	1,600 ft north of 14th St. Bridge (S.R. 844) (III) to 5,100 ft south of Oakland Park Blvd. Bridge (III)				

SITE PARAMETERS

Mapped Area (ac):	22.41	**Storage Capacity (cy):**	72,600
Containment Area (ac):	N/A	**Dike Height (ft):**	N/A
Impacted Area (ac):	5.60	**Excavation Depth (ft):**	N/A
Buffer Area (ac):	16.81	**Existing Mean Site Elevation (ft):**	5.0
N Buffer Width (ft):	200	**Dike Volume (cy):**	N/A
S Buffer Width (ft):	350	**Max. Pumping Distance (mi):**	N/A
E Buffer Width (ft):	100	**Max. Barging Distance (mi):**	N/A
W Buffer Width (ft):	150	**Min. Distance from Waterway (mi):**	1.79
Total Site Area (ac):	22.41		

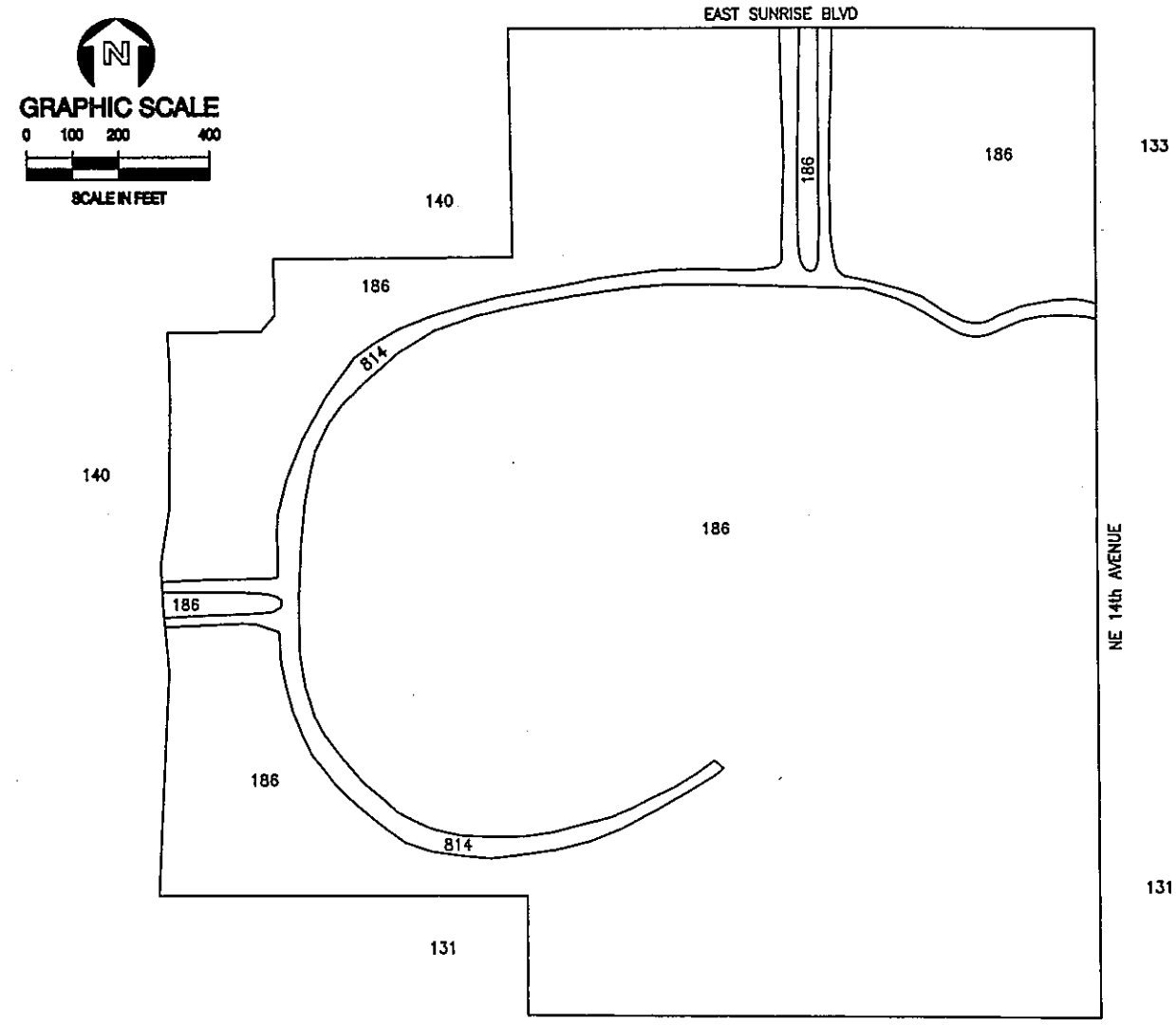
SITE

Public Access:	Old Dixie Hwy	**Comprehensive Plan Designation:**	C
		Adjacent Land Use:	
Road Easement (ft):	Not Required	Unidentified light industrial (N, E); Apartments (S, W)	
Pipeline Easement (ft):	N/A	**Land Use of Impacted Area:**	
Deep Draft Access:	N/A	Urban land in transition, Fill Areas, Tropical Hardwoods	
		Wetlands W/I Mapped Area (ac):	0.00
		Wetlands Impacted (ac):	0.00

Site Narrative:

Site B-13, a 22-acre parcel, contains a variety of disturbed land use, urban, and vegetative communities. Urban land in transition without positive indicators of intended activity (193) is the dominant land use type. Land clearing has disturbed this area resulting in little remaining natural vegetation. In some of the small areas with the topsoil removed, wetland vegetation has colonized the "low spots." However, these areas were not mapped separately. Other land use and communities include an abandoned single-family home site (111/193), light industrial (150), and small areas of fill (744). A small area of degraded tropical hardwoods (426) is located along the eastern fence line, which contains laurel oak (*Quercus laurifolia*), strangler fig (*Ficus aurea*), and other hardwoods. Other than the low-quality tropical hardwood community, no other natural vegetation communities occur on site; vegetation encountered includes an occasional exotic ornamental shrub or tree.

The parcel fronts Old Dixie Highway (814) on the west, unidentified light industrial (150) lie to the north and east, and apartments are located across (133) Old Dixie Highway to the south and west.



	LEGEND B-14	ACRES
186	COMMUNITY RECREATIONAL FACILITIES	83.12
814	ROADS AND HIGHWAYS	4.11
	TOTAL ACRES	87.23

	OTHER COVER TYPES SHOWN
131	FIXED SINGLE FAMILY UNITS
133	MULTIPLE DWELLING UNITS, LOW RISE
140	COMMERCIAL AND SERVICES

LAND USE AND VEGETATION OF CANDIDATE SITE B-14, BROWARD COUNTY, FLORIDA

TAYLOR ENGINEERING INC.
9000 CYPRESS GREEN DRIVE, SUITE 200
JACKSONVILLE, FLORIDA 32256

Figure B-11
Land Use and Vegetation
of Candidate Site B-14
Broward County, Florida

PROJECT C9920
REVISION
SHEET
DATE Aug., 2000

SITE DATA SUMMARY SHEET

Name: B-14

AKA: Holiday Park

Site Use: Multi-Reach Inland Storage

Comment: Recreational Use -- soccer, tennis, baseball/softball facilities

LOCATION

County:	Broward	**ICWW Reach Mileage:**	322.53
Municipality:	Fort Lauderdale	**East/West of**	West
Section/Township/Range:	2/50/42	**Receiving Waterbody:**	N/A
		FDEP	N/A

REACH

Reach Designation:	BW-3			**Projected Dredging Frequency (yr):**	20
Reach Length (mi):	13.2			**50-yr Dredging Requirement (cy):**	921
ICWW Mileage:	321.04	to	334.24	**50-yr Storage Requirement (cy):**	1,980
Cut/Station:	BW-32/0+00	to	DA-1/0+00		
Geographic: (FDEP Classification)	5,100 ft south of Oakland Park Blvd. Bridge (III) to 530 ft south of Broward/Dade County Line (III)				

SITE PARAMETERS

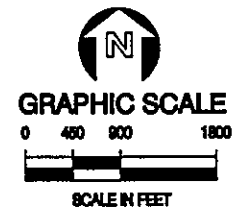
Mapped Area (ac):	87.23	**Storage Capacity (cy):**	72,600
Containment Area (ac):	N/A	**Dike Height (ft):**	N/A
Impacted Area (ac):	5.60	**Excavation Depth (ft):**	N/A
Buffer Area (ac):	27.18	**Existing Mean Site Elevation (ft):**	10.0
N Buffer Width (ft):	350	**Dike Volume (cy):**	N/A
S Buffer Width (ft):	350	**Max. Pumping Distance (mi):**	N/A
E Buffer Width (ft):	350	**Max. Barging Distance (mi):**	N/A
W Buffer Width (ft):	350	**Min. Distance from Waterway (mi):**	1.27
Total Site Area (ac):	32.78		

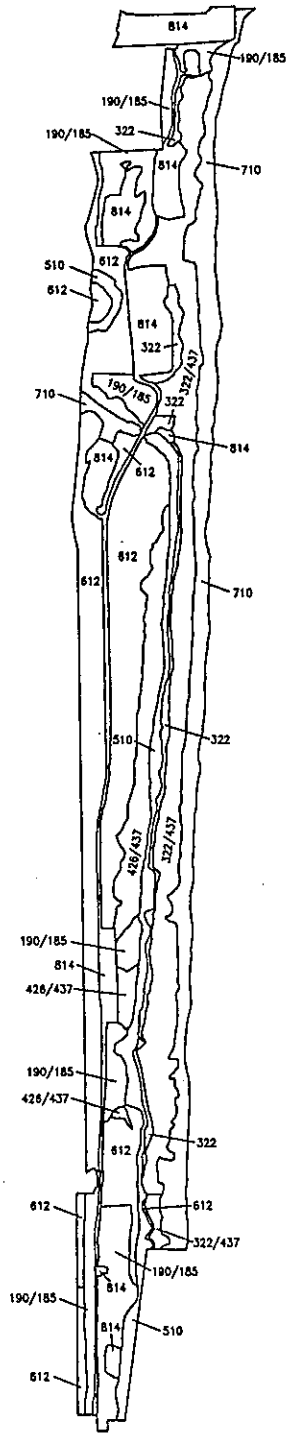
SITE

Public Access:	E Sunrise Blvd, NE 14th Ave	**Comprehensive Plan Designation:**	R&O
		Adjacent Land Use:	
Road Easement (ft):	Not Required	East Sunrise Blvd & Commercial business (N); NE 14th Ave (E); Residential high-density (S); Commercial (W)	
Pipeline Easement (ft):	N/A	**Land Use of Impacted Area:**	
Deep Draft Access:	N/A	Community recreational facilities	
		Wetlands W/I Mapped Area (ac):	0.00
		Wetlands Impacted (ac):	0.00

Site Narrative:

This 87-acre site, B-14, is a large community recreation facility (186) called Holiday Park. Little natural vegetation exists with the exception of some tree canopy cover that occurs in the center of the site. The park contains soccer, tennis, baseball/softball facilities, and several large structures. The site is bounded on the north by East Sunrise Boulevard and a commercial business (140). The eastern boundary is N.E. 14th Avenue, the south is residential high-density (131), and the west boundary also appears to be commercial (140).





	LEGEND B-15/MSA 784	ACRES
190/185	OPEN LAND/PARKS AND ZOOS	34.93
322	COASTAL SCRUB	9.91
322/437	COASTAL SCRUB/AUSTRALIAN PINE	53.44
426/437	TROPICAL HARDWOODS/AUSTRALIAN PINE	18.79
510	STREAMS AND WATERWAYS	21.21
612	MANGROVE SWAMP	86.55
710	BEACHES	42.34
814	ROADS AND HIGHWAYS	42.09
	TOTAL ACRES	309.26

LAND USE AND VEGETATION OF CANDIDATE SITE B-15/MSA 784, BROWARD COUNTY, FLORIDA

TAYLOR ENGINEERING INC.
9000 CYPRESS GREEN DRIVE, SUITE 200
JACKSONVILLE, FLORIDA 32256

Figure B-12
Land Use and Vegetation of
Candidate Site B-15/MSA 748
Broward County, Florida

PROJECT	C9920
REVISION	
SHEET	
DATE	Aug., 2000

SITE DATA SUMMARY SHEET

Name: B-15 /MSA 784

AKA: John U. Lloyd State Recreation Area

Site Use: Dewatering & Short-Term Storage (Single Operation)

Comment: 86.6-acre Mangrove Swamp, 42.3-acre Beach; 5.2-acre MSA 784 (bisected by road)

LOCATION

County:	Broward	**ICWW Reach Mileage:**	327.74
Municipality:	Hollywood	**East/West of**	East
Section/Township/Range:	25/50/42	**Receiving Waterbody:**	ICWW
		FDEP	(III)

REACH

Reach Designation:	BW-3			**Projected Dredging Frequency (yr):**	20
Reach Length (mi):	13.2			**50-yr Dredging Requirement (cy):**	921
ICWW Mileage:	321.04	**to**	334.24	**50-yr Storage Requirement (cy):**	1,980
Cut/Station:	BW-32/0+00	**to**	DA-1/0+00		
Geographic: (FDEP Classification)	5,100 ft south of Oakland Park Blvd. Bridge (III) to 530 ft south of Broward/Dade County Line (III)				

SITE PARAMETERS

Mapped Area (ac):	309.26	**Storage Capacity (cy):**	N/A
Containment Area (ac):	Insufficient Area	**Dike Height (ft):**	N/A
Impacted Area (ac):	N/A	**Excavation Depth (ft):**	N/A
Buffer Area (ac):	N/A	**Existing Mean Site Elevation (ft):**	5.0
N Buffer Width (ft):	N/A	**Dike Volume (cy):**	N/A
S Buffer Width (ft):	N/A	**Max. Pumping Distance (mi):**	6.7
E Buffer Width (ft):	N/A	**Max. Barging Distance (mi):**	N/A
W Buffer Width (ft):	N/A	**Min. Distance from Waterway (mi):**	N/A
Total Site Area (ac):	N/A		

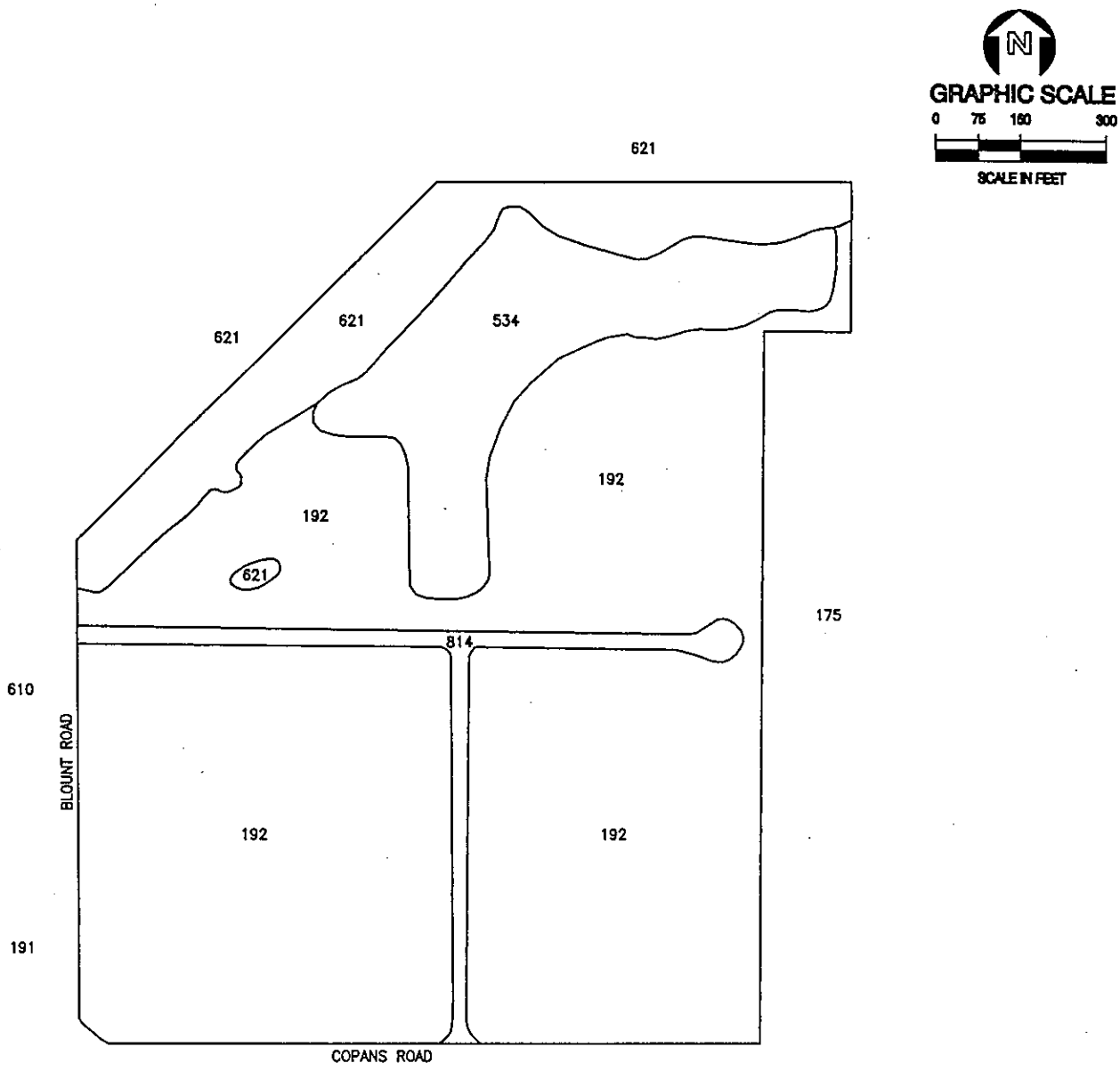
SITE

Public Access:	Ocean Dr	**Comprehensive Plan Designation:**	R&O
		Adjacent Land Use:	
Road Easement (ft):	Not Required	Government lands (N); Atlantic Ocean (E); ICWW (W)	
Pipeline Easement (ft):	Not Required	**Land Use of Impacted Area:**	
Deep Draft Access:	N/A	N/A	
		Wetlands W/I Mapped Area (ac):	86.55
		Wetlands Impacted (ac):	0.00

Site Narrative:

Site B-15/MSA 784 is a 309-acre oceanfront area that consists mostly of John U. Lloyd Beach State Recreation Area. The park borders the Atlantic Ocean on the east and the Intracoastal Waterway (ICWW) on the west. Ocean Drive, a paved highway (814), runs the length of the park and provides access to parking areas (814) and beach sites. Much of the property consists of mangrove swamp (612) that borders the ICWW and the New River Sound. The New River Sound is an internal waterway that connects to the ICWW on its northern and southern ends. The forested areas of the park are a combination of tropical hardwoods/Australian pine (426/437). Areas that have been cleared and are maintained in grasses or low herbaceous vegetation are shown as (190/185). A band of coastal scrub occurs adjacent to the beach (322) with some areas containing stands of Australian pine (322/437). Recreational uses of the park include swimming and fishing.

Adjacent land uses include government lands to the north, the Atlantic Ocean to the east, and the ICWW to the west.



	LEGEND B-17	ACRES
192	INACTIVE LAND WITH STREET PATTERN, BUT WITHOUT STRUCTURES	27.92
534	RESERVOIRS LESS THAN 10 ACRES WHICH ARE DOMINANT FEATURES	4.80
621	CYPRESS	4.24
814	ROADS AND HIGHWAYS	1.28
	TOTAL ACRES	38.24

OTHER COVER TYPES SHOWN

142	WHOLESALE SALES AND SERVICES
175	GOVERNMENTAL
191	UNDEVELOPED LAND WITHIN URBAN AREAS
610	WETLAND HARDWOOD FORESTS

LAND USE AND VEGETATION OF CANDIDATE SITE B-17, BROWARD COUNTY, FLORIDA

TAYLOR ENGINEERING INC.
9000 CYPRESS GREEN DRIVE, SUITE 200
JACKSONVILLE, FLORIDA 32256

Figure B-13
Land Use and Vegetation
of Candidate Site B-17
Broward County, Florida

PROJECT 9920
REVISION
SHEET
DATE Sept., 2000

SITE DATA SUMMARY SHEET

Name: B-17

AKA:

Site Use: Multi-Reach Inland Storage

Comment: New industrial park development (paved streets and drainage infrastructure)

LOCATION

County:	Broward	**ICWW Reach Mileage:**	313.33
Municipality:	Unincorporated	**East/West of**	West
Section/Township/Range:	21/48/42	**Receiving Waterbody:**	N/A
		FDEP	N/A

REACH

Reach Designation:	BW-1			**Projected Dredging Frequency (yr):**	10
Reach Length (mi):	4.74			**50-yr Dredging Requirement (cy):**	27,020
ICWW Mileage:	309.24	**to**	313.98	**50-yr Storage Requirement (cy):**	58,092
Cut/Station:	BW-1/0+00	**to**	BW-22/0+00		
Geographic: (FDEP Classification)	650 ft south of Palm Beach/Broward County (III) to 1,600 ft north of 14th St. Bridge (S.R. 844) (III)				

SITE PARAMETERS

Mapped Area (ac):	38.24	**Storage Capacity (cy):**	72,600
Containment Area (ac):	N/A	**Dike Height (ft):**	N/A
Impacted Area (ac):	5.60	**Excavation Depth (ft):**	N/A
Buffer Area (ac):	15.91	**Existing Mean Site Elevation (ft):**	15.0
N Buffer Width (ft):	200	**Dike Volume (cy):**	N/A
S Buffer Width (ft):	200	**Max. Pumping Distance (mi):**	N/A
E Buffer Width (ft):	200	**Max. Barging Distance (mi):**	N/A
W Buffer Width (ft):	200	**Min. Distance from Waterway (mi):**	4.72
Total Site Area (ac):	21.51		

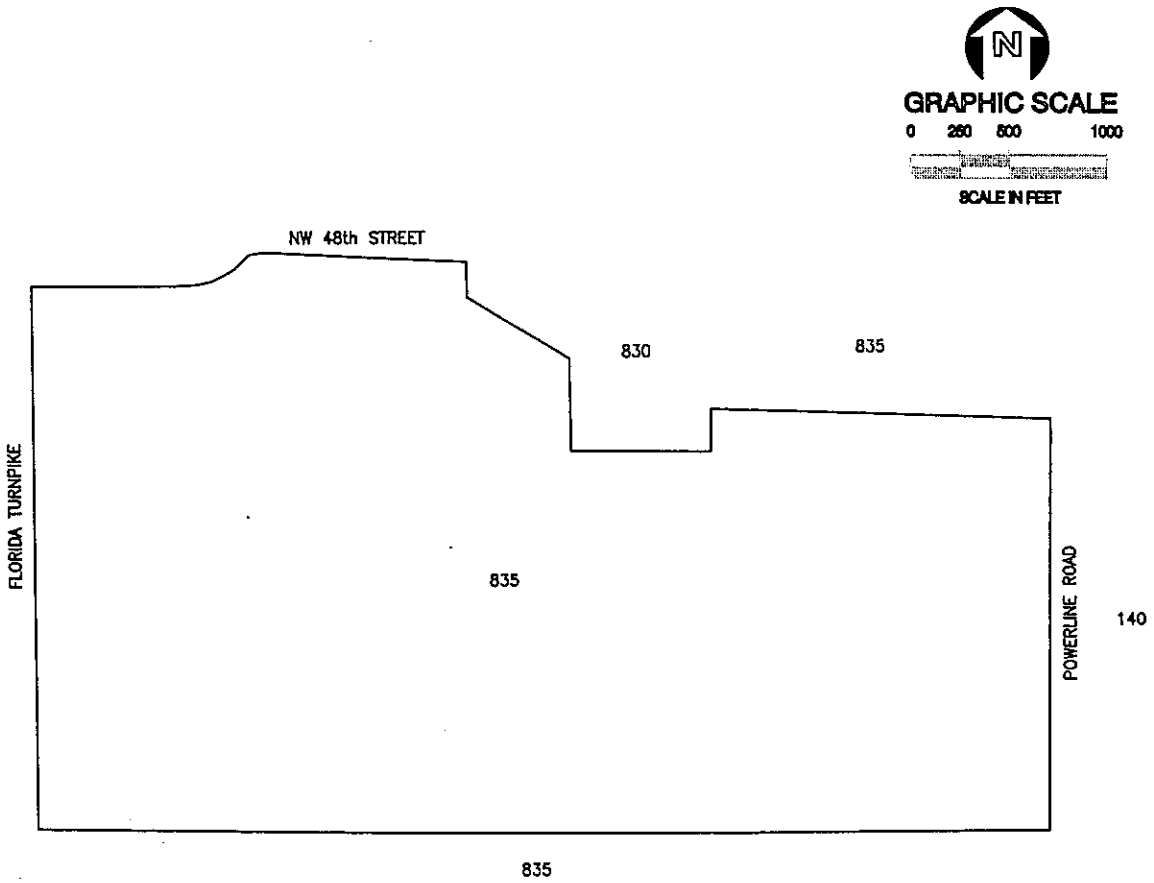
SITE

Public Access:	Blount Rd, Copans Rd	**Comprehensive Plan Designation:**	I
		Adjacent Land Use:	
Road Easement (ft):	Not Required	Cypress (N); Governmental (E); Copans Rd & Warehouses (S); Wetland Hardwood Forest (W)	
Pipeline Easement (ft):	N/A	**Land Use of Impacted Area:**	
Deep Draft Access:	N/A	Inactive land with street pattern, Roads	
		Wetlands W/I Mapped Area (ac):	4.24
		Wetlands Impacted (ac):	0.00

Site Narrative:

Site B-17, a new 38-acre industrial park development, presently without buildings, contains recently completed paved streets and drainage infrastructure (192). Most of the land was recently cleared and some weedy growth of vegetation was apparent. Species present, indicative of the recent disturbance, include species such as dog fennel (*Eupatorium capillifolium*), ragweed (*Ambrosia artemisiifolia*), sandspur (*Cenchrus* sp.), caesarweed (*Urena lobata*), beggarticks (*Bidens alba*), and ironweed (*Sida rhombifolia*). A large retention basin (534) occurs in the northern portion of the site. Cattail (*Typha* sp.) and primrose willow (*Ludwigia peruviana*) vegetate the margins of the basin. A stand of cypress (621) is located to the north and west of the retention pond. Species observed in this community include bald cypress (*Taxodium distichum*), Virginia chain fern (*Woodwardia virginica*), and Brazilian pepper (*Schinus terebinthifolius*). One small remnant cypress wetland occurs within the undeveloped industrial area.

Adjacent land uses include cypress to the north, governmental to the east, Copans Road and warehouses to the south, and undeveloped land and wetland hardwood forest to the west.



LEGEND B-18

		ACRES
835	SOLID WASTE DISPOSAL	306.36

OTHER COVER TYPES SHOWN

140	COMMERCIAL AND SERVICES
830	UTILITIES

LAND USE AND VEGETATION OF CANDIDATE SITE B-18, BROWARD COUNTY, FLORIDA

TAYLOR ENGINEERING INC.
9000 CYPRESS GREEN DRIVE, SUITE 200
JACKSONVILLE, FLORIDA 32256

Figure B-14
Land Use and Vegetation
of Candidate Site B-18
Broward County, Florida

PROJECT C9920
REVISION
SHEET
DATE Sept., 2000

SITE DATA SUMMARY SHEET

Name: B-18

AKA: Broward County Landfill

Site Use: Multi-Reach Inland Storage

Comment: Inactive portion of Broward County Landfill

LOCATION

County:	Broward	**ICWW Reach Mileage:**	311.75
Municipality:	Unincorporated	**East/West of**	West
Section/Township/Range:	16/48/42	**Receiving Waterbody:**	N/A
		FDEP	N/A

REACH

Reach Designation:	BW-1	**Projected Dredging Frequency (yr):**	10
Reach Length (mi):	4.74	**50-yr Dredging Requirement (cy):**	27,020
ICWW Mileage:	309.24 to 313.98	**50-yr Storage Requirement (cy):**	58,092
Cut/Station:	BW-1/0+00 to BW-22/0+00		
Geographic: (FDEP Classification)	650 ft south of Palm Beach/Broward County (III) to 1,600 ft north of 14th St. Bridge (S.R. 844) (III)		

SITE PARAMETERS

Mapped Area (ac):	306.36	**Storage Capacity (cy):**	72,600
Containment Area (ac):	N/A	**Dike Height (ft):**	N/A
Impacted Area (ac):	5.60	**Excavation Depth (ft):**	N/A
Buffer Area (ac):	27.18	**Existing Mean Site Elevation (ft):**	15.0
N Buffer Width (ft):	350	**Dike Volume (cy):**	N/A
S Buffer Width (ft):	350	**Max. Pumping Distance (mi):**	N/A
E Buffer Width (ft):	350	**Max. Barging Distance (mi):**	N/A
W Buffer Width (ft):	350	**Min. Distance from Waterway (mi):**	5.27
Total Site Area (ac):	32.78		

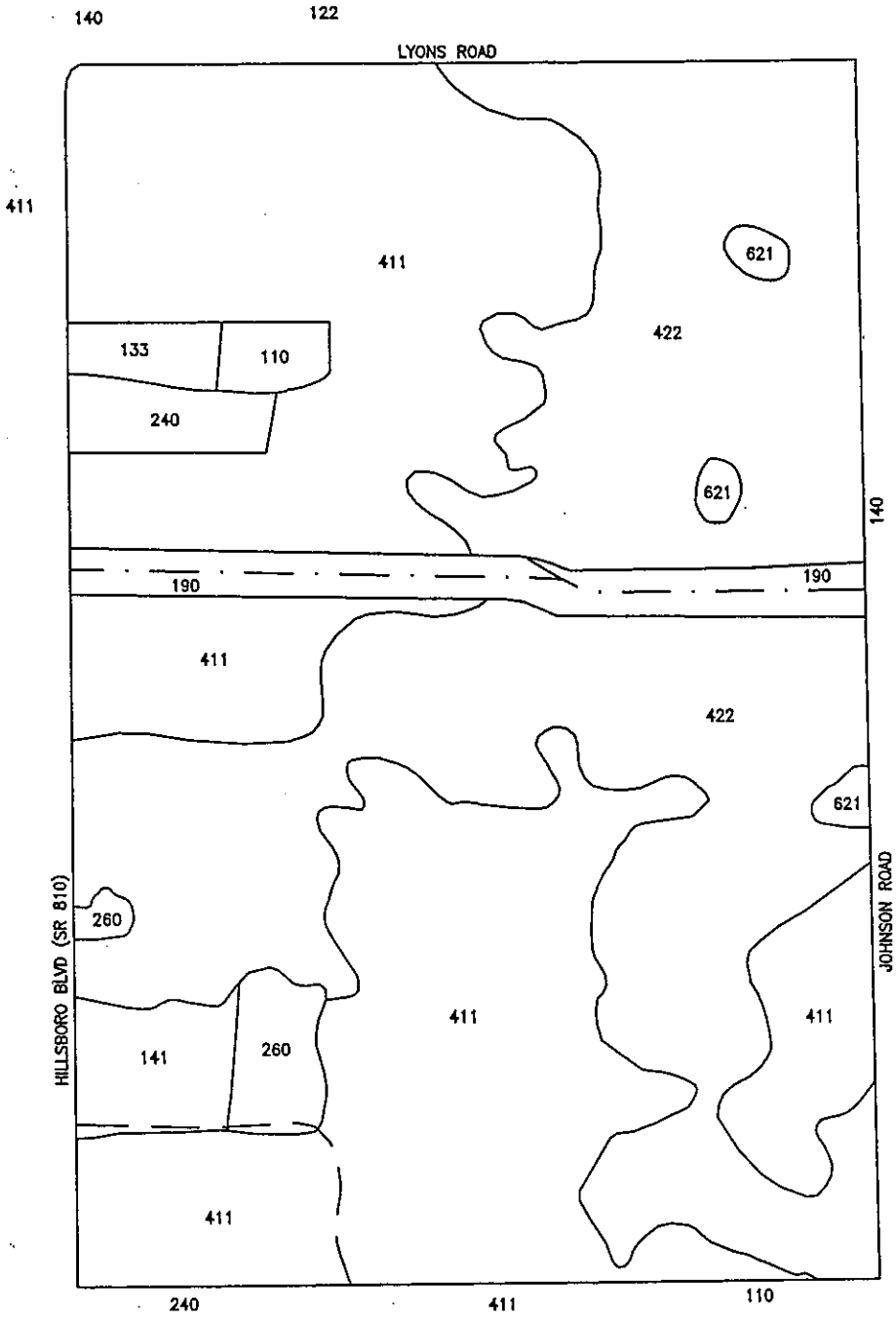
SITE

Public Access:	NW 48th St, Powerline Rd, FL Turnpike	**Comprehensive Plan Designation:**	I
		Adjacent Land Use:	
Road Easement (ft):	5,700	Utilities (N); Powerline Rd (E); Former landfill areas (S); Florida Turnpike (W)	
Pipeline Easement (ft):	N/A	**Land Use of Impacted Area:**	
Deep Draft Access:	N/A	Solid Waste Disposal	
		Wetlands W/I Mapped Area (ac):	0.00
		Wetlands Impacted (ac):	0.00

Site Narrative:

Site B-18 is a 306-acre county landfill facility. In general, the site can be accessed from the north along N.W. 48th Street. However, the property had to be inspected from adjacent public roads because access is strictly controlled. The site contained mowed lawns with scattered support buildings associated with the landfill operation. Large earthen berms vegetated with grasses and low-growing herbs were apparent. Based on aerial photographs, a network of limerock roads provided access to two lightly vegetated and apparently active areas within the landfill. The northernmost active area also contained a water-filled borrow pit. Most other areas within the berms were vegetated by grasses. Land located south of the present operational landfill area probably once served as a landfill. A variety of cover types now vegetates this area.

Adjacent land uses include utilities (835) (perhaps some sort of energy recovery or salvage operation) to the north, Powerline Road to the east, former landfill areas to the south, and the Florida Turnpike to the west.



GRAPHIC SCALE

0 100 200 400

SCALE IN FEET

LEGEND B-21		ACRES
110	RESIDENTIAL, LOW DENSITY	.78
133	MULTIPLE DWELLING UNITS, LOW RISE	.95
141	RETAIL SALES AND SERVICES	2.13
190	OPEN LAND	3.88
240	NURSERIES AND VINEYARDS	1.45
260	OTHER OPEN LAND	1.66
411	PINE FLATWOODS	47.71
422	BRAZILIAN PEPPER	43.12
621	CYPRESS	.81
	TOTAL ACRES	102.49

OTHER COVER TYPES SHOWN

120 RESIDENTIAL, MEDIUM DENSITY
122 MOBILE HOME UNITS
140 COMMERCIAL AND SERVICES

DITCH
ROADS

LAND USE AND VEGETATION OF CANDIDATE SITE, B-21, BROWARD COUNTY, FLORIDA

TAYLOR ENGINEERING INC.
9000 CYPRESS GREEN DRIVE, SUITE 200
JACKSONVILLE, FLORIDA 32256

Figure B-15
Land Use and Vegetation
of Candidate Site B-21
Broward County, Florida

PROJECT C9920
REVISION
SHEET
DATE Sept., 2000

SITE DATA SUMMARY SHEET

Name: B-21

AKA:

Site Use: Multi-Reach Inland Storage

Comment: Predominantly undeveloped land

LOCATION

County:	Broward	**ICWW Reach Mileage:**	309.66
Municipality:	Unincorporated	**East/West of**	West
Section/Township/Range:	6/48/42	**Receiving Waterbody:**	N/A
		FDEP	N/A

REACH

Reach Designation:	BW-1	**Projected Dredging Frequency (yr):**	10
Reach Length (mi):	4.74	**50-yr Dredging Requirement (cy):**	27,020
ICWW Mileage:	309.24 to 313.98	**50-yr Storage Requirement (cy):**	58,092
Cut/Station:	BW-1/0+00 to BW-22/0+00		
Geographic: (FDEP Classification)	650 ft south of Palm Beach/Broward County (III) to 1,600 ft north of 14th St. Bridge (S.R. 844) (III)		

SITE PARAMETERS

Mapped Area (ac):	102.49	**Storage Capacity (cy):**	72,600
Containment Area (ac):	N/A	**Dike Height (ft):**	N/A
Impacted Area (ac):	5.60	**Excavation Depth (ft):**	N/A
Buffer Area (ac):	27.18	**Existing Mean Site Elevation (ft):**	15.0
N Buffer Width (ft):	350	**Dike Volume (cy):**	N/A
S Buffer Width (ft):	350	**Max. Pumping Distance (mi):**	N/A
E Buffer Width (ft):	350	**Max. Barging Distance (mi):**	N/A
W Buffer Width (ft):	350	**Min. Distance from Waterway (mi):**	6.72
Total Site Area (ac):	32.78		

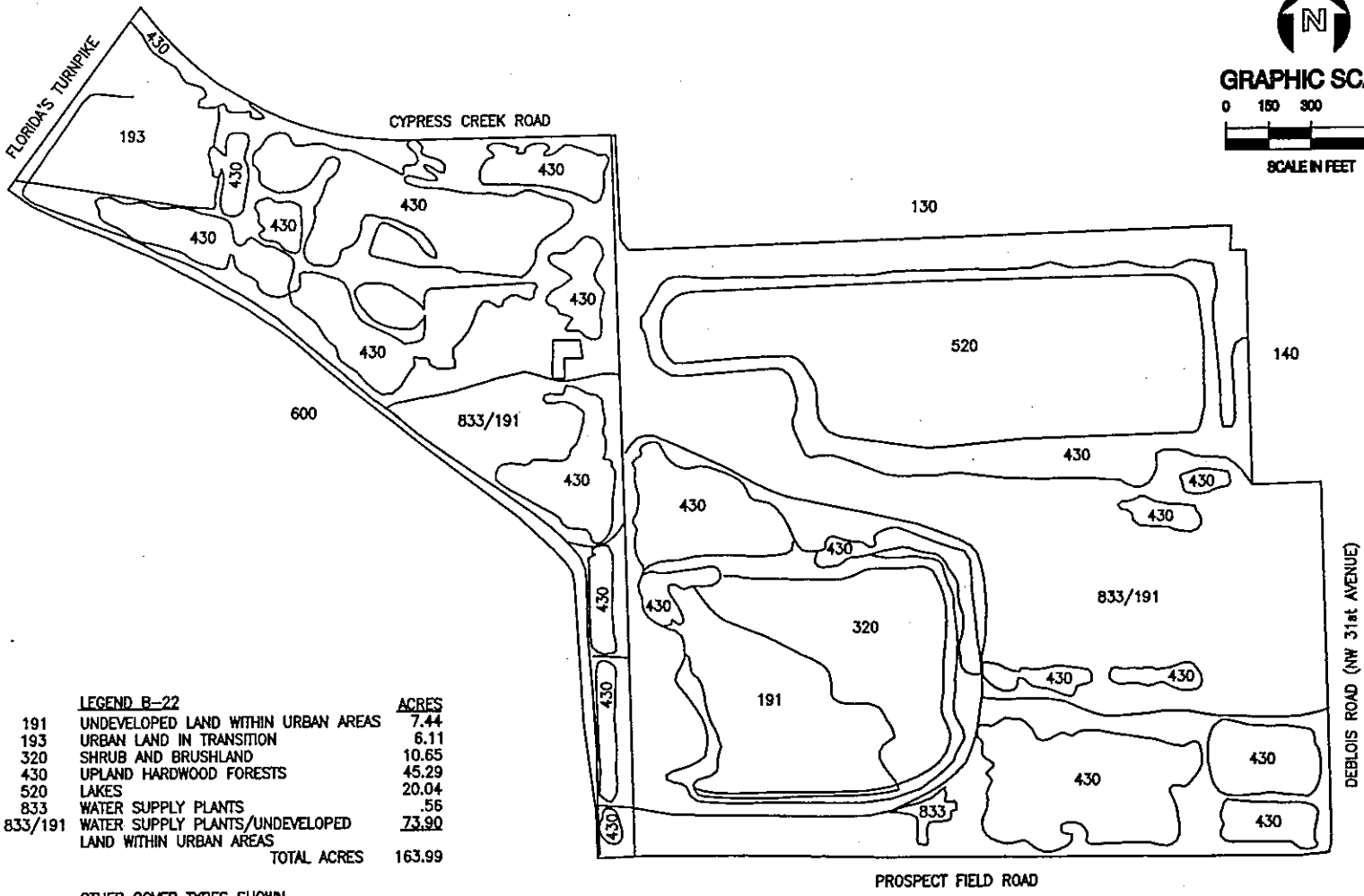
SITE

Public Access:	Johnson Rd, Hillsboro Rd, Lyons Rd	**Comprehensive Plan Designation:**	EC
		Adjacent Land Use:	Pine Flatwoods (N, W); Commercial property & mobile homes (E); Commercial (S); Single-family & plant nursery (W)
Road Easement (ft):	Not Required		
Pipeline Easement (ft):	N/A	**Land Use of Impacted Area:**	Cypress, Brazilian Pepper, Pine Flatwoods
Deep Draft Access:	N/A		
		Wetlands W/I Mapped Area (ac):	0.81
		Wetlands Impacted (ac):	0.00

Site Narrative:

Site B-21, a 102-acre tract of mostly undeveloped land off Hillsboro Boulevard, contains two small areas of development, including a recently closed nursery (240), a small apartment building (133), a single-family residence (110), retail stores (141), and two small areas of open, cleared land (260). The majority of the site consists of well-vegetated areas of pine flatwoods (411), Brazilian pepper (422), and three isolated cypress communities (621) that are located in the southern portion of property. Vegetation species observed in the pine flatwoods include slash pine (*Pinus elliottii*), saw palmetto (*Serenoa repens*), and Boston fern (*Nephrolepsis* sp.). Common vegetation in the cypress community includes bald cypress (*Taxodium distichum*), Virginia chain fern (*Woodwardia virginica*), and fern (*Thelypteris* sp.). A large north to south oriented drainage ditch bisects the site. Recent clearing, along both sides of this ditch, appears to be related to ditch construction or maintenance.

Highways border the property on three sides: Hillsboro Boulevard to the north, Lyons Road to the east, and Johnson Road to the south. Adjacent land uses include pine flatwoods to the north; commercial property and mobile home residences to the east; commercial property to the south; and single-family residential, pine flatwoods, and plant nursery to the west.



