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JUN 19 1985

PALM BEACH COUNTY SOLID WASTE AUTHORITY

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TIMOTHY F. HUNT, JR.
Executive Director

PALM BEACH COUNTY
SOLID WASTE AUTHORITY

State of Florida
Department of Environmental Regulation
Division of Environmental Permitting
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32301

Attn: Mr. Hamilton Oven, P.E.
Power Plant Siting Section

Re: Application for Power Plant Site Certification
Palm Beach County Solid Waste Authority
Resource Recovery Facility

Gentlemen:

Transmitted herewith is the Palm Beach County Solid Waste Authority's Application for an Electrical Power Plant Siting Certification which is submitted in accordance with Rules of the Florida Department of Environmental Regulation, Chapter 17-17 F.A.C.

The Solid Waste Authority welcomes the opportunity to work with the Department of Environmental Regulation and other agencies involved in reviewing this application for site certification.

We anticipate that the information contained herein provides all that is necessary to permit a thorough evaluation of our application. However, if you find that additional data or clarification is required, please contact me at your earliest convenience.

Also enclosed is our check for $22,500.00 to cover the application fee.

Very truly yours,

Timothy F. Hunt, Jr.
Executive Director

TH/pc
enclosure

5114 Okeechobee Blvd. / Suite 2C / West Palm Beach, Florida 33409 / Telephone (305) 471-5770

Engineer Submitting Application: ______________________
Sumpter H. Barker

Florida Registration Number: #12839
12839

1st American Bank and Trust

P. O. Box 107
140 North County Road
Palm Beach, Florida 33480

63-659
670

050251-9 P B C SOLID WASTE AUTH-ACQ&CONSTR FD

No. 15584

DATE 6/7/85

*$***22,500.00

PAY TWENTY-TWO THOUSAND FIVE HUNDRED AND NO/100

To the order of

STATE OF FLORIDA DEPARTMENT OF
ENVIROMENTAL REGULATION
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32301

TRUST DEPARTMENT

[signature]
AUTHORIZED SIGNATURE

⑆067006597⑆ 201 542 0⑈

FIRST AMERICAN BANK AND TRUST – TRUST DEPARTMENT

DETACH AND RETAIN THIS STATEMENT

ACCOUNT NUMBER	ACCOUNT NAME	DATE	
050251-9	P B C SOLID WASTE AUTH-ACQ&CONSTR FD	6/7/85	1186

DESCRIPTION

*****22,500.00

DISTRIBUTION PER REQUEST
APPLICATION FEE - POWER PLANT SITE
CERTIFICATION CENTRAL RESOURCE RECOVERY
FACILITY

P $

I $

Code

CONSULTING TEAM

- Barker, Osha & Anderson, Inc.
  860 U.S. Highway One
  Suite 202
  North Palm Beach, FL 33408
  (305) 626-4653

- Hayden/Wegman, Inc.
  5114 Okeechobee Blvd.
  Suite 2-B
  West Palm Beach, FL 33417
  (305) 471-0444

- Burke & Chappell Engineers, Inc.
  2324 S. Congress Avenue
  West Palm Beach, FL 33406
  (305) 968-4800

- Dunn & Associates, Inc.
  P.O. Box 2408
  Boca Raton, FL 33427-2408
  (305) 487-6898

- GBS Architects
  1080 E. Indiantown Rd.
  Suite 205
  Jupiter, FL 33458
  (305) 747-6330

- Geraghty & Miller, Inc.
  2700 PGA Boulevard
  Suite 104
  Palm Beach Gardens, FL 33410
  (305) 694-0300

- Gibson & Adams
  Professional Association
  Florida National Bank Bldg.
  303 First St.
  Suite 400
  West Palm Beach, FL 33402-1629
  (305) 655-8686

- Joyce Environmental Consultants, Inc.
  619 Industrial Street
  Lake Worth, FL 33461
  (305) 582-4317

- Kimley-Horn & Associates, Inc,
  5800 Corporate Way
  West Palm Beach, FL 32407
  (305) 683-5500

- Post, Buckley, Schuh & Jernigan, Inc.
  889 North Orange Ave.
  Orlando, FL 33801-1088
  (305) 423-7275

- York Services, Inc.
  1 Research Drive
  Stamford, CT 06906
  (203) 325-1371

Key: [ ] Sections Kept for Air Permit Files

PALM BEACH COUNTY
SOLID WASTE AUTHORITY

RESOURCE RECOVERY FACILITY APPLICATION FOR POWER PLANT SITE CERTIFICATION

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CHAPTER 10. APPENDICES (Included in Volume II or III Unless Noted Otherwise)

LIST OF FIGURES

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ABBREVIATIONS AND ACRONYMS

AAL	—	Ambient air level
AADT	—	Average annual daily traffic
AAQS	—	Ambient air quality standard
ADT	—	Average daily traffic
agl	—	Above grade level
AQCR	—	Air Quality Control Region
AQS	—	Air quality standards
Authority	—	Palm Beach County Solid Waste Authority
BACT	—	Best available control technology
Be	—	Beryllium
BCC	—	Palm Beach County Board of County Commissioners
CARB	—	California Air Resources Board
CDMOC	—	Long term urban dispersion program
CDS	—	Compliance data system
CEC	—	Cation exchange capacity
CO	—	Carbon monoxide
CO_2	—	Carbon dioxide
Complex I	—	Complex terrain dispersion program
CPC	—	Palm Beach County Planning Commission
CRYSTER	—	Single source dispersion model
CUPS	—	Consumptive Use Permits
CY	—	Cubic yards
DAHRM	—	Division of Archives History and Records Management (Florida Department of State)
dBA	—	Decibel (A-weighted scale)
DER	—	Department of Environmental Regulation
DNR	—	Department of Natural Resources
DO	—	Dissolved oxygen
DRI	—	Development of Regional Impact
DSCF	—	Dry standard cubic foot
EDS	—	Environmental Data Service
EPA	—	United States Environmental Protection Agency
ESP	—	Electrostatic precipitator
FAA	—	Federal Aviation Administration
FAAQS	—	Florida Ambient Air Quality Standards
FAC	—	Florida Administrative Code
FDER	—	Florida Department of Environmental Regulation
FEMA	—	Federal Emergency Management Agency
FGFWFC	—	Florida Game and Freshwater Fish Commission
FHwA	—	Federal Highway Administration
FIRM	—	Flood Insurance Rate Map
FLUCCS	—	Florida Land Use and Cover Classification System

FP&L	—	Florida Power & Light Company
FS	—	Florida Statutes
GEP	—	Good engineering practice of stack height
gpd	—	Gallons per day
gpm	—	Gallons per minute
gr/dscf	—	Grains per dry standard cubic foot
HCL	—	Hydrochloric acid
Hf	—	Hydroflouric acid
Hg	—	Mercury
HHV	—	Higher heating value
HSH	—	Highest second highest concentration
HUD	—	Federal Department of Housing and Urban Development
Hz	—	Hertz
ISC	—	Industrial Source Complex Dispersion Model
ISCLT	—	Industrial source complex long term dispersion model
ISCST	—	Industrial source complex short term dispersion model
JTU	—	Jackson Turbidity Units
kips	—	kilopounds (1000 pounds)
km	—	kilometers
kv	—	kilovolt
kw	—	kilowatt
LAER	—	Lower available emission rate
LCD	—	Local climatological data
Leq	—	Energy equivalent noise level
LOS	—	Level of service
m^3	—	Cubic meter
MCL	—	Maximum contaminant level
mgd	—	Million gallons per day
mps	—	Meters per second
MPTER	—	Multiple point gaussion disperssion program
MSL	—	Mean sea level
MSW	—	Municipal Solid Waste
MW	—	Megawatts
NAAQS	—	National Ambient Air Quality Standards
NCC	—	National climatic center, Asheville, N.C.
NEDS	—	National emissions data system
NGVD	—	National Geodetic Vertical Datum
NHPA	—	National Historic Preservation Act
NOAA	—	National Oceanic & Atmospheric Administration
NO_X	—	Nitrogen oxides
NPDES	—	National Pollutant Discharge Elimination System
NSPS	—	New Source Performance Standards
NTIS	—	National Technical Information Service
NWI	—	National Wetlands Inventory
OCC	—	Organic carbon concentration
OSHA	—	Occupational Safety and Health Administration
O_2	—	Oxygen
Oz	—	Ozone
Pb	—	Lead
PFU	—	Plaque forming units

PM	—	Particulate matter
ppm	—	Parts per million
PSD	—	Prevention of Significant Deterioration
psi	—	Pounds per square inch
PTDIS	—	Interactive version of point source dispersion program
PTMAX		Interactive version of point source dispersion program
PTMTP	—	Interactive version of point source dispersion program
PTPLU	—	Single source gaussian dispersion program
PUD	—	Planned Unit Development
PURPA	—	Public Utility Regulatory Policies Act
PZB	—	Palm Beach County Department of Planning, Zoning & Building
RAM	—	Short term urban dispersion program
RCRA	—	Resource Conservation & Recovery Act
RDF	—	Refuse derived fuel
RFP	—	Requests for proposals
SCC	—	Source classification code
SCS	—	Soil Conservation Service
SHPO	—	State Historic Preservation Officer
SHORTZ	—	Short term dispersion program for ground-level concentrations
SIA	—	Significant impact area
SIC	—	Standard industrial classification code
SIL	—	Significant impact level
SIP	—	State Implementation Plan
SO_2	—	Sulfur dioxide
SR	—	State Road
SFWMD	—	South Florida Water Manage District
STAR	—	Wind distribution by Pasquill stability classes
tpd_7	—	Tons per day; seven days per week
tpy	—	Tons per year
TSP	—	Total suspended particulates
UG/M3	—	Micrograms per cubic meter
USDA	—	United States Department of Agriculture
USDEP. COMM.	—	United States Department of Commerce
USEPA	—	United States Environmental Protection Agency
USFWS	—	United States Fish and Wildlife Service
VOC	—	Volatile organic compounds
vpd	—	Vehicles per day
vph	—	Vehicles per hour
WCA	—	City of West Palm Beach Water Catchment Area

APPLICATION INFORMATION

Applicant's Official Name:	Palm Beach County Solid Waste Authority
Address:	5114 Okeechobee Blvd. Suite 2-C West Palm Beach, FL 33417
Name, Title and Phone Number of Official Representative Responsible for Obtaining Certification:	Mr. Timothy F. Hunt, Jr. Executive Director (305) 471-5770
Site Location:	Palm Beach County
Nearest Incorporated City:	West Palm Beach
Latitude & Longitude:	26° 46′ 00″ N 80° 08′ 45″ W
UTM Zone 17:	0585820 meters East 2960180 meters North

Section	Township	Range
22	42S	42E
27	42S	42E
34	42S	42E
2	43S	42E
3	43S	42E

Location of any directly associated transmission facility:	Palm Beach County
Name Plate Generating Capacity:	50 megawatts
Ultimate Capacity for Certification:	75 megawatts

APPLICANT INFORMATION

Remarks: The Palm Beach County Solid Waste Authority was created by the Florida Legislature under the Palm Beach County Solid Waste Act, Chapter 75-473, Laws of Florida. In creating the Authority, the legislative intent was to form a countywide authority for a coordinated management of solid waste in order to meet expanding problems within Palm Beach County relating to safe and sanitary processing and disposal of solid waste and to require the municipalities and county to plan for and develop adequate solid waste collection systems. The Authority may require that all waste disposed of by public and/or private agencies from any municipality or unincorporated are of the county be transported to Authority designated processing and disposal facilities in a manner and form as mandated in accordance with the Solid Waste Act.

The Authority does not operate, maintain nor construct facilities for the purpose of electric power generation. Neither does the Authority distribute electrical energy generated at facilities operated by others. The sole purpose of the proposed facility is to dispose of solid waste and recover energy and materials. The proposed facility will provide Palm Beach County with a method of solid waste disposal that will replace present traditional landfilling operations.

EXECUTIVE SUMMARY

INTRODUCTION

In Palm Beach County, there has been an increased interest in solid waste disposal with emphasis on the concept of resource recovery. This has been stimulated by a greater awareness of the environmental and siting problems associated with landfill disposal methods, and by the potential for recovering energy and recyclable materials from solid waste. Landfilling, while suitable in other locations, has become increasingly difficult as a primary disposal method in Palm Beach County. Areas which are environmentally and economically suitable for sanitary landfilling in this rapidly urbanizing county are quickly diminishing. Palm Beach County can no longer rely on conventional landfilling as its only method of solid waste disposal and is, therefore, developing an alternative primary disposal method — a refuse derived fuel (RDF) Resource Recovery Facility.

The decision to build a Resource Recovery Facility is the culmination of nine years of dedicated solid waste management planning. Since 1975, the Palm Beach County Solid Waste Authority (the Authority) has been working to find a long-term alternative to sanitary landfilling. The Authority started its effort shortly after the State of Florida enacted legislation (Chapter 403.706 Florida Statutes, FS) requiring heavily populated counties like Palm Beach to submit resource recovery and management plans. Numerous studies, commissioned by the Authority since 1975, have concluded that resource recovery is the prudent long-term solution to the County's refuse disposal needs. By using the energy obtainable from solid waste to generate electricity, resource recovery makes the most sense economically and environmentally.

SITE LOCATION

Pursuant to Section 403.505 FS, Palm Beach County is applying for certification of a resource recovery plant with landfills at a 1,320 acre site located in the unincorporated north-central area of the county. The site is bounded on the north by the Beeline Highway (SR 710), on the east by the Florida Turnpike, on the south by a line approximately 610 feet south of 45th Street, on the west by the City of West Palm Beach Water Catchment Area, and on the northwest by a large privately-owned property. The site is due west (across the Turnpike) of the existing Dyer Boulevard Landfill and is within 2 miles of a Florida Power & Light Company (FP&L) transmission line corridor. A 73 acre parcel east of the southernmost portion of the site will serve as the corridor for the 138 kv transmission line from the resource recovery plant to the existing FP&L transmission line corridor.

PURPOSE OF THE PROPOSED FACILITY

The primary purpose of the facility is to dispose of the municipal solid waste generated within the County. Non-combustibles and inert ash residue resulting from the plant's combustion process will be disposed of on the site. The power derived from the combustion of the refuse is an additional benefit. Its sale to FP&L will help offset the overall cost of operating the facility. An affirmative determination of need from the Florida Public Service Commission has been applied for as part of this document. Other materials may be recovered as market conditions warrant.

The Authority will contract with a full-service vendor to design, construct, and operate the plant. The Authority will own the facility.

The proposed project is designed to help achieve the State's goal of enhancing environmental quality and preserving natural resources. To protect its groundwater and surface water resources, Palm Beach County is striving to limit sanitary landfilling of solid waste and plans to utilize resource recovery, an environmentally sound and economically advantageous method of solid waste disposal.

FACILITY DESCRIPTION

The proposed project will be a RDF Resource Recovery Facility with an initial continuous design rate processing capacity of 2,000 tons per day of municipal solid waste (MSW) and a gross electrical generating capacity of approximately 50 megawatts (MW). In anticipation of future disposal needs, Palm Beach County is seeking certification for ultimate site electrical generating capacity of approximately 75 MW (gross), using 3,000 tons per day of MSW.

The landfill associated with the Resource Recovery Facility will consist of a 150 acre Class I landfill of double-liner technology with a leachate collection system and a 235 acre Class III landfill of single-liner technology with a leachate collection system. Borrow lakes consisting of approximately 243 acres will be developed over the life of the landfill to provide fill for construction and cover material for the landfill contents.

APPLICATION OVERVIEW

This application has been prepared in accordance with Chapter 17-17, FAC (Electrical Power Plant Siting) and follows the format prescribed in DER Form 17-1.211 (1), FAC (Instruction Guide for Certification Applications: Electrical Power Plant Site, Associated Facilities, and Associated Transmission Lines).

The application consists of four (4) volumes:

Volume I (Application) — contains the Applicant Information sheet, Chapters 1 through 9 as presented in the DER Instruction Guide, and the listing of references.

Volume II and III (Appendices) — contain the appendices of the application (Chapter 10). In addition to those appendices specifically required in the DER Instruction Guide, included are thirteen (13) additional appendices which are more appropriately included in Volume II or III than in the application text of Volume I.

Volume IV (Air Quality) — contains DER Form 17-1.202(1), Application to Operate/Construct Air Pollution Sources; the specific requirements of the Prevention of Significant Deterioration (PSD) review; a Best Available Control Technology (BACT) analysis and an air quality impact analysis.

As required by Chapter 17-17.121(3)(a) FAC, also submitted, under separate cover, are three (3) copies of materials which show the procedures taken to accomplish compliance of the site with existing land use plans and zoning ordinances. This compilation of information is referred to as the "Compliance Document".

PRINCIPAL FINDINGS

The proposed facility will be designed and operated to meet all applicable Federal, State and County Standards. As intended, the facility will have a minimal impact on the surrounding environment. The analysis presented in the application supports this conclusion:

- Air Quality — As discussed in the Appendix 10.1.5 — Air Quality Impact Analysis, the combustion process for the facility will be environmentally sound. The results of the Prevention of Significant Deterioration (PSD) analysis indicate:

  — Best Available Control Technology (BACT) for the proposed source is the use of emission controls inherent to the system design with an Electrostatic Precipitator (ESP) designed to meet an outlet grain loading of 0.03 gr/dscf corrected to 12% CO_2;

  — The facility will operate in compliance with the Prevention of Significant Deterioration (PSD) increments, National Ambient Air Quality Standards (NAAQS), and Florida Ambient Air Quality Standards (FAAQS) for all criteria pollutants;

  — Fugitive dust created during construction of the facility is addressed in Section 4.5. With suggested standard mitigative measures there will be no adverse effects due to fugitive emissions.

  — Total Suspended particulates (TSP) are examined in Section 5.6.1 and Appendix 10.1.5. The proposed resource recovery plant emissions will result in an ambient impact equal to approximately 1.3 percent of the Florida Ambient Air Quality Standard for TSP;

  — As discussed in Section 3.4.1, the tipping area and RDF plant will be enclosed and under negative air pressure. Thus, odors will not be able to leave the resource recovery plant. Odors within the building will be drawn into the furnace and destroyed in the combustion process; and

  — The emissions from the facility will not have an adverse effect on surrounding soils, vegetation or visibility.

- Land Use and Zoning — (Section 2.2.2 and Compliance Document) A series of advertised formal public hearing have been conducted concerning the awarding of a Special Exception to the Agricultural Residential Zoning of the site. At those hearings public input, testimony and documents were entered into the official record as land use and zoning issues were evaluated. Even though the Palm Beach County

Planning Commission (CPC) voted against the requested Special Exception, the staff of the County Planning, Zoning and Building Department had recommended to the CPC approval of the Special Exception, indicating that the requested use conformed to the County Zoning Code and the Land Use Plan. The Board of County Commissioners (BCC) concluded that the proposed Resource Recovery Facility is compatible with the Land Use Plan and zoning patterns in the area. Accordingly, the Board of County Commissioners approved the Special Exception with a number of conditions.

- Noise — The Environmental Noise Study (Section 5.7 and Appendix 10.15) indicated that the predicted noise levels resulting from the operation of the facility will not exceed recommended noise level criteria for any location off of the Resource Recovery Facility site. There are a few areas on-site where the level of noise will exceed recommended levels; however these areas are localized or enclosed and no personnel would work within any of the areas for extended periods of time. The effects of these noise levels can be mitigated using standard equipment and procedures.

- Traffic — (Section 5.9.1 and Appendix 10.16) The potential traffic impact which the proposed Resource Recovery Facility would have on the adjacent roadway network was determined. The facility will meet the County's Traffic Performance Standards as a Category C Project. The Authority has committed itself to construct or upgrade a number of vicinity roads, insuring continued acceptable levels of service.

- Groundwater — This facility will lie over portions of the Turnpike Aquifer, a principal source of drinking water in Palm Beach County. Thorough hydro-geologic investigations were conducted to determine existing groundwater quality and to serve as a basis for future monitoring programs (Section 2.3.1). The current groundwater quality beneath the site is good. A plume of mineralized water has been identified beneath the existing Dyer Boulevard Landfill, adjacent to the site. Some of the non-potable water for the resource recovery plant use will be drawn from this plume, eliminating what could have become a serious problem. (Section 3.5)

- Surface Water — Existing hydraulic connections of on-site and adjacent waters were identified and the surface water quality on site was determined by sampling and analysis. (Section 2.3.4) The only problems identified related to color and turbidity, otherwise the surface water quality was satisfactory. The design of the resource recovery plant and landfills will insure adequate retention and natural treatment of stormwater run-off on-site. This same surface water management plan is closely tied to the site wetlands mitigation scheme. Any long-term effects on surface water associated with the operation of the Resource Recovery Facility will not be adverse. (Sections 3.8, 4.2 and 5.3.1)

- Soil And Foundation Conditions — Preliminary investigations have indicated that there appears to be a competent bearing layer starting at a depth of 50 to 70 feet over most of the site. Piles or piers placed into this stratum will be used as the foundation for major structures. However, the present position, density, composition and degree of cementation of the soils beneath the site are quite variable, particularly in reference to depth. Therefore, a careful determination will be made of the subsurface conditions in order to insure adequate foundation design for the resource recovery plant and associated facilities. (Section 2.3.1.1 and 2.3.1.2.2)

- Plant and Animal Communities — (Sections 2.3.5 and 2.3.6) The presence of extensive wetlands within a 5 mile radius of the site increases the possibility that important species associated with wetlands may occur. However, this site presents no outstanding or exceptional features to attract important species. The populations that utilize the site would be present in approximately equal amounts in any similar area in the region. Although the development of the Resource Recovery Facility will have a significant effect on the ecology of the site it does not pose a threat to any plant or animal communities.

- Archaeological Sites and Historic Preservation Areas — (Section 5.10) There are no historical or prehistoric resources known to be present within the project site boundaries as confirmed by field investigations. Projected use of the project site will not impact any historic or prehistoric cultural resources.

PROJECT STATUS

The Palm Beach County solid waste energy recovery facility will be designed, constructed and operated by a full-service vendor under contract to the Authority. The selected contractor will have to guarantee compliance with the terms and all conditions of the site certification and rezoning conditions. As currently envisioned, construction of the facility will begin in 1986 with startup expected in 1989.

CHAPTER 1: NEED FOR POWER AND THE PROPOSED FACILITIES

The primary objective of the proposed Resource Recovery Facility is to dispose of all municipal solid waste (MSW) generated in Palm Beach County. After several years of investigation into alternative methods of disposal including the present practice of landfilling solid waste with its accelerating costs and undesirable economic and environmental consequences led to the Authority's decision to construct a Resource Recovery Facility.

Presently, most of the solid waste (88%) disposed of in Palm Beach County is delivered to the Authority's two active landfills, the Lantana Road and Dyer Boulevard facilities. Both facilities accept Class I materials (garbage; putrescible waste) as well as Class III materials (trash/yard trash; nonputrescible wastes) for disposal. The City of Lake Worth presently operates the only other Class I landfill in the County, which is scheduled to close in 1986. Upon closure of the Lake Worth Landfill, it is estimated that the Authority's disposal facilities will be processing 92.5% of the total waste stream of Palm Beach County.

The capacity in the Lantana Road Landfill will be exhausted by the middle of 1986, leaving the Dyer Boulevard Landfill as the only permitted Class I sanitary landfill in Palm Beach County. At the anticipated rate of utilization following the closure of all other Class I landfills in the County, the Dyer Boulevard Landfill is estimated to reach its capacity by late 1987.

Because of the depleting landfill capacity, the Authority has provided plans for Class I and Class III waste disposal at a new site by the end of 1987. The selected site is centrally located within the County and of adequate size to accommodate a Class I and a Class III sanitary landfill operation, together with the planned Resource Recovery Facility. The site contains approximately 1,320 acres and is located west of Florida's Turnpike and east of the West Palm Beach Water Catchment Area.

It has been determined that the traditional means of disposing of MSW is inadequate to meet the needs of this rapidly growing county for two primary reasons: (1) there is a paucity of land which could feasibly be used for landfilling and land which is available is inordinately expensive; (2) the landfilling of putrescible garbage poses a serious long-term threat to the quality of the groundwater which supplies the domestic water needs of county residents. The best alternative for Palm Beach County to eliminate these concerns is through the construction of a Resource Recovery Facility. The volume of the MSW processed through the Resource Recovery Facility would be reduced by up to 90% (weight is reduced up to 80%) resulting in the life of the co-located landfill being extended by 4 to 6 times. Moreover, the inert ash rather than putrescable garbage will be the material landfilled, reducing the potential for degradation of water quality, gas generation and attendant risks to public health.

The combustion of refuse derived fuel (RDF) from MSW produces steam. Since there are no steam customers available in Palm Beach County, the generation of electricity represents the most feasible alternative for implementation of the resource recovery operation. The electric power derived from the MSW is beneficial resulting in the net effect of stabilizing or possibly reducing the rapidly escalating cost of solid waste disposal.

In Chapter 84-198, Laws of Florida (1984), the Florida Legislature has declared that "it is critical to encourage energy conservation in order to protect the health, prosperity, and general welfare of this State and its citizens". The Legislature has further declared that the "combustion of solid waste by small power production facilities for the production of electricity not only represents conservation efforts well directed towards that goal, but also represents an environmentally preferred alternative to conventional solid waste disposal in this State".

The 2,000 TPD of MSW expected to be processed at initial operations replaces the need of 600,000 barrels of oil per year for electric energy generation. In addition, the ash generated from the combustion process will require less landfill space, reduce leachate generation, and eliminate methane gas generation. This will conserve land, improve the environment, and result in greater protection to water quality than continued sanitary landfilling in Palm Beach County.

The proposed resource recovery plant will also recover marketable materials such as ferrous metals and aluminum. The system has the flexibility to recover other materials as market conditions may warrant.

Under Section 403.501, FS, (Electrical Power Plant Siting), the Legislature has charged the Florida Public Service Commission with the responsibility of determining whether construction of a proposed electrical generating facility is necessary to meet the present or expected need for electricity in penninsular Florida as a whole. Certification under the Act must be obtained for the construction of any generating facility greater than 50 megawatts (MW), and may be obtained for a small facility under Section 403.503, Florida Statues and Chapter 75-473, Laws of Florida, Special Acts of 1975, as amended and supplemented. (Palm Beach County Solid Waste Act.)

The Authority is seeking certification of its proposed 75 MW small power production facility, and is filing a petition with the Public Service Commission. The Commission's report to the Florida Department of Environmental Regulation, as required by Section 403.507(1)(b) of the Florida Electrical Power Plant Siting Act is expected to conclude that the proposed facility will increase electrical system reliability and integrity and will maintain the supply of adequate electricity at a reasonable cost while reducing our dependence on fossil fuel. In addition, the construction of such a plant is a conservation measure which may mitigate the need for additional construction by electric utilities.

The Authority is filing an application with the Federal Energy Regulatory Commission (FERC) for certification of its proposed resource recovery plant as a qualifying small power production facility pursuant to Section 201 of the Public Utility Regulatory Policies Act of 1978 (PURPA) and rules promulgated by FERC.

CHAPTER 2: SITE AND VICINITY CHARACTERIZATION

2.1 SITE AND ASSOCIATED FACILITIES DELINEATION

2.1.1 Site Location

The location of the proposed Resource Recovery Facility within Palm Beach County is illustrated in Figure 2.1-1. The 1,320 acre site is bordered on the north by the Beeline Highway, on the east by Florida's Turnpike, on the south by a line approximately 610 feet south of 45th Street, on the west by the City of West Palm Beach Water Catchment Area, and on the northwest by the Grier Property. A topographical map (showing site perimeter) of the site is included in Appendix 10.4.

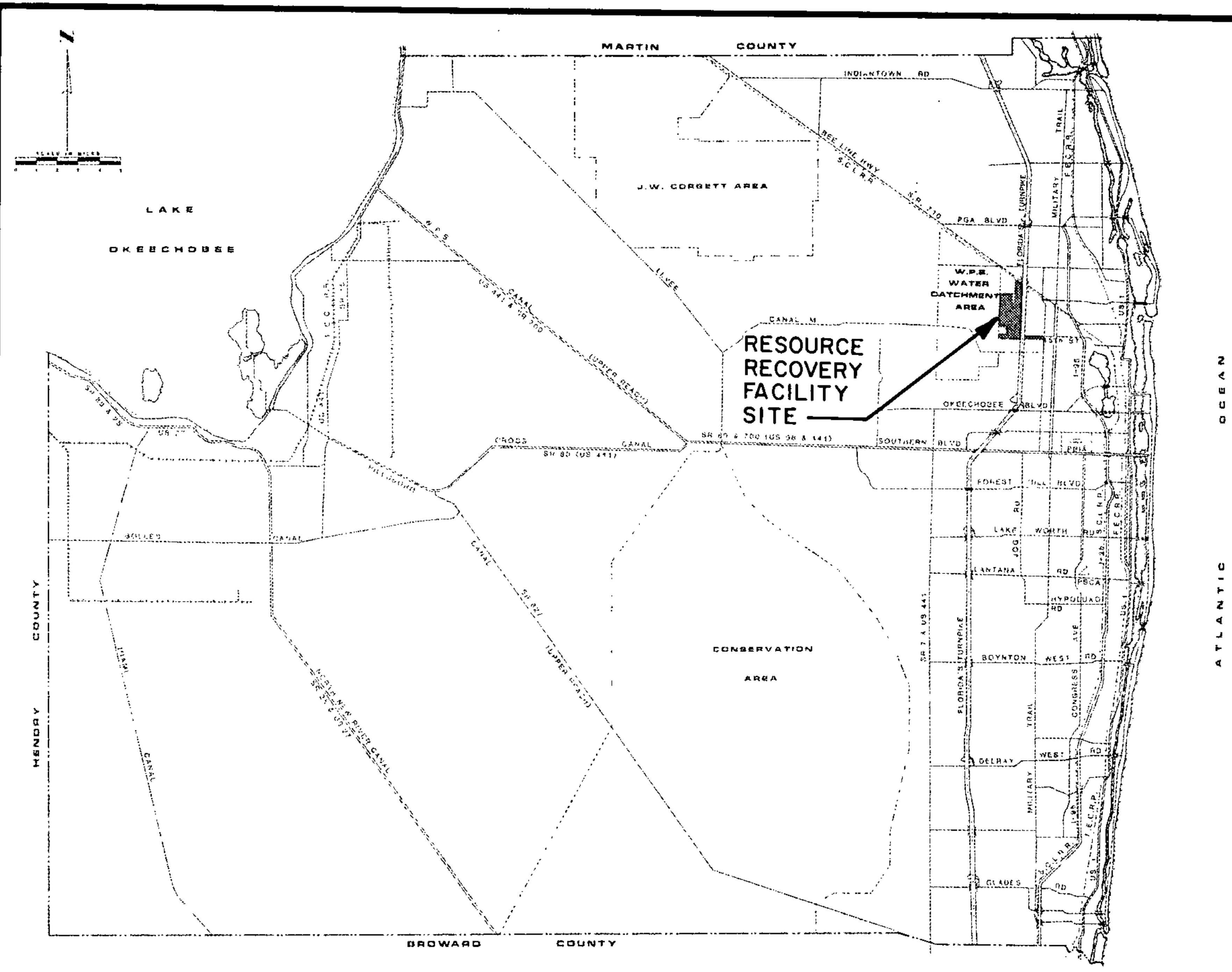
The transmission corridor to the existing Florida Power and Light Company (FP & L) transmission lines will traverse the south side of the 73 acre parcel east of Florida's Turnpike and south of 45th Street (Figure 2.1-2). A detailed description of this parcel is contained in Chapter 6.

2.1.2 Existing Uses

At present, there is limited use of the property proposed for development. An occupied house located on a 6.6 acre parcel in the south central portion of the site will be purchased and removed in the course of site development. In the vicinity of the house, there is an operational radio transmission tower. This tower will remain in place during and after construction of the plant and all facilities. A privately-owned unoccupied 10 acre parcel in the southwestern portion of the site may be acquired in the future, but is not essential to the development of the facility. Past and present property use has changed the topography of the site in certain areas. In the northeast portion of the site, there is a 82-acre (approximately) borrow lake which supports an active dredge operation. Dredged material is used for construction fill and cover material at the Dyer Boulevard Landfill located east of Florida's Turnpike. Areas to the north of this borrow lake have been scraped below natural ground elevations, including a 22-acre flooded area which has been excavated to an elevation of three feet below the natural ground elevation. A similar condition exists in the east central portion of the site, approximately 4,000 feet north of 45th Street where a 6.2-acre flooded parcel has been excavated to an elevation of three feet below the natural ground elevation.

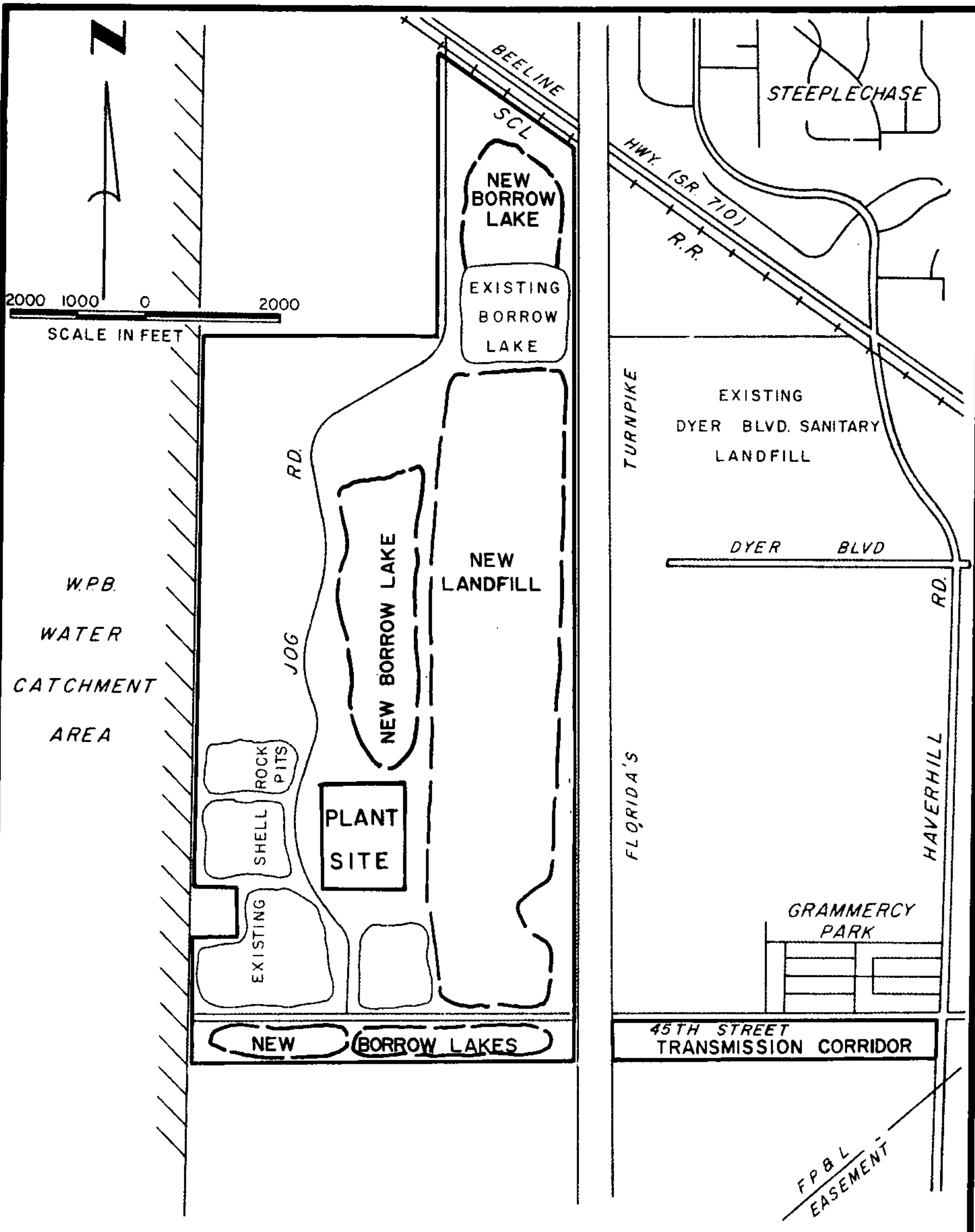
Three abandoned shell pit operations, which encompass approximately 171 acres, occupy the southwest corner of the site north of 45th Street. The bottom of the shell pits are approximately six feet below surrounding ground elevations; and the elevations of the berms adjacent to the shell pits are approximately six feet above ground elevations.

PALM BEACH COUNTY
SOLID WASTE AUTHORITY
RESOURCE RECOVERY FACILITY



LOCATION OF RESOURCE RECOVERY
FACILITY WITHIN PALM BEACH COUNTY

FIG. 2.1-1



PALM BEACH COUNTY
SOLID WASTE AUTHORITY
RESOURCE RECOVERY FACILITY

RESOURCE RECOVERY FACILITY
AND ADJACENT PROPERTIES

FIG. 2.1-2

Access to the site is made from 45th Street by traveling north on a shell rock road located between the two shell pits bordering on 45th Street. At the northern boundary of the shell pits, this road proceeds east to the eastern site boundary. Within the site, the road meanders in a northerly direction, terminating at the active borrow lake.

2.1.3 Site Modifications

The proposed site development plan for the site is shown in Figure 2.1-2. Space has been allocated for Class I and Class III Sanitary Landfills, a north-south roadway, borrow lakes, the resource recovery plant, and perimeter buffer zones. The western portion of the site will serve as a multiple-purpose conservation area — habitat preservation, buffer, stormwater retention and wetlands mitigation will all be accomplished in this area. Throughout the rest of the text, these specific usages are discussed with no general reference to the conservation area.

In accordance with the Water Quality Assurance Act of 1983, a landfill cannot be constructed within 3,000 feet of a Class I water body. The West Palm Beach Water Catchment Area (WCA) is classified as a Class I surface water body. (DER Docket Number 83-32R, Rule Number 17-3.161, Classified Waters.) Therefore, all landfill activities will occur within the eastern 1,900 feet of the site in order to comply with these minimum setback requirements. The existing borrow lake in the northeast portion of the site will be expanded to allow maximum utilization of the designated area for dredging fill material to be used at the Dyer Boulevard Landfill, as well as the landfill areas to be constructed on the site.

The western region of the site within the 3,000-foot setback from the WCA will be utilized to accommodate the 40-acre resource recovery plant, including a laydown area, employee parking, wastewater treatment plant and other associated facilities, roadway right-of-way, additional borrow areas, wetlands mitigation and stormwater management. Two borrow lakes will be developed on the property south of 45th Street within the boundaries of the site while allowing for the extension of the north-south roadway south of 45th Street. An access service road for the landfill will be maintained within the 200-foot setback west of the Turnpike canal.

The landfill height has been established to provide the capacity for a Class I and a Class III landfill to serve the County in excess of twenty years. Existing ground elevations on the site average + 17.5 feet NGVD (National Geodetic Vertical Datum) (± 1 foot). The base of landfill operation will begin at an elevation of + 30 feet NGVD. The proposed final elevations of the designated Class I and Class III landfill areas of the site are + 130 feet NGVD.

The proposed land use for the site is summarized as follows:

Class I Landfill	150 acres
Class III Landfill	235 acres
Borrow Lakes	243 acres
Roadway	30 acres
Conservation Area	427 acres
Resource Recovery Plant	40 acres
Buffer, Roads, Ditches, etc.	195 acres
TOTAL SITE	1,320 acres

After the landfill capacity has been exhausted, the landfill area is planned to be developed as a recreation facility.

2.1.4 100-Year Flood Zone

As indicated in Figure 2.1-3, none of the proposed site lies within a 100-Year Flood Zone.

2.2 SOCIO-POLITICAL ENVIRONMENT

2.2.1 Governmental Jurisdictions

Available maps and literature were examined to identify local, regional, State and Federal areas stipulated in the application guide. In addition to this review, the governmental units listed in Table 2.2-1 were contacted to provide supplemental information.

Information on the special category areas is listed in Table 2.2-2 and shown graphically in Figure 2.2-1 and Figure 2.2-2. Local parks of the Cities of Palm Beach Gardens, Riviera Beach and West Palm Beach, and the Towns of Lake Park and Mangonia Park are located within 5 miles of the site. None of these lie within 1 mile of the plant. The City of West Palm Beach Water Catchment Area is directly adjacent to the western border of the site. This area of approximately 19 square miles is the drinking water source for West Palm Beach, and is a wetland area. While it is not strictly a private holding as indicated in Table 2.2-2, the catchment area is managed for environmental protection by the City.

The existing Dyer Boulevard Landfill is scheduled for closure in 1987. This area is planned to be developed as a recreational facility, and is anticipated to be managed as a Palm Beach County Park.

Table 2.2-1
Agencies Contacted in Survey of Governmental Jurisdictions

FEDERAL	U.S. Fish and Wildlife Service
STATE	Florida Department of State -Bureau of Historical Preservation Florida Department of Natural Resources -Recreation and Parks Division Florida Agricultural and Consumer Services -Forestry Division Florida Game and Freshwater Fish Commission
COUNTY	Parks and Recreation Department Planning, Zoning and Building Department -Planning Division
LOCAL	City of Palm Beach Gardens City of Riviera Beach City of West Palm Beach Town of Lake Park Town of Mangonia Park

It is anticipated that a survey of the site will be conducted on an annual basis. If the monitoring program indicates a decline in positive species abundance or conditions, or an increase in negative species abundance, more detailed analysis will be initiated to determine the causes for the change and potential solutions.

TABLE 2.3-8
INDICATOR SPECIES

Positive Species	Negative Species
Cypress	Melaleuca
Sawgrass	Torpedograss
Spikerush	Brazilian Pepper
Red Maple	Hydrilla
Willow	Cattails
Slash Pine	Myrtle

NOTE: No correspondence between positive and negative species is implied by their position in the table.

2.3.7 Meteorology and Ambient Air Quality

2.3.7.1 Meteorology

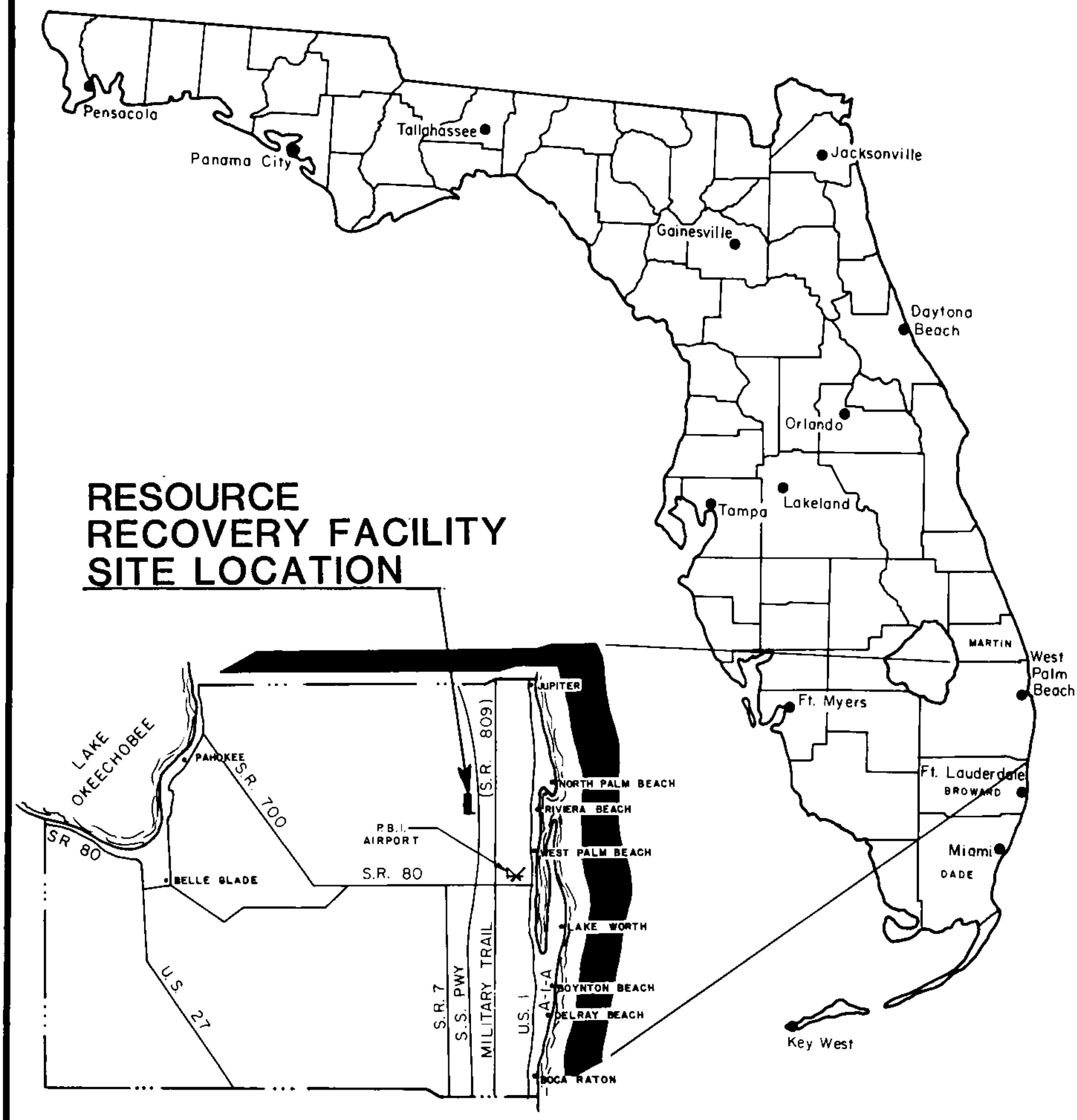
The proposed Resource Recovery Facility is to be located in Palm Beach County in the lower east coast climatological regime of Florida (Figure 2.3-19). The site is approximately 10 kilometers west of the Intercoastal Waterway and 11.5 kilometers from the Atlantic Ocean shoreline. There is no significant relief to the terrain in the vicinity.

Summer temperatures are warm and humid while the winter temperatures are moderated slightly by an occasional influx of cool air from the north. The region is dominated by the effects of the Gulf Stream which flows northward following the contours of the lower east coast and a dominant trade wind that blows from east to west (Figures 2.3-20 and 2.3-21).

The water trajectory is a moderating influence that cools the region in the summer and gives warmth in the winter. The local seawater temperature is approximately 75°F in February and 84°F in August (Neumann & Pierson, **Principles of Oceanography**, 1966). Average mean winter (January) and summer (July) maximum and minimum temperatures for Florida are shown in Figures 2.3-22 and 2.3-23.

The primary rainy season occurs during the six month period from May through October when the daytime ambient air temperatures exceed that of the water temperature. With an easterly flow instability results in most of the precipitation being associated with thunderstorms. The maximum average rainfalls are during the months of September and October. The heaviest rains may be associated with tropical storms. The chances of hurricane force winds at West Palm Beach, in any given year, are 1 in 7.

Meteorological conditions that aggravate air pollution are least likely to occur in the lower east coast region due to the prevailing easterly trade winds and the overall prevailing instability of the air. The trade winds are sufficiently pervasive so as to minimize any true sea breeze effect.



