

Engineering Report

**Stormwater Management Project
South Dade Landfill**

Prepared for

**The Metropolitan-Dade
Solid Waste Management**



August 1992

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August 21, 1992

Albert Egger, P.E.
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METRO-DADE
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Draft Engineering Report
South Dade Landfill Stormwater
Work Order No. 2E

Dear Mr. Egger:

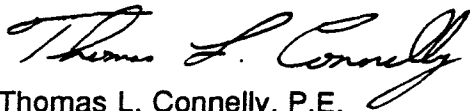
In conformance with Task A of the work plan for the design of the South Dade Landfill Mitigation Facilities and Stormwater Management System, we are submitting the draft Engineering Report. The draft document will be modified based on input received from your review of the document.

A major effort has been made to clarify the numerous permit conditions specified by the various regulatory agencies for this project. In addition, we have revised and restated many of the design standards which have been modified or evolved over the three-year period of regulatory review.

We look forward to meeting with you to resolve many potential issues so that detailed engineering can commence to complete this high priority project.

Very truly yours,

HAZEN AND SAYWER, P.C.



Thomas L. Connelly, P.E.
Principal Engineer

Hwd:4095L005

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Section 1 - Introduction

The Metro-Dade County Department of Solid Waste Management (DSWM) is responsible for providing solid waste disposal services for the entire County and its nearly two million residents. The Department directly manages one of the nation's largest integrated public solid waste disposal systems. Currently, the DSWM is developing a countywide solid waste masterplan which will address the short and long-term issues of solid waste minimization, recycling, processing and disposal.

The South Dade Landfill shown on Figure 1-1 is the only municipal Class I landfill operating in Dade County. In 1976, the need for a landfill in South Dade was identified. After siting studies were complete, the Board of County Commissioners authorized the acquisition of land for the South Dade Landfill. The first cell was constructed and placed into operation in 1978. The current status of the South Dade Landfill is as follows:

SOUTH DADE CLASS I SANITARY LANDFILL

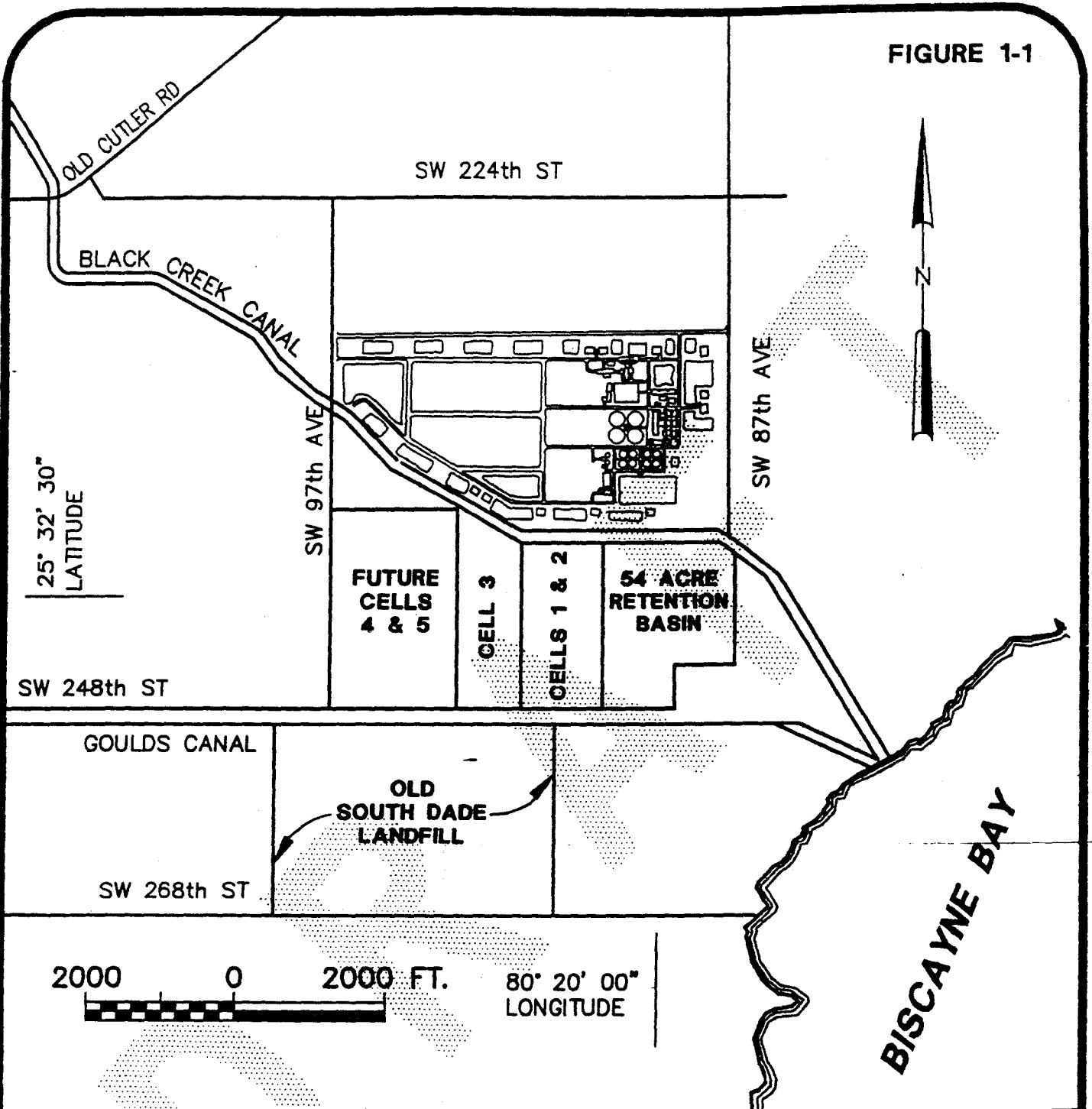
	<u>Acres</u>	<u>Description</u>
Cell No. 1	33	Filled to Capacity
Cell No. 2	33	Filled to Capacity
Cell No. 3	49	Active
Cell No. 4	50	Under Construction
Cell No. 5	<u>50</u>	Permitted
	215	

DSWM has developed programs and/or permitted the following closure activities at the South Dade Landfill:

- Stormwater Management Plan
- 54-Acre Retention Area and Mitigation Program
- Groundwater Remedial Program
- Landfill Gas Recovery System
- Final Capping
- Long-term Monitoring

Multiple permits have been obtained from federal, state, regional and local agencies. This report summarizes the implementation of the stormwater management plan, the development of the 54-acre retention area, assorted mitigation programs and identifies the permitting requirements for this complex project.

FIGURE 1-1



SOUTH DADE LANDFILL LOCATION PLAN

DATUM: NGVD 1929

SCALE: 1"=2000'

SOURCE: U.S.G.S. QUADRANGLE
PERRINE, FL.

IN: SOUTH DADE COUNTY, FL.

AT: COCONUT PALM DRIVE
AND BLACK CREEK CANAL



Section 2 - Project History

Early History

During the 50s, 60s and most of the 70s, Dade County disposed of solid waste by landfilling and incineration. During this period federal, state and local governments enacted laws and developed policies which began to affect the operation of these facilities. Existing landfills, essentially open dumps, had a high potential for polluting groundwater through uncontrolled leachate discharge and air pollution through fires which were common. Incinerators operated without air pollution control equipment and routinely exceeded particulate emission standards. Beginning in the early 1970s, Dade County embarked on a program to evaluate and subsequently to improve its solid waste disposal infrastructure.

1975 Comprehensive Development Master Plan

In 1975, Dade County adopted a new Comprehensive Development Master Plan (CDMP), which was two years in the making and included a 100-person Citizens' Advisory Task Force, which formulated the goals and policies of the CDMP. This document set very broad goals for solid waste disposal to address "major concerns" relating to "seepage of polluted water from dumps into the Biscayne Aquifer and the emission of air pollution to the air." In addition, specific criteria were established for "providing future solid waste disposal facilities, or when bringing existing facilities up to standard", as follows:

- The County should establish a refuse disposal system which maximizes resource recovery through the separation of recyclable materials, and the production of minimum amount of solid waste in the least obnoxious for possible.
- Where possible, resource recovery operations should attempt to use all materials not separated for recycling for the production of energy.
- All existing open dumps should be closed as health hazards and converted to usable land by providing the necessary fill and excavation.
- The use of incinerators should be minimized by insuring that the maximum amount of solid waste is recycled or converted into usable products.
- Permitted landfill operations should not interact with the water table, and daily coverage of the disposed waste with suitable landfill must be accomplished. Where pollution from landfills has been detected, shutdown of the facility should be expedited.

- Approval of any existing and all future landfill sites in Dade County should be based on scientific analysis which indicates that soils with adequate percolation rates are available and that interaction with the water table does not occur. Exceptions would be made where a landfill site is used only for nontoxic and non-obnoxious wastes.
- Landfill sites, if acceptable, should be located a minimum of one mile from residential neighborhoods if nonprocessed domestic waste is to be disposed of.
- Landfill sites where non-offensive processed solid wastes are to be disposed of should be buffered from residential neighborhoods by a minimum distance of 1,000 feet.
- Sanitary landfills should be provided at the rate of four acres per 10,000 population served where it has been determined that this is the best method of disposal.
- Incinerators should be located on a site of 10 to 20 acres that is accessible to the area it is designed to serve. Proper operation of existing incinerators is required to meet air pollution standards. Siting considerations should include noise impacts on adjoining areas.
- Where landfill and incinerator operations are the only means of disposal available, land for these facilities should be acquired at the time an area is opened for development, but proposals for individual projects are received so that these facilities can be properly located in relation to the development.
- All solid waste disposal facilities should be located away from residential uses. When properly operated, such facilities can be placed near industrial uses. The future use of landfills as parks and other recreation should be taken into consideration when choosing their location and timing the development surrounding them.

1977 South Dade County Solid Waste Study

In 1976, the Public Works Department determined an immediate need for a landfill that by the year 2000 would have to accommodate the 6,500,000 tons of waste to be generated in South Dade during the 24-year period. Recognizing the immediate need to provide landfill capacity for the South Dade area, the Public Works Department selected the firm of Greenleaf/Telesca to conduct a study of the types of landfill and landfill site required and the preferred location of such a new facility.

This study was authorized by the Dade County Board of County Commissioners, on May 4, 1976, through resolution #R499-76. The resolution "approved the contract with a consulting engineer for site analysis for the South Dade Solid Waste disposal project." The report examined the types of solid waste generated in the South Dade Service Area, projected the quantities of such waste anticipated through the year 2000, evaluated geophysical, environmental and economic factors, as well as growth trends and probable neighborhood impacts. The report specifically makes reference to the Federal Water Pollution Control Act Amendment of 1972, PL 92-500 which contained the latest revisions to the Rivers and Harbors Appropriation Act of 1899. These Acts form the basis for the current USCOE wetlands permitting. Due to the magnitude of this proposal and its potential impact on all systems, the project was presented to the Development Impact Committee (DIC). The Committee advertised and held a public hearing on January 13, 1977, and its report took into consideration comments from several other organizations which were invited to participate such as the Sierra Club, League of Women Voters, Tropical Audobon Society, University of Miami, United States National Park Service Biscayne Bay National Monument with input from the above groups as well as other concerned citizens, the DIC supported the consultants recommendation that the "Black Point" site was the most suitable for a new landfill.

Siting Process

The site selection process was divided into two phases. First Dade County was divided into three regions based on geophysical and demographic characteristics. Eight geophysical categories were used including topography, soil classification, groundwater, flood criteria, drainage, wellfields, environmental and transportation. When the regional demographics were added into the valuation, the eastern region surpassed both the central and western regions with positive aspects outweighing negatives as follows:

Positive factors:

- Saline aquifer underlies most of the area.
- No water supply wells in area.
- Soil impermeability prevents leachate percolation.
- Artesian water table prevents downward percolation.
- Well defined drainage network.
- Extensive undeveloped areas remote from present population are available.
- Abundant recreation and park areas are compatible with ultimate use of landfill and borrow pit lands.
- The borrow pit can be located as near to the landfill site as available land permits.
- Minimal public objection anticipated.

Negative factors:

- Portions of area subject to storm flooding.
- Special construction estimated at \$1.10 per ton of refuse. (Not including underdrains, leachate pumping, and leachate treatment).
- Highway network is of limited capacity.

With the eastern region selected as the primary siting area, three sites were evaluated in depth using environmental, economic, transportation routes, haul costs, ultimate use and neighborhood impacts. Of these sites, the "Black Point" site was evaluated as the best choice and was recommended by the consultant.

Based on the recommendation of the Development Impact Committee on February 15, 1977, the Board of County Commissioners approved resolution R-138-77 "authorizing the acquisition of approximately 323 acres of land; approving erection, construction and operation of the South Dade Solid Waste Disposal Center; and authorizing the County Manager to take further action."

Recent History

Figure 2-1 provides a general site plan for the development of the South Dade Landfill. Subsequently, landfill Cell No. 1 was designed, permitted and constructed with a natural marl liner. The 33-acre cell was placed into operation in 1978. A second cell of equal size was designed and constructed with an enhanced recompacted marl liner to meet the then current leachate requirements and was put into operation around 1981. Neither Cell 1 nor Cell 2 was permitted through the USCOE due to the current interpretation of wetlands jurisdiction by the Corps.

Similarly, Cell No. 3 was designed and permitted in 1986 using the current state-of-the-art flexible membrane liner. The 80 mil HDPE liner actually exceeded the requirements of the FAC 17.7, which called for only 60 mil liner. This cell went into operation in September, 1988, at which time Cells 1 and 2 stopped receiving waste and received an interim final cap.

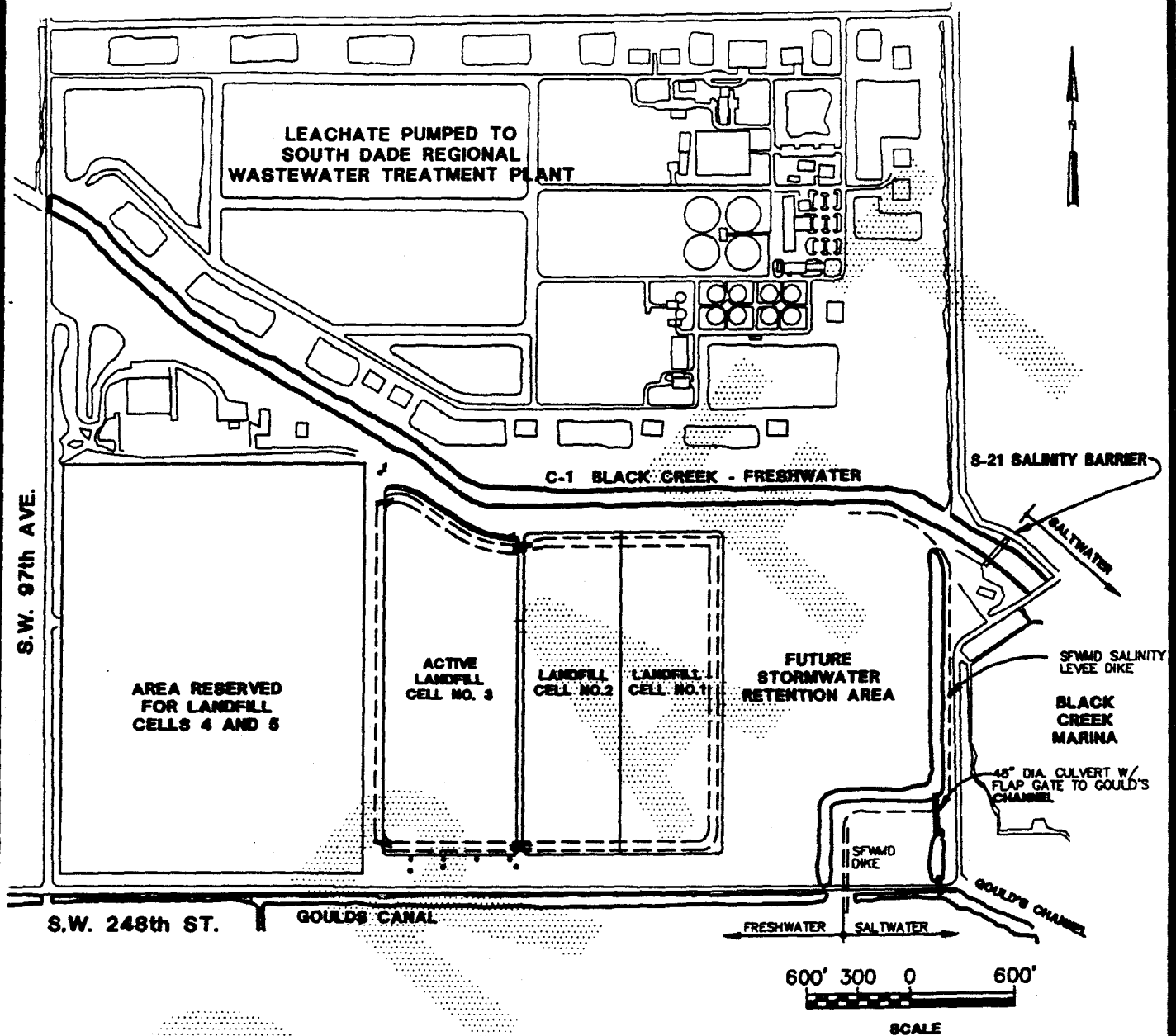
Design of Cell No. 4 commenced in March of 1990, so that additional landfill capacity would be available by the first quarter of 1992. Since FDER had already permitted both Cells 4 and 5, no particular permitting problems were anticipated. In May of 1990, the United States Department of the Army Corps of Engineers (USCOE) staff visited the site and determined that 91.5 acres would be considered wetlands. A 404(b) permit was required. This ruling by the USCOE apparently came from a February, 1990 Memorandum-of-Understanding between USCOE and the United States Environmental Protection Agency (USEPA) defining the method of wetland determination so that a more uniform national policy would result. Dade County submitted a 404(b) permit application for the construction of Cells 4 and 5 on 91.5 acres of wetlands. The USCOE

reviewed this request with the permit application for the closure of Cells No. 1, 2 and 3 and the use of the 54-acre wetland as stormwater retention basin. Other issues reviewed included the implementation of a groundwater remedial program.

On February 25, 1991, the USCOE held a Public Hearing in Dade County addressing the above issues. Written and verbal public comments and input were received by the USCOE. Dade County modified the mitigation plan in response to the United States Environmental Protection Agency requests and took steps to increase the level of QA/AC construction to provide reasonable assurance of minimizing "potential human error" during liner installation. The USCOE issued the Dredge and Fill permit for Cells 4 and 5 (Permit No. 90IPG-04061) on December 18, 1991. Cell 4 construction commenced in 1992 and the first sanitary subcell is projected to be on-line to accept solid waste by December 1992.

In March 1992, the USCOE issued the Dredge and Fill permit (Permit No. 90IPG-00189) to utilize the 54-acre wetland areas as part of the stormwater works required to expand and eventually close the South Dade landfill.

FIGURE 2-1



SOUTH DADE LANDFILL SITE PLAN

DATUM: NGVD 1929

IN: SOUTH DADE COUNTY, FL.

SOURCE: U.S.G.S. QUADRANGLE
PERRINE, FL.

AT: COCONUT PALM DRIVE
AND BLACK CREEK CANAL



Section 3 - Ongoing Site Activities

The stormwater management project is one of several projects which will be constructed to improve, upgrade and expand the South Dade Landfill. The plan was developed to address environmental concerns for surface and groundwater contamination, odor releases, wetland deterioration and future fill capacity. The improvement of the landfill will include the construction of the following additional projects:

Closure of Cells 1 and 2

Cells 1 and 2 have been filled to capacity. The area has been identified as sources of groundwater contamination and odor releases and the refuse has not received final cover as required by current state regulations. Closure of these two cells has been permitted by FDER (SF13-174281) and will include a project for final capping of the waste mound, installation of a landfill gas extraction system and construction of a groundwater extinction system. The final capping will reduce the infiltration of precipitation into the refuse which is being released as leachate into the groundwater table beneath the cells. The final capping will consist of placing a 40 mil PVC membrane over the top plateau of the fill area and the side slopes will be covered with a one-foot thick clay augmented limerock layer. Over the membrane or clay augmented layer an additional one-foot thick layer of soil suitable for maintaining vegetation will be placed and the entire area will be planted with grass. The capping will extend down the side slopes until it reaches and becomes the inside surface of the stormwater swale. The capping will limit the infiltration of precipitations and cause clean surface runoff to enter the stormwater collection system.

The landfill gas extraction system will capture gaseous emissions from the decomposing refuse within the landfill and prevent the spread of noxious odors to the adjacent residential communities. It consist of narrow diameter wells bored into the refuse which will be interconnected with header pipes to a compressor. The extracted gas will pass through the compressor to a flare unit for combustion of the flammable methane. The flare will destroy the noxious odors by incineration of the organic compounds. The compressor and flare unit will be located at the base of Cells 1 & 2 on the north side. The north stormwater swale cross sectional area and horizontal alignment will need to be adjusted so that both facilities will occupy the available area. Provisions will also be required to provide electrical service.

Along the entire length of existing berm adjacent to the east side of Cell 1, a groundwater extraction system will be constructed. The system is being constructed to collect ammonia contaminated groundwater which has been released as leachate from the bottoms of Cells 1 and 2. The system will collect leachate currently being released and draw back ammonia contamination which has extended to the east into the adjacent wetlands. Groundwater modeling

indicates that an extraction rate of 400 gpm will draw back ammonia contamination and not adversely affect the adjacent draining channels. The system will consist of an underground gravel channel surrounding a perforated pipe from which pumps will extract 400 gpm of ammonia contaminated water for transmission to a wastewater treatment plant for processing and disposal. The stormwater management system will use the same berm for the containment, filtration and overflow of stormwater from Cells 1 - 5 into the 54 acre wetland area. The stormwater facilities will be designed and constructed around the groundwater extraction system.

Cells 4 and 5 - Fill Operational Areas

Cells 4 and 5 are being progressively developed for future landfill disposal of solid waste. As each cell area is developed, a perimeter collection swale will be established by confining the swale between an interior landfill liner berm and an exterior berm. Stormwater run off will enter the swales from surface sheet flows and letdown culverts discharge from energy dissipators. Access to the disposal area will be provided over the swale by the construction of three culverts. The swale will eventually connect to the stormwater swales being developed for Cell #3. The Cell 4 area is being constructed with a composite liner system of 60 mil HDPE and eighteen inches of clay.

Waste Reduction Area Improvement

The 24 acre area on the northwest section of the site contains entrance and access roads, scale facility, shredder facility, equipment and truck maintenance shops and administrative offices. Comprehensive improvements to this area will include the expansion of surface runoff flows to a separate stormwater management system. There will be no connections between is stormwater system and the landfill's stormwater system to the landfill system.

Section 4 - Stormwater Design Criteria

Concept

The stormwater management plan for the South Dade Landfill was developed with and approved by South Florida Water Management District (SFWMD) and the Metropolitan Dade County Department of Environmental Resource Management (DERM). All "clean" stormwater runoff which does not come into contact with solid waste and flows over the capped landfill will be collected in the landfill perimeter swales. Collected stormwater will be normally conveyed to the 54-acre retention basin after passing through a filter berm "treatment" system. During intense storm events, excess runoff generated above a 1.72+ inch/day rainfall event will be discharged into the retention basin over a spillway structure.

Stormwater in the retention basin will percolate into the groundwater over time. No off-site discharges will be allowed. The South Dade Landfill is a 293-acre tract. The site acreage and land uses are tabulated below:

LAND USAGE SOUTH DADE SOLID WASTE FACILITY

<u>Description</u>	<u>Acres</u>	<u>Description</u>
Cell 1	33	Landfill cell filled to capacity
Cell 2	33	Landfill cell filled to capacity
Cell 3	<u>49</u>	Landfill cell currently active
	115	
Wetlands	<u>54</u>	Proposed stormwater retention area
SUBTOTAL	169	
Cell 4	50	Under Construction
Cell 5 - (Future)	50	Site Development Underway
Entrance/Shredder	<u>24</u>	Has a separate drainage plan
FACILITY SUBTOTAL	293	

Elements of the stormwater management plan for Cells 1 through 5 are summarized below:

- Clean stormwater runoff collected from Cells 1 through 5 will be collected in a landfill perimeter swale system. The perimeter swale system is sized to store more than 1.7 inches of runoff and allow solids to settle.

- Stored, clean stormwater (first 1.72+ inches) collected in the landfill perimeter swales will drain through a filter berm underdrain system into the adjacent 54-Acre wetland retention basin.
- Excess stormwater runoff collected (above first 1.72+ inches) in the perimeter swale system will flow over 500 linear feet of spillway into the 54-Acre wetland retention basin.
- All runoff from the 25-year – 3-day storm event from Cells 1 through 5 will be collected in the perimeter swale system and routed to the 54-acre wetland retention basin. The stored, clean runoff will percolate into the groundwater regime over time. No off-site discharge is anticipated for Cells 1 through 5.

The stormwater management plan for the entire South Dade Landfill will result in all of the clean stormwater runoff being contained on-site and diverted to the 54-Acre wetland basin. All contaminated stormwater runoff and leachate will be pumped to the South District Regional Wastewater Treatment Plant for treatment and disposal.

Stormwater Works

Stormwater works were sized to handle design storm events established by SFWMD and DERM to protect the integrity of the sanitary landfill and the environment. The Department of Solid Waste Management (DSWM) will be responsible to operate and maintain the stormwater system at the closed landfill. It is important to balance the initial capital cost of stormwater works against the long-term O&M cost associated with a functioning system. Failure of an element of the stormwater system can result in adverse impacts to the environment or adjacent property owners.

Design parameters of the key stormwater works are summarized in the following sections.

