FPL

Lauderdale Repowering Project

Site Certification Application

Volume 2

Chapter 10
Appendices

Submitted By:

FPL

an FPL Group Company

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Lauderdale Repowering Project

Site Certification Application

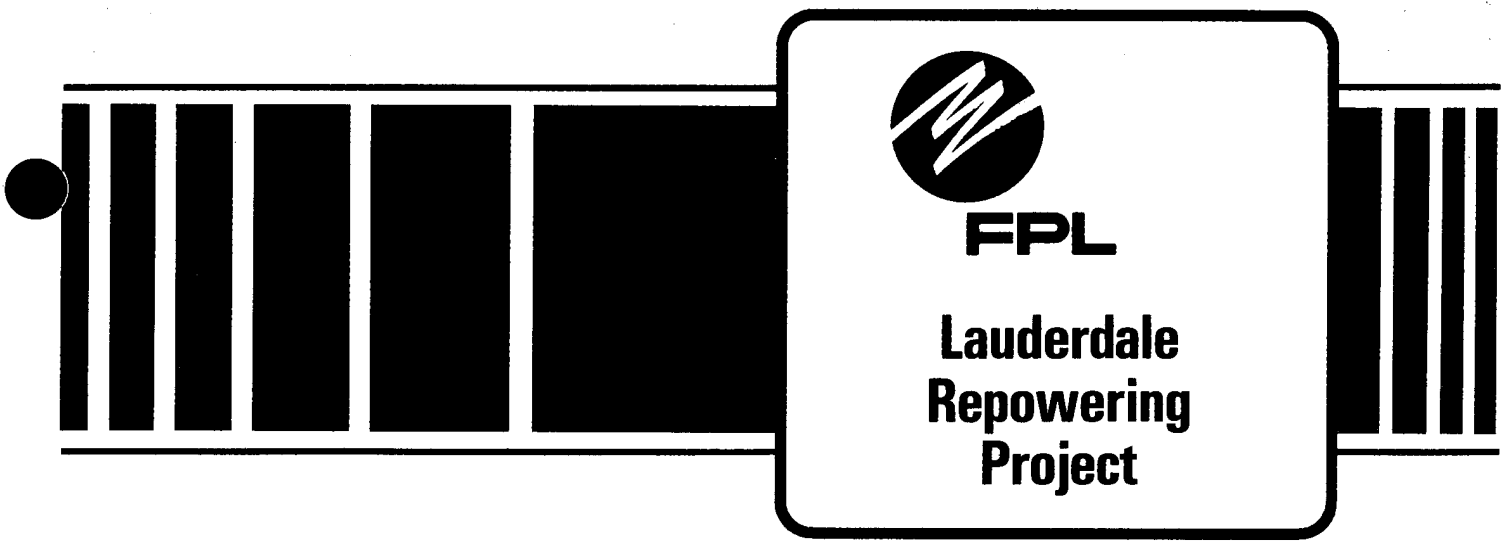
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FPL LAUDERDALE REPOWERING PROJECT
SITE CERTIFICATION APPLICATION
REVISION 1
VOLUME 2

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FEDERAL PERMIT APPLICATIONS OR APPROVALS

APPENDIX 10.1.1

316 DEMONSTRATIONS

10.1.1 316 A AND B DEMONSTRATIONS (EPA NPDES PERMIT INCLUDED)

Biological studies were performed to support the original permit. These studies are discussed in Section 2.3.6 under Aquatic Ecology. From these studies and EPA field inspection, it was concluded that a 316(a) thermal variance was not required because the Florida Water Quality Standards were not violated and the intake structure reflects best available technology to minimize impacts. Additional aquatic ecology studies were performed to supplement the previous studies. The results of these investigations support the conclusion of the original EPA permit (see Sections 2.3.6 and 5.1.2). The EPA NPDES permit is included in the appendix.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

345 COURTLAND STREET
ATLANTA, GEORGIA 30365

MAR 3 1 1987

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

RECEIVED

APR 0 6 1987

MANAGER
PERMITTING & PROGRAMS

REF: 4WM-FP

Mr. T.R. Fair
Environmental Permitting and Programs
Florida Power and Light Company
P.O. Box 14000
Juno Beach, Florida 33408

RE: Florida Power and Light Company
Lauderdale Power Plant
NPDES No. FL0001503

Dear Mr. Fair:

Enclosed is the National Pollutant Discharge Elimination System (NPDES) permit for the above referenced facility. This action constitutes the Environmental Protection Agency's final permit decision in accordance with 40 CFR 124.15(a). Any person may contest this decision by submitting a timely request for a hearing to the Regional Administrator under 40 CFR 124.74 or 124.114.

The permit will be effective as specified in the permit, provided that no request for a hearing is granted by the Agency under 40 C.F.R. 124.75 or 124.114. In the event that such a request is granted:

- For discharge(s) authorized by an NPDES permit, at the time this permit application was filed, the force and effect of the contested provision(s) of this permit will be stayed, and all provision(s) of the previous NPDES permit as well as all uncontested provision(s) of this permit shall be fully enforceable and effective until the administrative review process is completed, as provided by 40 CFR 124.16 and 124.60.

- For discharge(s) not authorized by an NPDES permit, at the time this permit application was filed, the Agency's granting of a hearing (requested by you or any other person) will result in a withdrawl of your authorization to commence such discharge(s) until the administrative review process is completed. In other words, there will not be an NPDES permit authorizing the discharge(s) and if such a discharge(s) occurs, the discarge(s) will constitute a violation of Section 301 of the Clean Water Act, (33 U.S.C. 1311) for which there is civil and/or criminal liability.

If you wish to request a hearing under 40 CFR 124.74 or 124.114 you must submit a request (an original and two copies) to the Regional Hearing Clerk within thirty (30) days from the receipt of this letter. The request will be timely if mailed by certified mail within the thirty (30) day time period. For the request to be valid, it must conform to the requirements of 40 CFR 124.74. A copy of the requirements of 40 CFR 124.74 is attached.

Information on procedures pertaining to the filing of a hearing request or other legal matters may be obtained by contacting Ms. Jacqueline Colson, Assistant Regional Counsel, at (404) 347-3506.

Sincerely yours,

Bruce R. Barrett, Director
Water Management Division

Enclosures (3): Hearing Request Requirements
Final NPDES Permit
Amendment to Fact Sheet or Statement of Basis

cc: Florida Department of Environmental Regulation (with Final Permit & Amendment)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IV
345 COURTLAND STREET
ATLANTA, GEORGIA 30365

AUTHORIZATION TO DISCHARGE UNDER THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

In compliance with the provisions of the Clean Water Act, as amended (33 U.S.C. 1251 et. seq; the "Act"),

Florida Power and Light Company
P.O. Box 14000
Juno Beach, Florida 33408

is authorized to discharge from a facility located at

Lauderdale Plant
SW 42 St., 2 miles West off Ravenswood
Fort Lauderdale, Florida 33314

to receiving waters named

Dania Cutoff Canal & South Fork New River (after cooling canal/pond residence)

in accordance with effluent limitations, monitoring requirements and other conditions set forth herein. The permit consists of this cover sheet, Part I 2 page(s), Part II 15 page(s), Part III 1 page(s), Attachments 1 and 2.

This permit shall become effective on May 1, 1987.

This permit and the authorization to discharge shall expire at midnight April 30, 1992.

March 31, 1987
Date Signed

Bruce P. Barrett, Director
Water Management Division

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

1. During the period beginning on the effective date of this permit and lasting through expiration of this permit, the permittee is authorized to discharge from outfall(s) serial number(s) 001 - Combined discharge of once through cooling water from Unit No. 4 and 5 and auxiliary equipment cooling water to South Fork of New River (after cooling canal/pond residence).

Such discharges shall be limited and monitored by the permittee as specified below:

Effluent Characteristic	Discharge Limitations		Monitoring Requirements	
	30 Day Average	Instantaneous Maximum	Measurement Frequency	Sample Type
Flow, m^3/day (MGD)	-	-	Daily	Recorder or pump logs
Discharge Temperature, $^oC(^oF)$	-	N/A	Daily	Plant records
Intake Temperature, $^oC(^oF)$	-	N/A	Daily	Plant records
Temperature Rise, $^oC(^oF)$	7.3(13.2)	N/A	6/Day	Recorders or Indicators

10.1.1-5

There shall be no discharge of free available chlorine nor total residual chlorine.

There shall be no discharge of floating solids or visible foam in other than trace amounts.

Samples taken in compliance with the monitoring requirements specified above shall be taken at the outlet corresponding to an individual unit prior to mixing with other waste streams.

2. During the period beginning on the effective date of this permit and lasting through expiration of this permit, the permittee is authorized to discharge from outfall serial number 004 - intake screen wash water to Dania Cut-off Canal.

Discharge of intake screen wash water is permitted without limitations or monitoring requirements.

There shall be no discharge of floating solids or visible foam in other than trace amounts.

3. During the period beginning on the effective date of this permit and lasting through expiration of this permit, the permittee is authorized to discharge from outfall(s) serial number(s) 005 - 1 thru 8 - Non-equipment area stormwater runoff to Dania Cut-off Canal and South Fork of New River (after cooling canal/pond residence).

   Discharge of stormwater runoff is permitted without limitations or monitoring requirements.

   There shall be no discharge of floating solids or visible foam in other than trace amounts.

B. SCHEDULE OF COMPLIANCE

1. The permittee shall achieve compliance with the effluent limitations specified for discharges in accordance with the following schedule:

   Operational Level Attained.....Effective Date of Permit

2. No later than 14 calendar days following a date identified in the above schedule of compliance, the permittee shall submit either a report of progress or, in the case of specific actions being required by identified dates, a written notice of compliance or noncompliance. In the latter case, the notice shall include the cause of noncompliance, any remedial actions taken, and the probability of meeting the next scheduled requirement.

PART II

STANDARD CONDITIONS FOR NPDES PERMITS

SECTION A. GENERAL CONDITIONS

1. Duty to Comply

The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application.

2. Penalties for Violations of Permit Conditions

Any person who violates a permit condition is subject to a civil penalty not to exceed $10,000 per day of such violation. Any person who willfully or negligently violates permit conditions is subject to a fine of not less than $2,500 nor more than $25,000 per day of violation, or by imprisonment for not more than 1 year, or both.

3. Duty to Mitigate

The permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

4. Permit Modification

After notice and opportunity for a hearing, this permit may be modified, terminated or revoked for cause (as described in 40 CFR 122.62 et seq) including, but not limited to, the following:

a. Violation of any terms or conditions of this permit;

b. Obtaining this permit by misrepresentation or failure to disclose fully all relevant facts;

c. A change in any conditions that requires either tempotary interruption or elimination of the permitted discharge; or

d. Information newly acquired by the Agency indicating the discharge poses a threat to human health or welfare.

If the permittee believes that any past or planned activity would be cause for modification or revocation and reissuance under 40 CFR 122.62, the permittee must report such information to the Permit Issuing Authority. The submittal of a new application may be required of the permittee. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance, does not stay any permit condition.

5. Toxic Pollutants

Notwithstanding Paragraph A-4, above, if a toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is established under Section 307(a) of the Act for a toxic pollutant which is present in the discharge and such standard or prohibition is more stringent than any limitation for such pollutant in this permit, this permit shall be modified or revoked and reissued to conform to the toxic effluent standard or prohibition and the permittee so notified.

The permittee shall comply with effluent standards or prohibitions established under Section 307(a) of the Clean Water Act for toxic pollutants within the time provided in the regulations that establish those standards or prohibitions, even if the permit has not yet been modified to incorporate the requirement.

6. Civil and Criminal Liability

Except as provided in permit conditions on "Bypassing" Section B, Paragraph B-3, nothing in this permit shall be construed to relieve the permittee from civil or criminal penalties for noncompliance.

7. Oil and Hazardous Substance Liability

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee is or may be subject under Section 311 of the Act.

8. State Laws

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable State law or regulation under authority preserved by Section 510 of the Act.

9. Property Rights

The issuance of this permit does not convey any property rights of any sort, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of Federal, State or local laws or regulations.

10. Onshore or Offshore Construction

This permit does not authorize or approve the construction of any onshore or offshore physical structures or facilities or the undertaking of any work in any waters of the United States.

11. Severability

The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.

12. Duty to Provide Information

The permittee shall furnish to the Permit Issuing Authority, within a reasonable time, any information which the Permit Issuing Authority may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The permittee shall also furnish to the Permit Issuing Authority upon request, copies of records required to be kept by this permit.

SECTION B. OPERATION AND MAINTENANCE OF POLLUTION CONTROLS

1. Proper Operation and Maintenance

The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems which are installed by a permittee only when the operation is necessary to achieve compliance with the conditions of the permit.

2. Need to Halt or Reduce not a Defense

It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the condition of this permit.

3. Bypass of Treatment Facilities

a. Definitions

(1) "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility, which is not a designed or established operating mode for the facility.

(2) "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

b. Bypass not exceeding limitations.

The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions of Paragraphs c. and d. of this section.

c. Notice

(1) Anticipated bypass. If the permittee knows in advance of the need for a bypass, it shall submit prior notice, if possible at least ten days before the date of the bypass; including an evaluation of the anticipated quality and effect of the bypass.

(2) Unanticipated bypass. The permittee shall submit notice of an unanticipated bypass as required in Section D, Paragraph D-8 (24-hour notice).

d. Prohibition of bypass.

(1) Bypass is prohibited and the Permit Issuing Authority may take enforcement action against a permittee for bypass, unless:

(a) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;

(b) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and

(c) The permittee submitted notices as required under Paragraph c. of this section.

(2) The Permit Issuing Authority may approve an anticipated bypass, after considering its adverse effects, if the Permit Issuing Authority determines that it will meet the three conditions listed above in Paragraph d.(1) of this section.

4. Upsets

"Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation. An upset constitutes an affirmative defense to an action brought for non-compliance with such technology based permit limitation if the requirements of 40 CFR 122.41(n)(3) are met.

5. Removed Substances

This permit does not authorize discharge of solids, sludge, filter backwash, or other pollutants removed in the course of treatment or control of wastewaters to waters of the United States unless specifically limited in Part 1.

SECTION C. MONITORING AND RECORDS

1. Representative Sampling

Samples and measurements taken as required herein shall be representative of the volume and nature of the monitored discharge. All samples shall be taken at the monitoring points specified in this permit and, unless otherwise specified, before the effluent joins or is diluted by any other wastestream, body of water, or substance. Monitoring points shall not be changed without notification to and the approval of the Permit Issuing Authority.

2. Flow Measurements

Appropriate flow measurement devices and methods consistent with accepted scientific practices shall be selected and used to insure the accuracy and reliability of measurements of the volume of monitored discharges. The devices shall be installed, calibrated and maintained to insure that the accuracy of the measurements are consistent with the accepted capability of that type of device. Devices selected shall be capable of measuring flows with a maximum deviation of less than ± 10% from the true discharge rates throughout the range of expected discharge volumes. Once-through condenser cooling water flow which is monitored by pump logs, or pump hour meters as specified in Part I of this permit and based on the manufacturer's pump curves shall not be subject to this requirement. Guidance in selection, installation, calibration and operation of acceptable flow measurement devices can be obtained from the following references:

1. "A Guide of Methods and Standards for the Measurement of Water Flow", U.S. Department of Commerce, National Bureau of Standards, NBS Special Publication 421, May 1975, 97 pp. (Available from the U.S. Government Printing Office, Washington, D.C. 20402. Order by SD catalog No. C13.10:421.)

2. "Water Measurement Manual", U.S. Department of Interior, Bureau of Reclamation, Second Edition, Revised Reprint, 1974, 327 pp. (Available from the U.S. Government Printing Office, Washington, D.C. 20402. Order by catalog No. 127.19/2:W29/2, Stock No. S/N 24003-0027.)

(3) "Flow Measurement in Open Channels and Closed Conduits", U.S. Department of Commerce, National Bureau of Standards, NBS Special Publication 484, October 1977, 982 pp. (Available in paper copy or microfiche from National Technical Information Service (NTIS), Springfield, VA 22151. Order by NTIS No. PB-273 535/5ST.)

(4) "NPDES Compliance Flow Measurement Manual", U.S. Environmental Protection Agency, Office of Water Enforcement, Publication MCD-77, September 1981, 135 pp. (Available from the General Services Administration (8BRC), Centralized Mailing Lists Services, Building 41, Denver Federal Center, Denver, CO 80225.)

3. Monitoring Procedures

Monitoring must be conducted according to test procedures approved under 40 CFR Part 136, unless other test procedures have been specified in this permit.

4. Penalties for Tampering

The Clean Water Act provides that any person who falsifies, tampers with, or knowingly renders inaccurate, any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both.

5. Retention of Records

The permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least 3 years from the date of the sample, measurement, report or application. This period may be extended by the Permit Issuing Authority at any time.

6. Record Contents

Records of monitoring information shall include:

a. The date, exact place, and time of sampling or measurements;

b. The individual(s) who performed the sampling or measurements;

c. The date(s) analyses were performed;

d. The individual(s) who performed the analyses;

e. The analytical techniques or methods used; and

f. The results of such analyses.

7. Inspection and Entry

The permittee shall allow the Permit Issuing Authority, or an authorized representative, upon the presentation of credentials and other documents as may be required by law, to:

a. Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;

b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;

c. Inspect at reasonable time any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and

d. Sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the Clean Water Act, any substances or parameters at any location.

SECTION D. REPORTING REQUIREMENTS

1. Change in Discharge

The permittee shall give notice to the Permit Issuing Authority as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when:

a. The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source; or

b. The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations in the permit, nor to notification requirements under Section D, Paragraph D-10(a).

2. Anticipated Noncompliance

The permittee shall give advance notice to the Permit Issuing Authority of any planned change in the permitted facility or activity which may result in noncompliance with permit requirements. Any maintenance of facilities, which might necessitate unavoidable interruption of operation and degradation of effluent quality, shall be scheduled during noncritical water quality periods and carried out in a manner approved by the Permit Issuing Authority.

3. Transfer of Ownership or Control

A permit may be automatically transferred to another party if:

a. The permittee notifies the Permit Issuing Authority of the proposed transfer at least 30 days in advance of the proposed transfer date;

b. The notice includes a written agreement between the existing and new permittees containing a specific date for transfer of permit responsibility, coverage, and liability between them; and

c. The Permit Issuing Authority does not notify the existing permittee of his or her intent to modify or revoke and reissue the permit. If this notice is not received, the transfer is effective on the date specified in the agreement mentioned in paragraph b.

4. Monitoring Reports

See Part III of this permit.

5. Additional Monitoring by the Permittee

If the permittee monitors any pollutant more frequently than required by this permit, using test procedures approved under 40 CFR 136 or as specified in this permit, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the Discharge Monitoring Report (DMR). Such increased frequency shall also be indicated.

6. Averaging of Measurements

Calculations for limitations which require averaging of measurements shall utilize an arithmetic mean unless otherwise specified by the Permit Issuing Authority in the permit.

7. Compliance Schedules

Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit shall be submitted no later than 14 days following each schedule date. Any reports of noncompliance shall include the cause of noncompliance, any remedial actions taken, and the probability of meeting the next scheduled requirement.

8. Twenty-Four Hour Reporting

The permittee shall orally report any noncompliance which may endanger health or the environment, within 24 hours from the time the permittee becomes aware of the circumstances. A written submission shall also be provided within 5 days of the time the permittee becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause, the period of noncompliance, including exact dates and times; and if the noncompliance has not been corrected, the anticipated time it is expected to continue, and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. The Permit Issuing Authority may verbally waive the written report, on a case-by-case basis, when the oral report is made.

The following violations shall be included in the 24 hour report when they might endanger health or the environment:

a. An unanticipated bypass which exceeds any effluent limitation in the permit.

b. Any upset which exceeds any effluent limitation in the permit.

9. Other Noncompliance

The permittee shall report in narrative form, all instances of noncompliance not previously reported under Section D, Paragraphs D-2, D-4, D-7, and D-8 at the time monitoring reports are submitted. The reports shall contain the information listed in Paragraph D-8.

10. Changes in Discharges of Toxic Substances

The permittee shall notify the Permit Issuing Authority as soon as it knows or has reason to believe:

a. That any activity has occurred or will occur which would result in the discharge, on a routine or frequent basis, of any toxic substance(s) (listed at 40 CFR 122, Appendix D, Table II and III) which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels":

(1) One hundred micrograms per liter (100 ug/l);

(2) Two hundred micrograms per liter (200 ug/l) for acrolein and acrylonitrile; five hundred micrograms per liter (500 ug/l) for 2,4-dinitrophenol and for 2-methyl-4,6-dinitrophenol; and one milligram per liter (1 mg/l) for antimony; or

(3) Five (5) times the maximum concentration value reported for that pollutant(s) in the permit application.

b. That any activity has occurred or will occur which would result in any discharge, on a non-routine or infrequent basis, of a toxic pollutant (listed at 40 CFR 122, Appendix D. Table II and III) which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels":

(1) Five hundred micrograms per liter (500 ug/l);

(2) One milligram per liter (1 mg/l) for antimony; or

(3) Ten (10) times the maximum concentration value reported for that pollutant(s) in the permit application.

11. Duty to Reapply

If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee must apply for and obtain a new permit. The application should be submitted at least 180 days before the expiration date of this permit. The Permit Issuing Authority may grant permission to submit an application less than 180 days in advance but not later than the permit expiration date.

Where EPA is the Permit Issuing Authority, the terms and conditions of this permit are automatically continued in accordance with 40 CFR 122.6, only where the permittee has submitted a timely and sufficient application for a renewal permit and the Permit Issuing Authority is unable, through no fault of the permittee to issue a new permit before the expiration date.

12. Signatory Requirements

All applications, reports, or information submitted to the Permit Issuing Authority shall be signed and certified.

a. All permit applications shall be signed as follows:

(1) For a corporation: by a responsible corporate officer. For the purpose of this Section, a responsible corporate officer means: (1) a president, secretary, treasurer or vice president of the corporation in charge of a principal business function, or any other person who performs similar policy - or decision-making functions for the corporation, or (2) the manager of one or more manufacturing production or operating facilities employing more than 250 persons or having gross annual sales or expenditures exceeding 25 million (in second quarter 1980 dollars), if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

(2) For a partnership or sole proprietorship: by a general partner or the proprietor, respectively; or

(3) For a municipality, State, Federal, or other public agency: by either a principal executive officer or ranking elected official.

b. All reports required by the permit and other information requested by the Permit Issuing Authority shall be signed by a person described above or by a duly authorized representative of that person. A person is a duly authorized representative only if:

(1) The authorization is made in writing by a person described above;

(2) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position.); and

(3) The written authorization is submitted to the Permit Issuing Authority.

c. Certification. Any person signing a document under paragraphs (a) or (b) of this section shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under the direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

13. Availability of Reports

Except for data determined to be confidential under 40 CFR Part 2, all reports prepared in accordance with the terms of this permit shall be available for public inspection at the offices of the Permit Issuing Authority. As required by the Act, permit applications, permits and effluent data shall not be considered confidential.

14. Penalties for Falsification of Reports

The Clean Water Act provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or noncompliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both.

SECTION E. DEFINITIONS

1. Permit Issuing Authority

The Regional Administrator of EPA Region IV or his designee, unless at some time in the future the State receives authority to administer the NPDES program and assumes jurisdiction over the permit; at which time, the Director of the State program receiving authorization becomes the issuing authority.

2. Act

"Act" means the Clean Water Act (formerly referred to as the Federal Water Pollution Control Act) Public Law 92-500, as amended by Public Law 95-217 and Public Law 95-576, 33 U.S.C. 1251 et seq.

3. Mass/Day Measurements

a. The "average monthly discharge" is defined as the total mass of all daily discharges sampled and/or measured during a calendar month on which daily discharges are sampled and measured, divided by the number of daily discharges sampled and/or measured during such month. It is therefore, an arithmetic mean found by adding the weights of the pollutant found each day of the month and then dividing this sum by the number of days the tests were reported. The limitation is identified as "Daily Average" or "Monthly Average" in Part I of the permit and the average monthly discharge value is reported in the " Average" column under "Quantity" on the Discharge Monitoring Report (DMR).

b. The "average weekly discharge" is defined as the total mass of all daily discharges sampled and/or measured during the calendar week on which daily discharges are sampled and measured, divided by the number of daily discharges sampled and/or measured during such week. It is, therefore, an arithmetic mean found by adding the weights of pollutants found each day of the week and then dividing this sum by the number of days the tests were reported. This limitation is identified as "Weekly Average" in Part I of the permit and the average weekly discharge value is reported in the "Maximum" column under "Quantity" on the DMR.

c. The "maximum daily discharge" is the total mass (weight) of a pollutant discharged during a calendar day. If only one sample is taken during any calendar day the weight of pollutant calculated from it is the "maximum daily discharge". This limitation is identified as "Daily Maximum", in Part I of the permit and the highest such value recorded during the reporting period is reported in the "Maximum" column under "Quantity" on the DMR.

d. The "average annual discharge" is defined as the total mass of all daily discharges sampled and/or measured during the calendar year on which daily discharges are sampled and measured, divided by the number of daily discharges sampled and/or measured during such year. It is, therefore, an arithmetic mean found by adding the weights of pollutants found each day of the year and then dividing this sum by the number of days the tests were reported. This limitation is defined as "Annual Average" in Part I of the permit and the average annual discharge value is reported in the "Average" column under "Quantity" on the DMR. The DMR for this report shall be submitted in January for the previous reporting calendar year.

4. Concentration Measurements

a. The "average monthly concentration", other than for fecal coliform bacteria, is the sum of the concentrations of all daily discharges sampled and/or measured during a calendar month on which daily discharges are sampled and measured, divided by the number of daily discharges sampled and/or measured during such month (arithmetic mean of the daily concentration values). The daily concentration value is equal to the concentration of a composite sample or in the case of grab samples is the arithmetic mean (weighted by flow value) of all the samples collected during that calendar day. The average monthly count for fecal coliform bacteria is the geometric mean of the counts for samples collected during a calendar month. This limitation is identified as "Monthly Average" or "Daily Average" under "Other Limits" in Part I of the permit and the average monthly concentration value is reported under the "Average" column under "Quality" on the DMR.

b. The "average weekly concentration", other than for fecal coliform bacteria, is the sum of the concentrations of all daily discharges sampled and/or measured during a calendar week on which daily discharges are sampled and measured divided by the number of daily discharges sampled and/or measured during such week (arithmetic mean of the daily concentration values). The daily concentration value is equal to the concentration of a composite sample or in the case of grab samples is the arithmetic mean (weighted by flow value) of all the samples collected during that calendar day. The average weekly count for fecal coliform bacteria is the geometric mean of the counts for samples collected during a calendar week. This limitation is identified as "Weekly Average" under "Other Limits" in Part I of the permit and the average weekly concentration value is reported under the "Maximum" column under "Quality" on the DMR.

c. The "maximum daily concentration" is the concentration of a pollutant discharge during a calendar day. It is identified as "Daily Maximum" under "Other Limits" in Part I of the permit and the highest such value recorded during the reporting period is reported under the "Maximum" column under "Quality" on the DMR.

d. The "average annual concentration", other than for fecal coliform bacteria, is the sum of the concentrations of all daily discharges sampled and/or measured during a calendar year on which daily discharges are sampled and measured divided by the number of daily discharges sampled and/or measured during such year (arithmetic mean of the daily concentration values). The daily concentration value is equal to the concentration of a composite sample or in the case of grab samples is the arithmetic mean (weighted by flow value) of all the samples collected during that calendar day. The average yearly count for fecal coliform bacteria is the geometric mean of the counts

for samples collected during a calendar year. This limitation is identified as "Annual Average" under "Other Limits" in Part I of the permit and the average annual concentration value is reported under the "Average" column under "Quality" on the DMR. The DMR for this report shall be submitted in January for the previous reporting year.

5. Other Measurements

a. The effluent flow expressed as M^3/day (MGD) is the 24 hour average flow averaged monthly. It is the arithmetic mean of the total daily flows recorded during the calendar month. Where monitoring requirements for flow are specified in Part I of the permit the flow rate values are reported in the "Average" column under "Quantity" on the DMR.

b. An "instantaneous flow measurement" is a measure of flow taken at the time of sampling, when both the sample and flow will be representative of the total discharge.

c. Where monitoring requirements for pH, dissolved oxygen or fecal coliform bacteria are specified in Part I of the permit, the values are generally reported in the "Quality or Concentration" column on the DMR.

6. Types of Samples

a. Composite Sample: A "composite sample" is a combination of not less than 8 influent or effluent portions, of at least 100 ml, collected over the full time period specified in Part I.A. The composite sample must be flow proportioned by either time interval between each aliquot or by volume as it relates to effluent flow at the time of sampling or total flow since collection of the previous aliquot. Aliquots may be collected manually or automatically.

b. Grab Sample: A "grab sample" is a single influent or effluent portion which is not a composite sample. The sample(s) shall be collected at the period(s) most representative of the total discharge.

7. Calculation of Means

a. Arithmetic Mean: The arithmetic mean of any set of values is the summation of the individual values divided by the number of individual values.

b. Geometric Mean: The geometric mean of any set of values is the Nth root of the product of the individual values where N is equal to the number of individual values. The geometric mean is equivalent to the antilog of the arithmetic mean of the logarithms of the individual values. For purposes of calculating the geometric mean, values of zero (0) shall be considered to be one (1).

c. Weighted by Flow Value: Weighted by flow value means the summation of each concentration times its respective flow divided by the summation of the respective flows.

8. Calendar Day

A calendar day is defined as the period from midnight of one day until midnight of the next day. However, for purposes of this permit, any consecutive 24-hour period that reasonably represents the calendar day may be used for sampling.

9. Hazardous Substance

A hazardous substance means any substance designated under 40 CFR Part 116 pursuant to Section 311 of the Clean Water Act.

10. Toxic Pollutant

A toxic pollutant is any pollutant listed as toxic under Section 307(a)(1) of the Clean Water Act.

PART III

OTHER REQUIREMENTS

A. Reporting of Monitoring Results

Monitoring results obtained each calendar month must be summarized for that month and reported on a Discharge Monitoring Report Form (EPA No. 3320-1), postmarked no later than the 28th day of the month following the completed calendar month. (For example, data for January shall be submitted by February 28.) Duplicate signed copies of these, and all other reports required by Section D of Part II, Reporting Requirements, shall be submitted to the Permit Issuing Authority and the State at the following addresses:

Environmental Protection Agency
Region IV
Facilities Performance Branch
Water Management Division
345 Courtland Street, N.E.
Atlanta, Georgia 30365

Florida Dept. of Environmental Regulation
Southeast District
3301 Gun Club Road
P.O. Box 3858
W. Palm Beach, Florida 33402

B. There shall be no discharge of polychlorinated biphenyl compounds such as those commonly used for transformer fluid.

C. The company shall notify the Regional Administrator in writing not later than ninety (90) days prior to instituting use of any cooling water biocide or chemical which may be toxic to aquatic life. Such notification shall include:

1. Name and general composition of biocide or chemical.
2. Frequency of use.
3. Quantities used.
4. Proposed effluent concentration.
5. EPA registration number if applicable.

D. Discharge of any product registered under the Federal Insecticide, Fungicide, and Rodenticide Act to any wastestream which may ultimately be released to lakes, rivers, streams, or other waters of the United States is prohibited unless specifically authorized elsewhere in this permit.

E. Reopener Clause

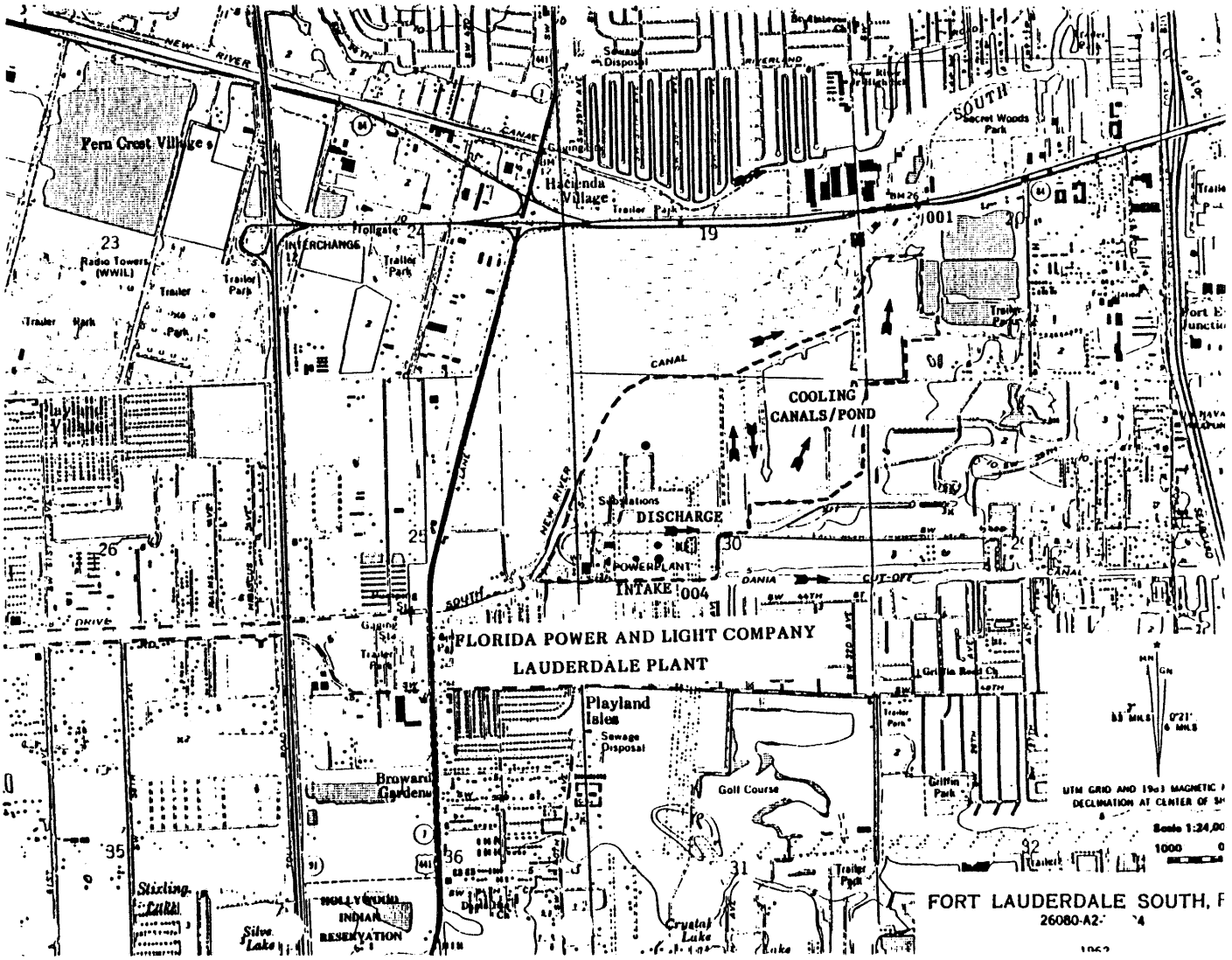
This permit shall be modified, or alternatively revoked and reissued, to comply with any applicable effluent standard or limitation issued or approved under Sections 301(b)(2)(C), and (D), 304(b)(2), and 307(a)(2) of the Clean Water Act, if the effluent standard or limitation so issued or approved:

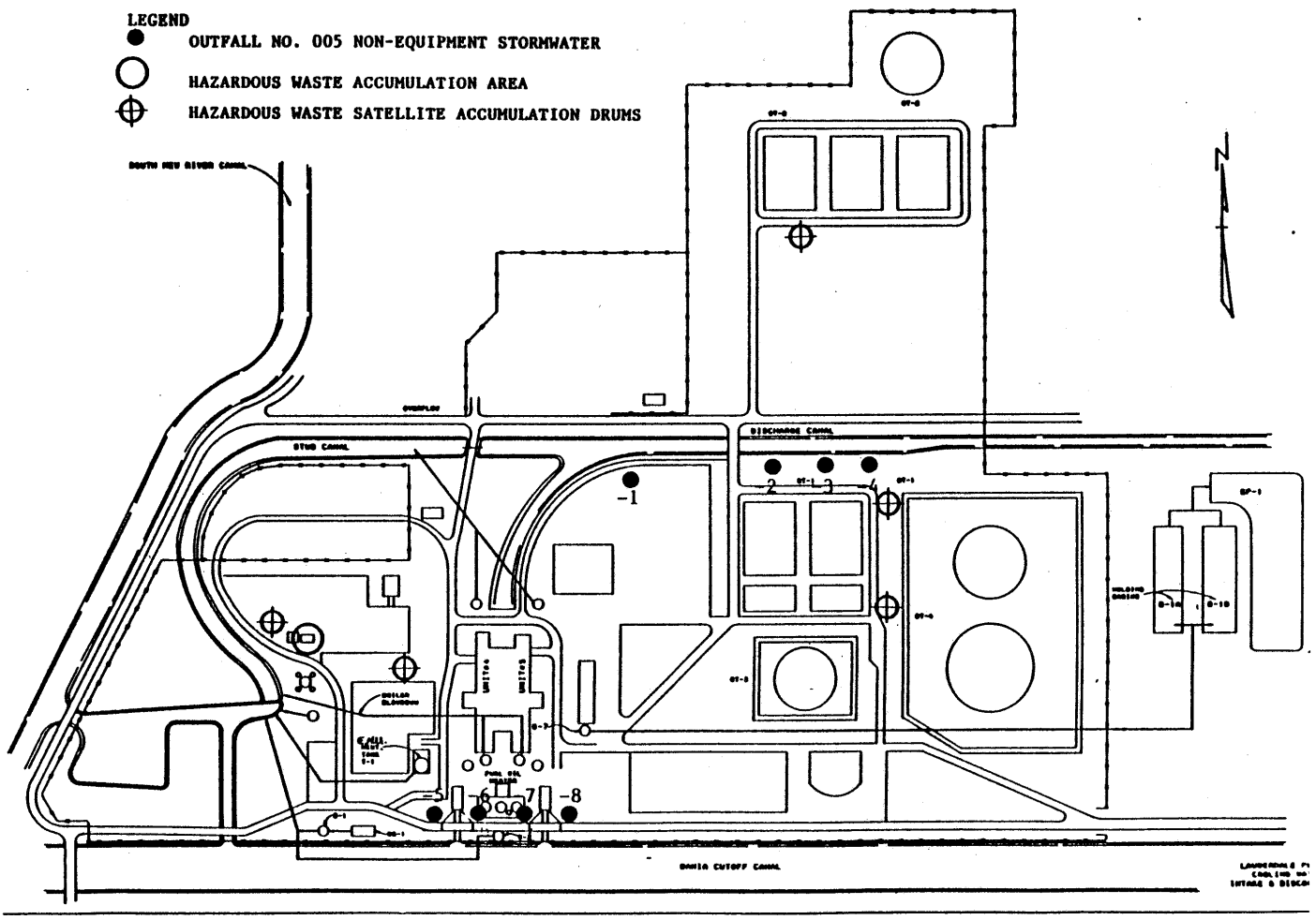
1. Contains different conditions or is otherwise more stringent than any effluent limitation in the permit; or
2. Controls any pollutant not limited in the permit.

The permit as modified or reissued under this paragraph shall also contain any other requirements of the Act then applicable.

Image Quality
As you review the next group of images, Please note that the original documents
were of poor quality.

ATTACHMENT 1


Fern Crest Village
Hacienda Village
Trailer Park
Sewage Disposal
Secret Woods Park
Trailer Park
Radio Towers (WWII)
Trailer Park
Trailer Park
Trailer Park



ATTACHMENT 2

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

345 COURTLAND STREET
ATLANTA, GEORGIA 30365

AMENDMENT TO THE FACT SHEET

Date: March 30, 1987

Facility: Florida Power & Light - Lauderdale Plant

Permit No: FL0001503

I. Comments received during the public comment period.

Comments were received from the applicant by letter dated March 20, 1987.

Item 1 - OSN 001 is identified as the combined discharge of once through cooling water and auxiliary cooling water; however, samples taken in compliance with the permit monitoring requirements shall be at the outlet corresponding to an induvidual unit. Thus no change was made to the permit.

Item 2 - The outfall number for non-equipment area stormwater was changed to a single serial number as requested.

Item 3 - Item I-B is a description of the facility taken directly from the renewal application. The application identifies only one stormwater outfall 005. OSN 005 is actually eight individual discharge pipes. Item III B and Attachment 2 has been changed to one outfall with eight individual pipe numbers.

Item 4 - The zip codes were corrected.

II. Changes in the final permit from the draft permit.

A. The zip codes for the facility were corrected.

B. Non-equipment area stormwater was assigned one serial number with eight (8) individual pipe numbers. Permit and Fact Sheet were changed appropriately.

III. Results of State Certification

State certification was requested on January 29, 1987. State certification is hereby deemed waived.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

345 COURTLAND STREET
ATLANTA, GEORGIA 30365

FACT SHEET

Permit No. FL0001503
Permit Writer: Darlene Vincent

Date: December 12, 1986
Revised: March 30, 1987

I. SYNOPSIS OF APPLICATION

A. Name of Address of Applicant

Florida Power & Light Company (FP&L)
P. O. Box 14000
Juno Beach, Florida 33408

for its

Lauderdale Plant
P. O. Box 8248
Ft. Lauderdale, FL 33314

B. Description of Facility from Application

FP&L, Lauderdale Plant is a two unit oil/gas-fired steam electric plant with a total nameplate rating of 312 MW(net 274 MW). The first unit (Unit 4) was placed in service in 1957 and the second (Unit 5), 1958. Each unit utilizes once through cooling water which is withdrawn from the Dania Cut-off Canal at a total rate of 232,000 gpm. The application describes three discharges points: Outfall Serial Number (OSN) 001 consists of once through condenser cooling water and auxiliary equipment cooling water, OSN 004 is intake screen wash water, and OSN 005 is non-equipment area stormwater. OSN 001 is discharged to South Fork of New river after cooling canal/pond residence. OSN 004 is discharged to the intake. And OSN 005 is discharged to Dania Cut-off Canal and South Fork of New River.

Boiler blowdown, water treatment plant wastes, floor drain discharges, and metal cleaning wastes are collected and routed to an evaporation/percolation pond system from which there is no discharge to waters of the United States. Sanitary wastes are routed to septic tanks and their associated drain fields.

II. SYNOPSIS OF PERMITTING ACTIVITIES (to date)

The permit was first issued February 31, 1974. It was reissued February 20, 1976 and again November 30, 1981. The permit expired November 30, 1986. On May 29, 1986, FP&L applied for permit renewal. Public Notice on the draft permit is scheduled for February 26, 1987. State Certification was requested on January 29, 1987.

III. RECEIVING WATER

A. Name of Receiving Waters

001 - South Fork New River (after cooling canal/pond residence)
004 - Facility Intake from Dania Cutoff Canal
005 - 1 thru 4 South Fork of New River after cooling canal/pond residence
5 thru 8 Intake on Dania Cut-off Canal

B. Location - See Permit Attachments

SW 42 Street, 2 miles West off Ravenswood
Broward Co., Ft. Lauderdale, Florida

Latitude 26° 04' 06'
Longitude 80° 11' 58"

C. Florida Water Quality Classification

Class III waters suitable for recreation, and the propagation and maintenance of fish and wildlife.

IV. DESCRIPTION OF OUTFALLS (As reported in Application)

A. OSN 001 - Once through cooling water Units 4 and 5 and auxiliary equipment cooling water.

Effluent Characteristic	Maximum 30 day Value
Total Suspended Solids, mg/l	1.5
Flow, MGD	269
Temperature (winter), °C	28.9
Temperature (summer), °C	35.3
pH Range, standard unit	7.58 - 7.75

B. OSN 004 - Screen wash water

Screen wash water is the same as once - through cooling water and thus has the same chemical and physical characteristics.

C. Analytical data for non-equipment area stormwater are not required.

V. APPLICABLE REGULATIONS

A. Best Practicable Control Technology Currently Available (BPT): 40 CFR 423.12 (47 FR 52290), November 9, 1982.

B. Best Available Technology Economically Achievable (BAT): 40 CFR 423.13 (47 FR 52290), November 9, 1982.

C. Best Conventional Pollutant Control Technology (BCT): 40 CFR 423.14 (47 FR 52290), November 9, 1982. A best professional judgement has been made by the permit writer that BCT = BPT + BAT.

D. Florida Water Quality Standards: The receiving water is classified as Class III waters - Recreation, propagation and maintenance of fish and wildlife (Florida Administrative Code Chapters 17-3, 17-4, and 17-6).

E. 316(a) and 316(b) of the Clean Water Act. The original permit required biological studies to address 316(a)&(b) concerns. The results of these studies were submitted by letter dated November 15, 1976. These results are not in the administrative file. Subsequent permits did not require further testing; thus, the following is assumed:
(1) A 316(a) variance was not requested. Thermal discharges do not violate Florida Water Quality Standards for thermal pollutants and
(2) The intake structure reflects best technology available to minimize adverse environmental impact.

VI. EFFLUENT LIMITATIONS

A. OSN 001

1. This outfall is identified as the combined discharge of once through cooling water from Unit No. 4 and 5 and auxiliary equipment cooling water Fork of New River (after cooling canal/pond residence).

2. Limitations and monitoring requirements for this outfall are included in accordance with the previous NPDES permit. Samples taken in compliance with these monitoring requirements shall be taken at the outlet corresponding to each individual unit.

3. The discharge of free available chlorine or total residual chlorine is not permitted. Should the permittee desire to reinstitute chlorination, the permittee should request a permit modification not later than four (4) months prior to the reinstitution of chlorination.

B. OSN 004

1. This outfall is identified as the discharge of intake screen wash water to Dania Cut-off Canal.

2. The discharge of intake screen wash water is permitted without limitations or monitoring.

C. OSN 005 - 1 thru 8

1. These outfalls are identified as the discharges of non-equipment area stormwater runoff. The locations of these outfalls are shown in Attachment 2 of the permit. It is the permit writer's best professional judgement that these discharges of stormwater runoff are uncontaminated. The outfalls are enumerated only for identification purposes. No monitoring is required at this time.

2. Discharge of stormwater runoff is permitted without limitations or monitoring requirements.

D. Part III

1. FP&L, Lauderdale Plant is a major industrial discharger and as such discharge monitoring reports must be submitted monthly.

2. Special Condition B is included in accordance with 40 CFR 423.13(a).

3. Special Condition C, D, and E are included in accordance with regional policy.

VII. ADMINISTRATIVE RECORD

An administrative record including application, fact sheet, draft permit, comments received, and additional information on hearing procedures is available by writing the EPA address above, or for review and copying at 345 Courtland Street, N.E., 3rd floor, Atlanta, Georgia, 30365, between the hours of 8:15a.m. and 4:30p.m. Monday through Friday. Copies will be provided at a cost of 20 cents per page.

VIII. RESULTS OF STATE CERTIFICATION

State certification was requested on January 29, 1987.

IX. REFERENCES AND CITED DOCUMENTS

All materials and documents referenced or cited in this fact sheet are either part of the Administrative Record as described in item VII above or are readily availabe at EPA, Region IV. Information regarding these materials may be obtained from the person listed below.

X. EPA CONTACT

Additional information concerning the permit may be obtained at tne address and during hours noted in item VII from:

Ms. Suzanne D. Potter
Public Notice Coordinator
404/347-3004

XI. PROCEDURES FOR THE FORMULATION OF FINAL DETERMINATIONS

A. Comment Period

The Environmental Protection Agency proposes to issue and NPDES permit to this applicant subject to the aforementioned effluent limitations and special conditions. These determinations are tentative and open to comment from the public.

Interested persons are invited to submit written comments regarding permit issuance or the proposed permit limitations and conditions to the following address:

Environmental Protection Agency
345 Courtland Street, NE
Atlanta, Georgia 30365
ATTN: Ms. Suzanne D. Potter, Public Notice Coordinator

All comments received within thirty (30) days following the date of public notice will be considered in the formulation of final determinations with regard to proposed permit issuance.

B. Public Hearing

The EPA Regional Administrator will hold a public hearing if there is a significant degree of public interest in a proposed permit or group of permits, or if he determines that useful information and data may be obtained thereby. Public Notice of such a hearing will be circulated at least thirty days prior to the hearing.

C. Issuance of the Permit

After consideration of all written comments and of the requirements and policies in the Act and appropriate regulations, and, if a public hearing is held, after consideration of all comments, statements and data presented at the hearing, the EPA Regional Administrator will make determinations regarding the permit issuance. If the determinations are substantially unchanged from the tentative determinations outlined above, the Regional Administrator will so notify all persons submitting written comments, and, if a public hearing was held, all persons participating in the hearing. If the determinations are substantially changed, the EPA Regional Administrator will issue a public notice indicating the revised determinations.

Unless a request for an evidentiary hearing is granted, the proposed permit contained in the Regional Administrator's determinations shall become issued and effective and will be the final action of the U. S. Environmental Protection Agency.

D. Evidentiary Hearing

If the determination are substantially unchanged, any interested person may submit a request for an evidentiary hearing on the permit and its conditions within thirty (30) days of the receipt of the notice described in Section C. If the determinations are substantially changed, any interested person may submit a request for an evidentiary hearing within thirty days of the date of the public notice or of the date of becoming aware of the determinations, which ever comes first. Such requests will be within the time period if mailed by Certified Mail within the thirty day period to the Regional Hearing Clerk, Environmental Protection Agency, 345 Courtland Street, N.E., Atlanta, Georgia 30365. All requests must contain:

(1) The name, mailing address and telephone number of the person making such request;

(2) A clear and concise factual statement of the nature and scope of the interest of the requester;

(3) The names and addresses of all persons whom the requester represents; and

(4) A statement by the requester that, upon motion of any party, or sua sponte by the Presiding Officer and without cost or expense to any other party, the requester shall make available to appear and testify, the following:

(i) The requester;

(ii) All persons represented by the requester, and

(iii) All officers, directors, employees, consultants and agents of the requester and the persons represented by the requester.

(5) Specific references to the contested permit terms and conditions, as well as suggested revised or alternative permit terms and conditions (not excluding permit denial) which, in the judgement of the requester, would be required to implement the purposes and policies of the Act.

(6) In the case of challenges to the application of control or treatment technologies identified in the statement of basis or fact sheet, identification of the basis for the objection, and the alternative technologies or combination of technologies which the requester believes are necessary to meet the requirements of the Act.

(7) Specific identification of each of the discharger's obligations which should be stayed if the request is granted. If the request contests more than one permit term or condition then each obligation which is proposed to be stayed must be referenced to the particular contested term warranting the stay.

(8) Each legal or factual question alleged to be at issue and its relevance to the permit decision.

(9) An estimate of the hearing time necessary for adjudication.

(10) Information supporting the request or relied upon which is not already a part of the administrative record required by 40 CFR 124.18 (48 Fed. Reg. 14272, April 1, 1983).

(1) The name, mailing address and telephone number of the person making such request;

(2) A clear and concise factual statement of the nature and scope of the interest of the requester;

(3) The names and addresses of all persons whom the requester represents; and

(4) A statement by the requester that, upon motion of any party, or sua sponte by the Presiding Officer and without cost or expense to any other party, the requester shall make available to appear and testify, the following:

(i) The requester;

(ii) All persons represented by the requester, and

(iii) All officers, directors, employees, consultants and agents of the requester and the persons represented by the requester.

(5) Specific references to the contested permit terms and conditions, as well as suggested revised or alternative permit terms and conditions (not excluding permit denial) which, in the judgement of the requester, would be required to implement the purposes and policies of the Act.

(6) In the case of challenges to the application of control or treatment technologies identified in the statement of basis or fact sheet, identification of the basis for the objection, and the alternative technologies or combination of technologies which the requester believes are necessary to meet the requirements of the Act.

(7) Specific identification of each of the discharger's obligations which should be stayed if the request is granted. If the request contests more than one permit term or condition then each obligation which is proposed to be stayed must be referenced to the particular contested term warranting the stay.

(8) Each legal or factual question alleged to be at issue and its relevance to the permit decision.

(9) An estimate of the hearing time necessary for adjudication.

(10) Information supporting the request or relied upon which is not already a part of the administrative record required by 40 CFR 124.18 (48 Fed. Reg. 14272, April 1, 1983).

The granting of a request will stay only the contested portions of the permit. Uncontested provisions of the permit shall be considered issued and effective and the permittee must comply with such provisions. Except, if the permit is for a new source or new discharge, the applicant will be without a permit for the proposed new source or new discharge, pending final Agency action. The final Agency decision on the permit provisions contested at an evidentiary hearing will be made in accordance with Title 40, Code of Federal Regulation, Subpart E, found at 48 Federal Register 14278, et seq.

APPENDIX 10.1.2

NPDES PERMIT APPLICATION

Please print or type in the unshaded areas only (fill-in areas are spaced for elite type, i.e., 12 characters/inch).

Form Approved OMB No 2040-0086 Approval expires 7-31-88

FORM 1 GENERAL

EPA

U.S. ENVIRONMENTAL PROTECTION AGENCY

GENERAL INFORMATION

Consolidated Permits Program

(Read the "General Instructions" before starting.)

I. EPA I.D. NUMBER

F FLD000807453 D

LABEL ITEMS

I. EPA I.D. NUMBER

III. FACILITY NAME

V. FACILITY MAILING ADDRESS

VI. FACILITY LOCATION

PLEASE PLACE LABEL IN THIS SPACE

GENERAL INSTRUCTIONS

If a preprinted label has been provided, affix it in the designated space. Review the information carefully; if any of it is incorrect, cross through it and enter the correct data in the appropriate fill-in area below. Also, if any of the preprinted data is absent *(the area to the left of the label space lists the information that should appear)*, please provide it in the proper fill-in area(s) below. If the label is complete and correct, you need not complete Items I, III, V, and VI *(except VI-B which must be completed regardless)*. Complete all items if no label has been provided. Refer to the instructions for detailed item descriptions and for the legal authorizations under which this data is collected.

II. POLLUTANT CHARACTERISTICS

INSTRUCTIONS: Complete A through J to determine whether you need to submit any permit application forms to the EPA. If you answer "yes" to any questions, you must submit this form and the supplemental form listed in the parenthesis following the question. Mark "X" in the box in the third column if the supplemental form is attached. If you answer "no" to each question, you need not submit any of these forms. You may answer "no" if your activity is excluded from permit requirements; see Section C of the instructions. See also, Section D of the instructions for definitions of bold-faced terms.

SPECIFIC QUESTIONS	MARK 'X' YES	NO	FORM ATTACHED
A. Is this facility a publicly owned treatment works which results in a discharge to waters of the U.S.? (FORM 2A)		X	
B. Does or will this facility *(either existing or proposed)* include a concentrated animal feeding operation or aquatic animal production facility which results in a discharge to waters of the U.S.? (FORM 2B)		X	
C. Is this a facility which currently results in discharges to waters of the U.S. other than those described in A or B above? (FORM 2C)	X		
D. Is this a proposed facility *(other than those described in A or B above)* which will result in a discharge to waters of the U.S.? (FORM 2D)		X	
E. Does or will this facility treat, store, or dispose of hazardous wastes? (FORM 3)		X	
F. Do you or will you inject at this facility industrial or municipal effluent below the lowermost stratum containing, within one quarter mile of the well bore, underground sources of drinking water? (FORM 4)		X	
G. Do you or will you inject at this facility any produced water or other fluids which are brought to the surface in connection with conventional oil or natural gas production, inject fluids used for enhanced recovery of oil or natural gas, or inject fluids for storage of liquid hydrocarbons? (FORM 4)		X	
H. Do you or will you inject at this facility fluids for special processes such as mining of sulfur by the Frasch process, solution mining of minerals, in situ combustion of fossil fuel, or recovery of geothermal energy? (FORM 4)		X	
I. Is this facility a proposed stationary source which is one of the 28 industrial categories listed in the instructions and which will potentially emit 100 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an attainment area? (FORM 5)	X		
J. Is this facility a proposed stationary source which is NOT one of the 28 industrial categories listed in the instructions and which will potentially emit 250 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an attainment area? (FORM 5)		X	

III. NAME OF FACILITY

1 SKIP FPL LAUDERDALE STEAM ELECTRIC POWER PLANT

IV. FACILITY CONTACT

A. NAME & TITLE *(last, first, & title)*	B. PHONE *(area code & no.)*
2 ARNOTT, D.H. PLANT MANAGER	305 797 1502

V. FACILITY MAILING ADDRESS

A. STREET OR P.O. BOX			
3 P.O.BOX 115			
B. CITY OR TOWN	**C. STATE**	**D. ZIP CODE**	
4 DANIA	FL	33004	

VI. FACILITY LOCATION

A. STREET, ROUTE NO. OR OTHER SPECIFIC IDENTIFIER			
5 SW 42nd Street, 2 miles west off Ravenswood Road			
B. COUNTY NAME			
BROWARD			
C. CITY OR TOWN	**D. STATE**	**E. ZIP CODE**	**F. COUNTY CODE** *(if known)*
6 FORT LAUDERDALE	FL	33314	

EPA Form 3510-1 (Rev. 10-80)

CONTINUE ON REVERSE

CONTINUED FROM THE FRONT

VII. SIC CODES (4-digit, in order of priority)

A. FIRST	B. SECOND
4911 (specify) Electric Generation	(specify)

C. THIRD	D. FOURTH
(specify)	(specify)

VIII. OPERATOR INFORMATION

A. NAME

FLORIDA POWER & LIGHT COMPANY

B. Is the name listed in Item VIII-A also the owner? ☒ YES ☐ NO

C. STATUS OF OPERATOR (Enter the appropriate letter into the answer box; if "Other", specify.)

F = FEDERAL
S = STATE
P = PRIVATE
M = PUBLIC (other than federal or state)
O = OTHER (specify)

P (specify)

D. PHONE (area code & no.)

A 407 640 2030

E. STREET OR P.O. BOX

P.O. BOX 078768

F. CITY OR TOWN

B WEST PALM BEACH

G. STATE FL

H. ZIP CODE 33407

IX. INDIAN LAND

Is the facility located on Indian lands? ☐ YES ☒ NO

X. EXISTING ENVIRONMENTAL PERMITS

A. NPDES (Discharges to Surface Water)	D. PSD (Air Emissions from Proposed Sources)
9 N FL 0001503	9 P

B. UIC (Underground Injection of Fluids)	E. OTHER (specify)
9 U	9 IHW-102-89 (specify) BCEQCB Permit (Broward County)

C. RCRA (Hazardous Wastes)	E. OTHER (specify)
9 R	9 I0061587 22 (specify) State IWWTS Permit

XI. MAP

Attach to this application a topographic map of the area extending to at least one mile beyond property bounderies. The map must show the outline of the facility, the location of each of its existing and proposed intake and discharge structures, each of its hazardous waste treatment, storage, or disposal facilities, and each well where it injects fluids underground. Include all springs, rivers and other surface water bodies in the map area. See instructions for precise requirements.

XII. NATURE OF BUSINESS (provide a brief description)

ELECTRIC POWER GENERATING PLANT

XIII. CERTIFICATION (see instructions)

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this application and all attachments and that, based on my inquiry of those persons immediately responsible for obtaining the information contained in the application, I believe that the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

A. NAME & OFFICIAL TITLE (type or print)	B. SIGNATURE	C. DATE SIGNED
Martin A. Smith, Ph.D., Manager Environmental Permitting & Programs		11/27/89

COMMENTS FOR OFFICIAL USE ONLY

C

EPA Form 3510-1 (Rev. 10-80) Reverse

Please print or type in the unshaded areas only.

EPA I.D. NUMBER (copy from Item 1 of Form 1)
FLD 0 0 0 8 0 7 4 5 3

Form Approved.
OMB No. 2040-0086
Approval expires 7-31-83

FORM 2C NPDES

EPA

U.S. ENVIRONMENTAL PROTECTION AGENCY
APPLICATION FOR PERMIT TO DISCHARGE WASTEWATER
EXISTING MANUFACTURING, COMMERCIAL, MINING AND SILVICULTURAL OPERATIONS
Consolidated Permits Program

I. OUTFALL LOCATION

For each outfall, list the latitude and longitude of its location to the nearest 15 seconds and the name of the receiving water.

A. OUTFALL NUMBER (list)	B. LATITUDE			C. LONGITUDE			D. RECEIVING WATER (name)
	1. DEG.	2. MIN.	3. SEC.	1. DEG.	2. MIN.	3. SEC.	
001	26	05	08	80	10	55	South Fork of New River
004	26	04	01	80	11	58	Facility Intake from Dania Cut-Off Canal
005	26	04	01	80	11	58	Dania Cut-Off Canal(5 Release Points)
005	26	05	08	80	10	55	South Fork of New River Through Cooling Canal/Pond (4 Release Points)

II. FLOWS, SOURCES OF POLLUTION, AND TREATMENT TECHNOLOGIES

A. Attach a line drawing showing the water flow through the facility. Indicate sources of intake water, operations contributing wastewater to the effluent, and treatment units labeled to correspond to the more detailed descriptions in Item B. Construct a water balance on the line drawing by showing average flows between intakes, operations, treatment units, and outfalls. If a water balance cannot be determined *(e.g., for certain mining activities)*, provide a pictorial description of the nature and amount of any sources of water and any collection or treatment measures.

B. For each outfall, provide a description of: (1) All operations contributing wastewater to the effluent, including process wastewater, sanitary wastewater, cooling water, and storm water runoff; (2) The average flow contributed by each operation; and (3) The treatment received by the wastewater. Continue on additional sheets if necessary.

1. OUTFALL NO. (list)	2. OPERATION(S) CONTRIBUTING FLOW		3. TREATMENT		
	a. OPERATION (list)	b. AVERAGE FLOW (include units)	a. DESCRIPTION	b. LIST CODES FROM TABLE 2C-1	
001	Once through condenser cooling water for Unit #4, Unit #5 and auxiliary equipment water ; Effluent from central treatment facility+	256,781 GPM	Screening and treatment Discharge to surface water (after cooling canal/pond residence.)	1-T 4-A	
004	Intake screen wash water for Unit #4 and Unit #5	600 GPM	Discharge to surface water	4-A	
005*	Non-equipment area Stormwater runoff (consists of 9 release points)	Variable	Discharge to surface water	4-A	

*Analytical data for non-equipment area storm water was not required for the existing NPDES permit. There are no limitations or monitoring requirements for the discharge of stormwater runoff.

+ Analytical data for the proposed central wastewater treatment facility effluent will be collected and analyzed at the start-up of the wastewater treatment facility. The estimated water quality for various parameters are given in Table IV-1.

OFFICIAL USE ONLY *(effluent guidelines sub-categories)*

CONTINUED FROM THE FRONT

C. Except for storm runoff, leaks, or spills, are any of the discharges described in Items II-A or B intermittent or seasonal?

☐ YES *(complete the following table)* ☒ NO *(go to Section III)*

1. OUTFALL NUMBER *(list)*	2. OPERATION(s) CONTRIBUTING FLOW *(list)*	3. FREQUENCY		4. FLOW				
		a. DAYS PER WEEK *(specify average)*	b. MONTHS PER YEAR *(specify average)*	a. FLOW RATE *(in mgd)*		b. TOTAL VOLUME *(specify with units)*		c. DURATION *(in days)*
				1. LONG TERM AVERAGE	2. MAXIMUM DAILY	1. LONG TERM AVERAGE	2. MAXIMUM DAILY	

III. PRODUCTION

A. Does an effluent guideline limitation promulgated by EPA under Section 304 of the Clean Water Act apply to your facility?

☒ YES *(complete Item III-B)* ☐ NO *(to to Section IV)*

B. Are the limitations in the applicable effluent guideline expressed in terms of production *(or other measure of operation)*?

☐ YES *(complete Item III-C)* ☒ NO *(go to Section IV)*

C. If you answered "yes" to Item III-B, list the quantity which represents an actual measurement of your level of production, expressed in the terms and units used in the applicable effluent guideline, and indicate the affected outfalls.

1. AVERAGE DAILY PRODUCTION			2. AFFECTED OUTFALLS *(list outfall numbers)*
a. QUANTITY PER DAY	b. UNITS OF MEASURE	c. OPERATION, PRODUCT, MATERIAL, ETC. *(specify)*	

IV. IMPROVEMENTS

A. Are you now required by any Federal, State or local authority to meet any implementation schedule for the construction, upgrading or operation of wastewater treatment equipment or practices or any other environmental programs which may affect the discharges described in this application? This includes, but is not limited to, permit conditions, administrative or enforcement orders, enforcement compliance schedule letters, stipulations, court orders, and grant or loan conditions.

☐ YES *(complete the following table)* ☒ NO *(go to Item IV-B)*

1. IDENTIFICATION OF CONDITION, AGREEMENT, ETC.	2. AFFECTED OUTFALLS		3. BRIEF DESCRIPTION OF PROJECT	4. FINAL COMPLIANCE DATE	
	a. NO.	b. SOURCE OF DISCHARGE		a. REQUIRED	b. PROJECTED

B. OPTIONAL: You may attach additional sheets describing any additional water pollution control programs *(or other environmental projects which may affect your discharges)* you now have underway or which you plan. Indicate whether each program is now underway or planned, and indicate your actual or planned schedules for construction. ☒ MARK "X" IF DESCRIPTION OF ADDITIONAL CONTROL PROGRAMS IS ATTACHED

CONTINUED FROM PAGE 2

EPA I.D. NUMBER (copy from Item 1 of Form 1)
FLD 0 0 0 8 0 7 4 5 3

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OMB No. 2040-0086.
Approval expires 7-31-88

V. INTAKE AND EFFLUENT CHARACTERISTICS

A, B, & C: See instructions before proceeding – Complete one set of tables for each outfall – Annotate the outfall number in the space provided. NOTE: Tables V-A, V-B, and V-C are included on separate sheets numbered V-1 through V-9.

D. Use the space below to list any of the pollutants listed in Table 2c-3 of the instructions, which you know or have reason to believe is discharged or may be discharged from any outfall. For every pollutant you list, briefly describe the reasons you believe it to be present and report any analytical data in your possession.

1. POLLUTANT	2. SOURCE	1. POLLUTANT	2. SOURCE
N/A			

VI. POTENTIAL DISCHARGES NOT COVERED BY ANALYSIS

Is any pollutant listed in Item V-C a substance or a component of a substance which you currently use or manufacture as an intermediate or final product or byproduct?

☐ YES *(list all such pollutants below)* ☒ NO *(go to Item VI-B)*

N/A

PLEASE PRINT OR TYPE IN THE UNSHADED AREAS ONLY. You may report some or all of this information on separate sheets *(use the same format)* instead of completing these pages. SEE INSTRUCTIONS.

EPA I.D. NUMBER *(copy from Item 1 of Form 1)*: FLD 0 0 0 8 0 7 4 5 3

Form Approved OMB No. 2040-0086 Approval expires 7-31-88

V. INTAKE AND EFFLUENT CHARACTERISTICS *(continued from page 3 of Form 2-C)*

OUTFALL NO: 001

PART A - You must provide the results of at least one analysis for every pollutant in this table. Complete one table for each outfall. See instructions for additional details.

1. POLLUTANT	2. EFFLUENT a. MAXIMUM DAILY VALUE (1) CONCENTRATION	a. MAXIMUM DAILY VALUE (2) MASS	b. MAXIMUM 30 DAY VALUE (if available) (1) CONCENTRATION	b. MAXIMUM 30 DAY VALUE (if available) (2) MASS	c. LONG TERM AVRG. VALUE (if available) (1) CONCENTRATION	c. LONG TERM AVRG. VALUE (if available) (2) MASS	d. NO. OF ANALYSES	3. UNITS (specify if blank) a. CONCENTRATION	3. UNITS b. MASS	4. INTAKE (optional) a. LONG TERM AVERAGE VALUE (1) CONCENTRATION	4. INTAKE (optional) a. LONG TERM AVERAGE VALUE (2) MASS	4. INTAKE (optional) b. NO. OF ANALYSES
a. Biochemical Oxygen Demand *(BOD)*	4.2	1.3×10^4	4.2	1.3×10^4	1.5	4.6×10^3	12	mg/L	lb	1.5	4.6×10^3	12
b. Chemical Oxygen Demand *(COD)*	216	6.6×10^5	216	6.6×10^5	76.5	2.4×10^5	12	mg/L	lb	118.8	3.7×10^5	12
c. Total Organic Carbon *(TOC)*	47	1.5×10^5	47	1.5×10^5	34	1.1×10^5	*	mg/L	lb	14	4.3×10^4	*
d. Total Suspended Solids *(TSS)*	2	6.2×10^3	2	6.2×10^3	1.5	4.6×10^3	*	mg/L	lb	5.5	1.7×10^4	*
e. Ammonia *(as N)*	0.214	6.6×10^2	0.214	6.6×10^2	0.082	2.5×10^2	12	mg/L	lb	0.144	4.4×10^2	12
f. Flow	VALUE 369		VALUE 369		VALUE 369		Design X	MGD	Design X	VALUE 369		Design X
g. Temperature *(winter)*	VALUE 23.8		VALUE 23.8		VALUE 23.8		3	°C		VALUE 23.5		2
h. Temperature *(summer)*	VALUE 31.1		VALUE 31.1		VALUE 30.1		6	°C		VALUE 29.8		4
i. pH	MINIMUM 7.2	MAXIMUM 8.1	MINIMUM 7.2	MAXIMUM 8.1			12	STANDARD UNITS				

PART B - Mark "X" in column 2-a for each pollutant you know or have reason to believe is present. Mark "X" in column 2-b for each pollutant you believe to be absent. If you mark column 2a for any pollutant which is limited either directly, or indirectly but expressly, in an effluent limitations guideline, you must provide the results of at least one analysis for that pollutant. For other pollutants for which you mark column 2a, you must provide quantitative data or an explanation of their presence in your discharge. Complete one table for each outfall. See the instructions for additional details and requirements.

1. POLLUTANT AND CAS NO. *(if available)*	2. MARK 'X' a. BELIEVED PRESENT	2. MARK 'X' b. BELIEVED ABSENT	3. EFFLUENT a. MAXIMUM DAILY VALUE (1) CONCENTRATION	a. MAXIMUM DAILY VALUE (2) MASS	b. MAXIMUM 30 DAY VALUE (if available) (1) CONCENTRATION	b. MAXIMUM 30 DAY VALUE (if available) (2) MASS	c. LONG TERM AVRG. VALUE (if available) (1) CONCENTRATION	c. LONG TERM AVRG. VALUE (if available) (2) MASS	d. NO. OF ANALYSES	4. UNITS a. CONCENTRATION	4. UNITS b. MASS	5. INTAKE (optional) a. LONG TERM AVERAGE VALUE (1) CONCENTRATION	5. INTAKE (optional) a. LONG TERM AVERAGE VALUE (2) MASS	5. INTAKE (optional) b. NO. OF ANALYSES
a. Bromide (24959-67-9)	X		<1.0	-	<1.0	-	-	-	*'	mg/L	lb	<1.0	-	*'
b. Chlorine, Total Residual		X	-	-	-	-	-	-	-	-	-	-	-	-
c. Color	X		100	-	90	-	-	-	*	PCU	-	90	-	*
d. Fecal Coliform	X		130	1.8×10^2	130	1.8×10^{12}	29.2	4.1×10^{11}	12	No./100mL	No.	85.0	1.2×10^2	12
e. Fluoride (16984-48-8)	X		0.71	2.2×10^3	0.71	2.2×10^3	0.42	1.3×10^3	12	mg/L	lb	0.45	1.4×10^3	12
f. Nitrate-Nitrite *(as N)*	X		0.521	1.6×10^3	0.521	1.6×10^3	0.168	5.2×10^2	12	mg/L	lb	0.119	3.7×10^2	12

*based on historical data from previous permit 'below detection limits

10.1.2-6

ITEM V-B CONTINUED FROM FRONT

1. POLLUTANT AND CAS NO. (if available)	2. MARK 'X' a. BELIEVED PRESENT	2. MARK 'X' b. BELIEVED ABSENT	3. EFFLUENT a. MAXIMUM DAILY VALUE (1) CONCENTRATION	3. EFFLUENT a. MAXIMUM DAILY VALUE (2) MASS	3. EFFLUENT b. MAXIMUM 30 DAY VALUE (if available) (1) CONCENTRATION	3. EFFLUENT b. MAXIMUM 30 DAY VALUE (if available) (2) MASS	3. EFFLUENT c. LONG TERM AVRG. VALUE (if available) (1) CONCENTRATION	3. EFFLUENT c. LONG TERM AVRG. VALUE (if available) (2) MASS	3. EFFLUENT d. NO. OF ANALYSES	4. UNITS a. CONCENTRATION	4. UNITS b. MASS	5. INTAKE (optional) a. LONG TERM AVERAGE VALUE (1) CONCENTRATION	5. INTAKE (optional) a. LONG TERM AVERAGE VALUE (2) MASS	5. INTAKE (optional) b. NO. OF ANALYSES
g. Nitrogen, Total Organic (as N)	X		2.20	6.8×10^2	2.20	6.8×10^2	1.18	3.6×10^3	12	mg/L	lb	1.21	3.7×10^3	12
h. Oil and Grease	X		3.3	1.0×10^4	3.3	1.0×10^4	0.8	2.5×10^3	12	mg/L	lb	0.5	1.5×10^3	12
i. Phosphorus (as P), Total (7723-14-0)	X		0.069	2.1×10^2	0.069	2.1×10^2	0.036	1.1×10^2	12	mg/L	lb	0.043	1.3×10^2	12
j. Radioactivity														
(1) Alpha, Total		X												
(2) Beta, Total		X												
(3) Radium, Total		X												
(4) Radium 226, Total		X												
k. Sulfate (as SO_4) (14808-79-8)	X		1410	4.3×10^6	1410	4.3×10^6	690.3	2.1×10^6	12	mg/L	lb	695.3	2.1×10^6	12
l. Sulfide (as S)		X												
m. Sulfite (as SO_3) (14265-45-3)		X												
n. Surfactants	X		< 0.10	–	< 0.10	–	–	–	*'	mg/L	–	< 0.10	–	*'
o. Aluminum, Total (7429-90-5)	X		151	4.6×10^2	151	4.6×10^2	75.1	2.3×10^2	12	ug/L	lb	83.6	2.6×10^2	12
p. Barium, Total (7440-39-3)		X												
q. Boron, Total (7440-42-8)		X												
r. Cobalt, Total (7440-48-4)		X												
s. Iron, Total (7439-89-6)	X		1550	4.8×10^3	1550	4.8×10^3	530	1.6×10^3	12	ug/L	lb	693	2.1×10^3	12
t. Magnesium, Total (7439-95-4)	X		0.019	59	0.019	59	0.018	55	*	mg/L	lb	0.016	49	*
u. Molybdenum, Total (7439-98-7)	X		< 0.10	–	< 0.10	–	–	–	*	mg/L	–	< 0.10	–	*
v. Manganese, Total (7439-96-5)	X		< 0.05	–	< 0.05	–	–	–	*	mg/L	–	< 0.05	–	*
w. Tin, Total (7440-31-5)		X												
x. Titanium, Total (7440-32-6)		X												

*based on historical data from previous permit 'below detection limits

EPA I.D. NUMBER (copy from Item 1 of Form 1)	OUTFALL NUMBER
FLD 0 0 0 8 0 7 4 5 3	001

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CONTINUED FROM PAGE 3 OF FORM 2-C

PART C - If you are a primary industry and this outfall contains process wastewater, refer to Table 2c-2 in the instructions to determine which of the GC/MS fractions you must test for. Mark "X" in column 2-a for all such GC/MS fractions that apply to your industry and for ALL toxic metals, cyanides, and total phenols. If you are not required to mark column 2-a *(secondary industries, nonprocess wastewater outfalls, and nonrequired GC/MS fractions)*, mark "X" in column 2-b for each pollutant you know or have reason to believe is present. Mark "X" in column 2-c for each pollutant you believe is absent. If you mark column 2a for any pollutant, you must provide the results of at least one analysis for that pollutant. If you mark column 2b for any pollutant, you must provide the results of at least one analysis for that pollutant if you know or have reason to believe it will be discharged in concentrations of 10 ppb or greater. If you mark column 2b for acrolein, acrylonitrile, 2,4 dinitrophenol, or 2-methyl-4, 6 dinitrophenol, you must provide the results of at least one analysis for each of these pollutants which you know or have reason to believe that you discharge in concentrations of 100 ppb or greater. Otherwise, for pollutants for which you mark column 2b, you must either submit at least one analysis or briefly describe the reasons the pollutant is expected to be discharged. Note that there are 7 pages to this part; please review each carefully. Complete one table *(all 7 pages)* for each outfall. See instructions for additional details and requirements.

1. POLLUTANT AND CAS NUMBER (If available)	2. MARK 'X'			3. EFFLUENT						4. UNITS		5. INTAKE (optional)		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (if available)		c. LONG TERM AVRG. VALUE (if available)		d. NO. OF ANALYSES	a. CONCENTRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
METALS, CYANIDE, AND TOTAL PHENOLS															
1M. Antimony, Total (7440-36-0)	X			25.0	77	25.0	77	18.3	56	12	ug/L	lb	18.3	56	12
2M. Arsenic, Total (7440-38-2)	X			24.0	74	24.0	74	7.2	22	12	ug/L	lb	6.1	19	12
3M. Beryllium, Total, 7440-41-7)	X			3.3	10	3.3	10	2.0	6	12	ug/L	lb	2.0	6	12
4M. Cadmium, Total (7440-43-9)	X			<0.005	-	< 0.005	-	-	-	*'	ug/L	-	< 0.005	-	*'
5M, Chromium, Total (7440-47-3)	X			10.0	31	10.0	31	6.8	21	12	ug/L	lb	6.8	21	12
6M. Copper, Total (7440-50-8)	X			32.8	101	32.8	101	8.9	27	12	ug/L	lb	8.7	27	12
7M. Lead, Total (7439-92-1)	X			7.0	22	7.0	22	2.5	8	12	ug/L	lb	2.8	9	12
8M. Mercury, Total (7439-97-6)	X			2.7	8	2.7	8	0.6	2	12**	ug/L	lb	0.6	2	12**
9M. Nickel, Total (7440-02-0)	X			23.0	71	23.0	71	19.8	61	12	ug/L	lb	19.8	61	12
10M. Selenium, Total (7782-49-2)	X			31.5	97	31.5	97	12.6	39	12	ug/L	lb	12.7	39	12
11M. Silver, Total (7440-22-4)	X			0.5	2	0.5	2	0.5	2	12	ug/L	lb	0.5	2	12
12M. Thallium, Total (7440-28-0)	X			<150	-	<150	-	<150	-	1'	ug/L	-	< 150	-	1'
13M. Zinc, Total (7440-66-6)	X			40.4	124	40.4	124	13.0	40	12	ug/L	lb	16.5	51	12
14M. Cyanide, Total (57-12-5)	X			<0.003	-	<0.003	-	<0.003	-	1'	mg/L	-	<0.003	-	1'
15M. Phenols, Total	X			<2.0	-	<2.0	-	<2.0	-	1'	ug/L	-	<2.0	-	1'
DIOXIN															
2,3,7,8-Tetrachlorodibenzo-P-Dioxin (1764-01-6)				DESCRIBE RESULTS: Testing not required.											

*based on historical value from previous permit. [redacted]elow detection limits. **contaminated sample ho[redacted]s.