	LEGEND B-22	ACRES
191	UNDEVELOPED LAND WITHIN URBAN AREAS	7.44
193	URBAN LAND IN TRANSITION	6.11
320	SHRUB AND BRUSHLAND	10.65
430	UPLAND HARDWOOD FORESTS	45.29
520	LAKES	20.04
833	WATER SUPPLY PLANTS	.56
833/191	WATER SUPPLY PLANTS/UNDEVELOPED LAND WITHIN URBAN AREAS	73.90
	TOTAL ACRES	163.99

OTHER COVER TYPES SHOWN

130 RESIDENTIAL, HIGH DENSITY
140 COMMERCIAL AND SERVICES
600 WETLANDS
——— DIRT ROADS

LAND USE AND VEGETATION OF CANDIDATE SITE B-22, BROWARD COUNTY, FLORIDA

TAYLOR ENGINEERING INC.
9000 CYPRESS GREEN DRIVE, SUITE 200
JACKSONVILLE, FLORIDA 32256

Figure B-16
Land Use and Vegetation
of Candidate Site B-22
Broward County, Florida

PROJECT C9920
REVISION
SHEET
DATE Sept., 2000

SITE DATA SUMMARY SHEET

Name: B-22

AKA:

Site Use: Multi-Reach Inland Storage

Comment: Municipal Well Field

LOCATION

County:	Broward	**ICWW Reach Mileage:**	318.02
Municipality:	Fort Lauderdale	**East/West of**	West
Section/Township/Range:	7/49/42	**Receiving Waterbody:**	N/A
		FDEP	N/A

REACH

Reach Designation:	BW-2			**Projected Dredging Frequency (yr):**	20
Reach Length (mi):	7.06			**50-yr Dredging Requirement (cy):**	5,703
ICWW Mileage:	313.98	to	321.04	**50-yr Storage Requirement (cy):**	12,262
Cut/Station:	BW-22/0+00	to	BW-32/0+00		
Geographic: (FDEP Classification)	1,600 ft north of 14th St. Bridge (S.R. 844) to 5,100 ft south of Oakland Park Blvd. Bridge			(III) to (III)	

SITE PARAMETERS

Mapped Area (ac):	163.99	**Storage Capacity (cy):**	72,600
Containment Area (ac):	N/A	**Dike Height (ft):**	N/A
Impacted Area (ac):	5.60	**Excavation Depth (ft):**	N/A
Buffer Area (ac):	19.31	**Existing Mean Site Elevation (ft):**	10.0
N Buffer Width (ft):	200	**Dike Volume (cy):**	N/A
S Buffer Width (ft):	200	**Max. Pumping Distance (mi):**	N/A
E Buffer Width (ft):	200	**Max. Barging Distance (mi):**	N/A
W Buffer Width (ft):	200	**Min. Distance from Waterway (mi):**	5.67
Total Site Area (ac):	24.91		

SITE

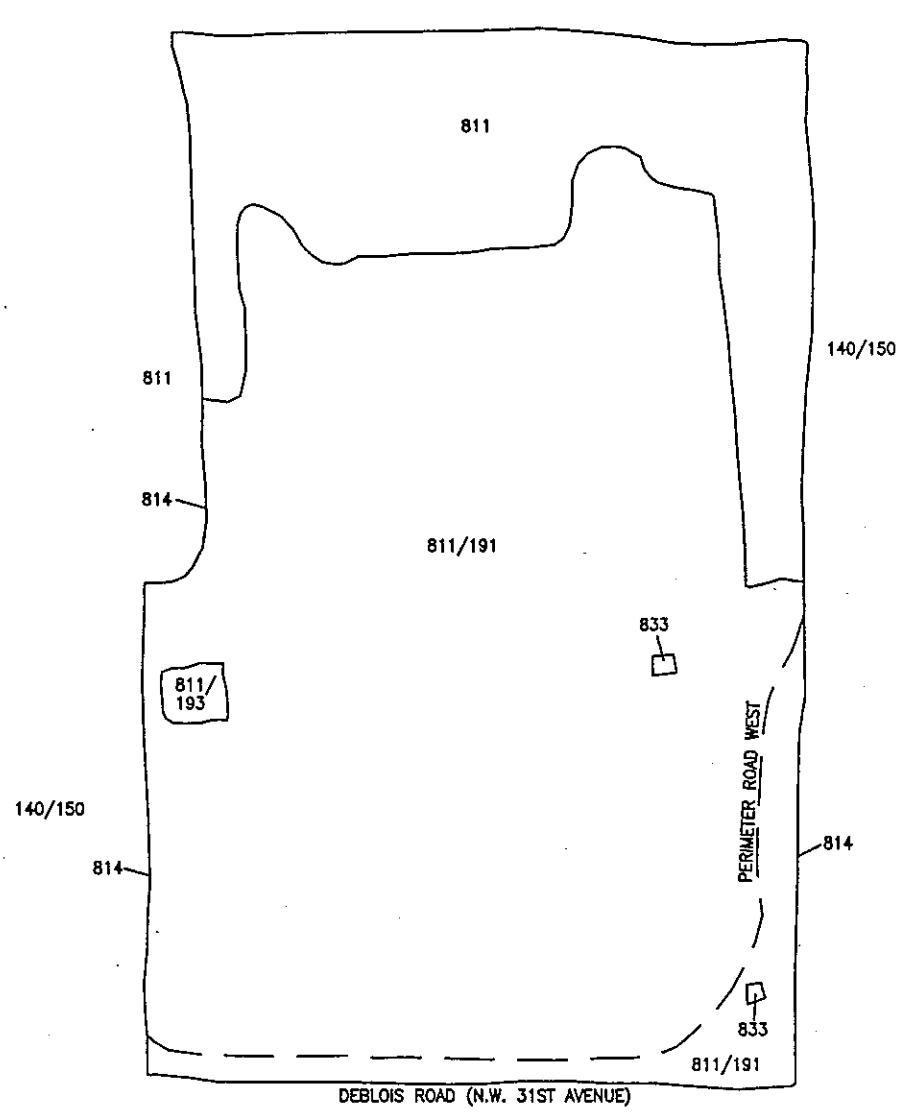
Public Access:	Deblois Rd, Prospect Field Rd, Cypress Creek Rd	**Comprehensive Plan Designation:**	R&O
		Adjacent Land Use:	
Road Easement (ft):	200	Cypress Creek Road (N); Deblois Rd/NW 31st Ave (E); Prospect Field Rd (S); Retention pond & FL Turnpike (W)	
Pipeline Easement (ft):	N/A	**Land Use of Impacted Area:**	
Deep Draft Access:	N/A	Undeveloped land within urban areas, Shrub & brushland, Upland hardwood forests	
		Wetlands W/I Mapped Area (ac):	0.00
		Wetlands Impacted (ac):	0.00

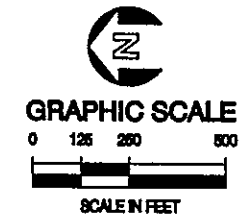
Site Narrative:

Due to perimeter fencing this 164-acre site, B-22, was not accessible. Additionally, thick vegetation obscured visibility of the site from the adjacent roads and properties, thus much of the mapping is based on aerial photo interpretation. The site is a municipal well field and several active wells are visible.

Upland hardwood forests (430, 45 acres) occurred, primarily around the lake [borrow pond (520, 20 acres)] and in scattered areas in the sites northwest and southeast corner. These areas appear to contain an abundance of Brazilian pepper (*Schinus terebinthifolius*), Australian pine (*Casuarina equisetifolia*), cabbage palm (*Sabal palmetto*), and what appeared to be other tropical exotics. The grassy areas mapped as water supply plants/undeveloped (833/191, 74 acres) are in between the upland hardwood forest and connect the individual production wells. The grassy areas have the appearance of a golf course on the aerial photograph. The water supply plants (833, 0.5 acres) are the buildings associated with well-field water production. A small shrub and brushland community (320, 11 acres) appears to contain low shrubby plants and may be primarily exotics.

The site is bounded on the north by Cypress Creek Road, the east by Deblois Rd. (N.W. 31st Avenue), the south by Prospect Field Road, and the west by what appears to be a large retention pond and Florida's Turnpike.





LEGEND B-23

		ACRES
811	AIRPORTS	23.80
811/191	AIRPORTS/UNDEVELOPED LAND WITHIN URBAN AREAS	78.73
811/193	AIRPORTS/URBAN LAND IN TRANSITION WITHOUT POSITIVE INDICATORS OF INTENDED ACTIVITY	.55
833	WATER SUPPLY PLANTS	.11
	TOTAL ACRES	103.19

OTHER COVER TYPES SHOWN

140/150	COMMERCIAL AND SERVICES/INDUSTRIAL
814	ROADS AND HIGHWAYS
— —	ROAD

LAND USE AND VEGETATION OF CANDIDATE SITE B-23, BROWARD COUNTY, FLORIDA

TAYLOR ENGINEERING INC.
9000 CYPRESS GREEN DRIVE, SUITE 200
JACKSONVILLE, FLORIDA 32256

Figure B-17
Land Use and Vegetation
of Candidate Site B-23
Broward County, Florida

PROJECT C9920
REVISION
SHEET
DATE Aug., 2000

SITE DATA SUMMARY SHEET

Name: B-23

AKA: Fort Lauderdale Executive Airport

Site Use: Multi-Reach Inland Storage

Comment:

LOCATION

County:	Broward	**ICWW Reach Mileage:**	318.01
Municipality:	Fort Lauderdale	**East/West of**	West
Section/Township/Range:	8/49/42	**Receiving Waterbody:**	N/A
		FDEP	N/A

REACH

Reach Designation:	BW-2	**Projected Dredging Frequency (yr):**	20
Reach Length (mi):	7.06	**50-yr Dredging Requirement (cy):**	5,703
ICWW Mileage:	313.98 to 321.04	**50-yr Storage Requirement (cy):**	12,262
Cut/Station:	BW-22/0+00 to BW-32/0+00		
Geographic: (FDEP Classification)	1,600 ft north of 14th St. Bridge (S.R. 844) (III) to 5,100 ft south of Oakland Park Blvd. Bridge (III)		

SITE PARAMETERS

Mapped Area (ac):	103.19	**Storage Capacity (cy):**	72,600
Containment Area (ac):	N/A	**Dike Height (ft):**	N/A
Impacted Area (ac):	5.60	**Excavation Depth (ft):**	N/A
Buffer Area (ac):	27.18	**Existing Mean Site Elevation (ft):**	10.0
N Buffer Width (ft):	350	**Dike Volume (cy):**	N/A
S Buffer Width (ft):	350	**Max. Pumping Distance (mi):**	N/A
E Buffer Width (ft):	350	**Max. Barging Distance (mi):**	N/A
W Buffer Width (ft):	350	**Min. Distance from Waterway (mi):**	5.21
Total Site Area (ac):	32.78		

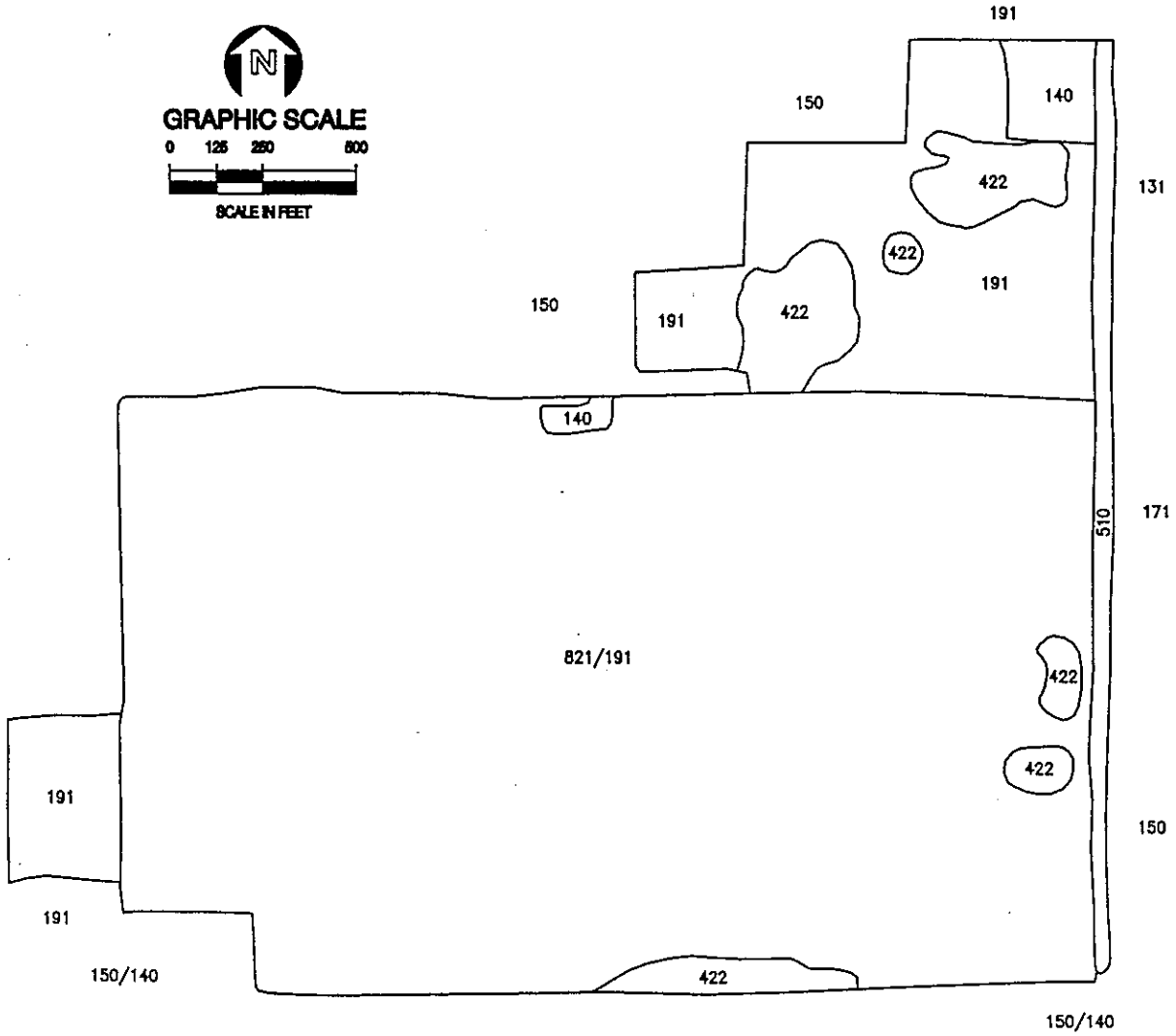
SITE

Public Access:	Deblois Rd, Perimeter Rd West	**Comprehensive Plan Designation:**	T
		Adjacent Land Use:	Commercial & Services/Industrial & Airport facilities (N); Airport (E); Commercial/residential (S); Deblois Rd (W)
Road Easement (ft):	Not Required		
Pipeline Easement (ft):	N/A	**Land Use of Impacted Area:**	Open/Undeveloped vegetated land
Deep Draft Access:	N/A		
		Wetlands W/I Mapped Area (ac):	0.00
		Wetlands Impacted (ac):	0.00

Site Narrative:

This 103-acre site, B-23, is located along the west end of Ft. Lauderdale Executive Airport (811). Most of the western part of the site, open land vegetated with Bahia grass (*Paspalum notatum*), is mapped as airports/undeveloped land within urban areas (811/191). A perimeter road (814) is located along the western boundary. Several production well pump houses, most likely associated with the municipal well field, are also located in the area (833).

Commercial/industrial (140/150) and other airport related facilities (811) form Site B-23's northern boundary. Adjacent land uses include airport (811) to the east, commercial/residential (140/150) to the south, and Deblois Road (NW 31st Street) to the west. The parcel of land west of Deblois Road appears to be a municipal well field.



	LEGEND B-24	ACRES
140	COMMERCIAL SERVICES	1.83
191	UNDEVELOPED LAND WITHIN URBAN AREAS	16.97
422	BRAZILIAN PEPPER	6.43
510	STREAMS AND WATERWAYS	2.76
821/191	TRANSMISSION TOWERS/UNDEVELOPED LAND WITHIN URBAN AREAS	92.66
	TOTAL ACRES	120.65

	OTHER COVER TYPES SHOWN
131	FIXED SINGLE FAMILY UNITS
133	MULTIPLE DWELLING UNITS, LOW RISE
150	INDUSTRIAL
171	EDUCATIONAL FACILITIES
150/140	INDUSTRIAL/COMMERCIAL AND SERVICES

LAND USE AND VEGETATION FOR CANDIDATE SITE B-24, BROWARD COUNTY, FLORIDA

TAYLOR ENGINEERING INC.
9000 CYPRESS GREEN DRIVE, SUITE 200
JACKSONVILLE, FLORIDA 32256

Figure B-18
Land Use and Vegetation
of Candidate Site B-24
Broward County, Florida

PROJECT C9920
REVISION
SHEET
DATE Aug., 2000

SITE DATA SUMMARY SHEET

Name: B-24

AKA:

Site Use: Multi-Reach Inland Storage

Comment: Transmission tower farm

LOCATION

County:	Broward	**ICWW Reach Mileage:**	322.03
Municipality:	Lauderhill	**East/West of**	West
Section/Township/Range:	31/49/42	**Receiving Waterbody:**	N/A
		FDEP	N/A

REACH

Reach Designation:	BW-3			**Projected Dredging Frequency (yr):**	20
Reach Length (mi):	13.2			**50-yr Dredging Requirement (cy):**	921
ICWW Mileage:	321.04	**to**	334.24	**50-yr Storage Requirement (cy):**	1,980
Cut/Station:	BW-32/0+00	**to**	DA-1/0+00		
Geographic: (FDEP Classification)	5,100 ft south of Oakland Park Blvd. Bridge (III) to 530 ft south of Broward/Dade County Line (III)				

SITE PARAMETERS

Mapped Area (ac):	120.65	**Storage Capacity (cy):**	72,600
Containment Area (ac):	N/A	**Dike Height (ft):**	N/A
Impacted Area (ac):	5.60	**Excavation Depth (ft):**	N/A
Buffer Area (ac):	27.18	**Existing Mean Site Elevation (ft):**	10.0
N Buffer Width (ft):	350	**Dike Volume (cy):**	N/A
S Buffer Width (ft):	350	**Max. Pumping Distance (mi):**	N/A
E Buffer Width (ft):	350	**Max. Barging Distance (mi):**	N/A
W Buffer Width (ft):	350	**Min. Distance from Waterway (mi):**	5.43
Total Site Area (ac):	32.78		

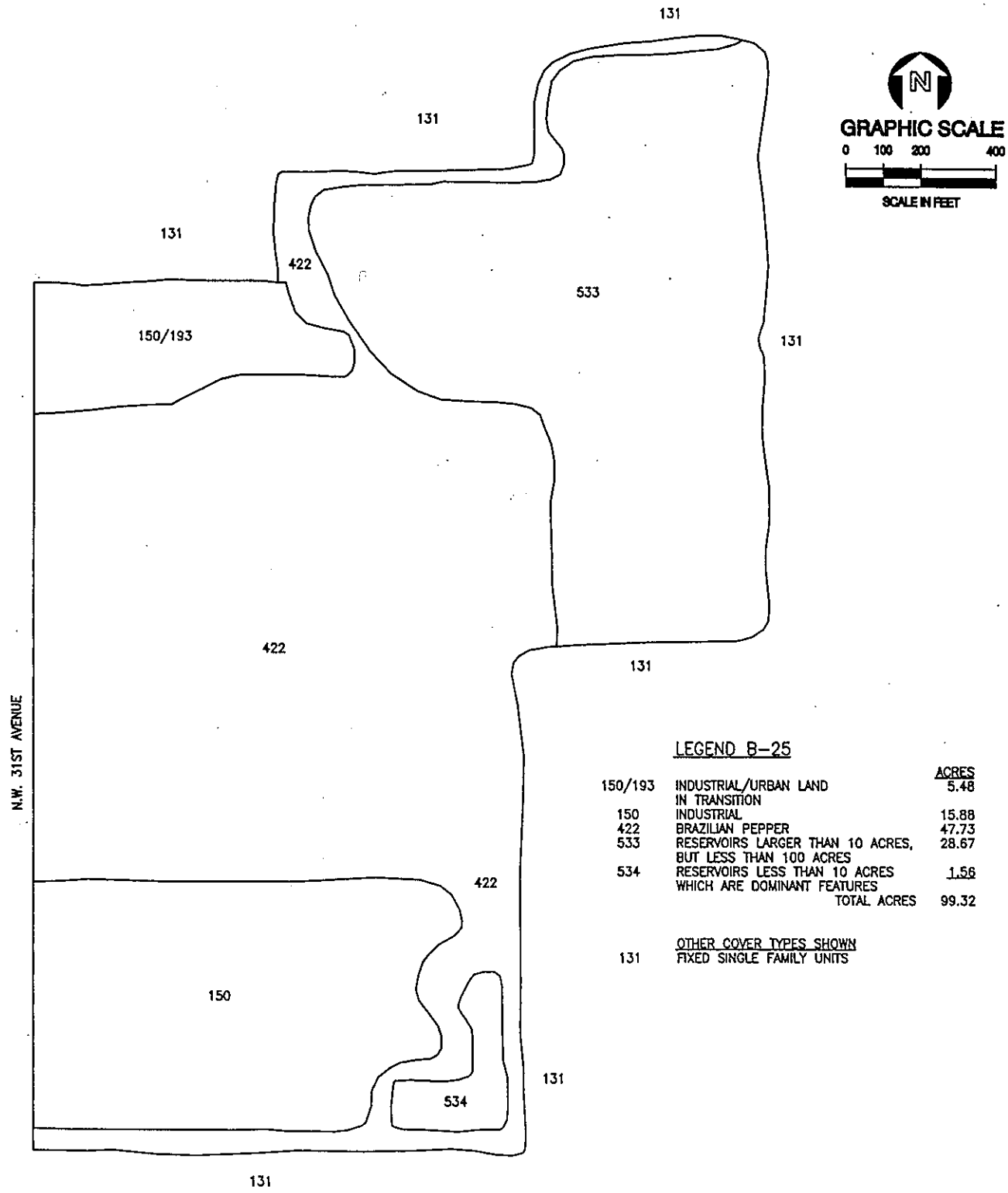
SITE

Public Access:	S.R. 7 (U.S. 441) & Sunrise Blvd	**Comprehensive Plan Designation:**	I
		Adjacent Land Use:	Light Ind. & undeveloped land (N); High-density res., school, & Light Ind. (E); Light Ind./commercial (S); High-density res.
Road Easement (ft):	Not Required		
Pipeline Easement (ft):	N/A	**Land Use of Impacted Area:**	Transmission towers/undeveloped land within urban areas
Deep Draft Access:	N/A		
		Wetlands W/I Mapped Area (ac):	0.00
		Wetlands Impacted (ac):	0.00

Site Narrative:

Site B-24, a 121-acre open field, is a transmission tower farm (821/191). It appears that, some land-scraping disturbance has occurred within the tower area. Several scattered areas of Brazilian pepper (422) occur throughout the site and larger areas of Brazilian pepper (*Schinus terebinthifolius*) occur in the northeastern portion. Undeveloped land (191) surrounds the Brazilian pepper community outside the tower area. No wetlands were observed on the site.

The site is bordered on the north by what appears to be light industrial land (150) and undeveloped land (191), and to the east by high-density residential (131), a school (171), and light industrial (150). To the south the site is bounded by light industrial/commercial (150/140), and to the west by high-density multifamily residential (133), and undeveloped land (191).



LEGEND B-25

		ACRES
150/193	INDUSTRIAL/URBAN LAND IN TRANSITION	5.48
150	INDUSTRIAL	15.88
422	BRAZILIAN PEPPER	47.73
533	RESERVOIRS LARGER THAN 10 ACRES, BUT LESS THAN 100 ACRES	28.67
534	RESERVOIRS LESS THAN 10 ACRES WHICH ARE DOMINANT FEATURES	1.56
	TOTAL ACRES	99.32

OTHER COVER TYPES SHOWN

131	FIXED SINGLE FAMILY UNITS

LAND USE AND VEGETATION OF CANDIDATE SITE B-25, BROWARD COUNTY, FLORIDA

TAYLOR ENGINEERING INC.
9000 CYPRESS GREEN DRIVE, SUITE 200
JACKSONVILLE, FLORIDA 32256

Figure B-19
Land Use and Vegetation
of Candidate Site B-25
Broward County, Florida

PROJECT C9920
REVISION
SHEET
DATE Aug., 2000

SITE DATA SUMMARY SHEET

Name: B-25

AKA:

Site Use: Multi-Reach Inland Storage

Comment: U.S. EPA and State of Florida Superfund site (former industrial facility)

LOCATION

County:	Broward	**ICWW Reach Mileage:**	321.68
Municipality:	Fort Lauderdale	**East/West of**	West
Section/Township/Range:	32/49/42	**Receiving Waterbody:**	N/A
		FDEP	N/A

REACH

Reach Designation:	BW-3			**Projected Dredging Frequency (yr):**	20
Reach Length (mi):	13.2			**50-yr Dredging Requirement (cy):**	921
ICWW Mileage:	321.04	**to**	334.24	**50-yr Storage Requirement (cy):**	1,980
Cut/Station:	BW-32/0+00	**to**	DA-1/0+00		
Geographic: (FDEP Classification)	5,100 ft south of Oakland Park Blvd. Bridge (III) to 530 ft south of Broward/Dade County Line (III)				

SITE PARAMETERS

Mapped Area (ac):	99.32	**Storage Capacity (cy):**	72,600
Containment Area (ac):	N/A	**Dike Height (ft):**	N/A
Impacted Area (ac):	5.60	**Excavation Depth (ft):**	N/A
Buffer Area (ac):	31.35	**Existing Mean Site Elevation (ft):**	10.0
N Buffer Width (ft):	350	**Dike Volume (cy):**	N/A
S Buffer Width (ft):	350	**Max. Pumping Distance (mi):**	N/A
E Buffer Width (ft):	350	**Max. Barging Distance (mi):**	N/A
W Buffer Width (ft):	350	**Min. Distance from Waterway (mi):**	4.80
Total Site Area (ac):	37.95		

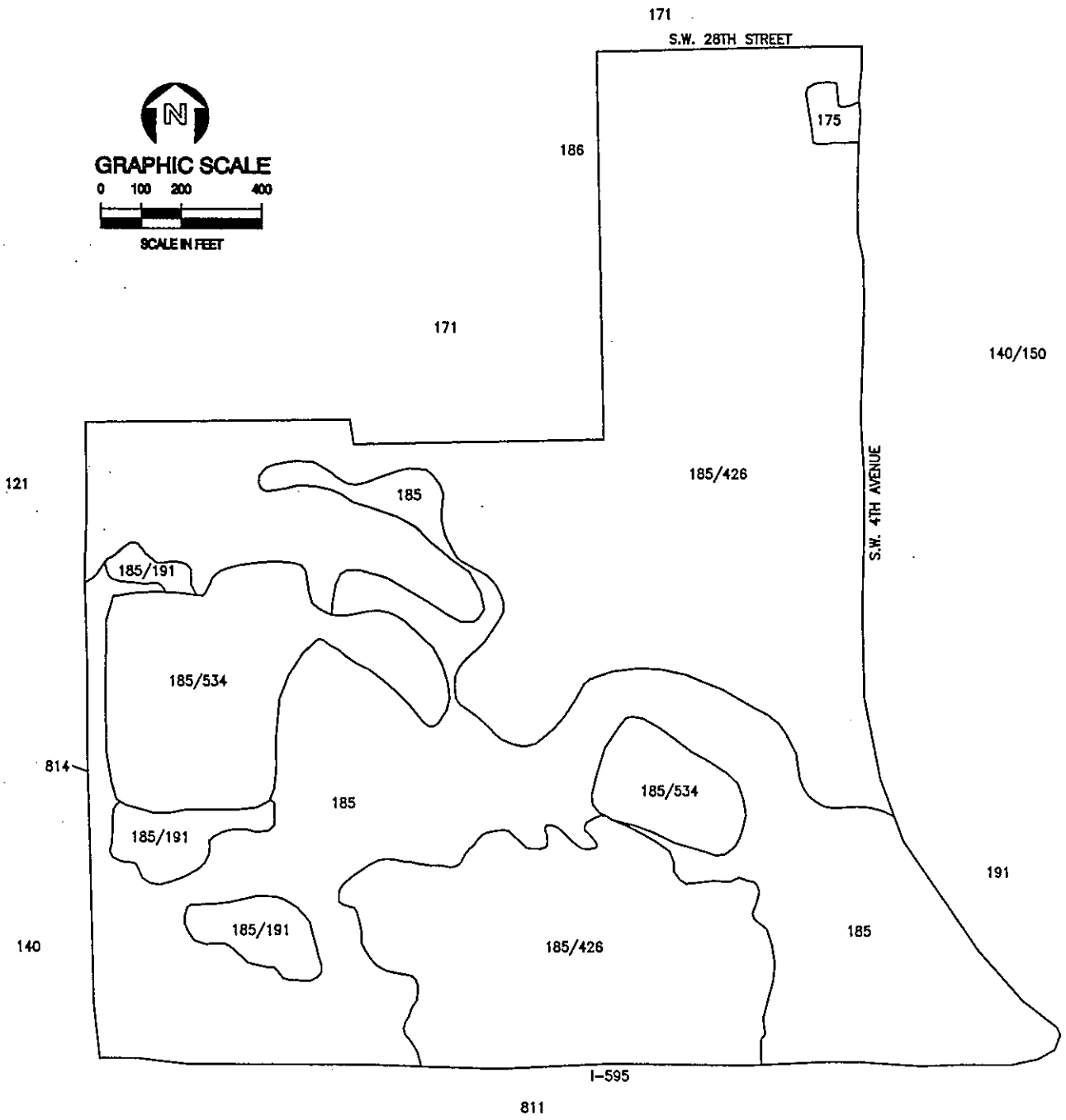
SITE

Public Access:	N.W. 31st Street	**Comprehensive Plan Designation:**	C
		Adjacent Land Use:	
Road Easement (ft):	Not Required	High-density single family homes (N, E, S); NW 31st Street (W)	
Pipeline Easement (ft):	N/A	**Land Use of Impacted Area:**	
Deep Draft Access:	N/A	Brazilian Pepper	
		Wetlands W/I Mapped Area (ac):	1.56
		Wetlands Impacted (ac):	0.00

Site Narrative:

The State of Florida and the U.S. Environmental Protection Agency list this 99-acre site, a former industrial facility, as a Superfund site. Mapped as industrial (150), the area is fenced off and no longer accessible. The buildings are located along the southern edge of the site adjacent to a retention pond (534) and a strip of Brazilian pepper (422). The northern part of the site is wooded mainly with Brazilian pepper (422) and other exotic tree species and a medium-sized borrow pit (533). A small area along the site's northern border, mapped as (150/193), appears to have been some type of trucking facility.

The site is bounded on the north, east, and south by high-density, single-family homes (131). NW 31st Street forms the western boundary.



LEGEND B-26

		ACRES
175	GOVERNMENT	.37
185	PARKS AND ZOOS	28.16
185/191	PARKS AND ZOOS/UNDEVELOPED LAND WITHIN URBAN AREAS	2.54
185/426	PARKS AND ZOOS/TROPICAL HARDWOODS	50.00
185/534	PARKS AND ZOOS/RESERVOIRS LESS THAN 10 ACRES WHICH ARE DOMINANT FEATURES	9.20
	TOTAL ACRES	90.27

OTHER COVER TYPES SHOWN

121	FIXED SINGLE FAMILY UNITS
140	COMMERCIAL AND SERVICES
140/150	COMMERCIAL AND SERVICES/INDUSTRIAL
171	EDUCATIONAL FACILITIES
811	AIRPORTS
814	ROADS AND HIGHWAYS

LAND USE AND VEGETATION OF CANDIDATE SITE B-26, BROWARD COUNTY, FLORIDA

TAYLOR ENGINEERING INC.
9000 CYPRESS GREEN DRIVE, SUITE 200
JACKSONVILLE, FLORIDA 32256

Figure B-20
Land Use and Vegetation
of Candidate Site B-26
Broward County, Florida

PROJECT C9920
REVISION
SHEET
DATE Aug., 2000

SITE DATA SUMMARY SHEET

Name: B-26

AKA: Snyder Park

Site Use: Multi-Reach Inland Storage

Comment: Recreational Use -- Two small ponds, paved trails

LOCATION

County:	Broward	**ICWW Reach Mileage:**	326.4
Municipality:	Fort Lauderdale	**East/West of**	West
Section/Township/Range:	22/50/42	**Receiving Waterbody:**	N/A
		FDEP	N/A

REACH

Reach Designation:	BW-3			**Projected Dredging Frequency (yr):**	20
Reach Length (mi):	13.2			**50-yr Dredging Requirement (cy):**	921
ICWW Mileage:	321.04	**to**	334.24	**50-yr Storage Requirement (cy):**	1,980
Cut/Station:	BW-32/0+00	**to**	DA-1/0+00		
Geographic: (FDEP Classification)	5,100 ft south of Oakland Park Blvd. Bridge (III) to 530 ft south of Broward/Dade County Line (III)				

SITE PARAMETERS

Mapped Area (ac):	90.27	**Storage Capacity (cy):**	72,600
Containment Area (ac):	N/A	**Dike Height (ft):**	N/A
Impacted Area (ac):	5.60	**Excavation Depth (ft):**	N/A
Buffer Area (ac):	27.79	**Existing Mean Site Elevation (ft):**	5.0
N Buffer Width (ft):	200	**Dike Volume (cy):**	N/A
S Buffer Width (ft):	200	**Max. Pumping Distance (mi):**	N/A
E Buffer Width (ft):	200	**Max. Barging Distance (mi):**	N/A
W Buffer Width (ft):	200	**Min. Distance from Waterway (mi):**	2.14
Total Site Area (ac):	33.39		

SITE

Public Access:	I-595, S.W. 28th St, S.W. 4th Ave	**Comprehensive Plan Designation:**	CON, R&O
		Adjacent Land Use:	NOVA Southeastern University & Recreational facility (N); S.W. 4th Ave & Commercial/retail (E); I-595 (S); Residential St
Road Easement (ft):	Not Required		
Pipeline Easement (ft):	N/A	**Land Use of Impacted Area:**	Park, Tropical Hardwood
Deep Draft Access:	N/A		
		Wetlands W/I Mapped Area (ac):	0.00
		Wetlands Impacted (ac):	0.00

Site Narrative:

Site B-26, a 90-acre community recreational facility known as Snyder Park (185), contains all the facilities typically associated with its use. Although the entire parcel serves as a park, other community designations have been included to better describe the vegetation cover and other recreational features. The larger of two tropical hardwood hammock communities (426) is located in the northern portion of Site B-26, while a smaller community is located in the south-central portion. In the middle of the park are two small ponds (524) and various paved trails and roads (mapped as park, 185). The park also contains three small, open, undeveloped areas (191) near the western boundary.

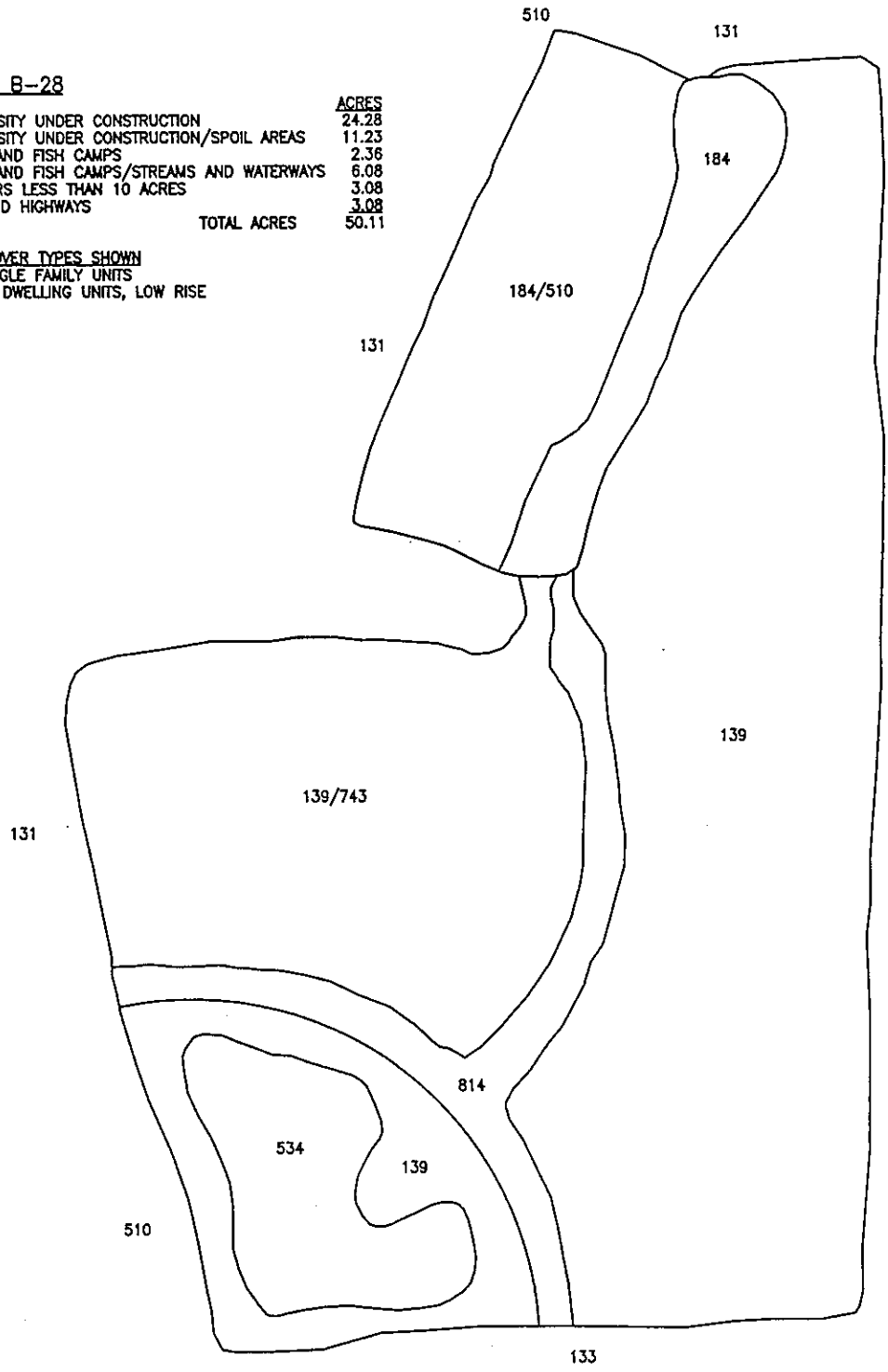
The site is bounded on the north by NOVA Southeastern University (171) and a community recreational facility (186). The site is bounded on the east by S.W. 4th Avenue and commercial/retail (140/150), on the south by Interstate 95, and on the west by a residential street (814).

LEGEND B-28

		ACRES
139	HIGH DENSITY UNDER CONSTRUCTION	24.28
139/743	HIGH DENSITY UNDER CONSTRUCTION/SPOIL AREAS	11.23
184	MARINAS AND FISH CAMPS	2.36
184/510	MARINAS AND FISH CAMPS/STREAMS AND WATERWAYS	6.08
534	RESERVOIRS LESS THAN 10 ACRES	3.08
814	ROADS AND HIGHWAYS	3.08
	TOTAL ACRES	50.11

OTHER COVER TYPES SHOWN

131	FIXED SINGLE FAMILY UNITS
133	MULTIPLE DWELLING UNITS, LOW RISE



N

GRAPHIC SCALE

0 75 150 300

SCALE IN FEET

LAND USE AND VEGETATION OF CANDIDATE SITE B-28, BROWARD COUNTY, FLORIDA

TAYLOR ENGINEERING INC. 9000 CYPRESS GREEN DRIVE, SUITE 200 JACKSONVILLE, FLORIDA 32256	Figure B-21 Land Use and Vegetation of Candidate Site B-28 Broward County, Florida	PROJECT C9920 REVISION SHEET DATE Aug., 2000

SITE DATA SUMMARY SHEET

Name: B-28

AKA:

Site Use: Dewatering & Short-Term Storage (Single Operation)

Comment: Harbor Isles Boat Marina, previous dredged material spoil area

LOCATION

County:	Broward	**ICWW Reach Mileage:**	332.26
Municipality:	Hollywood	**East/West of**	West
Section/Township/Range:	23/51/42	**Receiving Waterbody:**	ICWW
		FDEP	(III)

REACH

Reach Designation:	BW-3			**Projected Dredging Frequency (yr):**	20
Reach Length (mi):	13.2			**50-yr Dredging Requirement (cy):**	921
ICWW Mileage:	321.04	to	334.24	**50-yr Storage Requirement (cy):**	1,980
Cut/Station:	BW-32/0+00	to	DA-1/0+00		
Geographic: (FDEP Classification)	5,100 ft south of Oakland Park Blvd. Bridge (III) to 530 ft south of Broward/Dade County Line (III)				

SITE PARAMETERS

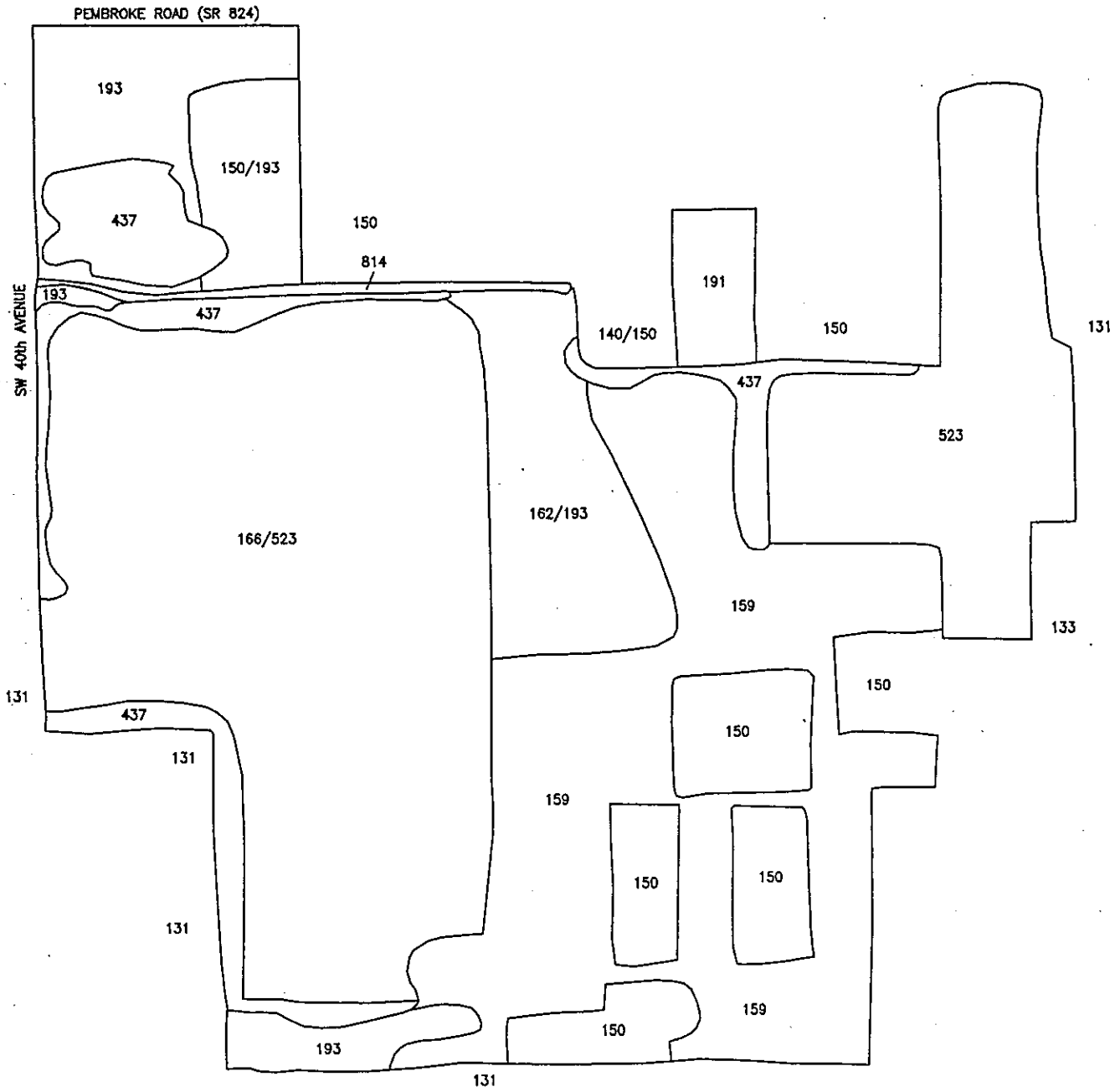
Mapped Area (ac):	50.11	**Storage Capacity (cy):**	11,066
Containment Area (ac):	2.59	**Dike Height (ft):**	5.5
Impacted Area (ac):	4.47	**Excavation Depth (ft):**	4.18
Buffer Area (ac):	5.15	**Existing Mean Site Elevation (ft):**	5.0
N Buffer Width (ft):	150	**Dike Volume (cy):**	7,770
S Buffer Width (ft):	150	**Max. Pumping Distance (mi):**	11.02
E Buffer Width (ft):	150	**Max. Barging Distance (mi):**	N/A
W Buffer Width (ft):	150	**Min. Distance from Waterway (mi):**	N/A
Total Site Area (ac):	9.62		

SITE

Public Access:	Parkview Dr	**Comprehensive Plan Designation:**	CM, R&O
		Adjacent Land Use:	
Road Easement (ft):	Not Required	Canal (W, N); ICWW (E); High-density residential (S)	
Pipeline Easement (ft):	Not Required		
		Land Use of Impacted Area:	
Deep Draft Access:	N/A	High-density under construction, Spoil Areas	
		Wetlands W/I Mapped Area (ac):	3.08
		Wetlands Impacted (ac):	0.00

Site Narrative:

This 50-acre site, B-28, is principally comprised of a boat marina (184/510) for the Harbor Isles development and land under development for high-rise condominiums (139). A portion of the site contains construction fill (139/743) and a small retention pond (534) is located in the southwestern corner. The site is bordered on the east by the ICWW, on the south by high-density residential (133), and on the west and north by a large canal (510).