PALM BEACH COUNTY
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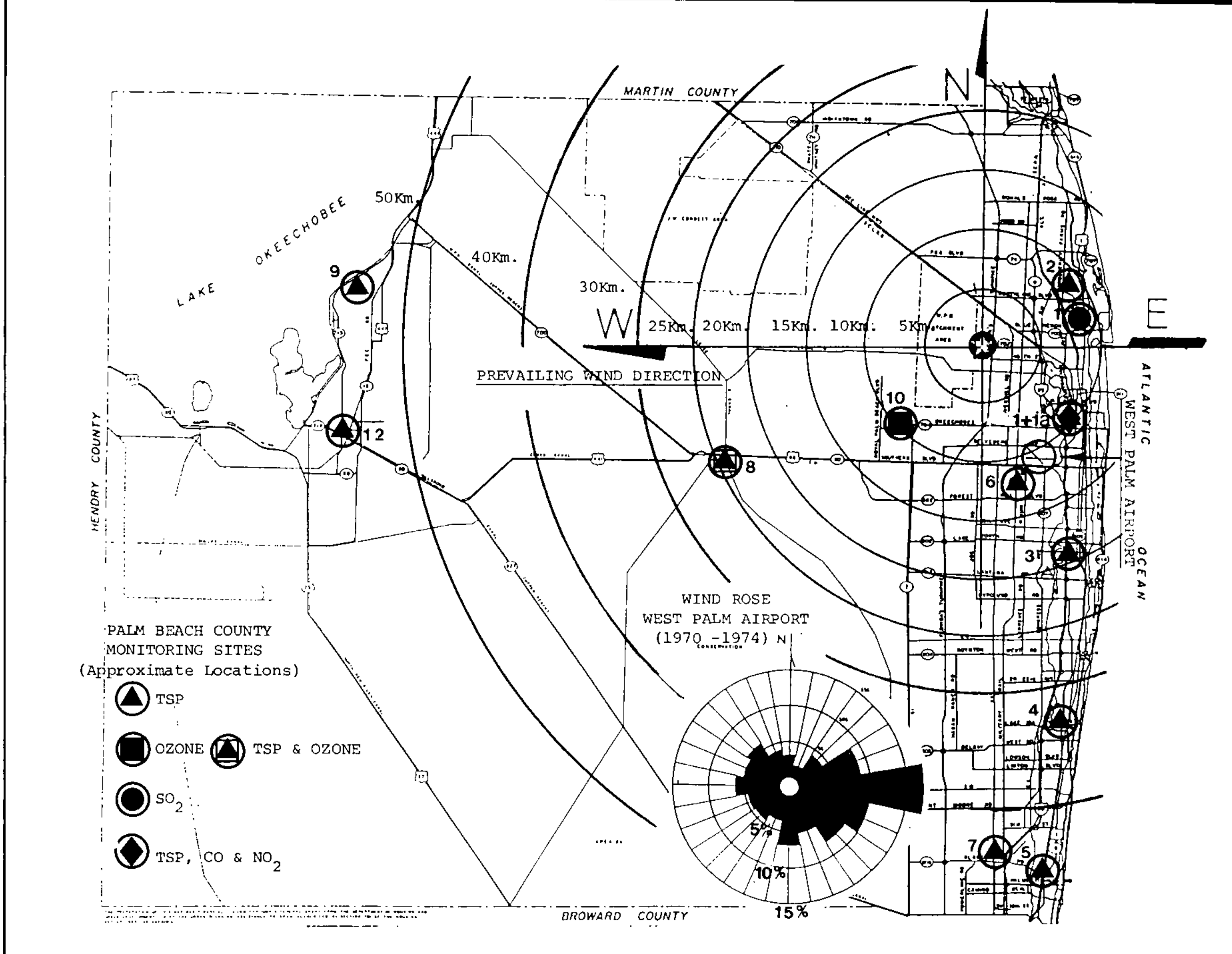
RESOURCE RECOVERY FACILITY

LOCATION MAP

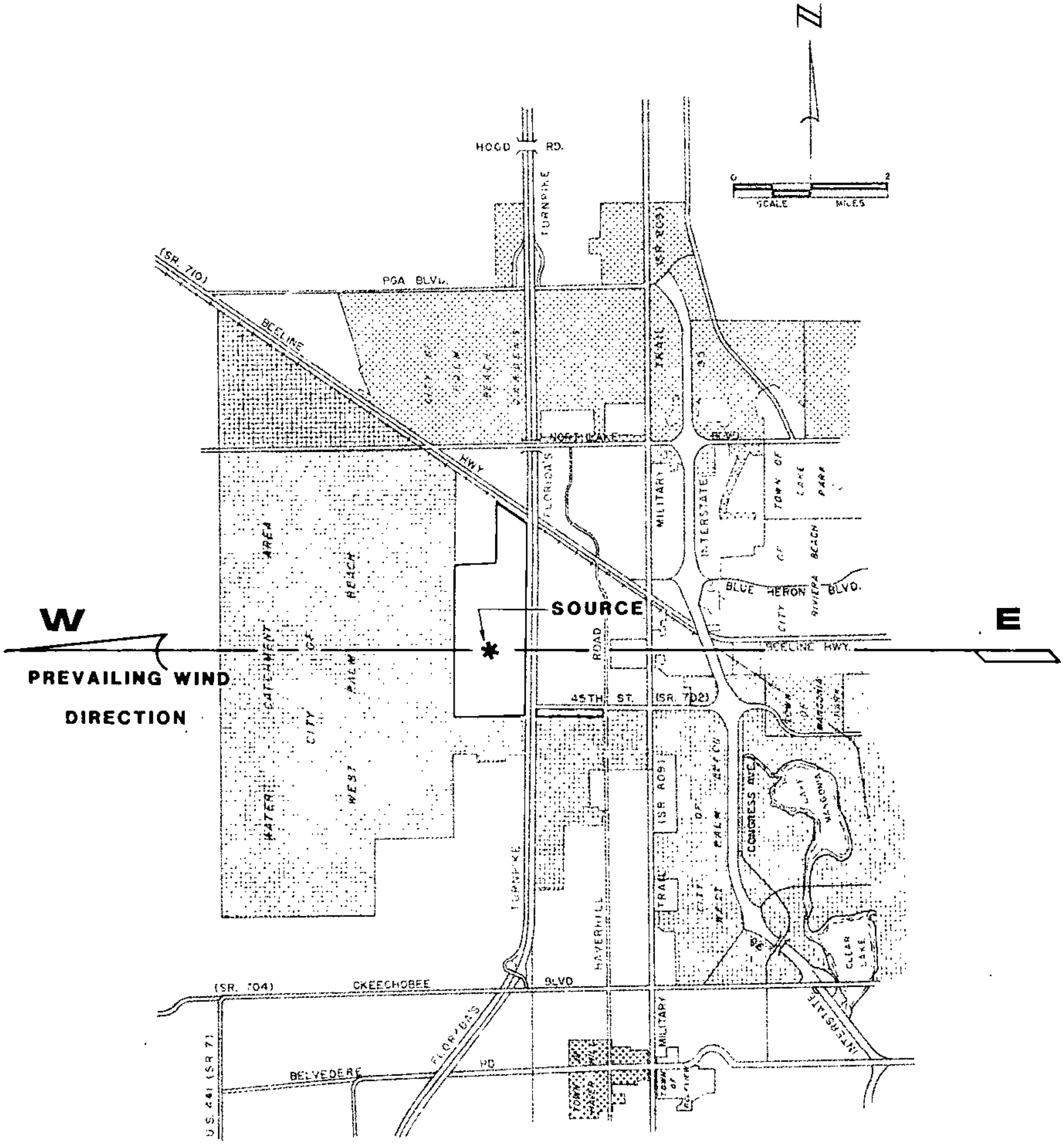
FIG. 2.3-19

PALM BEACH COUNTY
SOLID WASTE AUTHORITY
RESOURCE RECOVERY FACILITY



WIND ROSE

FIG. 2.3-20



PALM BEACH COUNTY
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RESOURCE RECOVERY FACILITY

PREVAILING WIND DIRECTION

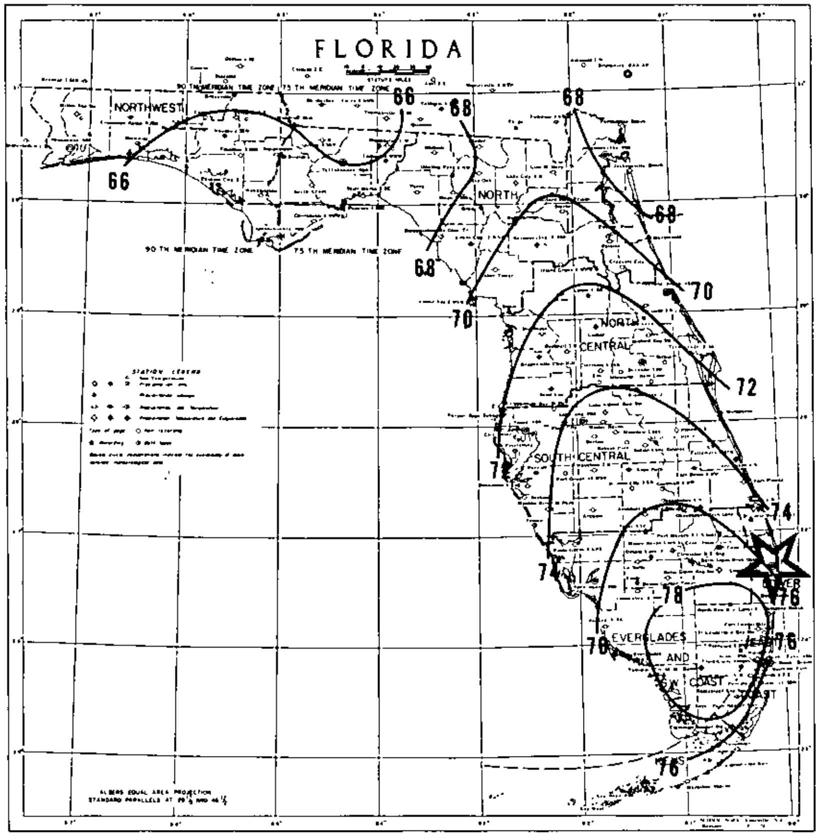
FIG. 2.3 - 21

PALM BEACH COUNTY
SOLID WASTE AUTHORITY
RESOURCE RECOVERY FACILITY

MAXIMUM MEAN
TEMPERATURE
JANUARY & JULY

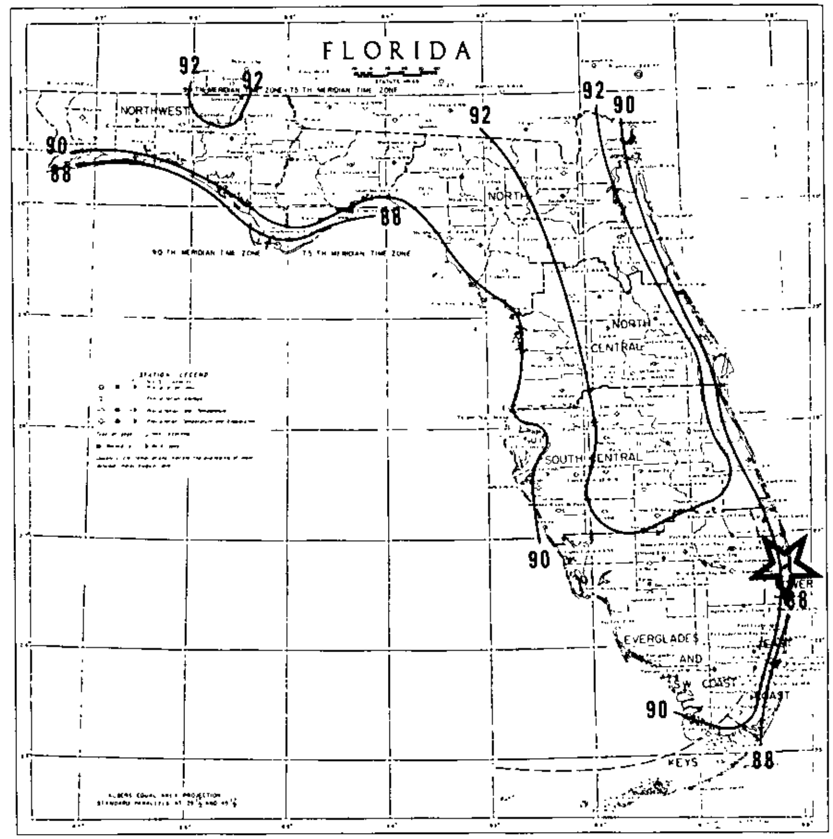
FIG. 2.3-22

MEAN MAXIMUM TEMPERATURE (°F.), JANUARY



Data are based on the period 1931-52. Isolines are drawn through points of approximately equal value. Caution should be used in interpolating on these maps.

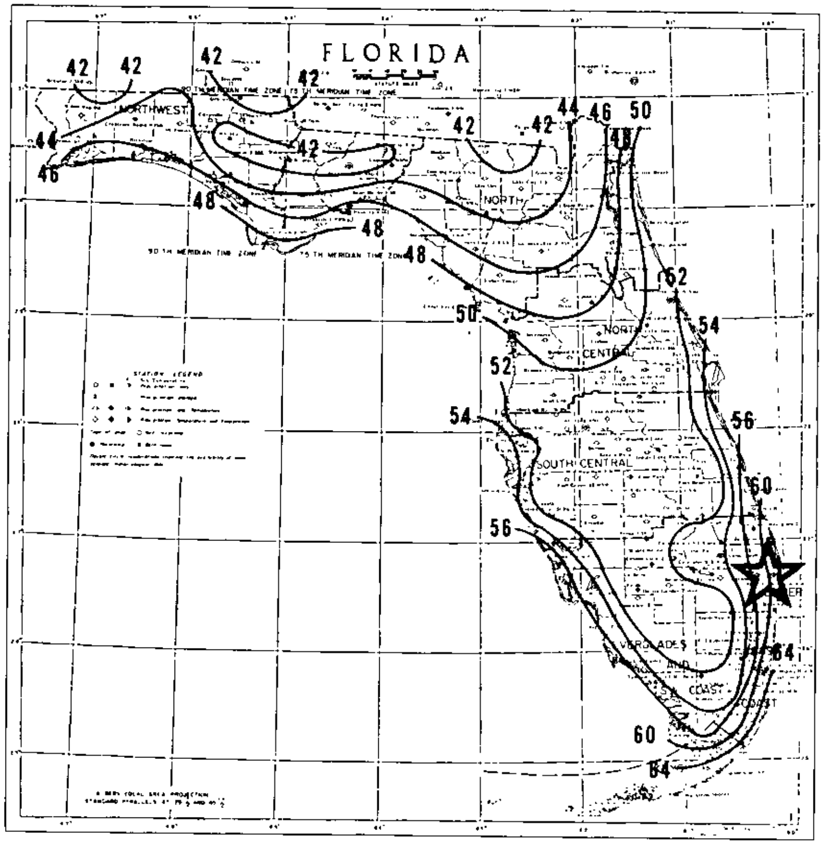
MEAN MAXIMUM TEMPERATURE (°F.), JULY



Data are based on the period 1931-52. Isolines are drawn through points of approximately equal value. Caution should be used in interpolating on these maps.

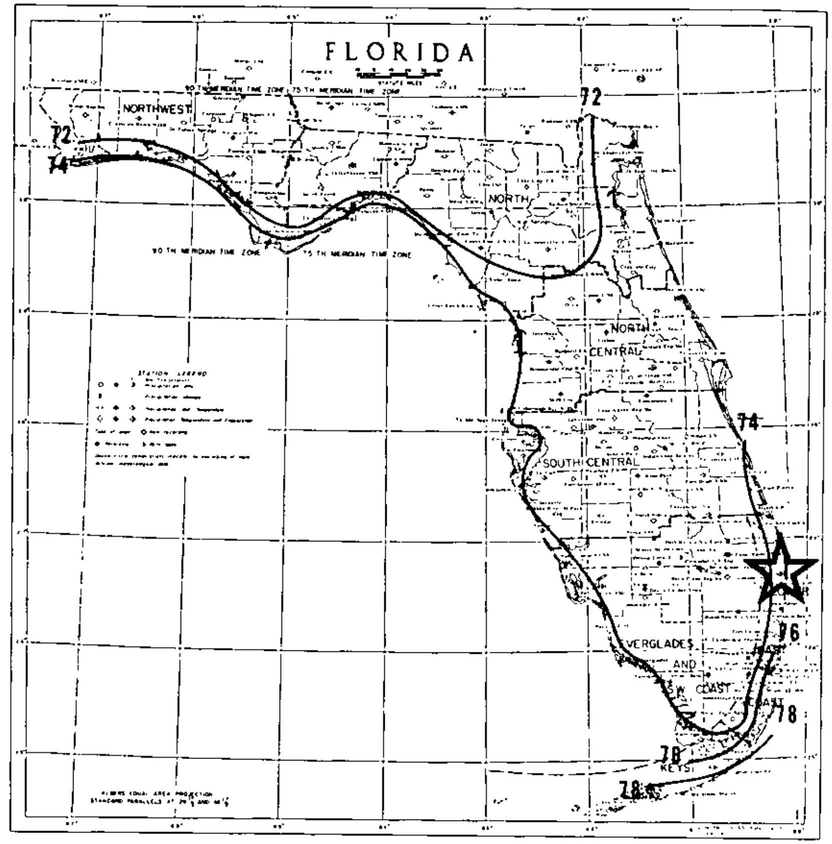
PALM BEACH COUNTY
SOLID WASTE AUTHORITY
RESOURCE RECOVERY FACILITY

MEAN MINIMUM TEMPERATURE (°F.), JANUARY



Data are based on the period 1931-52. Isolines are drawn through points of approximately equal value. Caution should be used in interpolating on these maps.

MEAN MINIMUM TEMPERATURE (°F.), JULY



Data are based on the period 1931-52. Isolines are drawn through points of approximately equal value. Caution should be used in interpolating on these maps.

MEAN MINIMUM TEMPERATURE
JANUARY & JULY

FIG. 2.3-23

2.3.7.1.1 Regional Climatology

There are two full time, full service weather stations within 100 km of the proposed facility:

- Palm Beach International Airport
- Miami International Airport

The Palm Beach International Airport is approximately 9.5 kilometers (5.9 miles) southeast of the proposed facility. The Miami International Airport is approximately 100 kilometers (62 miles) south of the proposed facility. Both stations lie within the Florida lower east coast climatological regime. Meteorological normals for these two stations are shown in Tables 2.3-9 and 2.3-10.

2.3.7.1.2 Atmospheric Dispersion

Local atmospheric dispersion is a function of wind speed, wind direction, atmospheric stability and mixing heights. Five years (1970-1974) of pre-processed hourly data have been provided by the Florida DER in a format suitable for diffusion analyses in the West Palm Beach vicinity. These data are based on surface weather observations from Palm Beach International Airport and upper air data from Miami International Airport.

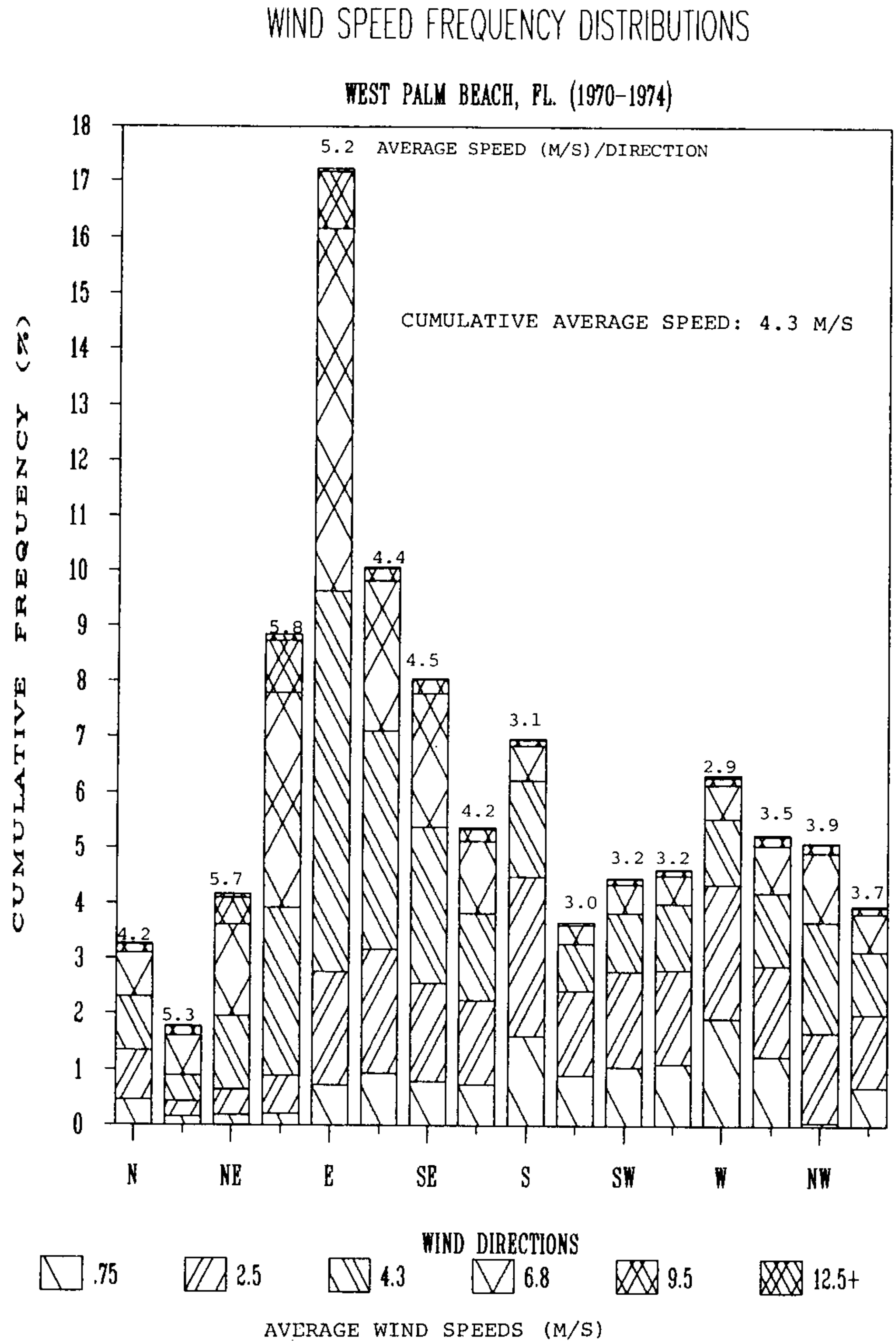
Wind speed, wind direction and atmospheric stability data for the same years were also available in "Star" format. In these data local atmospheric stability are derived from wind speed, local sky cover and time of day, in accordance with the procedures of B. Turner (Journal Applied Meteorology, Feb. 1964).

A wind frequency distribution, summarized for the data collection period from 1970-1974, is available for the Palm Beach International Airport. The joint distributions of these data as a function of wind speed and direction are shown in Figure 2.3-24. A directional summary of these data, in wind rose format, is shown in Figure 2.3-25, along with the average speed for each direction.

The annual average wind speed derived from the 1970-1974 summary wind frequency distribution is approximately 4.3 m/s (9.6 mph). The highest average speed as a function of wind direction is approximately 5.8 m/s (13.0 mph) for winds from the ENE. The winds with the highest annual frequency of occurrence are from the E (17.2%). Winds from the E and ESE account for 27.3% of all occurrences and winds from an expanded sector ENE through SE account for 44.2% of all occurrences.

The summary joint distributions of the wind directions and stability classes are shown in Figure 2.3-26 and 2.3-27. Stability classes 1-6 correspond to Pasquill categories A-F respectively, where 1 (A) is extremely unstable and 6 (F) is stable. The proportion of stable stability classes 5 and 6 per total frequency for each wind direction exceeds 50% for the directions SSW through NW. These two classes are 62% of all the winds from the west (W). These two classes represent less than 20% of the observations for winds from the NNE through E. For extremely unstable to neutral (1-4) stability classes, 39% out of a possible 48% total wind frequency are from the NE through SW wind directions.

The wind distribution, average speeds and stability category data are based on USDEP COMM, NOAA, EDS, NCC STAR Program results.



PALM BEACH COUNTY
SOLID WASTE AUTHORITY
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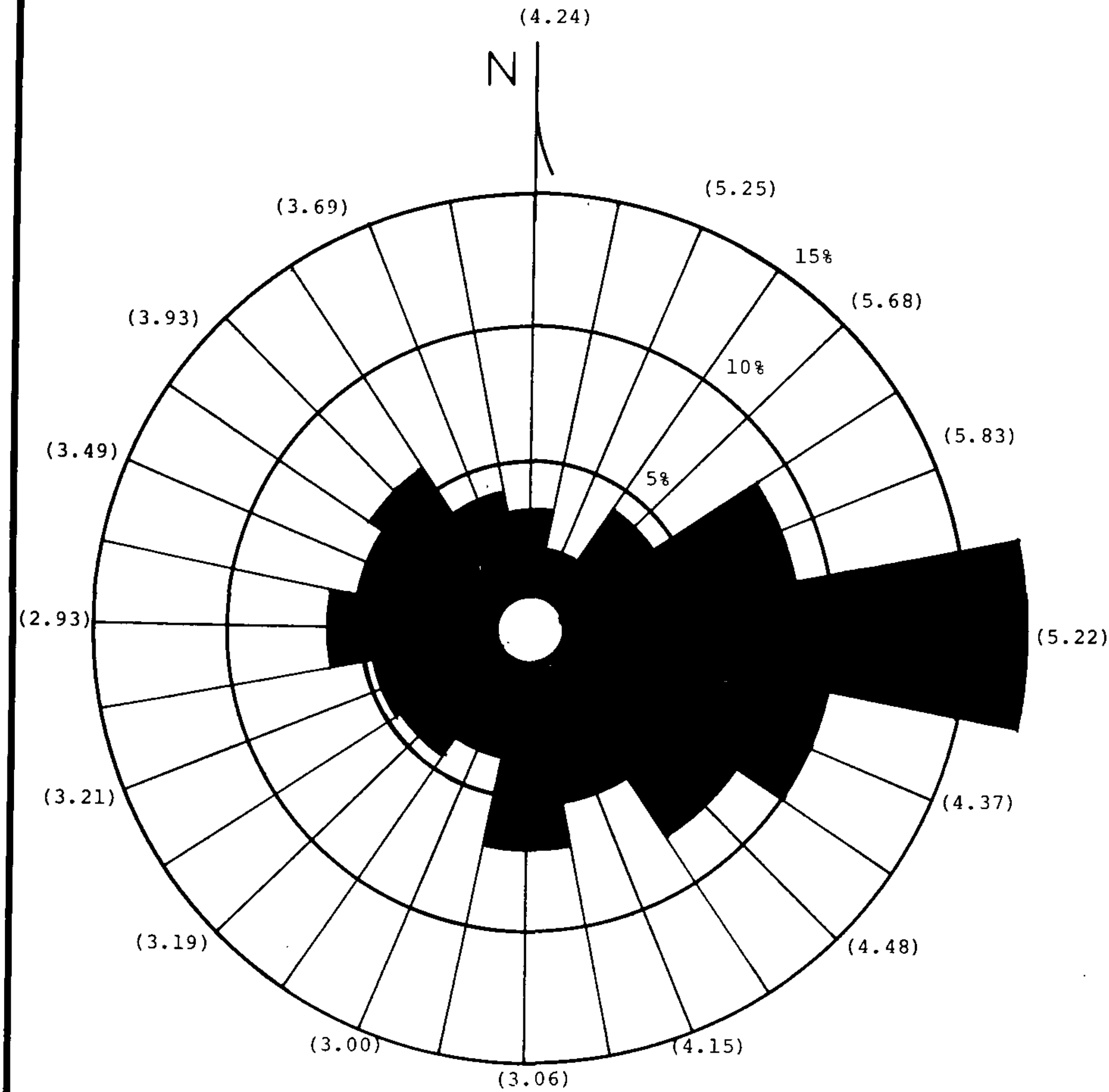
WIND SPEED FREQUENCY DISTRIBUTIONS
WEST PALM BEACH, FL. (1970-1974)

FIG. 2.3-24



Average Wind Speed: (4.3 m/s)

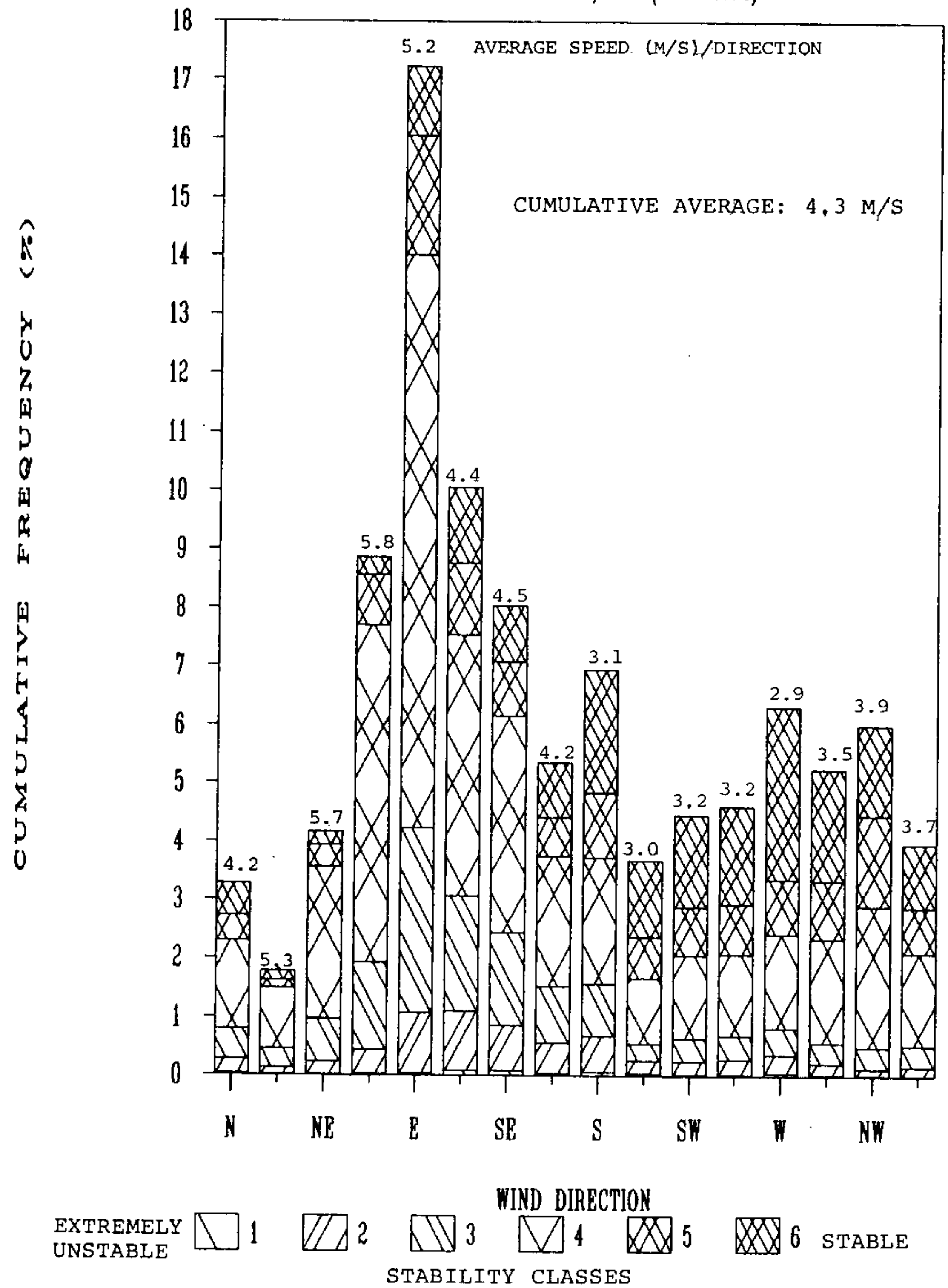
PALM BEACH COUNTY
SOLID WASTE AUTHORITY
RESOURCE RECOVERY FACILITY

WIND DIRECTION FREQUENCY DISTRIBUTION
WEST PALM BEACH, FL. (1970-1974)

FIG. 2.3-25

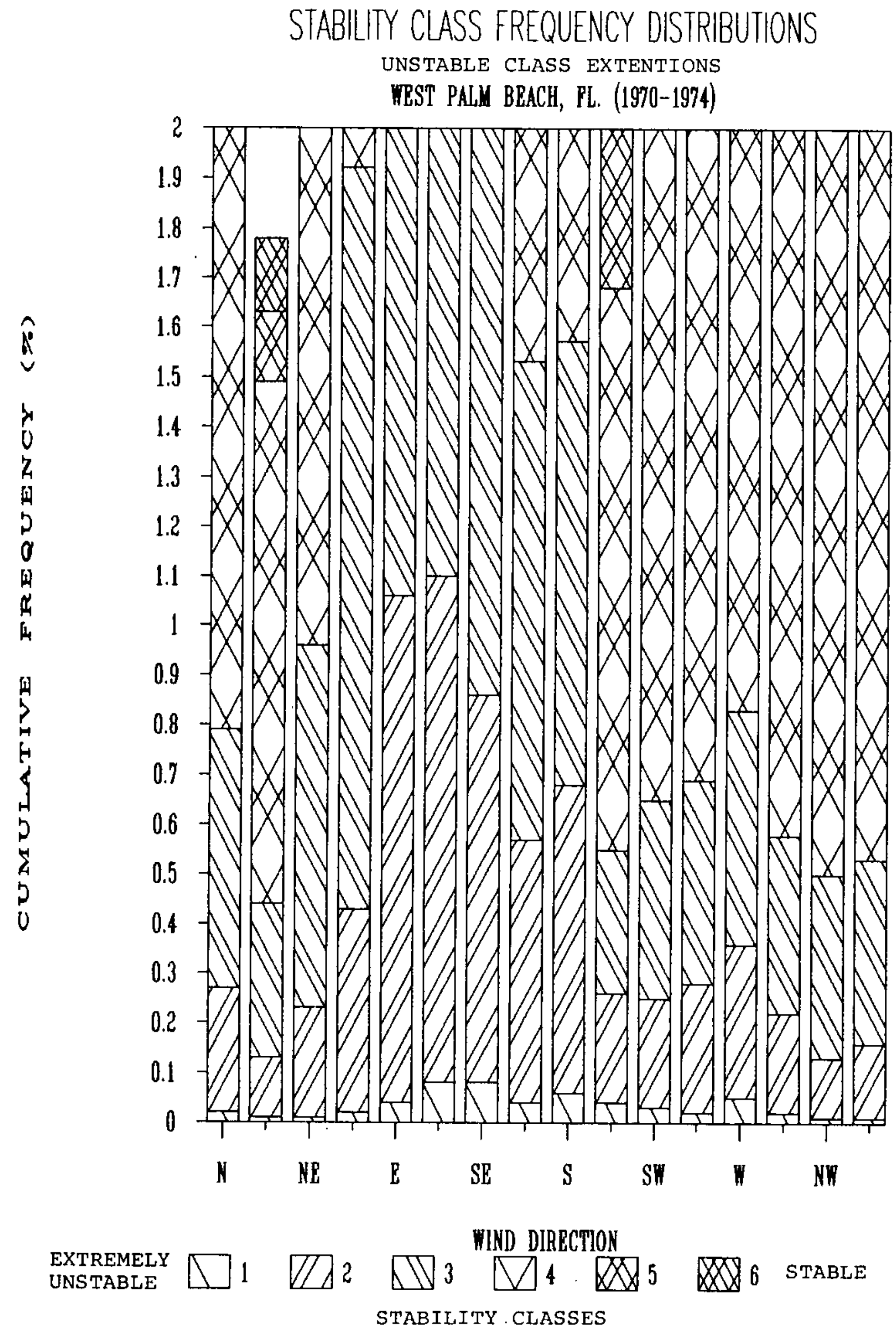
STABILITY CLASS FREQUENCY DISTRIBUTIONS

WEST PALM BEACH, FL. (1970-1974)



PALM BEACH COUNTY
SOLID WASTE AUTHORITY
RESOURCE RECOVERY FACILITY

STABILITY CLASS FREQUENCY DISTRIBUTIONS
WEST PALM BEACH, FL. (1970-1974)
FIG. 2.3-26



PALM BEACH COUNTY
SOLID WASTE AUTHORITY
RESOURCE RECOVERY FACILITY

STABILITY CLASS FREQUENCY DISTRIBUTIONS
UNSTABLE CLASS EXTENTIONS
WEST PALM BEACH, FL. (1970-1974)
FIG. 2.3-27

TABLE 2.3-9

NORMALS, MEANS, AND EXTREMES

Station: MIAMI, FLORIDA   INTERNATIONAL AIRPORT   Standard time used: EASTERN   Latitude: 25° 48' N   Longitude: 80° 16' W   Elevation (ground): 7 feet

Month	Temperature: Normal: Daily maximum	Daily minimum	Monthly	Extremes: Record highest	Year	Record lowest	Year	Normal heating degree days (Base 65°)	Precipitation: Normal total	Maximum monthly	Year	Minimum monthly	Year	Maximum in 24 hrs.	Year	Snow, Ice pellets: Mean total	Maximum monthly	Year	Maximum in 24 hrs.	Year
(a)	(b)	(b)	(b)	7		7		(b)	(b)	29		29		29		29	29		29	
J	75.8	57.9	66.9	86	1967	35	1971+	74	2.03	6.66	1969	0.04	1951	2.50	1958	0.0	0.0		0.0	
F	77.0	58.8	67.9	87	1971	36	1967	56	1.87	6.56	1966	0.01	1944	5.73	1966	0.0	0.0		0.0	
M	79.8	61.1	70.5	90	1971	37	1968	19	2.27	7.22	1949	0.02	1956	7.07	1949	0.0	0.0		0.0	
A	82.6	65.8	74.2	96	1971	46	1971	0	3.88	10.21	1960	0.07	1971	5.18	1960	0.0	0.0		0.0	
M	85.4	69.7	77.6	93	1967	61	1971+	0	6.44	18.54	1968	0.44	1965	8.42	1958	0.0	0.0		0.0	
J	88.0	73.5	80.8	94	1967	67	1967	0	7.37	22.36	1968	1.81	1945	7.63	1966	0.0	0.0		0.0	
J	88.8	74.7	81.6	96	1969	70	1965	0	6.75	13.51	1947	1.77	1963	4.55	1952	0.0	0.0		0.0	
A	89.7	74.9	82.3	96	1970	70	1967	0	6.97	16.88	1943	1.65	1954	6.92	1964	0.0	0.0		0.0	
S	88.0	74.6	81.3	93	1968+	70	1966+	0	9.47	24.40	1960	2.63	1951	7.58	1960	0.0	0.0		0.0	
O	84.7	70.9	77.8	90	1969+	56	1968	0	8.21	21.08	1952	1.50	1962	9.95	1948	0.0	0.0		0.0	
N	80.2	64.6	72.4	87	1969	40	1970	0	2.83	13.15	1959	0.09	1970	7.93	1959	0.0	0.0		0.0	
D	77.1	59.1	68.1	85	1968+	34	1968	65	1.67	6.39	1958	0.13	1968+	4.38	1964	0.0	0.0		0.0	
YR	83.1	67.1	75.1	96	APR. 1971+	34	DEC. 1968	214	59.76	24.40	SEP. 1960	0.01	FEB. 1944	9.95	OCT. 1948	0.0	0.0		0.0	

Month	Relative humidity: Hour 01 (Local time)	Hour 07	Hour 13	Hour 19	Wind: Mean speed	Prevailing direction	Fastest mile: Speed	Direction	Year	Pct. of possible sunshine	Mean sky cover sunrise to sunset	Mean number of days: Sunrise to sunset: Clear	Partly cloudy	Cloudy	Precipitation .01 inch or more	Snow, Ice pellets 1.0 inch or more	Thunderstorms	Heavy fog	Temperatures: Max.: 90° and above	Max.: 32° and below	Min.: 32° and below	Min.: 0° and below	Average daily solar radiation - langleys
(a)	7	7	7	7	22	15	14	14			23	22	22	22	29	22	22	23	7	7	7	7	20
J	81	84	60	69	9.4	NNW	37	31	1966		5.2	10	12	9	6	0	1	2	0	0	0	0	334
F	78	82	57	66	10.1	ESE	38	30	1964		5.2	8	12	8	5	0	1	1	0	0	0	0	397
M	77	82	56	65	10.3	SE	46	04	1966		5.3	9	14	8	6	0	2	1	*	0	0	0	475
A	76	81	55	64	10.4	ESE	32	23	1958		5.4	8	15	7	6	0	3	1	2	0	0	0	572
M	78	81	60	69	9.4	ESE	37	32	1961		5.8	6	15	10	10	0	7	*	2	0	0	0	540
J	84	86	67	75	8.1	SE	37	13	1967+		6.8	3	14	13	15	0	13	0	7	0	0	0	506
J	82	83	64	72	7.8	SE	38	18	1962		6.5	3	17	11	16	0	15	0	10	0	0	0	539
A	82	86	65	73	7.6	SE	74	36	1964		6.5	3	18	10	16	0	16	*	11	0	0	0	510
S	85	89	67	77	8.2	ESE	69	06	1965		6.8	2	15	13	17	0	12	*	6	0	0	0	440
O	84	88	66	75	9.1	ENE	41	05	1966		6.1	6	13	12	15	0	6	*	*	0	0	0	387
N	81	85	59	69	9.2	N	32	08	1966		5.2	9	13	8	8	0	1	1	0	0	0	0	330
D	79	84	58	69	8.8	N	38	32	1967		5.2	10	12	9	6	0	1	1	0	0	0	0	319
YR	81	84	61	70	9.0	ESE	74	36	AUG. 1964		5.8	77	170	118	127	0	76	7	37	0	0	0	447

Means and extremes above are from existing and comparable exposures. Annual extremes have been exceeded at other sites in the locality as follows:
Highest temperature 100 in July 1942; lowest temperature 28 in January 1940; maximum precipitation in 24 hours 12.58 in April 1942. Old City Office:
Lowest temperature 27 in February 1917; maximum precipitation in 24 hours 15.10 in November 1925.

Station: WEST PALM BEACH, FLORIDA   PALM BEACH INTERNATIONAL AP   Standard time used: EASTERN   Latitude: 26° 41' N   Longitude: 80° 06' W   Elevation (ground): 15 feet

Month	Temperature: Normal: Daily maximum	Daily minimum	Monthly	Extremes @: Record highest	Year	Record lowest	Year	Normal heating degree days (Base 65°)	Precipitation: Normal total	Maximum monthly	Year	Minimum monthly	Year	Maximum in 24 hrs.	Year	Snow, Ice pellets: Mean total	Maximum monthly	Year	Maximum in 24 hrs.	Year
(a)	(b)	(b)	(b)	7		7		(b)	(b)	33		33		33		26	26		26	
J	75.5	58.3	66.9	86	1965	29	1970	87	2.48	7.92	1958	0.22	1960	6.36	1957	0.0	0.0		0.0	
F	76.5	58.6	67.6	87	1964	35	1967	64	2.35	6.88	1966	0.29	1948	4.70	1966	0.0	0.0		0.0	
M	78.6	61.1	69.9	92	1965	31	1968	31	3.44	11.95	1970	0.33	1956	4.88	1970	0.0	0.0		0.0	
A	82.4	65.4	73.9	99	1971	45	1971	0	4.34	18.26	1942	0.04	1967	15.23	1942	0.0	0.0		0.0	
M	85.9	69.2	77.6	96	1971+	56	1971+	0	5.11	14.10	1946	0.39	1967	7.04	1958	0.0	0.0		0.0	
J	89.2	72.7	81.0	95	1971	62	1965	0	7.53	17.91	1966	1.07	1952	9.21	1945	0.0	0.0		0.0	
J	90.8	74.3	82.6	96	1969	68	1965	0	6.66	17.74	1941	1.22	1961	3.38	1965	0.0	0.0		0.0	
A	91.1	74.8	83.0	97	1970	68	1969	0	6.74	13.52	1950	2.16	1955	5.89	1949	0.0	0.0		0.0	
S	89.7	74.5	82.1	92	1971+	68	1967	0	9.66	24.86	1960	2.73	1939	8.71	1960	0.0	0.0		0.0	
O	85.2	71.1	78.2	93	1971	46	1968	0	7.96	18.74	1965	2.16	1962	9.58	1965	0.0	0.0		0.0	
N	80.2	64.8	72.5	87	1971+	37	1970	6	2.86	10.77	1971	0.23	1970	5.44	1971	0.0	0.0		0.0	
D	76.9	59.4	68.2	85	1968+	33	1968	65	2.57	8.73	1949	0.06	1968	5.26	1959	0.0	0.0		0.0	
YR	83.5	67.0	75.3	99	APR. 1971	29	JAN. 1970	253	61.70	24.86	SEP. 1960	0.04	APR. 1967	15.23	APR. 1942	0.0	0.0		0.0	

Month	Relative humidity: Hour 01 (Local time)	Hour 07	Hour 13	Hour 19	Wind: Mean speed	Prevailing direction	Fastest mile: Speed	Direction	Year	Pct. of possible sunshine	Mean sky cover sunrise to sunset	Mean number of days: Sunrise to sunset: Clear	Partly cloudy	Cloudy	Precipitation .01 inch or more	Snow, Ice pellets 1.0 inch or more	Thunderstorms	Heavy fog	Temperatures: Max.: 90° and above	Max.: 32° and below	Min.: 32° and below	Min.: 0° and below	Average daily solar radiation - langleys
(a)	7	7	7	7	29	14	22	22			23	26	26	26	29	29	29	29	7	7	7	7	
J	80	82	58	73	9.9	NW	48	29	1955		5.8	8	11	12	7	0	1	2	0	0	1	0	
F	80	81	57	70	10.4	SE	46	29	1956		5.7	8	10	10	6	0	1	1	0	0	0	0	
M	76	79	54	66	10.7	SE	51	27	1957		5.6	8	13	10	8	0	1	1	*	0	*	0	
A	75	77	53	64	10.8	E	55	32	1958		5.5	8	13	9	7	0	4	1	3	0	0	0	
M	76	76	57	68	9.6	ESE	45	27	1954		5.8	8	13	10	11	0	7	*	3	0	0	0	
J	84	83	67	77	8.0	ESE	71	09	1957		6.8	4	12	14	14	0	13	*	6	0	0	0	
J	85	85	65	76	7.5	ESE	45	20	1950		6.6	4	13	14	15	0	16	0	14	0	0	0	
A	83	84	63	75	7.4	ESE	86	13	1964		6.5	3	16	12	16	0	16	*	17	0	0	0	
S	84	86	67	78	8.8	ENE	55	03	1965		7.1	2	14	14	17	0	11	*	8	0	0	0	
O	82	85	65	75	9.9	ENE	74	16	1964		6.4	6	13	12	14	0	5	*	2	0	0	0	
N	79	82	57	72	9.9	ENE	35	34	1959		5.3	8	13	9	8	0	1	1	0	0	0	0	
D	78	80	57	71	9.8	NNW	36	07	1958		5.3	9	12	10	7	0	1	1	0	0	0	0	
YR	80	82	60	72	9.4	ESE	86	13	AUG. 1964		6.1	76	153	136	131	0	78	8	53	0	1	0	

@ For period February 1964 through the current year.
Means and extremes above are from existing and comparable exposures. Annual extremes have been exceeded at other sites in the locality as follows:
Highest temperature 101° in July 1942.

REFERENCE NOTES APPLYING TO ALL "NORMALS, MEANS, AND EXTREMES" TABLES

(a) Length of record, years, based on January data. Other months may be for more or fewer years if there have been breaks in the record.
(b) Climatological standard normals (1941-1970).
* Less than one half.
\+ Also on earlier dates, months, or years.
T Trace, an amount too small to measure.
Below zero temperatures are preceded by a minus sign.
The prevailing direction for wind in the Normals, Means, and Extremes table is from records through 1963.
‡ ≤ 70° at Alaskan stations.