10.1.2-8

CONTINUED FROM THE FRONT

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK 'X' a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	3. EFFLUENT a. MAXIMUM DAILY VALUE (1) CONCENTRATION	(2) MASS	b. MAXIMUM 30 DAY VALUE (if available) (1) CONCENTRATION	(2) MASS	c. LONG TERM AVRG. VALUE (if available) (1) CONCENTRATION	(2) MASS	d. NO. OF ANALYSES	4. UNITS a. CONCENTRATION	b. MASS	5. INTAKE (optional) a. LONG TERM AVERAGE VALUE (1) CONCENTRATION	(2) MASS	b. NO. OF ANALYSES
GC/MS FRACTION – VOLATILE COMPOUNDS															
1V. Acrolein (107-02-8)	X			< 100	–	< 100	–	< 100	–	1	ug/L	–	< 100	–	1
2V. Acrylonitrile (107-13-1)	X			< 100	–	< 100	–	< 100	–	1	ug/L	–	< 100	–	1
3V. Benzene (71-43-2)	X			< 1.0	–	< 1.0	–	< 1.0	–	1	ug/L	–	< 1.0	–	1
4V. Bis (Chloromethyl) Ether (542-88-1)															
5V. Bromoform (75-25-2)	X			< 4.7	–	< 4.7	–	< 4.7	–	1	ug/L	–	< 4.7	–	1
6V. Carbon Tetrachloride (56-23-5)	X			< 2.8	–	< 2.8	–	< 2.8	–	1	ug/L	–	< 2.8	–	1
7V. Chlorobenzene (108-90-7)	X			< 6.0	–	< 6.0	–	< 6.0	–	1	ug/L	–	< 6.0	–	1
8V. Chlorodibromomethane (124-48-1)	X			< 2.2	–	< 2.2	–	< 2.2	–	1	ug/L	–	< 2.2	–	1
9V. Chloroethane (75-00-3)	X			< 8.2	–	< 8.2	–	< 8.2	–	1	ug/L	–	< 8.2	–	1
10V. 2-Chloroethylvinyl Ether (110-75-8)	X			< 15	–	< 15	–	< 15	–	1	ug/L	–	< 15	–	1
11V. Chloroform (67-66-3)	X			< 1.6	–	< 1.6	–	< 1.6	–	1	ug/l	–	< 1.6	–	1
12V. Dichlorobromomethane (75-27-4)	X			< 3.1	–	< 3.1	–	< 3.1	–	1	ug/L	–	< 3.1	–	1
13V. Dichlorodifluoromethane (75-71-8)	X			< 10	–	< 10	–	< 10	–	1	ug/L	–	< 10	–	1
14V. 1,1-Dichloroethane (75-34-3)	X			< 4.7	–	< 4.7	–	< 4.7	–	1	ug/L	–	< 4.7	–	1
15V. 1,2-Dichloroethane (107-06-2)	X			< 2.8	–	< 2.8	–	< 2.8	–	1	ug/L	–	< 2.8	–	1
16V. 1,1-Dichloroethylene (75-35-4)	X			< 2.8	–	< 2.8	–	< 2.8	–	1	ug/L	–	< 2.8	–	1
17V. 1,2-Dichloropropane (78-87-5)	X			< 6.0	–	< 6.0	–	< 6.0	–	1	ug/L	–	< 6.0	–	1
18V. 1,3-Dichloropropylene (542-75-6)	X			< 5.0	–	< 5.0	–	< 5.0	–	1	ug/L	–	< 5.0	–	1
19V. Ethylbenzene (100-41-4)	X			< 6.2	–	< 6.2	–	< 6.2	–	1	ug/L	–	< 6.2	–	1
20V. Methyl Bromide (74-83-9)	X			< 5.8	–	< 5.8	–	< 5.8	–	1	ug/L	–	< 5.8	–	1
21V. Methyl Chloride (74-87-3)	X			< 4.3	–	< 4.3	–	< 4.3	–	1	ug/L	–	< 4.3	–	1

EPA I.D. NUMBER (copy from Item 1 of Form 1): FLD 0 0 0 8 0 7 4 5 3 | OUTFALL NUMBER: 001

Form Approved.
OMB No 2040-0086
Approval expires 7-31-88

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK 'X' a. TEST INC. REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	3. EFFLUENT a. MAXIMUM DAILY VALUE (1) CONCENTRATION	(2) MASS	b. MAXIMUM 30 DAY VALUE (if available) (1) CONCENTRATION	(2) MASS	c. LONG TERM AVRG. VALUE (if available) (1) CONCENTRATION	(2) MASS	d. NO. OF ANALYSES	4. UNITS a. CONCENTRATION	b. MASS	5. INTAKE (optional) a. LONG TERM AVERAGE VALUE (1) CONCENTRATION	(2) MASS	b. NO. OF ANALYSES
GC/MS FRACTION – VOLATILE COMPOUNDS *(continued)*															
22V. Methylene Chloride (75-09-2)	X			◁ 5.0	–	◁ 5.0	–	◁ 5.0	–	1	ug/L	–	◁ 5.0	–	1
23V. 1,1,2,2-Tetrachloroethane (79-34-5)	X			◁ 4.1	–	◁ 4.1	–	◁ 4.1	–	1	ug/L	–	◁ 4.1	–	1
24V. Tetrachloroethylene (127-18-4)	X			◁ 3.0	–	◁ 3.0	–	◁ 3.0	–	1	ug/L	–	◁ 3.0	–	1
25V. Toluene (108-88-3)	X			◁ 6.0	–	◁ 6.0	–	◁ 6.0	–	1	ug/L	–	◁ 6.0	–	1
26V. 1,2-Trans-Dichloroethylene (156-60-5)	X			◁ 1.6	–	◁ 1.6	–	◁ 1.6	–	1	ug/L	–	◁ 1.6	–	1
27V. 1,1,1-Trichloroethane (71-55-6)	X			◁ 3.8	–	◁ 3.8	–	◁ 3.8	–	1	ug/1	–	◁ 3.8	–	1
28V. 1,1,2-Trichloroethane (79-00-5)	X			◁ 5.0	–	◁ 5.0	–	◁ 5.0	–	1	ug/L	–	◁ 5.0	–	1
29V. Trichloroethylene (79-01-6)	X			◁ 1.0	–	◁ 1.0	–	◁ 1.0	–	1	ug/L	–	◁ 1.0	–	1
30V. Trichlorofluoromethane (75-69-4)	X			◁ 3.2	–	◁ 3.2	–	◁ 3.2	–	1	ug/L	–	◁ 3.2	–	1
31V. Vinyl Chloride (75-01-4)	X			◁ 1.0	–	◁ 4.0	–	◁ 1.0	–	1	ug/L	–	◁ 1.0	–	1
GC/MS FRACTION – ACID COMPOUNDS															
1A. 2-Chlorophenol (95-57-8)	X			◁ 2.0	–	◁ 2.0	–	◁ 2.0	–	1	ug/L	–	◁ 2.0	–	1
2A. 2,4-Dichlorophenol (120-83-2)	X			◁ 2.0	–	◁ 2.0	–	◁ 2.0	–	1	ug/L	–	◁ 2.0	–	1
3A. 2,4-Dimethylphenol (105-67-9)	X			◁ 2.0	–	◁ 2.0	–	◁ 2.0	–	1	ug/L	–	◁ 2.0	–	1
4A. 4,6-Dinitro-O-Cresol (534-52-1)	X														
5A. 2,4-Dinitrophenol (51-28-5)	X			◁ 30	–	◁ 30	–	◁ 30	–	1	ug/L	–	◁ 30	–	1
6A. 2-Nitrophenol (88-75-5)	X			◁ 2.0	–	◁ 2.0	–	◁ 2.0	–	1	ug/L	–	◁ 2.0	–	1
7A. 4-Nitrophenol (100-02-7)	X			◁ 10	–	◁ 10	–	◁ 10	–	1	ug/L	–	◁ 10	–	1
8A. P-Chloro-M-Cresol (59-50-7)	X														
9A. Pentachlorophenol (87-86-5)	X			◁ 10	–	◁ 10		◁ 10	–	1	ug/L	–	◁ 10	–	1
10A. Phenol (108-95-2)	X			◁ 2.0	–	◁ 2.0	–	◁ 2.0	–	1	ug/L	–	◁ 2.0	–	1
11A. 2,4,6-Trichlorophenol (88-06-2)	X			◁ 3.0	–	◁ 3.0	–	◁ 3.0	–	1	ug/L	–	◁ 3.0	–	1

CONTINUED FROM THE FRONT

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK 'X' a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	3. EFFLUENT a. MAXIMUM DAILY VALUE (1) CONCENTRATION	(2) MASS	b. MAXIMUM 30 DAY VALUE (if available) (1) CONCENTRATION	(2) MASS	c. LONG TERM AVRG. VALUE (if available) (1) CONCENTRATION	(2) MASS	d. NO. OF ANALYSES	4. UNITS a. CONCENTRATION	b. MASS	5. INTAKE (optional) a. LONG TERM AVERAGE VALUE (1) CONCENTRATION	(2) MASS	b. NO. OF ANALYSES
GC/MS FRACTION – BASE/NEUTRAL COMPOUNDS															
1B. Acenaphthene (83-32-9)	X			◁ 1.0	–	◁ 1.0	–	◁ 1.0	–	1	ug/L	–	◁ 1.0	–	1
2B. Acenaphtylene (208-96-8)	X			◁ 1.0	–	◁ 1.0	–	◁ 1.0	–	1	ug/L	–	◁ 1.0	–	1
3B. Anthracene (120-12-7)	X			◁ 1.0	–	◁ 1.0	–	◁ 1.0	–	1	ug/L	–	◁ 1.0	–	1
4B. Benzidine (92-87-5)	X			◁ 5.0	–	◁ 5.0	–	◁ 5.0	–	1	ug/L	–	◁ 5.0	–	1
5B. Benzo *(a)* Anthracene (56-55-3)	X			◁ 1.0	–	◁ 1.0	–	◁ 1.0	–	1	ug/L	–	◁ 1.0	–	1
6B. Benzo *(a)* Pyrene (50-32-8)	X			◁ 2.0	–	◁ 2.0	–	◁ 2.0	–	1	ug/L	–	◁ 2.0	–	1
7B. 3,4-Benzo-fluoranthene (205-99-2)	X			◁ 1.5	–	◁ 1.5	–	◁ 1.5	–	1	ug/L	–	◁ 1.5	–	1
8B. Benzo *(ghi)* Perylene (191-24-2)	X			◁ 2.5	–	◁ 2.5	–	◁ 2.5	–	1	ug/L	–	◁ 2.5	–	1
9B. Benzo *(k)* Fluoranthene (207-08-9)	X			◁ 1.5	–	◁ 1.5	–	◁ 1.5	–	1	ug/L	–	◁ 1.5	–	1
10B. Bis *(2-Chloro-ethoxy)* Methane (111-91-1)	X			◁ 1.0	–	◁ 1.0	–	◁ 1.0	–	1	ug/L	–	◁ 1.0	–	1
11B. Bis *(2-Chloro-ethyl)* Ether (111-44-4)	X			◁ 1.0	–	◁ 1.0	–	◁ 1.0	–	1	ug/L	–	◁ 1.0	–	1
12B. Bis *(2-Chloroiso-propyl)* Ether (102-60-1)	X			◁ 1.0	–	◁ 1.0	–	◁ 1.0	–	1	ug/L	–	◁ 1.0	–	1
13B. Bis *(2-Ethyl-hexyl)* Phthalate (117-81-7)	X			◁ 1.0	–	◁ 1.0	–	◁ 1.0	–	1	ug/L	–	◁ 1.0	–	1
14B. 4-Bromo-phenyl Phenyl Ether (101-55-3)	X			◁ 2.0	–	◁ 2.0	–	◁ 2.0	–	1	ug/L	–	◁ 2.0	–	1
15B. Butyl Benzyl Phthalate (85-68-7)	X			◁ 1.5	–	◁ 1.5	–	◁ 1.5	–	1	ug/L	–	◁ 1.5	–	1
16B. 2-Chloro-naphthalene (91-58-7)	X			◁ 1.0	–	◁ 1.0	–	◁ 1.0	–	1	ug/L	–	◁ 1.0	–	1
17B. 4-Chloro-phenyl Phenyl Ether (7005-72-3)	X			◁ 1.5	–	◁ 1.5	–	◁ 1.5	–	1	ug/L	–	◁ 1.5	–	1
18B. Chrysene (218-01-9)	X			◁ 1.0	–	◁ 1.0	–	◁ 1.0	–	1	ug/L	–	◁ 1.0	–	1
19B. Dibenzo *(a,h)* Anthracene (53-70-3)	X			◁ 2.5	–	◁ 2.5	–	◁ 2.5	–	1	ug/L	–	◁ 2.5	–	1
20B. 1,2-Dichloro-benzene (95-50-1)	X			◁ 1.0	–	◁ 1.0	–	◁ 1.0	–	1	ug/L	–	◁ 1.0	–	1
21B. 1,3-Dichloro-benzene (541-73-1)	X			◁ 1.0	–	◁ 1.0	–	◁ 1.0	–	1	ug/L	–	◁ 1.0	–	1

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK 'X' a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	3. EFFLUENT a. MAXIMUM DAILY VALUE (1) CONCENTRATION	(2) MASS	b. MAXIMUM 30 DAY VALUE (if available) (1) CONCENTRATION	(2) MASS	c. LONG TERM AVRG. VALUE (if available) (1) CONCENTRATION	(2) MASS	d. NO. OF ANALYSES	4. UNITS a. CONCENTRATION	b. MASS	5. INTAKE (optional) a. LONG TERM AVERAGE VALUE (1) CONCENTRATION	(2) MASS	b. NO. OF ANALYSES
GC/MS FRACTION – BASE/NEUTRAL COMPOUNDS (continued)															
22B. 1,4-Dichlorobenzene (106-46-7)	X			◁ 1.0	–	◁ 1.0	–	◁ 1.0	–	1	ug/L	–	◁ 1.0	–	1
23B. 3,3'-Dichlorobenzidine (91-94-1)	X			◁ 3.0	–	◁ 3.0	–	◁ 3.0	–	1	ug/L	–	◁ 3.0	–	1
24B. Diethyl Phthalate (84-66-2)	X			◁ 1.0	–	◁ 1.0	–	◁ 1.0	–	1	ug/L	–	◁ 1.0	–	1
25B. Dimethyl Phthalate (131-11-3)	X			◁ 1.0	–	◁ 1.0	–	◁ 1.0	–	1	ug/L	–	◁ 1.0	–	1
26B. Di-N-Butyl Phthalate (84-74-2)	X			◁ 1.0	–	◁ 1.0	–	◁ 1.0	–	1	ug/L	–	◁ 1.0	–	1
27B. 2,4-Dinitrotoluene (121-14-2)	X			◁ 2.0	–	◁ 2.0	–	◁ 2.0	–	1	ug/L	–	◁ 2.0	–	1
28B. 2,6-Dinitrotoluene (606-20-2)	X			◁ 2.0	–	◁ 2.0	–	◁ 2.0	–	1	ug/L	–	◁ 2.0	–	1
29B. Di-N-Octyl Phthalate (117-84-0)	X			◁ 2.0	–	◁ 2.0	–	◁ 2.0	–	1	ug/L	–	◁ 2.0	–	1
30B. 1,2-Diphenylhydrazine (as Azobenzene) (122-66-7)	X			◁ 1.0	–	◁ 1.0	–	◁ 1.0	–	1	ug/L	–	◁ 1.0	–	1
31B. Fluoranthene (206-44-0)	X			◁ 1.0	–	◁ 1.0	–	◁ 1.0	–	1	ug/L	–	◁ 1.0	–	1
32B. Fluorene (86-73-7)	X			◁ 1.0	–	◁ 1.0	–	◁ 1.0	–	1	ug/L	–	◁ 1.0	–	1
33B. Hexachlorobenzene (118-74-1)	X			◁ 1.0	–	◁ 1.0	–	◁ 1.0	–	1	ug/L	–	◁ 1.0	–	1
34B. Hexachlorobutadiene (87-68-3)	X			◁ 2.0	–	◁ 2.0	–	◁ 2.0	–	1	ug/L	–	◁ 2.0	–	1
35B. Hexachlorocyclopentadiene (77-47-4)	X			◁ 2.0	–	◁ 2.0	–	◁ 2.0	–	1	ug/L	–	◁ 2.0	–	1
36B. Hexachloroethane (67-72-1)	X			◁ 1.0	–	◁ 1.0	–	◁ 1.0	–	1	ug/L	–	◁ 1.0	–	1
37B. Indeno (1,2,3-cd) Pyrene (193-39-5)	X			◁ 2.5	–	◁ 2.5	–	◁ 2.5	–	1	ug/L	–	◁ 2.5	–	1
38B. Isophorone (78-59-1)	X			◁ 1.0	–	◁ 1.0	–	◁ 1.0	–	1	ug/L	–	◁ 1.0	–	1
39B. Naphthalene (91-20-3)	X			◁ 1.0	–	◁ 1.0	–	◁ 1.0	–	1	ug/L	–	◁ 1.0	–	1
40B. Nitrobenzene (98-95-3)	X			◁ 1.0	–	◁ 1.0	–	◁ 1.0	–	1	ug/L	–	◁ 1.0	–	1
41B. N-Nitrosodimethylamine (62-75-9)	X			◁ 1.5	–	◁ 1.5	–	◁ 1.5	–	1	ug/L	–	◁ 1.5	–	1
42B. N-Nitrosodi-N-Propylamine (621-64-7)	X			◁ 1.0	–	◁ 1.0	–	◁ 1.0	–	1	ug/L	–	◁ 1.0	–	1

CONTINUED FROM THE FRONT

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK 'X' a. TEST INCLUDED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	3. EFFLUENT a. MAXIMUM DAILY VALUE (1) CONCENTRATION	a. MAXIMUM DAILY VALUE (2) MASS	b. MAXIMUM 30 DAY VALUE (if available) (1) CONCENTRATION	b. MAXIMUM 30 DAY VALUE (if available) (2) MASS	c. LONG TERM AVRG. VALUE (if available) (1) CONCENTRATION	c. LONG TERM AVRG. VALUE (if available) (2) MASS	d. NO. OF ANALYSES	4. UNITS a. CONCENTRATION	4. UNITS b. MASS	5. INTAKE (optional) a. LONG TERM AVERAGE VALUE (1) CONCENTRATION	5. INTAKE (optional) a. LONG TERM AVERAGE VALUE (2) MASS	5. INTAKE (optional) b. NO. OF ANALYSES
GC/MS FRACTION – BASE/NEUTRAL COMPOUNDS *(continued)*															
43B. N-Nitrosodiphenylamine (86-30-6)	X			≤1.0	–	≤1.0	–	≤1.0	–	–	ug/L	–	≤1.0	–	1
44B. Phenanthrene (85-01-8)	X			≤1.0	–	≤1.0	–	≤1.0	–	–	ug/L	–	≤1.0	–	1
45B. Pyrene (129-00-0)	X			≤1.0	–	≤1.0	–	≤1.0	–	–	ug/L	–	≤1.0	–	1
46B. 1,2,4-Trichlorobenzene (120-82-1)	X			≤1.0	–	≤1.0	–	≤1.0	–	–	ug/L	–	≤1.0	–	1
GC/MS FRACTION – PESTICIDES															
1P. Aldrin (309-00-2)	X			≤0.006	–	≤0.006	–	≤0.006	–	–	ug/L	–	≤0.006	–	1
2P. α-BHC (319-84-6)	X			≤0.006	–	≤0.006	–	≤0.006	–	–	ug/L	–	≤0.006	–	1
3P. β-BHC (319-85-7)	X			≤0.006	–	≤0.006	–	≤0.006	–	–	ug/L	–	≤0.006	–	1
4P. γ-BHC (58-89-9)	X			≤0.006	–	≤0.006	–	≤0.006	–	–	ug/L	–	≤0.006	–	1
5P. δ-BHC (319-86-8)	X			≤0.006	–	≤0.006	–	≤0.006	–	–	ug/L	–	≤0.006	–	1
6P. Chlordane (57-74-9)	X			≤0.029	–	≤0.029	–	≤0.029	–	–	ug/L	–	≤0.029	–	1
7P. 4,4'-DDT (50-29-3)	X			≤0.006	–	≤0.006	–	≤0.006	–	–	ug/L	–	≤0.006	–	1
8P. 4,4'-DDE (72-55-9)	X			≤0.006	–	≤0.006	–	≤0.006	–	–	ug/L	–	≤0.006	–	1
9P. 4,4'-DDD (72-54-8)	X			≤0.029	–	≤0.029	–	≤0.029	–	–	ug/L	–	≤0.029	–	1
10P. Dieldrin (60-57-1)	X			≤0.006	–	≤0.006	–	≤0.006	–	–	ug/L	–	≤0.006	–	1
11P. α-Endosulfan (115-29-7)	X			≤0.006	–	≤0.006	–	≤0.006	–	–	ug/L	–	≤0.006	–	1
12P. β-Endosulfan (115-29-7)	X			≤0.006	–	≤0.006	–	≤0.006	–	–	ug/L	–	≤0.006	–	1
13P. Endosulfan Sulfate (1031-07-8)	X			≤0.029	–	≤0.029	–	≤0.029	–	–	ug/L	–	≤0.029	–	1
14P. Endrin (72-20-8)	X			≤0.006	–	≤0.006	–	≤0.006	–	–	ug/L	–	≤0.006	–	1
15P. Endrin Aldehyde (7421-93-4)	X			≤0.006	–	≤0.006	–	≤0.006	–	–	ug/L	–	≤0.006	–	1
16P. Heptachlor (76-44-8)	X			≤0.006	–	≤0.006	–	≤0.006	–	–	ug/L	–	≤0.006	–	1

CONTINUED FROM PAGE V-8

1. POLLUTANT AND CAS NUMBER (if available)	2. MARK 'X' a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	3. EFFLUENT a. MAXIMUM DAILY VALUE (1) CONCENTRATION	(2) MASS	b. MAXIMUM 30 DAY VALUE (if available) (1) CONCENTRATION	(2) MASS	c. LONG TERM AVRG. VALUE (if available) (1) CONCENTRATION	(2) MASS	d. NO. OF ANALYSES	4. UNITS a. CONCENTRATION	b. MASS	5. INTAKE (optional) a. LONG TERM AVERAGE VALUE (1) CONCENTRATION	(2) MASS	b. NO. OF ANALYSES
GC/MS FRACTION – PESTICIDES *(continued)*															
17P. Heptachlor Epoxide (1024-57-3)	X			◁ 0.006	–	◁0.006	–	◁ 0.006	–	1	ug/L	–	◁ 0.006	–	1
18P. PCB-1242 (53469-21-9)	X			◁ 0.118	–	◁0.118	–	◁ 0.118	–	1	ug/L	–	◁ 0.118	–	1
19P. PCB-1254 (11097-69-1)	X			◁ 0.118	–	◁0.118	–	◁ 0.118	–	1	ug/L	–	◁ 0.118	–	1
20P. PCB-1221 (11104-28-2)	X			◁ 0.118	–	◁0.118	–	◁ 0.118	–	1	ug/L	–	◁ 0.118	–	1
21P. PCB-1232 (11141-16-5)	X			◁ 0.118	–	◁0.118	–	◁ 0.118	–	1	ug/L	–	◁ 0.118	–	1
22P. PCB-1248 (12672-29-6)	X			◁ 0.118	–	◁0.118	–	◁ 0.118	–	1	ug/L	–	◁ 0.118	–	1
23P. PCB-1260 (11096-82-5)	X			◁ 0.118	–	◁0.118	–	◁ 0.118	–	1	ug/L	–	◁ 0.118	–	1
24P. PCB-1016 (12674-11-2)	X			◁ 0.118	–	◁0.118	–	◁ 0.118	–	1	ug/L	–	◁ 0.118	–	1
25P. Toxaphene (8001-35-2)	X			◁ 0.588	–	◁0.588	–	◁ 0.588	–	1	ug/L	–	◁ 0.588	–	1

PLEASE PRINT OR TYPE IN THE UNSHADED AREAS ONLY. You may report some or all of this information on separate sheets *(use the same format)* instead of completing these pages. SEE INSTRUCTIONS.

EPA I.D. NUMBER *(copy from Item 1 of Form 1)*

Form Approved. OMB No. 2040-0086 Approval expires 7-31-88

V. INTAKE AND EFFLUENT CHARACTERISTICS *(continued from page 3 of Form 2-C)*

OUTFALL NO. 001

PART A - You must provide the results of at least one analysis for every pollutant in this table. Complete one table for each outfall. See instructions for additional details.

1. POLLUTANT	2. EFFLUENT a. MAXIMUM DAILY VALUE (1) CONCENTRATION	a. MAXIMUM DAILY VALUE (2) MASS	b. MAXIMUM 30 DAY VALUE (if available) (1) CONCENTRATION	b. MAXIMUM 30 DAY VALUE (if available) (2) MASS	c. LONG TERM AVRG. VALUE (if available) (1) CONCENTRATION	c. LONG TERM AVRG. VALUE (if available) (2) MASS	d. NO. OF ANALYSES	3. UNITS (specify if blank) a. CONCENTRATION	3. UNITS b. MASS	4. INTAKE (optional) a. LONG TERM AVERAGE VALUE (1) CONCENTRATION	a. LONG TERM AVERAGE VALUE (2) MASS	b. NO. OF ANALYSES
a. Biochemical Oxygen Demand *(BOD)*												
b. Chemical Oxygen Demand *(COD)*			ANALYTICAL DATA FOR THE CENTRAL WASTEWATER TREATMENT EFFLUENT WILL BE COLLECTED									
c. Total Organic Carbon *(TOC)*			AND ANALYZED AT THE STARTUP OF THE WASTEWATER TREATMENT FACILITY.									
d. Total Suspended Solids *(TSS)*			(Table IV-1 in Attachment 4 lists the estimated water quality data)									
e. Ammonia *(as N)*												
f. Flow	VALUE		VALUE		VALUE					VALUE		
g. Temperature *(winter)*	VALUE		VALUE		VALUE			°C		VALUE		
h. Temperature *(summer)*	VALUE		VALUE		VALUE			°C		VALUE		
i. pH	MINIMUM	MAXIMUM	MINIMUM	MAXIMUM				STANDARD UNITS				

PART B - Mark "X" in column 2-a for each pollutant you know or have reason to believe is present. Mark "X" in column 2-b for each pollutant you believe to be absent. If you mark column 2a for any pollutant which is limited either directly, or indirectly but expressly, in an effluent limitations guideline, you must provide the results of at least one analysis for that pollutant. For other pollutants for which you mark column 2a, you must provide quantitative data or an explanation of their presence in your discharge. Complete one table for each outfall. See the instructions for additional details and requirements.

1. POLLUTANT AND CAS NO. *(if available)*	2. MARK 'X' a. BELIEVED PRESENT	2. MARK 'X' b. BELIEVED ABSENT	3. EFFLUENT a. MAXIMUM DAILY VALUE (1) CONCENTRATION	a. MAXIMUM DAILY VALUE (2) MASS	b. MAXIMUM 30 DAY VALUE (if available) (1) CONCENTRATION	b. MAXIMUM 30 DAY VALUE (if available) (2) MASS	c. LONG TERM AVRG. VALUE (if available) (1) CONCENTRATION	c. LONG TERM AVRG. VALUE (if available) (2) MASS	d. NO. OF ANALYSES	4. UNITS a. CONCENTRATION	4. UNITS b. MASS	5. INTAKE (optional) a. LONG TERM AVERAGE VALUE (1) CONCENTRATION	a. LONG TERM AVERAGE VALUE (2) MASS	b. NO. OF ANALYSES
a. Bromide (24959-67-9)														
b. Chlorine, Total Residual														
c. Color														
d. Fecal Coliform														
e. Fluoride (16984-48-8)														
f. Nitrate-Nitrite *(as N)*														

10.1.2-15

PLEASE PRINT OR TYPE IN THE UNSHADED AREAS ONLY. You may report some or all of this information on separate sheets *(use the same format)* instead of completing these pages. SEE INSTRUCTIONS.

EPA I.D. NUMBER *(copy from Item 1 of Form 1)*: FLD 0 0 0 8 0 7 4 5 3

Form Approved. OMB No. 2040-0086 Approval expires 7-31-88

V. INTAKE AND EFFLUENT CHARACTERISTICS *(continued from page 3 of Form 2-C)*

OUTFALL NO. 004

PART A - You must provide the results of at least one analysis for every pollutant in this table. Complete one table for each outfall. See instructions for additional details.

1. POLLUTANT	2. EFFLUENT a. MAXIMUM DAILY VALUE (1) CONCENTRATION	a. MAXIMUM DAILY VALUE (2) MASS	b. MAXIMUM 30 DAY VALUE (if available) (1) CONCENTRATION	b. MAXIMUM 30 DAY VALUE (if available) (2) MASS	c. LONG TERM AVRG. VALUE (if available) (1) CONCENTRATION	c. LONG TERM AVRG. VALUE (if available) (2) MASS	d. NO. OF ANALYSES	3. UNITS (specify if blank) a. CONCENTRATION	3. UNITS b. MASS	4. INTAKE (optional) a. LONG TERM AVERAGE VALUE (1) CONCENTRATION	a. LONG TERM AVERAGE VALUE (2) MASS	b. NO. OF ANALYSES
a. Biochemical Oxygen Demand *(BOD)*												
b. Chemical Oxygen Demand *(COD)*			SCREEN WASH WATER IS THE SAME AS THE ONCE-THROUGH COOLING WATER (INTAKE)									
c. Total Organic Carbon *(TOC)*			AND THUS HAS THE SAME CHEMICAL AND PHYSICAL CHARACTERISTICS.									
d. Total Suspended Solids *(TSS)*												
e. Ammonia *(as N)*												
f. Flow	VALUE		VALUE		VALUE					VALUE		
g. Temperature *(winter)*	VALUE		VALUE		VALUE			°C		VALUE		
h. Temperature *(summer)*	VALUE		VALUE		VALUE			°C		VALUE		
i. pH	MINIMUM	MAXIMUM	MINIMUM	MAXIMUM				STANDARD UNITS				

PART B - Mark "X" in column 2-a for each pollutant you know or have reason to believe is present. Mark "X" in column 2-b for each pollutant you believe to be absent. If you mark column 2a for any pollutant which is limited either directly, or indirectly but expressly, in an effluent limitations guideline, you must provide the results of at least one analysis for that pollutant. For other pollutants for which you mark column 2a, you must provide quantitative data or an explanation of their presence in your discharge. Complete one table for each outfall. See the instructions for additional details and requirements.

1. POLLUTANT AND CAS NO. *(if available)*	2. MARK 'X' a. BELIEVED PRESENT	2. MARK 'X' b. BELIEVED ABSENT	3. EFFLUENT a. MAXIMUM DAILY VALUE (1) CONCENTRATION	a. MAXIMUM DAILY VALUE (2) MASS	b. MAXIMUM 30 DAY VALUE (if available) (1) CONCENTRATION	b. MAXIMUM 30 DAY VALUE (if available) (2) MASS	c. LONG TERM AVRG. VALUE (if available) (1) CONCENTRATION	c. LONG TERM AVRG. VALUE (if available) (2) MASS	d. NO. OF ANALYSES	4. UNITS a. CONCENTRATION	4. UNITS b. MASS	5. INTAKE (optional) a. LONG TERM AVERAGE VALUE (1) CONCENTRATION	a. LONG TERM AVERAGE VALUE (2) MASS	b. NO. OF ANALYSES
a. Bromide (24959-67-9)														
b. Chlorine, Total Residual														
c. Color														
d. Fecal Coliform														
e. Fluoride (16984-48-8)														
f. Nitrate–Nitrite *(as N)*														

10•1•2-16

PLEASE PRINT OR TYPE IN THE UNSHADED AREAS ONLY. You may report some or all of this information on separate sheets *(use the same format)* instead of completing these pages. SEE INSTRUCTIONS.

EPA I.D. NUMBER *(copy from Item 1 of Form 1)*: FLD 0 0 0 8 0 7 4 5 3

Form Approved. OMB No. 2040-0086 Approval expires 7-31-88

OUTFALL NO. 005

V. INTAKE AND EFFLUENT CHARACTERISTICS *(continued from page 3 of Form 2-C)*

PART A - You must provide the results of at least one analysis for every pollutant in this table. Complete one table for each outfall. See instructions for additional details.

1. POLLUTANT	2. EFFLUENT a. MAXIMUM DAILY VALUE (1) CONCENTRATION	a. MAXIMUM DAILY VALUE (2) MASS	b. MAXIMUM 30 DAY VALUE (if available) (1) CONCENTRATION	b. MAXIMUM 30 DAY VALUE (if available) (2) MASS	c. LONG TERM AVRG. VALUE (if available) (1) CONCENTRATION	c. LONG TERM AVRG. VALUE (if available) (2) MASS	d. NO. OF ANALYSES	3. UNITS (specify if blank) a. CONCENTRATION	3. UNITS b. MASS	4. INTAKE (optional) a. LONG TERM AVERAGE VALUE (1) CONCENTRATION	a. LONG TERM AVERAGE VALUE (2) MASS	b. NO. OF ANALYSES
a. Biochemical Oxygen Demand *(BOD)*												
b. Chemical Oxygen Demand *(COD)*		ANALYTICAL DATA FOR NON-EQUIPMENT AREA STORMWATER WAS NOT REQUIRED										
c. Total Organic Carbon *(TOC)*		FOR THE EXISTING NPDES PERMIT. THERE ARE NO LIMITATIONS OR MONITORING										
d. Total Suspended Solids *(TSS)*		REQUIREMENTS FOR THE DISCHARGE OF STORMWATER RUNOFF.										
e. Ammonia *(as N)*												
f. Flow	VALUE		VALUE		VALUE					VALUE		
g. Temperature *(winter)*	VALUE		VALUE		VALUE			°C		VALUE		
h. Temperature *(summer)*	VALUE		VALUE		VALUE			°C		VALUE		
i. pH	MINIMUM	MAXIMUM	MINIMUM	MAXIMUM				STANDARD UNITS				

PART B - Mark "X" in column 2-a for each pollutant you know or have reason to believe is present. Mark "X" in column 2-b for each pollutant you believe to be absent. If you mark column 2a for any pollutant which is limited either directly, or indirectly but expressly, in an effluent limitations guideline, you must provide the results of at least one analysis for that pollutant. For other pollutants for which you mark column 2a, you must provide quantitative data or an explanation of their presence in your discharge. Complete one table for each outfall. See the instructions for additional details and requirements.

1. POLLUTANT AND CAS NO. *(if available)*	2. MARK 'X' a. BELIEVED PRESENT	2. MARK 'X' b. BELIEVED ABSENT	3. EFFLUENT a. MAXIMUM DAILY VALUE (1) CONCENTRATION	a. MAXIMUM DAILY VALUE (2) MASS	b. MAXIMUM 30 DAY VALUE (if available) (1) CONCENTRATION	b. MAXIMUM 30 DAY VALUE (if available) (2) MASS	c. LONG TERM AVRG. VALUE (if available) (1) CONCENTRATION	c. LONG TERM AVRG. VALUE (if available) (2) MASS	d. NO. OF ANALYSES	4. UNITS a. CONCENTRATION	4. UNITS b. MASS	5. INTAKE (optional) a. LONG TERM AVERAGE VALUE (1) CONCENTRATION	a. LONG TERM AVERAGE VALUE (2) MASS	b. NO. OF ANALYSES
a. Bromide (24959-67-9)														
b. Chlorine, Total Residual														
c. Color														
d. Fecal Coliform														
e. Fluoride (16984-48-8)														
f. Nitrate-Nitrite *(as N)*														

10.1.2-17

CONTINUED FROM THE FRONT

VII. BIOLOGICAL TOXICITY TESTING DATA

Do you have any knowledge or reason to believe that any biological test for acute or chronic toxicity has been made on any of your discharges or on a receiving water in relation to your discharge within the last 3 years?

☐ YES *(identify the test(s) and describe their purposes below)* ☒ NO *(go to Section VIII)*

VIII. CONTRACT ANALYSIS INFORMATION

Were any of the analyses reported in Item V performed by a contract laboratory or consulting firm?

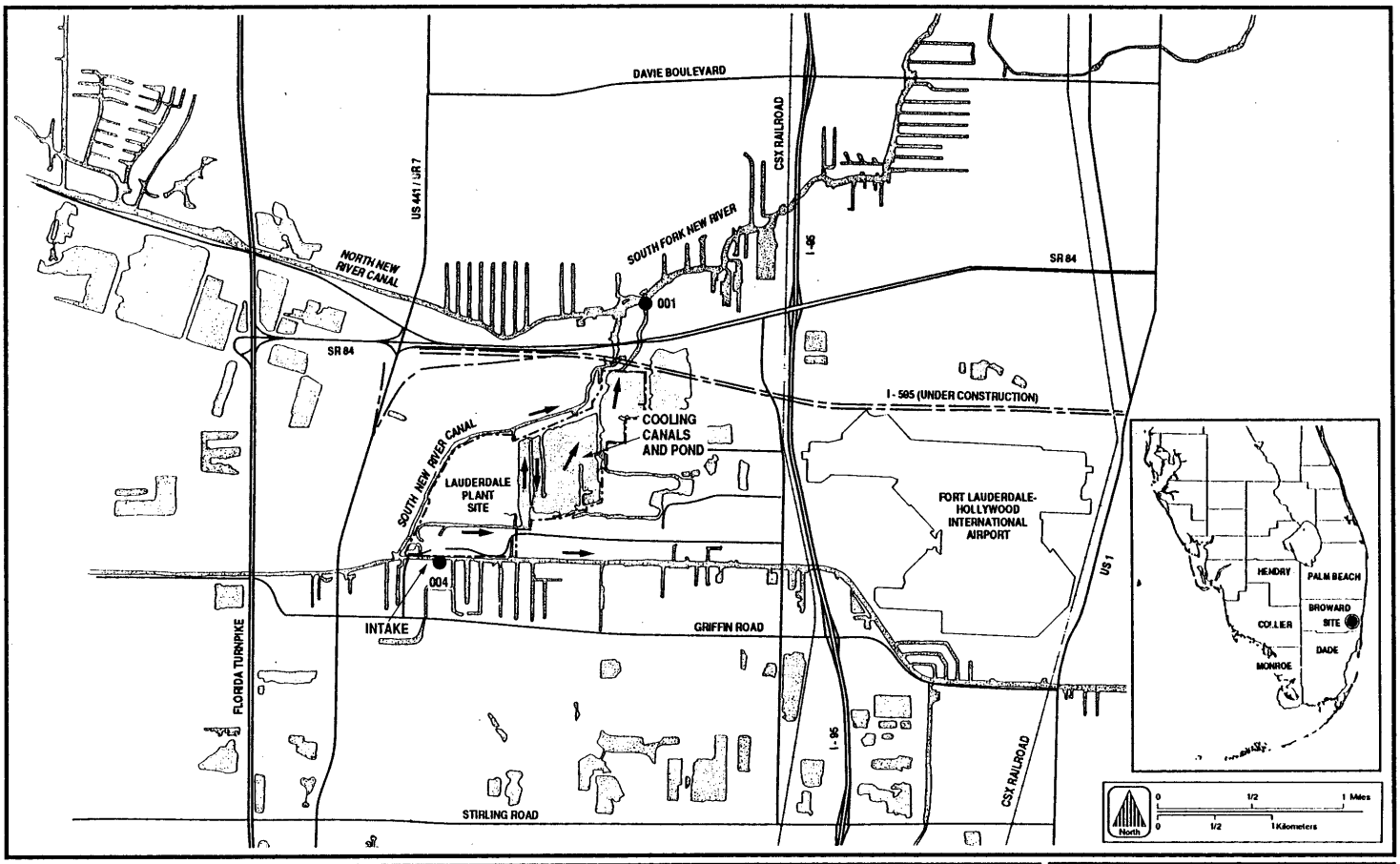
☒ YES *(list the name, address, and telephone number of, and pollutants analyzed by, each such laboratory or firm below)* ☐ NO *(go to Section IX)*

A. NAME	B. ADDRESS	C. TELEPHONE (area code & no.)	D. POLLUTANTS ANALYZED (list)
Hunter/ESE Hunter Services, Inc.	P.O. Box 1703 Gainesville, FL 32602	(904) 332-3318	as listed on pages V-1 to V-9

IX. CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or *those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.*

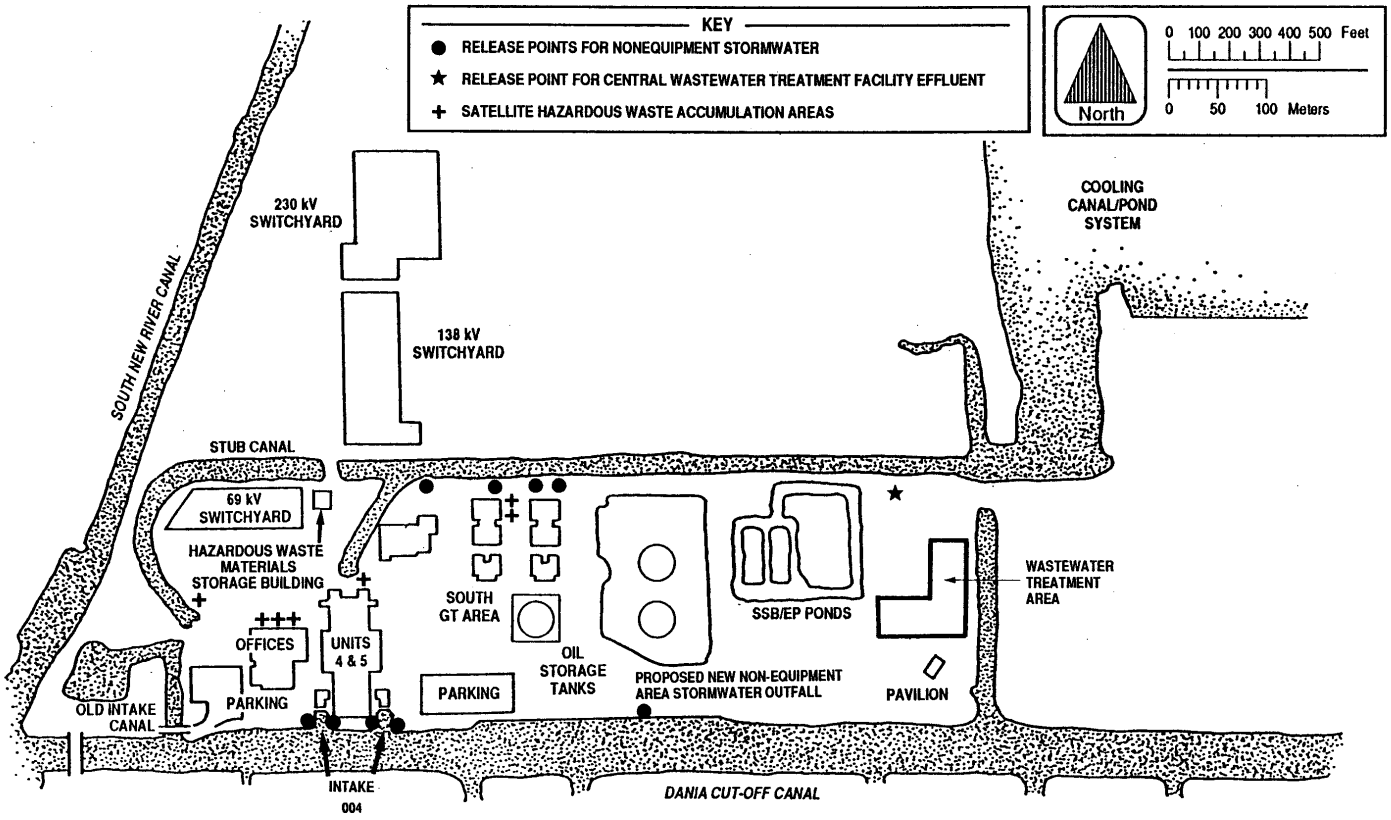
A. NAME & OFFICIAL TITLE (type or print)	B. PHONE NO. (area code & no.)
Martin A. Smith, Ph.D., Manager Environmental Permitting and Programs	(407) 640-2030
C. SIGNATURE	D. DATE SIGNED
Martin A. Smith	11/27/89



Attachment 1 **OUTLINE OF THE FPL FACILITY AND ITS EXISTING AND PROPOSED INTAKE AND OUTFALL LOCATIONS**

Lauderdale Repowering Project

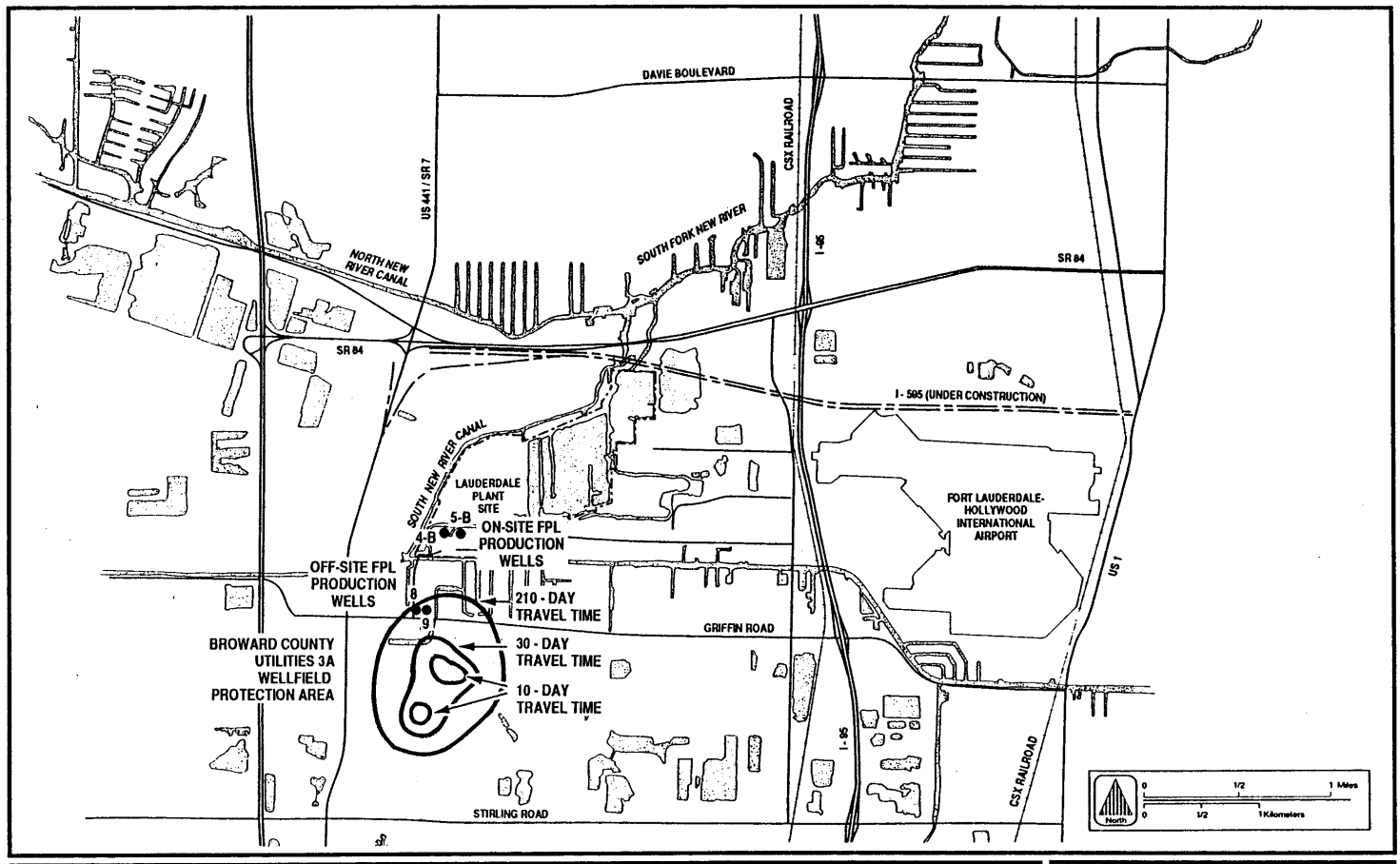
FPL



Attachment 2 DETAIL OF PROPOSED INTAKE AND OUTFALL LOCATIONS

Lauderdale Repowering Project

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Attachment 3 LOCATION OF BROWARD COUNTY UTILITIES DIVISION DISTRICT 3A WELLFIELD PROTECTION ZONES AND LAUDERDALE PLANT ON-SITE AND OFF-SITE PRODUCTION WELLS

Lauderdale Repowering Project

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Attachment 3. Off-Site Well Inventory of Permitted Wells Within a 1-Mile Radius of the Lauderdale Plant Site (Page 2)

General Use Permit (Non-Community System)

Location	Description
Oakridge Country Club 3490 Griffin Road	One well, 75 ft deep, 4-inch-diameter, pump capacity 180 to 240 gallons per minute (gpm)
Marino's Italian Restaurant 5191 S. SR 7	One well, depth unknown
Charge Service Station 4700 S. SR 7	One well, depth unknown
Oasis Truck Stop 5470 S. SR 7	One well, depth unknown
Woods Nursery 3400 S. SR 7	One well, depth unknown
Amoco Service Station 3612 S. SR 7	One well, depth unknown
Powell Brothers North of Dania Cut-Off Canal 9th East of 441 (4400 S. SR 7)	One well, depth unknown

Consumptive Use Permit (Community System)

Broward County Utility 3A Wellfield SW 40 Ave. and Griffin Rd.	Four wells, 100 ft deep, casing diameter 10 inches, cased section 0 to 100 ft, open internal 100 to 110 ft, permitted pumpage 4.288 mgd
Ferncrest Utilities, Inc. 3015 SW 54th Avenue Average Pumpage: 2.1 mgd	Two wells; well No. 1 89 ft deep, 6 inches diameter; well No.2 87 ft deep, 4 inches diameter; cased and open intervals not available, average pumpage 2.1 mgd

ATTACHMENT 4

RESPONSE TO ITEM IVB--IMPROVEMENTS

The discharge sources at the repowered plant will include the heat dissipation system, domestic/sanitary wastewater, equipment area stormwater, and wastewaters from the process water systems. The changes from the existing to the repowered plant in these wastewater flows, quality, and treatment processes is summarized as follows:

1. Heat Dissipation System--The heat dissipation system consists of two components, the condenser cooling water system and the auxiliary cooling (open cooling) system. These systems include:
   a. Condenser cooling water system--This system is the largest discharge from the plant (at 232,000 gpm) and will not be changed in terms of flow rate or temperature rise.
   b. Open cooling water system--The flow rate for this system will be increased from 6,000 gpm to 20,000 gpm. The water source will be changed from groundwater to surface water (i.e., the Dania Cut-Off Canal) but the location of the discharge will remain the same.
2. Domestic/sanitary wastewater--This is the smallest water use at the plant (9 gpm) and the quality is not expected to change with repowering. The existing system discharges to various septic tanks located on the plant property. After repowering, the system will discharge primarily to a POTW; however, some small contributors (i.e., remote restrooms) will continue to use the septic tanks.
3. Process water system--The source of water for this system will be changed from exclusively potable groundwater to predominately nonpotable groundwater. As such, the wastestreams generated during the water treatment processes will change (in quantity and quality) and a new treatment facility will be constructed.
4. Equipment area stormwater and floor washings will be collected and routed to the new central wastewater treatment facility before being released to the existing cooling canal/pond system.

A quantitive water use diagram for the above systems is presented in Figure IV-1. Discussions of these systems are presented in detail in the following sections.

HEAT DISSIPATION SYSTEM

SYSTEM DESIGN

The repowered plant will continue to utilize the existing open cycle cooling canal/pond system for heat dissipation. The heat will be dissipated via water used for condenser cooling (circulating water) and for open cooling (steam turbine generator hydrogen coolers, steam turbine lube oil coolers, steam turbine hydrogen seal oil coolers, CT generator hydrogen coolers, CT lube oil coolers, HRSG feed pump lube oil coolers, HRSG feed pump mechanical seal water heat exchangers, instrument air compressors and aftercoolers, service air compressors and aftercoolers, steam and water analysis sample cooler, condensate pump motor bearing coolers, and mechanical vacuum pump heat exchangers).

Water from the Dania Cut-Off Canal passes directly through the intake channel into the intake structure. The intake structure is divided in the center by a concrete wall which forms two separate pump bays, each furnished with one vertical circulating water pump (CWP) and one vertical open cooling water pump (OCWP). The dividing wall prevents any possible vortex interference between the two CWPs and reduces the size of the intake screens and stop logs upstream of the pumps. The dividing wall, in conjunction with the stop logs, also permits isolation of each bay to facilitate maintenance. The intake screens, consisting of bar or coarse screens, and traveling screens, and the floating trash boom, minimize the carryover of objectionable debris. The bar screens are furnished with a trash rake to clean off collected debris. Screen wash water and screen debris flow together through intake structure troughs which discharge into a trash bucket. The trash bucket traps the debris and allows the water to return to the channel. Debris is disposed to an off-site landfill.

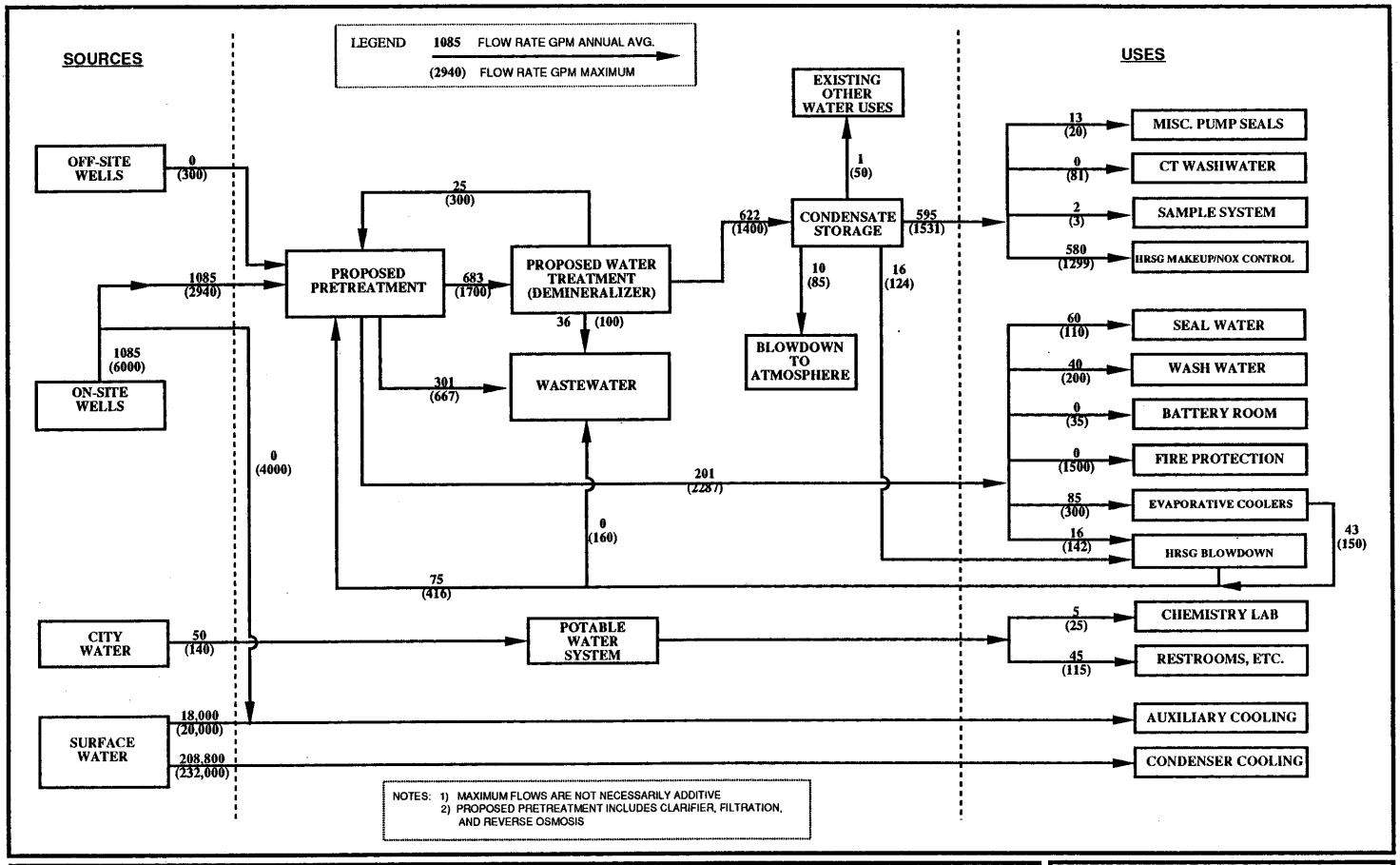


Figure IV-1 PROPOSED WATER USES SIMPLIFIED FLOW DIAGRAM

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Each circulating water pump discharges into a separate 4-1/2-ft diameter reinforced concrete pressure pipe which conveys the cooling water to a cast iron pipe and waterbox at the condenser inlet. The water flows through the Sea-cure stainless steel tubes, through a cast iron waterbox and pipe at the condenser outlet, and through both a reinforced concrete pressure pipe and a corrugated pipe encased in concrete, out into the discharge canal. The condenser is of a single shell, single pressure, divided waterbox design. The circulating water picks up heat in the condenser, causing the steam from the steam turbine to condense.

The two open cooling water pumps discharge into a common header which conveys cooling water to two 100-percent self-cleaning strainers which further strain objectionable debris from the water. The strainers are located adjacent to the intake structure and discharge the backwash flow into the Dania Cut-Off Canal. Water from the strainers passes on to and through three 50-percent capacity closed cooling water heat exchangers (HX) and is released to the discharge canal. Isolation valves are furnished for each HX, along with valving to facilitate backwashing the HX.

This water from the "open" side of the system is used to cool water from the closed side of the same system. That "closed" cooling water, in turn, has picked up heat from all those items listed above (e.g., hydrogen coolers, lube oil coolers, etc.).

DOMESTIC/SANITARY WASTEWATER

Domestic/sanitary wastewater, as shown in Figure IV-1, is now and will continue to be generated from the potable water system. The expected flow rate is 45 gpm average (about 65,000 gallons a day) and about 115 gpm maximum. The use within showers, sinks, and toilets is only expected to change the water quality from that of the city water in classical sanitary ways by increasing BOD, COD, suspended solids, nitrogen, phosphorous, and fecal coliform. The treatment and disposal system for the project will include an entirely new collection system discharging to the municipal sewer system. The system includes an underground gravity collection

system, pumping stations, and a force main connecting to the City of Hollywood sewer system at Edgewater Road. Septic tanks north of the existing discharge canal and east of the existing evaporation/percolation pond will remain in service.

PROCESS WATER SYSTEMS

Figure IV-2 is a flow diagram of the proposed process water treatment system. These uses include CT steam injection, HRSG makeup, pump seal water, evaporative coolers, and HRSG chemical cleaning. Wastewater flows will be recycled or sent to the proposed new central wastewater treatment system.

The proposed process water treatment system includes clarification and filtration to remove suspended solids and color (preceded by flocculation). Because the primary water source is non-potable water from on-site wells, further treatment is provided by reverse osmosis (RO) to remove dissolved solids. After undergoing the RO treatment, the water is passed through a degasifier to remove CO_2 and, finally, a mixed-bed demineralizer for final polishing. The demineralized water is thus of very high quality (e.g., TDS less than 1 mg/L). Service water, for fire protection, HRSG blowdown quench, and evaporative coolers, is drawn off after the RO stage (i.e., before demineralization).

Figure IV-2 shows the various reuses of water within the water treatment system which will be utilized to minimize source water requirements. Clarifier underflow water will be recycled (averaging 55 gpm) by the use of a filter press to remove that water from the clarifier sludge. Similarly, dual media filter backwash water (averaging 58 gpm) will also be recycled. Evaporative cooler water will be recycled (averaging 43 gpm) as will the rinse waters from demineralizer regeneration (averaging 25 gpm). Blowdown from the HRSGs and blowdown quench water (combined average of 32 gpm) will also be recycled. The total average flow of these recycled streams, about 213 gpm, will be returned to the raw water storage tank, which will be the source of water to the treatment system.

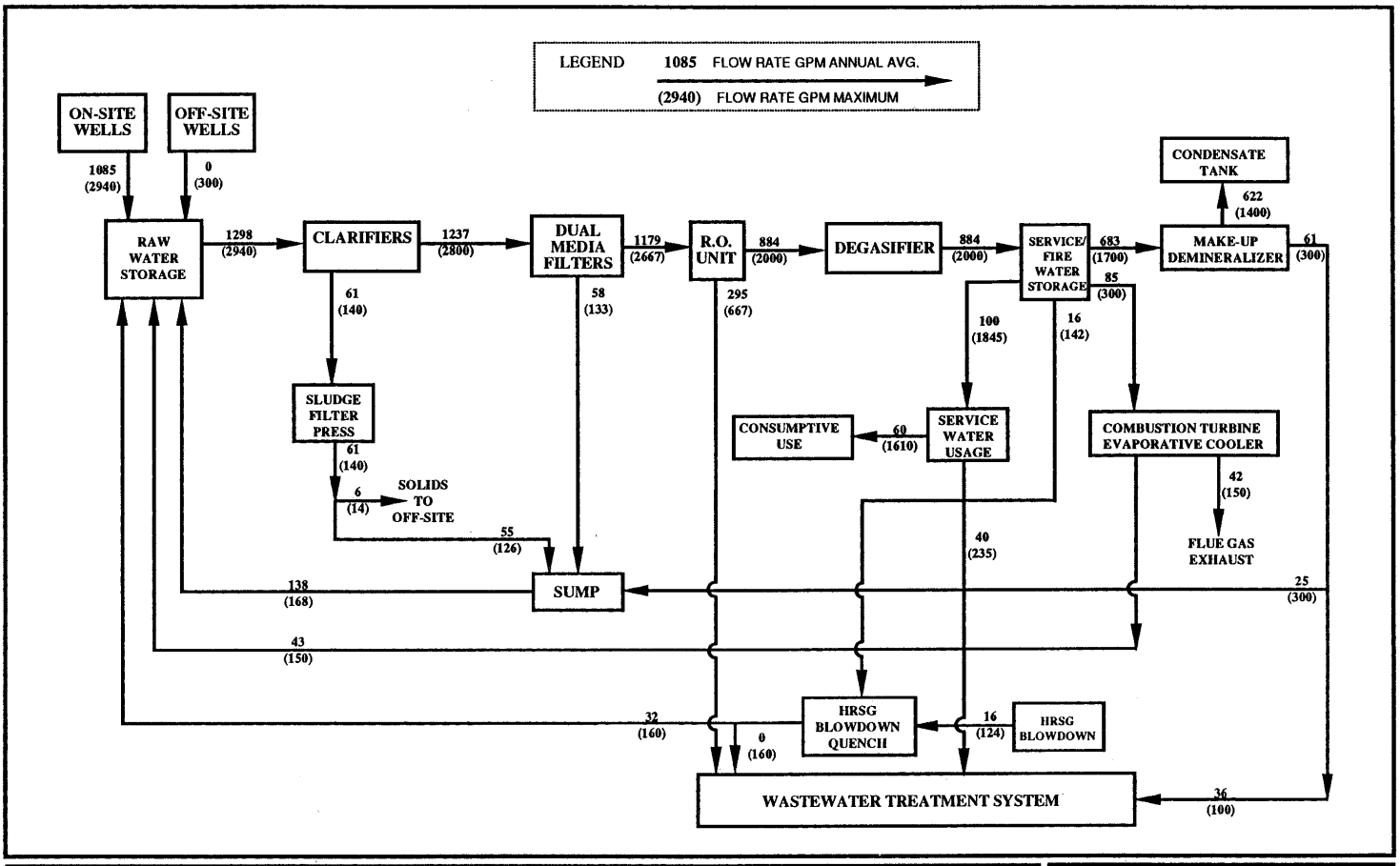


Figure IV-2 PROPOSED PROCESS WATER TREATMENT SYSTEM

Lauderdale Repowering Project

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Wastewaters from the proposed process water treatment system will be treated within a new central wastewater treatment facility, as shown on Figure IV-3. This facility is described in detail in the following section. Table IV-1 presents the estimated quality and quantity of the wastewaters which are influent to this facility.

CHEMICAL WASTESTREAM TREATMENT

Operation of the repowered Units 4 and 5 will generate various chemical-containing liquid wastestreams. Certain of these wastestreams will be treated before discharge. The wastewater treatment system design (see Figure IV-4) consists of the following processes:

1. Pretreatment of oily waste (to remove oils) through the use of a physical/chemical separation process,
2. Neutralization and filtration of the wastewater before discharge, and
3. Off-site disposal for separated oil and dewatered sludge.

Following are brief descriptions of each of the treatment processes involved.

OILY WASTE

Physical Separation Process

A physical separator will be used to remove free oils and grease from the oily wastestream. This separator is capable of effectively separating free oils, grease and settleable solids from water. The slant rib coalescer pack (SRCP) in the separator provides greater coalescing and solids separation area than any other media currently available. The ribs of the SRCP are slanted toward the surface in the direction of flow, encouraging separated oil to float to the surface along the plates before breaking free. The separator consists of the following:

1. Inlet and diffusion chamber where larger solids will drop out into the sludge chamber before entering the pack.

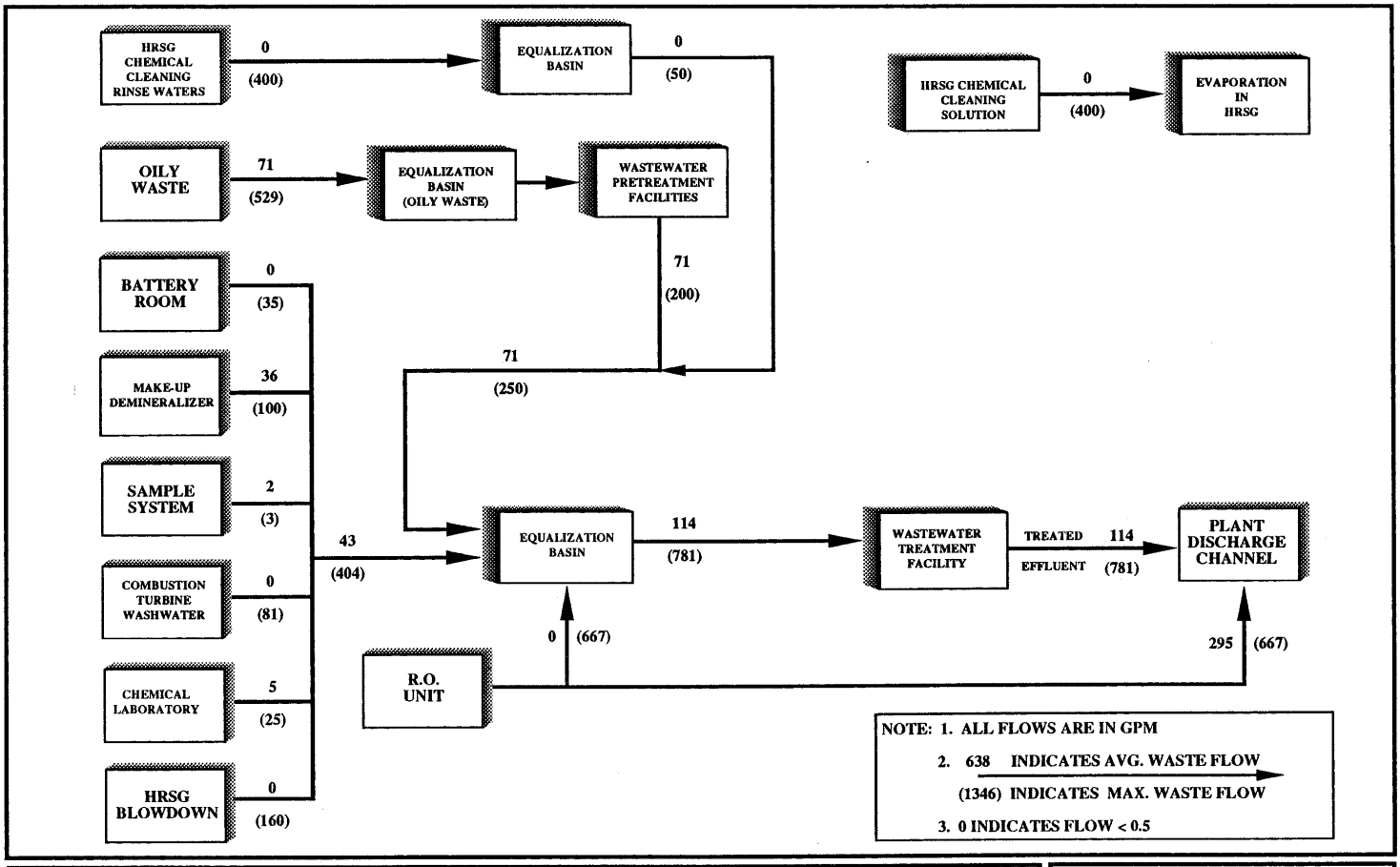


Figure IV-3 WASTEWATER FLOW CHARACTERIZATION

Lauderdale Repowering Project

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Table IV-1. Wastewater Characterization (Page 1 of 3)

Parameter	Concentration* Reverse Osmosis Concentrate	Demineralizer Regeneration Waste	Battery Room Waste	Sampling System Effluent
Flow, gpm (average)	743	103	0	2
Flow, gpm (maximum)	743	333	35	3
Calcium (Ca)	476	11	0.3	<1
Magnesium (Mg)	437	10	0.3	<1
Sodium (Na)	3,660	7,063	27	7
Potassium (K)	0	0	0	0
Ammonia (NH_3)	0	0	0	<1 -2
Carbonate (CO_3)	0	0	0	0
Bicarbonate (HCO_3)	674	107	3	0
Chloride (Cl)	6,672	1,443	41	<1
Sulfate (SO_4)	1,137	12,367	0.2	<1
Phosphate (PO_4)	0	0	0	<10
Silica (SiO_2)	44	42	1.2	<1.5
Iron (Fe)	0	0	0	0.01
Copper (Cu)	0	0	0	0.005
Carbon Dioxide (CO_2)	112	0	10	0
Oil and Grease	0	0	0	0
Organics (TOC)	0	0	0	<10
TDS	13,100	21,043	83	<1.0
TSS	0	0	10	0
pH (standard units)	7.0	7.0	7.0	9.4 - 9.8

Table IV-1. Wastewater Characterization (Page 2 of 3)

Parameter	Concentration*			
	Oily Waste	Combustion Turbine Washwater	HRSG Chemical Rinse Waters	Chemical Laboratory+
Flow, gpm (average)	39	0	1	5
Flow, gpm (maximum)	529	50	400	25
Calcium (Ca)	0.3	0	<1	1,566
Magnesium (Mg)	0.3	0	<1	214
Sodium (Na)	26	0.2	7	740
Potassium (K)	0	0	0	1
Ammonia (NH_3)	0	0	<1 - 2	0
Carbonate (CO_3)	0	0	0	620
Bicarbonate (HCO_3)	3	0	0	ND**
Chloride (Cl)	41	0.2	<1	331
Sulfate (SO_4)	0.2	0	<1	16
Phosphate (PO_4)	0	0	<10	96
Silica (SiO_2)	1.2	0.1	<1.5	19
Iron (Fe)	0	0.005	0.01	1
Copper (Cu)	0	0.004	0.005	0
Carbon Dioxide (CO_2)	0	0	0	0
Oil and Grease	1,640	0.1	0	0
Organics (TOC)	0	0.1	<10	ND**
TDS	72	0.509	<24.5	2,421
TSS	25	100	50	0
pH (standard units)	7.9	ND**	9.4 - 9.8	10.8

Table IV-1. Wastewater Characterization (Page 3 of 3)

Parameter	Concentration* Wastewater Treatment Facility Effluent	Concentration* Combined Release to Discharge Canal++
Flow, gpm (average)	114	409
Flow, gpm (maximum)	781	781
Calcium (Ca)	3	395
Magnesium (Mg)	3	363
Sodium (Na)	2,000	3,547
Potassium (K)	0	0
Ammonia (NH_3)	0	0
Carbonate (CO_3)	<10	<1.7
Bicarbonate (HCO_3)	<50	567
Chloride (Cl)	<400	5,601
Sulfate (SO_4)	3,000	1,455
Phosphate (PO_4)	<1	<.17
Silica (SiO_2)	<10	38
Iron (Fe)	<0.005	<0.001
Copper (Cu)	<0.005	<0.001
Carbon Dioxide (CO_2)	0	93
Oil and Grease	5	0.85
Organics (TOC)	1	0.17
TDS	7,000	12,058
TSS	5	0.9
pH (standard units)	7	7

*All units are in mg/L unless otherwise noted.
+Also: NH_4 = 6.1, MoO_4 = 18.3, NO_3 = 6.4, N_2H_4 = 32, and citric acid = 11.
**Not determined.
++Combined total of wastewater treatment system effluent and RO concentrate.

DESIGN PHILOSOPHY:

PRETREAT OILY WASTE TO REMOVE OILS THROUGH THE USE OF PHYSICAL/CHEMICAL SEPARATION PROCESS AND NEUTRALIZE AND FILTER THE COMBINED WASTEWATER BEFORE DISCHARGE AND OFF-SITE DISPOSAL FOR SEPARATED OIL AND DEWATERED SLUDGE

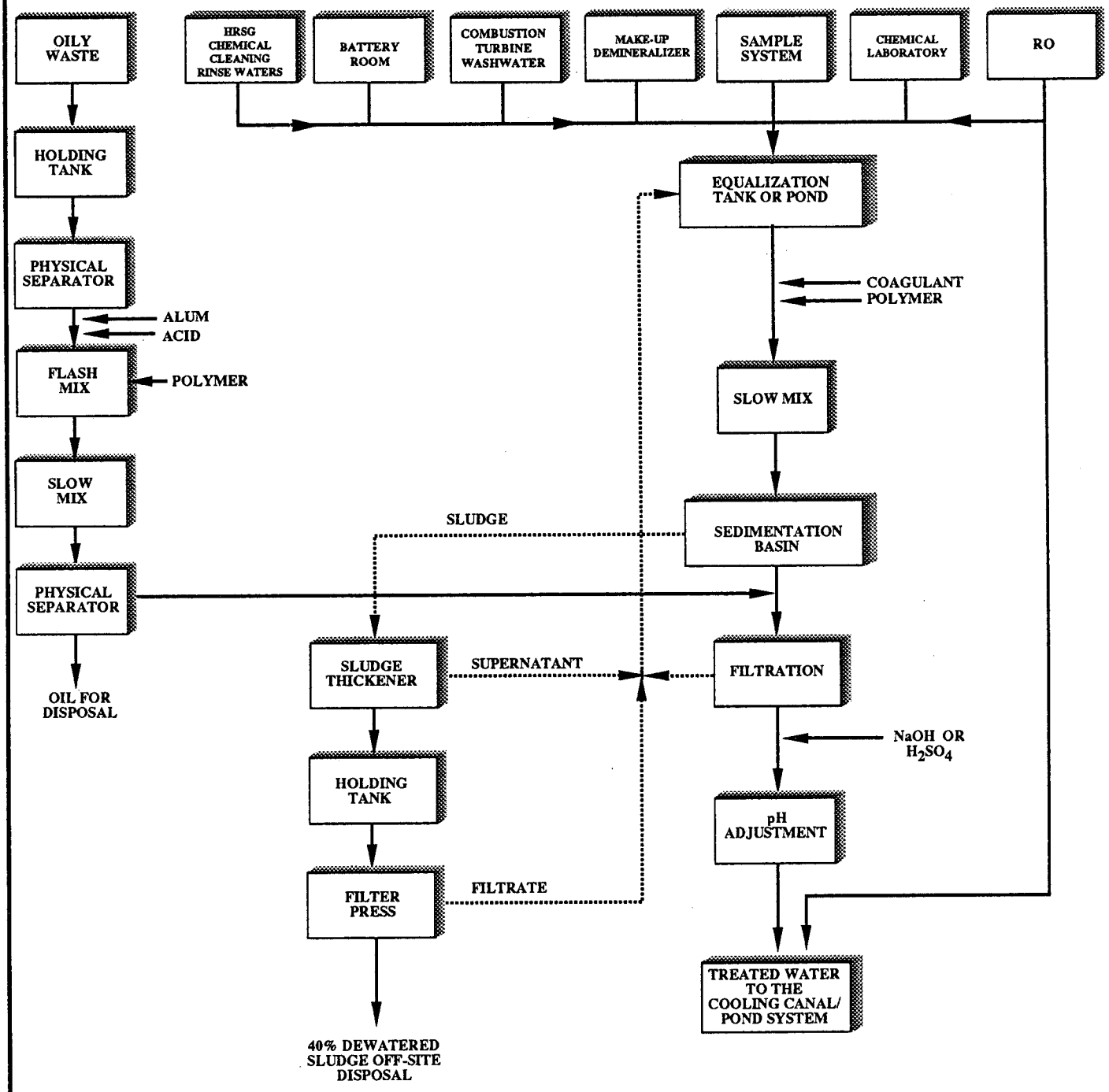


Figure IV-4 WASTEWATER TREATMENT SYSTEM

NOTE: FOR FLOW RATES, SEE FIGURE IV-3.

Lauderdale Repowering Project

FPL

2. Separation chamber filled with the SRCP. The ribbed plates are arranged perpendicular to the direction of flow. The ribbed plates will increase the resistance to flow, enlarge the oil droplets, and separate the oil from the water.
3. Sludge chamber providing adequate volume for the settled sludge.
4. Oil reservoir to accumulate the separated oil before it is removed to a remote storage tank.

Chemical Separation Process

A chemical separation process will be used to break the emulsification of oils in the water and enhance their separation. The first step is to lower the pH to 4 by adding sulfuric acid. At this pH level the chemical compound emulsions will be broken and oils will be freed from the wastewater. To ensure completion of the desired reactions and an increase in oil droplet sizes, aluminum sulfate (alum) will be added simultaneously with the acid. A physical separator will be provided to separate the oils and grease from the water.

The chemical process requires a rapid mixing tank for pH adjustment, a flocculation tank to enhance the particle size growth, two chemical preparation tanks, and two feed tanks with mixers as well as two feed pumps and two solution pumps.

Design Basis:

Flow (gpm)	200*
Oil influent concentration (ppm)	229 average, 1,600 maximum
Oil separation rate (gpm/ft^2)	

*An equalization basin is provided to allow the design flow to be less than the maximum.

Effluent Disposition

The effluent from the chemical separation process is recombined with the other wastewater flows to receive filtration and pH adjustment before discharge.

NON-OILY WASTESTREAMS

Chemical Precipitation Process

The chemical precipitation process is very effective in removing total suspended solids, inorganic contaminants, and for making pH adjustments. The chemical precipitation process may consist of coagulation/ flocculation/precipitation/ filtration depending on test results of actual wastewater testing. Chemical additions such as alum, iron salts, H_2SO_4, NaOH, or polymer, may be needed to carry out the treatment function. The following unit processes will be provided and utilized as necessary.

Slow Mix Flocculation Tanks--Two tanks will be provided for flocculation. The minute particles will be brought into contact with each other and with other particles under prolonged agitation in this slow mix flocculation tank, during which time the particles coalesce, increase in size, and will be packed to a greater density for settlement.

Sedimentation Basin--One inclined up flow clarifier will be provided for precipitation. The inclined plate settler unit contains a series of stacked plates, approximately 2 inches apart, inclined at an angle of 55 to 60 degrees from the horizontal.

Filters--Two dual media pressure filters are provided for filtration. The objective of filtration is to produce an effluent with very low total suspended solids.

Design Basis:

Flow (gpm)	650
Slow mix (minutes detention time)	20
Precipitation overflow rate (gpm/ft^2)	0.5

Filtration rate (gpm/ft^2)	5
Backwash rate (gpm/ft^2)	15

SLUDGE HANDLING

Sludge Dewatering

The removal of pollutants or impurities from the wastestreams will result in the production of water insoluble compounds called sludge. It is desirable to minimize the volume of this waste product through sludge dewatering. The sludge volume reduction will be achieved by means of a thickener and mechanical dewatering device.

A thickener is comparable to a conventional settling tank except that the tank is deeper to accommodate a greater volume for sludge and has a heavier raking mechanism.

The mechanical dewatering device that will be used is a pressure filter because of the expected sludge dewaterability and desired cake dryness.

Design Basis:

Flow (gpm)	60
Thickener overflow rate (lb/ft^2/day)	8
Pressure filter cycle (hr)	2.5
Solid content (%)	40

BIOCIDE WASTESTREAMS

Present design of the Lauderdale Repowering Project does not include the installation of a dispensing system for injecting biocide into the circulating water system. Likewise, the existing plant does not use such biocides.

In the future, should biofouling become a serious problem in the circulating water system, FPL would evaluate the cause and all potential solutions to such a problem. Chlorination on an intermittent basis is the present preferred conventional method to control biofouling. Potential

alternatives include but are not limited to bromine chloride, chlorine dioxide, sodium bromide, ozonation, ultraviolet, and mechanical cleaning.

Should future conditions warrant the use of a biocide, FPL would request a modification to the Site Certification to allow such use, consistent with 40 CFR 423.13 (federal BAT); Chapter 17-3.121, F.A.C. (state Class III Water Quality Criteria); and BEQCB 27-5.081 (Broward County effluent limits).

Two biocides which are presently in use at the site will be used after repowering. They are both added to the fuel oil to prevent microbial growth. Biobor JF is an anti-microbe additive reported (MSDS, U.S. Borax and Chemical Corporation) to be an organoboron compound (mixed dioxaborinanes). It includes 5 percent naphtha. It is added to the oil at 1 part to between 55 and 4,500 parts oil when testing indicates microbial growth. Its toxicity is as follows:

Acute oral in albino rates--3.16 mL/kg.
Acute dermal LD_{50} in albino rates--4.64 mL/kg.
No known human experience.

Long-term stability additive (LTSA) is a mixture of amines, polyamines, and alkyl ammonium alkyl phosphate (MSDS, Fuel Quality Services, Inc.) with kerosene (58 percent) as the solvent. It is a combustible liquid. It is added to the oil at 1 part to 5,000 parts of oil.

CHEMICAL ADDITIVES

A list of the chemical additives presently used for various processes and systems at the plant is as follows:

1. Lime [calcium hydroxide, $Ca(OH)_2$)] is a basic compound used to adjust pH levels. It is used in raw water treatment (softening).
2. Polymer is a substance with a high molecular weight composed of repeating chemical units linked together into chain or network

structures. Used as a flocculent to enhance sedimentation and sludge dewatering.

3. Sulfuric acid (H_2SO_4) is an acidic compound used to reduce pH levels, is used in demineralizer regeneration and in pH adjustment before discharge to break oil emulsification and to aid in chemical precipitation.
4. Sodium Hydroxide (NaOH) is a basic compound used to raise pH levels, used in demineralizer regeneration, pH adjustment, and to aid in chemical precipitation.
5. Hydrazine (H_2NNH_2) is a strong reducing agent used as an oxygen scavenger to inhibit corrosion in steam generator condensate and feedwater.
6. Ammonia (NH_3) is a basic compound used to adjust pH levels in steam generator condensate and feedwater.
7. Tri-, di-, and mono-sodium phosphate are inorganic salts used in steam generator water to prevent scaling (deposition).
8. Molybdate is a substance used as a corrosion inhibitor in the closed side of an open cooling water system.
9. Tolyltriazole ($CH_2C_6H_3N_3H$) is a substance used as a corrosion inhibitor in the closed side of an open cooling water system.
10. Aluminum sulfate [alum, $Al_2(SO_4)_3$] is an inorganic salt used as a coagulant in separating emulsified oil from wastewater and for chemical precipitation.
11. Iron salts are inorganic salts used as a coagulant.
12. Diatomaceous earth is a natural material used in sludge dewatering.

APPENDIX 10.1.3

HAZARDOUS WASTE DISPOSAL APPLICATION/PERMIT

10.1.3 HAZARDOUS WASTE DISPOSAL APPLICATION/PERMIT

The Lauderdale Repowering project does not require a federal hazardous waste storage or treatment permit under the Resource Conservation and Recovery Act. A discussion of the project's hazardous waste management practice is contained in Section 3.7.2.

APPENDIX 10.1.4

SECTION 404 APPLICATION/PERMIT

Rev. 1

JOINT APPLICATION
DEPARTMENT OF THE ARMY/FLORIDA DEPARTMENT OF ENVIRONMENTAL REGULATION
For Activities in the Waters of the State of Florida

CORPS APPLICATION NUMBER (official use only)	DER APPLICATION NUMBER (official use only)

1. APPLICANT'S NAME AND ADDRESS

FLORIDA POWER & LIGHT COMPANY
NAME

P O BOX 078768
STREET

WEST PALM BEACH FL 33407-0768
CITY STATE ZIP

TELEPHONE NUMBER (Day) (407) 640-2040 (Night) ( )

2. Name, address, zip code and title of applicant's authorized agent for permit application coordination
June M. Small, Manager
Environmental Resources and Planning
P.O. Box 078768, West Palm Beach, FL 33407-0768
Telephone number (407) 640-2040

3. NAME OF WATERWAY AT LOCATION OF THE ACTIVITY.
See Attachment 3

DER Code _____
W/W Code _____

4. LOCATION WHERE PROPOSED ACTIVITY EXISTS OR WILL OCCUR.

SW 42nd St., 2 miles west of Ravenswood Rd.
Street, road or other descriptive location

_____ Section See Attachment 4 Township _____ Range

City of Hollywood
Incorporated city or town

_____ Latitude _____ Longitude

Broward
County

Tax Assessors Description: (if known)

_____ Map No. _____ Subdiv. No. _____ Lot No.

5. NAME AND ADDRESS INCLUDING ZIP CODE OF ADJOINING PROPERTY OWNERS WHOSE PROPERTY ALSO ADJOINS THE WATERWAY.
See Attachment 5

6. PROPOSED USE
Private Single Dwelling [ ] Private Multi-dwelling [ ] Public [ ]
Commercial [ ] Other [X] (Explain in remarks) Public Electric Utility

7. DESCRIPTION OF PROJECT (Use additional sheets, if necessary) See Attachment 7

A. Structures: 1. New work [X] Maintenance of existing structure [ ]

COE Work Code

2. Piers, docks and use: Commercial [ ] Private [ ] Public [ ]

a. Single pier [ ] length_____ width_____

b. Number of piers [ ] length_____ width_____

c. Number of boat slips [ ] length_____ width_____

d. Number of finger piers [ ] length_____ width_____

e. Other (please describe) _____

3. Seawalls, revetments, bulkheads: length _____

a. Type: Vertical [ ] Riprap [ ] Slope:____Horizontal:____Vertical

b. Material to be used _____

4. Other type of structure See Attachment 7

B. Excavation or Dredging: New Work[ ] Maintenance work[ ] Total acreage involved_____
See Attachment 7

1. Access Channel [ ] or Canal [ ] Length_____ft. Width_____ft. Depth_____ft.

2. Boat Basin [ ] or Boat Slip [ ] Length_____ft. Width_____ft. Depth_____ft.

3. Other _____ Length_____ft. Width_____ft. Depth_____ft.

4. Cubic yards: Total for project _____

a. _____cyd. waterward/_____cyd. landward of ordinary/mean high water

b. Type of material to be excavated /dredged _____

C. Fill:

1. Amount of material

DER Code
253
403

a. Cubic yards placed waterward of ordinary/mean high water 23,100 (See Att. 7)

b. Cubic yards placed landward of ordinary/mean high water 900 (See Att. 7)

c. Total acreage to be filled 1.68 Total acreage of wetlands involved 0.26
See Attachment 7

2. Containment for fill

a. Dikes [ ] b. Seawall, etc. [ ] c. Other (please explain) See Attachment 7

3. Type of fill material to be used See Attachment 7

4. Source of fill material to be used See Attachment 7

8. Date activity is proposed to commence March 1, 1991; to be completed March 1, 1996

9. Previous permits for this project have been

		DER #	Corps #
		Not Applicable	
A.	Denied (date) _____	_____	_____
B.	Issued (date) _____	_____	_____
C.	Other (please explain) _____		

Differentiate between existing work and proposed work on the drawings.

10. Remarks (See Instruction Pamphlet for additional information required for all applications and certain activities. Use additional sheets if necessary.)
See Attachment 10

11. AFFIDAVIT OF OWNERSHIP OR CONTROL of the property on which to proposed project is to be undertaken

I CERTIFY THAT: (please check appropriate space)

[X] I am the record owner, lessee, or record easement holder of the property described below.

[ ] I am not the record owner, lessee, or record easement holder of the property described below, but I will have before undertaking the proposed work the requisite property interest. (Please explain what the interest will be and how it will be acquired.)

LEGAL DESCRIPTION OF PROPERTY SITUATED IN Broward COUNTY, FLORIDA
(Use additional sheets if necessary)

See Attachment 11

J.M. Small, Manager
Environmental Resources & Planning
Florida Power and Light Company

Signature

Sworn and subscribed before me at Palm Beach County, Florida, this 29th day of June, 1990.

NOTARY PUBLIC

My commission expires: NOTARY PUBLIC STATE OF FLORIDA AT LARGE
MY COMMISSION EXPIRES FEB. 17, 1993
BONDED THRU AGENTS NOTARY BROKERAGE

12. Application is made for a permit(s) to authorize the activities described herein.

A. I authorize the agent listed in Item #2 to negotiate modifications or revisions, when necessary, and accept or assent to any stipulations on my behalf.

B. I understand I may have to provide any additional information/data that may be necessary to provide reasonable assurance or evidence to show that the proposed project will comply with the applicable State Water Quality Standards or other environmental standards both before construction and after the project is completed.

C. In addition, I agree to provide entry to the project site for inspectors with proper identification or documents as required by law from the environmental agencies for the purpose of making preliminary analyses of the site. Further, I agree to provide entry to the project site for such inspectors to monitor permitted work if a permit is granted.

D. Further, I hereby acknowledge the obligation and responsibility for obtaining <u>all</u> of the required state, federal or local permits <u>before</u> commencement of construction activities. I also understand that before commencement of this proposed project I must be granted separate permits or authorizations from the U.S. Corps of Engineers, the U.S. Coast Guard, the Department of Environmental Regulation, and the Department of Natural Resources, as necessary.

I CERTIFY that I am familiar with the information contained in the application, and that to the best of my knowledge and belief such information is true, complete and accurate. I further certify that I possess the authority to undertake the proposed activities.

Signature of Applicant — Date: 6-29-90

<u>NOTE</u>: THIS APPLICATION MUST BE SIGNED by the person who desires to undertake the proposed activity or by an authorized agent. If an agent is applying on behalf of the applicant, attach proof of authority for the agent to sign and bind the applicant.

18 U.S.C. Section 1001 provides that: Whoever in any manner within the jurisdiction of any department or agency of the United States knowingly and willfully falsifies, conceals, or covers up by any trick, scheme, or device a material fact or makes any false, fictitious or fraudulent statements or representations or makes or uses any false writing or document knowing same to contain any false, fictitious or fraudulent statement or entry, shall be fined not more that $10,000 or imprisoned not more than five years, or both.

<u>NOTICE TO PERMIT APPLICANTS</u>

This is a Joint Application; it is <u>NOT</u> a Joint Permit!

You Must Obtain <u>All</u> Required Local, State and Federal

Authorizations or Permits <u>Before</u> Commencing Work!!

<u>For your information</u>: Section 370.034, Florida Statutes, requires that all dredge and fill equipment owned, used, leased, rented or operated in the state shall be registered with the Department of Natural Resources. Before selecting your contractor or equipment you may wish to determine if this requirement has been met. For further information, contact the Chief of the Bureau of Licenses and Motorboat Registration, Department of Natural Resources, 3900 Commonwealth Boulevard, Tallahassee, Florida 32303. Telephone Number 904/488-1195. THIS IS NOT A REQUIREMENT FOR A PERMIT FROM THE DEPARTMENT OF ENVIRONMENTAL REGULATION.

ATTACHMENT 3

Name of waterway at location of the activity:

1. Old Intake Canal--Unnamed finger canal connected to Dania Cut-Off Canal and South New River Canal.
2. Forested Wetland Adjacent to Finger Canal--Wetland not connected to Waters of the Nation or State.
3. Finger Canal--Unnamed finger canal connected to Dania Cut-Off Canal.

ATTACHMENT 4

Location where proposed activity exists or will occur:

1. Old Intake Canal

   Section 25, Township 50S, Range 41E; 26°04'03"N, 80°12'07"W.

2. Forested Wetland Adjacent to Finger Canal

   Section 30, Township 50S, Range 42E; 26°04'10"N, 80°11'45"W.

3. Finger Canal

   Section 30, Township 50S, Range 42E; 26°04'10"N, 80°11'45"W.

ATTACHMENT 5

Name and address including zip code of adjoining property owners whose property also adjoins the waterway:

1. Old Intake Canal

   South Florida Water Management District
   3301 Gun Club Road
   P.O. Box 24680
   West Palm Beach, FL 33416-4680

2. Forested Wetland Adjacent to Finger Canal

   Alandco, Inc.
   515 North Flagler Drive
   Suite 1100
   West Palm Beach, FL 33401

3. Finger Canal

   Alandco, Inc.
   515 North Flagler Drive
   Suite 1100
   West Palm Beach, FL 33401

ATTACHMENT 7

DESCRIPTION OF PROJECT

The proposed project plans associated with the Lauderdale Repowering Project have been reconfigured to avoid wetland impacts to the most sensitive forested wetlands and minimize wetland impacts to those areas with lower ecological values. This revised Dredge and Fill Permit Application combines the original two Dredge and Fill Permit Applications submitted in November 1989 and incorporates revisions for minimizing wetland impacts. These revisions are pursuant to an on-site inspection held April 11, 1990, with representatives from the U.S. Army Corps of Engineers, the U.S. Fish and Wildlife Service, the Florida Department of Environmental Regulation, and the South Florida Water Management District.

Three activities associated with the Lauderdale Repowering Project are addressed in this application: filling the old intake canal, construction of a central equipment parking/laydown area and wastewater treatment area, and modification of an access road.

A. Structures

4. Other types of structures

Sheet-Pile Barrier Dam and Fill Culverts

FPL proposes to fill in a previously excavated canal at the Lauderdale Plant site in Broward County. The project site is shown on the attached drawings (Figures 1 through 7). The canal was constructed more than 40 years ago for use as an intake/discharge canal for the old power plant. The canal is now obsolete, and the area will be used as stormwater detention area for the Lauderdale Repowering Project (see Section 3.8 in the SCA document).

The profiles of the existing canal are shown on Figures 5, 6, and 7. FPL proposes to use fill material from on-site to fill in the 1.24 acres of open water and the <0.1 acre of wetland area. The canal will be filled in to an elevation of +5 ft-msl.

In order to prevent any violation of water quality standards in the adjacent Dania Cut-Off Canal and South New River Canal, FPL proposes to seal the canal off from those waters prior to any filling work. Provided no manatees are present, where the canal adjoins the Dania Cut-Off Canal, FPL will install a sheet-pile barrier adjacent to the existing bridge. Seines would be utilized to remove aquatic organisms from the canal prior to installation of a filter fabric and riprap barrier at the existing culvert between the canal and the South New River Canal. This will isolate the area to be filled from the adjacent Waters of the State. Once these barriers are in place, the canal will be filled, graded, and compacted to a consistent elevation of +5 ft-msl.

Central Parking/Laydown Area and Wasterwater Treatment

FPL proposes to construct these structures on approximately 0.11 acre of forested wetland adjacent to the finger canal (**Figures 8 through 12**) and existing adjacent uplands. FPL originally proposed to construct these structures in the entire 2.5-acre forested isolated wetland; however, field visits and subsequent conversations with agency personnel resulted in a proposed impact of only 0.11 acre of the forested isolated wetland in an area which is largely dominated by Australian pine. The use of this area is needed in order to allow for the repowering of the existing Lauderdale Plant (see the Site Certification Application).

Trees (Casuarina equisetifolia, Acer rubrum, Ilex cassine) will first be removed from the proposed 0.11 acre forested wetland area. Approximately 900 yd^3 of existing soils will be removed to demuck the area to prepare the site for approximately 3,500 yd^3 of clean fill (sand and shellrock) which will be added, compacted, and graded to the elevations shown of Figures 11 and 12. The muck will either be used to fill in the adjacent finger canal or hauled to an acceptable upland site.