	LEGEND B-28A	ACRES
150	INDUSTRIAL	16.42
150/193	INDUSTRIAL/URBAN LAND IN TRANSITION	6.60
159	INDUSTRIAL UNDER CONSTRUCTION	52.23
162/193	SAND AND GRAVEL PITS/ URBAN LAND IN TRANSITION	15.88
166/523	HOLDING PONDS/ LAKES LARGER THAN 10 ACRES BUT LES THAN 100 ACRES	76.33
191	URBAN LAND WITHIN URBAN AREAS	4.17
193	URBAN LAND IN TRANSITION	14.20
437	AUSTRALIAN PINE	16.97
523	LAKES LARGER THAN 10 ACRES BUT LESS THAN 100 ACRES	29.33
814	ROADS AND HIGHWAYS	1.46
	TOTAL ACRES	233.59

OTHER COVER TYPES SHOWN

131	FIXED SINGLE FAMILY UNITS
133	MULTIPLE DWELLING UNITS, LOW RISE
140/150	COMMERCIAL AND SERVICES/INDUSTRIAL

N

GRAPHIC SCALE

0 150 300 600

SCALE IN FEET

LAND USE AND VEGETATION OF CANDIDATE SITE B-28A, BROWARD COUNTY, FLORIDA

TAYLOR ENGINEERING INC.
9000 CYPRESS GREEN DRIVE, SUITE 200
JACKSONVILLE, FLORIDA 32256

Figure B-22
Land Use and Vegetation
of Candidate Site B-28A
Broward County, Florida

PROJECT C9920
REVISION
SHEET
DATE Aug., 2000

SITE DATA SUMMARY SHEET

Name: B-28A

AKA:

Site Use: Multi-Reach Inland Storage

Comment: Industrial Use -- Building Complex, Holding Ponds, On-going construction; 76.33-acre holding pond

LOCATION

County:	Broward	**ICWW Reach Mileage:**	333.16
Municipality:	Pembroke Park	**East/West of**	West
Section/Township/Range:	20/51/42 & 29/51/42	**Receiving Waterbody:**	N/A
		FDEP	N/A

REACH

Reach Designation:	BW-3			**Projected Dredging Frequency (yr):**	20
Reach Length (mi):	13.2			**50-yr Dredging Requirement (cy):**	921
ICWW Mileage:	321.04	to	334.24	**50-yr Storage Requirement (cy):**	1,980
Cut/Station:	BW-32/0+00	to	DA-1/0+00		
Geographic: (FDEP Classification)	5,100 ft south of Oakland Park Blvd. Bridge (III) to 530 ft south of Broward/Dade County Line (III)				

SITE PARAMETERS

Mapped Area (ac):	233.59	**Storage Capacity (cy):**	1,847,193
Containment Area (ac):	N/A	**Dike Height (ft):**	N/A
Impacted Area (ac):	76.33	**Excavation Depth (ft):**	N/A
Buffer Area (ac):	0.0	**Existing Mean Site Elevation (ft):**	5.0
N Buffer Width (ft):	0	**Dike Volume (cy):**	N/A
S Buffer Width (ft):	0	**Max. Pumping Distance (mi):**	N/A
E Buffer Width (ft):	0	**Max. Barging Distance (mi):**	N/A
W Buffer Width (ft):	0	**Min. Distance from Waterway (mi):**	3.43
Total Site Area (ac):	76.33		

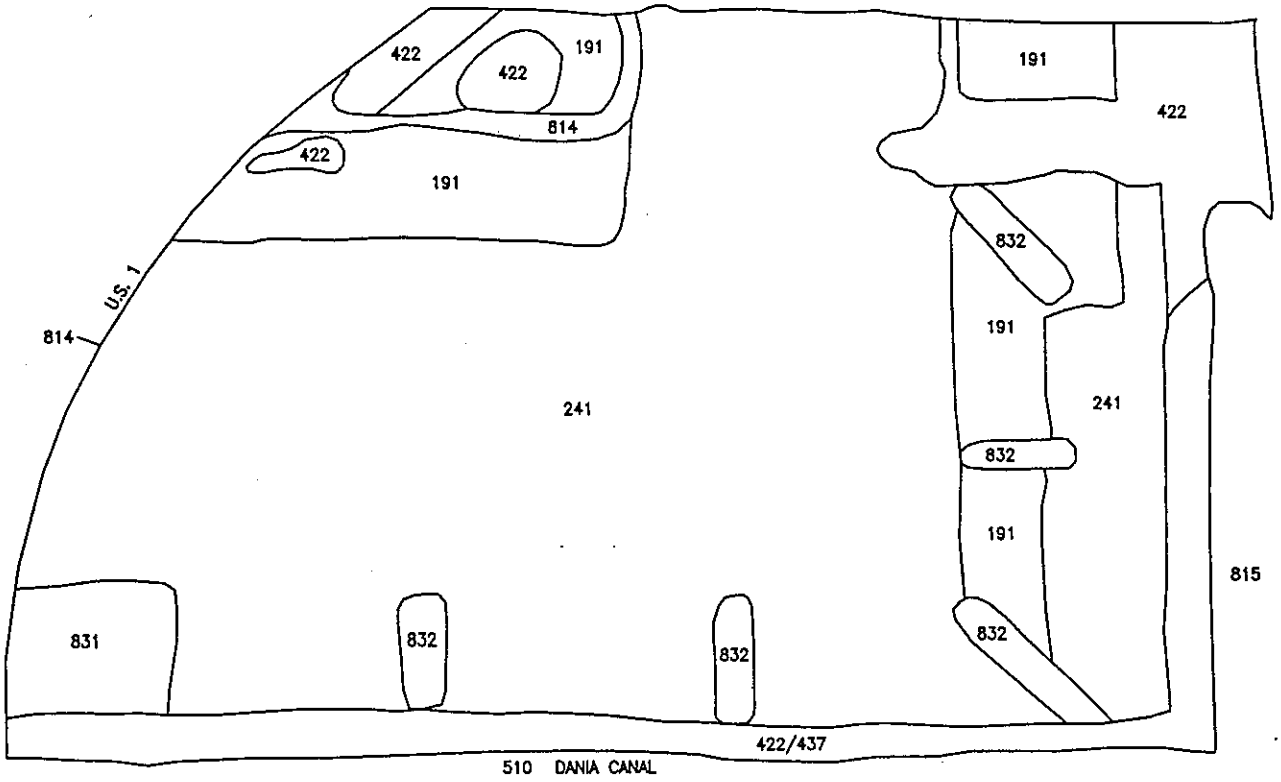
SITE

Public Access:	SW 40th Ave, Pembroke Rd (SR 824)	**Comprehensive Plan Designation:**	I
		Adjacent Land Use:	
Road Easement (ft):	Not Required	SW 40th Ave (W), Pembroke Rd & Commercial/Industrial (N); Fixed single & multiple-family units (E); Single-family units (S)	
Pipeline Easement (ft):	N/A	**Land Use of Impacted Area:**	
Deep Draft Access:	N/A	Holding Pond	
		Wetlands W/I Mapped Area (ac):	0.00
		Wetlands Impacted (ac):	0.00

Site Narrative:

This 234-acre site, B-28A, mainly consists of a large holding pond/lake larger than ten acres (166/523), an industrial area under construction (159), and an industrial building complex (150). Another lake (523) is located in the northeast corner of the site. The holding pond features an extensive Australian pine (437) community on its western side. Additionally, this invasive, exotic community (437) buffers the northern, western, and southern boundaries of the large holding pond/lake. The large pond indicates recent signs (e.g., dredging barge) of material extraction, most likely associated with the on-site construction. South of the large pond along the site's southwestern border is an area of urban land in transition without positive indications of intended activity (193). Little vegetation other than the Australian pine community (*Casuarina equisetifolia*) is found on-site.

The site is bounded on the west by SW 40th Avenue, on the north by Pembroke Road State Road (SR) 824 and a mix of commercial/industrial (140/150), on the east by fixed single family units (131) and multiple dwelling units (133), and on the south by fixed single-family units (131).



LEGEND B-29

		ACRES
191	UNDEVELOPED LAND WITHIN URBAN AREAS	10.65
241	TREE NURSERIES	52.52
422	BRAZILIAN PEPPER	6.45
422/437	BRAZILIAN PEPPER/AUSTRALIAN PINE	6.50
814	ROADS AND HIGHWAYS	1.01
831	ELECTRICAL POWER FACILITIES	2.12
832	ELECTRICAL POWER FACILITIES LINES	2.49
	TOTAL ACRES	81.74

OTHER COVER TYPES SHOWN

510	STREAMS AND WATERWAYS
815	PORT FACILITIES

N

GRAPHIC SCALE

0 100 200 400

SCALE IN FEET

LAND USE AND VEGETATION OF CANDIDATE SITE B-29, BROWARD COUNTY, FLORIDA

TAYLOR ENGINEERING INC.
9000 CYPRESS GREEN DRIVE, SUITE 200
JACKSONVILLE, FLORIDA 32256

Figure B-23
Land Use and Vegetation
of Candidate Site B-29
Broward County, Florida

PROJECT C9920
REVISION
SHEET
DATE Aug., 2000

SITE DATA SUMMARY SHEET

Name: B-29

AKA:

Site Use: Dewatering & Long-Term Storage (Multiple Operation)

Comment: Wholesale tree farm and nursery, numerous electrical power facility lines

LOCATION

County:	Broward	**ICWW Reach Mileage:**	328.17
Municipality:	Fort Lauderdale	**East/West of**	West
Section/Township/Range:	27/50/42 & 34/50/42	**Receiving Waterbody:**	Dania Canal
		FDEP	(III)

REACH

Reach Designation:	BW-3	**Projected Dredging Frequency (yr):**	20
Reach Length (mi):	13.2	**50-yr Dredging Requirement (cy):**	921
ICWW Mileage:	321.04 to 334.24	**50-yr Storage Requirement (cy):**	1,980
Cut/Station:	BW-32/0+00 to DA-1/0+00		
Geographic: (FDEP Classification)	5,100 ft south of Oakland Park Blvd. Bridge (III) to 530 ft south of Broward/Dade County Line (III)		

SITE PARAMETERS

Mapped Area (ac):	81.74	**Storage Capacity (cy):**	75,840
Containment Area (ac):	10.00	**Dike Height (ft):**	8.5
Impacted Area (ac):	13.63	**Excavation Depth (ft):**	3.79
Buffer Area (ac):	29.47	**Existing Mean Site Elevation (ft):**	5.0
N Buffer Width (ft):	350	**Dike Volume (cy):**	28,132
S Buffer Width (ft):	350	**Max. Pumping Distance (mi):**	8.78
E Buffer Width (ft):	350	**Max. Barging Distance (mi):**	8.78
W Buffer Width (ft):	350	**Min. Distance from Waterway (mi):**	N/A
Total Site Area (ac):	43.10		

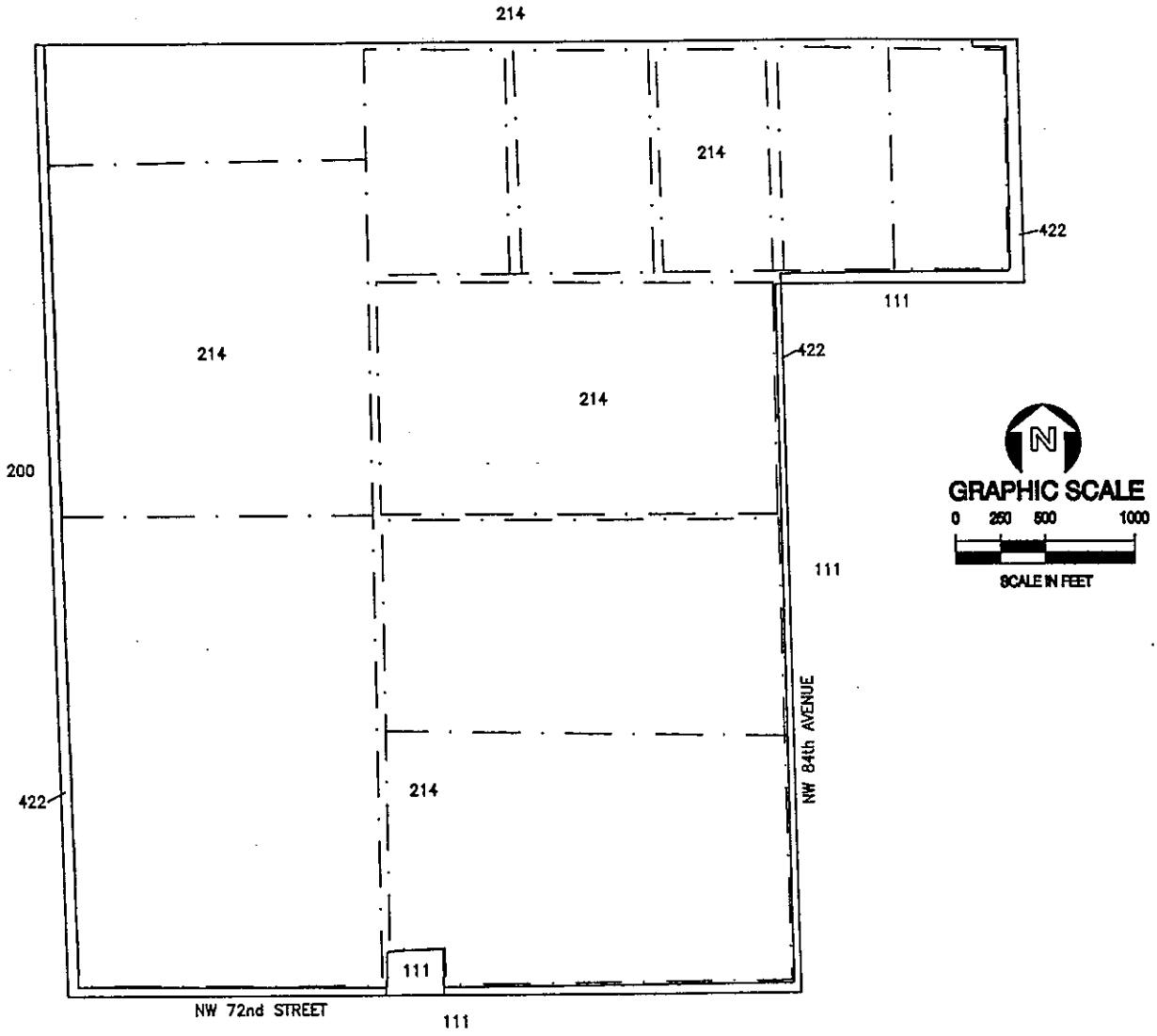
SITE

Public Access:	NW 10th St, US 1	**Comprehensive Plan Designation:**	EC, T
		Adjacent Land Use:	Marina (E); Highway US 1 (W, NW); Dania Canal (S); Undeveloped Land (NE)
Road Easement (ft):	Not Required		
Pipeline Easement (ft):	<300	**Land Use of Impacted Area:**	Undeveloped land within urban area, Tree nursery, Roads & Highways, Brazilian pepper
Deep Draft Access:	N/A	**Wetlands W/I Mapped Area (ac):**	0.00
		Wetlands Impacted (ac):	0.00

Site Narrative:

This 82-acre site, B-29, mainly consists of a wholesale tree farm and nursery (241). Other land uses include an electrical substation (831) in the southwest corner and power transmission lines (832) along the southern and eastern portions of the site. An area of undeveloped land (191) occurs on the sites' eastern side adjacent to fallow farmland (241). Additionally, many unmapped small dirt roads are evident throughout the site between plant rows. The southern boundary of the site is a mixture of Brazilian pepper and Australian pine communities (422/437) dominated by exotic vegetation species that occur adjacent to a large canal (Dania Canal, 510). The northeastern corner is primarily a Brazilian pepper (422) community. The northwestern corner is undeveloped land (191) adjacent to Highway US 1, a highway access ramp (814), and scattered clumps of Brazilian pepper (422).

The site is bounded on the west and northwest by Highway US 1 (814), on the northeast by undeveloped land (191), on the east by a marina (815), and on the south by Dania Canal (510).



LEGEND B-30

		ACRES
111	FIXED SINGLE FAMILY UNITS	1.74
214	ROW CROPS	513.53
422	BRAZILIAN PEPPER	17.67
	TOTAL ACRES	532.94

OTHER COVER TYPES SHOWN
200 AGRICULTURAL

LAND USE AND VEGETATION OF CANDIDATE SITE B-30, BROWARD COUNTY, FLORIDA

TAYLOR ENGINEERING INC.
9000 CYPRESS GREEN DRIVE, SUITE 200
JACKSONVILLE, FLORIDA 32256

Figure B-24
Land Use and Vegetation
of Candidate Site B-30
Broward County, Florida

PROJECT C9920
REVISION
SHEET
DATE Sept., 2000

SITE DATA SUMMARY SHEET

Name: B-30

AKA:

Site Use: Multi-Reach Inland Storage

Comment: Large agricultural site used for row crops

LOCATION

County:	Broward	**ICWW Reach Mileage:**	308.99
Municipality:	Unincorporated	**East/West of**	West
Section/Township/Range:	34/47/41& 3/48/41	**Receiving Waterbody:**	N/A
		FDEP	N/A

REACH

Reach Designation:	BW-1			**Projected Dredging Frequency (yr):**	10
Reach Length (mi):	4.74			**50-yr Dredging Requirement (cy):**	27,020
ICWW Mileage:	309.24	**to**	313.98	**50-yr Storage Requirement (cy):**	58,092
Cut/Station:	BW-1/0+00	**to**	BW-22/0+00		
Geographic: (FDEP Classification)	650 ft south of Palm Beach/Broward County (III) to 1,600 ft north of 14th St. Bridge (S.R. 844) (III)				

SITE PARAMETERS

Mapped Area (ac):	532.94	**Storage Capacity (cy):**	72,600
Containment Area (ac):	N/A	**Dike Height (ft):**	N/A
Impacted Area (ac):	5.60	**Excavation Depth (ft):**	N/A
Buffer Area (ac):	27.57	**Existing Mean Site Elevation (ft):**	5.0
N Buffer Width (ft):	350	**Dike Volume (cy):**	N/A
S Buffer Width (ft):	350	**Max. Pumping Distance (mi):**	N/A
E Buffer Width (ft):	350	**Max. Barging Distance (mi):**	N/A
W Buffer Width (ft):	350	**Min. Distance from Waterway (mi):**	10.45
Total Site Area (ac):	33.17		

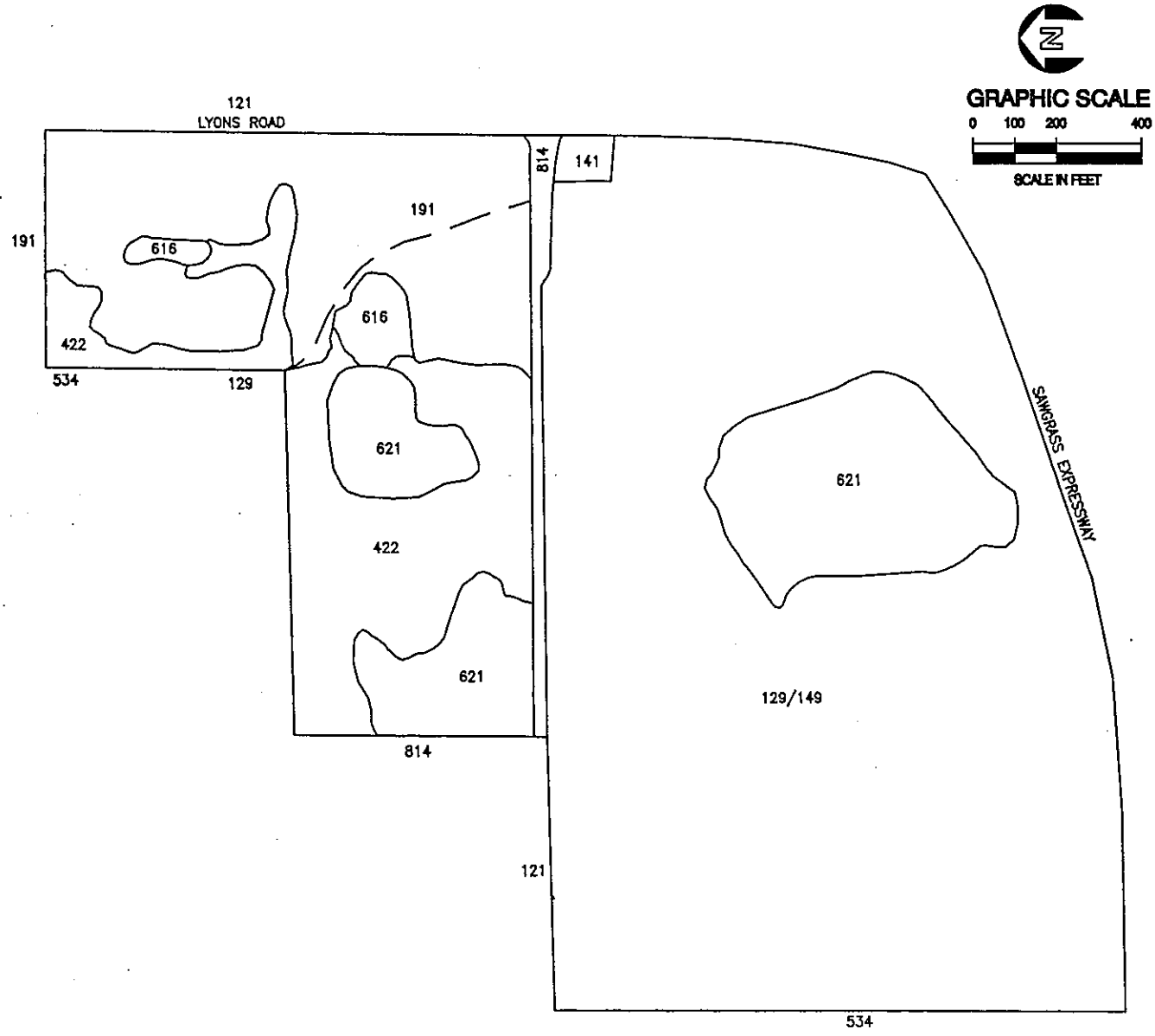
SITE

Public Access:	NW 84th Ave, NW 72nd St	**Comprehensive Plan Designation:**	E
		Adjacent Land Use:	
Road Easement (ft):	Not Required	Agriculture (N, W); Single-family residences (E, S)	
Pipeline Easement (ft):	N/A		
		Land Use of Impacted Area:	
Deep Draft Access:	N/A	Agriculture - Row Crops	
		Wetlands W/I Mapped Area (ac):	0.00
		Wetlands Impacted (ac):	0.00

Site Narrative:

Site B-30 is a 533-acre agricultural area used for row crop production (214). Inspection of the property was limited to adjacent public roads. Drainage ditches break the site into rectangular blocks. Green pepper plants were observed in the southeastern part of the site. A thin band of Brazilian pepper (422) is located along the western, southern, and eastern margins of the property. A large ditch forms a vegetated band between the Brazilian pepper and the agricultural fields. While the ditch itself mostly lacked vegetation, some areas contains leather fern (*Acrostichum* sp.) and others areas contains torpedo grass (*Panicum repens*). A single residence is located on the southern boundary of the property.

Adjacent land uses includes agricultural row crops to the north, single-family residences to the east and south, and agricultural fields to the west.



	LEGEND B-33	ACRES
129/149	MEDIUM DENSITY UNDER CONSTRUCTION/ COMMERCIAL AND SERVICES UNDER CONSTRUCTION	52.66
141	RETAIL SALES AND SERVICES	.35
191	UNDEVELOPED LAND WITHIN URBAN AREAS	12.22
422	BRAZILIAN PEPPER	9.42
616	INLAND PONDS AND SLOUGHS	.98
621	CYPRESS	10.77
814	ROADS AND HIGHWAYS	1.16
	TOTAL ACRES	87.56

	OTHER COVER TYPES SHOWN
121	FIXED SINGLE FAMILY UNITS
534	RESERVOIRS LESS THAN 10 ACRES

LAND USE AND VEGETATION OF CANDIDATE SITE B-33, BROWARD COUNTY, FLORIDA

TAYLOR ENGINEERING INC.
9000 CYPRESS GREEN DRIVE, SUITE 200
JACKSONVILLE, FLORIDA 32256

Figure B-25
Land Use and Vegetation
of Candidate Site B-33
Broward County, Florida

PROJECT C9920
REVISION
SHEET
DATE Sept., 2000

SITE DATA SUMMARY SHEET

Name: B-33

AKA:

Site Use: Multi-Reach Inland Storage

Comment: Bisected by Sawgrass Blvd -- north side contains two cypress wetlands and south side currently under development

LOCATION

County:	Broward	**ICWW Reach Mileage:**	310.25
Municipality:	Coconut Creek	**East/West of**	West
Section/Township/Range:	7/48/42	**Receiving Waterbody:**	N/A
		FDEP	N/A

REACH

Reach Designation:	BW-1	**Projected Dredging Frequency (yr):**	10
Reach Length (mi):	4.74	**50-yr Dredging Requirement (cy):**	27,020
ICWW Mileage:	309.24 to 313.98	**50-yr Storage Requirement (cy):**	58,092
Cut/Station:	BW-1/0+00 to BW-22/0+00		
Geographic: (FDEP Classification)	650 ft south of Palm Beach/Broward County (III) to 1,600 ft north of 14th St. Bridge (S.R. 844) (III)		

SITE PARAMETERS

Mapped Area (ac):	87.56	**Storage Capacity (cy):**	N/A
Containment Area (ac):	N/A	**Dike Height (ft):**	N/A
Impacted Area (ac):	Insufficient Area	**Excavation Depth (ft):**	N/A
Buffer Area (ac):	N/A	**Existing Mean Site Elevation (ft):**	15.0
N Buffer Width (ft):	N/A	**Dike Volume (cy):**	N/A
S Buffer Width (ft):	N/A	**Max. Pumping Distance (mi):**	N/A
E Buffer Width (ft):	N/A	**Max. Barging Distance (mi):**	N/A
W Buffer Width (ft):	N/A	**Min. Distance from Waterway (mi):**	6.74
Total Site Area (ac):	N/A		

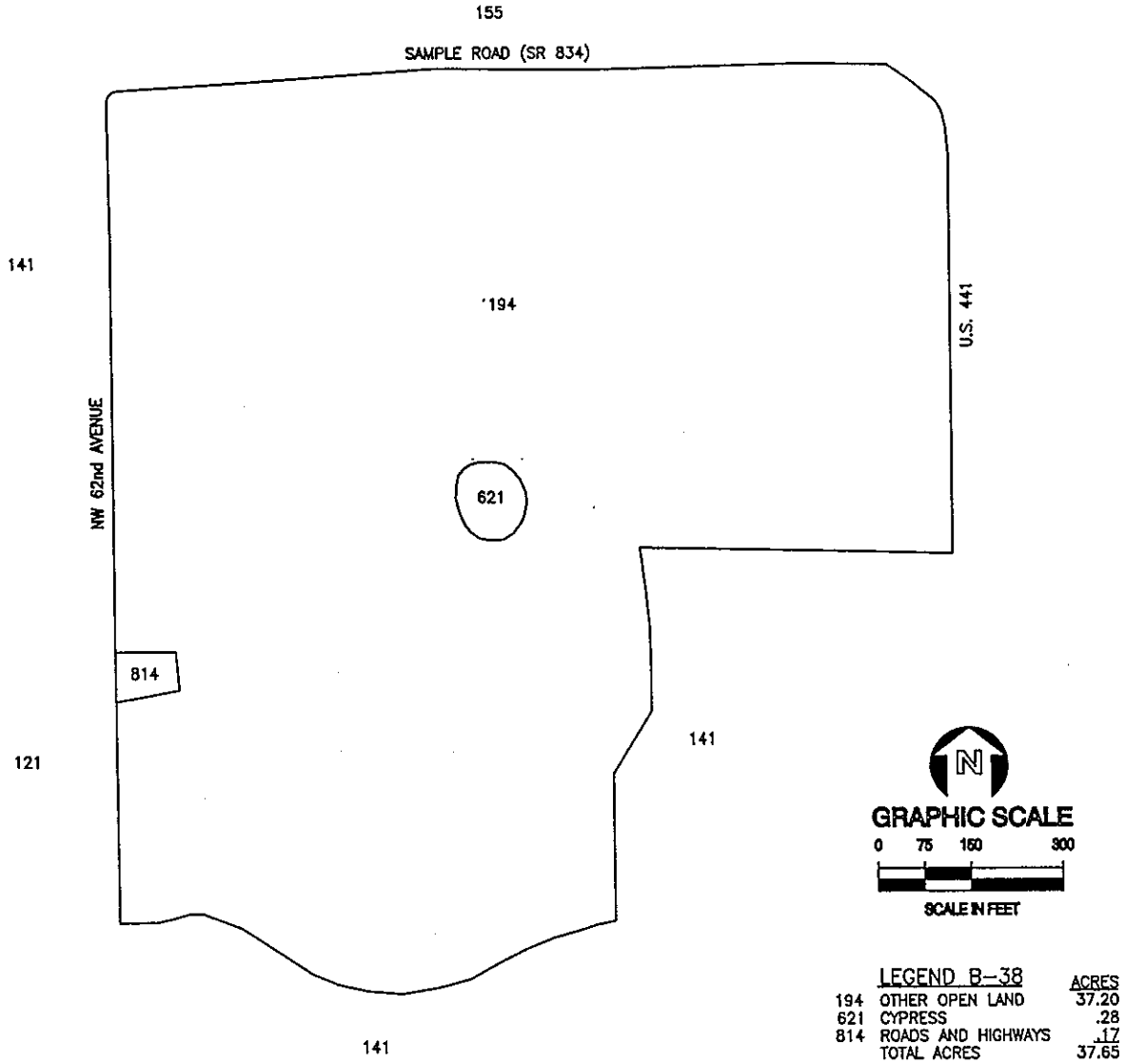
SITE

Public Access:	Lyons Blvd, Sawgrass Expressway, Sawgrass Blvd	**Comprehensive Plan Designation:**	C
		Adjacent Land Use:	
Road Easement (ft):	Not Required	Undeveloped land & Residential construction (N); Fixed single-family residential (E); Sawgrass Expressway (S);	
Pipeline Easement (ft):	N/A	**Land Use of Impacted Area:**	
Deep Draft Access:	N/A	N/A	
		Wetlands W/I Mapped Area (ac):	11.75
		Wetlands Impacted (ac):	0.00

Site Narrative:

Site B-33 is an 88-acre area bisected by Sawgrass Boulevard (814). The land is almost entirely under construction south of Sawgrass Boulevard. A cypress wetland is located in an undisturbed area. A small area of commercial property is located at the corner of Sawgrass Boulevard and Lyons Road. The property located north of Sawgrass Boulevard adjacent to Lyons Road was a cleared, grassed property classified as undeveloped land (191). Several wetland communities are located in the northern part of the property including two cypress wetlands (621) and one Carolina willow wetland (616). Species observed in the cypress community include bald cypress (*Taxodium distichum*), sweetbay (*Magnolia virginiana*), and Virginia chain fern (*Woodwardia virginica*).

Land uses adjacent to the site include undeveloped land and residential under construction to the north, fixed single-family residential to the east, Sawgrass Expressway to the south, and reservoir to the west.



LAND USE AND VEGETATION OF CANDIDATE SITE B-38, BROWARD COUNTY, FLORIDA

TAYLOR ENGINEERING INC. 9000 CYPRESS GREEN DRIVE, SUITE 200 JACKSONVILLE, FLORIDA 32256	Figure B-26 Land Use and Vegetation of Candidate Site B-38 Broward County, Florida	PROJECT C9920 REVISION SHEET DATE Sept., 2000

SITE DATA SUMMARY SHEET

Name: B-38

AKA:

Site Use: Multi-Reach Inland Storage

Comment: Undeveloped area -- property is posted as a construction site

LOCATION

County:	Broward	**ICWW Reach Mileage:**	312.47
Municipality:	Coral Springs	**East/West of**	West
Section/Township/Range:	24/48/41 & 13/48/41	**Receiving Waterbody:**	N/A
		FDEP	N/A

REACH

Reach Designation:	BW-1	**Projected Dredging Frequency (yr):**	10
Reach Length (mi):	4.74	**50-yr Dredging Requirement (cy):**	27,020
ICWW Mileage:	309.24 to 313.98	**50-yr Storage Requirement (cy):**	58,092
Cut/Station:	BW-1/0+00 to BW-22/0+00		
Geographic: (FDEP Classification)	650 ft south of Palm Beach/Broward County (III) to 1,600 ft north of 14th St. Bridge (S.R. 844) (III)		

SITE PARAMETERS

Mapped Area (ac):	37.65	**Storage Capacity (cy):**	72,600
Containment Area (ac):	N/A	**Dike Height (ft):**	N/A
Impacted Area (ac):	5.60	**Excavation Depth (ft):**	N/A
Buffer Area (ac):	28.46	**Existing Mean Site Elevation (ft):**	15.0
N Buffer Width (ft):	350	**Dike Volume (cy):**	N/A
S Buffer Width (ft):	350	**Max. Pumping Distance (mi):**	N/A
E Buffer Width (ft):	350	**Max. Barging Distance (mi):**	N/A
W Buffer Width (ft):	350	**Min. Distance from Waterway (mi):**	7.60
Total Site Area (ac):	34.06		

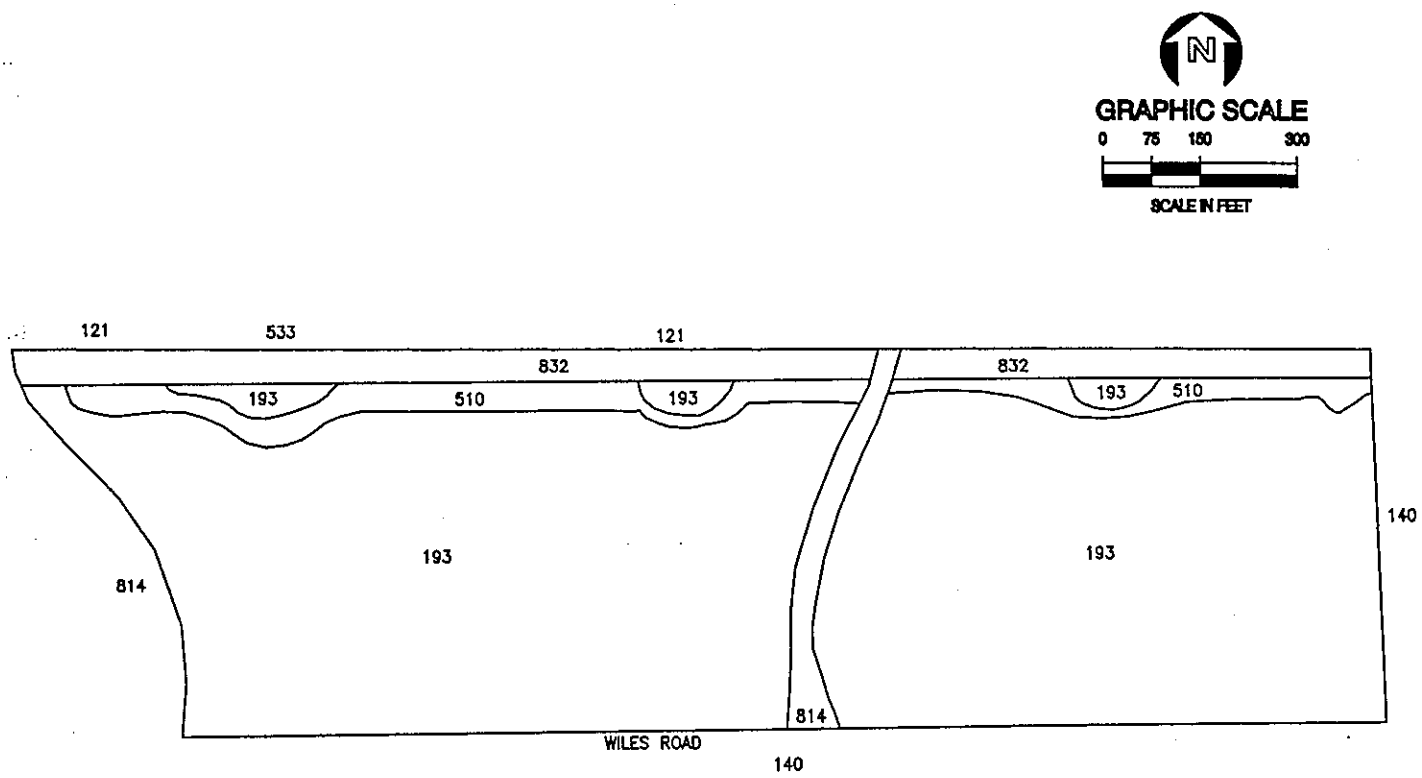
SITE

Public Access:	Sample Rd, US 441, NW 62nd Ave	**Comprehensive Plan Designation:**	H,C
		Adjacent Land Use:	Sample Rd & Light Industrial (N); US 441 (E); Retail sales and services (S); Single-family homes & Retail sales and services
Road Easement (ft):	Not Required		
Pipeline Easement (ft):	N/A	**Land Use of Impacted Area:**	Undeveloped area (former agricultural land)
Deep Draft Access:	N/A		
		Wetlands W/I Mapped Area (ac):	0.28
		Wetlands Impacted (ac):	0.00

Site Narrative:

Site B-38 is a 38-acre undeveloped area (194) of former agricultural land. The property contains regularly-spaced rectangular areas interrupted by low swales typical of agricultural fields. Although posted as a construction site, the property shows no evidence of recent development. Vegetation consists of mostly grasses and herbaceous species with a few scattered shrubs including beggarticks (*Bidens alba*), peppervine (*Ampelopsis arborea*), fingergrass (*Eustachys petraea*), natalgrass (*Rhynchelytrum repens*), and ironweed (*Sida rhombifolia*). A drained cypress wetland (621) is found on the property. A sandy ring encircles the wetland due to regular all-terrain vehicle use. The wetland contains cypress (*Taxodium distichum*), Brazilian pepper (*Schinus terebinthifolius*), and swamp fern (*Blechnum serrulatum*).

Surrounding land uses include Sample Road and light industrial area to the north, U.S. 441 to the east, retail sales and services to the south, and fixed single-family homes and retail sales and services to the west.