(A) 54-Acre Retention Basin

All runoff from the South Dade Landfill will be routed to the 54-acre retention basin. SFWMD has established permitting guidelines for the 54-acre retention basin. For their 3-day -- 25-year storm event, the perimeter dike around the 54-acre retention basin must conform to the following physical dimensions dictated by SFWMD:

Dike Width (top)	12 feet
Freeboard	3 feet

This is a very conservative design. The calculated depth of water in the retention basin due to the 3-day -- 25-year storm event is 5.40 feet. Existing groundwater varies from Elevation 1.8 to Elevation 2.0 feet. It was assumed that groundwater would be at water Elevation 2.0 feet. The perimeter dikes are designed as follows:

	<u>Elevation</u> <u>Feet</u>
Groundwater	2.0
High Water (3-day -- 25-year event)	7.4
Top of Dike	10.5

The perimeter dike height was compared against other storm events:

<u>Description</u>	<u>Water Depth</u> <u>Feet</u>	<u>Elevation</u> <u>Feet</u>	<u>Dike</u> <u>Freeboard</u> <u>Feet</u>
Top of Dike	---	10.5	---
SFWMD -- 3-day, 25-year storm	5.40	7.4	3.1
SFWMD -- 3-day, 100-year storm	7.10	9.1	1.4
25-year -- 1 day storm event (9.5 inches)	3.97	6.0	4.5

These calculations are based upon 100 percent runoff from the landfill being routed to the retention basin with no allowance for swale storage and evapotranspiration (ET) losses. These are extremely conservative assumptions and ensure an ample dike safety factor. A typical dike cross section is shown on Figure 4-1.

At a depth of about 23 to 28 feet, a thin (3-5 foot thick) semi-confining layer known as the Q4 Formation exist. Geraghty & Miller conducted pump test above and below this formation. The vertical permeability of the Q4 formation was calculated at about 4.5 gpd/S.F. Below this confining bed is the highly transmissive Fort Thompson (Biscayne Aquifer) Formation. Leakage or percolation rate from the 54-acre retention basin is controlled by rate of leakage through the Q4 Formation. An areawide groundwater model was run to illustrate how fast the impounded stormwater would percolate into the groundwater regime under the 54-acre retention basin after the SFWMD 3-day -- 25-

year storm event. This is graphically shown on Figure 4-2. Water levels would drop as illustrated below:

Retention Basin Water Depths versus Time

	<u>Time</u> <u>days</u>	<u>Water Depth</u> <u>feet</u>
25-Year -- 3-Day	0	5.4
SFWMD Storm Event	5	2.0
	8	1.0
	10	0.7
	15	0.4
	20	0.0

Water depth in the basin should be less than one-foot eight to ten days after the storm event. This storm event is expected to occur once every 25 years. The actual volume of runoff should be less when taking into account perimeter dike swale storage and ET losses.

Concern has been expressed about the impact of high water levels on certain species of vegetation (White Mangroves) in the 54-acre retention basin. An internal surface water management plan has been developed and approved for 54-acre retention basin. The details are described in the next section of this report.

(B) Stormwater Energy Dissipation Structures

Stormwater runoff from the closed landfill will flow into the perimeter swales via two mechanisms:

- Surface sheet flow down the landfill sideslopes into the perimeter swales.
- Through 18-inch diameter pipes transporting collected rainwater from the top of the landfill and discharging flow into an energy dissipator structure located in the bottom swale.

Currently, energy dissipator structures are being installed in the Cell 3 swales. This type of structure is known as an impact type of energy dissipator is shown on Figure 4-3. Dissipation is accomplished by the impact of the incoming water jet on a vertical hanging baffle, and by eddies which are formed from the changed direction of the jet after it strikes the baffle. A general location plan of eight (8) energy dissipators is shown on Figure 4-4.

The top of the landfill is at EL. 150 ft. It is possible that any one of the 8 downspout pipes could be completely full of stormwater during a major rainfall event. This could occur due to a number of site conditions; drainage areas topography modified increasing the amount of runoff to one structure, debris lodging in the 18-inch diameter pipe and breaking loose with the pipe full of stormwater, etc. The design thrust on the impact

energy dissipator with a full pipe of stormwater (head varies from 140 to 150 feet) is about 20,000 lbs. (10 tons +). The structure must have enough bearing surface to handle this thrust load. In addition, at Cells 1 and 2 where the structure will be installed in solid waste, the design must take into account a potential shear failure through the solid waste.

Thrust forces on piping bends entering the dissipator structure must also be evaluated. For example, thrust forces on a 22½ degree bend, 18-inch diameter pipe is about 6,000+ pounds. Typical piping details are shown on Figure 4-3.

(C) Perimeter Swales

Around the landfill, a perimeter swale will be installed to capture stormwater runoff. During rainfall events exceeding 1.7 inches/day, stormwater will be routed to the outlet spillway for discharge into the retention basin. The location and height of the perimeter dikes are sized to meet the following conditions:

- Volume to hold runoff from a 1.7 inch/day rainfall event.
- Ample swale cross section area to transport flows generated from SFWMD design storms. Backwater curves were for each storm event to provide a conservative dike freeboard to ensure dike integrity under all conditions.

Revised backwater curves and calculation presented in Appendix A reflect the deletion of two major culverts in the current construction contract. The outlet works for the perimeter swale system consist of two 250 L.F.-long spillways with a control elevation of EL. 10.50 feet. Storm events used to size the perimeter dikes are summarized below:

<u>Description</u>	<u>3-Day, 25-Year Storm Event</u>	<u>3-Day, 100-Year Storm Event</u>
Peak Flows (cfs)		
- North Swale	428	560
- South Swale	516	680
High Water Level (ft.)	14.6	15.0
Total Discharge (mg)	75	100

Swale construction is underway for Cell 3 to meet these conditions. The location and cross section of the perimeter dikes have been developed and are shown in the SFWMD permit drawings. The typical dike freeboard for the perimeter swales varies from 2.4 to 3.0 feet during a 3-day, 25-year storm event.

Typical perimeter swale side slopes are 3 to 1. This is a flat enough grade to plant grasses and other vegetation to protect against scouring from runoff and from channel flows. In order to reduce channel flow velocity and provide storage volume to capture the first 1.72 inches of runoff the perimeter swale dike sideslopes have been reduced to between 2.5 to 1 and 2.0 to 1 along critical sections. These steep slopes will be protected with erosion control systems which will allow vegetation to grow and stabilize the banks to more extensive riprap protection. Each dike section will be evaluated to ascertain the suitable erosion control system to ensure dike integrity.

(D) Filter Berm Bleed Down System

The first 1.72 inches of runoff will be collected and retained in the perimeter swale system. A filter berm bleed down system will be located within the dike separating Cell 1 and the 54-acre retention basin. Stored runoff within the perimeter swale system will percolate through the filter berm bleed down system and discharge into the wetland. It is anticipated that the first 1.72 inches of runoff can be discharged over 25 hours.

The filter berm bleed down system consists of the following elements shown in Figures 4-3 and 4-4:

- Approximately 950 L.F. of gravel filter berm to remove solids in the stormwater.
- A 24-inch diameter perforated pipe in the filter berm to collect stormwater.
- Four 24-inch diameter discharge lines to be Area 1 wetlands (see Figure 4-4)). The original design called for 12-inch diameter discharge lines at 100 feet centers. Due to the modified stormwater plan to route fresh water within the 54-acre wetland from Area 1 to Area 2 and ultimately Area 3, only four 24-inch diameter discharge lines are proposed to Area 1.

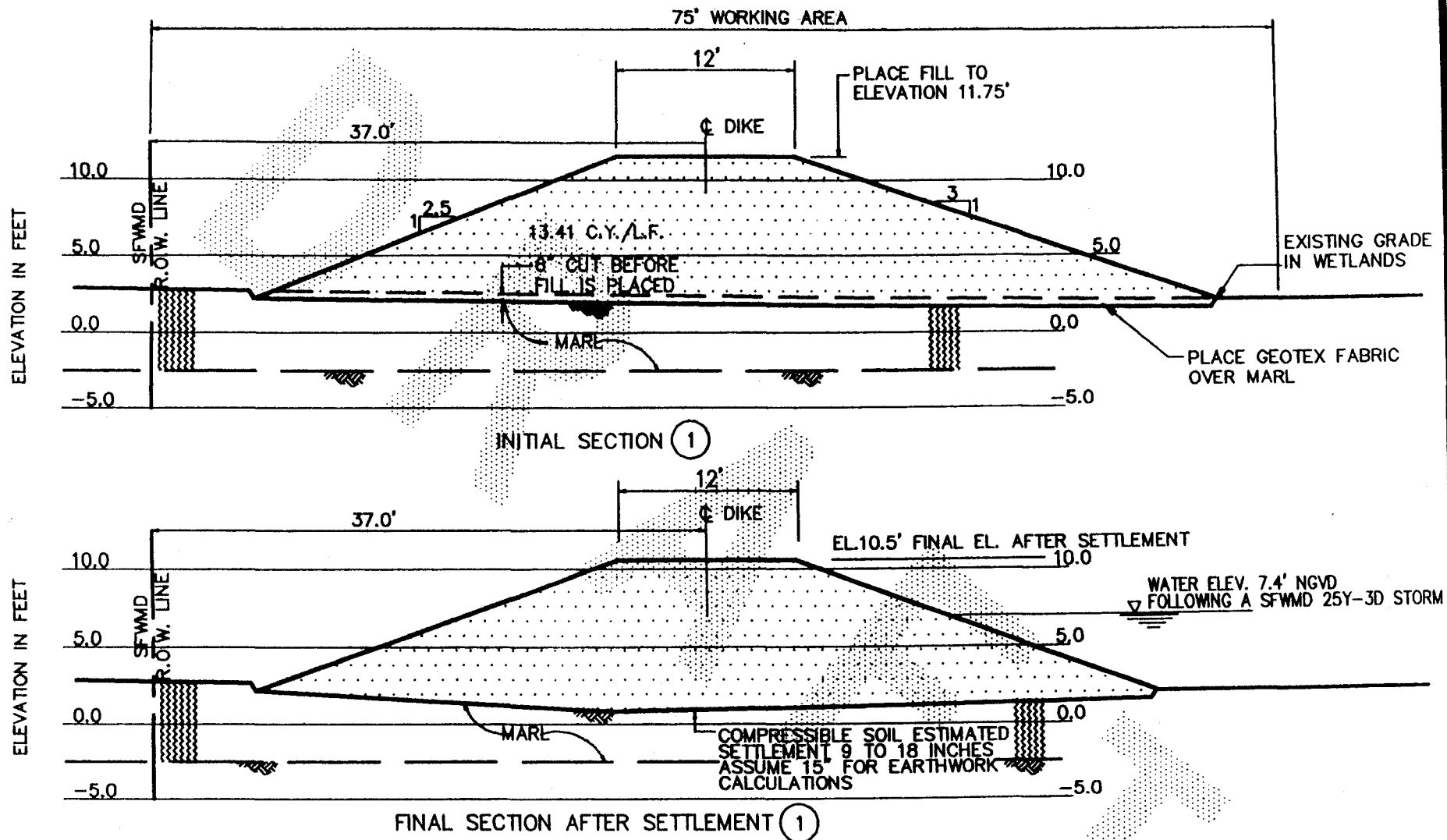
Potential pipeline conflicts identified with the groundwater interceptor project currently being designed by DSWM will be resolved in the future.

(E) Spillway Structure

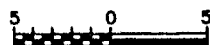
Two separate 250-linear foot spillways structures are provided to transport excess flows (over 1.72-inch day storm event)] to Area I. Site conditions and restraints influence the selection of location, type and components of the proposed spillway. The nominal crest elevation of the dike between Cell 1 and the 54-acre wetland is EL. 11.50 feet. The spillway control elevation is EL. 10.50 feet. During an intense storm event, runoff will flow into and fill the landfill perimeter swales. When water elevation rises to EL. 10.50 feet excess flow will commence to discharge over the 500 linear foot spillway into the wetlands. The major disadvantage will be that DSWM field staff will not have access across the spillway dike.

The spillway structure cross section is shown on Figure 4-5. The top of the roadway will act as a control weir and will be constructed of reinforced concrete. Several types of construction techniques are considered for the chute or discharge side slopes. These are concrete placed in an "Armorform", gunite placed over mesh reinforcement or a thin reinforced slab. At the bottom of the spillway water will discharge into a energy dissipator stilling basin structure. Concrete baffles will be installed in the stilling basin section to reduce the discharge velocity prior to flowing into the wetlands.

DRAFT



NOTE:
DIKE DESIGN MEETS SFWMD MAJOR
IMPOUNDMENT CRITERIA.

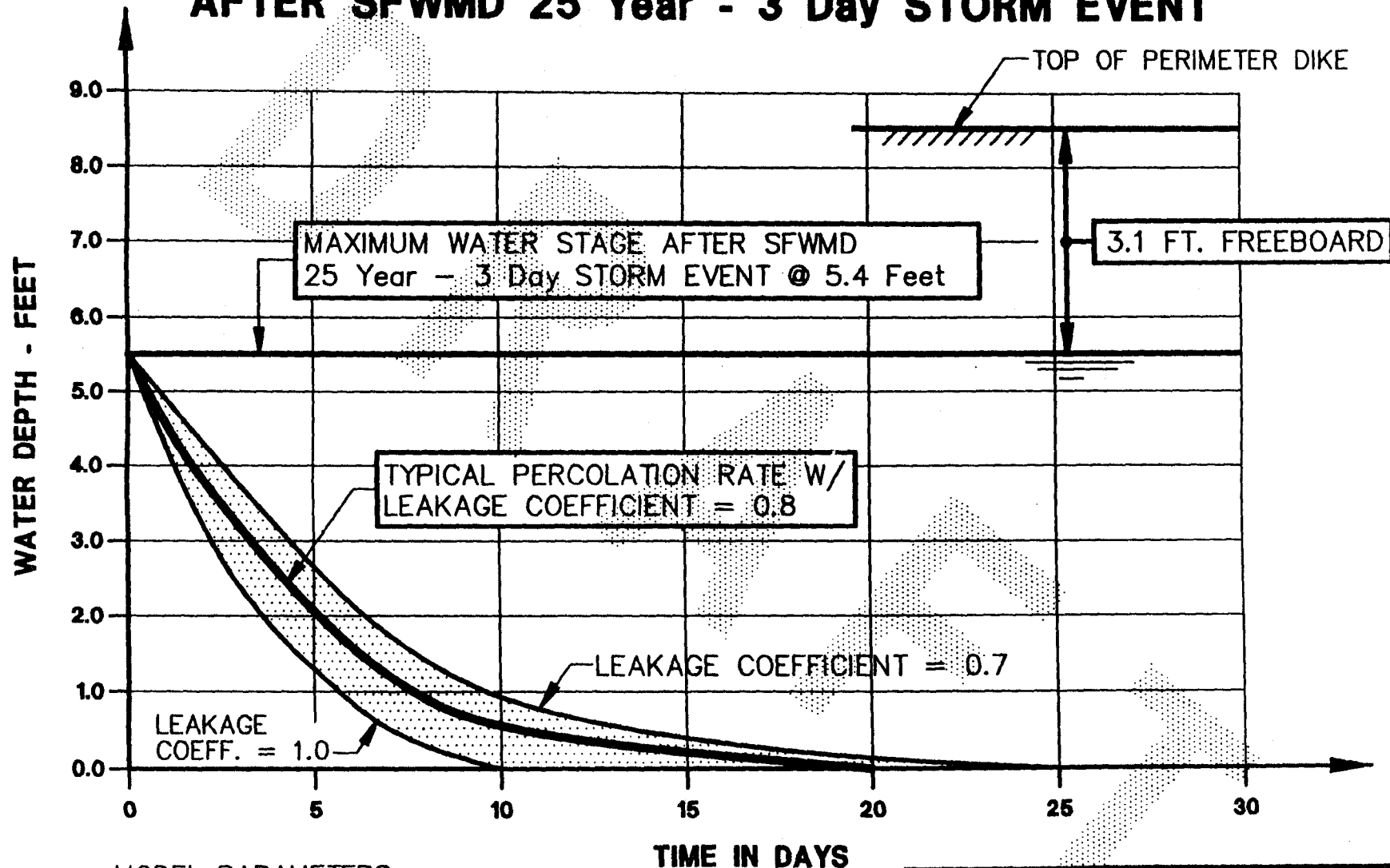


SOUTH DADE LANDFILL

**TYPICAL WETLAND
RETENTION BASIN DIKE**

FIGURE 4-1

RETENTION BASIN WATER DEPTH VERSUS TIME AFTER SFWMD 25 Year - 3 Day STORM EVENT



MODEL PARAMETERS

$K = 500 \text{ GPD/ft}^2$ (SHALLOW AQUIFER)
 Q_4 CONFINING DEPTH = 23 FEET
 Q_4 CONFINING PERMEABILITY $K = 4.5 \text{ GPD/ft}^2$
 LEAKAGE COEFFICIENT = K/Q_4 THICKNESS (FT.)

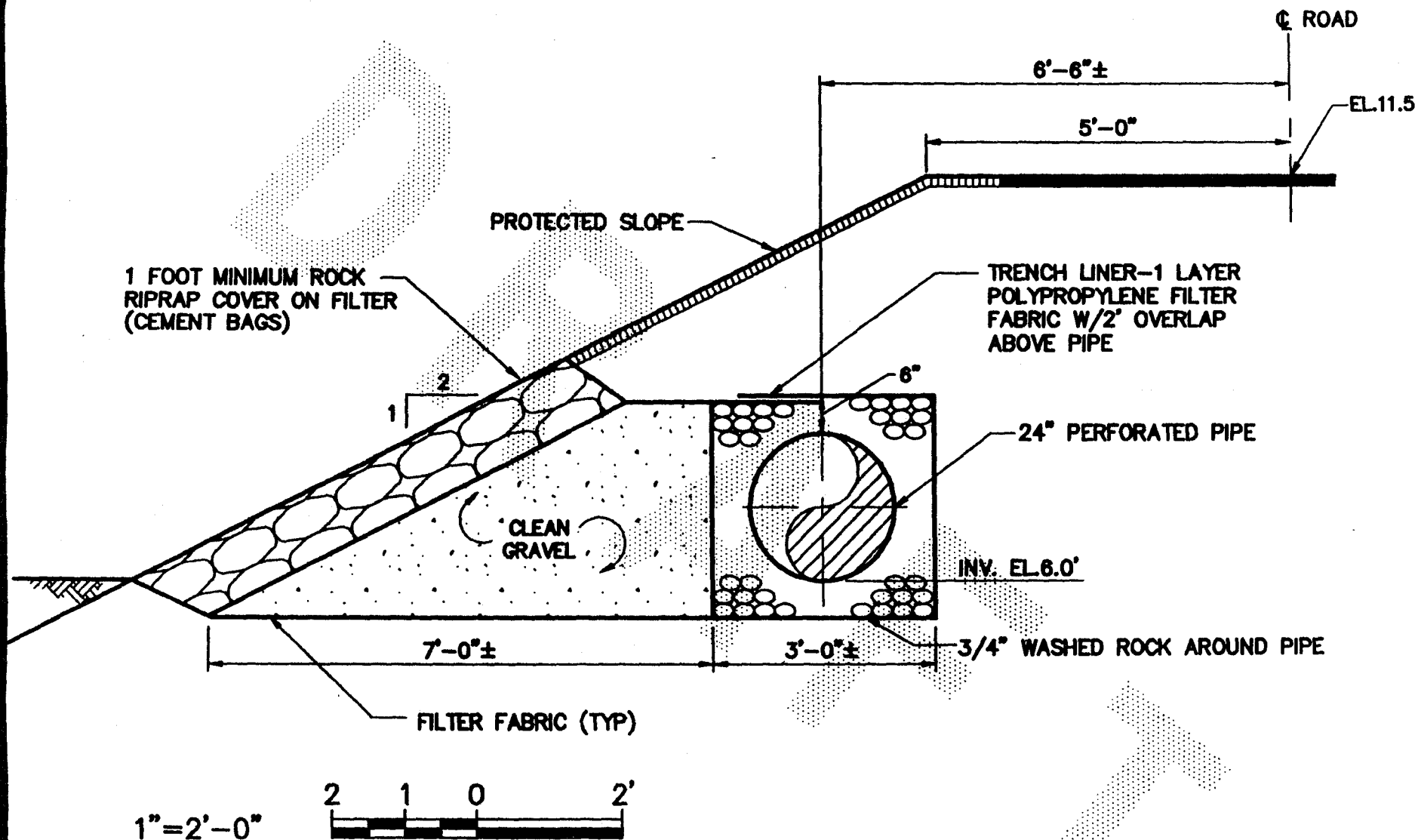
SOUTH DADE LANDFILL

GROUNDWATER PERCOLATION RATE
STORMWATER RETENTION BASIN

FIGURE 4-2

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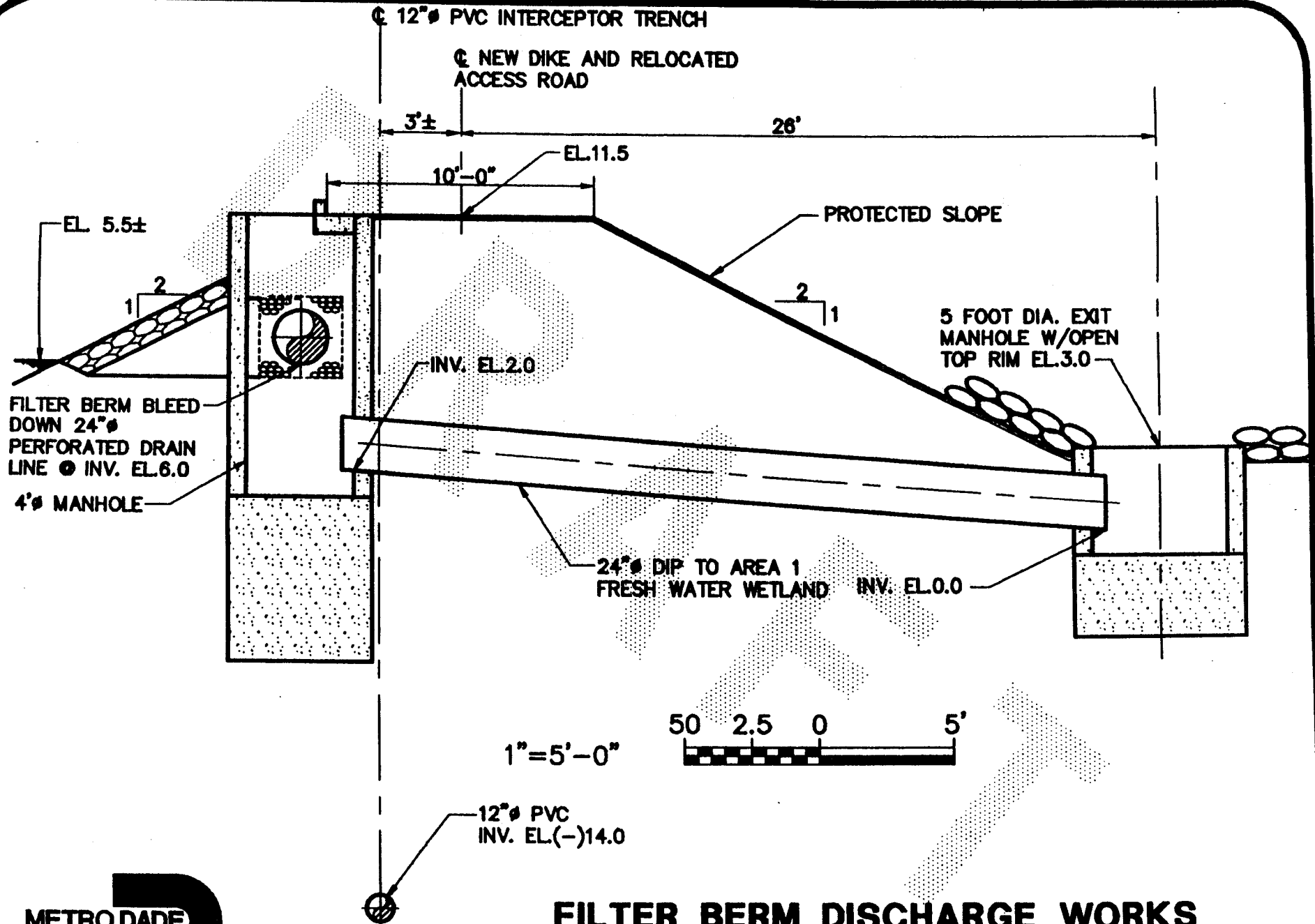


FILTER BERM BLEED DOWN DETAIL

FIGURE 4-3

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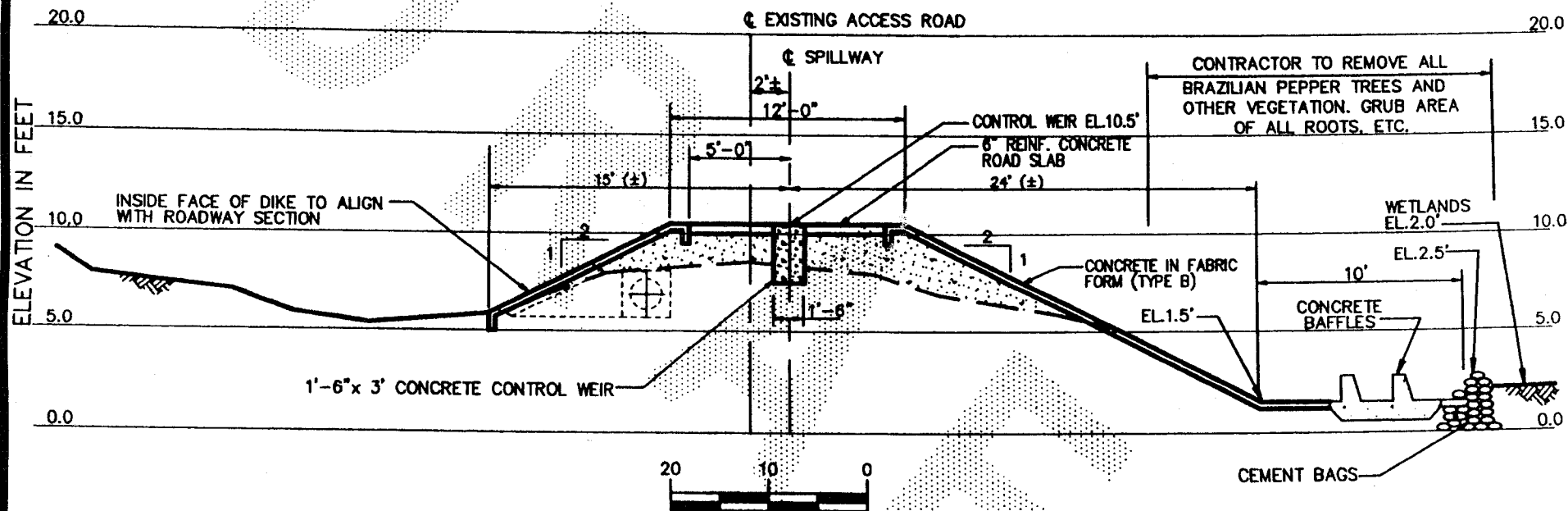
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FILTER BERM DISCHARGE WORKS

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SOUTH DADE LANDFILL

**TYPICAL SPILLWAY
CROSS SECTION**

FIGURE 4-5

Section 5 - Mitigation Plan

Existing Conditions

The 54-acre area located east of Cell 1 is an impacted wetland. Clean stormwater runoff from Cells 1 through 5 of the South Dade Landfill will be routed to the 54-acre wetland. Hydraulic calculations have confirmed water levels in the 54-acre wetland during peak storm events and the expected rate of percolation of stored stormwater into the groundwater regime.