Access Road/Turning Radius

About 0.14 acre of open water and 0.05 acre of shoreline wetland in a finger canal located on the eastern portion of the site (Figure 9) will be filled. This filling is required to allow the upgrading of the eastern access road. The upgrade provides an increased turning radius which is necessary to bring in large equipment (e.g., HRSGs, CTs, and turbine

generators) associated with the repowering project into the site. Approximately 560 yd^3 of structurally unsound material will be removed and then approximately 2,860 yd^3 of fill material will be added to 0.14 acre of the finger canal in order to raise it to about 5 ft-msl. A turbidity screen will be installed in the finger canal downstream of the work location to prevent a violation of water quality standards.

Two 15-ft-wide temporary bridges will be installed over the finger canal to allow workers to enter the site from the parking/laydown areas located to the east of the canal. The bridges will span the canal without any structures in the open water.

B. Excavation
   3. Other
      Length--170 ft
      Width--60 ft
      Depth--2.5 ft
   4. Cubic Yards
      a. Waterward 944 cyd
         Landward 0 cyd
      b. Type of Material: peat/muck

C. Fill
   1. Amount of material
      a. Cubic yards placed waterward of ordinary/mean high water:
         Old Intake Canal: 20,800 cyd
         Forested Wetland Adjacent to Finger Canal: 0 cyd
         Finger Canal: 2,860 cyd
      b. Cubic yards placed landward of ordinary mean high water:
         Old Intake Canal: insignificant cyd
         Forested Wetland Adjacent to Finger Canal: 3,500 cyd
         Finger Canal: insignificant cyd

c. Total acreage to be filled:

	Total	Wetlands
Old Intake Canal (open water)	1.34 acres	0.10 acre
Forested Wetland Adjacent to Finger Canal	0.11	0.11
Finger Canal (open water)	0.23	0.05
	1.68 acres	0.26 acre

2. Containment for fill

Old Intake Canal--Sheet-pile at connection to Dania Cut-Off Canal and blocked culvert at connection to South Fork River.

Forested Wetland Adjacent to Finger Canal--Elevation of surrounding berms would contain fill.

Finger Canal--Coffer dam/sheet-pile or equivalent.

3. Type of fill material to be used

Old Intake Canal--clean sand, peat, and limestone fragments.

Forested Wetland Adjacent to Finger Canal--sand, shell, or rock (limestone).

Finger Canal--sand, shell, or rock (limestone).

4. Source of fill material to be used

Old Intake Canal--excavation from on-site.

Forested Wetland Adjacent to Finger Canal--local contractor.

Finger Canal--local contractor.

ATTACHMENT 10

Remarks

Old Intake Canal

FPL requires the use of the project area as part of the repowering project to provide reliable cost efficient electrical power to existing and future Florida residents. Because this manmade canal is no longer required, this option is more favorable than impacting existing forested wetland areas. There is a narrow fringe of existing wetland (<0.1 acre) which will be removed, but the contribution of this wetland to the ecosystem is insignificant. There are no submerged seagrasses that will be removed by this project. Additionally, since there is a connection between the Dania Cut-Off Canal and the South New River Canal, the proposed project will have no significant effect on the marine fisheries or the movement of aquatic organisms from one canal to the other.

The work will be performed when there are no manatees in the area, so the proposed project is not expected to have any effect on manatees or any other endangered or threatened animal or plant species.

No toxic, hazardous, or otherwise deleterious agents will be introduced into the aquatic environment; therefore the project is expected to have an insignificant effect on the environment.

Forested Wetland Adjacent to Finger Canal

The proposed project would occur in 0.11 acre of a wetland adjacent to the finger canal. A biological assessment indicated a mixture of Australian pine and a deciduous hardwood canopy with a herbaceous understory. The canopy is primarily Australian pine (Casuarina equisetifolia), red maple (Acer rubrum), pond apple (Annona glabra), and red bay (Persea borbonia). The understory includes both species of wild coffee (Psychotria nervosa and P. sulznerri) and several ferns including Osmunda regalis, Thelypteris dentata, Blechnum serrulatum, Achrostichum danaefolium, and Nephrolepis exaltata. The northwestern side of the wetland in which the impact would occur slopes upward gradually with an associated transitional area of typical transition/disturbed plant species, including saltbush (Baccharis

sp.), castor bean (Ricinus communis), Madagascar periwinkle (Catharanthus roseus), Caesar's weed (Urena lobata), and royal palm (Roystonea sp.).

No endangered species were identified at the site, and thus the project is not expected to have any effect on any endangered plant or animal species.

Silt curtains stabilized with hay bales will be placed adjacent to the forested wetland to prevent any additional impact. Additionally, a berm will be constructed along the canal adjacent to the power plant discharge to avoid runoff or other turbidity-related problems in the nearby waterway.

Clean fill will be used. The project is not designed to introduce any toxic, hazardous, or otherwise deleterious materials into the environment.

Finger Canal

In order to avoid additional impacts to the forested wetland adjacent to the finger canal, FPL proposes to fill 0.23 acre of a finger canal to the Dania Cut-Off Canal. Although this finger canal is connected to Waters of the State and Nation, it supports very few plants. Additionally, the proposed fill activities will occur at the north end of the canal in the proximity of heavy traffic and construction activity. Therefore, the ecological impacts associated with filling the 0.23 acre of this finger canal will be very low.

Mitigation Proposal

Based on the revised engineering plans, total wetland and/or open-water impacts associated with repowering are 1.68 acres (old intake canal, 1.34 acres; forested wetland 0.11 acre; finger canal 0.23 acre), of which 1.57 acres is open water and 0.11 acre is wetland. To mitigate these wetland impacts, FPL plans to create a manatee shelf along the south edge of the cooling pond (**Figures 8 and 14**). A mitigation plan based on 1:1 compensation for loss of open water and fringe and 1.5:1 compensation for loss of forested wetlands results in mitigating 1.74 acres for 1.68 acres lost.

Discussions with agency personnel indicate that constructing a manatee shelf in an area frequented by manatees would provide much higher

ecological value than mitigating "in kind." The manatee shelf would be constructed by scraping down existing uplands at a slope of 12:1 for a length of 720 ft and width of 100 ft. The 100-ft distance is limited by the extent of FPL ownership of 100-ft under the transmission lines. The only break in the slope would occur at the location of the transmission line finger pads, which would be elevated above the water level. The manatee shelf would extend east to west for a distance of 720-ft, to provide the 1.65 acres needed for mitigation.

The manatee shelf will be planted with species such as cord grass (Spartina alterniflora) to be located every 36 inches on center interspersed with bacopa (Bacopa sp.), arrowhead (Sagittaria lancifolia), and capeweed (Lippia nodiflora). The actual species selected for planting will depend on adaptability to the hydrological and salinity conditions of the manatee shelf, high success rate for transplanting, and local availability. Only native species will be planted. Each species will be planted along a wide elevation gradient to ensure higher survival from fluctuating water levels. Plant monitoring will be conducted quarterly for 2 years. Replantings will be conducted if plant survival drops below 80 percent, and any exotic species which colonize during the monitoring period will be removed. FPL will not be responsible for replanting if the plants are uprooted by manatees.

ATTACHMENT 11

LEGAL DESCRIPTION

Rev. 1

TICOR TITLE INSURANCE

October 13, 1989

RE: Florida Power & Light Company Lauderdale Plant
Our File Number G-4848PG

This is to certify that we have examined the Public Records of Broward County, Florida, from Beginning through June 9, 1989 at 12:01 A.M. with regard to the following described property:

SEE ATTACHED EXHIBIT A

We find that apparent record to the above title is vested : in Florida Power & Light Company, a Florida Corporation.

We find the above described property is subject to the following:

SEE ATTACHED EXHIBIT B

This certificate is given in accordance with Section 177.041 Florida Statutes

TICOR TITLE INSURANCE COMPANY

10.1.4-17

TICOR TITLE INSURANCE

LAUDERDALE PLANT BOUNDARY LEGAL DESCRIPTION:

A Portion of the Section 25, Township 50 South, Range 41 East and a portion of Sections 19, 20 and 30, Township 50 South, Range 42 East of Broward County, Florida; being more particularly described as follows:

Commence at the center of said Section 30-50-42, thence South 1 41' 18" East, along East line of the Southwest 1/4 of said Section 30, for 814.58 feet to the approximate centerline of the Dania Cut-Off Canal, being the Point of beginning of hereinafter described boundary:

From said Point of beginning, thence South 88 44' 30" West, along said approximate centerline, for 3247.52 feet to the intersection with the Easterly Right-of-Way line of the South New River Canal (C-11, 260" Wide R/W), as shown on "Route 441 Resourse Recovery Site" Plat recorded in Plat Book 132, at Page 41 P.R.B.C.F.; thence North 35 44' 42" East, along said Easterly Right-of-Way Line, for 450.45 feet; thence North 20 05' 06" East, continuing along said Easterly Right-of-Way Line, for 1200.99 feet to a Point on the common section line between Section 25-50-41 and Section 30-50-42; thence North 22 11' 30" East for 847.25 feet; thence North 22 17' 02" East, along Easterly line of Parcel 2-A, as described in Official Records Book 14269, at Page 344 P.R.B.C.F.; thence North 33 08' 26" East, continuing along Easterly line of said Parcel 2-a, for 321.26 feet; thence North 38 52' 20" E, Along last described line, for 390.68 feet; thence North 61 13' 50" East, continuing along Easterly line of said Parcel 2-A, for 667.79 feet to a point on the North line of the Northwest 1/4 of Section 30-50-42; thence South 88 56' 29" East, along said North line, also being the South line of Parcel 1, as described in Official Records Book 16063, at Page 576 P.R.B.C.F., for 974.55 feet to the North 1/4 corner; thence South 1 20' 31" East, along the East line of the Northwest 1/4 of Sec. 30-50-42, for 125.00 feet; thence North 66 27' 10" East, continuing along the Southerly line of last described Parcel 1, for 2444.55 feet; thence North 3 32' 19" West, along line 275 feet West of and Parallel to the East line of Section 19-50-42, for 180.00 feet; thence North 26 21' 15" East for 551.79 feet to a point on the common section line between Sec. 19-50-42 and Sec. 20-50-42; thence North 3 32' 19" West, along West line of said Section 20, for 460.00 feet to the Northwest corner of the South 1/2 of the North 1/2 of the Southwest 1/4 of said Section 20; thence North 89 20' 02" East, along North line of said South 1/2 of North 1/2 of Southwest 1/4 of Section 20, for 1276.06 feet; thence South 2 43' 26" East, along the West line of parcel described in Official Records Book 15765, at Page 565 P.R.B.C.F.; for 568.16 feet; thence South 3 59' 55" West, continuing along last described deed line, for 796.52 feet to a Point on the North line of the South 1/4 of the Southwest 1/4 of said Section 20; thence South 89 38' 50" West, along the North line of last described South 1/4, also being the North line of Parcel described in Official Records Book 13396, at Page 92 P.R.B.C.F., for 515.16 feet to the Northwest corner of the Southeast 1/4, of the Southwest 1/4, of the Southwest 1/4 of said Section 20; thence South 3 07' 49" East, along the West line of the Southeast 1/4, of Southwest 1/4, of Southwest 1/4 of Section 20, also being the West line of last described recorded parcel for 680.05 feet to the Southwest corner of said Southeast 1/4, Southwest 1/4, Southwest 1/4; thence South 89 48' 27" West, along the South line of the Southwest 1/4 of Section 20, for 643.77 feet to the Section corner common to Sections 19, 20, 29 and 30; thence South 1 41' 35" East, along the East

line of the Northeast 1/4 of said Section 30-50-42, for 678.23 feet; thence South 89 34' 28" West for 100.02 feet; thence South 1 41' 35" East, along a line 100 feet West of and parallel to the East line of said Northeast 1/4, for 900.00 feet; thence South 58 55' 51" West for 513.52 feet; thence South 0 59' 09" East for 150.00 feet; thence South 89 00' 51" West for 150.00 feet to the point of curvature of a circular to the left; thence Westerly and Southwesterly along the arc of said curve to the left, having for its elements, a central angle of 24 35' 20", a radius of 300.00 feet, for an arc distance of 128.75 feet to the point of tangent; thence South 64 25' 31" West for 250.00 feet; thence South 86 37' 11" West for 144.67 feet to the Northeast corner of parcel described in Official Records book 15188, at Page 433 P.R.B.C.F.; thence South 86 20' 16" West, along the North line of last described recorded parcel for 976.32 feet; thence South 1 41' 18" East along the West line of last described recorded parcel, for 400.00 feet; thence North 88 12' 52" West, along a line 40 feet North and parallel to the South line of the Northeast 1/4 of said Section 30, for 161.61 feet; thence South 89 09' 16" West for 138.70 feet; thence South 1 41' 18" East for 50.01 feet; thence South 89 09' 16" West for 100.01 feet to a point on the West line of the Southeast 1/4 of said Section 30; thence South 1 41' 18" East, along the West line of said Southeast 1/4, for 793.69 feet to the Point of Beginning; less that portion of the Dania cut-off canal which lies below the mean high waterline.

TICOR TITLE INSURANCE

EXHIBIT B

a. Taxes for the year 1989 and subsequent years.

b. Meter Site Lease from Florida Power & Light Company and Houston Texas Gas and Oil Corporation filed July 27, 1959 in Official Records Book 1619, at Page 400.

c. Easement in favor of Houston Texas Gas Oil Corporation filed July 27, 1959 in Official Records Book 1619, at Page 406.

d. Resolution Designating Area of Operation of Broward County Water and Sewer System No. 3 filed January 23, 1969 in Official Records Book 3843, at Page 410. Corrective Resolution filed March 10, 1971 in Official Records Book 4442, at Page 847.

e. Resolution Assessing Lien filed March 22, 1983 in Official Records Book 10740, at Page 992.

f. Rockpit Agreement in favor of Robert Elmore filed June 25, 1954 in Official Records Book 169, at Page 464. Modified by instrument filed February 1, 1957 in Official Records Book 836, at Page 591.

g. Mortgage in favor of Bankers Trust Company and The Florida National Bank of Jacksonville as set out below:

Instrument	Date as of	Mortgage or Official Records Book	Page
Mortgage & Deed of Trust	Jan. 1, 1944	165	1
First Supplemental Indenture	Jul. 1, 1947	227	48
Second Supplemental Indenture	Jun. 1, 1948	250	357
Third Supplemental Indenture	Jun. 1, 1949	279	244
Fourth Supplemental Indenture	Nov. 1, 1951	370	584
Fifth Supplemental Indenture	Apr. 1, 1953	450	428
Sixth Supplemental Indenture	Nov. 1, 1954	236	1
Seventh Supplmental Indenture	Apr. 1, 1956	609	214
Eighth Supplemental Indenture	Dec. 1, 1956	794	164
Ninth Supplemental Indenture	May. 1, 1957	930	410
Tenth Supplemental Indenture	Apr. 1, 1958	1189	289
Eleventh Supplemental Indenture	Jun. 1, 1959	1574	427
Twelfth Supplemental Indenture	Nov. 1, 1959	1720	550
Thirteenth Supplemental Indenture	Aug. 1, 1962	2438	345
Fourteenth Supplemental Indenture	Apr. 1, 1964	2782	900
Fifteenth Supplemental Indenture	Mar. 1, 1965	2977	406
Sixteenth Supplemental Indenture	Dec. 1, 1965	3130	106
Seventeenth Supplemental Indenture	Dec. 1, 1966	3335	460
Eighteenth Supplemental Indenture	Dec. 1, 1967	3550	972
Nineteenth Supplemental Indenture	Jun. 1, 1968	3684	698
Twentieth Supplemental Indenture	Dec. 1, 1968	3804	19
Twenty-first Supplemental Indenture	Jun. 1, 1969	3958	352
and re-recorded		3968	663

TICOR TITLE INSURANCE

Instrument	Date as of	Mortgage Official Record Book	Page
Twenty-second Supplemental Indenture	Jul. 1, 1970	4261	695
Twenty-third Supplemental Indenture	Jan. 1, 1971	4401	198
Twenty-fourth Supplemental Indenture	Sep. 1, 1971	4604	690
Twenty-fifth Supplemental Indenture	Jun. 1, 1972	4907	307
Twenty-sixth Supplemental Indenture	Jan. 1, 1973	5128	841
Twenty-seventh Supplemental Indenture	Aug. 1, 1973	5425	726
Twenty-eighth Supplemental Indenture	Jan. 1, 1974	5614	379
Twenty-ninth Supplemental Indenture	May. 1, 1974	5782	771
Thirtieth Supplemental Indenture	May. 1, 1975	6142	790
Thirty-first Supplemental Indenture	May. 1, 1975	6217	424
Thirty-second Supplemental Indenture	Nov. 1, 1975	6395	980
Thirty-third Supplemental Indenture	Jun. 1, 1976	6615	918
Thirty-fourth Supplemental Indenture	Jan. 1, 1978	7381	894
Thirty-fifth Supplemental Indenture	Jan. 1, 1978	7383	919
Thirty-sixth Supplemental Indenture	Mar. 13, 1979	8107	329
Thirty-seventh Supplemental Indenture	Nov. 1, 1979	8558	734
Thirty-eighth Supplemental Indenture	Nov. 1, 1980	8769	399
Thirty-ninth Supplemental Indenture	May. 1, 1980	8908	97
Fortieth Supplemental Indenture	Oct. 1, 1980	9198	510
Forty-first Supplemental Indenture	Mar. 1, 1981	9458	156
Forty-second Supplemental Indenture	May. 1, 1981	9576	554
Forty-third Supplemental Indenture	Nov. 1, 1981	9906	255
Forty-fourth Supplemental Indenture	Dec. 1, 1981	9928	838
Forty-fifth Supplemental Indenture	Dec. 1, 1981	9928	854
Forty-sixth Supplemental Indenture	Mar. 1, 1982	10059	80
Forty-seventh Supplemental Indenture	Jun. 1, 1982	10246	13
Forty-eighth Supplemental Indenture	Oct. 1, 1982	10465	489
Forty-ninth Supplemental Indenture	Mar. 1, 1983	10712	415
Fiftieth Supplemental Indenture	Sep. 1, 1983	11148	889
Fifty-first Supplemental Indenture	Jan. 1, 1984	11408	378
Fifty-second Supplemental Indenture	May. 1, 1984	11743	13
Fifty-third Supplemental Indenture	Oct. 1, 1984	12068	736
Fifty-fourth Supplemental Indenture	Apr. 1, 1985	12466	728
Fifty-fifth Supplemental Indenture	Apr. 1, 1985	12466	745
Fifty-sixth Supplemental Indenture	Sep. 1, 1985	12791	534
Fifty-seventh Supplemental Indenture	Sep. 1, 1985	12791	554
Fifty-eighth Supplemental Indenture	Oct. 1, 1985	12883	682
Fifty-nineth Supplemental Indenture	Feb. 1, 1986	13211	289
Sixtieth Supplemental Indenture	May. 1, 1986	13365	189
Sixty-first Supplemental Indenture	Oct. 1, 1986	13800	526
Sixty-second Supplemental Indenture	Nov. 1, 1986	13879	661
Sixth-third Supplemental Indenture	Nov. 1, 1986	13879	678
Sixth-fourth Supplemental Indenture	Apr. 1, 1987	14371	55
Sixty-fifth Supplemental Indenture	Aug. 1, 1987	14745	856
Sixty-sixth Supplemental Indenture	Feb. 1, 1988	15210	755

h. Easement in favor of Florida Gas Transmission Company filed August 17, 1967 in Official Records Book 3628, at Page 304.

i. Easement in favor of Sunniland Pipe Line Co. Inc., filed April 17, 1972 in Official Records Book 4835, at Page 647. Assigned to Fedelity National Bank of Baton Rouge by instrument filed August 20, 1971 in Official Records Book 4587, at Page 469.

j. Easement in favor of Sunniland Pipe Line Company, Inc., filed December 21, 1988 in Official Records Book 16051, at Page 62.

k. Declaration of Agreement, Covenants, Conditions, and Restrictions filed May 14, 1986 in Official Records Book 13396, at Page 944.

l. Declaration filed May 14, 1986 in Official Records Book 13398, at Page 58 In re Lake owner.

m. Easement in favor of Robert Elmore filed May 14, 1986 in Official Records Book 13398, at Page 66.

n. Boundary Line Connection Agreement amoungst Robert Elmore, Florida Power & Light Company and Alandeo Inc., filed February 12, 1988 in Official Records Book 15188, at Page 433.

o. Easement in favor of Florida Gas Transmission Company filed December 6, 1968 in Official Records Book 3807, at Page 843.

p. Easement in favor of Sunniland Pipe Line Co. Inc., filed in Official Records Book 4613, at Page 348.

q. Declaration of Location of Easements and Disclaimer of Interest in other properties filed by Sunniland Pipe Line Company filed July 11, 1974 in Official Records Book 5846, at Page 423.

r. Supplemental Rockpit Agreement in favor of Robert Elmore filed July 14, 1955 in Official Records Book 413, at Page 285.

s. Easement in favor of Robert Elmore filed June 12, 1984 in Official Records Book 11773, at Page 331.

t. Resolution establishing a Bulkhead Line in Section 19, Township 50 South Range 42 East filed April 8, 1969 in Official Records Book 3900, at Page 569.

u. Easement in favor of Sunniland Pipe Line Co. Inc., filed January 28, 1974 in Official Records Book 5619, at Page 437.

TICOR TITLE INSURANCE

v. Easement in favor of Florida Gas Transmission Company filed September 17, 1970 in Official Records Book 4304, at Page 975.

w. Drainage Easement in favor of Alandco Inc., filed November 18, 1988 in Official Records Book 15968, at Page 1.

x. Easement and Boundary Line Connection Agreement filed November 18, 1988 in Official Records Book 15968, at Page 7.

y. Easement in favor of Sunniland Pipe Line Company, Inc. filed December 21, 1988 in Official Records Book 16051, at Page 53.

z. Canal Reservation in favor of the Trustee's of the Internal Improvement Fund of the State of Florida contained in Deed filed April 22, 1908 in Deed Book 43, at Page 346 as to North 1/2 of Lot 32 in Section 23 Plat Book 2, Page 26 (Dade County).

aa. Canal, mineral and petroleum reservations in favor of the Trustees of th Internal Improvement Fund of the State of Florida contained in Deed filed September 24, 1917 in Deed Book 7, at Page 576 as to Lot 17 in Section 25 Plat Book 2, Page 26 (Dade County).

bb. Canal Reservations in favor of the Trustees of the Internal Improvement Fund of the State of Florida contained in Deed filed March 12, 1908 in Deed Book 43, at Page 270 as to Lots 18 and 31 in Section 25 Plat Book 2, Page 20 (Dade County).

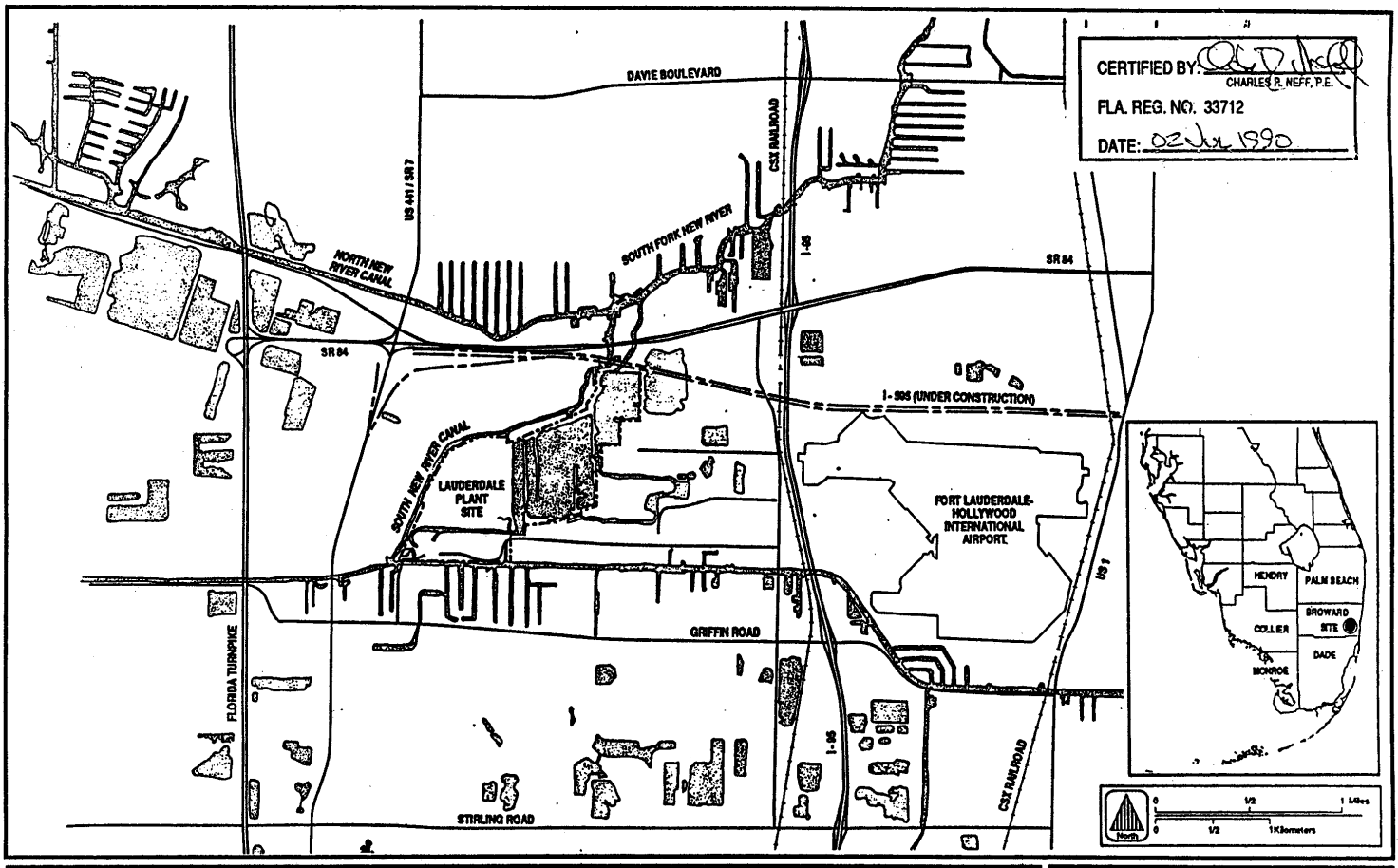


Figure 1 SITE LOCATION MAP

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10.1.4-25

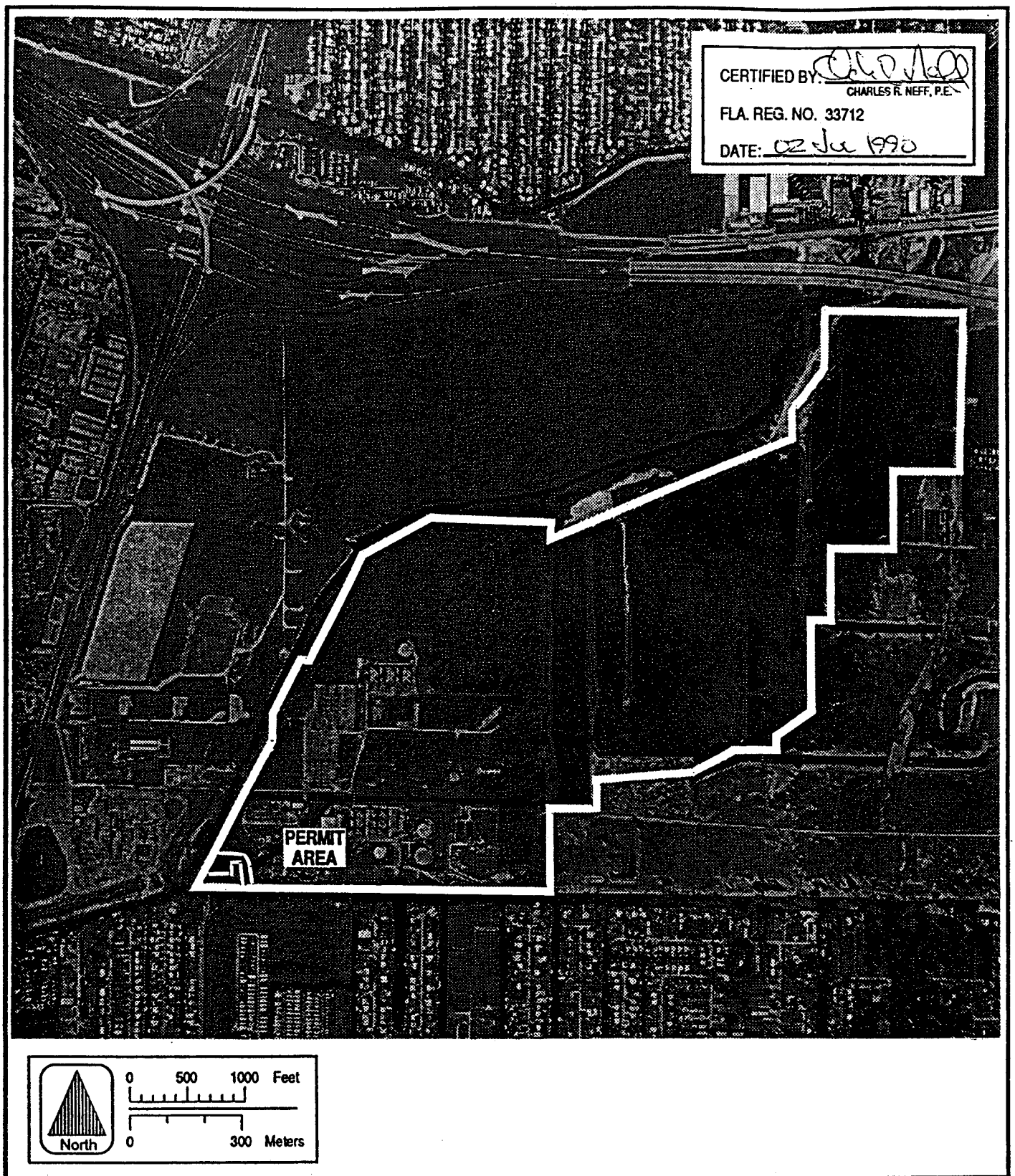


Figure 2 AERIAL OF LAUDERDALE PLANT SITE BOUNDARY SHOWING AREA TO BE FILLED — OLD INTAKE CANAL

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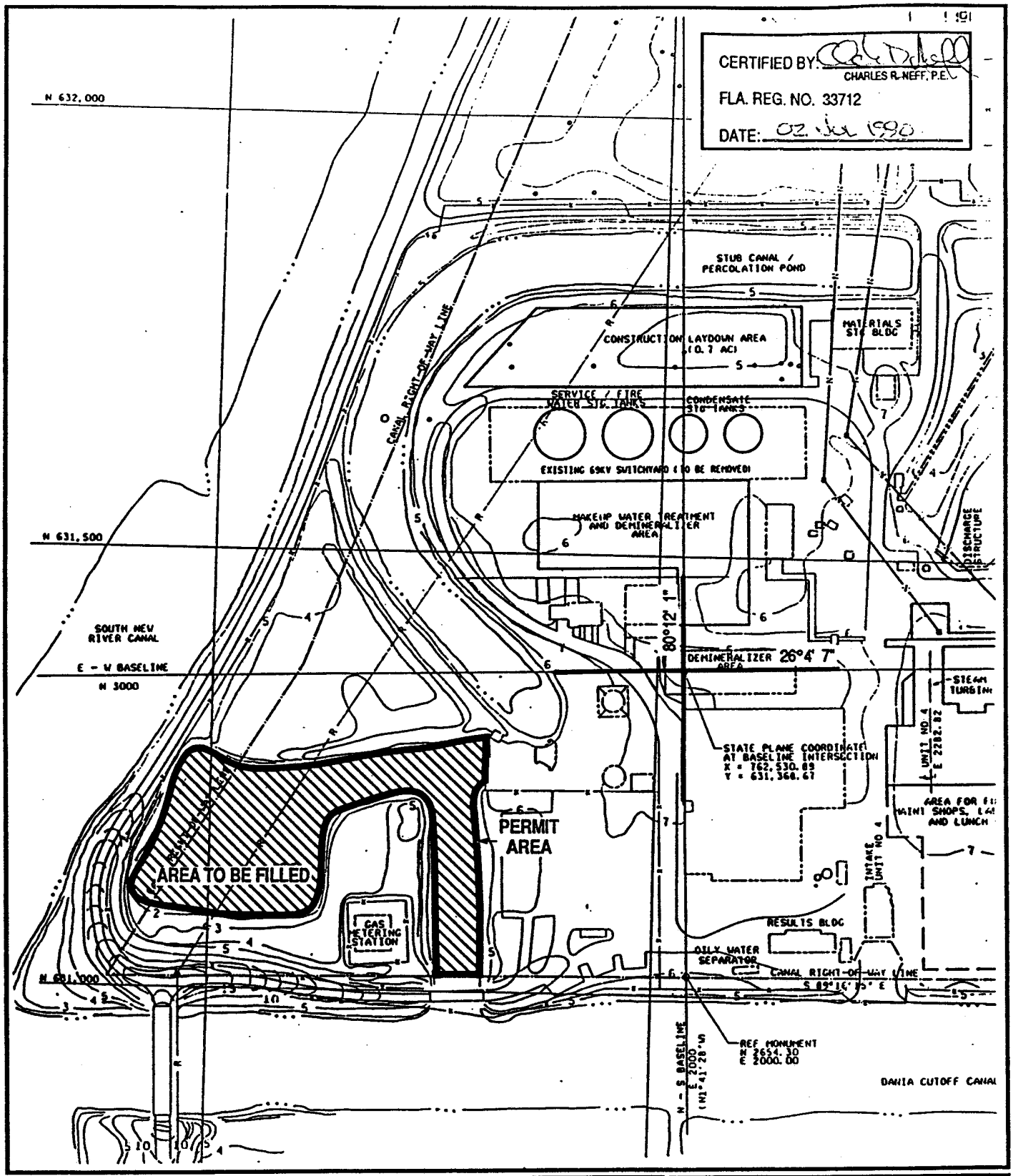


Figure 3 PLAN VIEW OF PERMIT AREA — OLD INTAKE CANAL

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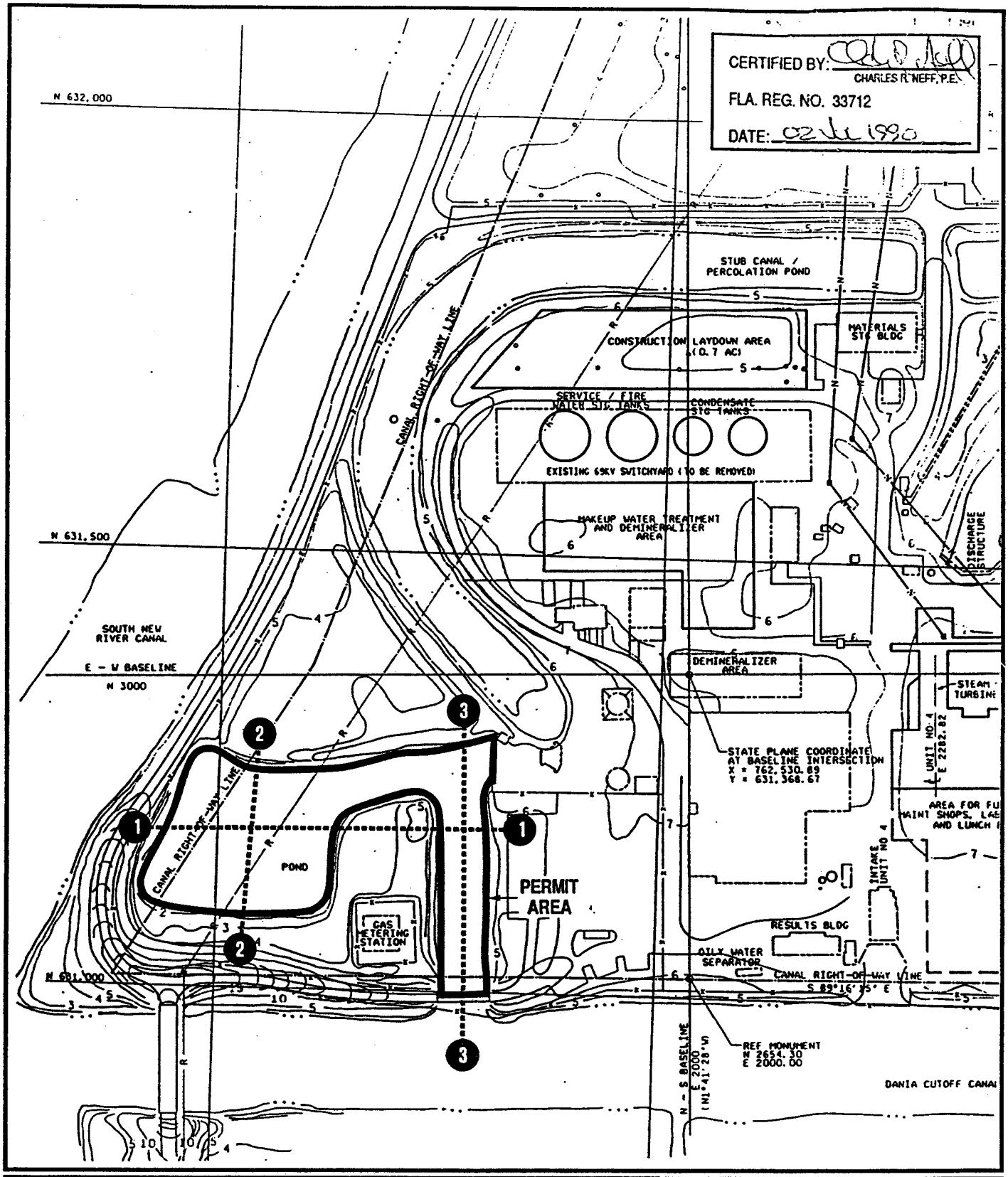


Figure 4 **PLAN VIEW SHOWING CROSS SECTIONS — OLD INTAKE CANAL**

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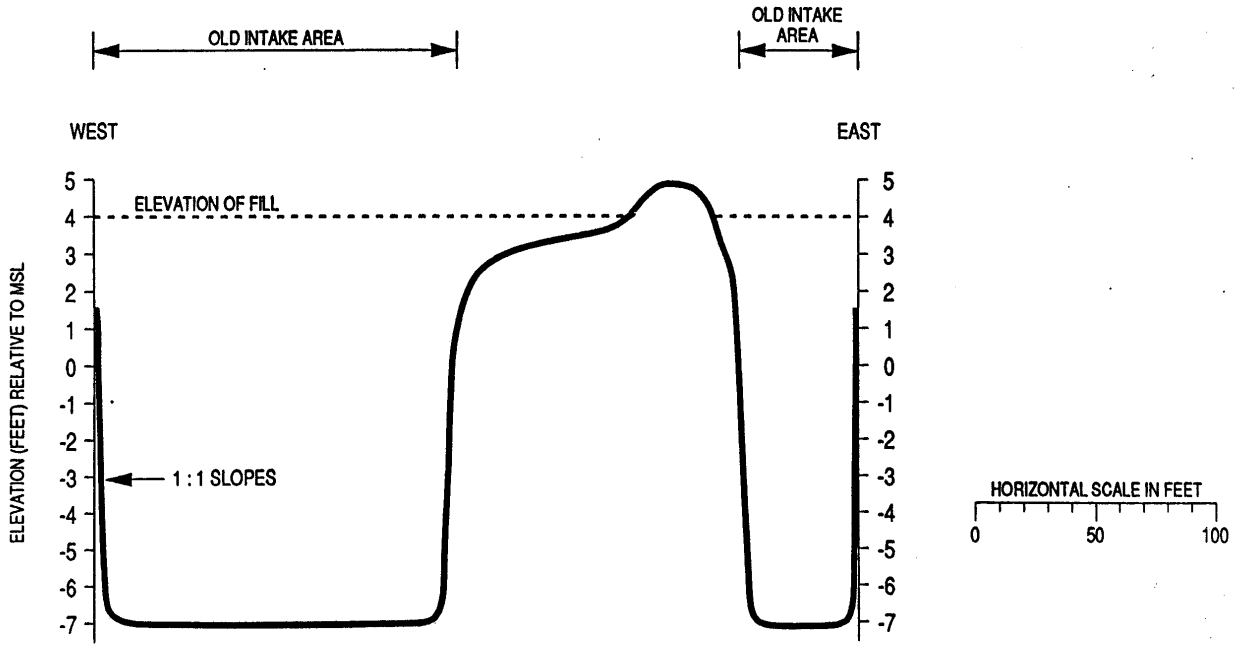


Figure 5 CROSS SECTION 1 — OLD INTAKE CANAL

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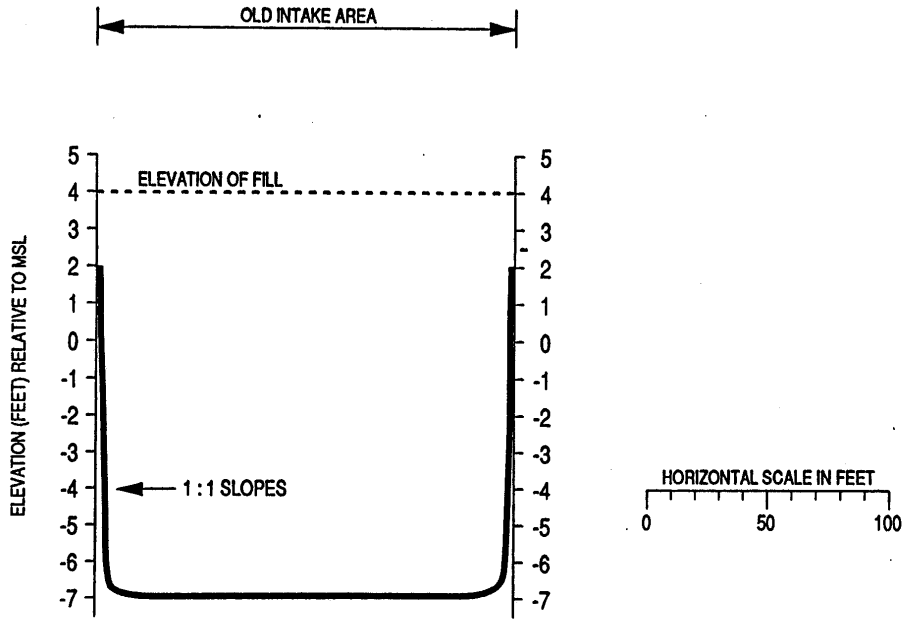


Figure 6 CROSS SECTION 2 — OLD INTAKE CANAL

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Image Quality
As you review the next group of images, Please note that the original documents
were of poor quality.

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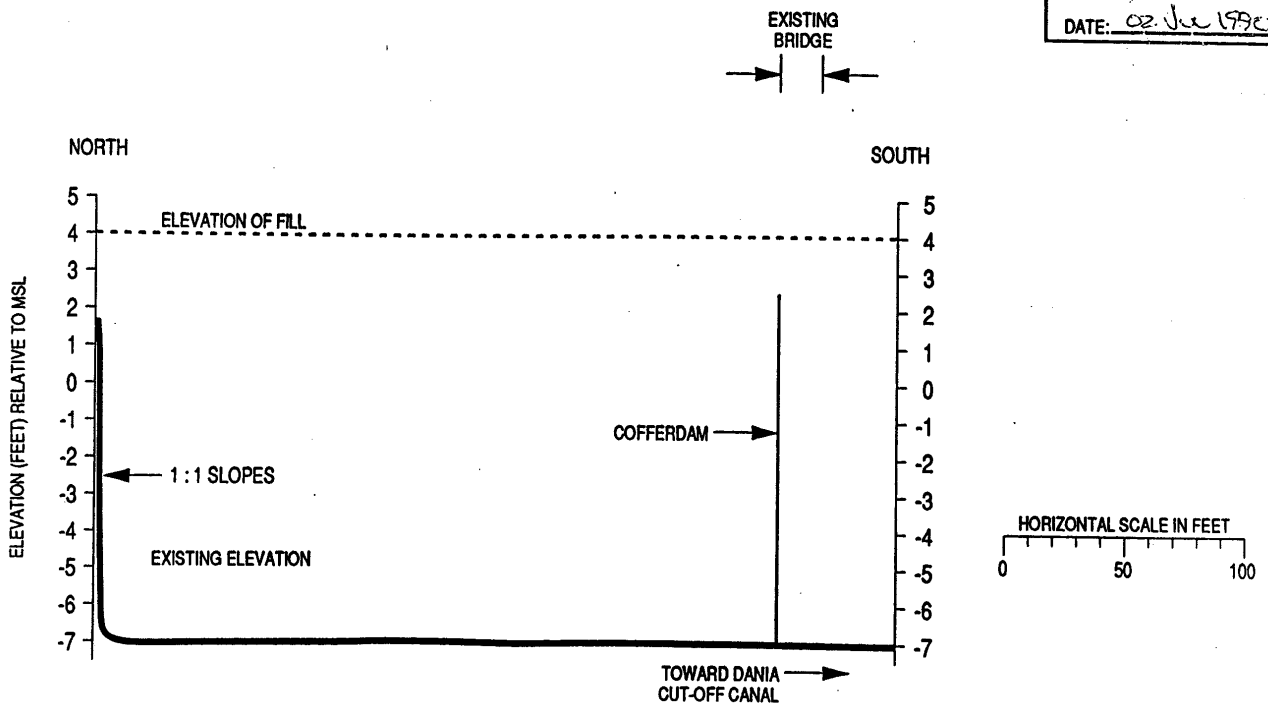


Figure 7 CROSS SECTION 3 — OLD INTAKE CANAL

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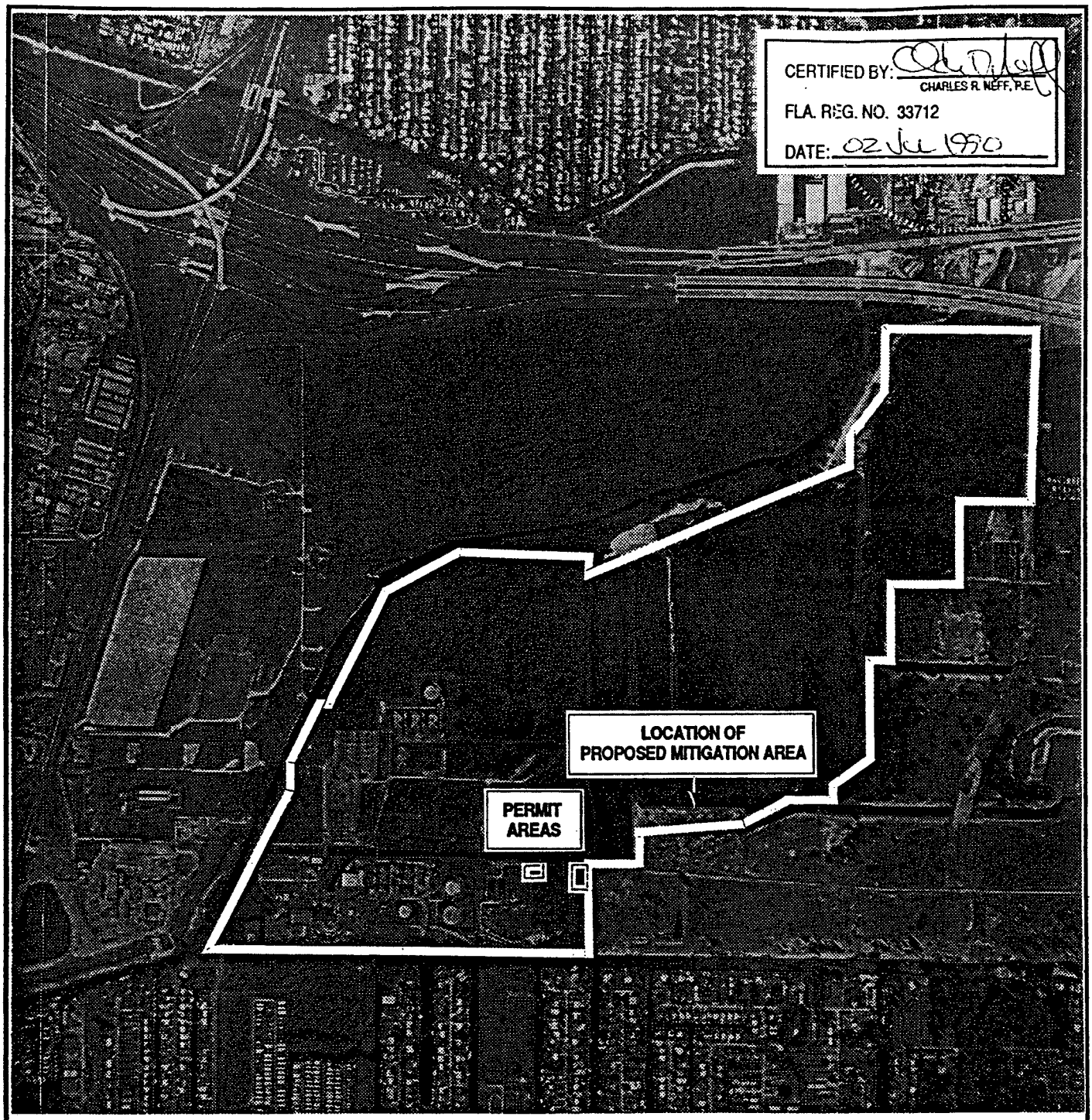


Figure 8 AERIAL OF LAUDERDALE PLANT SITE BOUNDARY SHOWING AREA FOR DREDGE AND FILL – FORESTED WETLAND ADJACENT TO FINGER CANAL

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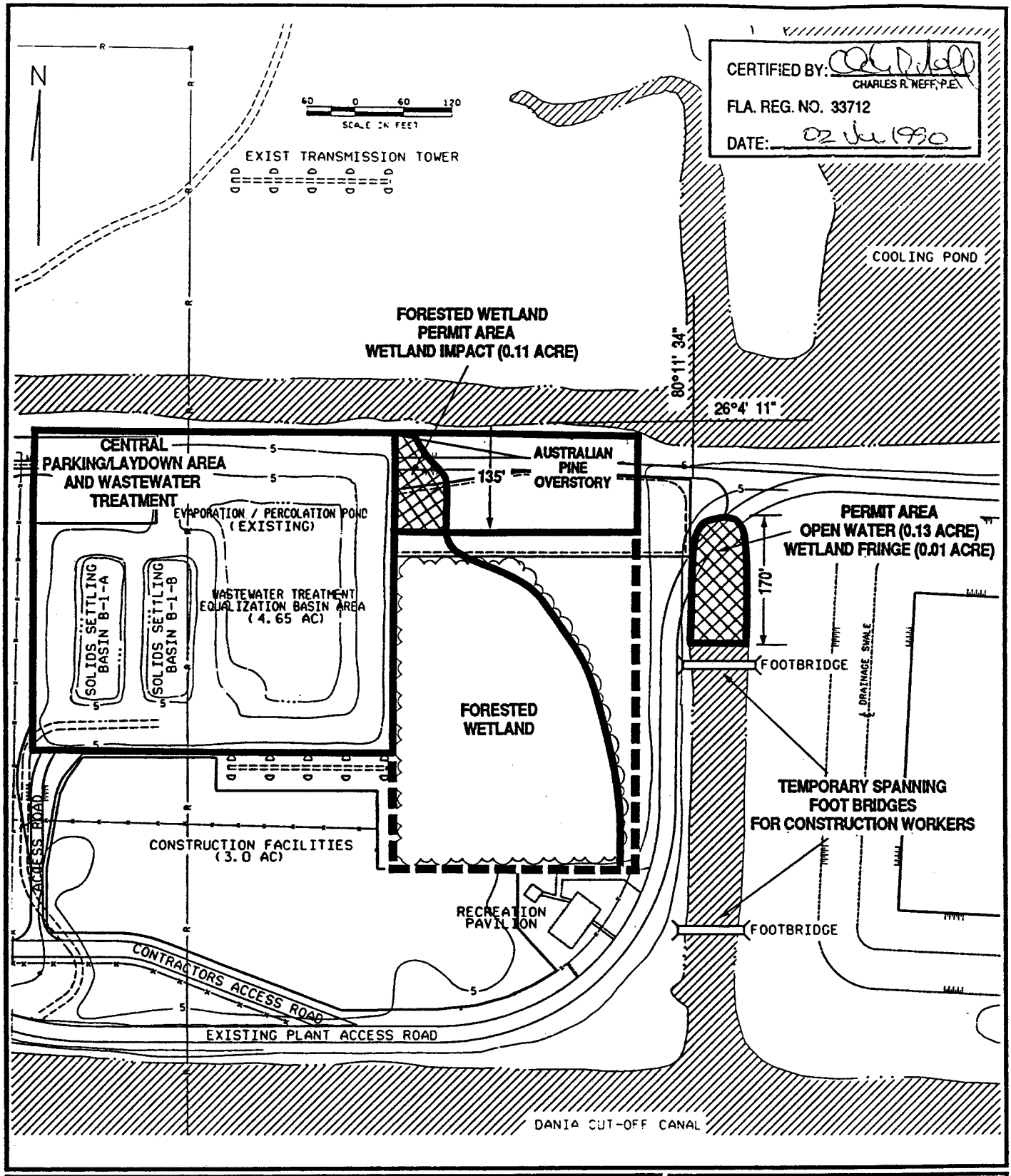


Figure 9 PLAN VIEW OF PERMIT AREA – FINGER CANAL AND FORESTED WETLAND ADJACENT TO FINGER CANAL

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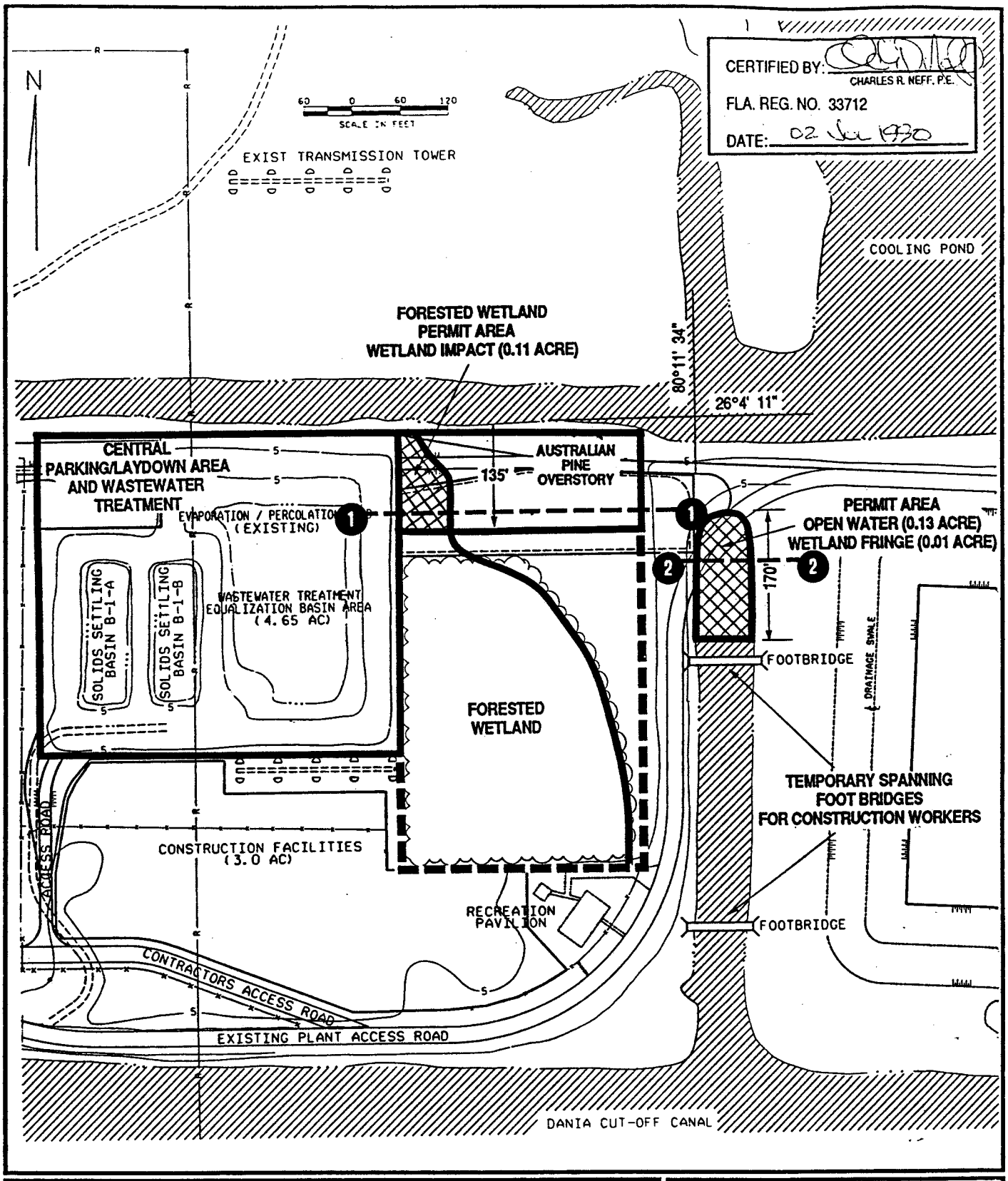


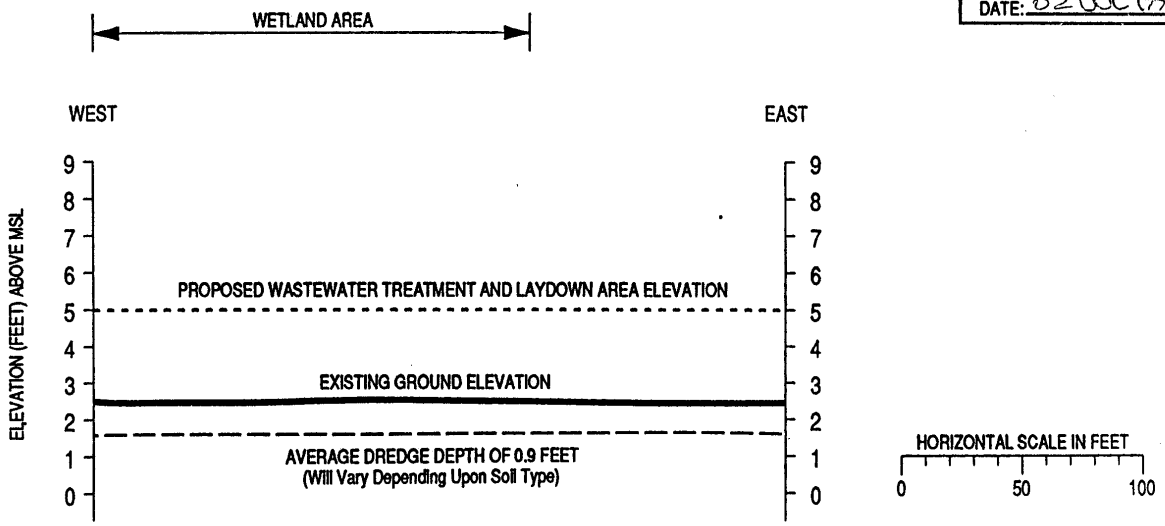
Figure 10 PLAN VIEW SHOWING CROSS SECTIONS – FINGER CANAL AND FORESTED WETLAND ADJACENT TO FINGER CANAL

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NOTE: MEAN HIGH WATER (MHW) IS ABOUT 2 FEET ABOVE MEAN SEA LEVEL (MSL) BASED ON TIDAL MEASUREMENTS TAKEN IN DANIA CUT-OFF CANAL.

Figure 11 CROSS SECTION 1 – FORESTED WETLAND ADJACENT TO FINGER CANAL

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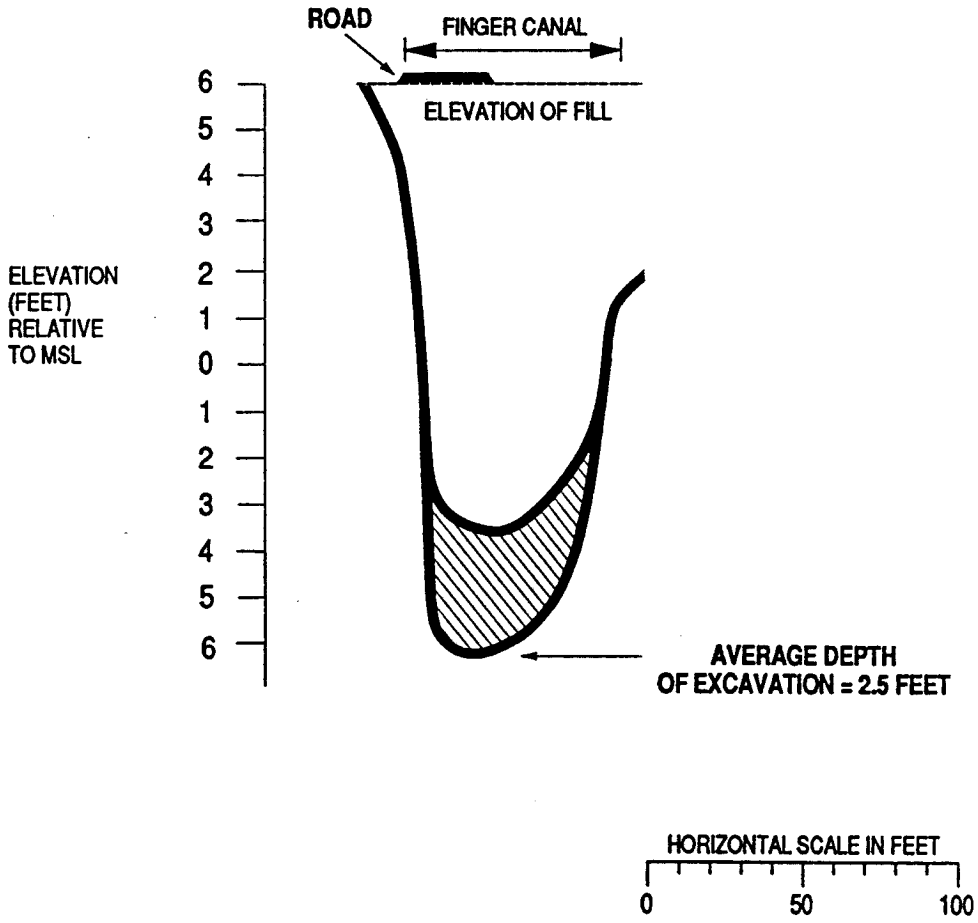


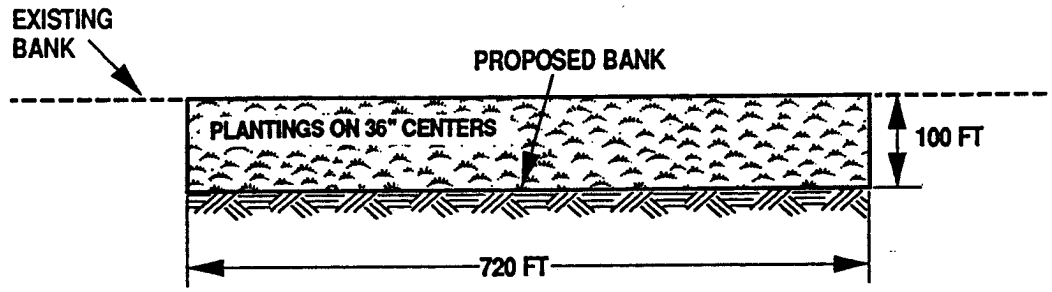
Figure 12 CROSS SECTION 2 – FINGER CANAL

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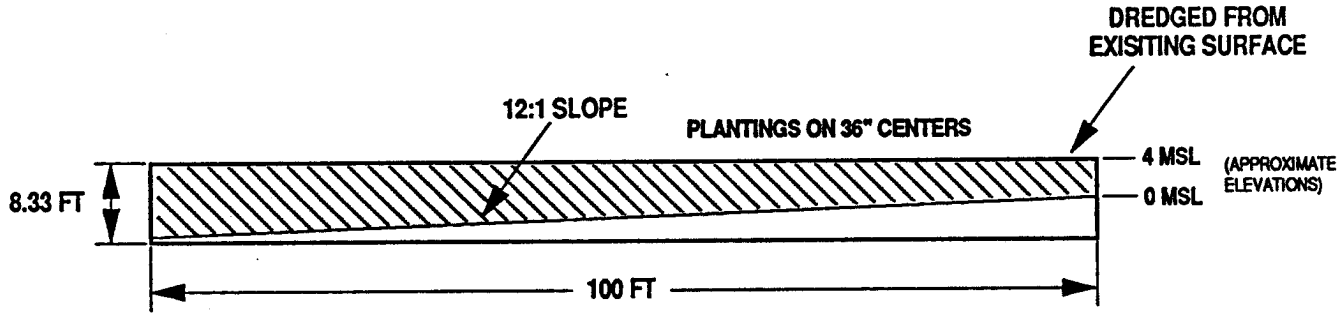
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PLAN VIEW



PROFILE VIEW

Figure 13 MITIGATION AREA

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Appendix 10.1.5

Air Permit Application

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1.0 INTRODUCTION

The Florida Power & Light Company (FPL) Lauderdale Plant is located in eastern Broward County, about 1 mile east of the Florida Turnpike and 1 mile west of Interstate Highway 95 (Figure 1-1). Currently, the FPL Lauderdale Plant consists of two fossil-fuel steam generating units (Units 4 and 5) and 24 gas turbines (GT 1 through GT 24) with a total plant net summer electric generating capability of 1,126 megawatts (MW) (1,248 MW net, winter). All of these units are designed to burn either natural gas or oil.

FPL is proposing a Combustion Turbine Repowering Project at the Lauderdale Plant site, which will consist of replacing the existing steam generators for Units 4 and 5 with combustion turbines (CTs) and heat recovery steam generators (HRSGs) operating as a combined cycle plant. Each repowered unit will consist of two CTs, each with its own HRSG. The CTs directly drive electric generators to produce electric power. The exhaust gases from the CTs exhaust through the HRSGs, producing steam in the HRSGs. This steam will essentially replace the steam presently generated by Units 4 and 5 steam generators and will be used in the existing steam turbines. The existing Units 4 and 5 electric generators and condenser cooling system will also remain in service as part of the repowered units. A map of the Lauderdale Plant site, indicating both the existing units and the proposed units, is presented in Figure 1-2.

The combined cycle power plant will burn natural gas as the primary fuel and No. 2 fuel oil as an alternate fuel. Each repowered unit will have a nominal generating capacity of 480 MW. Each CT/HRSG train will be served by an individual stack.

The Lauderdale Repowering Project will result in increases in air emissions over current emissions from the Lauderdale Plant. The U.S. Environmental Protection Agency (EPA) has promulgated regulations which require a prevention of significant deterioration (PSD) review for new or modified sources which increase emissions of regulated air pollutants

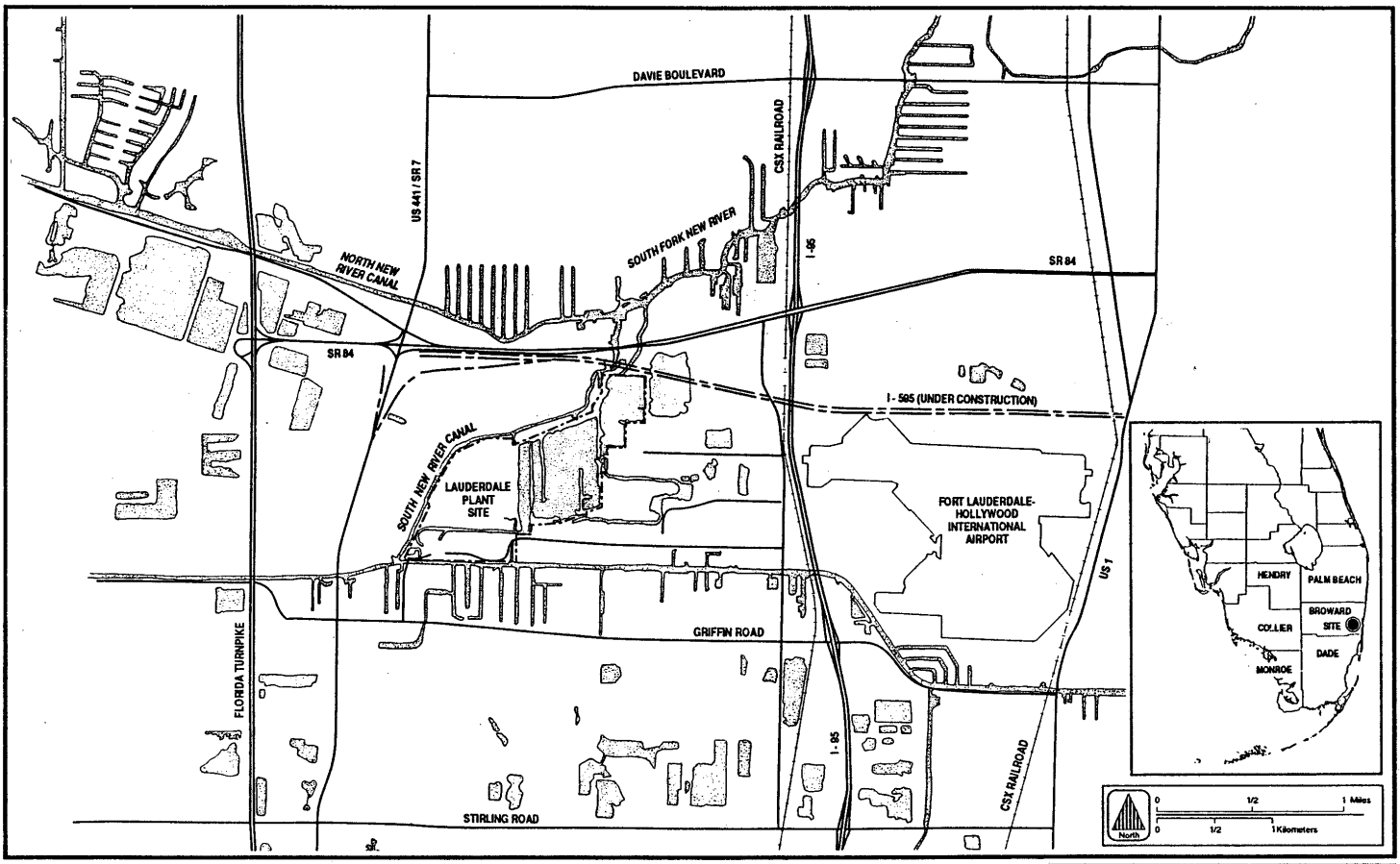


Figure 1-1 LOCATION OF LAUDERDALE PLANT SITE

Lauderdale Repowering Project

FPL

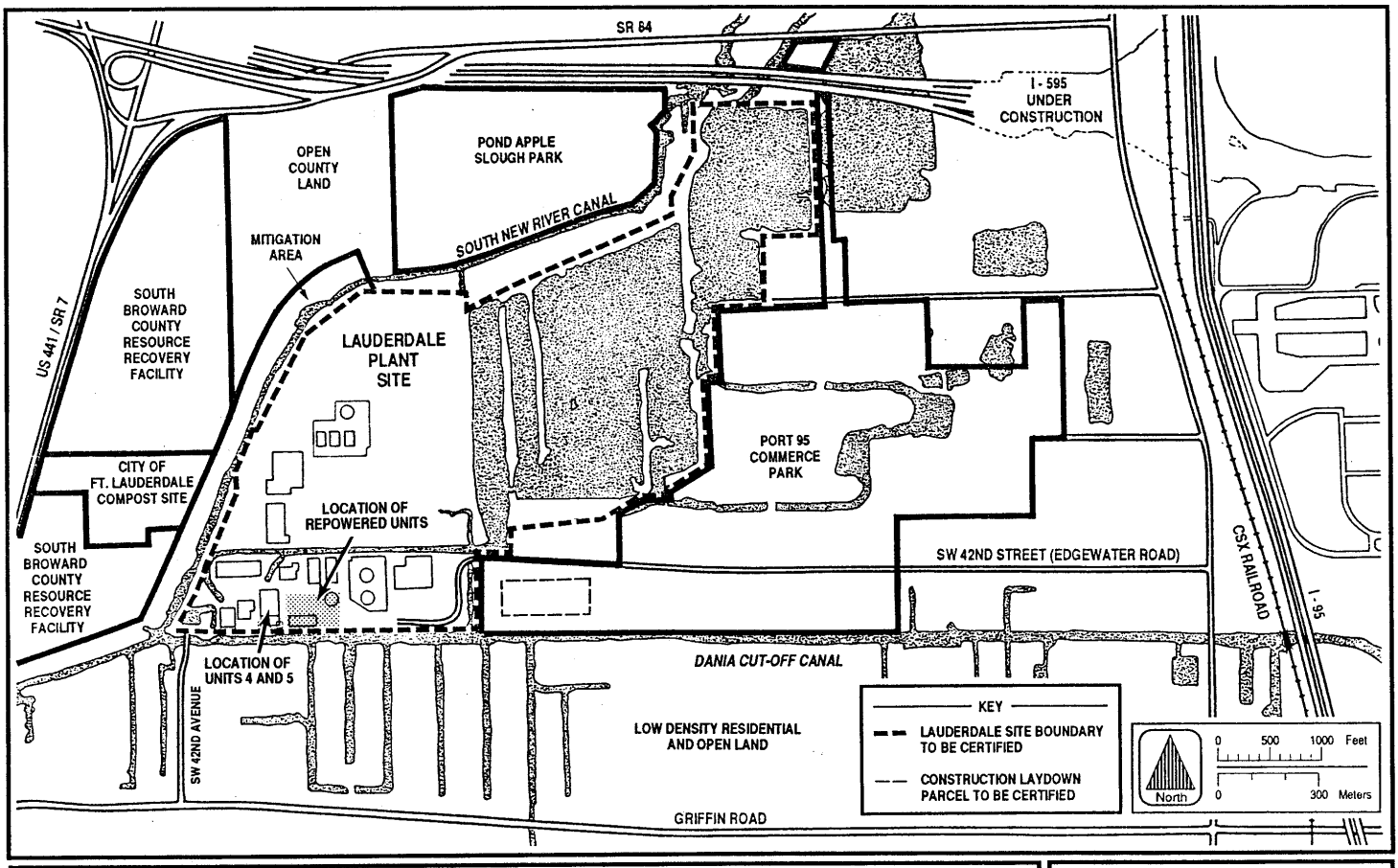


Figure1-2 LAUDERDALE SITE MAP

Lauderdale
Repowering
Project

FPL

above certain threshold amounts. Because the threshold amounts will be exceeded for certain emissions by the project, the project is subject to PSD review. Federal PSD regulations are promulgated under 40 Code of Federal Regulations (CFR) Part 52.21 and implemented through Florida Department of Environmental Regulation (FDER) air quality regulations. FDER's PSD regulations are codified in Chapter 17-2.500, Florida Administrative Code (F.A.C.).

Broward County is part of a three county area, which includes Dade and Palm Beach Counties, that have been designated as nonattainment for ozone. Any emissions of volatile organic compounds (VOC), the pollutant regulated in ozone nonattainment areas, must be addressed according to FDER Rule 17-2.510 F.A.C. Operational limitations are requested in this air permit application that would restrict existing and new VOC emissions from the Lauderdale Plant and repowered units. These limitations would bring the VOC emissions from the plant and repowered units under the threshold amounts requiring nonattainment review.

The technical information and analysis required by the federal and state PSD regulations are contained in this application. Although this document is an appendix to the Site Certification Application (SCA) for the facility, it has been prepared as a stand-alone application since EPA and other agencies may review the PSD application separately. The application is divided into eight major sections. Presented in Section 2.0 is a description of the facility, including air emissions and stack parameters. Air quality review requirements and applicability are presented in Section 3.0. The control technology review, including the Best Available Control Technology (BACT) evaluation, is presented in Section 4.0. Air quality monitoring information is presented in Section 5.0, and the methodology and results of the impact analyses performed for the project are presented in Sections 6.0, 7.0, and 8.0. Section 9.0 addresses nonattainment. Appendix D contains FDER Form 17-1.202(1).

2.0 PROJECT DESCRIPTION

2.1 GENERAL DESCRIPTION

The repowered Units 4 and 5 will each consist of two CTs and two HRSGs (i.e., a total of four CTs and four HRSGs for the two units). Each CT will be served by a single HRSG, exhausting to an individual stack. There will be no bypass stacks on the CTs for simple cycle operation; simple cycle operation will be accomplished by passing the exhaust gases through the HRSGs and diverting steam from the HRSGs directly to the condenser. A flow diagram of the project is presented in Figure 2-1.

The CTs will be capable of firing either natural gas or No. 2 distillate fuel oil. There will be supplementary firing of natural gas only in the HRSGs.

Steam injection will be used to control emissions of nitrogen oxides (NO_x) from the CTs. The use of natural gas or low-sulfur (0.5-percent sulfur or less) No. 2 fuel oil will minimize the emissions of sulfur dioxide (SO_2) from the units.

Air emission sources associated with the repowering project consist of the CTs, HRSGs, and fuel oil storage tanks. Storage of No. 2 fuel oil on-site will result in very minor emissions of volatile organic compounds. No. 6 fuel oil is currently stored on-site for Units 4 and 5.

The existing fossil-fuel steam generators for Units 4 and 5 will be retired upon completion of the repowering project. These units presently burn natural gas and/or No. 6 fuel oil. Shutdown of these existing units will result in creditable emission decreases.

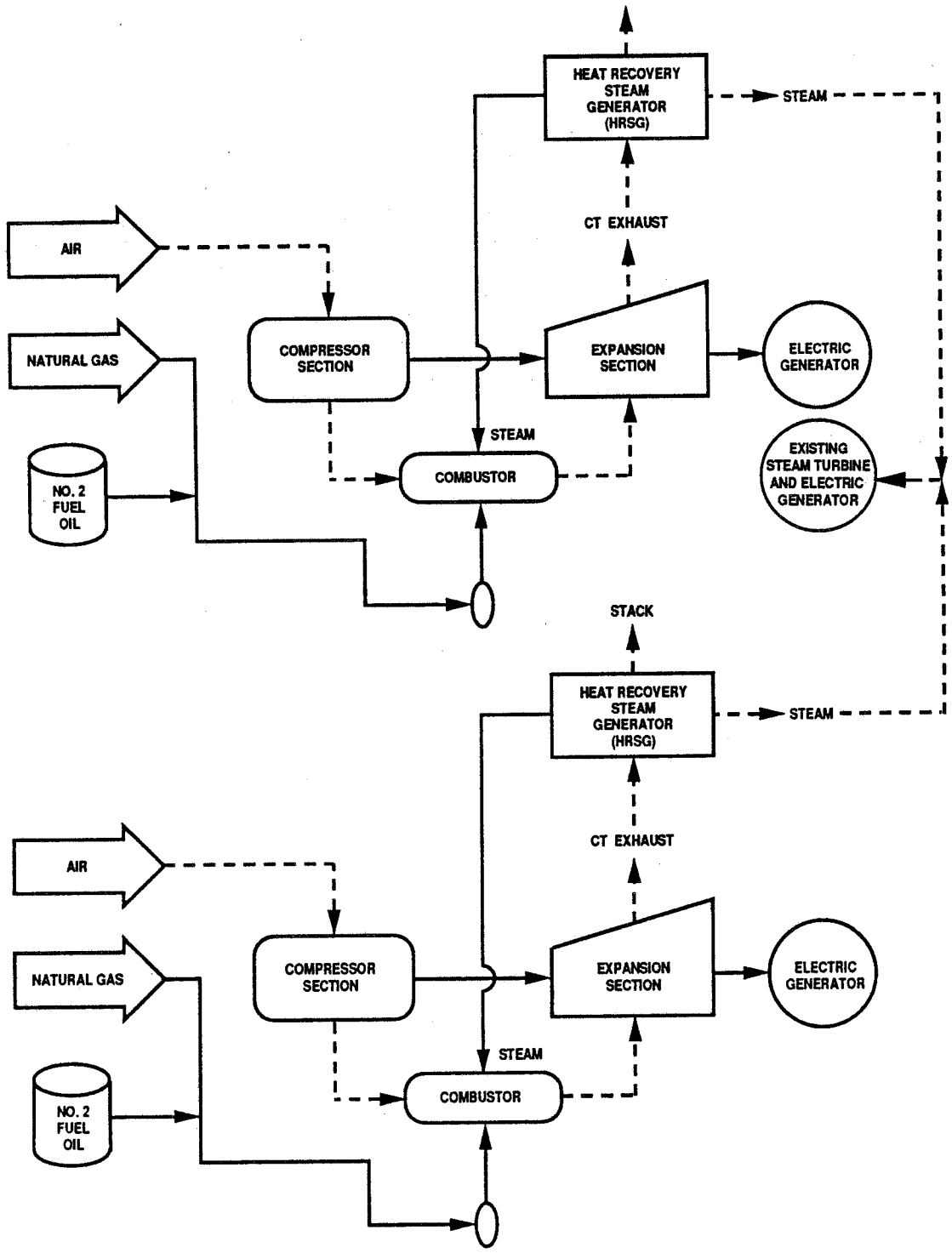


Figure 2-1 SIMPLIFIED FLOW DIAGRAM OF REPOWERED UNIT

Lauderdale Repowering Project

FPL

2.2 FACILITY EMISSIONS AND STACK OPERATING PARAMETERS

The performance information and stack parameters that envelope the CT manufacturers' designs currently being considered for the project are presented in Table 2-1. The volumetric flow rates that will be encountered over the range of ambient operating conditions and for the worst-case fuel (i.e., No. 2 fuel oil) are presented in this table.

Maximum emission rates for regulated criteria pollutants, regulated non-criteria pollutants, and nonregulated pollutants from each CT are presented in Tables 2-2, 2-3, and 2-4, respectively. Detailed performance information and stack parameters for each fuel (natural gas or No. 2 fuel oil) are presented in Appendix A. These design data include operation over the expected range of ambient conditions encountered at the site (40°F to 95°F).

Supplemental firing with natural gas will take place in the duct between each CT and its associated HRSG. The supplemental firing, at a maximum rate of 90.62 million British thermal units per hour (x 10^6 Btu/hr), will allow the HRSG to produce additional steam and therefore allow greater electrical power generation in the steam turbine/generator. The firing of natural gas will produce additional air emissions, as shown in Tables 2-2 through 2-4 for the maximum firing rate. These emissions will combine with the CT exhaust gases only during natural gas firing and exhaust through the HRSG stack.

Maximum air quality impacts due to operation of the repowered units will be a function of emission rate and plume rise. Review of the available design information shows that maximum emissions occur when burning No. 2 fuel oil, except in the case of mercury and polycyclic organic matter (POM). Both natural gas burning and No. 2 fuel oil burning result in similar exhaust gas flow rates (which are directly related to plume rise). As a result, worst-case operating parameters were based upon burning No. 2 fuel oil. Worst-case emissions also occur when operating at 40°F ambient temperature.

Table 2-1. Design Information and Stack Parameters for Lauderdale Repowering Project--for Each Combustion Turbine (CT)

Parameter	No.2 Oil at 40°F	No.2 Oil at 95°F
General		
Power (kW)	172,290	151,480
Heat Rate (Btu/kWh)	9,830	10,335
Heat Input (10^6 Btu/hr)	1,693.6	1,565.5
Fuel Oil (lb/hr)	89,531.7	81,837.2
Fuel		
Oil--HHV (Btu/lb)	19,130	19,130
Sulfur (%)	0.5	0.5
Gas Turbine Exhaust Conditions		
Volume Flow (acfm)	2,422,969	2,283,495
Volume Flow (scfm)	852,885	759,726
Mass Flow (lb/hr)	3,753,920	3,311,950
Temperature (°F)	1,040	1,127
Moisture (%)	11.23	83
Oxygen (%)	12.14	15
Molecular Weight	28.27	27.89
Steam Injected (lb/hr)	155,080	143,630
Stack Exhaust Conditions		
Temperature (°F)	280	280
Volume Flow (acfm)	1,195,331	1,064,768
Diameter (ft)	18	18
Velocity (ft/sec)	78.3	69.7
Height (ft)	150	150

Note: Based on one CT/HRSG operating at full load.

acfm = actual cubic feet per minute.
10^6 Btu/hr = million British thermal units per hour.
Btu/kWh = British thermal unit per kilowatt hour.
ft/sec = feet per second.
HHV = high heating value.
kW = kilowatt.
lb/hr = pounds per hour.
scfm = standard cubic feet per minute.

Table 2-2. Maximum Criteria Pollutant Emissions for Lauderdale Repowering Project

Pollutant	Maximum Emissions per CT[a]	Supplemental Firing Emissions per HRSG
Particulate[b]		
Basis	Design	Design
lb/hr	60.6	0.7
TPY	265.4	3.1
Sulfur Dioxide		
Basis	0.5% sulfur	2 gr/1,000 ft^3[c]
lb/hr	895.67	0.05
TPY	3,923.1	0.22
Nitrogen Oxides		
Basis	65 ppm[d]	0.11 lb/10^6 Btu
lb/hr	440.0	10.0
TPY	1,972.1	43.8
Carbon Monoxide		
Basis	33 ppm[e]	0.19 lb/10^6 Btu
lb/hr	108.9	17.6
TPY	477.1	77.1
VOCs		
Basis	6 ppm[e]	0.022 lb/10^6 Btu
lb/hr	8.49	2.0
TPY	37.2	8.8
Lead		
Basis (lb/10^{12} Btu)	8.9	neg.
lb/hr	0.015	neg.
TPY	0.068	neg.

[a]Maximum emissions with oil firing at ISO conditions except for particulate, CO, and VOC; maximum emissions for these pollutants are 40°F (see Table A-2).
[b]Does not include sulfate or sulfite aerosols; those emissions are included in sulfuric acid emissions.
[c]Maximum pipeline sulfur is 200 gr/1,000 ft^3.
[d]Corrected to 15 percent O_2 dry conditions.
[e]Corrected to dry conditions.

Note: gr/1,000 ft^3 = grains per 1,000 cubic feet.
lb/10^6 Btu = pounds per million British thermal units.
lb/10^{12} Btu = pounds per 10^{12} British thermal units
lb/hr = pounds per hour.
ppm = parts per million.
TPY = tons per year.

Table 2-3. Maximum Emissions of Other Regulated Pollutants, Lauderdale Repowering Project

Pollutant	Maximum Emissions per CT[a]	Supplemental Firing Emissions per HRSG
Arsenic		
Basis ($lb/10^{12}$ Btu)	4.2	neg.
lb/hr	0.0072	neg.
TPY	0.031	neg.
Beryllium		
Basis ($lb/10^{12}$ Btu)	2.5	neg.
lb/hr	0.0043	neg.
TPY	0.019	neg.
Mercury[b]		
Basis (pg/J)	3.0	4.9
lb/hr	0.020	0.001
TPY	0.089	0.004
Fluorides		
Basis (pg/J)	14	neg.
lb/hr	0.055	neg.
TPY	0.24	neg.
Sulfuric Acid Mist		
Basis	8% of sulfur	3% of sulfur
lb/hr	111.5	0.0002
TPY	489	0.001

[a]Maximum emissions at ISO conditions and oil firing unless otherwise noted.
[b]Maximum emissions are based upon natural gas firing.

Note: $lb/10^{12}$ Btu = pounds per 10^{12} British thermal units.
lb/hr = pounds per hour.
pg/J = picograms per Joule.
TPY = tons per year.