Unless otherwise indicated, dimensional units used in this bulletin are: temperature in degrees F.; precipitation, including snowfall, in inches; wind movement in miles per hour; and relative humidity in percent. Heating degree day totals are the sums of negative departures of average daily temperatures from 65° F. Cooling degree day totals are the sums of positive departures of average daily temperatures from 65° F. Sleet was included in snowfall totals beginning with July 1948. The term "ice pellets" includes solid grains of ice (sleet) and particles consisting of snow pellets encased in a thin layer of ice. Heavy fog reduces visibility to 1/4 mile or less.

Sky cover is expressed in a range of 0 for no clouds or obscuring phenomena to 10 for complete sky cover. The number of clear days is based on average cloudiness 0-3, partly cloudy days 4-7, and cloudy days 8-10 tenths.

Solar radiation data are the averages of direct and diffuse radiation on a horizontal surface. The langley denotes one gram calorie per square centimeter.

& Figures instead of letters in a direction column indicate direction in tens of degrees from true North; i.e., 09 - East, 18 - South, 27 - West, 36 - North, and 00 - Calm. Resultant wind is the vector sum of wind directions and speeds divided by the number of observations. If figures appear in the direction column under "Fastest mile" the corresponding speeds are fastest observed 1-minute values.

Data Source.
CLIMATOGRAPHY OF THE UNITED STATES NO 60
Climate of Florida
NOAA, EDS, NCC, October, 1976

The Summary by Hour analyses given in the monthly Local Climatological Data (LCD) for West Palm Beach for the period 1970-1974 were used to generate seasonal diurnal distributions for the resultant wind directions and average wind speeds. Winter consists of all available data for the months of December, January and February. Spring consisted of all available data for the months of March, April and May. The derived seasonal diurnal variations for wind direction are shown in Figure 2.3-28.

The diurnal variations of the wind directions for the spring and summer seasons are almost identical and uniquely different from the diurnal curve for the fall season. The winter season curve is erratic, particularly during the early morning hours, but tends to correspond with that of the fall season during the daylight and early evening hours.

The diurnal wind direction patterns give no indication of a diurnal shift that would be consistent with a persistent ocean sea breeze. They confirm instead the dominant easterly trade winds that were observed in the annual wind direction frequency roses. The seasonal diurnal wind speed distributions shown in Figure 2.3-29 all have the same general form. The minimum wind speeds occurred at or between 0400-0700. The minimum average speed was 1.9 m/s (4.3 mph) at 0400 during the summer season. The maximum wind speeds occurred at 1300. The highest average speed was 6.6 m/g (14.8 mph) during the spring season. The spring season (except at 0400) has the highest diurnal average wind speeds and the summer season (without exception) has the lowest diurnal average wind speeds.

Seasonal mixing heights for the West Palm Beach, based on G.C. Holtzworth, differ slightly from those of Miami when they are extracted from Holtzworth's isopheth maps. These values are given in Table 2.3-11.

TABLE 2.3-10

***NORMALS BY CLIMATOLOGICAL DIVISIONS**

Taken from "Climatography of the United States No. 81-4, Decennial Census of U. S. Climate"

TEMPERATURE (°F)

STATIONS (By Divisions)	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ANN
LOWER EAST COAST													
FORT LAUDERDALE	67.8	68.4	70.7	74.3	77.5	80.4	81.8	82.6	81.5	77.9	72.6	69.0	75.4
HOMESTEAD EXP STA	65.6	66.5	69.2	72.8	75.9	79.2	80.2	80.7	80.0	76.3	70.7	66.9	73.7
MIAMI BEACH	69.1	69.6	71.6	74.9	78.2	81.1	82.3	82.9	81.7	78.4	73.8	70.3	76.2
MIAMI WSO	66.9	67.9	70.5	74.2	77.6	80.8	81.8	82.3	81.3	77.8	72.4	68.1	75.1
MIAMI 12 SSW	66.5	67.5	70.4	74.2	77.5	80.4	81.6	82.0	81.0	77.2	71.6	67.7	74.8
WEST PALM BEACH WSO	66.9	67.6	69.9	73.9	77.6	81.0	82.6	83.0	82.1	78.2	72.5	68.2	75.3
DIVISION	66.9	67.6	70.0	73.6	77.0	80.2	81.5	82.0	81.0	77.4	72.0	68.2	74.8
KEYS													
KEY WEST WSO	69.6	70.4	72.5	75.8	79.0	81.8	83.3	83.6	82.3	79.0	74.1	70.6	76.8
KEY WEST	70.4	71.3	73.6	77.1	80.2	82.8	84.0	84.3	83.0	79.6	74.9	71.4	77.7
DIVISION	70.2	71.0	73.3	76.6	79.8	82.4	83.5	83.8	82.5	79.2	74.5	71.2	77.3

PRECIPITATION (In.)

STATIONS (By Divisions)	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ANN
LOWER EAST COAST													
FORT LAUDERDALE	2.20	2.06	2.84	4.19	5.29	7.42	5.96	6.88	8.98	8.39	3.18	2.90	60.29
HOMESTEAD EXP STA	1.75	1.71	2.38	3.69	6.46	8.77	8.81	8.29	10.61	8.72	2.28	1.22	64.69
MIAMI BEACH	1.68	1.65	1.95	2.92	4.54	5.63	4.45	5.06	7.36	6.71	2.53	1.78	46.26
MIAMI WSO	2.03	1.87	2.27	3.88	6.44	7.37	6.75	6.97	9.47	8.21	2.83	1.67	59.76
MIAMI 12 SSW	2.05	1.80	2.44	3.75	6.13	7.00	6.58	6.25	9.03	8.23	2.59	1.63	57.48
WEST PALM BEACH WSO	2.48	2.35	3.44	4.34	5.11	7.53	6.66	6.74	9.66	7.96	2.86	2.57	61.70
DIVISION	2.16	2.02	2.82	3.90	5.49	7.44	6.65	6.82	9.47	8.15	2.84	2.17	60.00
KEYS													
KEY WEST WSO	1.53	1.98	1.77	2.48	2.73	3.97	4.16	4.33	6.73	5.82	2.80	1.69	39.99
KEY WEST	1.49	2.00	1.73	2.51	2.77	4.01	4.16	4.25	6.53	5.87	2.81	1.71	39.84
DIVISION	1.71	1.88	1.92	2.29	3.10	4.33	4.54	4.68	7.05	6.73	2.43	1.88	42.55

* Normals for the period 1931-1960. Divisional normals may not be the arithmetical average of individual stations published, since additional data for shorter period stations are used to obtain better areal representation.

CONFIDENCE - LIMITS

In absence of trend or record changes, the chances are 9 out of 10 that the true mean will lie in the interval formed by adding and subtracting the values in the following table from the means for any station in the State. Because of the wider variation in mean precipitation, the corresponding monthly means and annual mean must be substituted for "p" in the precipitation table below to obtain mean precipitation confidence limits.

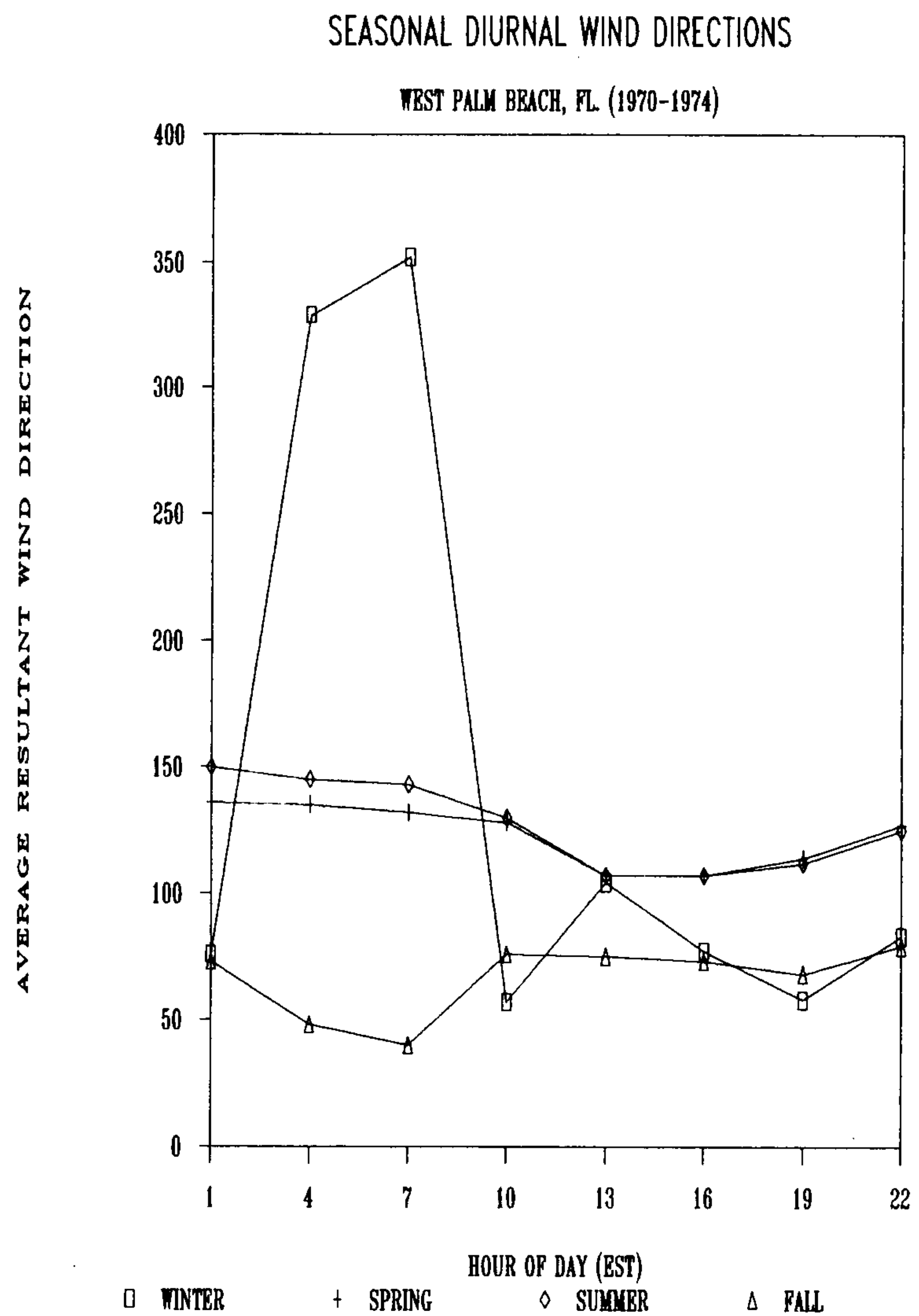
1.3	1.3	1.1	.5	.5	.4	.4	.3	.4	.5	.8	1.2	.4
$39\sqrt{p}$	$37\sqrt{p}$	$44\sqrt{p}$	$48\sqrt{p}$	$47\sqrt{p}$	$48\sqrt{p}$	$38\sqrt{p}$	$43\sqrt{p}$	$53\sqrt{p}$	$59\sqrt{p}$	$44\sqrt{p}$	$35\sqrt{p}$	$44\sqrt{p}$

COMPARATIVE DATA

Data in the following table are the mean temperature and average precipitation for St. Leo's Abbey, Florida, for the period 1901-1930 and are included in this publication for comparative purposes.

60.3	61.7	66.3	70.6	75.8	79.2	80.5	80.7	79.2	73.2	65.4	60.3	71.1
2.87	2.54	2.90	2.20	4.44	8.19	8.22	8.48	6.91	3.70	2.20	2.51	55.16

Data Source: CLIMATE OF THE STATES, Vol. 1, Water Information Center, Inc., 1974



PALM BEACH COUNTY
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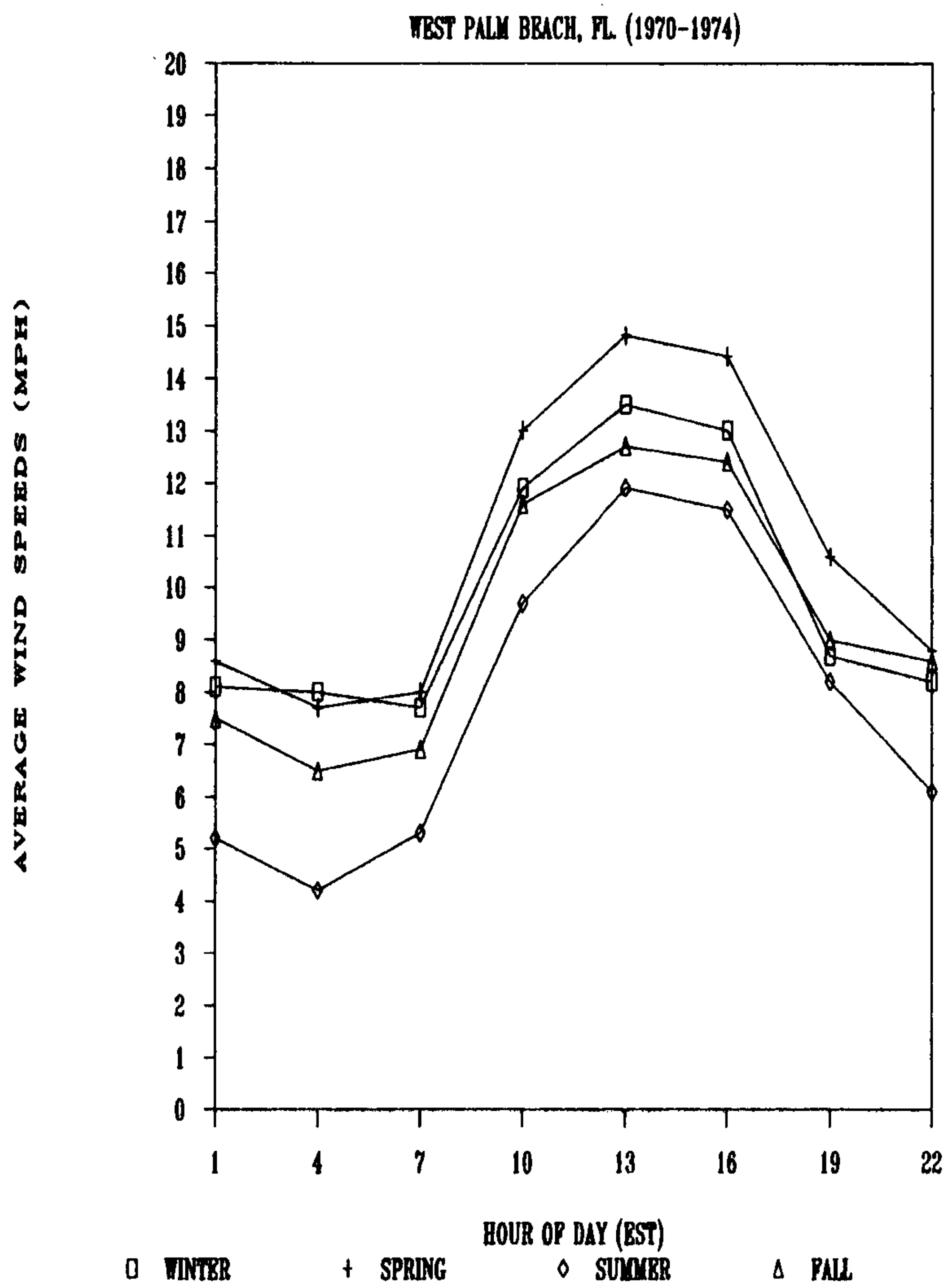
SEASONAL DIURNAL WIND DIRECTIONS
WEST PALM BEACH, FL. (1970-1974)

FIG. 2.3-28

SEASONAL DIURNAL WIND SPEEDS



PALM BEACH COUNTY
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SEASONAL DIURNAL WIND SPEEDS
WEST PALM BEACH, FL. (1970-1974)
FIG. 2.3-29

Processed hourly meteorological data and stabilities, as derived from the Palm Beach Airport and Miami Airport, were used to generate hourly and 24 hour air quality impacts. These data are presented, by year in Appendix IV.

The meteorological data from the Palm Beach Airport, along with upper air data from Miami Airport, can be considered as sufficiently representative of the proposed RRF site so as to preclude the need for additional on-site monitoring.

TABLE 2.3-11
HOLTZWORTH* MIXING HEIGHTS FOR WEST PALM BEACH AND MIAMI

	Morning		Afternoon	
Period	**West Palm**	**Miami#**	**West Palm**	**Miami#**
ANNUAL	800	923	1,375	1,351
SPRING	800	980	1,400	1,457
SUMMER	900	1,071	1,400	1,383
FALL	800	933	1,350	1,341
WINTER	700	707	1,175	1,221

* G.C. Holtzworth, Mixing Heights, Winds Speeds, and Potential for Urban Air pollution Throughout the tiguous United States; USEPA AP-101, January, 1972.
#Appendix B, Table B-1; all cases, Holtzworth, 1972.

2.3.7.2 Ambient Air Quality

In accordance with Rule 17-2.500(5)(f)(FAC), pollutants subject to New Source Review (NSR) may require ambient air monitoring to define background concentrations. These concentrations are used to assess the extent that the emissions from the proposed source may contribute to violations of applicable ambient air quality standards and/or the extent to which applicable PSD allowable increments may be consumed.

The Florida DER requested emission estimates for sixteen (16) pollutants including the criteria pollutants. These estimates have been prepared. In addition, estimates of dioxin (2,3,7,8-TCSS) have been prepared. The estimates have been prepared based on design total capacities of 1800 and 2100 TPD through-puts of RDF generated from the processing of 3,000 TPD of municipal solid waste (MSW). The total emission rates are compared to PSD significant levels in Table 2.3-12. Significant levels are exceeded for TSP, CO, NO_x, SO_2, VOC, mercury and fluorides.

Particulate matter, particulate lead, beryllium and particulate mercury (Hg) will be controlled by BACT – tentatively, an electrostatic precipitator (ESP) with an outlet grain loading of 0.03 gr/dscf at 12% CO_2. Low sulfur auxiliary fuel is, tentatively, the BACT for SO_2 and acid gases. NO_x, CO and VOC will be controlled by good combustion design and practices.

Source may be exempt from air quality monitoring if the impact of a given pollutant falls below the specified minimum concentrations [17-2.500(3)(e) (FAC)]. Air quality diffusion analyses were conducted using the EPA-ISCST and ISCLT models and five years of meteorological data (1970-1974). The highest second highest impact concentrations generated are compared to these de-minimus values in Table 2.3-13 for those pollutants that did not meet de-minimus levels based on emission potential. From these results only SO_2 is found to exceed its de-minimus value.

TABLE 2.3-12
SIGNIFICANT EMISSION RATES AND TOTAL FACILITY POTENTIAL TO EMIT (THREE UNITS AT 600 TPD EACH)
VALUES FOR PSD REGULATED POLLUTANTS

Pollutant	Significant Emission* Rates (Tons/Year)	Potential to# Emit (Tons/Year)
Particulate Matter (TSP)	25	214
Carbon Monoxide (CO)	100	3,942
Nitrogen Oxides (NO_x)	40	1,314
Sulfur Dioxide (SO_2)	40	2,957
Ozone (VOC)	40	65.6
Lead (Pb)	0.6	0.46
Asbestos	7.0 E-2	—
Beryllium (Be)	4.0 E-3	3.0 E-3
Mercury (Hg)	0.1	0.98
Vinyl Chloride	1.0	—
Fluorides	3.0	13.2
Sulfuric Acid Mist	7.0	0.131
Total Reduced Sulfur (including H_2S)	10	—
Reduced Sulfur (including H_2S)	10	—
Hydrogen Sulfide (H_2S)	10	—
Hydrogen Chloride	—	1,150
2,3,7,8-TCDD	—	1.8 E-5

* 17.2 (V) Table 500.2
# 1,800 TPD RDF fired (based on 3 units at 600 TPD each)

TABLE 2.3-13
COMPARISON OF IMPACT OF PALM BEACH COUNTY RDF FIRED SPREADER STOKER FURNACES TO DE-MINIMUS LEVELS (ISC MODEL)
SIGNIFICANT MONITORING CONCENTRATIONS

Pollutant	Averaging Time	De-Minimus Guidelines ug/m³	Highest 2nd Highest# Concentration ug/m³ *	Distance (km) From Source to De-Minimus Level High	H₂ndH
TSP	24 Hour	10	2.0	##	##
SO_2	24 Hour	13	27.9	9.0	9.0
CO	8 Hour	575	81.1	##	##
NO_x	24 Hour	14	12.3	1.5	##
Ozone (VOC)	1 Hour	*	3.0**	##	##
Mercury	24 Hour	0.25	9.3E-3	##	##
Fluorides	24 Hour	0.25	0.12	##	##
Lead	24 Hour	0.1	4.3E-3	##	##
Beryllium	24 Hour	5.0E-4	9.9E-5	##	##

* No value established. Ambient air standard: 235 ug/m³ not to be exceeded on more than an average of of one day per year over a three year period.

Model analyses for SO_2 based on 2,100 TPD and 9% S. Concentrations for other pollutants based on on their emissions ratio to SO_2.

** Assumes all VOC becomes ozone.

Less than de-minimus values at all distances greater than 0.6 km from the source. Minimum distance tance from RDF source to site boundary: 0.73 km.

There are thirteen active ambient air quality monitoring sites with a range of 50 km from the proposed RDF facility. These sites are listed in Table 2.3-14. The maximum and second highest maximum concentrations and their sites as measured in 1983, are shown in Table 2.3-15 along with the Federal and Florida ambient air quality standards. It has been determined by the Florida DER that the exiting monitoring facilities are sufficient to provide ambient air background in the study area. Pre-construction monitoring is not required.

TABLE 2.3-14
MONITORING STATION LOCAL ADDRESSES, UTM COORDINATES AND LOCATION (DISTANCE & ANGLE) RELATIVE TO THE PROPOSED PALM BEACH COUNTY RDF FIRED WATERWALL FURNACE FACILITY

(FACILITY UTM COORDINATES 2960180N; 585820E; UTM ZONE 17)

Site No.	Address (Monitoring Capability)	UTM Coordinates Zone 17	Distance From Proposed Facility (Meters)	Direction Relative To Proposed Facility (North = 0(360) Degrees (Degrees)
1	West Palm Beach Water Treatment Plant First St. & Tamarind Ave. West Palm Beach, Florida (CO, NO_2, Meteorology)	2955030N 0593232E	9,026	125
1A	Palm Beach County Health Dept. 901 Evernia Street West Palm Beach, Florida (Suspended Particulate)	2955030N 0593232E	9,026	125
2	North Palm Beach Water Treatment Plant 603 Anchorage Drive North Palm Beach, Florida (Suspended Particulate)	2965817N 0592780E	8,956	51
3	Lake Worth Water Treatment Plant 301-303 College Street Lake Worth, Florida (Suspended Particulate)	2943537N 0592793E	18,045	157
4	Delray Beach Water Treatment Plant 202 NW First Street Delray Beach, Florida (Suspended Particulate)	2927488N 0592195E	33,308	169

TABLE 2.3-14 (Continued)

Site No.	Address (Monitoring Capability)	UTM Coordinates Zone 17	Distance From Proposed Facility (Meters)	Direction Relative To Proposed Facility (North = 0(360) Degrees (Degrees)
5	Boca Raton Fire Station #1 1151 North Federal Highway Boca Raton, Florida (Suspended Particulate)	2915768N 05913137E	44,750	173
6	Southwest Fire Department 1180 S. Military Trail West Palm Beach, Florida (Suspended Particulate)	2949018N 0588207E	11,414	168
7	College of Boca Raton 1151 North Federal Highway Boca Raton, Florida (Suspended Particulate)	2918354N 0587320E	41,853	178
8	South Florida Water Mgmt. Pump Station Twenty Mile Bend State Road 80 (Suspended Particulate, Ozone, Meteorology)	2951402N 0562879E	24,563	249
9	Pahokee Sewage Treatment Plant 1050 McClure Road Pahokee, Florida (Suspended Particulate)	2964200N 0532300E	53,671	274
10	Royal Palm Beach R.V. Area 10999 Okeechobee Blvd. Royal Palm Beach, Florida (Ozone, Meteorology)	2954150N 0578100E	9,796	232
11	Palm Beach County Health Department Warehouse 2030 Avenue "L" Riviera Beach, Florida (Sulfur Dioxide)	2962350N 0592480E	7,005	72
12	Belle Glade Health Dept. 1024 NW Avenue "D" Belle Glade, Florida (Suspended Particulate)	2953082N 0533160E	53,136	262

TABLE 2.3-15
AMBIENT AIR QUALITY STANDARDS

Pollutant	Federal Primary	Federal Secondary	State	Maximum Concentration Measured in 1983 (Site #)	Maximum 2nd Max Concentration(3) Measured in 1983 (Site #)
Sulfur Dioxide					
Max 3-hr Concentration	No Standard	1300 UG/M^3 (0.5 PPM)	1300 UG/M^3 (0.5 PPM)	65 UG/M^3 (11) (0.025 PPM)	63 UG/M^3 (11) (0.024 PPM)
Max 24-Hr Concentration	365 UG/M^3 (0.14 PPM)	No Standard	260 UG/M^3 (0.1 PPM)	39 UG/M^3 (11) (0.015 PPM)	29 UG/M^3 (11) (0.011 PPM)
Annual Arithmetic Mean	80 UG/M^3	No Standard (0.03 PPM)	60 UG/M^3 (0.02 PPM)	7 UG/M^3 (11) (0.0027 PPM)	
Particulate Matter					
Max 24-Hr Concentration (2)	260 UG/M^3	150 UG/M^3	150 UG/M^3	134 UG/M^3 (5)	107 UG/M^3 (4)
Annual Geometric Mean	75 UG/M^3	60 UG/M^3	60 UG/M^3	43.1 UG/M^3 (12)	
Nitrogen Dioxide					
Annual Arithmetic Mean	100 UG/M^3	100 UG/M^3 (.05 PPM)	100 UG/M^3 (.05 PPM)	20 UG/M^3 (1) (.05 PPM)	(0.01 PPM)
Ozone					
Daily Max 1-Hr Concentration (1)	235 UG/M^3 (0.12 PPM)	235 UG/M^3 (0.12 PPM)	235 UG/M^3 (0.12 PPM)	180 UG/M^3 (10) (0.092 PPM)	172 UG/M^3 (10) (0.088 PPM)
Lead					
Quarterly Arithmetic Mean	No Standard	No Standard	1.5 UG/M^3	Not Monitored	
Carbon Monoxide					
Max 1-Hr Concentration	40000 UG/M^3 (35 PPM)	40000 UG/M^3 (35 PPM)	40000 UG/M^3 (35 PPM)	10171 UG/M^3(1) (8.9 PPM)	9943 UG/M^3(1) (8.7 PPM)
Max 8-Hr Concentration(2)	10000 UG/M^3 (10 PPM)	10000 UG/M^3 (10 PPM)	10000 UG/M^3 (10 PPM)	6600 UG/M^3(1) (6.6 PPM)	4500 UG/M^3(1) (4.5 PPM)

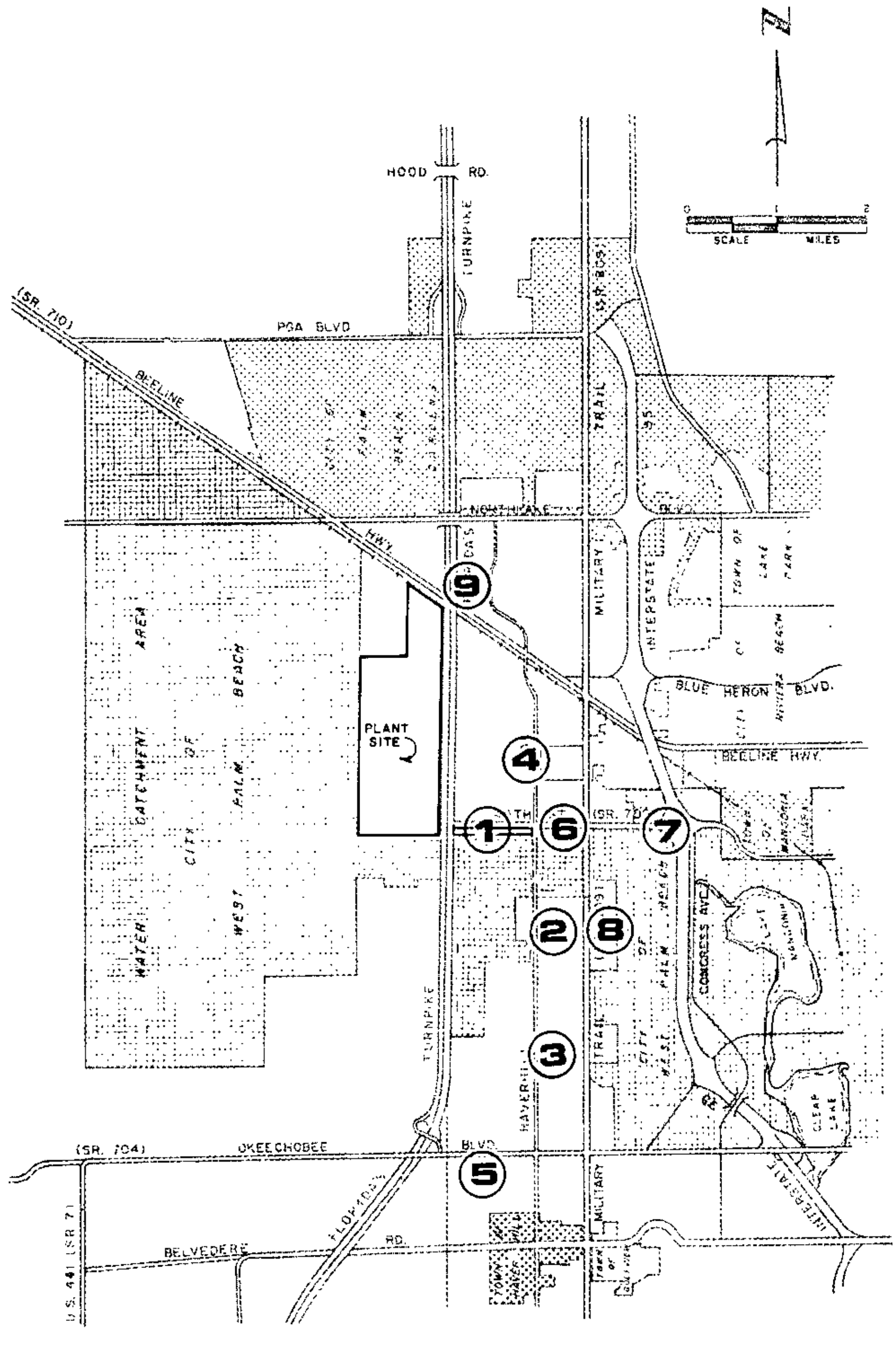
1. The standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above above 0.12 PPM is equal to or less than 1.
2. Concentration limits not to be exceeded more than once per year.
3. Since short term concentration limits are not to be exceeded more than once per year, the values presented in column (5) for short short term concentrations reflect the highest values of the second highest concentration measured at the monitoring station.

2.3.8 Noise

An Environmental Noise Study for the Resource Recovery Facility has been completed and is contained in its entirety in Appendix 10.15.

The first phase of the study includes: 1) surveying the area as to land use; 2) identifying noise-sensitive areas; and 3) characterizing existing noise levels for those areas. The noise-sensitive areas are depicted on Figure 2.3-30 and the existing noise level of each is indicated on Table 2.3-16. The characteristics of each of these areas are discussed in Appendix 10.15

The noise levels in the sensitive areas were measured during the daytime hours in order to relate to the anticipated hours during which the facility would be receiving MSW and during which the landfills would be in operation. Noise levels were found to be dominated by the existing vehicular traffic on vicinity roads. None of the existing noise levels exceeded the Federal Highway Administration (FHWA) or Department of Housing and Urban Development (HUD) recommended sound levels.



PALM BEACH COUNTY

SOLID WASTE AUTHORITY

RESOURCE RECOVERY FACILITY

AMBIENT NOISE LEVEL

MONITORING LOCATIONS

FIG. 2.3-30

TABLE 2.3-16
AREAS WITHIN THE OVERALL PROJECT AREA WITH REPRESENTATIVE EXISTING WEEKDAY SOUND LEVELS

	AREA	DISTANCE TO MAJOR ROAD	WEEKDAY SOUND LEVEL LEQ (dBA)
1.	45th St., West of Haverhill	100'	54
2.	Haverhill, 45th to Roebuck	100'	62
3.	Haverhill, Roebuck to South of 12th	100'	60
4.	Haverhill, 45th to Port Road (Bee Line)	100'	58
5.	Okeechobee, Turnpike to Haverhill	100'	65
6.	45th, Military Trail to Haverhill	100'	58
7.	45th, I-95 to Military Trail	100'	63
8.	Military Trail, Roebuck to Port Road (Bee Line)	100'	60
9.	North of Port Road and East of Turnpike	150'	55

2.3.9 Other Environmental Features

2.3.9.1 Transportation

2.3.9.1.1 Existing Conditions

Existing transportation facilities and characteristics in the vicinity of the proposed Resource Recovery Facility were inventoried in order to provide an input needed to define the extent of transportation impacts related to the facility. Data obtained for this analysis included the following:

2.3.9.1.1.1 Roadway Network

The existing principle street and highway system serving the proposed site is depicted on Figure 2.3-31. Major north-south roadways serving the site include I-95, Military Trail, Haverhill Road, Florida's Turnpike, and a north-south roadway. Major east-west roadways which will serve the site include Blue Heron Boulevard, Beeline Highway, 45th Street, and Okeechobee Boulevard. The cross-section of each of these facilities was determined and the number of through lanes are noted on Figure 2.3-31. In addition to the general cross-section characteristics, critical intersections were inventoried to determine turn lane provisions for capacity analyses which are discussed under Sections 4.6.3 and 5.9.1 of this application.

2.3.9.1.1.2 Traffic Volumes

Existing traffic volumes on the roadway network were obtained from Palm Beach County and from field studies performed by Kimley-Horn and Associates, Inc. These data include peak hour (afternoon) intersection turning movements, 1983-84 24-hour traffic volumes and background traffic volumes related to expected area growth (the background traffic volumes were required by Palm Beach County for the zoning application).

PALM BEACH COUNTY
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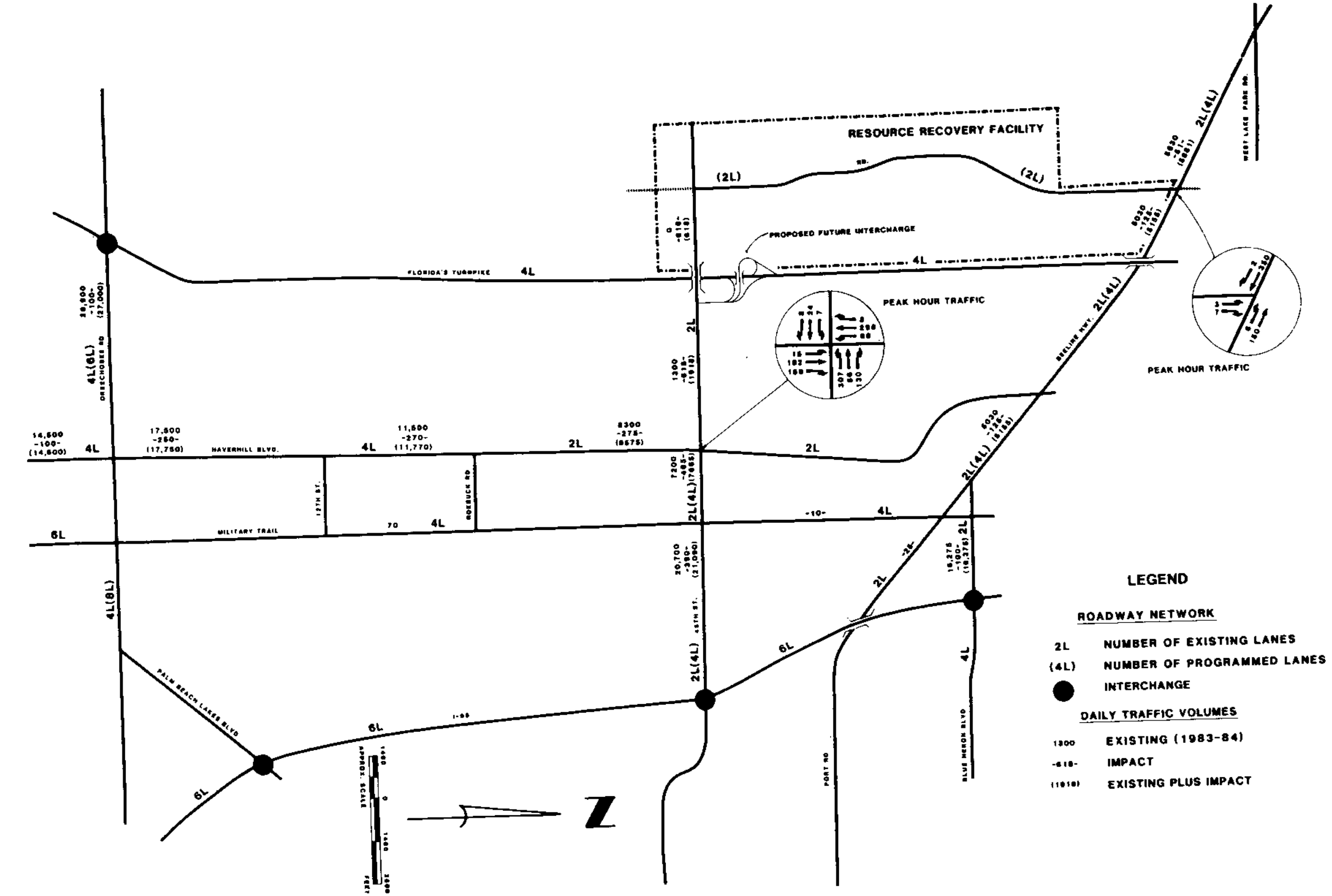


TRAFFIC ASSIGNMENT

FIG. 2.3-31

2.3.9.1.1.3 Planning Data – Land Use and Development Data

Land use and development data were provided on a copy of the conceptual plan dated October 18, 1984. The project is scheduled to begin operation in 1989.

In addition, information was provided on the operational characteristics of the proposed Resource Recovery Facility. This included the location of the solid waste transfer facilities and the actual number of trips from each transfer facility, and from the direct haul service area to the Resource Recovery Facility. The solid waste management facility locations are shown on Figure 2.3-32.

2.3.9.1.2 Future Conditions

A list of programmed roadway improvements was completed by reviewing the County Transportation Improvement Program which includes funded projects. Travel growth expected in the area also was estimated based on traffic impact analyses required for Palm Beach County Zoning Application related to future conditions include the following:

2.3.9.1.2.1 Roadway Network

Several roadway improvements are scheduled, or under construction within the vicinity of the proposed Resource Recovery Facility. Some of these improvements are required to meet existing travel demand, while others will serve the growth that will continue to impact the area. The programmed roadway improvements are depicted on Figure 2.3-31. The only north-south roadway programmed is the construction of a roadway from 45th Street to Beeline Highway through the Resource Recovery Facility site. This will be constructed by the Palm Beach County Solid Waste Authority. Major east-west roadways in the vicinity which are scheduled for improvement include Okeechobee Boulevard (4 lanes to 8 lanes and 6 lanes), 45th Street (2 lanes to 4 lanes), and Beeline Highway (2 lanes to 4 lanes). The limits of these improvements are depicted on Figure 2.3-31.

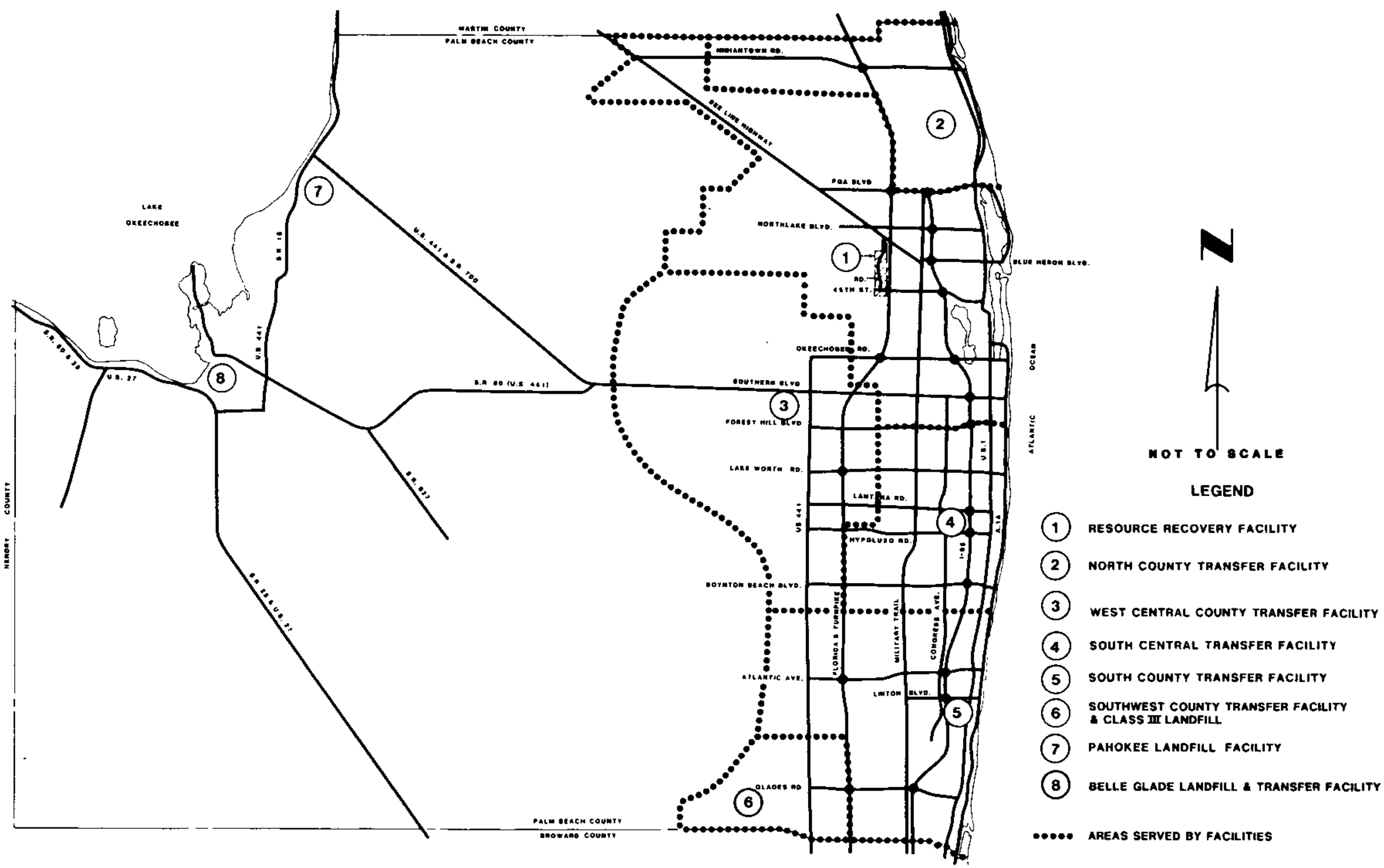
2.3.9.1.2.2 Traffic Volumes

Future traffic volumes were estimated based on traffic impact analyses. These analyses are discussed in Chapters 4 and 5 and in Appendix 10.16.

2.3.0.1.2.3 Land Use Data

Future land use data related to other growth expected as the Resource Recovery Facility is developed was available from the Palm Beach County Planning Department. These data were used to develop "background traffic volumes" discussed in Appendix 10.16 of this application.

PALM BEACH COUNTY
SOLID WASTE AUTHORITY
RESOURCE RECOVERY FACILITY



SOLID WASTE MANAGEMENT FACILITY LOCATIONS

FIG. 2.3-32

2.3.9.1.3 Roadway Capacity Analyses

Using the roadway inventory data, and the traffic volume data traffic capacity analyses were completed to determine the level of service of the roadways which will be impacted by the development of the Resource Recovery Facility. Under existing and "after" conditions, levels of service on the major north-south roadways are as follows:

	Existing	After
I-95	C	C
Military Trail	D	D
Haverhill Blvd.	A to D	B to F
Florida's Turnpike	A	A

while major east-west roadways have levels of service as follows:

Blue Heron Blvd.	C	C
Beeline Highway	C	A to C
45th Street	F	A
Okeechobee Blvd.	D	C

Although the impact of growth expected in the vicinity of the Resource Recovery Facility will mean increased traffic volumes, capacity analyses completed for the programmed improved conditions indicate Levels of Service "A" will be provided at any location where the Resource Recovery Facility will have a significant traffic impact.

Routine inspections of the site will occur as a result of various other monitoring programs. It is anticipated that evaluation of the general ecological conditions of the site will be made coincidentally to these other monitoring programs. Efforts will be made to ensure that individuals making these inspections report any disturbance such as disease or pest outbreaks to appropriate persons in the Solid Waste Authority for corrective measures.

4.5 AIR IMPACT

4.5.1 Landfill Construction

This has been discussed thoroughly in Section 3.4.2.

4.5.2 Resource Recovery Plant Construction

4.5.2.1 Emission Rates

Construction activities have the potential for causing localized, short-term adverse air quality impacts. Possible impacts include: fugitive dust emissions from land clearing and site preparation activities, and mobile source emissions from construction at the construction site.

Although emissions will continue throughout all phases of construction, the greatest impact from fugitive dust emissions will occur during the site preparation phase when the largest number of acres of the site will be exposed. The greatest impact from the mobile sources will occur during the facility construction phase when the amount of equipment on site is the greatest.

The emissions from present construction across the Turnpike at the Dyer Boulevard Landfill site for expansion and closure would approximate what might be expected at the new site, and therefore not further degrade air quality in the general area.

4.5.2.2 Mitigating Measures for Particulate Emissions

The construction site is located in an attainment area. The emissions are expected to have a short term impact that are typical of those found with other construction activities.

Construction requirements for fill and concrete will result in truck traffic along the site access road. This makes the unpaved roads a source of particulate matter. Several mitigating measures are available to reduce these emissions. Routine watering of the roadway will provide a reduction of roadway emissions of about 50 percent. A watering truck is usually on site for various other activities. Partial dedication of this truck or the addition of a second truck will be accomplished. Surface treatment with penetrating chemicals would provide a 50 percent reduction depending on the frequency of application. The application of penetrating chemicals is more costly than a routine watering but fewer applications are required. The purchase of chemicals, time to mix the chemicals, and the partial use of a watering truck or some other vehicle would contribute to the cost. Soil stabilization alone can achieve a 50 percent emission reduction by binding up surface soil. The advantage to soil stabilization is that the roadway becomes more drivable. Soil stabilization is done once, as soon as the roadway is developed. Additional emission reductions could be obtained if oil or penetrating chemicals were spread over the stabilized area. Paving achieves the greatest reduction in emissions, 85 percent, and represents the most stringent emission limitation. Road paving can be done either by soil compaction and adding base coarse material or by soil stabilization with an asphalt cap, whichever is most appropriate for the site. Good construction practice requires a developed access road for the number of trucks hauling fill. Since a road capable of handling heavy trucks must eventually be built, any dust control measure less than building the access road up to base coarse level would have to be torn up. Thus the development of the access road is not an excess cost but part of good construction, its early construction is cost effective, and is the recommended method for reducing particlate emissions.