The existing vegetation in the 54-acre retention basin has been identified as follows:

<u>Plant Species</u>	<u>Acreage</u>
Brazilian Pepper (Northwest)	5.0
Mangrove, Brazilian Pepper, Australian Pine	3.9
Mangrove, Sawgrass, Australian Pine, Buttonwood	7.3
Mangrove, Leather Fern, Sawgrass	7.9
Mangrove	1.1
Mangrove, Leather Fern	18.2
Brazilian Pepper (Southwest)	5.2
Australian Pine	5.3
Brazilian Pepper (Fringe - West)	0.8
TOTAL ACRES	54.7

The overall mitigation plan is to eliminate exotic vegetation. The protection of the white mangrove stand (18 acres +) adjacent to Cell No 1 was deemed a high priority by DERM, DSWM and the consultants. Extended exposure to deep impounded water will adversely impact white mangroves.

Water Level Management

Three (3) test years were selected to evaluate the runoff impact on the wetlands. The rainfall in these years are as follows:

<u>Year</u>	<u>Description</u>	<u>Annual Precipitation Inches</u>
1975	Dry	44.6
1981	Typical	58.8
1969	Wet	76.4

Computer runs were conducted on a daily basis to calculate the quantity of stormwater reaching the 54-acre retention basin, the depth of impounded water in the retention basin and the rate of percolation. DERM staff was interested in what the impact of introducing freshwater into the wetland basin was during wet months or a wet season. Figure 5-1 illustrates the impounded water levels due to stormwater introduced during the 1969 wet season (annual precipitation of 76.38 inches) into the wetland retention basin **without interior berms**.

On certain months, water depths ranged between 0.5 and 1.0 feet for extended periods of time. These water depths may cause adverse impacts on white mangroves.

After reviewing these results it was agreed by DERM, DSWM and the consultants that the 54-Acre wetland should be divided into a series of holding areas (see Figure 5-2). Runoff would first be routed to Area I. When water levels exceeded 2-foot depth (control weir) in Area I then it would overflow into Area II. A one-foot control weir would be placed between Area II and III. The first two holding areas would impound water, minimizing the volume of water routed to Area III, and minimizing the water levels in Area III where the white mangroves are located. Pertinent information on these areas is as follows:

<u>Designation</u>	<u>Area Acres</u>	<u>Control Weir Height</u>	<u>Detention Volume AC-FT</u>	<u>Interior Berm Height</u>
Area I	8.8	2.0 foot	17.6	3.0 foot
Area II	20.1	1.0 foot	20.1	2.5 foot
Area III	20.3	---	20.3	---

The impact on water levels for Areas I, II, and III are shown on Figures 5-3, 5-4, and 5-5. It is apparent that under normal rainfall conditions, runoff is stored in Area I and excess water is diverted into Area II some of the time. Only when a major storm event occurs does stormwater overflow into Area III. For example, in August 1981, after almost 12 inches of precipitation occurred over a 3-day period did the entire 54-acre basin flood to a depth of 1.76 feet. On September 28, 1981, approximately 4 inches of rain fell on a single day. Area I flooded (2.0 feet) and Area II water depth was calculated at about 0.5 feet. Area III had only the 4 inches of rainfall. On October 31, 1969, a 5.7-inch storm occurred. Area I flooded to 2 feet of water while Area II had a depth of 0.91 feet. No overflow occurred into Area III.

This overall concept of three drainage areas will control water levels in Area III and help the white mangrove to survive. It is planned to install fixed weir structures between each interior drainage area. In addition, hydraulic structures with removable stop logs between all drainage areas will be installed. This will provide full management

flexibility to re-route water between the drainage areas to optimize vegetation natural conditions during drought and wet weather periods.

Saltwater Inflow Structure

A new saltwater inflow structure will replace the existing 48-inch diameter flap valve/connection located between the Gould's Canal and the 54-Acre wetland basin. The purpose of this new facility is to allow saltwater to enter the wetland at high tide through an adjustable weir. Key features of the facility are as follows:

Inflow

A 48-inch ductile iron pipeline will be installed between the saltwater end of the Gould's Canal and the 54-Acre retention basin. A check valve will allow only saltwater to enter the 54-Acre basin. An adjustable weir will be set to operate between EL. 1.5 to EL. 3.0 feet. At high tide, saltwater levels ranges from W. EL. 2.0 to 2.5 feet (to be confirmed). In the event water levels in the 54-Acre wetland are lower than the high tide water level and the weir setting, then salt water can enter the 54-Acre wetland at high tide. During the dry season this will be a valuable management tool to allow controlled volumes of saltwater to enter and recharge the wetland. The check valve will not allow discharges from the 54-Acre wetland through the 48-inch diameter line into the Gould's canal.

Emergency Overflow Line

A 24-inch diameter overflow line set at weir EL. 9.2 feet is shown for emergency discharges from the 54-Acre wetland. The 100-year--3-day storm event will fill the basin with water to a height of W. EL. 9.0 feet. In the event sequential rain events occurred raising the water level above EL. 9.2 ft., then the 24-inch diameter line would act as an emergency discharge. The dikes are built up to EL. 10.5 feet.

Future Outflow Line

A blind flange will be installed on the 24-inch diameter overflow line. In the future, if approval is obtained from the various concerned agencies, then an adjustable weir structure (EL. 5.0 to EL. 9.0 feet) can be installed to allow discharges from the retention basin during periods of extreme rainfall.

Environmental Benefits

The mitigation plan will provide the following environmental benefits:

A. Eradication of Non-Native Plant Species

Portions of the existing wetlands within the proposed 54-acre wetland retention area are highly impacted by two major exotic species, Australian pine (*Casuarina equisetifolia*) and Brazilian pepper (*Schinus terebinthifolius*). The introduction of these exotics to South Florida has resulted in an epidemic of these species. Exotic vegetation infestation has literally changed the landscape of the area. Monocultures of Australian pine and Brazilian pepper have dominated native vegetation, such as white mangroves, red mangroves, sawgrass, and buttonwood, changing the community structure of plant and animal species previously associated with native communities and ecosystems. This dominance of exotic species has resulted in lower wildlife values for the mitigation area.

Exotic species will be cut and stumped. The stumps will be treated with Garlon 3A or another EPA approved herbicide. The exotic plant debris will only be removed from the areas being planted in freshwater marsh. The exotic debris in all other areas will be allowed to decay in place. All of the areas will be monitored for exotic species regrowth and re-treated as required.

A return to native plant communities will result in an increase in plant and animal diversity and species richness.

B. Creation of Freshwater Marsh and Open Water Habitat

The creation of freshwater marsh and open water habitat in Area 1 will increase species diversity. The removal of exotics and the planting of freshwater marsh species will provide an important open canopy and a freshwater source for species such as herons, ibises, egrets, storks, gallinules, and other wading birds. The created open water area will provide feeding, breeding, and nursery habitat for cormorants, marsh ducks, coots, and various diving ducks. Open marsh areas will also provide habitat for kites, hawks, eagles, owls, and other birds of prey. Open water areas with permanent water will ensure a productive fishery of mosquitofish and other small fishes which are utilized by birds, reptiles, and mammals. The presence of a fishery is also important for the control of mosquitos and other aquatic insects.

C. Mangrove Swamp Restoration

Area 2 will be restored as a white and red mangrove swamp. The exotic species in Area 2 will be cut and stumped and treated with Garlon 3A or another EPA approved herbicide. The dead exotic species will be removed where possible or remain where they fall to decay and decompose.

Red mangroves and *spartina* (cordgrass) will be planted in Area 2 after exotic plant eradication. Red mangroves will be planted in various areas to provide a future seed source. Cordgrass will be planted adjacent to the hammock areas to stabilize the slopes. Existing berms removed in Area 3 will be planted with white mangroves and cordgrass and added to the white mangrove preserve area.

The mangrove swamps restored to their native condition will provide a natural environment for species associated with such systems (crabs, wading birds, fishes, etc.).

D. Tropical Hammocks

The proposed project will create tropical hammocks within the 54-acre retention area. Over the years, tropical hammocks have become rare along the coast of Dade County. According to the Soil Conservation Service (SCS), tropical hammock communities are probably the most endangered ecological type in Florida. Such endangerment lies in the fact that the communities are not wide spread in occurrence and have received considerable pressures for other land uses. This project will re-create a tropical hammock modeled after hammocks located near Card Sound and North Key Largo. The creation of hammocks will provide native habitat for many species, such as: gray squirrel, cotton mouse, wood rat, mangrove fox squirrel, swallow-tailed kite, gray kingbird, red-bellied woodpecker, green anole, and liguus wood snail.

The establishment of a tropical hammock will also help prevent the re-invasion of exotic species.

Summary of Proposed Mitigation

The existing 54-Acre site is currently vegetated by the following communities:

	<u>Area Acres</u>
Brazilian Pepper	11.0
Australian Pine	5.3
White Mangroves	19.3
Mangrove and Exotic Mix	11.2
Mangrove and Sawgrass Mix	<u>7.9</u>
TOTAL	54.7

After the mitigation is completed it is anticipated that the 54-Acre site will be vegetated by the following native communities:

	<u>Area Acres</u>
Freshwater Marsh	8.0
White Mangroves	20.0
Mixed Mangroves	19.0
Tropical Hammock	4.7
External Berm	<u>3.2</u>
TOTAL	54.7

A comparison of the two scenarios (pre and post) clearly exhibits the environmental benefits of the mitigation project. The project will result in the restoration of 19.0 acres of mixed mangroves, the preservation and enhancement of area 3, 20.0 acres of white mangroves, the creation of area 4, 8.4 acres of freshwater marsh and open water, and the creation of 4.7 acres of tropical hammock.

The mitigation plan will increase plant and animal diversity and species richness.

The Department of Army Permit (Permit No. 90IPG-00189) and the State of Florida Department of Environmental Regulation Permit 131743959 have specific conditions that the DSWM must meet with respect to the construction, operation and monitoring of the 54-acre wetland. These conditions are outlined in the permitting section of this report.

TABLE 5-1
POTENTIAL SPECIES LIST FOR
SOUTH DADE LANDFILL RETENTION BASIN

I. FRESHWATER MARSH

Acrostichum danaeifolium
Eleocharis spp.
Juncus effusus
Nelumbo lutea
Nuphar luteum
Nymphaea odorata
Nymphoides aquatica
Panicum hemitomon
Peltandra virginica
Potodaria cordata
Sagittaria spp.
Scirpus validus
Spartina bakeri
Thalia geniculata

Leather fern
Spikerush
Soft rush
American lotus
Spatterdock
Fragrant water lily
Banna lily
Maidencane
Arrow arum
Pickerelweed
Duck potato
Soft-stem bulrush
Cordgrass
Arrow root

II. HAMMOCK/TRANSITION AREAS

Annona glabra
Bursera simaruba
Cephalanthus occidentalis
Conocarpus erectus
Ficus aursa
Hamelia patens
Ilex cassine
Myrica cerifera
Myrsine quianensis
Persea borbonia
Psychotria nervosa
Quercus virginiana
Sabal palmetto

Pond apple
Gumbo limbo
Buttonbush
Green buttonwood
Strangler fig
Firebush
Dahoon holy
Wax myrtle
Myrsine
Red bay
Wild coffee
Live oak
Cabbage palm

III. BRACKISH WATER AREAS

Cyperus odoratus
Distichlis spicata
Juncus roemerianus
Laguncularia racemosa
Rhizophora mangle
Scirpus robustus
Spartina alterniflora
Sporobolus virginicus

Flat sedge
Saltgrass
Needle rush
White mangrove
Red mangroves
Saltmarsh bulrush
Cordgrass
Seashore dropseed

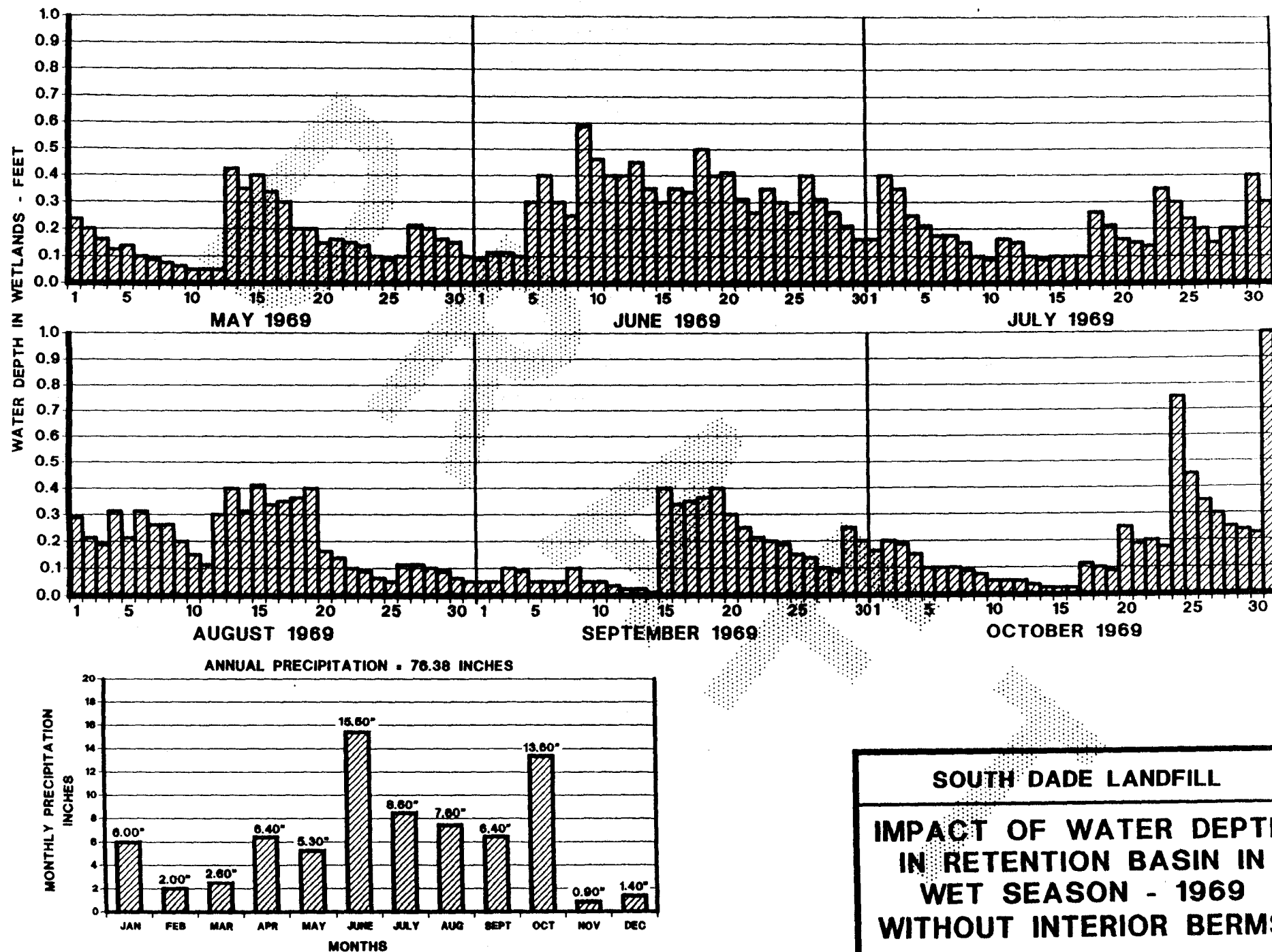
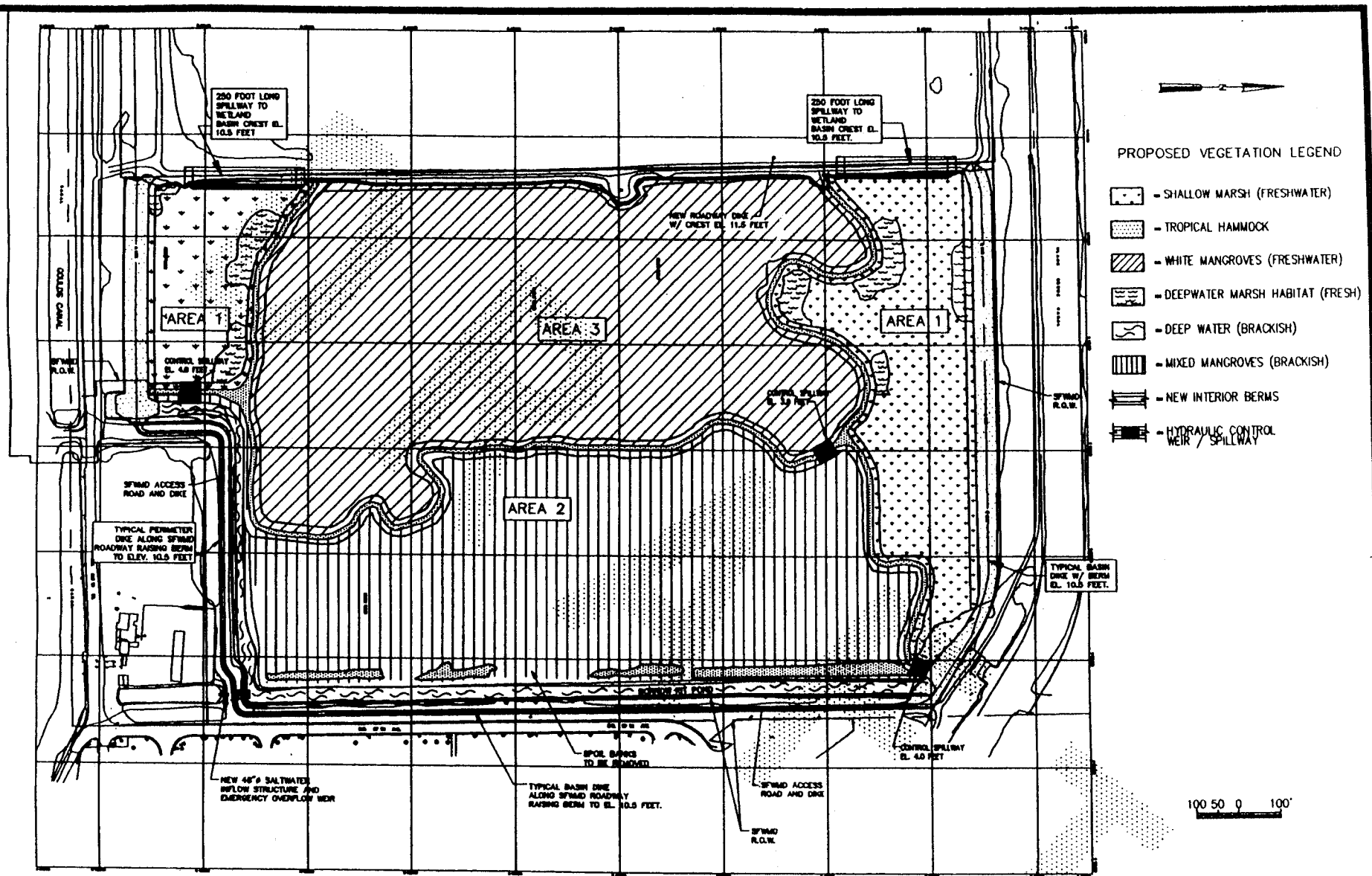


FIGURE 5-1

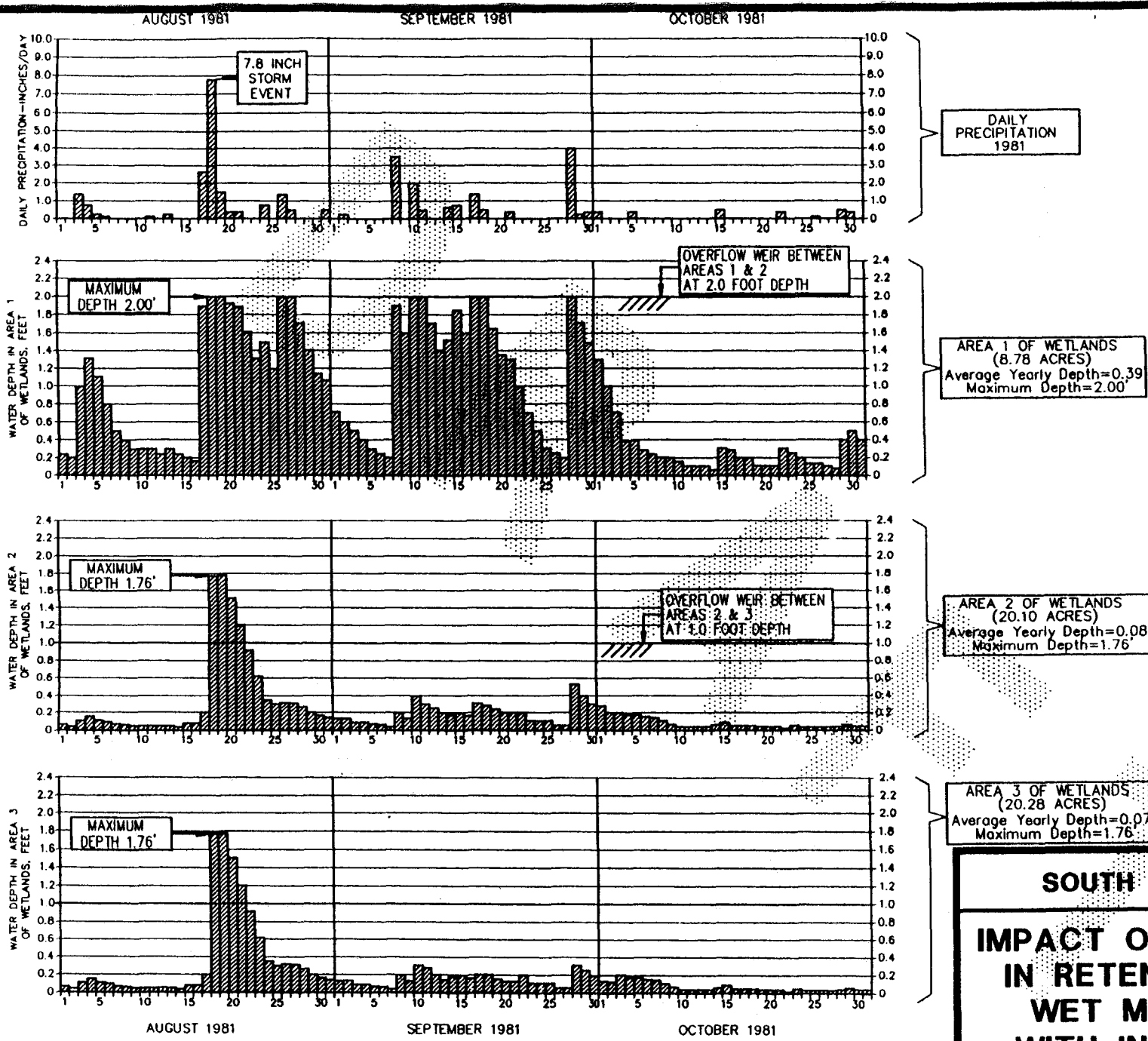


SOUTH DADE LANDFILL

DRAINAGE AREAS AND PLANTING PLAN

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DAILY PRECIPITATION 1981

AREA 1 OF WETLANDS (8.78 ACRES)
Average Yearly Depth=0.39
Maximum Depth=2.00'

AREA 2 OF WETLANDS (20.10 ACRES)
Average Yearly Depth=0.08
Maximum Depth=1.76'

AREA 3 OF WETLANDS (20.28 ACRES)
Average Yearly Depth=0.07
Maximum Depth=1.76'