Table 2-4. Maximum Emissions of Nonregulated Pollutants, Lauderdale Repowering Project

Pollutant	Maximum Emissions per CT[a]	Supplemental Firing Emissions per HRSG
Manganese		
Basis ($lb/10^{12}$ Btu)	6.44	neg.
lb/hr	0.011	neg.
TPY	0.048	neg.
Nickel		
Basis ($lb/10^{12}$ Btu)	170	neg.
lb/hr	0.29	neg.
TPY	1.28	neg.
Cadmium		
Basis ($lb/10^{12}$ Btu)	10.5	neg.
lb/hr	0.018	neg.
TPY	0.079	neg.
Chromium		
Basis ($lb/10^{12}$ Btu)	47.5	neg.
lb/hr	0.081	neg.
TPY	0.36	neg.
Copper		
Basis ($lb/10^{12}$ Btu)	280	neg.
lb/hr	0.48	neg.
TPY	2.1	neg.
Vanadium		
Basis (pg/J)	30	neg.
lb/hr	0.12	neg.
TPY	0.52	neg.
Selenium		
Basis (pg/J)	10.1	neg.
lb/hr	0.040	neg.
TPY	0.18	neg.
POM[b]		
Basis (pg/J)	0.28	0.28
lb/hr	0.0012	0.00006
TPY	0.0051	0.00026
Formaldehyde		
Basis ($lb/10^{12}$ Btu)	405	0.038 ng/J
lb/hr	0.69	0.008
TPY	3.04	0.035

[a]Maximum emissions at ISO conditions and oil firing unless otherwise noted.
[b]Maximum emissions are based upon natural gas firing.

Note: neg. = negligible.
pg/J = picograms per Joule.
POM = polycyclic organic matter.

Lowest exhaust gas volumetric flow from the repowered units occurs under 95°F operation. Since this condition results in the lowest plume rise of the exhaust gases and potentially higher impacts than the maximum emission rate case (40°F), stack data for this case were used in the air quality impact analysis.

The CTs will be subject to federal New Source Performance Standards (NSPS) for gas turbines. The NSPS, described in Section 4.2, limit emissions of sulfur dioxide and nitrogen oxides.

Prior to Repowering Units 4 and 5, the existing 150,000-barrel (bbl) tank (Tank No. 3), which was used for No. 6 fuel oil storage, will be converted for storage of No. 2 fuel oil. Tank No. 4, a 55,000-bbl tank which currently is used to store No. 2 fuel oil for the GTs, will be removed. Two other existing tanks with capacities of 80,000 bbl (Tank No. 2) and 75,000 bbl (Tank No. 5) will continue to be used for No. 6 and No. 2 fuel oil storage, respectively. Table 2-5 presents the maximum estimated emissions of volatile organic compounds (VOCs) from these storage tanks. VOCs are the only pollutant emitted from the tanks.

After repowering, Tank No. 2 will be converted from using No. 6 fuel oil to using No. 2 fuel oil. Tanks No. 2, 3, and 5 will be interconnected and used for No. 2 fuel oil for the Repowered Units and GTs 1-24. The potential net increase in VOC emissions before and after repowering is 4.8 tons/year (TPY) (13.65 TPY from Table 2-5a minus 8.84 TPY from Table 2-5).

There are also several miscellaneous storage tanks at the FPL Lauderdale facility. These tanks store No. 2 fuel oil, No. 6 fuel oil, or unleaded gasoline. Total potential VOC emissions from these tanks before repowering is estimated to be 0.12 TPY (see Appendix D for documentation). The only change in the tanks after repowering will be the removal of three No. 6 fuel oil metering tanks. This change will result in a 0.01 TPY decrease in VOC emissions. Maximum potential VOC emissions from the remaining tanks after repowering is 0.11 TPY.

Table 2-5. VOC Emissions From Storage Tanks at FPL Lauderdale Plant Before Repowering Units 4 and 5

Description	No. 2 Tank (Future Potential)	No. 3 Tank (Future Potential)	No. 5 Tank (Future Potential)	No. 3 Tank (Current Actual)	No. 4 Tank (Current Actual)
Type of Liquid Stored	No. 6 Fuel Oil	No. 2 Fuel Oil	No. 2 Fuel Oil	No. 6 Fuel Oil	No. 2 Fuel Oil
Tank Volume (gallons)	3,360,000	6,300,000	3,150,000	6,300,000	2,310,000
Total Annual Throughput (gallons)	192,642,943[a]	688,302,094[b]	343,635,079[c]	19,751,871[d]	1,656,000[e]
Turnovers Per Year	57.3	109.3	109.1	3.1	0.72
Molecular Weight of Vapor	130.0	130.0	130.0	190.0	130.0
Storage Temperature (°F)	75.0	75.0	75.0	75.0	75.0
Vapor Press. @ Storage Temperature (psia)	0.0001	0.0105	0.0105	0.0001	0.0105
Tank Diameter (ft)	120.0	150.0	120.0	150.0	100.0
Average Vapor Space Height (ft)	20.0	24.0	19.0	24.0	20.0
Average Diurnal Temperature Change (°F)	20.0	20.0	20.0	20.0	20.0
Paint Factor	1.33	1.33	1.33	1.33	1.33
Product Factor	1.0	1.0	1.0	1.0	1.0
Turnover Factor	0.6	0.4	0.4	1.0	1.0
Breathing Losses (lb/yr)	80.2	3730.9	2251.2	189.3	1685.7
(TPY)	0.04	1.87	1.13	0.09	0.84
Working Losses (lb/yr)	27.0	9019.5	4503.0	6.8	54.3
(TPY)	0.01	4.51	2.25	0.003	0.03
Total Emissions (TPY)	0.05	6.38	3.38	0.10	0.87

[a]Assumes 100 percent of the potential No. 6 fuel oil usage of Units 4 and 5.
[b]Assumes 66.7 percent of the potential No. 2 fuel oil usage required for GTs 1-24.
[c]Assumes 33.3 percent of the potential No. 2 fuel oil usage required for GTs 1-24.
[d]Creditable emission decrease for ceasing No. 6 fuel oil use; assumes 66.7 percent of the 1969 through 1989 average fuel usage for Units 4 and 5 (see Table 2-10).
[e]Creditable emission decrease for removing Tank No. 4; annual throughput is the 1970 through 1989 average for GTs 1-12 which are located adjacent to the tank.

Table 2-5a. Maximum Emissions of VOCs from Storage Tanks After Repowering Units 4 and 5

Description	No. 2 Tank (Future Potential)	No. 3 Tank (Future Potential)	No. 5 Tank (Future Potential)
Type of Liquid Stored	No. 2 Fuel Oil	No. 2 Fuel Oil	No. 2 Fuel Oil
Tank Volume (gallons)	3,360,000	6,300,000	3,150,000
Total Annual Throughput (gallons)	362,725,788[a]	725,451,576[b]	362,725,788[a]
Turnovers Per Year	108.0	115.2	115.15
Molecular Weight of Vapor	130.0	130.0	130.0
Storage Temperature (°F)	75.0	75.0	75.0
Vapor Pressure at Storage Temperature (psia)	0.0105	0.0105	0.0105
Tank Diameter (ft)	120.0	150.0	120.0
Average Vapor Space Height (ft)	20.0	24.0	19.0
Average Diurnal Temperature Change (°F)	20.0	20.0	20.0
Paint Factor	1.33	1.33	1.33
Product Factor	1.0	1.0	1.0
Turnover Factor	0.4	0.4	0.4
Breathing Losses (lb/yr) (TPY)	2,310.8 1.16	3,730.9 1.87	2,251.2 1.13
Working Losses (lb/yr) (TPY)	4,753.2 2.38	9,506.3 4.75	4,753.2 2.38
Total Emissions (TPY)	3.53	6.62	3.50

[a]Assumes tank handles 25 percent of all the potential No. 2 fuel oil use for the repowered Units 4 and 5 and GTs 1-24.
[b]Assumes tank handles 50 percent of all the potential No. 2 fuel oil use for the repowered Units 4 and 5 and GTs 1-24.

Solvent cleaning operations are conducted at the Lauderdale facility to support the power plant operations. Maximum potential VOC emissions due to these operations are estimated at 0.893 TPY both before and after repowering. Documentation and calculations supporting this estimate are presented in Appendix E.

Table 2-6 presents a summary of the maximum potential air emissions from the repowering project. Emission rates in TPY are shown for four CTs, four HRSGs, all storage tanks, and the total for both repowered Units 4 and 5. The total CT emissions for all pollutants except VOCs are based on full load operating conditions at 75°F ambient temperature, the average annual temperature for the area. With the exception of mercury (Hg) emissions, maximum annual emissions of regulated pollutants will result from No. 2 fuel oil burning. Emissions from the HRSGs are not additive to the CT emissions in this table, except for mercury, since the duct burners will only be fired with natural gas.

The requested annual VOC permit limitation for the repowered units is the sum of all VOC emissions based on natural gas and oil firing in the CTs and natural gas firing in the HRSGs. In equation form, the permit limitation may be expressed as:

$$\text{VOC emissions CTs} + \text{VOC emissions HRSGs} \leq 110.1 \text{ TPY} \quad (1)$$

Since the CTs can burn either natural gas or No. 2 fuel oil and the HRSGs burn natural gas only, Equation 1 can be written as:

$$VOC_{CT,gas} + VOC_{CT,oil} + VOC_{HRSG,gas} \leq 110.1 \text{ TPY} \quad (2)$$

Table 2-6. Summary of Maximum Average Regulated Air Emissions From the Lauderdale Repowering Project

Pollutant	Four CTs/HRSGs[a] (TPY)	Storage Tanks (TPY)	Total[b] (TPY)
Particulate Matter (TSP)[c]	819	NA	819
Particulate Matter (PM10)[c]	819	NA	819
Sulfur Dioxide[c]	12,142	NA	12,142
Nitrogen Oxides[c]	5,954	NA	5,954
Carbon Monoxide[d]	1,871	NA	1,871
Volatile Organic Compounds[c]	110.1	4.8[e]	114.9
Lead[c]	0.22	NA	0.22
Arsenic[c]	0.098	NA	0.098
Beryllium[c]	0.058	NA	0.058
Mercury[d]	0.35	NA	0.35
Fluorides[c]	0.75	NA	0.75
Sulfuric Acid Mist[c]	1,513	NA	1,513

[a]HRSGs only fired with natural gas and when natural gas is fired in CT.
[b]Does not include creditable emission decreases for Units 4 and 5.
[c]Based on oil firing at 75°F ambient temperature and 80.5 percent capacity factor (operation at full load).
[d]Based on natural gas firing at 75°F ambient temperature and 100 percent capacity factor; includes emissions from HRSGs, i.e., 96.4 TPY for CO and 0.014 TPY for mercury.
[e]Net emissions increase from storage tanks:

After Repowering		
Fuel Storage tanks	13.65 TPY	(Table 2-5a)
Miscellaneous tanks	0.11 TPY	(Appendix E)
Solvent cleaning	0.89 TPY	(Appendix E)
	14.65 TPY	
Before Repowering		
Fuel Storage tanks	8.84 TPY	(Table 2-5)
Miscellaneous tanks	0.12 TPY	(Appendix E)
Solvent cleaning	0.89 TPY	(Appendix E)
	9.85 TPY	
Net Change	4.80 TPY	

Note: NA = not applicable.
neg. = negligible.
TPY = tons per year.

where:

$VOC_{CT,gas}$ = actual VOC emissions due to natural gas burning in the CTs,

$VOC_{CT,oil}$ = actual VOC emissions due to No. 2 fuel oil burning in the CTs, and

$VOC_{HRSG,gas}$ = actual VOC emissions due to natural gas burning in the HRSGs.

Actual VOC emissions are calculated on an annual or monthly basis by using the actual heat input (HI), derived from the amount of fuel actually burned and its actual heating value, and multiplying the HI by the VOC emission factor (EF) for each source and fuel fired.

The permit limitation thus becomes:

$$(HI_{CT,gas} \times EF_{CT,gas}) + (HI_{CT,oil} \times EF_{CT,oil}) + (HI_{HRSG,gas} \times EF_{HRSG,gas}) \leq 110.1 \text{ TPY}$$

where: $HI_{CT,gas}$ = Heat Input to CTs due to natural gas firing,

$HI_{CT,oil}$ = Heat Input to CTs due to No. 2 fuel oil firing,

$HI_{HRSG,gas}$ = Heat Input to HRSGs due to natural gas firing,

$EF_{CT,gas}$ = VOC emission factor for CTs for natural gas firing,

$EF_{CT,oil}$ = VOC emission factor for CTs for No. 2 fuel oil firing, and

$EF_{HRSG,gas}$ = VOC emission factor for HRSGs for natural gas firing.

Emission factors for each source and fuel fired are presented in Table 2-6a.

Net tank emissions are determined by comparison of revised Tables 2-5 and 2-5a. As shown in Table 2-5, the net change in VOC emissions from the fuel oil storage tanks before repowering is 8.84 TPY (0.05 + 6.38 + 3.38 - 0.10 - 0.87). These changes are due to tank changes at Lauderdale which will be implemented prior to the repowering project. VOC emissions from the

Table 2-6a. VOC Emission Factors for Repowered Units 4 and 5

Source	Heat Input Rate (MM Btu/hr)	VOC Emissions[a] (lb/hr)	Emission Factor (lb/MM Btu)
Combustion Turbines (each)			
- Natural gas	1,685.0	1.27	0.00075
- No. 2 Fuel oil	1,646.9	7.80	0.0047
Heat Recovery Steam Generators (each)			
- Natural gas	90.62	2.0	0.022

[a]At 75°F ambient temperature; reported as carbon.

miscellaneous storage tanks (0.12 TPY) and from the solvent cleaning operations (0.89 TPY) are added to this to result in total tank/solvent emissions of 9.85 TPY before repowering (see footnote in Table 2-6). The repowering project itself will entail additional changes to the tanks, resulting in total fuel oil storage tank VOC emissions of 13.65 TPY after repowering (3.53 + 6.62 + 3.50; refer to Table 2-5a). Miscellaneous tank emissions will be 0.11 TPY and solvent cleaning emissions will be 0.89 TPY. The total tank/solvent emission rate after repowering is 14.65 TPY. The net increase in tank/solvent VOC emissions due to the proposed modification is therefore 4.8 TPY (14.65 - 9.85).

Compliance with annual limits will be determined each year based on annual fuel usage of natural gas and No. 2 fuel. These limits will be demonstrated by submitting to FDER end-year fuel usage, heat input, and VOC emissions tabulated monthly. Progress toward compliance will be available for FDER inspection monthly. These monthly records will be developed from daily fuel use logs recorded by the plant.

Supplemental firing will only be performed using natural gas and only occur concurrent with natural gas firing in the CTs. Therefore, supplemental firing in the HRSGs will not occur when fuel oil is burned in the CTs. Examples of the effect of the permit limitation equation on repowered Units 4 and 5 operations are presented in Table 2-7. At 100-percent annual capacity factor on natural gas, VOC emissions are well below the 110.1 TPY limitation. As more oil is burned in place of gas, total VOC emissions increase. At approximately 68-percent annual capacity factor on oil and 30-percent annual capacity factor on gas, the 110.1 TPY limitation is reached. Further increase in oil burning beyond the 68-percent annual capacity factor would require a reduction in natural gas burning, such that the total Unit 4 and 5 annual capacity factor would be less than 100 percent.

Fuel specifications for natural gas and distillate oil for the Lauderdale Repowering Project are presented in Tables 2-8 and 2-9.

Table 2-7. Annual Heat Input Limitations for Repowered Units

Natural Gas[a]				No.2 Fuel Oil				Total	
	Capacity Factor[b] (%)	Heat Input (10^9 Btu)	VOCs (TPY)		Capacity Factor[b] (%)	Heat Input (10^{12} Btu)	VOCs (TPY)	Capacity Factor[b] (%)	VOCs (TPY)
If the Capacity Factor and Associated Heat Input on Natural Gas is equal to:	0.0%	0.0	0.0	Then the Capacity Factor and Associated Heat Input on No. 2 Fuel Oil can be equal to or less than:	80.5%	46,454.5	110.1	80.5%	110.1
	5.0%	2,970.4	2.9		78.4%	45,245.6	107.2	83.4%	110.1
	10.0%	5,940.8	5.7		76.3%	44,036.8	104.4	86.3%	110.1
	15.0%	8,911.1	8.6		74.2%	42,828.0	101.5	89.2%	110.1
	20.0%	11,881.5	11.5		72.1%	41,619.2	98.6	92.1%	110.1
	25.0%	14,851.9	14.3		70.0%	40,410.3	95.8	95.0%	110.1
	30.0%	17,822.3	17.2		67.9%	39,201.5	92.9	97.9%	110.1
	35.0%	20,792.6	20.1		65.0%	37,518.0	88.9	100.0%	109.0
	40.0%	23,763.0	22.9		60.0%	34,632.0	82.1	100.0%	105.0
	45.0%	26,733.4	25.8		55.0%	31,746.0	75.2	100.0%	101.0
	50.0%	29,703.8	28.7		50.0%	28,860.0	68.4	100.0%	97.1
	55.0%	32,674.1	31.5		45.0%	25,974.0	61.6	100.0%	93.1
	60.0%	35,644.5	34.4		40.0%	23,088.0	54.7	100.0%	89.1
	65.0%	38,614.9	37.2		35.0%	20,202.0	47.9	100.0%	85.1
	70.0%	41,585.3	40.1		30.0%	17,316.0	41.0	100.0%	81.2
	75.0%	44,555.6	43.0		25.0%	14,430.0	34.2	100.0%	77.2
	80.0%	47,526.0	45.8		20.0%	11,544.0	27.4	100.0%	73.2
	85.0%	50,496.4	48.7		15.0%	8,658.0	20.5	100.0%	69.2
	90.0%	53,466.8	51.6		10.0%	5,772.0	13.7	100.0%	65.3
	95.0%	56,437.1	54.4		5.0%	2,886.0	6.8	100.0%	61.3
	100.0%	59,407.5	57.3		0.0%	0.0	0.0	100.0%	57.3

[a]Natural gas firing includes both CT and supplemental firing; the ammount of supplemental firing is proportional to CT capacity factor.
[b]Capacity Factor in this context is the percent of full load operation at 75°F ambient conditions.

Table 2-8. Representative Natural Gas Composition for Lauderdale Repowering Project

Parameter	Specification
Constituents	
Hydrogen (H_2)	--
Methane (CH_4)	83.40% by volume
Ethylene (C_2H_4)	--
Ethane (C_2H_6)	15.80% by volume
Carbon Monoxide (CO)	--
Carbon Dioxide (CO_2), maximum	2.0% by volume
Nitrogen (N_2)	0.80% by volume
Oxygen (O_2), maximum	0.40% by volume
Hydrogen Sulfide (H_2S), maximum	1 grain/100 scf
Water (H_2O) Vapor, maximum	4 lb/10^6 scf
Synthetic Lubricants (Phosphate-Ester Based)	Trace
Specific Gravity (relative to air)	0.636
Ultimate Analysis	
Sulfur (S)	0.0007 % by weight[a]
Hydrogen (H_2)	24.034% by weight
Carbon (C)	73.900% by weight
Nitrogen (N_2)	0.76% by weight
Oxygen (O_2)	1.236% by weight
Heat Content	
Btu/ft^3 (HHV)	950 (min) - 1,124
Btu/lb of Fuel (HHV)	23,170
(LHV)	20,870

[a]2 grains/1,000 scf, the maximum permissible pipeline sulfur content is 200 gr/1,000 ft^3.

Note: Btu/ft^3 = British thermal units per cubic feet.
HHV = high heating value.
LHV = low heating value.

Table 2-9. Representative Fuel Oil Composition for Lauderdale Repowering Project

Parameter	Specification
Specific gravity, 60°F	.82 - 0.86
Heat of Combustion	19,130 Btu/lb
Carbon	87% by weight
Oxygen	0% by weight
Sulfur	0.5% (maximum) by weight
Nitrogen	0.02% by weight
Hydrogen	12.5% by weight
Ash (fuel as delivered)	0.05% by weight
Trace metal contaminants (untreated)	
Sodium plus potassium	1 ppm (maximum)
Vanadium	0.5 ppm (maximum)
Lead	1 ppm (maximum)
Calcium	2 ppm (maximum)

Note: Btu/lb = British thermal units per pound.
ppm = parts per million.

2.3 EXISTING LAUDERDALE PLANT

The existing Units 4 and 5 fossil-fuel-fired steam generating units will be taken out of service prior to completion of the Repowering Project. Operation of these units has varied over their history to respond to electric demand. Without the repowering project, these units would be expected to be operated at levels higher than in recent years. These units have burned both natural gas and No. 6 fuel oil and do not have annual operating restrictions for either fuel. Because of the varied nature of operation, the last 2 years of fuel usage information is not representative of actual emissions for which the facility has previously emitted or has the potential to emit. Therefore, the last 20 years were considered as representative for calculating actual emissions.

Presented in Table 2-10 are the actual quantities of fuel burned in Units 4 and 5 from 1969 to 1989, as well as calculated VOC emissions. Data for GTs 1-24 are presented in Table 2-10a. Total VOC emissions by year for all units are summarized in Table 2-10b. Reference information for the VOC emission calculations is presented in Table 2-10c. As indicated in Table 2-10b, VOC emissions have been less than 60 TPY in any year. This level is well below the 100 TPY rate which designates a source as a "major" source.

Actual representative air emissions from Units 4 and 5 were calculated on the basis of the average fuel usage. Emission factors were obtained from EPA publication AP-42 and other publications (see Appendix B for references). The emission factors and resulting emissions for all regulated pollutants are shown in Table 2-11. Sulfur dioxide emissions were determined using the actual sulfur content in No. 6 fuel oil for the last 2 years, which is representative of the quality of fuel used in these units. The average sulfur content during 1987 and 1988 was 0.964 percent.

Maximum operating parameters and maximum sulfur dioxide, particulate matter, nitrogen oxide, and carbon monoxide emissions associated with the existing Units 4 and 5 are presented in Table 2-12.

Table 2-10. Fuel Usage and VOC Emissions for Lauderdale Units 4 and 5

Year	Unit 4		Unit 5		VOC Emissions (TPY)
	Natural Gas (10^6 ft^3)	No. 6 Fuel Oil (10^3 gal.)	Natural Gas (10^6 ft^3)	No. 6 Fuel Oil (10^3 gal.)	
1989	2,451	6,272	868	3,283	5.95
1988	1,279	3,460	1,937	3,948	5.07
1987	2,110	993	2,089	1,785	3.99
1986	1,857	0	2,356	468	3.13
1985	2,103	983	1,309	1,343	3.27
1984	938	6,268	818	5,498	5.70
1983	1,049	7,208	792	6,871	6.64
1982	1,611	3,397	1,957	5,481	5.87
1981	402	16,884	259	20,803	14.78
1980	2,161	20,301	1,788	21,098	18.50
1979	2,796	22,605	1,870	25,203	21.43
1978	1,937	20,983	4,046	20,849	20.08
1977	2,220	15,103	3,990	11,147	14.32
1976	2,958	18,766	4,991	18,472	19.71
1975	3,160	23,507	3,609	19,736	21.17
1974	2,756	29,413	2,367	31,794	26.84
1973	2,281	43,285	1,799	48,808	37.85
1972	5,979	36,036	4,434	32,928	33.50
1971	4,525	403	5,610	22,384	15.75
1970	6,015	18,358	6,769	328	16.05
1969	3,753	13,440	3,811	11,970	14.95
Average	2,588	14,651	2,737	14,962	14.98

Note: VOC emissions based on actual fuel usage and emission factors given in Table 2-10c.

10^6 ft^3 = million cubic feet.
10^3 gal = thousand gallons.
TPY = tons per year.

Table 2-10a. Fuel Usage and VOC Emissions for Lauderdale GTs 1-24

Year	GTs 1-12 Natural Gas (10^6 ft^3)	GTs 1-12 No. 2 Fuel Oil (10^3 gal)	GTs 13-24 Natural Gas (10^6 ft^3)	GTs 13-24 No. 2 Fuel Oil (10^3 gal)	VOC Emissions (TPY)
1989	812	1795	1,097	3,144	3.85
1988	169	276	372	435	1.03
1987	265	82	1,256	702	2.78
1986	69	29	229	414	0.57
1985	296	283	555	534	1.59
1984	384	169	263	138	1.18
1983	281	375	188	265	0.89
1982	539	151	188	158	1.33
1981	488	1,323	1,080	1,418	3.04
1980	2,289	4,716	5,566	3,782	14.78
1979	2,760	3,354	3,273	7,953	11.77
1978	1,355	2,405	3,841	4,333	9.87
1977	861	1,817	2,534	4,176	6.59
1976	493	1,205	1,834	2,225	4.46
1975	1,156	7,296	421	3,727	3.80
1974	4,872	1,735	3,984	586	16.01
1973	2,763	5,032	6,064	6,338	16.77
1972	1,841	719	4,440	505	11.32
1971	4,910	360	0	0	8.80
1970	3,708	0	0	0	6.62
Average	1,516	1,656	2,066	2,269	6.34

Note: VOC emissions based on actual fuel usage and emission factors given in Table 2-10c.
Heat content of natural gas and No. 2 fuel oil assumed to be 1,050 Btu/ft^3 and 136,800 Btu/gal, respectively.

10^6 ft^3 = million cubic feet.
10^3 gal = thousand gallons.
TPY = tons per year.

Table 2-10b. Actual VOC Emissions for Lauderdale Units 4 and 5 and GTs 1-24

Year	Units 4 and 5 VOC Emissions (TPY)	GTs 1-24 VOC Emissions (TPY)	Total VOC Emissions[a] (TPY)
1989	5.95	3.85	9.80
1988	5.07	1.03	6.10
1987	3.99	2.78	6.77
1986	3.13	0.57	3.70
1985	3.27	1.59	4.86
1984	5.70	1.18	6.88
1983	6.64	0.89	7.53
1982	5.87	1.33	7.20
1981	14.78	3.04	17.82
1980	18.50	14.78	33.28
1979	21.43	11.77	33.20
1978	20.08	9.87	29.95
1977	14.32	6.59	20.91
1976	19.71	4.46	24.17
1975	21.17	3.80	24.97
1974	26.84	16.01	42.85
1973	37.85	16.77	54.62
1972	33.50	11.32	44.82
1971	15.75	8.80	24.55
1970	16.05	6.62	22.67
1969	14.95	0	14.95
Average	14.98	6.04	21.03

[a]Maximum actual VOC emissions from storage tanks during this period were 2.3 TPY which occurred in 1973.

Table 2-10c. Reference Information for VOC Emissions for Existing Lauderdale Plant

Parameter	Units	Source	Data
VOC Emission Factor			
Fossil Steam--Oil	lb/10^3 gal	AP-42	0.76
	lb/10^6 Btu	AP-42	0.0050
Fossil Steam--Gas	lb/10^6 cf	AP-42	1.4
	lb/10^6 Btu	AP-42	0.0013
Gas Turbine--Oil	lb/10^6 Btu	Testing	0.0013[a]
Gas Turbine--Gas	lb/10^6 Btu	Testing	0.0034[a]
Heat Input			
Units 4 & 5--per Unit--Oil	10^6 Btu/hr	FPL	1,650
Units 4 & 5--per Unit--Gas	10^6 Btu/hr	FDER Permit	1,725
GTs 1-24--per Unit--Oil	10^6 Btu/hr	FDER Permit	675
GTs 1-24--per Unit--Gas	10^6 Btu/hr	FPL	702
Maximum VOC Emissions			
Units 4 & 5--Oil Total--both units	lb/hr		16.5
Units 4 & 5--Gas Total--both units	lb/hr		4.5
GTs 1-24--Oil Total--24 units	lb/hr		21.1
GTs 1-24--Gas Total--24 units	lb/hr		57.3

[a]Developed from actual testing of Lauderdale gas turbines (refer to Appendix C).

Table 2-11. Actual Representative Emissions of Regulated Pollutants, Lauderdale Units 4 and 5

Parameter	Unit No. 4 Natural Gas	Unit No. 4 No. 6 Fuel Oil	Unit No. 5 Natural Gas	Unit No. 5 No. 6 Fuel Oil	Total
Natural Gas Burned[a] (10^6 ft^3/yr)	2,588		2,737		
No. 6 Fuel Oil[a] (gal/yr)		14,651,000		14,962,000	
(% sulfur)		0.964		0.964	
Emission Factor	lb/10^6 scf	lb/1,000 gal	lb/10^6 scf	lb/1,000 gal	
PM	3	12.64[b]	3	12.64[b]	
PM10	3	8.97[b]	3	8.97[b]	
Sulfur Dioxide	0.6	151.3[c]	0.6	151.3[c]	
Nitrogen Oxides	550	67	550	67	
Carbon Monoxide	40	5	40	5	
Volatile Organic Compounds (methane)	0.3	0.28	0.3	0.28	
(non-methane)	1.4	0.76	1.4	0.76	
Lead	Neg.	0.0042	Neg.	0.0042	
Fluoride	Neg.	0.052	Neg.	0.052	
Mercury	0.011	0.00048	0.011	0.00048	
Beryllium	Neg.	0.00063	Neg.	0.00063	
Arsenic	Neg.	0.0029	Neg.	0.0029	
Sulfuric Acid	Neg.	5.8	Neg.	5.8	
Emission Rate (TPY)					
PM	3.88	92.59	4.11	94.56	195.14
PM10	3.88	65.74	4.11	67.14	140.87
Sulfur Dioxide	0.776	1,108.70	0.821	1,132.23	2,242.53
Nitrogen Oxides	711.70	490.81	752.68	501.23	2,456.41
Carbon Monoxide	51.76	36.63	54.74	37.41	180.53
Volatile Organic Compounds (methane)	0.39	2.05	0.41	2.09	4.94
(non-methane)	1.81	5.57	1.92	5.69	14.98
Lead	Neg.	0.0308	Neg.	0.0314	0.0622
Fluoride	Neg.	0.381	Neg.	0.389	0.770
Mercury	0.0142	0.00352	0.01505	0.00359	0.03639
Beryllium	Neg.	0.00462	Neg.	0.00471	0.00933
Arsenic	Neg.	0.0212	Neg.	0.0217	0.0429
Sulfuric Acid	Neg.	42.49	Neg.	43.39	85.88

Note: 10^6 ft^3/yr = million cubic feet per year.
gal/yr = gallons per year.
lb/10^6 scf= pounds per million standard cubic feet.
Neg. = negligible.
TPY = tons per year.

[a]Based on average annual fuel usage 1969-1989 (refer to Table 2-10).
[b]Based on equation: 10 S + 3, where S = sulfur content. PM10 is 71 percent of PM emissions.
[c]Based on equation: 157 S, where S = sulfur content.

Table 2-12. Summary of Existing Air Emission Sources at the FPL Lauderdale Plant

Source	Location (m) Relative To Proposed Units		Stack Data (ft)		Operating Data		Maximum Emissions[a] (lb/hr)			
	X	Y	Height	Diameter	Temperature (°F)	Velocity (ft/sec)	SO_2	NO_x	PM	CO
Units 4 and 5[b]	-50	0	151.0	14.0	300	58	3,630	1,892	330	138
Gas Turbines 1 - 12	123	112	45.0	18.0[c]	860	70	4,164	4,032	297	966
Gas Turbines 13 - 24	168	540	43.6	18.0[c]	860	70	4,164	4,032	297	966

[a]Total emissions from identified units.
[b]Units 4 and 5 will be shut down when the proposed units become operational.
[c]Effective stack diameter based on actual stack area.

Note: All operational and emissions data based on FDER permitted rates. The following permits are relevant: Unit 4-AO-06-146594; Unit 5-AO-06-143213; GT Units 1-2 AO-06-148760 and GT Units 13-24 AO-06-148761.

Operational limits for Units 4 and 5 have been requested to limit maximum potential VOC emissions to 99.9 TPY for the existing Lauderdale Plant.

There are 24 identical GT peaking units currently operating at the Lauderdale Plant. These units are used for peaking purposes to meet load demands and operate intermittently. The units can operate on either natural gas or No. 2 fuel oil. Maximum operating parameters and air emission rates from these existing units are presented in Table 2-12.

The operation of GTs and Units 4 and 5 will be limited so that the total potential VOC emissions of the units plus other VOC sources at the facility (i.e., storage tanks and solvent cleaning operations) will be less than 100 TPY (i.e., 99.9 TPY) before repowering. The maximum storage tank emissions are 9.8 TPY (Table 2-5), and maximum VOC emissions from miscellaneous tanks and solvent cleaning are 0.12 TPY and 0.89 TPY , respectively (refer to Section 2.2). Total VOC emissions from these sources is 10.8 TPY (9.8 + 0.12 + 0.89). This results in a VOC limitation on the GTs and Units 4 and 5 of 89.1 TPY (99.9 - 10.8). The requested permit limitation for Units 4 and 5 and GTs 1-24 is:

$$\text{VOC emissions Units 4\&5} + \text{VOC emissions GTs 1-24} \leq 89.1 \text{ TPY} \quad (1)$$

Since Units 4 and 5 use either natural gas or No. 6 fuel oil and GTs 1-24 use either natural gas or No. 2 fuel oil, Equation 1 can be written as:

$$\text{VOC emissions Units 4\&5 nat. gas} + \text{VOC emissions Units 4\&5 oil} + \text{VOC emissions GTs 1-24 nat. gas} + \text{VOC emissions GTs 1-24 oil} \leq 89.1 \quad (2)$$

Actual VOC emissions are calculated on an annual or monthly basis by using the actual heat input (HI), derived from the amount of fuel actually used

and its actual heating value, and multiplying the HI by the VOC emission factor (EF) for each source and fuel fired.

The permit limitation thus becomes:

$$(HI_{U4\&5NG} \times EF_{U4\&5NG}) + (HI_{U4\&5OIL} \times EF_{U4\&5OIL}) + (HI_{GTNG} \times EF_{GTNG}) + (HI_{GTOIL} \times EF_{GTOIL}) \leq 89.1 \text{ TPY}$$

where: $HI_{4\&5NG}$ = Heat Input to Units 4 and 5 due to natural gas firing,

$HI_{U4\&5OIL}$ = Heat Input to Units 4 and 5 due to No. 6 oil firing,

HI_{GTNG} = Heat Input to GT's 1-24 due to natural gas firing,

HI_{GTOIL} = Heat Input to GT's 1-24 due to No. 2 oil firing,

$EF_{U4\&5NG}$ = VOC emission factor for Units 4 & 5 for natural gas firing,

$EF_{U4\&5OIL}$ = VOC emission factor for Units 4 & 5 for No. 6 oil firing,

EF_{GTNG} = VOC emission factor for GT's 1-24 for natural gas firing,

EF_{GTOIL} = VOC emission factor for GT's 1-24 for No. 2 oil firing.

Emission factors for each source and fuel fired are presented in Table 2-10c.

These limitations more accurately reflect the actual operating conditions of the GTs and Units 4 and 5. Since they began operation in the early 1970s, the actual average VOC emissions have been 21 TPY.

All VOC emission calculations for the existing GTs were based on data developed from stack testing; AP-42 was used to develop VOC emissions for Units 4 and 5. The stack testing performed on the GTs consisted of performing Method 25A analyses and excluding all methane and ethane in the

gas stream as allowed under Rule 17-2.100(223), F.A.C. The description of testing and the VOC calculations are presented in Appendix C.

2.4 SITE LAYOUT AND STRUCTURES

Site plans of the Lauderdale Plant, both before and after the repowering project is completed, are shown in Figures 2-2 and 2-3. The four new CTs and HRSGs will be located just east of the existing Units 4 and 5 steam generator buildings and steam turbine building. The Units 4 and 5 steam generator buildings and stacks will be dismantled upon retirement of the units. The locations of the existing gas turbine units (GT1-GT24) are also shown on the site plan. These locations will not change with the implementation of the repowering project.

A profile view of the environmental enclosure for the CTs, air inlet filters, HRSGs, and discharge stacks is presented in Figures 2-4 and 2-5. The principal structures associated with the facility are the environmental enclosure for the CTs (74.5 ft high), the HRSGs (61 ft high), and the stacks (150 ft high).

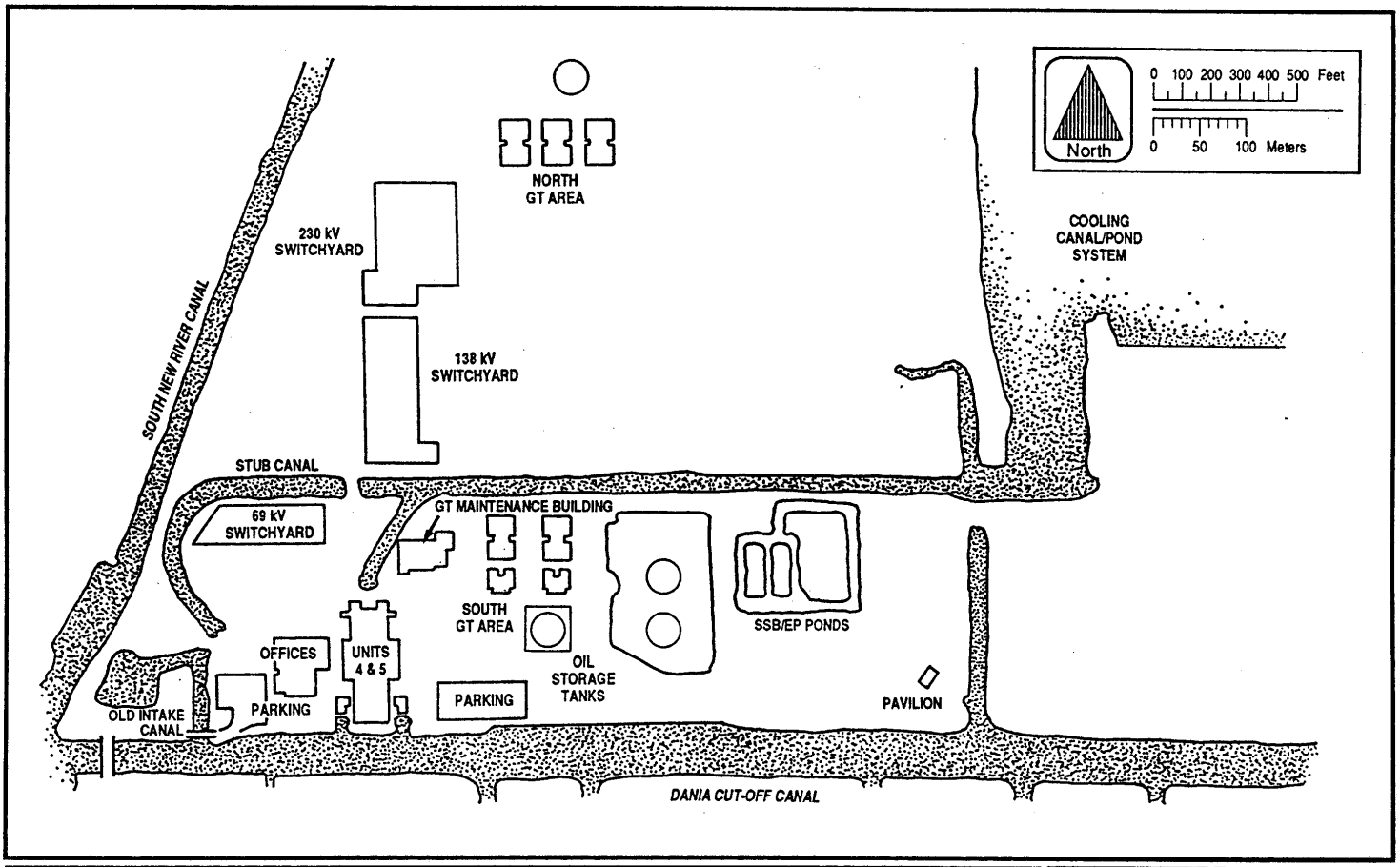


Figure 2-2 EXISTING LAUDERDALE SITE PLAN

Lauderdale Repowering Project

FPL

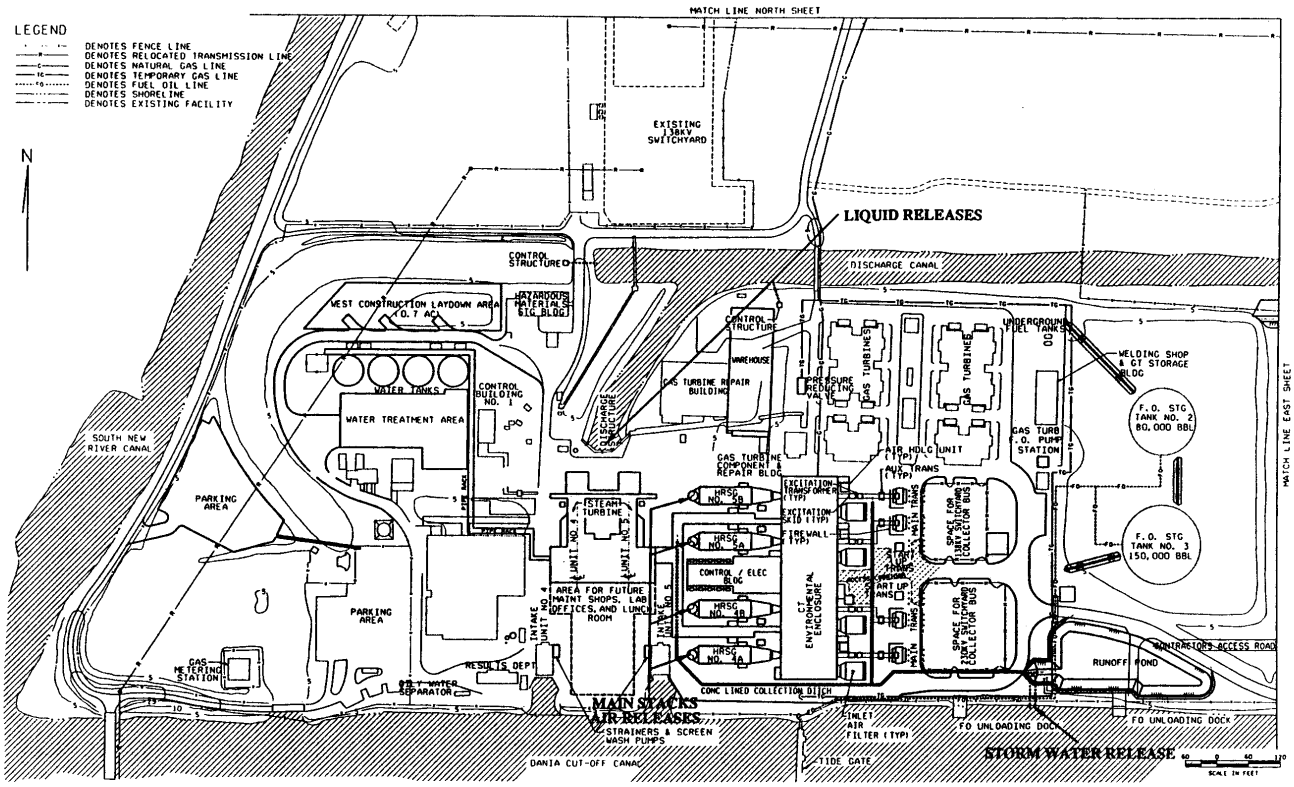


Figure 2-3 SITE LAYOUT OF FPL LAUDERDALE PLANT AFTER REPOWERING

REV. 1
06/29/90

Lauderdale Repowering Project

FPL

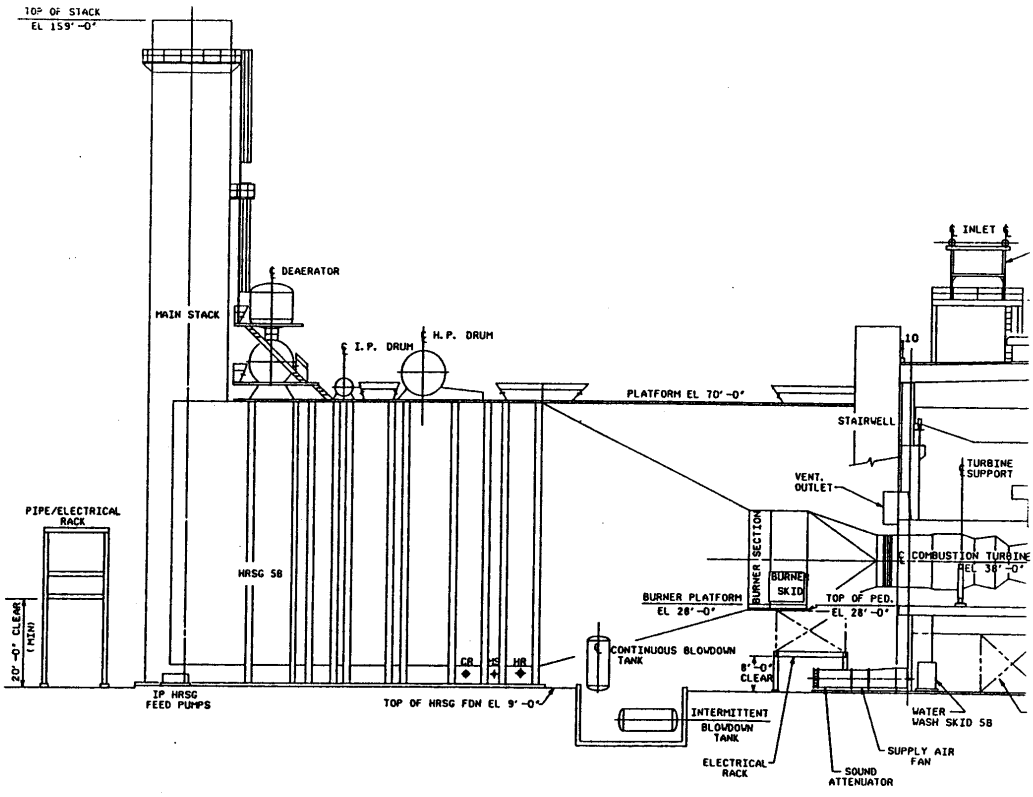


Figure 2-4 PROFILE OF HRSG AREA

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06/29/90

Lauderdale Repowering Project

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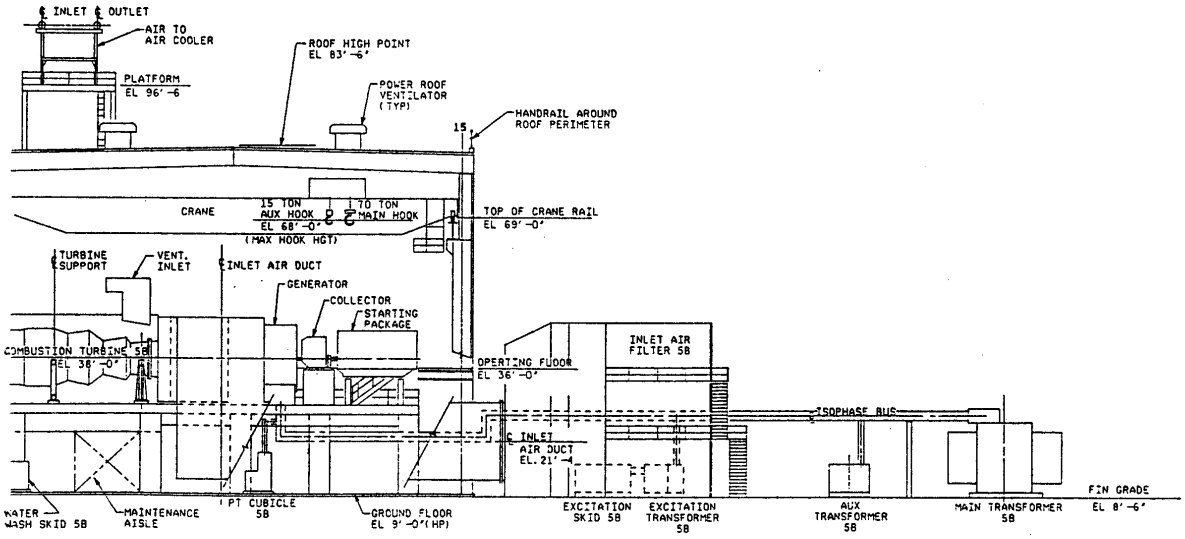


Figure 2-5 PROFILE OF INLET AIR FILTER AREA

Lauderdale Repowering Project

FPL

3.0 AIR QUALITY REVIEW REQUIREMENTS AND APPLICABILITY

The following discussion pertains to the federal and state air regulatory requirements and their applicability to the Lauderdale Repowering Project. These regulations must be satisfied before the proposed facility can begin operation.

3.1 NATIONAL AND STATE AAQS

The existing applicable national and Florida ambient air quality standards (AAQS) are presented in Table 3-1. Primary national AAQS were promulgated to protect the public health, and secondary national AAQS were promulgated to protect the public welfare from any known or anticipated adverse effects associated with the presence of pollutants in the ambient air. Areas of the country in violation of AAQS are designated as nonattainment areas, and new sources to be located in or near these areas may be subject to more stringent air permitting requirements.

3.2 PSD REQUIREMENTS

3.2.1 General Requirements

Under federal and State of Florida PSD review requirements, all major new or modified sources of air pollutants regulated under the Clean Air Act (CAA) must be reviewed and a preconstruction permit issued. Florida's State Implementation Plan (SIP), which contains PSD regulations, has been approved by EPA, and therefore PSD approval authority has been granted to FDER.

A "major facility" is defined as any one of 28 named source categories which has the potential to emit 100 tons per year (TPY) or more, or any other stationary facility which has the potential to emit 250 TPY or more of any pollutant regulated under CAA. "Potential to emit" means the capability, at maximum design capacity, to emit a pollutant after the application of control equipment.

Table 3-1. National and State AAQS, Allowable PSD Increments, and Significance Levels ($\mu g/m^3$)

Pollutant	Averaging Time	AAQS National Primary Standard	AAQS National Secondary Standard	AAQS State of Florida	PSD Increments Class I	PSD Increments Class II	Significant Impact Levels
Particulate Matter (TSP)	Annual Geometric Mean	NA	NA	NA	5	19	1
	24-Hour Maximum[a]	NA	NA	NA	10	37	5
Particulate Matter (PM10)	Annual Arithmetic Mean	50	50	50	4[c]	17[c]	1
	24-Hour Maximum[b]	150	150	150	8[c]	30[c]	5
Sulfur Dioxide	Annual Arithmetic Mean	80	NA	60	2	20	1
	24-Hour Maximum[b]	365	NA	260	5	91	5
	3-Hour Maximum[b]	NA	1,300	1,300	25	512	25
Carbon Monoxide	8-Hour Maximum[b]	10,000	10,000	10,000	NA	NA	500
	1-Hour Maximum[b]	40,000	40,000	40,000	NA	NA	2,000
Nitrogen Dioxide	Annual Arithmetic Mean	100	100	100	2.5[d]	25[d]	1
Ozone	1-Hour Maximum[e]	235	235	235	NA	NA	NA
Lead	Calendar Quarter Arithmetic Mean	1.5	1.5	15	NA	NA	NA

[a]Maximum concentration not to be exceeded more than once per year.
[b]Achieved when the expected number of exceedances per year is less than 1.
[c]Proposed October 5, 1989.
[d]The State of Florida has not yet adopted the PSD increments for NO_2 concentrations.
[e]Achieved when the expected number of days per year with concentrations above the standard is less than 1.

Note: Particulate matter (TSP) = total suspended particulate matter.
Particulate matter (PM10) = particulate matter with aerodynamic diameter less than or equal to 10 micrometers.

NA = Not applicable, i.e., no standard exists.

Sources: Federal Register, Vol. 43, No. 118, June 19, 1978.
40 CFR 50.
40 CFR 52.21.
Chapter 17-2.400, F.A.C.

A "major modification" is defined under PSD regulations as a change at an existing major facility which increases emissions by greater than significant amounts. PSD significant emission rates are shown in Table 3-2.

PSD review is used to determine whether significant air quality deterioration will result from the new or modified facility. Federal PSD requirements are contained in 40 CFR 52.21, Prevention of Significant Deterioration of Air Quality. The State of Florida has adopted PSD regulations which are essentially identical to federal regulations (Chapter 17-2.510, F.A.C.). Major facilities and major modifications are required to undergo the following analysis related to PSD for each pollutant emitted in significant amounts:

1. Control technology review,
2. Source impact analysis,
3. Air quality analysis (monitoring),
4. Source information, and
5. Additional impact analyses.

In addition to these analyses, a new facility must also be reviewed with respect to Good Engineering Practice (GEP) stack height regulations. Discussions concerning each of these requirements are presented in the following sections.

3.2.2 Increments/Classifications

In promulgating the 1977 CAA Amendments, Congress specified that certain increases above an air quality baseline concentration level of sulfur dioxide and total suspended particulate matter [PM(TSP)] concentrations would constitute significant deterioration. The magnitude of the allowable increment depends on the classification of the area in which a new source (or modification) will be located or have an impact. Three classifications were designated based on criteria established in the CAA Amendments. Initially, Congress promulgated areas as Class I (international parks, national wilderness areas, and memorial parks larger than 5,000 acres,

Table 3-2. PSD Significant Emission Rates and De Minimis Monitoring Concentrations

Pollutant	Regulated Under	Significant Emission Rate (TPY)	De Minimis Monitoring Concentration ($\mu g/m^3$)
Sulfur Dioxide	NAAQS, NSPS	40	13, 24-hour
Particulate Matter (TSP)	NAAQS, NSPS	25	10, 24-hour
Particulate Matter (PM10)	NAAQS	15	10, 24-hour
Nitrogen Oxides	NAAQS, NSPS	40	14, annual
Carbon Monoxide	NAAQS, NSPS	100	575, 8-hour
Volatile Organic Compounds (Ozone)	NAAQS, NSPS	40	100 TPY[a]
Lead	NAAQS	0.6	0.1, 3-month
Sulfuric Acid Mist	NSPS	7	NM
Total Fluorides	NSPS	3	0.25, 24-hour
Total Reduced Sulfur	NSPS	10	10, 1-hour
Reduced Sulfur Compounds	NSPS	10	10, 1-hour
Hydrogen Sulfide	NSPS	10	0.2, 1-hour
Asbestos	NESHAP	0.007	NM
Beryllium	NESHAP	0.0004	0.001, 24-hour
Mercury	NESHAP	0.1	0.25, 24-hour
Vinyl Chloride	NESHAP	1	15, 24-hour
Benzene	NESHAP	b	NM
Radionuclides	NESHAP	b	NM
Inorganic Arsenic	NESHAP	b	NM

[a]No de minimis concentration; an increase in VOC emissions of 100 TPY or more will require monitoring analysis for ozone.
[b]Any emission rate of these pollutants.

Note: Ambient monitoring requirements for any pollutant may be exempted if the impact of the increase in emissions is below de minimis monitoring concentrations.

NAAQS = National Ambient Air Quality Standards.
NM = No ambient measurement method.
NSPS = New Source Performance Standards.
NESHAP = National Emission Standards for Hazardous Air Pollutants.
$\mu g/m^3$ = micrograms per cubic meter.

Sources: 40 CFR 52.21.
Chapter 17-2, F.A.C.

and national parks larger than 6,000 acres) or as Class II (all areas not designated as Class I). No Class III areas, which would be allowed greater deterioration than Class II areas, were designated. EPA then promulgated as regulations the requirements for classifications and area designations.

On October 17, 1988, the EPA promulgated regulations to prevent significant deterioration due to emissions of nitrogen oxides (NO_x) and established PSD increments for nitrogen dioxide (NO_2) concentrations. The EPA class designations and allowable PSD increments are presented in Table 3-1. FDER has adopted the EPA class designations and allowable PSD increments for SO_2 and PM(TSP), but has not yet adopted the NO_2 increments.

The term "baseline concentration" evolves from federal and state PSD regulations and refers to a concentration level corresponding to a specified baseline date and certain additional baseline sources. By definition in the PSD regulations, as amended August 7, 1980, baseline concentration means the ambient concentration level which exists in the baseline area at the time of the applicable baseline date. A baseline concentration is determined for each pollutant for which a baseline date is established and includes:

1. The actual emissions representative of facilities in existence on the applicable baseline date; and
2. The allowable emissions of major stationary facilities which commenced construction before January 6, 1975, for SO_2 and PM(TSP) concentrations, or February 8, 1988, for NO_2 concentrations, but which were not in operation by the applicable baseline date.

The following emissions are not included in the baseline concentration and therefore affect PSD increment consumption:

1. Actual emissions from any major stationary facility on which construction commenced after January 6, 1975 for SO_2 and PM(TSP) concentrations, and after February 8, 1988, for NO_2 concentrations; and

2. Actual emission increases and decreases at any stationary facility occurring after the baseline date.

In reference to the baseline concentration, the term "baseline date" actually includes three different dates:

1. The major facility baseline date, which is January 6, 1975, in the cases of SO_2 and PM(TSP), and February 8, 1988, in the case of NO_2.
2. The minor facility baseline date, which is the earliest date after the trigger date on which a major stationary facility or major modification subject to PSD regulations submits a complete PSD application.
3. The trigger date, which is August 7, 1977, for SO_2 and PM(TSP), and February 8, 1988, for NO_2.

The minor source baseline date for SO_2 and PM(TSP) has been set as December 27, 1977, for the entire State of Florida (Chapter 17-2.450, F.A.C.).

3.2.3 Control Technology Review

The control technology review requirements of the federal and state PSD regulations require that all applicable federal and state emission limiting standards be met and that Best Available Control Technology (BACT) be applied to control emissions from the source [Chapter 17-2.500(5)(c), F.A.C]. The BACT requirements are applicable to all regulated pollutants for which the increase in emissions from the facility or modification exceeds the significant emission rate (see Table 3-2).

BACT is defined in Chapter 17-2.100(25), F.A.C. as:

> An emissions limitation, including a visible emission standard, based on the maximum degree of reduction of each pollutant emitted which the department, on a case by case basis, taking into account energy, environmental, and economic impacts, and other costs, determines is achievable through application of production processes and available methods, systems, and techniques (including fuel cleaning or treatment or innovative fuel combustion techniques) for control of

> such pollutant. If the Department determines that technological or economic limitations on the application of measurement methodology to a particular part of a source or facility would make the imposition of an emission standard infeasible, a design, equipment, work practice, operational standard or combination thereof, may be prescribed instead to satisfy the requirement for the application of BACT. Such standard shall, to the degree possible, set forth the emissions reductions achievable by implementation of such design, equipment, work practice, or operation.

The requirements for BACT were promulgated within the framework of PSD in the 1977 amendments of the CAA [Public Law 95-95; Part C, Section 165(a)(4)]. The primary purpose of BACT is to optimize consumption of PSD air quality increments and thereby enlarge the potential for future economic growth without significantly degrading air quality (EPA, 1978; 1980). Guidelines for the evaluation of BACT can be found in EPA's Guidelines for Determining Best Available Control Technology (BACT), (EPA, 1978) and in the PSD Workshop Manual (EPA, 1980). These guidelines were promulgated by EPA to provide a consistent approach to BACT and to ensure that the impacts of alternative emission control systems are measured by the same set of parameters. In addition, through implementation of these guidelines, BACT in one area may not be identical to BACT in another area. According to EPA (1980), "BACT analyses for the same types of emissions unit and the same pollutants in different locations or situations may determine that different control strategies should be applied to the different sites, depending on site-specific factors. Therefore, BACT analyses must be conducted on a case-by-case basis."

The BACT requirements are intended to ensure that the control systems incorporated in the design of a proposed facility reflect the latest in control technologies used in a particular industry and take into consideration existing and future air quality in the vicinity of the proposed facility. BACT must, as a minimum, demonstrate compliance with NSPS for a source (if applicable). An evaluation of the air pollution control techniques and systems, including a cost-benefit analysis of alternative control technologies capable of achieving a higher degree of

emission reduction than the proposed control technology, is required. The cost-benefit analysis requires the documentation of the materials, energy, and economic penalties associated with the proposed and alternative control systems, as well as the environmental benefits derived from these systems. A decision on BACT is to be based on sound judgment, balancing environmental benefits with energy, economic, and other impacts (EPA, 1978).

3.2.4 Air Quality Monitoring Requirements

In accordance with requirements of 40 CFR 52.21(m) and Chapter 17-2.500(f), F.A.C, any application for a PSD permit must contain an analysis of continuous ambient air quality data in the area affected by the proposed major stationary facility or major modification. For a new major facility, the affected pollutants are those that the facility would potentially emit in significant amounts. For a major modification, the pollutants are those for which the net emissions increase exceeds the significant emission rate (see Table 3-2).

Ambient air monitoring for a period of up to 1 year is generally appropriate to satisfy the PSD monitoring requirements. A minimum of 4 months of data is required. Existing data from the vicinity of the proposed source may be utilized if the data meet certain quality assurance requirements; otherwise, additional data may need to be gathered. Guidance in designing a PSD monitoring network is provided in EPA's Ambient Monitoring Guidelines for Prevention of Significant Deterioration (EPA, 1987a).

The regulations include an exemption which excludes or limits the pollutants for which an air quality analysis must be conducted. This exemption states that the Department may exempt a proposed major stationary facility or major modification from the monitoring requirements with respect to a particular pollutant if the emissions increase of the pollutant from the facility or modification would cause, in any area, air

quality impacts less than the de minimis levels presented in Table 3-2 [Chapter 17-2.500(3)(e), F.A.C.].

3.2.5 Source Impact Analysis

A source impact analysis must be performed for a proposed major source subject to PSD for each pollutant for which the increase in emissions exceeds the significant emission rate (Table 3-2). The PSD regulations specifically provide for the use of atmospheric dispersion models in performing impact analysis, estimating baseline and future air quality levels, and determining compliance with AAQS and allowable PSD increments. Designated EPA models must normally be used in performing the impact analysis. Specific applications for other than EPA-approved models require EPA's consultation and prior approval. Guidance for the use and application of dispersion models is presented in the EPA publication Guideline on Air Quality Models (Revised) (EPA, 1987b). The source impact analysis for criteria pollutants may be limited to only the new or modified source if the net increase in impacts due to the new or modified source is below significance levels, as presented in Table 3-1.

Various lengths of record for meteorological data can be utilized for impact analysis. A 5-year period can be used with corresponding evaluation of highest, second-highest short-term concentrations for comparison to AAQS or PSD increments. The term "highest, second-highest" (HSH) refers to the highest of the second-highest concentrations at all receptors (i.e., the highest concentration at each receptor is discarded). The second-highest concentration is significant because short-term AAQS specify that the standard should not be exceeded at any location more than once a year. If less than 5 years of meteorological data are used in the modeling analysis, the highest concentration at each receptor must normally be used for comparison to air quality standards.

3.2.6 Additional Impact Analysis

In addition to air quality impact analyses, federal and State of Florida PSD regulations require analyses of the impairment to visibility and the

impacts on soils and vegetation that would occur as a result of the proposed source [40 CFR 52.21; Chapter 17-2.500(5)(e), F.A.C.]. These analyses are to be conducted primarily for PSD Class I areas. Impacts due to general commercial, residential, industrial, and other growth associated with the source must also be addressed. These analyses are required for each pollutant emitted in significant amounts (Table 3-2).

3.2.7 Good Engineering Practice Stack Height

The 1977 CAA Amendments require that the degree of emission limitation required for control of any pollutant not be affected by a stack height that exceeds GEP, or any other dispersion technique. On July 8, 1985, EPA promulgated final stack height regulations (EPA, 1985a). Identical regulations have been adopted by FDER [Chapter 17-2.270, F.A.C.]. GEP stack height is defined as the highest of:

1. 65 meters (m), or
2. A height established by applying the formula:

   $$Hg = H + 1.5L$$

   where: Hg = GEP stack height,
   H = Height of the structure or nearby structure, and
   L = Lesser dimension (height or projected width) of nearby structure(s), or
3. A height demonstrated by a fluid model or field study.

"Nearby" is defined as a distance up to five times the lesser of the height or width dimensions of a structure or terrain feature, but not greater than 0.8 km. Although GEP stack height regulations require that the stack height used in modeling for determining compliance with AAQS and PSD increments not exceed the GEP stack height, the actual stack height may be greater.

The stack height regulations also allow increased GEP stack height beyond that resulting from the above formula in cases where plume impaction occurs. Plume impaction is defined as concentrations measured or predicted to occur when the plume interacts with elevated terrain. Elevated terrain

is defined as terrain which exceeds the height calculated by the GEP stack height formula. Because the terrain in the vicinity of the Lauderdale Plant is flat, plume impaction was not considered in determining the GEP stack height.

3.3 NONATTAINMENT RULES

Based on the current nonattainment provisions (Chapter 17-2.510, F.A.C.), all major new facilities and modifications to existing major facilities located in a nonattainment area must undergo nonattainment review if the proposed pieces of equipment have the potential to emit 100 TPY or more of the nonattainment pollutant, or if the major modification results in a significant net emission increase of the nonattainment pollutant.

For major facilities or major modifications which locate in an attainment or unclassifiable area, the nonattainment review procedures apply if the source or modification is located within the area of influence of a nonattainment area. The area of influence is defined as an area which is outside the boundary of a nonattainment area but within the locus of all points that are 50 km outside the boundary of the nonattainment area. Based on Chapter 17-2.510(2)(a)2.a, F.A.C., all VOC sources which are located within an area of influence are exempt from the provisions of new source review for nonattainment areas. Sources which emit other nonattainment pollutants and are located within the area of influence are subject to nonattainment review unless the maximum allowable emissions from the proposed source do not have a significant impact within the nonattainment area.

3.4 SOURCE APPLICABILITY

3.4.1 PSD Review

3.4.1.1 Pollutant Applicability

The Lauderdale Plant is located in Broward County, which has been designated by EPA and FDER as an attainment area for all criteria pollutants except ozone. Because of the ozone nonattainment designation, emissions of volatile organic compounds from the Lauderdale Plant will not

be subject to PSD review. Broward County and surrounding counties are designated as PSD Class II areas for SO_2, PM(TSP), and NO_x. The Lauderdale site is located approximately 60 km northeast of the Everglades National Park, the nearest PSD Class I area.

The existing Lauderdale Plant is considered to be an existing major facility because emissions of regulated pollutants exceed 100 TPY (refer to Table 2-9); therefore, PSD review is required for any pollutant for which the net increase in emissions exceeds the PSD significant emission rates presented in Table 3-2 (i.e., major modification).

Table 3-3 presents the maximum emissions from the proposed repowered Units 4 and 5, the reduction in emissions associated with the shutdown of the existing Units 4 and 5 steam generators, and the resulting net change in emissions. As shown, potential emissions from the repowering project will exceed the PSD significant emission rates for the following regulated pollutants: SO_2, PM(TSP), PM10, NO_x, carbon monoxide (CO), sulfuric acid mist, beryllium (Be), mercury (Hg) and inorganic arsenic (As). The project is subject to PSD review for these pollutants.

3.4.1.2 Ambient Monitoring

Based upon the net increase in emissions from the Lauderdale Repowering Project, presented in Table 3-3, a PSD preconstruction ambient monitoring analysis is required for SO_2, PM(TSP), PM10, NO_x, CO, sulfuric acid mist, Be, Hg, and As. However, if the net increase in impact of a pollutant is less than the de minimis monitoring concentration, then an exemption from the preconstruction ambient monitoring requirement may be granted for that pollutant. In addition, if an acceptable ambient monitoring method for the pollutant has not been established by EPA, monitoring is not required.

Maximum predicted impacts due to the net increase associated with repowering Lauderdale Units 4 and 5 are presented in Table 3-4 for pollutants requiring PSD review. The methodology used to predict maximum impacts and the impact analysis results are presented in Sections 6.0 and

Table 3-3. Net Increase in Emissions Due to the Lauderdale Repowering Project Compared to the PSD Significant Emission Rates

Pollutant	Emissions (TPY) Potential Emissions From Proposed Units 4 & 5[a]	Reductions From Existing Units 4 & 5	Net Increase in Emissions	Significant Emission Rate	PSD Review
Sulfur Dioxide	12,142	2,243	9,899	40	Yes
Particulate Matter (TSP)	819	195	624	25	Yes
Particulate Matter (PM10)	819	141	678	15	Yes
Nitrogen Dioxide	5,954	2,456	3,498	40	Yes
Carbon Monoxide	1,871	181	1,690	100	Yes
Volatile Organic Compounds	114.9	15.0	99.9	NA	No[b]
Lead	0.22	0.062	0.16	0.6	No
Sulfuric Acid Mist	1,513	85.9	1,427	7	Yes
Total Fluorides	0.75	0.77	<0.0	3	No
Total Reduced Sulfur[c]	NEG	NEG	NEG	10	No
Reduced Sulfur Compounds[c]	NEG	NEG	NEG	10	No
Hydrogen Sulfide[c]	NEG	NEG	NEG	10	No
Asbestos[c]	NEG	NEG	NEG	0.007	No
Beryllium	0.058	0.0093	0.049	0.0004	Yes
Mercury	0.35	0.036	0.31	0.1	Yes
Vinyl Chloride[c]	NEG	NEG	NEG	1	No
Benzene[c]	NEG	NEG	NEG	0	No
Radionuclides[c]	NEG	NEG	NEG	0	No
Inorganic Arsenic	0.098	0.043	0.055	0	Yes

Note: NEG = Negligible.

[a]See Table 2-6.
[b]Nonattainment pollutant; PSD review does not apply.
[c]Emissions of these pollutants considered not to have any emission rate increase.

Table 3-4. Predicted Net Increase In Impacts Due To The Repowering Project Compared To PSD De Minimis Monitoring Concentrations

Pollutant	Concentration ($\mu g/m^3$) Predicted Net Increase In Impacts[a]	Concentration ($\mu g/m^3$) De Minimis Monitoring Concentration
Sulfur Dioxide	36	13, 24-hour
Particulate Matter (TSP)	3.0	10, 24-hour
Particulate Matter (PM10)	3.0	10, 24-hour
Nitrogen Dioxide	0.86	14, annual
Carbon Monoxide	13	575, 8-hour
Lead	0.00032	0.1, 3-month
Total Flourides	0.003	0.25, 24-hour
Beryllium	0.0002	0.001, 24-hour
Mercury	0.0003	0.25, 24-hour
Sulfuric Acid Mist	NM	NM
Inorganic Arsenic	NM	NM

[a]Based on maximum emissions at 100-percent load and 100-percent capacity factor. Impacts for sulfur dioxide and nitrogen oxides include creditable emission decreases from existing Units 4 and 5. Impacts for all other pollutants reflect the increases from repowered Units 4 and 5 only.

Note : NA = Not applicable.
NM = No acceptable ambient measurement method has been developed and, therefore, de minimis levels have not been established by EPA.

7.0. As shown in Table 3-4, the maximum net increase in impact is below the respective de minimis monitoring concentration for all pollutants except SO_2. There is no acceptable ambient monitoring method for sulfuric acid mist and As, and therefore monitoring is not required for these pollutants. As a result, the proposed repowering project is subject to preconstruction ambient monitoring analysis for SO_2 only.

In response to the SO_2 monitoring requirement, FPL developed an ambient air monitoring plan of study in July 1988 (KBN, 1988). The plan described the monitoring network and monitoring methods and was subsequently approved by FDER (May 25, 1989). Monitoring was initiated in October 1988. The air quality analysis for SO_2 is presented in Section 5.0.

3.4.1.3 GEP Stack Height Impact Analysis

The GEP stack height regulations allow any stack to be at least 65 meters high. The proposed stacks for the repowered Units 4 and 5 will be 150 feet in height (45.7 meters) and, therefore, do not exceed the GEP stack height. The potential for downwash of the units' emissions due to nearby structures is discussed in Section 6.0, Air Quality Modeling Approach.

3.4.2 Nonattainment Review

A condition to the FDER permit is requested that would limit VOC emissions from the Lauderdale Plant to 99.9 TPY.

With this permit condition, the potential emissions from the plant would be reduced by about 160 TPY, a 65 percent reduction. In addition, the facility would be a minor source of VOCs. Note that the actual emissions from the plant are substantially less than 100 TPY (see Table 2-10b).

For minor sources, nonattainment review is required for ozone if the net increase in VOC emissions due to the proposed modification exceeds 100 TPY. As shown in Table 3-3, the maximum potential increase in VOC emissions due to the Repowering Project and contemporaneous emission decreases will be 99.9 TPY. Nonattainment requirements are, therefore, not applicable.

4.0 CONTROL TECHNOLOGY REVIEW

4.1 APPLICABILITY

The Control Technology review requirements of the PSD regulations are applicable to emissions of SO_2, PM(TSP), PM10, NO_x, CO, H_2SO_4 mist, beryllium, mercury, and inorganic arsenic (see Section 3.0). This section presents the applicable New Source Performance Standards (NSPS) and the proposed BACT for these pollutants. The approach to BACT analyses is based on the regulatory definitions of BACT as well as EPA's current policy guidance requiring the top down approach.

4.2 NEW SOURCE PERFORMANCE STANDARDS

The applicable NSPS for gas turbines are codified in 40 CFR 60, Subpart GG. These regulations apply to:

1. "Electric utility stationary gas turbine" with a heat input at peak load of greater than 100 million Btu/hr [40 CFR 60.332 (b)];
2. "Stationary gas turbines" with a heat input at peak load between 10 and 100 million Btu/hr [40 CFR 60.332 (c)]; or
3. "Stationary gas turbines" with a manufacturer's rate based load at ISO conditions of 30 MW or less [40 CFR 60.332 (d)].

The electric utility stationary gas turbine provisions apply to stationary gas turbines constructed for the purpose of supplying more than one-third of its potential electric output capacity to any utility power distribution system for sale [40 CFR 60.331 (q)]. The requirements for electric utility stationary gas turbines are applicable to the project and are the most stringent provision of the NSPS. These requirements are summarized in Table 4-1 and were considered in the BACT analysis.

As noted from Table 4-1, the NSPS NO_x emission limit can be adjusted upward to allow for fuel bound nitrogen. For a fuel bound nitrogen concentration of 0.015 percent or less, no increase in the NSPS is

Table 4-1. Federal NSPS For Electric Utility Stationary Gas Turbines

Pollutant	Emission Limitation[a]
Sulfur Dioxide	Maximum of 0.015 percent by volume at 15 percent oxygen on a dry basis or sulfur in fuel no greater than 0.8 percent by weight
Nitrogen Oxides[b]	0.0075 percent by volume (75 ppm) at 15 percent O_2 on a dry basis adjusted for heat rate and fuel nitrogen

[a] Applicable to electric utility gas turbines with a heat input at peak load of greater than 100 x 10^6 Btu/hr.

[b] Standard is multiplied by 14.4/Y; where Y is the manufacturer's rated heat rate in kilojoules per watt at rated load or actual measured heat rate based on the lower heating value of fuel measured at actual peak load; Y cannot be greater than 14.4. Standard is adjusted upward (additive) by the percent of nitrogen in the fuel:

Fuel-bound nitrogen (percent by weight)	Allowed Increase NO_x percent by volume
N<0.015	0
0.015<N<0.1	0.04(N)
0.1<N<0.25	0.004+0.0067(N-0.1)
N>0.25	0.005

where:

N = the nitrogen content of the fuel (percent by weight).

Source: 40 CFR 60 Subpart GG.

provided; for a fuel bound nitrogen concentration of 0.06 percent the NSPS is increased by 0.0024 percent or 24 ppm.

NSPS also apply to the burning of fuel in the duct burner of a combined cycle power plant (i.e., a power plant which recovers the waste heat from a gas turbine in a heat recovery steam generator). The NSPS, contained in 40 CFR 60, Subpart Db (Industrial-Commercial Institutional Fossil Fuel Steam Generating Units), apply to duct burners with a maximum heat input of 100 x 10^6 Btu/hr. These NSPS do not apply to the repowering project since the maximum heat input requested for the duct burners will be 90.62 x 10^6 BTU/hr.

4.3 BEST AVAILABLE CONTROL TECHNOLOGY

4.3.1 Nitrogen Oxides

4.3.1.1 Emission Control Hierarchy

NO_x emissions from combustion of fossil fuels consist of thermal NO_x and fuel bound NO_x. Thermal NO_x is formed from the reaction of oxygen and nitrogen in the combustion air at combustion temperatures. Formation of thermal NO_x depends on the flame temperature, residence time, combustion pressure, and air to fuel ratios in the primary combustion zone. The design and operation of the combustion chamber dictates these conditions. Fuel bound NO_x is created by the oxidation of volatilized nitrogen in the fuel. Nitrogen content in the fuel is the primary factor in its formation.

Table 4-2 presents a listing of the LAER/BACT decisions for gas turbines made by state environmental agencies and EPA regional offices. This table was developed from the information contained in the LAER/BACT clearinghouse documents (EPA, 1985b, 1986b, 1987c, 1988c) and by contacting state agencies such as the California Air Control Board, the South Coast Air Quality Management District, New Jersey Department of Environmental Protection, and Rhode Island Department of Environmental Management.

Table 4-2. LAER/BACT Decisions For Gas Turbines

Company Name	State	Unit Description	Capacity (Size)	Date of Permit	Emission Limit	Emission Control
Virginia Power	VA	GE Turbine	1,875 MMBTU/hr	Apr-88	NOx 42ppmvd @15% O2 (gas) NOx 77ppmvd @18% O2 (fuel oil)	Steam Injection W/Maximization NSPS subpart GG
Trunkline LNG	LA	Gas Turbine	147,102 SCF/hr	May-87	NOx 59 lb/hr	
Wichita Falls E. I., I.	TX	Gas Turbine	20 MW	Jun-86	NOx 684 TPY CO 420 TPY	Steam Injection
Merck Sharp & Pohme	PA	Turbine	310 MMBTU/hr	May-88	NOx 42 ppm @ 15% O2	Steam Injection
California Dept. of Corr.	CA	Gas Turbine	5.1 MW	Dec-86	NOx 38 ppmv @ 15% O2	1 to 1 H2O injection
City of Santa Clara	CA	Gas Turbine		Jan-87	NOx 42 ppmvd @ 15% O2	Water Injection
Combined Energy Resources	CA	Cogeneration Fac.	27 MW	Mar-87	NOx 199 lb/D	SCR Unit, Duct Burner H2O Injection, Low NOx Design
Double 'C' Limited	CA	Gas Turbine	25 MW	Nov-86	NOx 194 lb/D	H2O Inj. & Selected Catalytic Red. 95.80 Efficiency
Kern Front Limited	CA	Gas Turbine	25 MW	Nov-86	NOx 194 lb/D 4.5 ppmvd @ 15% O2	H2O Inj. & Selected Catalytic Red. 95.80 Efficiency
Midway - Sunset Project	CA	Gas Turbine	973 MMBTU/hr	Jan-87	NOx 113.4 lb/hr 16.31 ppmv	H2O Injection, 73% Efficiency
O'Brien Energy Systems	CA	Gas Turbine	359.5 MMBTU/hr	Dec-86	NOx 30.3 lb/hr 15 ppmvd @ 15% O2	Duct Burner, H2O Injection and Scrubber
PG & E, Station T	CA	GE Gas Turbine	396 MMBTU/hr	Aug-86	NOx 25 ppm @ 15% O2 63 lb/hr	Steam Injection @ Steam/Fuel Ratio of 1.7/1, 75% Efficiency
Sierra LTD.	CA	GE Gas Turbine	11.34 MMCF/D		NOx 4.04 lb/hr	Scrubber & CO Catalytic Converter
Sycamore Cogeneration Co.	CA	Gas Turbine	75 MW	Mar-87	CO 10 ppmv @ 15% O2 3 hr Avg	CO Oxidizing Catalyst Combustion Control
U.S. Borax & Chemical Corp.	CA	Gas Turbine	45 MW	Feb-87	NOx 40 lb/hr 25 ppm @ 15% O2 Dry CO 23 lb/hr	Scrubber Proper Combust. Techniques
Western Power System, Inc	CA	GE Gas Turbine	26.5 MW	Mar-86	NOx 9 ppmvd @ 15% O2	H2O Injection, Selective Cat. Red. 80% Efficiency
Calcogen, Cal Polytechic	CA	Gas Turbine	21.4 MW	Apr-84	NOx 42 ppm @ 15% O2	H2O Injection, 70% Efficiency
Greenleaf Power Co.	CA	GE Gas Turbine	35.62 MW	Apr-85	NOx 42 ppm @ 15% O2 91 lb/hr CO 20.4 lb/hr 0.016 lb/MMBTU	H2O Injection Good Eng. Practices Steam Injection 95.86 Efficiency

Table 4-2. LAER/BACT Decisions For Gas Turbines (Page 2 of 4)

Company Name	State	Unit Description	Capacity (Size)	Date of Permit	Emission Limit	Emission Control
Greenleaf Power Co.	CA	Duct Burner	63.7 MMBTU/hr	Apr-85	NOx 0.1 lb/MMBTU 6.4 lb/hr CO 0.12 lb/MMBTU 7.6 lb/hr	Low NOx Design
OLS Energy	CA	GE Gas Turbine	256 MMBTU/hr	Jan-86	NOX 9 PPMVD @ 15% O2	H2O Injection & Scrubber 80% Eff. for Scrubber
Ciba Giegy Corp.	NJ	Gas Turbine	3 MW	Jan-85	NOx 11.06 lb/hr CO 9.4 lb/hr	SIP, H2O Injection, 55% Eff.
Energy Reserve, Inc.	CA	Gas Turbine	322.5 MMBTU/hr	Oct-85	NOx 185.4 lb/D	H2O Injection, Select. Cat. Red. 92.5% Efficiency
Gilroy Energy Co.	CA	Gas Turbine	60 MW	Aug-85	NOx 25 PPMDV @ 15% O2	Steam Inj., Quiet Combustor
		Auxiliary Boiler	90 MMBTU/hr		NOx 40 PPMDV @ 3% O2	Low NOx Burners
Kern Energy Corp.	CA	Gas Turbine	8.8 MMCF/D	Apr-86	NOx 8.29 lb/hr 0.023 lb/MMBTU	Scrubber w/ NH3 Red. Agent Steam Inj. & Low NOx Config. Exh. Duct Burner 87% Efficiency
Moran Power, Inc.	CA	Gas Turbine	8.0 MMCF/D	Apr-86	NOx 8.29 lb/hr 0.023 lb/MMBTU	Scrubber w/ NH3 Red. Agent Steam Inj. & Low NOx Config. Exh. Duct Burner 87% Efficiency
Northern California Power	CA	GE Gas Turbine	25.8 MW	Apr-85	NOx 75 ppm	H2O Injection
Shell California Production	CA	Gas Turbine	22 MW	Apr-85	NOx 42 ppm @ 15% O2 35 lb/hr CO 10 PPMV @ 15% O2 22 lb/hr	H2O Inj. Proper Combustion
Southeast Energy, Inc.	CA	Gas Turbine	8.0 MMCF/D	Apr-86	NOx 8.29 lb/hr 0.023 lb/MMBTU	Scrubber w/ NH3 Red. Agent Steam Inj. & Low NOx Config. Exh. Duct Burner 87% Efficiency
Sunlaw/Industrial Park	CA	Gas Turbine	412.3 MMBTU/hr	Jun-85	NOx 9 PPMVD @ 15% O2	Scr. & Steam Inj., 80% Eff.
Union Cogeneration	CA	Gas Turbine w/ Duct Burner	16 MW	Jan-86	NOx 25 PPMV @ 15% O2	H2O Injection & Scrubber

Table 4-2. LAER/BACT Decisions For Gas Turbines (Page 3 of 4)

Company Name	State	Unit Description	Capacity (Size)	Date of Permit	Emission Limit	Emission Control
Willamette Industries	CA	GE Gas Turbine	230 MMBTU/hr	Apr-85	NOx 15 PPMVD @ 15% O2	H2O Inj. w/ Selective Cat. Red. 92% Efficiency
Witco Chemical Corp.	CA	Gas Turbine	350 MMBTU/hr	Dec-84	NOx 0.18 lb/MMBTU Oil 0.20 lb/MMBTU Gas	
		Duct Burner	111.6 MMBTU/hr		NOx 0.12 lb/MMBTU	Gas Firing Only
AES Placerita, Inc.	CA	Turbine & Recovery Boiler	519 MMBTU/hr	Mar-86	NOx 629 lb/d 7 PPMVD @ 15% O2 CO 103 lb/d 2 PPMVD @ 15% O2	H2O Inj, Select. Cat. Red. 80% Efficiency
AES Placerita, Inc.	CA	Turbine & Recovery Boiler	530 MMBTU/hr	Jul-87	NOx 340 lb/D 9 PPMVD @ 15% O2	Steam Inj, Select. Cat. Red.
AES Placerita, Inc.	CA	Gas Turbine	530 MMBTU/hr	Jul-87	NOx 289 lb/D 9 PPMVD @ 15% O2	Steam Inj, Select. Cat. Red.
Alaska Electrical Generation	AK	Gas Turbine	80 MW	Mar-87	NOx 75 PPMVD @ 15% O2 CO 109 lb/SCF Fuel	H2O Injection
Alaska Electrical Generation	AK	Gas Turbine	38 MW	Mar-85	NOx 75 PPM @ 15% O2	H2O Injection
BAF Energy	CA	Turbine, Generator	887.2 MMBTU/hr	Jul-87	NOx 9 PPM @ 15% O2 30.1 lb/hr	Steam Injection, Scrubber 80% Efficiency
BAF Energy	CA	Auxiliary Boiler	150 MMBTU/hr	Oct-87	NOx 17.4 lb/D 40 PPMVD @ 3% O2 CO 63.6 lb/D 0.018 lb/MMBTU	Flue Gas Recirculation Low NOx Burners Oxidation Catalyst
Champion International Corp.	TX	Gas Turbine	30.6 MW (1342 MMBTU/hr)	Mar-85	NOx 720.34 TPY CO 70.08 TPY	Low NOx Burners
Cogen Technologies	NJ	GE Gas Turbines	40 MW	Jun-87	NOx 9.6 PPMVD @ 15% O2 CO 50 PPMVD @ 15% O2	H2O Inject. & SCR, 95% Efficiency
Combined Energy Resources	CA	Gas Turbine	2 MW	Feb-88	NOx 199 lb/hr	H2O Inj. & Scrubber, 81% Efficiency

Table 4-2. LAER/BACT Decisions For Gas Turbines (Page 4 of 4)

Company Name	State	Unit Description	Capacity (Size)	Date of Permit	Emission Limit	Emission Control
Formosa Plastic Corp.	TX	GE Gas Turbine	38.4 MW	May-86	NOx 640 TPY CO 32.4 TPY	Steam Injection
Midland Cogeneration Venture	MI	Turbine	984.2 MMBTU/hr	Feb-88	NOx 42 PPMV @ 15% O2 CO 26 lb/hr	Steam Injection Turbine Design
		Duct Burner	249 MMBTU/hr		NOx 0.1 lb/MMBTU	Burner Design
Pacific Gas Transmission	OR	Gas Turbine	14000 HP	May-87	NOx 154 PPM 50 lb/hr CO 6 lb/hr 25 TPY	Combustion Control
Power Development Co.	CA	Gas Turbine	49 MMBTU/H	Jun-87	NOX 36 lb/D 9 PPMVD @ 15% O2	Scrubber & H2O Injection
San Joaquin Cogen Limited	CA	Gas Turbine	48.6 MW	Jun-87	NOx 250 lb/D 6 PPMVD @ 15% O2 CO 1326 lb/d 55 PPMVD @ 15% O2	Scrubber & H2O Injection 76% Efficiency Combustion Controls
United Airlines	CA	Gas Turbine-Cogeneration	21 MW	Dec-85	NOx 15 ppmvd @ 15% O2	SCR & Steam Injection Oil Limited to 500 hours operation
TBG/Grumman	NY	Gas Turbine	16 MW	Mar-88	NOx 75 PPM + NSPS Corr. 0.2 lb/MMBTU CO 0.181 lb/MMBTU	H2O Inj. & Combustion Controls CO Catalyst
Texas Gas Transmission Corp.	KY	Gas Turbine	14300 HP	Feb-88	NOx 0.015 % by Volume	
Orlando Utilities Commission	FL	Gas Turbine	4 x 445 MMBTU/H	Sept-88	NOx 42 PPMDV Gas 65 PPMDV Oil CO 10 PPMMDV	Steam Injection Good Combustion
Anheuser-Busch	FL	Gas Turbine	95.7 MMBTU/hr	Apr-87	NOx 0.1 lb/MMBTU	
Ocean State Power	RI	Combined Cycle	500 MW	Jan-89	NOx 9 ppmvd @ 15% O2 (Natural Gas) NOx 42 ppmvd @15% O2 (Fuel Oil) CO 25 ppmvd @ 15% O2	SCR & Steam Injection
Pawtucket Power	RI	Cogeneration-Gas Turbine	58 MW	Feb-89	NOx 9 ppmvd @ 15% O2 (Natural Gas) NOx 18 ppmvd @ 15% O2 (Fuel Oil) CO 23 ppmvd @ 15% O2	SCR & Steam Injection
Cogen Technologies	NJ	Gas Turbine	55 MW	Mar-87	NOx 9 ppmvd @ 15% 02 (Natural Gas) NOx 14 ppmvd @ 15% O2 (Fuel Oil) CO-8ppm; 20 ppm NH3	SCR and Wet Injection

The most stringent NO_x controls for combustion turbines established as LAER/BACT by state agencies is selective catalytic reduction (SCR) and wet injection. Presently, there are about 35 operating and permitted facilities with SCR in the United States. However, none of these installations employ advanced combustion turbines, as will the Lauderdale Repowering Project. Almost all of these facilities were required to have SCR due to nonattainment status of the area where the facility was located. The requirement for SCR in these cases was to meet the Lowest Achievable Emission Rate (LAER). LAER is defined as follows:

> Lowest achievable emission rate means, for any source, the more stringent rate of emissions based on the following: (i) The most stringent emissions limitation which is contained in the implementation plan of any State of such class or category of stationary source, unless the owner or operator of the proposed stationary source demonstrates that such limitations are not achievable; or (ii) The most stringent emissions limitation which is achieved in practice by such class or category of stationary source. This limitation, when applied to a modification, means the lowest achievable emissions rate for the new or modified emissions units within the stationary source. In no event shall the application of this term permit a proposed new modified stationary source to emit any pollutant in excess of the amount allowable under applicable new source standards of performance (40 CFR 51 Appendix S. II, A.18).