General site emissions, particulate emissions across open and active construction areas, are best controlled by a comprehensive watering program. This method can reduce emissions by 50 percent. Other methods used to control emissions are not practical because soil is usually in a state of transition. An excessive amount of penetrating chemicals would be required and binding agents would continually be broken up. However, since a watering truck is available onsite for other construction activities, its added utilization will not represent a significant cost. Completed cut and fill areas which are vegetated or covered with chemical binders can reduce particulate emissions by 65 to 80 percent. Since these areas are not active and would not receive traffic, vegetation can grow undisturbed and chemical binders need only infrequent applications. Embankments brought up to grade and no longer subject to construction activity will be immediately landscaped or vegetated. Till piles or embankments requiring future activity will be treated with a readily available binder. Good site maintenance practice will be observed. Although not quantifiable, covering trucks carrying fill or loose material and watering down the access road can greatly reduce dust problems. The practices are not costly and what extra effort may be required usually is greatly outweighed by the benefits.

4.6 IMPACT ON HUMAN POPULATIONS

The construction of the proposed Resource Recovery Facility will result in both positive and negative effects in the local and regional population. Positive effects are primarily regional in nature and result from construction jobs created, material purchases and tax revenues. The next section presents a review of potential negative effects on human populations.

4.6.1 Sensitive Receptors

Sensitive receptors are defined as individuals or organizations/ institutions which are located close enough to the project site to have the potential to be affected by the construction process. A comprehensive description of the land use and demographic features of the area surrounding the site is presented in Section 2.2.

As indicated in Section 3.2 major land uses adjacent to the project site include wetlands, residential, light industrial and the existing Dyer Boulevard Landfill. Only the residential areas and the City of West Palm Beach Water Catchment Area (WCA) are considered sensitive receptors for the purpose of this analysis.

There are three residential areas within one mile of the proposed landfill, none within one mile of the proposed resource recovery plant. The Grier property, bordering the site on the northwest, contains two homes, neither of which is within one-half mile of the proposed landfill. Each is at least 7,000 feet from the proposed plant. The Steeplechase/ Horseshoe Acres development lies to the northeast of the proposed site, the closest home lying barely within a mile of the northern edge of the proposed landfill and 2 miles from the proposed plant location. The Gramercy Park development lies 3,000 feet to the east of the southernmost section of the proposed landfill and approximately 6,000 feet from the proposed plant. The WCA lies 3,000 feet west of the proposed landfill and approximately 2,300 feet west of the proposed plant.

There are no schools, hospitals, churches or other potentially sensitive institutions or activities within the site vicinity.

4.6.2 **Work Force**

4.6.2.1 **Resource Recovery Plant**

The total construction work force for the plant is expected to average 160 for the 36 months of the plant construction. The lowest work force of 50 will be in place during the initial phase of construction while peak levels of work force are expected to be 350 to 400 during critical stages of construction. It is estimated that up to 700 to 800 different jobs will be available during the project period. The estimated levels of work force over the duration of the Resource Recovery Facility construction are indicated on Figure 4.6-1.

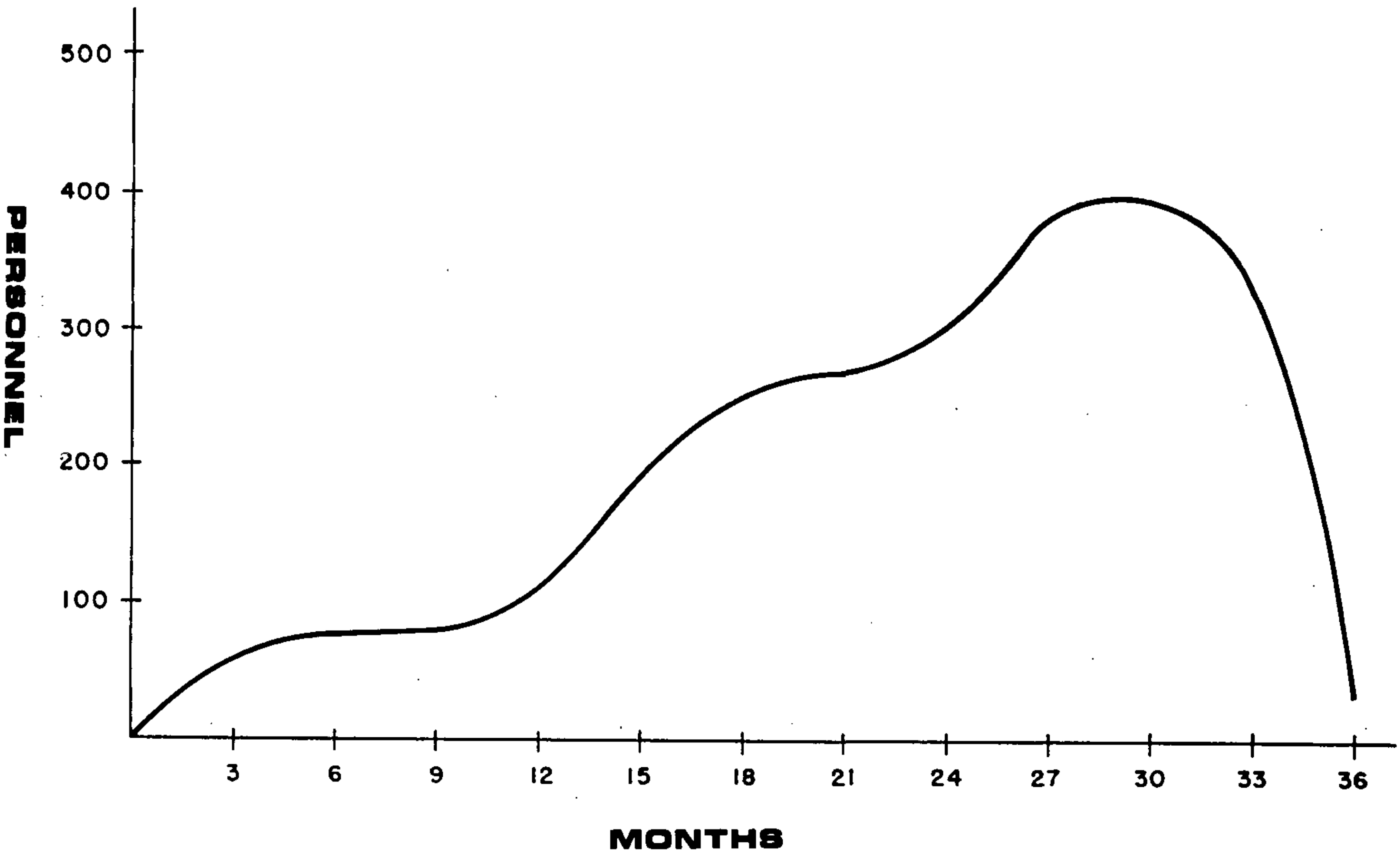
4.6.2.2 **Landfill**

The landfill work force will remain fairly consistent throughout the life of this facility, with land clearing, excavation, access road construction, cell construction and closeout, all continuing on a regular basis throughout the life of the landfill. The landfill workers are included in the work force estimate during the construction of the plant in order to accurately represent the total work force during that period.

4.6.2.3 **Workshifts**

The majority of activities required for the construction of the resource recovery facility will take place on an eight hour per day, five days a week schedule. Dewatering and continuous placement of concrete may be required on a 24 hour basis for short periods, based on final design and the method of construction being utilized. All remaining construction activities will be conducted on an eight hour per day basis.

PALM BEACH COUNTY
SOLID WASTE AUTHORITY
RESOURCE RECOVERY FACILITY



ESTIMATED WORK FORCE
DURING CONSTRUCTION

FIG. 4.6-1

4.6.2.4 Work Force Revenues

The construction of the Resource Recovery Facility will provide the economic benefits of a $200,000,000 construction project to the area. Direct economic benefits include jobs for the construction of the facility and for the manufacturing of capital items to be installed in the facility. Indirect economic benefits include increased earnings and jobs for the companies providing materials and services to the firms actually involved in the construction.

4.6.2.5 Work Force Availability

Most of the personnel requirements for the construction of the proposed facility will be met by the available labor pool in Martin, Palm Beach, and Broward Counties. No significant relocation of construction workers and their families is expected. Therefore, no impact on housing, schools or other community support assets is expected.

4.6.3 Traffic Associated with Construction

Construction of the Resource Recovery Facility will impact the level of traffic at the site access located on 45th Street, but it will not result in a significant traffic impact on 45th Street between the site and I-95. However, levels of service along this route will improve due to the programmed four-laning.

The traffic impact of construction is associated with the number of vehicles which will enter and exit the facility site per day over the duration of construction. The four general categories of traffic which will enter and exit the site include vehicles associated with the general work force, delivery of construction equipment, construction materials, and equipment for installation. The traffic anticipated on the peak days during construction will not exceed 200 vehicles per day. This will result in a less than significant traffic impact. Capacity analyses completed for the full operation facility indicated acceptable levels of service can be made with impacts almost four times as great as during construction (Section 5.9.1). Therefore, the traffic impact of site construction will not affect the area.

4.7 IMPACT ON LANDMARKS AND SENSITIVE AREAS

There are no landmarks or sensitive areas within the limits of the site. None of the areas identified in Section 2.2.1 or 2.2.5 will be impacted by site preparation, or plant and associated facilities construction.

4.8 IMPACT ON ARCHAEOLOGICAL AND HISTORIC SITES

No archaeological or historic sites were identified in the DAHRM survey of the site and vicinity (Section 2.2.6). It is highly unlikely that any significant, unrecorded sites exist in the vicinity. No impact to archaeological or historic sites will result from site preparation of construction.

In the unlikely event an undiscovered site exists, the routine supervision and inspection of construction will reveal it. If a site is found, DAHRM will be notified and necessary measures taken to assure conservation of the site until an assessment of its nature can be made.

4.9 SPECIAL FEATURES

The fill to achieve design elevations for the landfill and resource recovery plant will be dredged from dredge lakes planned on the site. It is not anticipated that the dredge operation will adversely effect ground water.

During construction certain quantities of solid and liquid waste will be generated. This waste may take the form of discarded packaging materials, refuse produced by construction workers, earth spoils, sanitary wastes, or waste oils. Proper handling (Section 4.1.1.1) and disposal of these wastes on site will maintain the aesthetic and ecological integrity of the site and surrounding areas.

4.10 BENEFITS FROM CONSTRUCTION

The primary benefits from construction of the proposed Resource Recovery Facility are related to the employment of construction workers (and, therefore, the creation of jobs) and the benefits to personal income due to work force revenues. These benefits are discussed in Section 4.6.2.

Moreover, site preparation and construction of facilities will benefit the groundwater resource to the extent that 53 acre-feet of water per year will be salvaged from the existing water-table evapotranspiration and become available in the shallow aquifer.

4.11 VARIANCES

No variances from standards or guidelines are anticipated.

in a filtration capacity. Water storage within the volume to be excavated will increase five-fold by virtue of the borrow lakes created. The long-term effects will be some reduction in soil filtration benefits while the short-term availability of water will be substantially increased due to the increase in water stored in the borrow lakes. (Sections 4.3 and 5.3.)

The creation of hard surfaces on landfills and roadways will permanently reduce the water-table evapotranspiration rate and concomitantly increase groundwater availability on the site to a minor extent. (Section 4.3.)

The money spent to obtain permitting, purchase land, finance and construct the Resource Recovery Facility represents an irreversible committment. However, as discussed in Chapters 1 and 7, this project is probably less costly and certainly poses less danger to Florida's environment than would a continued committment to dispose of all of Palm Beach County's municipal solid waste by traditional sanitary landfilling. Therefore, the money spent of this project will be, to a great extent, an investment in our future.

5.12 **VARIANCES**

It is not expected that any variances from applicable standards will be sought in connection with the operation of the facility.

Recently the Florida Electric Power Coordinating Group set up the Florida Electric and Magnetic Field Science Advisory Commission to evaluate the potential for adverse effects of exposure to electro-magnetic fields associated with power transmission lines. The report of the Advisory Commission, which was submitted March, 1985, addressed only lines 230 kV and above. After a full review of available scientific evidence by its members, the Commission concluded that "It is unlikely that human exposure to 60 Hertz electric and magnetic fields can lead to public health problems". The Commission further recommended the "Florida Utilities should adhere to the National Electrical Safety Code or to an equivalent State Code".

In view of the findings of this Commission and due to the fact that the transmission line is only 138 kV and will be constructed primarily on Solid Waste Authority's property, the transmission line should not present a health hazard.

6.1.10.2 **Electrical Discharges**

Another area of concern is the occurrence of electrical discharges along the transmission line causing the production of corona (an avalanche of ionization and air surrounding the line which in turn may produce ozone, audible noise, and radio frequency noise). Modern transmission line design incorporates techniques which reduce corona effects to a minimum.

6.2 **ASSOCIATED LINEAR FACILITIES**

There are no other linear facilities extending over mile from the main site.

CHAPTER 9: COORDINATION

Site selection, rezoning and preparation of this application for the proposed Resource Recovery Facility has necessitated coordination with individuals and private firms as well as federal, state, regional, county and local governmental agencies. Assistance and information has been provided to the Palm Beach County Solid Waste Authority and to the members of the engineering consulting team.

Table 9-1 lists the individuals and agencies with which coordination was accomplished and the primary topic of coordination.

Table 9-2 lists the lead members of the consulting team and their responsibilities in connection with this project.

TABLE 9-1

Federal

Agency	Individual	Subject
United States Fish and Wildlife Service Post Office Box 2676 Vero Beach, FL 32961	Bob Pennington Joe Carroll Joe Johnston	Environmental/Ecological Environmental Effects of Facility
United States Army Corps of Engineers, Miami	Mike Slayton	Wetlands
United States Army Corps of Engineers, Stuart	Chris Dowling	Wetlands
United States Army Corps of Engineers, Jacksonville	Marie Grigsby John Adams	Wetlands
United States Environmental Protection Agency, Atlanta	Eric Hughes	Wetlands
United States Geological Survey, Miami	Ellis Dunsky	Surface Water Management Plan

State

Agency	Individual	Subject
Florida Department of Environmental Regulation West Palm Beach	Larry O'Donnell Steve Burian Joe Lurix John Guidry	Ecology Surface Water Management Plan Wetlands

State (Continued)

Agency	Individual	Subject
Florida Department of Environmental Regulation Tallahassee	Mike Nagy	Ecology Surface Water Management Plan Wetlands
Florida Game and Freshwater Fish Commission, West Palm Beach	Biff Lampton	Ecology
Florida Game and Freshwater Fish Commission, Vero Beach	Steve Lau	Ecology
Florida Department of Transportation, Tallahassee	Claude White	Turnpike Access
Florida Turnpike Authority	Sam Roddenberry	Turnpike Access

Regional

Agency	Individual	Subject
South Florida Water Management District Post Office Box V 3301 Gun Club Road West Palm Beach, FL 33402 (305)686-8800	Charles W. Pemble, P.E. Richard S. Tomasello, P.E. Charles A. Padera Bill Hellfrich Sally Lockhard	Surface Water Management Plan Wetlands

County

Agency	Individual	Subject
Palm Beach County Planning, Zoning & Building Div. 3400 Belevedere Road West Palm Beach, FL 33406 (305)471-3500	Robert E. Basehart Patsy McKernan John Lehner Pat Bush	Rezoning
Palm Beach County Health Department 901 Evernia Street West Palm Beach, FL 33401 (305)837-3052	Frank J. Gargiulo, P.E.	Water & Sewer Services, Rezoning
Northern Palm Beach County Water Control District 5725 Corporate Way, Suite 203 West Palm Beach, FL 33407 (305)471-4105	Peter L. Pimentel	Surface Water Management Plan Drainage Outfall

Local

Agency	Individual	Subject
City of West Palm Beach	Richard Simmons, City Manager Allan Frefry	Water Catchment Area

Private Firms

Agency	Individual	Subject
Babcock & Wilcox 400 S. Tyson Street Charlotte, NC 28285 (704) 334-4742	Dennis Williams	Operation of Resource Recovery Plant
CSI Resource Systems, Inc. 88 Broad Street Boston, MA 02110 (617)542-3070	Clovis Pendergast, P.E. Richard D. Larson, P.E. James J. Binder, P.E.	3rd Party Review
Florida Power & Light Co. Distribution Engineering Department Post Office Box 529100 Miami, FL 33152	Robert H. Stevens, P.E.	Electrical Power Transmission Route
Foster Wheeler 110 South Orange Avenue Livingston, NJ 07039 (201) 533-3231	Walter Murray	Operational Characteristics of RDF/Combustion Plant
Resources Recovery (Dade County), Inc. Post Office Box 524056 Miami, FL 33152 (305)593-7000	Brian Rundle James H. Todd	Operational Characteristics of RDF/Combustion Plant — Noise
Southern Bell Engineering Division 715 South Dixie Highway West Palm Beach, FL 33401	Kirt Danielson	Utility Easement
Mock, Roos & Associates, Inc. 5720 Corporate Way West Palm Beach, FL 33407	Mark Williams Alan Wertepny	Drainage Outfall

TABLE 9-2
MEMBERS OF CONSULTING TEAM

Agency	Individual	Responsibility
Barker, Osha & Anderson, Inc. 860 U.S. Highway One Suite 202 North Palm Beach, FL 33408 (305)626-4653	Sumpter(Sam)H. Barker,P.E. Michael Schenk, P.E. Mic Jackson, Ph.D.	Project Director Project Manager Editor
Hayden/Wegman, Inc. 5114 Okeechobee Blvd. Suite 2-B West Palm Beach, FL 33417 (305)471-0444	Gary L. Smith, P.E. Stanley G. Timmerman Lou Terracciano, P.E.	Plant Design Air Quality Analysis

TABLE 9-2 (Continued)
MEMBERS OF CONSULTING TEAM

Agency	Individual	Responsibility
York Services, Inc. 1 Research Drive Stamford, CT 06906 (203) 325-1371	Edward Kaplin, Ph.D.	Air Quality Analysis
Post, Buckley, Schuh & Jernigan, Inc. 889 North Orange Ave. Orlando, FL 33801-1088 (305)423-7275	David Deans, P.E. Albert R. Capellini, P.E. Carolyn Kulwicki	Landfill Design, Surface Water Management Plan Conceptual Plan
Geraghty & Miller, Inc. 2700 PGA Boulevard Suite 104 Palm Beach Gardens, FL 33410 (305)694-0300	Vincent P. Amy Paul Jakob James A. Wheatley	Geohydrological Analysis Injection Well Design
Joyce Environmental Consultants, Inc. 619 Industrial Street Lake Worth, FL 33461 (305)582-4317	Robert D. Blackburn, Ph.D. Marc C. Bruner, Ph.D.	Environmental/Ecological
Kimley-Horn & Associates, Inc. 5800 Corporate Way West Palm Beach, FL 32407 (305)683-5500	James R. Zook, P.E.	Traffic Analysis
Dunn & Associates, Inc. P.O. Box 2408 Boca Raton, FL 33427-2408 (305)487-6898	Stanley E. Dunn, Ph.D. Joseph M. Cuschieri, Ph.D	Noise Analysis
GBS Architects 1080 E. Indiantown Rd. Suite 205 Jupiter, FL 33458 (305)747-6330	George Gentile, A.S.L.A. Don E. Hearing, A.S.L.A.	Site Plan, Landscaping
Burke & Chappell Engineers, Inc. 2324 S. Congress Avenue West Palm Beach, FL 33406 (305)968-4800	Tom Chappell, P.E.	Transmission Corridor Coordination with FP&L
Gibson & Adams Professional Association Florida National Bank Bldg. 303 First St., Suite 400 West Palm Beach, FL 33402-1629 (305)655-8686	Herbert C. Gibson, Attorney at Law James M. Adams, Attorney at Law	Legal Assistance

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State of Florida
DEPARTMENT OF ENVIRONMENTAL REGULATION

INTEROFFICE MEMORANDUM

For Routing To District Offices And/Or To Other Than The Addressee	
To: Tom Rogers	Loctn.: BAQM-TLH
To:	Loctn.:
To:	Loctn.:
From:	Date:
Reply Optional [ ] Reply Required [ ]	Info. Only [ ]
Date Due:	Date Due:

TO: Power Plant Siting Review Committee

FROM: Hamilton S. Oven, Jr., P.E. HSO

DATE: June 18, 1985

SUBJECT: Palm Beach County Resource Recovery Project
Power Plant Siting Certification Application
PA 84-20

Please review the attached power plant siting application from Palm Beach County for completeness (as opposed to sufficiency) and provide me with your comments by the morning of July 2, 1985. There will be a meeting of the Siting Review Committee to discuss the application at 1:30 on July 2, 1985, in Room 518 (Division of Permitting Director's Conference Room).

HSOjr/sb

Attachment

Distribution:
- Tom Rogers, BAQM (+1 extra)
- Ed Svec, BAQM
- Don Kell, Groundwater
- John Reese, Solid Waste
- Larry Olsen, Biology
- Don White, South Florida District (7 copies)
- Julie Cobb, Office of General Counsel
- Debbie White, Standard Form Permitting
- George Baragona, Engineering Support

APPENDIX 10.1

FEDERAL PERMIT APPLICATIONS OR APPROVAL

DER
JUN 19 1985
BAQM

APPENDIX 10.1.5

PREVENTION OF SIGNIFICANT DETERIORATION

DER
JUN 19 1985
BAQM

PALM BEACH COUNTY SOLID WASTE AUTHORITY

SOLID WASTE-TO-ENERGY FACILITY

REPORT ON AIR QUALITY IMPACTS ANALYSIS

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PALM BEACH COUNTY SOLID WASTE AUTHORITY
SOLID WASTE-TO-ENERGY FACILITY

REPORT ON AIR QUALITY IMPACTS ANALYSIS

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REPORT ON AIR QUALITY IMPACTS ANALYSIS

1.0 INTRODUCTION

The Palm Beach County Solid Waste Authority (PBCSWA) intends to construct a Resource Recovery Facility designed to convert 2000 tons per day (tpd) of municipal solid waste (MSW) into electricity for sale to the Florida Power and Light utility grid. This report describes the technical analyses that have been performed to determine the air quality impact of the proposed facility. Such analyses are required as a condition for obtaining a permit to construct and operate facilities that may emit air pollutants. The analyses reported upon herein have been performed in accordance with the requirements and specifications of the Florida Department of Environmental Regulation (FDER) and the United States Environmental Protection Agency (EPA).

This section of the report contains a brief description of the proposed facility, its location, the study area for air quality impacts produced by the proposed facility, and the current attainment status of the air quality standards in the study area. Section 2.0 provides a discussion of how state and federal laws and regulations regarding prevention of significant Deterioration (PSD) in air quality apply to the proposed facility. Section 3.0 is the analysis of the Best Available Control Tech (BACT). In Section 4.0, the pollutants that will be emitted by the proposed facility are identified and the pollutant emission rates are quantified. Section 5.0 presents a discussion of the dispersion modeling analyses that have been performed to determine the air quality impacts of the proposed facility and provides a detailed review of modeling results. Section 6.0 is a summary and conclusions of this report regarding the air quality impact of the proposed Palm Beach County Solid Waste-to-Energy Facility. Section 7.0 provides references utilized for this report.

1.1 Source Description

The initial Resource Recovery Facility construction involves the installation of 2000 TPD of MSW processing capacity. Within 5 years of initial construction an additional 1000 tpd of MSW processing capacity is planned. Accordingly, the PBCSWA and its consultants considered it prudent to file for permits for the ultimate plant capacity of 3000 tpd of MSW.

The MSW will be processed from 4500 Btu/lb heterogeneous MSW into a more homogenous 6200 Btu/lb Refuse Derived Fuel (RDF) in an RDF Manufacturing Facility located on a common site with the combustion facility. Table 1-1 provides a breakdown of MSW components and heating values. Table 1-2 provides a breakdown of RDF components and heating values. 1800 tpd[7] of RDF will be produced by the RDF Manufacturing Plant from the 3000 tpd[6] of MSW.

1.2 Source Location

The proposed waste-to-energy facility for Palm Beach County will be located on a 1320 acre parcel of land bounded on the north by the Beeline

Highway; on the south by 45th Street; on the east by the Florida Turnpike; and on the west by the West Palm Beach Water Catchment Area. The ground elevation at the proposed site is 17 feet above mean sea level as are the surrounding areas of the county.

1.3 Study Area

The land surface of Palm Beach County slopes gently to the south. Highest general elevations (approximately 25 feet above mean sea level) occur near the north county line. The southern Everglades have the lowest base level elevations at approximately 11 feet above mean sea level.

The proposed combustion facilities stack is located approximately 2600 ft to the west of the Florida Turnpike and 3300 ft to the north of 45th Street. Since the proposed waste-to-energy facility is subject to PSD regulations (see Section 2.0) the area considered as the study area for the air quality analyses included all PSD Class I areas located within a radius of 100 kilometers (62 miles). For PSD Class II, all areas within a radius of 50 kilometers (31 miles) comprise the study area, until a lessor radius of significant impact from the proposed source is determined. No PSD Class I area is located within the study area. Everglades National Park is the closest PSD Class I area and is located about 120 km to the southwest. Therefore the study area has been limited to 50 km radius and visibility analysis is not required pursuant to PSD regulations.

1.4 Air Quality Standard Attainment Status in the Study Area

The study area includes Palm Beach and Martin Counties. Air quality monitoring in Palm Beach County is performed by the Palm Beach County Health Department.

Based on the most recent information available (Palm Beach County Health Department's Annual Report Dated 1983), Palm Beach County is in attainment with all NAAQS standards. However, EPA does not consider the County to be in compliance with regard to ozone in spite of the monitoring data until EPA completes their own ozone monitoring program which is presently ongoing. Martin County has been assumed to be in compliance pending FDER information to the contrary.

TABLE 1-1

PALM BEACH COUNTY SOLID WASTE COMPOSITION STUDY

ANALYSIS AND COMPOSITION OF MUNICIPAL SOLID WASTE (MSW)
PERCENT BY WEIGHT

COMPONENT	MOISTURE	INORGANIC	CARBON	HYDROGEN	OXYGEN	NITROGEN	CHLORINE	SULFUR	TOTAL	HHV BTU/LB
CORRUGATED BOARD	1.42	0.11	1.86	0.26	1.79	0.01	0.01	0.01	5.46	315.
NEWSPAPER	4.91	0.25	5.98	0.76	5.19	0.02	0.02	0.03	17.16	1017.
MAGAZINES	0.75	0.42	1.06	0.15	1.05	0.00	0.00	0.01	3.44	178.
OTHER PAPER	5.57	1.64	5.85	0.81	5.40	0.06	0.11	0.03	19.46	989.
PLASTICS	1.09	0.62	4.09	0.56	0.58	0.06	0.22	0.02	7.24	839.
RUBBER, LEATHER	0.19	0.44	0.84	0.10	0.22	0.03	0.10	0.02	1.94	164.
WOOD	0.13	0.07	0.34	0.04	0.29	0.00	0.00	0.00	0.83	58.
TEXTILES	0.40	0.07	1.33	0.18	0.97	0.11	0.01	0.01	3.07	235.
YARD WASTE	0.56	0.10	0.24	0.03	0.18	0.01	0.00	0.00	1.11	40.
FOOD WASTE	1.10	0.33	1.17	0.17	0.84	0.07	0.02	0.00	3.71	213.
MIXED COMBUSTIBLES	8.81	1.31	3.74	0.52	2.96	0.09	0.06	0.03	17.52	653.
FERROUS	0.11	5.15	0.08	0.01	0.08	0.00	0.00	0.00	5.43	14.
ALUMINUM	0.04	1.71	0.03	0.00	0.03	0.00	0.00	0.00	1.80	5.
OTHER NON-FERROUS	0.01	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.32	1.
GLASS	0.23	11.17	0.06	0.01	0.04	0.00	0.00	0.00	11.51	9.
TOTALS	25.30	23.64	26.65	3.61	19.61	0.46	0.55	0.17	100.00	4728.

HEAT VALUE AS RECEIVED (25.3% H2O) = 4728; HEAT VALUE OF DRY SOLIDS = 6329; HEAT VALUE OF COMBUSTIBLES = 9261.

TABLE 1-2

PALM BEACH COUNTY SOLID WASTE COMPOSITION STUDY

TYPICAL ANALYSIS AND COMPOSITION OF REFUSE DERIVED FUEL (RDF)
PERCENT BY WEIGHT

COMPONENT	RECOVERY RATE (%)	MOISTURE	INORGANIC	CARBON	HYDROGEN	OXYGEN	NITROGEN	CHLORINE	SULFUR	TOTAL	HHV BTU/LB
CORRUGATED BOARD	99.0	1.18	0.17	2.72	0.38	2.62	0.01	0.01	0.02	7.39	461.
NEWSPAPER	99.0	5.10	0.37	8.76	1.11	7.60	0.03	0.03	0.04	23.03	1488.
MAGAZINES	99.0	0.78	0.62	1.55	0.22	1.54	0.01	0.01	0.01	4.72	260.
OTHER PAPER	99.0	5.78	2.39	8.56	1.19	7.90	0.08	0.16	0.05	26.12	1443.
PLASTICS	98.0	1.12	0.90	5.92	0.82	0.84	0.09	0.31	0.03	10.03	1215.
RUBBER, LEATHER	99.0	0.20	0.64	1.22	0.15	0.33	0.04	0.14	0.03	2.76	239.
WOOD	99.0	0.14	0.03	0.50	0.06	0.42	0.00	0.00	0.00	1.16	84.
TEXTILES	98.0	0.41	0.10	1.92	0.26	1.40	0.16	0.01	0.01	4.28	340.
YARD WASTE	85.0	0.50	0.13	0.30	0.04	0.22	0.01	0.00	0.00	1.19	51.
FOOD WASTE	60.0	0.69	0.29	1.04	0.15	0.74	0.07	0.02	0.01	3.01	189.
MIXED COMBUSTIBLES	40.0	3.70	0.77	2.21	0.31	1.75	0.05	0.04	0.02	8.85	386.
FERROUS	7.0	0.01	0.53	0.01	0.00	0.01	0.00	0.00	0.00	0.56	1.
ALUMINUM	35.0	0.01	0.88	0.01	0.00	0.01	0.00	0.00	0.00	0.93	2.
OTHER NON-FERROUS	10.0	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.
GLASS	35.0	0.08	5.78	0.03	0.00	0.02	0.00	0.00	0.00	5.92	5.
TOTALS		20.00	13.66	34.75	4.69	25.40	0.54	0.73	0.22	100.00	6171.

HEAT VALUE AS PRODUCED (20.0% H2O) = 6171.
HEAT VALUE OF DRY SOLIDS = 7714.
HEAT VALUE OF COMBUSTIBLES = 9302.

ASH AS PRODUCED (20.0% H2O) = 13.7%
DENSITY = 2.5 TO 3.5 POUNDS/CUBIC FOOT
SIZE = MINUS 2" X MINUS 2" X MINUS 2"

2.0 REGULATION APPLICABILITY

An air quality impact analysis begins with the determination of which regulations are applicable to the proposed source. The first step in the regulatory analysis is the determination of the applicability of PSD regulations. The issue of applicability involves determining whether the proposed source and its emissions are subject to PSD review and, if so, what analyses must be performed.

PSD regulations are only applicable in areas where National Ambient Air Quality Standards (NAAQS) for a given pollutant are met (or where monitoring is insufficient to determine compliance with NAAQS). In such areas, PSD regulations apply to the construction or modification of major air pollution sources. Although the general concept of an air pollution source is a stack, vent or other emission point, for PSD purposes a source is essentially defined as the aggregate of all such emission points that have the potential to emit a regulated pollutant at a given facility. A source's potential to emit is defined as its design capacity emission rate, after the application of any emission controls or other legally enforceable emission limitations. A proposed new source is considered major if it either falls within one of 28 specific source categories and has the potential to emit 100 tons per year of any regulated pollutant or if it falls in an unspecified source category and has the potential to emit 250 tons per year of any regulated pollutant.

The proposed Palm Beach County waste-to-energy facility falls within one of the 28 categories of sources subject to PSD review. As a municipal incinerator, it will be subject to review because it has the capability of charging more than 250 tons of RDF per day. Because the proposed Palm Beach County waste-to-energy facility will emit more than 100 tons per year of several regulated pollutants (see Section 4.0) it is subject to PSD review and related analyses for those pollutants. For each pollutant emitted at a rate in excess of 100 tons/year, three sets of analyses may be required: one for BACT; one for air quality impacts and one for additional types of impacts.

In some instances, ambient air quality monitoring may be required in support of the air quality impact analyses, but the Florida DER has determined that existing monitoring provides sufficient ambient air quality data for the study area. Air quality impact analyses and additional impacts analyses performed for the Palm Beach County waste-to-energy facility are discussed in subsequent sections of this report.

3.0 BEST AVAILABLE CONTROL TECHNOLOGY (BACT)

The BACT analysis, required by PSD review, addresses energy, economic and environmental impacts for alternative emission control strategies. BACT is defined in the 40 CFR 52.21 as "An emission limitation based on the maximum degree of reduction of each pollutant emitted which the Department, taking into account, energy, environmental and economic impacts and other costs, determines on a case by case basis, is achievable through application of production processes and available methods, systems, and techniques, for control of each pollutant".

Technical feasibility is the important first step in this analysis. A technically feasible control technology is one that has been demonstrated to function on identical or similar processes in the U.S.

Once technically feasible control alternatives have been established, they are ranked by their environmental, economic and energy consumption impacts. The starting point for this process is a "base case" control level which is specified by the standard and regulations that would apply in the absence of PSD. They typically include New Source Performance Standards (NSPS).

Table 3-1 lists the air emissions for which an evaluation for BACT was conducted and control alternatives which are considered for the control of each of the pollutants. The air pollutants and the emission levels for which BACT must be determined are shown in Table 3-2.

TABLE 3-1

BACT POLLUTANTS AND CONTROL ALTERNATIVES

Air Emission Parameter	Control Alternatives
Particulate, Lead, Beryllium & Particulate Mercury	Electrostatic Precipitator (ESP) Fabric Filter Dry Scrubber
Sulfur Dioxide, Hydrogen Fluoride, Hydrogen Chloride & Gaseous Mercury	Dry Scrubber
Nitrogen Oxide	Amonia Injection Catalytic Reduction Design and Operating Procedures
Carbon Monoxide	Design and Operating Procedures

This BACT evaluation of the above described control alternatives considered their technical feasibility, energy usage and certain environmental factors. The proposed units are projected to be on-line approximately 80-85% of the time. Air pollution control equipment must be reliable to minimize contribution to unit downtime. Installation of air pollution control equipment increases the facility cost, but results in benefits to the surrounding area and pollution. At some point, the cost of air pollution control equipment is not outweighed by the resulting benefits. To this end, the capital, operational and energy costs, were compared to the benefits.

TABLE 3-2
BACT POLLUTANTS AND ANNUAL EMISSIONS

Air Emission Parameter	Tons/Year	Significant
Particulate	214	25
Sulfur Dioxide	2957.	40
Nitrogen Oxide	1314.	~~100~~ 40
Carbon Monoxide	3942.	100
Lead – No allow Significant	0.46 (920 lbs)	1200 lbs
Beryllium	0.003 (6 lbs)	0.8 lbs
Mercury (particulate & gaseous)	0.98 (1960 lbs)	200 lbs
Hydrogen Fluoride	13.2	3
Hydrogen Chloride	1150.	—

3.1 BACT for Particulate, Lead, Beryllium and Particulate Mercury

3.1.1 Alternatives Not Considered

A number of technologies have been used to control particulate emissions from incinerators in addition to those listed in Table 3-1. These include venturi scrubbers, cyclone collectors and wet spray chambers. Of these only venturi scrubbers have been remotely capable of controlling particulate emissions to the EPA NSPS mandated level of 0.08 gr/dscf corrected to 12% CO_2. The venturi scrubbers were not considered as a viable control alternative for two reasons:

1. Their performance has been sketchy at best and they have had overall difficulty in satisfying the NSPS control level; and

2. Wet scrubbers produce an aesthetically undesirable water vapor plume. Accordingly, wet scrubbing is considered unacceptable and has been eliminated as a control option.

3.1.2 Fabric Filters (Baghouses)

Baghouses remove particulate by filtering the flue gas stream through a fabric. Actually, most of the effectiveness is attributed to filtering through a mat of particulate which has built-up on the surface of the fabric. Characteristics of baghouses are as follows:

- Particulate removal efficiencies as high as 99.8% have been demonstrated on coal fired units.
- Variations in flue gas flow rate and particulate composition do not generally effect performance.
- Pressure drop through unit is significant resulting in relatively high energy usage by fans.
- Available filter materials limit operating temperatures to less than 500°F.
- Sparks in flue gas can cause pinhole leaks and even fires within the filter.
- Consideration must be given to prevention of corrosion caused by acid gas condensation.
- Blinding of filter media.
- Experience on resource recovery facilities is very limited.

Although the TSP emission rate would be guaranteed less than 0.01 gr/dscf corrected to 12% CO_2, a baghouse used above is not considered appropriate primarily due to the incidence of fires caused by sparks and the filter media blinding.

3.1.3 Dry Scrubbers

Dry scrubbers are devices which are designed to remove S02 and acid gases from the flue gas stream, in addition to particulates. Aqueous solutions of lime are sprayed into the gas stream, which react with the SO_2 and acid gases. Heat from the reaction, and from the flue gas, dry the resultant products, which are then collected in a baghouse. Characteristics of dry scrubbers are the same as those for baghouses, except as follows:

- S02, acid gases and other flue gas constituents, that may condense with lower exist gas temperatures are controlled.
- Sparks in the flue gas are eliminated.
- Acid gas corrosion may be less a problem.
- Approximately twice as much residue is produced.
- Experience on resource recovery facilities is very limited.

Table 3-3 shows estimated costs for a dry scrubber and baghouse system, guaranteed for a TSP emission limit of 0.01 gr/dscf, corrected to 12% CO_2, and guaranteed to remove 70% of the SO_2 and 90% of the HCL in the flue gas stream.

3.1.4 Electrostatic Precipitator

Electrostatic precipitation functions by imparting a negative charge to particulates in the flue gas stream. The particulates are then attracted to positively charged plates, where they are collected. Characteristics of electrostatic precipitators include the following:

- Generally capable of particulate removal efficiencies greater than 98% with efficiencies as high as 99.8%.
- Can handle high temperature gases of over 600°F in special applications.
- Low pressure drop through units resulting in lower energy usage by fans.
- Performance is sensitive to actual vs. design flue gas flow rates (actual gas flow must be less than design) and particle resistivity.
- Consideration must be given to prevent corrosion caused by acid condensation. Acid mist condensaton begins about 250°F.
- Recognized as the most reliable and efficient technology on resource recovery systems.

Table 3-4 shows estimated costs for electrostatic precipitators investigated for this project.

TABLE 3-3

DRY SCRUBBER COSTS

1. Capital Cost

Capital Cost = Construction Cost x Bonding Factor

= $5,000,000 x 1.6

= $8,000,000

Bond Amortized over 20 years @ 11% interest (CRF = 0.12256)

Annual Capital Cost = $8,000,000 x 0.12256

= $980,000

2. Operations and Maintenance

a.	Electricity (3.5 million KwH @ 5 cents)	$175,000
b.	Water (50 gpm @ 0.70/1000 gal)	18,000
c.	Labor (8 men; two per shift @30000)	240,000
d.	O&M (incl. bag replacement) @ 2% of construction cost	100,000
e.	Lime 2000 tpy @ $150/ton	300,000
f.	Waste Handling & Disposal (5915 TPY TSP; + 2000 TPY Chemicals; + 863 TPY SO_2 & HCl; @ $10/ton)	88,000
g.	Reheat Steam (5 MMBTUH @ $6/MMBTUH)	263,000
	Subtotal	$1,184,000
	Total Annual Cost (1. + 2.)	$2,164,000

TABLE 3-4

ELECTROSTATIC PRECIPITATOR COSTS

1. Capital Cost

Capital Cost = \$2,300,000 x 1.6

= \$3,680,000

Annual Capital Cost = \$3,680,000 x 0.12256
(i = 11; n - 20) = \$462,000

2. Operations & Maintenance

a.	Electricity (920,000 KWH @ 5¢/KwH)	\$46,000
b.	O&M (@ 2% of construction cost)	46,000
c.	Labor (1/2 man for 4 shifts @ 30,000)	60,000
d.	Water	- 0 -
e.	Chemicals	- 0 -
f.	Waste Disposal (8366 TPY @ \$10/ton)	84,000
	Subtotal	\$236,000
	Total Annual Cost (1. + 2.).	\$698,000

3.1.5 Particulate Lead, Beryllium and Particulate Mercury BACT Selected

An electrostatic precipitator (ESP) with an outlet particulate loading of 0.03 gr/dscf corrected to 12% CO_2 is selected based on analysis of all the control alternatives reviewed.

This selection is based upon the criteria of technical feasibility and the minimization of environmental, economic and energy impacts. Based on the information developed herein the ESP emerges as the alternative which best meets the BACT selection criteria.

3.2 BACT for Sulfur Dioxide (SO_2), Hydrochloric Acid (HCl) and Hydroflouric Acid (HF)

Because of the low sulfur content of municipal solid waste (approximately 0.2 percent sulfur by weight), there have been no federal standards or regulations (NSPS) promulgated for control of SO_2 emissions from municipal incinerators. Similarly, the State of Florida has not promulgated regulations for control of SO_2 emissions from municipal incinerators.

In regard to control alternatives, control techniques for large sources of SO_2 emissions have been developed for fossil fuel-fired combustion units. These include methods for neutralizing acidic sulfur oxides either in gas-liquid (wet scrubbing) or gas-solid (dry scrubbing) devices. Both techniques produce solid waste by-products: sludge from wet scrubbing and dry ash from dry scrubbing. These technologies, however, have not been applied to large municipal incinerators in the U.S. because of the low sulfur content of municipal solid waste.

In addition to refuse, auxiliary fuel will also contribute to SO_2 emissions. The auxiliary fuel is used during start-up and shut-down. It is expected that auxiliary fuel usage for start-up and shut-down will constitute about 1.25% of heat input to each furnace and that either No. 2 oil (0.25% S) or natural gas (negligible S) will be used as the auxiliary fuel.

3.2.1 Use of Low Sulfur Fuel

SO_2 emissions are a function of the sulfur content in the fuel being burned. Low sulfur fuel is generally considered to have a sulfur content of 2% or less. Historically, fossil fuel burning plants have switched from the firing of high sulfur fuel (3.5 - 7%) to a low sulfur fuel as a means of complying with acid gas source emissions regulations. Since the refuse fuel (and auxiliary fuel) will have a sulfur content of about 0.2%, it is inherently within any current definition for low sulfur fuel. As such, both the federal and state of Florida regulatory authorities have not promulgated air emissions standards for the control of SO_2 from municipal incinerators.

3.2.2 Wet Scrubber Systems

Another technically viable but aesthetically preclusive alternative for SO_2 control is a wet scrubber system for SO_2 and acid gas control. As was mentioned for the particulate BACT analysis, wet scrubbing has been eliminated from consideration due to the dense water vapor plume which is generated (see Section 3.1 A 2. above).

3.2.3 Dry Scrubbers

A control alternative which was previously evaluated for particulate control is the use of a dry scrubber system to control S02 and acid gas emissions.

Dry scrubbers operate by injecting droplets of alkali reagent into the flue gas. The resulting reactions remove the sulfur dioxide as sulfites and sulfates in particulate form. The heat generated during the reaction plus flue gas heat evaporates the water carrying the alkali reagent. A bag filter is located downstream to remove the sulfate and sulfite particulates.

Table 3-5 provides comparative costs of controlling particulate and acid gases utilizing an ESP versus a dry scrubber.

3.2.4 SO_2 and Acid Gas BACT Selection

The use of low sulfur auxiliary fuel in conjunction with the inherent low sulfur content of the waste fuel is selected as BACT based on analysis of the viable alternatives.

This choice of alternatives best meets the selection criteria as required by EPA and the State of Florida DER and is consistent with the most recent BACT determinations for resource recovery facilities in other areas of the country.

3.3 BACT for Nitrogen Dioxide

No add-on type controls have been demonstrated for nitrogen oxides (NOx) emissions from municipal incinerators in the U.S. Good combustion design and practices are the only demonstrated control alternative in the U.S.

The furnace units planned for Palm Beach County will employ advanced combustion systems in which the primary combustion air is added through multiple compartments located underneath the stokers. Uniform mixing of air and burning RDF eliminates high oxygen concentration gradients that favor the formation of NOx. Secondary combustion air is introduced at high velocity through specially designed nozzles, into the gas stream along the front and rear walls of the combustion chamber. The temperature at the end of combustion chamber can thus be maintained at about 1800-2000°F. Significant NOx emissions typically occur at temperatures greater than 2000°F.

The environmental impact due to NOx emissions from the incinerator will not result in a violation of NAAQS.

Good combustion design and practice is proposed as BACT for NOx.

3.4 BACT for Carbon Monoxide and Volatile Organic Compounds

No add-on type controls have been demonstrated for CO emissions from municipal incinerators. Good boiler design and proper operating conditions are the only effective emission control methodology.

TABLE 3-5

COST COMPARISON OF ELECTROSTATIC PRECIPITATORS VS DRY SCRUBBERS
750 TPD UNIT

	ELECTROSTATIC PRECIPITATOR	DRY SCRUBBER
Emission Limit gr/dscf @ 12% CO_2	0.03	.01
Removal Efficiency, Percent	99.0	99.9
Capital Cost	$3,680,000	$8,000,000
Annual Cost:		
Net Debt Service	$462,000	$980,000
Operating and Maintenance Costs	$236,000	$1,184,000
Total	$698,000	$2,164,000
Unit Cost:		
Per Ton MSW (260,000 TPY)	$2.69	$8.32
Per Ton RDF (182,000 TPY)	$3.84	$11.89
Per Ton Particulate plus Acid	$119.00	$319.00
Incremental:		
Additional Tons Removed	base	917
Additional Annual Cost	base	$1,508,000
Per Ton Removed		$1,644
Per Ton MSW (260,000 TPY)		$5.63
Per Ton RDF (182 000 TPY)		$8.05

Notes:

1 - Particulate Removed annually by each precipitator = 21400 Total Uncontrolled TPY x 0.83 Availability x 1 Unit/3 units x .99 efficiency = 5861 TPY removed.

2 - Particulate removed by dry scrubber = 21400 x 0.83 x 1/3 x .999 = 5915 TPY removed.

Table 3-5 (continued)

Notes:

3 - Sulfur Dioxide Generated Annually per unit =
2957 Total - Uncontrolled TPY x 0.83 x 1/3 = 818 TPY
@ 70% control by dry scrubber SO_2 emission = 818 x 0.3 =
245 TPY Controlled and 573 TPY removed.

4 - HCl and HF Generated Annually per Unit =
(1150 + 13.2) x 0.83 x 1/3 = 322 TPY uncontrolled
@ 90% control by dry scrubber = 322 x 0.1 = 32.2 TPY controlled
and 290 TPY removed.

The state-of-the-art design of the combustion chamber and the advance temperature control capability inherent in waterwall units will minimize formation of CO and volatile organic compounds (VOC). A continuous CO monitor will assist the plant operators maintain optimum combustion conditions, thereby further reducing CO and VOC formation.

Facility impacts will not cause a violation of NAAQS. Good equipment design and practice plus continuous CO monitors are therefore proposed as BACT for CO and VOC.