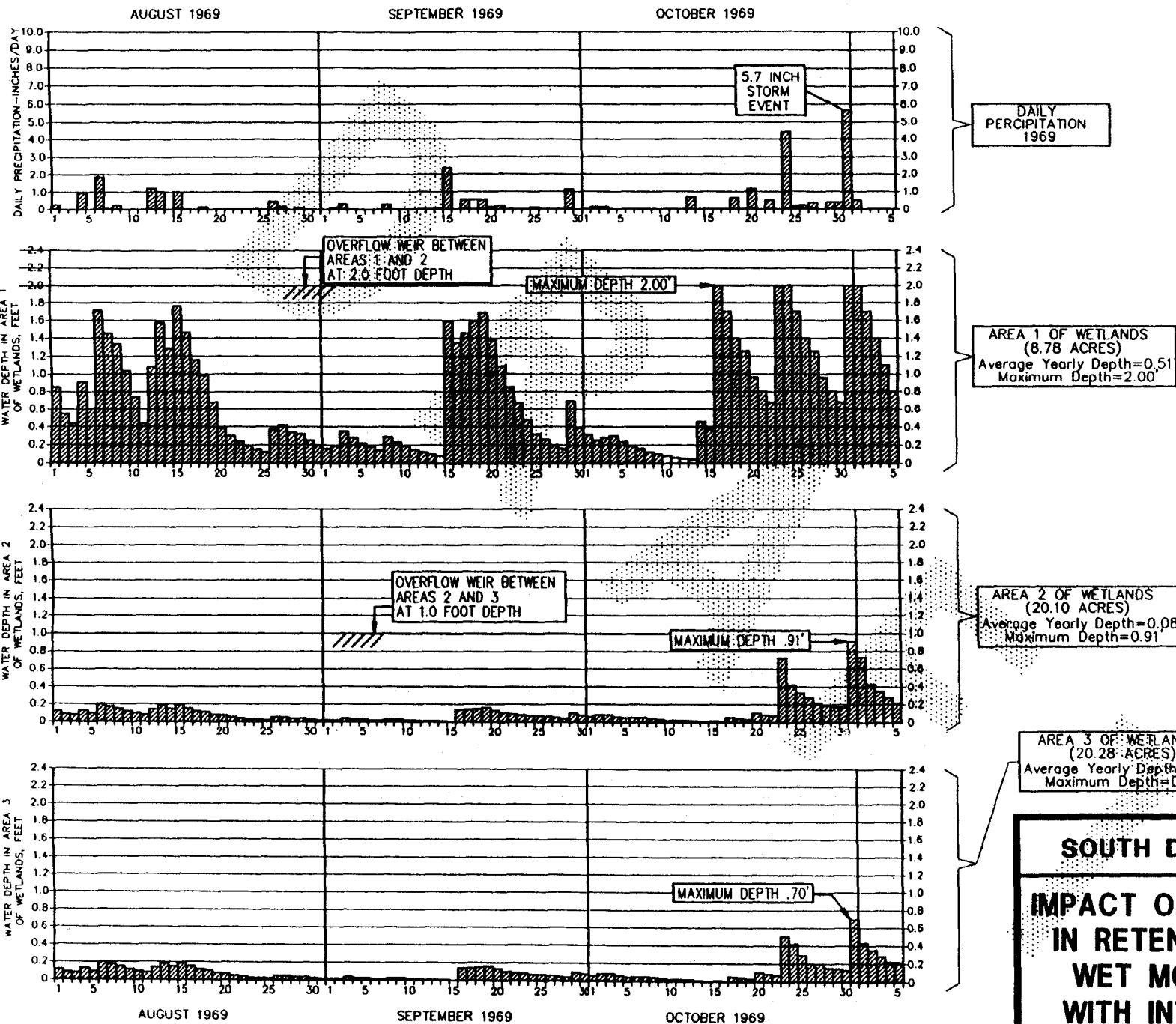
WET WEATHER MONTHS DURING AN AVERAGE RAINFALL YEAR

SOUTH DADE LANDFILL
IMPACT OF WATER DEPTH IN RETENTION BASIN IN WET MONTHS - 1981 WITH INTERIOR BERMS

FIGURE 5-3

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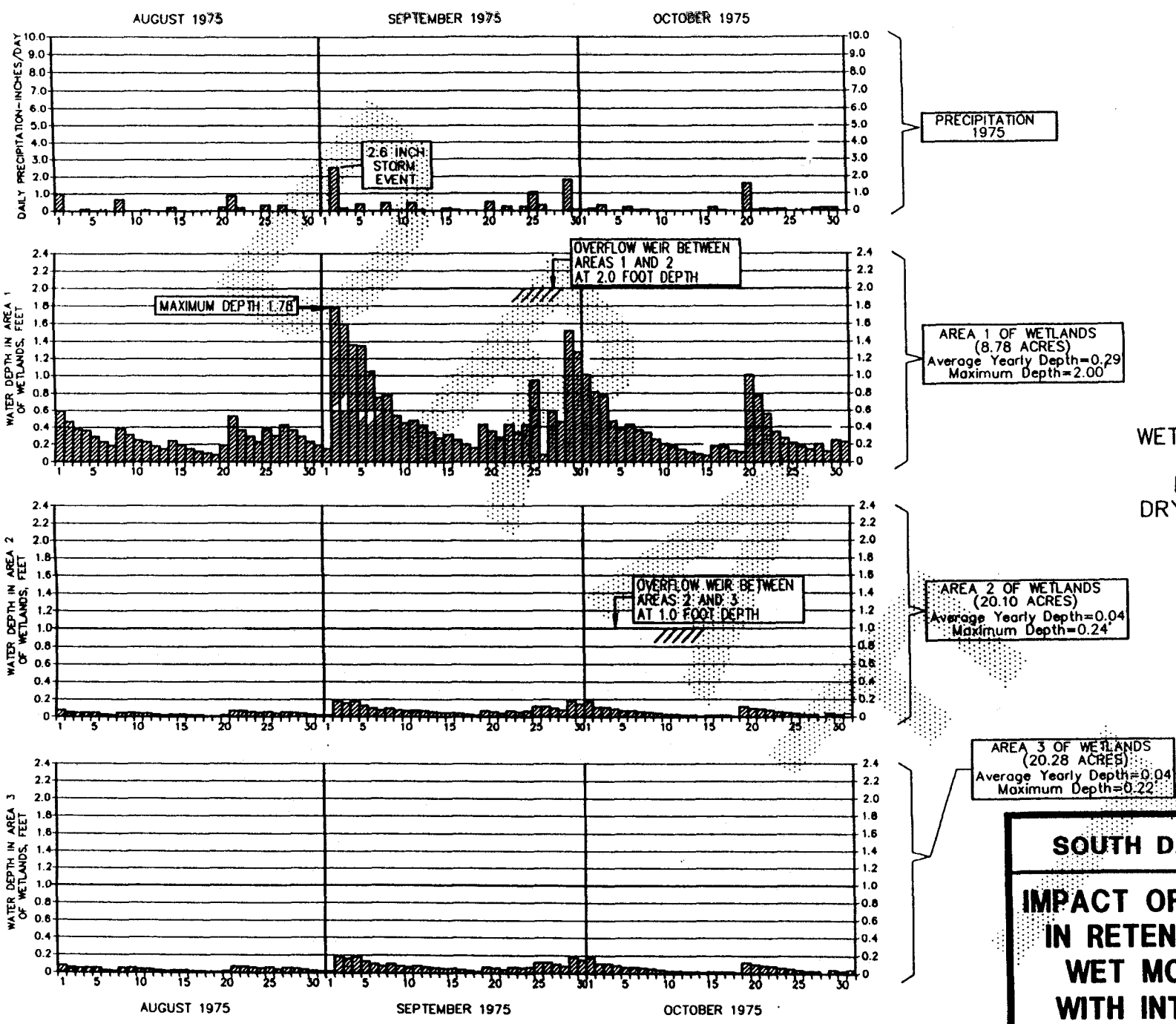
SOUTH DADE LANDFILL

**IMPACT OF WATER DEPTH
IN RETENTION BASIN IN
WET MONTHS - 1969
WITH INTERIOR BERMS**

FIGURE 5-4

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WET WEATHER MONTHS DURING DRY RAINFALL YEAR

SOUTH DADE LANDFILL
IMPACT OF WATER DEPTH IN RETENTION BASIN IN WET MONTHS - 1975 WITH INTERIOR BERMS

FIGURE 5-5

Section 6 - Permitting Requirements

Introduction

The stormwater management plan and Dredge and Fill permit applications have been submitted and reviewed by federal, state, regional and local agencies as well as organizations representing local citizens. In addition, applications to construct other site improvement projects have been submitted to the agencies. The following permits have been issued:

<u>Organization</u>	<u>ID#</u>	<u>Date</u>	<u>Description</u>
USCOE	901PG-04061	12/18/91-12/16/96	Cells 4 & 5
USCOE	901PG-00189	03/30/92	54-Acre Basin
FDER	S013-153804	08/29/88-08/31/93	Cells 4 & 5
FDER	SF13-174281	10/29/91-10/28/96	Cells 1 & 2
FDER	131743959	02/10/92-02/10/97	54-Acre Basin
SFWMD	13-00166S	05/14/87	MSSW ⁽¹⁾
SFWMD	13-00166S	07/12/90	MSSW ⁽¹⁾
SFWMD	13-00166S	12/12/91	MSSW ⁽¹⁾
SFWMD	13-00166S	12/12/91	MSSW ⁽¹⁾
SFWMD	13-00166-W	12/12/91-12/12/96	Water Use
SFWMD	9526	12/12/91-12/31/93	Levee Structure
SFWMD	9530	12/12/91-12/31/93	Right of Way
DERM	FW90-049/22	01/22/92-01/22/95	Dredge and Fill

⁽¹⁾Management and storage of surface waters.

One permit (Class I - DERM) is pending approval. The DSWM has also entered into three agreements (two with DERM and one with the National Park Service). The development of the construction documents, operational plan and monitoring program for the stormwater system must comply with 154 general conditions and 183 special conditions contained in the permits and twenty specific understandings within the agreements.

Detailed Review

Each permit and agreement was reviewed and a detailed summary has been provided (See Appendix B) of all major requirements. General condition requirements from each major regulatory agency have been listed only once where multiple permits have been issued by the same agency.

Comprehensive Review

Each permit and agreement was reevaluated and a comprehensive matrix has been developed (See Appendix C) which identify major permit requirements and any submission dates, completion dates, or interdependent permit requirements. Each requirement has been assigned a special permit identification number (PIN).

Stormwater Management Project Requirements

The comprehensive review was performed to identify specific requirements for the construction, operation and monitoring of the stormwater management project. The implementation of this project will require the incorporation of the following regulatory agency requirements and agreements:

A. Construction Documents

1. Conduct a topographic survey on 1-foot contour intervals based on 50-foot grid of the 54-acre wetlands (PIN 63)
2. The exotic plant species shall be removed from the 54-acre wetland and SFWMD ROW area and replanted with specified wetland plant species (PIN 16 and 147).
3. Install salt water inflow structure and emergency overflow weir prior to construction starting on the remainder of the project. Plug temporarily inlet and discharge ends until interior wetlands construction is complete (58). The structure is to have a 24-inch stubout for future installation of adjustable overflow weir (Elevation 5.0-9.1) and 48-inch adjustable overflow weir (Elevation 5-3.0) (PIN 79-92).
4. Areas within the 54-acre wetland to be excavated and filled shall be staked and approved by FDER prior to construction (PIN 57).
5. Four continuous stage recorders must be installed in the 54-acre wetland (PIN 70).

6. Sediment and turbidity must be controlled during construction (PIN 99 and 142)
7. Permanent benchmark to be set near control structure (PIN 116)
8. Areas within SFWMD ROW to be regrassed with Bahia Sod and pegged (PIN 146)
9. No material storage, temporary facilities or equipment storage is allowed within SFWMD ROW (PIN 152)

B. Operational Activities

1. A management plan for South Dade Landfill and surrounding areas must be prepared and submitted (PIN 6)

C. Monitoring Program

1. Develop and submit to USCOE the United States Department of Interior approved method and schedule of operating an ammonia water quality monitoring program (PIN 13)
2. Sample ground water locations S1-S10 and effluent sump at quarterly intervals (PIN 26, 27 and 46)
3. Monitor wetland area vegetation per agreed to procedures (PIN 65-69 and 86)
4. Monitor continually depth of water within wetlands (PIN 73)
5. Monitor surface water quality within wetlands monthly (PIN 74)
6. Obtain water quality samples at discharge from two bubble-up/spillway structures (PIN 122).

Additional Requirements

The numerous permits and agreements have requirements that generally incorporate more than one project and establish requirements for construction, operational and monitoring activities. The construction of the stormwater management project will only satisfy specific conditions found within various regulatory permits. Numerous additional requirements presented in the comprehensive permit review will need to be satisfied by other activities. Full compliance with the permits and agreements will require additional efforts by the DSWM beyond the scope of this stormwater management plan and closure project.

Section 7 - Monitoring Program

Introduction

The current monitoring program will be expanded to comply with the requirements of the recently issued permits. Monitoring will be required for the following items:

- Groundwater Quality
- Surface Water Quality
- Surface Water Elevations
- Stormwater Quality
- Plant Type and Density
- Leachate Quality and Quantity

The intent of the monitoring program is to determine both the effectiveness of the mitigation projects and the detection of the release of additional pollutants.

Groundwater Quality

The sampling of the five cluster wells (S-1 to S-5) was expanded by the FDER Cell 1 and 2 Closure Permit to include two locations on the perimeter dike (S-6 and S-7), two locations at the trench (S-8 and S-9), two locations at Biscayne Bay (S-10N and S-10S) and one location in the leachate effluent trench (sump). In addition the SFWMD requires that wells be installed to monitor the horizontal location of the leachate plume and saline interface during groundwater withdrawals from the extraction trench.

Surface Water Quality

Within the 54-acre wetlands, interior berms are being constructed to control the movement of stormwater. Permit requirements from the FDER specify monthly surface water quality monitoring at the upstream and down stream side of each interior spillway, six locations, mid way within the Vegetative Area 3 and twenty feet down stream from the emergency spillway into Gould's Canal. Proposed sampling locations are shown on Figure 7-1. At each sampling location a four foot wide, thirty foot long boardwalk will be constructed to provide access to the sampling location.

Surface Water Elevations

An FDER permit requirement states that continuous stage recorders shall be installed within each vegetation area in the 54-acre wetlands. A total of four areas will be monitored. In addition, the surface water elevation at the 48-inch weir on the saltwater inflow structure shall be monitored. Proposed locations for the stage recorders are shown on Figure 7-1.

Stormwater Quality

A SFWMD permit (MSSW-00166) requires that stormwater flow entering vegetation Area 1 through the filter berm/discharge structures shall be sampled. The discharge structures will be located at the toe of the filter berm on the wetland side, adjacent to the interior berm which separates Area 1 from Area 3. The proposed locations are shown on Figure 7-1.

Plant Types and Density

The 54-acre wetlands shall be replanted as specified in the FDER Dredge and Fill Permit. Following the replantings, the vegetation will be monitored to determine the success of the replanting program. Based on the standards set within the permits, the wetland plant types and density will be surveyed on an annual basis and areas will either be replanted or declared stable. Monitoring will be required for a minimum of five years.

Leachate Quality and Quantity

Within the requirements of FDER's permit for the Closure of Cells 1 and 2, leachate collected at the site will be monitored. The leachate sample shall be collected from the sump at the site and a composite sample assembled based on flow variations. The flow variations will also be monitored at the site and reported to FDER.

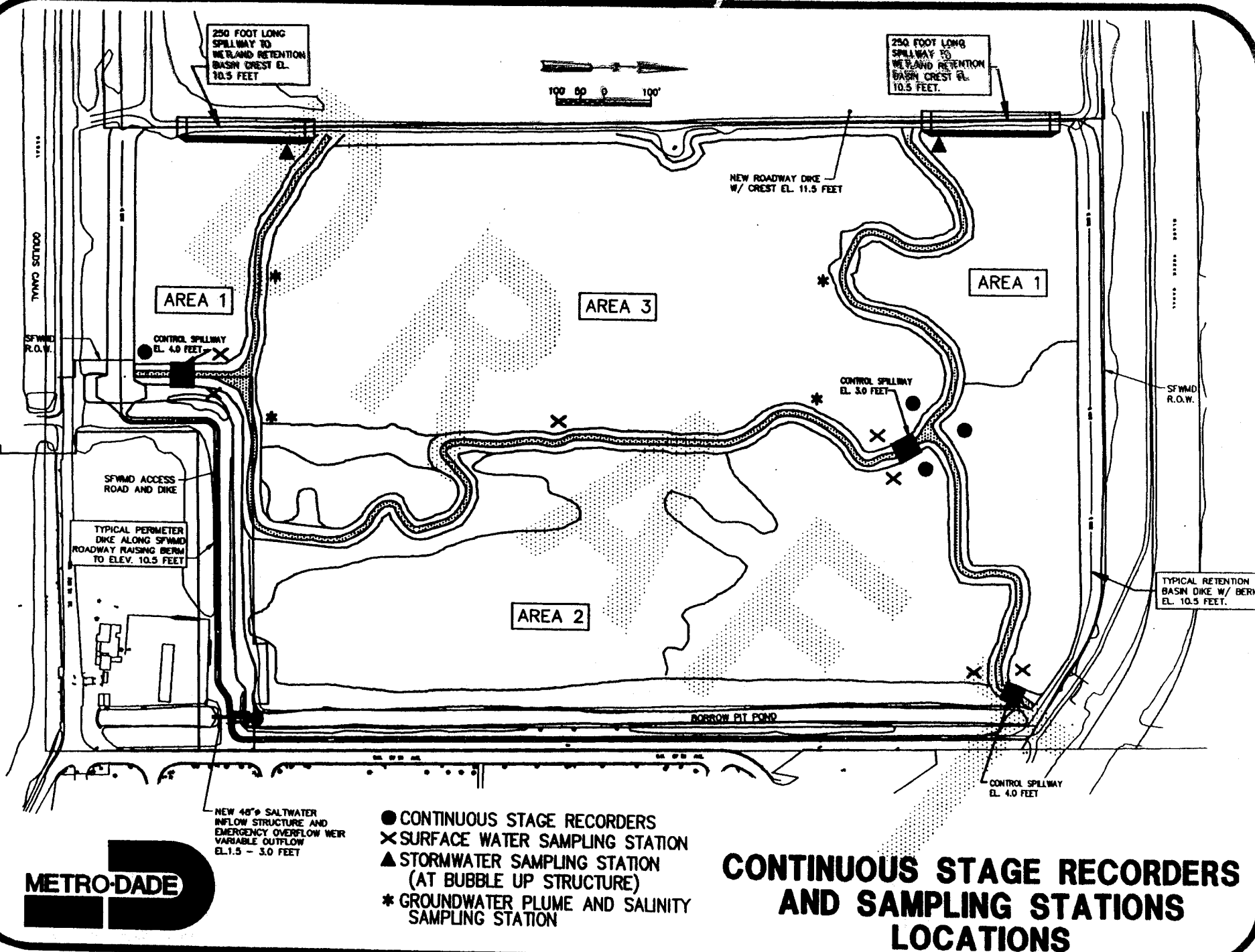


FIGURE 7-1

Section 8 - Program Implementation

The DSWM has developed programs and/or permitted the following closure activities at the South Dade Landfill:

- Stormwater Management Plan
- 54-Acre Retention Area and Mitigation Program
- Groundwater Remedial Program
- Landfill Gas Extraction System
- Final Capping
- Long-term Monitoring

The implementation of these closure activities has already been partially completed. The design and preparation of contract plans and technical specifications has been completed for the Groundwater Extraction Project, Landfill Gas Extraction Project and Final Capping Project for Cells 1 and 2. In addition, the Contract Bid Documents and Contract General Specifications for the Groundwater Extraction Project have been prepared and reviewed by the County's Legal Department. The preliminary design for permitting requirements has been completed for the Stormwater and 54-Acre Retention Area Mitigation program.

The implementation of construction activities to complete the closure projects will be accomplished by the preparation of two separate contract documents. One contract will be prepared for construction of the Groundwater Extraction Project. This project will be bid and constructed first for the following reasons:

- The control of the groundwater plume has been identified as the environmental improvement having the highest priority.
- The contract documents are currently at the highest level of completion.
- The work area is well defined and limited in size.
- The construction activities should be completed prior to award of the second contract.

A second contract will be prepared which combines the stormwater/54-acre retention area mitigation improvements with the final capping of Cells 1 and 2 and the landfill gas extraction project. This contract will combine the three projects for the following reasons:

- There are many interconnected construction activities between the projects. The final capping must tie into the stormwater swales, the landfill gas extraction wells must be placed through the final cap and the header pipe pass under the stormwater swale, the landfill gas compressor and flare

must be constructed on the stormwater swale berm and the stormwater swales may not be built, per a permit special condition, prior to the construction of the saltwater inflow structure.

- The design of the stormwater project will need to be coordinated with the current designs for final capping and the landfill gas extraction system.
- Construction coordination and contract supervision in overlapping construction areas will be best with a single Contractor.
- The site contains only limited areas suitable for contractor staging areas.

The development of the construction documents for the second contract will require the preparation of the following items:

- A separate set of construction plans for the stormwater/54-acre retention area development. This plan set will be bound with the two other construction plans for final cover and landfill gas extraction. The plans will be identified as Parts A, B and C.
- A combined set of technical specifications. The existing technical specifications for final cover and landfill gas extraction will be unified with the stormwater specifications for similar items.

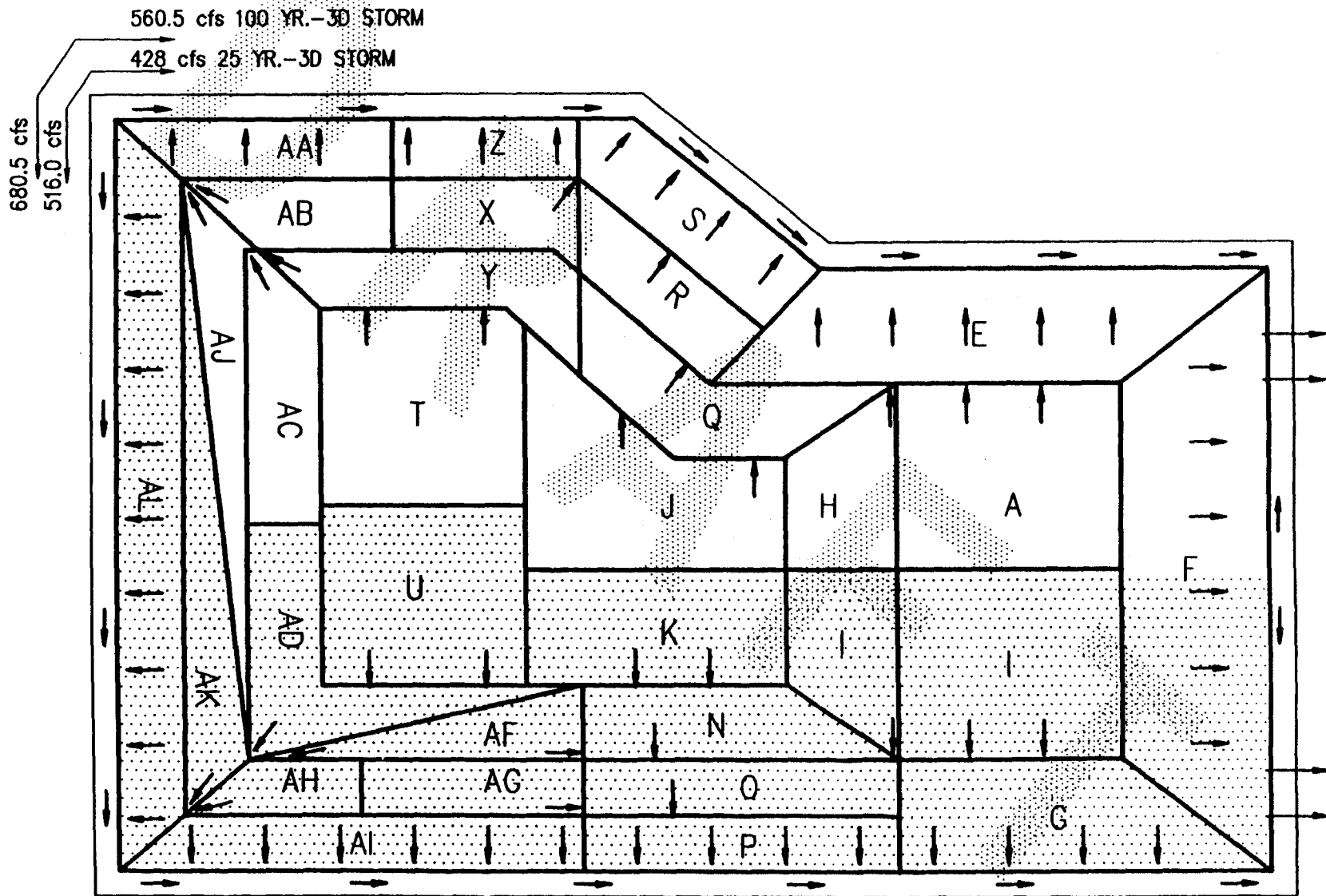
It is estimated that the completed plans and technical specifications will be available for legal review within three months.