	LEGEND B-39	ACRES
193	URBAN LAND IN TRANSITION	21.95
510	STREAMS AND WATERWAYS	1.67
814	ROADS AND HIGHWAYS	.58
832	ELECTRICAL POWER TRANSMISSION LINES	2.41
	TOTAL ACRES	26.61

OTHER COVER TYPES SHOWN

121	FIXED SINGLE FAMILY UNITS
140	COMMERCIAL AND SERVICES
533	RESERVOIRS LARGER THAN 10 ACRES, BUT LESS THAN 100 ACRES

LAND USE AND VEGETATION OF CANDIDATE SITE B-39, BROWARD COUNTY, FLORIDA

TAYLOR ENGINEERING INC.
9000 CYPRESS GREEN DRIVE, SUITE 200
JACKSONVILLE, FLORIDA 32256

Figure B-27
Land Use and Vegetation
of Candidate Site B-39
Broward County, Florida

PROJECT C9920
REVISION
SHEET
DATE Sept., 2000

SITE DATA SUMMARY SHEET

Name: B-39

AKA:

Site Use: Multi-Reach Inland Storage

Comment: Undeveloped property surrounding entrance to Whispering Woods, a gated residential community

LOCATION

County:	Broward	**ICWW Reach Mileage:**	311.47
Municipality:	Unincorporated	**East/West of**	West
Section/Township/Range:	11/48/41	**Receiving Waterbody:**	N/A
		FDEP	N/A

REACH

Reach Designation:	BW-1			**Projected Dredging Frequency (yr):**	10
Reach Length (mi):	4.74			**50-yr Dredging Requirement (cy):**	27,020
ICWW Mileage:	309.24	to	313.98	**50-yr Storage Requirement (cy):**	58,092
Cut/Station:	BW-1/0+00	to	BW-22/0+00		
Geographic: (FDEP Classification)	650 ft south of Palm Beach/Broward County (III) to 1,600 ft north of 14th St. Bridge (S.R. 844) (III)				

SITE PARAMETERS

Mapped Area (ac):	26.61	**Storage Capacity (cy):**	N/A
Containment Area (ac):	N/A	**Dike Height (ft):**	N/A
Impacted Area (ac):	Insufficient Area	**Excavation Depth (ft):**	N/A
Buffer Area (ac):	N/A	**Existing Mean Site Elevation (ft):**	10.0
N Buffer Width (ft):	N/A	**Dike Volume (cy):**	N/A
S Buffer Width (ft):	N/A	**Max. Pumping Distance (mi):**	N/A
E Buffer Width (ft):	N/A	**Max. Barging Distance (mi):**	N/A
W Buffer Width (ft):	N/A	**Min. Distance from Waterway (mi):**	9.15
Total Site Area (ac):	N/A		

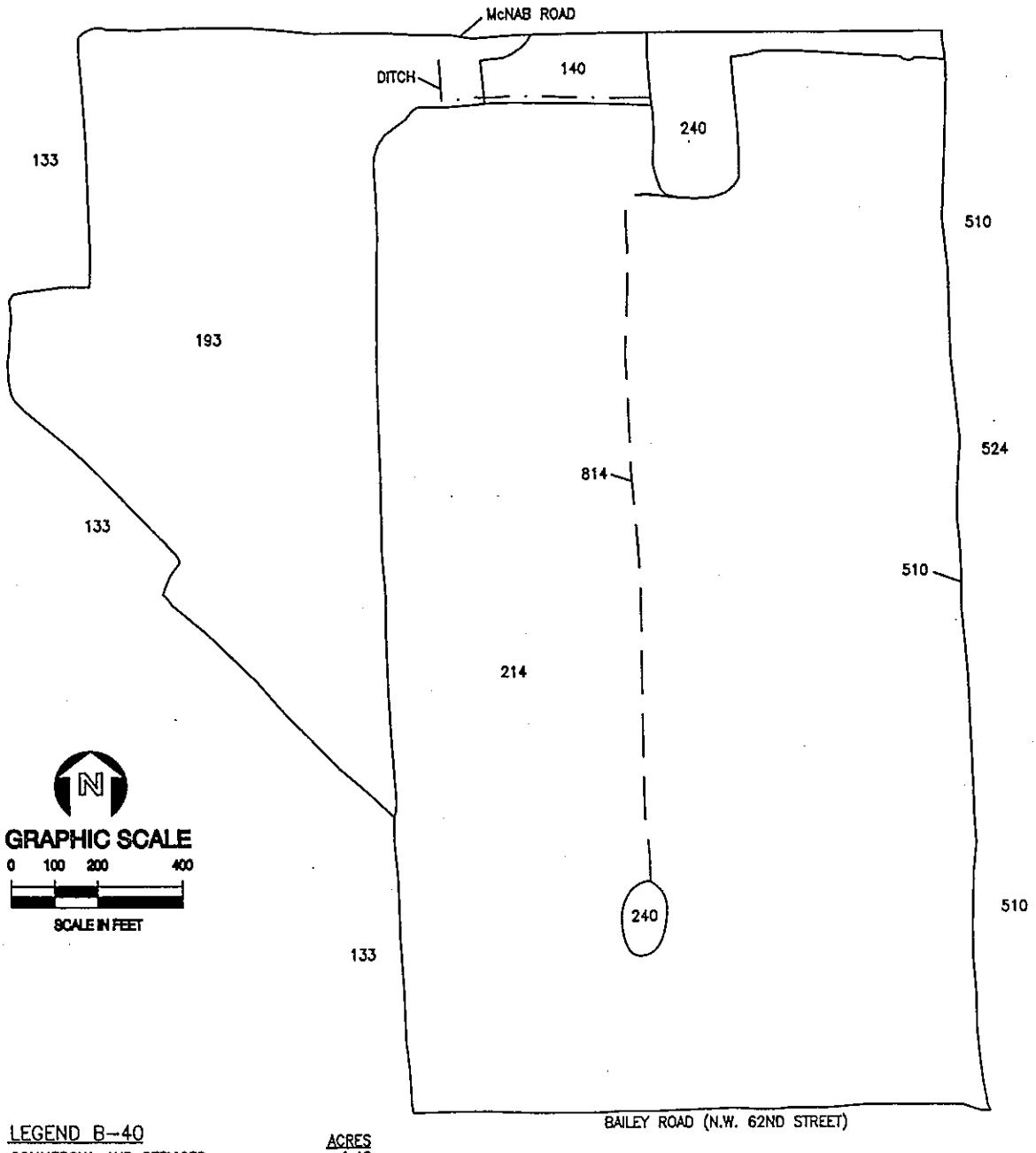
SITE

Public Access:	Wiles Rd, Leitner Dr	**Comprehensive Plan Designation:**	C
		Adjacent Land Use:	
Road Easement (ft):	Not Required	Residential (N); Commercial and Services (E, S); Leitner Dr (W)	
Pipeline Easement (ft):	N/A		
		Land Use of Impacted Area:	
Deep Draft Access:	N/A	N/A	
		Wetlands W/I Mapped Area (ac):	1.67
		Wetlands Impacted (ac):	0.00

Site Narrative:

Site B-39 is a 27-acre area of undeveloped property on either side of the entrance (814) to Whispering Woods, a gated residential community. The property (up for sale) is likely intended for commercial highway frontage. The property is currently cleared with low-growing lawn grasses and herbs such as St. Augustine grass (*Stenotaphrum secundatum*), matchheads (*Phyla nodiflora*), and Spanish needles or beggarticks (*Bidens alba*). A few scattered trees grow on the property including cabbage palm (*Sabal palmetto*), slash pine (*Pinus elliottii*), and Brazilian pepper (*Schinus terebinthifolius*). The north side of the property sits adjacent to a canal (510) and an electric power line corridor (832).

Adjacent land uses include a residential community to the north, commercial and services to the east and south, and Leitner Drive to the west.



	LEGEND B-40	ACRES
140	COMMERCIAL AND SERVICES	1.40
193	URBAN LAND IN TRANSITION WITHOUT POSITIVE INDICATORS OF INTENDED ACTIVITY	25.89
214	ROW CROPS	73.89
240	NURSERIES AND VINEYARDS	2.72
	TOTAL ACRES	103.90

OTHER COVER TYPES SHOWN

133	MULTIPLE DWELLING UNITS, LOW RISE
510	STREAMS AND WATERWAYS
524	LAKES LESS THAN 10 ACRES WHICH ARE DOMINANT FEATURES
814	ROADS AND HIGHWAYS

——— ROAD

LAND USE AND VEGETATION OF CANDIDATE SITE B-40, BROWARD COUNTY, FLORIDA

TAYLOR ENGINEERING INC.
9000 CYPRESS GREEN DRIVE, SUITE 200
JACKSONVILLE, FLORIDA 32256

Figure B-28
Land Use and Vegetation
of Candidate Site B-40
Broward County, Florida

PROJECT C9920
REVISION
SHEET
DATE Aug., 2000

SITE DATA SUMMARY SHEET

Name: B-40

AKA:

Site Use: Multi-Reach Inland Storage

Comment: Agricultural Use – Row crops and Retail fruit stand

LOCATION

County:	Broward	**ICWW Reach Mileage:**	317.39
Municipality:	North Lauderdale	**East/West of**	West
Section/Township/Range:	11/49/41	**Receiving Waterbody:**	N/A
		FDEP	N/A

REACH

Reach Designation:	BW-2			**Projected Dredging Frequency (yr):**	20
Reach Length (mi):	7.06			**50-yr Dredging Requirement (cy):**	5,703
ICWW Mileage:	313.98	to	321.04	**50-yr Storage Requirement (cy):**	12,262
Cut/Station:	BW-22/0+00	to	BW-32/0+00		
Geographic: (FDEP Classification)	1,600 ft north of 14th St. Bridge (S.R. 844) to 5,100 ft south of Oakland Park Blvd. Bridge			(III) to (III)	

SITE PARAMETERS

Mapped Area (ac):	103.9	**Storage Capacity (cy):**	72,600
Containment Area (ac):	N/A	**Dike Height (ft):**	N/A
Impacted Area (ac):	5.60	**Excavation Depth (ft):**	N/A
Buffer Area (ac):	27.18	**Existing Mean Site Elevation (ft):**	10.0
N Buffer Width (ft):	350	**Dike Volume (cy):**	N/A
S Buffer Width (ft):	350	**Max. Pumping Distance (mi):**	N/A
E Buffer Width (ft):	350	**Max. Barging Distance (mi):**	N/A
W Buffer Width (ft):	350	**Min. Distance from Waterway (mi):**	8.05
Total Site Area (ac):	32.78		

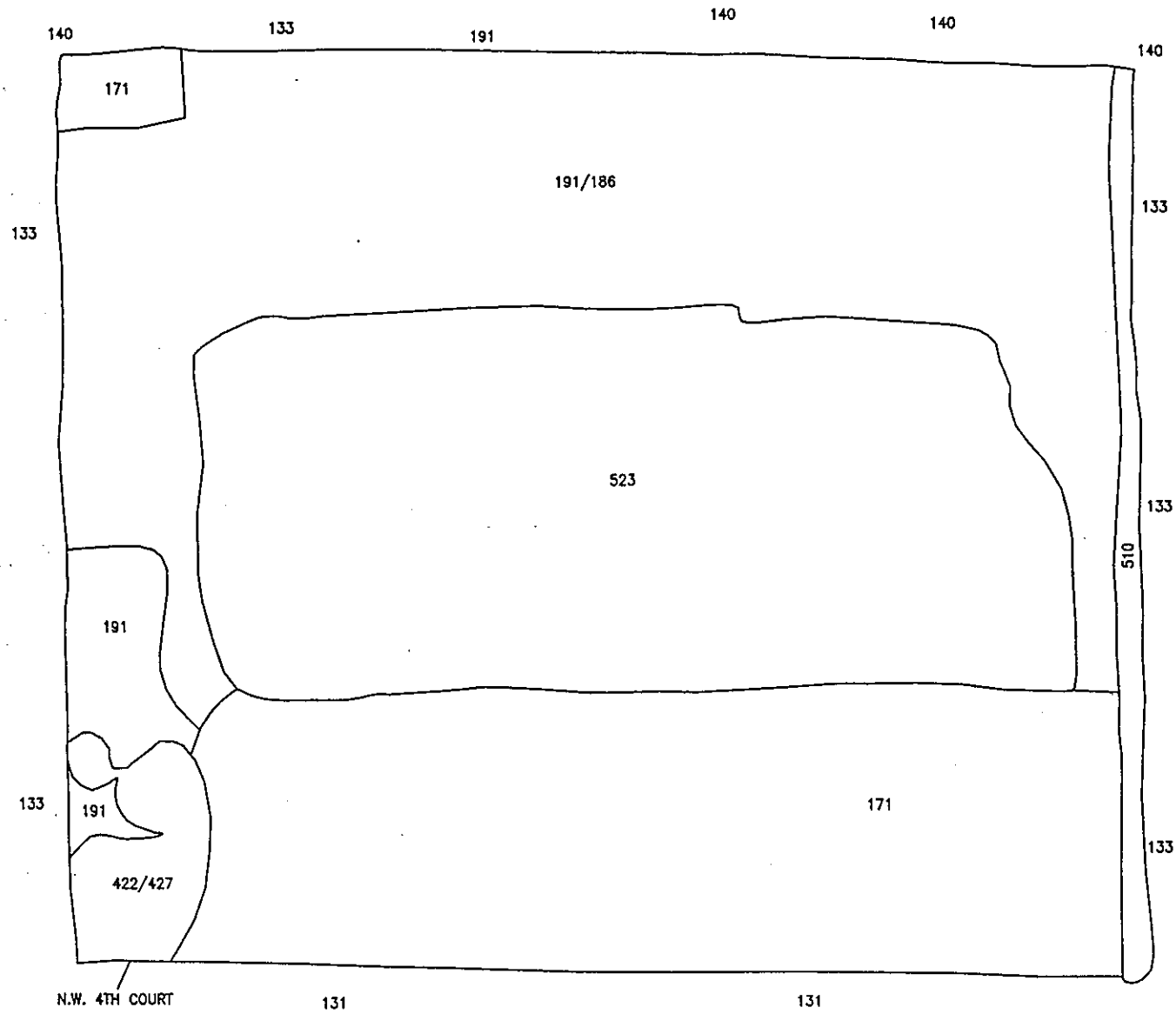
SITE

Public Access:	McNab Rd, Bailey Rd/NW 62nd St	**Comprehensive Plan Designation:**	I
		Adjacent Land Use:	
Road Easement (ft):	Not Required	McNab Rd (N); Retention Pond & Canal (E); Bailey Rd/NW 62nd St (S); Apartments (W)	
Pipeline Easement (ft):	N/A	**Land Use of Impacted Area:**	
Deep Draft Access:	N/A	Row crops, Urban land in transition (without positive indicators of intended activity), Nurseries & Vineyards	
		Wetlands W/I Mapped Area (ac):	0.00
		Wetlands Impacted (ac):	0.00

Site Narrative:

This 104-acre parcel, Site B-40, principally serves as an area for row crops (214) and an associated retail fruit stand (140). Many small irrigation ditches are prevalent throughout the row crop areas. The small ditches were included in the row crops land use designation and therefore not mapped individually. Other on-site land uses include a plant nursery (240), dirt roads (814), and urban land in transition without positive indicators of intended activity (193). The relatively large area of urban lands in transition contains what appears to be weedy and exotic plant species typical of disturbed areas. Other small cleared portions of this area appear ready for imminent construction.

McNab Road (814) forms the northern border while a small retention pond (524) and a large canal (510) running the length of the boundary forms the eastern borders. Light industrial and an apparent tree nursery are located on the eastside of the canal. Bailey Road (N.W. 62nd Street) borders the parcel to the south and apartments (multiple dwelling units, 133) occur along the western boundary.



LEGEND B-41

		ACRES
171	EDUCATIONAL FACILITIES	19.60
191	UNDEVELOPED LAND WITHIN URBAN AREAS	1.80
191/186	UNDEVELOPED LAND WITHIN URBAN AREAS/ COMMUNITY RECREATIONAL FACILITIES	24.66
422/427	BRAZILIAN PEPPER/LIVE OAK	1.80
510	STREAMS AND WATERWAYS	1.54
523	LAKES LARGER THAN 10 ACRES, BUT LESS THAN 100 ACRES WHICH ARE DOMINANT FEATURES	23.44
	TOTAL ACRES	72.84

OTHER COVER TYPES SHOWN

131	FIXED SINGLE FAMILY UNITS
133	MULTIPLE DWELLING UNITS, LOW RISE
140	COMMERCIAL AND SERVICES

N

GRAPHIC SCALE

0 75 150 300

SCALE IN FEET

LAND USE AND VEGETATION OF CANDIDATE SITE B-41, BROWARD COUNTY, FLORIDA

TAYLOR ENGINEERING INC.
9000 CYPRESS GREEN DRIVE, SUITE 200
JACKSONVILLE, FLORIDA 32256

Figure B-29
Land Use and Vegetation
of Candidate Site B-41
Broward County, Florida

PROJECT C9920
REVISION
SHEET
DATE Aug., 2000

SITE DATA SUMMARY SHEET

Name: B-41

AKA:

Site Use: Multi-Reach Inland Storage

Comment: Site contains Westminster Academy Sports Complex and 23-acre retention pond

LOCATION

County:	Broward	**ICWW Reach Mileage:**	318.89
Municipality:	Unincorporated	**East/West of**	West
Section/Township/Range:	18/49/42	**Receiving Waterbody:**	N/A
		FDEP	N/A

REACH

Reach Designation:	BW-2	**Projected Dredging Frequency (yr):**	20
Reach Length (mi):	7.06	**50-yr Dredging Requirement (cy):**	5,703
ICWW Mileage:	313.98 to 321.04	**50-yr Storage Requirement (cy):**	12,262
Cut/Station:	BW-22/0+00 to BW-32/0+00		
Geographic: (FDEP Classification)	1,600 ft north of 14th St. Bridge (S.R. 844) (III) to 5,100 ft south of Oakland Park Blvd. Bridge (III)		

SITE PARAMETERS

Mapped Area (ac):	72.84	**Storage Capacity (cy):**	N/A
Containment Area (ac):	N/A	**Dike Height (ft):**	N/A
Impacted Area (ac):	Insufficient Area	**Excavation Depth (ft):**	N/A
Buffer Area (ac):	N/A	**Existing Mean Site Elevation (ft):**	10.0
N Buffer Width (ft):	N/A	**Dike Volume (cy):**	N/A
S Buffer Width (ft):	N/A	**Max. Pumping Distance (mi):**	N/A
E Buffer Width (ft):	N/A	**Max. Barging Distance (mi):**	N/A
W Buffer Width (ft):	N/A	**Min. Distance from Waterway (mi):**	5.89
Total Site Area (ac):	N/A		

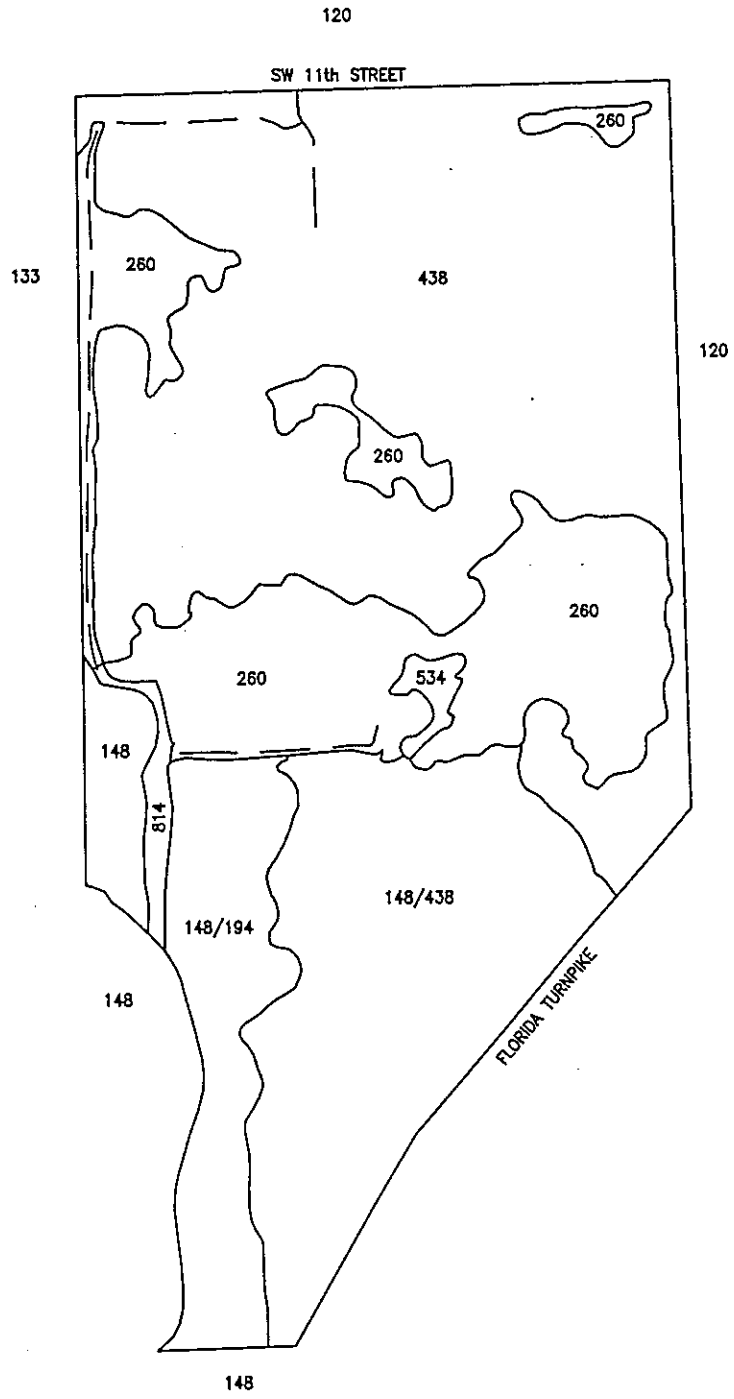
SITE

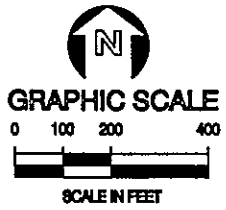
Public Access:	NW 44th Ct	**Comprehensive Plan Designation:**	CR
		Adjacent Land Use:	
Road Easement (ft):	Not Required	Large canal & apartments (E); Single-family homes (S); apartments (W); Mixed uses (N)	
Pipeline Easement (ft):	N/A	**Land Use of Impacted Area:**	
Deep Draft Access:	N/A	N/A	
		Wetlands W/I Mapped Area (ac):	0.00
		Wetlands Impacted (ac):	0.00

Site Narrative:

This 73-acre site, B-41, contains no natural vegetation communities. However, many urban and transitional land use communities are located on the property. The dominant feature of the site is a 23-acre retention pond (524). Adjacent to the lake on the south is the Westminster Academy Sports Complex (171) and a small area of Brazilian pepper and Australian pine (422/437). Two small areas of undeveloped land (191) lie in the southwest corner of the parcel. An undeveloped community recreation facility (191/186) surrounds the retention pond. In the northwest corner of the site is a small daycare facility (171).

The site is bordered on the east by a large canal (510) and apartments (133), single-family homes to the south, apartments to the west, and mixed uses on the north.





LEGEND B-42

		ACRES
148	CEMETERIES	1.41
148/194	CEMETERIES/OTHER OPEN LAND	5.24
148/438	CEMETERIES/MIXED HARDWOODS	11.93
260	OTHER OPEN LAND	12.35
438	MIXED HARDWOODS	28.46
534	RESERVOIRS LARGER THAN 10 ACRES WHICH ARE DOMINANT FEATURE	.36
814	ROADS AND HIGHWAYS	.56
	TOTAL ACRES	60.31

OTHER COVER TYPES SHOWN

120	RESIDENTIAL, MEDIUM DENSITY
133	MULTIPLE DWELLING UNITS, LOW RISE

LAND USE AND VEGETATION OF CANDIDATE SITE B-42, BROWARD COUNTY, FLORIDA

TAYLOR ENGINEERING INC.
9000 CYPRESS GREEN DRIVE, SUITE 200
JACKSONVILLE, FLORIDA 32256

Figure B-30
Land Use and Vegetation
of Candidate Site B-42
Broward County, Florida

PROJECT C9920
REVISION
SHEET
DATE Aug., 2000

SITE DATA SUMMARY SHEET

Name: B-42

AKA:

Site Use: Multi-Reach Inland Storage

Comment: Appears to be undeveloped land associated with Queen of Heaven Catholic Cemetery

LOCATION

County:	Broward	**ICWW Reach Mileage:**	316.9
Municipality:	North Lauderdale	**East/West of**	West
Section/Township/Range:	6/49/42 & 7/49/42	**Receiving Waterbody:**	N/A
		FDEP	N/A

REACH

Reach Designation:	BW-2	**Projected Dredging Frequency (yr):**	20
Reach Length (mi):	7.06	**50-yr Dredging Requirement (cy):**	5,703
ICWW Mileage:	313.98 to 321.04	**50-yr Storage Requirement (cy):**	12,262
Cut/Station:	BW-22/0+00 to BW-32/0+00		
Geographic: (FDEP Classification)	1,600 ft north of 14th St. Bridge (S.R. 844) (III) to 5,100 ft south of Oakland Park Blvd. Bridge (III)		

SITE PARAMETERS

Mapped Area (ac):	60.31	**Storage Capacity (cy):**	N/A
Containment Area (ac):	N/A	**Dike Height (ft):**	N/A
Impacted Area (ac):	Insufficient Area	**Excavation Depth (ft):**	N/A
Buffer Area (ac):	N/A	**Existing Mean Site Elevation (ft):**	10.0
N Buffer Width (ft):	N/A	**Dike Volume (cy):**	N/A
S Buffer Width (ft):	N/A	**Max. Pumping Distance (mi):**	N/A
E Buffer Width (ft):	N/A	**Max. Barging Distance (mi):**	N/A
W Buffer Width (ft):	N/A	**Min. Distance from Waterway (mi):**	6.14
Total Site Area (ac):	N/A		

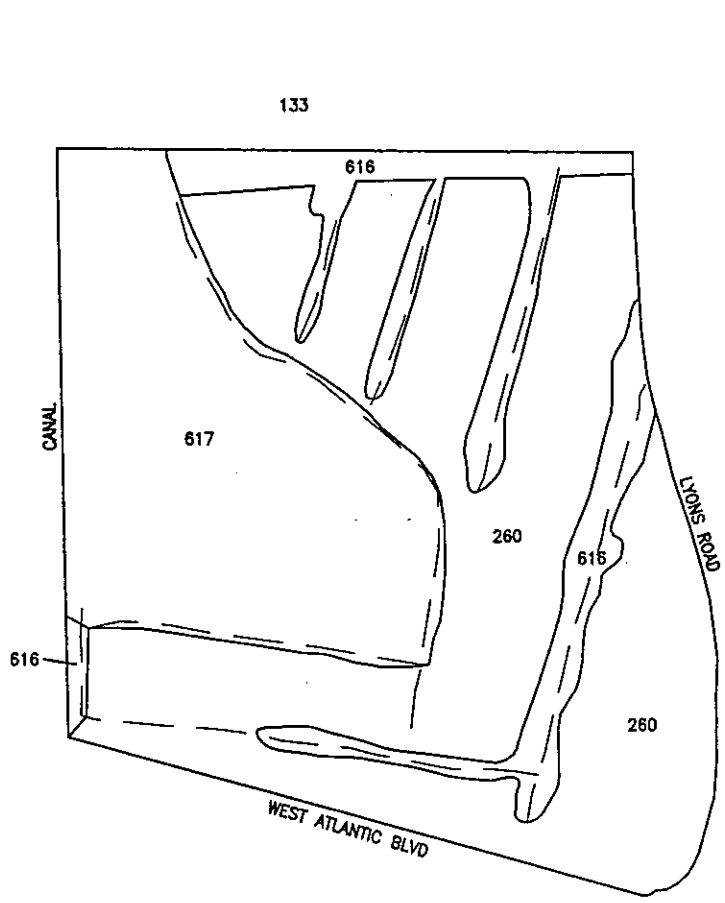
SITE

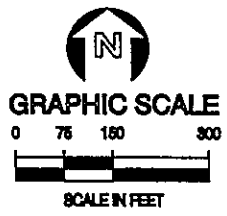
Public Access:	SW 11th St, FL Turnpike	**Comprehensive Plan Designation:**	CF
		Adjacent Land Use:	
Road Easement (ft):	Not Required	Single-family residential (N, E); FL Turnpike (SE); Cemetery (S, SW); Low-rise multi-family residential (NW)	
Pipeline Easement (ft):	N/A	**Land Use of Impacted Area:**	
Deep Draft Access:	N/A	N/A	
		Wetlands W/I Mapped Area (ac):	0.36
		Wetlands Impacted (ac):	0.00

Site Narrative:

Site B–42 appears to be undeveloped land associated with Queen of Heaven Catholic Cemetery. The 60-acre site is mostly wooded property. One large area, mapped as other open lands (260), and several smaller areas appear to be former Bahia grass (*Paspalum notatum*) pastures. The area contained no evidence of current grazing use. The remains of some cross fences and agricultural type outbuildings occupy the site. The wooded area in the northern part of the property, mapped as mixed hardwoods (438), contained a mixture of trees and shrubs including earleaf acacia (*Acacia auriculiformis*), rose apple (*Syzygium jambos*), Brazilian pepper (*Schinus terebinthifolius*), and cabbage palm (*Sabal palmetto*). The wooded area in the southern part of the property contained some species noted in the northern area in addition to remnants of tropical hardwoods such as gumbo-limbo (*Bursera simaruba*), and strangler fig (*Ficus aurea*). Heavy debris from the adjacent cemetery operations littered the area; therefore, it received a cemetery/mixed hardwoods (148/438) designation.

Adjacent land uses included single-family residential to the north and east, the Florida Turnpike to the southeast, the active part of the cemetery to the south and southwest, and low-rise multifamily residential to the northwest.





LEGEND B-43

		ACRES
260	OTHER OPEN LANDS	12.64
616	INLAND PONDS AND SLOUGHS	3.23
617	MIXED WETLAND HARDWOODS	7.35
	TOTAL ACRES	23.22

OTHER COVER TYPES SHOWN

133	MULTIPLE DWELLING UNITS, LOW RISE

LAND USE AND VEGETATION OF CANDIDATE SITE B-43, BROWARD COUNTY, FLORIDA

TAYLOR ENGINEERING INC.
9000 CYPRESS GREEN DRIVE, SUITE 200
JACKSONVILLE, FLORIDA 32256

Figure B-31
Land Use and Vegetation
of Candidate Site B-43
Broward County, Florida

PROJECT C9920
REVISION
SHEET
DATE Aug., 2000

SITE DATA SUMMARY SHEET

Name: B-43

AKA:

Site Use: Multi-Reach Inland Storage

Comment: Combination of former agricultural property and mixed wetland hardwoods

LOCATION

County:	Broward	**ICWW Reach Mileage:**	315.5
Municipality:	Coconut Creek	**East/West of**	West
Section/Township/Range:	31/48/42	**Receiving Waterbody:**	N/A
		FDEP	N/A

REACH

Reach Designation:	BW-2	**Projected Dredging Frequency (yr):**	20
Reach Length (mi):	7.06	**50-yr Dredging Requirement (cy):**	5,703
ICWW Mileage:	313.98 to 321.04	**50-yr Storage Requirement (cy):**	12,262
Cut/Station:	BW-22/0+00 to BW-32/0+00		
Geographic: (FDEP Classification)	1,600 ft north of 14th St. Bridge (S.R. 844) (III) to 5,100 ft south of Oakland Park Blvd. Bridge (III)		

SITE PARAMETERS

Mapped Area (ac):	23.22	**Storage Capacity (cy):**	N/A
Containment Area (ac):	N/A	**Dike Height (ft):**	N/A
Impacted Area (ac):	Insufficient Area	**Excavation Depth (ft):**	N/A
Buffer Area (ac):	N/A	**Existing Mean Site Elevation (ft):**	10.0
N Buffer Width (ft):	N/A	**Dike Volume (cy):**	N/A
S Buffer Width (ft):	N/A	**Max. Pumping Distance (mi):**	N/A
E Buffer Width (ft):	N/A	**Max. Barging Distance (mi):**	N/A
W Buffer Width (ft):	N/A	**Min. Distance from Waterway (mi):**	5.81
Total Site Area (ac):	N/A		

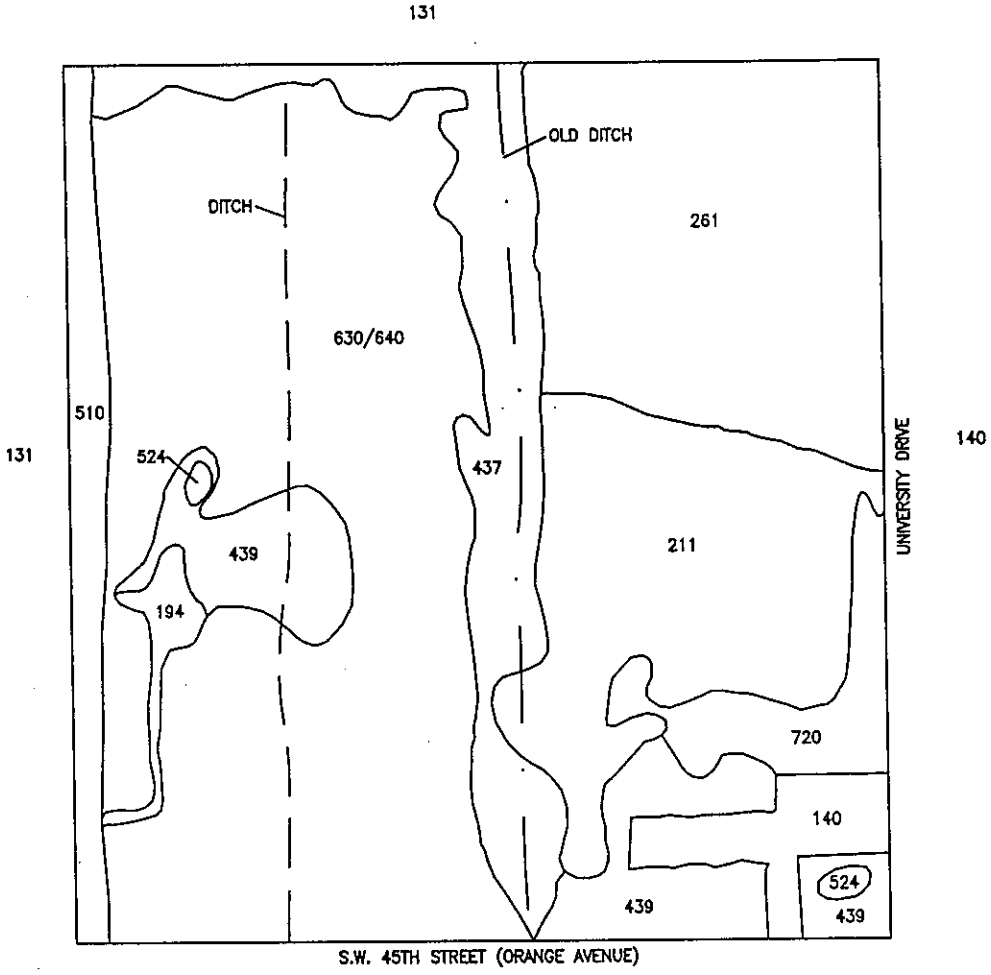
SITE

Public Access:	West Atlantic Blvd, Lyons Rd	**Comprehensive Plan Designation:**	C
		Adjacent Land Use:	
Road Easement (ft):	Not Required	Multi-family residential (N); Large canal & undeveloped land (W); Major highways (E, S)	
Pipeline Easement (ft):	N/A	**Land Use of Impacted Area:**	
Deep Draft Access:	N/A	N/A	
		Wetlands W/I Mapped Area (ac):	7.35
		Wetlands Impacted (ac):	0.00

Site Narrative:

Site B-43, a 23-acre site, is a combination of former agricultural property and mixed wetland hardwoods (617). The open, former agricultural property, mapped as other open lands (260), contained regularly spaced ditches common to agricultural operations to promote drainage and/or irrigation of fields. Carolina willow *(Salix caroliniana)*, Brazilian pepper (*Schinus terebinthifolius*), primrose willow (*Ludwigia peruviana*), and cattail (*Typha* sp.) vegetated the ditches and embankments. The open fields, occasionally mowed, contained a mixture of grasses and herbs including St. Augustine grass (*Stenotaphrum secundatum*), fingergrass (*Eustachys* sp.), beggarticks (*Bidens alba*), and pennywort (*Hydrocotyle* sp.). The mixed wetland hardwood community located adjacent to a large canal; large ditches separated the entire wetland from the rest of the site. Species commonly found in this mixed wetland hardwood community included Javanese bishopwood (*Bischofia javanica*), strangler fig (*Ficus aurea*), umbrella tree (*Schefflera actinophylla*), wild coffee (*Psychotria* sp.), and swamp fern (*Blechnum serrulatum*).

Land uses adjacent to the site include multifamily residential to the north, major highways to the east and south, and a large canal and undeveloped land to the west.



	LEGEND B-46A	ACRES
140	COMMERCIAL AND OPEN SERVICES	1.07
194	OTHER OPEN LAND	.41
211	IMPROVED PASTURES	5.65
261	FALLOW CROP LAND	7.18
437	AUSTRALIAN PINE	3.99
439	OTHER HARDWOODS	3.10
510	STREAMS AND WATERWAYS	1.64
524	LAKES LESS THAN 10 ACRES WHICH ARE DOMINANT FEATURES	.12
630/640	WETLAND FORESTED MIXED/VEGETATED NON-FORESTED WETLANDS	15.83
720	SAND OTHER THAN BEACHES	1.39
	TOTAL ACRES	40.38

OTHER COVER TYPES SHOWN

131 FIXED SINGLE FAMILY UNITS

N

GRAPHIC SCALE

0 75 150 300

SCALE IN FEET

LAND USE AND VEGETATION OF CANDIDATE SITE B-46A, BROWARD COUNTY, FLORIDA

TAYLOR ENGINEERING INC.
9000 CYPRESS GREEN DRIVE, SUITE 200
JACKSONVILLE, FLORIDA 32256

Figure B-32
Land Use and Vegetation
of Candidate Site B-46A
Broward County, Florida

PROJECT C9920
REVISION
SHEET
DATE Aug., 2000

SITE DATA SUMMARY SHEET

Name: B-46A

AKA:

Site Use: Multi-Reach Inland Storage

Comment: Large portion of site (15.8-acres) consists of mixed/vegetated non-forested wetlands

LOCATION

County:	Broward	**ICWW Reach Mileage:**	327.82
Municipality:	Unincorporated	**East/West of**	West
Section/Township/Range:	28/50/41	**Receiving Waterbody:**	N/A
		FDEP	N/A

REACH

Reach Designation:	BW-3	**Projected Dredging Frequency (yr):**	20
Reach Length (mi):	13.2	**50-yr Dredging Requirement (cy):**	921
ICWW Mileage:	321.04 to 334.24	**50-yr Storage Requirement (cy):**	1,980
Cut/Station:	BW-32/0+00 to DA-1/0+00		
Geographic: (FDEP Classification)	5,100 ft south of Oakland Park Blvd. Bridge (III) to 530 ft south of Broward/Dade County Line (III)		

SITE PARAMETERS

Mapped Area (ac):	40.38	**Storage Capacity (cy):**	N/A
Containment Area (ac):	N/A	**Dike Height (ft):**	N/A
Impacted Area (ac):	Insufficient Area	**Excavation Depth (ft):**	N/A
Buffer Area (ac):	N/A	**Existing Mean Site Elevation (ft):**	5.0
N Buffer Width (ft):	N/A	**Dike Volume (cy):**	N/A
S Buffer Width (ft):	N/A	**Max. Pumping Distance (mi):**	N/A
E Buffer Width (ft):	N/A	**Max. Barging Distance (mi):**	N/A
W Buffer Width (ft):	N/A	**Min. Distance from Waterway (mi):**	8.70
Total Site Area (ac):	N/A		

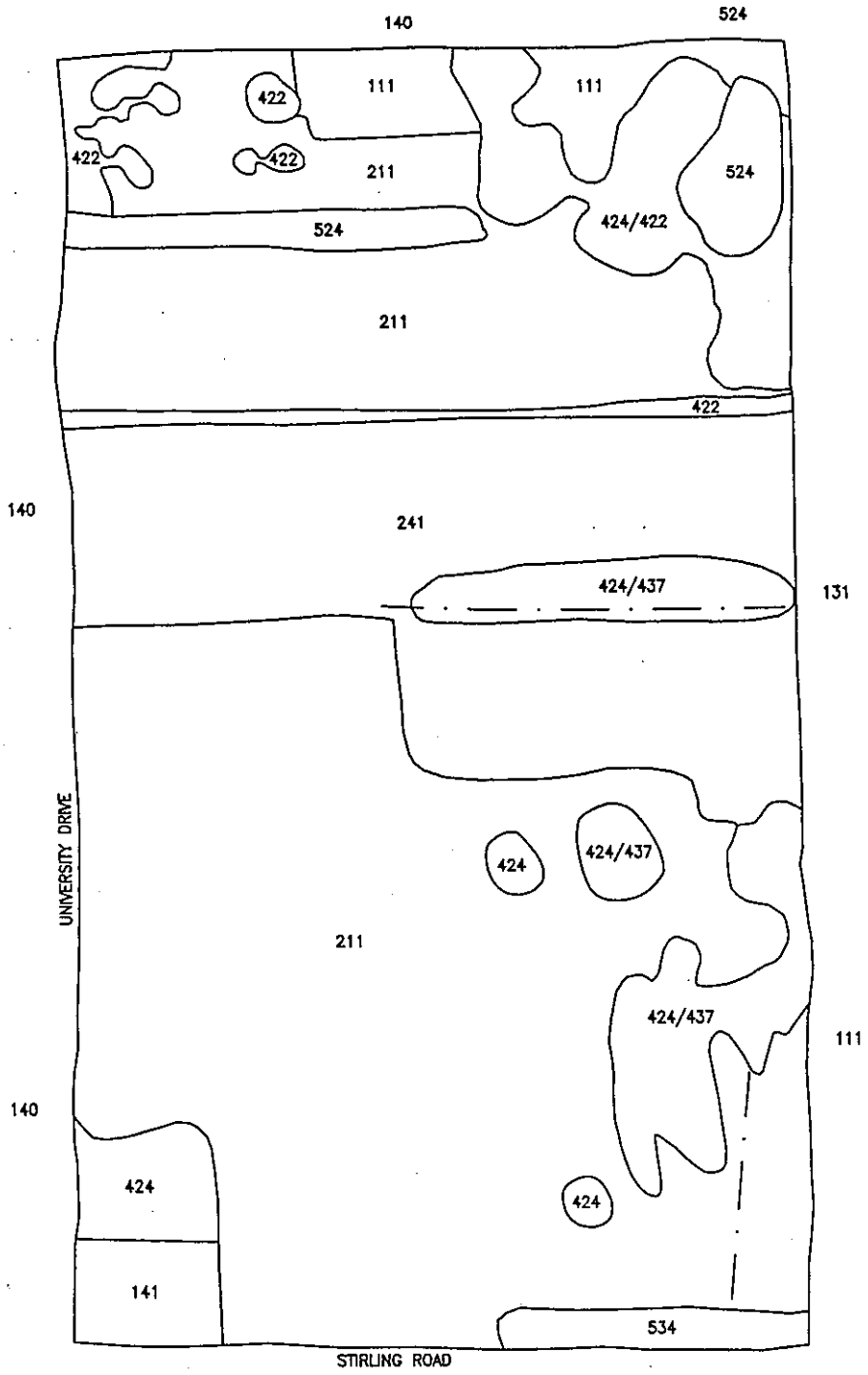
SITE

Public Access:	SW 45th St (Orange Dr), University Dr	**Comprehensive Plan Designation:**	None Designated
		Adjacent Land Use:	
Road Easement (ft):	Not Required	Residential (N); Commercial (E); SW 45th St (S), Large canal & Residential (W)	
Pipeline Easement (ft):	N/A	**Land Use of Impacted Area:**	
Deep Draft Access:	N/A	N/A	
		Wetlands W/I Mapped Area (ac):	15.83
		Wetlands Impacted (ac):	0.00

Site Narrative:

Although mainly undeveloped, this 40-acre site, B-46A, shows evidence of previous clearing and ditching that have disturbed the vegetation communities. The largest community is a combination of wetland forested mix and vegetated non-forested wetlands (630/640). Although once cleared, this community has experienced a return of some large exotic legume trees and Australian pines (*Casuarina equisetifolia*). Soils appear deep and largely muck. Open areas were wet and wetland vegetation such as soft rush (*Juncus effusus*), pennywort (*Hydrocotyle* sp.), royal fern (*Osmunda regalis*), buttonbush (*Cephalanthus occidentalis*), and swamp fern (*Blechnum serrulatum*) were predominant. A filled area in the west-central portion of the site (Other open land, 194 and Other hardwoods, 439) had once served as a mobile home residence. The vegetation, mapped as other hardwoods (439), contained a mix of exotic and native species with no dominant community characteristics. No structures currently occupy the area surrounding a small pond (524). Other land use types include an improved pasture (211) and fallow cropland (261) both on the east side of the property. An open, cleared area (720) and retail offices (140) are located in the southeastern corner. Two ditches, both oriented north to south, occur on-site. An abundance of Australian pine (437) surrounds the easternmost ditch; the westernmost ditch flows through the wetland community (630/640).