4.0 EMISSIONS DATA

The Florida DER requested emission estimates for sixteen pollutants. Six of these are criteria pollutants: 1) particulate; 2) sulfur dioxide (SO_2); 3) carbon monoxide (CO); 4) volatile organic compounds (VOC); 5) nitrogen oxides (NOx); and 6) lead (Pb). The remaining 10 pollutants included: 7) chlorides (HCl); 8) ozone (O_3); 9) total reduced sulfur (including H_2S); 10) reduced sulfur compounds (including H2S); 11) sulfuric acid mist; (12) fluorides (HF); 13) vinyl chloride; 14) mercury (Hg); 15) asbestos; and 16) beryllium (Be).

Most of the pollutants are emitted to a certain degree by the proposed Palm Beach County waste-to-energy facility. Ambient concentrations of the criteria pollutants are regulated through the implementation of NAAQS. The NAAQS have been incorporated in their entirety as part of the Florida State Implementation Plan (SIP).

Although no mention was made by the Florida DER of emissions of trace organic compounds, public attention has recently focused on dioxin emissions (2,3,7,8-TCDD) from waste to energy facilities. Therefore the County has voluntarily submitted available data on dioxin emissions.

Emission estimates of the aforementioned pollutants in conjunction with stack and facility operating parameters were then used as input data to an air quality dispersion models to predict facility impacts. These data are described in greater detail in Section 4.1.

Carbon monoxide (CO), as a pollutant, was considered only in terms of emissions potential from the facility itself. Mobile sources associated with the facility activity are negliable since there will be no significant increase in traffic beyond that which already exists in the area.

In order to adequately demonstrate compliance with the NAAQS and PSD increments, it is required that the applicant include in its modeling analysis the pollutant contributions from all existing and PSD sources having a significant impact within the modeling area of the applicant's source. Stack and emissions data for these other sources were developed in conjunction with FDER.

4.1 Emissions Data for the Palm Beach County Waste-to-Energy Facility

Table 4-1 lists the pollutants that will be emitted from the proposed facility. The table shows pollutant emission factors, design capacity emission rates on an annual basis, actual emission rates on an annual basis and design capacity emission rates on an hourly basis.

Emission factors are based on a higher heating value (HHV) of 6,200 Btu/lb for the RDF. Design capacity emission rates are derived from a waste throughput of 2100 tons/day or 766500 tons/year. Actual annual emission rates assume an availability factor of 0.8 and a resulting waste throughput of 613,200 tons/year. These values are totals for three units each rated at 700 tons/day.

Table 4-2 lists stack parameter data, including location coordinates adjacent building dimensions, height, diameter and volumetric flow rate and temperature for the proposed waste-to-energy facility. For modeling purposes, the three flues in the one proposed stack were treated as a single stack with an inside diameter equal to that of one of the flues. The modeled emission rate for each pollutant was set equal to the sum from the three flues, and the modeled volume flow rates and temperatures were those of an individual flue. These actions ensured that the modeled plume rise was calculated correctly for the proposed stack.

The emission factors contained in Table 4-1 were derived from a detailed investigation of the literature. The criteria used for the emission factor selection included: similarity of the facility design, similarity of the chemical composition of the refuse, reliability of stack tests and availability of data from facilities incorporating state-of-the-art design and air pollution control technology. In the sections which follow, the rationale behind the selection of emission factors for each pollutant listed in Table 4-1 is provided.

4.1.1 Total Suspended Particulate (PM)

The emission factor is based upon the ability of the electrostatic precipitator manufacturer to not exceed a guaranteed grain loading of 0.03 grains/dscf at 12% CO_2. This emission level represents BACT for TSP.

4.1.2 Sulfur Dioxide (SO_2)

The SO_2 emission factor is based upon RDF fuel sulfur content which is assuumed to be completely converted to SO_2.

4.1.3 Carbon Monoxide (CO)

Several data bases were investigated to develop an emission factor for CO. The value used was a median value between values cited by California Air Resources Board Report entitled "Air Pollution Control at Resource Recovery Facilities" and vendor information which indicated lower values. The principal reason for the difference is due to excess air design. Most of the spreader stoker furnaces cited by CARB were designed to fire RDF at about 40% excess air. Our investigations have indicated that a prudent operating point for RDF combustion to be at 50% excess air with a design point of 60% to accomodate variations in fuel moisture and heating value.

4.1.4 Volatile Organic Compounds (VOC)

The emission factor for VOC represents the non-methane portion of the total hydrocarbon emissions. Reference literature indicated a wide range of VOC emissions. This wide range is believed to be caused by the low excess air design cited for CO, inability to maintain sufficient temperature (especially those systems which fired pulped RDF which typically had a moisture content of 50% or above) and inadequate combustion controls. The proposed facility will utilize state-of-the-art combustion controls coupled with conservative furnace design in terms of excess air, gas temperature and dwell time to minimize VOC emissions. Accordingly, the VOC emission factor used was selected from mid-range data to provide sufficient conservatism and avoid understating possible facility emissions.

TABLE 4-1

CONTROLLED EMISSION FACTORS DEVELOPMENT FOR RDF FIRED SPREADER STOKER FURNACES

(ANNUAL AVERAGE BASED ON 1800 TPD RDF FIRED)

POLLUTANT	LBS/TON RDF	LBS/HR	TONS/YEAR	GM/SEC @ 1800 TPD	GM/SEC @ 2100 TPD
CARBON MONOXIDE	12.0	900.	3942.	113.	132
NITROGEN DIOXIDE	4.0	300.	1314.	37.8	44.1
SULFUR DIOXIDE	9.0	675.	2957.	85.1	99.3
CHLORIDES	3.5	263.	1150.	33.1	38.6
VOLATILE ORGANIC COMPOUNDS	.20	15.0	65.6	1.89	2.21
PARTICULATE MATTER	.65	48.8	214.	6.14	7.16
SULFURIC ACID MIST	.0004	.030	.131	.0038	.0044
FLOURIDES	.04	3.00	13.2	.38	.44
LEAD	.0014	.105	.46	.0132	.0154
MERCURY	.003	.225	.98	.0284	.0331
BERYLLIUM	9.0 E-06	6.8 E-04	3.0 E-03	8.5 E-05	9.9E-5
2,3,7,8-TCDD	8.5 E-08	6.4 E-06	2.8 E-05	8.0 E-07	9.3E-7

TABLE 4-2

STACK PARAMETERS FOR EACH OF THREE SPREADER STOKER FURNACES
(TWO INITIALLY INSTALLED PLUS ONE FUTURE)

	ENGLISH	METRIC
LOCATION		UTM ZONE 17
X-COORDINATE		0585820 METERS EAST
Y-COORDINATE		2960180 METERS NORTH
BASE ELEVATION FOR MODEL INPUT	0.00 FEET	0.00 METERS
STACK DIAMETER	6.69 FEET	2.04 METERS
STACK HEIGHT	250 FEET	76.20 METERS
VOLUMETRIC FLOW		
100% CAPACITY	172377 ACFM	81.4 M3/SEC
75% CAPACITY	124311 ACFM	58.7 M3/SEC
50% CAPACITY	80033 ACFM	37.8 M3/SEC
EXIT VELOCITY		
100% CAPACITY	81.69 FEET/SECOND	24.90 METERS/SECOND
75% CAPACITY	58.91 FEET/SECOND	17.96 METERS/SECOND
50% CAPACITY	37.93 FEET/SECOND	11.56 METERS/SECOND
EXIT TEMPERATURE		
100% CAPACITY	450 FAHRENHEIT	505 KELVIN
75% CAPACITY	415 FAHRENHEIT	486 KELVIN
50% CAPACITY	385 FAHRENHEIT	469 KELVIN

4.1.5 Nitrogen Oxides (NO_x)

The NO_x emission factor was selected from the CARB report and is representative of the upper bound of the median values of the data bases used.

4.1.6 Lead (Pb)

The Pb emission factor was selected based upon detailed analyses conducted during facility permit work by Hayden-Wegman for North Santa Clara County, CA. Data bases provided only sparse information with median values which were either too low or too high to be considered representative of the proposed Palm Beach County project.

4.1.7 Beryllium (Be)

The Be emission fator is based on a weighted average of the values cited by CARB report and Hayden-Wegman for North Santa Clara.

4.1.8 Mercury (Hg)

Hg emission factor is based on the North Santa Clara Report which is higher than other data bases reviewed.

4.1.9 Chlorides (as HCl)

The HCl emission factor is based on North Santa Clara and data reported by Rinaldi, et al.

4.1.10 Fluorides (as HF)

The HF emission factor is based on the median value from the CARB Report.

4.1.11 Sulfuric Acid Mist (H_2SO_4)

H_2SO_4 emission factor is based on data from North Santa Clara, CA. Data bases are very sketchy. The controlled emission is based on 99% removal by the ESP.

4.1.12 Ozone (O3), Total Reduced Sulfur, Reduced Sulfur Compounds, Vinyl Chloride and Asbestos

No emissions of ozone, total reduced sulfur, reduced sulfur compounds, vinyl chloride and asbestos are expected.

4.1.13 Dioxin (2,3,7,8 Tetra Chloro Dibenzo Dioxin)

The emission factor for 2,3,7,8-TCDD is derived from stack test data taken from Chicago, N.W. facility by the EPA and reported by Cleverly. The reason for using these data are as follows: (a) they represent a direct measurement of flue gas emission, (b) the data have been shown to be comparable to similar measurements made by the Swiss Environmental Agency and to measurements derived from independent analyses from fly ash collected from

U.S. and European waste-to-energy facilities; and (c) the data are conservative in that they show the highest emission rate (of the seven large scale waste to energy facilities for which data are available) for the tetra homologue which contains the isomer of greatest toxicity and concern. The emission factor was calculated from a conservative emission rate of 0.085 ug/sec for the 3000 tons/day Brooklyn Navy Yard facility. It is expected that this emission level will not be encountered at the proposed facility due to excellent combustion controls and auxiliary fuel systems that are designed to maintain exit gas temperatures at a level above the critical threshold where dioxin could be formed.

5.0 AIR QUALITY MODELING ANALYSES

5.1 Model Requirements

5.1.1 Determination of Worst-Case Load Conditions

A pollutant source does not generally operate or emit pollutants at a constant rate. Most facilities, particularly waste-to-energy facilities, operate at variable rates depending on supply and demand, weekday versus weekend or day versus night work schedules or other factors. Changes in source operating rates produce different pollutant emission rates and exhaust gas flow rates and temperatures. When flow rates and temperatures vary, so does pollutant dispersion (plume rise) such that different points of maximum pollutant impact are produced. As a result, screening modeling was performed to determine the source operating load that produces the worst-case impacts. Such screening modeling was performed for 100, 75 and 50 percent load. Model results indicated that 100% load produced worst case conditions.

5.1.2 Determination of the Modeling Area

The next required modeling analysis determined the territorial extent of significant impact of the proposed source. Significant impact levels have been defined for various averaging periods for specific pollutants as shown in Table 5-1. Significant monitored concentrations (De Minimus Values) have also been defined for other pollutants as shown in Table 5-2.

As screening analysis was performed first, using a screening-type model and a limited set of hypothetical meteorological data to define appropriate receptor locations (i.e., points where impacts are calculated). Once receptors were selected, other refined models and historical meteorological data could then be used to calculate source impacts for all averaging periods of concern.

TABLE 5-1

SIGNIFICANCE LEVELS FOR AIR QUALITY IMPACTS

POLLUTANT	AVERAGING TIME	SIGN. LEVEL CONC. (ug/m3)	DISTANCE (KM) FROM SOURCE TO SIGNIFICANCE LEVEL HIGHEST	HIGH SECOND HIGH
Sulfur Dioxide	3 Hour	25	24.5	9.0
	24 Hour	5	25.0	20.0
	Annual	1	15.0	NA
Total Suspended Particulate	24 Hour	5	#	#
	Annual	1	#	NA
Nitrogen Dioxide	Annual	1	5.0	NA
Carbon Monoxide	8 Hour	2000	#	#
	Annual	500	#	NA

NA Not applicable

\# Less than significant levels at all distances. Minimum boundary line distance from RDF Source: 0.73 km.

TABLE 5-2

COMPARISON OF IMPACT OF PALM BEACH COUNTY RDF FIRED SPREADER STOKER FURNACES TO DE-MINIMUS LEVELS (ISC MODEL)

SIGNIFICANT MONITORING CONCENTRATIONS

POLLUTANT	AVERAGING TIME	DE-MINIMUS GUIDELINES ug/m^3	HIGHEST 2ND HIGHEST# CONCENTRATION ug/m^3	DISTANCE (KM) FROM SOURCE TO DE-MINIMUS LEVEL HIGH	H2NDH
TSP	24 Hour	10	2.0	##	##
SO_2	24 Hour	13	27.9	9.0	9.0
CO	8 Hour	575	81.1	##	##
NO_x	24 Hour	14	12.3	1.5	##
Ozone (VOC)	1 Hour	*	3.0**	##	##
Mercury	24 Hour	0.25	9.3E-3	##	##
Fluorides	24 Hour	0.25	0.12	##	##
Lead	24 Hour	0.1	4.3E-3	##	##
Beryllium	24 Hour	5.0E-4	9.9E-5	##	##

* No value established. Ambient air standard: 235 ug/m^3 not to be exceeded on more than an average of one day per year over a three year period.

\# Model analyses for SO_2 based on 2100 TPD and 9% S. Concentrations for other pollutants based on their emissions ratio to SO_2.

** Assumes all VOC becomes ozone.

\## Less than de-minimus values at all distances greater than 0.6 km from the source. Minimum distance from RDF source to site boundary: 0.73 km.

The circle enclosing the furthest radial distance to which significant impacts are found defines the "modeling area" for the applicant's source. Subsequent modeling analyses included all sources located within this area that have significant emissions of the criteria pollutants emitted (in significant amounts) by the applicant's source. Model results indicated that only SO_2 produced significant impacts in both short-term and long-term averaging periods.

5.1.3 Determination of the Screening Area

An additional "screening area" was defined for additional sources to be considered for inclusion in subsequent modeling analyses. This screening area was contained in the annular ring that extends 50 kilometers (31 miles) beyond the applicant's source's modeling area. Sources located in the screening area were included in subsequent modeling along with the applicant's source, if their impact within the applicant's source modeling area was as much as 1 ug/m3 on an annual basis of 5 ug/m3 on a 24-hour basis.

5.1.4 PSD Increment Consumption and NAAQS Analysis

The PSD regulations have established limits for increases in concentrations of two pollutants, PM on a 24-hour and annual basis, and SO2 on a 3-hour, 24-hour and annual basis. These limits of concentration increases have been defined as increments which are shown in Table 5-3. The starting point for PSD increment consumption is January 6, 1975. In a given area, the starting point for tracking PSD increment consumption is the date therafter on which the first PSD source permit application is submitted for regulatory review. The first PSD permit application date is defined as the baseline date for the given area. No major PSD increment consuming source has triggered the baseline date in the study area.

TABLE 5-3

ALLOWABLE PSD INCREMENTS
(ug/m3)

	Class I Area	Class II Area	Class III Area
Sulfur Dioxide			
. Annual	2	20	40
. 24-hour	5*	91*	182*
. 3-hour	25*	512*	700*
Total Suspended Particulate Matter			
. Annual	5	19	37
. 24-hour	10*	37*	75*

* Not to be exceeded more than once a year.

No multisource modeling for PSD increment consumption is required since no major source has been constructed since January 6, 1975 within the modeling area.

The sum of the impacts of the proposed PSD source emissions and all existing source emissions must also not produce concentrations that violate NAAQS. The NAAQS concentrations are shown in Table 5-4. Modeling for compliance with NAAQS must include: 1) all source emissions from the proposed PSD source, 2) actual emissions from all operating sources and all allowable emissions from permitted (but not operating) sources within the modeling area, and 3) actual emissions from all operating sources and all allowable emissions from permitted (but not operating) sources within the screening area, if such sources have significant impacts (>1 ug/m3, annual and >5 ug/m3, 24-hour) within the modeling area. Modeling impacts must be added to appropriate background levels to determine compliance with NAAQS.

5.1.5 Soils and Vegetation Impacts

The emission of pollutants listed in Table 5-1 are not expected to cause any harm to the vegetation or soils within the study area. For these pollutants, either all applicable NAAQS and state standards will be met, emissions will be less than de minimus values, or ambient impacts will be insignificant.

The potential impact to soil and vegetation resulting from emission from the proposed facility are discussed for the following specific compounds and materials: total suspended particulates (TSP); carbon monoxide (CO; sulfuric acid (H_2SO_4); sulfur dioxide (SO_2); nitrogen dioxide (NO_2).

Total Suspended Particulates. Particulate matter can interfere with plant metabolism when large enough quantities coat leaf surfaces causing the blockage of gas and light exchange mechanisms. The specific sensitivity of plants to particulate matter produced by resource recovery facilities is not known, nor have levels which produce plant injuries from other sources been documented.

The proposed facility will contribute a maximum annual average of 0.26 ug/m^3 of TSP. The maximum observed level in 1983 was 134 ug/m^3, to which the facilities emissions will add an insignificant amount of 0.2 ug/m^3.

Carbon Monoxide. Plants appear to be resistant to high levels of CO. In most species tested, exposure to 115 mg/m^3 for up to three weeks did not produce visible injury (Zimmerman, et al., 1983). More recently, exposure to less than 27 ug/m^3 (Chakrabarti, 1976) also produce no visible injury.

The proposed facility will contribute a maximum annual concentration of 4.8 ug/m^3. Total concentrations, as a result of the operation of the proposed facility, will thus be considerably below concentrations causing visible injury to vegetation.

Sulfuric Acid. H_2SO_4 is formed when gaseous SO_3 produced by the facility reacts with water droplets. the acidified water vapor can result in acidic precipitation. It is difficult to predict the extent that $H2SO_4$ produced by the facility will impact vegetation because (1) H_2SO_4 aerosols are neutralized by the presence of ammonia in the atmosphere (Huntzicher, et al., 1980); (2) when effects of acid precipitation on plants are observed they may be positive due to fertilization impacts of sulfur or negative due to the leaching of leaf surfaces; and (3) the impact of emissions of H_2SO_4 from a single facility on vegetation may be difficult to differentiate from the overall impacts of acid rain on vegetation.

Although evaluation of data relative to acidic precipitation impacts on vegetation is complex, the majority of crop species studied to date indicates the exposure to simulated acid rain has little or no adverse impact on vegetative growth and yield.

The proposed facility will add an annual verage of 1.6E-4 ug/m^3 of H_2SO_4. It is not anticipated that this concentration will contribute significantly to acidic precipitation when compared to existing concentrations and other major producers, such as fossil fuel power plants.

Sulfur Dioxide. Sensitivity of plant species to SO_2 appears to vary not only with climate of an area, but with the duration of exposure. Garsed and Rutter (1982) reported that various species of conifer (Pinus sp.) had markedly differing sensitivities to levels of SO_2 ranging from 200 ug/m^3 for 11 months to 8000 ug/m^3 for 6 hours. A 14% reduction in relative growth rate was seen in one pine species at the 200 ug/m^3 dosage level. A number of oak and pine species (black and red oak, white pine) have been reported to develop visible injury when exposed to concentrations of SO_2 between 786 and 1,572 ug/m^3 for three hours (Jones, et al. 1979), have reported a threshold value for foliar injury to certain species (blackberry winged sumac, other herbaceous species) at 340 ug/m^3 for 3 hours under environmental conditions which maximized plant sensitivity.

A maximum annual ground level concentration for SO_2 of 3.6 ug/m^3 is predicted for the authority facility. This value, when added to a background level of 10 ug/m^3 is considerably below the concentration causing a reduction in relative growth rate of a pine species. The maximum background level of SO_2 over a three hour averaging period, is 140 ug/m^3 to which the facility will add a maximum of 82 ug/m^3. This maximum level does not exceed threshold value for certain sensitive species under worst-case conditions.

Nitrogen Dioxide. Nitrogen dioxide can be beneficial to vegetation in specific amounts. Uptake of NO_2 varies with a number of factors such as nutrient supply in the soil, fertilization, and rainfall. NO_2 can also be converted to nitric acid and contribute to acid precipitation. Natural biological cycling of nitrogen compounds produces greater acidity than does atmospheric decomposition (Frink, et al., 1976).

Short-term injury threshold for NO_2-tolerant species, such as corn an sorghum, has been found to be 24,400 ug/m^3 NO_2 for a one-hour exposure when grown in a controlled environment (Heck and Tingey, 1970). Continuous exposure throughout the growth period to 470 ug/m^3 reduced size and productivity and increased senescence in tomatoes and navel oranges (Taylor, et al., 1975; Spierings, 1971). The concentration of NO_2 has been found to be a greater influence on the extent of injury than the length of exposure.

The greater-than-additive effect of NO_2 and SO_2 in combination on crops species and varieties. In a recent study of yield reduction in soybeans, no adverse effect was observed at atmospheric concentrations of 481 ug/m^3 SO_2 in combination with 155 ug/m^3 of NO_2 (Amundson, 1983). The results of these investigations indicate that the presence of elevated levels of NO_2 in the atmosphere in combination with SO_2 above a threshold level can lead to adverse crop response. NO_2 concentrations below 120 ug/m^3 have not been reported to produce injury in the absence of other pollutants (Thompson, et al., 1974).

The proposed facility will produce a maximum annual NO_2 concentration of 1.06 ug/m^3. The maximum annual ambient NO_2 concentration recorded in the county was 20 ug/m^3. Total concentrations will thus be well below the estimated threshold level (120 ug/m^3) of injury to certain plants.

Hydrogen Chloride. Gaseous HCl will be emitted from the proposed facility as a result of the combustion of certain materials contained in the refuse (especially plastics). HCl fallout onto soil does not pose a serious risk to vegetation. HCl disassociates in soil, and the Cl which occurs in a dissolved form is generally leached from the soil with precipitation. Since it is therefore unavailable for uptake through plant roots, indirect injury to vegetation through the soil is unlikely.

Studies of plant growth in an environment containing gaseous HCl have reported that exposure on the order of 10,000 ug/m^3 for 1 to 2 hours will produced plant injury. Intermittent exposure to concentrations of approximately 50 ug/m^3 were found to pose minimal risk to sensitive vegetation. Concentrations ranging from approximately 6,000 ug/m^3 for 120 hours or below would provide for adequate protection from HCl injury.

The proposed facility will increase HCl concentrations by a 1-hour maximum of 57 ug/m^3 and an annual average of 1.4 ug/m^3. Peak and long term concentrations are well below levels specifically documented to cause injury and those proposed as adequate for vegetation protection. Therefore, HCl emissions are not expected to adversely impact local vegetation.

5.2 Model Selection Criteria

5.2.1 Number of Emission Points

A number of models are available for the screening modeling analyses needed for selecting receptor locations and determining worst-case load impacts. PTMAX and PTPLU are applicable to individual sources and PTMTP and Valley are applicable to individual multiple sources. A number of models are also available for the more comprehensive modeling analyses needed to define the modeling area, compute PSD increment consumption, and assess compliance with NAAQS. The CRSTER model is only applicable to single or collocated sources. The MPTER, RAM, ISCST, ISCLT, Complex I, SHORTZ, LONGZ, and CDMQC models are applicable to multiple sources.

Since it was anticipated that the modeling and screening areas would contain sources that emit the same pollutants (in significant amounts*) as will be emitted by the proposed facility (in significant amounts*) Hayden-Wegman planned, at the outset of this study, to use multiple source models for the refined modeling analyses. Upon consideration of the topography and demography of the study area and the type and number of sources to be modeled, the following dispersion models are utilized: PTPLU, PTDIS, ISCST and ISCLT.

These models are used with downwash option and in rural mode pursuant to FDER instructions.

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* As defined in Table 5-1

TABLE 5-4

AMBIENT AIR QUALITY STANDARDS

POLLUTANT	FEDERAL PRIMARY	FEDERAL SECONDARY	STATE	MAXIMUM CONCENTRATION MEASURED IN 1983 (SITE #)	MAXIMUM 2ND MAX CONCENTRATION (3) MEASURED IN 1983 (SITE #)
SULFUR DIOXIDE					
MAX 3-HOUR CONCENTRATION (2)	NO STANDARD	1300 UG/M3 (0.5 PPM)	1300 UG/M3 (0.5 PPM)	65 UG/M3 (11) (0.025 PPM)	63 UG/M3 (11) (0.024 PPM)
MAX 24-HOUR CONCENTRATION	365 UG/M3 (0.14 PPM)	NO STANDARD	260 UG/M3 (0.1 PPM)	39 UG/M3 (11) (0.015 PPM)	29 UG/M3 (11) (0.011 PPM)
ANNUAL ARITHMETIC MEAN	80 UG/M3 (0.03 PPM)	NO STANDARD	60 UG/M3 (0.02 PPM)	7 UG/M3 (11) (0.0027 PPM)	
PARTICULATE MATTER					
MAX 24-HOUR CONCENTRATION (2)	260 UG/M3	150 UG/M3	150 UG/M3	134 UG/M3 (5)	107 UG/M3 (4)
ANNUAL GEOMETRIC MEAN	75 UG/M3	60 UG/M3	60 UG/M3	43 UG/M3 (12)	
NITROGEN DIOXIDE					
ANNUAL ARITHMETIC MEAN	100 UG/M3 (.05 PPM)	100 UG/M3 (.05 PPM)	100 UG/M3 (.05 PPM)	20 UG/M3 (1) (0.01 PPM)	
OZONE					
DAILY MAX 1-HOUR CONCENTRATION (1)	235 UG/M3 (0.12 PPM)	235 UG/M3 (0.12 PPM)	235 UG/M3 (0.12 PPM)	180 UG/M3 (10) (0.092 PPM)	172 UG/M3 (10) (0.088 PPM)
LEAD					
QUARTERLY ARITHMETIC MEAN	NO STANDARD	NO STANDARD	1.5 UG/M3	NOT MONITORED	
CARBON MONOXIDE					
MAX 1-HOUR CONCENTRATION	40000 UG/M3 (35 PPM)	40000 UG/M3 (35 PPM)	40000 UG/M3 (35 PPM)	10171 UG/M3 (1) (8.9 PPM)	9943 UG/M3 (1) (8.7 PPM)
MAX 8-HOUR CONCENTRATION (2)	10000 UG/M3 (10 PPM)	10000 UG/M3 (10 PPM)	10000 UG/M3 (10 PPM)	6600 UG/M3 (1) (6.6 PPM)	4500 UG/M3 (1) (4.5 PPM)

1. THE STANDARD IS ATTAINED WHEN THE EXPECTED NUMBER OF DAYS PER CALENDAR YEAR WITH MAXIMUM HOURLY AVERAGE AVERAGE CONCENTRATIONS ABOVE 0.12 PPM IS EQUAL TO OR LESS THAN 1.

2. CONCENTRATION LIMITS NOT TO BE EXCEEDED MORE THAN ONCE PER YEAR.

3. SINCE SHORT TERM CONCENTRATION LIMITS ARE NOT TO BE EXCEEDED MORE THAN ONCE PER YEAR, THE VALUES PRESENTED IN COLUMN (5) FOR SHORT TERM CONCENTRATIONS REFLECT THE HIGHEST VALUES OF THE SECOND HIGHEST CONCENTRATION MEASURED AT THE MONITORING STATION.

5.2.2 Pollutant Averaging Periods

As discussed earlier, pollutant concentrations must be predicted on the basis of several averaging periods for PM (24-hour and annual) and SO_2 (3-hour, 24-hour and annual). Pollutant impacts must also be predicted on the basis of 1-hour and 8-hour averaging periods for CO and on a calendar quarter basis for lead.

The PTPLU, and PTDIS screening models can be used with hypothetical meteorological data to predict worst-case 1-hour impacts which can be converted to worst-case 3-hour, 8-hour and 24-hour impacts using scaling factors provided in EPA's Volume 10.

5.2.3 GEP Determination and Potential for Downwash

The relationship between a source's stack height and the dimensions of adjacent structures and terrain determine whether plume downwash will occur. EPA has developed criteria for constructing stacks with heights defined according to good engineering practice (GEP) criteria in order to minimize plume downwash. The ISC models are the only ones capable of calculating impacts caused by plume downwash. Modeling for downwash is required only if the applicant's stack is not constructed according to GEP criteria.

Hayden-Wegman performed a GEP analysis for the proposed source's stack. The analysis was performed in accordance with EPA regulations. Building dimensions are 233 ft long by 110 ft wide by 120 ft high. GEP stack height was determined to be 300 ft. Accordingly, the results of this analysis indicated that the proposed source stack was below GEP height so downwash modeling was performed.

5.3 Modeling Considerations

5.3.1 Highest, Second-Highest Concentrations

For the short term averaging periods, compliance with PSD increments and NAAQS is based on the highest, second-highest modeled (modeled plus background for NAAQS) concentrations. Such concentrations are determined by first obtaining the highest and second-highest concentrations at all the receptors within the study area. The highest, second highest concentration is defined as being the highest value from among the set of second highest concentrations for all the receptors. In this report, highest, second-highest concentrations are presented for all short-term averaging periods for the pollutants for which short-term NAAQS or PSD increments have been established.

5.3.2 Block Averaging Times

Compliance with short-term PSD increments and NAAQS is based on block averages. Block averages are those that start at midnight for all non-overlapping averaging periods until the following midnight. Thus, each day produces a single 24-hour block average, three 8-hour block averages, and eight 3-hour block averages. In this report all modeled short-term concentrations are presented as block averages.

5.3.3 Dispersion Coefficients

Dispersion coefficients are constants that are built into dispersion models for use in calculating the amount of horizontal and vertical plume spread depending on downwind atmospheric stability and distance. All of the models used contain Pasquill/Gifford coefficients. The Pasquill/Gifford coefficients are applicable to rural areas. In long term-models, the Pasquill/Gifford coefficients are applicable to rural areas. In long-term models, the Pasquill/Gifford coefficients are used to calculate pollutant dispersion in the vertical, but pollutant dispersion is calculated to be evenly distributed within a wind direction sector in the horizontal.

5.3.4 Stability Categories

There are several models available for determining stability categories. All the models discussed herein use stability classifications developed by the Pasquill/Turner method. The Pasquill/Turner method is based on measurements of cloud cover, isolation (solar heat) and wind speed. The stability classifications used for this study were developed using the CRSTER preprocessor which converts standard National Weather Service observations into the format required for model input.

5.3.5 Plume Rise

The standard algorithms for determining plume rise are those of Briggs and these algorithms are used in all the models that were used in this study. The Briggs algorithms calculate plume rise based on thermal buoyancy (exhaust gas temperature) and momentum (exhaust gas volume flow).

a. Buoyancy Induced Dispersion

If a large source has a thermally buoyant plume, dispersion will begin immediately upon its exit from the stack. This phenomenon is accounted for in algorithms for buoyance induced dispersion, which are available as an option in several of the models discussed herein. This option was employed in this study because the proposed source has a hot plume.

b. Stack Tip Downwash

Downwash of a plume can be induced by a stack if it is poorly constructed, or if the exhaust gas velocity is low. This option was employed for this study as a measure of conservatism although the proposed stack will be properly constructed and have adequate exhaust gas velocity.

c. Final Versus Transitional Plume Rise

Upon entering the atmosphere, a plume will rise as a function of its thermal buoyancy and momentum, as discussed above. The plume will rise until it loses its buoyancy and momentum. As the plume rises, it travels downwind until it reaches its equilibrium, or final height. Algorithms have been developed to account for this period of transitional plume rise and were utilized for model runs.

5.3.6 Chemical Transformation

Some pollutants undergo chemical transformations after their release into the atmosphere. Various methods can be used to account for these transformations, the most common of which makes use of an exponential decay or "half-life" term, that is dependent on travel time. Of the pollutants that will be emitted by the proposed facility, those most subject to chemical transformations in the atmosphere are sulfur oxides (SO_x), and NO_x. After entering the atmosphere, the amount of SO_2 in the SO_x emissions is slowly depleted. During the short travel times involved in the study area, this depletion is of minimal significance and was not considered. The conversion of NO_x to NO_2 is rapid so all NO_x emissions were treated as NO_2. Therefore, although several of the models selected for this study contain "half-life" equations for calculating pollutant decay, this option was not used.

5.3.7 Particle Deposition

Large particles settle out of the atmosphere while smaller particles remain suspended. Modeled concentrations will be underpredictions if particle deposition is not calculated and source emissions do include particles that settle out before reaching the receptor. In air permitting analyses, the latter situation is allowed to occur, especially if particulate size distributions are not available, to ensure that ambient air quality standards are met. For this study, all particulate emissions were considered to be non-settleable.

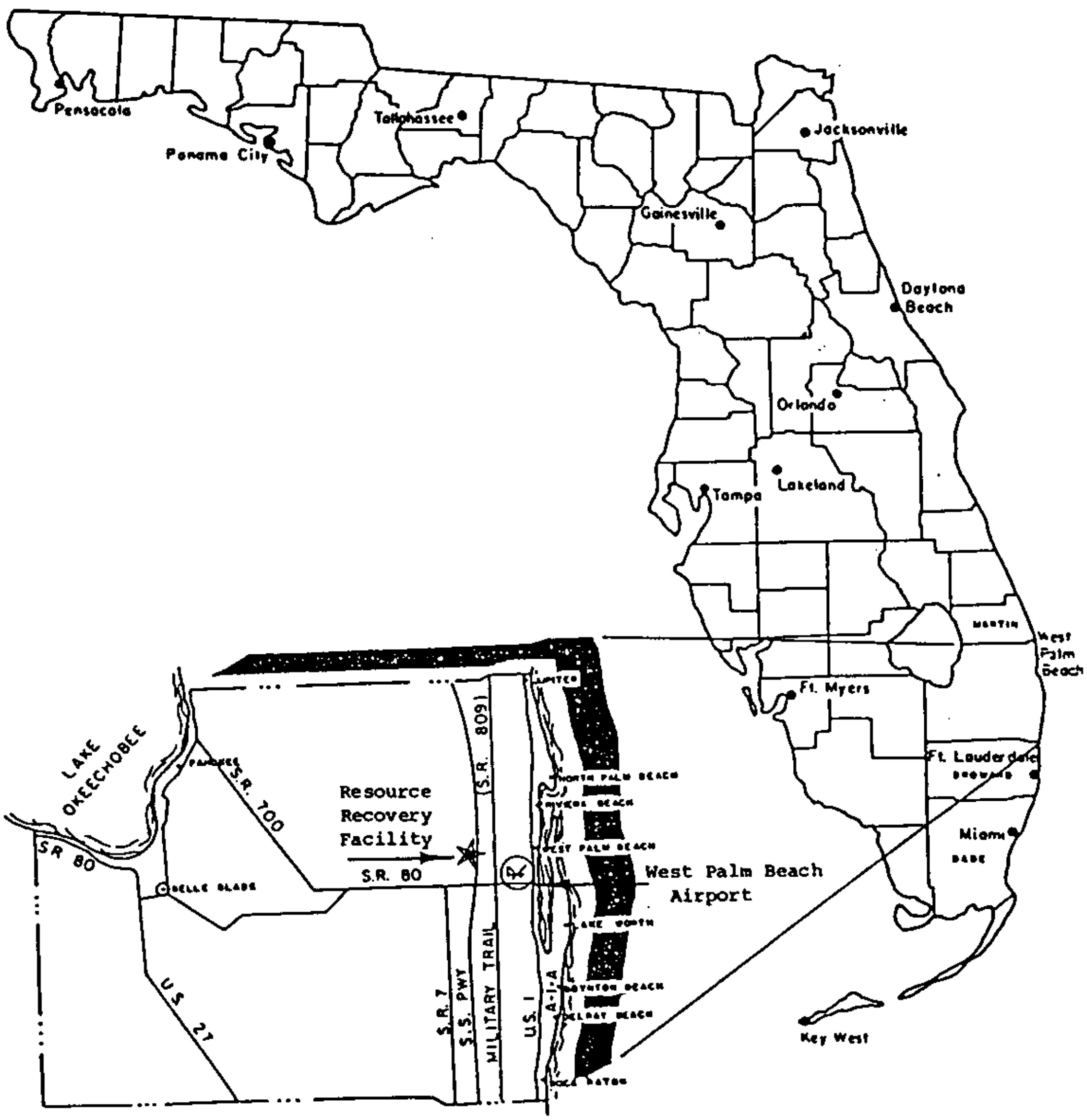
5.4 Meteorological and Climatology

5.4.1 Climatology

The proposed waste-to-energy facility is to be located in Palm Beach County in the lower east coast climatological regime of Florida (Figure 5.1). The site is approximately 10 kilometers west of the Intercoastal Waterway and 11.5 kilometers from the Atlantic Ocean shoreline. There is no significant terrain in the vicinity (Figure 5.2). Summer temperatures are warm and humid while the winter temperatures are moderated slightly by an occasional influx of cool air from the north. The region is dominated by the effect of the Gulf Stream which flows northward following the contours of the lower east coast and a dominant trade wind that blows from east to west. This water trajectory is a moderating influence that cools the region in the summer and gives warmth in the winter. Average mean winter (January) and summer (July) maximum temperatures for Florida are shown in Figure 5.3 and 5.4. The primary rainy season occurs during the six month period from May through October. Most of the precipitation is associated with thunderstorms. The maximum average rainfalls are during the months of September and October. These rains may be associated with tropical storms. The frequency of tropical storms, by year, for Florida is shown in Exhibit Table 5.1. The chances of hurricane force winds at West Palm Beach are 1 in 7. Meteorological conditions that aggravate air pollution are least likely to occur in the lower east coast region due to the prevailing easterly trade winds and the overall prevailing instability of the air. The trade winds are sufficiently pervasive so as to minimize any true sea breeze effect.

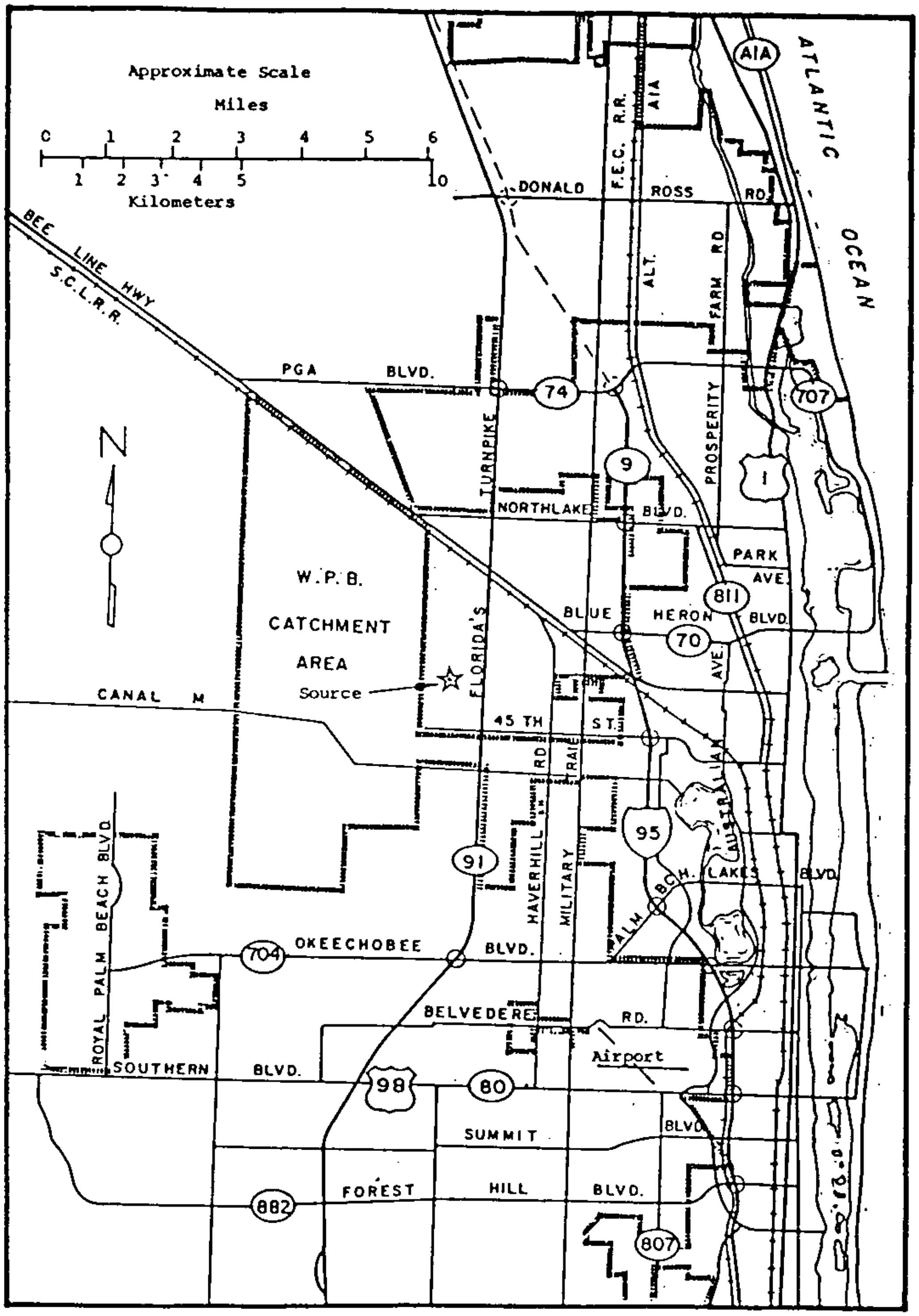
LOCATION MAP

PALM BEACH COUNTY, FLORIDA



PALM BEACH COUNTY
SOLID WASTE AUTHORITY
RESOURCE RECOVERY FACILITY

FIGURE 5.1



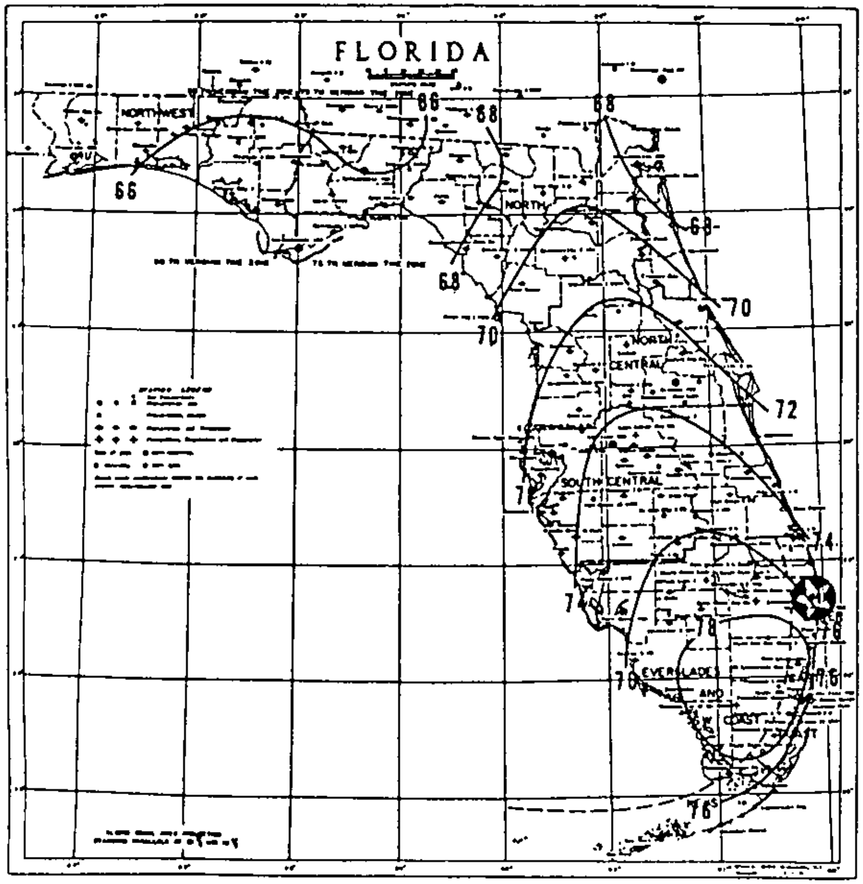
PALM BEACH COUNTY
SOLID WASTE AUTHORITY
RESOURCE RECOVERY FACILITY

FIGURE 5.2

PALM BEACH COUNTY
SOLID WASTE AUTHORITY
RESOURCE RECOVERY FACILITY

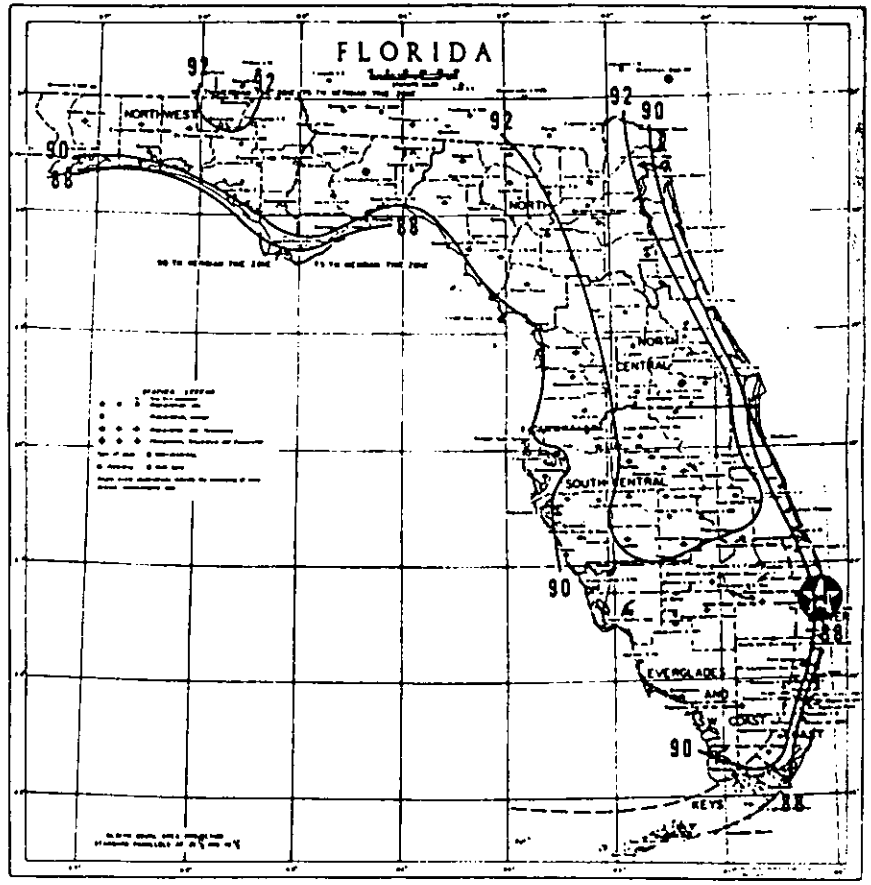
Data Source: CLIMATE OF THE STATES, Vol. 1, Water Information Center, Inc., 1974

MEAN MAXIMUM TEMPERATURE (°F.), JANUARY



Data are based on the period 1931-52. Isolines are drawn through points of approximately equal value. Caution should be used in interpolating on these maps.