APPENDIX A

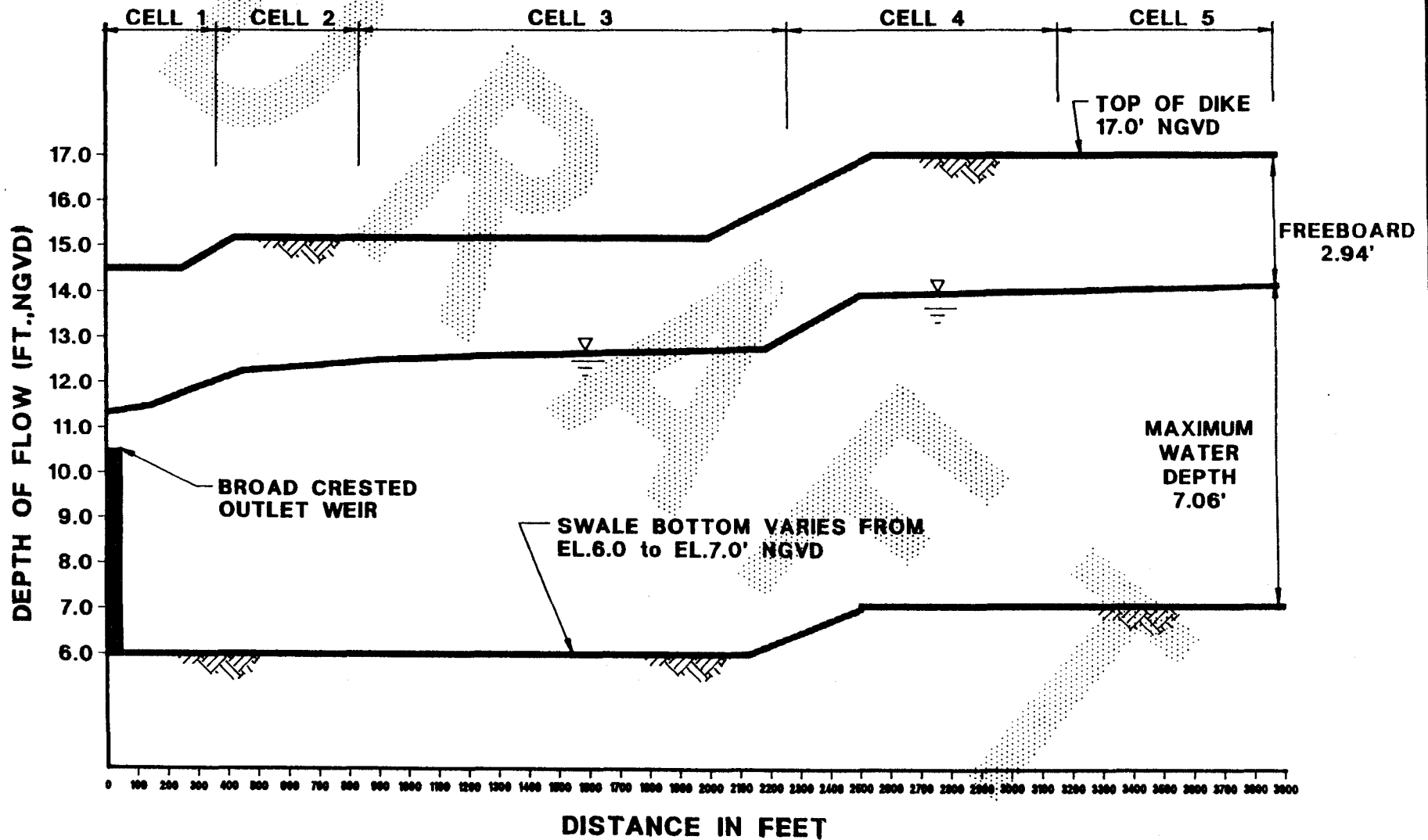
**Backwater Calculations
North and South Swale
South Dade Landfill**

DRAINAGE PATTERN

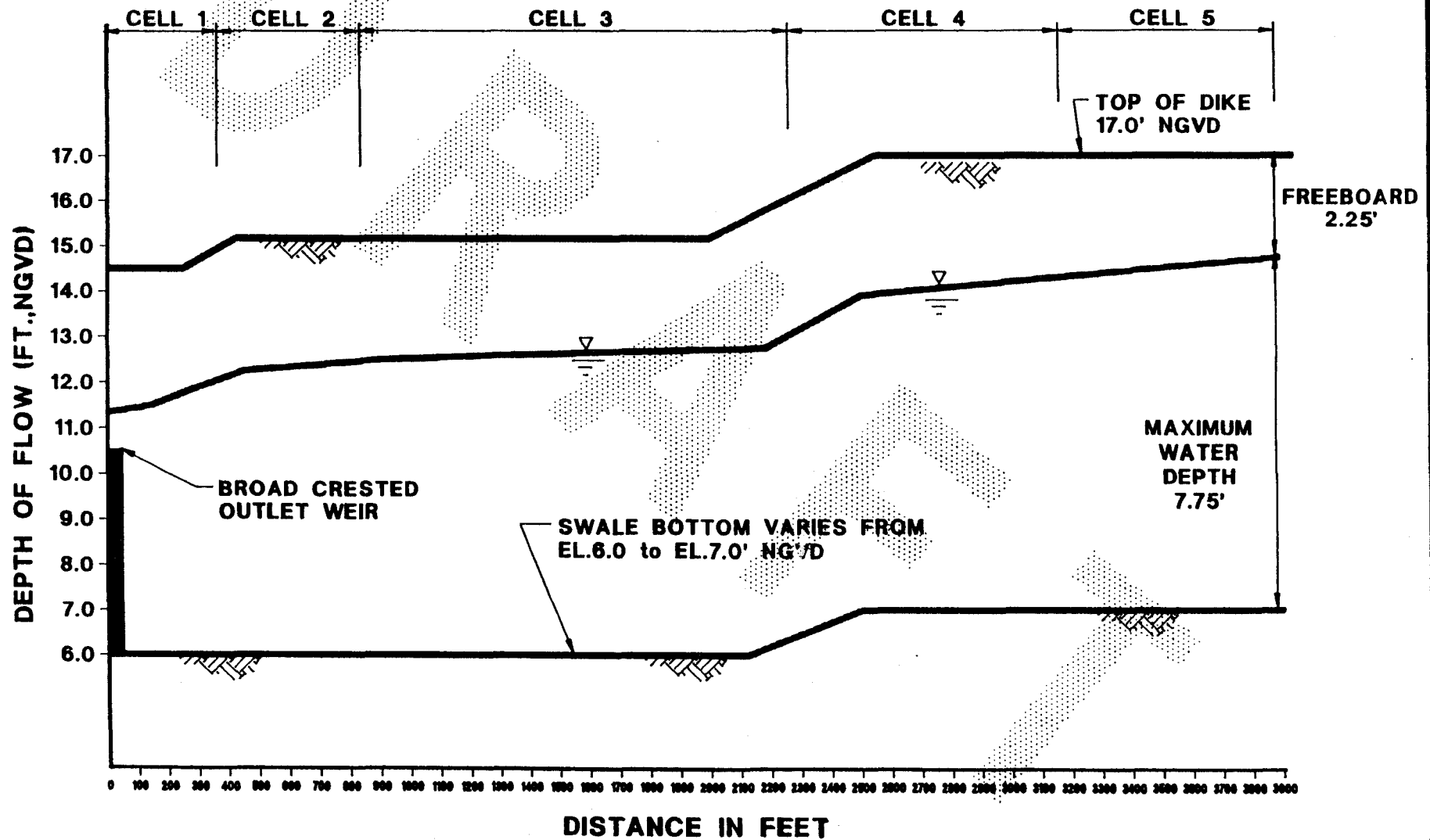
SOUTH DADE LANDFILL
CELL 1-5



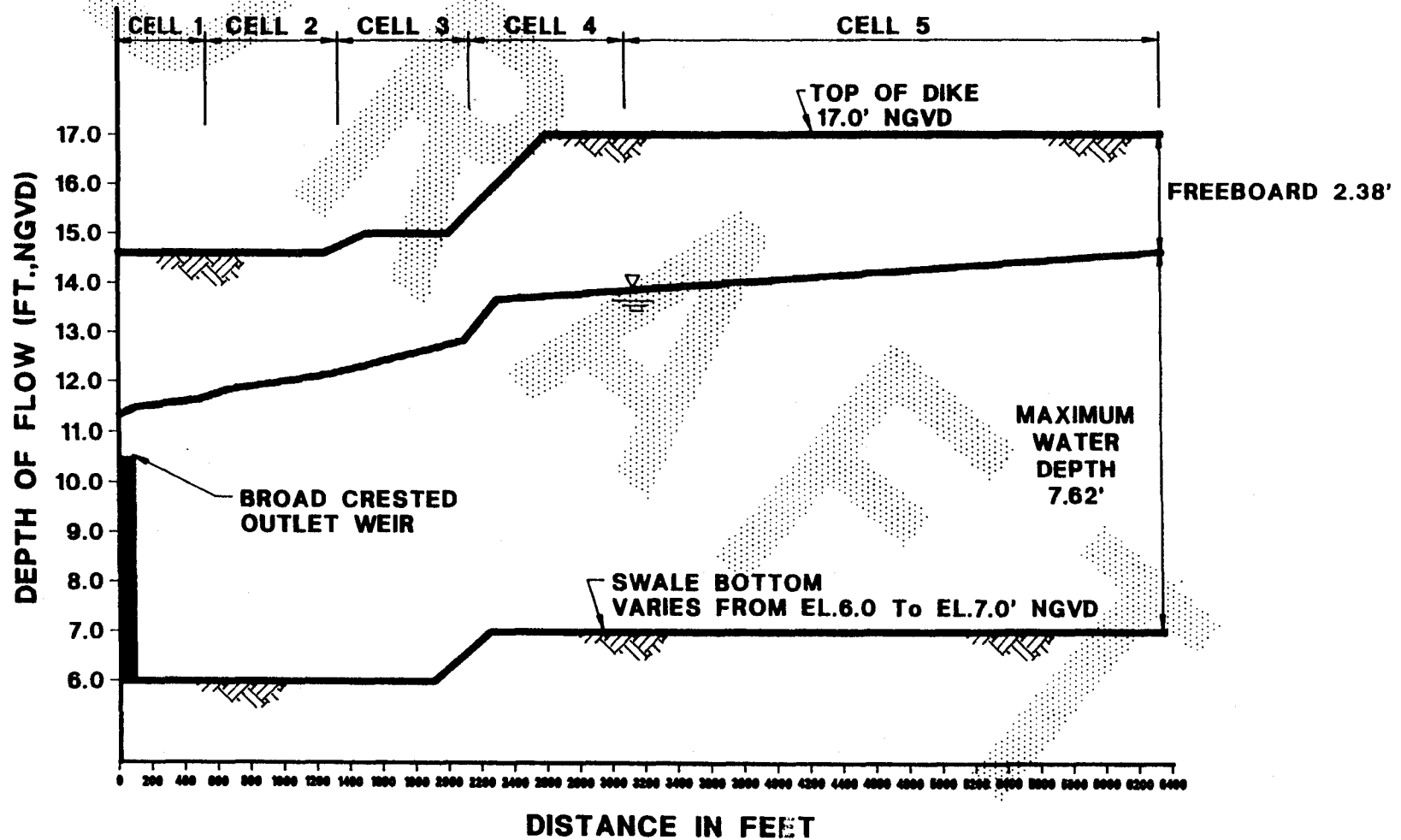
**SFWMD 25 YEAR - 3 DAY STORM
SURFACE WATER PROFILE
NORTHERN PERIMETER SWALE - SOUTH DADE LANDFILL
MAXIMUM FLOW=428 CFS LENGTH=3890 FT.**



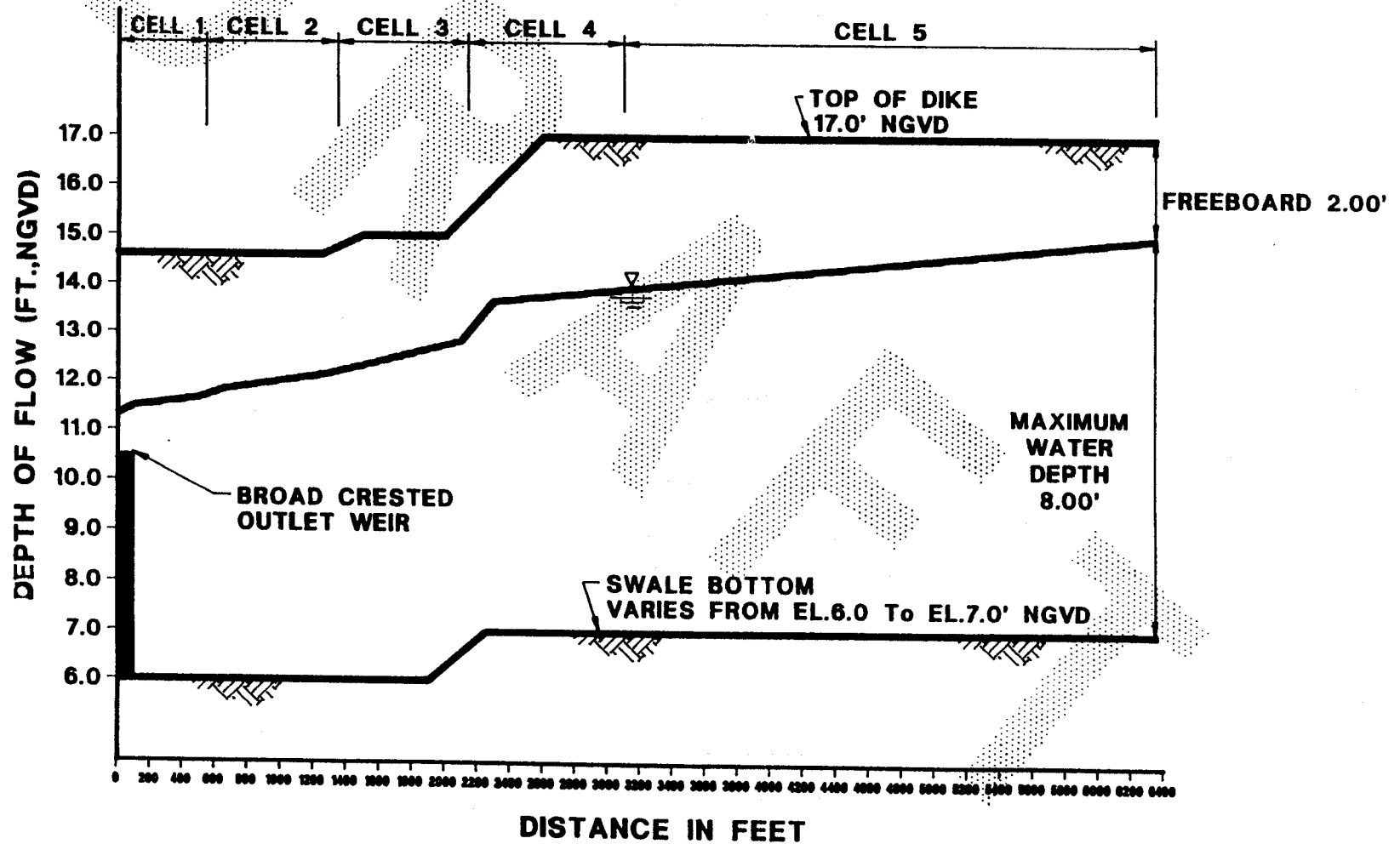
**SFWMD 100 YEAR - 3 DAY STORM
SURFACE WATER PROFILE
NORTHERN PERIMETER SWALE - SOUTH DADE LANDFILL
MAXIMUM FLOW=560 CFS LENGTH=3890 FT.**



**SFWMD 25 YEAR - 3 DAY STORM
SURFACE WATER PROFILE
SOUTHERN PERIMETER SWALE - SOUTH DADE LANDFILL
MAXIMUM FLOW=516 CFS LENGTH=6096 FT.**



**SFWMD 100 YEAR - 3 DAY STORM
SURFACE WATER PROFILE
SOUTHERN PERIMETER SWALE - SOUTH DADE LANDFILL
MAXIMUM FLOW=680 CFS LENGTH=6096 FT.**



SOUTH DADE LANDFILL HYDRAULIC CALCULATIONS

CELLS 1-5 PERIMETER SWALE

NORTH SWALE 3890 FT.

25YEAR-3DAY STORM

DATE: APRIL 22, 1992

F/N: Y:\PUBLIC\SYM\BACKW2N

BY:FJA (MIAMI)

SECTION	SECTION LENGHT (FT.)	INSIDE SLOPE (0:1)	OUTSIDE SLOPE (0:1)	BOTTOM WIDTH (FT)	CHANNEL FLOW (CFS)	FLOW AREA (FT^2)	AVERAGE VELOCITY THROUGH SECTION (FT/S)	DOWNSTREAM HYDRAULIC WATER ELEVATION (FT, NGVD)	BACHWATER LOSSES THROUGH SECTION (FT)	UPSTREAM HYDRAULIC WATER ELEVATION (FT, NGVD)
SECTION N1	70.0	3	2	10.00	428.00	123.23	3.47	11.30	0.16	11.46
TRANSITION 1	67.0	3	2	10.00	420.00	129.13	3.25	11.46	0.03	11.49
SECTION N2	160.0	3	2	10.00	413.00	130.25	3.17	11.49	0.44	11.93
SECTION N3	160.0	3	2	10.00	395.00	147.21	2.68	11.93	0.31	12.24
SECTION N4	240.0	3	2	10.00	378.00	159.74	2.37	12.24	0.32	12.56
TRANSITION 2	100.0	3	3	22.50	351.00	276.70	1.27	12.56	0.03	12.59
SECTION N5	180.0	3	3	35.00	340.00	360.93	0.94	12.59	0.03	12.62
TRANSITION 3	50.0	3	3	27.50	321.00	313.32	1.02	12.62	0.02	12.64
SECTION N6	185.0	3	2	22.00	315.00	256.30	1.03	12.64	0.05	12.69
TRANSITION 4	50.0	3	2.5	25.00	295.00	290.33	1.02	12.69	0.02	12.71
SECTION N7	735.0	3	3	27.50	289.00	319.60	0.90	12.71	0.08	12.79
CULVERT 1	216.0	---	---	18.00	208.00	230.22	0.90	12.79	0.00	12.79
SECTION N8	70.0	2	2	20.00	185.00	228.01	0.81	12.79	0.02	12.81
CULVERT 2	90.0	---	---	18.00	177.00	230.58	0.77	12.81	0.00	12.81
SECTION N9	680.0	3	2.5	5.00	167.00	161.58	1.03	12.81	0.20	13.01
CULVERT 4	96.0	---	---	12.00	92.00	156.12	0.59	13.01	0.00	13.01
SECTION N10	740.0	3	2.5	5.00	82.00	170.19	0.48	13.01	0.05	13.06

3889.0

SOUTH DADE LANDFILL HYDRAULIC CALCULATIONS

CELLS 1-5 PERIMETER SWALE

NORTH SWALE

3890 FT.

100YEAR-3DAY STORM

DATE: APRIL 22, 1992

F/N: Y:\PUBLIC\SYM\BACKW2N

BY:FJA (MIAMI)

SECTION	SECTION LENGHT (FT.)	INSIDE SLOPE (#:1)	OUTSIDE SLOPE (#:1)	BOTTOM WIDTH (FT)	CHANNEL FLOW (CFS)	FLOW AREA (FT^2)	AVERAGE VELOCITY THROUGH SECTION (FT/S)	DOWNSTREAM HYDRAULIC WATER ELEVATION (FT, NGVD)	BACWATER LOSSES THROUGH SECTION (FT)	UPSTREAM HYDRAULIC WATER ELEVATION (FT, NGVD)
SECTION N1	70.0	3	2	10.00	560.50	126.90	4.42	11.40	0.30	11.70
TRANSITION 1	67.0	3	2	10.00	550.40	138.23	3.98	11.70	0.20	11.90
SECTION N2	160.0	3	2	10.00	540.80	146.03	3.70	11.90	0.56	12.46
SECTION N3	160.0	3	2	10.00	517.70	168.93	3.06	12.46	0.37	12.83
SECTION N4	240.0	3	2	10.00	494.60	184.92	2.67	12.83	0.38	13.21
TRANSITION 2	100.0	3	3	22.50	460.00	318.18	1.45	13.21	0.05	13.26
SECTION N5	180.0	3	3	35.00	445.60	412.22	1.08	13.26	0.04	13.30
TRANSITION 3	50.0	3	3	27.50	419.70	360.62	1.16	13.30	0.01	13.31
SECTION N6	185.0	3	2	22.00	412.50	294.41	1.40	13.31	0.05	13.36
TRANSITION 4	50.0	3	2.5	25.00	385.80	332.97	1.16	13.36	0.02	13.38
SECTION N7	735.0	3	3	27.50	378.60	366.34	1.03	13.38	0.10	13.48
CULVERT 1	216.0	---	---	18.00	272.70	242.64	1.12	13.48	0.00	13.48
SECTION N8	70.0	2	2	20.00	241.60	261.50	0.92	13.48	0.01	13.49
CULVERT 2	90.0	---	---	18.00	231.50	242.82	0.95	13.49	0.00	13.49
SECTION N9	680.0	3	2.5	5.00	218.50	191.73	1.14	13.49	0.21	13.70
CULVERT 4	96.0	---	---	12.00	120.50	164.40	0.73	13.70	0.00	13.70
SECTION N10	740.0	3	2.5	5.00	106.70	201.55	0.53	13.70	0.05	13.75

3889.0

SOUTH DADE LANDFILL HYDRAULIC CALCULATIONS

CELLS 1-5 PERIMETER SWALE

SOUTH SWALE 6096 FT.

25YEAR-3DAY STORM

DATE: APRIL 22, 1992

F/N: A:\BACKWT2S.WK1

BY:FJA (MIAMI)

SECTION	SECTION LENGHT (FT.)	INSIDE SLOPE (H:1)	OUTSIDE SLOPE (H:1)	BOTTOM WIDTH (FT)	CHANNEL FLOW (CFS)	FLOW AREA (FT^2)	AVERAGE VELOCITY THROUGH SECTION (FT/S)	DOWNSTREAM HYDRAULIC WATER ELEVATION (FT, NGVD)	BACWATER LOSSES THROUGH SECTION (FT)	UPSTREAM HYDRAULIC WATER ELEVATION (FT, NGVD)
SECTION S1	70.0	3	2	12.00	516.00	136.92	3.77	11.38	0.20	11.58
SECTION S2	490.0	3	3	45.00	510.00	344.51	1.48	11.58	0.23	11.81
TRANSITION 1	80.0	3	3	40.00	468.00	333.67	1.40	11.81	0.03	11.84
SECTION S3	650.0	3	3	40.00	461.00	335.92	1.37	11.84	0.26	12.10
TRANSITION 2	50.0	3	3	25.00	407.00	264.13	1.54	12.10	0.03	12.13
SECTION S4	800.0	2.5	2.5	10.00	402.00	135.24	2.59	12.13	0.64	12.77
SECTION S5	3052.0	3	2.5	5.00	322.00	159.89	2.01	12.77	0.83	13.60
SECTION S6	904.0	3	2.5	5.00	68.00	196.84	0.35	13.60	0.02	13.62

6096.0

SOUTH DADE LANDFILL HYDRAULIC CALCULATIONS

CELLS 1-5 PERIMETER SWALE

SOUTH SWALE 6096 FT.

100YEAR-3DAY STORM

DATE: APRIL 22, 1992

F/N: A:\BACK100S.WK1

BY:FJA (MIAMI)

SECTION	SECTION LENGHT (FT.)	INSIDE SLOPE (H:1)	OUTSIDE SLOPE (H:1)	BOTTOM WIDTH (FT)	CHANNEL FLOW (CFS)	FLOW AREA (FT^2)	AVERAGE VELOCITY THROUGH SECTION (FT/S)	DOWNSTREAM HYDRAULIC WATER ELEVATION (FT, NGVD)	BACWATER LOSSES THROUGH SECTION (FT)	UPSTREAM HYDRAULIC WATER ELEVATION (FT, NGVD)
SECTION S1	70.0	3	2	12.00	680.50	143.61	4.74	11.55	0.31	11.86
SECTION S2	490.0	3	3	45.00	672.70	366.72	1.83	11.86	0.34	12.20
TRANSITION 1	80.0	3	3	40.00	617.90	363.32	1.70	12.20	0.05	12.25
SECTION S3	650.0	3	3	40.00	609.10	367.19	1.66	12.25	0.36	12.61
TRANSITION 2	50.0	3	3	25.00	536.50	296.33	1.81	12.61	0.04	12.65
SECTION S4	800.0	2.5	2.5	10.00	447.20	177.06	2.50	12.65	0.58	13.23
S5	3052.0	3	2.5	5.00	357.90	179.90	1.99	13.23	0.75	13.98
S6	904.0	3	2.5	5.00	92.00	215.02	0.43	13.98	0.02	14.00

6096.0

APPENDIX B

Permit Condition Review South Dade Landfill

<u>Organization</u>	<u>ID#</u>	<u>Date</u>	<u>Page</u>
USCOE	901PG-04061	12/18/91-12/16/96	B-1
USCOE	901PG-00189	03/30/92	B-4
FDER	S013-153804	08/29/88-08/31/93	B-5
FDER	SF13-174281	10/29/91-10/28/96	B-7
FDER	131743959	02/10/92-02/10/97	B-11
SFWMD	13-00166S	05/14/87	B-23
SFWMD	13-00166S	07/12/90	B-26
SFWMD	13-00166S	12/12/91	B-29
SFWMD	13-00166S	12/12/91	B-32
SFWMD	13-00166-W	12/12/91-12/12/96	B-36
SFWMD	9526	12/12/91-12/31/93	B-38
SFWMD	9530	12/12/91-12/31/93	B-41
DERM	FW90-049/22	01/22/92-01/22/95	B-43
DERM/DSWM Agreement	--	02/05/91	B-45
DERM/DSWM Agreement	--	02/05/91	B-47

**PERMIT CONDITION REVIEW
SOUTH DADE LANDFILL**

COE 90IPG04061

Begin/End: 18 Dec 1991/16 Dec 1992

Activity: Fill 91.5 acres of wetlands to construct two landfill expansion cells.

General Conditions:

2. Must get permit modification if abandoning project prior to completion of authorized work and restoration may be required.
3. If hist/arch. resources are found, must notify COE JAX.
5. Must comply with DER permit condition as though they are special condition to this permit.

Special Conditions:

1. Enhance 100 acres of wetland at M.E. Thompson Park by removal of exotic species.
Submit acceptable plan by March 19, 1992.
Complete enhancement by Dec. 18, 1993.
2. Purchase 100 acres of wetlands in C-111 basin.
50 acres by 18 Dec 1992.
50 acres (for mitigation under 90IPG-00189) by 18 Dec 1993 in a contiguous block - if possible.
Deed restriction - preserve in perpetuity for enhancement of wetlands and fish/wildlife values.
Provide deed restriction/conservation easement to COE for approval.
Within 30 days of COE approval record in Dade Co. Public Records.
Within 60 days/recording, provide COE certified copy.
3. Construction of Cell 5 subject to agreement attachment and cited in SC #4 below.
4. Must comply with SC #5(a-g) (clarification of specific condition of the Dept. of Interior agreement signed August 30, 1991).
5. a) By October 31, 1996 submit to COE a DER approved management plan for the So. Dade Landfill, Old So. Dade Landfill, Shredder Facility, Waste Water Treatment Plant, and any surrounding lands contemplated for acquisition. Plan will address land use, landfill closure, ground water remediation, leachate treatment and disposal, wetland mitigation.