As noted from the discussion contained in Subsection 3.2.3, there are distinct regulatory and policy differences between LAER and BACT.

In Florida, the most recent PSD permits and BACT determination for gas turbines have required wet injection for NO_x control. The emission

limits included in these permits were 42 ppm and 65 ppm (corrected to 15 percent O_2, dry conditions), respectively, for natural gas and fuel oil firing.

The hierarchy for NO_x control suggested by the existing and permitted facilities is as follows:

1. SCR with wet injection.
2. Wet Injection.

The selected control level of SCR used for the BACT analysis for the Lauderdale Repowering Project was 9 ppm NO_x corrected to 15 percent dry conditions for natural gas burning. This level of control assumes 79 percent removal of NO_x by the SCR equipment with an uncontrolled NO_x concentration of 42 ppm. For fuel oil firing, a control level of 13 ppm was used to account for fuel bound nitrogen. These levels of control are the most stringent currently being established as LAER. For wet injection, the combustor design available for the advanced combustion turbines can limit NO_x to 42 ppm when firing natural gas and 65 ppm when firing fuel oil.

4.3.1.2 Technology Description and Feasibility

SELECTIVE CATALYTIC REDUCTION (SCR)

SCR uses ammonia (NH_3) to react with NO_x in the gas stream under the presence of a catalyst. NH_3, which is diluted with air to about 5 percent by volume, is introduced into the gas stream at reaction temperatures between 570°F and 750°F. The reactions are as follows:

$$4NH_3 + 4NO + O_2 = 4N_2 + 6H_2O$$
$$4NH_3 + 2NO_2 + O_2 = 3N_2 + 6H_2O$$

SCR has mainly been installed at facilities located in nonattainment areas for NO_2, i.e., in California. While the operating experience has

not been extensive, certain cost, technical and environmental considerations have surfaced. These considerations are summarized in Table 4-3.

SCR operating experience, as applied to gas turbines, consists primarily of baseload natural gas fired installations either of cogeneration or combined cycle configuration; no simple cycle facilities have SCR. Exhaust gas temperatures of simple cycle CTs are generally in the range of 1000°F, which exceeds the optimum range for SCR. All current SCR applications have the catalyst placed in the HRSG to achieve proper reaction conditions. This allows a relatively constant temperature for the reaction of NH_3 and NO_x on the catalyst surface. Cycling the CTs, as is expected for the repowered units, will cause variable exhaust conditions. Such conditions will potentially result in catalyst damage due to temperature induced stresses.

The use of SCR has been limited to facilities which burn natural gas or small amounts of fuel oil since SCR catalysts are contaminated by sulfur-containing fuels (i.e., fuel oil). For most fuel oil burning facilities, catalyst operation is discontinued, or the exhaust bypasses the SCR system. Experience at the United Airlines cogeneration facility using Jet A fuel oil found catalyst contamination after 2,500 hours of operation. For this facility, the catalyst has been replaced three times and the recommended duration of operation by the manufacturer is now 500 hours.

As presented in Table 4-3, ammonium bisulfate is formed by the reaction of NH_3 and SO_3. Ammonium bisulfate can be corrosive and could cause damage to the HRSG surfaces that follow the catalyst, as well as the stack. Corrosion protection for these areas would be required.

Reported and permitted NO_x removal efficiencies of SCR range from 40 to 80 percent. The most stringent emission limiting standards associated with SCR are approximately 9 ppm for natural gas firing. However, two

Table 4-3. Cost, Technical and Environmental Considerations of SCR Utilized on Combustion Turbines (Page 1 of 2)

Consideration	Description
COST:	
Catalyst Replacement	Catalyst life varies depending on the application. Cost ranges from 20% to 40% of total capital cost and is the dominant annual cost factor.
Ammonia	Ratio of at least 1:1 NH_3 to NO_x generally needed to obtain high removal efficiencies. Special storage and handling equipment required.
Space Requirements	For new installations, space in the catalyst is needed for replacement layers. Additional space is also required for catalyst maintenance and replacement.
Backup Equipment	Reliability requirements necessitate redundant systems such as ammonia control and vaporization equipment.
Catalyst Back Pressure Heat Rate Reduction	Addition of catalyst creates back pressure on the turbine which reduces overall heat rate.
TECHNICAL:	
Ammonia Flow Distribution	NH_3 must be uniformly distributed in the exhaust stream to assure optimum mixing with NO_x prior to reaching the catalyst.
Temperature	The narrow temperature range that SCR systems operate within, i.e., about 100°F, must be maintained even during load changes. Operational problems could occur if this range is not maintained. HRSG duct firing requires careful monitoring.
Ammonia Control System	Quantity of NH_3 introduced must be carefully controlled. With too little NH_3, the desired control efficiency is not reached; with too much NH_3, NH_3 emissions (referred to as slip) occur.

Table 4-3. Cost, Technical and Environmental Considerations of SCR Utilized on Combustion Turbines (Page 2 of 2)

Consideration	Description
Flow Control	The velocity through the catalyst must be within a range to assure satisfactory residence time.
ENVIRONMENTAL:	
Ammonia Slip	NH_3 slip, or NH_3 that passes unreacted through the catalyst and into the atmosphere, can occur if: 1) too much ammonia is added, 2) the flow distribution is not uniform, 3) the velocity is not within the optimum range, or the proper temperature is not maintained.
Ammonia Bisulfate	Ammonium bisulfate salts can lead to increased corrosion. These salts usually occur when firing fuel oil. These compounds are emitted as particulates.
N_2O and Nitrosoamines formation	The mechanism under which these compounds form is not totally understood. Secondary impacts can occur.

facilities have reported emission limits of about 4.5 ppm. These emission limits were clearly determined to be LAER on CTs using water injection with uncontrolled NO_x levels below 42 ppm. For fuel oil firing, permitted NO_x emission limits with SCR have ranged from 14 ppm to 42 ppm.

The available information suggests that SCR is a technically feasible alternative for natural gas firing. However, the following significant technical limitations exist:

1. SCR catalysts are potentially damaged by temperature variability of the CT exhaust gases due to cycling operation, and
2. Continuous operation on SCR or CTs using distillate oil has not been demonstrated; technical, economic, and environmental uncertainties would result.

WET INJECTION

The injection of water or steam in the combustion zone of CTs reduces the flame temperature with a corresponding decrease of NO_x emissions. The amount of NO_x reduction possible depends on the combustor design and the water-to-fuel ratio employed. An increase in the water to fuel ratio will cause a concomitant decrease in NO_x emissions until flame instability occurs. At this point, operation of the CT becomes inefficient and unreliable, and significant increases in products of incomplete combustion will occur, i.e., CO and VOC emissions.

The advanced CTs are new designs which are substantially higher in power output (i.e., about 50 percent greater) and combustion temperatures (i.e., 2,300°F vs 2,000°F) than previous designs. As a result, the maximum degree of wet injection NO_x control on advanced CTs is lower than that of smaller CT designs.

For the advanced combustion turbines being considered for the Lauderdale Repowering Project, the combustion chamber design includes steam

injection. The lowest NO_x emission levels guaranteed by CT manufacturers are 42 ppmvd and 65 ppmvd (both corrected to 15 percent O_2) for natural gas and fuel oil firing, respectively. The first U.S. facility to propose advanced combustion turbines is the Virginia Electric and Power Company combined cycle plant located at Chesterfield, Virginia. This facility was permitted at 42 ppmvd at 15 percent O_2 for natural gas firing and 77 ppmvd at 15 percent O_2 for fuel oil firing; the fuel-bound nitrogen content was based on 0.05 percent nitrogen in the fuel.

Wet injection is a technically feasible alternative for the Lauderdale Repowering Project. The application of this technology has the following limitations:

1. Wet injection can be accomplished until a condition of maximum moisturization occurs; this design condition occurs at 42 ppm on natural gas and 65 ppm on fuel oil for the advanced CTs,

2. Wet injection will not substantially reduce NO_x formation due to fuel-bound nitrogen. Any emission limiting requirements must account for this effect.

3. Wet injection will increase the emissions of CO and VOC. Emissions are dependent on the water-to-fuel ratio.

For the BACT analysis, wet injection was assumed to be capable of achieving NO_x emission levels of 42 ppm when firing natural gas, and 65 ppm when firing fuel oil (corrected to 15 percent O_2 dry conditions). These emission levels are the most stringent being established as BACT.

4.3.1.3 Impact Analysis

A BACT determination requires an analysis of the economic, environmental, and energy impacts of the proposed and alternative control technologies [see 40 CFR 52.21(b)(12), Chapter 17-2.100(25),

F.A.C., and Chapter 17-2.500(5)(c), F.A.C.]. The analysis must, by definition, be specific to the project, i.e., case-by-case. The BACT analyses was performed for the following alternatives:

1. SCR and wet injection at an emission rate of approximately 9 ppmvd corrected to 15 percent O_2; maximum NO_x emissions are 713 TPY.

2. Wet injection at an emission rate of 42 ppmvd corrected to 15 percent O_2; maximum NO_x emissions are 3,329 TPY (emissions from Table A-6 75°F times 4 CTs).

ECONOMIC

The total annualized cost for the alternative NO_x control technologies is $16,805,851 (Table 4-4). The cost effectiveness for SCR was estimated to be $6,424/ton of NO_x removed for natural gas firing. Cost estimates for SCR for oil firing were not performed since the application of SCR when firing oil is considered infeasible for the project (See Section 4.3.1.4).

ENVIRONMENTAL

The maximum predicted impacts of the alternative technologies are all considerably below the PSD increment for NO_x of 25 $\mu g/m^3$, annual average and the AAQS for NO_x of 100 $\mu g/m^3$. Additional controls beyond NSPS (i.e., SCR and SCR with water injection) reduce predicted impacts by less than about 3 percent of the PSD increment and less than about 1 percent of the AAQS.

Use of SCR on the proposed project will cause emissions of ammonia, ammonium sulfates, such as ammonium bisulfate. Ammonia emissions associated with SCR are approximately 10 ppm and higher based on previous experience; previous permit conditions have specified this level. Minimum ammonia emissions would be about 365 TPY. However, ammonia emissions could be five times this level (i.e., about 1,830) since actual operating experience has found ammonia slippage rates as high as 50 ppm.

Table 4-4. Capital and Annual Costs for Alternative NO_x Control Technology

Item	SCR	
	Cost	Basis
CAPITAL COSTS COMPONENTS:		
Catalyst and Associated Equipment	$12,400,000	Note 1
NH3 Storage Tank	$200,000	Note 1
System Installation	$1,725,200	Note 1
HRSG Modification	$1,600,000	Note 1
Engineering, Erection Supervision and Start-up	$1,800,000	Note 1
Tax (material only)	$846,000	
Escalation	$2,878,600	5%
Interest During Construction	$1,836,200	
Contingency	$4,656,900	
Total Capital Cost	$27,942,900	
Annualized Capital Cost	$3,467,713	Note 2
OPERATING AND MAINTENANCE:		
Catalyst Replacement	$2,400,000	Note 3
Operating Personnel	$40,000	
Catalyst Change-out	$200,000	
Ammonia	$350,400	Note 4
Electrical Cost	$245,280	Note 5
Escalation	$808,920	
Contingency	$485,352	
Total Annual Cost	$4,529,952	
Levelized Annual Cost	$7,218,479	Note 6
ENERGY PENALTIES:		
Start-up Costs	$1,800,000	Note 7
Pressure Drop	$1,085,106	Note 8
Heat Rate	$955,282	Note 9
Total	$3,840,389	
Levelized Annual Cost	$6,119,659	
TOTAL ANNUALIZED COSTS:	$16,805,851	

Notes:
1. Based on engineering estimate.
2. Capital recovery factor based on 12 percent over 30 years.
3. Two years replacement.
4. $200/ton.
5. 500 kW/hr required.
6. Levelizing factor based 12 percent interest, 30 years and 5 percent escalation rate.
7. Loss of 50 kW for 15 starts/CT.
8. 4" pressure drop across SCR.
9. 0.58 percent heat rate penalty.

The replacement of the SCR catalyst will create additional economic and environmental impacts since available catalysts, e.g. vanadium pentoxide, are listed as hazardous chemical wastes under RCRA regulations (40 CFR 261).

Ammonia delivery and storage must be handled with caution because of its hazardous nature. Special precautions would be required to assure no environmental discharge occurs.

ENERGY

Energy penalties will occur with all control alternatives evaluated. However, significant energy penalties occur with SCR. With SCR the output of the CT is reduced by about 0.58 percent over that of wet injection. This penalty is due to the SCR pressure drop, which would be about 4 inches of water, and would amount to about 32,009,004 kWh in potential lost generation per year. The energy required by the SCR equipment would be about 4,380,000 kWh/year. Taken together, the lost generation and energy requirements of SCR could supply the electrical needs of 3,200 residential customers. The pressure drop would also reduce the units heat rate by about 62 Btu/kWh. This would result in increased natural gas usage amounting to 325.9 million cubic ft.

4.3.1.4 Proposed BACT and Rationale

The proposed BACT for the Lauderdale Repowering Project is wet injection. The proposed NO_x emissions levels using wet injection are 42 ppm when firing natural gas and 65 ppm when firing fuel oil. This control technology is proposed for the following reasons:

1. SCR was rejected based on technical, economic and environmental grounds. SCR has not been demonstrated on oil-fired CT/HRSG especially the size being proposed for the project, i.e. > 150 MW/CT. Operation of SCR on fuel-oil-firing CTs will cause operating problems and also result in catalyst poisoning; therefore, SCR on oil firing is not considered feasible. Operation of SCR on CT units experiencing cycling load

conditions has not been demonstrated; temperature variability of the exhaust gases potentially would damage the catalyst. The estimated incremental cost of SCR for natural gas firing exceeds $6,424 per ton of NO_x removed. These costs are about 6 times more costly per ton of NO_x removed than the proposed BACT of wet injection (estimated to be about $1,200 per ton of polutant removed.). Additional environmental impacts would result from SCR operation including emissions of ammonia and ammonium bisulfates, and the generation of hazardous waste, i.e., spent catalyst replacement.

2. The proposed BACT of wet injection provides the least costly control alternative and results in low environmental impacts (less than 3 percent of the allowable PSD increments and 1 percent of the AAQS for NO_x). Wet injection at the proposed emissions levels has been adopted previously in BACT determinations. In addition, CT manufacturers have been willing to guarantee this level of NO_x emissions.

3. The proposed CTs are the largest model in production and have not been installed as fully operational anywhere in the world. As a result, there is no demonstrated experience with installing and operating SCR with CTs this large.

4.3.2 Carbon Monoxide (CO)

4.3.2.1 Emission Control Hierarchy

CO emissions are a result of incomplete or partial combustion of fossil fuel. Combustion design and catalytic oxidation are the control alternatives that are viable for the project.

Combustion design is the more common control technique used in CTs. Sufficient time, temperature and turbulence is required within the combustion zone to maximize combustion efficiency and minimize the

emissions of CO. Combustion efficiency is dependent upon combustor design. When wet NO_x control systems are employed, the amount of water or steam injected in the combustion zone also affects combustion efficiency. For the CTs being evaluated and with wet injection NO_x control, CO emissions range from 25 ppm to 33 ppm, corrected to dry conditions.

Catalytic oxidation is a post-combustion control that has been employed in CO nonattainment areas where regulations have required CO emission levels to be less than those associated with wet injection. These installations have been required to utilize LAER technology, and typically have CO limits in the 10 ppm range (corrected to dry conditions).

4.3.2.2 Technology Description

In an oxidation catalyst control system, CO emissions are reduced by allowing unburned CO to react with oxygen at the surface of a precious metal catalyst such as platinum. Combustion of CO starts at about 300°F, with efficiencies above 90 percent occurring at temperatures above 600°F. Catalytic oxidation occurs at temperatures 50 percent lower than that of thermal oxidation, which reduces the amount of thermal energy required. For CT/HRSG combinations, the oxidation catalyst can be located directly after the CT or in the HRSG. Catalyst size depends upon the exhaust flow, temperature and desired efficiency. The existing gas turbine applications have been limited to smaller cogeneration facilities burning natural gas.

Oxidation catalysts have not been used on fuel-oil-fired CTs or combined cycle facilities. The use of sulfur-containing fuels in an oxidation catalyst system would result in an increase of SO_3 emissions and concomitant corrosive effects to the back end of the HRSG and stack. In addition, trace metals in the fuel would result in catalyst poisoning during prolonged periods of operation.

Since the repowered units will likely require numerous startups, variations in exhaust conditions will influence catalyst life and performance. Very little technical data exist to demonstrate the effect of such cycling.

The lack of demonstrated operation with oil firing suggests rejection of catalytic oxidation as a technically feasible alternative. However, continuous operation using natural gas is technically feasible and therefore was evaluated as an alternative BACT technology.

Combustion design is dependent upon the manufacturer's operating specifications, which include air to fuel ratio and the amount of water injected. The advanced CTs presently being considered have designs to optimize combustion efficiency and minimize CO emissions. Installations with oxidation catalyst and combustion controls generally have controlled CO levels of 10 ppm as LAER.

For the Lauderdale Repowering Project the following alternatives were evaluated for natural gas firing or BACT:

1. Oxidation catalyst at 10 ppmvd; maximum CO emissions are 374.9 TPY.

2. Combustion controls at 30 ppmvd; maximum emissions are 1,124.8 TPY (see Table A-6, 75°F times 4 CTs).

4.3.2.3 Impact Analysis

ECONOMIC

The estimated annualized cost of a CO oxidation catalyst is $9,947,387 (Table 4-5) with a cost effectiveness of $13,265/ton of CO removed. The cost effectiveness is based on advanced CT emissions of 30 ppmvd. Catalytic oxidation has not been applied to fuel oil firing CTs and is considered infeasible. No costs are associated with combustion techniques since they are inherent in the design.

Table 4-5. Capital and Annual Costs for Alternative CO Control Technology

Item	Oxidation Cost	Oxidation Basis
CAPITAL COSTS COMPONENTS:		
Catalyst and Associated Equipment	$6,520,000	Note 1
System Installation	$1,408,600	Note 1
HRSG Modification	$1,000,000	Note 1
Engineering, Erection Supervision and Start-up	$1,200,000	Note 1
Tax (material only)	$451,200	
Escalation	$1,639,800	5%
Interest During Construction	$1,046,000	
Contingency	$2,885,500	
Total Capital Cost	$16,151,100	
Annualized Capital Cost	$2,004,435	Note 2
OPERATING AND MAINTENANCE:		
Catalyst Replacement	$2,750,000	Note 3
Operating Personnel	$0	
Catalyst Change-out	$80,000	
Escalation	$709,800	
Contingency	$424,600	
Total Annual Cost	$3,964,400	
Levelized Annual Cost	$6,317,271	Note 5
ENERGY PENALTIES:		
Start-up Costs	$0	
Pressure Drop	$542,553	Note 5
Heat Rate	$477,641	Note 6
Total	$1,020,194	
Levelized Annual Cost	$1,625,680	Note 4
TOTAL ANNUALIZED COSTS:	$9,947,387	

Notes:
1. Based on engineering estimate.
2. Capital recovery factor based on 12 percent over 30 years.
3. Two years replacement.
4. $200/ton.
5. Levelizing factor based on 12 percent interest, 30 years and 5 percent escalation rate.
6. 2" pressure drop across catalyst.
7. 0.29 percent heat rate penalty.

ENVIRONMENTAL

The air quality impacts of both oxidation catalyst control and combustion design control techniques are below the significant impact levels for CO. Therefore, no significant environmental benefit would be realized by the installation of a CO catalyst.

ENERGY

An energy penalty would result from the pressure drop across the catalyst bed. A pressure drop of about 2 inches water gauge would be expected. At a catalyst back pressure of about 2 inches, an energy penalty of about 16,004,500 kWh/yr would result. This energy penalty is sufficient to supply the electrical needs of about 1,400 residential customers over a year. Natural gas usage would increase by about 163 million cubic ft.

4.3.2.4 Proposed BACT and Rationale

Combustion design is proposed as BACT due to the technical and economic consequences of utilizing catalytic oxidation on advanced CTs. Catalytic oxidation is not considered feasible for the following reasons:

1. Catalytic oxidation has not been demonstrated on cycling CTs or those using fuel oil; and
2. The economic impacts are significant, i.e., annualized cost of almost $10,000,000 with a cost effectiveness of over $13,000/ton of CO removed.

4.3.3 Sulfur Dioxide (SO_2)

4.3.2.1 Emission Control Hierarchy

Sulfur dioxide (SO_2) emissions are a result of the oxidation of sulfur in fossil fuel and can be minimized by reducing the sulfur content in fuel or through applying post combustion removal techniques. For CTs, the use of low sulfur fuels is the only demonstrated control technology determined to be technically feasible. Post combustion techniques, such as flue gas desulfurization (FGD), have not been applied to CTs.

FGD systems have been applied to oil- and coal-fired steam electric power plants. However, the relative gas volume for such facilities is significantly less than that for CTs (i.e., about 2 to 3 times) and the resultant SO_2 concentration is considerably higher. While the former factor will influence the cost of FGD, the latter poses significant technological constraints to removing SO_2. As a result, FGD is not feasible for application to CTs.

The BACT/LAER clearinghouse documents (EPA, 1985, 1986b, 1987c, and 1988c) show fuel sulfur contents from 0.8 percent to less than 0.2 percent have been specified as BACT for CTs. The lowest sulfur containing fuels were required in California and New Jersey, where LAER decisions dictated more stringent standards. Furthermore, such requirements generally limited fuel oil use for backup or emergency purposes only.

For the repowered units, the only technically feasible control technology for SO_2 is low sulfur fuel use. The use of natural gas will clearly minimize SO_2 emissions. SO_2 emissions from distillate fuel can be minimized by specification of a lower sulfur content fuel, or blending of a lower sulfur content fuel, such as No. 1 fuel oil or kerosene, with No. 2 fuel oil. To reduce the uncertainties of supplier reliability, the blending of kerosene, a commonly available low sulfur fuel, was selected as an alternative control technology considered for the project. A sulfur content of 0.2 percent was selected as the top down BACT level since it is near the lowest of sulfur contents contained in the BACT clearinghouse documents.

4.3.3.2 Technology Description

The No. 2 fuel oil used in the repowered units will have a maximum sulfur content of 0.5 percent with a nominal average of 0.3 percent. For the purposes of this analysis, the maximum sulfur content of 0.5 percent was assumed. Kerosene has a maximum sulfur content of approximately 0.05 percent.

To obtain an average sulfur content of 0.2 percent, No. 2 fuel oil and kerosene would have to be blended in a ratio of about 1 to 2. Blending would require a separate storage tank, transfer pumps, mixing tank and mixing equipment.

The maximum emissions on No. 2 fuel oil would be 15,082.8 TPY (see Table 2-6) and would be 6,033.1 TPY on a blended fuel with a sulfur content of 0.2 percent.

4.3.3.3 Impact Analysis

ECONOMIC

The differential capital and annualized cost of utilizing 0.2 percent sulfur oil in place of 0.5 percent sulfur fuel oil is presented in Table 4-6. The total differential annualized cost for utilizing a maximum 0.2 percent sulfur fuel was estimated to be $46,479,242. The resulting cost effectiveness is $5,136/ton of SO_2 removed. Based on a more typical sulfur content of 0.3 percent for No. 2 fuel oil, the cost effectiveness would be $15,408/ton of SO_2 removed.

ENVIRONMENTAL

Based upon use of 0.5 percent sulfur fuel oil, the maximum SO_2 impacts of the repowered units will be less than 22 percent of the AAQS for SO_2, and less than 55 percent of the allowable PSD Class II increments. As a result, significant air quality benefits will not occur by reducing fuel sulfur content below that in No. 2 fuel oil, particularly considering the primary fuel will be natural gas, and existing Units 4 and 5, which use No. 6 fuel oil containing 1 percent sulfur, will be shut down.

Table 4-6. Capital and Annual Costs for Alternative SO_2 Control Technology

Item	Cost	Basis
CAPITAL COSTS COMPONENTS:		
Fuel Tank and Associated Equipment	$5,000,000	Note 1
System Installation	$750,000	Note 1
Engineering, Construction Supervision, and Startup	$575,000	Note 1
Tax (material only)	$379,500	
Escalation	$1,039,198	5%
Interest During Construction	$662,894	
Contingency	$1,681,318	
Total Capital Cost	$10,087,910	
Annualized Capital Cost	$1,251,910	Note 2
OPERATING AND MAINTENANCE:		
Fuel Costs	$28,646,967	Note 3
Operating Personnel	$40,000	
Miscellaneous Parts	$50,000	
Escalation	$287,370	
Contingency	$143,685	
Total Annual Cost	$29,168,021	
Levelized Annual Cost	$46,479,242	Note 4
TOTAL ANNUALIZED COSTS:	$47,731,151	

Notes: 1. Based on engineering estimate.
2. Capital recovery factor based on 12 percent interest over 30 years.
3. $0.07 per gallon average price differential.
4. Levelizing factor based 12 percent interest, 30 years and 5 percent escalation rate.

ENERGY

No substantial energy penalties are expected to result from the blending of kerosene with No. 2 fuel oil.

4.3.3.4 Proposed BACT and Rationale

The proposed BACT for the repowered units is the use of natural gas and No. 2 fuel oil with a maximum sulfur content of 0.5 percent. The selection of this control alternative is based upon the following:

1. The blending of kerosene is not cost effective or economically feasible. In addition, it is uncertain if the quantities of kerosene required to be blended with No. 2 fuel oil could be obtained.
2. There is no significant environmental benefit in using fuel oil with less than 0.5 percent sulfur content.

4.3.4 Particulate Emissions/PM10

The emission of particulates from the CTs is a result of incomplete combustion and trace solids in the fuel (particularly fuel oil) and in the injected water or steam used for NO_x control. The design of the CTs ensures that particulate emissions will be minimized by combustion controls and the use of clean fuels. A review of EPA's BACT/LAER Clearinghouse Documents did not reveal any post-combustion particulate control technologies being used on gas/oil fueled CTs. The natural gas and No. 2, i.e. distillate, fuel oil to be used in the CTs will only contain trace quantities of particulate (0.05 percent ash, maximum in fuel oil). Therefore, the use of clean fuel and combustion design is the proposed BACT for total suspended particulate matter [PM(TSP)] and particulate matter smaller than 10 microns (PM10).

The maximum particulate emissions from the CTs when burning fuel oil will be of less concentration than that normally specified for fabric filter designs; i.e., the grain loading associated with the maximum particulate emissions (about 60 lb/hr) is less than 0.01 grains per standard cubic foot (gr/scf), which is a typical design specification

for a baghouse. This further demonstrates that no further particulate controls are necessary for the proposed project.

4.3.5 Other Regulated and Nonregulated Pollutant Emissions

The PSD source applicability analysis shows that PSD significance emission levels are exceeded for sulfuric acid mist, mercury, beryllium, and arsenic, requiring PSD review (including BACT) for these pollutants.

There are no technically feasible methods for controlling the emissions of these pollutants from CTs, other than the inherent quality of the fuel (see Section 4.3.3 and 4.3.4). In addition, the inherent efficiency of the combined cycle configuration of the repowered units minimizes the quality of fuel used relative to steam cycle plants, i.e., by about 20 percent. Sulfuric acid mist emissions are a direct function of the sulfur content of the fuel. Levels of trace metals in No. 2 distillate oil are limited by fuel oil specifications for the advanced CTs. Low sulfur No. 2 distillate oil represents BACT for these pollutants.

For the nonregulated pollutants, most of which are trace metals, none of the control technologies evaluated for other pollutants (i.e., SCR and oxidation catalyst) would reduce such emissions and low sulfur distillate oil represents BACT because of its inherent low metals content.

5.0 AIR QUALITY MONITORING DATA

5.1 PSD PRECONSTRUCTION MONITORING REQUIREMENTS

As determined by the source applicability analysis described in Section 3.4, an ambient monitoring analysis is required by PSD regulations for SO_2 only. In order to satisfy these requirements, FPL developed a PSD air quality monitoring plan for the Lauderdale Repowering Project (KBN, 1988). The plan was submitted to FDER in August 1988 and was subsequently approved. Descriptions of the ambient air quality monitoring network design, rationale for monitoring locations and parameters, description of monitoring sites and sampling equipment are presented in the air monitoring plan. The attachment to the plan presents the Quality Assurance and Standard Operating Procedures used to perform the monitoring. These procedures, as well as the ambient air quality and meteorological data collected as part of this program, are included in Appendix 10.5.1 of the SCA.

The SO_2 monitoring data collected for PSD purposes are described in Section 5.2. Although pollutants other than SO_2 are not required to be monitored under PSD regulations, background concentrations for other criteria pollutants are important for assessing compliance of the proposed project with AAQS. As described in Section 6.0, emissions of NO_x and SO_2 will require full modeling analysis under PSD regulations.

Background concentrations are air quality concentrations due to air emission sources not explicitly accounted for in the air dispersion modeling analysis (see Section 6.0). To estimate existing background concentrations, existing air monitoring data are used. Existing ambient data and background concentration estimates are presented in Sections 5.2 and 5.3 for SO_2 and NO_2, respectively. Meteorological data were also collected by the FPL PSD monitoring network. Collected data are summarized in Section 5.4.

5.2 SULFUR DIOXIDE

The PSD approved air monitoring network for the Lauderdale Repowering Project contained two continuous SO_2 monitoring stations: FPL Davie Substation site and FPL Pinehurst Substation site (see Figure 5-1). In addition to these data, ambient monitoring data from Broward County were available from FDER and other FPL-operated air monitoring stations. Locations of the monitoring sites in the vicinity of the site are shown in Figure 5-1.

Ambient SO_2 data collected at these air monitoring sites for the period 1986 through 1988 are presented in Table 5-1. Data are available from four FDER sites (one collocated monitor) and five FPL sites. All data are collected by the 24-hour bubbler method, except for the FPL Pinehurst and Davie sites, which have continuous monitors. All of the bubbler data are gathered utilizing required quality assurance (QA) procedures for bubbler data, while the continuous monitors meet PSD QA criteria.

As indicated in Table 5-1, all recorded SO_2 concentrations are low and well below the AAQS. The highest measured 3-hour concentration at any monitor was 189 $\mu g/m^3$ at the FPL Pinehurst site, and the highest measured 24-hour concentration was 39 $\mu g/m^3$, measured at the FPL Davie site. These values are well below the AAQS of 1,300 $\mu g/m^3$, 3-hour average, and 260 $\mu g/m^3$, 24-hour average.

The highest recorded annual mean SO_2 concentration at any site was 5 $\mu g/m^3$, recorded at the FPL Pinehurst site. This concentration is well below the AAQS of 60 $\mu g/m^3$ for the annual averaging period.

Background SO_2 concentrations for use in the impact analysis are based upon the second maximum 3-hour and 24-hour concentration and the maximum annual average concentration measured at any monitoring location in the vicinity of the Lauderdale Plant site. This conservative assumption was employed since the observed values were low compared to AAQS. The resulting background concentrations are: 138 $\mu g/m^3$, 3-hour; 42 $\mu g/m^3$,

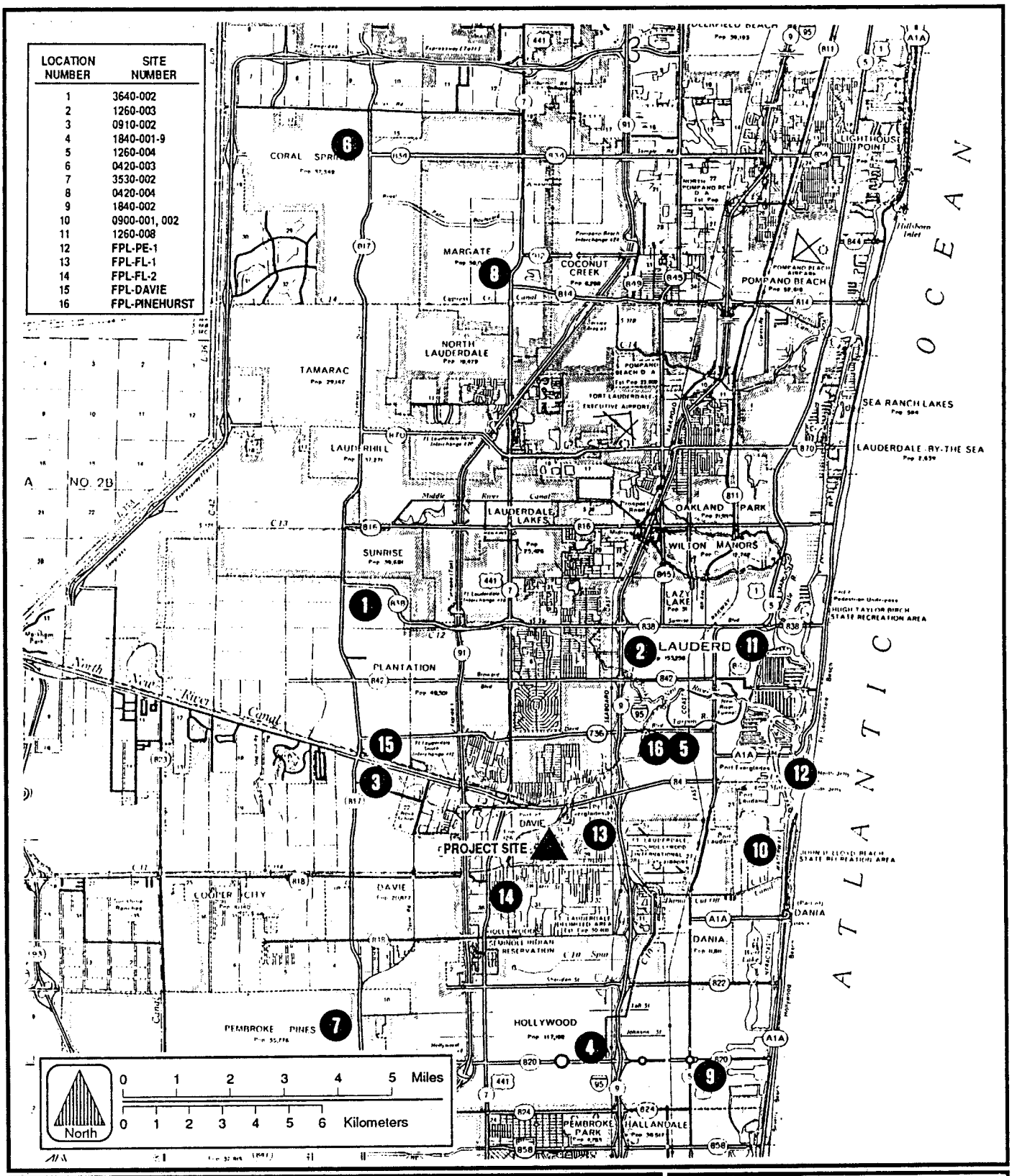


Figure 5-1 LOCATION OF AMBIENT MONITORING SITES IN THE VICINITY OF FPL LAUDERDALE PLANT

Lauderdale Repowering Project

FPL

Table 5-1. Summary of Ambient Sulfur Dioxide Data, Broward County--1986-1988

Site Number	Site Name/Location	Time Period	No. obs.	Sulfur Dioxide Concentration ($\mu g/m^3$) Max. 3-hr	2nd Max. 3-hr	Max. 24-hr	2nd Max. 24-hr	Arithmetic Mean
0910-002	Davie	1986	58	--	--	5	4	3
	UF Ag Research Station	1987	--	--	--	--	--	--
		1988	--	--	--	--	--	--
1260-003	Fort Lauderdale	1986	55	--	--	9	8	3
	2101 NW 6th St.	1987	61	--	--	13	13	3
		1988	54	--	--	23	22	4
1260-004-1	Fort Lauderdale	1986	61	--	--	21	8	3
	500 SW 14 Ct.	1987	61	--	--	21	19	3
		1988	60	--	--	23	20	4
1260-004-9	Fort Lauderdale	1986	61	--	--	25	12	3
	500 SW 14 Ct.	1987	60	--	--	21	17	3
		1988	60	--	--	24	20	4
3530-002-1	Pembroke	1986	60	--	--	3	3	2
	11251 Taft St.	1987	--	--	--	--	--	--
		1988	--	--	--	--	--	--
FPL FL-1	Fort Lauderdale	1987	57	--	--	13	3	3
	SW 39 St.	1988	56	--	--	7	7	3
FPL FL-2	Davie	1987	51	--	--	5	4	4
	US 441	1988	47	--	--	12	7	4
FPL PE-1	Port Everglades	1987	53	--	--	10	10	4
	Ocean Dr.	1988	47	--	--	10	5	4
FPL Pine-hurst	Fort Lauderdale	1988[a] 1989	8,339	189	133	42	42	5
	SW 9th Ave. & 22nd St. N.							
FPL Davie	Davie	1988[a] 1989	8,337	152	138	39	38	4
	SR84							
Federal Primary AAQS				--	--	--	365	80
Federal Secondary AAQS				--	1,300	--	--	--
Florida AAQS				--	1,300	--	260	60

[a]Data cover period October 1988 through September 1989.

24-hour; and 5 $\mu g/m^3$, annual average. These background levels are also considered conservative since they reflect current operation of Units 4 and 5 at Lauderdale, which will be shut down after startup of the repowered units.

5.3 NITROGEN DIOXIDE

Available NO_2 data from monitoring sites located in the vicinity of the Lauderdale Plant site are presented in Table 5-2. Data are available from four FDER sites and four FPL sites, and cover the period 1986 through 1988. All sites are 24-hour bubbler sites, except for the FPL Pinehurst site that has a continuous monitor. All data have been gathered utilizing recommended quality assurance techniques for bubbler and continuous monitors.

The highest measured annual mean NO_x concentration was measured at Site 1260-003 in 1986, and was 47 $\mu g/m^3$. This level is roughly one-half the AAQS of 100 $\mu g/m^3$, annual average concentration. An annual average concentration of 26 $\mu g/m^3$ was measured at the FPL Pinehurst site.

The annual average concentration used in the analysis was obtained from the continuous monitor located at the FPL Pinehurst Substation since the federal reference method is continuous. A value of 26 $\mu g/m^3$ measured at Site 1260-003 was used to represent the background NO_2 concentration in the air quality impact analysis. As in the case of the background NO_2 concentration, this background level is considered conservative since it is representative of impacts from the existing Lauderdale Units 4 and 5, as well as other sources explicitly included in the modeling analysis.

5.4 METEOROLOGICAL DATA

Wind speed and direction, temperature and precipitation were collected at the FPL Pinehurst site. A 10-m meteorological tower was installed with the windspeed and direction, and temperature measurements; the precipitation-measuring gauge was installed on the ground. The output of

Table 5-2. Summary of Ambient Nitrogen Dioxide Data, Broward County--1986-1988

Site Number	Site Name/Location	Time Period	No. obs.	Nitrogen Dioxide Concentration ($\mu g/m^3$) Max. 24-hr	2nd Max. 24-hr	Arithmetic Mean
0910-002	Davie	1986	56	57	51	27
	UF Ag Research Station	1987	--	--	--	--
		1988	--	--	--	--
1260-003	Fort Lauderdale	1986	56	108	104	47
	2101 NW 6th St.	1987	61	109	108	46
		1988	56	92	91	43
1260-004-1	Fort Lauderdale	1986	61	76	63	31
	500 SW 14 Ct.	1987	61	81	56	30
		1988	60	72	65	30
1260-004-9	Fort Lauderdale	1986	60	75	63	30
	500 SW 14 Ct.	1987	60	77	66	30
		1988	60	71	70	31
3530-002-1	Pembroke	1986	60	60	60	28
	11251 Taft St.	1987	--	--	--	--
		1988	--	--	--	--
FPL FL-1	Fort Lauderdale	1987	57	68	67	36
	SW 39 St.	1988	56	157	157	42
FPL FL-2	Davie	1987	53	83	81	38
	US 441	1988	54	78	72	35
FPL PE-1	Port Everglades	1987	55	91	58	27
	Ocean Dr.	1988	53	77	72	26
FPL Pine-hurst	Fort Lauderdale SW 9th Ave. & 22 St. N.	1988[a]	7,107	101	100	26
Federal Primary/Secondary AAQS				--	--	100
Florida AAQS				--	--	100

[a]Data cover period October 1988 through September 1989.

these sensors was connected to a data-acquisition system housed in a shelter. The data from this monitoring are contained in Appendix 10.5.1 of the SCA.

6.0 AIR QUALITY MODELING APPROACH

6.1 GENERAL MODELING APPROACH

The general modeling approach followed EPA and FDER modeling guidelines for determining compliance with AAQS and PSD increments. In general, when model predictions are used to determine compliance with AAQS and PSD increments, current policies stipulate that the highest annual average and highest, second-highest (HSH) short-term (i.e., 24 hours or less) concentrations be compared to the applicable standard when 5 years of meteorological data are used. The HSH concentration is calculated for a receptor field by:

1. Eliminating the highest concentration predicted at each receptor,
2. Identifying the second-highest concentration at each receptor, and
3. Selecting the highest concentration among these second-highest concentrations.

This approach is consistent with the air quality standards, which permit a short-term average concentration to be exceeded once per year at each receptor.

To develop the maximum short-term concentrations for the facility, the general modeling approach was divided into screening and refined phases to reduce the computation time required to perform the modeling analysis. The basic difference between the two phases is the receptor grid used when predicting concentrations, and the number of meteorological periods evaluated. In general, concentrations for the screening phase were predicted using a coarse receptor grid and a 5-year meteorological record.

After a final list of HSH short-term concentrations was developed, the refined phase of the analysis was conducted by predicting concentrations for a refined receptor grid centered on the receptor at which the HSH concentration from the screening phase was produced. The air dispersion model was then executed for the meteorological periods during which both

the highest and second-highest concentrations were predicted to occur at that receptor, based on the screening phase results. This approach was used to ensure that valid HSH concentrations were obtained. More detailed descriptions of the emission inventory and receptor grids used in the screening and refined phases of the analysis are presented in the following sections.

6.2 MODEL SELECTION

The selection of the appropriate air dispersion model was based on its applicability to simulate impacts in areas surrounding the Lauderdale Plant site. Within 50 km of the site, the terrain can be described as simple, i.e., flat to gently rolling. As defined in the EPA modeling guidelines, simple terrain is considered to be an area where the terrain features are all lower in elevation than the top of the stack(s) under evaluation. Therefore, a simple terrain model was selected to predict maximum ground-level concentrations.

The Industrial Source Complex (ISC) dispersion model (EPA, 1988a) was selected to evaluate the pollutant emissions from the repowered units and other modeled sources. This model is contained in EPA's User's Network for Applied Modeling of Air Pollution (UNAMAP), Version 6 (EPA, 1988b). The ISC model is applicable to sources located in either flat or rolling terrain where terrain heights do not exceed stack heights.

The ISC model consists of two sets of computer codes which are used to calculate short- and long-term ground level concentrations. The main differences between the two codes are the input format of the meteorological data and the method of estimating the plume's horizontal dispersion.

The first model code, the ISCST model, is an extended version of the single-source (CRSTER) model (EPA, 1977). The ISCST model is designed to calculate hourly concentrations based on hourly meteorological parameters (i.e., wind direction, wind speed, atmospheric stability, ambient

temperature, and mixing heights). The hourly concentrations are processed into non-overlapping, short-term and annual averaging periods. For example, a 24-hour average concentration is based on 24 1-hour averages calculated from midnight to midnight of each day. For each short-term averaging period selected, the highest and second-highest average concentrations are calculated for each receptor. As an option, a table of the 50 highest concentrations over the entire field of receptors can be produced.

The second model code within the ISC model is the ISC long-term (ISCLT) model. The ISCLT model uses joint frequencies of wind direction, wind speed, and atmospheric stability to calculate seasonal and/or annual average ground-level concentrations. Because the input wind directions are for 16 sectors, with each sector defined as 22.5 degrees, the model calculates concentrations by assuming that the pollutant is uniformly distributed in the horizontal plane within a 22.5 degree sector.

In this analysis, the ISCST model was used to calculate both short-term and annual average concentrations because these concentrations are readily obtainable from the model output. In general, experience has demonstrated that the ISCST model will produce higher annual average concentrations as compared to the ISCLT model.

Major features of the ISCST model are presented in Table 6-1. Concentrations due to stack and volume sources are calculated by the ISCST model using the steady-state Gaussian plume equation for a continuous source. The area source equation in the ISCST model is based on the equation for a continuous and finite crosswind line source. The ISC model has rural and urban options which affect the wind speed profile exponent law, dispersion rates, and mixing-height formulations used in calculating ground level concentrations. The criteria used to determine when the rural or urban mode is appropriate are based on land use near the proposed plant's surroundings (Auer, 1978). If the land use is classified as heavy industrial, light-moderate industrial, commercial, or compact residential

Table 6-1. Major Features of the ISCST Model

ISCST Model Features
• Polar or Cartesian coordinate systems for receptor locations
• Rural or one of three urban options which affect wind speed profile exponent, dispersion rates, and mixing height calculations
• Plume rise due to momentum and buoyancy as a function of downwind distance for stack emissions (Briggs, 1969, 1971, 1972, and 1975)
• Procedures suggested by Huber and Snyder (1976); Huber (1977); and Schulmann and Hanna (1986) and Schulmann and Scire (1980) for evaluating building wake effects
• Procedures suggested by Briggs (1974) for evaluating stack-tip downwash
• Separation of multiple point sources
• Consideration of the effects of gravitational settling and dry deposition on ambient particulate concentrations
• Capability of simulating point, line, volume and area sources
• Capability to calculate dry deposition
• Variation with height of wind speed (wind speed-profile exponent law)
• Concentration estimates for 1-hour to annual average
• Terrain-adjustment procedures for elevated terrain including a terrain truncation algorithm
• Receptors located above local terrain, i.e., "flagpole" receptors
• Consideration of time-dependent exponential decay of pollutants
• The method of Pasquill (1976) to account for buoyancy-induced dispersion
• A regulatory default option to set various model options and parameters to EPA recommended values (see text for regulatory options used)
• Procedure for calm-wind processing

Source: EPA, 1988a.

for more than 50 percent of the area within a 3 km radius circle centered on the proposed source, the urban option should be selected. Otherwise, the rural option is more appropriate.

For modeling analyses that will undergo regulatory review, such as PSD permit applications, the following model features are recommended by EPA (1987a) and are referred to as the regulatory options in the ISCST model:

1. Final plume rise at all receptor locations,
2. Stack-tip downwash,
3. Buoyancy-induced dispersion,
4. Default wind speed profile coefficients for rural or urban option,
5. Default vertical potential temperature gradients,
6. Calm wind processing, and
7. Reducing calculated SO_2 concentrations in urban areas by using a decay half-life of 4 hours (i.e., reduce the SO_2 concentration emitted by 50 percent for every 4 hours of plume travel time).

In this analysis, the EPA regulatory options were used to address maximum impacts. Based on a review of the land use around the facility and discussions with the FDER, the rural mode was selected based on the degree of residential, industrial and commercial development within 3 km of the Lauderdale Plant site.

6.3 METEOROLOGICAL DATA

Meteorological data used in the ISCST model to determine air quality impacts consisted of a concurrent 5-year period of hourly surface weather observations and twice-daily upper air soundings from the National Weather Service (NWS) stations at Miami International Airport and West Palm Beach, respectively. The 5-year period of meteorological data was from 1982 through 1986. The NWS station in Miami, located approximately 30 km to the south-southwest of the site, was selected for use in the study because it is the closest primary weather station to the study area with similar surrounding topographical features. This station also has the most

readily available and complete database which is representative of the Lauderdale Plant site.

The surface observations included wind direction, wind speed, temperature, cloud cover, and cloud ceiling height. The wind speed, cloud cover, and cloud ceiling values were used in the ISCST meteorological preprocessor program to determine atmospheric stability using the Turner stability scheme. Based on the temperature measurements at morning and afternoon, mixing heights were calculated from the radiosonde data at West Palm Beach International Airport using the Holzworth approach (Holzworth, 1972). The West Palm Beach International Airport is located about 70 km north of the site. Hourly mixing heights were derived from the morning and afternoon mixing heights using the interpolation method developed by EPA (Holzworth, 1972). The hourly surface data and mixing heights were used to develop a sequential series of hourly meteorological data (i.e., wind direction, wind speed, temperature, stability, and mixing heights). Because the observed hourly wind directions at the NWS stations are classified into one of thirty-six 10-degree sectors, the wind directions were randomized within each sector to account for the expected variability in air flow. These calculations were performed using the EPA RAMMET meteorological preprocessor program.

6.4 EMISSION INVENTORY

6.4.1 Proposed Repowered Units

Stack operating parameters and air emission rates for the repowered Units 4 and 5 were presented in Section 2.0, Tables 2-1 through 2-4. As described in Section 2.0, the highest emissions and lowest flow rate for the CT/HRSG units were used in the modeling analysis.

6.4.2 Existing Lauderdale Plant Sources

The existing sources consist of Units 4 and 5 stacks and gas turbines GT 1 through GT 24. Stack parameters and maximum air emission rates for these sources were presented in Table 2-10. Units 4 and 5 were modeled to determine the net change in air quality impacts due to the shutdown of

Units 4 and 5 and the startup of the repowered Units 4 and 5. Data for the existing gas turbines (GT 1 through GT 24) were used in assessing future compliance with AAQS.

6.4.3 Other Air Emission Sources

Modeling of the repowered units demonstrated that the facility's impacts are above the significant impact levels for SO_2 and NO_2 at distances of approximately 70 and 30 km, respectively, from the Lauderdale Plant site. Therefore, the emission inventories for these pollutants were developed from available databases.

FDER supplied KBN with printouts of the facilities within a 100 km square centered on the site (UTM coordinates: East 580.3 km, North 2883.3). FDER also provided KBN with AIR 10 reports for Broward, Dade, and Palm Beach counties. Using this information, supplemented with data from permits, PSD applications, and previous modeling analyses, the SO_2 and NO_2 emitting facilities within 50 km of the location of the site were identified.

Facilities located within 15 km of the Lauderdale Plant site, with SO_2 or NO_2 emissions greater than 25 TPY, are presented in Tables 6-2 and 6-3, respectively. These facilities were included explicitly in the modeling analysis. Facilities located 15 to 50 km from the site, with SO_2 or NO_2 emissions greater than 100 TPY, are presented in Tables 6-4 and 6-5. These facilities were subject to further screening to determine the potential of significant interaction with the repowered units. An additional source, FPL-Turkey Point, was also included in the modeling analysis due to its relative emissions and potential impacts, although this facility is more than 70 km from the Lauderdale Plant.

As described above, each facility between 15 and 50 km from the site was further screened to determine the probability of source interaction. The recommended screening technique is the Screening Threshold method developed by the North Carolina Department of Natural Resources and Community

Table 6-2. SO_2 Sources (>25 TPY) Within 15 km of the FPL-Lauderdale Plant

APIS Facility Identification Number	Facility	County	UTM Coordinates (km) East	UTM Coordinates (km) North	Relative Location (km) To Proposed Site[a] X	Relative Location (km) To Proposed Site[a] Y	Distance From Proposed Site (km)	Direction From Proposed Site (degrees)	Maximum Allowable SO_2 Emissions[b] (TPY)
50BRO060036	FPL-Port Everglades	Broward	587.4	2,885.3	7.1	2.0	7.4	74	76,239
50BRO06????	South Broward County Res. Rec.	Broward	579.6	2,883.3	-0.7	0.0	0.7	270	1,318
50BRO060046	Weekley Asphalt Paving	Broward	576.9	2,886.1	-3.4	2.8	4.4	310	39
TOTAL									77,596

[a]The UTM coordinates of the proposed combined cycle unit are 580.3 km East and 2883.3 km North.

[b]Maximum facility emissions are based on information on emissions found in APIS, or specific operation permits and PSD applications.

Note: ???? indicates no APIS was provided.

Source: FDER, 1989.

Table 6-3. NO_x Sources (>25 TPY) Within 15 km of the FPL-Lauderdale Plant

APIS Facility Identification Number	Facility	County	UTM Coordinates (km) East	UTM Coordinates (km) North	Relative Location (km) To Proposed Site[a] X	Relative Location (km) To Proposed Site[a] Y	Distance From Proposed Site (km)	Direction From Proposed Site (degrees)	Maximum Allowable NO_x Emissions[b] (TPY)
50BRO060036	FPL-Port Everglades	Broward	587.4	2,885.3	7.1	2.0	7.4	74	45,570
50BRO06????	South Broward County Res. Rec.	Broward	579.6	2,883.3	-0.7	0.0	0.7	270	2,383
50BRO060046	Weekley Asphalt Paving	Broward	576.9	2,886.1	-3.4	2.8	4.4	310	313
TOTAL									48,266

[a]The UTM coordinates of the proposed combined cycle unit are 580.3 km East and 2883.3 km North.

[b]Maximum facility emissions are based on information on emissions found in APIS, or specific operation permits and PSD applications.

Note: ???? indicates no APIS was provided.

Source: FDER, 1989.

Table 6-4. SO_2 Sources (>100 TPY) Within 15 to 50 km of the FPL-Lauderdale Plant

APIS Facility Identification Number	Facility	County	UTM Coordinates (km) East	UTM Coordinates (km) North	Relative Location (km) To Proposed Site X	Relative Location (km) To Proposed Site Y	Distance From Proposed Site (km)	Direction From Proposed Site (degrees)	Maximum Allowable SO_2 Emissions[a] (TPY)
50DAD130003	FPL-Turkey Point[b]	Dade	567.2	2,813.2	-13.1	-70.1	71.3	191	36,192
50DAD130004	General Portland	Dade	551.7	2,843.4	-28.6	-39.9	49.1	216	10,546
50DAD130348	Metro Dade Resource Recovery	Dade	564.3	2,857.4	-16.0	-25.9	30.4	212	1,831[c]
50DAD130020	Tarmac Florida	Dade	562.9	2,861.7	-17.4	-21.6	27.7	219	2,792
50BRO06????	North Broward County Res. Rec.	Broward	583.6	2,907.6	3.3	24.3	24.5	8	896
50DAD130001	FPL-Cutler	Dade	570.4	2,834.9	-9.9	-48.4	49.4	192	488
50BRO060015	East Coast Asphalt	Broward	584.9	2,902.2	4.6	18.9	19.5	14	230
50DAD130015	Rinker Materials	Dade	558.2	2,851.3	-22.1	-32.0	38.9	215	218 A
50PMB500015	Boca Raton Hotel and Club, LTD	Palm Beach	592.0	2,913.7	11.7	30.4	32.6	21	208 E
50BRO062094	Waste Management	Broward	583.2	2,908.0	2.9	24.7	24.9	7	187
50DAD130483	General Asphalt Portable Plant	Dade	561.5	2,853.2	-18.8	-30.1	35.5	212	103
TOTAL									53,691

[a]Maximum facility emissions are based on emissions found in APIS, or specific operation permits and PSD applications.

[b]FPL-Turkey Point will be included in the modeling due to its relative emissions and potential impact.

[c]Based on SO_2 source test conducted in January 1983.

Note: A = Emission rate based on ACTUAL emission information in APIS, because no information was available on allowable emissions.
E = Emissions rate based on ESTIMATED emission information in APIS, because no information was available on allowable or actual emissions.

???? indicates no APIS was provided.

Source: FDER, 1989.

Table 6-5. NO_x Sources (>100 TPY) Within 15 to 50 km of the FPL-Lauderdale Plant

APIS Facility Identification Number	Facility	County	UTM Coordinates (km) East	UTM Coordinates (km) North	Relative Location (km) To Proposed Site X	Relative Location (km) To Proposed Site Y	Distance From Proposed Site (km)	Direction From Proposed Site (degrees)	Maximum Allowable NO_x Emissions[a] (TPY)
50DAD130003	FPL-Turkey Point[b]	Dade	567.2	2,813.2	-13.1	-70.1	71.3	191	16,521
50DAD130001	FPL-Cutler	Dade	570.4	2,834.9	-9.9	-48.4	49.4	192	4,796
50DAD130020	Tarmac Florida	Dade	562.9	2,861.7	-17.4	-21.6	27.7	219	4,191 A
50BRO06????	North Broward County Res. Rec.	Broward	583.6	2,907.6	3.3	24.3	24.5	8	2,225
50DAD130014	Rinker Portland	Dade	559.0	2,852.2	-21.3	-31.1	37.7	214	702 E
50DAD130004	General Portland	Dade	551.7	2,843.4	-28.6	-39.9	49.1	216	616
50DAD130348	Metro Dade Resource Recovery	Dade	564.3	2,857.4	-16.0	-25.9	30.4	212	511
50BRO062094	Waste Management	Broward	583.2	2,908.0	2.9	24.7	24.9	7	236
50DAD130470	South Florida Cogeneration	Dade	580.5	2,850.9	0.2	-32.4	32.4	180	217
50BRO062081	Ryan Sales and Service	Broward	560.7	2,876.5	-19.6	-6.8	20.7	251	200 E
TOTAL									30,215

[a]Maximum facility emissions are based on information on emissions found in APIS, or specific operation permits and PSD applications.
[b]FPL-Turkey Point will be included in the modeling due to its relative emissions and potential impacts.

Note: A = Emission rate based on ACTUAL emission information in APIS, because no information was available on allowable emissions.
E = Emission rate based on ESTIMATED emission information in APIS, because no information was available on allowable or actual emissions.

???? indicates no APIS was provided.

Source: FDER, 1989.

Development, approved by EPA and FDER. The method is designed to objectively eliminate from the emission inventory those facilities which are not likely to have significant interaction with the source undergoing evaluation. In general, facilities that should be considered in the modeling analyses are those with emissions greater than Q (in TPY), which is calculated by the following criterion:

$$Q = 20 \times D$$

where D is the distance (km) from the particular source to the source undergoing evaluation (i.e., from the site).

A listing of the SO_2 and NO_2 facilities in the inventory with associated maximum or allowable emissions, distance from the proposed site, and associated Q are presented in Tables 6-6 and 6-7, respectively. For the South Broward County Resource Recovery Project (SBCRRP), SO_2 and NO_2 emissions were increased to accomodate a fourth unit into the project. Those facilities with maximum allowable emissions which are below the calculated screening threshold were eliminated from further consideration in the modeling analysis. The remaining facilities, along with all facilities greater than 25 TPY emissions and located within 15 km of the site, comprise the facility list used in the modeling. A summary of SO_2 and NO_x sources used in the modeling is presented in Tables 6-8 and 6-9, respectively. PSD increment-affecting sources are noted and were used in the PSD modeling analysis.

6.5 RECEPTOR LOCATIONS

As discussed in Section 6.1, the general modeling approach considered screening and refined phases to address compliance with maximum allowable PSD Class I and Class II increments and AAQS. In the ISCST modeling, concentrations were predicted for the screening phase using several receptor grids. The locations of the receptors were based on identifying the areas in which maximum concentrations are predicted due to the repowered units.

Table 6-6. Summary of SO_2 Facilities Eliminated From Modeling Using the "Screening Threshold" Technique

APIS Facility Identification Number	Facility	Distance From Proposed Site (km)	Direction From Proposed Site (degrees)	Maximum SO_2 Emissions (TPY)[a]	Q, Emission Threshold (TPY) (20 x Distance)	Included in Modeling
50DAD130003	FPL-Turkey Point	71.3	191	36,192	1,426	YES[b]
50DAD130004	General Portland	49.1	216	10,546	981	YES
50DAD130348	Metro Dade Resource Recovery	30.4	212	1,831	609	YES
50DAD130020	Tarmac Florida	27.7	219	2,792	554	YES
50BRO06????	North Broward County Res. Rec.	24.5	8	896	490	YES
50DAD130001	FPL-Cutler	49.4	192	488	988	YES[b]
50BRO060015	East Coast Asphalt	19.5	14	230	389	NO
50DAD130015	Rinker Materials	38.9	215	218	777	NO
50PMB500015	Boca Raton Hotel and Club, LTD	32.6	21	208	652	NO
50BRO062094	Waste Management	24.9	7	187	497	NO
50DAD130483	General Asphalt Portable Plant	35.5	212	103	709	NO

[a]Maximum facility emissions determined from APIS or other available information on facility.

[b]FPL-Turkey Point and FPL-Cutler will be included in the modeling due to their relative emissions and potential impacts.

Note: ???? indicates no APIS was provided.

Source: FDER, 1989.

Table 6-7. Summary of NO_x Facilities Used or Eliminated From Modeling Using the Screening Threshold Technique

APIS Facility Identifiction Number	Facility	Distance From Proposed Site (km)	Direction From Proposed Site (degrees)	Maximum NO_x Emissions[a] (TPY)	Q, Emission Threshold (TPY) (20 x Distance)	Included in Modeling
50BRO060003	FPL-Turkey Point[b]	71.3	191	16,521	1,426	YES
50BRO060001	FPL-Cutler	49.4	192	4,796	988	YES
50DAD130020	Tarmac Florida	27.7	219	4,191	554	YES
50BRO06????	North Broward County Res. Rec.	24.5	8	2,225	490	YES
50DAD130014	Rinker Portland	37.7	214	702	754	NO
50DAD130004	General Portland	49.1	216	616	981	NO
50DAD130348	Metro Dade Resource Recovery	30.4	212	511	609	NO
50BRO062094	Waste Management	24.9	7	236	497	NO
50DAD130470	South Florida Cogeneration	32.4	180	217	648	NO
50BRO062081	Ryan Sales and Service	20.7	251	200	414	NO

[a]Maximum facility emissions from APIS, or other available information on facility.
[b]FPL-Turkey Point will be included in the modeling due to its relative emissions and potential impacts.

Note: ???? indicates no APIS was provided.

Source: FDER, 1989.

Table 6-8. Summary of SO_2 Emission Sources to be Used in the Modeling Analysis

APIS Facility Number	Facility	Coordinates Relative to Proposed Unit (km) X	Coordinates Relative to Proposed Unit (km) Y	Source Description	Stack Data (ft) Height	Stack Data (ft) Diameter	Operating Data Temperature (^oF)	Operating Data Velocity (ft/sec)	Modeled Emissions (lb/hr)	Annual Emissions (TPY)	PSD Source
50BR0060036	FPL-Port Everglades	7.1	2.0	Units 1 and 2	344	14.0	289	68.0	5,060	22,163[a]	No
				Units 3 and 4	343	18.1	275	68.0	8,470	37,098[a]	No
				Gas Turbines 1 to 12	51	18.0[b]	860	70.0	3,876	16,978[a]	No
50BR0060001	FPL-Cutler	-9.9	-48.4	Unit 5	150	15.0	275	20.0	41	181	No
				Unit 6	150	14.0	275	46.0	70	307	No
50BR0060003	FPL-Turkey Point	-13.1	-70.1	Units 1 and 2	400	18.1	275	63.0	19,800	36,192	No
50BRO06????	South Broward County Res. Rec.	-0.7	0.0	Units 1 to 3	195	7.5	226	59.1	303	1,318	Yes
50BRO06????	North Broward County Res. Rec.	3.3	24.3	Units 1 to 3	200	7.5	226	59.1	281	896	Yes
50DAD130004	General Portland	-28.6	-39.9	Cement Kilns 1 and 2	225	14.8	475	15.0	2,408[c]	10,546	No
50DAD130020	Tarmac Florida	-17.4	-21.6	Kiln 1	200	8.0	378	28.9	125	520	No
				Kiln 2[d]	200	8.0	378	28.9	400	520	Yes
				Kiln 3	200	15.0	351	36.1	400	1,752	Yes
50DAD130348	Metro Dade Resource Rec.	-16.0	-25.9	Boilers 1 to 4	151	9.0	390	40.0	684	2,996	Yes
50BRO060046	Weekley Asphalt Paving	-3.4	2.8	Concrete Batch Plant	0	0.0	77	0.0	8.9	39	No

[a]Annual emissions are based on the assumption of 8,760 hours of operation at the modeled emission rate.

[b]Effective diameter based on the rectangular area of the stack.

[c]Short-term emissions are based on the assumption of 8,760 hours of operation at the annual emission rate.

[d]Proposed conversion to coal.

Note: ???? indicates no APIS was provided.

Source: FDER, 1989

Table 6-9. Summary of NO_x Emission Sources to be Used in the Modeling Analysis

APIS Facility Number	Facility	Coordinates Relative To Proposed Unit (km) X	Y	Source Description	Stack Data (ft) Height	Diameter	Operating Data Temperature (°F)	Velocity (ft/sec)	Modeled Emissions (lb/hr)	Annual Emissions (TPY)	PSD Source
50BRO060036	FPL-Port Everglades	7.1	2.0	Units 1 and 2	344	14.0	289	68.0	2,410	10,908	No
				Units 3 and 4	343	18.1	275	68.0	4,034	17,669	No
				Gas Turbines 1 to 12	51	18.0	860	70.0	3,960	17,345	No
50BRO060003	FPL-Turkey Point	-13.1	-70.1	Units 1 and 2	400	18.1	275	63.0	3,772	16,521	No
50BRO060003	FPL-Cutler	-9.9	-48.4	Unit 5	150	15.0	275	20.0	406	1,778	No
				Unit 6	150	14.0	275	46.0	689	3,018	No
50BRO06????	South Broward County Res. Rec.	-0.7	0.0	Units 1 to 3	195	7.5	226	59.1	544	2,383	Yes
50BRO06????	North Broward County Res. Rec.	3.3	24.3	Units 1 to 3	200	7.5	226	59.1	508	2,225	Yes
50DAD130020	Tarmac Florida	-17.4	-21.6	Kilns 1 and 2	200	8.0	378	28.9	135	1,180	No
				Kiln 3	200	15.0	351	36.1	541	2,370	No
				Coal Handling System	109	3.3	151	59.0	146	641	No
50BRO060046	Weekley Asphalt Paving	-3.4	2.8	Concrete Batch Plant	30	1.0	77	1.0	71	313	No

Note: ???? indicates no APIS was provided.

Source: FDER, 1989.

A description of the receptor locations for determining compliance with PSD increments and AAQS is as follows:

1. 471 receptors located in a radial grid centered on the repowered units. These receptors were classified into two main groups: (1) plant property receptors and (2) near-field receptors.
2. The grid for the plant property receptors consisted of 36 receptors, presented in Table 6-10.
3. The grid for the near-field receptors consisted of 308 receptors located at distances of 600, 900, 1,200, 1,600, 2,000, 2,500, 3,000, 4,000, 5,000, 6,000, 7,000 and 8,000 m along 36 radials with each radial spaced at 10 degree increments. For directions of 10 through 160°, receptors at a downwind distance of 600 m from the repowered units were not included in the analysis because these receptors are on plant property.
4. 22 receptors located along the north and east boundaries of the Everglades National Park for the PSD Class I analysis. The locations of these receptors are presented in Table 6-11.

After the screening modeling was completed, refined short-term modeling was conducted using a receptor grid centered on the receptor which had the HSH short-term concentrations from the screening analysis. The receptors were located at intervals of 100 m between the distances considered in the screening phase, along 9 radials spaced at 2 degree increments, centered on the radial along which the maximum concentration was produced. For example, if the maximum concentration was produced along the 90 degree radial at a distance of 1.6 km, the refined receptor grid would consist of receptors at the following locations:

Directions (degrees)	Distance (km)
82, 84, 86, 88, 90, 92, 94, 96, 98	1.3, 1.4, 1.5, 1.6, 1.7, 1.8, and 1.9 per direction

Table 6-10. Plant Property Receptors Used in the Screening Analysis

Direction (degrees)	Distance (m)	Direction (degrees)	Distance (m)
10	927	190	71
20	1,036	200	73
30	1,112	210	82
40	1,341	220	92
50	2,280	230	110
60	1,585	240	146
70	756	250	197
80	610	260	343
90	605	270	334
100	390	280	306
110	201	290	297
120	137	300	302
130	110	310	306
140	92	320	317
150	82	330	354
160	73	340	463
170	71	350	561
180	69	360	792

Note: Direction and distance are relative to center point of stacks for proposed units.

Table 6-11. Receptors Used in the PSD Class I Modeling Analysis to Address Impacts on the Everglades National Park.

Receptor No.	UTM Coordinates (km)		Relative Position to Proposed Site (km)[a]		
	East	North	East	North	Distance
1	515.0	2,848.0	-65.3	-35.3	74.2
2	525.0	2,848.0	-55.3	-35.3	65.6
3	533.5	2,848.0	-46.8	-35.3	58.6
4	533.5	2,843.0	-46.8	-40.3	61.8
5	533.5	2,838.0	-46.8	-45.3	65.1
6	533.5	2,833.0	-46.8	-50.3	68.7
7	533.5	2,828.0	-46.8	-55.3	72.4
8	533.5	2,823.0	-46.8	-60.3	76.3
9	533.5	2,818.0	-46.8	-65.3	80.3
10	533.5	2,815.3	-46.8	-68.1	82.6
11	538.0	2,815.3	-42.3	-68.1	80.1
12	541.3	2,814.0	-39.1	-69.3	79.6
13	542.0	2,811.0	-38.3	-72.3	81.8
14	543.0	2,810.0	-37.3	-73.3	82.2
15	543.0	2,805.0	-37.3	-78.3	86.7
16	543.0	2,800.0	-37.3	-83.3	91.3
17	543.0	2,796.5	-37.3	-86.8	94.5
18	548.0	2,796.5	-32.3	-86.8	92.6
19	553.0	2,796.5	-27.3	-86.8	91.0
20	556.0	2,796.0	-24.3	-87.3	90.6
21	556.6	2,792.0	-23.7	-91.3	94.3
22	557.0	2,789.0	-23.3	-94.3	97.1

[a]The UTM coordinates of the proposed units are 580.3 km east and 2,883.3 km north.

To ensure that a valid HSH concentration was calculated, concentrations were predicted using the refined grid for the periods that produced both the highest and HSH concentrations from the screening receptor grid.

Refined modeling analysis was not performed for the annual averaging period, because the spatial distribution of annual average concentrations are not expected to vary significantly from those produced from the screening analysis.

6.6 BACKGROUND CONCENTRATIONS

Background concentrations used in the air quality impact analysis are discussed in Section 5.0. The SO_2 background concentrations used in the AAQS analysis were 138 $\mu g/m^3$, 42 $\mu g/m^3$ and 5 $\mu g/m^3$ for averaging times of 3-hour, 24-hour and annual, respectively. For NO_2, the background concentration used for comparison with AAQS was 26 $\mu g/m^3$.

6.7 BUILDING DOWNWASH EFFECTS

Based on the building dimensions associated with buildings and structures planned at the Lauderdale Plant, the stacks for the CT/HRSG units will be less than GEP. In addition, the existing Units 4 and 5 stacks are below GEP height based upon the existing boiler buildings. Some of the existing GT 1 through GT 12 units also have the potential to be affected by building downwash. Therefore, the potential for building downwash to occur was considered in the modeling analysis.

The procedures used for addressing the effects of building downwash are those recommended in the ISC Dispersion Model User's Guide. The building height, length, and width are input to the model, which uses these parameters to modify the dispersion parameters. For short stacks (i.e., physical stack height is less than $H_b + 0.5\ L_b$, where H_b is the building height and L_b is the lesser of the building height or projected width), the Schulman and Scire method is used. If this method is used, then direction-specific building dimensions are input for H_b and L_b for 36 radial directions, with each direction representing a 10 degree sector.

The features of the Schulman and Scire method are: 1) reduced plume rise due to initial plume dilution, 2) enhanced plume spread as a linear function of the effective plume height, and 3) specification of building dimensions as a function of wind direction.

For cases where the physical stack is greater than $H_b + 0.5\ L_b$ but less than GEP, the Huber-Snyder method is used. For this method, the ISCST model calculates the area of the building using the length and width, assumes the area is representative of a circle, and then calculates a building width by determining the diameter of the circle. If a specific width is to be modeled, then the value input to the model must be adjusted according to the following formula:

$$M_w = \frac{\pi W^2}{4}$$

$$M_w = 0.8886\ W$$

where: M_w is input to the model to produce a building width of W used in the dispersion calculation. W is the actual building width.

The building dimensions considered in the modeling analysis are presented in Table 6-12. In the case of the existing Units 4 and 5, the Unit 4 and 5 stacks are located adjacent to the existing boiler buildings and are affected by downwash for all directions. Similarly, the proposed repowered Unit 4 and 5 stacks are located adjacent to the proposed gas turbine environmental enclosure building. Downwash effects, if any, would occur for essentially all wind directions. For the existing gas turbines (i.e., GT 1 through GT 12, several units will be affected by building downwash due to the proposed environmental enclosure building. However, the downwash potential is limited to certain wind directions and only affects two of the gas turbines, located closest to the CT environmental enclosure.

Investigations into the stack design of the GTs revealed that noise reduction baffles are located within all but the last stack section. These

The features of the Schulman and Scire method are: 1) reduced plume rise due to initial plume dilution, 2) enhanced plume spread as a linear function of the effective plume height, and 3) specification of building dimensions as a function of wind direction.

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$$M_w = \frac{\pi W^2}{4}$$

$$M_w = 0.8886\ W$$

where: M_w is input to the model to produce a building width of W used in the dispersion calculation. W is the actual building width.

The building dimensions considered in the modeling analysis are presented in Table 6-12. In the case of the existing Units 4 and 5, the Unit 4 and 5 stacks are located adjacent to the existing boiler buildings and are affected by downwash for all directions. Similarly, the proposed repowered Unit 4 and 5 stacks are located adjacent to the proposed gas turbine environmental enclosure building. Downwash effects, if any, would occur for essentially all wind directions. For the existing gas turbines (i.e., GT 1 through GT 12, several units will be affected by building downwash due to the proposed environmental enclosure building. However, the downwash potential is limited to certain wind directions and only affects two of the gas turbines, located closest to the CT environmental enclosure.

Investigations into the stack design of the GTs revealed that noise reduction baffles are located within all but the last stack section. These

Table 6-12. Building Dimensions Used in ISCST Modeling Analysis To Address Potential Building Wake Effects

Source	Associated Building	Actual Building Dimensions Length (m)	Width (m)	Height (m)	Projected Width[a] (m)	Modeled Building Dimensions Length, Width (m)	Height (m)
Proposed Repowered Units	CT Environmental Enclosure	121.7	71.0	22.7	140.9	124.8	22.7
Units 4 and 5	Units 4 and 5 Boiler Building	17.3	12.7	36.4	21.5	19.0	36.4
Gas Turbines 1-12	CT Environmental Enclosure	121.7	71.0	22.7	140.9	124.8	22.7
Gas Turbines 13-24	None	--	--	--	--	--	--

[a]Diagonal of actual building dimensions.

baffles cause the actual stack gas velocity to be higher than what was previously determined from the exit diameter. Because of the potential from downwash from these units, the stack gas diameter will be adjusted by modifying the last stack section so that the exit velocity is the same as that going through the baffles. The stack velocity and diameter used in the modeling analysis was 54.3 m/s and 3.44 m, respectively.

7.0 AIR QUALITY MODELING RESULTS

7.1 PROPOSED UNITS ONLY

A summary of the maximum predicted impacts of regulated pollutants due to the proposed units only, based on the screening and refined analysis, is presented in Table 7-1. The operating conditions used in the analysis were based on maximum emissions (i.e., 40°F or ISO conditions) and minimum flow rate (i.e., 95°F) for the repowered units.

The maximum predicted 3-hour, 24-hour, and annual SO_2 concentrations due to the proposed repowered Units 4 and 5 only are 275, 44, and 4.8 $\mu g/m^3$, respectively. The net increase in SO_2 impacts, considering the offsets from shutting down existing Units 4 and 5, are predicted to be 259 $\mu g/m^3$, 3-hour; 36 $\mu g/m^3$, 24-hour; and 2.3 $\mu g/m^3$, annual average. These maximum impacts are all above the significance levels established by EPA and FDER, and therefore further modeling analysis is required for SO_2 to demonstrate compliance with PSD increments and AAQS.

The maximum predicted 24-hour and annual average PM(TSP) concentrations due to the repowered units only are 3.0 and 0.32 $\mu g/m^3$, respectively. Maximum PM10 impacts are identical to the PM(TSP) impacts. Since these maximum concentrations are below the significance levels for these pollutants, no further modeling analysis is necessary. Because of these very low impacts, the repowered units would not cause or significantly contribute to any exceedances of the PM10 AAQS or the PM(TSP) PSD increments.

The maximum predicted annual NO_2 concentration due to the repowered units only is 2.3 $\mu g/m^3$. This level of impact is above the significance level. However, the offset afforded by shutting down existing Units 4 and 5 brings the impact to 0.9 $\mu g/m^3$, annual average, which is below the significant impact level. Nonetheless, further evaluation of NO_x was performed.

The maximum predicted 1- and 8-hour average CO concentrations due to the repowered units only are 61 and 13 $\mu g/m^3$, respectively. These maximum

Table 7-1. Results of Modeling Analysis of the Lauderdale Repowering Project

Pollutant	Averaging Period	Maximum Predicted Concentrations ($\mu g/m^3$)[a] Repowered Units Only	Repowered Units With Offsets	Significance Impact Level
Sulfur Dioxide	3-hour	275	259	25
	24-hour	44	36	5
	Annual	4.8	2.3	1
Total Suspended Particulate Matter	24-hour	3.0	b	5
	Annual	0.32	b	1
Particulate Matter 10 microns	24-hour	3.0	b	5
	Annual	0.32	b	1
Nitrogen Dioxide	Annual	2.3	0.9	1
Carbon Monoxide	1-hour	61	b	2,000
	8-hour	13	b	500
Lead	Calendar Quarter	0.00032	<0.00032	--

[a]Based upon four CTs/HRSGs operating at maximum load.
[b]Not modeled because predicted concentrations due to the proposed units only were less than significance level.

Note: $\mu g/m^3$ = micrograms per cubic meter.

impacts are less than the CO significance impact levels. Because the maximum predicted impacts due to the repowered units are less than the CO significance levels, additional modeling is not required for this pollutant.

The maximum predicted Pb concentration (calendar quarter average) due to the propsed units only is predicted to be 0.00032 $\mu g/m^3$. No significance level has been established for Pb, but an AAQS has been set at 1.5 $\mu g/m^3$, calendar quarter average. Since the predicted impacts due to the repowered units only are well below the AAQS, no further modeling analysis was conducted.

7.2 PSD CLASS II INCREMENT ANALYSIS

Maximum SO_2 and NO_2 concentrations predicted from the screening analysis for comparison to the PSD Class II increments are presented in Tables 7-2 and 7-3, respectively. Based upon these results, the refined analysis was based on modeling the meteorological periods during which the overall HSH and associated highest 3-hour and 24-hour SO_2 concentrations were predicted in the screening analysis. The refined analysis for the annual average SO_2 and NO_2 concentrations was based on modeling the receptor and year which produced the highest annual concentration using the refined emission inventory. A summary of the maximum SO_2 and NO_2 PSD Class II increment consumption concentrations predicted in the refined analysis is presented in Table 7-4.

The maximum 3-hour average SO_2 PSD increment consumption from the refined analysis is predicted to be 332 $\mu g/m^3$, which is 65 percent of the maximum allowable PSD Class II increment of 512 $\mu g/m^3$, not to be exceeded more than once per year.

The maximum 24-hour average SO_2 PSD Class II increment consumption is predicted to be 51 $\mu g/m^3$, which is 56 percent of the maximum allowable

Table 7-2. Maximum Predicted SO_2 Concentrations from the Screening Analysis for Comparison to PSD Class II Increments

Averaging Period	Maximum Concentration ($\mu g/m^3$)	Receptor Location[a] Direction (°)	Receptor Location[a] Distance (km)	Period Julian Day	Period Hour Ending	Period Year
3-Hour[b]	111	320	0.317	173	3	1982
	106	250	0.197	57	24	1983
	65	300	1.2	182	15	1984
	259	230	0.3	322	12	1985
	141	130	0.11	60	15	1986
24-Hour[b]	14	320	0.317	173	--	1982
	14	250	0.197	57	--	1983
	14	300	1.6	213	--	1984
	36	230	0.30	323	--	1985
	14	190	1.2	355	--	1986
Annual	2.0	290	2.0	--	--	1982
	2.3	290	2.0	--	--	1983
	1.9	290	2.5	--	--	1984
	1.4	310	2.5	--	--	1985
	1.7	270	3.0	--	--	1986

[a]Relative to the location of the repowered units.
[b]Highest, second-highest concentrations predicted for this averaging period.

Note: Based on four CTs/HRSGs operating at maximum load and firing No. 2 fuel oil with 0.5 percent sulfur content.

-- = Not applicable.
$\mu g/m^3$ = micrograms per cubic meter.

Table 7-3. Maximum Predicted NO_2 Concentrations from the Screening Analysis for Comparison to PSD Class II Increments

Averaging Period	Maximum Concentration ($\mu g/m^3$)	Receptor Location[a] Direction (°)	Receptor Location[a] Distance (km)	Year
Annual	5.5	300	2.0	1982
	5.9	290	2.0	1983
	4.9	290	2.5	1984
	3.5	310	2.5	1985
	4.0	270	3.0	1986

[a]Relative to the location of the repowered units.

Note: Based on four CTs/HRSGs operating at maximum load firing No. 2 fuel oil.

$\mu g/m^3$ = micrograms per cubic meter.

Table 7-4. Maximum Predicted SO_2 and NO_2 Concentrations from the Refined Analysis for Comparison to PSD Class II Increments

Averaging Period	Maximum Concentration ($\mu g/m^3$)	Receptor Location[a] Direction (°)	Receptor Location[a] Distance (km)	Period Julian Day	Period Hour Ending	Period Year	PSD Class II Increment
SO_2 Concentrations							
3-Hour[b]	332	232	0.20	322	12	1985	512
24-Hour[b]	51	228	0.20	323	--	1985	91
Annual	2.3	290	2.0	--	--	1983	20
NO_2 Concentrations							
Annual	5.9	290	2.0	--	--	1983	25

[a]Relative to the location of the repowered units.
[b]Highest, second-highest concentrations predicted for this averaging period.

Note: Based on four CTs/HRSGs operating at maximum load.

-- = not applicable.
$\mu g/m^3$ = micrograms per cubic meter.

PSD Class II increment of 91 $\mu g/m^3$, not to be exceeded more than once per year.

The maximum annual average SO_2 PSD increment consumption is predicted to be 2.3 $\mu g/m^3$, which is 11.5 percent of the maximum allowable PSD Class II increment of 20 $\mu g/m^3$.

The maximum annual average NO_2 PSD Class II increment consumption from the refined analysis is predicted to be 5.9 $\mu g/m^3$, which is 24 percent of the maximum allowable PSD Class II increment of 25 $\mu g/m^3$.

7.3 AAQS ANALYSIS

The maximum 3-hour, 24-hour, and annual average total SO_2 concentrations predicted from the screening analysis are presented in Table 7-5. The maximum annual NO_2 concentrations due to all sources are shown in Table 7-6. The total concentrations were determined from the impacts of the modeled sources added to the background concentration (refer to Section 5.0). These results show that the maximum SO_2 and NO_2 concentrations due to all sources are below the AAQS for all averaging periods.

Similar to the PSD Class II increment analysis, the refined AAQS analysis was based on modeling the meteorological periods during which the overall HSH and associated highest 3-hour and 24-hour concentrations were predicted in the screening analysis. The maximum SO_2 and NO_2 concentrations predicted in the refined analysis are presented in Table 7-7.

The maximum 3-hour average SO_2 concentration due to all sources from the refined analysis is predicted to be 1,032 $\mu g/m^3$, which is 79 percent of the AAQS of 1,300 $\mu g/m^3$, not to be exceeded more than once per year. The repowering project contributed less than 31 percent of this maximum 3-hour average concentration.

Table 7-5. Maximum Predicted Total SO_2 Concentrations from the Screening Analysis for Comparison to AAQS

Averaging Period	Concentration ($\mu g/m^3$) Total	Total Due To: Modeled Sources	Total Due To: Background	Receptor Location[a]: Direction (°)	Receptor Location[a]: Distance (km)	Period: Julian Day	Period: Hour Ending	Year
3-hour[b]	580	459	138	50	7.000	176	15	1982
	597	447	138	60	6.000	203	12	1983
	585	410	138	50	6.000	135	15	1984
	939	801	138	230	0.110	322	12	1985
	556	418	138	50	7.000	241	12	1986
24-hour[b]	153	111	42	240	4.000	242	--	1982
	161	119	42	260	7.000	302	--	1983
	149	107	42	270	8.000	266	--	1984
	200	158	42	230	0.110	322	--	1985
	166	124	42	260	7.000	312	--	1986
Annual	29	24	5	310	5.000	--	--	1982
	29	24	5	300	4.000	--	--	1983
	29	24	5	300	4.000	--	--	1984
	23	18	5	310	4.000	--	--	1985
	26	21	5	310	7.000	--	--	1986

[a]Relative to the location of the repowered units.
[b]Highest, second-highest concentrations predicted for this averaging period.

Note: Based on four CTs/HRSGs operating at maximum load and firing No. 2 fuel oil with 0.5 percent sulfur content.

-- = not applicable.

$\mu g/m^3$ = micrograms per cubic meter.

Table 7-6. Maximum Predicted Total NO_2 Concentrations in the Screening Analysis for Comparison to AAQS

Averaging Period	Concentration ($\mu g/m^3$) Total	Total Due To: Modeled Sources	Total Due To: Background	Receptor Location[a]: Direction (°)	Receptor Location[a]: Distance (km)	Year
Annual	81	55	26	310	5.0	1982
	81	55	26	310	5.0	1983
	77	51	26	310	5.0	1984
	65	39	26	310	4.0	1985
	69	43	26	310	5.0	1986

[a]Relative to the location of the repowered units.

Note: Based on four CTs/HRSGs operating at maximum load and firing No. 2 fuel oil.

$\mu g/m^3$ = micrograms per cubic feet.

Table 7-7. Maximum Predicted SO_2 and NO_2 Concentrations from the Refined Analysis for Comparison to AAQS

Averaging Period	Concentration ($\mu g/m^3$) Total	Total due to: Modeled Sources	Total due to: Background	Receptor Location[a]: Direction (°)	Receptor Location[a]: Distance (km)	Period: Julian Day	Period: Hour Ending	Period: Year	AAQS
SO_2 Concentrations									
3-Hour[b]	1,032	894	138	232	0.110	322	12	1985	1,300
24-Hour[b]	253	211	42	236	0.110	322	--	1985	260
Annual	29	24	5	310	5.000	--	--	1982	60
NO_2 Concentration									
Annual	81	55	26	310	5.0	--	--	1983	100

[a]Relative to the location of the repowered units.
[b]Highest, second-highest concentrations predicted for this averaging period.

Note: Based on four CTs/HRSGs operating at maximum load and firing No. 2 fuel oil with 5 percent sulfur content.