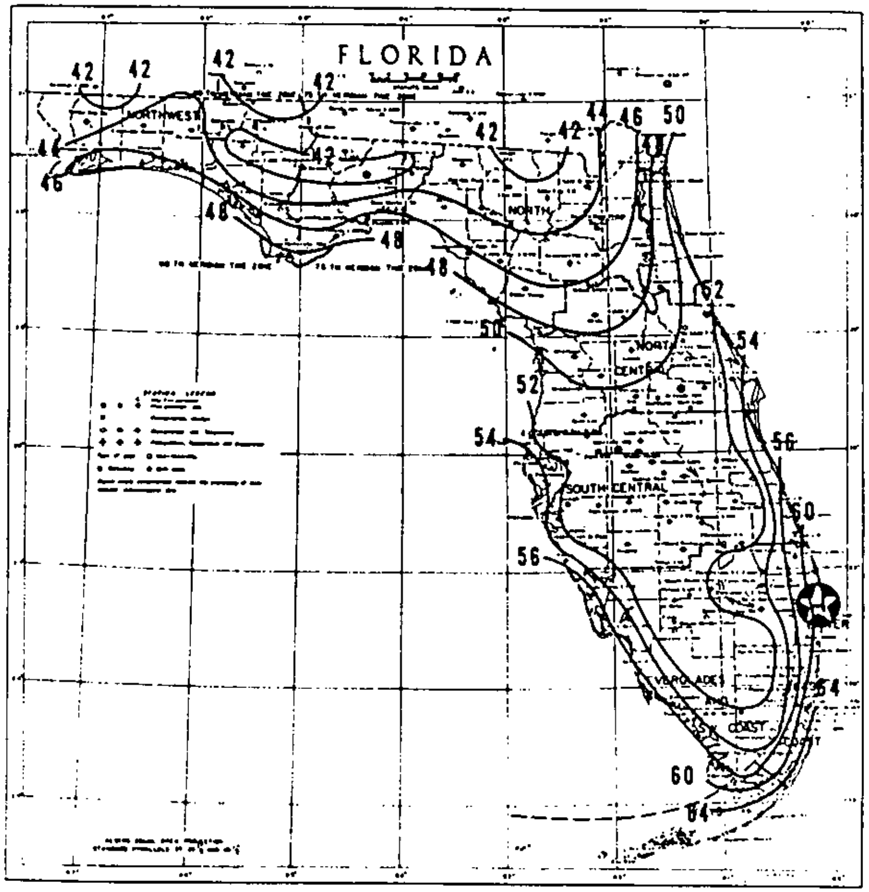
MEAN MAXIMUM TEMPERATURE (°F.), JULY



Data are based on the period 1931-52. Isolines are drawn through points of approximately equal value. Caution should be used in interpolating on these maps.

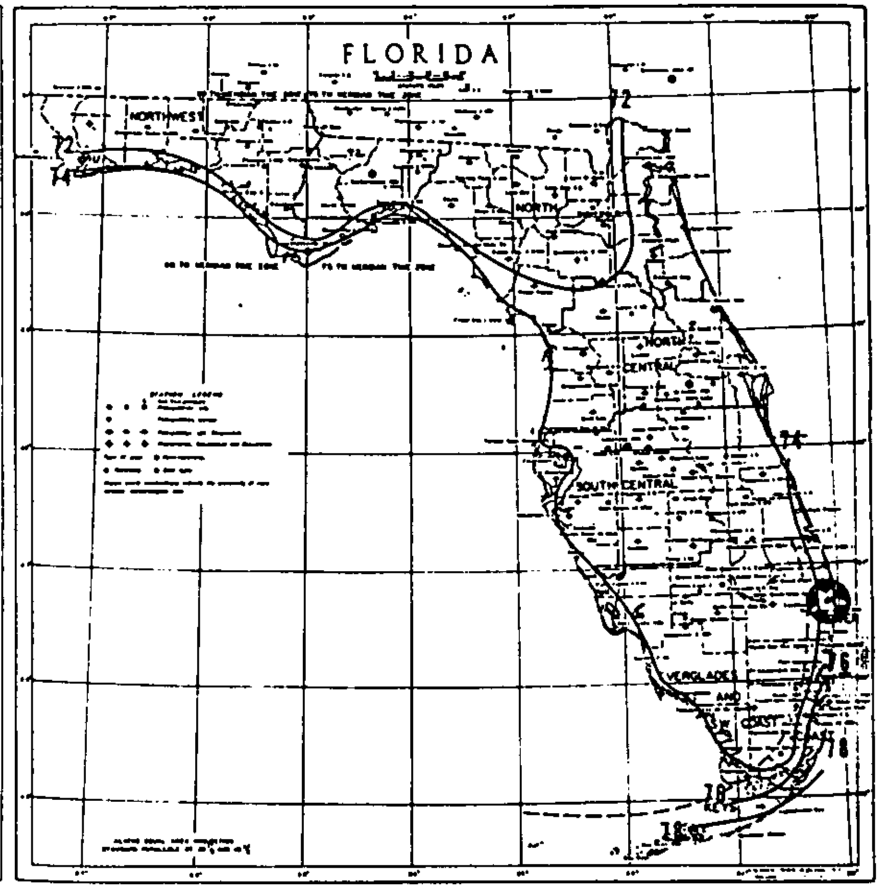
FIGURE 5.3

MEAN MINIMUM TEMPERATURE (°F.), JANUARY



Data are based on the period 1931-52. Isolines are drawn through points of approximately equal value. Caution should be used in interpolating on these maps.

MEAN MINIMUM TEMPERATURE (°F.), JULY



Data are based on the period 1931-52. Isolines are drawn through points of approximately equal value. Caution should be used in interpolating on these maps.

Data Source: CLIMATE OF THE STATES, Vol.1, Water Information Center, Inc., 1974

FIGURE 5.4

PALM BEACH COUNTY
SOLID WASTE AUTHORITY
RESOURCE RECOVERY FACILITY

FREQUENCY OF TROPICAL STORMS BY YEARS IN FLORIDA

Year	Of Known Hurricane Intensity	Not or Of Doubtful Hurricane Intensity	Total	Year	Of Known Hurricane Intensity	Not or Of Doubtful Hurricane Intensity	Total
1885	3	1	4	1930	0	1	1
1886	3	1	4	1931	0	0	0
1887	1	1	2	1932	1	1	2
1888	2	1	3	1933	2	2	4
1889	1	2	3	1934	0	0	0
1890	0	0	0	1935	3	0	3
1891	1	1	2	1936	1	2	3
1892	0	2	2	1937	0	3	3
1893	3	2	5	1938	0	1	1
1894	2	1	3	1939	1	1	2
1895	1	3	4	1940	0	0	0
1896	3	0	3	1941	1	1	2
1897	0	1	1	1942	0	0	0
1898	2	0	2	1943	0	0	0
1899	1	2	3	1944	1	0	1
1900	0	1	1	1945	2	1	3
1901	0	2	2	1946	1	1	2
1902	0	1	1	1947	2	1	3
1903	1	0	1	1948	2	0	2
1904	1	0	1	1949	1	0	1
1905	0	0	0	1950	2	2	4
1906	3	1	4	1951	0	1	1
1907	0	1	1	1952	0	1	1
1908	0	0	0	1953	1	2	3
1909	1	1	2	1954	0	0	0
1910	1	0	1	1955	0	0	0
1911	1	1	2	1956	1	0	1
1912	1	0	1	1957	0	3	3
1913	0	0	0	1958	0	1	1
1914	0	0	0	1959	0	2	2
1915	1	1	2	1960	1	2	3
1916	3	0	3	1961	0	0	0
1917	1	0	1	1962	0	0	0
1918	0	0	0	1963	0	1	1
1919	1	1	2	1964	3	2	5
1920	0	1	1	1965	1	1	2
1921	1	0	1	1966	2	0	2
1922	0	0	0	1967	0	0	0
1923	0	1	1	1968	4	0	4
1924	2	1	3	1969	1	1	2
1925	1	0	1	1970	1	1	2
1926	3	0	3	1971	0	0	0
1927	0	0	0				
1928	3	0	3				
1929	1	0	1	Total	84	66	150

CHANCES OF HURRICANE FORCE WINDS IN ANY GIVEN YEAR

City	Chances	City	Chances
Jacksonville	1 in 100	Key West	1 in 8
Daytona Beach	1 in 50	Fort Myers	1 in 11
Melbourne-Vero Beach	1 in 20	Tampa-St. Petersburg	1 in 25
Palm Beach	1 in 7	Apalachicola-St. Marks	1 in 17
Miami	1 in 6	Pensacola	1 in 8

Data Source: CLIMATE OF THE STATES, Vol.1, Water Information Center, Inc., 1974

PALM BEACH COUNTY
SOLID WASTE AUTHORITY
RESOURCE RECOVERY FACILITY

EXHIBIT TABLE 5.1

Regional Climatology

There are two full time, full service weather stations within 100 km of the proposed facility:

- Palm Beach International Airport
- Miami International Airport

The Palm Beach International Airport is approximately 9.5 kilometer (5.9 miles) southeast of the proposed facility. The Miami International Airport is approximately 100 kilometers (62 miles) south of the proposed facility. Both stations lie within the Florida lower east coast climatological regime.

Meteorological normals for these two stations are shown in Exhibit Tables 5.2 and 5.3. The meteorological data from the Palm Beach International Airport can be considered representative of the site location for the purpose for air quality modeling analyses. While surface weather data are available from the Palm Beach International Airport, Miami International Airport is the closest available station with recorded upper air data that can be considered as representative for modeling purposes.

A wind frequency distribution summarized for the data collection period from 1970-1974 is available for the Palm Beach International. The joint distribution of these data as a function of wind speed and direction are shown in Figure 5.5. A directional summary of these data in wind rose format is shown in Figure 5.6, along with the average speed for each direction.

The annual average wind speed derived from the 1970-1974 summary wind frequency distribution is approximately 4.27 m/s (9.6 mph). The highest average speed as a function of wind direction is approximately 5.83 m/s (13.0 mph) for winds from the ENE. The winds with the highest frequency of occurence are from the E (17.2%). Winds from the E and ESE account for 27.3% of all occurences and winds from an expanded sector ENE through SE account for 44.2% of all occurences. The summary joint distributions of the wind directions and stability classes are shown in Figure 5.7 and 5.8. The proportion stable stability classes: 5 & 6 per total frequency for each wind direction exceeds 50% for the directions SSW through NW. These two classes are 62% of all the winds from the west (W). These two classes represent less than 20% of the observations for winds from the NNE through E.

The wind distribution, average speeds and stability category data are based on USDEP, COMM. NOAA, EDS, NCC STAR Program results. These data were used to generate annual impact concentrations.

The Summary by Hour analyses given in the monthly Local Climatological Data (LCD) for West Palm Beach for the period 1970 -1974 were used to generate seasonal diurnal distributions for the resultant wind directions and average wind speeds. Winter consists of all available data for the months of December, January and February. Spring consisted of all available data for the months of March, April and May, etc. The derived seasonal diurnal variations for wind direction are shown in Figure 5.9.

The diurnal variations of the wind directions for the spring and summer seasons are almost identical and uniquely different from the diurnal curve for

NORMALS, MEANS, AND EXTREMES

MIAMI, FL — INTERNATIONAL AIRPORT — EASTERN — 25° 48′ N — 80° 16′ W — 7 FT — 1975

Month	Temp °F Normal: Daily maximum	Daily minimum	Monthly	Extremes: Record highest	Year	Record lowest	Year	Normal Degree days Base 65 °F: Heating	Cooling	Precipitation in inches, Water equivalent: Normal	Maximum monthly	Year	Minimum monthly	Year	Maximum in 24 hrs.	Year	Snow, Ice pellets: Maximum monthly	Year	Maximum in 24 hrs.	Year	Relative humidity pct. Hour 01	Hour 07	Hour 13	Hour 19 (Local time)	Wind: Mean speed m.p.h.	Prevailing direction	Fastest mile: Speed m.p.h.	Direction	Year	Pct. of possible sunshine	Mean sky cover, tenths, sunrise to sunset	Mean number of days, Sunrise to sunset: Clear	Partly cloudy	Cloudy	Precipitation .01 inch or more	Snow, Ice pellets 1.0 inch or more	Thunderstorms	Heavy fog, visibility 1/4 mile or less	Temperatures °F Max. (b) 90° and above	Max. 32° and below	Min. 32° and below	Min. 0° and below	Average station pressure mb. Elev. 12 feet m.s.l.
(a)				11		11					33		33		33		33		33		11	11	11	11	26	15	18	18			27	26	26	26	33	26	26	27	11	11	11	11	3
J	75.6	58.7	67.2	86	1967	33	1971	53	121	2.15	6.66	1969	0.04	1951	2.60	1973	0.0		0.0		80	84	61	70	9.3	NNW	37	31	1966		5.3	10	13	8	7	0	1	2	0	0	0	0	1019.0
F	76.6	59.0	67.8	88	1974	36	1967	67	131	1.95	6.56	1966	0.01	1944	5.73	1966	0.0		0.0		78	82	56	65	10.0	ESE	38	30	1964		5.2	9	11	8	6	0	1	1	0	0	0	0	1018.8
M	79.5	63.0	71.3	90	1974	37	1968	17	206	2.07	7.22	1949	0.02	1956	7.07	1949	0.0		0.0		77	82	56	63	10.3	SE	46	04	1966		5.3	9	14	8	6	0	2	1	*	0	0	0	1017.4
A	82.7	67.3	75.0	96	1971	46	1971	0	300	3.60	10.21	1960	0.07	1971	5.16	1960	0.0		0.0		75	80	54	64	10.6	ESE	32	23	1958		5.3	8	13	7	6	0	2	1	1	0	0	0	1017.9
M	85.3	70.7	78.0	93	1974	61	1971	0	403	6.12	18.54	1968	0.44	1965	6.42	1958	0.0		0.0		80	83	60	70	9.4	ESE	37	32	1961		5.8	6	15	10	10	0	7	*	2	0	0	0	1018.8
J	88.0	73.9	81.0	94	1967	67	1972	0	450	9.00	22.36	1968	1.81	1945	7.63	1966	0.0		0.0		84	87	67	76	8.2	SE	37	13	1967		6.9	3	14	13	15	0	13	0	6	0	0	0	1018.0
J	89.1	75.5	82.3	96	1969	70	1965	0	536	6.91	13.51	1947	1.77	1963	4.55	1952	0.0		0.0		83	86	63	73	7.8	SE	38	18	1962		6.6	3	16	12	16	0	16	*	8	0	0	0	1017.3
A	89.9	75.8	82.9	96	1970	70	1967	0	555	6.72	16.88	1943	1.63	1954	6.92	1964	0.0		0.0		83	87	64	74	7.7	SE	74	36	1964		6.5	2	19	10	17	0	16	*	8	0	0	0	1017.3
S	88.3	75.0	81.7	93	1968	70	1966	0	501	8.74	24.40	1960	2.63	1951	7.38	1960	0.0		0.0		85	89	67	77	8.2	ESE	69	08	1965		6.8	2	15	13	18	0	11	*	6	0	0	0	1015.0
O	84.6	71.0	77.8	90	1969	56	1968	0	397	8.18	21.08	1952	1.50	1962	9.95	1948	0.0		0.0		83	87	65	74	9.3	ENE	41	05	1966		6.1	6	14	11	15	0	5	*	*	0	0	0	1015.7
N	79.9	64.5	72.2	87	1973	40	1970	13	229	2.72	13.15	1959	0.09	1970	7.93	1959	0.0		0.0		80	84	60	70	9.4	N	38	06	1966		5.3	8	14	8	8	0	1	1	0	0	0	0	1018.4
D	76.6	60.0	68.3	85	1968	36	1968	96	139	1.64	6.39	1958	0.13	1968	4.38	1964	0.0		0.0		78	83	58	68	9.0	N	38	32	1967		5.2	10	12	9	6	0	1	1	0	0	0	0	1019.6
YR	83.0	67.9	75.5	96	APR 1971	36	DEC 1968	206	4038	59.80	24.40	SEP 1960	0.01	FEB 1944	9.95	OCT 1948	0.0		0.0		81	84	61	70	9.1	ESE	74	36	AUG 1964		5.8	76	172	117	129	0	75	7	32	0	0	0	1017.6

Means and extremes above are from existing and comparable exposures. Annual extremes have been exceeded at other sites in the locality as follows: Airport locations: Highest temperature 100 in July 1942; lowest temperature 26 in December 1934 (28 in January 1940); maximum precipitation in 24 hours 12.58 in April 1942. City locations: Lowest temperature 27 in February 1917; maximum precipitation in 24 hours 15.10 in November 1925; fastest mile of wind 122 from the South in October 1950. Miami Beach (Allison Hospital): Fastest mile of wind 132 from the East, September 18, 1926.

WEST PALM BEACH, FL — PALM BEACH INTL AP — EASTERN — 26° 41′ N — 80° 06′ W — 15 FT — 1975

Month	Temp °F Normal: Daily maximum	Daily minimum	Monthly	Extremes: Record highest	Year	Record lowest	Year	Normal Degree days Base 65 °F: Heating	Cooling	Precipitation in inches, Water equivalent: Normal	Maximum monthly	Year	Minimum monthly	Year	Maximum in 24 hrs.	Year	Snow, Ice pellets: Maximum monthly	Year	Maximum in 24 hrs.	Year	Relative humidity pct. Hour 01	Hour 07	Hour 13	Hour 19 (Local time)	Wind: Mean speed m.p.h.	Prevailing direction	Fastest mile: Speed m.p.h.	Direction	Year	Pct. of possible sunshine	Mean sky cover, tenths, sunrise to sunset	Mean number of days, Sunrise to sunset: Clear	Partly cloudy	Cloudy	Precipitation .01 inch or more	Snow, Ice pellets 1.0 inch or more	Thunderstorms	Heavy fog, visibility 1/4 mile or less	Temperatures °F Max. (b) 90° and above	Max. 32° and below	Min. 32° and below	Min. 0° and below	Average station pressure mb. Elev. 21 feet m.s.l.
(a)				11		11					37		37		37		30		30		11	11	11	11	33	14	26	26			27	30	30	30	35	33	33	33	11	11	11	11	3
J	75.0	55.9	65.5	87	1975	29	1970	83	98	2.60	8.30	1974	0.22	1960	6.36	1957	0.0		0.0		80	82	59	73	9.8	NW	48	29	1955		5.6	7	12	12	7	0	1	2	0	0	*	0	1019.6
F	76.0	56.2	66.1	89	1974	35	1967	91	127	2.60	8.88	1966	0.29	1944	4.70	1966	0.0		0.0		79	81	56	69	10.3	SE	45	29	1956		5.7	8	10	10	7	0	1	1	0	0	0	0	1018.0
M	79.3	60.2	69.8	92	1965	31	1968	25	169	3.32	11.93	1970	0.33	1956	4.86	1970	0.0		0.0		76	80	53	66	10.7	SE	31	17	1957		5.6	8	13	10	7	0	2	1	1	0	0	0	1016.9
A	82.9	66.6	73.9	99	1971	45	1971	0	270	3.51	16.26	1942	0.06	1967	15.23	1942	0.0		0.0		74	77	52	64	10.9	E	35	32	1958		5.6	8	14	8	7	0	3	1	1	0	0	0	1017.8
M	86.1	68.9	77.5	96	1971	56	1971	0	388	5.17	14.10	1942	0.39	1967	7.06	1958	0.0		0.0		77	77	57	68	9.6	ESE	43	27	1954		5.9	7	13	11	11	0	6	*	1	0	0	0	1018.0
J	88.3	72.7	80.5	96	1972	62	1965	0	465	8.14	17.91	1966	1.07	1952	9.21	1965	0.0		0.0		83	82	66	76	8.0	ESE	71	09	1957		6.9	4	12	14	16	0	13	0	6	0	0	0	1015.5
J	89.6	74.1	81.9	96	1969	68	1975	0	524	6.52	17.74	1941	1.22	1961	5.83	1972	0.0		0.0		84	84	64	75	7.3	ESE	46	34	1974		6.7	3	14	14	15	0	16	*	14	0	0	0	1016.7
A	90.2	74.4	82.3	97	1970	68	1969	0	536	6.01	13.32	1930	2.16	1935	5.69	1969	0.0		0.0		83	84	63	73	7.4	ESE	36	13	1964		6.6	3	16	12	16	0	16	*	16	0	0	0	1017.1
S	88.5	74.7	81.6	95	1972	68	1975	0	498	9.69	24.86	1960	2.73	1939	6.54	1965	0.0		0.0		86	85	66	76	8.7	ENE	55	03	1965		7.0	2	14	14	17	0	11	*	6	0	0	0	1016.7
O	84.3	70.7	77.5	91	1971	46	1968	0	376	8.73	18.74	1965	1.20	1972	9.30	1965	0.0		0.0		80	83	63	74	10.0	ENE	74	16	1964		6.3	4	13	12	14	0	5	*	2	0	0	0	1015.8
N	79.5	62.5	71.0	89	1973	37	1970	22	202	2.68	10.77	1971	0.23	1970	5.52	1972	0.0		0.0		78	81	58	71	9.9	ENE	35	34	1939		5.6	7	14	9	8	0	1	1	0	0	0	0	1018.3
D	76.1	57.4	66.8	87	1972	33	1968	78	134	2.21	8.73	1949	0.06	1968	5.26	1953	0.0		0.0		77	79	57	71	9.9	NNW	38	07	1956		5.3	9	12	10	7	0	1	1	0	0	0	0	1019.3
YR	83.0	66.0	74.5	99	APR 1971	29	JAN 1970	299	3786	62.06	24.86	SEP 1960	0.06	APR 1967	15.23	APR 1942	0.0		0.0		80	81	59	72	9.4	ESE	86	13	AUG 1964		6.1	72	157	136	131	0	79	8	54	0	*	0	1017.0

Means and extremes above are from existing and comparable exposures. Annual extremes have been exceeded at other sites in the locality as follows: Highest temperature 101° in July 1942.

Data Source:
CLIMATOGRAPHY OF THE UNITED STATES NO. 60
Climate of Florida
NOAA,EDS,NCC, October, 1976

(a) Length of record, years, through the current year unless otherwise noted, based on January data.
(b) 70° and above at Alaskan stations.
* Less than one half.
T Trace.

NORMALS - Based on record for the 1941-1970 period.
DATE OF AN EXTREME - The most recent in cases of multiple occurrence.
PREVAILING WIND DIRECTION - Record through 1963.
WIND DIRECTION - Numerals indicate tens of degrees clockwise from true north. 00 indicates calm.
FASTEST MILE WIND - Speed is fastest observed 1-minute value when the direction is in tens of degrees.

EXHIBIT TABLE 5.2

* NORMALS BY CLIMATOLOGICAL DIVISIONS

Taken from "Climatography of the United States No. 81-4, Decennial Census of U. S. Climate"

TEMPERATURE (°F)

STATIONS (By Divisions)	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ANN
LOWER EAST COAST													
FORT LAUDERDALE	67.8	68.4	70.7	74.3	77.5	80.4	81.8	82.6	81.5	77.9	72.6	69.0	75.4
HOMESTEAD EXP STA	65.6	66.5	69.2	72.8	75.9	79.2	80.2	80.7	80.0	76.3	70.7	66.9	73.7
MIAMI BEACH	69.1	69.6	71.6	74.9	78.2	81.1	82.3	82.9	81.7	78.4	73.8	70.3	76.2
MIAMI WSO	66.9	67.9	70.5	74.2	77.6	80.8	81.8	82.3	81.3	77.8	72.4	68.1	75.1
MIAMI 12 SSW	66.5	67.9	70.4	74.2	77.5	80.4	81.6	82.0	81.0	77.2	71.6	67.7	74.8
WEST PALM BEACH WSO	66.9	67.6	69.9	73.9	77.6	81.0	82.6	83.0	82.1	78.2	72.5	68.2	75.3
DIVISION	66.9	67.6	70.0	73.6	77.0	80.2	81.5	82.0	81.0	77.4	72.0	68.2	74.8
KEYS													
KEY WEST WSO	69.6	70.4	72.5	75.8	79.0	81.8	83.3	83.6	82.3	79.0	74.1	70.6	76.8
KEY WEST	70.4	71.3	73.6	77.1	80.2	82.8	84.0	84.3	83.0	79.6	74.9	71.6	77.7
DIVISION	70.2	71.0	73.3	76.6	79.8	82.4	83.5	83.8	82.5	79.2	74.5	71.2	77.3

PRECIPITATION (In.)

STATIONS (By Divisions)	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ANN
LOWER EAST COAST													
FORT LAUDERDALE	2.20	2.06	2.84	4.19	5.29	7.42	5.96	6.88	8.98	8.39	3.18	2.90	60.29
HOMESTEAD EXP STA	1.75	1.71	2.30	3.69	6.46	8.77	8.81	8.29	10.61	8.72	2.28	1.22	64.69
MIAMI BEACH	1.68	1.65	1.95	2.92	4.54	5.63	4.65	5.06	7.36	6.71	2.53	1.70	46.26
MIAMI WSO	2.03	1.87	2.27	3.88	6.44	7.37	6.75	6.97	9.47	8.21	2.83	1.67	59.76
MIAMI 12 SSW	2.05	1.80	2.44	3.75	6.13	7.00	6.50	6.25	9.03	8.23	2.59	1.63	57.48
WEST PALM BEACH WSO	2.48	2.35	3.44	4.34	5.11	7.53	6.46	6.74	9.66	7.96	2.86	2.57	61.70
DIVISION	2.16	2.02	2.82	3.90	5.49	7.44	6.65	6.82	9.47	8.15	2.84	2.17	60.00
KEYS													
KEY WEST WSO	1.53	1.98	1.77	2.48	2.73	3.97	4.16	4.33	6.73	5.82	2.80	1.69	39.99
KEY WEST	1.49	2.00	1.73	2.51	2.77	4.01	4.16	4.25	6.53	5.87	2.81	1.71	39.84
DIVISION	1.71	1.88	1.92	2.29	3.10	4.33	4.54	4.68	7.05	6.73	2.43	1.88	42.55

* Normals for the period 1931-1960. Divisional normals may not be the arithmetical average of individual stations published, since additional data for shorter period stations are used to obtain better areal representation.

CONFIDENCE - LIMITS

In absence of trend or record changes, the chances are 9 out of 10 that the true mean will lie in the interval formed by adding and subtracting the values in the following table from the means for any station in the State. Because of the wider variation in mean precipitation, the corresponding monthly means and annual mean must be substituted for "p" in the precipitation table below to obtain mean precipitation confidence limits.

1.3	1.3	1.1	.5	.5	.4	.4	.3	.4	.5	.8	1.2	.4
39√p	37√p	44√p	48√p	47√p	48√p	38√p	43√p	53√p	59√p	44√p	35√p	44√p

COMPARATIVE DATA

Data in the following table are the mean temperature and average precipitation for St. Leo's Abbey, Florida, for the period 1901-1930 and are included in this publication for comparative purposes.

60.3	61.7	66.3	70.6	75.8	79.2	80.5	80.7	79.2	73.2	65.4	60.3	71.1
2.87	2.54	2.90	2.20	4.44	8.19	8.22	8.48	6.91	3.70	2.20	2.51	55.16

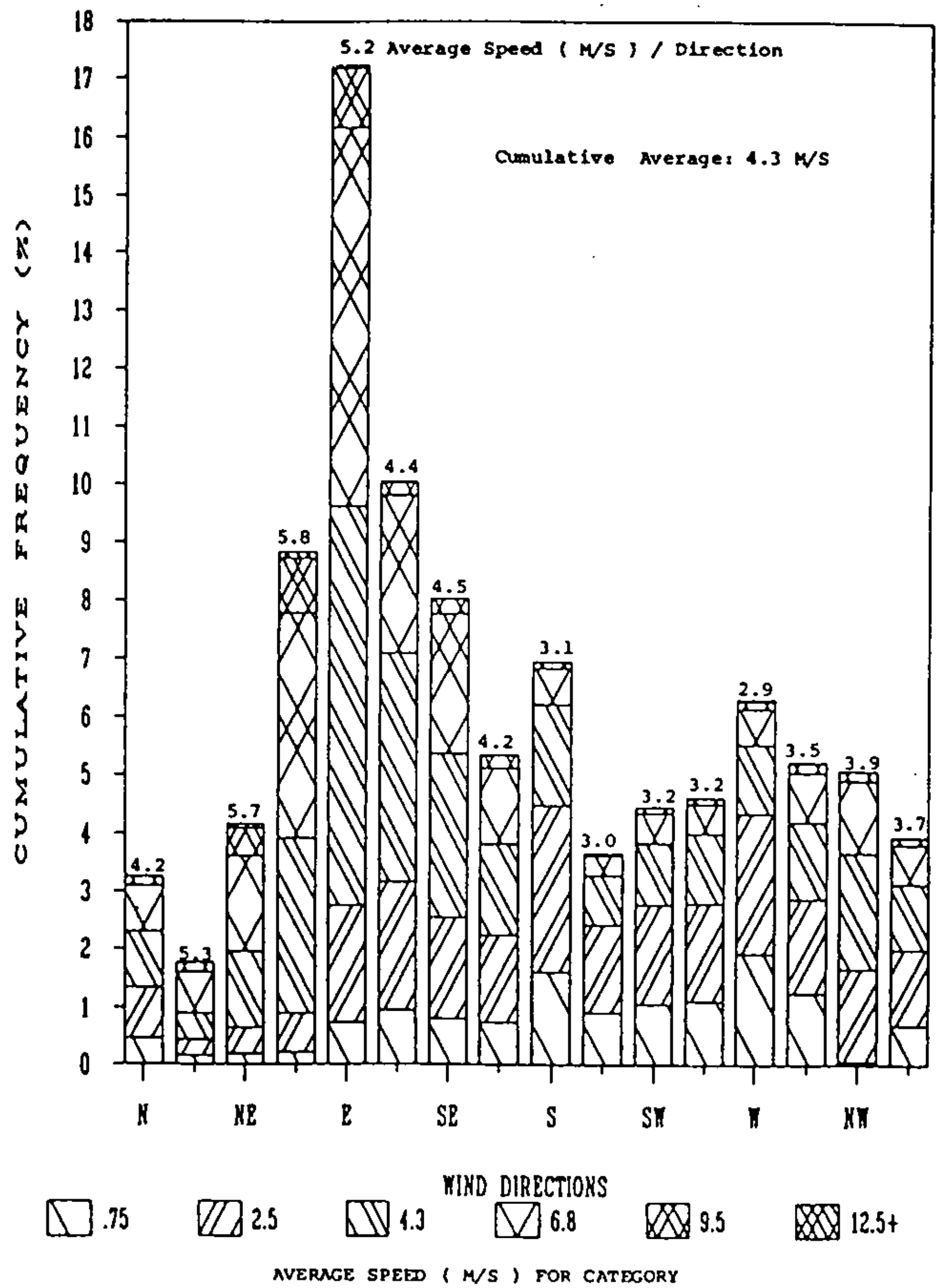
Data Source: CLIMATE OF THE STATES, Vol.1, Water Information Center, Inc., 1974

PALM BEACH COUNTY
SOLID WASTE AUTHORITY
RESOURCE RECOVERY FACILITY

EXHIBIT TABLE 5.3

WIND SPEED FREQUENCY DISTRIBUTIONS

WEST PALM BEACH, FL. (1970-1974)



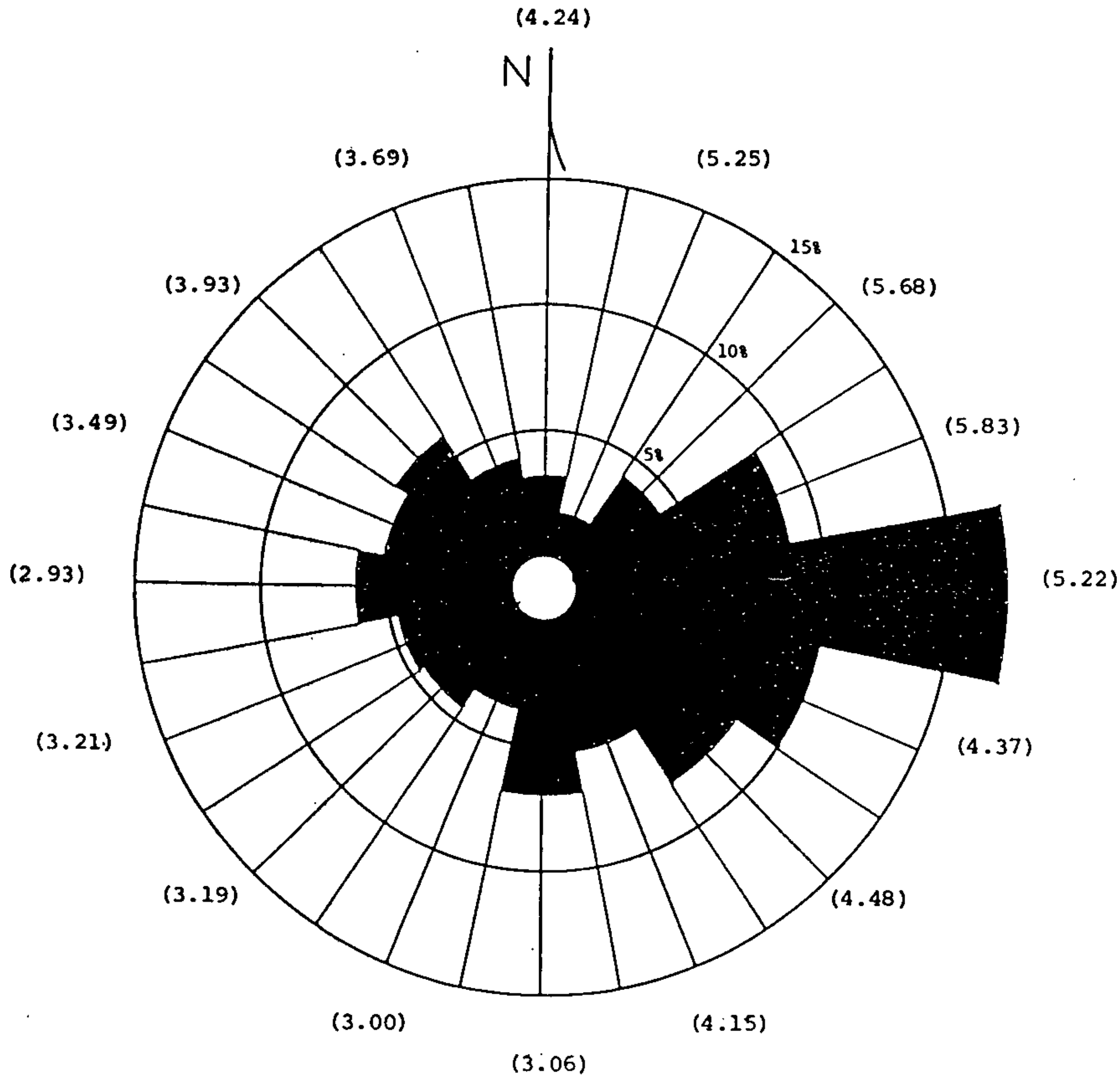
PALM BEACH COUNTY
SOLID WASTE AUTHORITY
RESOURCE RECOVERY FACILITY

FIGURE 5.5

WIND DIRECTION FREQUENCY DISTRIBUTION

WEST PALM BEACH: 1970-1974

(Annual Average Wind Speed: 4.3 M/S)

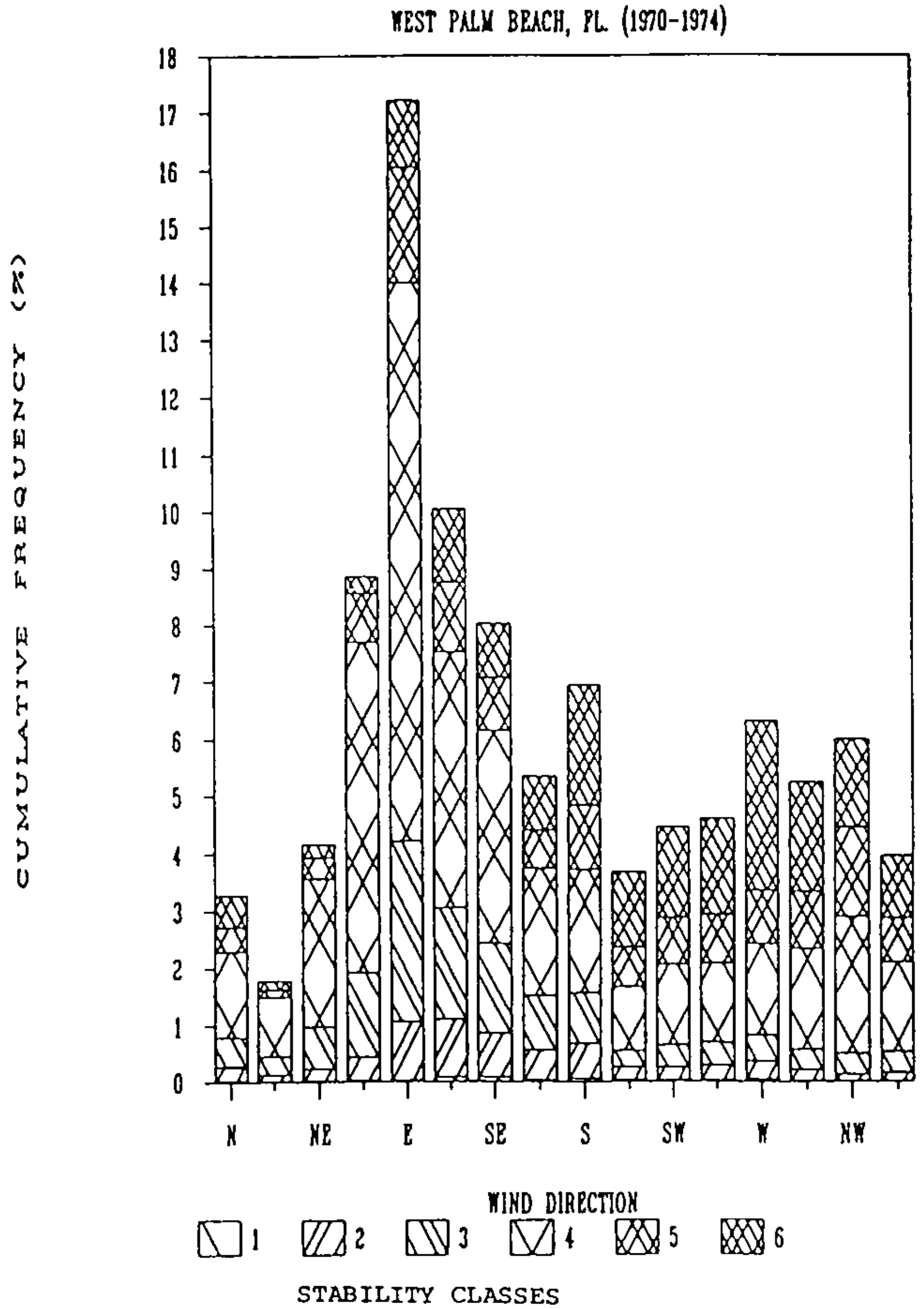


Average Wind Speed: (m/s)

PALM BEACH COUNTY
SOLID WASTE AUTHORITY
RESOURCE RECOVERY FACILITY

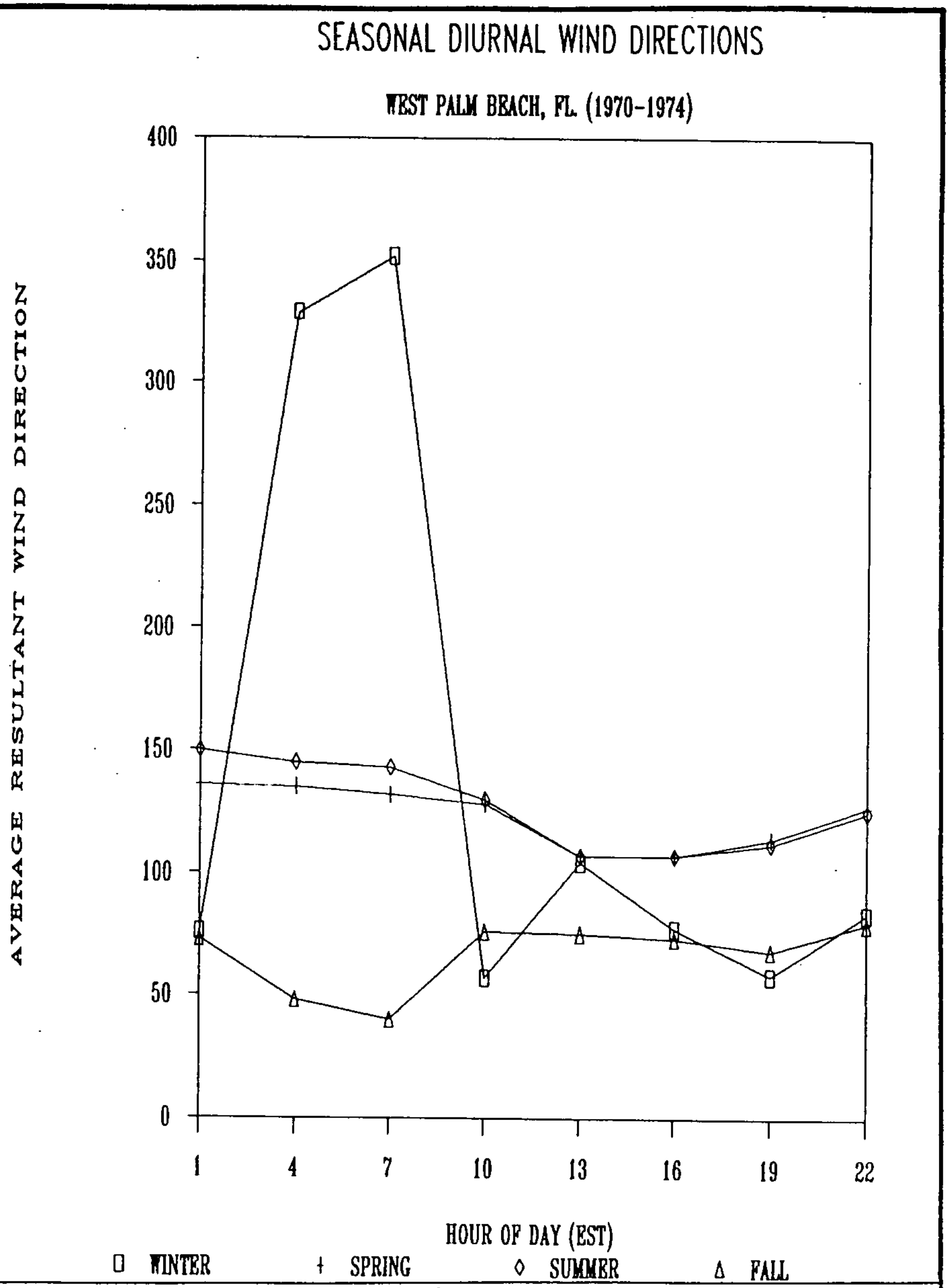
FIGURE 5.6

STABILITY CLASS FREQUENCY DISTRIBUTIONS



PALM BEACH COUNTY
SOLID WASTE AUTHORITY
RESOURCE RECOVERY FACILITY

FIGURE 5.7



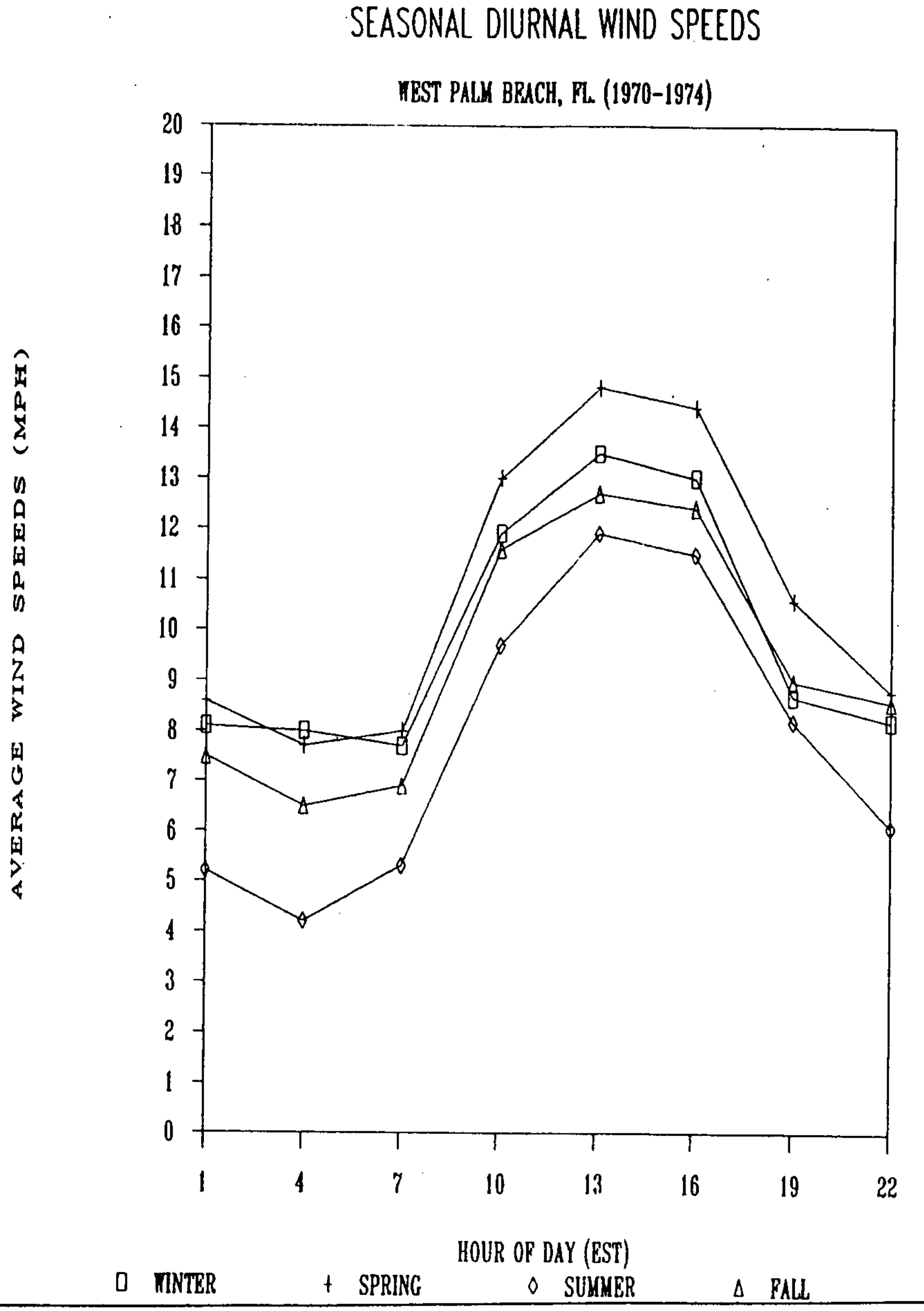
PALM BEACH COUNTY
SOLID WASTE AUTHORITY
RESOURCE RECOVERY FACILITY

FIGURE 5.8

the fall season. The winter season curve is erratic particularly during the early morning hours, but tends to correspond with that of the fall season during the daylight and early evening hours.

The diurnal wind direction patterns give no indication of a diurnal shift that would be consistent with an ocean sea breeze. They, instead confirm the dominant easterly trade winds that were observed in the annual wind direction frequency roses. The seasonal diurnal wind speed distributions shown in Figure 5.9 all have the same general form. The minimum wind speeds occurred at or between 0400-0700. The minimum average speed was 1.9 m/s (4.3 mph) at 0400 during the summer season. The maximum wind speeds occured at 1300. The highest average speed was 6.6 m/s (14.8 mph) during the spring season. The spring season (except at 0400) has the highest diurnal average wind speeds and the summer season (without exception) has the lowest diurnal average wind speed.

Seasonal mixing heights for the West Palm Beach, based on G.C. Holtzworth, differ slightly from those of Miami when they are extracted from Holtzworth's isopheth maps. These values are given in Exhibit Table 5.4.