- b) Authorize Independent Eng. Assess of Groundwater Remediation Plan for S.D.L.

Obtain National Park Service approval of engineering consultant.

Revise G.W.R.P. according to Engineering Consultant's recommendations and submit revised plan to FDER for approval with copy to C.O.E.

Put approved plan in operation no later than 18 months following FDER Construction Permit (for G.W.R.P.) issuance.

Obtain certification of operational status of the G.W.R.P. from the Engineering Consultant.

- c) Authorize Engineer (as identified in 6 above) to monitor cells 3 & 4 leachate each at collection system over one year period of landfill operation for effectiveness in preventing leachate from reaching Biscayne National Park. Submit copy of Engineer's report to COE.
- d) Submit for approval to FDER, prior to start of Cell 5 construction; through the Tech. Advisory Committee, design plans and specifications for leachate containment and removal for Cell 5 based upon performance records of Cells 3 and 4 systems and remediation of Cells 1 and 2.

Submit to COE copies of:

- i. FDER approved plans
- ii. FDER Construction Permit for Cell 5

- e) By Oct 31 of each year of operation, permittee must submit to COE Engineer certified (as to adequacy of the budget to operate the program) budget for ground water remediation program operation for subsequent year.
- f) Cooperate with NPS and FDER in developing ammonia water quality standards and monitoring program for B.N.P. and waters surrounding the landfill.

Submit to COE by December 31, 1992 the USDOJ approved standards and monitoring program. This date may be adjusted by COE must be notified immediately if the December 31, 1992 date cannot be met.

Engineer must submit to COE within one year of start of ground water remediation program USDOJ approval.

- i. Method of operating a water quality monitoring program.
- ii. FDER Construction Permit for Cell 5.

- g) By October 31 of each year of operation, permittee must submit to COE Engineer certified (as to adequacy of the budget to operate the program) budget for ground water remediation program operation for subsequent year.
- h) Cooperate with NPS and FDER in developing ammonia water quality standards and monitoring program for B.N.P. and water surrounding landfill.

Submit to COE by December 31, 1992 the USDOJ approved standards and monitoring program. This date may be adjusted by COE must be notified immediately if the December 31, 1992 date cannot be met.

Engineer must submit to C.O.E. within one year of start of ground water remediation program USDOJ approval.

- i) Engineer shall monitor the program and submit annual updates of methods of operation and schedule on October 31 of each year.
- 6. Extensions. General condition 1 establishes a time limit for the completion of the activity authorized by this permit. Unless there are circumstances requiring.....?

Further Information:

Condition 6 is incomplete as written in permit.

In addition, one cannot determine whether more information is missing.

COE 90IPG-00189

Begin/End:

Activity: Fill 9 acres of wetland to construct 54 acre stormwater management system for South Dade Landfill.

General Conditions:

2. Must get permit mod if abandoning project prior to completion of authorized work and restoration may be required.
3. If hist./arch. resources are found, must notify COE JAX.
5. Must comply with DER permit condition as though they are special condition to this permit.

Special Conditions:

1. Remove exotics and plant wetlands species within the stormwater basin by June 30, 1994 and monitor area for five years according to attached FDER permit *special condition [#s 1-22 and monitoring required].
 2. Same as SC #2 90IPG04061 except that the date specified herein (within one year of permit issuance) is two days earlier than that specified in 90IPG04061 (16 December 1993)
 4. (a-g) are identical to SC #5(a-g) in 90IPG04061
- *(1.) as per FDER SC #:
4. Provide semiannual narrative reports to FDER, WPB, including date activity begin, extent of work completed since previous report/permit issuance (includes graphic depiction), work anticipated in next six months (include graphic depiction), First Report due August 10, 1992.

FDER SO13-153804

Begin/End: August 29, 1988/August 31, 1993

Activity: Operate existing cells 1 and 2 (30 acres), construct a 46 acre bottom lined landfill (Cell 3), leachate collection system, hard roads, and surface water management system.

General Conditions:

8. If permittee cannot comply with anything in permit, he must immediately notify FDER and provide:
 - a) Description of non-compliance - exact dates and times.
 - b) Anticipated time non-compliance is expected to continue and steps being taken to correct non-compliance.
14. Establishes standards for all monitoring required by FDER roles.

Special Conditions:

1. Submit liner quality control plan to FDER and DERM prior to liner installation of future phases.
3. Provide a registered land surveyor second order accuracy survey of base grade of each future phase. Base grade shall be certified in writing by liner contractor and installer prior to liner placement.
4. Establish a documented control program for each new phase:
 - a) Map of each sector showing panel bar, cuts as installed.
 - b) Letter of certification signed by liner manufacturer or representative and sanitary landfill inspector stating all weld test results and vacuum a pressure testing of welded seams was observed by both.
 - c) The engineer (Florida Registered) shall review inspections and test records of each phase and shall certify in writing that bottomliner and leachate collection system have been installed in accordance with plans approved by FDER. Submit certification after construction completion.
5. Notify FDER five days prior to any liner installation work.
8. Disposal of no solid waste in new phases until Engineer certifies completion of construction on DER form 17-7.130(2) and contacts FDER and arranges for inspection of each new phase with Engineer and on-site facility operator.
9. Upon completion of project, Engineer of record (same as Engineer of Application) must submit a summary report to FDER attesting to complete conformity to FDER approved plans and specifications, including:
 - a) Liner installation documented control program.
 - b) Liner inspections and quality assurance/quality control testing procedures and laboratory analyzed.
 - c) Engineer certification of construction.
10. Submit monthly operating reports to FDER and DERM, by 15th of succeeding month, report to include:

- a) Type of solid waste received.
 - b) Quantities of solid waste received.
 - c) Quantities of leachate pumped to the P.O.T.W.
14. Groundwater Monitoring Plan
- Sample monitoring well clusters S-1 through S-5 in January, April, July, October.
- Sample mid depth mid-depth clusters S-1 through S-5 semi-annually.
15. Leachate composite samples quarterly.
16. Notify FDER immediately of destruction of any monitoring station and what is being done to replace it and prevent similar occurrence.
- Within 30 days of any new well construction, submit a well completion report.
18. Submit to FDER all ground water, surface water, and leachate analyses results within 60 days of sampling DER Form 17-1.216(2).
20. Apply for closure permit at least one year prior to date wastes will no longer be accepted.
21. Maximum height = 150'
22. Submit annual elevation survey of site showing horizontal and vertical dimensions of landfilled area on or before January 31 of each year.

FDER SF13-174281

Begin/End: October 28, 1991/October 28, 1996

Activity: Close Cells 1 and 2 Class I shredded waste landfill.

General Conditions:

- Same as FDER S013-153804 above.

Special Conditions:

2. Prior to liner placement, the top base grade shall be certified in writing by the liner contractor and installer.
3. Permittee shall notify FDER 5 days prior to final cover installation.
4. Permittee shall:
 - a) Submit to FDER/WPB two copies of bid specifications and contract documents and signed and sealed contract drawing for the ground water remediation interceptor trench for final written approval. This submittal shall occur at least thirty (30) days prior to the installation of the final cover system (side slope up and top cap) excluding the gas recovery/flaring station construction works. The Ground Water Interceptor Trench shall be constructed and operational within one (1) year of permit issuance. The permittee shall continue to operate the ground water remediation system until otherwise notified by the Department.
6. A documented control program shall be established for the top liner as follows:
 - a) A map of each sector showing panel layouts as installed.
 - b) A letter of certification signed by the liner manufacturer or manufacturer's representative and the sanitary landfill inspector stating that all weld test results and vacuum or pressure testing of all welded seams were visually observed by both.
 - c) The professional engineer registered in the State of Florida shall review the inspections and test records for the PVC liner installation as certified by the liner manufacturer or manufacturer's representative and the sanitary landfill inspector. The professional engineer shall certify in writing that the PVC top liner system have been installed in accordance with the plans as approved by the Department.
7. The professional engineer registered in the State of Florida shall certify in writing within sixty (60) days after completion of the final cover system installation (calcium montorillinite and PVC liner), the conformance of closure in accordance with the approved closure plans. Said certification shall be submitted to the Department accompanied by "As-Built" drawings. Such certification shall be submitted to the Department on the attached Exhibit A. Closure of these Cells (I & II) shall be completed within one (1) year of permit issuance pursuant to the specifications and contract documents dated May 1991, Project No. 91-9000-02, by Hazen and Sawyer, P.C. Engineers.

8. Concrete monuments shall be installed to mark the boundaries of the landfill property and other permanent markers shall be installed to outline the general waste filled areas. These latter markers shall be tied to one or more of the boundary markers by a survey performed by a professional engineer or registered land surveyor. The location and elevation of all markers shall be shown on a site plan filed with the Declaration to Public in accordance with section 17-701.074(f) and (5), Florida Administrative Code.
10. The ground water monitoring plan for the closure of Cells I and II is approved pursuant to Section 17-28.700, FAC. The location of the six (6) new monitoring wells shall be shown on Exhibit B attached and in accordance with the August 8, 1991 submittal.

a) Ground Water and Effluent Interceptor Trench Sample Locations:
Monitoring wells S6 Dike (N25), S7 Dike (S25), S8 Trench (N25), S9 Trench (S25), S10 Bay (N15), S10 Bay (S15), and Eff-T (Sump) shall be sampled quarterly (January, April, July, October).

b) Quarterly Ground water Parameters

<u>Parameters</u>	<u>Storet Codes</u>	<u>Units</u>
Ammonia as N	000610	mg/l
pH	000400	Std. Units
Conductance	000094	umhos/cm
Total Dissolved Solids	070304	mg/l
* Water Levels (1/10 of a foot)	082545	feet (MSL)

* Excluding effluent sampling location.

11. All ground water analysis shall be submitted within 60 days of sampling on DER Form 17-1.216(2) Exhibit C to:

Florida Department of Environmental Regulation
Solid Waste Administrator
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

and to:

Florida Department of Environmental Regulation
S.E. Florida District Office
Solid Waste Section
1900 South Congress Avenue, Suite A
West Palm Beach, FL 33406

- #12 - No later than January 31 of each year the permittee shall submit to the Department an annual ground water quality remediation evaluation report for the previous year. This report shall summarize all ground water monitoring and leachate collection data and identify improvements in ground water quality achieved during the previous year. Any recommendations for modifications to the ground water remediation program shall also be included in this report for Department review.

15. A monthly operating report (MOR) shall be submitted by the fifteenth (15) day of the succeeding month to:

Florida Department of Environmental Regulation
Solid Waste Programs Administrator
Twin Towers Office Building
2600 Blair stone Road
Tallahassee, FL 32399-2400; and a copy to:

Florida Department of Environmental regulation
Solid Waste Programs
1900 South Congress Avenue
West Palm Beach, FL 33406

Reports shall include the following information:

- a) Daily pump meter flows from the manhole system for the interceptor trench;
 - b) quantities of mineralized ground water pumped to wastewater treatment plant from the manholes; and
 - c) Daily inspection reports of the Interceptor Trench Manhole for pump failures.
16. The permittee shall maintain reasonable access to all the monitoring stations (owned by the permittee) required by this permit. In order to assure that representative samples are obtained, it shall be the responsibility of the permittee to maintain vandalism. Should any of these stations be destroyed, the permittee shall notify the Department immediately. The notification shall include pertinent information as to the cause, and what steps are being taken to replace the monitoring station and prevent the recurrence of such problems in the future. A Well Completion Report shall be sent to the Department on DER Form 17-01.216(2) within thirty (30) days of any new well construction.
17. The Department retains regulatory control over any activities which may affect the integrity of the environmental protection measures such as landfill cover, drainage, liners, monitoring system or leachate and stormwater controls. Consultation with the Department is require prior to conducting activities at the closed landfill.
18. The permittee shall maintain compliance with 40 CFR Part 264, Subpart H financial requirements until the permittee is released as provided for in 40 CFR Parts 264.143(i) and 264.145(i) as adopted by reference in Rule 17-701.076. All submittal in response to this Specific Condition shall be submitted to:
- Financial Coordinator
Solid Waste Section
Florida Department of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400
19. If any event occurs which causes delay or the reasonable likelihood of delay in the achievements of the ground water remediation program, permittee shall have the burden of proving that the delay was or will be caused by circumstances beyond the reasonable control of permittee. Upon occurrence of the event permittee shall promptly notify the Department orally and shall, within seven calendar days, notify the Department in writing of the anticipated length and cause of delay, the measures taken or to be taken to prevent or minimize the

delay, and the time table of which permittee intends to implement these measures.

20. At least sixty (60) days prior to the expiration of this permit, the permittee shall make an application to the Department for renewal of this permit.

DRAFT

FDER 131743959

Begin/End: February 10, 1992/February 10, 1997

Activity: Dredge and fill in conjunction with construction of a stormwater alternation system - plan fill of nine acres of wetland, excavate 1.2 acre wetland to - 6.0' ± NGVD to create seven deepwater wetland marshes - internal dikes and three water control structures.

General Conditions:

8. See FDER Permit S013-153804.
14. See FDER Permit S013-153804.

Special Conditions:

1. Cannot commence construction, excavation, or any activity involving use of sovereign land until permittee has obtained the appropriate FDNR license, lease, etc.
3. Notify in writing FDER WPB and Tallahassee, at least 48 hours prior to start work of date of commencement of work.
4. Semiannual narrative reports shall be submitted to the Bureau of Wetland Resource Management, Tallahassee, and the DER Southeast District office in West Palm Beach indicating the status of the project and shall include the following information:
 - a) Date permitted activity was begun; if work has not begun on-site, please so indicate.
 - b) Brief description and extent of work (fill, construction, wetland enhancement) completed since the previous report or since permit was issued. Indicate on copies of the permit drawings those areas where work has been completed.
 - c) Brief description and extent of work (fill, construction, wetland enhancement) anticipated in the next six months. Indicate on copies of the permit drawings those areas where it is anticipated that work will be done.

The status reports may be incorporated into the semiannual narrative report of the mitigation monitoring.

The first semiannual report is due six months from the date of permit issuance.

5. Prior to the initiation of construction, the areas of excavation and fill shall be staked. The permittee shall arrange a site inspection by personnel from the DER Southeast District office in West Palm Beach at least 48 hours prior to the commencement of construction to review the staking and to confirm that the staked alignment conforms to the alignment shown in the attached drawings. In the event the parties mutually agree to a more desirable alignment during the site inspection, the permittee shall submit a written request to revise the alignment in the form of a permit modification to the Bureau of Wetland Resource Management.
6. To control turbidity, the permittee shall install the saltwater inflow structure and emergency overflow weir shown on Sheet 1 of 7 of the attached drawings prior

to beginning construction on the rest of the project. The inlet and discharge ends of this structure shall be temporarily plugged during all of the construction work authorized by this permit so as to not allow any discharge of water from the site during construction except under the conditions provided for below. Upon the completion of construction in the interior wetlands, the blockages of the inlet and discharge ends of the structure shall be removed.

In the event water levels within the 54 acre wetland during the construction period exceed the average high water levels which occurred within the wetland prior to construction (based on preconstruction water level data and data obtained by the continuous stage recorder required in Specific Condition No. 17), the permittee shall lower water levels to the preconstruction high water levels by temporarily opening the emergency overflow weir into Gould's channel, provided turbidity levels in the discharged water do not exceed 29 NTU's above background levels in Gould's channel. In the event that water levels within the 54 acre wetland exceed preconstruction water elevations or that turbidity levels within the 54 acre wetland exceeds 29 NTU's above background values in the wetland, the permittee shall contact the Bureau of Wetland Resource Management with a remedial plan of action for review and approval. The purpose of this condition is to maintain the viability of the existing wetland vegetation within the wetland without causing impoundment which can lead to death of the vegetation.

7. At all times, best management practices shall be implemented to prevent siltation, erosion, and turbid discharges in excess of state water quality standards, pursuant to Rule 17-302, F.A.C., locations. All work areas in wetlands shall be isolated from the adjacent undisturbed wetlands by staked filter cloth and hay bales. In addition to the use of staked hay bales and staked filter cloth, best management practices shall include, but are not limited to, staged construction and the deployment of turbidity screens. The permittee shall be responsible for the turbidity control devices being installed properly, inspected daily and maintained in good working order for the duration of construction. All areas disturbed by construction shall be sodded or otherwise stabilized within 72 hours of attaining final grades and at any other time as necessary to prevent erosion, siltation and turbid discharges in violation of state water quality standards in waters of the State. All berms, ditches and other areas disturbed by construction shall be stabilized with wetland plants, native hammock vegetation, sodding, grass seed, mulch, or other means prior to opening the emergency overflow weir into Gould's channel.
8. The permittee shall fully implement the stormwater treatment design approved by the South Florida Water Management District so that all stormwater that is discharged into the 54 acre wetland areas from the landfill meets applicable treatment requirements prior to entering the wetlands. No untreated water shall be discharged into the wetland for the life of the facility.
10. Subsequent to the excavation of the seven deepwater wetland marsh habitats, the excavation of the deepwater marsh distributor waterway, and the removal of exotic vegetation, as shown on Sheet 1 of 7 of the attached drawings, and prior to planting in the wetlands, a topographic survey with one ft. contour intervals based on a 50 ft. grid shall be conducted by a registered land surveyor. Certified copies of the survey shall be submitted to the Bureau of Wetland Resource Management in Tallahassee and the Department Southeast District office in West Palm Beach, and approval of the survey shall be obtained in writing from the Bureau of Wetland Resource Management prior to planting of the wetland vegetation authorized by this permit.

12. As additional mitigation for the wetland losses, the wetlands shall be planted with the species at the densities shown on the attached drawings labeled "planting densities". The wetland shall be monitored as described in the monitoring portion of the permit until the enhancement is determined to be successful.
13. The mixed mangrove and shallow water marsh wetland enhancement proposed for areas 1 and 2 shown on Sheet 2 of 7 of the attached drawings shall be considered successful when the following conditions are met:
 - a) Percent cover by non-nuisance, non-exotic wetland species shall be 80% or more. Percent cover shall be reported for the aggregate of those wetland species, relative to the total area, including a measure of percent cover by non-wetland species, bare ground and water. A list of the wetland species included in the aggregate shall be included. Wetland species shall be those listed in Florida Administrative Code Rule 17-301.400;
 - b) Nuisance and exotic species, such as cattail, primrose willow, Brazilian pepper, melaleuca, and duckweed are limited to 5% or less of the total cover.;
 - c) Not less than 26.8 ac. of mixed mangrove and shallow marsh wetlands are determined to be jurisdictional pursuant to section 403.817, F.S.
 - d) The mitigation wetlands are constructed in accordance with the permit requirements; and
 - e) The water quality standards being monitored for this permit are met.
14. The Laguncularia racemosa (white mangrove) wetland enhancement area shown on Sheet 2 of 7 of the attached drawings shall be considered successful when the following conditions are met:
 - a) Percent cover by red, white, or black mangroves shall be 80% or more. Percent cover shall be reported for white mangroves and the aggregate of those wetland species, relative to the total area, including a measure of percent cover by non-wetland species, bare ground and water. A list of the wetland species included in the aggregate shall be included. Wetland species shall be those listed in Florida Administrative Code Rule 17-301.400;
 - b) Nuisance and exotic species, such as cattail, primrose willow, Brazilian pepper, and melaleuca are limited to 5% or less of the total cover.;
 - c) Not less than 20 ac. of white mangrove wetlands are determined to be jurisdictional pursuant to Section 403.817, F.S.
 - d) The mitigation wetlands are constructed in accordance with the permit requirements; and
 - e) The water quality standards being monitored for this permit are met.
15. The deepwater marsh wetland enhancement areas shown on Sheet 1 of 7 of the attached drawings shall be considered successful when the following conditions are met:

- a) Nuisance and exotic species, such as cattail, primrose willow, Brazilian pepper, melaleuca, water hyacinth, and duckweed are limited to 5% or less of the total cover;
 - b) Not less than 1.2 ac. of deepwater marsh wetlands are determined to be jurisdictional pursuant to Section 403.817, F.S.
 - c) The mitigation wetlands are constructed in accordance with the permit requirements; and
 - d) The water quality standards being monitored for this permit are met.
16. The tropical hardwood hammock areas shown on Sheet 1 of 7 of the attached drawings shall be considered successful when the following criteria are met:
- a) Nuisance and exotic species, such as Brazilian pepper and melaleuca, are limited to 5% or less of the total cover. The success determination shall not be made within three years of the completion of planting.
17. Prior to the initiation of construction, a continuous stage recorder shall be placed in each Area 1 and in Areas 2 and 3, as shown on Sheet 1 of 7 of the attached drawings to monitor the water depth in each area. The data and an analysis of the data shall be submitted to the Bureau of Wetland Resource Management in Tallahassee and the Southeast District office in West Palm Beach immediately prior to construction and with subsequent semiannual mitigation reports. If it is determined by the Department that the weir control elevations are not resulting in wetland enhancement, the permittee shall propose a written remedial action plan to the Bureau of Wetland Resource Management for review and approval. Within 30 days of receiving written approval of the remedial action from the Department, the permittee shall implement the remedial action.
- The water depth monitoring program shall continue until the Department determines that the system is providing wetland enhancement and is sufficiently stable to discontinue the monitoring.
18. The water quality within each Area 1 and within Areas 2 and 3, as shown on Sheet 1 of 7 of the attached drawings shall be monitored as described in the monitoring portion of this permit, until the department determines that the system is stable, functioning properly and is not likely to result in water quality violations in the future.
19. The permittee recognizes that it has a continuing obligation to continue monitoring the wetland enhancement and water quality monitoring requirements of the permit and to correct any unsuccessful enhancement attempts or water quality violations beyond the expiration date of the permit until such time as the wetland mitigation success criteria and the water quality criteria specified by this permit have been fully met. If the enhancement and water quality monitoring requirements of the project are not deemed to be successful or acceptable six months prior to the permit expiration date, the permittee shall, prior to the permit expiration date, execute an agreement with the Department evidencing that obligation.
20. Prior to construction, the permittee shall provide construction grade plans and specifications to the Bureau of Wetland Resource Management and to the DER Southeast District Office in west Palm Beach. Construction shall not commence until these plans have been reviewed and approved in writing by the Department.

21. The emergency overflow weir shown on the drawing labeled "Flow Schematic structure South Dade Landfill" shall initially be constructed with a single 24 in. standpipe weir at a fixed elevation of 9.2 ft. NGVD. In the event future monitoring or the Dade County Department of Environmental Resource Management (DERM) dictate the installation of an additional standpipe weir, labeled as "Future DERM 24 inch Adjustable Overflow Weir (El. 5.0' - 9.1') on the above drawing, the permittee shall request that this structure be added through a permit modification to the Bureau of Wetland Resource Management prior to construction. In addition, the 48 in. adjustable overflow weir shown on the above drawing shall be adjustable between elevations 1.5 ft. and 3.0 ft. NGVD. The initial operating elevation shall be established by the Dade County Department of Environmental Resource Management in consultation with the Department Bureau of Wetland Resource Office in West Palm Beach. Any adjustments that are requested by the Dade County Department of Environmental Resource Management to the operating elevation between 1.5 ft. and 3.0 ft. NGVD will require consultation with and approval by the DER Bureau of Wetland Resource Management in Tallahassee and the Department Southeast District Office in West Palm Beach.

Monitoring reports indicating the elevation of the 48 in. adjustable overflow weir will be submitted quarterly to the Bureau of Wetland Resource Management for the life of the facility, and will show any and all changes in the elevation of the 48 in. adjustable overflow weir.

If at any time it is determined by the Bureau of Wetland Resource Management that the 54 ac. wetland enhancement area is not functioning as designed, the Department reserves the right to require a modification to the elevation of the 48 in. adjustable overflow weir. The Dade County Department of Environmental Resource Management will consult with the Department Bureau of Wetland Resource Management and the Department Southeast District Office in West Palm Beach and shall implement the requested operating elevation change within seven days of the Department's written request.

The elevation adjustment and monitoring requirements of this condition shall extend for the life of the facility, and shall be subject to the long term agreement, the language of which is attached to this permit. This long term agreement shall be executed by the permittee, returned to the Bureau of Wetland Resource Management in Tallahassee for review within 30 days of issuance of this permit and shall be recorded by the permittee in the Public Records of Dade County within 30 days of final approval of the executed agreement by the Bureau of Wetland Resource Management.

22. Within 30 days of permit issuance, the permittee shall enter into a binding long-term agreement with the Department, using the document attached to this permit. This agreement shall evidence the obligation of the permittee to comply with Specific Conditions Nos. 8, 17, 18, 19, and 21 for the life of the facility, notwithstanding the fact that this permit will expire in five years. This agreement shall be submitted to the Bureau of Wetland Resource Management for final review and execution. Upon written approval by the Department, the fully executed agreement shall be recorded by the permittee in the Public Records of Dade County, and proof of its recording shall be submitted to the Bureau of Wetland Resource Management within 60 days of permit issuance.

Monitoring Required:

1. Vegetation Monitoring:

The permittee shall furnish to the Bureau of Wetland Resource Management and the DER Southeast District Office in West Palm Beach annual statistical reports of vegetational sampling of the enhanced wetlands done by any mutually agreed upon method. Acceptable methods may be found in Daubenmire (1968), Oosting (1956), or Muller-Dombois and Ellenberg (1974).

Reports shall describe, when appropriate, the percent survival, density and percent cover of mangroves, and percent cover of listed herbaceous species. Data for listed nuisance or exotic species, as stated in Specific Condition no. 13, 14, 15, and 16, shall be tabulated separately from the remaining data. A listed species is one listed in Florida Administrative Code Rule 17-301.400. Reports shall also include an assessment of the jurisdictional status of each mitigation area. Data shall be taken during the summer growing season. Reports shall be submitted annually within four months of data acquisition until a determination of a successful enhancement has been made.