-- = not applicable.
$\mu g/m^3$ = micrograms per cubic meter.

The maximum 24-hour average SO_2 concentration due to all sources is predicted to be 253 $\mu g/m^3$, which is 97 percent of the AAQS of 260 $\mu g/m^3$, not to be exceeded more than once per year. The repowering project contributed less than 20 percent of this maximum 24-hour average concentration.

The maximum annual average SO_2 concentration due to all sources is predicted to be 29 $\mu g/m^3$, which is 48 percent of the AAQS of 60 $\mu g/m^3$. The repowering project contributed less than 3 percent to the maximum concentration.

The maximum annual average NO_2 concentration of 81 $\mu g/m^3$ due to all sources is below the AAQS of 100 $\mu g/m^3$. The repowered units contributed less than 2 percent to the maximum concentration.

7.4 CLASS I AREA ANALYSIS

The results of the PSD Class I area modeling analysis for the Everglades National Park are presented in Tables 7-8 and 7-9 for SO_2 and NO_2, respectively. The modeling analysis evaluated a number of receptors along the boundary of the Class I area. Due to the large distance from the site to the Class I area boundary (approximately 60 km), no refined modeling analysis was conducted.

As shown in Table 7-8, total Class I PSD increment consumption concentrations for SO_2 are below the Class I increments for all averaging times. The maximum 3-hour increment consumption is predicted to be 15 $\mu g/m^3$, compared to the Class I increment of 25 $\mu g/m^3$. The maximum predicted 24-hour increment consumption for SO_2 is 4.4 $\mu g/m^3$, which is below the allowable increment of 5 $\mu g/m^3$. These maximum increment consumption values are due to the effects of two increment consuming sources located in Dade County: Tarmac Florida (cement plant) and Dade County Resource Recovery (MSW incinerator). The repowered units do not contribute to these maximum increment consumption values.

Table 7-8. Maximum Predicted SO_2 Concentrations for Comparison to PSD Class I Increments

Averaging Period	Maximum Concentration ($\mu g/m^3$) All Increment Consuming Sources	Maximum Concentration ($\mu g/m^3$) Contribution from Lauderdale Repowered Units[a]	Period Julian Day	Period Hour Ending	Period Year	PSD Class I Increment
3-Hour[b]	13	0.0	355	21	1982	25
	15	0.0	25	21	1983	
	13	0.0	185	21	1984	
	14	0.0	288	24	1985	
	13	0.0	260	24	1986	
24-Hour[b]	3.6	0.0	244	--	1982	5
	4.4	0.0	343	--	1983	
	3.9	0.0	153	--	1984	
	3.4	0.0	297	--	1985	
	3.2	0.0	348	--	1986	
Annual	0.68	0.08	--	--	1982	
	0.60	0.06	--	--	1983	
	0.66	0.11	--	--	1984	
	0.61	0.10	--	--	1985	
	0.64	0.05	--	--	1986	

[a]Impacts by existing Units 4 and 5 reduce (offset) impacts from repowered units.
[b]Highest, second-highest concentrations predicted for this averaging period.

Note: Based on four CTs/HRSGs operating at maximum load and firing No. 2 fuel oil with 0.5 percent sulfur content.

-- = not applicable.
$\mu g/m^3$ = micrograms per cubic meter.

Table 7-9. Maximum Predicted NO_2 Concentrations for Comparison to PSD Class I Increments

Averaging Period	Maximum Concentration ($\mu g/m^3$) All Increment Consuming Sources	Maximum Concentration ($\mu g/m^3$) Contribution From Lauderdale Repowering Project[a]	Year
Annual	0.29	0.12	1982
	0.29	0.11	1983
	0.29	0.13	1984
	0.28	0.12	1985
	0.23	0.09	1986

[a]Includes offsets from Units 4 and 5.

Note: Based on four CTs/HRSGs operating at maximum load and firing No. 2 fuel oil.

The maximum predicted annual increment consumption concentrations in the Class I area are predicted to be <0.15 $\mu g/m^3$ for both SO_2 and NO_x (see Table 7-9). These values are well below the allowable Class I increments of 2 $\mu g/m^3$ for SO_2 and 2.5 $\mu g/m^3$ of NO_2.

8.0 EFFECTS TO AIR QUALITY RELATED VALUES AND VEGETATION, SOILS, VISIBILITY, AND GROWTH

8.1 AIR QUALITY RELATED VALUES

This section focuses on the ecological effects of the proposed facility's impacts on Air Quality Related Values (AQRV), as defined under PSD regulations, in the Everglades National Park. The AQRVs are defined as being:

> "All those values possessed by an area except those that are not affected by changes in air quality and include all those assets of an area whose vitality, significance, or integrity is dependent in some way upon the air environment. These values include visibility and those scenic, cultural, biological, and recreational resources of an area that are affected by air quality. Important attributes of an area are those values or assets that make an area significant as a monument, preserve, or primitive area. They are the assets that are to be preserved if the area is to achieve the purposes for which it was set aside" (Federal Register, 1978).

The AQRVs include freshwater and coastal wetlands, dominant plant communities, unique and rare plant communities, soils and associated periphyton, and the wildlife dependent upon these communities for habitat. Rare, endemic, threatened, and endangered species of the national park and bioindicators of air pollution (e.g., lichens) are also evaluated.

8.1.1 General Description

The Everglades National Park is a subtropical preserve located in the southern tip of Florida. The territorial area of the park, totaling 289,000 hectares (ha) (714,000 acres), is comprised of an estimated 133,000 ha (329,000 acres) of mangrove and saltmarsh, 148,000 ha (366,000 acres) of prairie, and 8,000 ha (20,000 acres) of pineland (Taylor and Herndon, 1981). Small islands of tropical hardwood hammock, evergreen temperate swamp (bayheads) and cypress swamp are interspersed among the larger vegetation communities.

Mangroves occupy most of the coastline. Species include red mangrove (Rhizophora mangle), black mangrove (Avicennia germinans), and white mangrove (Laguncularia racemosa).

The seasonally inundated prairie is the largest vegetation community in the national park. This wetland is dominated by sawgrass (Cladium jamaicense), muhlygrass (Muhlenbergia filipes), and/or little bluestem (Schizachyrium rhizomatum) growing on thin marl overlying oolitic limestone. Muhlygrass dominates the drier prairies; sawgrass occurs where the hydroperiod is longer than 5-months. Algal periphyton mats are usually present in these prairies. Marl is the predominant soil in the prairies. It is a calcareous substance precipitated by the blue-green algae of the periphyton mats. The algae comprising the periphyton are important primary producers and are dependent upon calcium-rich waters (Gleason and Spackman, 1973). Sawgrass sometimes occurs on pockets of peat within the marl-limestone substrate.

The pinelands occur on a rough limestone (Miami oolite) with many crevices and solution holes, but very little soil development (Loope, et al., 1979). The single canopy tree in this vegetation type is South Florida slash pine (Pinus elliottii var. densa). The understory is diverse and includes tropical hardwoods and herbaceous species endemic to South Florida. Although pinelands were once the dominant upland community in South Florida, very little of this community type remains outside of the national park boundaries.

The hardwood hammocks range up to a few hectares in size and number in the thousands. They occur on small areas of ground higher than the surrounding prairie. Dominant species include gumbo-limbo (Bursera simaruba), poisonwood (Metopium toxiferum), buckthorn (Bumelia salicifolia), strangler fig (Ficus aurea), and pigeon-plum (Coccoloba diversifolia). Other important trees and shrubs include myrsine (Myrsine floridana), wild tamarind (Lysiloma latisiliquum), white stopper (Eugenia axillaris), wild coffee (Psychotria nervosa), and marlberry (Ardisia escallonioides). The hardwood hammocks contain numerous tropical plant species not found anywhere else in the United States (Loope and Urban, 1980). Epiphytic orchids and bromeliads are frequent. The hammocks grow on eroded limestone covered with a shallow layer of organic soil (Olmsted, et al., 1980).

The temperate swamp hardwoods occupy seasonally inundated areas and are dominated by redbay (Persea borbonia), wax myrtle (Myrica cerifera), sweetbay (Magnolia virigniana), and dahoon (Ilex cassine). Pond apple (Annona glabra), cocoplum Chrysobalanus icaco), and buttonbush (Caphalanthus occidentalis) are in the shrub layer. Ferns are common in the ground layer and epiphytes include Tillandsia spp. and Encyclia tampensis. The substrate is peat varying in depth from 30 to 200 cm over limestone.

Both bald cypress (Taxodium distichum) and pond cypress (Taxodium ascendens) occur in the national park. The understory of cypress-dominated communities is typically open and contains many of the same species that are present in the temperate swamp hardwood communities. Ferns usually dominate the ground layer. Epiphytic vascular plants and lichens are abundant. The substrate is peat or peaty marls.

Bark-dwelling lichens are abundant in hardwood and cypress hammocks and on ornamental trees planted at visitor centers at the national park. Lichens are important both for their intrinsic functions in the park ecosystem and for their use as bioindicators based on their sensitivity to air pollution. They serve as food for invertebrates, provide a germination substrate for vascular epiphytes, and some species fix nitrogen. In addition, because lichens are sensitive to air pollution, impacts of air pollution on the national park vegetation can be evaluated by determining the threshold levels of pollutants known to be injurious to lichens. If projected pollutant levels are below amounts known to adversely impact lichens, then less sensitive vascular plants are very unlikely to be affected.

Vascular epiphytes, many of them threatened or endangered species, are common in tree hammocks. Most of these are orchids (Epidendrum spp., Oncidium spp.) and bromeliads (Catopsis beteroniana, Catopsis nutans, Tillandsia balbisiana eg.). These plants obtain water and essential elements from precipitation and much of their surface area is exposed to

airborne contaminants. Therefore, vascular epiphytes may potentially be sensitive to air pollutants.

No plant species in the park are listed by the U.S. Fish and Wildlife Service as threatened or endangered. There are species that could occur in the region that are either under review for listing by the Fish and Wildlife Service or protected by the State of Florida under the Preservation of Native Flora of Florida Act (Table 8-1).

Characteristics of the major soil associations found within the national park are summarized in Table 8-2. The soils consist primarily of histosols and shallow entisols over limestone substrate.

Threatened and endangered wildlife species found in the national park are listed in Table 8-3. The primary habitats for each of these species are shown in Table 8-4.

8.1.2 Impacts to Vegetation

Sulfur is an essential plant nutrient usually taken up as sulfate ions by the roots from the soil solution. When sulfur dioxide in the atmosphere enters the foliage through pores in the leaves, it reacts with water in the leaf interior to form sulfite ions. Sulfite ions are highly toxic. They interact with enzymes, compete with normal metabolites, and interfere with a variety of cellular functions (Horsman and Wellburn, 1976). However, within the leaf, sulfite is oxidized to sulfate ions which can then be used by the plant as a nutrient. Small amounts of sulfite may be oxidized before they prove harmful.

If a plant is subject to long-term exposure to sulfur dioxide, sulfate may accumulate in the leaves because more is produced than can be utilized by the plant. Reduced yield and other impacts on growth and vigor may result from these chronic long-term exposures. Frequency of exposure is important. Low doses of sulfur dioxide followed by long periods of very low or no exposure may be less damaging than the same total dose received

Table 8-1. Rare Plants Occurrence Records for Region

SCIENTIFIC NAME	COMMON NAME	USFWS STATUS	FDA STATUS
SPECIAL PLANT			
Asclepias curtissii	Curtiss' milkweed		T
Conradina grandiflora	large-flowered rosemary	UR2	
Ernodea littoralis	beach-creeper		T
Jacquemontia reclinata	beach jacquemontia	UR2	E
Lechea cernua	nodding pinweed	UR2	
Myrcianthes fragrans var simponii	twinberry	UR2	
Okenia hypogaea	burrowing four-o'clock		E
Coccothrinax argentata	silver palm		C
Digitaria gracillima	longleaf crabgrass	UR2	
Epidendrum nocturnum	night-scented orchid		T
Hymenocallis latifolia	broad-leaved spiderlily	UR5	
Remirea maritima	beach-star		E
Tillandsia flexuosa	banded wild-pine		T
Acrostichum aureum	golden leather fern		E
Asplenium dentatum	slender spleenwort		T
Asplenium serratum	bird's nest spleenwort		E
Ophioglossum palmatum	hand fern	UR5	E

Note: C = Commercially exploited.
T = Threatened.
E = Endangered.
UR2 = Under review for listing, but substantial evidence of biological vulnerability and/or threat is lacking.
UR5 = Formally under review for listing, but no longer considered for listing because recent information indicates species is more widespread or abundant than previously believed.

Source: Wood, 1989.

Table 8-2. Summary of Characteristics of Major Soil Associations Found Within Everglades National Park

Soil Type/Association	Characteristics
Broward-Parkwood-Keri Association	Derived from moderately thin beds of sand over marl or relatively hard limestone. Parkwood soils are underlain by soft marl at somewhat deeper depths; the Keri series is typically comprised of layers of sand and marl within 100 cm from the surface.
Perrine-Ochopee Association	The Perrine series are poorly drained from recent unconsolidated, finely divided calcareous sediments and are generally associated with tidal swamps and marshes. Depth to underlying limestone is 20 to 91 cm. The Ochopee soils are poorly drained and originated from calcareous sands and marl.
Everglades-Brighton-Pamlico Association	Highly organic muck or peat soils formed from decomposition of emergent vegetation that overlie nearly neutral or alkaline sands and sandy clays. Underlain by marl or limestone. Everglades soils are slightly acid to alkaline; Brighton and Pamlico soils tend to be more acidic.
Tidal Marsh-Coastal Beach-Coastal Dunes	Restricted to the periphery of the coast and consists of nearly level salt marshes, coastal beach, and coastal dunes. Tidal exchange and sea salt deposition dominate the ionic balance and pH regime of these systems.
Rockland	Porous limestone through which water flows freely.

Source: Smith et al., 1973.

Table 8-3. Federal and State Listed Endangered and Threatened Animals in the Everglades National Park

Animals	State	Federal
Mammals		
Florida Panther	End.	End.
Mangrove Fox Squirrel	End.	-
Florida Black Bear	Thr.	-
Everglades Mink	Thr.	-
Manatee	Thr.	End.
Birds		
Wood Stork	End.	-
Everglade Kite	End.	End.
Cape Sable Seaside Sparrow	End.	End.
Peregrine Falcon	End.	End.
Southern Bald Eagle	Thr.	End.
Osprey	Thr.	-
Florida Sandhill Crane	Thr.	-
Brown Pelican	Thr.	End.
Great White Heron	Thr.	-
Southeastern American Kestrel	Thr.	-
Reptiles		
American Crocodile	End.	End.
American Alligator	Thr.	Thr.
Eastern Indigo Snake	Thr.	Thr.

Note: End. = endangered.
Thr. = threatened.

Table 8-4. Habitat of Federal and State Listed Endangered and Threatened Animals in the Everglades National Park

Species	HABITAT							
	Pine Forest	Tropical Hardwood Forest	Cypress Forest	Evergreen Swamp Forest	Inland Marshes, Ponds, Sloughs	Wet Prairies	Mangrove Forest	Coastal Marshes
Mammals								
Florida Panther	X	X	X	X		X	X	X
Mangrove Fox Squirrel	X	X	X	X		X		
Florida Black Bear	X	X	X	X		X	X	X
Everglades Mink			X	X	X	X		
Manatee							X	
Birds								
Wood Stork			X	X	X	X	X	X
Everglade Kite					X	X		
Cape Sable Seaside Sparrow					X	X		X
Peregrine Falcon	X				X	X	X	X
Southern Bald Eagle	X		X		X		X	X
Osprey	X		X			X	X	X
Florida Sandhill Crane					X	X		X
Brown Pelican							X	X
Great White Heron				X			X	X
Southeastern American Kestrel	X				X	X		
Reptiles								
American Crocodile							X	
American Alligator			X	X	X	X	X	
Eastern Indigo Snake	X	X	X			X	X	

Source: Duever et al., 1979.

continuously, because plants can utilize the accumulated sulfate during the period of no exposure.

Plant species vary widely with regard to the threshold level of pollutants which cause injury or growth reduction. Plant response to sulfur dioxide emissions from the proposed Lauderdale facility will depend upon the concentration of the gas, the duration of each exposure, and the frequency of exposures. Near the facility (i.e., within 10 km), the pattern of exposure will consist of a few episodes of relatively high concentration for a short duration interspersed with long periods of extremely low concentrations. At longer distances from the facility, concentrations are generally low for long periods of time.

The proposed Lauderdale Repowering Project does not contribute to the maximum 1-hour, 3-hour, and 24-hour predicted concentrations due to the offsets afforded by Units 4 and 5. The proposed project contributes only 0.11 $\mu g/m^3$ to the annual average concentrations.

The exposures to SO_2 that have been shown by laboratory tests or field observations to adversely affect plant species that occur or are similar to those that occur in the national park are presented in Table 8-5. The most sensitive species are two lichen species, Ramalina denticulata and Parmotrema tinctorum, that are common in the park, but less abundant in urban areas east of the national park. Ramalina denticulata showed increased biomass gain and photosynthetic rate when exposed to 6-hours weekly of 100 $\mu g/m^3$ SO_2 for 10 weeks compared with exposure to ambient air. At similar exposures to 400 $\mu g/m^3$ SO_2 this lichen showed decreased biomass gain and photosynthetic rate as well as increased membrane damage. Parmotrema tinctorum exhibited increased membrane damage (as indicated by increased electrolyte leakage into solution) at 200 $\mu g/m^3$ SO_2 in comparison with lichens exposed only to ambient air. Exposures that impact these lichens are much higher than the concentrations and frequencies of SO_2 that will result from the proposed facility. No adverse impact to

Table 8-5. Lowest Doses of SO_2 Reported to Affect Plant Species Common in Site Region

Species	Lowest SO_2 Concentration ($\mu g/m^3$) Known to Affect Species	Reference
Parmotrema tinctorum	200, for 6 hours/week for 10 weeks. Increased percent electrolyte leakage. (240, for 3 hours/week for 6 weeks showed no effect on leakage, biomass gain, or photosynthetic rate.	Hart et al., 1988
Ramalina denticulata	400, for 6 hours/week for 10 weeks. Reduced biomass gain, lowered photosynthetic rate, and increased percent electrolyte leakage in comparison to effects of lower SO_2 concentrations.	Hart et al., 1988
Taxodium distichum (bald cypress)	1,300, for 48 hours did not affect dry weight gain.	Shanklin and Kozlowski, 1985
Taxodium distichum	1,300, for 8 hours caused no visible injury.	Woltz and Howe, 1981
Pinus elliottii (slash pine)	650, for 2 hours - Reduced needle growth.	Berry, 1974
Lycopersicon (tomato) escoulentum	1,258, for 5 hours on each of 57 days reduced growth.	Kohut et al., 1982
C_4 species - Amaranthus retroflexus, Setaria faberii, Setaria lutescens (foxtail grasses)	650, for 8 hours/day for 5 days during 2 weeks. Increased weight at normal CO_2 concentrations.	Carlson and Bazzaz, 1982

vegetative resources in the national park is expected to result from its operation.

The air quality effects to the vegetation in Pond Apple Slough Park located about 1,350 m (4,400 ft) northeast of the repowered units were also evaluated. The maximum 3-hour, 24-hour, and annual SO_2 concentrations due to the repowering project is predicted to be 71 $\mu g/m^3$, 9.1 $\mu g/m^3$, and 0.27 $\mu g/m^3$, respectively. These levels are substantially below those likely to cause effects.

Similiar to SO_2, the Lauderdale Repowering Project does not contribute to the maximum 1-hour, 3-hour, or 24-hour NO_2 concentrations in the Class I area. The annual impact due to repowering is 0.13 $\mu g/m^3$.

Ground-level NO_x concentrations include both nitric oxide (NO) and nitrogen dioxide (NO_2). Uptake of NO_2 by vegetation occurs at a higher rate than uptake of NO; therefore, effects of NO_2 on plants have been studied more closely than effects of NO. However, since NO is more toxic to photosynthesis than NO_2 (Saxe, 1986), the exposure of vegetation to total NO_x concentrations was evaluated. Both nitrogen oxide forms can be utilized by the plant as a nutrient if absorbed by the leaves at low concentrations. High concentrations can cause acute damage to the leaves and reduce growth. Okano and Totsuka (1986) reported that 564 $\mu g/m^3$ NO_2 supplied to sunflowers (Helianthus annus) for 7 days had no adverse effect on weight, whereas 3,760 $\mu g/m^3$ for 7 days was toxic.

No information on nitrogen oxide effects on species of the national park is available. However, oats, alfalfa, and tomato are reported to be especially sensitive to NO_2. Exposure of tomato to 470 $\mu g/m^3$ of NO_2 throughout the growing season decreased yield 22 percent (Spierings, 1971). Net photosynthesis in oats and alfalfa is inhibited at a threshold concentration of 1,128 $\mu g/m^3$ (Hill and Bennett, 1970). The expected NO_x concentration is much lower than any of these potentially adverse

concentrations and should, therefore, have no adverse impact on the national park vegetation.

High deposition of particulates on plant leaves can reduce photosynthesis due to reduced light intensity and impeded diffusion. However, 5 to 20 g/m^2 of particulates on the leaf surface are the levels required to cause these impacts (Thompson, et al., 1984). The impacts of the repowered units will be negligible in comparison with the levels required to cause adverse effects to vegetation, and no impacts from particulates are expected.

Maximum NO_2 impacts due to the repowering project in the Pond Apple Slough Park are predicted to be 35 $\mu g/m^3$, 4.5 $\mu g/m^3$, and 0.13 $\mu g/m^3$ for the 3-hour, 24-hour and annual averaging times. These predicted impacts are below the effect levels for NO_2.

8.1.3 Impacts to Soils

For soils, potential and hypothesized effects of atmospheric deposition include:

1. increased soil acidification;
2. alteration in cation exchange;
3. loss of base cations; and
4. mobilization of trace metals.

The potential sensitivity of specific soils to atmospheric inputs is related to two factors. First, the physical ability of a soil to conduct water vertically through the soil profile is important in influencing the interaction with deposition. Second, the ability of the soil to resist chemical changes, as measured in terms of pH and soil cation exchange capacity (CEC) is important in determining how a soil responds to atmospheric inputs.

The soils of the national park are generally classified as histosols or entisols. Histosols or peat soils are organic and have extremely high

buffering capacities based on CEC, base saturation, and bulk density. Therefore, they would be relatively insensitive to atmospheric inputs. The entisols are shallow sandy soils overlying limestone, such as the soils found in the pinelands. The direct connection of these soils with subsurface limestone tends to neutralize any acidic inputs. Moreover, the groundwater table is highly buffered due to the interaction with subsurface limestone formations which results in high alkalinity (as $CaCO_3$).

The relatively low sensitivity of the soils to acid inputs coupled with the extremely low ground-level concentrations of contaminants projected for the national park from facility emissions preclude any significant impact on soils.

8.1.4 Impacts to Wildlife

A wide range of physiological and ecological effects to fauna has been reported for gaseous and particulate pollutants (Newman, 1981; Newman and Schreiber, 1988). The most severe of these effects have been observed at concentrations above the secondary ambient air quality standards. Physiological and behavioral effects have been observed in experimental animals at or below these standards. No observable effects to fauna are expected at concentrations below the values reported in Table 8-6.

The major air quality risk to wildlife in the United States is from continuous exposure to pollutants above the National Ambient Air Quality Standards. This occurs in non-attainment areas, e.g., Los Angeles Basin. Risks to wildlife also may occur for wildlife living in the vicinity of an emission source which experiences frequent upset or episodic conditions that occur because of malfunctioning of equipment, unique meteorological conditions or during start-up (Newman and Schreiber, 1988). Under these conditions, chronic effects, e.g., particulate contamination or acute effects, such as injury to health, have been observed (Newman, 1981).

For impacts on wildlife, the lowest threshold values of SO_2 reported to cause physiological changes are shown in Table 8-6. These values are

Table 8-6. Examples of Reported Effects of Air Pollutants at Concentrations Below National Secondary Ambient Air Quality Standards

Pollutant	Reported Effect	Concentration ($\mu g/m^3$)	Exposure
Sulfur Dioxide	respiratory stress in guinea pigs	427 to 854	1 hour
	respiratory stress in rats	267	7 hours/day; 5 day/week for 10 weeks
	decreased abundance in deer mice	13-157	continually for 5 months
Particulates	respiratory stress, reduced respiratory disease defenses	120 PbO_3	continually for 2 months
	decreased respiratory disease defenses in rats, same with hamsters	100 $NiCl_2$	2 hours

Source: Newman and Schreiber, 1988.

several orders of magnitude larger than predicted concentrations due to the repowering project, and below total SO_2 concentrations predicted for the Class I area. No significant effects on terrestrial wildlife AQRVs from SO_2 are expected.

Reported threshold effects in animals for NO_x for the 3- and 24-hour averaging periods are 1,917 and 95 to 950 $\mu g/m^3$, respectively. These values are also several orders of magnitude higher than predicted impacts due to the planned facility. No effects on wildlife AQRVs from NO_2 are expected due to the operation of the repowered units.

8.2 IMPACTS TO VISIBILITY

The Clean Air Act Amendments of 1977 provide for implementation of guidelines to prevent visibility impairment in mandatory Class I areas. The guidelines are intended to protect the aesthetic quality of these pristine areas from reduction in visual range and atmospheric discoloration due to various pollutants. Sources of air pollution can cause visible plumes if emissions of particulate matter (PM) and nitrogen oxides (NO_x) are sufficiently large. A plume will be visible if its constituents scatter or absorb sufficient light so that the plume is brighter or darker than its viewing background (e.g., the sky or a terrain feature, such as a mountain). PSD Class I areas, such as national parks and wilderness areas, are afforded special visibility protection designed to prevent plume visual impacts to observers within a Class I area.

The analysis to determine the potential adverse plume visibility effects was based on using the screening approach suggested in the Workbook for Plume Visual Impact Screening and Analysis (EPA, 1988c), which has been computerized by EPA in a program called the VISCREEN model. The VISCREEN model is currently recommended for use by the EPA to assess visual plume impacts in regulatory applications. The VISCREEN model can be used to calculate potential plume impact of specific pollutant emissions for specific transport and meteorological dispersion conditions. The model can be applied in two successive levels of screening (i.e., referred to as

Levels 1 and 2) without the need for extensive source, meteorological, or pollutant input. If the screening calculations using the VISCREEN model demonstrate that during worst-case meteorological conditions a plume is imperceptible or, if perceptible, is not likely to be considered objectionable (i.e., "adverse" or "significant" in the language of the EPA PSD and visibility regulations), further analysis of plume visual impact would not be required as part of the air quality review of the source. However, if the screening analyses demonstrate that the criteria are exceeded, plume visual impacts cannot be ruled out, and more detailed analyses to ascertain the magnitude, frequency, location, and timing of plume visual impacts would be required.

The Level 1 screening analysis is designed to provide a conservative estimate of plume visual impacts (i.e., impacts that would be larger than those calculated with more realistic input and modeling assumptions). This analysis assumes worst-case meteorological conditions of stable stability (Pasquill-Gifford stability class F) and a 1 m/s windspeed persisting for 12 hours in one direction towards a PSD Class I area. The input required for the Level 1 analysis is limited to the parameters:

1. Emission rates of PM and NO_x;
2. Distance between the emission source and (a) the observer; (b) the closest Class I area boundary; and (c) the most distant Class I area boundary;
3. Background visual range appropriate for the region in which the Class I area is located; and
4. If available, emission rates of NO_2, soot, and primary sulfate.

Visibility impacts are then determined for two parameters:

1. Contrast of a plume against a viewing background such as the sky or a terrain feature, and
2. Perceptibility of a plume on the basis of the color difference between the plume and the viewing background (Delta E).

Results are provided by the model for several scenarios based on the background view, the viewing angle, visibility improvement due to plumes located both inside and outside the Class I area, and the sun angle. The critical value for contrast is 0.05 while that for Delta E is 2.00. If these levels are not exceeded by the proposed source, the source passes the Level-1 visibility analysis, and the source will not have a significant impact on the Class I area.

The only PSD Class I area located within 100 km of the facility is the Everglades National Park. The terrain between the project site and PSD Class I area and within the Class I area can be considered as generally flat. With no terrain feature that can be used as a viewing background, the visibility impacts were determined using the sky as the only viewing background.

Input parameters and results of the Level 1 analysis for the proposed Lauderdale units are presented in Figure 8-1. As shown, the Lauderdale units will limit particulates, NO_x, and primary SO_4 (sulfuric acid mist). Emission rates are the same as presented in Tables 2-2 and 3-3. Primary NO_2 and soot are not emitted in significant quantities by oil- and gas-fired combustion sources; therefore, these emissions were set to zero.

The background visual range as determined for southeast Florida from the Workbook manual is 40 km. Other parameters input to the model were based upon default values given in the Workbook and incorporated into the computer model.

As shown in Figure 8-1, based on the worst-case meteorological conditions designed to produce conservatively high impacts, the proposed emissions from the modification units are calculated to exceed the Level 1 visibility screening criteria at the Class I area. Because the Level 1 screening analysis exceed the visibility criteria, a Level 2 screening analysis was performed which uses more realistic input, representative of the source and Class I area. The most important potential difference in input between the

*** Level-1 Screening ***

Input Emissions for

Particulates	242.40	LB /HR
NOx (as NO2)	1760.00	LB /HR
Primary NO2	.00	LB /HR
Soot	.00	LB /HR
Primary SO4	446.00	LB /HR

**** Default Particle Characteristics Assumed

Transport Scenario Specifications:

Background Ozone:	.04 ppm
Background Visual Range:	40.00 km
Source-Observer Distance:	59.00 km
Min. Source-Class I Distance:	59.00 km
Max. Source-Class I Distance:	90.00 km
Plume-Source-Observer Angle:	11.25 degrees

Stability: 6
Wind Speed: 1.00 m/s

R E S U L T S

Asterisks (*) indicate plume impacts that exceed screening criteria

Maximum Visual Impacts INSIDE Class I Area
Screening Criteria ARE Exceeded

					Delta E		Contrast	
Backgrnd	Theta	Azi	Distance	Alpha	Crit	Plume	Crit	Plume
SKY	10.	84.	59.0	84.	2.00	3.117*	.05	.039
SKY	140.	84.	59.0	84.	2.00	2.310*	.05	-.103*

Maximum Visual Impacts OUTSIDE Class I Area
Screening Criteria ARE Exceeded

					Delta E		Contrast	
Backgrnd	Theta	Azi	Distance	Alpha	Crit	Plume	Crit	Plume
SKY	10.	60.	54.0	109.	2.00	3.246*	.05	.040
SKY	140.	60.	54.0	109.	2.00	2.293*	.05	-.105*

Figure 8-1 LEVEL 1 VISUAL EFFECTS SCREENING ANALYSIS FOR THE LAUDERDALE REPOWERING PROJECT ON THE CLASS I AREA OF THE EVERGLADES NATIONAL PARK

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Level 1 and Level 2 analyses is the meteorology assumed for plume transport and dispersion patterns. Although the Level 1 analysis assumes stable stability and a 1 m/s windspeed persisting for 12 hours towards a Class I area, the meteorological data in the Level 2 analysis may be different because it accounts for realistic persistence of stability and windspeed conditions towards the Class I area.

The Level 2 screening analysis is designed to account for more realistic occurrences of meteorological conditions that would transport the proposed units' plumes towards the Class I area. In this analysis, an assessment of the frequency of the wind direction, windspeed, and stability classes are made to determine the frequency of conditions that are most likely to cause a potentially adverse plume visual impact. If the Level 1 default parameters are selected for addressing visual plume impacts, the VISCREEN model assigns an appropriate estimate of particle size and density for the emitted and background atmosphere particulate and worst-case plume dispersion conditions. For this analysis, the particle size and density for the emission sources were not changed.

The first step in the analysis is to construct a table that shows worst-case dispersion conditions ranked in order of decreasing severity and the frequency of occurrence of these conditions associated with the wind direction that could transport emissions toward the Class I area. Dispersion conditions are ranked by evaluating the product of sigma z times the windspeed, where sigma z is the vertical dispersion coefficient for the given stability class and downwind distance and the windspeed is the windspeed for the given windspeed category in the joint frequency table. The dispersion conditions are then ranked in ascending order of the value of sigma z times the windspeed.

For the Level 2 analysis, it is assumed that steady-state plume conditions are unlikely to persist for more than 12 hours. Thus, if a transit time of more than 12 hours is required to transport a plume parcel from the emission source to a Class I area for a given dispersion condition, it is

assumed that the plume material is more dispersed than a standard Gaussian plume model would predict. This enhanced dilution would result from daytime convective mixing and wind direction and speed changes.

To obtain the worst-case meteorological conditions, it is necessary to determine the dispersion conditions (i.e., a given windspeed and stability class associated with the wind direction that would transport emissions toward the Class I area) that has a sigma z times windspeed product with a cumulative probability of 1 percent. Thus, the dispersion condition is selected to address potential plume visual impacts such that the sum of all frequencies of occurrence worse than this condition totals 1 percent (i.e., about 4 days per year). The 1-percentile meteorology is assumed to be worst-case plume visual impacts when the probability of worst-case meteorology conditions is coupled with the probability of other factors being ideal for maximizing plume visual impacts. Dispersion conditions associated with transport times of more than 12 hours are not considered in this cumulative frequency.

For this study, the meteorological data from the National Weather Service (NWS) station in Miami were used to generate a frequency distribution of wind direction, windspeed, and stability occurrences based on the standardized stability array (STAR) program used for many air dispersion model applications. The STAR program generates frequencies using 16 wind direction classes with each class covering a 22.5 degree sector, 6 windspeed classes, and 6 stability classes.

The PSD Class I area of the Everglades National Park is located to the west-southwest through south-southwest of the Lauderdale facility at distances that vary from approximately 59 km to more than 75 km in directions from south-southwest through west-southwest. Therefore, the frequencies associated with 3 wind directions were included in the analysis (i.e., north-northeast, northeast, east-northeast) with the highest frequency from any of those directions used in the cumulative frequency to determine the worst-case meteorology. This analysis is presented in

Table 8-2, which shows the dispersion condition (i.e., product of sigma z times the windspeed), transport time to the nearest part of the Class I area (i.e., distance of 59 km), and the frequency associated with each wind direction. As indicated in Table 8-7, the first two dispersion conditions would produce the maximum visual plume impacts because the dispersion conditions produce the lowest product of sigma z times the windspeed.

However, the transport time from the emission source to the Class I area associated with each of these conditions is greater than 12 hours. With the third condition (i.e., F stability and 2.6 m/s wind) and subsequent conditions, emissions could be transported to the Class I area in less than 12 hours. The frequencies of these conditions, using the maximum frequency from one of the 3 directions, are added to the cumulative frequency. This is appropriate since the concern is with the number of days during which, at any time, dispersion conditions are worse than or equal to a given value. For this study, two conditions produce a cumulative frequency of 1 percent or more: F stability with windspeed of 2.6 m/s and E stability with windspeed of 2.6 m/s (F stability and a 4.4 m/s windspeed did not occur). The result of this analysis indicates that the dispersion condition of E stability and windspeed of 2.6 m/s is associated with a cumulative frequency of 1 percent and used to assess the potential visual plume impacts from the proposed units.

The results of the visual plume impact analysis using a worst-case meteorological condition of E stability and 2.6 m/s windspeed are shown in Figure 8-2. All values of Delta E and contrast are less than the screening criteria of 2.00 and 0.05, respectively. As a result, it is highly unlikely that emissions from the proposed Lauderdale units will cause adverse visibility impairment in the Everglades National Park. Since this analysis was performed with worst case emissions (i.e., oil firing), visibility impairment using the preferred fuel (natural gas) will be even more unlikely. No significant impacts are predicted, and further analysis of visibility impairment is unnecessary.

Table 8-7. Screening Level 2 Plume Visual Impact Analysis Identification of Worst-Case Meteorological Conditions

Dispersion Condition									
Stability[a]	Windspeed (m/s)	Sigma Z (m)	Sigma Z x Windspeed (m^2/s)	Transport Time to Class I Area[b] (hours)	Frequency of Occurrence of Dispersion Condition for Wind Directions NNE	NE	ENE	Frequency (f) and Cumulative Frequency (cf) Analysis (f)	(cf)
F	0.8	79.2	63.4	35[c]	0.0034	0.0027	0.0030	0	0
E	0.8	152	122	35[c]	0	0	0	0	0
F	2.6	79.2	206	11	.0052	0.0050	0.0075	0.0075	0.0075
F	4.4	79.2	348	6	0	0	0	0	0
E	2.6	152	395	11	0.0044	0.0039	0.0061	0.0061	0.0136

[a]Stability E and F correspond to slightly and moderately stable stabilities, respectively.
[b]Assumed to be located approximately 59 km to the south-southwest clockwise through west-southwest.
[c]Transport time to Class I area during this condition is longer than 12 hours so the frequency for this condition is not added to the cumulative frequency summation.

*** User-selected Screening Scenario Results ***

Input Emissions for

Particulates	242.40	LB /HR
NOx (as NO2)	1760.00	LB /HR
Primary NO2	.00	LB /HR
Soot	.00	LB /HR
Primary SO4	446.00	LB /HR

**** Default Particle Characteristics Assumed

Transport Scenario Specifications:

Background Ozone:	.04 ppm
Background Visual Range:	40.00 km
Source-Observer Distance:	59.00 km
Min. Source-Class I Distance:	59.00 km
Max. Source-Class I Distance:	90.00 km
Plume-Source-Observer Angle:	11.25 degrees
Stability:	5
Wind Speed:	2.60 m/s

R E S U L T S

Asterisks (*) indicate plume impacts that exceed screening criteria

Maximum Visual Impacts INSIDE Class I Area
Screening Criteria ARE NOT Exceeded

					Delta E		Contrast	
Backgrnd	Theta	Azi	Distance	Alpha	Crit	Plume	Crit	Plume
SKY	10.	84.	59.0	84.	2.00	1.154	.05	.015
SKY	140.	84.	59.0	84.	2.00	1.015	.05	-.040

Maximum Visual Impacts OUTSIDE Class I Area
Screening Criteria ARE NOT Exceeded

					Delta E		Contrast	
Backgrnd	Theta	Azi	Distance	Alpha	Crit	Plume	Crit	Plume
SKY	10.	55.	52.8	114.	2.00	1.175	.05	.015
SKY	140.	55.	52.8	114.	2.00	.968	.05	-.040

Figure 8-2 LEVEL 2 VISUAL EFFECTS SCREENING ANALYSIS FOR THE LAUDERDALE REPOWERING PROJECT ON THE CLASS I AREA OF THE EVERGLADES NATIONAL PARK

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8.3 IMPACTS DUE TO ASSOCIATED GROWTH

Air quality impacts due to general commercial, residential, industrial and other growth associated with the Lauderdale Repowering Project would potentially occur during the construction and operational phases. Construction activities and employment will generate relatively small quantities of air pollutants that can affect air quality. Fugitive particulate matter from construction activities will be controlled by water spraying. The emissions from construction will be minor, since major earthworks are not planned. Construction employment is expected to be about 800 people over the construction period. Travel to and from the site would generate some automotive pollutants, i.e., CO and NO_x. Indirect employment, based on multiplier effects, could reach about 16,500, of which about a third would be in Broward County and half in southeast Florida. The remainder would be out-of-state due to the nature of manufacturing. This employment is expected to be filled by existing construction and manufacturing workers that would supply the materials necessary for the plant. The impact of this growth is insignificant relative to the existing population base in the area.

Operational employment would be about 28 personnel added to the current plant staff of 157. Indirect employment is estimated to be about 2,700, of which a majority would be located in southeast Florida. The additional employment is expected to originate primarily from the general population growth in the area, which would not be a direct result of the project. Indeed, the purpose of the project is to provide additional generation of electrical power in the FPL system's load center, i.e., southeast Florida. The repowered facility, which in part replaces a less efficient steam cycle plant, will emit less pollutants per MW generated than the existing facility. Overall, this efficiency, coupled with the use of existing infrastructure provided at the site, results in substantially lower air quality effects than other comparable projects.

9.0 NONATTAINMENT

Conditions of site certification and accompanying FDER permit are requested that would limit the potential VOC emissions from both the existing plant and the repowered units. The limitations on the existing plant would limit potential VOC emissions of the existing plant to 99.9 tons per year (TPY) and the plant would be a minor source of VOCs. The existing Units 4 and 5 and GTs 1 to 24 would be limited to 89.1 TPY total VOC emissions. The remaining VOC emissions, i.e., 10.8 TPY, would potentially be emitted from the storage tanks and other miscellaneous VOC sources. The existing Units 4 and 5 would be limited by their permanent shutdown. The condition of certification and accompanying FDER permit for the existing plant is requested to take effect as of the permanent shutdown of Units 4 and 5. This action would establish the Lauderdale Plant as a minor source of VOCs.

A condition of certification is requested to limit the potential VOC emissions of the repowered Units 4 and 5 and the associated storage tanks and miscellaneous VOC sources to 124.75 TPY. The VOC emissions from the repowered Units 4 and 5 would be limited to 110.1 TPY. VOC emissions from storage tanks and miscellaneous sources would be limited to 14.65 TPY.

The net emission increase for changes in the tanks/miscellaneous source is 4.80 TPY. The creditable emissions decreases for shutting down existing Units 4 and 5 are 15.0 TPY. Thus, the net increase in VOC emissions associated with the Lauderdale Repowering Project is 99.9 TPY (110.1 + 4.8 - 15.0), and the nonattainment provisions in Rule 17-2.510, F.A.C., do not apply.

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APPENDIX A

PERFORMANCE INFORMATION AND STACK PARAMETERS FOR NATURAL GAS AND NO. 2 FUEL OIL

Table A-1. Design Information and Stack Parameters for Lauderdale Repowering Project - Fuel Oil

Data	Gas Turbine No.2 Oil @ 40°F	Gas Turbine No.2 Oil @ ISO	Gas Turbine No.2 Oil @ 75°F	Gas Turbine No.2 Oil @ 95°F
General:				
Power (kW)	172,290.0	172,290.0	163,300.0	151,480.0
Heat Rate (Btu/kwh)	9,830.0	9,945.0	10,085.0	10,335.0
Heat Input (mmBtu/hr)	1,693.6	1,713.4	1,646.9	1,565.5
Fuel Oil (lb/hr)	88,531.7	89,567.4	86,088.9	81,837.2
Fuel:				
Heat Content - Oil(HHV)	19,130 Btu/lb	19,130 Btu/lb	19,130 Btu/lb	19,130 Btu/lb
% Sulfur	0.5	0.5	0.5	0.5
CT Exhaust:				
Volume Flow (acfm)	2,422,969	2,450,119	2,380,384	2,283,495
Volume Flow (scfm)	852,885	830,869	800,537	759,726
Mass Flow (lb/hr)	3,753,920	3,622,090	3,489,860	3,311,950
Temperature (oF)	1,040	1,097	1,110	1,127
Moisture (%)	11.23	12.29	13.09	14.83
Oxygen (%)	12.14	11.62	11.48	11.15
Molecular Weight	28.27	28.18	28.08	27.89
Water Injected (lb/hr)	155,080	156,890	151,065	143,630
HRSG Stack:				
Volume Flow (acfm)	1,195,331	1,164,475	1,121,964	1,064,768
Temperature (oF)	280	280	280	280
Diameter (ft)	18.0	18.0	18.0	18.0
Velocity (ft/sec)	78.3	76.3	73.5	69.7

Table A-2. Maximum Criteria Pollutant Emissions for Lauderdale Repowering Project - Fuel Oil

Pollutant	Gas Turbine No.2 Oil @ 40°F	Gas Turbine No.2 Oil @ ISO	Gas Turbine No.2 Oil @ 75°F	Gas Turbine No.2 Oil @ 95°F
Particulate[a]:				
Basis				
lb/hr	60.6	60.4	58.0	54.9
TPY	265.3	264.5	254.2	240.5
Sulfur Dioxide:				
Basis	0.5 % Sulfur	0.5 % Sulfur	0.5 % Sulfur	0.5 % Sulfur
lb/hr	885.32	895.67	860.89	818.37
TPY	3,877.7	3,923.1	3,770.7	3,584.5
Nitrogen Oxides:				
Basis	65 ppm[b]	65 ppm[b]	65 ppm[b]	65 ppm[b]
lb/hr	431.6	440.0	422.2	398.7
TPY	1,890.2	1,927.1	1,849.2	1,746.1
ppm	65.0	65.0	65.0	65.0
Carbon Monoxide:				
Basis	33 ppm[c]	33 ppm[c]	33 ppm[c]	33 ppm[c]
lb/hr	108.9	104.8	100.1	93.1
TPY	477.1	459.2	438.4	407.7
ppm	33.0	33.0	33.0	33.0
VOCs[d]:				
Basis	6 ppm[c]	6 ppm[c]	6 ppm[c]	6 ppm[c]
lb/hr	8.49	8.17	7.80	7.25
TPY	37.2	35.8	34.2	31.8
ppm	6.0	6.0	6.0	6.0
Lead:				
Basis	EPA(1988)	EPA(1988)	EPA(1988)	EPA(1988)
lb/hr	1.51E-02	1.52E-02	1.47E-02	1.39E-02
TPY	6.60E-02	6.68E-02	6.42E-02	6.10E-02

[a]Does not include sulfate or sulfite aerosols.
[b]Corrected to 15% O2 dry conditions.
[c]Corrected to dry conditions.
[d]As carbon.

Note: Particulate does not include sulfate or sulfite aerosols.

Table A-3. Maximum Other Regulated Pollutant Emissions for Lauderdale Repowering Project - Fuel Oil

Pollutant	Gas Turbine No.2 Oil @ 40°F	Gas Turbine No.2 Oil @ ISO	Gas Turbine No.2 Oil @ 75°F	Gas Turbine No.2 Oil @ 95°F
As (lb/hr)	0.0071131649	0.007196381	0.0069168981	0.0065752924
(TPY)	3.12E-02	3.15E-02	3.03E-02	2.88E-02
Be (lb/hr)	0.0042340268	0.0042835601	0.0041172013	0.0039138645
(TPY)	1.85E-02	1.88E-02	1.80E-02	1.71E-02
Hg (lb/hr)	5.08E-03	5.14E-03	4.94E-03	4.70E-03
(TPY)	2.23E-02	2.25E-02	2.16E-02	2.06E-02
F (lb/hr)	0.0550423478	0.0556862816	0.0535236163	0.0508802385
(TPY)	2.41E-01	2.44E-01	2.34E-01	2.23E-01
H2SO4 (lb/hr)	110.2	111.5	107.2	101.9
(TPY)	483	489	470	446

Sources: EPA, 1988; EPA, 1980.

Table A-4. Maximum Non-Regulated Pollutant Emissions for Lauderdale Repowering Project - Fuel Oil

Pollutant	Gas Turbine No.2 Oil @ 40°F	Gas Turbine No.2 Oil @ ISO	Gas Turbine No.2 Oil @ 75°F	Gas Turbine No.2 Oil @ 95°F
Manganese (lb/hr)	1.09E-02	1.10E-02	1.06E-02	1.01E-02
(TPY)	4.78E-02	4.83E-02	4.65E-02	4.42E-02
Nickel (lb/hr)	2.88E-01	2.91E-01	2.80E-01	2.66E-01
(TPY)	1.26E+00	1.28E+00	1.23E+00	1.17E+00
Cadmium (lb/hr)	1.78E-02	1.80E-02	1.73E-02	1.64E-02
(TPY)	7.79E-02	7.88E-02	7.57E-02	7.20E-02
Chromium (lb/hr)	8.04E-02	8.14E-02	7.82E-02	7.44E-02
(TPY)	3.52E-01	3.56E-01	3.43E-01	3.26E-01
Copper (lb/hr)	4.74E-01	4.80E-01	4.61E-01	4.38E-01
(TPY)	2.08E+00	2.10E+00	2.02E+00	1.92E+00
Vanadium (lb/hr)	1.18E-01	1.19E-01	1.15E-01	1.09E-01
(TPY)	5.17E-01	5.23E-01	5.03E-01	4.78E-01
Selenium (lb/hr)	3.98E-02	4.02E-02	3.87E-02	3.67E-02
(TPY)	1.74E-01	1.76E-01	1.69E-01	1.61E-01
POM (lb/hr)	4.72E-04	4.78E-04	4.59E-04	4.37E-04
(TPY)	2.07E-03	2.09E-03	2.01E-03	1.91E-03
Formaldehyde (lb/hr)	6.86E-01	6.94E-01	6.67E-01	6.34E-01
(TPY)	3.00E+00	3.04E+00	2.92E+00	2.78E+00

Source: EPA, 1988.

Table A-5. Design Information and Stack Parameters for Lauderdale Repowering Project - Natural Gas Firing

Data	Gas Turbine Natural Gas @ 40°F	Gas Turbine Natural Gas @ ISO	Gas Turbine Natural Gas @ 75°F	Gas Turbine Natural Gas @ 95°F
General:				
Power - Net (kW)	172,470.0	167,240.0	157,700.0	146,250.0
Heat Rate -Net (Btu/kwh)	10,330.0	10,500.0	10,685.0	10,960.0
Heat Input (MMBtu/hr)	1,781.6	1,756.0	1,685.0	1,602.9
Natural Gas (Mcf/hr)	1,696.8	1,672.4	1,604.8	1,526.6
(lb/hr)	77,461.5	76,348.7	73,261.9	69,691.3
Fuel:				
Heat Content - Gas (HHV)	1,050 Btu/cf	1,050 Btu/cf	1,050 Btu/cf	1,050 Btu/cf
CT Exhaust:				
Volume Flow (acfm)	2,419,751	2,400,874	2,338,327	2,259,990
Volume Flow (scfm)	842,207	815,741	788,401	753,330
Mass Flow (lb/hr)	3,672,830	3,547,251	3,417,317	3,243,016
Temperature (°F)	1057	1094	1106	1124
Molecular Weight	28.01	27.93	27.84	27.65
Moisture (%)	11.87	12.73	13.51	15.29
Oxygen (%)	11.94	11.63	11.51	11.18
Steam Injected (lb/hr)	95,253	93,870	90,114	85,688
HRSG Stack:				
Volume Flow (acfm)	1,180,366	1,143,273	1,104,956	1,055,803
Temperature (oF)	280	280	280	280
Diameter (ft)	18.0	18.0	18.0	18.0
Velocity (ft/sec)	77.3	74.9	72.4	69.2
Height (ft)	150.0	150.0	150.0	150.0

Table A-6. Maximum Criteria Pollutant Emissions for Lauderdale Repowering Project - Natural Gas Firing

Pollutant	Gas Turbine Natural Gas @ 40°F	Gas Turbine Natural Gas @ ISO	Gas Turbine Natural Gas @ 75°F	Gas Turbine Natural Gas @ 95°F
Particulate:				
Basis				
lb/hr	16.1	15.3	14.7	13.8
TPY	70.5	67.0	64.4	60.4
Sulfur Dioxide:				
Basis	2 gr/Mscf	2 gr/Mscf	2 gr/Mscf	2 gr/Mscf
lb/hr	0.97	0.96	0.92	0.87
TPY	4.2	4.2	4.0	3.8
Nitrogen Oxides:				
Basis	42 ppm[a]	42 ppm[a]	42 ppm[a]	42 ppm[a]
lb/hr	278.2	274.9	263.9	250.6
TPY	1,218.5	1,204.0	1,156.0	1,097.5
ppm	42.0	42.0	42.0	42.0
Carbon Monoxide:				
Basis	30 ppm[b]	30 ppm[b]	30 ppm[b]	30 ppm[b]
lb/hr	97.1	93.1	89.2	83.5
TPY	425.2	407.8	390.6	365.5
ppm	30.0	30.0	30.0	30.0
VOCs:				
Basis	1 ppm[b]	1 ppm[b]	1 ppm[b]	1 ppm[b]
lb/hr	1.39	1.33	1.27	1.19
TPY	6.07	5.83	5.58	5.22
ppm	1.0	1.0	1.0	1.0
Lead:				
Basis				
lb/hr	neg.	neg.	neg.	neg.
TPY	neg.	neg.	neg.	neg.

[a]Corrected to 15 percent O2 dry conditions.
[b]Corrected to dry conditions.

Note: neg. = negligible

Table A-7. Maximum Other Regulated Pollutant Emissions for Lauderdale Repowering Project - Natural Gas Firing

Pollutant	Gas Turbine Natural Gas @ 40°F	Gas Turbine Natural Gas @ ISO	Gas Turbine Natural Gas @ 75°F	Gas Turbine Natural Gas @ 95°F
As (lb/hr)	neg.	neg.	neg.	neg.
(TPY)	neg.	neg.	neg.	neg.
Be (lb/hr)	neg.	neg.	neg.	neg.
(TPY)	neg.	neg.	neg.	neg.
Hg (lb/hr)	2.03×10^{-2}	2.00×10^{-2}	1.92×10^{-2}	1.83×10^{-2}
(TPY)	8.89×10^{-2}	8.76×10^{-2}	8.40×10^{-2}	7.99×10^{-2}
F (lb/hr)	neg.	neg.	neg.	neg.
(TPY)	neg.	neg.	neg.	neg.
H2SO4 (lb/hr)	0.045	0.044	0.042	0.040
(TPY)	0.195	0.192	0.184	0.175

Note: neg. = negligible

Sources: EPA, 1988.
EPA, 1980.

Table A-8. Maximum Non-Regulated Pollutant Emissions for Lauderdale Repowering Project - Natural Gas Firing

Pollutant	Gas Turbine Natural Gas @ 40°F	Gas Turbine Natural Gas @ ISO	Gas Turbine Natural Gas @ 75°F	Gas Turbine Natural Gas @ 95°F
Manganese (lb/hr)	neg.	neg.	neg.	neg.
(TPY)	neg.	neg.	neg.	neg.
Nickel (lb/hr)	neg.	neg.	neg.	neg.
(TPY)	neg.	neg.	neg.	neg.
Cadmium (lb/hr)	neg.	neg.	neg.	neg.
(TPY)	neg.	neg.	neg.	neg.
Chromium (lb/hr)	neg.	neg.	neg.	neg.
(TPY)	neg.	neg.	neg.	neg.
Copper (lb/hr)	neg.	neg.	neg.	neg.
(TPY)	neg.	neg.	neg.	neg.
Vanadium (lb/hr)	neg.	neg.	neg.	neg.
(TPY)	neg.	neg.	neg.	neg.
Selenium (lb/hr)	neg.	neg.	neg.	neg.
(TPY)	neg.	neg.	neg.	neg.
POM (lb/hr)	1.16×10^{-3}	1.14×10^{-3}	1.10×10^{-3}	1.04×10^{-3}
(TPY)	5.08×10^{-3}	5.00×10^{-3}	4.80×10^{-3}	4.57×10^{-3}
Formaldehyde (lb/hr)	1.57×10^{-1}	1.55×10^{-1}	1.49×10^{-1}	1.42×10^{-1}
(TPY)	6.89×10^{-1}	6.79×10^{-1}	6.52×10^{-1}	6.20×10^{-1}

Note: neg. = negligible

Source: EPA, 1988.

Table A-9. Maximum Emissions for Additional Non-Regulated Pollutant for Lauderdale Repowering Project--Fuel Oil

Pollutant	Gas Turbine No.2 Oil @ 40°F	Gas Turbine No.2 Oil @ ISO	Gas Turbine No.2 Oil @ 75°F	Gas Turbine No.2 Oil @ 95°F
Antimony (lb/hr)	3.70×10^{-2}	3.74×10^{-2}	3.60×10^{-2}	3.42×10^{-2}
(TPY)	1.62×10^{-1}	1.64×10^{-1}	1.58×10^{-1}	1.50×10^{-1}
Barium (lb/hr)	3.31×10^{-2}	3.34×10^{-2}	3.21×10^{-2}	3.06×10^{-2}
(TPY)	1.45×10^{-1}	1.47×10^{-1}	1.41×10^{-1}	1.34×10^{-1}
Cobalt (lb/hr)	1.54×10^{-2}	1.55×10^{-2}	1.49×10^{-2}	1.42×10^{-2}
(TPY)	6.72×10^{-2}	6.80×10^{-2}	6.54×10^{-2}	6.21×10^{-2}
Zinc (lb/hr)	1.16	1.17	1.13	1.07
(TPY)	5.07	5.13	4.93	4.69
Chlorine[a] (lb/hr)	4.43×10^{-2}	4.48×10^{-2}	4.3×10^{-2}	4.09×10^{-2}
(TPY)	1.94×10^{-1}	1.96×10^{-1}	1.89×10^{-1}	1.79×10^{-1}

[a]Assumes 0.5 ppm in fuel oil.

Source: EPA, 1979.

APPENDIX B

EMISSION FACTORS

AP-42
Supplement A
October 1986

SUPPLEMENT A
TO

COMPILATION OF AIR POLLUTANT EMISSION FACTORS

Volume I: Stationary Point And Area Sources

TABLE 1.3-1. UNCONTROLLED EMISSION FACTORS FOR FUEL OIL COMBUSTION

EMISSION FACTOR RATING: A

Boiler Type[a]	Particulate[b] Matter		Sulfur Dioxide[c]		Sulfur Trioxide		Carbon Monoxide[d]		Nitrogen Oxide[e]		Volatile Organics[f] Nonmethane		Methane	
	$kg/10^3$ l	$lb/10^3$ gal	$kg/10^3$ l	$lb/10^3$ gal	$kg/10^3$ l	$lb/10^3$ gal	$kg/10^3$ l	$lb/10^3$ gal	$kg/10^3$ l	$lb/10^3$ gal	$kg/10^3$ l	$lb/10^3$ gal	$kg/10^3$ l	$lb/10^3$ gal
Utility Boilers														
Residual Oil	g	g	19S	157S	0.34S[h]	2.9S[h]	0.6	5	8.0 (12.6)(5)[i]	67 (105)(42)[i]	0.09	0.76	0.03	0.28
Industrial Boilers														
Residual Oil	g	g	19S	157S	0.24S	2S	0.6	5	6.6[j]	55[j]	0.034	0.28	0.12	1.0
Distillate Oil	0.24	2	17S	142S	0.24S	2S	0.6	5	2.4	20	0.024	0.2	0.006	0.052
Commercial Boilers														
Residual Oil	g	g	19S	157S	0.24S	2S	0.6	5	6.6	55	0.14	1.13	0.057	0.475
Distillate Oil	0.24	2	17S	142S	0.24S	2S	0.6	5	2.4	20	0.04	0.34	0.026	0.216
Residential Furnaces														
Distillate Oil	0.3	2.5	17S	142S	0.24S	2S	0.6	5	2.2	18	0.085	0.713	0.214	1.78

[a] Boilers can be approximately classified according to their gross (higher) heat rate as shown below:
Utility (power plant) boilers: >106 x 10^9 J/hr (>100 x 10^6 Btu/hr)
Industrial boilers: 10.6 x 10^9 to 106 x 10^9 J/hr (10 x 10^6 to 100 x 10^6 Btu/hr)
Commercial boilers: 0.5 x 10^9 to 10.6 x 10^9 J/hr (0.5 x 10^6 to 10 x 10^6 Btu/hr)
Residential furnaces: <0.5 x 10^9 J/hr (<0.5 x 10^6 Btu/hr)

[b] References 3-7 and 24-25. Particulate matter is defined in this section as that material collected by EPA Method 5 (front half catch).

[c] References 1-5. S indicates that the weight % of sulfur in the oil should be multiplied by the value given.

[d] References 3-5 and 8-10. Carbon monoxide emissions may increase by factors of 10 to 100 if the unit is improperly operated or not well maintained.

[e] Expressed as NO_2. References 1-5, 8-11, 17 and 26. Test results indicate that at least 95% by weight of NO_x is NO for all boiler types except residential furnaces, where about 75% is NO.

[f] References 18-21. Volatile organic compound emissions are generally negligible unless boiler is improperly operated or not well maintained, in which case emissions may increase by several orders of magnitude.

[g] Particulate emission factors for residual oil combustion are, on average, a function of fuel oil grade and sulfur content:
Grade 6 oil: 1.25(S) + 0.38 kg/10^3 liter [10(S) + 3 lb/10^3 gal] where S is the weight % of sulfur in the oil. This relationship is based on 81 individual tests and has a correlation coefficient of 0.65.
Grade 5 oil: 1.25 kg/10^3 liter (10 lb/10^3 gal)
Grade 4 oil: 0.88 kg/10^3 liter (7 lb/10^3 gal)

[h] Reference 25.

[i] Use 5 kg/10^3 liters (42 lb/10^3 gal) for tangentially fired boilers, 12.6 kg/10^3 liters (105 lb/10^3gal) for vertical fired boilers, and 8.0 kg/10^3 liters (67 lb/10^3 gal) for all others, at full load and normal (>15%) excess air. Several combustion modifications can be employed for NO_x reduction: (1) limited excess air can reduce NO_x emissions 5-20%, (2) staged combustion 20-40%, (3) using low NO_x burners 20-50%, and (4) ammonia injection can reduce NO_x emissions 40-70% but may increase emissions of ammonia. Combinations of these modifications have been employed for further reductions in certain boilers. See Reference 23 for a discussion of these and other NO_x reducing techniques and their operational and environmental impacts.

[j] Nitrogen oxides emissions from residual oil combustion in industrial and commercial boilers are strongly related to fuel nitrogen content, estimated more accurately by the empirical relationship:
kg $NO_2/10^3$ liters = 2.75 + 50(N)^2 [lb $NO_2/10^3$gal = 22 + 400(N)^2] where N is the weight % of nitrogen in the oil. For residual oils having high (>0.5 weight %) nitrogen content, use 15 kg $NO_2/10^3$ liter (120 lb $NO_2/10^3$gal) as an emission factor.

TABLE 1.3-2. CUMULATIVE PARTICLE SIZE DISTRIBUTION AND SIZE SPECIFIC EMISSION FACTORS FOR UTILITY BOILERS FIRING RESIDUAL OIL[a]

EMISSION FACTOR RATING: C (uncontrolled)
E (ESP controlled)
D (scrubber controlled)

Particle size[b] (um)	Cumulative mass % ≤ stated size			Cumulative emission factor[c] [kg/10^3 l (lb/10^3 gal)]		
	Uncontrolled	Controlled		Uncontrolled	Controlled[d]	
		ESP	Scrubber		ESP	Scrubber
15	80	75	100	0.80A (6.7A)	0.0060A (0.05A)	0.06A (0.50A)
10	71	63	100	0.71A (5.9A)	0.0050A (0.042A)	0.06A (0.50A)
6	58	52	100	0.58A (4.8A)	0.0042A (0.035A)	0.06A (0.50A)
2.5	52	41	97	0.52A (4.3A)	0.0033A (0.028A)	0.058A (0.48A)
1.25	43	31	91	0.43A (3.6A)	0.0025A (0.021A)	0.055A (0.46A)
1.00	39	28	84	0.39A (3.3A)	0.0022A (0.018A)	0.050A (0.42A)
0.625	20	10	64	0.20A (1.7A)	0.0008A (0.007A)	0.038A (0.32A)
TOTAL	100	100	100	1A (8.3A)	0.008A (0.067A)	0.06A (0.50A)

[a]Reference 29. ESP = electrostatic precipitator.
[b]Expressed as aerodynamic equivalent diameter.
[c]Particulate emission factors for residual oil combustion without emission controls are, on average, a function of fuel oil grade and sulfur content:
Grade 6 Oil: A = 1.25(S) + 0.38
Where S is the weight % of sulfur in the oil
Grade 5 Oil: A = 1.25
Grade 4 Oil: A = 0.88
[d]Estimated control efficiency for scrubber, 94%; ESP, 99.2%.

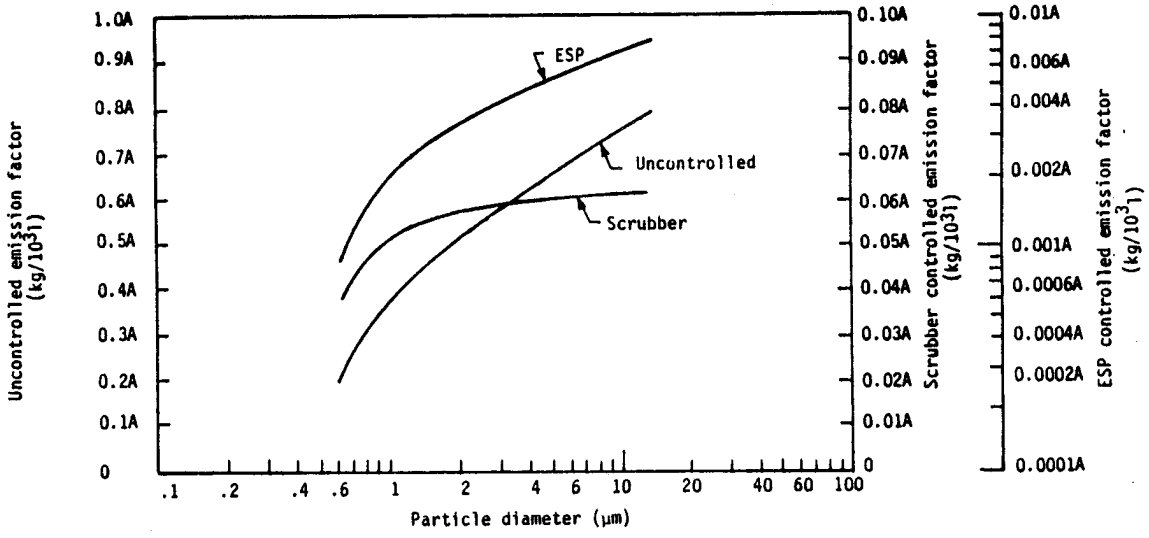


Figure 1.3-1. Cumulative size specific emission factors for utility boilers firing residual oil.

TABLE 1.4-1. UNCONTROLLED EMISSION FACTORS FOR NATURAL GAS COMBUSTION[a]

Furnace size & type (10^6 Btu/hr heat input)	Particulate[b]		Sulfur dioxide[c]		Nitrogen oxides[d]		Carbon monoxide[e]		Volatile organics			
									Nonmethane		Methane	
	$kg/10^6 m^3$	$lb/10^6 ft^3$	$kg/10^6 m^3$	$lb/10^6 ft^3$	$kg/10^6 m^3$	$lb/10^6 ft^3$	$kg/10^6 m^3$	$lb/10^6 ft^3$	$kg/10^6 m^3$	$lb/10^6 ft^3$	$kg/10^6 m^3$	$lb/10^6 ft^3$
Utility boilers (> 100)	16 - 80	1 - 5	9.6	0.6	8800[h]	550[h]	640	40	23	1.4	4.8	0.3
Industrial boilers (10 - 100)	16 - 80	1 - 5	9.6	0.6	2240	140	560	35	44	2.8	48	3
Domestic and commercial boilers (< 10)	16 - 80	1 - 5	9.6	0.6	1600	100	320	20	84	5.3	43	2.7

[a]Expressed as weight/volume fuel fired.
[b]References 15-18.
[c]Reference 4. Based on avg. sulfur content of natural gas, 4600 $g/10^6$ Nm^3 (2000 $gr/10^6$ scf).
[d]References 4-5, 7-8, 11, 14, 18-19, 21.
[e]Expressed as NO_2. Tests indicate about 95 weight % NO_x is NO_2.
[f]References 4, 7-8, 16, 18, 22-25.
[g]References 16, 18. May increase 10 - 100 times with improper operation or maintenance.
[h]For tangentially fired units, use 4400 $kg/10^6$ m^3 (275 $lb/10^6$ ft^3). At reduced loads, multiply factor by load reduction coefficient in Figure 1.4-1. For potential NO_x reductions by combustion modification, see text. Note that NO_x reduction from these modifications will also occur at reduced load conditions.

The combined loss from filling and emptying is called working loss. Filling loss comes with an increase of the liquid level in the tank, when the pressure inside the tank exceeds the relief pressure and vapors are expelled from the tank. Emptying loss occurs when air drawn into the tank during liquid removal becomes saturated with organic vapor and expands, thus exceeding the capacity of the vapor space.

The following equations, provided to estimate emissions, are applicable to tanks with vertical cylindrical shells and fixed roofs. These tanks must be substantially liquid and vapor tight and must operate approximately at atmospheric pressure. Fixed roof tank breathing losses can be estimated from[2]:

$$L_B = 2.26 \times 10^{-2} M_V \left(\frac{P}{P_A - P} \right)^{0.68} D^{1.73} H^{0.51} \Delta T^{0.50} F_P C K_C \qquad (1)$$

where:

L_B = fixed roof breathing loss (lb/yr)

M_V = molecular weight of vapor in storage tank (lb/lb mole), see Note 1

P_A = average atmospheric pressure at tank location (psia)

P = true vapor pressure at bulk liquid conditions (psia), see Note 2

D = tank diameter (ft)

H = average vapor space height, including roof volume correction (ft), see Note 3

ΔT = average ambient diurnal temperature change (°F)

F_P = paint factor (dimensionless), see Table 4.3-1

C = adjustment factor for small diameter tanks (dimensionless), see Figure 4.3-4

K_C = product factor (dimensionless), see Note 4

Notes: (1) The molecular weight of the vapor, M_V, can be determined by Table 4.3-2 for selected petroleum liquids and volatile organic liquids or by analysis of vapor samples. Where mixtures of organic liquids are stored in a tank, M_V can be estimated from the liquid composition. As an example of the latter calculation, consider a liquid known to be composed of components A and B with mole fractions in the liquid X_a and X_b, respectively. Given the vapor pressures of the pure

TABLE 4.3-1. PAINT FACTORS FOR FIXED ROOF TANKS[a]

Tank color		Paint factors (F_p)	
		Paint condition	
Roof	Shell	Good	Poor
White	White	1.00	1.15
Aluminum (specular)	White	1.04	1.18
White	Aluminum (specular)	1.16	1.24
Aluminum (specular)	Aluminum (specular)	1.20	1.29
White	Aluminum (diffuse)	1.30	1.38
Aluminum (diffuse)	Aluminum (diffuse)	1.39	1.46
White	Gray	1.30	1.38
Light gray	Light gray	1.33	1.44[b]
Medium gray	Medium gray	1.40	1.58[b]

[a]Reference 2.
[b]Estimated from the ratios of the seven preceding paint factors.

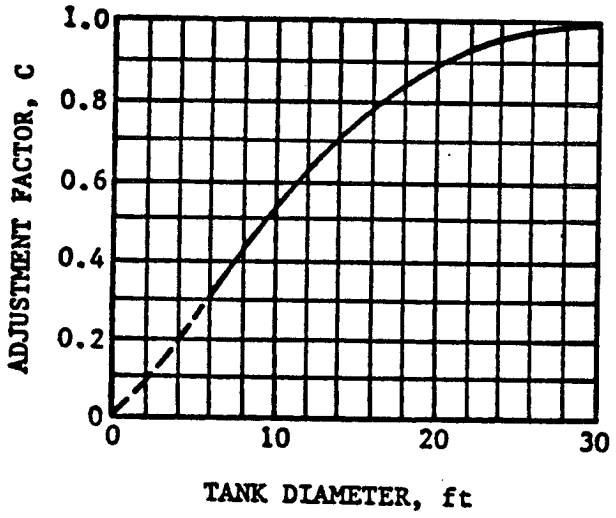


Figure 4.3-4. Adjustment factor (C) for small diameter tanks.[2]

TABLE 4.3-2. PHYSICAL PROPERTIES OF TYPICAL ORGANIC LIQUIDS[a]

Organic liquid[b]	Vapor molecular weight @ 60°F	Product density (d), lb/gal @ 60°F	Condensed vapor density (w), lb/gal @ 60°F	True vapor pressure in psia at: 40°F	50°F	60°F	70°F	80°F	90°F	100°F
Petroleum Liquids[c]										
Gasoline RVP 13	62	5.6	4.9	4.7	5.7	6.9	8.3	9.9	11.7	13.8
Gasoline RVP 10	66	5.6	5.1	3.4	4.2	5.2	6.2	7.4	8.8	10.5
Gasoline RVP 7	68	5.6	5.2	2.3	2.9	3.5	4.3	5.2	6.2	7.4
Crude oil RVP 5	50	7.1	4.5	1.8	2.3	2.8	3.4	4.0	4.8	5.7
Jet naphtha (JP-4)	80	6.4	5.4	0.8	1.0	1.3	1.6	1.9	2.4	2.7
Jet kerosene	130	7.0	6.1	0.0041	0.0060	0.0085	0.011	0.015	0.021	0.029
Distillate fuel no. 2	130	7.1	6.1	0.0031	0.0045	0.0074	0.0090	0.012	0.016	0.022
Residual oil no. 6	190	7.9	6.4	0.00002	0.00003	0.00004	0.00006	0.00009	0.00013	0.00019
Volatile Organic Liquids										
Acetone	58	6.6	6.6	1.7	2.2	2.9	3.7	4.7	5.9	7.3
Acrylonitrile	53	6.8	6.8	0.8	1.0	1.4	1.8	2.4	3.1	4.0
Benzene	78	7.4	7.4	0.6	0.9	1.2	1.5	2.0	2.6	3.3
Carbon disulfide	76	10.6	10.6	3.0	3.9	4.8	6.0	7.4	9.2	11.2
Carbon tetrachloride	154	13.4	13.4	0.8	1.1	1.4	1.8	2.3	3.0	3.8
Chloroform	119	12.5	12.5	1.5	1.9	2.5	3.2	4.1	5.2	6.3
Cyclohexane	84	6.5	6.5	0.7	0.9	1.2	1.6	2.1	2.6	3.2
1,2-Dichloroethane	99	10.5	10.5	0.6	0.8	1.0	1.4	1.7	2.2	2.8
Ethylacetate	88	7.6	7.6	0.6	0.8	1.1	1.5	1.9	2.5	3.2
Ethyl alcohol	46	6.6	6.6	0.2	0.4	0.6	0.9	1.2	1.7	2.3
Isopropyl alcohol	60	6.6	6.6	0.2	0.3	0.6	0.7	0.9	1.3	1.8
Methyl alcohol	32	6.6	6.6	0.7	1.0	1.4	2.0	2.6	3.5	4.5
Methylene chloride	85	11.1	11.1	3.1	4.3	5.4	6.8	8.7	10.3	13.3
Methylethyl ketone	72	6.7	6.7	0.7	0.9	1.2	1.5	2.1	2.7	3.3
Methylmethacrylate	100	7.9	7.9	0.1	0.2	0.3	0.6	0.8	1.1	1.4
1,1,1-Trichloroethane	133	11.2	11.2	0.9	1.2	1.6	2.0	2.6	3.3	4.2
Trichloroethylene	131	12.3	12.3	0.5	0.7	0.9	1.2	1.5	2.0	2.0
Toluene	92	7.3	7.3	0.2	0.2	0.3	0.4	0.6	0.8	1.0
Vinylacetate	86	7.8	7.8	0.7	1.0	1.3	1.7	2.3	3.1	4.0

[a] References 3-4.
[b] For a more comprehensive listing of volatile organic liquids, see Reference 3.
[c] RVP = Reid vapor pressure in psia.

components, P_a and P_b, and the molecular weights of the pure components, M_a and M_b, M_V is calculated:

$$M_V = M_a \left(\frac{P_a X_a}{P_t} \right) + M_b \left(\frac{P_b X_b}{P_t} \right)$$

where: P_t, by Raoult's law, is:

$$P_t = P_a X_a + P_b X_b$$

(2) True vapor pressures for organic liquids can be determined from Figures 4.3-5 or 4.3-6, or Table 4.3-2. In order to use Figures 4.3-5 or 4.3-6, the stored liquid temperature, T_S, must be determined in degrees Fahrenheit. T_S is determined from Table 4.3-3, given the average annual ambient temperature, T_A, in degrees Fahrenheit. True vapor pressure is the equilibrium partial pressure exerted by a volatile organic liquid, as defined by ASTM-D-2879 or as obtained from standard reference texts. Reid vapor pressure is the absolute vapor pressure of volatile crude oil and volatile nonviscous petroleum liquids, except liquified petroleum gases, as determined by ASTM-D-323.

(3) The vapor space in a cone roof is equal in volume to a cylinder, which has the same base diameter as the cone and is one third the height of the cone. If information is not available, assume H equals one half tank height.

(4) For crude oil, $K_C = 0.65$. For all other organic liquids, $K_C = 1.0$.

Fixed roof tank working losses can be estimated from[2]:

$$L_W = 2.40 \times 10^{-5} M_V P V N K_N K_C \qquad (2)$$

where:

L_W = fixed roof working loss (lb/year)

M_V = molecular weight of vapor in storage tank (lb/lb mole), see Note 1 to Equation 1

P = true vapor pressure at bulk liquid temperature (psia), see Note 2 to Equation 1

V = tank capacity (gal)

N = number of turnovers per year (dimensionless)

$$N = \frac{\text{Total throughput per year (gal)}}{\text{Tank capacity, V (gal)}}$$

K_N = turnover factor (dimensionless), see Figure 4.3-7

K_C = product factor (dimensionless), see Note 1

Note: (1) For crude oil, $K_C = 0.84$. For all other organic liquids, $K_C = 1.0$.

TABLE 4.3-3. AVERAGE STORAGE TEMPERATURE (T_S) AS A FUNCTION OF TANK PAINT COLOR[a]

Tank color	Average storage temperature, T_S
White	T_A[b] + 0
Aluminum	T_A + 2.5
Gray	T_A + 3.5
Black	T_A + 5.0

[a]Reference 5.
[b]T_A is the average annual ambient temperature in degrees Fahrenheit.

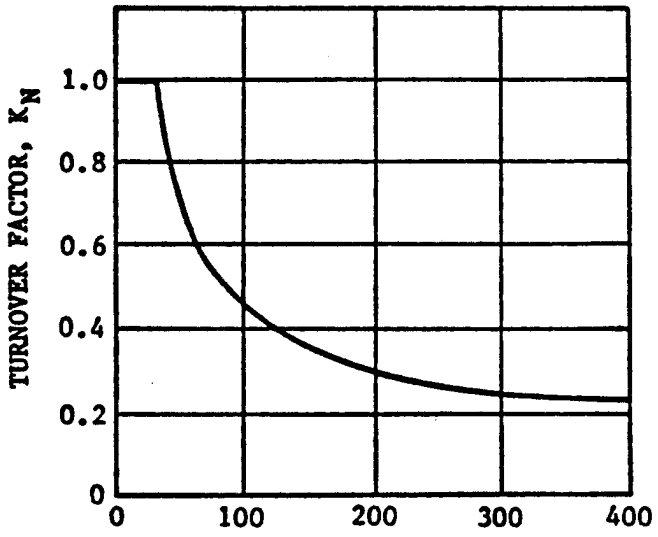


Figure 4.3-7. Turnover factor (K_N) for fixed roof tanks.