PALM BEACH COUNTY
SOLID WASTE AUTHORITY
RESOURCE RECOVERY FACILITY

FIGURE 5.9

EXHIBIT TABLE 5.4

HOLTZWORTH* MIXING HEIGHTS FOR WEST PALM BEACH AND MIAMI

PERIOD	MORNING WEST PALM	MORNING MIAMI#	AFTERNOON WEST PALM	AFTERNOON MIAMI#
ANNUAL	800	923	1375	1351
SPRING	800	980	1400	1457
SUMMER	900	1071	1400	1383
FALL	800	933	1350	1341
WINTER	700	707	1175	1221

*G.C. Holtzworth, Mixing Heights, Winds Speeds, and Potential for Urban Air Pollution Throughout the Contiguous United States: USEPA AP-101, January, 1972.

#APPENDIX B, Table B-1; all cases, Holtzworth, 1972.

5.4.2 Available Sources of Meteorological Data

When refined dispersion modeling analyses are performed, a full year (or more) of meteorological data is required. The short-term dispersion models require hour-by-hour meteorological data and the long-term models require seasonal or annual average data. The meteorological parameters needed include wind direction, wind speed, temperature, cloud cover, solar insolation, and mixing height. Mixing height is calculated using the CRSTER preprocessor program from surface temperature and upper air soundings of the rate of temperature change with height, the latter of which are usually obtained by balloon measurements.

The nearest NWS station to the proposed waste-to-energy facility is West Palm Beach Airport which is located 9.5 kilometers (5.9 miles) to the southeast. The nearest NWS station for upper air data is Miami Airport located 100 kilometers (62 miles) to the south. The Florida DER provided the most recent five-year surface and upper air meteorological data for the years 1970 thru 1974 inclusive and these data were used for the ISCST model runs.

5.4.3 Procedures for Using the Meteorological Data

Each of the five years of hourly meteorological data are used in separate refined modeling analyses to determine the maximum impacts of the proposed source by itself. The meteorological days which produced the 50 maximum 1, 3, 8 and 24-hour impacts for each of the 5 years were used in subsequent refined multisource modeling analyses to determine compliance with NAAQS consumption. Tables 5-5A thru E list these days for each of the years 1970 thru 1974.

5.5 Receptor Selection

5.5.1 Procedures for Receptor Selection

Receptor selection is an important part of the modeling analysis. Receptors must be selected in such a manner as to ensure that all possible locations of maximum impact are included in the analysis. This can be accomplished by developing receptor grids, supplemented by discrete receptors at critical locations, if necessary. Two types of receptor grids can be used, rectangular or polar.

With a rectangular grid, receptors are placed at the intersections of a selected set of equally spaced map coordinate lines, where the lines are oriented north/south and east/west. The selected set of receptors is usually centered on the proposed source and extends outward a prescribed distance. Available map coordinate systems include latitude/longitude, Universal Transverse Mercator (UTM) meters, and State grid feet. With a polar grid, receptors are placed at the intersections of radials that extend out from the proposed source. In order to develop a polar receptor grid, the PTPLU and PTDIS models were first used to predict maximum hourly impacts of the proposed source, based on PTPLU's built-in set of hypothetical meteorological data. For this analysis, the receptor elevation in PTPLU is set equal to the highest terrain elevation found within 1 kilometer of the proposed source's stack. The proposed source is modeled using PTPLU to determine the distances (without regard to direction) at which

TABLE 5-5A

METEOROLOGICAL DAYS OF OCCURRENCE FOR THE 50 MAXIMUM IMPACTS FOR THE INDICATED TIME PERIOD
BASED ON INITIAL ISCST MODEL RUN FOR THE YEAR 1970

1-HOUR MAXIMUM DAY	3-HOUR MAXIMUM DAY	8-HOUR MAXIMUM DAY	24-HOUR MAXIMUM DAY	CUMULATIVE DAY	
49	20	60	33	20	215
155	32	61	60	32	216
161	33	73	61	33	218
164	60	76	121	49	224
175	73	121	129	60	226
176	121	152	242	61	228
180	139	194	269	73	231
187	218	211	270	76	239
190	224	215	279	121	241
216	226	226	280	129	242
306	228	231	292	139	269
318	231	241	328	152	270
	239	270	342	161	274
	241	291		164	279
	270	342		175	280
	274			176	291
	342			180	292
				187	306
				190	318
				194	328
				211	342

TABLE 5-5B

METEOROLOGICAL DAYS OF OCCURRENCE FOR THE 50 MAXIMUM IMPACTS FOR THE INDICATED TIME PERIOD
BASED ON INITIAL ISCST MODEL RUN FOR THE YEAR 1971

1-HOUR MAXIMUM DAY	3-HOUR MAXIMUM DAY	8-HOUR MAXIMUM DAY	24-HOUR MAXIMUM DAY	CUMULATIVE DAY	
104	19	33	19	19	196
148	34	58	33	33	207
157	58	114	34	34	211
162	85	186	58	58	214
166	111	214	101	85	215
168	114	268	268	101	220
171	168	309	310	104	256
172	172	319	319	111	268
176	191	320	320	114	309
195	193	321	321	148	319
196	207	327	327	157	320
211	220	336	335	162	321
215	309	353	357	166	327
220	319	357		168	335
256	320	358		171	336
319	353	359		172	353
	356			176	356
	357			186	357
	359			191	358
				193	359
				195	

TABLE 5-5C

METEOROLOGICAL DAYS OF OCCURRENCE FOR THE 50 MAXIMUM IMPACTS FOR THE INDICATED TIME PERIOD
BASED ON INITIAL ISCST MODEL RUN FOR THE YEAR 1972

1-HOUR MAXIMUM DAY	3-HOUR MAXIMUM DAY	8-HOUR MAXIMUM DAY	24-HOUR MAXIMUM DAY	CUMULATIVE DAY	
40	16	71	71	16	183
75	17	81	101	17	193
88	62	95	119	40	195
103	71	100	120	62	206
170	94	101	127	71	209
172	95	126	168	75	212
183	100	127	170	81	215
193	101	170	174	88	218
195	119	209	285	94	225
206	126	280	295	95	228
215	127	285	296	100	232
218	133	286	306	101	233
225	169	287		103	280
228	170	294		119	285
232	171	295		120	286
233	193			126	287
	209			127	294
	212			133	295
	233			168	296
	280			169	306
	294			170	351
	295			171	353
	296			172	356
	351			174	
	353				
	356				

TABLE 5-5D

METEOROLOGICAL DAYS OF OCCURRENCE FOR THE 50 MAXIMUM IMPACTS FOR THE INDICATED TIME PERIOD
BASED ON INITIAL ISCST MODEL RUN FOR THE YEAR 1973

1-HOUR MAXIMUM DAY	3-HOUR MAXIMUM DAY	8-HOUR MAXIMUM DAY	24-HOUR MAXIMUM DAY	CUMULATIVE DAY	
119	17	17	17	17	177
132	29	29	32	29	179
142	33	32	74	32	182
143	64	33	84	33	186
167	94	74	105	64	189
177	97	84	106	74	191
182	104	97	107	84	209
186	105	104	108	94	217
187	107	106	110	97	221
189	108	107	111	104	234
191	110	108	284	105	258
209	111	111	285	106	259
217	112	121	294	107	261
221	132	122	295	108	262
234	179	123		110	266
258	186	179		111	267
262	259	287		112	284
266	261	294		119	285
267	266	314		121	287
	284	315		122	294
	285			123	295
	296			132	296
	314			142	314
	315			143	315
	355			167	355

TABLE 5-5E

METEOROLOGICAL DAYS OF OCCURRENCE FOR THE 50 MAXIMUM IMPACTS FOR THE INDICATED TIME PERIOD
BASED ON INITIAL ISCST MODEL RUN FOR THE YEAR 1974

1-HOUR MAXIMUM DAY	3-HOUR MAXIMUM DAY	8-HOUR MAXIMUM DAY	24-HOUR MAXIMUM DAY	CUMULATIVE DAY	
80	39	65	74	39	197
90	47	73	101	47	201
127	73	74	110	65	204
133	74	101	111	73	205
155	83	102	277	74	208
158	92	103	278	80	211
173	101	110	285	83	222
197	102	111	294	90	229
201	111	115	295	92	231
204	115	137	357	101	234
205	130	184		102	247
208	161	278		103	256
211	170	279		110	265
222	184	294		111	267
229	265	295		115	277
231	277	296		127	278
234	278	330		130	279
247	284	357		133	284
256	295			137	285
267	306			155	294
				158	295
				161	296
				170	306
				173	330
				184	357

maximum impacts occur. All maximum impact distances (for each stability category) were input as rings to ISCST and additional rings were placed at prudent locations (three within and others between and beyond the PTPLU maximum impact distances). A total of 27 rings and 70 radials were input yielding 1890 receptors to determine the maximum impacts of the source alone.

Maximum impacts can be found using either a polar or rectangular receptor grid. The polar grid is preferable for single source analysis because it provides better impact resolution near the proposed source. The rectangular grid system is usually preferable for multisource analyses because the impact resolution is the same throughout the grid. However, in this study, because a polar grid was used in the screening modeling analyses performed to determine the size of the modeling area, the same type of grid was used for the refined multisource modeling analyses. Additional discrete receptors were also placed at all monitoring sites within the study area. Table 5-6 lists monitoring station sites together with their locations and pollutants monitored. No other additional discrete receptors were needed for this study.

5.6 Modeling Procedures and Preliminary Analysis Results

5.6.1 PTPLU and PTDIS Screening Modeling Analyses

The initial screening modeling analyses were performed to determine the critical downwind distances using PTPLU and PTDIS models. All receptors and the proposed facility were assumed to be at zero elevations. Maximum impacts depending on stability class were identified at 571, 926, 1046 and 1615 meters. 571 meters is within the Facility boundries.

5.6.2 ISCST Modeling Analyses

Modeled impacts were calculated at 27 concentric rings of receptors centered on the proposed waste to energy facility stack and spaced at every 6° azimuth. The ring distances from the stack were selected based on the results of the earlier screening modeling analyses performed using the PTPLU model. The ring distances modeled were located 100, 250, 500, 571, 730, 926, 1046, 1500, 1615, 2000, 4000, 5000, 7005, 8956, 9026, 9796, 10000, 11414, 15000, 18045, 20000, 24563, 33308, 41853, 44750, 53136 and 53671 meters from the stack of the proposed waste-to-energy facility. SO_2 impacts were calculated on a 1-hour, 3-hour, 8-hour, 24-hour an annual average basis using ISCST. SO_2 impacts were calculated for each of the five years (1970 through 1974) of available meteorological data. The impacts of each of the other pollutants emitted by the facility were determined based on the ratio of the emission rate of the other pollutant versus the appropriate SO_2 emission rate. (Emission rates based on 2100 TPD except for all sources 1970: 1800 TPD.)

Refined multisource runs were performed for the existing sources in Table 5-7 to determine the maximum combined SO_2 imparts of all sources. Also included in Table 5-7 are the stack parameters and UTM coordinates for each source. Since single source ISCST modeling had determined that the proposed source did not produce significant short-term SO_2 impacts upon the existing sources (see Table 5-8) only the impacts of the existing sources in combination with the proposed source downwind of the proposed source were evaluated by ISCST and ISCLT. Downwind radials were located at the angle

TABLE 5-6

MONITORING STATION LOCAL ADDRESSES, UTM COORDINATES AND LOCATION (DISTANCE & ANGLE)
RELATIVE TO THE PROPOSED PALM BEACH COUNTY RDF FIRED WATERWALL FURNACE FACILITY

(FACILITY UTM COORDINATES 2960180N; 585820E; UTM ZONE 17)

SITE NO.	ADDRESS (MONITORING CAPABILITY)	UTM COORDINATES ZONE 17	DISTANCE FROM PROPOSED FACILITY (METERS)	DIRECTION RELATIVE TO PROPOSED FACILITY (NORTH = 0 (360) DEGREES) (DEGREES)
1	WEST PALM BEACH WATER TREATMENT PLANT FIRST STREET & TAMARIND AVENUE WEST PALM BEACH, FLORIDA (CO, NO2, METEOROLOGY)	2955030N 0593232E	9026	125
1 A	PALM BEACH COUNTY HEALTH DEPARTMENT 901 EVERNIA STREET WEST PALM BEACH, FLORIDA (SUSPENDED PARTICULATE)	2955030N 0593232E	9026	125
2	NORTH PALM BEACH WATER TREATMENT PLANT 603 ANCHORAGE DRIVE NORTH PALM BEACH, FLORIDA (SUSPENDED PARTICULATE)	2965817N 0592780E	8956	51
3	LAKE WORTH WATER TREATMENT PLANT 301-303 COLLEGE STREET LAKE WORTH, FLORIDA (SUSPENDED PARTICULATE)	2943537N 0592793E	18045	157
4	DELRAY BEACH WATER TREATMENT PLANT 202 NW FIRST STREET DELRAY BEACH, FLORIDA (SUSPENDED PARTICULATE)	2927488N 0592195E	33308	169
5	BOCA RATON FIRE STATION #1 1151 NORTH FEDERAL HIGHWAY BOCA RATON, FLORIDA (SUSPENDED PARTICULATE)	2915768N 05913137E	44750	173

TABLE 5.6 Cont'd

MONITORING STATION LOCAL ADDRESSES, UTM COORDINATES AND LOCATION (DISTANCE & ANGLE)
RELATIVE TO THE PROPOSED PALM BEACH COUNTY RDF FIRED WATERWALL FURNACE FACILITY

(FACILITY UTM COORDINATES 2960180N; 585820E; UTM ZONE 17)

SITE NO.	ADDRESS (MONITORING CAPABILITY)	UTM COORDINATES ZONE 17	DISTANCE FROM PROPOSED FACILITY (METERS)	DIRECTION RELATIVE TO PROPOSED FACILITY (NORTH = 0 (360) DEGREES) (DEGREES)
6	SOUTHWEST FIRE DEPARTMENT 1180 SOUTH MILITARY TRAIL WEST PALM BEACH, FLORIDA (SUSPENDED PARTICULATE)	2949018N 0588207E	11414	168
7	COLLEGE OF BOCA RATON 1151 NORTH FEDERAL HIGHWAY BOCA RATON, FLORIDA (SUSPENDED PARTICULATE)	2918354N 0587320E	41853	178
8	SOUTH FLORIDA WATER MANAGEMENT PUMP STATION TWENTY MILE BEND STATE ROAD 80 (SUSPENDED PARTICULATE, OZONE, METEOROLOGY)	2951402N 0562879E	24563	249
9	PAHOKEE SEWAGE TREATMENT PLANT 1050 McCLURE ROAD PAHOKEE, FLORIDA (SUSPENDED PARTICULATE)	2964200N 0532300E	53671	274
10	ROYAL PALM BEACH R.V. AREA 10999 OKEECHOBEE BOULEVARD ROYAL PALM BEACH, FLORIDA (OZONE, METEOROLOGY)	2954150N 0578100E	9796	232
11	PALM BEACH COUNTY HEALTH DEPARTMENT WAREHOUSE 2030 AVENUE 'L' RIVIERA BEACH, FLORIDA (SULFUR DIOXIDE)	2962350N 0592480E	7005	72
12	BELLE GLADE HEALTH DEPARTMENT 1024 NW AVENUE 'D' BELLE GLADE, FLORIDA (SUSPENDED PARTICULATE)	2953082N 0533160E	53136	263

TABLE 5-7

STACK PARAMETERS OF MAJOR SOURCES WITHIN 50 KM OF THE PROPOSED PALM BEACH COUNTY
RDF FIRED SPREADER STOKER FURNACE FACILITY

(FACILITY UTM COORDINATES 2960180N; 585820E; UTM ZONE 17)

SOURCE	EMISSION POINT NO.	VOLUMETRIC FLOW (M3/SEC)	STACK DIAMETER (METERS)	STACK HEIGHT (METERS)	EXIT VELOCITY (MPS)	EXIT TEMPERATURE (DEG K)	SO2 EMISSION (GPS)
PRATT & WHITNEY	UNIT 1	42.83	2.29	19.96	10.40	533.	67.95
	UNIT 2	42.83	2.29	19.96	10.40	533.	67.95
LAKE WORTH UTILITIES	UNIT S-1	12.34	1.52	18.29	6.80	433.	36.3
	UNIT S-2	11.25	1.52	18.29	6.20	434.	36.3
	UNIT S-3	27.44	2.13	38.10	7.70	408.	103.9
	UNIT S-4	39.95	2.29	38.10	9.70	408.	133.9
	UNIT S-5	133.70	3.05	22.86	18.30	450.	11.6
FLORIDA POWER AND LIGHT	UNIT 2	103.34	4.57	45.72	6.30	430.	54.2
	UNIT 3	353.50	4.88	90.83	18.90	408.	349.3
	UNIT 4	353.50	4.88	90.83	18.90	408.	349.3

TABLE 5-8

SO2 IMPACT OF THE PROPOSED FACILITY ON EXISTING MAJOR SO2 SOURCES
WITHIN THE MODELING AND SCREENING AREA

(FACILITY UTM COORDINATES 2960180N; 585820E; UTM ZONE 17)

SOURCE NO.	NAME & ADDRESS	DISTANCE (METERS)/ DIRECTION (DEGREES) (NORTH = 0 (360) DEGREES) RELATIVE TO PROPOSED FACILITY	MET YEAR	MAXIMUM IMPACT OF PROPOSED FACILITY ON THE EXISTING SOURCE (UG/M3) 3-HOUR	24-HOUR	ANNUAL MEAN
1	PRATT & WHITNEY	24801/305	1970	11.6	2.2	0.24
	301-303 COLLEGE STREET		1971	12.7	2.9	0.30
	LAKE WORTH, FLORIDA		1972	11.7	3.5	0.30
	UTM ZONE 17;		1973	13.0	4.3	0.38
	2974400N; 0565500E		1974	12.3	3.3	0.32
2	FLORIDA POWER & LIGHT	8391/ 87	1970	23.0	4.3	0.26
	RIVIERA BEACH, FLORIDA		1971	16.6	4.1	0.25
	UTM ZONE 17;		1972	17.4	4.4	0.21
	2960600N; 0594200E		1973	17.9	3.9	0.21
			1974	16.7	3.3	0.22
3	LAKE WORTH UTILITIES AUTHORITY	17897/157	1970	9.4	2.5	0.18
	TOM G. SMITH MUNICIPAL POWER PLANT		1971	15.2	2.9	0.17
	127 COLLEGE STREET		1972	15.0	2.1	0.18
	LAKE WORTH, FLORIDA 33460		1973	13.7	3.6	0.21
	UTM ZONE 17;		1974	12.7	2.4	0.17
	2943700N; 0592800E					

from each existing source to the proposed source and at 1° increments and decrements to ± 5° or an 11° sector downwind of the proposed source. Rings were selected from the minimum fence line distance of 730 meters and for every 100 meters starting at 800 meters thru 1700 meters inclusive. This procedure yielded a total of 33 radials and 11 rings which were used for all the refined multisource lSCST and lSCLT model runs.

5.6.3 Modeling Results

The results of the five years of single source ISCST modeling analysis are summarized by year in Tables 5-9A thru E. Cumulative 5-year results are presented in Table 5-9F. The data in Table 5-9F show that the proposed facility will not produce any impacts that exceed ambient air quality standards or PSD requirements.

The results of five years of lSCST and ISCLT multisource modeling analysis are summarized in Table 5-10.

Table 5-11 provides an overall summary of both single and multisource impacts as well as background levels and the Air Quality and PSD standards and demonstrates that the proposed facility's air quality impact together with other sources will not exceed ambient air quality or PSD requirements. These results are portrayed in Figures 5-10 and 5-11.

TABLE 5-9A

IMPACT OF PALM BEACH COUNTY RDF FIRED SPREADER STOKER FURNACES ON AIR QUALITY
BASED ON ISCST MODEL FOR METEOROLOGICAL YEAR 1970

HIGHEST 2ND HIGH MODELED CONCENTRATION (UG/M3) FOR THE INDICATED AVERAGING TIMES

	1-HOUR (1046M; 108D) (D175; P12)	3-HOUR (1500M; 264D) (D239; P05)	8-HOUR (1500M; 262D) (D231; P02)	24-HOUR (1500M; ;252D) (D121)	ANNUAL ARITHMETIC MEAN (1) (1500M; 264D)
CARBON MONOXIDE	143.	96.0	81.1	34.2	4.80
NITROGEN DIOXIDE	47.7	32.0	27.0	11.4	1.60
SULFUR DIOXIDE	107.	72.0	60.9	25.6	3.60
CHLORIDES	41.7	28.0	23.7	10.0	1.40
VOLATILE ORGANIC COMPOUNDS	2.4	1.6	1.4	5.7E-01	8.0E-02
PARTICULATE MATTER	7.8	5.2	4.4	1.9	0.26
SULFURIC ACID MIST	4.8E-03	3.2E-03	2.7E-03	1.1E-03	1.6E-04
FLOURIDES	4.8E-01	3.2E-01	2.7E-01	1.1F-01	1.6E-02
LEAD	1.7E-02	1.1E-02	9.5E-03	4.0E-03	5.6E-04
MERCURY	4.8E-02	3.2F-02	2.7E-02	1.1E-02	1.6E-03
BERYLLIUM	1.1E-04	7.2E-05	6.1E-05	2.6E-05	3.6E-06
2,3,7,8-TCDD	1.0E-06	6.8E-07	5.7E-07	2.4E-07	3.4E-08

NOTES

1. THE ABOVE DATA WAS DEVELOPED BY MODELING THE IMPACTS OF THE SO2 EMISSION THEN MULTIPLING THE RATIO OF THE COMPONENT EMISSION TO THE SO2 EMISSION BY THE MAXIMUM SO2 IMPACT TO DETERMINE THE COMPONENT'S IMPACT.

TABLE 5-9B

IMPACT OF PALM BEACH COUNTY RDF FIRED SPREADER STOKER FURNACES ON AIR QUALITY
BASED ON ISCST MODEL FOR METEOROLOGICAL YEAR 1971

	HIGHEST 2ND HIGH MODELED CONCENTRATION (UG/M3) FOR THE INDICATED AVERAGING TIMES				
	1-HOUR (730M; 300D) (D215; P11)	3-HOUR (1500M; 276D) (D186; P04)	8-HOUR (1500M; 270D) (D214; P02)	24-HOUR (1500M; 258D) (D320)	ANNUAL ARITHMETIC MEAN (1) (1615M; 270D)
CARBON MONOXIDE	173.	88.8	54.7	34.6	3.10
NITROGEN DIOXIDE	57.9	29.6	18.3	11.5	1.03
SULFUR DIOXIDE	130.	66.6	41.1	26.0	2.33
CHLORIDES	50.6	25.9	16.0	10.1	0.90
VOLATILE ORGANIC COMPOUNDS	2.9	1.5	9.1E-01	5.8E-01	5.2E-02
PARTICULATE MATTER	9.4	4.8	3.0	1.9	1.7E-01
SULFURIC ACID MIST	5.8E-03	3.0E-03	1.8E-03	1.2E-03	1.0E-04
FLOURIDES	5.8E-01	3.0E-01	1.8E-01	1.2E-01	1.0E-02
LEAD	2.0E-02	1.0E-02	6.4E-03	4.0E-03	3.6E-04
MERCURY	5.8E-02	3.0E-02	1.8E-02	1.2E-02	1.0E-03
BERYLLIUM	1.3E-04	6.7E-05	4.1E-05	2.6E-05	2.3E-06
2,3,7,8-TCDD	1.2E-06	6.3E-07	3.9E-08	2.5E-07	2.2E-08

NOTES

1. THE ABOVE DATA WAS DEVELOPED BY MODELING THE IMPACTS OF THE SO2 EMISSION THEN MULTIPLING THE RATIO OF THE COMPONENT EMISSION TO THE SO2 EMISSION BY THE MAXIMUM SO2 IMPACT TO DETERMINE THE COMPONENT'S IMPACT.

TABLE 5-9C

IMPACT OF PALM BEACH COUNTY RDF FIRED SPREADER STOKER FURNACES ON AIR QUALITY
BASED ON ISCST MODEL FOR METEOROLOGICAL YEAR 1972

HIGHEST 2ND HIGH MODELED CONCENTRATION (UG/M3) FOR THE INDICATED AVERAGING TIMES

	1-HOUR (730M; 70D) (D236; P12)	3-HOUR (1500M; 282D) (D170; P04)	8-HOUR (1046M; 249D) (D127; P02)	24-HOUR (730M; 240D) (D295)	ANNUAL ARITHMETIC MEAN (1) (1615M; 270D)
CARBON MONOXIDE	178.	85.3	55.7	27.6	3.20
NITROGEN DIOXIDE	59.4	28.4	18.6	9.2	1.07
SULFUR DIOXIDE	134.	64.0	41.8	20.7	2.40
CHLORIDES	52.0	24.9	16.2	8.1	0.93
VOLATILE ORGANIC COMPOUNDS	3.0	1.4	9.3E-01	4.6E-01	5.3E-02
PARTICULATE MATTER	9.7	4.6	3.0	1.5	0.17
SULFURIC ACID MIST	5.9E-03	2.8E-03	1.9E-03	9.2E-04	1.1E-04
FLOURIDES	5.9E-01	2.8E-01	1.9E-01	9.2E-02	1.1E-02
LEAD	2.1E-02	1.0E-02	6.5E-02	3.2E-03	3.7E-04
MERCURY	5.9E-02	2.8E-02	1.9E-02	9.2E-03	1.1E-03
BERYLLIUM	1.3E-04	6.4E-05	4.2E-05	2.1E-05	2.4E-06
2,3,7,8-TCDD	1.3E-06	6.0E-07	3.9E-07	2.0E-07	2.3E-08

NOTES

1. THE ABOVE DATA WAS DEVELOPED BY MODELING THE IMPACTS OF THE SO2 EMISSION THEN MULTIPLING THE RATIO OF THE COMPONENT EMISSION TO THE SO2 EMISSION BY THE MAXIMUM SO2 IMPACT TO DETERMINE THE COMPONENT'S IMPACT.

TABLE 5-9D

IMPACT OF PALM BEACH COUNTY RDF FIRED SPREADER STOKER FURNACES ON AIR QUALITY
BASED ON ISCST MODEL FOR METEOROLOGICAL YEAR 1973

HIGHEST 2ND HIGH MODELED CONCENTRATION (UG/M3) FOR THE INDICATED AVERAGING TIMES

	1-HOUR (730M; 120D) (D258; P13)	3-HOUR (730M; 110D) (D267; P04)	8-HOUR (1500M; 300D) (D163; P02)	24-HOUR (730M; 270D) (D107)	ANNUAL ARITHMETIC MEAN (1) (1615M; 270D)
CARBON MONOXIDE	182.	86.5	55.5	31.7	3.40
NITROGEN DIOXIDE	60.6	28.8	18.5	10.6	1.13
SULFUR DIOXIDE	136.	64.9	41.6	23.8	2.55
CHLORIDES	53.0	25.2	16.2	9.2	0.99
VOLATILE ORGANIC COMPOUNDS	3.0	1.4	9.3E-01	5.3E-01	5.7E-02
PARTICULATE MATTER	9.9	4.7	3.0	1.7	0.18
SULFURIC ACID MIST	6.1E-03	2.9E-03	1.9E-03	1.1E-03	1.1E-04
FLOURIDES	6.1E-01	2.9E-01	1.9E-01	1.1E-01	1.1E-02
LEAD	2.1E-02	1.0E-02	6.5E-03	3.7E-03	4.0E-04
MERCURY	6.1E-02	2.9E-02	1.9E-02	1.1E-02	1.1E-03
BERYLLIUM	1.4E-04	6.5E-05	4.2E-05	2.4E-05	2.6E-06
2,3,7,8-TCDD	1.3E-06	6.1E-07	3.9E-07	2.2E-07	2.4E-08

NOTES

1. THE ABOVE DATA WAS DEVELOPED BY MODELING THE IMPACTS OF THE SO2 EMISSION THEN MULTIPLING THE RATIO OF THE COMPONENT EMISSION TO THE SO2 EMISSION BY THE MAXIMUM SO2 IMPACT TO DETERMINE THE COMPONENT'S IMPACT.

TABLE 5-9E

IMPACT OF PALM BEACH COUNTY RDF FIRED SPREADER STOKER FURNACES ON AIR QUALITY
BASED ON ISCST MODEL FOR METEOROLOGICAL YEAR 1974

	HIGHEST 2ND HIGH MODELED CONCENTRATION (UG/M3) FOR THE INDICATED AVERAGING TIMES				
	1-HOUR (730M; 80D) (D127; P11)	3-HOUR (1500M; 276D) (D184; P05)	8-HOUR (926M; 258D) (D101; P02)	24-HOUR (730M; 260D) (D111)	ANNUAL ARITHMETIC MEAN (1) (1615M; 270D)
CARBON MONOXIDE	175.	91.9	59.3	37.2	3.53
NITROGEN DIOXIDE	58.2	30.7	19.8	12.4	1.18
SULFUR DIOXIDE	131.	69.0	44.5	27.9	2.64
CHLORIDES	50.1	26.8	17.3	10.9	1.03
VOLATILE ORGANIC COMPOUNDS	2.9	1.5	1.0	6.2E-01	5.9E-02
PARTICULATE MATTER	9.5	5.0	3.2	2.0	0.19
SULFURIC ACID MIST	5.8E-03	3.1E-03	2.0E-03	1.2E-03	1.2E-04
FLOURIDES	5.8E-01	3.1E-01	2.0E-01	1.2E-01	1.2E-02
LEAD	2.0E-02	1.1E-02	6.9E-03	4.3E-03	4.1E-04
MERCURY	5.8E-02	3.1E-02	2.0E-02	1.2E-02	1.2E-03
BERYLLIUM	1.3E-04	6.9E-05	4.4E-05	2.8E-05	2.6E-06
2,3,7,8-TCDD	1.2E-06	6.5E-07	4.2E-07	2.6E-07	2.5E-08

NOTES

1. THE ABOVE DATA WAS DEVELOPED BY MODELING THE IMPACTS OF THE SO2 EMISSION THEN MULTIPLING THE RATIO OF THE COMPONENT EMISSION TO THE SO2 EMISSION BY THE MAXIMUM SO2 IMPACT TO DETERMINE THE COMPONENT'S IMPACT.

TABLE 5-9F

PEAK SECOND-HIGH IMPACTS OF PALM BEACH COUNTY RDF FIRED SPREADER STOKER FURNACES ON AIR QUALITY
BASED ON ISCST MODEL FOR METEOROLOGICAL YEARS 1970-1974

	PEAK MODELED SECOND-HIGH CONCENTRATION (UG/M3) FOR THE INDICATED AVERAGING TIMES AND (YEAR)				
	1-HOUR (1973) (730M; 120D) (D258; P13)	3-HOUR (1970) (1500M; 264D) (D239; P05)	8-HOUR (1970) (1500M; 262D) (D231; P02)	24-HOUR (1974) (730M; 260D) (D111)	ANNUAL ARITHMETIC MEAN (1) (1970) (1500M; 264D)
CARBON MONOXIDE	182.	96.0	81.1	37.2	4.80
NITROGEN DIOXIDE	60.6	32.0	27.0	12.4	1.60
SULFUR DIOXIDE	136.	72.0	60.9	27.9	3.60
CHLORIDES	53.0	28.0	23.7	10.9	1.40
VOLATILE ORGANIC COMPOUNDS	3.0	1.6	1.4	6.2E-01	8.0E-02
PARTICULATE MATTER	9.9	5.2	4.4	2.0	0.26
SULFURIC ACID MIST	6.1E-03	3.2E-03	2.7E-03	1.2E-03	1.6E-04
FLOURIDES	6.1E-01	3.2E-01	2.7E-01	1.2E-01	1.6E-02
LEAD	2.1E-02	1.1E-02	9.5E-03	4.3E-03	5.6E-04
MERCURY	6.1E-02	3.2E-02	2.7E-02	1.2E-02	1.6E-03
BERYLLIUM	1.4E-04	7.2E-05	6.1E-05	2.8E-05	3.6E-06
2,3,7,8-TCDD	1.3E-06	6.8E-07	5.7E-07	2.6E-07	3.4E-08

NOTES

1. THE ABOVE DATA WAS DEVELOPED BY MODELING THE IMPACTS OF THE SO2 EMISSION THEN MULTIPLING THE RATIO OF THE COMPONENT EMISSION TO THE SO2 EMISSION BY THE MAXIMUM SO2 IMPACT TO DETERMINE THE COMPONENT'S IMPACT.

TABLE 5-10

CUMULATIVE IMPACTS OF PALM BEACH COUNTY RDF-FIRED SPREADER STOKER FURNACES AND OTHER MAJOR SOURCES OF SO_2 ON AIR QUALITY (BASIS: RDF @ 2100 TPD, 9 LB S/TON RDF)

		ALL SOURCES PEAK CONCENTRATION		RDF SOURCE CONTRIBUTION		LOCATION	
YEAR	AVERAGING TIME	ug/m^3	MET. DAY	ug/m^3	MET. DAY	METERS	DEGREE
1970##	3 HR*	157	318/8	31	328/8#	1700	130
	24 HR*	63	269/1	21	269/1	730	269
	ANNUAL	14		5		1300	270
1971	3 HR*	118	168/5	53	220/4#	1300	269
	24 HR*	40	336/1	16	319/1#	730	262
	ANNUAL	11		3		1300	270
1972	3 HR*	110	218/4	56	60/5#	730	272
	24 HR*	52	168/1	17	211/1#	730	265
	ANNUAL	12		4		1400	270
1973	3 HR*	150	104/7	51	104/7	730	269
	24 HR*	63	17/1	22	17/1	1600	265
	ANNUAL	12		4		1400	270
1974	3 HR*	277	204/8	53	133/5#	1700	263
	24 HR*	68	357/1	21	74/1#	1200	269
	ANNUAL	12		4		1300	270
5 YEAR MAXIMUMS							
1974	3 HR*	277	204/8	53	133/5#	1700	263
1974	24 HR*	68	357/1	21	74/1#	1200	269
1970	ANNUAL	14		5		1300	270

* Maximum 2nd high impact
\# Concentration for same location as all sources (NOT CONCURRENT OCCURENCES)
\## Based on 1800 TPD, 9 lb s/ton RDF

TABLE 5-11

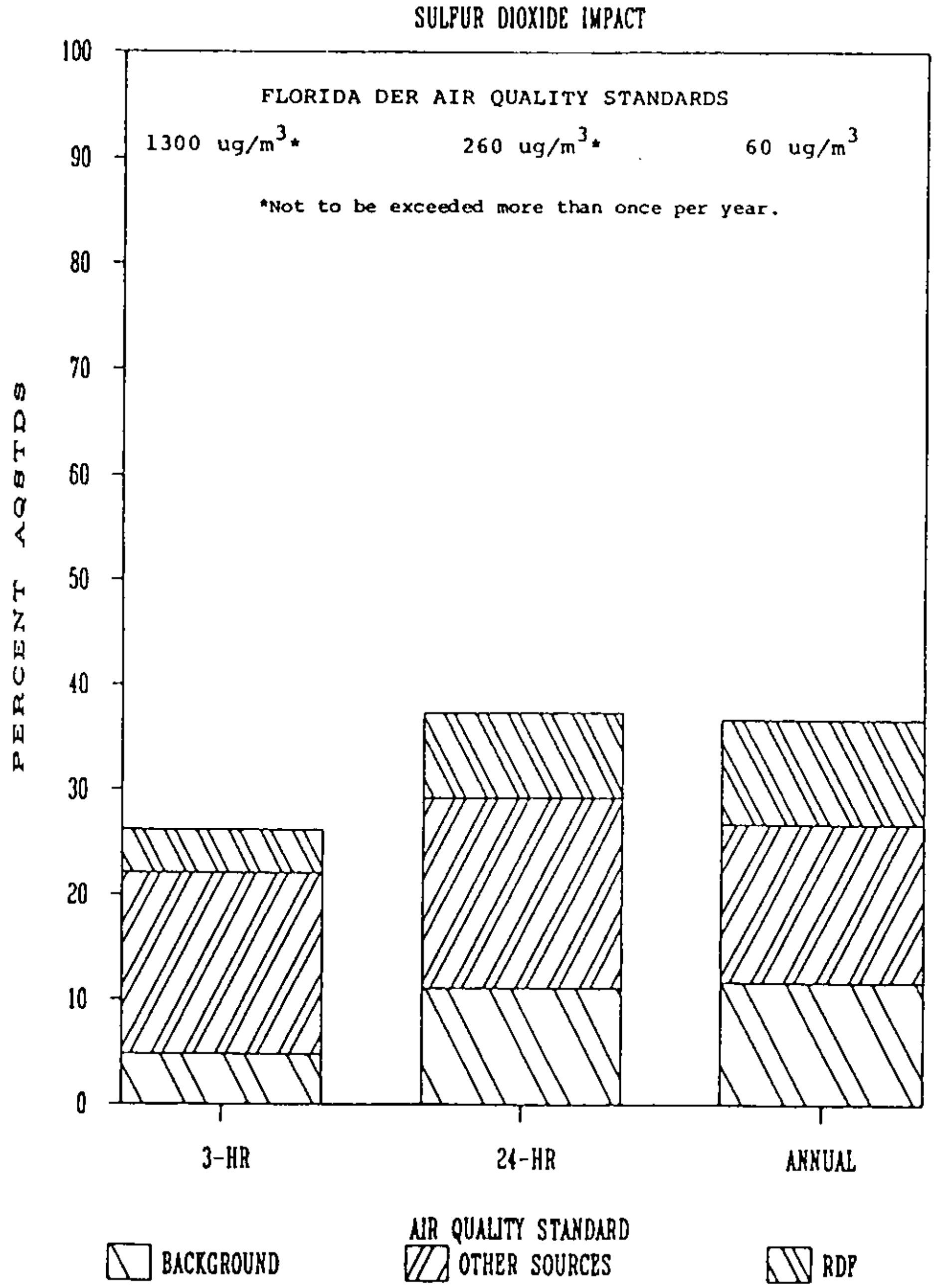
SUMMARY OF MAXIMUM AIR QUALITY IMPACTS OF THE PROPOSED PALM BEACH COUNTY WASTE TO ENERGY FACILITY

POLLUTANT	AMBIENT AIR QUALITY STANDARD (UG/M3)	PREVENTION OF SIGNIFICANT DETERIORATION (PSD) INCREMENT (UG/M3)	BACKGROUND CONCENTRATION (UG/M3) (2)	PALM BEACH COUNTY WASTE TO ENERGY FACILITY IMPACT (UG/M3) (3)	TOTAL POINT SOURCE IMPACT (UG/M3) (5)
SULFUR DIOXIDE					
MAX 3-HOUR CONCENTRATION	1300 (1)	512	63	72	277
MAX 24-HOUR CONCENTRATION	260 (1)	91	29	28	68
ANNUAL ARITHMETIC MEAN	60	20	7	4	15
PARTICULATE MATTER					
MAX 24-HOUR CONCENTRATION	150 (1)	37	107	2	NC
ANNUAL GEOMETRIC MEAN	60	19	43	0.3	NC
NITROGEN DIOXIDE					
ANNUAL ARITHMETIC MEAN	100	NO STANDARD	20	2	22 (6)
OZONE					
DAILY MAX 1-HOUR CONCENTRATION	235 (1)	NO STANDARD	172	NE	NA
LEAD					
QUARTERLY ARITHMETIC MEAN	1.5	NO STANDARD	NM	4.3E-03 (4)	1.1E-02 (4)
CARBON MONOXIDE					
MAX 1-HOUR CONCENTRATION	40000 (1)	NO STANDARD	9943	182	NC
MAX 8-HOUR CONCENTRATION	10000 (1)	NO STANDARD	4500	81	NC

NA = NOT APPLICALBE; NC = NOT CALCULATED SINCE PROPOSED FACILITY'S IMPACT IS BELOW SIGNIFICANCE LEVEL;
NE = NOT EMITTED; NM = NOT MONITORED.

1. CONCENTRATION LIMITS NOT TO BE EXCEEDED MORE THAN ONCE PER YEAR.
2. BACKGROUND INFORMATION IS BASED UPON DATA COMPILED BY THE PALM BEACH COUNTY ANNUAL REPORT DATED 1983.
3. DETAILED MODELING RESULTS FOR THE PROPOSED SOURCE COVERING 5 YEARS OF HOURLY METEOROLOGICAL DATA IS INCLUDED IN TABLES 5-9A THRU 9F. (EXIT VELOCITY = 24.9 M/S)
4. QUARTERLY MEAN NOT GENERATED. VALUE CITED IS 24-HOUR MAXIMUM 2ND-HIGH.
5. TOTAL IMPACTS ARE INCLUSIVE OF THE PROPOSED SOURCE. DETAILED INFORMATION IS INCLUDED IN TABLE 5-10. (VS = 21.34 M/S)
6. TOTAL IMPACTS WERE ASSUMED TO BE EQUAL TO BACKGROUND LEVELS SINCE NO2 EMISSION LEVELS OF OTHER SOURCES WERE NOT READILY AVAILABLE AND THE PROPOSED SOURCE'S IMPACT WAS VIRTUALLY AT THE SIGNIFICANCE LEVEL (1.6 UG/M3 VS 1.0 UG/M3).

CONTRIBUTIONS TO AQSTD



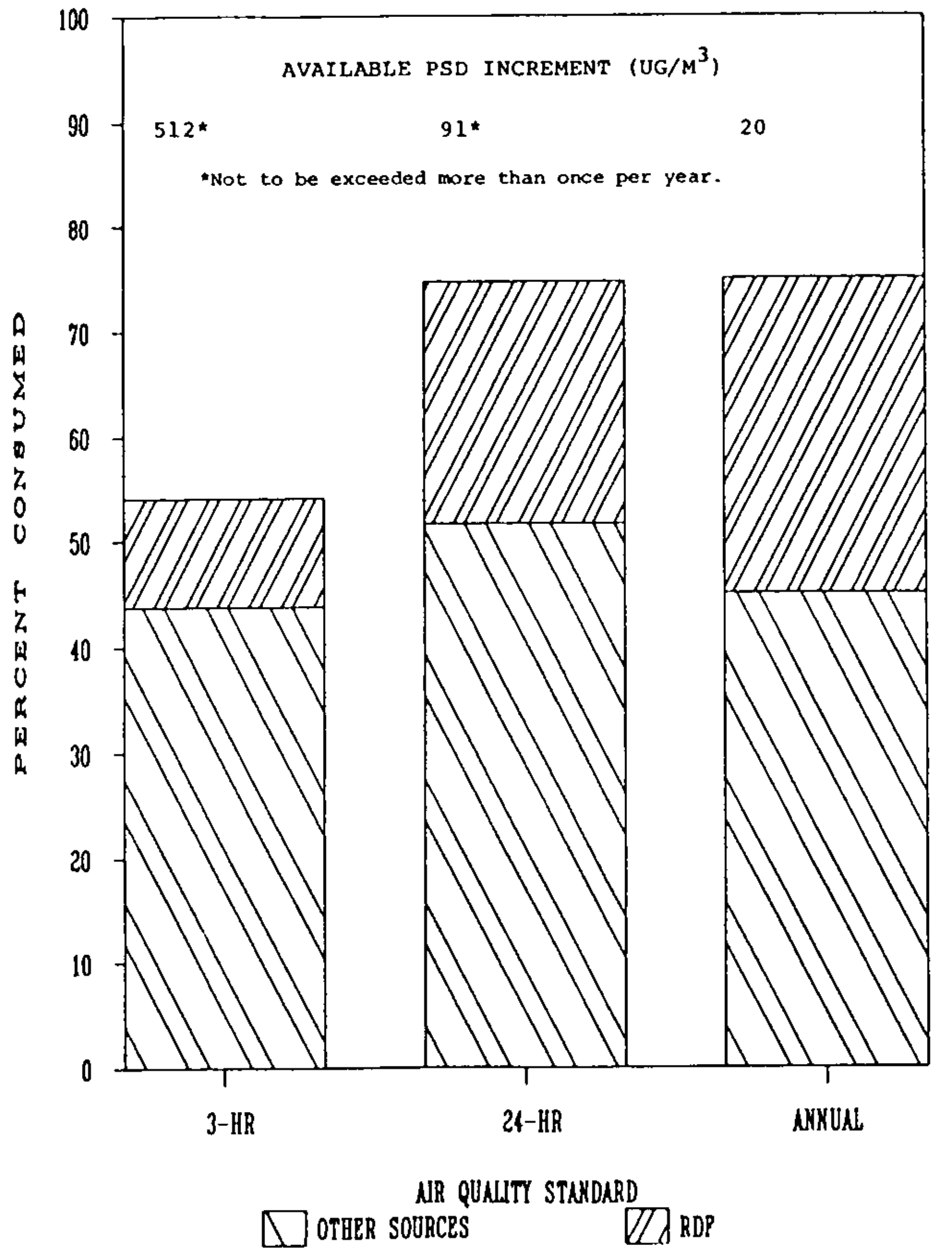
% Consumed:	Background	Other Sources	RDF
3-Hr	4.8	17.2	4.1
24-Hr	11.1	18.1	8.1
Annual	11.7	15.0	8.3

PALM BEACH COUNTY
SOLID WASTE AUTHORITY
RESOURCE RECOVERY FACILITY

FIGURE 5.10

PSD INCREMENT

SULFUR DIOXIDE IMPACT



% Consumed:	OTHER SOURCES	RDP
3-Hr	43.8	10.4
24-Hr	51.6	23.1
Annual	45.0	25.0

PALM BEACH COUNTY
SOLID WASTE AUTHORITY
RESOURCE RECOVERY FACILITY

FIGURE 5.11

6.0 SUMMARY AND CONCLUSIONS

An analysis of best available control technology and an evaluation of ambient impacts have been presented herein for the proposed Palm Beach County waste-to-energy facility. It has been determined that the proposed facility is subject to PSD review.

The results of the BACT analysis indicate that the only recommended add-on control device is an electrostatic precipitator for the control of particulate matter. Sulfur dioxide emissions will be minimized through the use of refuse derived fuel which inherently has a low sulfur content and by utilizing No. 2 fuel oil or natural gas as available as an auxiliary fuel. Good combustion design and practice is proposed as BACT for nitrogen oxides, carbon monoxide and volatile organic compounds.

Predicted concentrations of the acid gas pollutants are calculated to be well below state standards. Trace metal emissions will be controlled as particulate matter in the electrostatic precipitator.

An extensive air quality impact analyses has been performed. This analysis demonstrates that all applicable PSD increments, federal and state air quality standards will not be exceeded as a result of the proposed Palm Beach County waste-to-energy facility acting alone or in concert with other existing sources.

Assuming that all VOC emissions are converted to ozone, the maximum 1 hour source impact in any year would be .002 ppm. Based on local 1982-83 ambient air quality data as background, this maximum impact would not exceed the ozone standard.

There are no existing legal ambient air quality standards for the compound 2,3,7,8-TCDD. The New York State Department of Environmental Conservation in its Air Guide No. 1 (revised 12/15/83 has recommended an acceptable ambient air level (AAL) on an annual average basis of 9.2×10^{-8} ug/m^3. The maximum annual impact generated by the conservative assumptions of this report is 3.4×10^{-8}.

On an annual basis, all impacts in the West Palm Beach Water Catchment Area will be less than any established de-minus levels. In making this determination, a variety of conservative assumptions were employed in the analysis. For example, maximum design capacity operations were assumed for all 8,760 hours of the year; other major sources were assumed to fire oil continuously when in fact natural gas which contain virtually no sulfur is predominantly used; and the other source category includes Florida Power and Light whose operations will be offset by the electrical output of the proposed facility. Because of these and other conservative assumptions, it can be stated with confidence that public health will be protected with an adequate margin of safety.