The site is bordered on the north by residential (131), the east by commercial (140), the south by SW 45th Street (Orange Avenue), and the west by a large canal (510) and residential (131).



N

GRAPHIC SCALE

0 75 150 300

SCALE IN FEET

LEGEND B-48A

		ACRES
111	FIXED SINGLE FAMILY UNITS	1.91
141	RETAIL SALES AND SERVICES	.90
211	IMPROVED PASTURES	31.43
241	TREE NURSERIES	11.47
422	BRAZILIAN PEPPER	1.35
424	MELALEUCA	1.16
424/437	MELALEUCA/AUSTRALIAN PINE	3.85
424/422	MELALEUCA/BRAZILIAN PEPPER	2.76
524	LAKES LESS THAN 10 ACRES WHICH ARE DOMINANT FEATURES	1.72
534	RESERVOIRS LESS THAN 10 ACRES WHICH ARE DOMINANT FEATURES	.73
	TOTAL ACRES	57.28

OTHER COVER TYPES SHOWN

131	FIXED SINGLE FAMILY UNITS
140	COMMERCIAL AND SERVICES

——— DITCH

LAND USE AND VEGETATION OF CANDIDATE SITE B-48A BROWARD COUNTY, FLORIDA

TAYLOR ENGINEERING INC.
9000 CYPRESS GREEN DRIVE, SUITE 200
JACKSONVILLE, FLORIDA 32256

Figure B-33
Land Use and Vegetation
of Candidate Site B-48A
Broward County, Florida

PROJECT C9920
REVISION
SHEET
DATE Aug., 2000

SITE DATA SUMMARY SHEET

Name: B-48A

AKA:

Site Use: Multi-Reach Inland Storage

Comment: Combination of improved pasture and palm tree nursery

LOCATION

County:	Broward	**ICWW Reach Mileage:**	329.17
Municipality:	Unincorporated	**East/West of**	West
Section/Township/Range:	33/50/41 & 34/50/41	**Receiving Waterbody:**	N/A
		FDEP	N/A

REACH

Reach Designation:	BW-3			**Projected Dredging Frequency (yr):**	20
Reach Length (mi):	13.2			**50-yr Dredging Requirement (cy):**	921
ICWW Mileage:	321.04	to	334.24	**50-yr Storage Requirement (cy):**	1,980
Cut/Station:	BW-32/0+00	to	DA-1/0+00		
Geographic: (FDEP Classification)	5,100 ft south of Oakland Park Blvd. Bridge (III) to 530 ft south of Broward/Dade County Line (III)				

SITE PARAMETERS

Mapped Area (ac):	57.28	**Storage Capacity (cy):**	72,600
Containment Area (ac):	N/A	**Dike Height (ft):**	N/A
Impacted Area (ac):	5.60	**Excavation Depth (ft):**	N/A
Buffer Area (ac):	27.18	**Existing Mean Site Elevation (ft):**	5.0
N Buffer Width (ft):	350	**Dike Volume (cy):**	N/A
S Buffer Width (ft):	350	**Max. Pumping Distance (mi):**	N/A
E Buffer Width (ft):	350	**Max. Barging Distance (mi):**	N/A
W Buffer Width (ft):	350	**Min. Distance from Waterway (mi):**	8.38
Total Site Area (ac):	32.78		

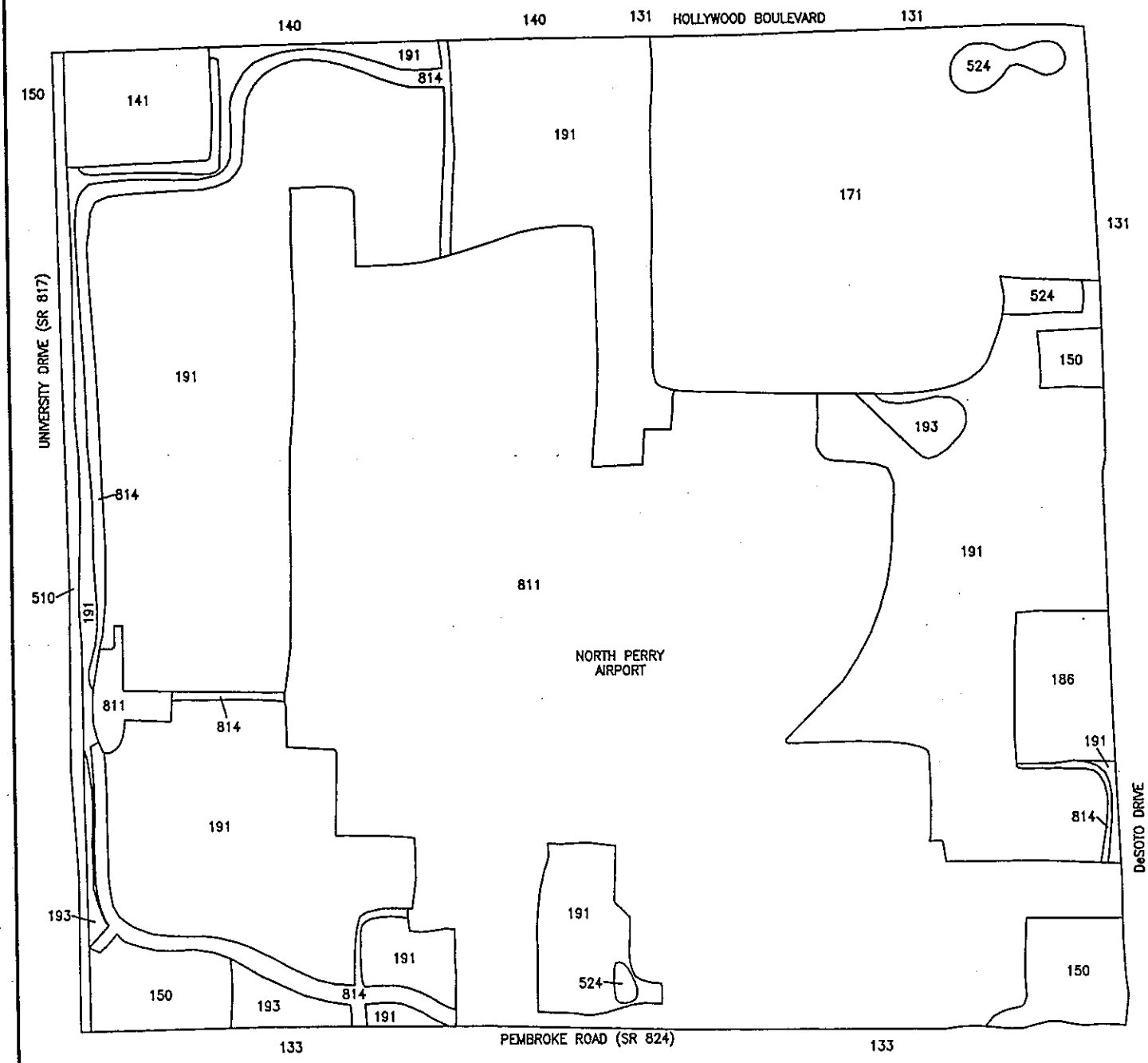
SITE

Public Access:	Stirling Rd, University Dr	**Comprehensive Plan Designation:**	C
		Adjacent Land Use:	
Road Easement (ft):	Not Required	Commercial & Rectangular Pond (N); Fixed single-family units & Housing (E); Stirling Rd (S); University Dr (W)	
Pipeline Easement (ft):	N/A	**Land Use of Impacted Area:**	
Deep Draft Access:	N/A	Tree nursery, Improved pastures, Melaleuca, Australian pine, Brazilian pepper	
		Wetlands W/I Mapped Area (ac):	0.00
		Wetlands Impacted (ac):	0.00

Site Narrative:

This 57-acre site, B-48A, is primarily improved pastureland (211) and a palm tree nursery (241). Scattered patches of Melaleuca and Australian pine (424/437) occur within the pasture. Some of the fencerows in the center of the site are mapped as Brazilian pepper (422) because of the dominance of that exotic species. In the northeastern corner of the site is a small pond (524) adjacent to Melaleuca/Brazilian pepper (434/422) and a single-family home (111). South of the house, a linear pond (524) separates the house from the pastureland. Another pond/borrow pit (534) is located in the extreme southeastern corner of the site.

The site is bounded on the north by commercial (140) and a rectangular pond (524), on the east by fixed single family units (131) and single-family housing (111), on the south by Stirling Road (814), and on the west by University Drive (814).



LEGEND B-51		ACRES
141	RETAIL SALES AND SERVICES	10.60
150	INDUSTRIAL	16.49
171	EDUCATIONAL FACILITIES	91.14
186	COMMUNITY RECREATIONAL FACILITIES	9.20
191	UNDEVELOPED LAND WITHIN URBAN AREAS	232.71
193	URBAN LAND IN TRANSITION	6.33
510	STREAMS AND WATERWAYS	8.60
524	LAKES LESS THAN 10 ACRES	4.48
	WHICH ARE DOMINANT FEATURES	
811	AIRPORTS	253.53
814	ROADS AND HIGHWAYS	15.93
	TOTAL ACRES	649.01

OTHER COVER TYPES SHOWN	
131	FIXED SINGLE FAMILY UNITS
133	MULTIPLE DWELLING UNITS, LOW RISE
140	COMMERCIAL AND SERVICES

GRAPHIC SCALE
0 200 400 800
SCALE IN FEET

LAND USE AND VEGETATION OF CANDIDATE SITE B-51, BROWARD COUNTY, FLORIDA

TAYLOR ENGINEERING INC.
9000 CYPRESS GREEN DRIVE, SUITE 200
JACKSONVILLE, FLORIDA 32256

Figure B-34
Land Use and Vegetation
of Candidate Site B-51
Broward County, Florida

PROJECT C9920
REVISION
SHEET
DATE Aug., 2000

SITE DATA SUMMARY SHEET

Name: B-51

AKA: North Perry Airport

Site Use: Multi-Reach Inland Storage

Comment:

LOCATION

County:	Broward	**ICWW Reach Mileage:**	332.22
Municipality:	Pembroke Pines	**East/West of**	West
Section/Township/Range:	15/51/41 & 22/51/41	**Receiving Waterbody:**	N/A
		FDEP	N/A

REACH

Reach Designation:	BW-3	**Projected Dredging Frequency (yr):**	20
Reach Length (mi):	13.2	**50-yr Dredging Requirement (cy):**	921
ICWW Mileage:	321.04 to 334.24	**50-yr Storage Requirement (cy):**	1,980
Cut/Station:	BW-32/0+00 to DA-1/0+00		
Geographic: (FDEP Classification)	5,100 ft south of Oakland Park Blvd. Bridge (III) to 530 ft south of Broward/Dade County Line (III)		

SITE PARAMETERS

Mapped Area (ac):	649.01	**Storage Capacity (cy):**	72,600
Containment Area (ac):	N/A	**Dike Height (ft):**	N/A
Impacted Area (ac):	5.60	**Excavation Depth (ft):**	N/A
Buffer Area (ac):	30.21	**Existing Mean Site Elevation (ft):**	5.0
N Buffer Width (ft):	350	**Dike Volume (cy):**	N/A
S Buffer Width (ft):	350	**Max. Pumping Distance (mi):**	N/A
E Buffer Width (ft):	350	**Max. Barging Distance (mi):**	N/A
W Buffer Width (ft):	350	**Min. Distance from Waterway (mi):**	7.82
Total Site Area (ac):	35.81		

SITE

Public Access:	Hollywood Blvd, DeSota Dr, SR 817, SR 824	**Comprehensive Plan Designation:**	T
		Adjacent Land Use:	Hollywood Blvd (N); DeSota Dr (E); SR 824/Pembroke Dr (S); SR 817/University Dr (W)
Road Easement (ft):	250		
Pipeline Easement (ft):	N/A	**Land Use of Impacted Area:**	Undeveloped lands within urban areas (function as buffers or safety zones at the end of runway)
Deep Draft Access:	N/A	**Wetlands W/I Mapped Area (ac):**	0.00
		Wetlands Impacted (ac):	0.00

Site Narrative:

This 649-acre site, B-51, is the North Perry Airport. The site contains associated buildings and structures (811) and undeveloped land within urban areas (191) that function as buffers or safety zones at the end of the runway. A large perimeter road is near the western boundary and other roads (814) associated with airport facilities are on-site. The northeastern portion of the site contains an educational facility (171) with several ponds (524). Two small industrial areas (150) are located in the southeast and southwest corners of the site.

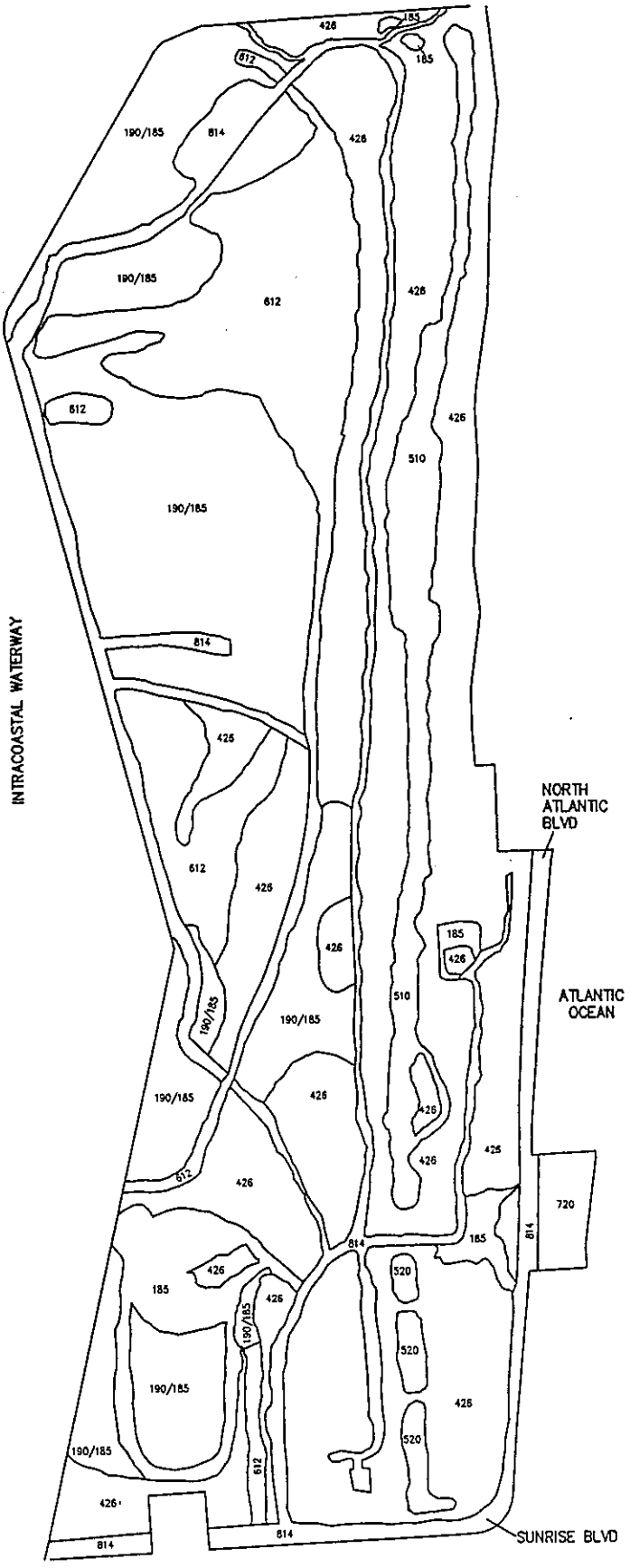
The airport is bounded on the north by Hollywood Boulevard, on the east by DeSota Drive (814), on the south by Pembroke Road/SR 824, and on the west by University Drive/SR 817.

0 300 600 1200

Scale: 1– 600

	LEGEND B–52	ACRES
185	PARKS AND ZOOS	6.84
190/185	OPEN LAND/PARKS AND ZOOS	43.83
426	TROPICAL HARDWOODS	71.03
510	STREAMS AND WATERWAYS	8.80
520	LAKES	1.59
612	MANGROVE SWAMP	23.38
720	SAND OTHER THAN BEACHES	1.66
814	ROADS AND HIGHWAYS	21.84
	TOTAL ACRES	178.97

LAND USE AND VEGETATION
OF CANDIDATE SITE B–52,
BROWARD COUNTY, FLORIDA



TAYLOR ENGINEERING INC.
9000 CYPRESS GREEN DRIVE, SUITE 200
JACKSONVILLE, FLORIDA 32256

Figure B–35
Land Use and Vegetation
of Candidate Site B–52
Broward County, Florida

PROJECT	C9920
REVISION	
SHEET	
DATE	Oct., 2000

SITE DATA SUMMARY SHEET

Name: B-52

AKA: Hugh Taylor Birch State Park

Site Use: Dewatering & Long-Term Storage (Multiple Operation)

Comment: Recreational Use -- Dominant features include tropical hardwoods, developed park and open land, and mangrove

LOCATION

County:	Broward	**ICWW Reach Mileage:**	321.4
Municipality:	Fort Lauderdale	**East/West of**	East
Section/Township/Range:	31/49/43 & 36/49/42	**Receiving Waterbody:**	ICWW
		FDEP	(III)

REACH

Reach Designation:	BW-3	**Projected Dredging Frequency (yr):**	20
Reach Length (mi):	13.2	**50-yr Dredging Requirement (cy):**	921
ICWW Mileage:	321.04 to 334.24	**50-yr Storage Requirement (cy):**	1,980
Cut/Station:	BW-32/0+00 to DA-1/0+00		
Geographic: (FDEP Classification)	5,100 ft south of Oakland Park Blvd. Bridge (III) to 530 ft south of Broward/Dade County Line (III)		

SITE PARAMETERS

Mapped Area (ac):	178.97	**Storage Capacity (cy):**	89,339
Containment Area (ac):	8.70	**Dike Height (ft):**	10.0
Impacted Area (ac):	11.76	**Excavation Depth (ft):**	4.92
Buffer Area (ac):	6.40	**Existing Mean Site Elevation (ft):**	10.0
N Buffer Width (ft):	150	**Dike Volume (cy):**	37,213
S Buffer Width (ft):	150	**Max. Pumping Distance (mi):**	12.84
E Buffer Width (ft):	150	**Max. Barging Distance (mi):**	N/A
W Buffer Width (ft):	100	**Min. Distance from Waterway (mi):**	N/A
Total Site Area (ac):	18.16		

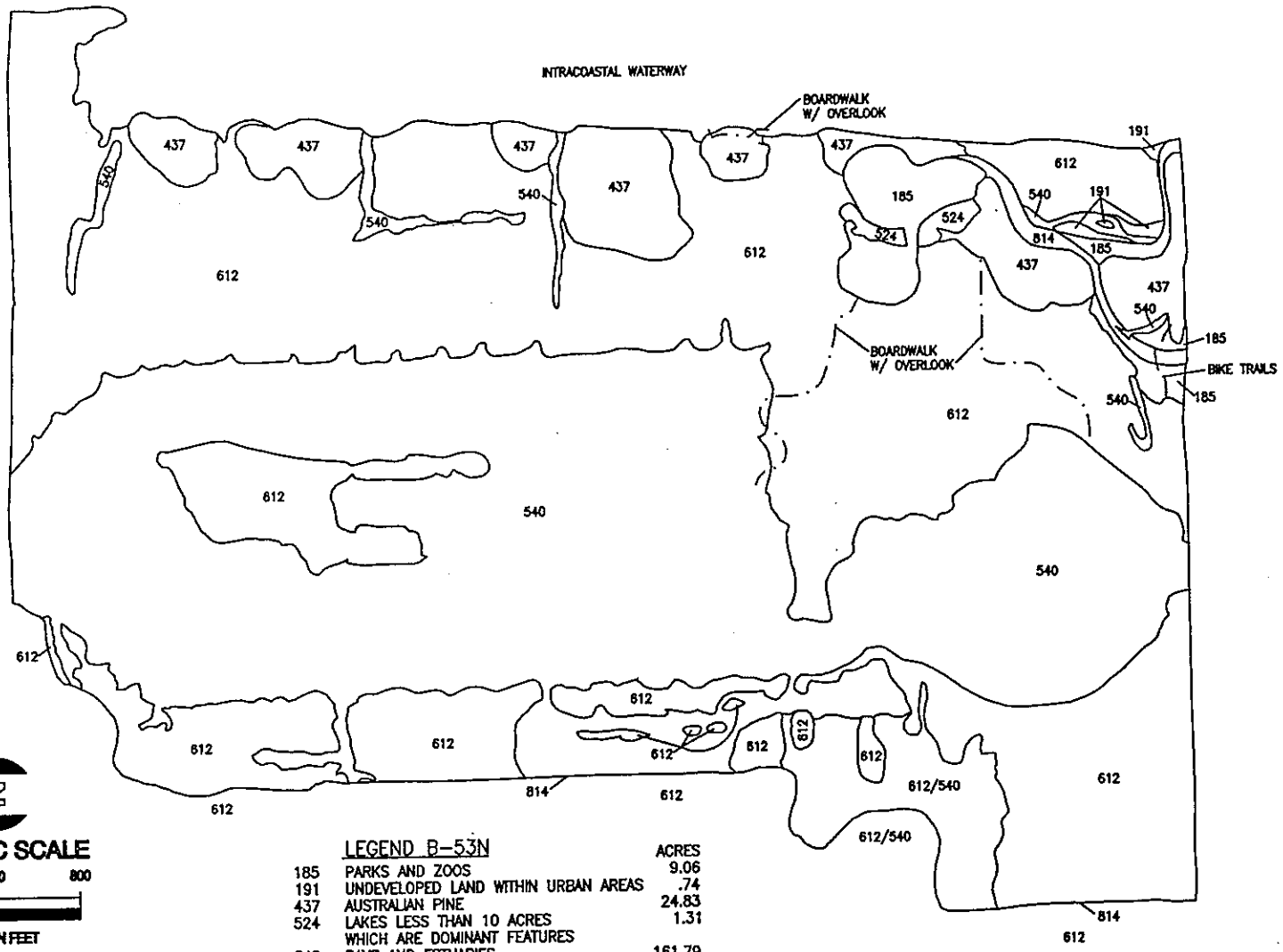
SITE

Public Access:	A1A, Sunrise Blvd	**Comprehensive Plan Designation:**	CON
		Adjacent Land Use:	Atlantic Ocean (E); Roads & Highways (E, S); ICWW (W)
Road Easement (ft):	3,200		
Pipeline Easement (ft):	Not Required	**Land Use of Impacted Area:**	Open land/Parks, Roads
Deep Draft Access:	N/A		
		Wetlands W/I Mapped Area (ac):	23.38
		Wetlands Impacted (ac):	0.00

Site Narrative:

Site B-52, Hugh Taylor Birch State Park, is a 179-acre site. Dominant vegetation and land use categories include tropical hardwoods (426), developed park and open land (190/185), and mangrove swamp (612). Although entrance to the park was not possible, mapping was developed based on inspection of the site from the adjacent highway, aerial photographic interpretation, and an existing land use and vegetation map provided by the Florida Park Service.

Adjacent land uses include the Atlantic Ocean to the east, roads and highways to the east and south, and the ICWW to the west.



	LEGEND B-53N	ACRES
185	PARKS AND ZOOS	9.06
191	UNDEVELOPED LAND WITHIN URBAN AREAS	.74
437	AUSTRALIAN PINE	24.83
524	LAKES LESS THAN 10 ACRES WHICH ARE DOMINANT FEATURES	1.31
540	BAYS AND ESTUARIES	161.79
612	MANGROVE SWAMPS	187.66
612/540	MANGROVE SWAMPS/BAYS AND ESTUARIES	11.79
814	ROADS AND HIGHWAYS	1.91
	TOTAL ACRES	399.10

LAND USE AND VEGETATION OF CANDIDATE SITE B-53N, BROWARD COUNTY, FLORIDA

TAYLOR ENGINEERING INC.
9000 CYPRESS GREEN DRIVE, SUITE 200
JACKSONVILLE, FLORIDA 32256

Figure B-36
Land Use and Vegetation
of Candidate Site B-53N
Broward County, Florida

PROJECT C9920
REVISION
SHEET
DATE Sept., 2000

SITE DATA SUMMARY SHEET

Name: B-53N

AKA: West Lake Park

Site Use: Dewatering & Short-Term Storage (Single Operation)

Comment: Recreational Use -- Anne Kolb Nature Center, Bike trails, Mangrove swamps, Bays and Estuaries

LOCATION

County:	Broward	**ICWW Reach Mileage:**	329.31
Municipality:	Hollywood	**East/West of**	West
Section/Township/Range:	1/51/42 & 2/51/42	**Receiving Waterbody:**	ICWW
		FDEP	(III)

REACH

Reach Designation:	BW-3	**Projected Dredging Frequency (yr):**	20
Reach Length (mi):	13.2	**50-yr Dredging Requirement (cy):**	921
ICWW Mileage:	321.04 to 334.24	**50-yr Storage Requirement (cy):**	1,980
Cut/Station:	BW-32/0+00 to DA-1/0+00		
Geographic: (FDEP Classification)	5,100 ft south of Oakland Park Blvd. Bridge (III) to 530 ft south of Broward/Dade County Line (III)		

SITE PARAMETERS

Mapped Area (ac):	399.1	**Storage Capacity (cy):**	N/A
Containment Area (ac):	Insufficient Area	**Dike Height (ft):**	N/A
Impacted Area (ac):	N/A	**Excavation Depth (ft):**	N/A
Buffer Area (ac):	N/A	**Existing Mean Site Elevation (ft):**	5.0
N Buffer Width (ft):	N/A	**Dike Volume (cy):**	N/A
S Buffer Width (ft):	N/A	**Max. Pumping Distance (mi):**	8.70
E Buffer Width (ft):	N/A	**Max. Barging Distance (mi):**	N/A
W Buffer Width (ft):	N/A	**Min. Distance from Waterway (mi):**	N/A
Total Site Area (ac):	N/A		

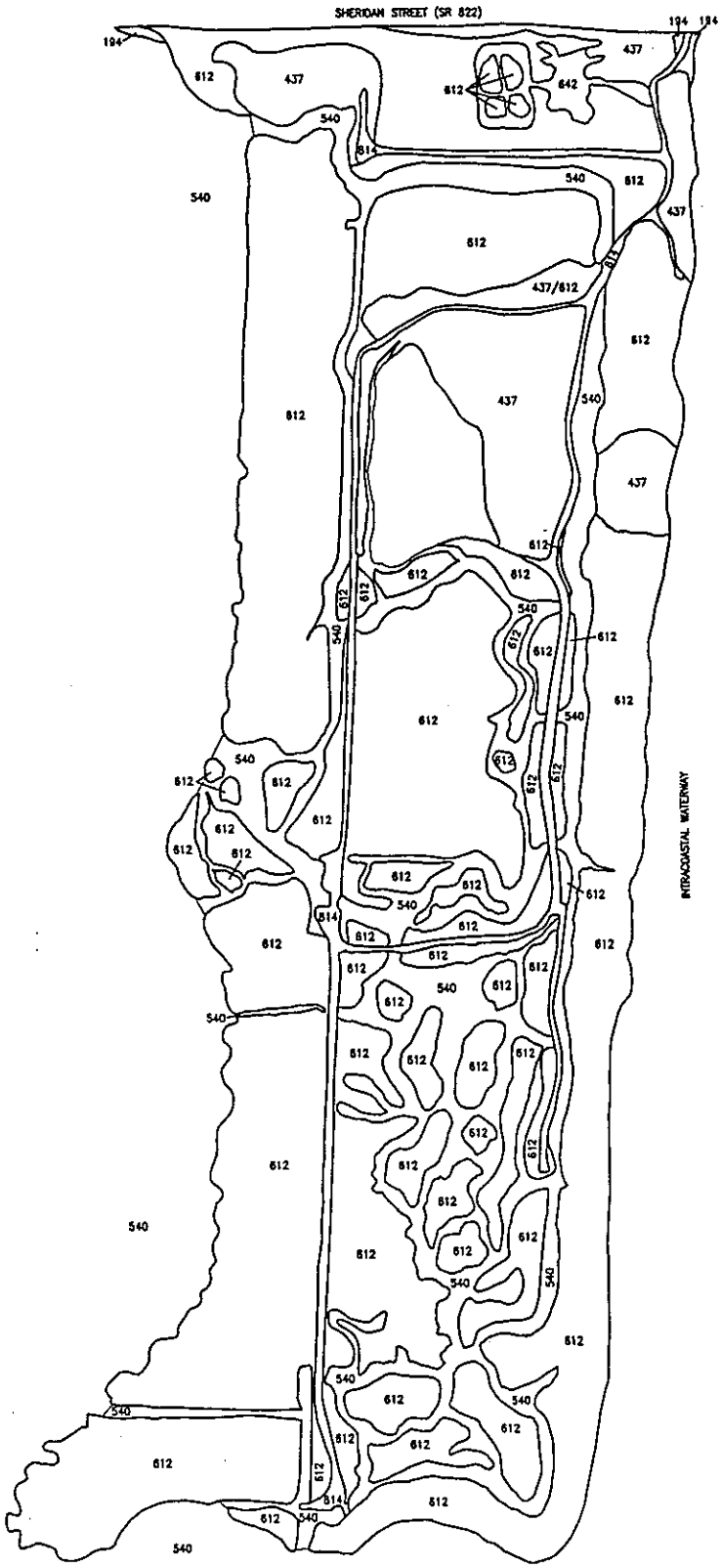
SITE

Public Access:	Sheridan St/SR 822	**Comprehensive Plan Designation:**	CON
		Adjacent Land Use:	
Road Easement (ft):	Not Required	Mangrove Swamp (N, W); ICWW (E); Sheridan St/SR 822 (S)	
Pipeline Easement (ft):	Not Required	**Land Use of Impacted Area:**	
Deep Draft Access:	N/A	N/A	
		Wetlands W/I Mapped Area (ac):	361.24
		Wetlands Impacted (ac):	0.00

Site Narrative:

This 399-acre site, B-53N, is the northern portion of West Lake Park. The parks and zoos (185) designation was not included, except for the actual park buildings (Anne Kolb Nature Center). However, the entire site is a park (185) primarily made up of mangrove (612) and bays and estuaries (540). The park also contains some relatively large areas of Australian pine (437). The mangrove swamp (612) consists primarily of red (*Rhizophora mangle*), white (*Laguncularia racemosa*), and black mangrove (*Avicennia germinans*), and buttonwood (*Conocarpus erecta*). The developed portion of the site is the Anne Kolb Nature Center (185) and associated parking. Several trails of boardwalk originate from the nature center and traverse portions of the mangrove swamps. A bike trail in the southern portion of West Lake Park site links the northern park portion with the southern portion.

The area is bounded on the north by mangrove swamp (612), the east by the ICWW (510), the south by Sheridan Street, SR 822 (814), and on the west by an additional mangrove swamp (612).



N

GRAPHIC SCALE

0 150 300 600

SCALE IN FEET

	LEGEND B-53S	ACRES
194	OTHER OPEN LAND	.24
437	AUSTRALIAN PINE	13.70
437/612	AUSTRALIAN PINE/MANGROVE SWAMPS	1.48
540	BAYS AND ESTUARIES	25.48
612	MANGROVE SWAMP	103.50
642	SALTWATER MARSHES	1.49
814	ROADS AND HIGHWAYS	5.77
	TOTAL ACRES	151.66

LAND USE AND VEGETATION
OF CANDIDATE SITE B-53S,
BROWARD COUNTY, FLORIDA

TAYLOR ENGINEERING INC.
9000 CYPRESS GREEN DRIVE, SUITE 200
JACKSONVILLE, FLORIDA 32256

Figure B-37
Land Use and Vegetation
of Candidate Site B-53S
Broward County, Florida

PROJECT	C9920
REVISION	
SHEET	
DATE	Aug., 2000

SITE DATA SUMMARY SHEET

Name: B-53S

AKA: West Lake Park

Site Use: Dewatering & Short-Term Storage (Single Operation)

Comment: Recreational Use -- Mangrove swamps, Bays and Estuaries, Bike and foot trails

LOCATION

County:	Broward	**ICWW Reach Mileage:**	329.31
Municipality:	Hollywood	**East/West of**	West
Section/Township/Range:	12/51/42 & 11/51/42	**Receiving Waterbody:**	ICWW
		FDEP	(III)

REACH

Reach Designation:	BW-3			**Projected Dredging Frequency (yr):**	20
Reach Length (mi):	13.2			**50-yr Dredging Requirement (cy):**	921
ICWW Mileage:	321.04	to	334.24	**50-yr Storage Requirement (cy):**	1,980
Cut/Station:	BW-32/0+00	to	DA-1/0+00		
Geographic: (FDEP Classification)	5,100 ft south of Oakland Park Blvd. Bridge (III) to 530 ft south of Broward/Dade County Line (III)				

SITE PARAMETERS

Mapped Area (ac):	151.66	**Storage Capacity (cy):**	N/A
Containment Area (ac):	Insufficient Area	**Dike Height (ft):**	N/A
Impacted Area (ac):	N/A	**Excavation Depth (ft):**	N/A
Buffer Area (ac):	N/A	**Existing Mean Site Elevation (ft):**	5.0
N Buffer Width (ft):	N/A	**Dike Volume (cy):**	N/A
S Buffer Width (ft):	N/A	**Max. Pumping Distance (mi):**	8.73
E Buffer Width (ft):	N/A	**Max. Barging Distance (mi):**	N/A
W Buffer Width (ft):	N/A	**Min. Distance from Waterway (mi):**	N/A
Total Site Area (ac):	N/A		

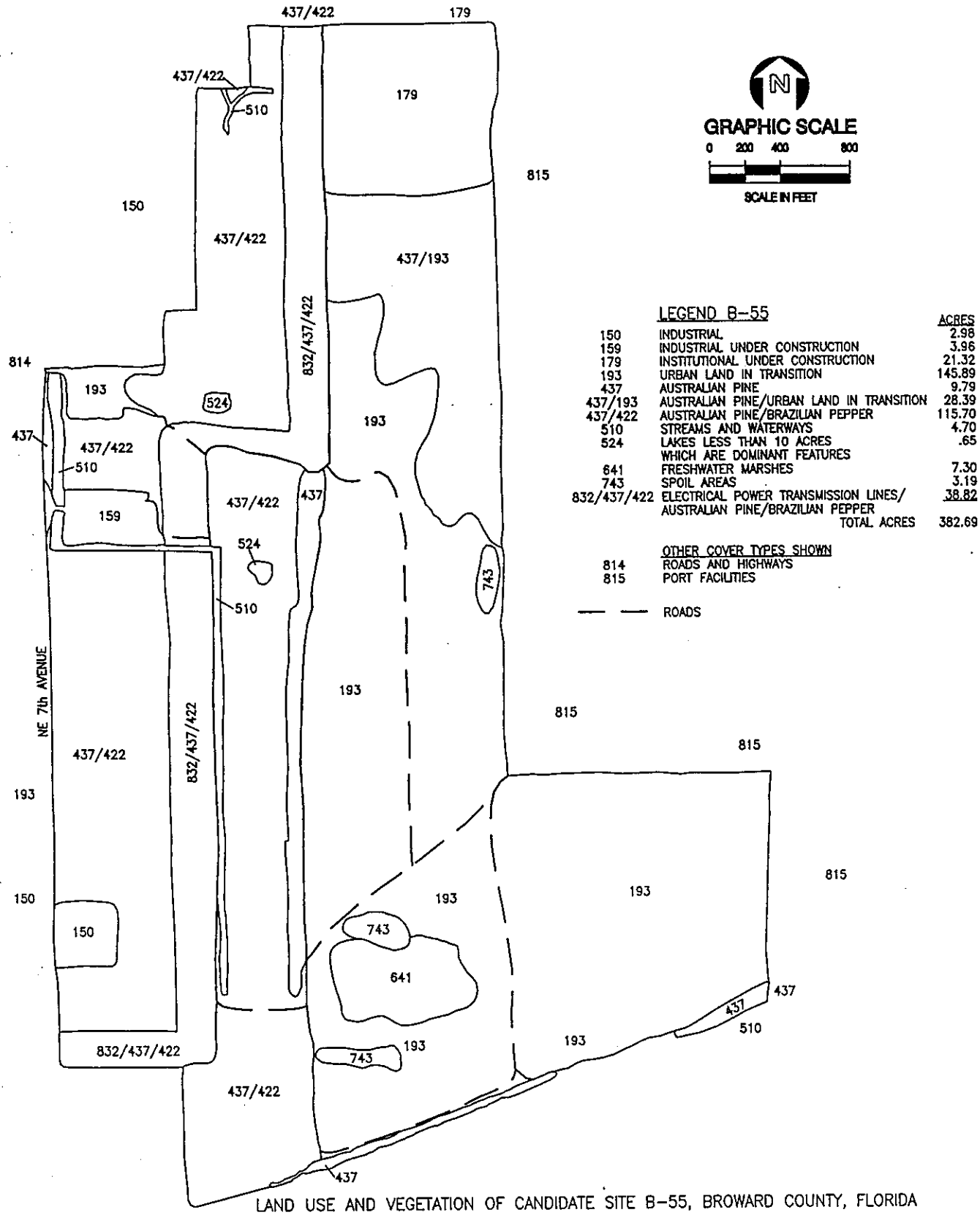
SITE

Public Access:	Sheridan St/SR 822	**Comprehensive Plan Designation:**	CON
		Adjacent Land Use:	
Road Easement (ft):	Not Required	ICWW (E); Bays & Estuaries (S, W); Sheridan St/SR 822 (N)	
Pipeline Easement (ft):	Not Required	**Land Use of Impacted Area:**	
Deep Draft Access:	N/A	N/A	
		Wetlands W/I Mapped Area (ac):	131.95
		Wetlands Impacted (ac):	0.00

Site Narrative:

The 152-acre site, B-53S, is the southern portion of West Lake Park. Although the entire parcel serves as a park (185), other community designations have been included to better describe the vegetation cover. The site is primarily made up of the mangrove (612; 104 acres) and bays and estuaries (540; 26 acres) communities. Many of the mangrove areas appeared to have been recently cleared of exotic species as part of site restoration. The mangrove community contains a mix of red (*Rhizophora mangle*), white (*Laguncularia racemosa*), and black mangrove (*Avicennia germinans*) with some Brazilian pepper (*Schinus terebinthifolius*), Australian pine (*Casuarina equisetifolia*), and tropical hardwoods in some of the higher elevations. Some of the site is mapped as Australian pine (437, 14 acres). These areas appear to be undergoing some type of restoration, mainly clearing of the exotic species. These areas may have historically been tropical hardwoods. A network of roads (814, 6 acres) also occurs on-site as does an area mapped as other open land (194, less that 0.5 acres) in the north central portion of the site. The roads are used as bike trails and foot trails for the park and a few scattered overlooks are found along the Intracoastal Waterway (510) along the site's eastern boundary.

The site is bounded on the east by the ICWW, the south and west by bays and estuaries (540), and the north by Sheridan Street-SR 822 (814). There is a connection to the northern portion of the West Lake Park via a bike trail underneath Sheridan Street.