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Toxic Air Pollutant Emission Factors—A Compilation For Selected Air Toxic Compounds And Sources

By
Anne A. Pope
Air Quality Management Division
U.S. Environmental Protection Agency
Research Triangle Park, North Carolina 27711

Patricia A. Cruse
Claire C. Most
Radian Corporation
Research Triangle Park, North Carolina 27709

U.S. ENVIRONMENTAL PROTECTION AGENCY
Office Of Air And Radiation
Office Of Air Quality Planning And Standards
Research Triangle Park, North Carolina 27711

October 1988

INDUSTRIAL PROCESS	SIC CODE	EMISSION SOURCE	SCC	POLLUTANT	CAS NUMBER	EMISSION FACTOR	NOTES	REFERENCE
Municipal waste combustion	4953	Refuse derived fuel unit stack	50100121	Acetaldehyde	75070	1.5 x 10-9 g/kg waste burned	From test results, no data on controls	130
Municipal wastewater treatment	4941	Evaporation		Chloroform	67663	0.014 kg/10E6 liter mun wastewater disch		164
Naphthalene production		Process emissions		Naphthalene	91203	0.239 kg/Mg naphthalene produced	Based on POM emissions and 8% naphthalene	99
Naphthalene production		Storage		Naphthalene	91203	0.0227 kg/Mg produced	Based on data from State files and engineering judgement	99
Natural gas combustion		Double shell boilers, home heating		POM		0.48 pg/J heat input	Represents primarily particulate POM, uncontrolled	114
Natural gas combustion		Hot air furnace, home heating		POM		0.33 pg/J heat input	Represents primarily particulate POM, uncontrolled	114
Natural gas combustion		Wall space heater, home heating		POM		27.5 pg/J heat input	Represents primarily particulate POM, uncontrolled	114
Natural gas combustion		Domestic	1	Formaldehyde	50000	0.43 ng/J heat input	Control status unspecified, based on source tests	106
Natural gas combustion		Industrial	102006	Formaldehyde	50000	0.038 ng/J heat input	Control status unspecified, based on source tests	106
Natural gas combustion		Boilers, exhaust system	102006	Benzene	71432	1.18% by vol (or 4% by wt) benzene	South Coast study, California, engineering judgement	132
Natural gas combustion		Firetube boiler, process heater	10200601	POM		0.28 pg/J heat input	Represents primarily particulate POM, uncontrolled	114
Natural gas combustion		Scotch marine, hospital heating	10200601	POM		27.4 pg/J heat input	Represents primarily particulate POM, uncontrolled	114
Natural gas combustion		Commercial/institutional	103006	Formaldehyde	50000	0.095 ng/J heat input	Control status unspecified, based on source tests	106
Neoprene manufacture	2822	Dichlorobutene refining	301	Butadiene, 1,3-	106990	1.56 kg/Mg neoprene produced	Calculated from national emissions and national capacity, mostly controlled	78
Neoprene manufacture	2822	Dichlorobutene synthesis	301	Butadiene, 1,3-	106990	0.3 kg/Mg neoprene produced	Calculated from national emissions and national capacity, mostly controlled	78
Neoprene manufacture	2822	Equipment leaks	301	Butadiene, 1,3-	106990	1.1 kg/Mg neoprene produced	Uncontrolled, calculated from	78

INDUSTRIAL PROCESS	SIC CODE	EMISSION SOURCE	SCC	POLLUTANT	CAS NUMBER	EMISSION FACTOR	NOTES	REFERENCE
Nonylphenol production	2869	General	301	Phenol	108952	8.0 x 10E-4 lb/lb used	From engineering estimates	13
Nonylphenol production	2869	Fugitive	301	Phenol	108952	1.9 x 10E-4 lb/lb used	From engineering estimates	13
Nonylphenol production	2869	Storage	407094	Phenol	108952	1.0 x 10E-5 lb/lb used	From engineering estimates	13
Normal superphosphate production	2574	Curing building	30102806	Fluoride	16984488	3.8 lb/ton P2O5	Uncontrolled	97
Normal superphosphate production	2874	Mixer and den	30102805	Fluoride	16984488	0.2 lb/ton P2O5	Wet scrubber (97%)	97
Oil and coal combustion	49	Stack - particulate	102	Polychlorinated dibenzo-p-dioxins		68 ng/g	No penta homologue included, one location, TCDD detection = 20 ng/g	119
Oil and coal combustion	49	Stack - particulate	102	Tetrachlorodibenzo-p-dioxin, 2,3,7,8-	1746016	Not detectable	One location, detection limit = 10 ng/g	119
Oil combustion		Oil-fired boiler or furnace, util/commerc/industr/residential	1	Formaldehyde	50000	405 lb/10E12 Btu	Uncontrolled, based on emissions testing	36
Oil combustion		Industrial, commercial, and residential boilers	1	Lead	7439921	8.9 lb/10E12 Btu	Uncontrolled, calculated based on engineering judgement, assumed use distillate oil	36
Oil combustion		Residual oil-fired boilers, util/commerc/industr/residential	1	Manganese	7439965	26 lb/10E12 Btu	Uncontrolled, calculated based on engineering judgement	36
Oil combustion		Residual oil-fired boilers, util/commerc/industr/residential	1	Manganese	7439965	11.96 lb/10E12 Btu	Controlled with multiclone, calculated based on engineering judgement	36
Oil combustion		Residual oil-fired boilers, util/commerc/industr/residential	1	Manganese	7439965	5.72 lb/10E12 Btu	Controlled with ESP, calculated based on engineering judgement	36
Oil combustion		Residual oil-fired boilers, util/commerc/industr/residential	1	Manganese	7439965	2.86 lb/10E12 Btu	Controlled with scrubber, calculated based on engineering judgement	36
Oil combustion		Distillate oil-fired boilers, util/commerc/industr/residential	1	Manganese	7439965	14 lb/10E12 Btu	Controlled with scrubber, calculated based on engineering judgement	36
Oil combustion		Distillate oil-fired boilers, util/commerc/industr/residenti	1	Manganese	7439965	6.44 lb/10E12 Btu	Controlled with multiclone, calculated based on engineering	36

INDUSTRIAL PROCESS	SIC CODE	EMISSION SOURCE	SCC	POLLUTANT	CAS NUMBER	EMISSION FACTOR	NOTES	REFERENCE
		al					judgement	
Oil combustion		Distillate oil-fired boilers, util/commerc/industr/residenti al	1	Manganese	7439965	3.08 lb/10E12 Btu	Controlled with ESP, calculated based on engineering judgement	36
Oil combustion		Distillate oil-fired boilers, util/commerc/industr/residenti al	1	Manganese	7439965	1.54 lb/10E12 Btu	Controlled with scrubber, calculated based on engineering judgement	36
Oil combustion		Residual oil-fired boiler, util/commerc/industr/residenti al	1	Mercury	7439976	3.2 lb/10E12 Btu	Uncontrolled, based on engineering judgement	36
Oil combustion		Residual oil-fired boiler, util/commerc/industr/residenti al	1	Mercury	7439976	3.2 lb/10E12 Btu	Controlled by multiclone, based on engineering judgement	36
Oil combustion		Residual oil-fired boiler, util/commerc/industr/residenti al	1	Mercury	7439976	2.4 lb/10E12 Btu	Controlled by ESP, based on engineering judgement	36
Oil combustion		Residual oil-fired boiler, util/commerc/industr/residenti al	1	Mercury	7439976	0.83 lb/10E12 Btu	Controlled by scrubber, based on engineering judgement	36
Oil combustion		Distillate oil-fired boiler, util/commerc/industr/residenti al	1	Mercury	7439976	3.0 lb/10E12 Btu	Uncontrolled, based on engineering judgement	36
Oil combustion		Distillate oil-fired boiler, util/commerc/industr/residenti al	1	Mercury	7439976	3.0 lb/10E12 Btu	Controlled by multiclone, based on engineering judgement	36
Oil combustion		Distillate oil-fired boiler, util/commerc/industr/residenti al	1	Mercury	7439976	2.25 lb/10E12 Btu	Controlled by ESP, based on engineering judgement	36
Oil combustion		Distillate oil-fired boiler, util/commerc/industr/residenti al	1	Mercury	7439976	0.78 lb/10E12 Btu	Controlled by scrubber, based on engineering judgement	36
Oil combustion		Residual oil-fired boilers, util/commerc/industr/residenti al	1	Nickel	7440020	1260 lb/10E12 Btu	Uncontrolled, based on engineering judgement	36
Oil combustion		Residual oil-fired boilers, util/commerc/industr/residenti	1	Nickel	7440020	642.6 lb/10E12 Btu	Controlled by multiclone, based on engineering judgement	36

INDUSTRIAL PROCESS	SIC CODE	EMISSION SOURCE	SCC	POLLUTANT	CAS NUMBER	EMISSION FACTOR	NOTES	REFERENCE
		al						
Oil combustion		Residual oil-fired boilers, util/commerc/industr/residenti al	1	Nickel	7440020	352.8 lb/10E12 Btu	Controlled by ESP, based on engineering judgement	36
Oil combustion		Residual oil-fired boilers, util/commerc/industr/residenti al	1	Nickel	7440020	50.4 lb/10E12 Btu	Controlled by scrubber, based on engineering judgement	36
Oil combustion		Distillate oil-fired boilers, util/commerc/industr/residenti al	1	Nickel	7440020	170 lb/10E12 Btu	Uncontrolled, based on engineering judgement	36
Oil combustion		Distillate oil-fired boilers, util/commerc/industr/residenti al	1	Nickel	7440020	86.7 lb/10E12 Btu	Controlled by multiclone, based on engineering judgement	36
Oil combustion		Distillate oil-fired boilers, util/commerc/industr/residenti al	1	Nickel	7440020	47.6 lb/10E12 Btu	Controlled by ESP, based on engineering judgement	36
Oil combustion		Distillate oil-fired boilers, util/commerc/industr/residenti al	1	Nickel	7440020	6.8 lb/10E12 Btu	Controlled by scrubber, based on engineering judgement	36
Oil combustion		Residual oil-fired boilers, util/commerc/industr/residenti al	1	Arsenic	7440382	19 lb/10E12 Btu	Uncontrolled, calculated based on engineering judgement	36
Oil combustion		Distillate oil-fired boilers, util/commerc/industr/residenti al	1	Arsenic	7440382	4.2 lb/10E12 Btu	Uncontrolled, calculated based on engineering judgement	36
Oil combustion		Distillate oil-fired boilers, util/commerc/industr/residenti al	1	Arsenic	7440382	2.06 lb/10E12 Btu	Controlled with multiclone, calculated based on engineering judgement	36
Oil combustion		Distillate oil-fired boilers, util/commerc/industr/residenti al	1	Arsenic	7440382	0.50 lb/10E12 Btu	Controlled with ESP, calculated based on engineering judgement	36
Oil combustion		Distillate oil-fired boilers, util/commerc/industr/residenti al	1	Arsenic	7440382	0.42 lb/10E12 Btu	Controlled with scrubber, calculated based on engineering judgement	36
Oil combustion		Residual oil-fired boilers, util/commerc/industr/residenti	1	Arsenic	7440382	9.31 lb/10E12 Btu	Controlled with multiclone, calculated based on engineering	36

INDUSTRIAL PROCESS	SIC CODE	EMISSION SOURCE	SCC	POLLUTANT	CAS NUMBER	EMISSION FACTOR	NOTES	REFERENCE
		al					judgement	
Oil combustion		Residual oil-fired boilers, util/commerc/industr/residenti al	1	Arsenic	7440382	2.28 lb/10E12 Btu	Controlled with ESP, calculated based on engineering judgement	36
Oil combustion		Residual oil-fired boilers, util/commerc/industr/residenti al	1	Arsenic	7440382	1.90 lb/10E12 Btu	Controlled with scrubber, calculated based on engineering judgement	36
Oil combustion		Residual oil-fired boilers, util/commerc/industr/residenti al	1	Beryllium	7440417	4.2 lb/10E12 Btu	Uncontrolled, calculated based on engineering judgement	36
Oil combustion		Distillate oil-fired boilers, util/commerc/industr/residenti al	1	Beryllium	7440417	2.5 lb/10E12 Btu	Uncontrolled, calculated based on engineering judgement	36
Oil combustion		Distillate oil-fired boilers, util/commerc/industr/residenti al	1	Beryllium	7440417	1.58 lb/10E12 Btu	Controlled with multiclone, calculated based on engineering judgement	36
Oil combustion		Distillate oil-fired boilers, util/commerc/industr/residenti al	1	Beryllium	7440417	0.35 lb/10E12 Btu	Controlled with ESP, calculated based on engineering judgement	36
Oil combustion		Distillate oil-fired boilers, util/commerc/industr/residenti al	1	Beryllium	7440417	0.15 lb/10E12 Btu	Controlled with scrubber, calculated based on engineering judgement	36
Oil combustion		Residual oil-fired boilers, util/commerc/industr/residenti al	1	Beryllium	7440417	2.65 lb/10E12 Btu	Controlled with multiclone, calculated based on engineering judgement	36
Oil combustion		Residual oil-fired boilers, util/commerc/industr/residenti al	1	Beryllium	7440417	0.59 lb/10E12 Btu	Controlled with ESP, calculated based on engineering judgement	36
Oil combustion		Residual oil-fired boilers, util/commerc/industr/residenti al	1	Beryllium	7440417	0.25 lb/10E12 Btu	Controlled with scrubber, calculated based on engineering judgement	36
Oil combustion		Residual oil-fired boilers, util/commerc/industr/residenti al	1	Cadmium	7440439	15.7 lb/10E12 Btu	Uncontrolled, calculated based on engineering judgement	36
Oil combustion		Distillate oil-fired boilers, util/commerc/industr/residenti	1	Cadmium	7440439	10.5 lb/10E12 Btu	Uncontrolled, calculated based on engineering judgement	36

INDUSTRIAL PROCESS	SIC CODE	EMISSION SOURCE	SCC	POLLUTANT	CAS NUMBER	EMISSION FACTOR	NOTES	REFERENCE
		al						
Oil combustion		Distillate oil-fired boilers, util/commerc/industr/residenti al	1	Cadmium	7440439	7.45 lb/10E12 Btu	Controlled with multiclone, calculated based on engineering judgement	36
Oil combustion		Distillate oil-fired boilers, util/commerc/industr/residenti al	1	Cadmium	7440439	1.58 lb/10E12 Btu	Controlled with ESP, calculated based on engineering judgement	36
Oil combustion		Distillate oil-fired boilers, util/commerc/industr/residenti al	1	Cadmium	7440439	0.63 lb/10E12 Btu	Controlled with scrubber, calculated based on engineering judgement	36
Oil combustion		Residual oil-fired boilers, util/commerc/industr/residenti al	1	Cadmium	7440439	46.86 lb/10E12 Btu	Controlled with multiclone, calculated based on engineering judgement	36
Oil combustion		Residual oil-fired boilers, util/commerc/industr/residenti al	1	Cadmium	7440439	9.90 lb/10E12 Btu	Controlled with ESP, calculated based on engineering judgement	36
Oil combustion		Residual oil-fired boilers, util/commerc/industr/residenti al	1	Cadmium	7440439	3.96 lb/10E12 Btu	Controlled with scrubber, calculated based on engineering judgement	36
Oil combustion		Residual oil-fired boilers, util/commerc/industr/residenti al	1	Chromium	7440473	21 lb/10E12 Btu	Uncontrolled, calculated based on engineering judgement	36
Oil combustion		Distillate oil-fired boilers, util/commerc/industr/residenti al	1	Chromium	7440473	47.5 lb/10E12 Btu	Uncontrolled, calculated based on engineering judgement	36
Oil combustion		Distillate oil-fired boilers, util/commerc/industr/residenti al	1	Chromium	7440473	27.8 lb/10E12 Btu	Controlled with multiclone, calculated based on engineering judgement	36
Oil combustion		Distillate oil-fired boilers, util/commerc/industr/residenti al	1	Chromium	7440473	13.92 lb/10E12 Btu	Controlled with ESP, calculated based on engineering judgement	36
Oil combustion		Distillate oil-fired boilers, util/commerc/industr/residenti al	1	Chromium	7440473	3.84 lb/10E12 Btu	Controlled with scrubber, calculated based on engineering judgement	36
Oil combustion		Residual oil-fired boilers, util/commerc/industr/residenti	1	Chromium	7440473	12.18 lb/10E12 Btu	Controlled with multiclone, calculated based on engineering	36

INDUSTRIAL PROCESS	SIC CODE	EMISSION SOURCE	SCC	POLLUTANT	CAS NUMBER	EMISSION FACTOR	NOTES	REFERENCE
		al					judgement	
Oil combustion		Residual oil-fired boilers, util/commerc/industr/residenti al	1	Chromium	7440473	6.09 lb/10E12 Btu	Controlled with ESP, calculated based on engineering judgement	36
Oil combustion		Residual oil-fired boilers, util/commerc/industr/residenti al	1	Chromium	7440473	1.68 lb/10E12 Btu	Controlled with scrubber, calculated based on engineering judgement	36
Oil combustion		Residual oil-fired boilers, util/commerc/industr/residenti al	1	Copper	7440508	278 lb/10E12 Btu	Uncontrolled, calculated based on engineering judgement	36
Oil combustion		Distillate oil-fired boilers, util/commerc/industr/residenti al	1	Copper	7440508	280 lb/10E12 Btu	Uncontrolled, calculated based on engineering judgement	36
Oil combustion		Distillate oil-fired boilers, util/commerc/industr/residenti al	1	Copper	7440508	165.2 lb/10E12 Btu	Controlled with multiclone, calculated based on engineering judgement	36
Oil combustion		Distillate oil-fired boilers, util/commerc/industr/residenti al	1	Copper	7440508	42 lb/10E12 Btu	Controlled with ESP, calculated based on engineering judgement	36
Oil combustion		Distillate oil-fired boilers, util/commerc/industr/residenti al	1	Copper	7440508	25.2 lb/10E12 Btu	Controlled with scrubber, calculated based on engineering judgement	36
Oil combustion		Residual oil-fired boilers, util/commerc/industr/residenti al	1	Copper	7440508	165.2 lb/10E12 Btu	Controlled with multiclone, calculated based on engineering judgement	36
Oil combustion		Residual oil-fired boilers, util/commerc/industr/residenti al	1	Copper	7440508	42.0 lb/10E12 Btu	Controlled with ESP, calculated based on engineering judgement	36
Oil combustion		Residual oil-fired boilers, util/commerc/industr/residenti al	1	Copper	7440508	25.2 lb/10E12 Btu	Controlled with scrubber, calculated based on engineering judgement	36
Oil combustion		Utility boilers	101004	Lead	7439921	28 lb/10E12 Btu	Uncontrolled, calculated based on engineering judgement, assumed use residual oil	36
Oil combustion		Distillate watertube boilers	10300501	PCH		<0.12 pg/J heat input	Uncontrolled	114

INDUSTRIAL PROCESS	SIC CODE	EMISSION SOURCE	SCC	POLLUTANT	CAS NUMBER	EMISSION FACTOR	NOTES	REFERENCE
Oil combustion		Scotch marine boilers, distillate oil	10300501	POM		17.7 pg/J	Uncontrolled	114
Oil combustion		Cast iron sectional boilers, distillate oil	10300501	POM		<14.9 pg/J	Uncontrolled, home heating application	114
Oil combustion		Hot air furnace, distillate oil	10300501	POM		<0.14 pg/J	Uncontrolled, same reference also lists <15.4 for same boiler/fuel type	114
Oil combustion	49	Boiler flue gas	1	Tetrachlorodibenzo-p-dioxin, 2,3,7,8-	1746016	Not detectable	Low ash, 2% sulfur oil, sampled after heat exch., before ESP, 2378-TCDD detec. limit=<4.2-<7.9 ng/m3	119
Oil combustion	49	Flue gas	1	Tetrachlorodibenzofuran, 2,3,7,8-	51207319	Not detectable	Low ash, 2% sulfur oil, sampled after heat exch., before ESP, 2378-TCDD detec. limit=<0.67-<1.3ng/m3	119
Oil combustion, commercial		Residual oil-fired tangential furnaces	103004	Vanadium	7440622	3660 pg/J	Uncontrolled, based on reported emissions and engineering judgement	54
Oil combustion, commercial		Residual oil-fired wall furnaces	103004	Vanadium	7440622	3660 pg/J	Uncontrolled, based on reported emissions and engineering judgement	54
Oil combustion, commercial		Tangential furnace, residual oil	103004	Selenium	7782492	10.1 pg/J	Uncontrolled, based on reported emissions data and engineering judgement	54
Oil combustion, commercial		Wall furnace, residual oil	103004	Selenium	7782492	10.1 pg/J	Uncontrolled, based on reported emissions data and engineering judgement	54
Oil combustion, commercial		Scotch marine boilers, residual oil	10300401	POM		0.95 pg/J heat input	Uncontrolled, represents benzo(a)pyrene only	114
Oil combustion, commercial		Distillate oil-fired tangential furnaces	103005	Vanadium	7440622	30.0 pg/J	Uncontrolled, based on reported emissions data and engineering judgement	54
Oil combustion, commercial		Distillate oil-fired wall furnaces	103005	Vanadium	7440622	30.0 pg/J	Uncontrolled, based on reported emissions data and engineering judgement	54
Oil combustion, commercial		Tangential furnace, distillate oil	103005	Selenium	7782492	10.1 pg/J	Uncontrolled, based on reported emissions data and engineering judgement	54

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were of poor quality.

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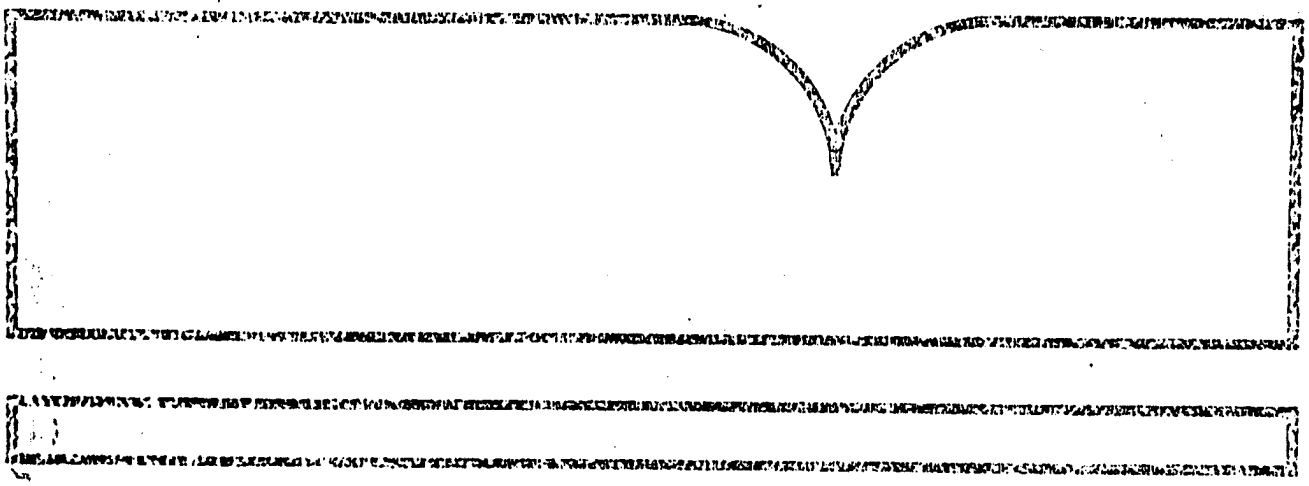
Emissions Assessment of Conventional Stationary Combustion Systems: Volume V: Industrial Combustion Sources

TRW, Inc.
Redondo Beach, CA

Prepared for

Industrial Environmental Research Lab.
Research Triangle Park, NC

1981



U.S. Department of Commerce
National Technical Information Service

TABLE 61. COMPARISON OF EXISTING TRACE ELEMENT EMISSION FACTOR DATA WITH RESULTS OF CURRENT STUDY OF OIL-FIRED INDUSTRIAL COMBUSTION SOURCES, pg/J

	Distillate oil-fired boilers			Residual oil-fired boilers			
		Existing data			Existing data		
Element	Current study	Ref. 42	Ref. 43	Current study	Ref. 42	Ref. 21	Ref. 28
Aluminum (Al)	178	15	250	177	156	87	132
Arsenic (As)	3.5	1.3	1.5	1.2	9.1	18	12
Barium (Ba)	1.2	8.4	16	3.3	9.5	29	31
Calcium (Ca)	75	845	450	229	780	320	1428
Cadmium (Cd)	1.3	2.5	11	0.66	0.2	52	6.9
Cobalt (Co)	3.6	2.3	1.0	11	23	50	10
Chromium (Cr)	24	36	29	29	50	30	21
Copper (Cu)	37	205	160	10	93	64	350
Fluorine (F)	–	14	–	–	1.0	2.7	149
Iron (Fe)	363	545	140	83	379	411	453
Mercury (Hg)	–	1.7	1.2	–	1.9	0.9	1.5
Potassium (K)	85	60	230	261	213	777	392
Lithium (Li)	0.5	1.5	1.2	1.1	1.0	1.4	1.7
Magnesium (Mg)	42	40	210	24	111	297	2384
Nickel (Ni)	255	112	290	728	804	964	433
Lead (Pb)	24	48	42	2	7	80	34
Antimony (Sb)	–	1.7	5.7	–	21	10	25
Silicon (Si)	735	173	–	8655	1610	400	595
Vanadium (V)	195	30	2.9	366	250	3656	714
Zinc (Zn)	42	40	110	33	46	29	66

United States
Environmental Protection
Agency

Office of Air Quality
Planning and Standards
Research Triangle Park NC 27711

EPA-450/2-80-074
June 1980

Air

EPA

Health Impacts, Emissions, and Emission Factors for Noncriteria Pollutants Subject to De Minimis Guidelines and Emitted from Stationary Conventional Combustion Processes

TABLE 4-3 TRACE ELEMENT EMISSION FACTORS FOR OIL-FIRED AND GAS-FIRED UTILITY AND INDUSTRIAL BOILERS

FURNACE TYPE	RESIDUAL OIL[a] pg/J			NATURAL GAS[b] pg/J		
	Hg	Be	F	Hg	Be	F
UNCONTROLLED[c]						
Tangential firing	23C	24C	23C	4.9	Nil	Nil
Wall firing	23C	24C	23C	4.9	Nil	Nil

(a) Emission factors for residual oil are calculated based on characterization of eleven residual oil samples and the assumption that all trace elements in the oil feed are emitted through the stack (Shih, et al, October 1979). C indicates the concentration of trace element in residual oil, in ppm.

(b) Based on stack test measurements for gas-fired utility boilers (1.).

(c) When boilers are equipped with wet scrubbers (used for flue gas desulfurization), the emission factor for Be may be assumed to be 0.01 times the uncontrolled factor given above, and emissions of Hg and F are .2 times the values given above (1.).

NOTE: To convert emission factor units to LB/10^{12}BTU, multiply factors by 2.33.

APPENDIX C

VOC EMISSION CALCULATIONS

VOC EMISSION ESTIMATES FOR GAS TURBINES 1-24

Emission estimates for VOCs from gas turbines contained in EPA Air Pollutant Emission Factors ,i.e., AP-42 are for unburned hydrocarbons. Investigations into the possible VOC emissions for the type of gas turbine unit at the Lauderdale Plant were unsuccessful in determining the amount of unreactive hydrocarbons, i.e., methane and ethane, that may be in the amount of unburned hydrocarbons. As a result, source testing which excluded these nonreactive hydrocarbons was performed as allowed by FDER Rule 17-2.100(223) F.A.C. The results of these tests are presented in the following report.

The emissions from the tests were evaluated statistically to determine an upper limit that would be applicable to all 24 gas turbines. The results of this evaluation indicated an upper bound for the emissions as follows:

Natural Gas - 0.0034 lb VOC per million Btu heat input
No. 2 Fuel Oil - 0.0013 lb VOC per million Btu heat input

The natural gas emission factor reflects an upper confidence limit of 95 percent. This confidence limit was chosen to account the generally higher VOC emissions on natural gas relative to fuel oil and the greater operating usage on natural gas. In addition, natural gas can contain minute quantities of ethylene, propane, butane and, hexane and higher molecular weight gases that are considered VOCs. The fuel oil emission factor was based on a 90 percent confidence limit. All statistics were based on the t distribution.

SOURCE TEST REPORT

VOLATILE ORGANIC COMPOUND EMISSIONS
EXCLUDING METHANE AND ETHANE

FLORIDA POWER AND LIGHT COMPANY
LAUDERDALE POWER PLANT
GAS TURBINE PEAKING UNITS 8 AND 23

NOVEMBER 8 AND 10, 1989

Prepared for:

KBN ENGINEERING AND APPLIED SCIENCES, INC.
1034 N.W. 57th STREET
GAINESVILLE, FLORIDA 32605

Prepared by:

AIR CONSULTING AND ENGINEERING, INC.
2106 N.W. 67th PLACE, SUITE 4
GAINESVILLE, FLORIDA 32606
(904) 335-1889

163-89-05

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Air Consulting and Engineering, Inc.

REPORT CERTIFICATION

To the best of my knowledge, all applicable field and analytical procedures comply with Florida Department of Environmental Regulation requirements and all test data and plant operating data are true and correct.

Stephen L. Neck

Stephen L. Neck, P.E.

State of Florida
Registration No. 20020

November 22, 1989

Date

SEAL

2106 N.W. 67th Place, Suite 4 • Gainesville, Florida 32606 • (904) 335-1889

1.0 INTRODUCTION

A study of non-methane/ethane emissions of Volatile Organic Compounds (VOC) was performed at the Florida Power and Light's Lauderdale Power Plant. Testing was performed on November 8 and 10, 1989. This study of gas turbine emissions supplements a previous test report of August-September 1989, in which emissions of total VOC's and non-methane organics were quantified.

A Byron 301 mon-methane VOC analyzer with a flame ionization detector (FID) was utilized for testing. The gas chromatograph column temperature and carrier flow were raised above the normal settings to enable seperation of both methane and ethane from the remainder of the volatile organics. A more detailed description of the technique is provided in Section 5.0.

Emissions from the two units were monitored during both natural gas and distillate fuel firing.

2.0 SUMMARY AND DISCUSSION OF RESULTS

Results of the testing are summarized in Table 1. Complete emission results and strip chart records are provided in Appendix B.

Table 1 Emission Summary
Florida Power and Light Company
Ft. Lauderdale Power Plant
November 8 and 10, 1989

Date	Fuel	Load MW	C_3H_8 ppm	O_2 %	Fuel Factor	Emission Rate* lb/MMBTU Carbon
Unit 8						
11/8/89	Natural gas	32.5	0.41	16.82	8710	0.0017
11/8/89	Distillate	32.5	0.20	16.51	9190	0.0008
Unit 23						
11/10/89	Distillate	33.0	0.46	16.90	8710	0.0020
11/10/89	Oil	32.5	0.11	16.75	9190	0.0005

* $E = (\text{ppm } C_3H_8)\ (2.595 \times 10^{-9})\ (\text{Fuel Factor}) \left(\frac{20.9}{20.9 - \%O_2}\right) (36)$

Where 36 = molecular weight of carbon in C_3H_8

3.0 PROCESS DESCRIPTION AND OPERATION

Each of the 24 gas turbine generators is fired with two Rolls-Royce engines. The exhaust from each engine is expanded through a common turbine generator.

4.0 SAMPLING POINT LOCATION

Because the exhaust stack is filled with baffling material for noise control, there is no place to measure volumetric flows.

All samples were taken from a tee to the "combustibles analyzer" sample line provided for each unit.

5.0 FIELD AND ANALYTICAL PROCEDURES

The Byron 301 utilizes a Chromosorb 106 column to seperate methane from the remainder of VOC compounds. Since the constituents of natural gas are mainly methane and ethane, it is desireable to modify the analyzer to allow for the additional seperation of ethane, which, along with methane, is excluded from the VOC list by statute. During normal operation, the 301 column temperature is maintained at 50°C at a flame air pressure of 16 psi and a carrier pressure of 13 psi. To enable the column to seperate ethane as well as methane from the total, it was necessary to raise the column temperature to 71°C and to raise the flame air and carrier pressures to 31 and 29 psi, respectively.

The 301 analyzer operates on three minute cycles. A sample is continuously withdrawn from the stack and passes through a sample loop. Every three minutes the contents of the sample loop are injected into the G/C column. After a few seconds the methane, and in this case ethane, are passed through the column and into the FID. After approximately one minute, the analysis "window" is closed and the column is back flushed to pass the remainder of the VOC contents into the FID. Approximately two minutes is allowed for this analysis. To demonstrate performance of the analyzer, calibration gases of ≈25 ppm CH_4, ≈25 ppm C_2H_6, and three protocol 1 gases of C_3H_8 (3, 5, and 8.3 ppm C_3H_8/air) were utilized. It was demonstrated that the C_2H_6 was totally evolved during the normal methane analysis "window" after changing column operating parameters as previously mentioned.

The only complication to the testing arose from the fact that the new column operating parameters allowed the evolution of some very heavy organics that had previously been trapped in the column over its lifetime. This "background" was very constant, however, and was demonstrated by use of zero air response. Calibrations were made over this 0.5 ppm C_3H_8 response and almost perfect linearity was demonstrated.

APPENDIX A

COMPLETE EMISSION DATA

FPL-LAUDERDALE
UNIT 8
FT. LAUDERDALE, FLORIDA

NOVEMBER 8, 1989

LOAD	TIME	PPM C3H8	% O2	lb C/mmBTU	"F" FACTOR
32.5 MW	1203	0.30	16.425	0.0011	8710
NATURAL GAS	1206	0.50	16.425	0.0019	
	1209	0.45	16.425	0.0017	
	1212	0.45	16.350	0.0017	
	*	--	--	--	
	1223	0.35	16.350	0.0013	
	1226	0.40	16.350	0.0015	
	1229	0.40	16.350	0.0015	
	1232	0.40	16.325	0.0015	
	1235	0.40	16.325	0.0015	
	1238	0.45	16.325	0.0017	
	1241	0.45	16.275	0.0017	
	1244	0.40	16.275	0.0015	
	1247	0.40	16.275	0.0015	
	1250	0.45	16.275	0.0017	
	1253	0.40	16.275	0.0015	
	1256	0.45	16.275	0.0017	
	1259	0.40	16.275	0.0015	
	1302	0.40	16.275	0.0015	
	1305	0.40	16.250	0.0015	
AVERAGES:		0.41	16.321	0.0015	
			16.821**	0.0017**	

* Wait for zero air pressure

** Add 0.5 for drift

SOURCE: ACE, Inc., 1989

FPL-LAUDERDALE
UNIT 8
FT. LAUDERDALE, FLORIDA

NOVEMBER 8, 1989

LOAD	TIME	PPM C3H8	% O2	lb C/mmBTU	"F" FACTOR
32.5 MW	1340	0.30	16.575	0.0012	9190
OIL FIRING	1343	0.30	16.525	0.0012	
	1346	0.30	16.525	0.0012	
	1349	0.25	16.525	0.0010	
	1352	0.25	16.525	0.0010	
	1355	0.20	16.525	0.0008	
	1358	0.20	16.525	0.0008	
	1401	0.15	16.500	0.0006	
	1404	0.20	16.500	0.0008	
	1407	0.20	16.500	0.0008	
	1410	0.20	16.500	0.0008	
	1413	0.20	16.500	0.0008	
	*	--	--	--	
	1422	0.30	16.500	0.0012	
	1425	0.10	16.500	0.0004	
	1428	0.20	16.500	0.0008	
	1431	0.15	16.500	0.0006	
	1434	0.15	16.500	0.0006	
	1437	0.15	16.500	0.0006	
	1440	0.15	16.500	0.0006	
	1443	0.15	16.500	0.0006	
AVERAGES:		0.20	16.508	0.0008	

* Wait for air supply

SOURCE: ACE, Inc., 1989

FPL-LAUDERDALE
UNIT 23
FT. LAUDERDALE, FLORIDA

NOVEMBER 10, 1989

LOAD	TIME	PPM C3H8	% O2	lb C/mmBTU	"F" FACTOR
33.0 MW	1220	.55	16.900	0.0023	8710
NATURAL GAS	1223	.50	16.900	0.0021	
	1226	.55	16.900	0.0023	
	1229	.45	16.900	0.0019	
	1232	.45	16.900	0.0019	
	1235	.45	16.900	0.0019	
	1238	.45	16.900	0.0019	
	1241	.45	16.900	0.0019	
	1244	.45	16.900	0.0019	
	1247	.55	16.900	0.0023	
	1250	.45	16.900	0.0019	
	1253	.45	16.900	0.0019	
	1256	.45	16.900	0.0019	
	1259	.45	16.900	0.0019	
	1302	.45	16.900	0.0019	
	1305	.45	16.900	0.0019	
	1308	.45	16.900	0.0019	
	1311	.45	16.900	0.0019	
	1314	.45	16.900	0.0019	
	1317	.45	16.900	0.0019	
	1320	.45	16.900	0.0019	
AVERAGES:		0.46	16.900	0.0020	

SOURCE: ACE, Inc., 1989

FPL-LAUDERDALE
UNIT 23
FT. LAUDERDALE, FLORIDA

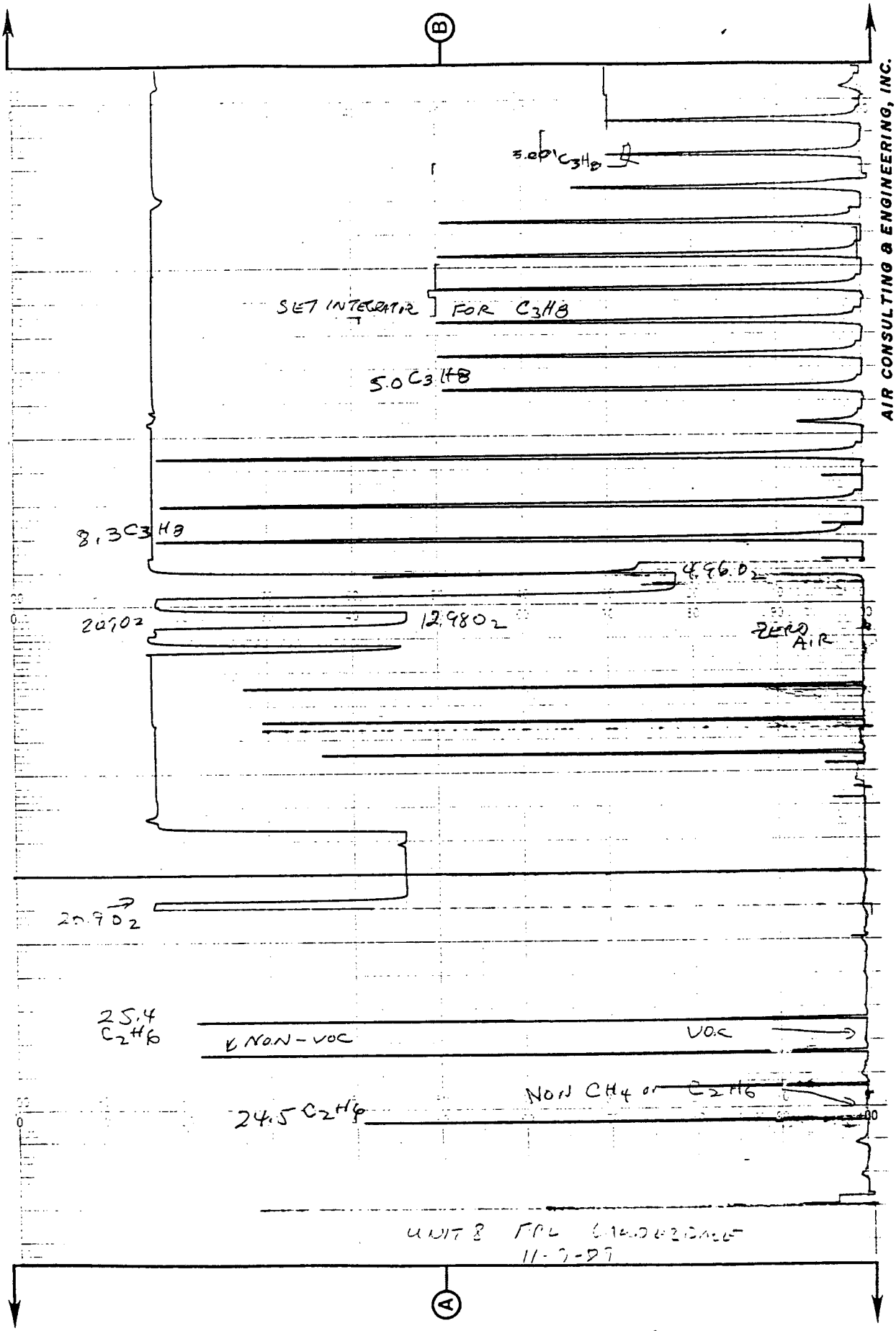
NOVEMBER 10, 1989

LOAD	TIME	PPM C3H8	% O2	lb C/mmBTU	"F" FACTOR
32.5 MW	1346	0.10	16.750	0.0004	9190
OIL FIRING	1349	0.10	16.750	0.0004	
	1352	0.15	16.750	0.0006	
	1355	0.10	16.750	0.0004	
	1358	0.15	16.750	0.0006	
	1401	0.10	16.750	0.0004	
	1404	0.15	16.750	0.0006	
	1407	0.10	16.750	0.0004	
	1410	0.10	16.750	0.0004	
	1413	0.10	16.750	0.0004	
	1417	0.10	16.750	0.0004	
	1420	0.10	16.750	0.0004	
	1423	0.15	16.750	0.0006	
	1426	0.10	16.750	0.0004	
	1429	0.10	16.750	0.0004	
	1432	0.10	16.750	0.0004	
	1435	0.10	16.750	0.0004	
	1438	0.15	16.750	0.0006	
	1441	0.10	16.750	0.0004	
	1443	0.10	16.750	0.0004	
	1446	0.10	16.750	0.0004	
AVERAGES:		0.11	16.750	0.0005	

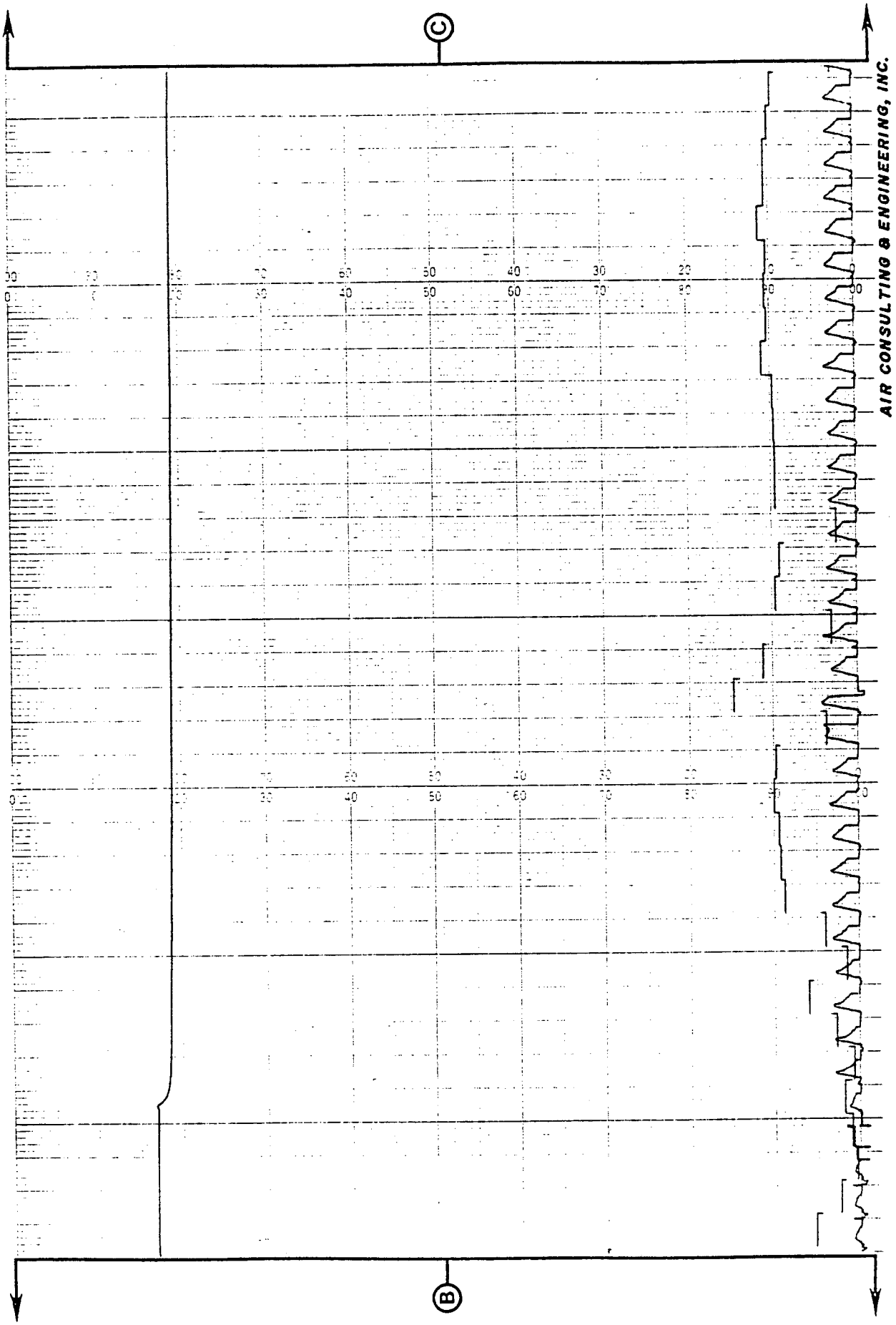
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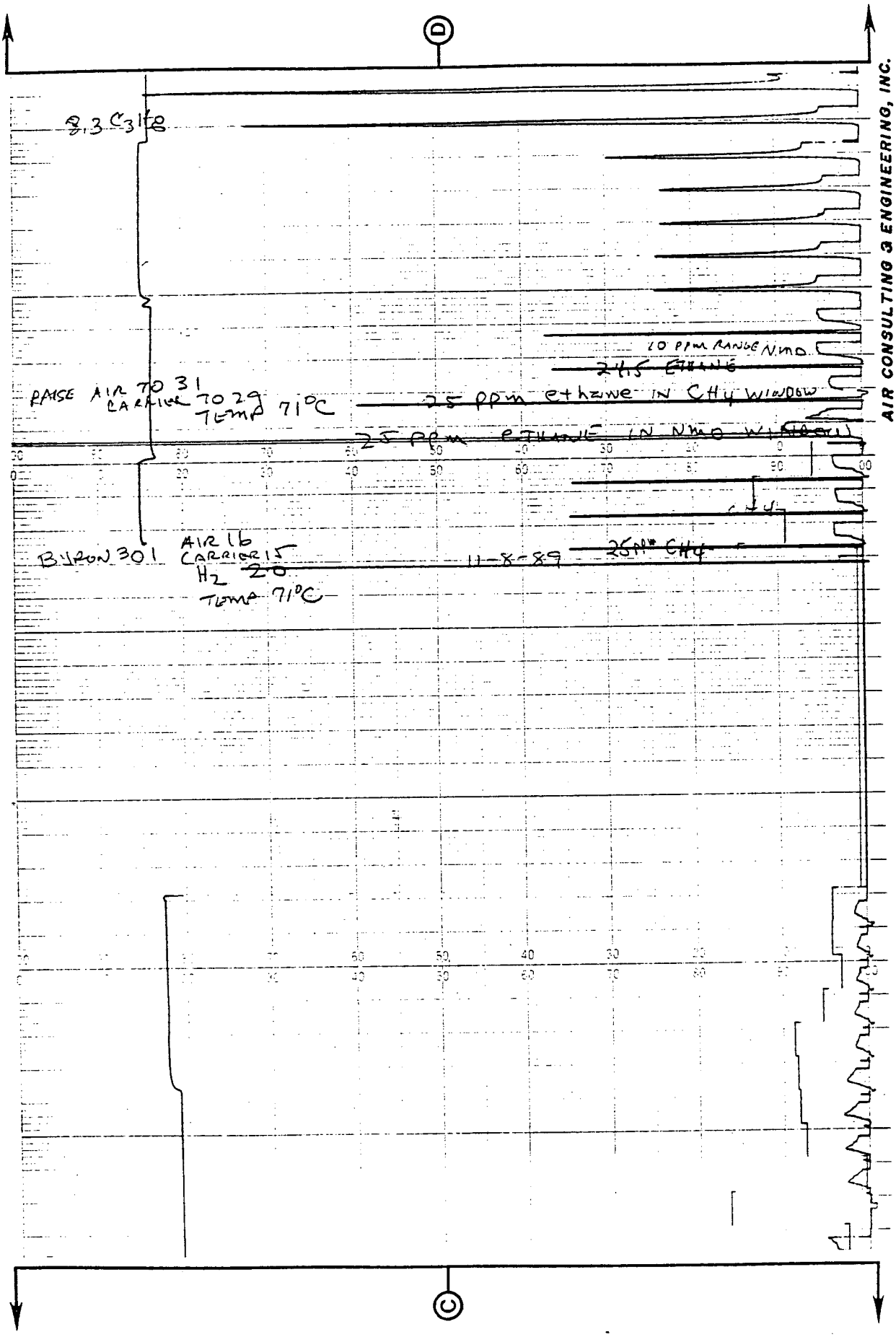
APPENDIX B

STRIP CHART RECORDS
CALIBRATION GAS CERTIFICATIONS

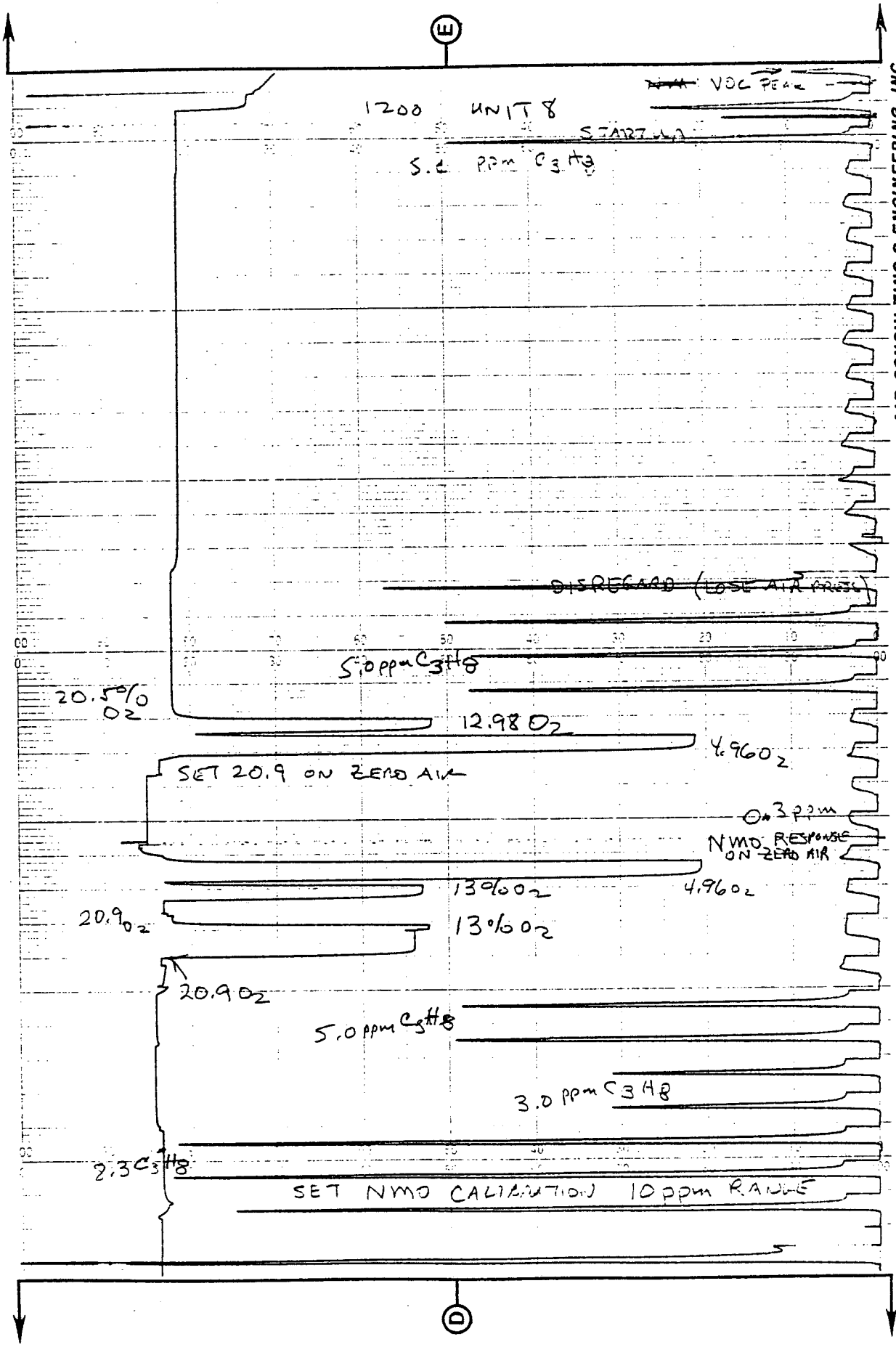


AIR CONSULTING & ENGINEERING, INC.

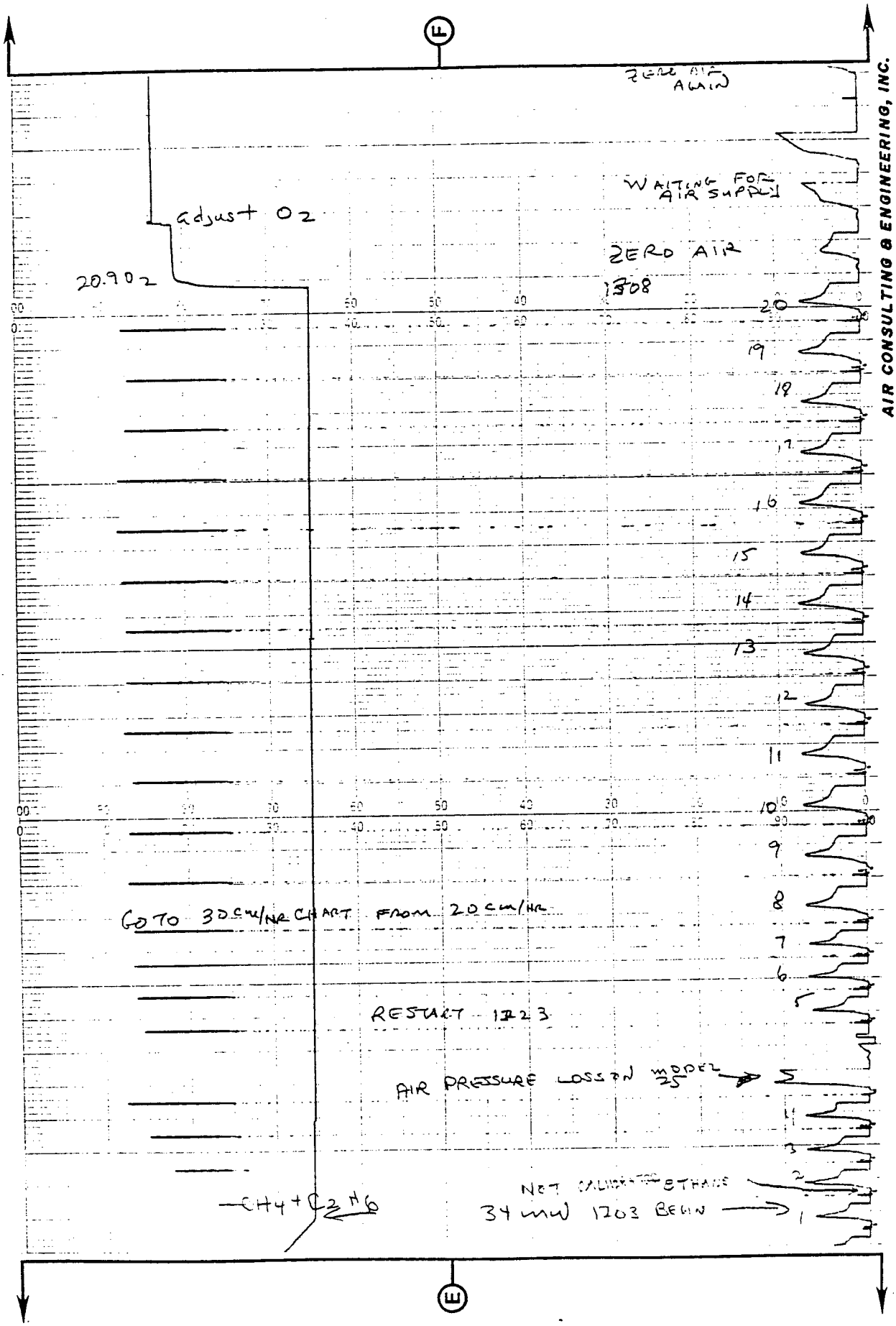

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B
AIR CONSULTING & ENGINEERING, INC.



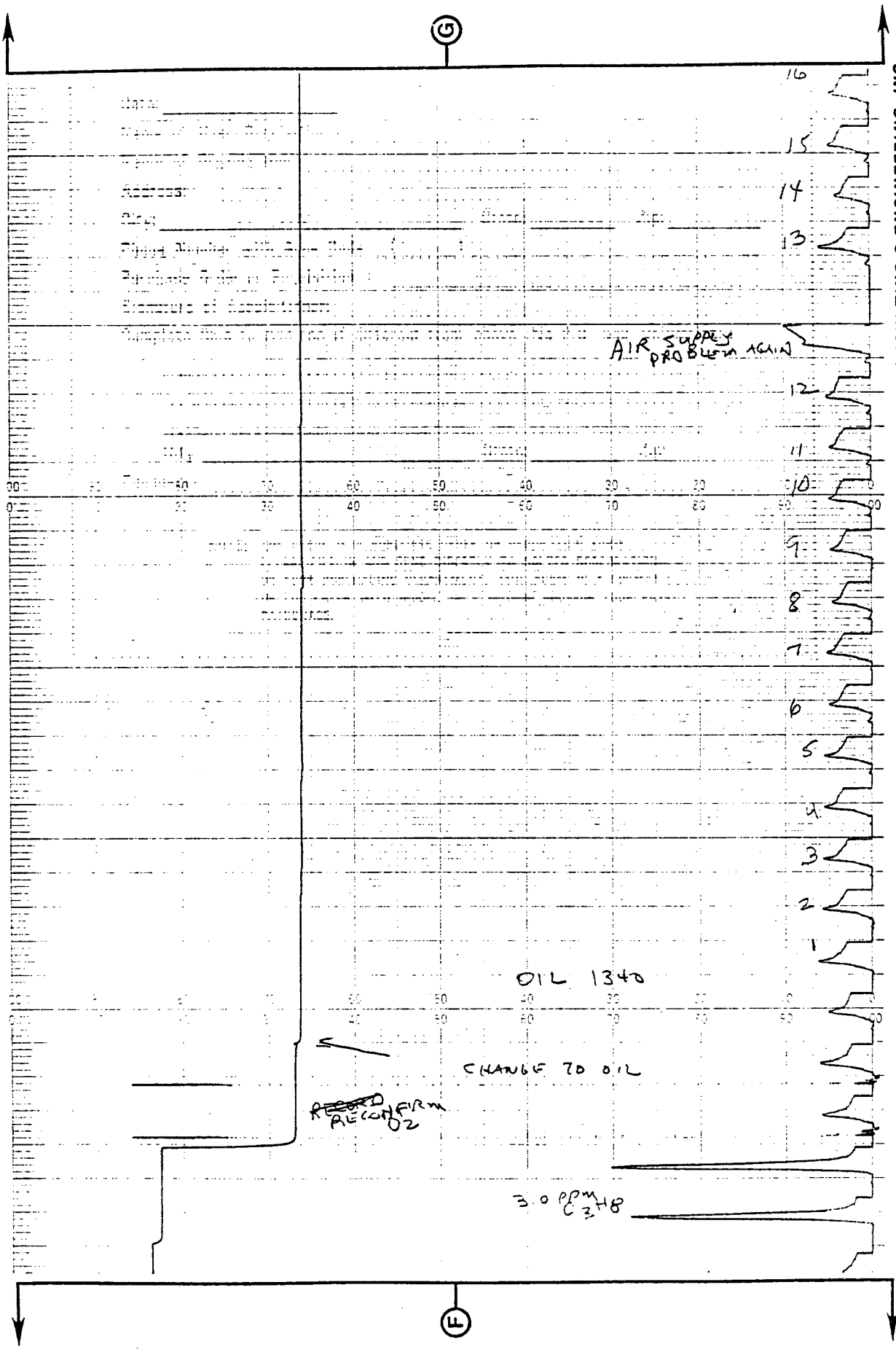
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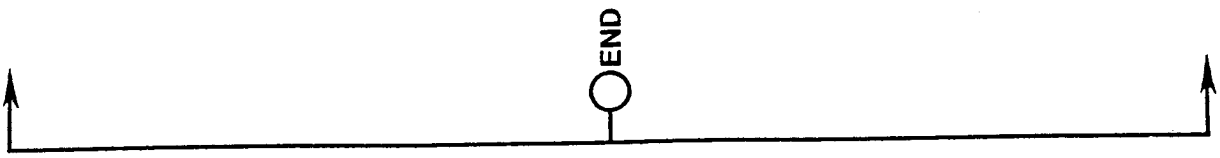
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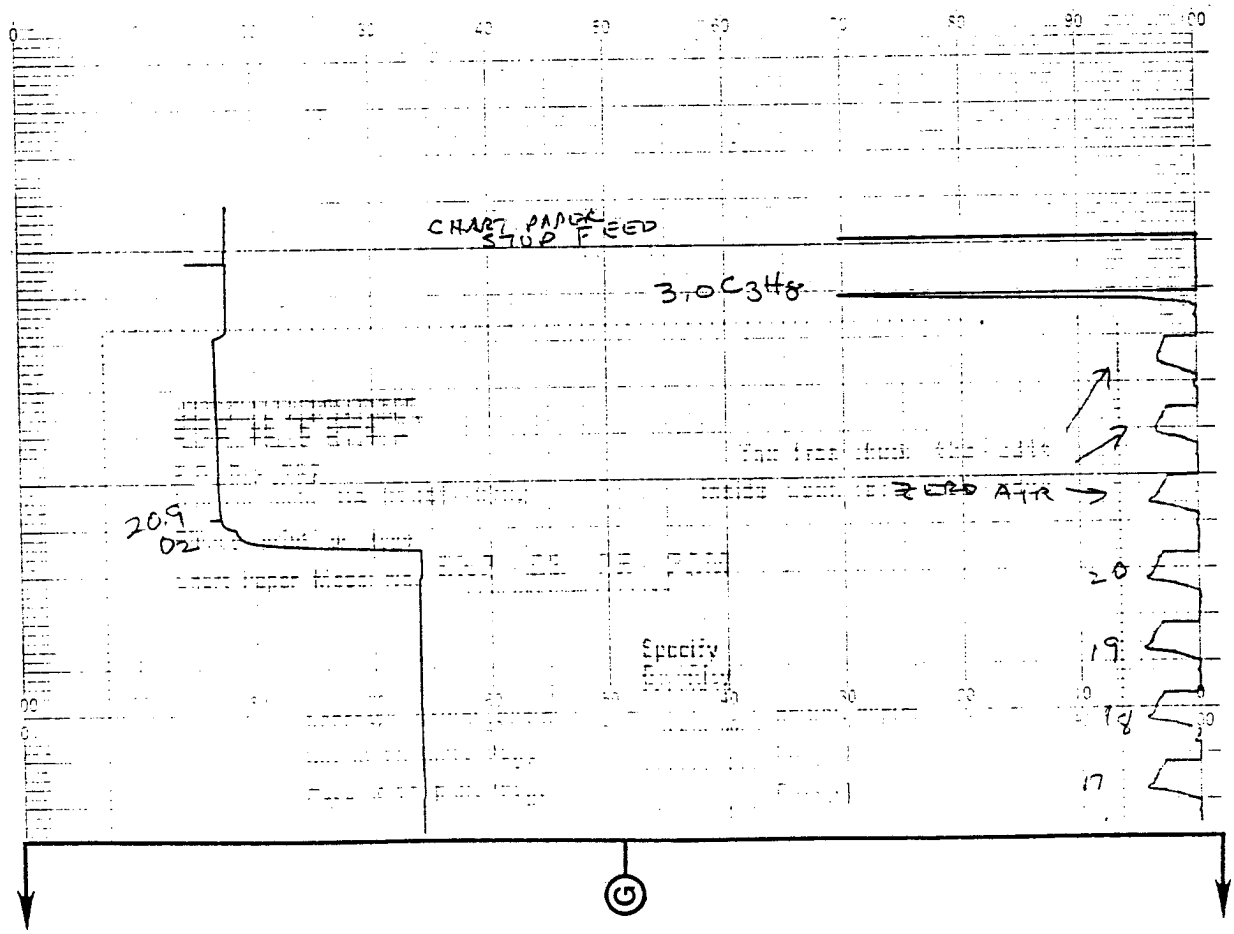


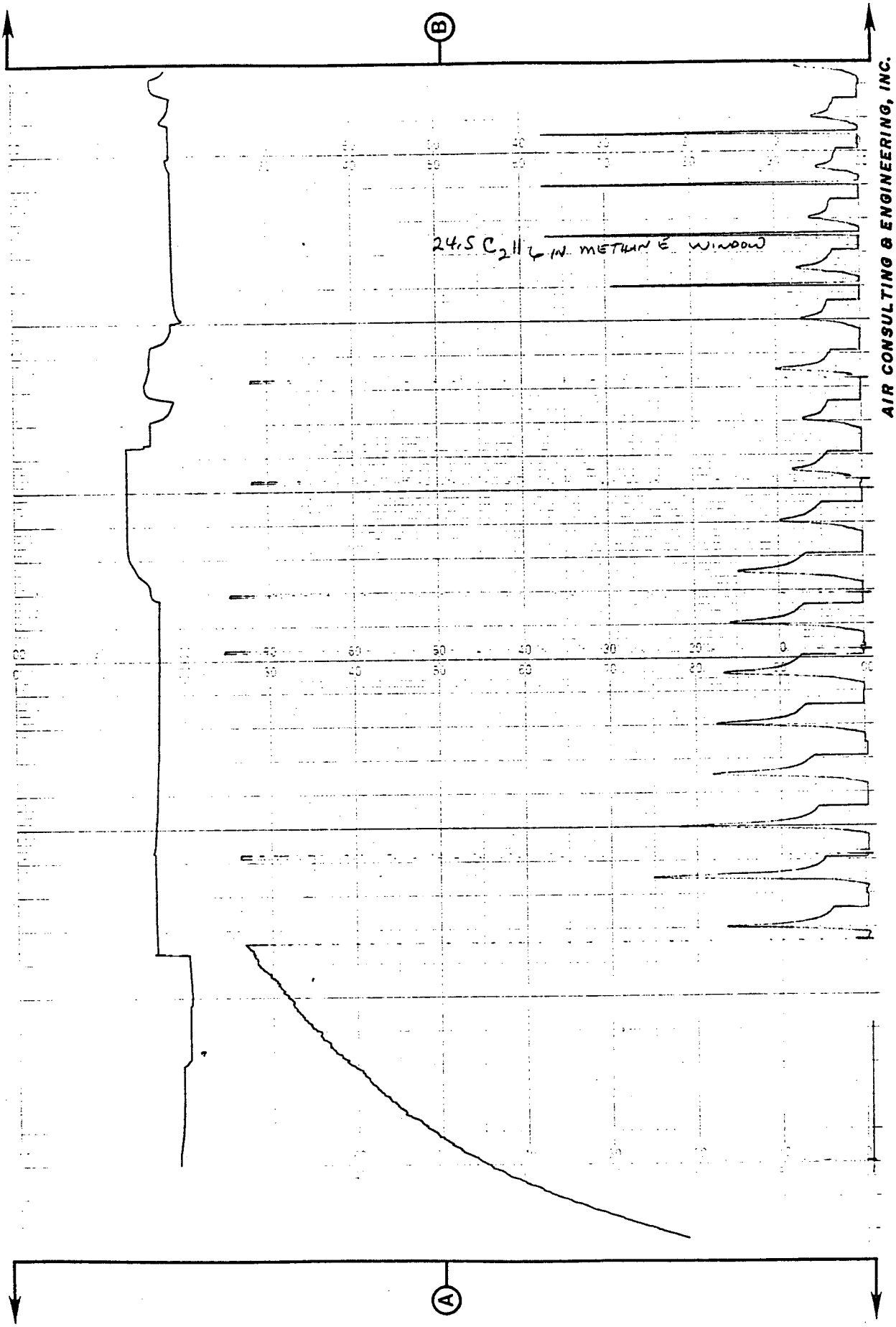
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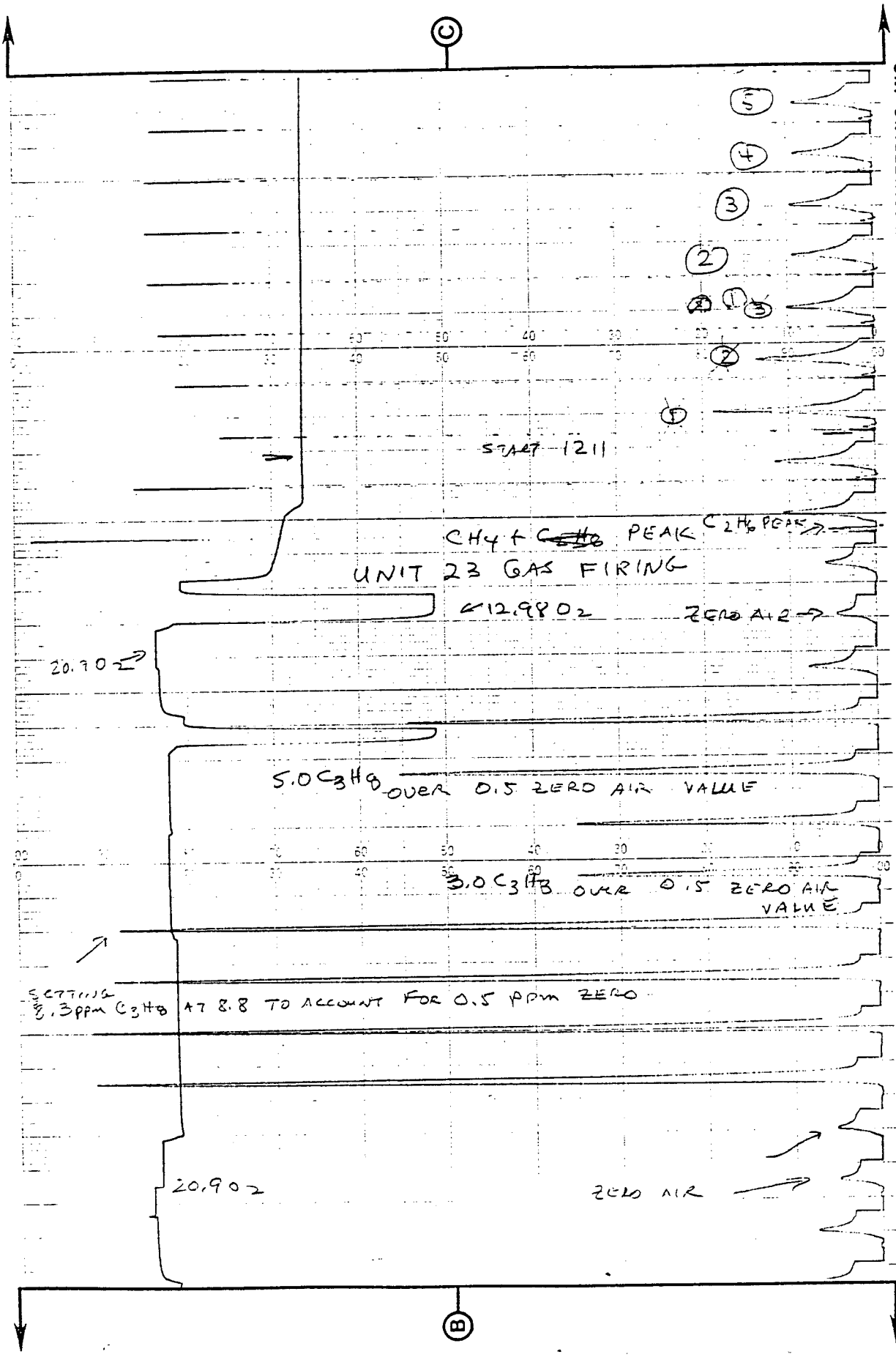
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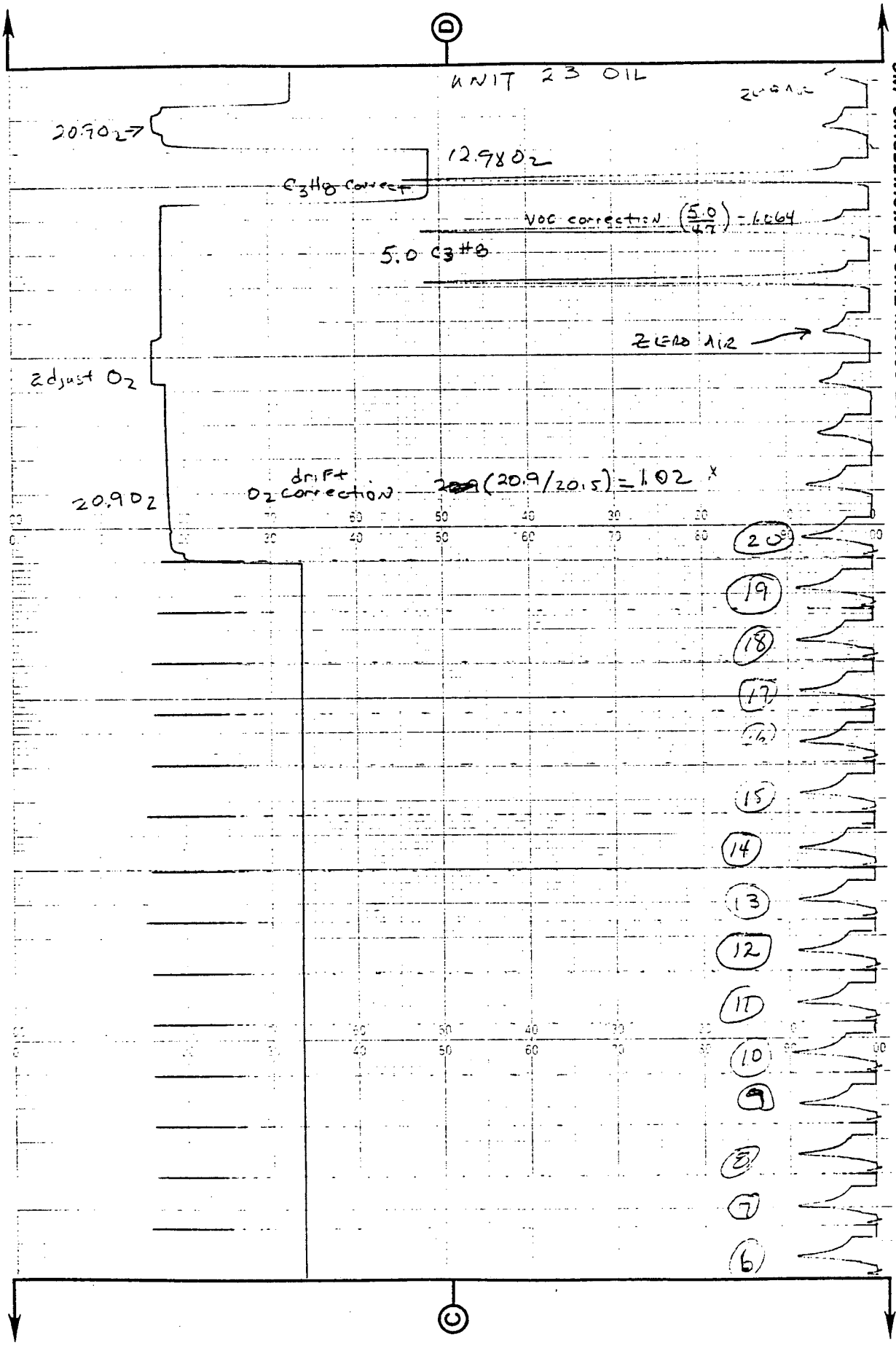

CHART PAPER STUD FEED
3.0 C3H8
RECD AIR
20.9
O2
20
19
18
17



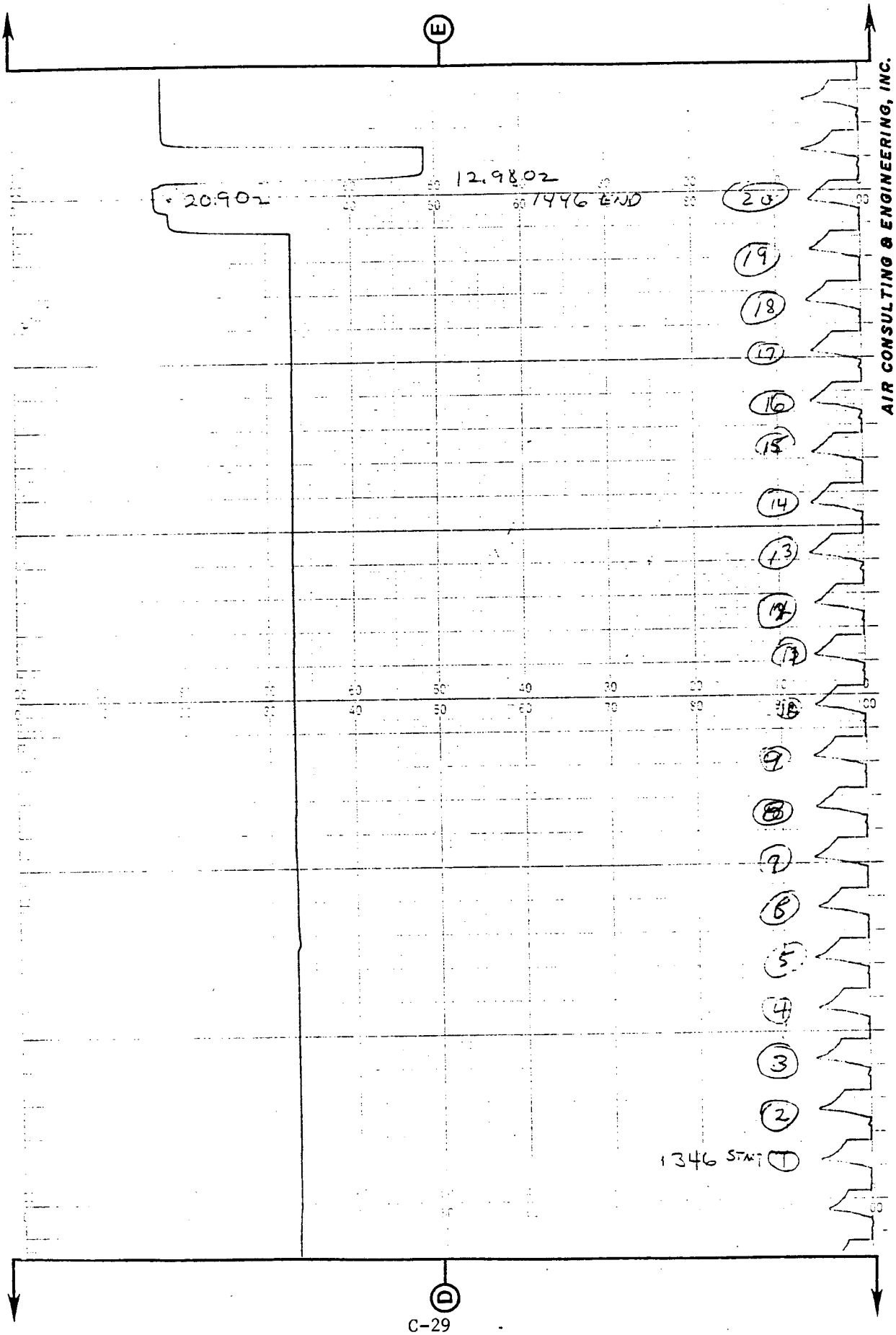
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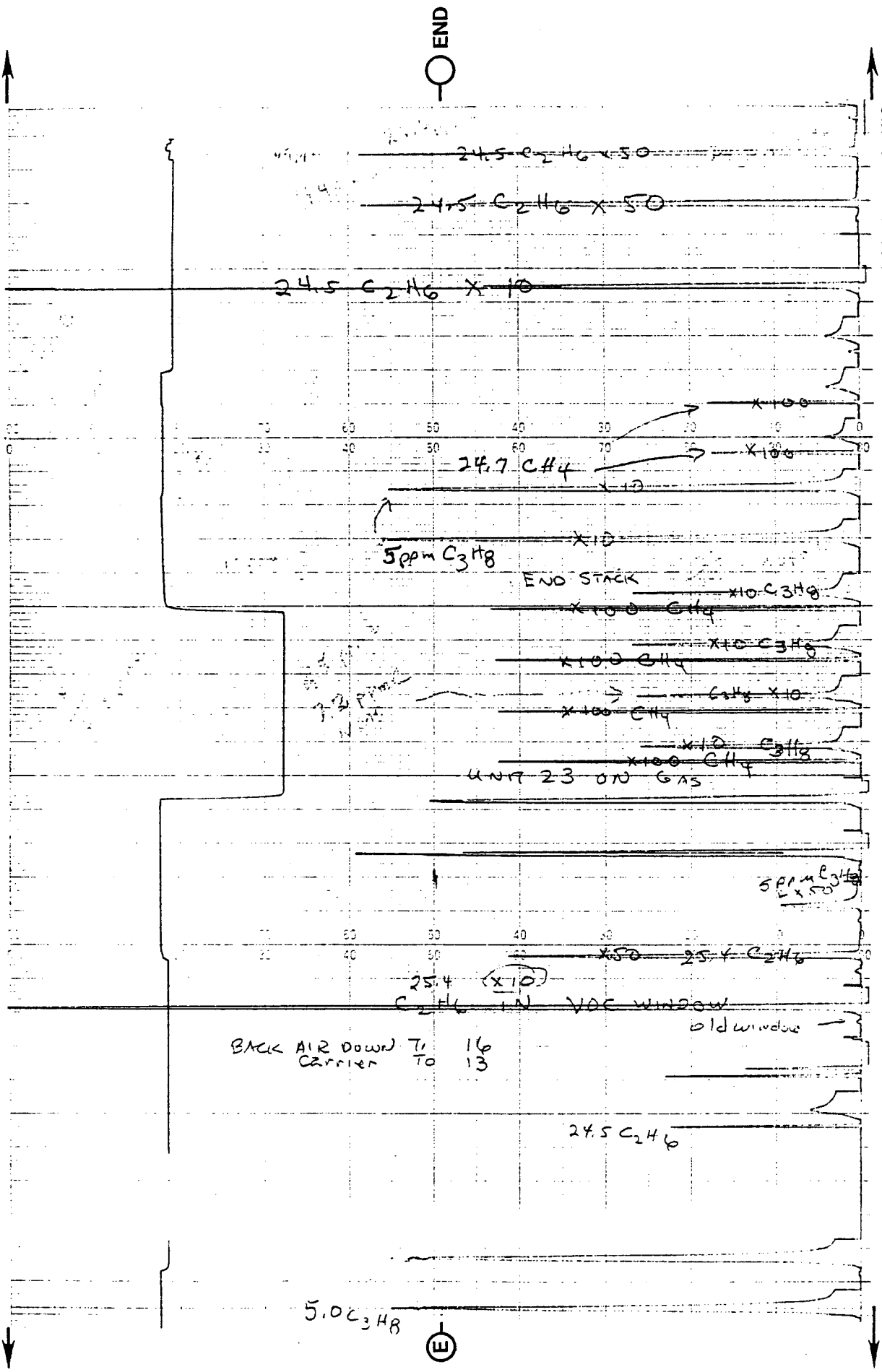
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AIR CONSULTING & ENGINEERING, INC.

ANALYTICAL REPORT – cont'd

AIR CONSULTING
ATTN: STEVE NECK

Date: 3/27/87
Our Project No.: 338458
Your P.O. No.: 87102

Cyl. No. AAL-14506	Analytical Accuracy ±1%
Component	Concentration
PROPANE	4.998 PPM
AIR	BALANCE
NBS TRACEABLE	

Cyl. No.	Analytical Accuracy
Component	Concentration

Cyl. No. AAL-11220 L	Analytical Accuracy ±1%
Component	Concentration
PROPANE	3.001 PPM
AIR	BALANCE
NBS TRACEABLE	

Cyl. No.	Analytical Accuracy
Component	Concentration

Cyl. No.	Analytical Accuracy
Component	Concentration

Cyl. No.	Analytical Accuracy
Component	Concentration

Analyst John T. Sanson
JOHN SANSON

Approved By
FRANCIS E. NEVILL

CERTIFIED REFERENCE MATERIALS EPA PROTOCOL GASES
ACUBLEND® CALIBRATION & SPECIALTY GAS MIXTURES PURE GASES
ACCESSORY PRODUCTS CUSTOM ANALYTICAL SERVICES

The only liability of this Company for gas which fails to comply with this analysis shall be replacement thereof by the Company without extra cost.

Scott Specialty Gases

PLUMSTEADVILLE, PA. 18949 PHONE: 215-766-8861 TWX: 510-665-9344

Date Shipped 7/26/88
Our Project No: 4082
Your P.O. No: 88-156
Page 1 of 3

Air Consulting & Engr
Attn Steve Neck
Suite #4
2106E NW 67th Place
Gainsville FL 32606

CERTIFICATE OF ANALYSIS – EPA PROTOCOL GASES*

(Concentrations are in mole % or ppm)

Cylinder Number AAL-17097 Certified Accuracy ± 1 % NBS Traceable Analysis Dates: First 7/22/88 Last NR

CP=2000 psig

COMPONENTS	CERTIFIED CONC	EXPIRATION DATE	ANALYTICAL PRINCIPLE	PRIMARY STANDARD NBS/SRM's	REPLICATE CONCENTRATIONS FIRST	SECOND
Propane	8.30 ppm	1/22/90	F. I. D.	1665/1666	8.301 ppm	-
Air	Balance				8.291 ppm	-
					8.312 ppm	-

C-32

Cylinder Number AAL-4045 Certified Accuracy ± 1 % NBS Traceable Analysis Dates: First 7/5/88 Last NR

CP=2000 psig

COMPONENTS	CERTIFIED CONC	EXPIRATION DATE	ANALYTICAL PRINCIPLE	PRIMARY STANDARD NBS/SRM's	REPLICATE CONCENTRATIONS FIRST	SECOND
Propane	29.8 ppm	1/5/90	F. I. D.	1667	29.72 ppm	-
Air	Balance				29.82 ppm	-
					29.85 ppm	-

*We hereby certify the cylinder gas has been analyzed according to EPA Protocol No: 1-Procedure G-1

Analyst Tom Sassaman Approved By Mark S. Sirinides

The only liability of this Company for gas which fails to comply with this analysis shall be replacement thereof by the Company without extra cost.

CERTIFIED REFERENCE MATERIALS ■ EPA PROTOCOL GASES ■ ACUBLEND® ■ CALIBRATION & SPECIALTY GAS MIXTURES
PURE GASES ■ ACCESSORY PRODUCTS ■ CUSTOM ANALYTICAL SERVICES

TROY, MICHIGAN / SAN BERNARDINO, CALIFORNIA / HOUSTON, TEXAS / WHEELING, ILLINOIS
SOUTH PLAINFIELD, NEW JERSEY / FREMONT, CALIFORNIA / WAKEFIELD, MASSACHUSETTS / LONGMONT, COLORADO

APPENDIX D

APPLICATION TO OPERATE/CONSTRUCT AIR POLLUTION SOURCES

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

APPLICATION TO OPERATE/CONSTRUCT AIR POLLUTION SOURCES

SOURCE TYPE: 4-Heat Recovery Steam Generators & 4-Combustion Turbines [ ] New[1] [ ] Existing[1]

APPLICATION TYPE: [ ] Construction [ ] Operation [ ] Modification

COMPANY NAME: Florida Power & Light Company COUNTY: Broward

Identify the specific emission point source(s) addressed in this application (i.e. Lime Kiln No. 4 with Venturi Scrubber; Peaking Unit No. 2, Gas Fired) HRSG Stack

SOURCE LOCATION: Street S.W. 42nd St.; 2 miles west of Ravenswood Rd. City N.A.

UTM: East 580,200 North 2,883,300

Latitude 26 ° 4 ' 5 "N Longitude 80 ° 11 ' 54 "W

APPLICANT NAME AND TITLE: Charles D. Henderson, P.E.

APPLICANT ADDRESS: P.O. Box 078768, West Palm Beach, Florida 33407-0768

SECTION I: STATEMENTS BY APPLICANT AND ENGINEER

A. APPLICANT

I am the undersigned owner or authorized representative* of _____

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 maintain and operate the pollution control source and pollution control facilities in such a manner as to comply with the provision of Chapter 403, Florida Statutes, and all the 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 establishment.

*Attach letter of authorization

Signed: _____

_____
Name and Title (Please Type)

Date: _____ Telephone No. _____

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

This is to certify that the engineering features of this pollution control project have been designed/examined by me and found to be in conformity with modern engineering principles applicable to the treatment and disposal of pollutants characterized in the permit application. There is reasonable assurance, in my professional judgment, that

[1] See Florida Administrative Code Rule 17-2.100(57) and (104)

the pollution control facilities, when properly maintained and operated, will discharge an effluent that complies with all applicable statutes of the State of Florida and the rules and regulations of the department. It is also agreed that the undersigned will furnish, if authorized by the owner, the applicant a set of instructions for the proper maintenance and operation of the pollution control facilities and, if applicable, pollution sources.

Signed_____

_____
Name (Please Type)

_____
Company Name (Please Type)

_____
Mailing Address (Please Type)

Florida Registration No._____ Date:_____ Telephone No._____

SECTION II: GENERAL PROJECT INFORMATION

A. Describe the nature and extent of the project. Refer to pollution control equipment, and expected improvements in source performance as a result of installation. State whether the project will result in full compliance. Attach additional sheet if necessary.

Refer to Sections 2.1 and 2.2

B. Schedule of project covered in this application (Construction Permit Application Only)

Start of Construction March 1, 1991 Completion of Construction 1993

C. Costs of pollution control system(s): (Note: Show breakdown of estimated costs only for individual components/units of the project serving pollution control purposes. Information on actual costs shall be furnished with the application for operation permit.)

Refer to Section 4.3.1

D. Indicate any previous DER permits, orders and notices associated with the emission point, including permit issuance and expiration dates.

See Table 2.1-1 and Appendix 10.4 in SCA

Note: Reference to sections are made to Air Permit Application report unless otherwise noted.

E. Requested permitted equipment operating time: hrs/day_____; days/wk_____; wks/yr_____;

if power plant, hrs/yr_____; if seasonal, describe:_____

See Section 2.3 and Table 2-7

F. If this is a new source or major modification, answer the following questions. (Yes or No)

1. Is this source in a non-attainment area for a particular pollutant? Yes

   a. If yes, has "offset" been applied? No

   b. If yes, has "Lowest Achievable Emission Rate" been applied? No

   c. If yes, list non-attainment pollutants. Volatile Organic Compounds

2. Does best available control technology (BACT) apply to this source? If yes, see Section VI. Yes

3. Does the State "Prevention of Significant Deterioriation" (PSD) requirement apply to this source? If yes, see Sections VI and VII. Yes

4. Do "Standards of Performance for New Stationary Sources" (NSPS) apply to this source? Yes

5. Do "National Emission Standards for Hazardous Air Pollutants" (NESHAP) apply to this source? No

H. Do "Reasonably Available Control Technology" (RACT) requirements apply to this source? No

   a. If yes, for what pollutants?_____

   b. If yes, in addition to the information required in this form, any information requested in Rule 17-2.650 must be submitted.

Attach all supportive information related to any answer of "Yes". Attach any justification for any answer of "No" that might be considered questionable.

See Section 3.0

SECTION III: AIR POLLUTION SOURCES & CONTROL DEVICES (Other than Incinerators)

A. Raw Materials and Chemicals Used in your Process, if applicable: Not Applicable

Description	Contaminants		Utilization Rate - lbs/hr	Relate to Flow Diagram
	Type	% Wt		

B. Process Rate, if applicable: (See Section V, Item 1)

1. Total Process Input Rate (lbs/hr): _____

2. Product Weight (lbs/hr): _____

C. Airborne Contaminants Emitted: (Information in this table must be submitted for each emission point, use additional sheets as necessary)

See Table 2-6 and Figure 2-1

Name of Contaminant	Emission[1]		Allowed[2] Emission Rate per Rule 17-2	Allowable[3] Emission lbs/hr	Potential[4] Emission		Relate to Flow Diagram
	Maximum lbs/hr	Actual T/yr			lbs/hr	T/yr	

[1]See Section V, Item 2.

[2]Reference applicable emission standards and units (e.g. Rule 17-2.600(5)(b)2. Table II, E. (1) - 0.1 pounds per million BTU heat input)

[3]Calculated from operating rate and applicable standard.

[4]Emission, if source operated without control (See Section V, Item 3).

D. Control Devices: (See Section V, Item 4) See Section 4.0

Name and Type (Model & Serial No.)	Contaminant	Efficiency	Range of Particles Size Collected (in microns) (If applicable)	Basis for Efficiency (Section V Item 5)

E. Fuels See Table 2-1 and Tables A-1 through A-8

Type (Be Specific)	Consumption*		Maximum Heat Input (MMBTU/hr)
	avg/hr	max./hr	

*Units: Natural Gas--MMCF/hr; Fuel Oils--gallons/hr; Coal, wood, refuse, other--lbs/hr.

Fuel Analysis: See Tables 2-8 and 2-9

Percent Sulfur:_____ Percent Ash:_____

Density: _____ lbs/gal Typical Percent Nitrogen:_____

Heat Capacity: _____ BTU/lb _____ BTU/gal

Other Fuel Contaminants (which may cause air pollution):_____

_____

F. If applicable, indicate the percent of fuel used for space heating.

Annual Average _____ Maximum _____

G. Indicate liquid or solid wastes generated and method of disposal.

_____

_____

_____

_____

H. Emission Stack Geometry and Flow Characteristics (Provide data for each stack):
See Table 2-1

Stack Height: _____ ft. Stack Diameter: _____ ft.

Gas Flow Rate: _____ ACFM _____ DSCFM Gas Exit Temperature: _____ °F.

Water Vapor Content: _____ % Velocity: _____ FPS

SECTION IV: INCINERATOR INFORMATION Not Applicable

Type of Waste	Type 0 (Plastics)	Type I (Rubbish)	Type II (Refuse)	Type III (Garbage)	Type IV (Pathological)	Type V (Liq.& Gas By-prod.)	Type VI (Solid By-prod.)
Actual lb/hr Incinerated							
Uncontrolled (lbs/hr)							

Description of Waste _____

Total Weight Incinerated (lbs/hr) _____ Design Capacity (lbs/hr) _____

Approximate Number of Hours of Operation per day _____ day/wk _____ wks/yr. _____

Manufacturer _____

Date Constructed _____ Model No. _____

	Volume $(ft)^3$	Heat Release (BTU/hr)	Fuel		Temperature (°F)
			Type	BTU/hr	
Primary Chamber					
Secondary Chamber					

Stack Height: _____ ft. Stack Diamter: _____ Stack Temp. _____

Gas Flow Rate: _____ ACFM _____ DSCFM* Velocity: _____ FPS

*If 50 or more tons per day design capacity, submit the emissions rate in grains per standard cubic foot dry gas corrected to 50% excess air.

Type of pollution control device: [ ] Cyclone [ ] Wet Scrubber [ ] Afterburner

[ ] Other (specify) _____

DER Form 17-1.202(1)
Effective November 30, 1982 Page 6 of 12

Brief description of operating characteristics of control devices: _____

_____

_____

_____

_____

Ultimate disposal of any effluent other than that emitted from the stack (scrubber water, ash, etc.):

_____

_____

_____

_____

NOTE: Items 2, 3, 4, 6, 7, 8, and 10 in Section V must be included where applicable.

SECTION V: SUPPLEMENTAL REQUIREMENTS

Please provide the following supplements where required for this application.