Semiannual narrative reports shall be submitted to the Bureau of Wetland Resource Management in Tallahassee and the DER Southeast District Office in West Palm Beach detailing the progress of this enhancement program. The reports should include: photographs taken from the same permanent stations (some of which must be located in the vegetation sampling areas), a description of problems encountered and solutions undertaken, and anticipated work for the following six months. The reports shall be submitted at six-month intervals, with the first report due six months from start of mitigation construction, and may be combined with the status reports required by specific Condition No. 4.

A monitoring plan describing sampling methods and report format, and map of sampling locations and photographic stations shall be submitted to the Department for approval prior to the first sampling event.

If the data indicate that the mitigation effort is not successful pursuant to Specific Condition No. 13, 14, 15, and 16 above, the supplicant shall present methods and proposals to be reviewed and approved in writing by the Department to ensure success of the effort.

The references cited above are the following:

Daubenmire, R. 1968. Plant Communities: A Textbook of Synecology. Harper & Row, New York. 300 pp.

Oosting, H. J. 1956. The Study of Plant Communities: An Introduction to Plant Ecology. W. H. Freeman, San Francisco. 440 pp.

Mueller-Dombois, D. and H. Ellenberg. 1974. Aims and Methods of Vegetation Ecology. John Wiley, New York. 547 pp.

2. Water Quality:

Frequency: monthly, until the Department determines that the frequency of monitoring can be reduced.

Location: on each side of the outfall spillway between each Area 1 and Area 2, on each side of the outfall spillway between Area 2 and 3, within the middle of Area 3, and within 20 ft. downstream of the emergency overflow weir in Gould's channel.

Parameters:

dissolved oxygen

pH

conductance

salinity

chlorophyll A and B

total phosphorous

total Kjeldahl nitrogen

unionized ammonia

Sampling Depth:

surface and one foot above bottom

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Permittee: Dade County Department of Solid Waste Management
Permit No. 131743959

All monitoring data shall be submitted within one week of analysis with documents containing the following information: (1) permit number; (2) dates of sampling and analysis; (3) a statement describing the methods used in collection, handling, storage and analysis of the samples; (4) a map indicating the sampling locations (5) a statement by the individual responsible for implementation of the sampling program concerning the authenticity, precision, limits of detection and accuracy of the data and (6) documentation that the laboratory doing the sampling and analyses has a quality assurance and control plan approved by the Department.

Monitoring reports shall also include the following information for each sample that is taken:

- (a) time of day samples taken;
- (b) water temperature (C°);
- (c) depth of water body;
- (d) depth of sample;
- (e) antecedent weather conditions; and
- (f) wind direction and velocity.

Monitoring reports shall be submitted to the Bureau of Wetland Resource Management in Tallahassee and to the Department of Environmental Regulation, Southeast District Office with the semiannual mitigation reports. Failure to submit reports in a timely manner constitutes grounds for revocation of the permit.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION

In re: File No. 131743959, Dade County
Dade County Department of Solid Waste Management

AGREEMENT

(permittee) and the State of Florida, Department of Environmental Regulation
("Department") agree as follows:

1. (permittee) has submitted an application for, and the Department has issued, dredge and fill permit number 131743959 authorizing construction of berms, water control structures, and associated dredging and filling to enhance the hydrology and habitat quality within a 54 acre wetland associated with the South Dade Landfill, a piece of real property described as:

XX - legal description

2. Such permit has been issued, and may only be issued, upon a finding by the Department that the (permittee) has provided reasonable assurances that the construction and operation of the facilities authorized in Permit NO. 131743959 will not cause applicable water quality standards to be violated and will not be contrary to the public interest.
3. (permittee) and the Department agree that such reasonable assurances have been provided only if certain general and specific conditions are met. All conditions of permit number 131743959 are incorporated herein.
4. Specific Condition number 8 requires that the following shall be applicable for the life of the facility:

The permittee shall fully implement the stormwater treatment design approved by the South Florida Water Management District so that all stormwater that is discharged into the 54 ac. wetland area from the landfill meets applicable treatment requirements prior to entering the wetlands. No untreated water shall be discharged into the wetland for the life of the facility.

5. Specific Condition number 17 requires that the following shall be applicable until the wetland enhancement effort is determined to be successful:

Prior to the initiation of construction, a continuous stage recorder shall be placed in each Area 1 and in Areas 2 and 3, as shown on Sheet 1 of 7 of the attached drawings to monitor the water depth in each area. The data and an analysis of the data shall be submitted to the Bureau of Wetland Resource Management in Tallahassee and the Southeast District office in West Palm Beach immediately prior to construction and with subsequent semiannual mitigation reports. If it is determined by the Department that the weir control elevations are not resulting in wetland enhancement, the permittee shall propose a written remedial action plan to the Bureau of Wetland Resource Management for review and approval. Within 30 days of receiving written approval for the remedial action from the Department, the permittee shall implement the remedial action.

The water depth monitoring program shall continue until the Department determines that the system is providing wetland enhancement and is sufficiently stable to discontinue the monitoring.

6. Specific Condition number 18 requires that the following shall be applicable until a successful determination is made by the Department:

The water quality within each Area 1 and within Areas 2 and 3, as Sheet 1 of 7 of the attached drawings shall be monitored as described the monitoring portion of this permit, until the Department determines the system is stable, functioning properly and is not likely to result in water quality violations in the future.

7. Specific Condition number 19 requires that the following be met for the life of the facility:

The permittee recognizes that it has a continuing obligation to continue monitoring the wetland enhancement and water quality monitoring requirements of the permit and to correct any unsuccessful enhancement attempts or water quality violations beyond the expiration date of permit until such time as the wetland mitigation success criteria water quality criteria specified by this permit have been fully met. If the enhancement and water quality monitoring requirements of the permit are not deemed to be successful or acceptable six months prior to permit expiration date, the permittee shall, prior to the permit date, execute an agreement with the Department evidencing that obligation.

8. Specific Condition number 21 requires the following monitoring and water level control procedures for the life of the facility:

The emergency overflow weir shown on the drawing labeled "Flow Schematic Control Structure South Dade Landfill" shall initially be constructed with 24 in. standpipe weir at a fixed elevation of 9.2 ft. NGVD. In the future monitoring or the Dade County Department of Environmental Management (DERM) dictate the installation of an additional standpipe labeled as "Future DERM 24 inch Adjustable Overflow Weir (El. 5.0 on the above drawing, the permittee shall request that this structure added through a permit modification to the Bureau of Wetland Resource overflow weir shown on the above drawing shall be adjustable between elevations 1.5 ft. and 3.0 ft. NGVD. The initial operating elevation be established by the Dade County Department of Environmental Resource Management in consultation with the Department Bureau of Wetland Resource Management in Tallahassee and the Department Southeast District of West Palm Beach. Any adjustments that are requested by the Dade County Department of Environmental Resource Management to the operating elevations between 1.5 ft. and 3.0 ft. NGVD will require consultation with an approval by the DER Bureau of Wetland Resource Management in Tallahassee and the Department Southeast District Office in West Palm Beach.

Monitoring reports indicating the elevation of the 48 in. adjustable overflow weir will be submitted quarterly to the Bureau of Wetland Management for the life of the facility, and will show any and all in the elevation of the 48 in. adjustable overflow weir.

If at any time it is determined by the Bureau of Wetland Resource Management that the 54 ac. wetland enhancement area is not functioning as designed, the Department reserves the right to require a modification the elevation of the 48 in. adjustable overflow weir. The Dade County Department of Environmental Resource Management will consult with the Department Bureau of Wetland Resource Management and the Department's Southeast District Office in West

Palm Beach and shall implement the requested operating elevation change within seven days of the Department written request.

The elevation adjustment and monitoring requirements of this condition shall extend for the life of the facility, and shall be subject to this long term agreement, the language of which is attached to this permit. This long term agreement shall be executed by the permittee, returned to Bureau of Wetland Resource Management in Tallahassee for review within 30 days of issuance of this permit, and shall be recorded by the Department of Solid Waste Management in the Public Records of Dade County within 60 days of final approval of executed agreement by the Bureau of Wetland Resource Management.

9. (permittee) agrees and acknowledges its obligation, in meeting the above-referenced water quality and public interest tests, to abide by Specific Condition numbers 8, 17, 18, 19, and 21 for as long as the authorized facilities are in operation and use, notwithstanding that the permit expires on _____, 19____.
10. This agreement is an Order under Chapter 120, Florida Statutes, enforceable by the Department utilizing the remedies provided by Chapters 403 and 120, Florida Statutes.
11. Within thirty (30) days from the execution of this agreement, (permittee) shall cause this agreement to be recorded in the public records of Dade County, Florida. A copy of the recorded agreement shall be sent to the Department within 5 days of recording.
12. This agreement runs with the land and is binding upon (permittee), its successors and assigns.
13. This agreement is entered into in consideration of the issuance by the department of permit number <Permit Number>.

DEPARTMENT OF
ENVIRONMENTAL REGULATION

PERMITTEE

Carol M. Browner
Secretary

DATE

DATE

ACKNOWLEDGEMENT

STATE OF FLORIDA
COUNTY OF LEON

The foregoing instrument was acknowledged before me this day of _____, 1992 by Carol M. Browner, Secretary of the State of Florida Department of Environmental Regulation, on behalf of the Department.

Notary Public
My Commission Expires:

ACKNOWLEDGEMENT

DRAFT

Begin/End: 14 May 1987/N/A

Activity: Construction and operation of a water management system serving 46 acres of sanitary landfill with total on-site retention (S. Dade Shredded Waste Landfill Facility - Cell #3)

Special Conditions:

1. All facilities shall meet FDER requirements.
2. There shall be no off-site discharge as a result of dewatering activities conducted at this site.
3. Facilities other than those stated herein shall not be constructed without an approved modification of this permit.
4. The permittee shall be responsible for the correction of any erosion, shoaling or water quality problems that result from the construction or operation of the surface water management system.
5. Measures shall be taken during construction to insure that sedimentation and/or turbidity problems are not created in the receiving water.
6. The permittee shall be responsible for the correction of any water quality problems that result from the construction or operation of the surface water management system.
7. The district reserves the right to require that water quality treatment methods be incorporated into the drainage system if such measures are shown to be necessary.
8. Operation of the surface water management system shall be the responsibility of Metropolitan Dade County Public Works Department.
9. Prior to the initiation of any withdrawal of water (irrigation, dewatering, public water supply, etc.), it will be necessary to apply for a water use permit. The permittee is cautioned that a minimum of 90 days is required for consideration of the water use permit application. The permittee is cautioned that the issuance of a surface water management permit shall not be construed to be a guarantee that water will be available.
10. Prior to the commencement of construction of future phases, paving, grading and drainage plans shall be submitted to the district for review and approval.
11. The permittee shall submit to the district all groundwater monitoring data required by FDER.

Limiting Conditions:

1. The permittee shall prosecute the work authorized in a manner so as to minimize any adverse impact of the works on fish, wildlife, natural environmental values and water quality. The permittee shall institute necessary measures during the construction period, including full compaction of any fill material placed around newly installed structures, to reduce erosion turbidity, nutrient loading and sedimentation in the receiving waters.

2. Water quality data for the water discharged from the permittee's property or into surface waters of the state shall be submitted to the district as required. Parameters to be monitored may include those listed in Chapter 17-3. If water quality data is required, the permittee shall provide data as required, on volumes of water discharged during the days of sampling and total monthly discharges from the property or into the surface waters of the state.
3. The permittee shall comply with all applicable local subdivision regulations and other local requirements. In addition, the permittee shall obtain all necessary federal, state, local and special district authorizations prior to the start of any construction or alteration of works authorized by this permit.
4. The operation phase of this permit shall not become effective until a Florida registered professional engineer certifies that all facilities have been constructed in accordance with the design approved by the district. Within 30 days after completion of construction of the surface water management system, the permittee shall submit the certification and notify the district that the facilities are ready for inspection and approval. Upon approval of the completed surface water management system, the permittee shall request transfer of the permit to the responsible entity approved by the district.
5. All roads shall be set at or above elevations required by the applicable local government flood criteria.
6. All building floors shall be set at or above elevations acceptable to the applicable local government.
7. Off-site discharges during construction and development shall be made only through the facilities authorized by this permit. No roadway or building construction shall commence on-site until completion of the permitted discharge structure and detention areas. Water discharged from the project shall be through structures having a mechanism suitable for regulating upstream water stages. Stages may be subject to operating schedules satisfactory to the district.
8. No construction authorized herein shall commence until a responsible entity acceptable to the district has been established and has agreed to operate and maintain the system. The entity must be provided with sufficient ownership so that it has control over all water management facilities authorized herein. Upon receipt of written evidence of the satisfaction of this condition, the district will issue an authorization to commence construction.
9. The permit does not convey to the permittee any property right nor any rights or privileges other than those specified in the permit and Chapter 40-E, FAC.
10. The permittee shall hold and save the district harmless from any and all damages, claims or liabilities which may arise by reason of the construction, operation, maintenance or use of any facility authorized by the permit.
11. This permit is issued based on the applicant's submitted information which reasonably demonstrates that adverse off-site water resource related impacts will not be caused by the completed permit activity. It is also the responsibility of the permittee to insure that adverse off-site water resource related impacts do not occur during construction.
12. Prior to dewatering, plans shall be submitted to the district for approval. Information shall include as a minimum: pump sizes, locations and hours of operation for each pump. If off-site discharge is proposed or off-site adverse

impacts are evident, an individual water use permit may be required. The permittee is cautioned that several months may be required for consideration of the water use permit application.

DRAFT

SFWMD MSSW 13-00166-S MODIFICATION JULY 12, 1990

Begin/End: July 12, 1990/N/A [Ref Application No. 900118-9 dated Jan. 11, 1990]

Activity: Construction and operation of a water management system serving 20.1 acres of industrial lands with total on-site retention

Special Conditions:

1. All facilities shall meet FDER requirements.
2. Discharge facilities:
Description: None
Receiving Water: N/A
Control Elevation: 2.0 feet NGVD (W.S.W.T.)
3. The permittee shall be responsible for the correction of any erosion, shoaling or water quality problems that result from the construction or operation of the surface water management system.
4. Measures shall be taken during construction to insure that sedimentation and/or turbidity problems are not created in the receiving water.
5. The district reserves the right to require that water quality treatment methods be incorporated into the drainage system if such measures are shown to be necessary.
6. Operation of the surface water management system shall be the Dade County Solid Waste Management. If, at any time, the permittee transfers ownership of any portion of the property to a third party, modification of the permit will be required.
7. Prior to the initiation of any withdrawal of water (irrigation, dewatering, public water supply, etc.), it will be necessary to apply for a water use permit. The permittee is cautioned that a minimum of 90 days is required for consideration of the water use permit application. The permittee is cautioned that the issuance of a surface water management permit shall not be construed to be a guarantee that water will be available.
8. Lake side slopes shall be 4:1 (horizontal : vertical) to a depth of two feet below the control elevation. Side slopes shall be nurtured or planted from two feet below to one foot above control elevation to insure vegetative growth.
9. No dewatering activities will be permitted at this site.
10. All ground water data submitted to FDER shall also be submitted to this District.
11. Leachate as defined in CH 17-701, FAC shall not enter and/or mix storm water. Storm water containing leachate shall be treated and disposed of as leachate.
12. Any modifications to the surface water management system will require modification to this permit.

Limiting Conditions:

1. The permittee shall prosecute the work authorized in a manner so as to minimize any adverse impact of the works on fish, wildlife, natural environmental values

and water quality. The permittee shall institute necessary measures during the construction period, including full compaction of any fill material placed around newly installed structures, to reduce erosion turbidity, nutrient loading and sedimentation in the receiving waters.

2. Water quality data for the water discharged from the permittee's property or into surface waters of the state shall be submitted to the district as required. Parameters to be monitored may include those listed in Chapter 17-3. If water quality data is required, the permittee shall provide data as required, on volumes of water discharged during the days of sampling and total monthly discharges from the property or into the surface waters of the state.
3. The permittee shall comply with all applicable local subdivision regulations and other local requirements. In addition, the permittee shall obtain all necessary federal, state, local and special district authorizations prior to the start of any construction or alteration of works authorized by this permit.
4. The operation phase of this permit shall not become effective until a Florida registered professional engineer certifies that all facilities have been constructed in accordance with the design approved by the district. Within 30 days after completion of construction of the surface water management system, the permittee shall submit the certification and notify the district that the facilities are ready for inspection and approval. Upon approval of the completed surface water management system, the permittee shall request transfer of the permit to the responsible entity approved by the district.
5. All roads shall be set at or above elevations required by the applicable local government flood criteria.
6. All building floors shall be set at or above elevations acceptable to the applicable local government.
7. Off-site discharges during construction and development shall be made only through the facilities authorized by this permit. No roadway or building construction shall commence on-site until completion of the permitted discharge structure and detention areas. Water discharged from the project shall be through structures having a mechanism suitable for regulating upstream water stages. Stages may be subject to operating schedules satisfactory to the district.
8. No construction authorized herein shall commence until a responsible entity acceptable to the district has been established and has agreed to operate and maintain the system. The entity must be provided with sufficient ownership so that it has control over all water management facilities authorized herein. Upon receipt of written evidence of the satisfaction of this condition, the district will issue an authorization to commence construction.
9. The permit does not convey to the permittee any property right nor any rights or privileges other than those specified in the permit and Chapter 40-E, FAC.
10. The permittee shall hold and save the district harmless from any and all damages, claims or liabilities which may arise by reason of the construction, operation, maintenance or use of any facility authorized by the permit.
11. This permit is issued based on the applicant's submitted information which reasonably demonstrates that adverse off-site water resource related impacts will not be caused by the completed permit activity. It is also the responsibility of the

permittee to insure that adverse off-site water resource related impacts do not occur during construction.

12. Prior to dewatering, plans shall be submitted to the district for approval. Information shall include as a minimum: pump sizes, locations and hours of operation for each pump. If off-site discharge is proposed or off-site adverse impacts are evident, an individual water use permit may be required. The permittee is cautioned that several months may be required for consideration of the water use permit application.

SFWMD MSSW 13-00166-S MODIFICATION #13-00166-S-01

Begin/End: 12 Dec 1991/N/A [Ref. Application No. 911014-6 dated 13 Sept 1991]

Activity: Modification of a surface water management system to serve 1.16 acre of sanitary landfill with total retention on-site.
[South Dade Solid Waste Reduction Facility]

Special Conditions:

1. Discharge facilities:
Description: Total on-site retention
Receiving water: N/A
Control elevation: 2.0 feet NGVD
2. The permittee shall be responsible for the correction of any erosion, shoaling or water quality problems that result from the construction or operation of the surface water management system.
3. Measures shall be taken during construction to insure that sedimentation and/or turbidity problems are not created in the receiving water.
4. The district reserves the right to require that additional water quality treatment methods be incorporated into the drainage system if such measures are shown to be necessary.
5. Lake side slopes shall be 4:1 (horizontal:vertical) to a depth of two feet below the control elevation. Side slopes shall be nurtured or planted from 2 feet below to 1 foot above control elevation to insure vegetative growth.
6. Prior to the initiation of any withdrawal of water (irrigation, dewatering, public water supply, etc.), it will be necessary to apply for a water use permit. The permittee is cautioned that a minimum of 90 days is required for consideration of the water use permit application. The permittee is cautioned that the issuance of a surface water management permit shall not be construed to be a guarantee that water will be available.
7. Any modifications to the surface water management system will require a modification to this permit.
8. Facilities other than those stated herein shall not be constructed without an approved modification of this permit.
9. Prior to January 11, 1992, the South Florida Water Management District shall be notified by the permittee or authorized agent of the actual or anticipated construction start date and the expected completion date/duration.
10. When the duration of construction exceeds one year, construction status reports shall be submitted to the South Florida Water Management District on an annual basis (via the supplied annual status report or equivalent) beginning one year after the initial commencement of construction date.
11. Within 30 days after completion of construction of the surface water management system, the permittee or authorized agent shall notify the South Florida Water Management District of that completion date and submit certification by a Florida registered professional engineer that all facilities have been constructed in accordance with the design approved by the district (via the supplied construction completion/construction certification or equivalent). Such certification may consist of wording in paragraph 3.1.7 "Construction Completion Certification" of

the current basis of review for surface water management permit applications within the South Florida Water Management District. If the certification language used is different from the suggested language, a set of record drawings consisting of elevations, locations and dimensions of components of the surface water management system shall also be submitted.

12. Operation of the surface water management system shall be the responsibility of Metro Dade County Solid Waste Management. Prior to transfer of title for any portion of the project to a third party, modification of the permit will be required to verify continued compliance with limiting condition no. 8.
13. All ground water data to be submitted to the Florida Department of Environmental Regulation shall also be submitted to this district.
14. All facilities shall meet Florida Department of Environmental Regulation requirements of Chapter 17-701, Florida Administrative Code.
15. No dewatering activities will be permitted at this site.
16. Leachate as defined in Chapter 17-701, Florida Administrative Code, shall not enter and/or mix with storm water. Storm water containing leachate shall be treated and disposed of as leachate.

Limiting Conditions:

1. The permittee shall prosecute the work authorized in a manner so as to minimize any adverse impact of the works on fish, wildlife, natural environmental values and water quality. The permittee shall institute necessary measures during the construction period, including full compaction of any fill material placed around newly installed structures, to reduce erosion turbidity, nutrient loading and sedimentation in the receiving waters.
2. Water quality data for the water discharged from the permittee's property or into surface waters of the state shall be submitted to the district as required. Parameters to be monitored may include those listed in Chapter 17-3. If water quality data is required, the permittee shall provide data as required, on volumes of water discharged during the days of sampling and total monthly discharges from the property or into the surface waters of the state.
3. The permittee shall comply with all applicable local subdivision regulations and other local requirements. In addition, the permittee shall obtain all necessary federal, state, local and special district authorizations prior to the start of any construction or alteration of works authorized by this permit.
4. The operation phase of this permit shall not become effective until a Florida registered professional engineer certifies that all facilities have been constructed in accordance with the design approved by the district. Within 30 days after completion of construction of the surface water management system, the permittee shall submit the certification and notify the district that the facilities are ready for inspection and approval. Upon approval of the completed surface water management system, the permittee shall request transfer of the permit to the responsible entity approved by the district.
5. All roads shall be set at or above elevations required by the applicable local government flood criteria.

6. All building floors shall be set at or above elevations acceptable to the applicable local government.
7. Off-site discharges during construction and development shall be made only through the facilities authorized by this permit. No roadway or building construction shall commence on-site until completion of the permitted discharge structure and detention areas. Water discharged from the project shall be through structures having a mechanism suitable for regulating upstream water stages. Stages may be subject to operating schedules satisfactory to the district.
8. No construction authorized herein shall commence until a responsible entity acceptable to the district has been established and has agreed to operate and maintain the system. The entity must be provided with sufficient ownership so that it has control over all water management facilities authorized herein. Upon receipt of written evidence of the satisfaction of this condition, the district will issue an authorization to commence construction.
9. The permit does not convey to the permittee any property right nor any rights or privileges other than those specified in the permit and Chapter 40-E, FAC.
10. The permittee shall hold and save the district harmless from any and all damages, claims or liabilities which may arise by reason of the construction, operation, maintenance or use of any facility authorized by the permit.
11. This permit is issued based on the applicant's submitted information which reasonably demonstrates that adverse off-site water resource related impacts will not be caused by the completed permit activity. It is also the responsibility of the permittee to insure that adverse off-site water resource related impacts do not occur during construction.
12. Prior to dewatering, plans shall be submitted to the district for approval. Information shall include as a minimum: pump sizes, locations and hours of operation for each pump. If off-site discharge is proposed or off-site adverse impacts are evident, an individual water use permit may be required. The permittee is cautioned that several months may be required for consideration of the water use permit application.

SFWMD/MSSW/13-00166-S/14 MAY 1987/ MODIFICATION OF 12 DECEMBER 1991
[293AC]

Begin/End: 12 December 1991/ N/A

Activity: Modification of a surface water management system to serve 293.0 acres
of sanitary landfill with total retention on-site (South Dade Landfill)

Special Conditions:

1. Discharge facilities:
Description:
Basin 1 and Basin 2: Total on-site retention of the 100 year-3 day storm event
Receiving water: N/A
Control elevation: 2.0 feet NGVD
2. The permittee shall be responsible for the correction of any erosion, shoaling or water quality problems that result from the construction or operation of the surface water management system.
3. Measures shall be taken during construction to insure that sedimentation and/or turbidity problems are not created in the receiving water.
4. The district reserves the right to require that additional water quality treatment methods be incorporated into the drainage system if such measures are shown to be necessary.
5. Lake side slopes shall be 4:1 (horizontal:vertical) to a depth of two feet below the control elevation. Side slopes shall be nurtured or planted from 2 feet below to 1 foot above control elevation to insure vegetative growth.
6. Prior to the initiation of any withdrawal of water (irrigation, dewatering, public water supply, etc.), it will be necessary to apply for a water use permit. The permittee is cautioned that a minimum of 90 days is required for consideration of the water use permit application. The permittee is cautioned that the issuance of a surface water management permit shall not be construed to be a guarantee that water will be available.
7. Any modifications to the surface water management system will require a modification to this permit.
8. Facilities other than those stated herein shall not be constructed without an approved modification of this permit.
9. A benchmark shall be provided in the vicinity of the control structure and a description provided to the district when available.
10. Prior to February 15, 1992, the South Florida Water Management District shall be notified by the permittee or authorized agent of the actual or anticipated construction start date and the expected completion date/duration.
11. Within 30 days after completion of construction of the surface water management system, the permittee or authorized agent shall notify the South Florida Water Management District of that completion date and submit certification by a Florida registered professional engineer that all facilities have been constructed in accordance with the design approved by the district (via the supplied construction completion/ construction certification or equivalent). Such certification may consist of wording in paragraph 3.1.7 "Construction Completion Certification" of the current basis of review for surface water management permit applications

within the South Florida Water Management District. If the certification language used is different from the suggested language, a set of record drawings consisting of elevations, locations and dimensions of components of the surface water management system shall also be submitted.