LEGEND B-55

		ACRES
150	INDUSTRIAL	2.98
159	INDUSTRIAL UNDER CONSTRUCTION	3.96
179	INSTITUTIONAL UNDER CONSTRUCTION	21.32
193	URBAN LAND IN TRANSITION	145.89
437	AUSTRALIAN PINE	9.79
437/193	AUSTRALIAN PINE/URBAN LAND IN TRANSITION	28.39
437/422	AUSTRALIAN PINE/BRAZILIAN PEPPER	115.70
510	STREAMS AND WATERWAYS	4.70
524	LAKES LESS THAN 10 ACRES WHICH ARE DOMINANT FEATURES	.65
641	FRESHWATER MARSHES	7.30
743	SPOIL AREAS	3.19
832/437/422	ELECTRICAL POWER TRANSMISSION LINES/ AUSTRALIAN PINE/BRAZILIAN PEPPER	38.82
	TOTAL ACRES	382.69

OTHER COVER TYPES SHOWN

814	ROADS AND HIGHWAYS
815	PORT FACILITIES

ROADS

LAND USE AND VEGETATION OF CANDIDATE SITE B-55, BROWARD COUNTY, FLORIDA

TAYLOR ENGINEERING INC.
9000 CYPRESS GREEN DRIVE, SUITE 200
JACKSONVILLE, FLORIDA 32256

Figure B-38
Land Use and Vegetation
of Candidate Site B-55
Broward County, Florida

PROJECT C9920
REVISION
SHEET
DATE Sept., 2000

SITE DATA SUMMARY SHEET

Name: B-55
AKA: Port Everglades Outparcel
Site Use: Dewatering & Long-Term Storage (Multiple Operation)
Comment: Adjacent to port container storage area

LOCATION

County:	Broward	**ICWW Reach Mileage:**	327.97
Municipality:	Hollywood	**East/West of**	West
Section/Township/Range:	25/50/42 & 26/50/42	**Receiving Waterbody:**	Dania Canal
		FDEP	(III)

REACH

Reach Designation:	BW-3	**Projected Dredging Frequency (yr):**	20
Reach Length (mi):	13.2	**50-yr Dredging Requirement (cy):**	921
ICWW Mileage:	321.04 to 334.24	**50-yr Storage Requirement (cy):**	1,980
Cut/Station:	BW-32/0+00 to DA-1/0+00		
Geographic: (FDEP Classification)	5,100 ft south of Oakland Park Blvd. Bridge (III) to 530 ft south of Broward/Dade County Line (III)		

SITE PARAMETERS

Mapped Area (ac):	382.69	**Storage Capacity (cy):**	76,600
Containment Area (ac):	10.00	**Dike Height (ft):**	8.5
Impacted Area (ac):	13.26	**Excavation Depth (ft):**	3.42
Buffer Area (ac):	28.58	**Existing Mean Site Elevation (ft):**	5.0
N Buffer Width (ft):	350	**Dike Volume (cy):**	27,839
S Buffer Width (ft):	350	**Max. Pumping Distance (mi):**	7.54
E Buffer Width (ft):	350	**Max. Barging Distance (mi):**	7.54
W Buffer Width (ft):	350	**Min. Distance from Waterway (mi):**	N/A
Total Site Area (ac):	41.84		

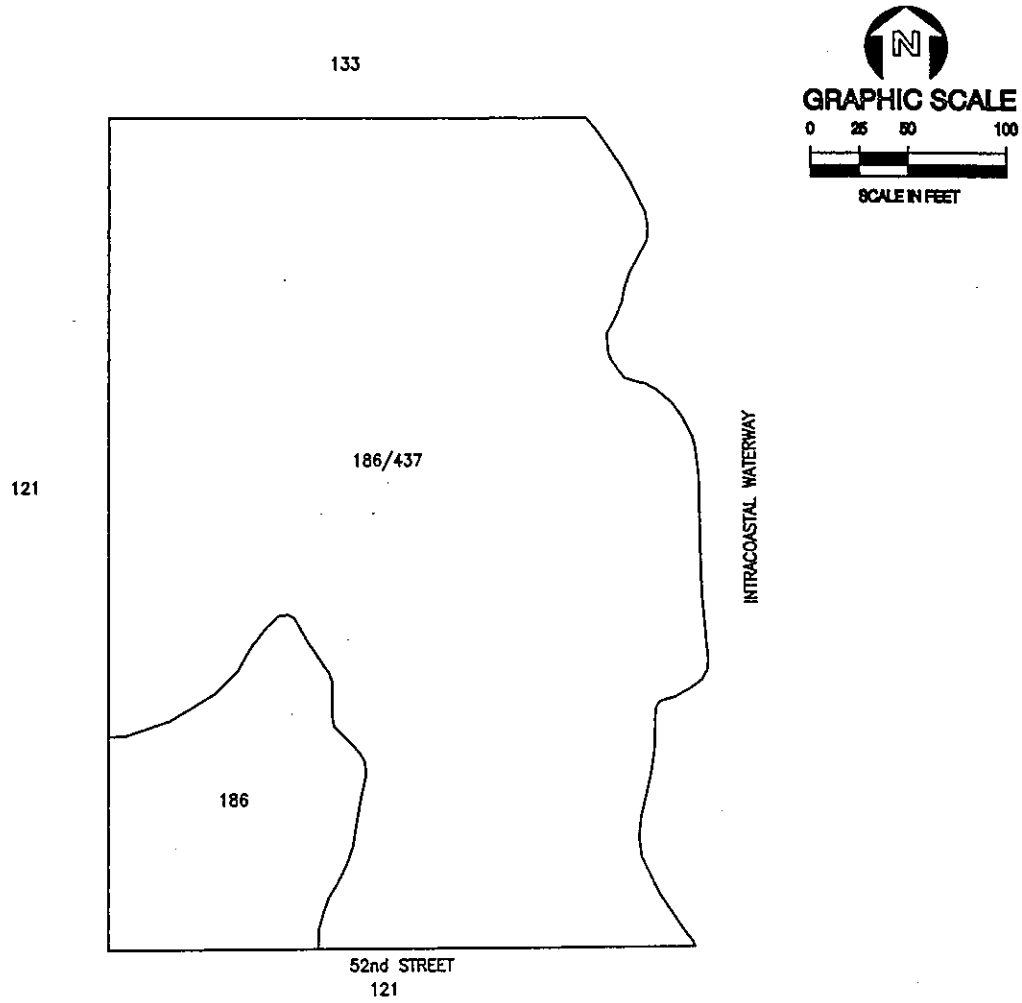
SITE

Public Access:	NE 7th Ave	**Comprehensive Plan Designation:**	T
		Adjacent Land Use:	Port facility (E); Industrial/Commercial (W); Community Center (N); Australian pine & Brazilian pepper (S); Dania Canal (SE)
Road Easement (ft):	Not Required		
Pipeline Easement (ft):	Not Required		
Deep Draft Access:	Yes	**Land Use of Impacted Area:**	Urban land in transition
		Wetlands W/I Mapped Area (ac):	7.95
		Wetlands Impacted (ac):	0.00

Site Narrative:

The eastern portion of this 383-acre site, Site B-55, is primarily composed of large open mowed areas with scattered Australian pine (*Casuarina equisetifolia*), a variety of native and exotic grasses including Bahiagrass (*Paspalum notatum*), torpedo grass (*Panicum repens*), and other opportunistic plant species. The area was mapped as urban land in transition without positive indicators of intended activity (193). This community contains several dirt roads (814) and a small freshwater marsh (641) in the southwestern corner. The marsh contains cattails (*Typha* sp.) and a small area of fill dirt (743). Another small fill area is located in the center of the urban land in transition without positive indicators of intended activity community (193) along the entrance road to the port (814). The eastern portion of the site lies adjacent to a large port facility (815) that borders the site along the eastern edge. West of the port entrance road and north of the 193 community is an Australian pine/urban land in transition without positive indicators of intended activity (437/193) land use community. An institutional area under construction (community center, 179) is located north of this community across the northern boundary of the property.

The southeastern boundary of the site is the Dania Cutoff Canal (510). The western portion of the site contains a large transmission line corridor/Australian pine/Brazilian pepper community (832/437/422) surrounded by Australian pine/Brazilian pepper (437/422). Several dirt roads (814) appear associated with providing access to the transmission line corridor. A small commercial site (150) is located in the southwestern corner, and a commercial site under construction (159) is located in the center of the western boundary. Two small ponds (524) occur within the 437/422 community and a ditch (510) parallels the eastern side of the transmission lines, running west to the industrial under construction, then north along the site's western boundary. Bordering the western site boundary are commercial property (150), the 193 community, and the South Federal Highway U.S. 1 (814). The map for the inaccessible western portion of the site was developed through aerial photo interpretation.



	LEGEND MSA FO 710	ACRES
186	COMMUNITY RECREATIONAL FACILITIES	.39
186/437	COMMUNITY RECREATIONAL FACILITIES/ AUSTRALIAN PINE	2.48
	TOTAL ACRES	2.87

	OTHER COVER TYPES SHOWN
121	FIXED SINGLE FAMILY UNITS
133	MULTIPLE DWELLING UNITS, LOW RISE

LAND USE AND VEGETATION OF CANDIDATE SITE MSA FO 710, BROWARD COUNTY, FLORIDA

TAYLOR ENGINEERING INC.
9000 CYPRESS GREEN DRIVE, SUITE 200
JACKSONVILLE, FLORIDA 32256

Figure B-39
Land Use and Vegetation
of Candidate Site MSA FO 710
Broward County, Florida

PROJECT C9920
REVISION
SHEET
DATE Oct., 2000

SITE DATA SUMMARY SHEET

Name: MSA FO 710
AKA: DeGraff Park
Site Use: Material Rehandling (Barge Offloading)
Comment: Recreational Use -- Playground and Picnic Tables

LOCATION

County:	Broward	**ICWW Reach Mileage:**	310.7
Municipality:	Lighthouse Point	**East/West of**	West
Section/Township/Range:	8/48/43	**Receiving Waterbody:**	ICWW
		FDEP	(III)

REACH

Reach Designation:	BW-1	**Projected Dredging Frequency (yr):**	10
Reach Length (mi):	4.74	**50-yr Dredging Requirement (cy):**	27,020
ICWW Mileage:	309.24 to 313.98	**50-yr Storage Requirement (cy):**	58,092
Cut/Station:	BW-1/0+00 to BW-22/0+00		
Geographic: (FDEP Classification)	650 ft south of Palm Beach/Broward County (III) to 1,600 ft north of 14th St. Bridge (S.R. 844) (III)		

SITE PARAMETERS

Mapped Area (ac):	2.87	**Storage Capacity (cy):**	N/A
Containment Area (ac):	N/A	**Dike Height (ft):**	N/A
Impacted Area (ac):	0.87	**Excavation Depth (ft):**	N/A
Buffer Area (ac):	1.74	**Existing Mean Site Elevation (ft):**	10.0
N Buffer Width (ft):	100	**Dike Volume (cy):**	N/A
S Buffer Width (ft):	100	**Max. Pumping Distance (mi):**	N/A
E Buffer Width (ft):	0	**Max. Barging Distance (mi):**	3.21
W Buffer Width (ft):	100	**Min. Distance from Waterway (mi):**	N/A
Total Site Area (ac):	2.61		

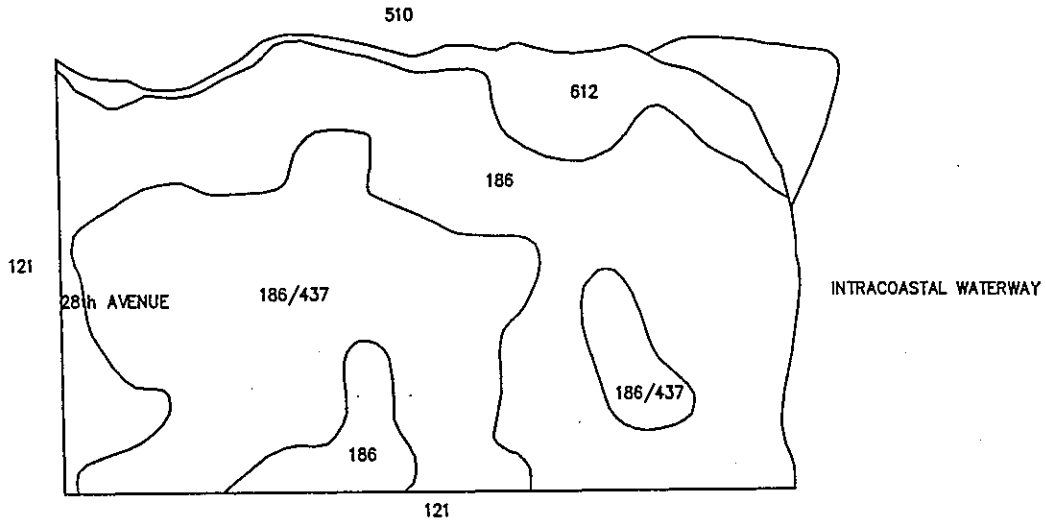
SITE

Public Access:	52nd St.	**Comprehensive Plan Designation:**	R&O
		Adjacent Land Use:	
Road Easement (ft):	Not Required	Single (S, W) & multi-family (N) residences; ICWW (E)	
Pipeline Easement (ft):	N/A	**Land Use of Impacted Area:**	
Deep Draft Access:	Yes	Community Recreation Facilities, Australian Pine	
		Wetlands W/I Mapped Area (ac):	0.00
		Wetlands Impacted (ac):	0.00

Site Narrative:

Site MSA FO 710, a 3-acre park known as DeGraff Park, is located in a residential neighborhood adjacent to the ICWW. The park provides limited parking, a playground, and picnic tables. Most of the park is vegetated with a canopy of Australian pine (186/437) and an understory of exotic landscape plants. Understory plants include St. Augustine Grass (*Stenotaphrum secundatum*), Madagascar periwinkle (*Vinca rosea*), bowstring hemp (*Sansevieria* sp.), oyster plant (*Rhoeo discolor*), and philodendron (*Philodendron* sp.). The grassed playground (186) contains a variety of landscape trees and shrubs including oleander (*Nerium oleander*), fig (*Ficus* sp.), and a variety of palms. The shoreline, vegetated with scattered sea grape (*Coccoloba uvifera*) and portia-tree (*Thespesia populnea*), slopes off sharply to the waterway.

Adjacent land uses include multifamily residential to the north, the ICWW to the east, and fixed single-family residences to the south and west.



LEGEND MSA FO 727C		ACRES
186	COMMUNITY RECREATIONAL FACILITIES	4.04
186/437	COMMUNITY RECREATIONAL FACILITIES/ AUSTRALIAN PINE	2.98
612	MANGROVE SWAMPS	.72
	TOTAL ACRES	7.74
	OTHER COVER TYPES SHOWN	
121	FIXED SINGLE FAMILY UNITS	
510	STREAMS AND WATERWAYS	
——	BREAKWATER	

LAND USE AND VEGETATION FOR CANDIDATE SITE MSA FO 727C, BROWARD COUNTY, FLORIDA

TAYLOR ENGINEERING INC.
9000 CYPRESS GREEN DRIVE, SUITE 200
JACKSONVILLE, FLORIDA 32256

Figure B-40
Land Use and Vegetation
of Candidate Site MSA FO 727C
Broward County, Florida

PROJECT C9920
REVISION
SHEET
DATE Oct., 2000

SITE DATA SUMMARY SHEET

Name: MSA FO 727C

AKA: Harbor's Edge Park

Site Use: Material Rehandling (Barge Offloading)

Comment: Recreational Use -- Paved and Unpaved Trails and Playground

LOCATION

County:	Broward	**ICWW Reach Mileage:**	314.49
Municipality:	Pompano Beach	**East/West of**	West
Section/Township/Range:	30/48/43	**Receiving Waterbody:**	ICWW
		FDEP	(III)

REACH

Reach Designation:	BW-2			**Projected Dredging Frequency (yr):**	20
Reach Length (mi):	7.06			**50-yr Dredging Requirement (cy):**	5,703
ICWW Mileage:	313.98	to	321.04	**50-yr Storage Requirement (cy):**	12,262
Cut/Station:	BW-22/0+00	to	BW-32/0+00		
Geographic: (FDEP Classification)	1,600 ft north of 14th St. Bridge (S.R. 844) (III) to 5,100 ft south of Oakland Park Blvd. Bridge (III)				

SITE PARAMETERS

Mapped Area (ac):	7.74	**Storage Capacity (cy):**	N/A
Containment Area (ac):	N/A	**Dike Height (ft):**	N/A
Impacted Area (ac):	2.58	**Excavation Depth (ft):**	N/A
Buffer Area (ac):	3.78	**Existing Mean Site Elevation (ft):**	5.0
N Buffer Width (ft):	100	**Dike Volume (cy):**	N/A
S Buffer Width (ft):	100	**Max. Pumping Distance (mi):**	N/A
E Buffer Width (ft):	0	**Max. Barging Distance (mi):**	6.59
W Buffer Width (ft):	100	**Min. Distance from Waterway (mi):**	N/A
Total Site Area (ac):	6.36		

SITE

Public Access:	12th St., 28th Ave.	**Comprehensive Plan Designation:**	R&O
		Adjacent Land Use:	Canal (N), ICWW (E); Fixed single-family residences (S, W)
Road Easement (ft):	Not Required		
Pipeline Easement (ft):	N/A	**Land Use of Impacted Area:**	Community Recreation Facilities, Australian Pine
Deep Draft Access:	Yes		
		Wetlands W/I Mapped Area (ac):	0.72
		Wetlands Impacted (ac):	0.00

Site Narrative:

Site MSA FO 727C, an 8-acre park known as Harbor's Edge Park, provides paved and unpaved trails, a playground, and a small parking area. A canopy of Australian pine (186/437) vegetates about a third of the park. The rest of the upland portions provide a well-maintained St. Augustine grass (*Stenotaphrum secundatum*) lawn and landscaping of scattered trees and shrubs (186) including gumbo-limbo (*Bursera simaruba*), coconut palm (*Cocos nucifera*), and cabbage palm (*Sabal palmetto*). A canal (510) borders the site in the north with the adjacent park shoreline vegetated with red mangrove (*Rhizophora mangle*), Australian pine (*Casuarina equisetifolia*), Brazilian pepper (*Schinus terebinthifolius*), and other scattered trees. A small environmental restoration area occurs near the intersection of the canal and the ICWW. This area contains a breakwater, mangroves, and other beach strand/shoreline vegetation including coinvine (*Dalbergia ecastaphyllum*), railroad vine (*Ipomoea pes-capre*), gray nickers (*Caesalpinia bonduc*), and inkberry (*Scaveola* sp.).

Adjacent land uses include a canal to the north and east, and fixed single-family residential to the south and west.

APPENDIX C

Dike Requirements and Capacity Analysis

Width of Dike at Grade, B_G

$$B_G = 2HS + T \quad (1)$$

Width of Dike at Excavated Grade, B_g

$$B_g = 2HS + T + (G - g)\,S \quad (2)$$

Width of Dike at Depth of Freeboard and Ponding, B_F

$$B_F = 2FS + T \quad (3)$$

Volume of Dike Material Required, V_{MR}

$$V_{MR} = \tfrac{1}{2}H\,(T + B_G)\,P \quad (4)$$

Volume of Dike Material Available on Site, V_{MA}

$$V_{MA} = (G - g)[A - \tfrac{1}{2}P_I\,(B_g - B_G)] \quad (5)$$

Volume of Disposal Capacity, V_D

$$V_D = V_{MA} + (H - F)\left\{A + \tfrac{1}{2}P_I[B_G - (H - F)\,S - B_F]\right\} \quad (6)$$

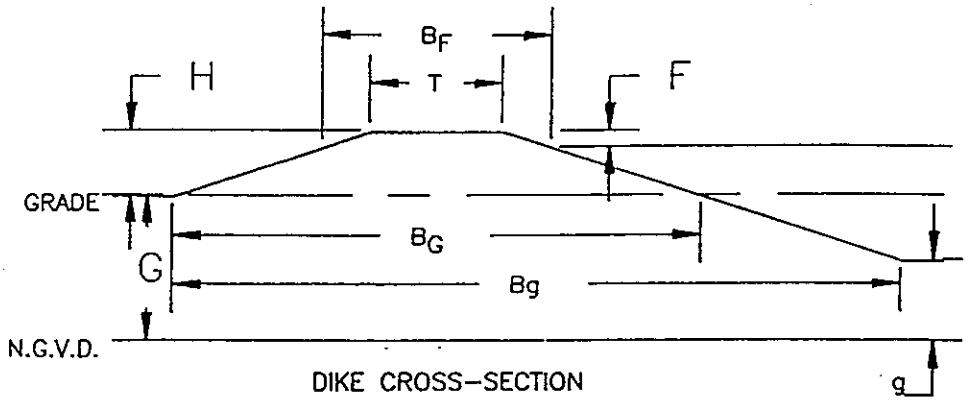
Depth of Excavation, $(G - g)$

$$(G - g) = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \quad (7)$$

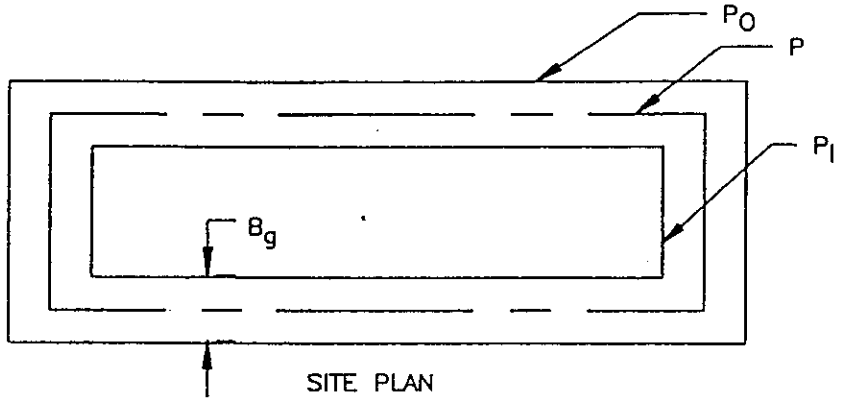
where: $a = \tfrac{1}{2}P_I S$

$b = P_I HS + \tfrac{1}{2}P_I T - A - \tfrac{1}{2}P_I B_G$

$c = \tfrac{1}{2}H\,(T + B_G)\,P$



DIKE CROSS–SECTION



SITE PLAN

P_o	OUTER PERIMETER OF DIKE FOOTPRINT	SITE SPECIFIC
P	DIKE PERIMETER @ CENTERLINE OF DIKE CREST	SITE SPECIFIC
P_I	PERIMETER OF DIKE AT INTERIOR DIKE TOE	SITE SPECIFIC
A	REQUIRED DISPOSAL AREA, BOUNDED BY P_o	SITE SPECIFIC
A_I	AREA WITHIN P_I	SITE SPECIFIC
G	SITE GRADE (+ NGVD)	SITE SPECIFIC
g	EXCAVATED GRADE (+ NGVD)	SITE SPECIFIC
H	DIKE HEIGHT ABOVE GRADE	15 ft.
S	DIKE SIDE SLOPE	3 (1V:3H)
T	DIKE CREST WIDTH	12 ft.
F	FREEBOARD AND PONDING	4 ft.

TAYLOR ENGINEERING INC
9086 CYPRESS GREEN DRIVE
JACKSONVILLE, FLORIDA 32256

Figure C–1

Dike Requirements and Site Capacity

PROJECT
REVISION
SHEET
DATE

APPENDIX D

Property Ownership, Sitebank

Table D-1: Site Ownership[1], Primary and Secondary Sites, Intracoastal Waterway, Broward County

Site Name	Parcel Number	Owner	Parcel Acreage	Assessed Value	Comprehensive Plan Designation	Zoning
B-19	4842-09-11-0010	Richard & Gilda Mancini TRS 6850 19 Mile Road Sterling Heights, MI 48314-2113	28.85	1,711,110	Industrial	Vacant Commercial
MSA FO 726, 726B, 726C	4843-30-00-0050	U.S. Government, U.S. Department of Interior Bureau of Land Management Washington D.C. 20402-0001	4.30	344,790	Recreation and Open Space	Multi-Family < 10 Units
	4843-30-00-0051	FIND MSA 726 1314 Marcinski Road Jupiter, FL 33477-9427	0.53	14,840		Sewage Disposal & Waste Lands
	4843-30-00-0060	FIND MSA 726 B	9.04	263,920		Sewage Disposal & Waste Lands
	4843-30-00-0061	City of Pompano Beach P.O. Box 1300 Pompano Beach, FL 33061-1300	1.13	84,750		Municipal
	4843-30-09-0010	U.S. Government, U.S. Department of Interior	1.53	114,750		Federal Other than Military
	4843-30-09-0020	City of Pompano Beach	0.03	1,500		Municipal

Table D-1: Site Ownership[1], Primary and Secondary Sites, Intracoastal Waterway, Broward County

Site Name	Parcel Number	Owner	Parcel Acreage	Assessed Value	Comprehensive Plan Designation	Zoning
MSA FO 727B	4843-30-00-0830	FIND 1314 Marcinski Road Jupiter, FL 33477-9427	13.17	5,935,840	Recreation and Open Space	Municipal
Port Everglades MSA 783	5042-26-08-0011	U.S. Government c/o Buildings Manager 51 Southwest 1st Avenue Miami, FL 33130-1608	2.27	720,660	Transportation and Utilities	County Other
B-54	5140-25-01-0010	Miami Gardens Inc. P.O. Box 610727 North Miami, FL 33261-0727	126.19	3,154,750	Regional Activity Center	Grazing Land Soil Class IV

[1] Based on tax roll/public record information, Broward County, Florida as of July 2002

APPENDIX E

Sediment Data

COLUMBIA ANALYTICAL SERVICES, INC.

Client:	Taylor Engineering, Inc.	**Service Request No.:**	J2003037
Project:	Broward County Phase I / C1999-020	**Date Received:**	9/11/00
Matrix:	Sediment		

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for sample(s) designated for Tier II data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Additional quality control analyses reported herein include: Matrix/Duplicate Matrix Spike (MS/DMS), and Laboratory Control Sample (LCS).

PCBs by Method SW846 8082: These samples were extracted twice for PCB analysis. For the first extraction event, it was ascertained that the batch QC samples (laboratory control samples, or LCSs) were out of control due to an incorrectly prepared spike solution. To verify that the original results were valid, the samples were re-extracted after the holding time had expired. The re-extracted sample results confirmed the original results, confirming that the problems in the original extraction were isolated to the batch QC and did not affect the sample results.

However, sample J2003037-007 (BW-3-7C) had a positive result for PCB1016 that was not confirmed in the re-extracted sample. Both are reported. We believe that this is the result of non-homogeneous soil samples, which often result in "hot spots".

Approved by ______________________ Date 10/31/00

Columbia Analytical Services INC.
An Employee-Owned Company

October 31, 2000

Service Request No. J2003037

Certification Numbers:

Florida DOH:	E82502
Louisiana:	AI 30759
Massachusetts:	M-FL937
New Hampshire:	294297-A
North Carolina:	527
South Carolina:	96021001

Lori Brownell
Taylor Engineering, Inc.
9000 Cypress Green Dr., Ste. 200
Jacksonville, FL 32256

RE: Project No.: C1999-020
Project Name: Broward County Phase I

Dear Lori Brownell:

Enclosed are the results of the samples(s) submitted to our laboratory on September 11, 2000. For your reference, these analyses have been assigned our service request number: J2003037.

All analyses were performed according to our laboratory's quality assurance program. All results are intended to be considered in the entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the samples analyzed.

Please call if you have any questions.

Respectfully submitted,

Columbia Analytical Services, Inc.

Travis Trader
Project Manager

TT/jg

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Taylor Engineering, Inc.	**Service Request:**	J2003037
Project:	Broward County Phase I / C1999-020	**Date Collected:**	9/7-8/00
Sample Matrix:	Sediment	**Date Received:**	9/11/00
		Date Extracted:	9/19/00

Polynuclear Aromatic Hydrocarbons by GC/MS SIM
EPA Methods 3550/8270
Units: µg/Kg (ppb)
Dry Weight Basis

Sample Name:	**BW-1-1C**	**BW-1-2C**	**BW-1-3C**
Lab Code:	J2003037-001	J2003037-002	J2003037-003 (a)
Date Analyzed:	9/20/00	9/20/00	9/20/00

Analyte	**MRL**			
Naphthalene	3.3	U	U	6.6U
2-Methylnaphthalene	3.3	U	U	6.6U
1-Methylnaphthalene	3.3	U	U	6.6U
Acenaphthylene	3.3	U	U	29
Acenaphthene	3.3	U	U	6.6U
Fluorene	3.3	U	U	7.4
Phenanthrene	3.3	12	U	100
Anthracene	3.3	3.7	U	50
Fluoranthene	3.3	45	11	640
Pyrene	3.3	40	9.4	490
Benz(a)anthracene	3.3	20	5.7	280
Chrysene	3.3	33	7.3	470
Benzo(b)fluoranthene	3.3	36	8.1	790
Benzo(k)fluoranthene	3.3	28	6.1	520
Benzo(a)pyrene	3.3	28	6.9	560
Indeno(1,2,3-cd)pyrene	3.3	26	5.7	570
Dibenz(a,h)anthracene	3.3	5.8	U	130
Benzo(g,h,i)perylene	3.3	25	6.5	560

U Not detected at or above the MRL.
(a) MRL is elevated because of the low percent solids in the sample as received.

Approved By: Tamir Tuvia Date: 10/31/00

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Taylor Engineering, Inc.	**Service Request:**	J2003037
Project:	Broward County Phase I / C1999-020	**Date Collected:**	9/7-8/00
Sample Matrix:	Sediment	**Date Received:**	9/11/00
		Date Extracted:	9/19/00

Polynuclear Aromatic Hydrocarbons by GC/MS SIM
EPA Methods 3550/8270
Units: µg/Kg (ppb)
Dry Weight Basis

Sample Name:	**BW-2-4C**	**BW-2-5C**	**BW-3-6C**
Lab Code:	J2003037-004	J2003037-005	J2003037-006
Date Analyzed:	9/20/00	9/20/00	9/20/00

Analyte	**MRL**			
Naphthalene	3.3	U	U	U
2-Methylnaphthalene	3.3	U	U	U
1-Methylnaphthalene	3.3	U	U	U
Acenaphthylene	3.3	5.4	U	U
Acenaphthene	3.3	U	U	U
Fluorene	3.3	U	U	U
Phenanthrene	3.3	25	5.6	6.4
Anthracene	3.3	11	U	U
Fluoranthene	3.3	140	27	31
Pyrene	3.3	130	23	29
Benz(a)anthracene	3.3	68	13	16
Chrysene	3.3	110	21	18
Benzo(b)fluoranthene	3.3	140	30	24
Benzo(k)fluoranthene	3.3	86	20	18
Benzo(a)pyrene	3.3	99	23	19
Indeno(1,2,3-cd)pyrene	3.3	99	26	17
Dibenz(a,h)anthracene	3.3	22	6.1	4.7
Benzo(g,h,i)perylene	3.3	99	29	19

U Not detected at or above the MRL.

Approved By: Tracie Tucker Date: 10/31/00

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Taylor Engineering, Inc.	**Service Request:**	J2003037
Project:	Broward County Phase I / C1999-020	**Date Collected:**	9/7-8/00
Sample Matrix:	Sediment	**Date Received:**	9/11/00
		Date Extracted:	9/19/00

Polynuclear Aromatic Hydrocarbons by GC/MS SIM
EPA Methods 3550/8270
Units: µg/Kg (ppb)
Dry Weight Basis

Sample Name:	**BW-3-7C**	**BW-3-8C**	**Method Blank**
Lab Code:	J2003037-007 (a)	J2003037-008	EX200373-MB
Date Analyzed:	9/20/00	9/20/00	9/20/00

Analyte	**MRL**			
Naphthalene	3.3	6.6U	U	U
2-Methylnaphthalene	3.3	6.6U	U	U
1-Methylnaphthalene	3.3	6.6U	U	U
Acenaphthylene	3.3	6.9	6.8	U
Acenaphthene	3.3	6.6U	U	U
Fluorene	3.3	6.6U	U	U
Phenanthrene	3.3	29	24	U
Anthracene	3.3	14	9.5	U
Fluoranthene	3.3	75	140	U
Pyrene	3.3	69	110	U
Benz(a)anthracene	3.3	42	72	U
Chrysene	3.3	64	99	U
Benzo(b)fluoranthene	3.3	69	120	U
Benzo(k)fluoranthene	3.3	56	90	U
Benzo(a)pyrene	3.3	58	100	U
Indeno(1,2,3-cd)pyrene	3.3	53	86	U
Dibenz(a,h)anthracene	3.3	13	20	U
Benzo(g,h,i)perylene	3.3	54	86	U

U Not detected at or above the MRL.
(a) MRL is elevated because of the low percent solids in the sample as received.

Approved By: _____ Date: 10/31/00

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Taylor Engineering, Inc.	**Service Request:**	J2003037
Project:	Broward County Phase I / C1999-020	**Date Collected:**	9/7/00
Sample Matrix:	Sediment	**Date Received:**	9/11/00
		Date Extracted:	9/21/00

Organochlorine Pesticides
EPA Method 3550/8081
Units: µg/Kg (ppb)
Dry Weight Basis

	Sample Name:	**BW-1-1C**	**BW-1-2C**	**BW-1-3C**
	Lab Code:	J2003037-001	J2003037-002	J2003037-003
	Date Analyzed:	9/29/00	9/29/00	9/29/00
Analyte	**MRL**			
Alpha-BHC	0.66	U	U	U
Beta-BHC	0.66	U	U	U
Delta-BHC	0.66	U	U	U
Heptachlor	0.66	U	U	U
Aldrin	0.66	U	U	U
Gamma-BHC (Lindane)	0.66	U	U	U
Heptachlor Epoxide	0.66	U	U	U
Endosulfan I	0.66	U	U	U
Endrin	0.66	U	U	U
Endosulfan II	0.66	U	U	U
4,4'-DDD	0.66	U	U	U
Endrin Aldehyde	0.66	U	U	U
Endosulfan Sulfate	0.66	U	U	U
4,4'-DDT	0.66	U	U	U
4,4'-DDE	0.66	U	U	U
Dieldrin	0.66	U	U	U
Methoxychlor	1.6	U	U	U
Chlordane	1.6	U	U	U
Toxaphene	6.6	U	U	U

U Not detected at or above the MRL.

Approved By: Travis Tracht Date: 10/31/00

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Taylor Engineering, Inc.
Project: Broward County Phase I / C1999-020
Sample Matrix: Sediment

Service Request: J2003037
Date Collected: 9/7/00
Date Received: 9/11/00
Date Extracted: 9/21/00

Organochlorine Pesticides
EPA Method 3550/8081
Units: µg/Kg (ppb)
Dry Weight Basis

	Sample Name:	BW-2-4C	BW-2-5C	BW-3-6C
	Lab Code:	J2003037-004	J2003037-005	J2003037-006
	Date Analyzed:	9/29/00	9/29/00	9/29/00
Analyte	**MRL**			
Alpha-BHC	0.66	U	U	U
Beta-BHC	0.66	U	U	U
Delta-BHC	0.66	U	U	U
Heptachlor	0.66	U	U	U
Aldrin	0.66	U	U	U
Gamma-BHC (Lindane)	0.66	U	U	U
Heptachlor Epoxide	0.66	U	U	U
Endosulfan I	0.66	U	U	U
Endrin	0.66	U	U	U
Endosulfan II	0.66	U	U	U
4,4'-DDD	0.66	U	U	U
Endrin Aldehyde	0.66	U	U	U
Endosulfan Sulfate	0.66	U	U	U
4,4'-DDT	0.66	U	U	U
4,4'-DDE	0.66	U	U	U
Dieldrin	0.66	U	U	U
Methoxychlor	1.6	U	U	U
Chlordane	1.6	U	U	U
Toxaphene	6.6	U	U	U

U Not detected at or above the MRL.

Approved By: Tricia Tuccio Date: 10/31/00

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Taylor Engineering, Inc.	**Service Request:**	J2003037
Project:	Broward County Phase I / C1999-020	**Date Collected:**	9/7/00
Sample Matrix:	Sediment	**Date Received:**	9/11/00
		Date Extracted:	9/21/00

Organochlorine Pesticides
EPA Method 3550/8081
Units: µg/Kg (ppb)
Dry Weight Basis

	Sample Name:	**BW-3-7C**	**BW-3-8C**	**Method Blank**
	Lab Code:	J2003037-007	J2003037-008	EX200381-MB
	Date Analyzed:	9/29/00	9/29/00	9/29/00
Analyte	**MRL**			
Alpha-BHC	0.66	U	U	U
Beta-BHC	0.66	U	U	U
Delta-BHC	0.66	U	U	U
Heptachlor	0.66	U	U	U
Aldrin	0.66	U	U	U
Gamma-BHC (Lindane)	0.66	U	U	U
Heptachlor Epoxide	0.66	U	U	U
Endosulfan I	0.66	U	U	U
Endrin	0.66	U	U	U
Endosulfan II	0.66	U	U	U
4,4'-DDD	0.66	U	U	U
Endrin Aldehyde	0.66	U	U	U
Endosulfan Sulfate	0.66	U	U	U
4,4'-DDT	0.66	U	U	U
4,4'-DDE	0.66	U	U	U
Dieldrin	0.66	U	U	U
Methoxychlor	1.6	U	U	U
Chlordane	1.6	U	U	U
Toxaphene	6.6	U	U	U

U Not detected at or above the MRL.

Approved By: Tracie Tacker Date: 10/31/00

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Taylor Engineering, Inc.
Project: Broward County Phase I / C1999-020
Sample Matrix: Sediment

Service Request: J2003037
Date Collected: 9/7/00
Date Received: 9/11/00
Date Extracted: 9/21/00

Polychlorinated Biphenyls (PCBs)
EPA Method 3550/8082
Units: µg/Kg (ppb)
Dry Weight Basis

	Sample Name:	**BW-1-1C**	**BW-1-2C**	**BW-1-3C**
	Lab Code:	J2003037-001	J2003037-002	J2003037-003 (a)
	Date Analyzed:	10/2/00	10/2/00	10/2/00
Analyte	**MRL**			
PCBs: Aroclor 1016	33	U	U	66U
Aroclor 1221	33	U	U	66U
Aroclor 1232	33	U	U	66U
Aroclor 1242	33	U	U	66U
Aroclor 1248	33	U	U	66U
Aroclor 1254	33	U	U	66U
Aroclor 1260	33	U	U	66U

U Not detected at or above the MRL.
(a) MRL is elevated because of the low percent solids in the sample as received.

Approved By: [signature] Date: 10/31/00

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Taylor Engineering, Inc.
Project: Broward County Phase I / C1999-020
Sample Matrix: Sediment

Service Request: J2003037
Date Collected: 9/7/00
Date Received: 9/11/00
Date Extracted: 9/21/00

Polychlorinated Biphenyls (PCBs)
EPA Method 3550/8082
Units: µg/Kg (ppb)
Dry Weight Basis

	Sample Name:	**BW-2-4C**	**BW-2-5C**	**BW-3-6C**
	Lab Code:	J2003037-004	J2003037-005	J2003037-006
	Date Analyzed:	10/2/00	10/2/00	10/2/00
Analyte	**MRL**			
PCBs: Aroclor 1016	33	U	U	U
Aroclor 1221	33	U	U	U
Aroclor 1232	33	U	U	U
Aroclor 1242	33	U	U	U
Aroclor 1248	33	U	U	U
Aroclor 1254	33	U	U	U
Aroclor 1260	33	U	U	U

U Not detected at or above the MRL.

Approved By: Tania Tascher Date: 10/31/00

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Taylor Engineering, Inc.
Project: Broward County Phase I / C1999-020
Sample Matrix: Sediment

Service Request: J2003037
Date Collected: 9/7/00
Date Received: 9/11/00
Date Extracted: 9/21/00

Polychlorinated Biphenyls (PCBs)
EPA Method 3550/8082
Units: µg/Kg (ppb)
Dry Weight Basis

	Sample Name:	**BW-3-7C**	**BW-3-8C**	**Method Blank**
	Lab Code:	J2003037-007 (a)	J2003037-008	EX200378-MB
	Date Analyzed:	10/2/00	10/2/00	10/2/00
Analyte	**MRL**			
PCBs: Aroclor 1016	33	260	U	U
Aroclor 1221	33	66U	U	U
Aroclor 1232	33	66U	U	U
Aroclor 1242	33	66U	U	U
Aroclor 1248	33	66U	U	U
Aroclor 1254	33	66U	U	U
Aroclor 1260	33	66U	U	U

U Not detected at or above the MRL.
(a) MRL is elevated because of the low percent solids in the sample as received.

Approved By: Travis Tuckey Date: 10/31/00

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Taylor Engineering, Inc.	**Service Request:**	J2003037
Project:	Broward County Phase I / C1999-020	**Date Collected:**	9/7/00
Sample Matrix:	Sediment	**Date Received:**	9/11/00
		Date Extracted:	10/2/00

Polychlorinated Biphenyls (PCBs)
EPA Method 3550/8082
Units: µg/Kg (ppb)
Dry Weight Basis

	Sample Name:	**BW-3-7C**	**Method Blank**
	Lab Code:	J2003037-007RE (a)	EX200407-MB
	Date Analyzed:	10/9/00	10/9/00
Analyte	**MRL**		
PCBs: Aroclor 1016	33	66U	U
Aroclor 1221	33	66U	U
Aroclor 1232	33	66U	U
Aroclor 1242	33	66U	U
Aroclor 1248	33	66U	U
Aroclor 1254	33	66U	U
Aroclor 1260	33	66U	U

U Not detected at or above the MRL.
(a) MRL is elevated because of the low percent solids in the sample as received.

Approved By: Travis Trawle Date: 10/31/00

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: Taylor Engineering, Inc.
Project: Broward County Phase I / C1999-020
Sample Matrix: Sediment

Service Request: J2003037
Date Collected: 9/7-8/00
Date Received: 9/11/00
Date Extracted: 9/21/00
Date Analyzed: 9/24/00

Petroleum Range Organics
EPA Methods 3550/FL-PRO
Units: mg/Kg (ppm) Total PHS
Dry Weight Basis

Sample Name	Lab Code	MRL	Result
BW-1-1C	J2003037-001	3.3	U
BW-1-2C	J2003037-002	3.3	U
BW-1-3C	J2003037-003	6.6 (a)	U
BW-2-4C	J2003037-004	3.3	U
BW-2-5C	J2003037-005	3.3	U
BW-3-6C	J2003037-006	3.3	U
BW-3-7C	J2003037-007	6.6 (a)	U
BW-3-8C	J2003037-008	3.3	U
Method Blank	EX200385-MB	3.3	U

U Not detected at or above the MRL.
(a) MRL is elevated because of the low percent solids in the sample as received.

Approved By: Travis Tracht Date: 10/31/00

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Taylor Engineering, Inc.	**Service Request:**	J2003037
Project:	Broward County Phase I/C1999-020	**Date Collected:**	9/7/00
Sample Matrix:	Sediment	**Date Received:**	9/11/00
		Date Extracted:	NA

Inorganic Parameters
Dry Weight Basis

					Sample Name:	BW-1-1C	BW-1-2C	BW-1-3C
					Lab Code:	J2003037-001	J2003037-002	J2003037-003
Analyte	**Units**	**EPA Method**	**MRL**	**Date/Time Analyzed**				
TOC	mg/kg (ppm)	SID,S3	500	9/25/00 1645		700	3000	39000
TKN	mg/kg (ppm)	351.4M	100	10/6/00 1400		370	U	3700
Bicarbonate as CaCO3	mg/kg (ppm)	310.1M	5	9/20/00 1250		200	94	240
Solids, Total	%	160.3	0.001	9/21/00 0900		79.9	80.7	30.9

U Not detected at or above the MRL.

Approved By: Travis Tooley Date: 10/31/00

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Taylor Engineering, Inc.	**Service Request:**	J2003037
Project:	Broward County Phase I/C1999-020	**Date Collected:**	9/7/00
Sample Matrix:	Sediment	**Date Received:**	9/11/00
		Date Extracted:	NA

Inorganic Parameters
Dry Weight Basis

				Sample Name:	**BW-2-4C**	**BW-2-5C**	**BW-3-6C**
				Lab Code:	J2003037-004	J2003037-005	J2003037-006
Analyte	**Units**	**EPA Method**	**MRL**	**Date/Time Analyzed**			
TOC	mg/kg (ppm)	SID,S3	500	9/25/00 1645	4800	970	3900
TKN	mg/kg (ppm)	351.4M	100	10/6/00 1400	460	360	240
Bicarbonate as CaCO3	mg/kg (ppm)	310.1M	5	9/20/00 1250	91	160	112
Solids, Total	%	160.3	0.001	9/21/00 0900	72.8	75.7	77.1

U Not detected at or above the MRL.

Approved By: [signature] Date: 10/31/00

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Taylor Engineering, Inc.	**Service Request:**	J2003037
Project:	Broward County Phase I/C1999-020	**Date Collected:**	9/7/00
Sample Matrix:	Sediment	**Date Received:**	9/11/00
		Date Extracted:	NA

Inorganic Parameters
Dry Weight Basis

				Sample Name:	**BW-3-7C**	**BW-3-8C**	**Method Blank**
				Lab Code:	J2003037-007	J2003037-008	J000920-MB
Analyte	**Units**	**EPA Method**	**MRL**	**Date/Time Analyzed**			
TOC	mg/kg (ppm)	SID,S3	500	9/25/00 1645	680	U	--
TKN	mg/kg (ppm)	351.4M	100	10/6/00 1400	1000	380	U
Bicarbonate as CaCO3	mg/kg (ppm)	310.1M	5	9/20/00 1250	480	240	--
Solids, Total	%	160.3	0.001	9/21/00 0900	57.5	72.8	--

U Not detected at or above the MRL.