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STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION
APPLICATION TO CONSTRUCT/OPERATE AIR POLLUTANT EMISSION SOURCE

APIS

1. Type of Application						2. Source Identification/Jurisdiction				
Construction Init.	Modif.	Operation Init.	Renewal	Site Cert.	Amendment	District	Office	County	Facility	Source
[X]	[ ]	[X]	[ ]	[X]	[ ]					

3. Facility Owner (Company Name)	4. Facility Ownership Code	5. Facility Name/Location
PALM BEACH COUNTY SOLID WASTE AUTH.	U	2900 FT. WEST FLORIDA TURNPIKE 2600 FT. NORTH 45th STREET

6. City	Code	7. County	8. Facility Zip	9. Facility Codes: Type	CDS	VOC
N/A		PALM BEACH	33412			

10. Facility UTM Coordinates (km)	Zone	East	North	11. Facility Lat./Long. (°, ', ")	Latitude	Longitude
	17	585.8	2960.2		26° 46' 05"	80° 08' 30"

12. Authorized Agent (Address and Telephone)	Name	Title	Organization/Firm
	S. G. TIMMERMAN	ASSOCIATE	HAYDEN-WEGMAN, INC.

Street or P.O. Box	City	St.	Zip	Telephone
5114 OKEECHOBEE BLVD. 2-B	W. PALM BEACH	FL	33409	305-471-0444

13. STATEMENT BY OWNER OR AUTHORIZED AGENT

I, the undersigned, am the owner or authorized representative* of the facility described above. I certify that the statements made in this application for a permit are true, correct, and complete to the best of my knowledge and belief. Further, I agree to operate and maintain the air pollution source and pollution control equipment described in this application so as to comply with all provisions of Chapter 403, Florida Statutes, and all applicable rules and regulations of the department and revisions thereof. I also understand that a permit, if granted by the department, will be non-transferable, and I will promptly notify the department upon sale or legal transfer of the permitted source.

*Attach letter of authorization

Signed: [signature] Date: April 25, 1985

14. Prof. Engineer (Address and Telephone)	Name	Fla. Regis. No.	Organization/Firm
	GEORGE E. CRANSTON	21733	HAYDEN-WEGMAN, INC.

Street or P.O. Box	City	St.	Zip	Telephone
330 W. 42nd STREET	NEW YORK	NY	10036	212-563-6900

15. STATEMENT BY PROFESSIONAL ENGINEER REGISTERED IN FLORIDA (where required by Chapter 471, F.S.)

I, the undersigned, certify that the engineering features of this project have been designed or examined by me and found to be in conformity with modern engineering principles applicable to the control of emissions of the air pollutants characterized in this permit application. There is reasonable assurance, in my professional judgment, that the air pollution source and the pollution control equipment, when properly operated and maintained, will comply with all applicable statutes of the State of Florida and all applicable rules and regulations of the department.

Signed: [signature] Date: 4-24-85

(Affix Seal)

16. Facility Comment

APIS

17. Permit Application Processing Information	Fee Paid	Permit/PPS Number Assigned This App.	Date Comp. YY/MM/DD	Date Issued YY/MM/DD	Date Exp. YY/MM/DD	AOR Req.

18. Description of Source Addressed in This Application	19. Current DER Permit No.
250 FT. HIGH STACK FOR 2-350 MILLION BTU/HR REFUSE DERIVED FUEL FIRED BOILERS	No. N/A
	20. Init. Const. Date - YY/MM/DD 87/00/00

21. Date(s) and Description(s) of Any Previous Modification(s) to Source

N/A

22. Nature and Extent of Proposed Project

PROJECT IS A SOLID WASTE RESOURCE RECOVERY FACILITY WHICH SHALL GENERATE ELECTRIC POWER FROM COMBUSTION OF REFUSE DERIVED FUEL AND RECOVER RECYCLABLE MATERIALS. THE POLLUTION CONTROL SHALL BE A FOUR FIELD ELECTROSTATIC PRECIPITATOR AND SHALL MEET BACT FOR ALL APPLICABLE POLLUTANTS.

23. Projected Dates of Initiation and Completion of Construction

87/00/00 - 89/00/00

24. Source Codes	SIC	Type	25. Source Regs.	NSPS	NESHAP	111(d)	PSD	NAA NSR	RACT

26. Boiler Data	Type	Design Heat Input Rate (10^6 Btu/hr)	27. Generator Design Output (gross MW)	28. Pct. fuel for space heat
	SPREADER STOKER	2 UNITS 350 EACH	50	

29. Incinerator Data	Type	Design Capacity (tpd)	Type of Waste	Dwell Time (sec.) @ °F	After-burner Temp. °F

30. Liq. Storage Tank Data	Type	Capacity (10^3 bbl)	Product	Condition

31. Normal Operating Schedule	hr/dy	dy/wk	wk/yr	32. Normal % Operation By Season	DJF	MAM	JJA	SON
	24	7	50		25	25	25	25

33. Requested Limit(s)	hr/dy	dy/wk	wk/yr	hr/yr	34. Allowable Oper. Limit(s)	hr/dy	dy/wk	wk/yr	hr/yr
	24	7	52	8760					

35. Emission Point Type	35. Emission Point ID on Diagram	36. Stack Ht. (ft.)	37. Exit Diam. (ft.)	38. Exit Temp. (°F)	39. Water Vapor (%)	40. Actual Volumetric Flow Rate (acfm)	41. Dry Standard Flow Rate (dscfm)	42. Plume Ht. (ft.)
3		250	6.69 EACH	450	8% BY WEIGHT	172,377 EACH	88,650	0

43. Bldg. Dimensions (ft.)	Ht.	Width	44. Point UTM Coordinates	East	North	45. Source Numbers with Common Stack
	120	110				

46. Source Comment

47. Description of Process

SPREADER STOKER FURNACES (2) FIRED WITH REFUSE DERIVED FUEL MANUFACTURED FROM MUNICIPAL SOLID WASTE.

48a. Component 'a' Process or Fuel Type Employed

49a. Source Classification Code for Process/Fuel Type 'a'	50a. Process/Fuel Usage Rates					51a. Fuel Characteristics		
	Max. Hourly	Est. Annual	Requested Ann. Limit	Annual Limit	Unit Code	S (%)	Ash (%)	10^6 Btu/Unit (As Fired)
	58.3 TONS	438,000 TONS	-		99 (RDF)	0.22	13.62	12.328×10^6/TON RDF

52a. SCC Comment for Process/Fuel 'a'

48b. Component 'b' Process or Fuel Type Employed

49b. Source Classification Code for Process/Fuel Type 'b'	50b. Process/Fuel Usage Rates					51b. Fuel Characteristics		
	Max. Hourly	Est. Annual	Requested Ann. Limit	Annual Limit	Unit Code	S (%)	Ash (%)	10^6 Btu/Unit (As Fired)

52b. SCC Comment for Process/Fuel 'b'

48c. Component 'c' Process or Fuel Type Employed

49c. Source Classification Code for Process/Fuel Type 'c'	50c. Process/Fuel Usage Rates					51c. Fuel Characteristics		
	Max. Hourly	Est. Annual	Requested Ann. Limit	Annual Limit	Unit Code	S (%)	Ash (%)	10^6 Btu/Unit (As Fired)

52c. SCC Comment for Process/Fuel 'c'

48d. Component 'd' Process or Fuel Type Employed

49d. Source Classification Code for Process/Fuel Type 'd'	50d. Process/Fuel Usage Rates					51d. Fuel Characteristics		
	Max. Hourly	Est. Annual	Requested Ann. Limit	Annual Limit	Unit Code	S (%)	Ash (%)	10^6 Btu/Unit (As Fired)

52d. SCC Comment for Process/Fuel 'd'

53. Description of Control Equipment

FOUR FIELD ELECTROSTATIC PRECIPITATOR (SUPPLIER NOT SELECTED)

54. Liquid/Solid Wastes Generated by Control Equipment and Methods/Locations of Disposal

FLY ASH WILL BE QUENCHED WITH BOTTOM ASH; DEWATERED AND DISPOSED IN CLASS 1 LANDFILL

55a. Pollutant 'a' Emitted ID	56a. Type Control Equipment Pri.	Sec.	57a. Efficiency (%)	58a. Maximum Emissions - Normal Cond. lb/hr	tpy	59a. Emi. Meth. Code	60a. Requested Emi. Limit lb/hr	61a. Allowable Emission lb/hr	62a. Potential Emission tpy	63a. Comp. Test Freq.
PM	010		99	38	166	2				

64a. Requested Limit in Units Other Than lb/hr	65a. Allowable Emission in Units Other Than lb/hr	66a. Reg. Code
0.03 GRAINS/DSCF @ 12% CO_2		

55b. Pollutant 'b' Emitted ID	56b. Type Control Equipment Pri.	Sec.	57b. Efficiency (%)	58b. Maximum Emissions - Normal Cond. lb/hr	tpy	59b. Emi. Meth. Code	60b. Requested Emi. Limit lb/hr	61b. Allowable Emission lb/hr	62b. Potential Emission tpy	63b. Comp. Test Freq.
SO_2	0	0	0	525	2300	2				

64b. Requested Limit in Units Other Than lb/hr	65b. Allowable Emission in Units Other Than lb/hr	66b. Reg. Code

55c. Pollutant 'c' Emitted ID	56c. Type Control Equipment Pri.	Sec.	57c. Efficiency (%)	58c. Maximum Emissions - Normal Cond. lb/hr	tpy	59c. Emi. Meth. Code	60c. Requested Emi. Limit lb/hr	61c. Allowable Emission lb/hr	62c. Potential Emission tpy	63c. Comp. Test Freq.
CO	0	0	0	700	3066	2				

64c. Requested Limit in Units Other Than lb/hr	65c. Allowable Emission in Units Other Than lb/hr	66c. Reg. Code

55d. Pollutant 'd' Emitted ID	56d. Type Control Equipment Pri.	Sec.	57d. Efficiency (%)	58d. Maximum Emissions - Normal Cond. lb/hr	tpy	59d. Emi. Meth. Code	60d. Requested Emi. Limit lb/hr	61d. Allowable Emission lb/hr	62d. Potential Emission tpy	63d. Comp. Test Freq.
VOC	0	0	0	11.7	51	2				

64d. Requested Limit in Units Other Than lb/hr	65d. Allowable Emission in Units Other Than lb/hr	66d. Reg. Code

54e. Pollutant 'e' Emitted ID	55e. Type Control Equipment Pri.	Sec.	56e. Efficiency (%)	57e. Maximum Emissions - Normal Cond. lb/hr	tpy	59e. Emi. Meth. Code	60e. Requested Emi. Limit lb/hr	61e. Allowable Emission lb/hr	62e. Potential Emission tpy	63e. Comp. Test Freq.
NOX	0	0	0	233	1022					

64e. Requested Limit in Units Other Than lb/hr	65e. Allowable Emission in Units Other Than lb/hr	66e. Reg. Code

67. Visible Emissions	68. Requested % Opacity limit: Normal Cond.	Exceptional Cond.	69. Allowable % Opacity: Normal Cond.	Exceptional Cond.	70. Test Freq.	71. Req.
VE #1 RINGELMAN	10	40 % 2 min/hr		% min/hr		

72. Fugitive Pollutant ID	73. Fugitive Emission Sources and Control Measures	74. Quantifiable Fugitive Emissions tpy
PM	CYCLONES & BAG FILTERS ARE PROVIDED FOR EACH OF THE THREE (3) RDF MFG. TRAINS, OBW & FERROUS RECOVERY LINE. SEE ATTACHMENT 5	19.34

APIS

53. Description of Control Equipment

54. Liquid/Solid Wastes Generated by Control Equipment and Methods/Locations of Disposal

55f. Pollutant 'a' Emitted	56f. Type Control Equipment		57f. Efficiency	58f. Maximum Emissions - Normal Cond.		59f. Emi. Meth. Code	60f. Requested Emi. Limit	61a. Allowable Emission	62a. Potential Emission	63a. Comp. Test Freq.
ID	Pri.	Sec.	(%)	lb/hr	tpy	Code	lb/hr	lb/hr	tpy	Freq.
PB	0	0	0	0.082	0.36	2				

64f. Requested Limit in Units Other Than lb/hr	65a. Allowable Emission in Units Other Than lb/hr	66a. Reg. Code

55g. Pollutant 'b' Emitted	56g. Type Control Equipment		57g. Efficiency	58g. Maximum Emissions - Normal Cond.		59g. Emi. Meth. Code	60g. Requested Emi. Limit	61b. Allowable Emission	62b. Potential Emission	63b. Comp. Test Freq.
ID	Pri.	Sec.	(%)	lb/hr	tpy	Code	lb/hr	lb/hr	tpy	Freq.
BE	0	0	0	5.3E-4	2.34E-3	2				

64c. Requested Limit in Units Other Than lb/hr	65b. Allowable Emission in Units Other Than lb/hr	66b. Reg. Code

55h. Pollutant 'c' Emitted	56h. Type Control Equipment		57h. Efficiency	58h. Maximum Emissions - Normal Cond.		59h. Emi. Meth. Code	60h. Requested Emi. Limit	61c. Allowable Emission	62c. Potential Emission	63c. Comp. Test Freq.
ID	Pri.	Sec.	(%)	lb/hr	tpy	Code	lb/hr	lb/hr	tpy	Freq.
HG	0	0	0	0.18	0.76	2				

64c. Requested Limit in Units Other Than lb/hr	65c. Allowable Emission in Units Other Than lb/hr	66c. Reg. Code

55i. Pollutant 'd' Emitted	56i. Type Control Equipment		57i. Efficiency	58i. Maximum Emissions - Normal Cond.		59i. Emi. Meth. Code	60i. Requested Emi. Limit	61d. Allowable Emission	62d. Potential Emission	63d. Comp. Test Freq.
ID	Pri.	Sec.	(%)	lb/hr	tpy	Code	lb/hr	lb/hr	tpy	Freq.
HCL	0	0	0	205	894					

64d. Requested Limit in Units Other Than lb/hr	65d. Allowable Emission in Units Other Than lb/hr	66d. Reg. Code

54j. Pollutant 'e' Emitted	55j. Type Control Equipment		56j. Efficiency	57j. Maximum Emissions - Normal Cond.		59j. Emi. Meth. Code	60j. Requested Emi. Limit	61e. Allowable Emission	62e. Potential Emission	63e. Comp. Test Freq.
ID	Pri.	Sec.	(%)	lb/hr	tpy	Code	lb/hr	lb/hr	tpy	Freq.
FL	0	0	0	2.33	10.3	2				

64e. Requested Limit in Units Other Than lb/hr	65e. Allowable Emission in Units Other Than lb/hr	66e. Reg. Code

67. Visible Emissions	68. Requested % Opacity limit		69. Allowable % Opacity		70. Test Freq.	71. Reg.
	Normal Cond.	Exceptional Cond.	Normal Cond.	Exceptional Cond.	Freq.	Reg.
VE		%: min/hr		%: min/hr		

72. Fugitive Pollutant ID	73. Fugitive Emission Sources and Control Measures	74. Quantifiable Fugitive Emissions tpy

53. Description of Control Equipment

54. Liquid/Solid Wastes Generated by Control Equipment and Methods/Locations of Disposal

55k. Pollutant 'a' Emitted	56k. Type Control Equipment		57k. Efficiency	58k. Maximum Emissions - Normal Cond.		5k. Emi. Meth. Code	60a. Requested Emi. Limit	61a. Allowable Emission	62a. Potential Emission	63a. Comp. Test Freq.
ID	Pri.	Sec.	(%)	lb/hr	tpy	Code	lb/hr	lb/hr	tpy	
SAM	0	0	0	0.0233	0.102	2				

64a. Requested Limit in Units Other Than lb/hr	65a. Allowable Emission in Units Other Than lb/hr	66a. Reg. Code

55b. Pollutant 'b' Emitted	56b. Type Control Equipment		57b. Efficiency	58b. Maximum Emissions - Normal Cond.		59b. Emi. Meth. Code	60b. Requested Emi. Limit	61b. Allowable Emission	62b. Potential Emission	63b. Comp. Test Freq.
ID	Pri.	Sec.	(%)	lb/hr	tpy	Code	lb/hr	lb/hr	tpy	
•										

64b. Requested Limit in Units Other Than lb/hr	65b. Allowable Emission in Units Other Than lb/hr	66b. Reg. Code

55c. Pollutant 'c' Emitted	56c. Type Control Equipment		57c. Efficiency	58c. Maximum Emissions - Normal Cond.		59c. Emi. Meth. Code	60c. Requested Emi. Limit	61c. Allowable Emission	62c. Potential Emission	63c. Comp. Test Freq.
ID	Pri.	Sec.	(%)	lb/hr	tpy	Code	lb/hr	lb/hr	tpy	

64c. Requested Limit in Units Other Than lb/hr	65c. Allowable Emission in Units Other Than lb/hr	66c. Reg. Code

55d. Pollutant 'd' Emitted	56d. Type Control Equipment		57d. Efficiency	58d. Maximum Emissions - Normal Cond.		59d. Emi. Meth. Code	60d. Requested Emi. Limit	61d. Allowable Emission	62d. Potential Emission	63d. Comp. Test Freq.
ID	Pri.	Sec.	(%)	lb/hr	tpy	Code	lb/hr	lb/hr	tpy	

64d. Requested Limit in Units Other Than lb/hr	65d. Allowable Emission in Units Other Than lb/hr	66d. Reg. Code

54e. Pollutant 'e' Emitted	55e. Type Control Equipment		56e. Efficiency	57e. Maximum Emissions - Normal Cond.		59e. Emi. Meth. Code	60e. Requested Emi. Limit	61e. Allowable Emission	62e. Potential Emission	63e. Comp. Test Freq.
ID	Pri.	Sec.	(%)	lb/hr	tpy	Code	lb/hr	lb/hr	tpy	

64e. Requested Limit in Units Other Than lb/hr	65e. Allowable Emission in Units Other Than lb/hr	66e. Reg. Code

67. Visible Emissions	68. Requested % Opacity limit		69. Allowable % Opacity		70. Test Freq.	71. Req.
	Normal Cond.	Exceptional Cond.	Normal Cond.	Exceptional Cond.		
VE		%' min/hr		%' min/hr		

72. Fugitive Pollutant ID	73. Fugitive Emission Sources and Control Measures	74. Quantifiable Fugitive Emissions tpy

SUPPLEMENTAL REQUIREMENTS

1. Provide an 8 1/2" x 11" map (e.g., the relevant portion of a USGS topographic map) showing the location of the facility and points of air pollutant emissions in relation to residences, roads, and other features of the surrounding area.

2. Provide an 8 1/2" x 11" plot plan of the facility showing the location of manufacturing processes, stacks, vents, and sources of fugitive emissions.

3. Provide an 8 1/2" x 11" flow diagram which will identify, the individual operations and processes. Indicate where raw materials enter, where solid and liquid wastes exit, where gaseous and/or particulate emissions are evolved, and where finished products are obtained.

4. For each pollutant emitted by the source addressed in this application, provide an estimate of the maximum uncontrolled emission rate (in lb/hr) and show the derivation of each such estimate (e.g., AP-42 emission factor). For a construction permit application involving the combustion of any fuel other than distillate oil, liquefied petroleum gas, or natural gas, provide an ultimate analysis of the fuel to be used. The ultimate analysis should give the percent content by weight of carbon, hydrogen, oxygen, sulfur, nitrogen, ash, and moisture.

5. For a construction permit application, show the bases of the normal maximum (after controls) emission estimates (e.g., design calculations, design drawings, pertinent manufacturer's test data, etc.) and describe the proposed methods for showing proof of compliance with any applicable emission limiting standards. For an operation permit application, provide test results or methods used to show proof of compliance.

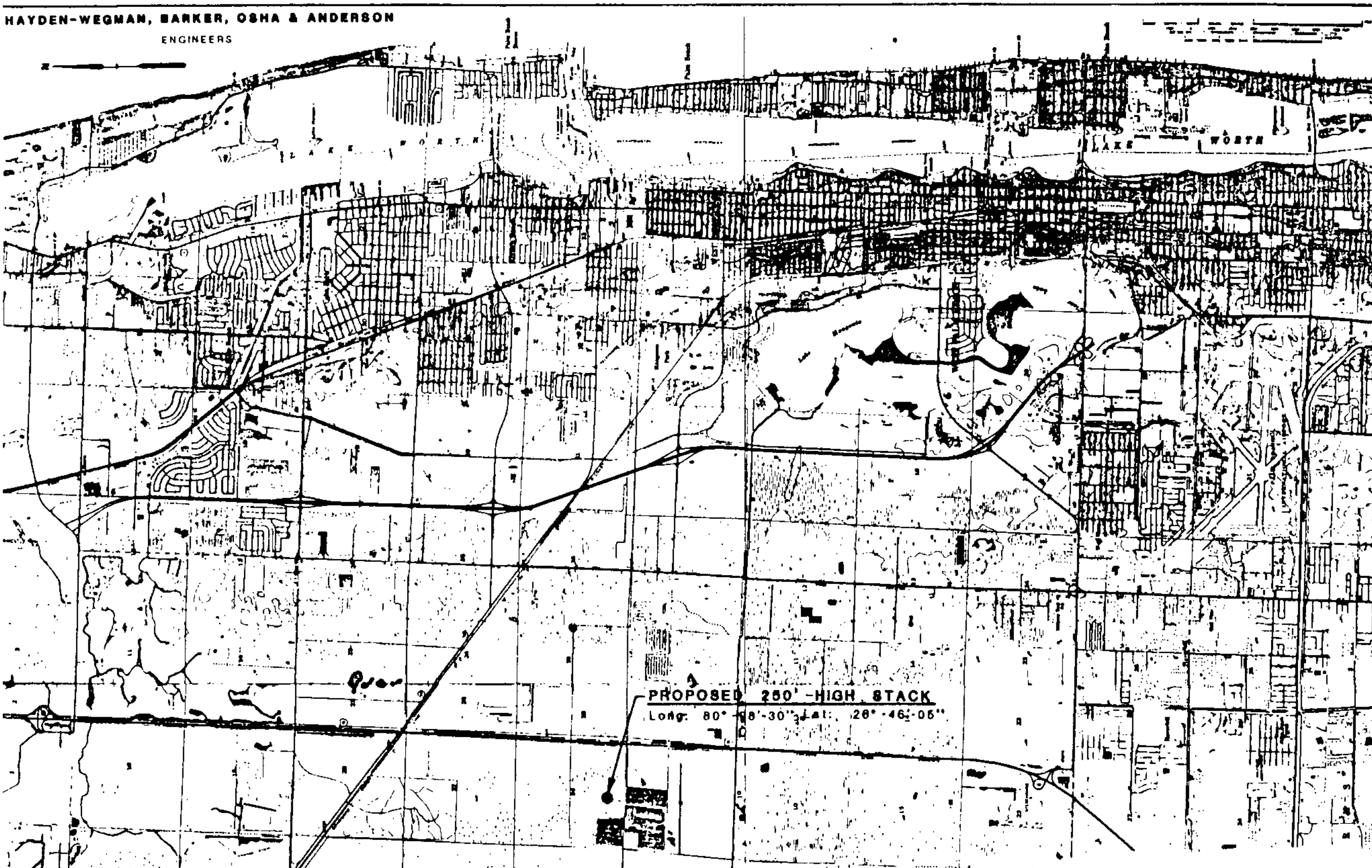
6. For a construction permit application, provide design details for all air pollution control systems (e.g., for baghouse, include cloth to air ratio; for scrubber, include cross-section sketch, design pressure drop, etc.) and show the derivation of the efficiency of each control device. Items 4, 5, and 6 should be consistent; i.e., Uncontrolled Emissions = (Normal Maximum Emissions)/(1-Control Efficiency).

7. For a construction permit application subject to review under Rule 17-2.500, "Prevention of Significant Deterioration," or Rule 17-2.510, "New Source Review for Nonattainment Areas," provide all additional information required by the department under such rule (e.g., BACT or LAER evaluation, monitoring data, summary of modeling results, one copy of all pertinent model output, etc.).

8. For a permit application subject to the "Reasonably Available Control Technology" provisions of Rule 17-2.650, provide all additional information required by the department under that rule.

9. For a permit application involving the incineration of hazardous wastes, provide all additional information required by the department under Rule 17-30 and Chapter 403, Florida Statutes.

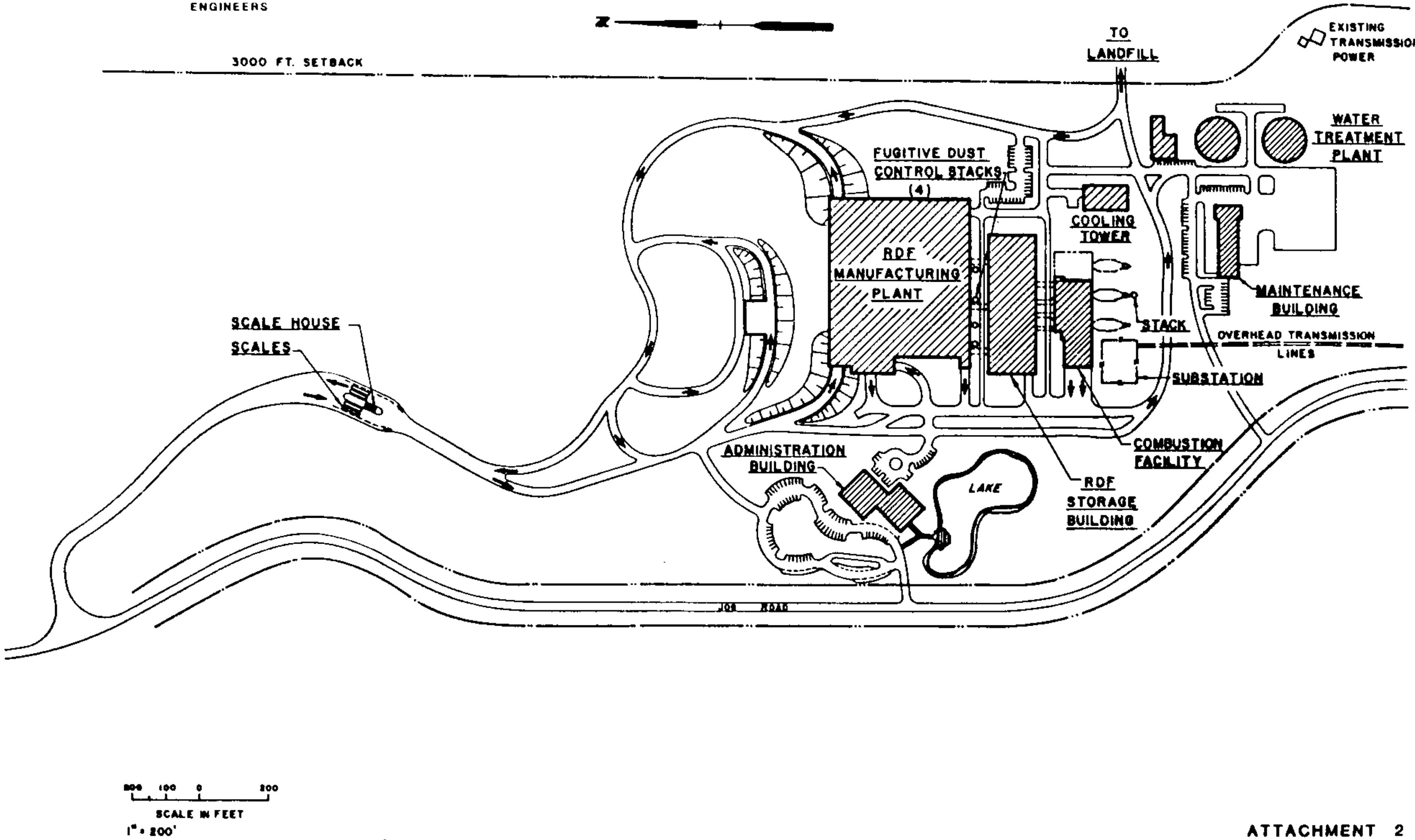
10. Submit the appropriate application fee in accordance with Rule 17-4.05. The check should be made payable to the Department of Environmental Regulation.



STACK LOCATION MAP

ATTACHMENT 1

HAYDEN-WEGMAN, BARKER, OSHA & ANDERSON
ENGINEERS

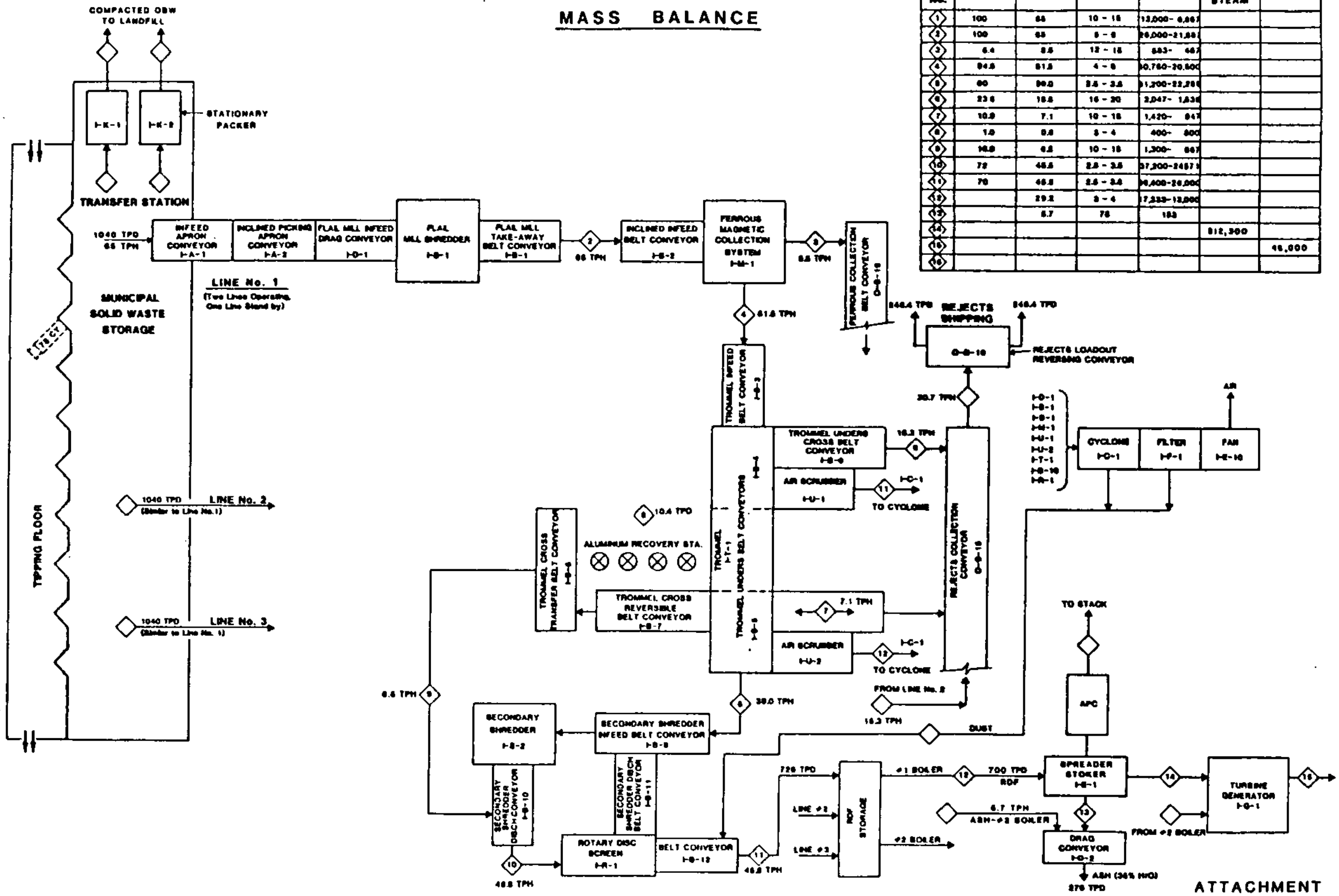


ATTACHMENT 2

HAYDEN/WEGMAN-BARKER OSHA & ANDERSON
ENGINEERS

MASS BALANCE

FLOW No.	% FLOW	TPH	Lb/Ft³	Ft³/Hr	Lb/Hr STEAM	Kw
1	100	65	10 - 15	13,000- 8,667		
2	100	65	5 - 6	26,000-21,66[illegible]		
3	8.4	5.5	12 - 15	883- 667		
4	94.6	61.5	4 - 6	30,750-20,500		
5	60	39.0	2.5 - 3.5	31,200-22,28[illegible]		
6	23.6	15.3	16 - 20	2,047- 1,63[illegible]		
7	10.9	7.1	10 - 15	1,420- 947		
8	1.0	0.6	3 - 4	400- 300		
9	10.0	6.5	10 - 15	1,300- 867		
10	72	46.8	2.5 - 3.5	37,200-2457[illegible]		
11	70	45.5	2.5 - 3.5	36,400-26,000		
12		29.2	3 - 4	17,333-13,000		
13		5.7	75	153		
14					312,300	
15						46,000
16						



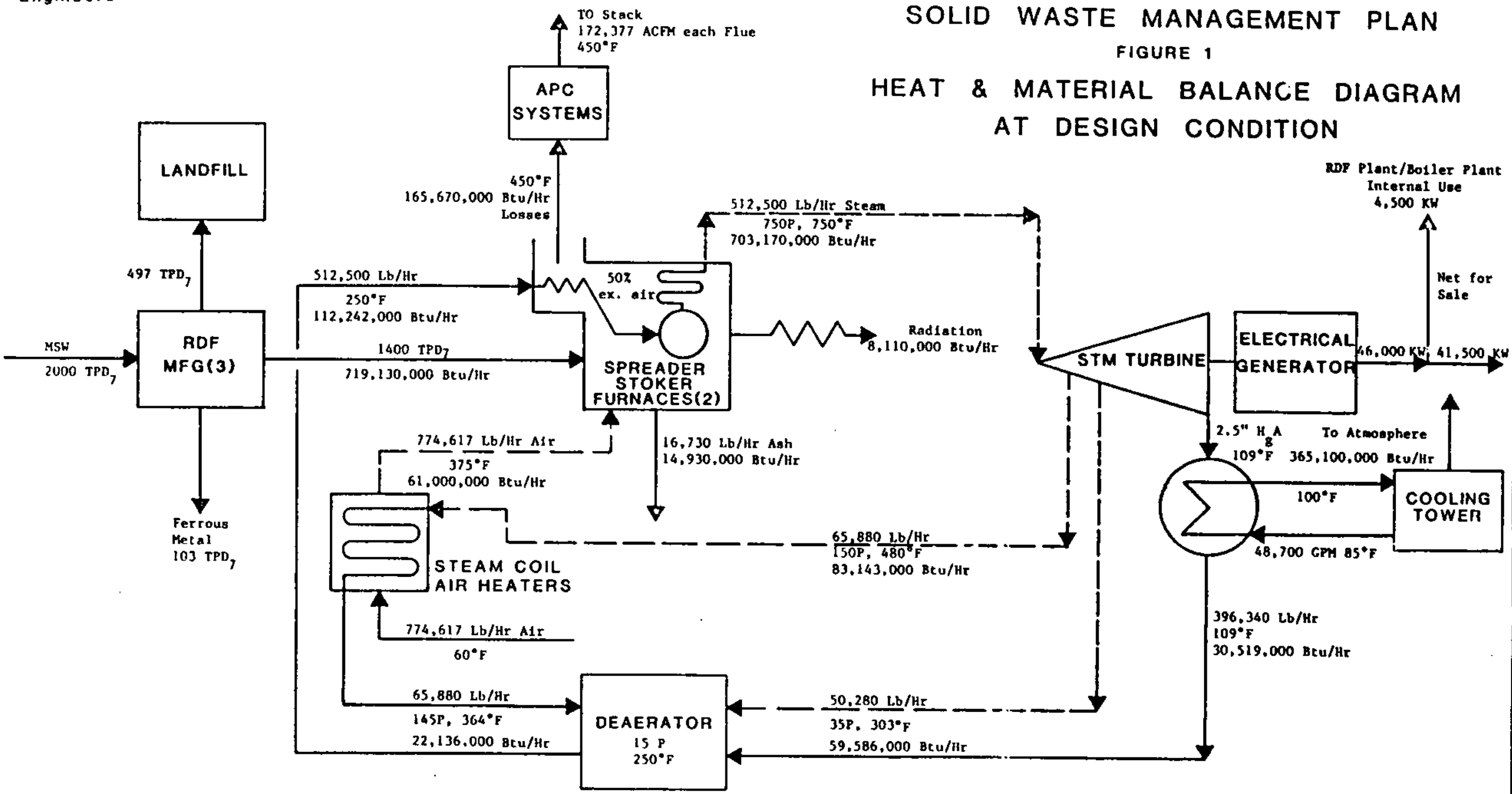
ATTACHMENT 3

HAYDEN/WEGMAN-BARKER OSHA & ANDERSON
Engineers

PALM BEACH SOLID WASTE AUTHORITY
SOLID WASTE MANAGEMENT PLAN

FIGURE 1

HEAT & MATERIAL BALANCE DIAGRAM AT DESIGN CONDITION



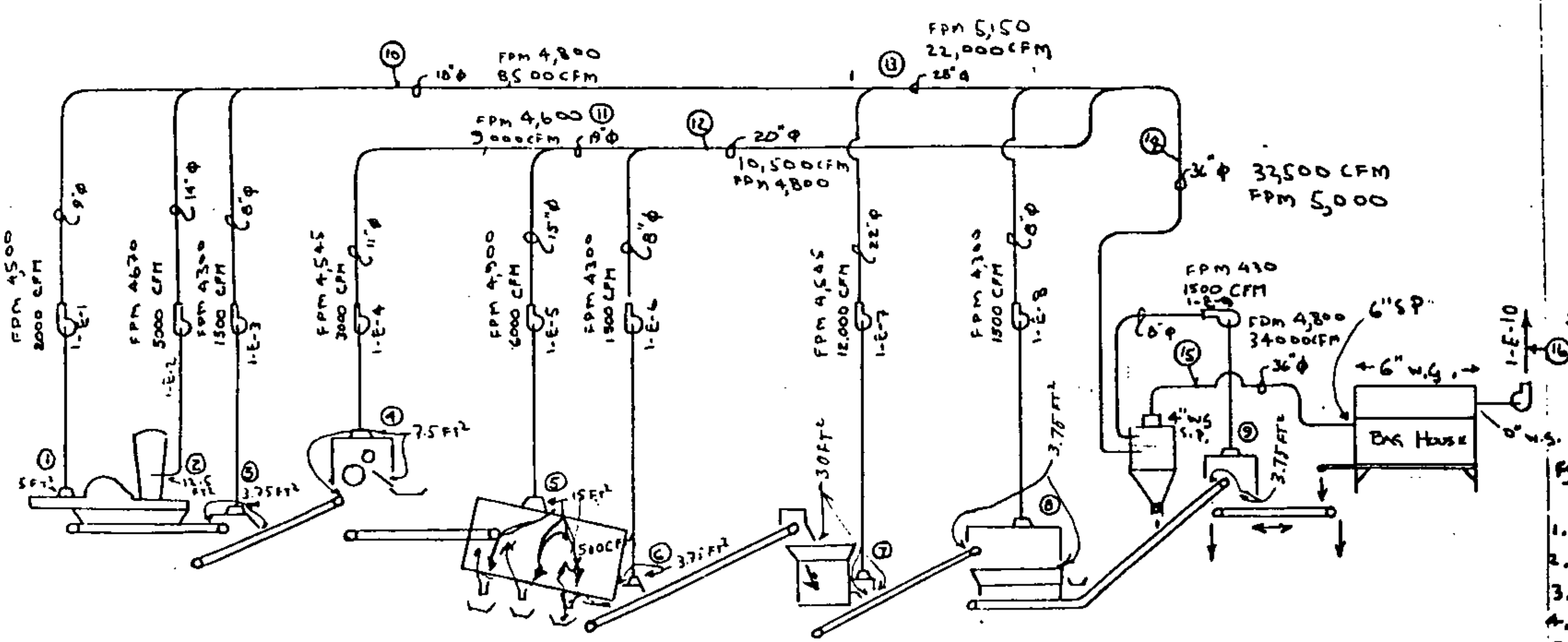
ATTACHMENT 4

PROJECT: PALM BEACH
OWNER: SWA
FEATURE: RDF PLANT: DUST CONTROL

Wegman ENGINEERS

SHEET NO. 11 OF ____
DATE 8-18-82 BY SGT
CHKD. BY ________ NO. ____

DUST CONTROL SYSTEM PER RDF MANUFACTURING LINE



1. FLAIL MILL INFEED
2. EXPLOSION VENT
3. FLAIL MILL DISCHARGE CONVEYOR
4. MAGNETIC SEPARATION HOOD
5. TROMMEL
6. TROMMEL DISCHARGE
7. SHREDDER DISCHARGE
8. DISC SCREEN
9. PACKER INFEED CONVEYOR

NOTES:

1. ALL EXHAUST FANS TO BE MATERIAL HANDLING (RD WHEELS)
2. ALL EXHAUST FANS TO BE VARIABLE SPEED
3. DUCT THRU 18" Φ - 14 GAGE FITTINGS - 12 GAGE
   THRU 36" Φ - 12 GAGE " - 10 GAGE
4. BAG HOUSE CLOTH AREA 8 TO 1 (RANGE 6 TO 1 / 10 TO 1)
5. CYCLONE

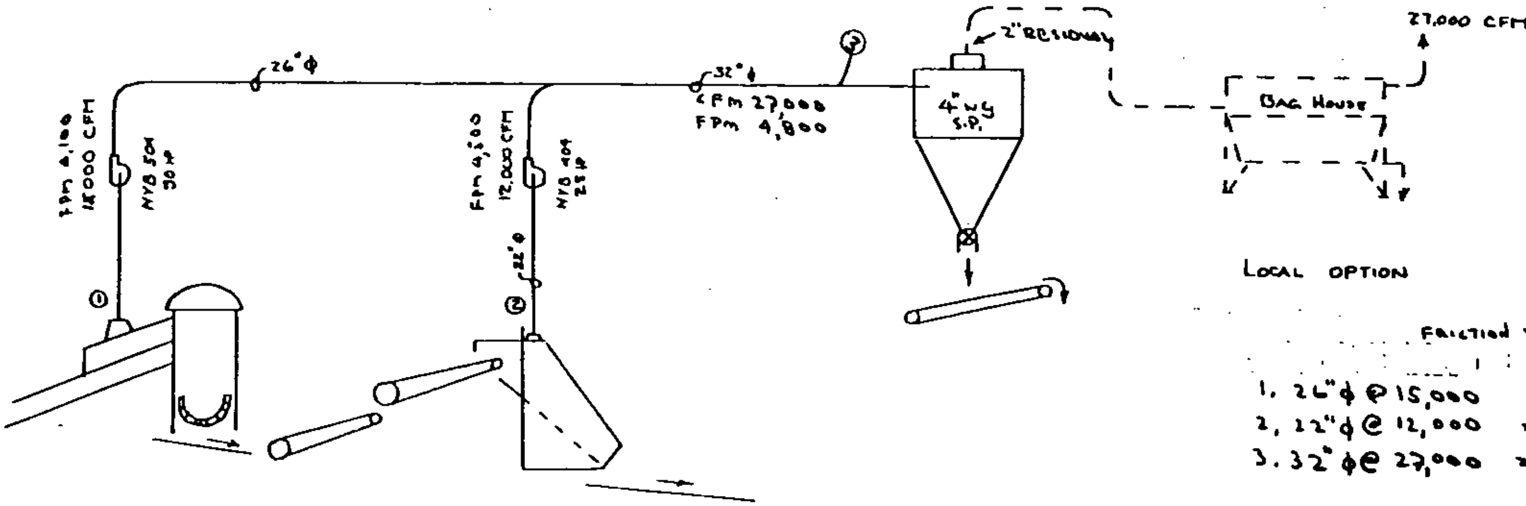
FRICTION W.G. INCHES/100 FT DUCT @ STATED [illegible]	
1. 9"Φ @ 2,000	3.3
2. 14"Φ @ 5,000	2.1
3. 8"Φ @ 1,500	3.6
4. 11"Φ @ 3,000	2.7
5. 15"Φ @ 6,000	2.1
6. 8"Φ @ 1,500	3.6
7. 22"Φ @ 12,000	1.15
8. 8"Φ @ 1,500	3.6
9. 8"Φ @ 1,500	3.6
10. 18"Φ @ 8,500	1.6
11. 19"Φ @ 9,000	1.4
12. 20"Φ @ 10,500	1.35
13. 28"Φ @ 22,000	1.1
14. 36"Φ @ 32,500	0.53
15. 36"Φ @ 34,000	0.66
16. @ 34,000	

PROJECT: PALM BEACH
OWNER: SWA
FEATURE: RDF PLANT - DUST CONTROL

Wegman Engineers

SHEET NO. 12 OF
DATE 8-18-82 BY SGT
CHKD. BY NO.

DUST CONTROL SYSTEM OBW & FERROUS PROCESSING LINE



FRICTION W.G. INCHES/100 FT DUCT @ STATED C.F.M.

1. 26"ϕ @ 15,000 = 0.56
2. 22"ϕ @ 12,000 = 1.15
3. 32"ϕ @ 27,000 = 0.56

1. SHREDDER INFEED
2. METAL AIR SCRUBBER

NOTES:

1. EXHAUST FANS TO BE MATERIAL HANDLING DESIGN (RD WHEELS)
2. METAL AIR SCRUBBER FAN TO BE VARIABLE SPEED
3. DUCT TO BE 12 GAGE - FITTINGS 10 GAGE
4. BAG HOUSE AIR TO CLOTH RATIO 8-1

Attachment 5
Sheet 2 of 3

HAYDEN/WEGMAN-BARKER, OSHA & ANDERSON
ENGINEERS
22-APR-1985

PALM BEACH SOLID WASTE AUTHORITY
SOLID WASTE MANGEMENT PLAN

ATTACHMENT 5 (SHEET 3 OF 3)
FIELD 73. FUGITIVE EMISSION SOURCES AND CONTROL MEASURES
TECHNICAL CALCULATIONS

(1) EMISSION SOURCES	(2) OPERATING HOURS PER DAY (HOUR)	(3) OPERATING DAYS PER WEEK (DAYS)	(4) UNCONTROLLED EMISSION FACTOR (GRAINS/SCF)	(5) CYCLONE & BAGHOUSE DESIGN RATING (SCFM)	(6) COLLECTION EFFICIENCY OF CYCLONE & BAGHOUSE (%)	(7) MAXIMUM EMISSION (LB/HR)	(8) ANNUAL EMISSION (TON/YEAR)
RDF MANUFACTURING TRAIN #1	16	6	5	34,000	99.8	2.91	6.18
RDF MANUFACTURING TRAIN #2	16	6	5	34,000	99.8	2.91	6.18
RDF MANUFACTURING TRAIN #3	16	2	5	34,000	99.8	2.91	2.06
OBW & FERROUS RECOVERY LINE	16	6	5	27,000	99.8	2.31	4.91
TOTAL						11.06	19.34

NOTES (REFER TO COLUMN NO. ABOVE):

(4) THE EMISSION FACTOR IS BASED ON HEAVY DUST CONCENTRATION OF THE ROCK CRUSHING AND SCREENING OPERATION (WORST CASE).

(7) =(4)*(5)*(1.00-(6)/100.00)*(60 MIN/HR)/(7000 GRAINS/LB)

(8) =(7)*(2)*(3)*(52 WK/YR)*(0.85 AVAILABILITY FACTOR)/(2000 LB/TON)