12. Operation of the surface water management system shall be the responsibility of Metro Dade County Solid Waste Management. Prior to transfer of title for any portion of the project to a third party, modification of the permit will be required to verify continued compliance with limiting condition no. 8.
13. All ground water data to be submitted to the Florida Department of Environmental Regulation shall also be submitted to this district.
14. If the surface water management plan is changed as a result of the permitting requirements of the Florida Department of Environmental regulation, U.S. Army Corps of Engineers or Dade County DERM, a modification to the surface water management permit may be required.
15. No dewatering activities will be permitted at this site.
16. Leachate as defined in Chapter 17-701, Florida Administrative Code, shall not enter and/or mix with storm water. Storm water containing leachate shall be treated and disposed of as leachate.
17. A berm shall be constructed around all working cells to prevent any runoff from entering the surface water management system.
18. The sides of all waste cells shall be covered and vegetated as soon as possible in accordance with chapter 17-701, FAC.
19. Leachate as defined in chapter 17-701, Florida Administrative code shall not enter and/or mix with storm water. Storm water containing leachate shall be treated and disposed of as leachate.
20. Prior to landfill closure for cells 3,4 and 5, a request for permit modification shall be submitted detailing measures to be taken during and after closure of the site.
21. Water quality samples shall be taken at the discharge location of the two bubble-up/spillway structures during periods of discharge as shown on exhibit 2. A laboratory certified by the state of Florida shall be responsible for all water sampling and analyses. Reports including permit numbers shall be submitted to this district on a semi-annual basis. Initial sampling results shall be reported to the district prior to July 16, 1992. The district will evaluate and make a determination as to whether the discharge degrades receiving water and conforms to state water quality standards as defined in chapter 17-302, FLorida Administrative Code. If water quality problems develop, the district reserves the right to require more frequent sampling and more thorough analyses in order to provide assurance that the discharging will not cause additional off-site water quality impacts. The samples should be analyzed on a monthly basis for the following parameters.

PARAMETERS

Total organic carbon, dissolved oxygen, pH, turbidity, specific conductance, chemical oxygen demand, total suspended solids, alkalinity, nitrate/nitrite (as N) ammonia (as N), total phosphate, sulfate, chloride, total and fecal coliform, arsenic, aluminum, chromium, cadmium, copper, iron, lead, mercury and zinc.

22. Upon completion of construction, and on an annual basis (March of each year) the permittee shall submit reports to this district for structural adequacy of all above ground dikes, levees and berms behind which water is to be contained and where failure could impact off-site areas. Such reports shall include proposal of technique and schedule for repair of any deficiencies, noted and shall be signed and sealed by a Florida registered professional engineer.
23. No dewatering activities will be permitted at this site except for remedial plan as approved in the concurrent water use permit.
24. Prior to the removal of planks in the emergency overflow weir in basin 1, notification must be sent to and written approval must be obtained from South Florida Water Management District, in accordance with exhibit no. 16 of the SFWMD staff report
25. No works shall commence within the 54 acre wetland retention basin (basin 2) until a permit has been issued by the Florida Department of Environmental Regulation (FDER), Division of Water Management, Tallahassee, for all proposed works within the retention basin (excluding work associated with the remedial action plan). A copy of the FDER permit shall be submitted to SFWMD staff, when available.

Limiting Conditions:

1. The permittee shall prosecute the work authorized in a manner so as to minimize any adverse impact of the works on fish, wildlife, natural environmental values and water quality. The permittee shall institute necessary measures during the construction period, including full compaction of any fill material placed around newly installed structures, to reduce erosion, turbidity, nutrient loading and sedimentation in the receiving waters.
2. Water quality data for the water discharged from the permittee's property or into surface waters of the state shall be submitted to the district as required. Parameters to be monitored may include those listed in Chapter 17-3. If water quality data is required, the permittee shall provide data as required, on volumes of water discharged during the days of sampling and total monthly discharges from the property or into the surface waters of the state.
3. The permittee shall comply with all applicable local subdivision regulations and other local requirements. In addition, the permittee shall obtain all necessary federal, state, local and special district authorizations prior to the start of any construction or alteration of works authorized by this permit.
4. The operation phase of this permit shall not become effective until a Florida registered professional engineer certifies that all facilities have been constructed in accordance with the design approved by the district. Within 30 days after completion of construction of the surface water management system, the permittee shall submit the certification and notify the district that the facilities are ready for inspection and approval. Upon approval of the completed surface water management system, the permittee shall request transfer of the permit to the responsible entity approved by the district.
5. All roads shall be set at or above elevations required by the applicable local government flood criteria.
6. All building floors shall be set at or above elevations acceptable to the applicable local government.

7. Off-site discharges during construction and development shall be made only through the facilities authorized by this permit. No roadway or building construction shall commence on-site until completion of the permitted discharge structure and detention areas. Water discharged from the project shall be through structures having a mechanism suitable for regulating upstream water stages. Stages may be subject to operating schedules satisfactory to the district.
8. No construction authorized herein shall commence until a responsible entity acceptable to the district has been established and has agreed to operate and maintain the system. The entity must be provided with sufficient ownership so that it has control over all water management facilities authorized herein. Upon receipt of written evidence of the satisfaction of this condition, the district will issue an authorization to commence construction.
9. The permit does not convey to the permittee any property right nor any rights or privileges other than those specified in the permit and Chapter 40-E, FAC.
10. The permittee shall hold and save the district harmless from any and all damages, claims or liabilities which may arise by reason of the construction, operation, maintenance or use of any facility authorized by the permit.
11. This permit is issued based on the applicant's submitted information which reasonably demonstrates that adverse off-site water resource related impacts will not be caused by the completed permit activity. It is also the responsibility of the permittee to insure that adverse off-site water resource related impacts do not occur during construction.
12. Prior to dewatering, plans shall be submitted to the district for approval. Information shall include as a minimum: pump sizes, locations and hours of operation for each pump. If off-site discharge is proposed or off-site adverse impacts are evident, an individual water use permit may be required. The permittee is cautioned that several months may be required for consideration of the water use permit application.

SFWMD MSSW 13-00166-W

Begin/End: 12 December 1991/12 December 1996

Activity: Use groundwater from the Biscayne Aquifer via on-site trench for industrial use with an annual allocation of 210.00 million gallons (South Dade Landfill)

Limiting Conditions:

1. In the event of a declared water shortage, water withdrawal reductions will be ordered by the district in accordance with the water shortage plan, chapter 40E-21, Florida Administrative Code. During a water shortage pumpage reports may be necessary on a weekly basis.
2. Source classification is:
Groundwater from the Biscayne Aquifer via an on-site trench
3. Permittee shall mitigate to the satisfaction of the district any adverse impact on existing legal uses caused by withdrawals. When adverse impacts occur, or are imminent, district reserves the right to curtail withdrawal rates. Adverse impacts are:
 - A) Reduction in well water levels that impairs the ability of an adjacent well to produce water (an adjacent well may be a domestic well, lawn irrigation well, public water supply well, etc.);
 - B) significant reduction in levels in an adjacent water body such as a lake, pond or a canal system;
 - C) saline water intrusion or induction of pollutants into the water supply of an adjacent water use, resulting in a significant reduction in water quality, and
 - D) change in water quality that causes impairment or loss of use of a well or water body.
4. Permittee shall mitigate to the satisfaction of the district any adverse impact on existing off-site land use as a consequence of withdrawals permitted herein. If increased withdrawals cause an adverse impact on existing land use, the district reserves the right to curtail future withdrawal rates. Adverse impacts are:
 - A) Significant reduction in water levels in an adjacent water body (such as a lake, pond, wetland or canal system);
 - B) land collapse or subsidence caused by reduction in water levels;
 - C) damage to crops and other vegetation, causing financial harm to the landowner; and
 - D) damage to habitat of rare, endangered species.
5. Permittee shall not refuse immediate entry or access to any authorized representative of the district who requests entry for the purposes of inspection and presents appropriate credentials.
6. If any condition of the permit is violated, the permit shall be subject to reviews and possible modification, enforcement action, or revocation.

7. Application for a permit modification may be made at any time.
8. Withdrawal facilities are:
Proposed:
2 - 12" x 15' horizontal wells with 6" x 480 GPM pumps
9. This permit shall expire on December 12, 1996.
10. Maximum annual allocation shall not exceed 210.00 MG.
Maximum daily allocation shall not exceed .5800 MG.
11. Use classification is industrial.
12. The permittee shall obtain all necessary federal, state, local and special district authorizations prior to use or withdrawal of water.
13. The permit does not convey any property right to the permittee, nor any rights and privileges other than those specified in the permit and chapter 40E-2, FAC.
14. Withdrawals on a daily basis shall be reported to the district monthly. Data submittal begins either in the month following the date of the permit issuance or in the month that water use is initiated.
15. Permittee shall establish a water quality monitoring program prior to June 12, 1993. The program shall be developed to monitor the contaminant plume and the saline interface and shall include collecting water level and water quality data in the vicinity of the withdrawals facilities. In developing the program, the permittee shall consider well localities, depth, method of construction, types of screen, methods of analysis, and frequency of data collection. A preliminary proposal shall be submitted to staff for approval prior to March 12, 1992.
16. Prior to December 12, 1994, the permittee shall investigate the availability, cost and feasibility of obtaining reclaimed water and actively participate in the discussions and negotiations with potential suppliers of reclaimed water when the supplies become available.

SFWMD/L-31E LEVEE STRUCTURE UPGRADE/9529

Begin/End: 12 December 1991/31 December 1993

Activity: Upgrade L-31E levee 2-60" R.C.P.'s for emergency overflow and 48" D.I.P. saltwater inflow pipe through the L-31E north right of way located adjacent to cell # 4 and the wetland retention basin, respectively.

Special Conditions:

1. This permit is issued by the district as a license to use or occupy district works or lands. It is revocable by the district for cause for the reasons stated in district rule 40E-6.341, Florida Administrative Code. The permittee expressly acknowledges that the permittee bears all risks of loss as a result of revocation of this permit.
2. The South Florida Water Management District is not responsible for damage to installations located within its right of way.
3. Permittee shall be responsible for the repair and/or replacement of existing facilities located within the South Florida Water Management District's rights of way.
4. Any additional facilities or alterations to existing facilities within the South Florida Water Management District's rights of way will require a modification of this permit.
5. Canal right of way disturbed during construction, installation and/or maintenance of the authorized facility shall be restored to original or better condition by the permittee.
6. Permittee is solely responsible for any relocation(s) which may be required as a result of this authorization. Likewise, the permittee is responsible for any notification or coordination with the owners of previously permitted facilities located within the district's rights of way.
7. Permittee recognizes that in an emergency situation any or all permitted items within the district's right of way are subject to immediate alteration, modification or removal by district forces. Any damage resulting therefrom is not the responsibility of the district.
8. A copy of the permit package will be kept at the job site until completion of all phases of construction.
9. Permittee recognized that upon the sale or transfer of the property, it is the permittee's responsibility to inform the new owner that a permit exists and that immediately following the sale of the property, a request for transfer of said permit must be submitted to the district.
10. No plugs, dams or fills are authorized within the L-31E (Goulds Canal) section.
11. The stockpiling of excavated material within the canal section is not authorized.
12. Invert elevation of proposed 2 - 60 " R.C.P. outfalls shall be set at -5.0' NGVD or lower.
13. Invert elevation of proposed 48" D.I.P. outfall shall be set at -4.0' NGVD or lower.

14. Any erosion and/or shoaling resulting from the installation and/or operation of the authorized facility shall be corrected by the permittee to the satisfaction of the district, at his sole expense.
15. The top of the rip-rap headwall for the 2 - 60" R.C.P. outfalls shall be of an elevation to match the existing grade.
16. Endwalls/headwalls will include adequate returns to prevent erosion.
17. Canal flows shall in no way be restricted, impeded or blocked during construction.
18. Turbidity screens shall be used during excavation and trench backfilling.
19. No dams or fills are authorized within the canal during construction of the authorized facility(ies).
20. All work shall be in accordance with applicable state of Florida, Department of Environmental Regulation's turbidity control standards, methods and requirements.
21. Prior to commencement of construction within the South Florida Management District right of way, the permittee shall contact the regional operations and maintenance director of the homestead field station to set up a pre-construction meeting.
22. District shall be notified 24 hours in advance of trench backfilling.
23. Trench shall be backfilled in 6 inch compacted lifts.
24. Permittee shall upgrade the L-31E levee to 10.5' NGVD and match the side slopes in accordance with the attached drawings.
25. Disturbed areas within the right of way will be grassed with Bahia sod, and pegged as required, upon completion of construction of the authorized facilities.
26. All material and debris shall be completely removed from the South Florida Water Management District's canal and rights of way.
27. Permittee shall not perform any vehicle maintenance activities or repair of vehicles within the right of way; nor shall any substances and/or parts associated with the repair and/or maintenance of any vehicles be used, stored or discarded within the right of way.
28. All work associated with the installation of the authorized facility shall be performed within a 25 foot wide work corridor centered on the culvert (or installation) alignment.
29. Permittee shall carefully remove all exotic vegetation, i.e., Brazilian pepper, Australian pine and Melaleuca from within the district's rights of way throughout the limits of the project and keep the right of way free of said vegetation throughout the life of this permit.
30. Permittee shall replace any white, black or red mangroves destroyed during exotic vegetation removal or installation of the saltwater inflow structure with nursery grown stock of the same species.

31. This permit shall not become valid until permits have been obtained from Department of Environmental Regulation, if required.
32. The permittee shall comply with any more stringent conditions set forth in other permits if required by Department of Environmental Regulation.
33. This permit shall not become valid without a concurrently issued surface water management and water use permit from this district.

DRAFT

SFWMD/RIGHT OF WAY USE/9530

Begin/End: 12 December 1991/31 December 1993

Activity: Use of the south 50 feet of the south right of way of C-1 for use as a temporary access road between district station 42+00 to 77+00

Special Conditions:

1. This permit is issued by the district as a license to use or occupy district works or lands. It is revocable by the district for cause for the reasons stated in district rule 40E-6.341, Florida Administrative Code. The permittee expressly acknowledges that the permittee bears all risks of loss as a result of revocation of this permit.
2. The South Florida Water Management District is not responsible for damage to installations located within its right of way.
3. Permittee shall be responsible for the repair and/or replacement of existing facilities located within the South Florida Water Management District's rights of way.
4. Any additional facilities or alterations to existing facilities within the South Florida Water Management District's rights of way will require a modification of this permit.
5. Canal right of way disturbed during construction, installation and/or maintenance of the authorized facility shall be restored to original or better condition by the permittee.
6. Permittee is solely responsible for any relocation(s) which may be required as a result of this authorization. Likewise, the permittee is responsible for any notification or coordination with the owners of previously permitted facilities located within the district's rights of way.
7. Permittee recognizes that in an emergency situation any or all permitted items within the district's right of way are subject to immediate alteration, modification or removal by district forces. Any damage resulting therefrom is not the responsibility of the district.
8. A copy of the permit package will be kept at the job site until completion of all phases of construction.
9. Permittee recognizes that upon the sale or transfer of the property, it is the permittee's responsibility to inform the new owner that a permit exists and that immediately following the sale of the property, a request for transfer of said permit must be submitted to the district.
10. Prior to commencement of construction within the South Florida Management District right of way, the permittee shall contact the regional operations and maintenance director of the homestead field station to set up a pre-construction meeting.
11. Disturbed areas within the right of way will be grassed with Bahia sod, and pegged as required, upon completion of construction of the authorized facilities.
12. All material and debris shall be completely removed from the South Florida Water Management District's canal and rights of way.

13. Permittee shall not perform any vehicle maintenance activities or repair of vehicles within the right of way; nor shall any substances and/or parts associated with the repair and/or maintenance of any vehicles be used, stored or discarded within the right of way.
14. The use of the district's right of way for storage and/or parking of equipment or construction vehicles/equipment is not authorized by this permit.
15. Permittee shall restrict all access and stockpiling of material to the south 50' of the right of way.
16. Permittee shall carefully remove all exotic vegetation, i.e., Brazilian pepper, Australian pine and Melaleuca from within the district's rights of way throughout the limits of the project and keep the right of way free of said vegetation throughout the life of this permit.
17. This permit shall not become valid until permits have been obtained from Department of environmental Regulation, if required.
18. The permittee shall comply with any more stringent conditions set forth in other permits if required by Department of Environmental Regulation.
19. This permit shall not become valid without a concurrently issued surface water management and water use permit from this district.

DERM/FRESHWATER WETLANDS D & F/FW 90-049

Begin/End: 22 January 92/22 January 95

Activity: Fill 100 acres of freshwater wetlands for completion of the South Dade Landfill (cells 4 & 5); off-site enhancement of 130 acres of freshwater wetlands in Metro Dade County Park and Recreation property at M.E. Thompson Park

Special Conditions:

1. All of the plans and documents referenced on page 2 of this permit are a part of the conditions of this permit. In case of conflict between any of these plans and any condition of this permit, a determination as to which plan condition will be followed will be made by DERM.
2. The maximum area of the property that may be filled is 100 acres. NO ADDITIONAL FILL BEYOND THE LIMITS OF THIS AREA IS AUTHORIZED UNDER THIS PERMIT.
3. All fill material shall consist of clean limestone fill as depicted on the plans. No trash, garbage, wood, asphalt, roofing materials, tires, metals, cleared vegetation, building debris or similar materials are allowed to be used as fill. EVIDENCE THAT IMPROPER FILL MATERIAL HAS BEEN USED ON YOUR PROPERTY SHALL RESULT IN THE REVOCATION OF THIS PERMIT AND THE IMMEDIATE FILING OF AN ENFORCEMENT ACTION AGAINST YOU.
4. This permit does not authorize residential usage of the property nor does it authorize placement of a trailer on the property. Separate approval from Dade County Building and Zoning Department (375-2500) is required for these uses.
5. This permit authorizes only land clearing, demucking and base filling of the subject 100 acres. Other permits for the construction and operation of the landfill facilities built on this site will be the responsibility of other sections of DERM.
6. The permittee agrees to mitigate for impacts to wetlands by enhancing 130 acres of wetlands off-site at M.E. Thompson Park by removing Melaleuca in perpetuity. A detailed plan for this mitigation work must be submitted to this office within 60 days of the issuance of this permit. This plan must contain not only methods for exotic species removal but also methods for monitoring and maintenance. This plan must be reviewed and approved by DERM and Metropolitan Dade County Parks and Recreation Department prior to commencement of mitigation work. Initial Melaleuca removal shall be completed within two years of Class IV permit issuance.
7. (special condition 7 omitted from DERM permit Freshwater Wetlands D & F/FW90-049)
8. A plan for monitoring the community water supply (well) on the M.E. Thompson Park property must be submitted to the Planning and Evaluation and Water Supply Sections of DERM for review. This monitoring technique will test for any potential herbicides that could enter the drinking water supply following the herbicide application.
9. Mitigation monitoring techniques shall be conducted in accordance with the above-referenced approved mitigation plan. A baseline monitoring report shall be submitted to DERM within one (1) month following the initial exotic plant treatment. Subsequent reports shall be submitted to DERM on a quarterly basis

for the first year after exotic plant treatment, semiannual basis for the second and third years after exotic plant treatment and annually for the fourth and fifth years after exotic plant treatment.

10. All conditions of the Memorandum of Agreement between DERM and the Solid Waste Management Department as contained in the "Agreement Addressing Environmental Issues at the South Dade Landfill" (executed 5 February, 1991) and the "Agreement Addressing Environmental Issues at the County Owned Property Southwest of the Intersection of S.W. 248th Street and 97th Avenue" (executed 5 February, 1991) as approved by Resolution R-950-91 by the Board of County Commissioners of September 16, 1991, as well as any subsequent amendments, shall be followed.
11. DERM Biological Resources Section shall be notified a minimum of two (2) weeks prior to the commencement of work.
12. Permitting for the 54 acre stormwater retention and mitigation area which will be utilized for the runoff from closed portions of the landfill will be the subject of a future public hearing and subsequent Class I permit.
13. The 100 acres of wetlands in the C-111 Basin which the Department of Solid Waste Management will acquire pursuant to the Army Corps of Engineers Permit No. 901PG-04061 shall be coordinated with the Director of the Environmentally Endangered Lands Program for Dade County. This will help optimize the choice of location since other lands within this area are being proposed for acquisition.
14. The time allotted to complete the work for which this permit was issued shall be limited to the period stipulated on the permit unless the permit holder requests in writing an extension of time from the Department at least thirty (30) days prior to the time of permit expiration. Applications for extensions of time which are not timely filed pursuant to Section 24-58.9 (B) (2) shall be returned to the applicant.

DERM + DSWM AGREEMENT ADDRESSING ENVIRONMENTAL ISSUES AT THE SOUTH DADE LANDFILL

Begin/End: 5 February 1991/N/A

Activity: Methods and schedules for addressing odor, groundwater contamination and stormwater management at the South Dade Landfill

2. DSWM does hereby agree to pursue with due diligence the implementation of additional improvements to the aforesaid property with proposed schedules as follows:
 - a) An odor masking or neutralizing system which has been purchased and is scheduled to be installed at the landfill by March 1991.
 - b) A landfill gas extraction and thermal destruction system is currently being designed and will be submitted to DERM for review. Based upon DERM completion of its review and approval by May 1991, and permitting receipt by June 1991, construction is scheduled to begin in June 1991 and the project is to be operational by January 1992.
 - c) Final capping on the side slopes of cells 1 & 2 is scheduled to be installed by July 1991.
 - d) The shredder facility tipping floor will be expanded to provide additional covered storage area for solid waste. Based upon design and permitting anticipated to be completed by March 1991; construction is scheduled to begin by September 1991.
 - e) A Scrubber System or other additional odor control measures will be evaluated, if odors are not significantly reduced by the projects listed under 2(a) (f). A groundwater remediation program is currently being designed and permitted as one element of the closure plan for cells 1 & 2. This program will consist of selective groundwater extraction and disposal. The remedial action plan will include monitoring to allow for system evaluation and periodic adjustment for maximum effectiveness with the goal that the average area-wide ammonia levels decrease within five years of the operational date. This design is expected to be completed in early 1991 and permitted in mid 1991. Based upon that permitting date, construction is expected to begin in early 1992 and the project to be operational by early 1993.
 - f) A comprehensive stormwater management plan is in the conceptual design phase, as part of the closure plan for cells 1 & 2 and for future cells. DSWM and DERM along with other regulatory agencies are currently evaluating the stormwater management alternatives. Upon issuance of the stormwater permits, construction is estimated to take 12 months.
3. DERM does hereby agree to participate in the design and permitting process by attending regular design review meetings, providing written comments on proposed concepts and detailed designs within 30 days of receipt of written documents by DSWM.
4. DERM hereby acknowledges that all proposed improvements set forth in paragraph 2 above are contingent upon obtaining permits from other regulatory agencies, and understands that if the permitting process becomes protracted through no fault of DSWM, the proposed schedules may need to be revised.

5. DERM and DSWM both acknowledge that all schedules are based upon current law and regulations and therefore, any change in law or regulations may affect any design, permitting or construction schedules herein.

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DERM & DSWM AGREEMENT ADDRESSING ENVIRONMENTAL ISSUES AT THE COUNTY OWNED PROPERTY SOUTHWEST OF THE INTERSECTION OF SW 248TH STREET AND 97TH AVENUE

Begin/End: 5 February 1991/N/A

Activity: Methods and proposed schedules for addressing groundwater contamination at a $\pm$ 35 acre parcel bounded by SW 248th Street, theoretical SW 256 Street, SW 97 Avenue, approximately 750 feet west of theoretical SW 97 Avenue, less the 5 acre tract located in southwest corner of the property pursue with due diligence the implementation of measures to define, and if necessary to correct, the above described environmental issues as follows:

- a) Groundwater Monitoring Plan - The DSWM submitted a groundwater monitoring plan as required by the various regulatory agencies which was implemented in early 1989 and will continue to collect data as described in said plan.
 - b) Groundwater Assessment and Actions - By May 1, 1991 the DSWM will coordinate meetings and commence to develop plans in conjunction with the adjacent property owners to assess the groundwater quality and develop remedial actions for the above described property as well as the adjacent $\pm$ 200 acres formerly utilized for solid waste disposal by Dade County. In the event that all the adjacent property owners do not voluntarily participate with DSWM in the plan development, DSWM will assume the financial responsibility for plan implementation for those properties. DERM agrees to use its authority under Chapter 24 of the Metropolitan Dade County Code to obtain site access, as necessary, to implement said plans.
 - c) Odor Control - DSWM acknowledges the potential for fires in the deposited solid waste which can be a source of odors. As such, DSWM will make an earnest effort to extinguish the fires as they are identified for the described $\pm$ 35 acres and hereby agrees to provide technical advice at the request of the property owners of the adjacent $\pm$ 200 acres previously leased by Dade County, in their efforts to extinguish fire on their respective properties. In the event that all the adjacent property owners do not voluntarily participate with DSWM and extinguish the fires on their respective properties, DSWM will assume the financial responsibility for fire suppression activities as necessary to stop nuisance odors. DERM agrees to use its authority under chapter 24 of the Metropolitan Dade County to obtain access, as necessary, to implement said fire suppression activities.
3. DERM does hereby acknowledge, pursuant to this agreement, that the responsibility of DSWM as a property owner applies only to the County-owned property and that, although DSWM agrees to assume financial responsibility for the adjacent $\pm$ 200 acres in accordance with sections (2) (b). and (c). of this agreement, plans and time schedules for addressing these environmental issues may be impacted by DERM's efforts to obtain access.

DERM also acknowledges that other state and Federal regulatory agencies are involved and that additional permitting may adversely impact the above described schedules.

APPENDIX C

Permit Condition Matrix South Dade Landfill