Approved By: Travis Tucker Date: 10/31/00

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Taylor Engineering, Inc.
Project: Broward County Phase I / C1999-020
Sample Matrix: Sediment

Service Request: J2003037
Date Collected: 9/7-8/00
Date Received: 9/11/00
Date Extracted: 9/19/00
Date Analyzed: 9/20/00

Surrogate Recovery Summary
Polynuclear Aromatic Hydrocarbons by GC/MS SIM
EPA Methods 3550/8270

Sample Name	Lab Code	Percent Recovery 2-Fluorobiphenyl
BW-1-1C	J2003037-001	23 (a)
BW-1-2C	J2003037-002	26 (a)
BW-1-3C	J2003037-003	16 (a)
BW-2-4C	J2003037-004	25 (a)
BW-2-5C	J2003037-005	24 (a)
BW-3-6C	J2003037-006	27 (a)
BW-3-7C	J2003037-007	19 (a)
BW-3-8C	J2003037-008	33 (a)
Method Blank	EX200373-MB	47
Laboratory Control Sample	EX200373-LCS	75
Batch QC	J2002982-001MS	57
Batch QC	J2002982-001DMS	67

CAS Acceptance Limits: 36-144

(a) Outside of acceptance limits.

Approved By: Tania Tanner Date: 10/31/00

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Taylor Engineering, Inc.
Project: Broward County Phase I / C1999-020
Sample Matrix: Soil

Service Request: J2003037
Date Collected: NA
Date Received: NA
Date Extracted: 9/19/00
Date Analyzed: 9/20/00

Matrix Spike/Duplicate Matrix Spike Summary
Polynuclear Aromatic Hydrocarbons by GC/MS SIM
EPA Methods 3550/8270
Units: µg/Kg (ppb)

Sample Name: Batch QC
Lab Code: Batch QC

	Spike Level		Sample	Spike Result		Percent Recovery			Relative	CAS RPD
Analyte	MS	DMS	Result	MS	DMS	MS	DMS	CAS Acceptance Limits	Percent Difference	Acceptance Limit
Acenaphthene	165	165	U	89	106	54	64	42-134	17	30
Fluoranthene	165	165	U	86	99	52	60	38-128	14	30
Benzo(a)pyrene	165	165	U	76	79	46	48	39-131	4	30

U Not detected at or above the MRL.

Approved By: [signature] Date: 10/31/00

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Taylor Engineering, Inc.	**Service Request:**	J2003037
Project:	Broward County Phase I / C1999-020	**Date Collected:**	NA
LCS Matrix:	Soil	**Date Received:**	NA
		Date Extracted:	9/19/00
		Date Analyzed:	9/20/00

Laboratory Control Sample Summary
Polynuclear Aromatic Hydrocarbons by GC/MS SIM
EPA Methods 3550/8270
Units: µg/Kg (ppb)

Analyte	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits
Acenaphthene	165	116	70	42-134
Fluoranthene	165	125	76	38-128
Benzo(a)pyrene	165	99	60	39-131

Approved By: Travis Tracht Date: 10/31/00

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Taylor Engineering, Inc.
Project: Broward County Phase I / C1999-020
Sample Matrix: Sediment

Service Request: J2003037
Date Collected: 9/7/00
Date Received: 9/11/00
Date Extracted: 9/21/00
Date Analyzed: 9/29/00

Surrogate Recovery Summary
Organochlorine Pesticides
EPA Method 3550/8081

Sample Name	Lab Code	Percent Recovery Tetrachloro-*m*-xylene	Percent Recovery Dibutylchlorendate
BW-1-1C	J2003037-001	70	31
BW-1-2C	J2003037-002	80	46
BW-1-3C	J2003037-003	(a)	11 (a)
BW-2-4C	J2003037-004	26	11 (a)
BW-2-5C	J2003037-005	27	9 (a)
BW-3-6C	J2003037-006	64	36
BW-3-7C	J2003037-007	43	18 (a)
BW-3-8C	J2003037-008	39	19 (a)
Method Blank	EX200381-MB	86	111
Laboratory Control Sample	EX200381-LCS	91	93
Batch QC	J2003100-005MS	94	96
Batch QC	J2003100-005DMS	89	91
CAS Acceptance Limits:		26-124	31-146

(a) Outside of acceptance limits because of matrix interferences. The chromatogram showed nontarget components that interfered with the analysis.

Approved By: Travis Trusler Date: 10/31/00

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Taylor Engineering, Inc.
Project: Broward County Phase I / C1999-020
Sample Matrix: Soil

Service Request: J2003037
Date Collected: NA
Date Received: NA
Date Extracted: 9/21/00
Date Analyzed: 9/29/00

Matrix Spike/Duplicate Matrix Spike Summary
Organochlorine Pesticides
EPA Method 3550/8081
Units: µg/Kg (ppb)

Sample Name: Batch QC
Lab Code: Batch QC

Analyte	Spike Level MS	Spike Level DMS	Sample Result	Spike Result MS	Spike Result DMS	Percent Recovery MS	Percent Recovery DMS	CAS Acceptance Limits	Relative Percent Difference
Heptachlor	33	33	U	28	29	85	88	27-130	4
Aldrin	33	33	U	28	25	85	76	28-127	11
Gamma-BHC (Lindane)	33	33	U	37	27	112	82	28-127	31
Endrin	33	33	U	32	26	97	79	27-153	21
4,4'-DDT	33	33	U	34	26	103	79	27-151	27
Dieldrin	33	33	U	30	26	91	79	29-142	14

U Not detected at or above the MRL.

Approved By: Tania Tucker Date: 10/31/00

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Taylor Engineering, Inc.	**Service Request:**	J2003037
Project:	Broward County Phase I / C1999-020	**Date Collected:**	NA
LCS Matrix:	Soil	**Date Received:**	NA
		Date Extracted:	9/21/00
		Date Analyzed:	9/29/00

Laboratory Control Sample Summary
Organochlorine Pesticides
EPA Method 3550/8081
Units: µg/Kg (ppb)

Analyte	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits
Heptachlor	3.3	3.4	103	27-130
Aldrin	3.3	2.8	85	28-127
Gamma-BHC (Lindane)	3.3	3.1	94	28-127
Endrin	3.3	3.0	91	27-153
4,4'-DDT	3.3	3.0	91	27-151
Dieldrin	3.3	2.8	85	29-142

The laboratory control sample is prepared using a standard obtained from Accustandard (Lot No. 024-294) which is different than the source of the calibration standard.

Approved By: Travis Tuckes Date: 10/31/00

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Taylor Engineering, Inc.
Project: Broward County Phase I / C1999-020
Sample Matrix: Sediment

Service Request: J2003037
Date Collected: 9/7/00
Date Received: 9/11/00
Date Extracted: 9/21/00
Date Analyzed: 10/2/00

Surrogate Recovery Summary
Polychlorinated Biphenyls (PCBs)
EPA Method 3550/8082

Sample Name	Lab Code	Percent Recovery Decachlorobiphenyl
BW-1-1C	J2003037-001	33 (c)
BW-1-2C	J2003037-002	57
BW-1-3C	J2003037-003	56
BW-2-4C	J2003037-004	34 (c)
BW-2-5C	J2003037-005	99
BW-3-6C	J2003037-006	18 (c)
BW-3-7C	J2003037-007	113
BW-3-8C	J2003037-008	80
Method Blank	EX200378-MB	99
Laboratory Control Sample	EX200378-LCS	30 (a)
Batch QC	J2003100-005MS	31 (a)
Batch QC	J2003100-005DMS	31 (a)
Laboratory Control Sample	EX200407-LCS	152 (b)
Batch QC	J2003037-001MS	88
Batch QC	J2003037-001DMS	72
BW-3-7C	J2003037-007RE	28
	CAS Acceptance Limits:	50-150

(a) Results flagged due to the wrong spiked being used. The Batch QC was spiked at a factor of 10 less than it should have been. The Batch QC was concentrated by a factor of 10 to compensate for this but the chromatogram showed interference peaks. Therefore, since CAS does not consider this Batch QC a representsative of it's normal extraction procedure, the samples were re-extracted with a new batch of QC.

(b) Outside of acceptance limits.

(c) Outside of acceptance limits because of confirmed (by re-extraction) matrix interferences. The chromatogram showed nontarget components that interfered with the analysis.

Approved By: Tracie Tracie Date: 10/31/00

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Taylor Engineering, Inc.	**Service Request:**	J2003037
Project:	Broward County Phase I / C1999-020	**Date Collected:**	NA
Sample Matrix:	Soil	**Date Received:**	NA
		Date Extracted:	9/21/00
		Date Analyzed:	10/2/00

Matrix Spike/Duplicate Matrix Spike Summary
Polychlorinated Biphenyls (PCBs)
EPA Method 3550/8082
Units: µg/Kg (ppb)

Sample Name: Batch QC
Lab Code: Batch QC

	Spike Level		Sample	Spike Result		Percent Recovery		CAS Acceptance	Relative Percent
Analyte	**MS**	**DMS**	**Result**	**MS**	**DMS**	**MS**	**DMS**	**Limits**	**Difference**
PCB 1016	33	33	U	46	52	139 (a)	158 (a)	50-150	12
PCB 1260	33	33	U	23	97	70 (a)	294 (a)	50-150	123

U Not detected at or above the MRL.

(a) Results flagged due to the wrong spiked being used. The MS/MSD was spiked at a factor of 10 less than it should have been. The MS/MSD was concentrated by a factor of 10 to compensate for this but the chromatogram showed interference peaks. Therefore, since CAS does not consider this MS/MSD a representsative of it's normal extraction procedure, the samples were re-extracted with a new batch of QC.

Approved By: Tricia Tuccio Date: 10/31/00

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Taylor Engineering, Inc.
Project: Broward County Phase I / C1999-020
Sample Matrix: Soil

Service Request: J2003037
Date Collected: NA
Date Received: NA
Date Extracted: 10/2/00
Date Analyzed: 10/9/00

Matrix Spike/Duplicate Matrix Spike Summary
Polychlorinated Biphenyls (PCBs)
EPA Method 3550/8082
Units: µg/Kg (ppb)

Sample Name: Batch QC
Lab Code: Batch QC

Analyte	Spike Level MS	Spike Level DMS	Sample Result	Spike Result MS	Spike Result DMS	Percent Recovery MS	Percent Recovery DMS	CAS Acceptance Limits	Relative Percent Difference
PCB 1016	33	33	U	60	68	182 (a)	206 (a)	50-150	13
PCB 1260	33	33	U	20	21	61	64	50-150	5

U Not detected at or above the MRL.
(a) Outside of acceptance limits because of matrix interferences. The chromatogram showed nontarget components that interfered with the analysis.

Approved By: Tania Tasler Date: 10/31/00

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Taylor Engineering, Inc.	**Service Request:**	J2003037
Project:	Broward County Phase I / C1999-020	**Date Collected:**	NA
LCS Matrix:	Soil	**Date Received:**	NA
		Date Extracted:	9/21/00
		Date Analyzed:	10/2/00

Laboratory Control Sample Summary
Polychlorinated Biphenyls (PCBs)
EPA Method 3550/8082
Units: µg/Kg (ppb)

Analyte	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits
PCB 1016	33	27	83 (a)	50-150
PCB 1260	33	16	48 (a)	50-150

(a) Results flagged due to the wrong spiked being used. The LCS was spiked at a factor of 10 less than it should have been. The LCS was concentrated by a factor of 10 to compensate for this but the chromatogram showed interference peaks. Therefore, since CAS does not consider this LCS a representsative of it's normal extraction procedure, the samples were re-extracted with a new batch of QC.

Approved By: Tamir Tamler Date: 10/31/00

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Taylor Engineering, Inc.
Project: Broward County Phase I / C1999-020
LCS Matrix: Soil

Service Request: J2003037
Date Collected: NA
Date Received: NA
Date Extracted: 10/2/00
Date Analyzed: 10/9/00

Laboratory Control Sample Summary
Polychlorinated Biphenyls (PCBs)
EPA Method 3550/8082
Units: µg/Kg (ppb)

Analyte	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits
PCB 1016	33	39	118	50-150
PCB 1260	33	41	124	50-150

Approved By: Tonia Tooley Date: 10/31/00

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Taylor Engineering, Inc.
Project: Broward County Phase I / C1999-020
Sample Matrix: Sediment

Service Request: J2003037
Date Collected: 9/7-8/00
Date Received: 9/11/00
Date Extracted: 9/21/00
Date Analyzed: 9/24/00

Surrogate Recovery Summary
Petroleum Range Organics
EPA Methods 3550/FL-PRO

Sample Name	Lab Code	Percent Recovery o-Terphenyl (OTP)	Percent Recovery Nonatriacontane (C39)
BW-1-1C	J2003037-001	93	88
BW-1-2C	J2003037-002	91	91
BW-1-3C	J2003037-003	91	91
BW-2-4C	J2003037-004	100	60
BW-2-5C	J2003037-005	102	70
BW-3-6C	J2003037-006	92	83
BW-3-7C	J2003037-007	90	77
BW-3-8C	J2003037-008	112	100
Method Blank	EX200385-MB	87	76
Laboratory Control Sample	EX200385-LCS	98	82
Batch QC	J2003109-001MS	60	71
Batch QC	J2003109-001DMS	99	68
CAS Acceptance Limits:		58-129	42-138

Approved By: Tami Tucker Date: 10/31/00

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Taylor Engineering, Inc.
Project: Broward County Phase I / C1999-020
Sample Matrix: Soil

Service Request: J2003037
Date Collected: NA
Date Received: NA
Date Extracted: 9/21/00
Date Analyzed: 9/24/00

Matrix Spike/Duplicate Matrix Spike Summary
Petroleum Range Organics
EPA Methods 3550/FL-PRO
Units: mg/Kg (ppm) Total PHS

Sample Name: Batch QC
Lab Code: Batch QC

Analyte	Spike Level MS	Spike Level DMS	Sample Result	Spike Result MS	Spike Result DMS	Percent Recovery MS	Percent Recovery DMS	Percent Recovery CAS Acceptance Limits	Relative Percent Difference	CAS RPD Acceptance Limit
Total PHS (C8-C40)	165	165	U	145	165	88	100	62-204	13	25

U Not detected at or above the MRL.

Approved By: [signature] Date: 10/31/00

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Taylor Engineering, Inc.	**Service Request:**	J2003037
Project:	Broward County Phase I / C1999-020	**Date Collected:**	NA
LCS Matrix:	Soil	**Date Received:**	NA
		Date Extracted:	9/21/00
		Date Analyzed:	9/24/00

Laboratory Control Sample
Petroleum Range Organics
EPA Methods 3550/FL-PRO
Units: mg/Kg (ppm) Total PHS

			Percent Recovery	
Analyte	**True Value** LCS	**Result** LCS	LCS	CAS Acceptance Limits
Total PHS (C8-C40)	165	178	108	63-153

Approved By: Tracie Tuckey Date: 10/31/00

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Taylor Engineering, Inc.
Project: Broward County Phase I/C1999-020
Sample Matrix: Sediment

Service Request: J2003037
Date Collected: NA
Date Received: NA
Date Extracted: NA
Date Analyzed: 9/20-10/6/00

Duplicate Summary
Inorganic Parameters

Sample Name: Batch QC
Lab Code: Batch QC

Analyte	Units	EPA Method	MRL	Sample Result	Duplicate Sample Result	Average	Relative Percent Difference
TOC	mg/kg (ppm	SID,S3	500	14667	14344	14505.5	2.23
TKN	mg/kg (ppm	351.4M	100	U	U	U	<1
Solids, Total	%	160.3	0.001	79.8	80.8	80.3	1.25

U Not detected at or above the MRL.

Approved By: Tania Tasler Date: 10/31/00

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Taylor Engineering, Inc.	**Service Request:**	J2003037
Project:	Broward County Phase I/C1999-020	**Date Collected:**	NA
Sample Matrix:	Sediment	**Date Received:**	NA
		Date Extracted:	NA
		Date Analyzed:	9/20-10/6/00

Matrix Spike Summary
Inorganic Parameters

Sample Name: Batch QC
Lab Code: Batch QC

Analyte	Units	EPA Method	MRL	Spike Level	Sample Result	Spiked Sample Result	Percent Recovery	CAS Percent Recovery Acceptance Limits
TKN	mg/kg (ppm)	351.4M	100	2389	U	1810	75.8	75-125

U Not detected at or above the MRL.

Approved By: Travis Tooley Date: 10/31/00

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Taylor Engineering, Inc.
Project: Broward County Phase I/C1999-020
Sample Matrix: Water

Service Request: J2003037
Date Collected: NA
Date Received: NA
Date Analyzed: 9/20-10/6/00

Laboratory Control Sample Summary
Inorganic Parameters

Analyte	Units	EPA Method	TRUE Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits
TKN	mg/kg (ppm)	351.4M	10.3	10.4	101.0	75-125

Approved By: Tracie Trader Date: 10/31/00

Columbia Analytical Services inc.
An Employee-Owned Company

Columbia Analytical Services
8540 Baycenter Road
Jacksonville, FL 32256
Tel 904-739-2277
Fax 904-739-2011

CROSS REFERENCE

Lab Sample ID	Client Sample ID	Date/Time Collected	Matrix
J2003037-001	BW-1-1C	9/7/00	Sediment
J2003037-002	BW-1-2C	9/7/00	Sediment
J2003037-003	BW-1-3C	9/7/00	Sediment
J2003037-004	BW-2-4C	9/7/00	Sediment
J2003037-005	BW-2-5C	9/7/00	Sediment
J2003037-006	BW-3-6C	9/8/00	Sediment
J2003037-007	BW-3-7C	9/8/00	Sediment
J2003037-008	BW-3-8C	9/8/00	Sediment

MRI
Florida Division

MIDWEST RESEARCH INSTITUTE
1470 Treeland Boulevard, S.E.
Palm Bay, Florida 32909-2211
Telephone: (321) 723-4547
FAX: (321) 722-2514

Laboratory Analysis Report

Submitted to: Columbia Analytical Service
8540 Baycenter Road
Jacksonville Fla. 32256

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness. Release of the data contained in this hardcopy data package has been authorized by the facility director or his designee, as verified by the following signature.

Michael F. Helmstetter, Ph.D.

Report Number 9912
Revision 0
October 2000

Midwest Research Institute
Florida Division

Quality Control Summary

Client: Columbia Analytical Services
Work Order: 9912
Date Received: September 19, 2000

Samples were accepted by Midwest Research Institute in accordance with documented chain-of-custody procedures. Analytical results presented in this report have been reviewed for compliance with the laboratory's CompQAP.

A. Laboratory Blank:

All analytes were below method detection limits.

B. Matrix Spike Recovery

Recoveries for analytes were within laboratory precision and accuracy limits.

C. Sample Duplicate

Analysis data demonstrated acceptable reproducibility of laboratory processes.

D. Key:

QCS	Second Source Calibration Verification
CCV	Continuing Calibration Verification
LRB	Laboratory Reagent Blank
****-D	Sample Duplicate
****-S	Sample Spike
****-SD	Sample Spike Duplicate
NRC: MESS-2	National Research Council of Canada. Marine Esturaine Sediment #2.

Midwest Research Institute
Florida Division

Laboratory Analysis
Aluminum

Client: Columbia Analytical Services
CompQAP #: 990096
Work Order/Report Number: 9912
Date Received: 09/12/00
Matrix: Sediment
Method: 200.8
Analyst: N. Julien
Data Released By: T. Price

Field ID:	Sample Date/Time:	Lab ID:	Analysis Result (mg/Kg dry wt)	Date Analyzed
J20003037-01	09/07/00 at 1135	9912-01	2025	10/24/00
J20003037-02	09/07/00 at 1232	9912-02	638	10/24/00
J20003037-03	09/07/00 at 1335	9912-03	10034	10/24/00
J20003037-04	09/07/00 at 1420	9912-04	2735	10/24/00
J20003037-05	09/07/00 at 1540	9912-05	990	10/24/00
J20003037-06	09/08/00 at 1540	9912-06	987	10/24/00
J20003037-07	09/08/00 at 1310	9912-07	1695	10/24/00
J20003037-08	09/08/00 at 1135	9912-08	827	10/24/00

QC Data Set:	ELAN-29800						
ANALYTE:Al 27							
SampleID	Found	Units	Expected	%Rec/RPD	Lo Limit	Hi Limit	Action
QCS	50.4282	ug/L	46.7	107.9832976	75	125	PASS
CCV	49.9201	ug/L	50	99.8402	90	110	PASS
CCV	54.3221	ug/L	50	108.6442	90	110	PASS
LRB1-L50	4.1976	ug/L				<10	PASS
991203-L5000	8.4888	ug/L					
991203-L5000-D	8.075	ug/L		4.996438015		20	PASS
991203-L5000-S	29.9823	ug/L	20	107.4675	75	125	PASS
991203-L5000-SD	28.5904	ug/L		4.752726099		20	PASS
NRC:MESS-2	45486.27038	ug/g dry wt.	42822	106.2217327			

Midwest Research Institute
Florida Division

Laboratory Analysis
Arsenic

Client: Columbia Analytical Services
CompQAP #: 990096
Work Order/Report Number: 9912
Date Received: 09/12/00
Matrix: Sediment
Method: 200.8
Analyst: N. Julien
Data Released By: T. Price

Field ID:	Sample Date/Time:	Lab ID:	Analysis Result (mg/Kg dry wt)	Date Analyzed
J20003037-01	09/07/00 at 1135	9912-01	4.68	10/20/00
J20003037-02	09/07/00 at 1232	9912-02	2.09	10/20/00
J20003037-03	09/07/00 at 1335	9912-03	13.2	10/20/00
J20003037-04	09/07/00 at 1420	9912-04	3.52	10/20/00
J20003037-05	09/07/00 at 1540	9912-05	3.44	10/20/00
J20003037-06	09/08/00 at 1540	9912-06	4.51	10/20/00
J20003037-07	09/08/00 at 1310	9912-07	7.63	10/20/00
J20003037-08	09/08/00 at 1135	9912-08	3.16	10/20/00

QC Data Set:	ELAN-29400						
ANALYTE:As 75							
SampleID	Found	Units	Expected	%Rec	Lo Limit	Hi Limit	Action
QCS	6.3935	ug/L	6.67	95.85457271	75	125	PASS
CCV	50.7638	ug/L	50	101.5276	90	110	PASS
CCV	50.8796	ug/L	50	101.7592	90	110	PASS
LRB1-L50	0.1485	ug/L				<2	PASS
991203-L50	3.2647	ug/L					
991203-L50-D	3.6125	ug/L		10.11458152	0	20	PASS
991203-L50-S	7.2312	ug/L	4	99.1625	75	125	PASS
NRC:MESS-2	20.68892017	ug/g dry wt.	20.7	99.94647425			

Midwest Research Institute
Florida Division

Laboratory Analysis
Cadmium

Client: Columbia Analytical Services
CompQAP #: 990096
Work Order/Report Number: 9912
Date Received: 09/12/00
Matrix: Sediment
Method: 200.8
Analyst: N. Julien
Data Released By: T. Price

Field ID:	Sample Date/Time:	Lab ID:	Analysis Result (mg/Kg dry wt)	Date Analyzed
J20003037-01	09/07/00 at 1135	9912-01	<0.08	10/20/00
J20003037-02	09/07/00 at 1232	9912-02	<0.08	10/20/00
J20003037-03	09/07/00 at 1335	9912-03	0.31	10/20/00
J20003037-04	09/07/00 at 1420	9912-04	<0.08	10/20/00
J20003037-05	09/07/00 at 1540	9912-05	<0.08	10/20/00
J20003037-06	09/08/00 at 1540	9912-06	0.10	10/20/00
J20003037-07	09/08/00 at 1310	9912-07	<0.08	10/20/00
J20003037-08	09/08/00 at 1135	9912-08	<0.08	10/20/00

QC Data Set:	ELAN-29400						
ANALYTE:Cd 114							
SampleID	Found	Units	Expected	%Rec	Lo Limit	Hi Limit	Action
QCS	8.8465	ug/L	8.78	100.7574032	75	125	PASS
CCV	50.2211	ug/L	50	100.4422	90	110	PASS
CCV	51.0025	ug/L	50	102.005	90	110	PASS
LRB1-L50	0.002775	ug/L				<1	PASS
991203-L50	0.076	ug/L					
991203-L50-D	0.085	ug/L		11.18012422	0	20	PASS
991203-L50-S	4.0006	ug/L	4	98.115	75	125	PASS
NRC:MESS-2	0.302835311	ug/g dry wt.	0.24	126.1813794			

Midwest Research Institute
Florida Division

Laboratory Analysis
Chromium

Client: Columbia Analytical Services
CompQAP #: 990096
Work Order/Report Number: 9912
Date Received: 09/12/00
Matrix: Sediment
Method: 200.8
Analyst: N. Julien
Data Released By: T. Price

Field ID:	Sample Date/Time:	Lab ID:	Analysis Result (mg/Kg dry wt)	Date Analyzed
J20003037-01	09/07/00 at 1135	9912-01	0.99	10/20/00
J20003037-02	09/07/00 at 1232	9912-02	0.56	10/20/00
J20003037-03	09/07/00 at 1335	9912-03	29.0	10/20/00
J20003037-04	09/07/00 at 1420	9912-04	2.07	10/20/00
J20003037-05	09/07/00 at 1540	9912-05	1.13	10/20/00
J20003037-06	09/08/00 at 1540	9912-06	1.73	10/20/00
J20003037-07	09/08/00 at 1310	9912-07	1.14	10/20/00
J20003037-08	09/08/00 at 1135	9912-08	0.30	10/20/00

QC Data Set:	ELAN-29400						
ANALYTE:Cr 52							
SampleID	Found	Units	Expected	%Rec	Lo Limit	Hi Limit	Action
QCS	86.2565	ug/L	87.8	98.24202733	75	125	PASS
CCV	50.2543	ug/L	50	100.5086	90	110	PASS
CCV	50.9656	ug/L	50	101.9312	90	110	PASS
LRB1-L50	0.0925	ug/L				<1	PASS
991203-L50	7.162	ug/L					
991203-L50-D	7.4117	ug/L		3.426720737		20	PASS
991203-L50-S	10.5472	ug/L	4	84.63	75	125	PASS
NRC:MESS-2	84.47416047	ug/g dry wt.	106	79.69260421			

Midwest Research Institute
Florida Division

Laboratory Analysis
Copper

Client: Columbia Analytical Services
CompQAP #: 990096
Work Order/Report Number: 9912
Date Received: 09/12/00
Matrix: Sediment
Method: 200.8
Analyst: N. Julien
Data Released By: T. Price

Field ID:	Sample Date/Time:	Lab ID:	Analysis Result (mg/Kg dry wt)	Date Analyzed
J20003037-01	09/07/00 at 1135	9912-01	11.7	10/20/00
J20003037-02	09/07/00 at 1232	9912-02	1.57	10/20/00
J20003037-03	09/07/00 at 1335	9912-03	302	10/20/00
J20003037-04	09/07/00 at 1420	9912-04	20.2	10/20/00
J20003037-05	09/07/00 at 1540	9912-05	19.8	10/20/00
J20003037-06	09/08/00 at 1540	9912-06	10.3	10/20/00
J20003037-07	09/08/00 at 1310	9912-07	24.3	10/20/00
J20003037-08	09/08/00 at 1135	9912-08	5.09	10/20/00

QC Data Set:	ELAN-29400						
ANALYTE:Cu 63							
SampleID	Found	Units	Expected	%Rec	Lo Limit	Hi Limit	Action
QCS	45.1399	ug/L	44.4	101.6664414	75	125	PASS
CCV	49.3083	ug/L	50	98.6166	90	110	PASS
CCV	51.0889	ug/L	50	102.1778	90	110	PASS
LRB1-L50	0.1013	ug/L				<1	PASS
991203-L50	74.5619	ug/L					
991203-L50-D	73.6693	ug/L		1.20433485	0	20	PASS
991203-L50-S	78.7625	ug/L	4	105.015	75	125	PASS
NRC:MESS-2	38.03659763	ug/g dry wt.	39.3	96.78523569			

Midwest Research Institute
Florida Division

Laboratory Analysis
Lead

Client: Columbia Analytical Services
CompQAP #: 990096
Work Order/Report Number: 9912
Date Received: 09/12/00
Matrix: Sediment
Method: 200.8
Analyst: N. Julien
Data Released By: T. Price

Field ID:	Sample Date/Time:	Lab ID:	Analysis Result (mg/Kg dry wt)	Date Analyzed
J20003037-01	09/07/00 at 1135	9912-01	3.72	10/20/00
J20003037-02	09/07/00 at 1232	9912-02	0.83	10/20/00
J20003037-03	09/07/00 at 1335	9912-03	114	10/20/00
J20003037-04	09/07/00 at 1420	9912-04	10.0	10/20/00
J20003037-05	09/07/00 at 1540	9912-05	7.59	10/20/00
J20003037-06	09/08/00 at 1540	9912-06	3.42	10/20/00
J20003037-07	09/08/00 at 1310	9912-07	5.71	10/20/00
J20003037-08	09/08/00 at 1135	9912-08	4.97	10/20/00

QC Data Set:	ELAN-29400						
ANALYTE:Pb 208							
SampleID	Found	Units	Expected	%Rec	Lo Limit	Hi Limit	Action
QCS	50.3504	ug/L	51.1	98.53307241	75	125	PASS
CCV	50.0435	ug/L	50	100.087	90	110	PASS
CCV	50.5111	ug/L	50	101.0222	90	110	PASS
LRB1-L50	0.0496	ug/L				<1	PASS
991203-L50	28.1619	ug/L					
991203-L50-D	30.9088	ug/L		9.30038073		20	PASS
991203-L50-S	31.8771	ug/L	4	92.88	75	125	PASS
NRC:MESS-2	19.23225417	ug/g dry wt.	21.9	87.8185122			

Midwest Research Institute
Florida Division

Laboratory Analysis
Mercury

Client: Columbia Analytical Services
CompQAP #: 990096
Work Order/Report Number: 9912
Date Received: 09/12/00
Matrix: Sediment
Method: 245.5
Analyst: N. Julien
Data Released By: T. Price

Field ID:	Sample Date/Time:	Lab ID:	Analysis Result (mg/Kg dry wt)	Date Analyzed
J20003037-01	09/07/00 at 1135	9912-01	<0.09	10/24/00
J20003037-02	09/07/00 at 1232	9912-02	<0.09	10/24/00
J20003037-03	09/07/00 at 1335	9912-03	1.399	10/24/00
J20003037-04	09/07/00 at 1420	9912-04	<0.09	10/24/00
J20003037-05	09/07/00 at 1540	9912-05	0.110	10/24/00
J20003037-06	09/08/00 at 1540	9912-06	<0.09	10/24/00
J20003037-07	09/08/00 at 1310	9912-07	<0.09	10/24/00
J20003037-08	09/08/00 at 1135	9912-08	<0.09	10/24/00

QC Data Set:	FIMS-29800A						
ANALYTE:Hg 253.7							
SampleID	Found	Units	Expected	%Rec	Lo Limit	Hi Limit	Action
QCS	0.249122885	ug/L	0.218	114.2765527	90	110	PASS
CCV	9.411404715	ug/L	10	94.11404715	90	110	PASS
CCV	9.317983633	ug/L	10	93.17983633	90	110	PASS
LRB	0.162717615	ug/L				<0.2	PASS
991201-L2	0	ug/L					
991201-L2-D	-0.00311404	ug/L		NA		20	PASS
991201-L2-S	0.903070458	ug/L	1	90.61844936	75	125	PASS
991201-L2-SD	0.996491539	ug/L		9.836065574		20	PASS
NRC:MESS-2	0.104838668	ug/g dry wt.	0.092	113.9550739			

Midwest Research Institute
Florida Division

Laboratory Analysis
Nickel

Client: Columbia Analytical Services
CompQAP #: 990096
Work Order/Report Number: 9912
Date Received: 09/12/00
Matrix: Sediment
Method: 200.8
Analyst: N. Julien
Data Released By: T. Price

Field ID:	Sample Date/Time:	Lab ID:	Analysis Result (mg/Kg dry wt)	Date Analyzed
J20003037-01	09/07/00 at 1135	9912-01	1.78	10/20/00
J20003037-02	09/07/00 at 1232	9912-02	0.18	10/20/00
J20003037-03	09/07/00 at 1335	9912-03	9.90	10/20/00
J20003037-04	09/07/00 at 1420	9912-04	1.40	10/20/00
J20003037-05	09/07/00 at 1540	9912-05	1.32	10/20/00
J20003037-06	09/08/00 at 1540	9912-06	1.58	10/20/00
J20003037-07	09/08/00 at 1310	9912-07	2.53	10/20/00
J20003037-08	09/08/00 at 1135	9912-08	0.97	10/20/00

QC Data Set:	ELAN-29400						
ANALYTE:Ni 60							
SampleID	Found	Units	Expected	%Rec	Lo Limit	Hi Limit	Action
QCS	41.3881	ug/L	40.2	102.9554726	75	125	PASS
CCV	51.4983	ug/L	50	102.9966	90	110	PASS
CCV	52.425	ug/L	50	104.85	90	110	PASS
LRB1-L50	0.0883	ug/L				<1	PASS
991203-L50	2.4405	ug/L					
991203-L50-D	2.6155	ug/L		6.922468354	0	20	PASS
991203-L50-S	6.3958	ug/L	4	98.8825	75	125	PASS
NRC:MESS-2	46.68932234	ug/g dry wt.	49.3	94.70450779			

Midwest Research Institute
Florida Division

Laboratory Analysis
Zinc

Client: Columbia Analytical Services
CompQAP #: 990096
Work Order/Report Number: 9912
Date Received: 09/12/00
Matrix: Sediment
Method: 200.8
Analyst: N. Julien
Data Released By: T. Price

Field ID:	Sample Date/Time:	Lab ID:	Analysis Result (mg/Kg dry wt)	Date Analyzed
J20003037-01	09/07/00 at 1135	9912-01	16.8	10/24/00
J20003037-02	09/07/00 at 1232	9912-02	6.34	10/24/00
J20003037-03	09/07/00 at 1335	9912-03	270	10/24/00
J20003037-04	09/07/00 at 1420	9912-04	29.0	10/24/00
J20003037-05	09/07/00 at 1540	9912-05	39.1	10/24/00
J20003037-06	09/08/00 at 1540	9912-06	4.77	10/24/00
J20003037-07	09/08/00 at 1310	9912-07	30.0	10/24/00
J20003037-08	09/08/00 at 1135	9912-08	29.2	10/24/00

QC Data Set:	ELAN-29800						
ANALYTE:Zn 68							
SampleID	Found	Units	Expected	%Rec/RPD	Lo Limit	Hi Limit	Action
QCS	22.0006	ug/L	22.2	99.1018018	75	125	PASS
CCV	46.3922	ug/L	50	92.7844	90	110	PASS
CCV	47.3068	ug/L	50	94.6136	90	110	PASS
LRB1-L50	0	ug/L				<1	PASS
991203-L50	22.8053	ug/L					
991203-L50-D	24.4915	ug/L		7.130292113		20	PASS
991203-L50-S	60.6144	ug/L	40	94.52275	75	125	PASS
991203-L50-SD	61.1177	ug/L		0.826897753		20	PASS
NRC:MESS-2	143.026828	ug/g dry wt.	172	83.15513255			

SUMMARY OF GRADATION TEST RESULTS

Project: Intracoastal Waterway - Broward County, Florida
Client: Taylor Engineering, Inc.
Project No.: 00-1393

Sample No.	GRADATION TEST Percent Passing										
	No. 4	No. 10	No. 20	No. 30	No. 40	No. 50	No. 60	No. 80	No. 100	No. 140	No. 200
BW-1-1GS	99.1	95.0	73.5	54.8	38.9	23.1	19.5	10.3	7.4	4.8	4.1
BW-1-2GS	100.0	99.9	99.2	97.5	89.9	71.0	55.6	15.1	4.2	1.0	0.9
BW-1-3GS	99.6	98.1	95.0	92.9	75.3	22.7	11.7	3.1	2.0	1.5	1.4
BW-1-4GS	100.0	100.0	99.6	99.3	98.4	97.1	96.4	93.4	88.8	68.7	65.2
BW-2-5GS	100.0	99.8	99.4	99.1	98.5	97.0	95.6	75.4	30.8	6.4	5.3
BW-2-6GS	97.7	89.6	65.8	53.3	39.9	29.9	27.4	22.0	19.5	15.0	13.6
BW-2-7GS	96.0	93.0	88.2	85.6	79.9	68.5	62.6	41.7	31.0	19.0	16.2
BW-3-8GS	98.2	96.0	92.7	91.1	88.4	83.2	79.9	54.1	31.5	9.8	6.4
BW-3-9GS	98.6	96.3	93.3	91.6	88.2	82.8	80.3	67.5	39.6	10.5	9.0
BW-3-10GS	100.0	99.0	96.4	93.9	88.5	77.2	71.2	49.5	36.9	22.8	19.4
BW-3-11GS	93.0	85.5	77.6	72.8	63.3	45.3	37.1	16.9	10.6	6.3	5.6
BW-3-12GS	96.9	90.0	82.2	76.9	66.2	47.3	38.8	20.4	12.5	6.6	6.0

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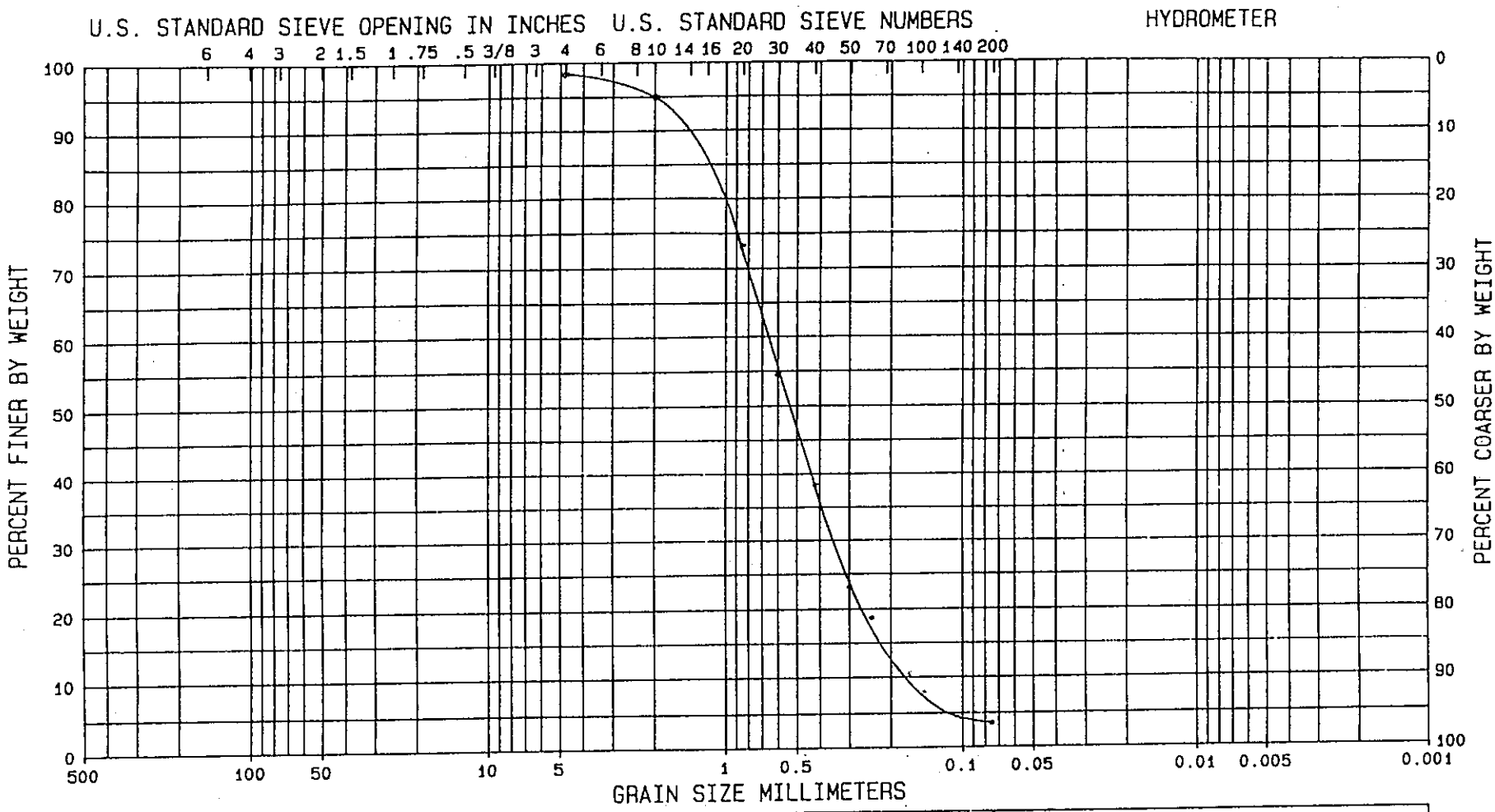


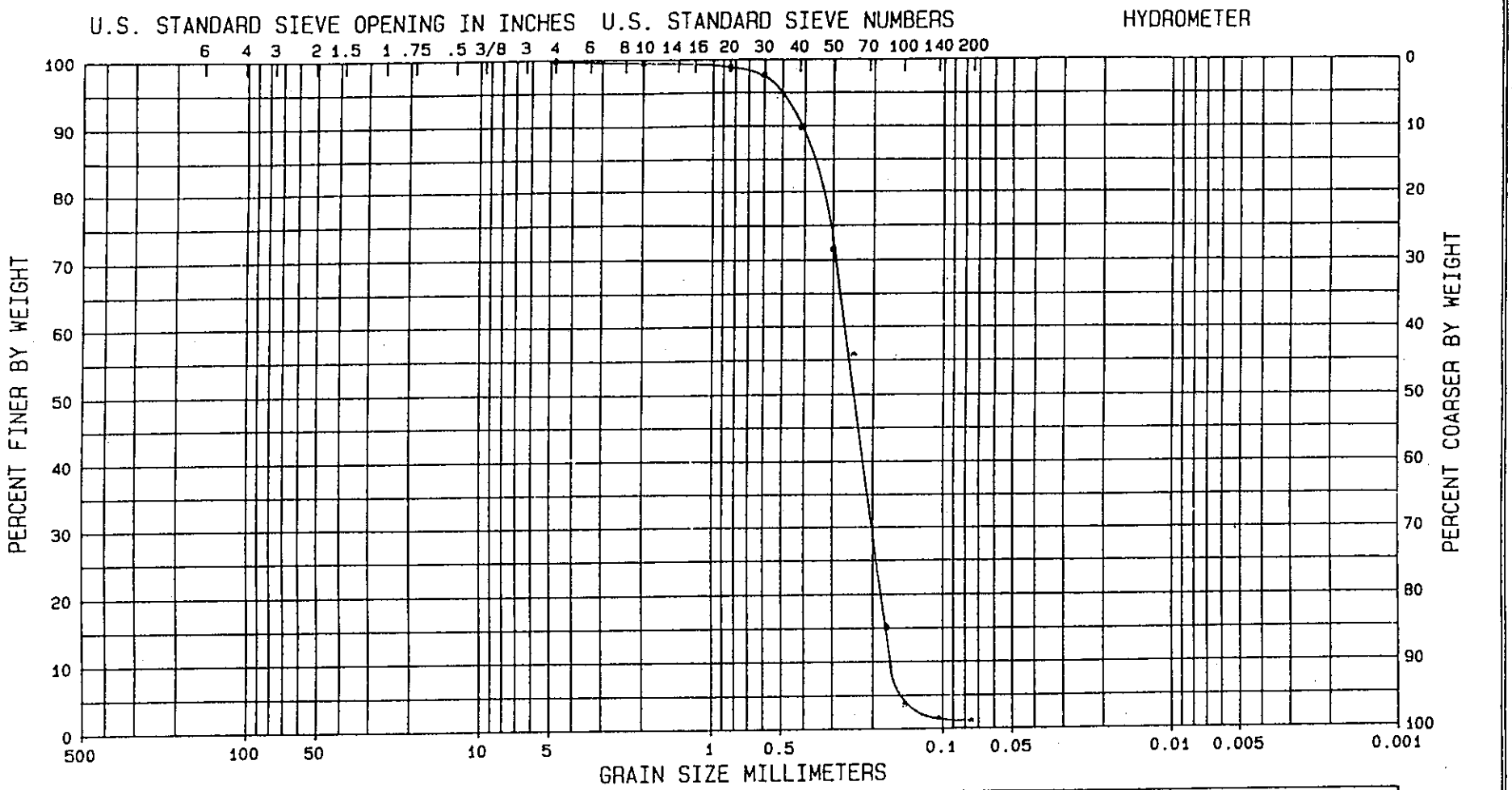
COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

SAMPLE NO.		CLASSIFICATION	NAT W%	LL	PL	PI
Bw1 -1 GS						

GRADATION CURVES

Intracoastal Waterway
Broward County
E&A Project No. 00-1393

ELLIS & ASSOCIATES, INC.



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

SAMPLE NO.		CLASSIFICATION	NAT W%	LL	PL	PI
BW1-2GS						

GRADATION CURVES

Intracoastal Waterway
Broward County
E&A Project No. 00-1393

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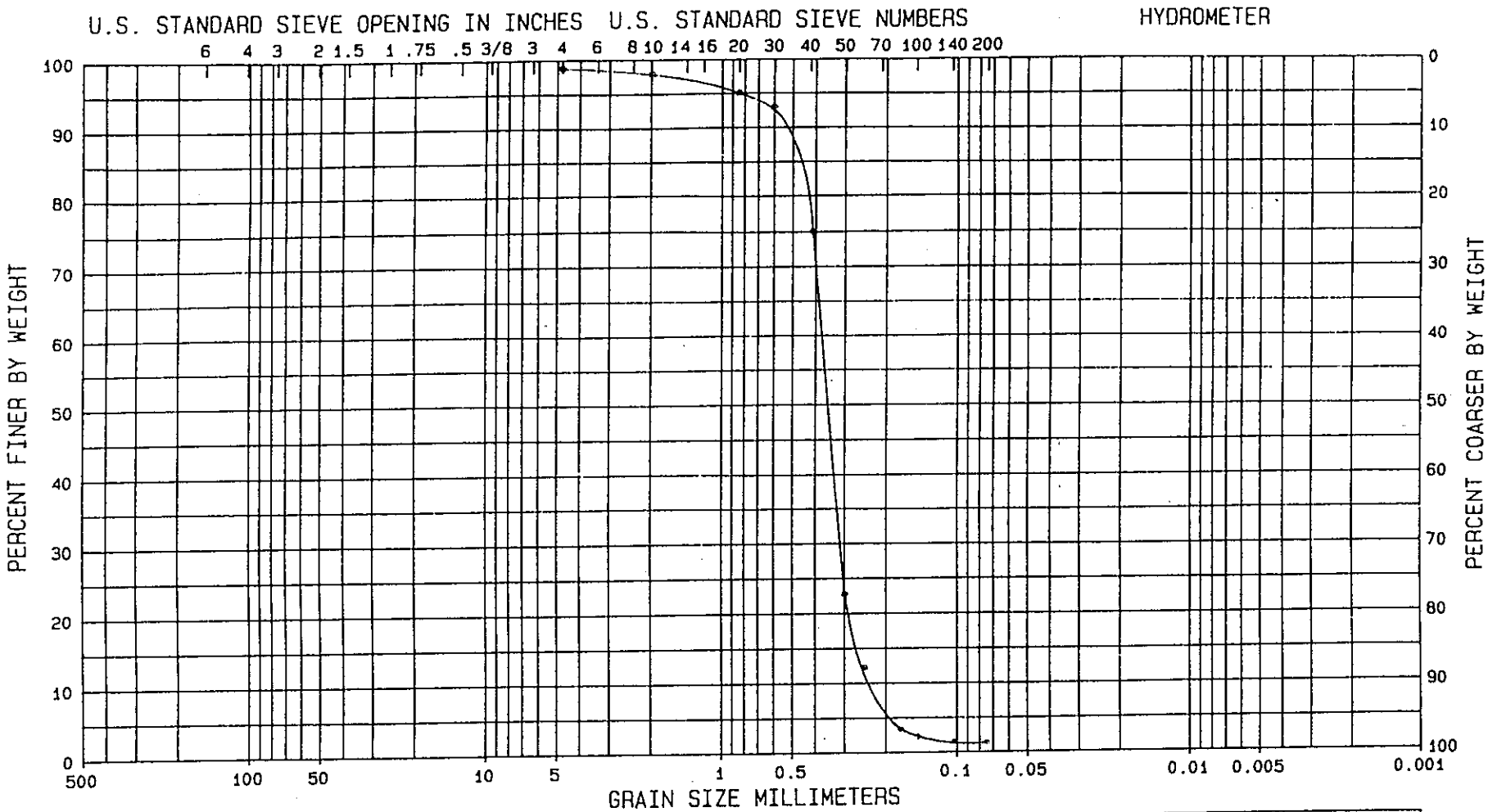


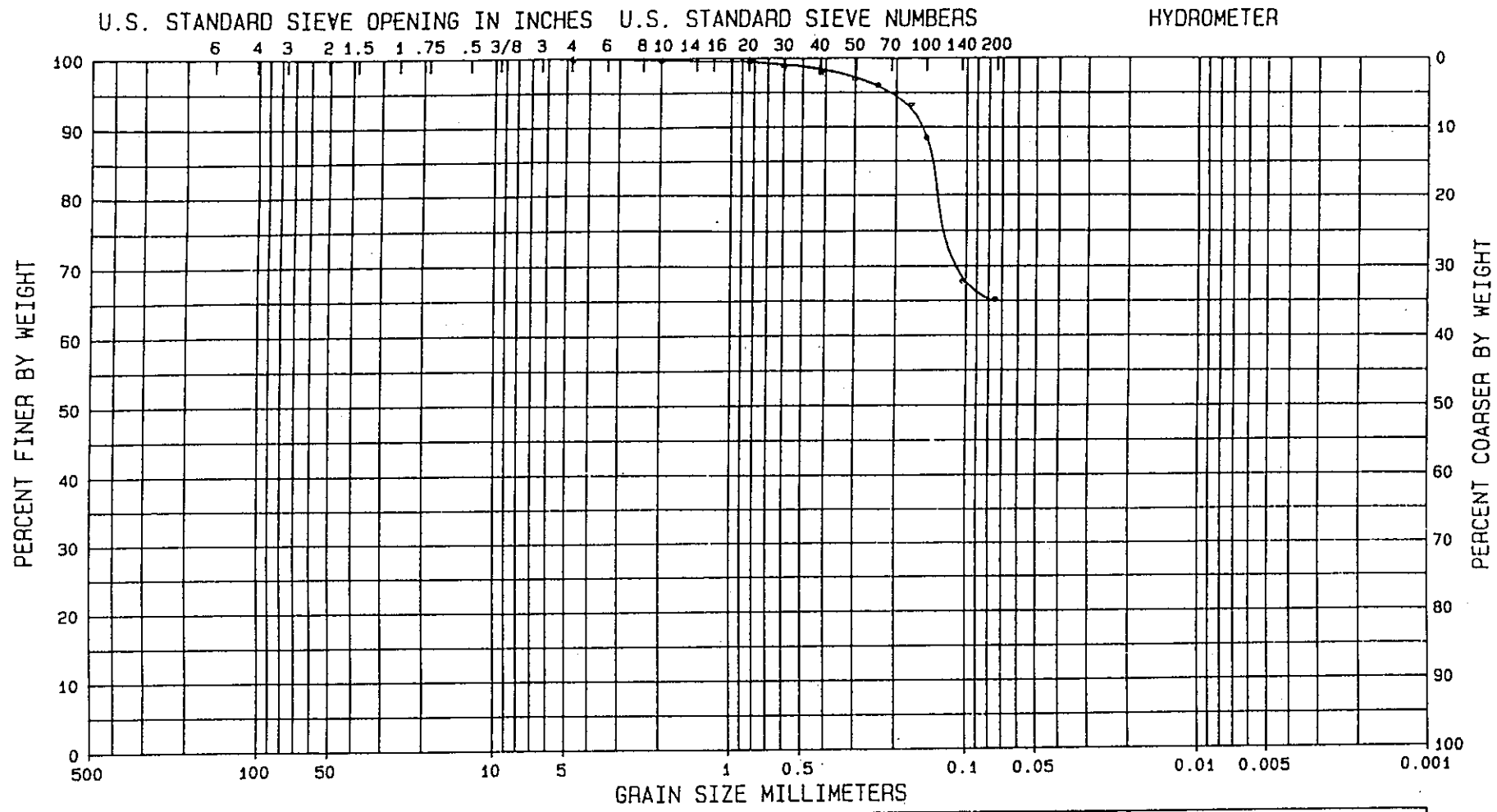
COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

SAMPLE NO.		CLASSIFICATION	NAT w%	LL	PL	PI
BW1-3GS						

GRADATION CURVES

Intracoastal Waterway
Broward County
E&A Project No. 00-1393

ELLIS & ASSOCIATES, INC.



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

SAMPLE NO.		CLASSIFICATION	NAT W%	LL	PL	PI
BW1-4GS						

GRADATION CURVES

Intracoastal Waterway
Broward County
E&A Project No. 00-1393

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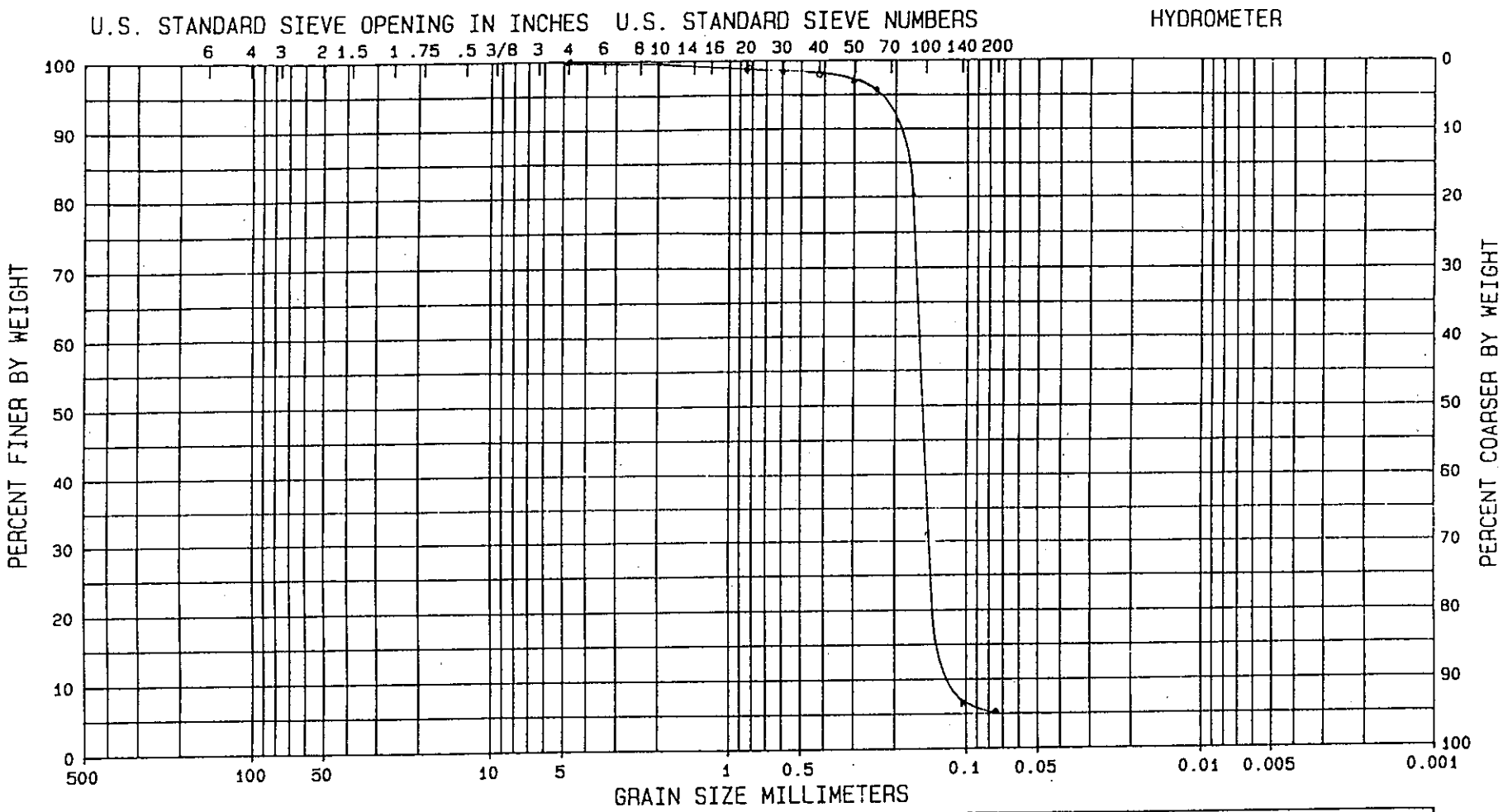

COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

SAMPLE NO.		CLASSIFICATION	NAT W%	LL	PL	PI
BW2-5GS						

GRADATION CURVES

Intracoastal Waterway
Broward County
E&A Project No. 00-1393

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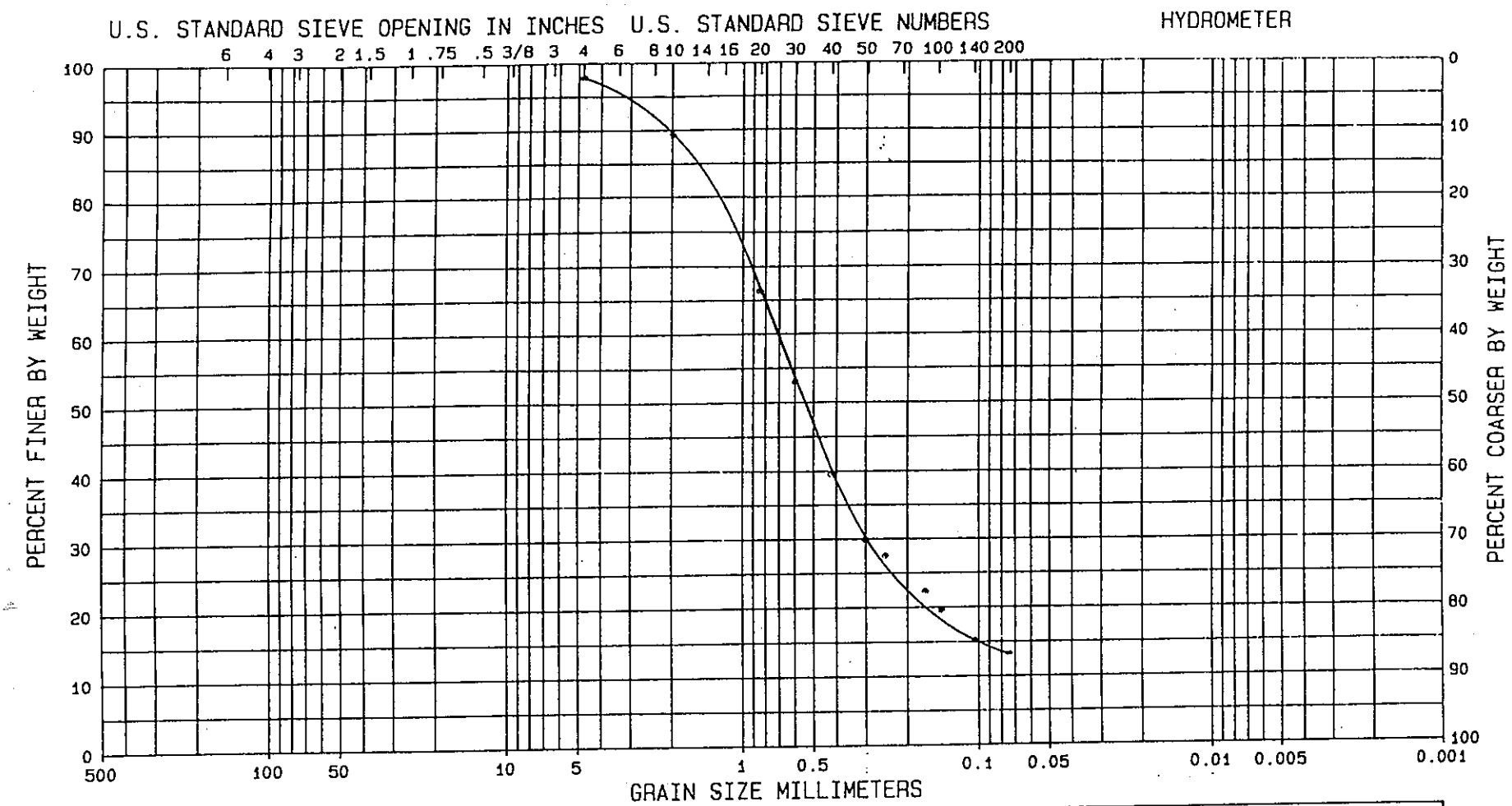

COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

SAMPLE NO.		CLASSIFICATION	NAT W%	LL	PL	PI
BW2-6GS						

GRADATION CURVES

Intracoastal Waterway
Broward County
E&A Project No. 00-1393

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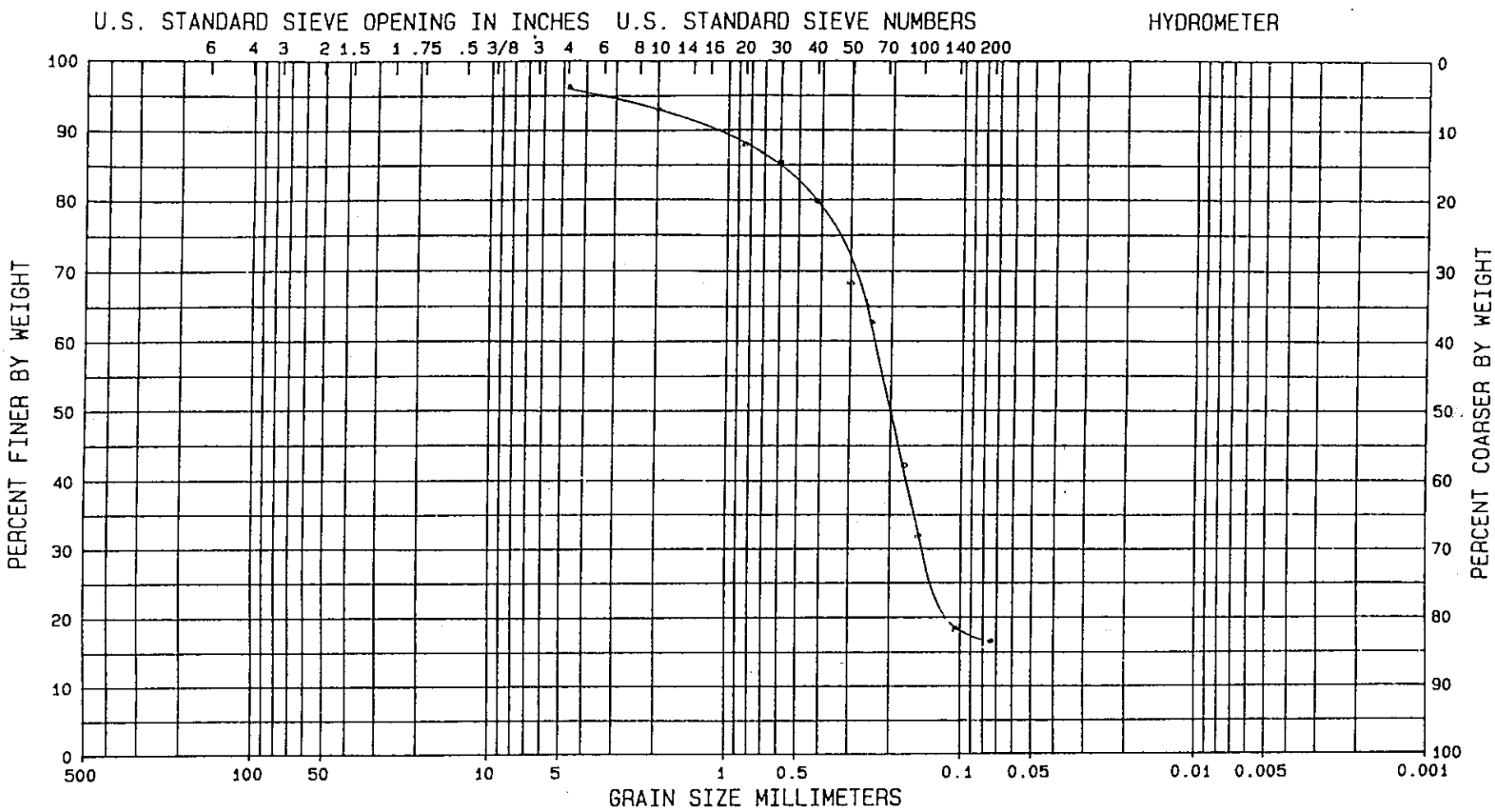

COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

SAMPLE NO.		CLASSIFICATION	NAT W%	LL	PL	PI
BW2-7GS						

GRADATION CURVES

Intracoastal Waterway
Broward County
E&A Project No. 00-1393

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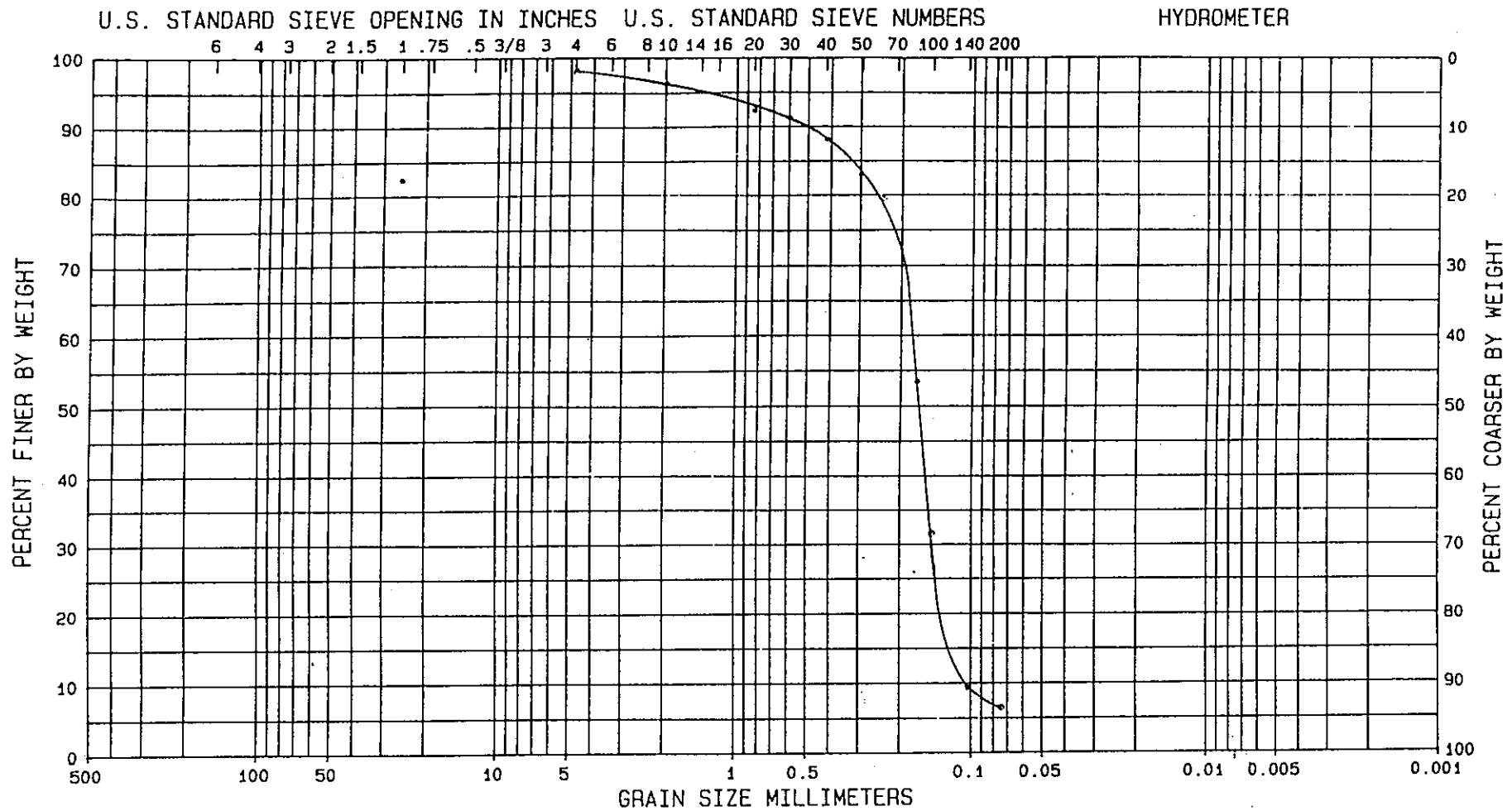

COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

SAMPLE NO.		CLASSIFICATION	NAT W%	LL	PL	PI
BW3-8GS						

GRADATION CURVES

Intracoastal Waterway
Broward County
E&A Project No. 00-1393

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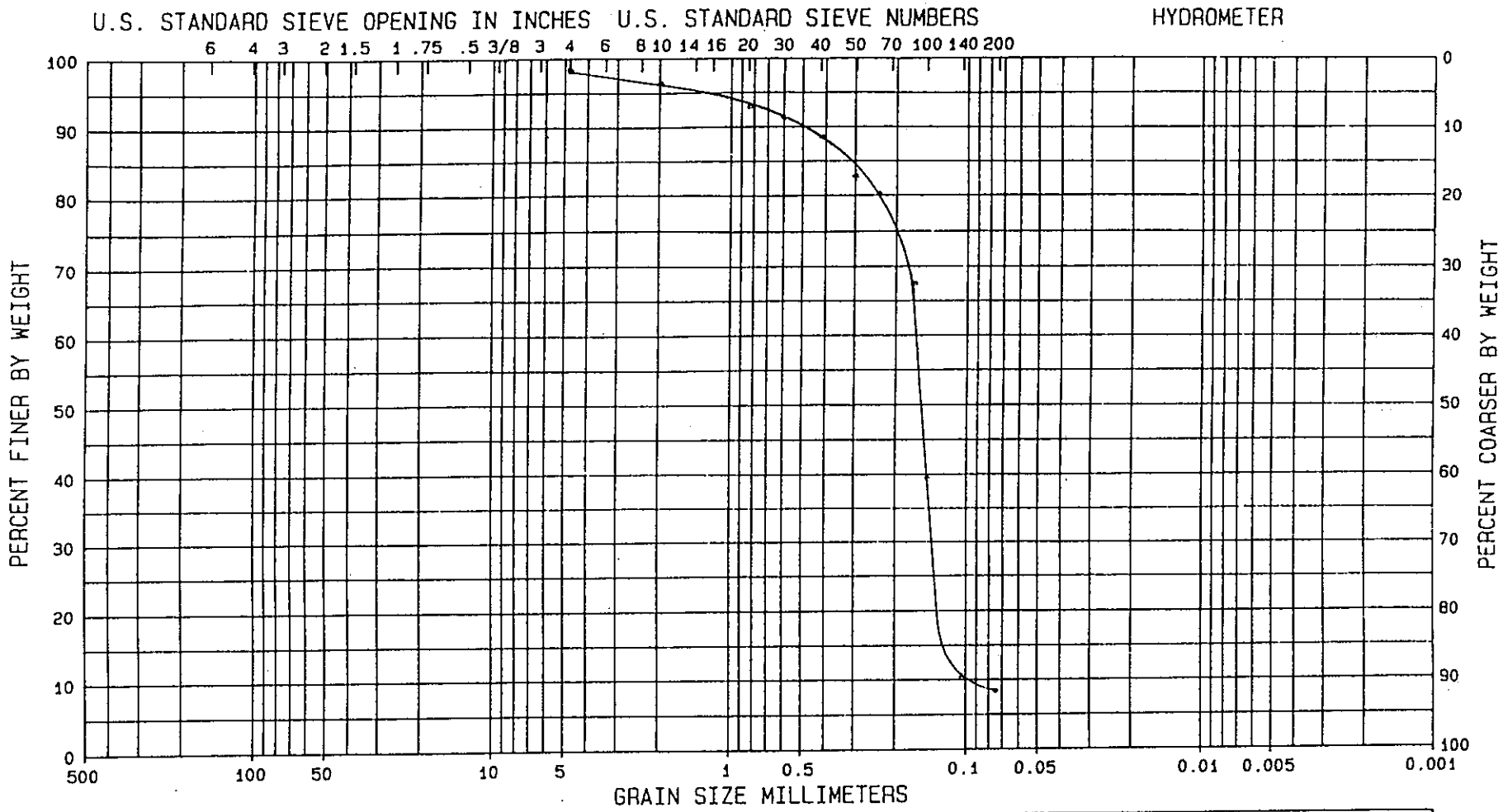


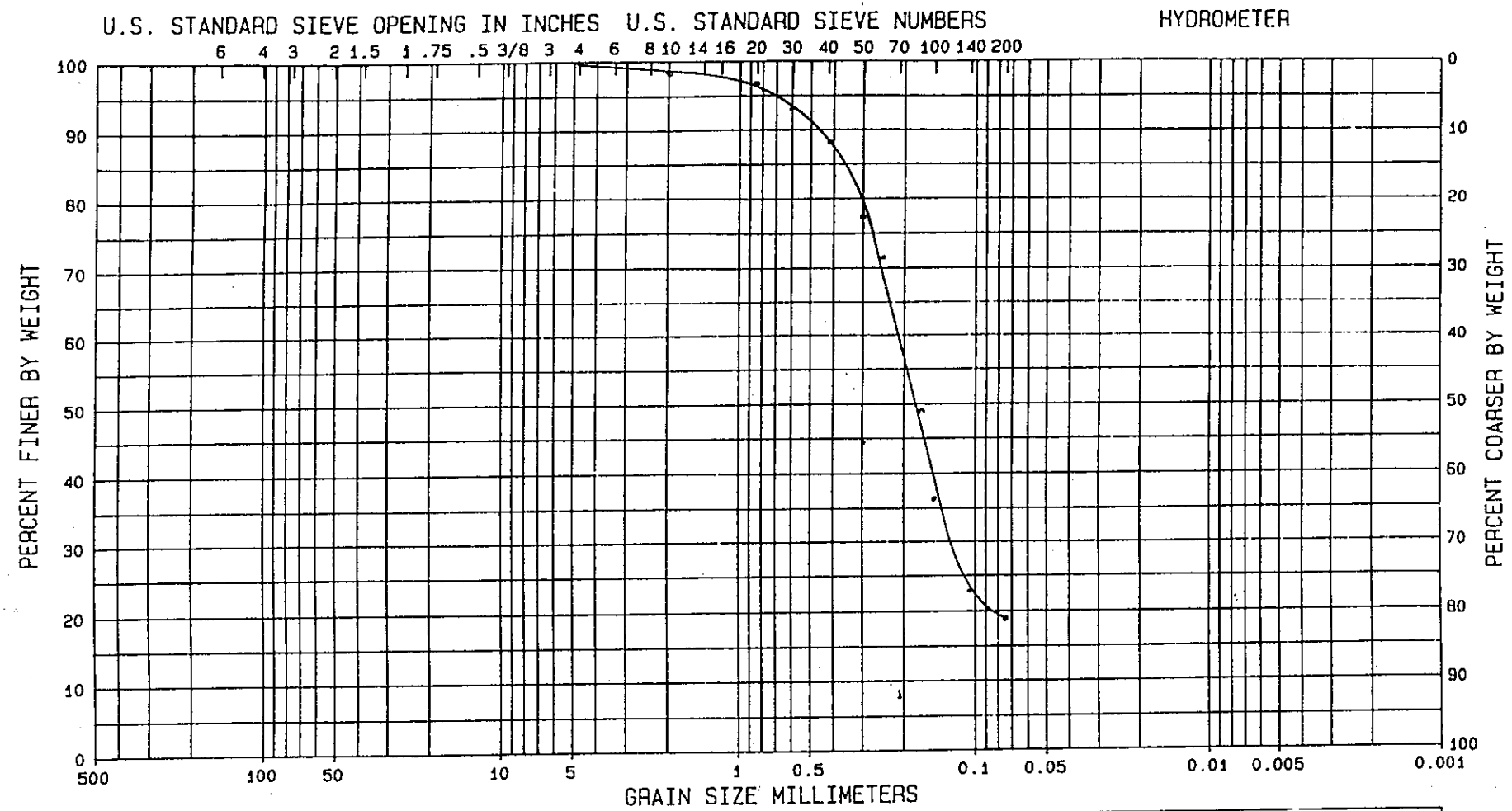
COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

SAMPLE NO.		CLASSIFICATION	NAT w%	LL	PL	PI
BW3-9GS						

GRADATION CURVES

Intracoastal Waterway
Broward County
E&A Project No. 00-1393

ELLIS & ASSOCIATES, INC.



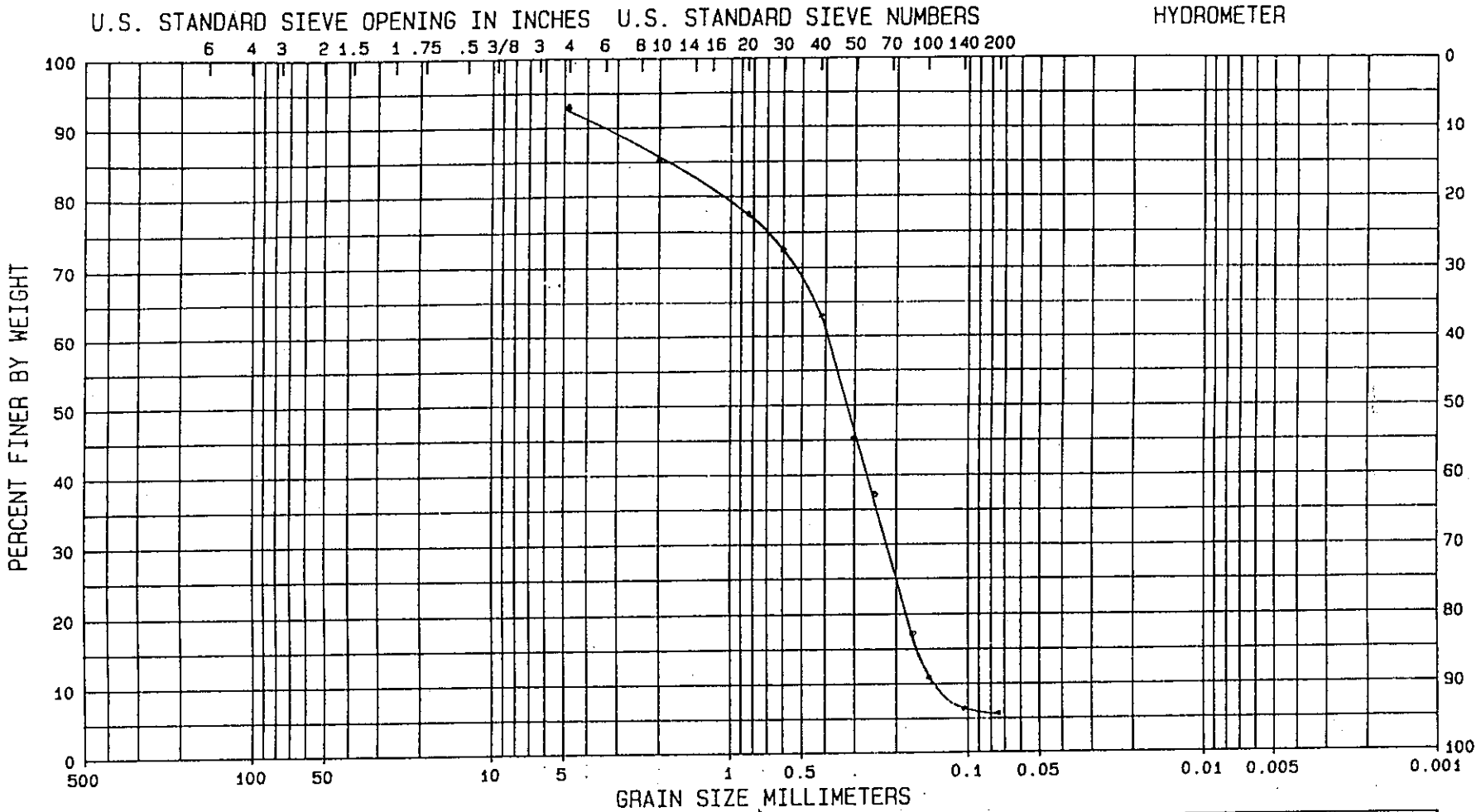
COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

SAMPLE NO.		CLASSIFICATION	NAT w%	LL	PL	PI
BW3-10GS						

GRADATION CURVES

Intracoastal Waterway
Broward County
E&A Project No. 00-1393

ELLIS & ASSOCIATES, INC.



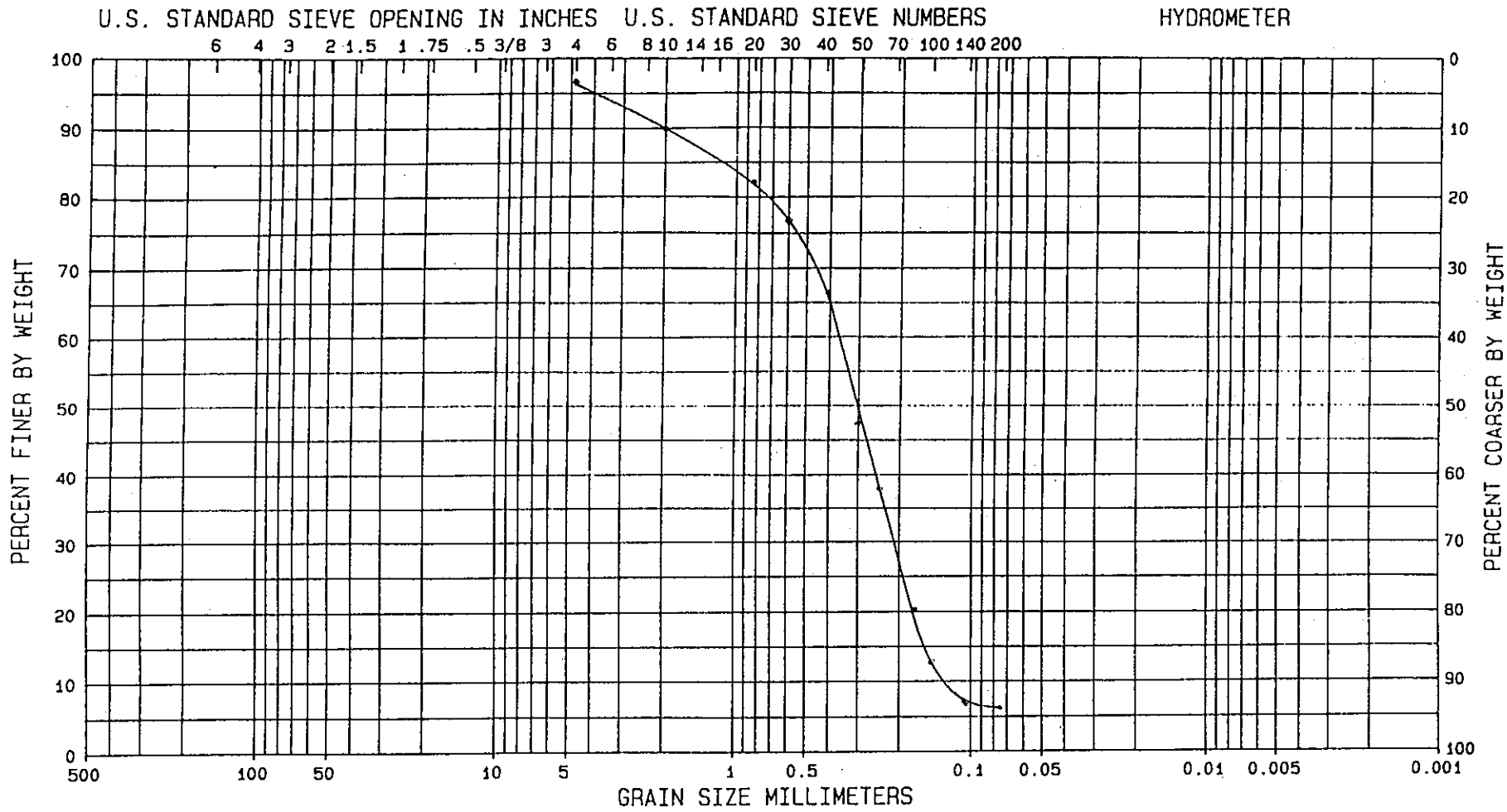
COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

SAMPLE NO.		CLASSIFICATION	NAT W%	LL	PL	PI
BW3-11GS						

GRADATION CURVES

Intracoastal Waterway
Broward County
E&A Project No. 00-1393

ELLIS & ASSOCIATES, INC.



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

SAMPLE NO.		CLASSIFICATION	NAT W%	LL	PL	PI
BW3-12GS						

GRADATION CURVES

Intracoastal Waterway
Broward County
E&A Project No. 00-1393

APPENDIX F

Citizen's Advisory Committee and Interested Party Mailing Lists

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September 24, 1999

TECHNICAL ADVISORY COMMITTEE (TAC)
Long Range Dredge Material Management Plan for the Atlantic Intracoastal Waterway in Florida
Broward and Miami-Dade Counties

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BROWARD COUNTY TAC 8-30-01
LONG RANGE DREDGED MATERIAL MANAGEMENT PLAN

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C1999-020 & -021	TAC Mtg Br + M-D	18 Jan 02

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No. 5505 Engineer's Computation Pad
ALVIN