1. Total process input rate and product weight -- show derivation [Rule 17-2.100(127)]

2. To a construction application, attach basis of emission estimate (e.g., design calculations, design drawings, pertinent manufacturer's test data, etc.) and attach proposed methods (e.g., FR Part 60 Methods 1, 2, 3, 4, 5) to show proof of compliance with applicable standards. To an operation application, attach test results or methods used to show proof of compliance. Information provided when applying for an operation permit from a construction permit shall be indicative of the time at which the test was made. See Tables A-1 through A-8

3. Attach basis of potential discharge (e.g., emission factor, that is, AP42 test).
   See Tables A-1 through A-8

4. With construction permit application, include 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.)
   See Tables A-1 and A-4 for wet injection rates

5. With construction permit application, attach derivation of control device(s) efficiency. Include test or design data. Items 2, 3 and 5 should be consistent: actual emissions = potential (1-efficiency).
   See Tables A-1, A-2, A-4 and A-5

6. An 8 1/2" x 11" flow diagram which will, without revealing trade secrets, identify the individual operations and/or processes. Indicate where raw materials enter, where solid and liquid waste exit, where gaseous emissions and/or airborne particles are evolved and where finished products are obtained.
   See Figure 2-1

7. An 8 1/2" x 11" plot plan showing the location of the establishment, and points of airborne emissions, in relation to the surrounding area, residences and other permanent structures and roadways (Example: Copy of relevant portion of USGS topographic map).
   See Figure 1-2

8. An 8 1/2" x 11" plot plan of facility showing the location of manufacturing processes and outlets for airborne emissions. Relate all flows to the flow diagram.
   See Figure 2-3

9. The appropriate application fee in accordance with Rule 17-4.05. The check should be made payable to the Department of Environmental Regulation. Not Applicable

10. With an application for operation permit, attach a Certificate of Completion of Construction indicating that the source was constructed as shown in the construction permit.

SECTION VI: BEST AVAILABLE CONTROL TECHNOLOGY

A. Are standards of performance for new stationary sources pursuant to 40 C.F.R. Part 60 applicable to the source?

[X] Yes [ ] No

Contaminant	Rate or Concentration
See Section 4.2 and Table 4-1	

B. Has EPA declared the best available control technology for this class of sources (If yes, attach copy)

[X] Yes [ ] No

Contaminant	Rate or Concentration
See Section 4.3 and Table 4-2	

C. What emission levels do you propose as best available control technology?

Contaminant	Rate or Concentration
See Tables A-1 through A-8	

D. Describe the existing control and treatment technology (if any). Not Applicable

1. Control Device/System:
2. Operating Principles:
3. Efficiency:*
4. Capital Costs:

*Explain method of determining

5. Useful Life:

6. Operating Costs:

7. Energy:

8. Maintenance Cost:

9. Emissions:

Contaminant	Rate or Concentration

10. Stack Parameters

a. Height: ft.

b. Diameter: ft.

c. Flow Rate: ACFM

d. Temperature: °F.

e. Velocity: FPS

E. Describe the control and treatment technology available (As many types as applicable, use additional pages if necessary). See Section 4.3

1.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

2.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

[1]Explain method of determining efficiency.
[2]Energy to be reported in units of electrical power - KWH design rate.

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

3.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

4.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Costs:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

F. Describe the control technology selected: See Section 4.3

1. Control Device:

2. Efficiency:[1]

3. Capital Cost:

4. Useful Life:

5. Operating Cost:

6. Energy:[2]

7. Maintenance Cost:

8. Manufacturer:

9. Other locations where employed on similar processes:

a. (1) Company:

(2) Mailing Address:

(3) City:

(4) State:

[1]Explain method of determining efficiency.
[2]Energy to be reported in units of electrical power - KWH design rate.

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:[1]

Contaminant	Rate or Concentration

(8) Process Rate:[1]

b. (1) Company:

(2) Mailing Address:

(3) City: (4) State:

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:[1]

Contaminant	Rate or Concentration

(8) Process Rate:[1]

10. Reason for selection and description of systems:

[1]Applicant must provide this information when available. Should this information not be available, applicant must state the reason(s) why.

SECTION VII - PREVENTION OF SIGNIFICANT DETERIORATION

A. Company Monitored Data See Section 5.0 and Appendix 10.5.1

1. _____no. sites _____ TSP _____( ) SO^{2}* _____ Wind spd/dir

Period of Monitoring _____/_____/_____ to _____/_____/_____
month day year month day year

Other data recorded _____

Attach all data or statistical summaries to this application.

*Specify bubbler (B) or continuous (C).

2. Instrumentation, Field and Laboratory

a. Was instrumentation EPA referenced or its equivalent? [ ] Yes [ ] No

b. Was instrumentation calibrated in accordance with Department procedures?

[ ] Yes [ ] No [ ] Unknown

B. Meteorological Data Used for Air Quality Modeling See Section 6.3

1. _____ Year(s) of data from ____/____/____ to ____/____/____
month day year month day year

2. Surface data obtained from (location)_____

3. Upper air (mixing height) data obtained from (location)_____

4. Stability wind rose (STAR) data obtained from (location)_____

C. Computer Models Used See Section 6.2

1. _____ Modified? If yes, attach description.

2. _____ Modified? If yes, attach description.

3. _____ Modified? If yes, attach description.

4. _____ Modified? If yes, attach description.

Attach copies of all final model runs showing input data, receptor locations, and principle output tables.

D. Applicants Maximum Allowable Emission Data See Section 6.4

Pollutant	Emission Rate	
TSP	_____	grams/sec
SO^2	_____	grams/sec

E. Emission Data Used in Modeling See Section 6.4

Attach list of emission sources. Emission data required is source name, description of point source (on NEDS point number), UTM coordinates, stack data, allowable emissions, and normal operating time.

F. Attach all other information supportive to the PSD review.

G. Discuss the social and economic impact of the selected technology versus other applicable technologies (i.e., jobs, payroll, production, taxes, energy, etc.). Include assessment of the environmental impact of the sources. See Section 4.3

H. Attach scientific, engineering, and technical material, reports, publications, journals, and other competent relevant information describing the theory and application of the requested best available control technology.

See Section 4.3

APPENDIX E

DOCUMENTATION OF VOC EMISSIONS FROM MISCELLANEOUS TANKS AND SOLVENT CLEANING OPERATIONS

June 20, 1990

Mr. C.H. Fancy, P.E.
Chief, Bureau of Air Regulation
Florida Department of Environmental Regulation
2600 Blair Stone Road
Tallahassee, FL 32399-2400

RE: AC06-179848, FPL Lauderdale Plant Modification

Dear Mr. Fancy:

FPL has received the Department's completeness letter dated May 15, 1990, concerning the above-referenced permit application. FPL's responses to these questions are contained herein. Before responding to the Department's specific questions, a few points of clarification are first offered.

The first point of clarification is that FPL is not requesting an increase of 99.9 tons per year (TPY), as stated by the Department in the letter. The application only requests a 5.41 TPY increase in VOC emissions (page 2 of Attachment A). This increase is the result of comparing present actual to future potential emissions for only the tanks which are being "modified" (Tank No. 3 and Tank No. 4). "Modified" in this sense refers to the definition of modification in F.A.C. 17-2.100: a physical change or change in the method of operation which increases emissions. Increases in the hours of operation or in the production rate of a source are excluded from the term modification. This is why Tank No. 2 and Tank No. 5 were not included in the calculation of the increase in emissions; these tanks are not undergoing a physical change or change in the method of operation, they are only potentially changing production rate. Currently, the tanks have no federally enforceable restrictions on operating hours or production rate.

It is further noted that the approach of comparing present actual to future potential emissions is currently mandated by EPA, and therefore this approach was used. However, the courts have recently ruled that this approach may not be appropriate (WEPCO decision).

The 5.41 TPY increase in VOC emissions is well below the nonattainment new source review thresholds of 40 TPY if the modification is to an existing major source or 100 TPY if the modification is to an existing minor source.

The second point of clarification is that the primary reason for submitting the permit application is to impose a federally enforceable permit limit of 99.9 TPY VOC on the facility. This will render the existing facility as a "minor" source. The Lauderdale facility has always been a minor VOC source, as documented in the application; however, there are no federally enforceable

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permit limitations to limit emissions to this level. The 99.9 TPY rate stated in the application does not represent an "increase" but merely limits future emissions to this level.

Responses to FDER's specific questions are provided below:

1. A listing of auxiliary storage tanks at Lauderdale is presented in Table 1. The additional tanks consist of the existing gas turbine dump tanks, the fuel oil metering tanks for Units 4 and 5, and two underground storage tanks for vehicle fuel. None of these tanks is being modified (i.e., no physical change or change in the method of operation) at this time; therefore, there is no increase in VOC emissions from these tanks. (Note: the two underground tanks will be removed and replaced with similar tanks at another on-site location). However, VOC emissions from the auxiliary tanks would be included in determining if the existing facility is a minor source (i.e., less than 100 TPY). To this end, maximum potential VOC emissions from these tanks are quantified in Table 1. As shown, the potential VOC emission rate from these sources is 0.018 TPY.

2. As described in the comments above, Tank No. 5 at Lauderdale is not being modified; therefore, this tank is not considered in determining the net emissions increase. This is also explained on Page 2 of Attachment A in the application.

3. FPL uses mineral spirits and Penetone 58 at several locations within the Lauderdale facility. All uses are for parts cleaning. A list of these areas and maximum solvent usage for each is provided below:

a.	GT machine shop (mineral spirits)	10 gal	65 lb	0.033 TPY
b.	Filter cleaning station (mineral spirits)	20 gal	129 lb	0.065 TPY
c.	Burner cleaning area (Penetone 58)	50 gal	495 lb	0.248 TPY
d.	R/R track area (mineral spirits)	90 gal	581 lb	0.290 TPY
e.	Fuel Blowback- plant (mineral sprts)	15 gal	97 lb	0.048 TPY
f.	Fuel blowback- site 2 (mineral sprts)	65 gal	419 lb	0.210 TPY
	TOTALS	250 gal	1786 lb	0.893 TPY

It can be conservatively assumed that all solvent used escapes to the atmosphere. As a result, the maximum VOC emission rate from the solvent cleaning operations is 0.893 TPY.

The solvent cleaning operations are not being modified and, therefore, do not enter into the calculations of net VOC emission increase.

4. All known VOC sources at the Lauderdale site are described above and in the application. There are no other known VOC sources at the site.

5. Based upon the above discussion, the VOC emission increase of 5.41 TPY documented in the permit application remains correct. However, the permit

KBN

limitation for the Lauderdale facility does change based on the additional VOC emissions from the miscellaneous operations. Since future potential VOC emissions from the fuel storage tanks (Nos. 2, 3, and 5) have been calculated to be 9.8 TPY (see permit application Table 1) and potential VOC emissions from the miscellaneous tanks and solvent cleaning operations have been calculated to be 0.018 TPY and 0.893 TPY, respectively, the permit limitation requested by FPL for existing Units 4 and 5 and GTs 1-24 is 89.2 TPY (99.9 - 9.8 - 0.018 - 0.893). The permit limitation thus becomes:

$$(HI_{U4\&5NG} \times EF_{U4\&5NG}) + (HI_{U4\&5OIL} \times EF_{U4\&5OIL}) + (HI_{GTNG} \times EF_{GTNG}) + (HI_{GTOIL} \times EF_{GTOIL}) \leq 89.2 \text{ TPY}$$

where:

$HI_{4\&5NG}$ = Heat Input to Units 4 and 5 due to natural gas firing,
$HI_{U4\&5OIL}$ = Heat Input to Units 4 and 5 due to No. 6 oil firing,
HI_{GTNG} = Heat Input to GT's 1-24 due to natural gas firing,
HI_{GTOIL} = Heat Input to GT's 1-24 due to No. 2 oil firing,
$EF_{U4\&5NG}$ = VOC emission factor for Units 4 & 5 for natural gas firing,
$EF_{U4\&5OIL}$ = VOC emission factor for Units 4 & 5 for No. 6 oil firing,
EF_{GTNG} = VOC emission factor for GT's 1-24 for natural gas firing,
EF_{GTOIL} = VOC emission factor for GT's 1-24 for No. 2 oil firing.

Please call if you have any questions concerning this additional information.

Sincerely,

David A. Buff

David A. Buff, P.E.
Principal Engineer

DAB/tyf

cc: M.A. Smith, Ph.D. (FPL)
C.D. Henderson, P.E. (FPL)
P. Cunningham, Esq. (HBG&S)

Table 1. Maximum Potential Emissions of VOCs from Miscellaneous Storage Tanks, FPL Lauderdale

Parameter	Gas Turbine Dump Tanks[a] (2)	Fuel Oil Metering Tanks (3)	Unleaded Gasoline[a] (1)	Diesel Fuel[a] (1)
Type of Liquid Stored	No. 2 Fuel Oil	No. 6 Fuel Oil	No. 2 Oil	No. 2 Oil
Tank Volume (gallons)	1,500	252,000	4,000	1,000
Total Annual Throughput (gallons)	300,000	192,642,943	10,000	5,000
Turnovers Per Year	200.0	764.5	2.5	5.0
Molecular Weight of Vapor	130	190	130	130
Storage Temperature (°F)	75	75	75	75
Vapor Pressure at Storage Temperature (psia)	0.0105	0.000075	0.0105	0.0105
Tank Diameter (ft)	5.3	30.0	8.0	4.0
Average Vapor Space Hgt. (ft)	2.0	6.0	2.0	1.5
Average Diurnal Temperature Change (°F)	20	20	20	20
Paint Factor	1.30	1.40	1.33	1.33
Product Factor	1.0	1.0	1.0	1.0
Turnover Factor	0.30	0.23	1.0	1.0
Breathing Losses (lb/yr)	3.2	6.1	6.6	1.7
(TPY)	0.002	0.003	0.003	0.001
Working Losses (lb/yr)	2.9	15.2	0.3	0.2
(TPY)	0.001	0.008	0.000	0.000
Total Emissions (TPY)	0.003	0.011	0.003	0.001

[a]Underground tanks.

July 1, 1990

Mr. C. H. Fancy, P.E.
Chief, Bureau of Air Regulation
Florida Department of Environmental Regulation
2600 Blair Stone Road
Tallahassee, FL 32399-2400

RE: AC06-179848, FPL Lauderdale Plant Modification

Dear Mr. Fancy:

It has come to our attention that there was a minor error in Table 1 contained in my letter of June 20, 1990, regarding the above-referenced permit application. The error was in the calculation of VOC emissions for the unleaded gasoline tank at Lauderdale. An incorrect vapor pressure was used in the table and associated calculation of VOC emissions. This caused an underestimation of VOC emissions from this tank.

A corrected Table 1 is attached, which shows the revised VOC emissions. Since the unleaded gasoline tank is located underground, the average diurnal temperature change experienced by the tank was assumed to be zero. This eliminates breathing losses from the tank. The revised working loss, and total VOC emissions, from the tank is 0.106 tons per year (TPY). This revises the total VOC emissions due to all the miscellaneous tanks shown in Table 1 to 0.121 TPY.

All other VOC emission calculations presented in the June 20 letter remain unchanged. However, the above change again necessitates a slight revision in the proposed VOC permit limitation equation for the Lauderdale facility. The revised permit limitation for existing Units 4 and 5 and GTs 1 to 24 becomes 89.1 TPY (99.9 - 9.8 - 0.121 - 0.893).

The permit limitation in equation form thus becomes:

$$(HI_{U4\&5NG} \times EF_{U4\&5NG}) + (HI_{U4\&5OIL} \times EF_{U4\&5OIL}) + (HI_{GTNG} \times EF_{GTNG}) + (HI_{GTOIL} \times EF_{GTOIL}) \leq 89.1 \text{ TPY}$$

where:
$HI_{4\&5NG}$ = Heat Input to Units 4 and 5 due to natural gas firing,
$HI_{U4\&5OIL}$ = Heat Input to Units 4 and 5 due to No. 6 oil firing,
HI_{GTNG} = Heat Input to GT's 1-24 due to natural gas firing,
HI_{GTOIL} = Heat Input to GT's 1-24 due to No. 2 oil firing,
$EF_{U4\&5NG}$ = VOC emission factor for Units 4 & 5 for natural gas firing,
$EF_{U4\&5OIL}$ = VOC emission factor for Units 4 & 5 for No. 6 oil firing,
EF_{GTNG} = VOC emission factor for GT's 1-24 for natural gas firing,
EF_{GTOIL} = VOC emission factor for GT's 1-24 for No. 2 oil firing.

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I apologize for any inconvenience this may have caused you. Please call if you have any questions.

Sincerely,

David A. Buff

David A. Buff, M.E., P.E.
Principal Engineer

DAB/mah

cc: M.A. Smith
C.D. Henderson
P.C. Cunningham

Table 1. Maximum Potential Emissions of VOCs from Miscellaneous Storage Tanks, FPL Lauderdale

Parameter	Gas Turbine Dump Tanks[a] (2)	Fuel Oil Metering Tanks (3)	Unleaded Gasoline[a] (1)	Diesel Fuel[a] (1)
Type of Liquid Stored	No. 2 Fuel Oil	No. 6 Fuel Oil	Unleaded Gas	No. 2 Oil
Tank Volume (gallons)	1,500	252,000	4,000	1,000
Total Annual Throughput (gallons)	300,000	192,642,943	10,000	5,000
Turnovers Per Year	200.0	764.5	2.5	5.0
Molecular Weight of Vapor	130	190	130	130
Storage Temperature (°F)	75	75	75	75
Vapor Pressure at Storage Temperature (psia)	0.0105	0.000075	6.8	0.0105
Tank Diameter (ft)	5.3	30.0	8.0	4.0
Average Vapor Space Hgt. (ft)	2.0	6.0	2.0	1.5
Average Diurnal Temperature Change (°F)	20	20	20	20
Paint Factor	1.30	1.40	1.33	1.33
Product Factor	1.0	1.0	1.0	1.0
Turnover Factor	0.30	0.23	1.0	1.0
Breathing Losses (lb/yr)	3.2	6.1	0.0	1.7
(TPY)	0.002	0.003	0.000	0.001
Working Losses (lb/yr)	2.9	15.2	212.2	0.2
(TPY)	0.001	0.008	0.106	0.000
Total Emissions (TPY)	0.003	0.011	0.106	0.001

[a]Underground tanks.

APPENDIX 10.1.6

COASTAL ZONE MANAGEMENT CERTIFICATION

10.1.6 COASTAL ZONE MANAGEMENT CERTIFICATION

The Lauderdale Repowering project will not impact the coastal zone in Broward County.

APPENDIX 10.1.7

NOTICE OF PROPOSED CONSTRUCTION OR ALTERATION
(FAA FORM 7460-1)

Rev. 1
DO NOT REMOVE CARBONS

Form Approved OMB No. 2120-0

US Department of Transportation
Federal Aviation Administration

NOTICE OF PROPOSED CONSTRUCTION OR ALTERATION

Aeronautical Study Number: 89-ASO- 2515-OE

1. Nature of Proposal

A. Type: [X] New Construction [ ] Alteration

B. Class: [X] Permanent [ ] Temporary (Duration _____ months)

C. Work Schedule Dates: Beginning March 1991; End December 1994

2. Complete Description of Structure

A. Include effective radiated power and assigned frequency of all existing, proposed or modified AM, FM, or TV broadcast stations utilizing this structure

B. Include size and configuration of power transmission lines and their supporting towers in the vicinity of FAA facilities and public airports.

C. Include information showing site orientation, dimensions, and construction materials of the proposed structure.

See Attachment A

(if more space is required, continue on a separate sheet.)

3A. Name and address of individual, company, corporation, etc. proposing the construction or alteration. (Number, Street, City, State and Zip Code)

(407) 640-2060
area code Telephone Number

Charles D. Henderson
Florida Power & Light Company
P.O. Box 078768
6001 Village Boulevard
West Palm Beach, FL 33407-0768

DEC 11 1989
ASO-530

B. Name, address and telephone number of proponent's representative if different than 3 above.

Not Applicable

4. Location of Structure

A. Coordinates (To nearest second)	B. Nearest City or Town, and State	C. Name of nearest airport, heliport, flightpark, or seaplane base	5. Height and Elevation (Complete to the nearest fo
	Hollywood	Ft. Lauderdale/Hollywood	A. Elevation of site above mean sea level: 9 f
26° 04' 30" Latitude	(1) Distance to 4B: Miles	(1) Distance from structure to nearest point of nearest runway: 10,600 ft	B. Height of Structure including all appurtenances and lighting (if any) above ground, or water if so situated: 150 f
80° 11' 55" Longitude	(2) Direction to 4B: West to East	(2) Direction from structure to airport: West to East	C. Overall height above mean sea level (A + B): 159 f

D. Description of location of site with respect to highways, streets, airports, prominent terrain features, existing structures, etc. Attach a U.S. Geological Survey quadrangle map or equivalent showing the relationship of construction site to nearest airport(s). (if more space is required, continue on a separate sheet of paper and attach to this notice.)

See Attachment A, and Figures 1 and 2

Notice is required by Part 77 of the Federal Aviation Regulations (14 C.F.R. Part 77) pursuant to Section 1101 of the Federal Aviation Act of 1958, as amended (49 U.S.C. 1101). Persons who knowingly and willingly violate the Notice requirements of Part 77 are subject to a fine (criminal penalty) of not more than $500 for the first offense and not more than $2,000 for subsequent offenses, pursuant to Section 902(a) of the Federal Aviation Act of 1958, as amended (49 U.S.C. 1472(a)).

I HEREBY CERTIFY that all of the above statements made by me are true, complete, and correct to the best of my knowledge. In addition, I agree to obstruction mark and/or light the structure in accordance with established marking & lighting standards if necessary.

Date	Typed Name/Title of Person Filing Notice	Signature
11/28/89	Charles D. Henderson/Manager	C. D. Henderson

FOR FAA USE ONLY — *FAA will either return this form or issue a separate acknowledgeme*

The Proposal:

- [ ] Does not require a notice to FAA.
- [X] Is not identified as an obstruction under any standard of FAR, Part 77, Subpart C, and would not be a hazard to air navigation.
- [ ] Is identified as an obstruction under the standards of FAR, Part 77, Subpart C, but would not be a hazard to air navigation.
- [ ] Should be obstruction [ ] marked, [ ] lighted per FAA Advisory Circular 70/7460-1, Chapter(s) _____
- [X] Obstruction marking and lighting are not necessary.

Remarks:

Supplemental Notice of Construction FAA Form 7460-2 is required any time the project is abandoned, or

- [ ] At least 48 hours before the start of construction.
- [ ] Within five days after the construction reaches its greatest height.

This determination expires on 8/2/91 unless:

(a) extended, revised or terminated by the issuing office;
(b) the construction is subject to the licensing authority of the Federal Communications Commission and a application for a construction permit is made to the FCC on or before the above expiration date. In such cas the determination expires on the date prescribed by the FCC for completion of construction, or on the dat the FCC denies the application.

NOTE: Request for extension of the effective period of this determination must be postmarked or delivered to th issuing office at least 15 days prior to the expiration date.

If the structure is subject to the licensing authority of the FCC, a copy of this determination will be sent to th Agency.

Issued in	Signature	Date
Atlanta Ga	Walter K Wilkoff	2/2/90

FAA Form 7460-1 (8-85)

DO NOT REMOVE CARBO

Attachment A

The proposed structures are four steel stacks which will be constructed for the Lauderdale Repowering Project. The stacks are required to exhaust gases from four combustion turbines (CTs). The CTs are connected to heat recovery steam generators (HRSGs) which will produce steam. The steam will be used in the existing steam electric generators at the site. Figures 1 and 2 show the site. Figure 3 shows a plot plan of the stack locations. Figures 4 and 5 show profiles of the plant. Figure 6 shows the stacks relative to the imaginary surfaces. After this facility is constructed, the existing two boilers, which have an elevation of about 120 ft, and the two associated 150-ft stacks will be removed (elevations are above grade, which is 7 ft above msl).

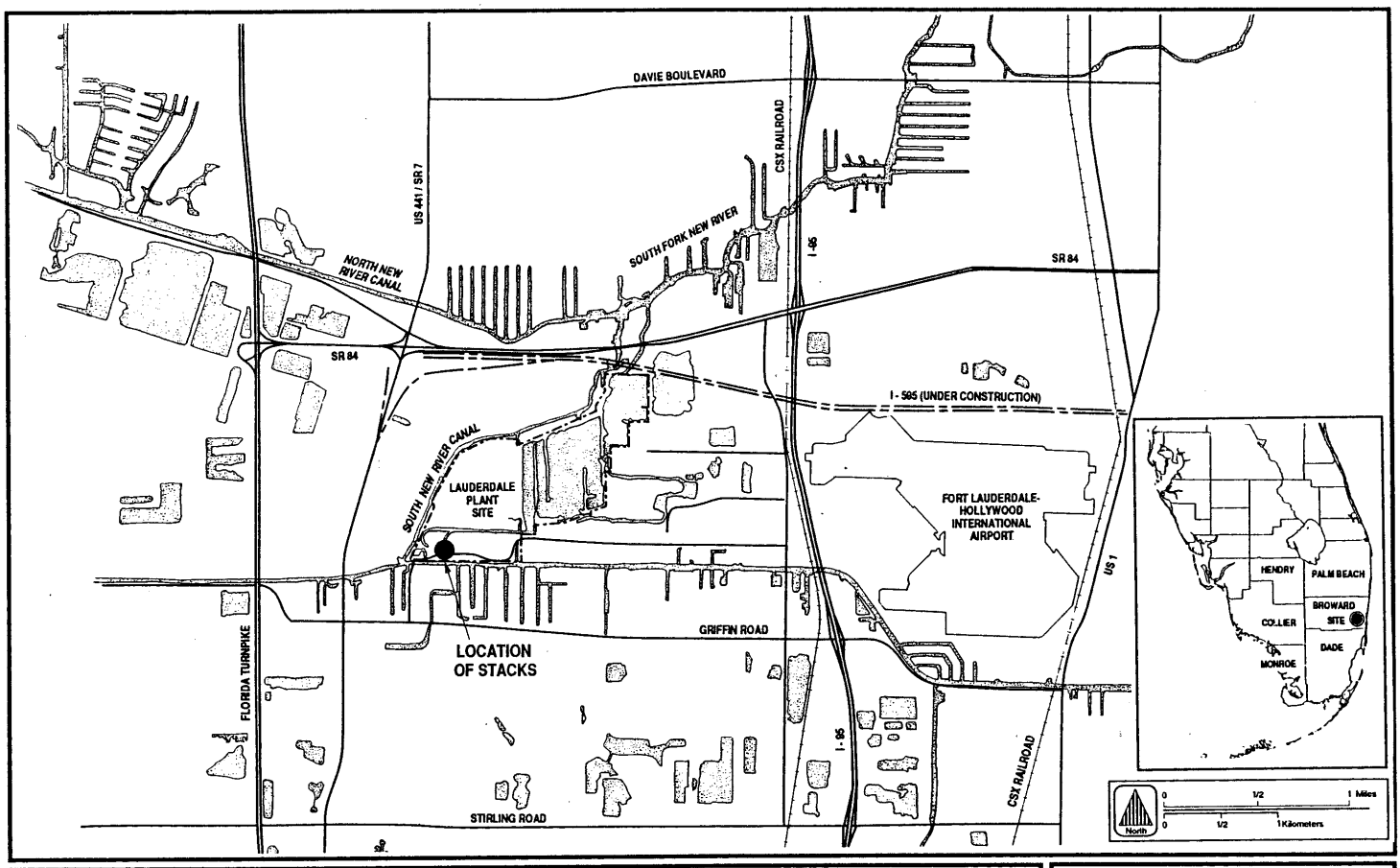


Figure 1 SITE LOCATION MAP

Lauderdale Repowering Project

FPL

10.1.7-3

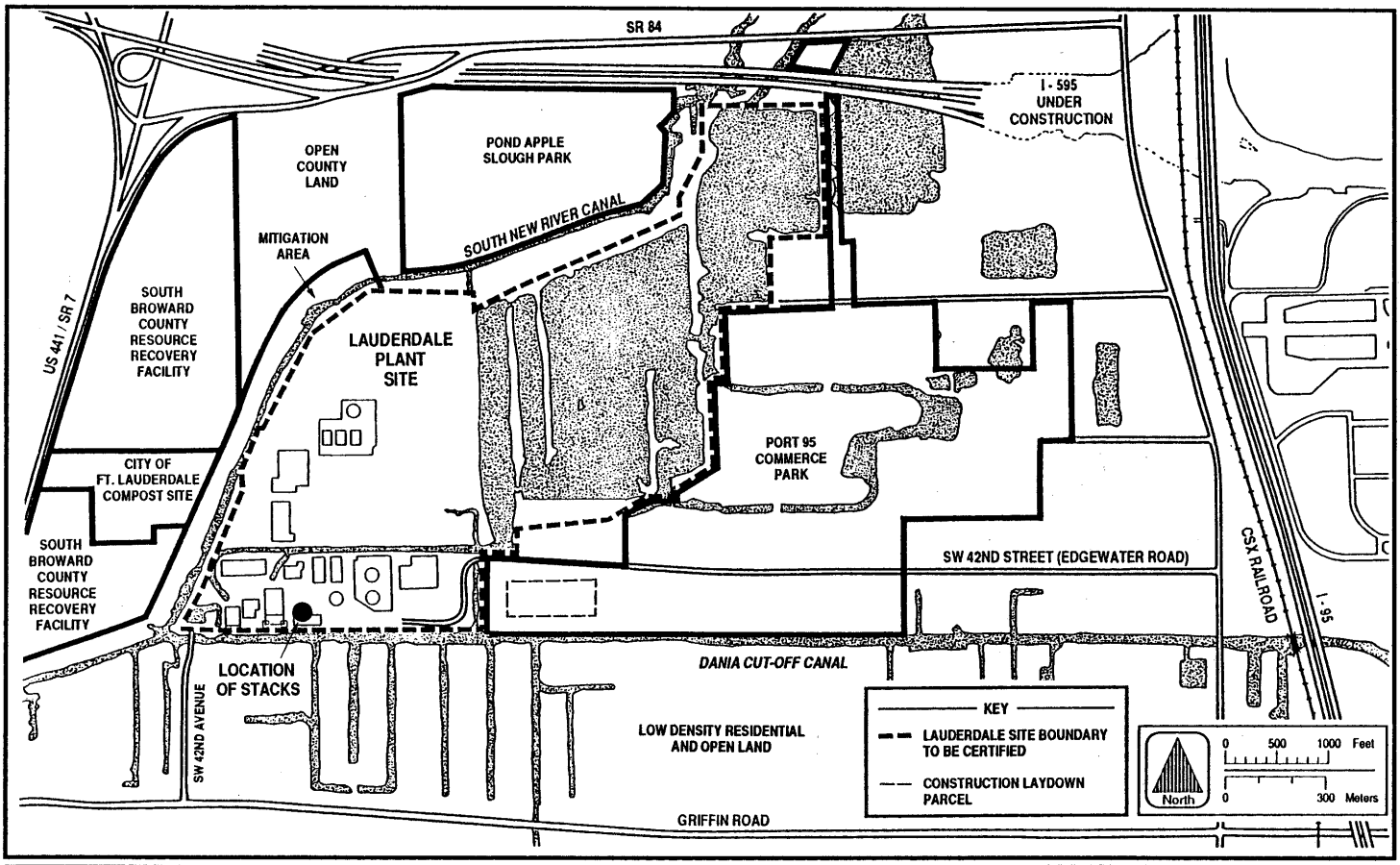


Figure 2 LAUDERDALE SITE VICINITY AND ADJACENT PROPERTIES

Lauderdale
Repowering
Project

FPL

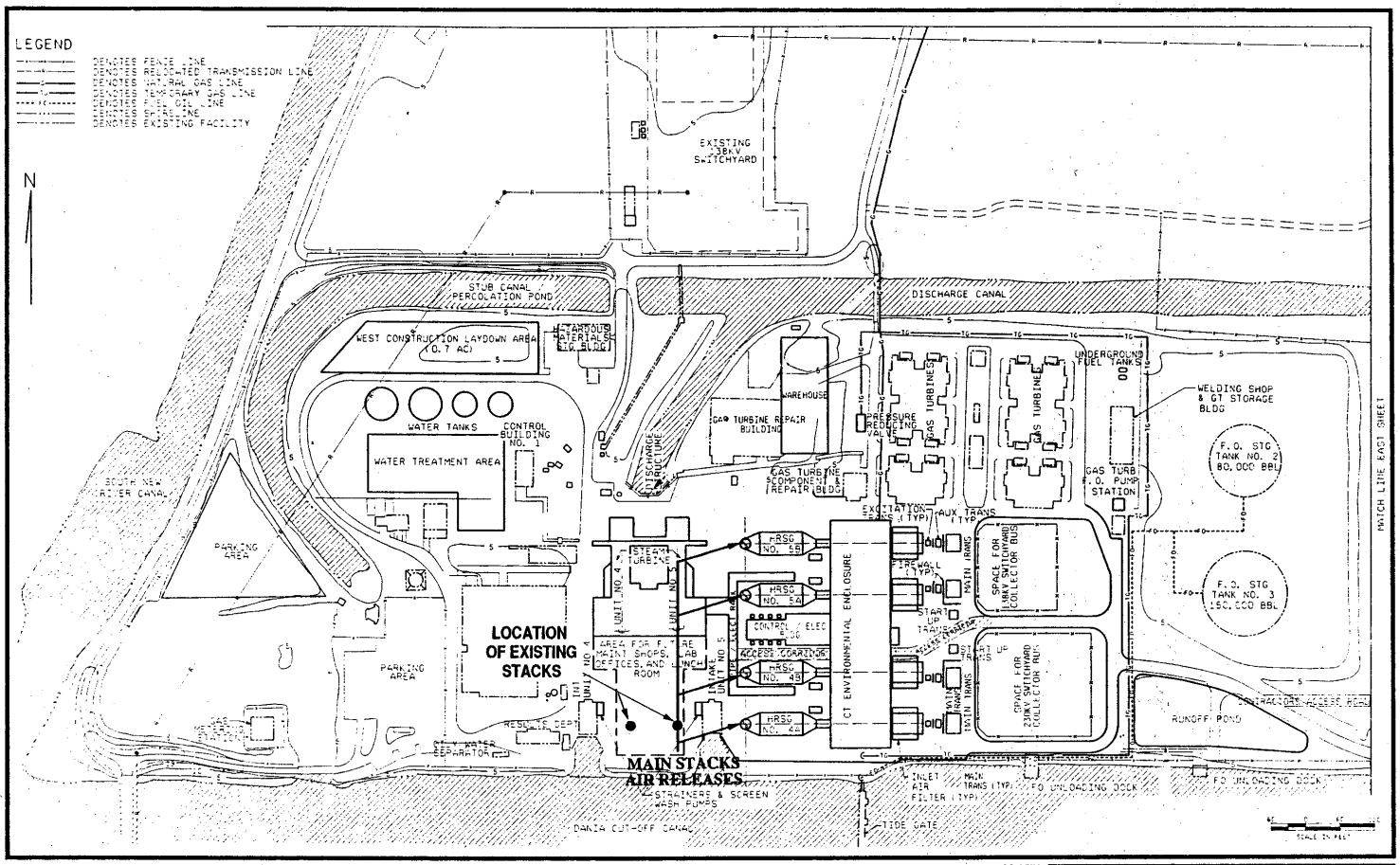


Figure 3 SITE LAYOUT - POWER BLOCK AREA SHOWING STACKS

Poor Original

Lauderdale Repowering Project

FPL

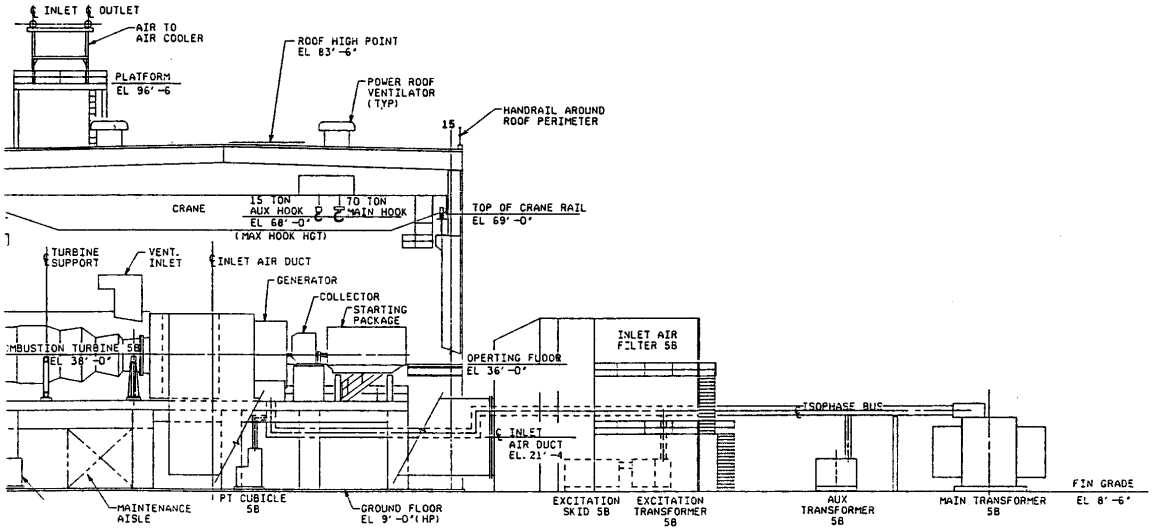


Figure 4 PROFILE - INLET AIR FILTER AREA

Lauderdale Repowering Project

FPL

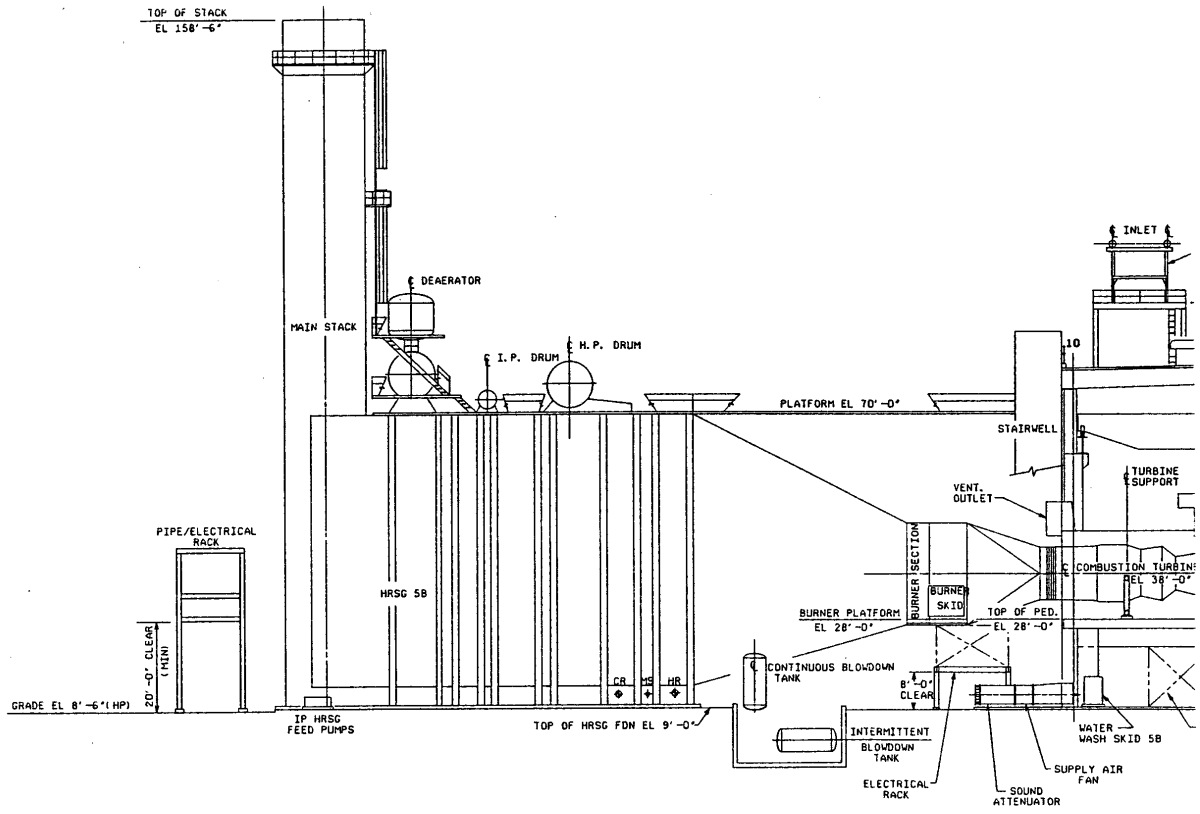


Figure 5 PROFILE - HEAT RECOVERY STEAM GENERATOR AREA

Lauderdale Repowering Project

FPL

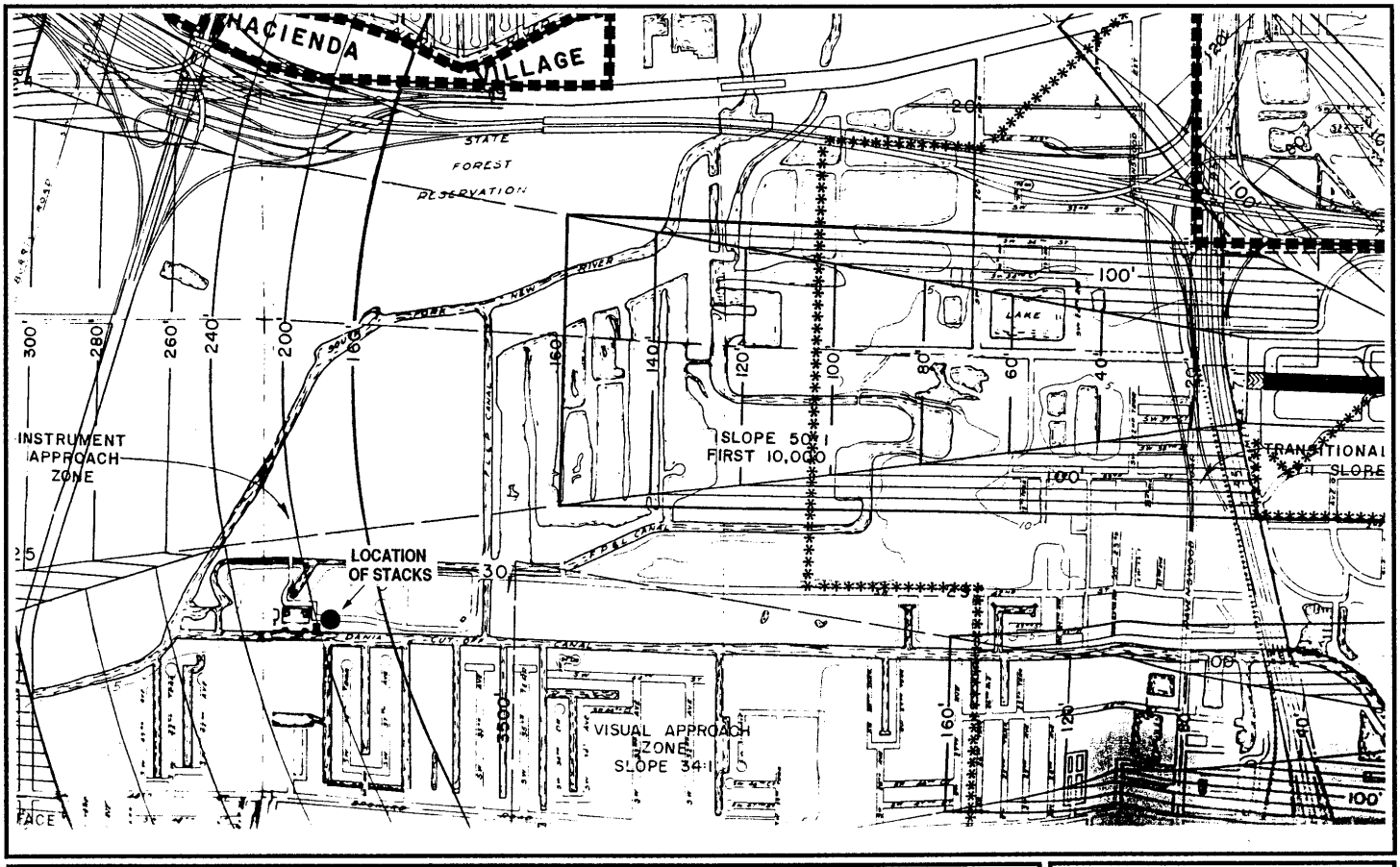


Figure 6 PROPOSED LOCATION OF STACKS RELATIVE TO FORT LAUDERDALE-HOLLYWOOD INTERNATIONAL AIRPORT IMAGINARY SURFACES

SOURCE: BROWARD COUNTY AVIATION DEPARTMENT.

Lauderdale Repowering Project

FPL

APPENDIX 10.2

ZONING DESCRIPTIONS

ZONING

BROWARD COUNTY, FLORIDA

This pamphlet is a reprint of the Zoning Ordinance of the Code of Broward County, Florida, published by order of the Board of County Commissioners.

MUNICIPAL CODE CORPORATION

Tallahassee, Florida

Reprint
1984

ARTICLE LXIV. GENERAL INDUSTRIAL M-3 DISTRICT

Sec. 39-1071. Purpose of district.

The M-3 General Industrial District is intended primarily for the larger and heavier types of manufacturing uses

which normally have no serious effects upon contiguous nonresidential areas. In order to minimize conflict and to preserve the general industrial areas for the intended uses, certain residential and institutional uses are not permitted therein.

Sec. 39-1072. Uses permitted.

No building or structure, or part thereof, shall be erected, altered or used, or land or water used, in whole or in part, for other than one or more of the following uses:

(1) Any use permitted in M-2 districts.

(2) Any of the following uses:

Brewing and distilling of malt beverages or liquors.
Bulk storage of petroleum and petroleum products.
Butane or propane manufacturing or storage.
Can manufacturing from metal, such as tin cans or aluminum cans.
Carpet manufacture, power looms.
Celluloid or similar cellulose material manufacture or storage.
Cleansing preparation manufacturing, such as soaps, detergents, cleansers, etc.
Concrete batching or mixing plant.
Concrete products manufacture.
Cotton gin.
Cotton oil plant.
Cottonseed product.
Dredging base.
Dry ice manufacturing.
Feed, flour and grist milling.
Fertilizer compounding from dry, nonodorous materials.
Fertilizer compounding from liquid, nonodorous materials.
Furniture manufacturing, not elsewhere permitted.
Glass products from previously manufactured glass.
Magnetic wire manufacturing.

Oil compounding involving flammable materials, such as oil, lacquer, shellac, etc., except as incidental to other business.
Pottery manufacturing, not elsewhere permitted.
Salt works.
Septic tank service.
Soap manufacturing.
Vegetable oil manufacturing or refining.
Veneer or plywood plant.

(3) Any use not prohibited by section 39-1073, not prohibited by other resolutions or by law, and not listed as permissible only in an M-4 or an M-5 district.

(4) Accessory uses and structures, including living quarters accessory to a permitted use.

(5) Docks and docking of boats and ships for loading and unloading, storage, repair and building of boats not over 120 feet in length.

Sec. 39-1073. Uses prohibited.

(a) Dwellings except as accessory to a permitted use.

(b) Hotels, motels, apartment hotels, rooming, boarding or lodging houses, villas, bungalow courts.

(c) Institutions for the housing, care or treatment of sick, indigent, aged, adolescent or other persons.

(d) Any use which produces effects upon contiguous property in the form of noise, odor, vibration, smoke, particulate matter, glare, heat, or fire or explosive hazard to a degree equivalent to any use specified in this ordinance as first permitted in an M-4 or M-5 district.

Sec. 39-1074. Height.

No building or structure, or part thereof, shall be erected or altered to a height exceeding 150 feet.

Sec. 39-1075. Plot size.

Every plot utilized for a use first permitted in an M-3 district shall not be less than 100 feet in width and 10,000 square feet in area.

Sec. 39-1076. Yards.

Every plot shall be provided with yards required under sections 39-163 and 39-169.

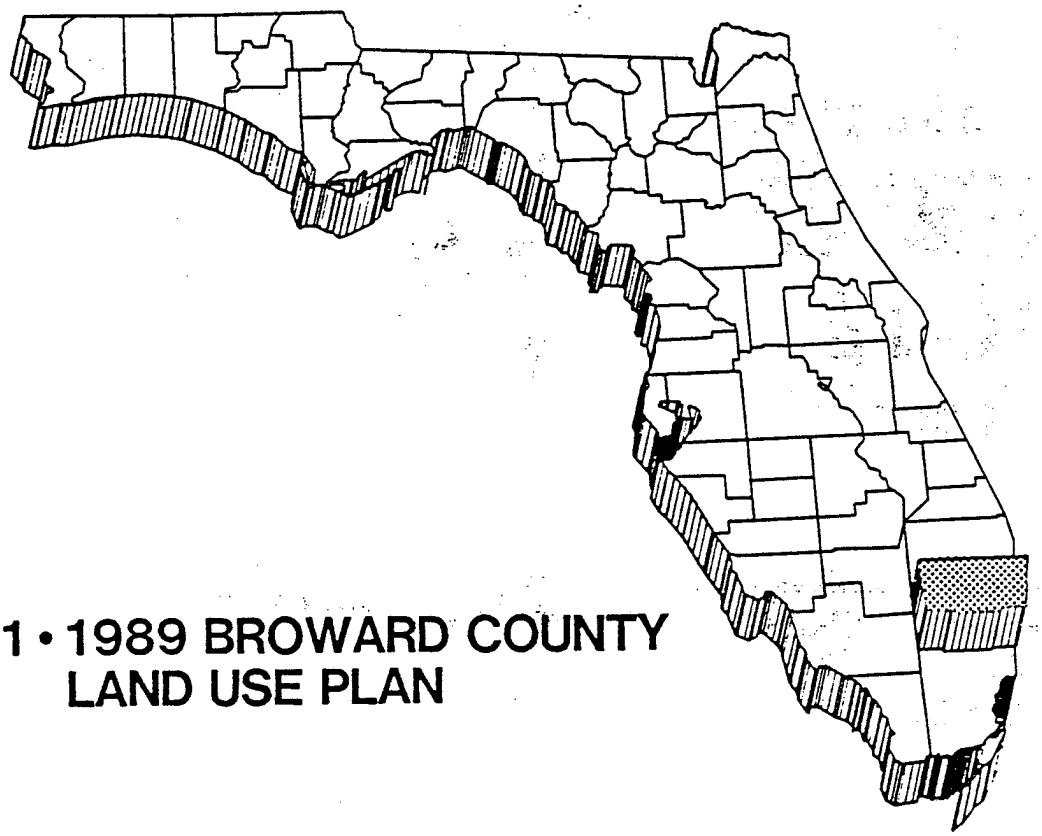
Secs. 39-1077—39-1086. Reserved.

APPENDIX 10.3

LAND USE PLAN DESCRIPTIONS

BROWARD COUNTY, FLORIDA

COMPREHENSIVE PLAN 1989



VOLUME 1 • 1989 BROWARD COUNTY LAND USE PLAN

BROWARD COUNTY BOARD OF COUNTY COMMISSIONERS

Scott I. Cowan Nicki Englander Grossman John P. Hart Ed Kennedy Lori Nance Parrish Sylvia Poitier Gerald F. Thompson

Electric Energy

POLICY 08.01.19 Local government entities, Florida Power and Light Company, developers and landowners should coordinate and cooperate with one another with respect to the utilities route selection and location of electric facilities to ensure the future electrical energy needs of Broward County residents will be served. New electric transmission lines subject to the Florida Transmission Lines Siting Act should be sited in a manner that will consolidate such lines within existing corridors and that new corridors should be planned in coordination with land use plans of local governments.

OBJECTIVE 08.05.00 UTILITIES CATEGORY

Establish within the Future Broward County Land Use Plan Map (Series) a Utilities land use category to ensure the availability of land for a complete range of public and private utilities adequate to meet the current and future needs of Broward County's population.

POLICY 08.05.01 Permit those land uses in designated utilities areas which are identified within the Utilities Permitted Uses subsection of the Plan Implementation Requirements section of the Broward County Land Use Plan.

POLICY 08.05.02 Permit utilities uses within other specified land use categories as identified in the Permitted Uses subsection of the Plan Implementation Requirements section of the Broward County Land Use Plan, and as required to achieve Objective 08.05.00.

B. PERMITTED USES IN FUTURE LAND USE CATEGORIES

This section identifies those uses permitted in the future land use categories established within the Broward County Land Use Plan. Local government entity zoning as to permitted uses and densities must be in compliance with these permitted uses and the Future Broward County Land Use Plan Map (Series) designation.

Local government entity zoning as to permitted uses which is in compliance with a certified land use plan shall be in compliance with the Broward County Land Use Plan. A certified local land use plan and land development regulations adopted by a local government entity may prohibit or restrict any of the land uses permitted within any land use category in the Broward County Land Use Plan.

Areas designated on the Future Broward County Land Use Plan Map (Series) for particular uses are approximate. The exact boundaries for zoning will be determined by the local government entity within the reasonable limits of the designation on the map. Local government entities will determine those uses which will be permitted, allowed by special exceptions or not permitted from those uses listed below.

INDUSTRIAL USE

The purpose of reserving land for industrial uses, consistent with Objective 03.01.00, is to provide opportunity for the retention and expansion of Broward County's economic base activities. Although other uses are permitted in areas designated industrial, at least 80 percent of such land area must be devoted to industrial use, such as manufacturing, warehouse distribution, research and development, or other substantial employment based activities.

Uses permitted in areas designated industrial are as follows:

1. Light and heavy industrial uses.

2. Heavy commercial uses including new and used automobile, truck, motorcycle, boat and trailer display, sales, and service; newspaper, magazine, and printing plants; bakeries, carpentry, cabinet shops and other trade shops; motion picture studios; ice houses; propane gas sales and repair; and salvage yards.

3. Educational, scientific and industrial research facilities, research laboratories, and medical or dental laboratories.

4. Office uses.

5. Transportation and communication facilities.

6. Recreation and open space, cemeteries, and commercial recreation uses, as long as the location of these uses does not preclude or adversely affect the future use of surrounding areas for industry.

7. Community facilities and utilities.

8. Non-residential agricultural uses.

9. Ancillary commercial uses within buildings devoted to primary industrial uses.

10. Wholesaling uses.

11. The following uses may also be permitted if certified by the Broward County Planning Council in the local land use plan as long as the total area of these uses does not consume more than 20 percent of the industrial land designated on the Future Broward County Land Use Plan Map (Series) within a flexibility zone, and as long as the location of these uses do not preclude or adversely affect the future use of surrounding areas for industrial uses:

    a. Commercial and retail business uses.

    b. Hotel, motel and similar lodging.

UTILITIES USE

Utilities are designated on the Future Broward County Land Use Plan Map (Series), consistent with Objective 08.05.00, to ensure the availability of land necessary to provide an adequate level of utility service to meet the current and future needs of Broward County.

Utilities are also allowed in areas designated residential, commercial, office park, industrial, employment center, regional activity center and agricultural.

Uses permitted in areas designated utilities are as follows:

1. Utilities such as water and wastewater treatment plants, pumping stations, electrical power plants and substations, solid waste disposal and transfer stations.

2. Other uses determined to be ancillary to the primary uses described in (1).

The following uses may also be permitted in the areas designated utilities as long as the location of these uses does not preclude or adversely affect the future use of the surrounding areas for utility facilities:

3. Recreation and open space uses.

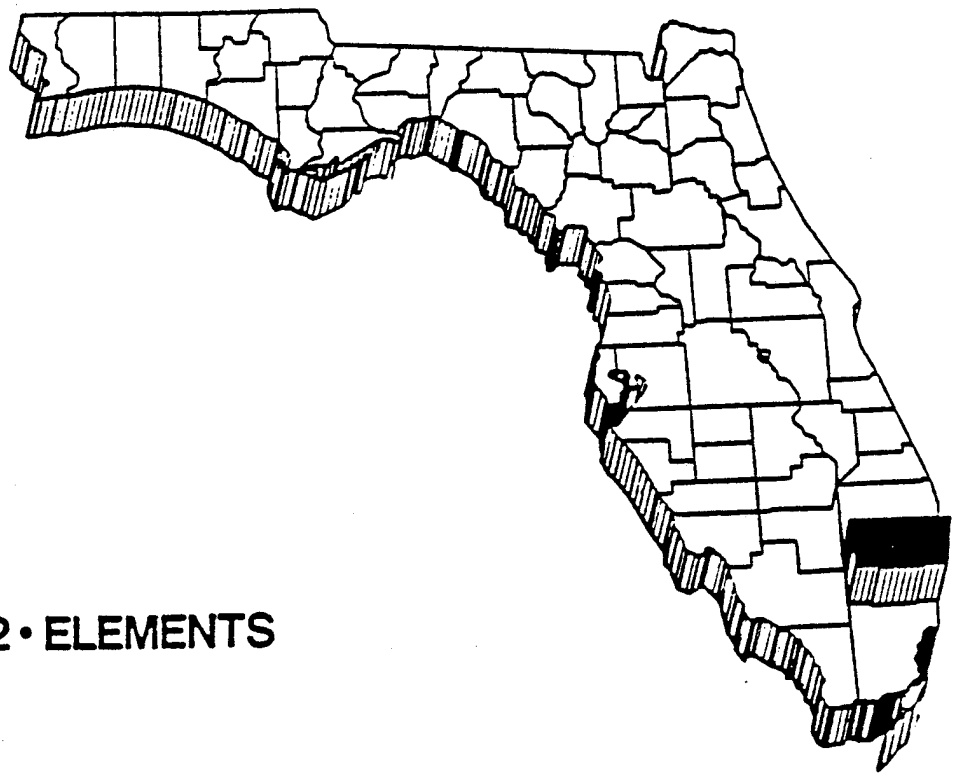
4. Non-residential agricultural uses.

5. Communication facilities.

Rev. 1

BROWARD COUNTY, FLORIDA

COMPREHENSIVE PLAN 1989



VOLUME 2 • ELEMENTS

BROWARD COUNTY BOARD OF COUNTY COMMISSIONERS

Scott Cowan Nicki Englander Grossman John P. Hart Ed Kennedy Lori Nance Parrish Sylvia Poitier Gerald F. Thompson

ADOPTED MARCH 1, 1989

Objective 9: The uses permitted within the COMMERCIAL land use category are specified within the Permitted Uses subsection of the Plan Implementation Requirements section of Volume 1, the Broward County Land Use Plan. The location and intensity of COMMERCIAL land uses shall be specified on the adopted Future Unincorporated Area Land Use Element Map Series.

Policy 27: The Future Unincorporated Area Land Use Element shall designate the following intensities of commercial land uses: COMMERCIAL, OFFICE PARK and COMMERCIAL RECREATION. The uses permitted within these commercial intensities are specified within the Permitted Uses subsection of the Plan Implementation Requirements Section of Volume 1, the Broward County Land Use Plan.

Policy 28: The COMMERCIAL land use category shall address the provision of office, retail and other non-residential activities necessary to support the Unincorporated Area's resident and seasonal population.

Policy 29: The OFFICE PARK land use category shall establish the location of office complexes and corporate headquarters.

Policy 30: The COMMERCIAL RECREATION land use category shall encompass those public and private recreational facilities necessary within a resort area such as Broward County.

Policy 31: The location of commercial uses on the Future Unincorporated Area Land Use Element Map Series shall be adopted in accordance with adopted levels of service standards specified within the elements of the Broward County Comprehensive Plan, which requires the availability of public services and facilities needed to support development be be concurrent with the impact of development.

Policy 32: The zoning, rezoning, platting and replatting of land for commercial uses shall comply with the COMMERCIAL land use categories on the Future Unincorporated Area Land Use Element Map Series.

Objective 10: The uses permitted within the INDUSTRIAL land use category are specified within the Permitted Uses subsection of the Plan Implementation Requirements section of Volume 1, the Broward County Land Use Plan. The location and intensity of INDUSTRIAL land uses shall be specified on the adopted Future Unincorporated Area Land Use Element Map Series.

Policy 33: The INDUSTRIAL land use category shall provide opportunities for expanding the Unincorporated Area's economic base by designating the amount of industrial acreage on the Future Unincorporated Area Land Use Element Map Series which will accommodate the needs of the existing and future population.

recreational activities in compliance with the standards specified within the Broward County Land Use Plan.

Policy 42: The location of EMPLOYMENT CENTER and REGIONAL ACTIVITY CENTER land use categories on the Future Unincorporated Area Land Use Plan Map Series shall be adopted in accordance with the level of service standards specified within the elements of the Broward County Comprehensive Plan, which requires the availability of public services and facilities needed to be concurrent with the impact of development.

Policy 43: The zoning, rezoning, platting and replatting of land for employment center and regional activity center uses shall comply with the EMPLOYMENT CENTER and REGIONAL ACTIVITY CENTER land use categories on the Future Unincorporated Area Land Use Element Map Series.

Objective 12: The uses permitted within the TRANSPORTATION land use category are specified within the Permitted Uses subsection of the Plan Implementation Requirements section of Volume 1, the Broward County Land Use Plan. The location and intensity of TRANSPORTATION land uses shall be specified on the adopted Future Unincorporated Area Land Use Element Map Series.

Policy 44: The TRANSPORTATION land use category shall insure the availability of land adequate to meet the current and future transportation needs of the population and the economy.

Policy 45: The location of transportation uses on the Future Unincorporated Area Land Use Element Map Series shall be adopted in accordance with the adopted level of service standards specified within the elements of the Broward County Comprehensive Plan, which requires the availability of public services and facilities needed to be concurrent with the impact of development.

Policy 46: The zoning, rezoning, platting and replatting of land for transportation uses shall comply with the TRANSPORTATION land use category on the Future Unincorporated Area Land Use Map Series.

Objective 13: The uses permitted within the UTILITY land use category are specified within the Permitted Uses subsection of the Plan Implementation Requirements section of Volume 1, the Broward County Land Use Plan. The location and intensity of UTILITY land uses shall be specified on the adopted Future Unincorporated Area Land Use Element Map Series.

Policy 47: The UTILITY land use category shall ensure the availability of land for a complete range of public and private utilities adequate to meet the current and future needs if the Unincorporated Area population.

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Policy 48: Utility uses within other land use categories shall be permitted in accordance with the Permitted Uses subsection of the Plan Implementation Requirements section of Volume 1, the Broward County Land Use Plan.

Policy 49: The location and distribution of UTILITY land uses on the Future Unincorporated Area Land Use Map Series shall be adopted in accordance with the adopted level of service standards within the element of the Broward County Comprehensive Plan, which requires the availability of public services and facilities needed to support development be concurrent with the impact of development.

Policy 50: The zoning, rezoning, platting and replatting of land for utility uses shall conform with the UTILITY land use category on the Future Unincorporated Area Land Use Map Series and to utility uses permitted within other specified land use categories.

Objective 14: The uses permitted within the COMMUNITY FACILITY land use category are specified within the Permitted Uses subsection of the Plan Implementation Requirements section of Volume 1, the Broward County Land Use Plan. The location and intensity of COMMUNITY FACILITY land uses shall be specified on the adopted Future Unincorporated Area Land Use Element Map Series.

Policy 51: The COMMUNITY FACILITY land use category shall ensure that the availability of suitable land for a complete range of regional and community facilities adequate to meet the needs of the Unincorporated Area population.

Policy 52: COMMUNITY FACILITY uses compatible within other specific land use categories shall be permitted in accordance with the Permitted Uses subsection of the Plan Implementation section of Volume 1, the Broward County Plan Use Plan.

Policy 53: The location and distribution of Community Facility land uses on the Future Unincorporated Area Land Use Element Map Series shall be adopted in accordance with the adopted level of service standards within the element of the Broward County Comprehensive Plan, which requires the availability of public services and facilities needed to support development be concurrent with the impact of development.

Policy 54: The zoning, rezoning, platting and replatting of COMMUNITY FACILITY uses shall comply with the Future Unincorporated Area Land Use Element Map Series.

Objective 15: The uses permitted within the PARK AND RECREATION land use category are specified within the Permitted Uses subsection Plan Implementation Requirements section of Volume 1, the Broward County Land Use Plan. The location and intensity of PARK AND RECREATION land uses shall be specified on the

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APPENDIX 10.4

EXISTING PERMITS

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10.4 EXISTING PERMITS

BROWARD COUNTY PERMIT	10.4-1
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BROWARD COUNTY PERMIT

Image Quality
As you review the next group of images, Please note that the original documents
were of poor quality.

BROWARD COUNTY ENVIRONMENTAL QUALITY CONTROL BOARD
500 S.W. 14th Court
Fort Lauderdale, Florida 33315
(305) 765-4900

License To Operate A Direct Discharge Industrial Wastewater Treatment Facility

OWNER/AGENT:
M. E. Sanders, Plant Manager
Florida Power & Light Co.
Lauderdale Plant
P.O. Box 155
Dania, Florida 33004

LICENSE NO. IWH-102-89

FACILITY NAME/ADDRESS
Florida Power & Light Co.
Lauderdale Plant
S. W. 42nd Street
(2 miles west of Ravenswood Rd.)
Ft. Lauderdale, Florida 33314
Phone: (305) 797-1502

This license is issued under the provisions of the Code of Regulations of Broward County Environmental Quality Control Board, hereinafter called the Code. The above-named applicant, hereinafter called licensee, is hereby authorized to perform the work or operate the facility shown on the approved drawing(s), plans, documents, and specifications submitted by applicant and made a part hereof and described specifically below. If no objection to this license is received within 14 days you will be deemed to have accepted it and all the attached terms and conditions.

TO OPERATE: A direct discharge industrial wastewater treatment and disposal system as described on description page 2.

IN ACCORDANCE WITH: BCEQCB license renewal application received 2/23/89 (none attached)

The licensee shall maintain his discharge within the limits for the parameters listed on page 3 in addition to all others required by applicable local, state or Federal Regulations. Licensee sampling is required at the frequency described on analysis requirements page 3.

Subject to General Conditions 1 thru 12 and Specific Conditions 1 thru 4 and attachment "A".

Expiration date: 3/10/90
Renewal Application Due 1/9/90
Issued this 25th day of February, 1989
Broward County Environmental Quality Control Board
Prepared by Glenn Malstrom

Victor H. Howard, P.E.
Pollution Control Officer

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This license allows Florida Power & Light Company - Lauderdale Plant to operate a direct discharge industrial wastewater treatment and disposal system discharging industrial wastewaters associated with the generation of electricity from steam to Class III Surface Waters and Class G-II Groundwaters and more particularly described as follows:

Surface Waters

1) A maximum of 344 MGD of once-through cooling water at a flow rate of 232,000 GPM is discharged from Units 4 & 5 to the discharge canal, and eventually to the South Fork of the New River, classified as Class III Surface Waters.

2) Up to 8.64 MGD of auxiliary cooling water at a flow rate of 6000 GPM is discharged from Units 4 & 5 to the discharge canal as described in (1) above.

3) Stormwaters from non-equipment area drains discharge at a flow rate of 24,029 GPM to the intake and discharge canals, and eventually to the South Fork of the New River, classified as Class III Surface Waters. Direct stormwater discharge is not covered by this license.

Groundwater

4) A total of 296,000 gallons per year of wastewater from air preheater wash (metal cleaning wastes), fireside boiler wash (soot leaching & metal cleaning wastes) and stack wash (wastewater may or may not be generated depending on the cleaning process used) is discharged to solids settling basins B-1A & B-1B from where it is discharged to the evaporation/percolation pond, classified as Class G-II Groundwaters (Batch Discharge).

5) Up to 2,885,250 gallons per year of wastewaters from neutralization tank discharge and coagulator blowdown are discharged to the stub canal evaporation/percolation pond, classified as Class G-II Groundwaters (Batch Discharge).

6) Up to 4,854,00 gallons per year of boiler blowdown wastewater is discharged to the stub canal evaporation/percolation pond, classified as Class G-II Groundwaters.

7. Oily waters and equipment cleaning washwaters as well as somestorm water run off, totalling 2,085,000 gallons per year are collected by equipment area drains and routed via various sumps to an oil/water separator and then to either the stub canal evaporation/percolation pond or to diked areas of the fuel oil storage areas, classified as Class G-II Groundwaters.

The licensee shall maintain the quality and quantity of the effluents discharged such that the groundwater quality outside a defined Zone of Discharge is within the water quality standards expressed in Section 27-5.073 of the BCEQCB Code of Regulations. For the purposes of this license the defined Zone of Discharge is at the perimeter of the property line. The surface water quality after thorough mixing (500 to 1) shall be within the water quality standards expressed in Section 27-5.071 of the BCEQCB Code of Regulations. The licensee may be required to eliminate, reduce flow, or provide additional treatment to discharges should conditions of the waters within the Zone of Discharge, as monitored in the monitoring wells, warrant or should quality of the discharges to surface waters warrant.

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GROUNDWATER

Sampling and analysis of groundwater monitoring wells U-1, OB-2, OB-3, M-2, M-3, and M-4 shall be conducted semi-annually for the following.

PARAMETER	LIMITS WATER QUALITY STANDARDS (5.073) AT PERIMETER OF ZONE OF DISCHARGE
pH	6.5-8.5
Phosphates (Total as P)	0.01 mg/l
Nitrogen-Nitrate	10 mg/l
Chlorides	-------
Oil & Grease	10 mg/l
Copper	1.0 mg/l
Chromium (Total)	0.05 mg/l
Selenium	0.01 mg/l
Vanadium	---------
Zinc	5.0 mg/l
Silver	0.05 ug/l
Nickel	0.1 mg/l
Lead	0.05 mg/l
Mercury	0.002 ug/l
PCB's	0.01 ug/l

SURFACE WATERS

Sampling and analysis of the intake water and the once through unit cooling water discharge (1) and auxiliary cooling waters discharge (2) to surface waters shall be conducted prior to thorough mixing with the receiving waters and reported semi-annually. The difference between intake water ambient quality and discharge water quality shall be within water quality standards (5.071) after thorough mixing.

PARAMETERS	FREQUENCY	LIMITS WATER QUALITY STANDARDS(5.071) AFTER THOROUGH MIXING (500 TO 1)
Flow (gallons per day)	Daily	---------
*Discharge Temperature	Daily	90 degrees F
*Temperature Rise	Every 4 hrs.	---------
Total Residual Chlorine	Twice/Month	0.01 mg/l
pH	Semi-Annually	6.5-8.5
Phosphorus(Total)	Semi-Annually	0.05 mg/l
Nitrogen-Total	Semi-Annually	1.50 mg/l
Oil & Grease	Semi-Annually	1.0 mg/l
Copper	Semi-Annually	0.015 mg/l
Chromium (Total)	Semi-Annually	0.05 mg/l
Selenium	Semi-Annually	0.025 mg/l
Vanadium	Semi-Annually	---------
Zinc	Semi-Annually	1.0 mg/l
Silver	Semi-Annually	0.05 ug/l
Nickel	Semi-Annually	0.1 mg/l
Lead	Semi-Annually	0.03 mg/l
Mercury	Semi-Annually	0.1 ug/l
PCB's	Semi-Annually	0.001 ug/l

*With respect to temperature measurements, the cooling water effluent shall have a Zone of Mixing in accordance with Section 27-4.244 F.A.C. and extending from the discharge point in the direction of normal flow a distance of 800 meters.

GENERAL CONDITIONS:

1. The terms, conditions, requirements, limitations and restrictions set forth herein are accepted by the licensee and enforceable by the EQCB pursuant to Chapter 27 of the Broward County Environmental Quality Control Board (EQCB) Code. The EQCB will review this licence periodically and may revoke the license, initiate administrative and/or judicial action for any violation of the conditions by the licensee, its agents, employees, servants or representatives.

2. This license is valid only for the specific uses set forth in the license application and any deviation from the approved uses may constitute grounds for revocation and enforcement action by the EQCB.

3. In the event the licensee is temporarily unable to comply with any of the conditions of the license, the licensee shall notify the PCO within 12 hours. Within 5 working days of the event, the licensee shall submit a written report to the PCO that describes the incident, its cause, the measures being taken to correct the problem and prevent its reoccurrence, the owner's intention toward repair, replacement, and reconstruction of destroyed facilities, and a schedule of events leading toward operation within the license conditions.

4. The issuance of this license does not convey any vested rights or exclusive privileges. Nor does it authorize any injury to public or private property or any invasion of personal rights, nor any violations of federal, state or local laws or regulations.

5. This license must be available for inspection on licensee's premises during the entire life of the license.

6. By accepting this license, the licensee understands and agrees that all records, notes, monitoring data and other information relating to the construction or operation of this permitted source, that are submitted to the EQCB, may be used by the EQCB as evidence in any enforcement proceeding arising under EQCB rules and regulations, except where such use is prohibited by Section 403.111, Florida Statutes.

7. The licensee agrees to comply with Chapter 27, Code of Regulations of the EQCB.

8. Any new owner of a licensed facility shall apply by letter for a transfer of license within thirty (30) days after sale or legal transfer. The transferor shall remain liable for performance in accord with the license until the transferee applies for and is granted transfer of license.

9. The licensee, by acceptance of this license, specifically agrees to allow access to the licensed source at reasonable times by EQCB personnel for the purposes of inspection and testing to determine compliance with this license and EQCB rules and regulations.

10. This license does not constitute a waiver of or approval of any other license that may be required for other aspects of the total project.

11. If the licensee wishes to renew the license or extend its term, he shall make application 60 days prior to its expiration. Expired licenses are not renewable.

12. In addition to the general conditions set forth above, each license issued by the EQCB shall contain specific conditions determined by site conditions and requirements pursuant to the regulations as determined by the PCO. Licensee agrees that specific conditions are enforceable by the EQCB for any violation thereof.

SPECIFIC CONDITIONS:

1. Any change in the licensed confirmation and/or operation of the treatment or disposal system facility shall be submitted for approval prior to change.

2. Samples shall be taken at a point downstream of the treatment facilities just before effluent is discharged to the sanitary sewer. Location and configuration of the sampling point shall be set by BCEQCB. Samples shall consist of grab samples taken during a period of peak discharge and shall be sampled and analyzed by a lab certified by Florida Department of Environmental Regulation. Analysis reports shall be submitted to BCEQCB no later than the 15th day of the following month.

3. A facility with a periodic batch discharge shall maintain a discharge log book available for inspection by BCEQCB. Included in the log shall be the date, time, quantity of discharge, analysis performed, laboratory performing analysis, name of person doing sampling and signature of person recording the event in log book. Records shall be kept for a period of not less than five (5) years.

4. Any hazardous waste that is generated and leaves the facility shall be reported to BCEQCB on a monthly basis by the fifteenth (15) day of the following month and be disposed in accordance with EPA and DER requirements. A copy of the manifest must be included.

OCT-26-'89 13:19 ID:CSS SED TEL NO:305-766-3537 #141 P05

ATTACHMENT "A"

HAZARDOUS MATERIAL SECTION OF THE
DIRECT DISCHARGER INDUSTRIAL WASTEWATER LICENSE

NATURE OF BUSINESS: Steam electric power plant

AREAS COVERED: Laboratory, warehouse, water treatment plant, storeroom building, 2 storage sheds, and satellite accumulation areas.

COMPLIANCE (FEATURES):

Appropriate building(s) act as secondary containment for chemicals within them.

No more than 55 gallons shall be accumulated in each satellite area and each drum is labeled as to type of waste and has appropriate locking device to prevent unauthorized addition to drum. Appropriate plant personnel coordinate drum usage, etc. A portable satellite storage containment system is utilized for each drum.

Facility is manned 24 hrs./day, 7 days/week, and drums are inspected daily or weekly as appropriate.

This license is subject to
Attachment "A" Specific
Conditions 1,2,3,5,7 & 9
shown below.

ATTACHMENT "A" SPECIFIC CONDITIONS

1. An up to date Inventory List of hazardous material stored shall be submitted with license renewal and with applications for operation or construction licenses.

2. Report any hazardous waste that leaves the facility to EQCB by legible copy of manifest on a monthly and annual basis, by the fifteenth day of the following month.

3. A Spill Contingency Plan shall be prepared and kept on site. Upon discharge of any hazardous material immediately implement the emergency clean-up plan. Discharges shall be reported to EQCB within 12 hours as provided in General Condition 3.

4. Monitor wells shall be tested weekly.

5. Employees shall be trained in the handling of hazardous materials and the Spill Contingency Plan.

6. EQCB shall be notified for purposes of inspection 24 hours prior to removal of a tank. If there is evidence of release of product, a clean-up will be ordered and a monitor well shall be installed.

7. Hazardous material facilities shall have hazardous materials or wastes only in areas that have no floor drains or other means of discharge to septic tank or ground and have adequate secondary containment. Reactive materials shall be kept in separate secondary containments. Secondary containment areas shall be under cover and allow no storm water within. Waste storage areas require secondary containment.

9. Disassembly shall be done within a secondary containment area. All containers of fluids (engines, transmissions, fuel tanks, radiators, overflow tanks and hydraulic and windshield washer systems); their drained fluids; and undrained vehicles awaiting disassembly shall be stored within a secondary containment. Outside storage of the above parts is prohibited unless empty and stored with the fluid cavities open for inspection but not to storm water.

OCT-26-'89 13:20 ID:CSS SED TEL NO:305-785-2557 #141 P06

ATTACHMENT "A" CONTINUED

EQCB CODE	TRADE NAME OF HAZARDOUS MAT'LS	CHEMICAL OR GENERIC NAME OF HAZARDOUS MAT'LS	CONTAINER SIZE	TOT QUANT ON-SITE (GAL/LBS)	MONTHLY USE (GAL/LBS)
16	Amino Acid solution	Dimethl Formamide sodium metabibulfite	1 gal.	5 gals.	1/2 gal.
16	Aluminum Sulfate	Aluminum Sulfate	50 lbs.	1300 lbs.	300 lbs.
16	Ammonium Hydroxide	Ammonium Hydroxide	55 gals.	110 gals.	5 gals.
16	Ammonium Molybdate	Ammonium Molybdate	1/8 gal.	1 gal.	1/2 gal.
16	Ammonium Vanadate	Ammonium Vanadate	1/4 lb.	1/4 lb.	1/8 lb.
16	Chemtreat CL 2971	Molybdate/Nitrate Salt Solution	55 gals.	55 gals.	5 gals.
12A	Chemtreat CL 4123	Triazole	5 gals.	1 gal.	1/4 gal.
16	Disodium Phosphate	Disodium Phosphate	50 lbs.	800 lbs.	50 lbs.
16	Drewfloc 4	Acrylamide	400 lbs.	200 lbs.	6 lbs.
16	Hydrated Lime	Calcium Oxide	50 lbs.	16050 lbs.	3000 lbs.
16	Hydrazine 35%	Hydrazine	175 gals.	260 gals.	20 gals.
16	Hydrazine Di-hydrochloride	Hydrazine Di-hydrochloride	1 lb.	1 lb.	1/8 lb.
16.	Hydrochloric Acid	Hydrochloric Acid	1 gal.	2 gals.	1/4 gal.
12	Isopropanol	Isopropanol	1 gal.	2 gals.	1/2 gal.
16	Magox	Magnesium Oxide	50 lbs.	10000 lbs.	650 lbs.
16	Molybdate 3 Reagent	Sulfuric Acid	1 gal.	2 gals.	1 gal.
16	Nessler's Solution	Mercuric Oxide Na/K Hydroxide	1/8 gal.	1/8 gal.	1/8 gal.
16	Nitric Acid	Nitric Acid	1 gal.	2 gals.	1/8 gals.
16	Oxalic Acid	Oxalic Acid	1/4 gal.	1 gal.	1/16 gal.

OCT-26-'89 13:20 ID:CSS SED TEL NO:305-785-3537 #141 P07

ATTACHMENT "A" CONTINUED

EQCB CODE	TRADE NAME OF HAZARDOUS MAT'LS	CHEMICAL OR GENERIC NAME OF HAZARDOUS MAT'LS	CONTAINER SIZE	TOT QUANT ON-SITE (GAL/LBS)	MONTHLY USE (GAL/LBS)
16	P-Dimethylamino Benzaldehyde	P-Dimethylamino Benzaldehyde	1/4 lb.	1/4 lb.	1/8 lb.
12B	Phenolphthalein Solution	2-Propanol Methanol	1/4 gal.	1/2 gal.	1/8 gal.
16	Potassium Chromate	Potassium Chromate	1/8 gal.	1/8 gal.	1/8 gal.
16	Potassium Hydroxide	Potassium Hydroxide	1 lb.	1 lb.	1/8 lb.
16	Silver Nitrate	Silver Nitrate	1/2 gal.	1/2 gal.	1/8 gal.
16	Sodium Tripoly-phosphate	Sodium Tripoly-phosphate	100 lbs.	3100 lbs.	70 lbs.
16	Sulfuric Acid Solution	Sulfuric Acid Solution	1 gal.	1 gal.	1/8 gal.
16	Sulfuric Acid	Sulfuric Acid	Outside AG 1500 gals.	997 gals.	453 gals.
12A	Halogenated Hydrocarbon	1,1,2 Trichloro 1,1,2 Trifluoroethane	1 gal.	1 gal.	1/8 gal.
16	Trisodium Phosphate	Trisodium Phosphate	50 lbs.	300 lbs.	40 lbs.
10	Paint	Aromatic Hydrocarbon	1 lb. can 1,5 gals.	100 gals.	35 gals.
12B	Paint Thinner No. 1	Xylene	55 gals.	55 gals.	7 gals.
12B	Paint Thinner No. 2	Mek, Toluene	55 gals.	275 gals.	7 gals.
12B	Paint Thinner No. 4	MEK	55 gals.	110 gals.	7 gals.
12B	Paint Thinner No. 5	MEK	55 gals.	330 gals.	7 gals.
12B	Mineral Spirits	Mineral Spirits	55 gals.	430 gals.	20 gals.
12A	M-2	Chlorinated Hydrocarbon	55 gals.	110 gals.	4 gals.
12A	Penetone 19	Aromatic Hydrocarbon	55 gals.	110 gals.	4 gals.

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ATTACHMENT "A" CONTINUED

EQCB CODE	TRADE NAME OF HAZARDOUS MAT'LS	CHEMICAL OR GENERIC NAME OF HAZARDOUS MAT'LS	CONTAINER SIZE	TOT QUANT ON-SITE (GAL/LBS)	MONTHLY USE (GAL/LBS)
12A	Penetone 58B	Aromatic Hydrocarbon	55 gals.	110 gals.	4 gals.
12B	NSC 200	Ethylene Glycol Monobutyl Ether	55 gals.	55 gals.	4 gals.
25	Turbo 32, 68, 100, 220, 25	Petroleum Base	55 gals.	1925 gals.	10 gals.
25	Aeroshell 500, 600	Petroleum Base	55 gals.	165 gals.	8 gals.
25	Tellusb 32, 68, 100	Petroleum Base	55 gals.	605 gals.	8 gals.
25	Spirex SAE 85-140	Petroleum Base	55 gals.	220 gals.	8 gals.
25	Clavus 68	Petroleum Base	55 gals.	465 gals.	8 gals.
25	Valvata J-680	Petroleum Base	55 gals.	110 gals.	8 gals.
25	Rotella 30, 30T 40	Petroleum Base	55 gals.	880 gals.	8 gals.
25	Dextron II ATF	Petroleum Base	55 gals.	55 gals.	8 gals.
25	Type FATF	Petroleum Base	55 gals.	55 gals.	8 gals.
25	Calibration Fluid	Petroleum Base	55 gals.	110 gals.	8 gals.
25	Tonna 68	Petroleum Base	55 gals.	55 gals.	8 gals.
25	Rondo HD 150	Petroleum Base	55 gals.	55 gals.	8 gals.
25	Multitrak	Petroleum Base	55 gals.	55 gals.	8 gals.
25	Unilube Multi-trak Hyd. Fluid	Petroleum Base	55 gals.	110 gals.	8 gals.
25	Kendall R&O AW68	Petroleum Base	55 gals.	220 gals.	8 gals.
25	WD-40	Petroleum Base	55 gals.	55 gals.	8 gals.
25	Nox Rust	Petroleum Base	55 gals.	165 gals.	8 gals.
25	Gulf Lubecoat 0,1,2,3	Petroleum Base	35 lbs.	35 lbs.	3 lbs.
25	Shell Alvania	Petroleum Base	35 lbs.	1920 lbs.	3 lbs.

OCT-26-'89 13:21 ID:CSS SED TEL NO:305-765-2527 #141 P05

ATTACHMENT "A" CONTINUED

EQCB CODE	TRADE NAME OF HAZARDOUS MAT'LS	CHEMICAL OR GENERIC NAME OF HAZARDOUS MAT'LS	CONTAINER SIZE	TOT QUANT ON-SITE (GAL/LBS)	MONTHLY USE (GAL/LBS)
12B	Biobor JF	Naptha	55 gals.	0 gals.	1 gal.
16	Oxsorbant	Chromium Chloride	1/8 gal.	5/8 gal.	1/16 gal.
16	Soda Ash	Sodium Carbonate	50 lbs.	7000 lbs.	2000 lbs.
16	Sodium Hydroxide	Sodium Hydroxide	1500 lbs.	960 lbs.	490 lbs.

TOTAL MONTHLY USE:	1821 gals.
HAZ MAT FEE PAID:	$ 325.00
STORAGE TANK FEE PAID:	N/A
IND. WASTEWATER FEE PAID:	$1600.00
TOTAL	$1925.00

c:\wpdoc7\iwh10289.lic

OCT-26-'89 13:22 ID:CSS SED TEL NO:305-765-3537 #141 P10

FDER AIR PERMITS

Florida Department of Environmental Regulation
Southeast District • 1900 S. Congress Ave., Suite A • West Palm Beach, Florida 33406 • 407-964-9668
Bob Martinez, Governor Dale Twachtmann, Secretary [illegible], Assistant Secretary
[illegible], Assistant Secretary

RECEIVED
AUG 0 9 1988
MANAGER
PERMITTING & PROGRAMS

RECEIVED
AUG 0 9 1988
AUG 0 9 1988
ENV. PERMITTING

NOTICE OF PERMIT

Broward County
AP - Florida Power & Light Co. -
Lauderdale Unit 4

Mr. T. R. Fair, Manager
Environmental Permitting & Programs
Florida Power & Light
P. O. Box 14000
Juno Beach, FL 33408

Dear Mr. Fair:

Enclosed is Permit Number AO 06-146594 to operate an air pollution source issued pursuant to Section 403.087, Florida Statutes.

Persons whose substantial interests are affected by this permit have a right, pursuant to Section 120.57, Florida Statutes, to petition for an administrative determination (hearing) on it. The petition must conform to the requirements of Chapters 17-103 and 28-5.201, FAC, and must be filed (received) in the Department's Office of General Counsel, 2600 Blair Stone Road, Tallahassee, FL 32399-2400, within fourteen (14) days of receipt of this notice. Failure to file a petition within the fourteen (14) days constitutes a waiver of any right such person has to an administrative determination (hearing) pursuant to Section 120.57, Florida Statutes. This permit is final and effective on the date filed with the Clerk of the Department unless a petition is filed in accordance with this paragraph or unless a request for extension of time in which to file a petition is filed within the time specified for filing a petition and conforms to Rule 17-103.070, FAC. Upon timely filing of a petition or a request for an extension of time this permit will not be effective until further Order of the Department.

When the Order (Permit) is final, any party to the Order has the right to seek judicial review of the Order pursuant to Section 120.68, Florida Statutes, by the filing of a Notice of Appeal pursuant to Rule 9.110, Florida Rules of Appellate Procedure, with the Clerk of the Department in the Office of General Counsel, 2600 Blair Stone Road, Tallahassee, FL 32399-2400; and by filing a copy of the Notice of Appeal accompanied by the applicable filing fees with the appropriate District Court of Appeal. The Notice of Appeal must be filed within 30 days from the Final Order is filed with the Clerk of the Department.

Executed in West Palm Beach, Florida

STATE OF FLORIDA
DEPARTMENT OF REGULATION

Stephanie S. Brooks
Engineer
Air Permitting
1900 South Congress Ave., Suite A
West Palm Beach, FL 33406
407/964-9668

SB:s/272

Copies furnished to:
Broward County Environmental Quality Control Board

CERTIFICATE OF SERVICE

This is to certify that this NOTICE OF PERMIT and all copies were mailed before the close of business on AUG 03 1988 to the listed persons.

Clerk Stamp

FILING AND ACKNOWLEDGEMENT FILED, on this date, pursuant to §120.52(10), Florida Statutes, with the designated Department Clerk, receipt of which is hereby acknowledged.

Clerk

AUG 03 1988
Date

Florida Department of Environmental Regulation

Southeast District ● 1900 S. Congress Ave., Suite A ● West Palm Beach, Florida 33406 ● 407-964-9668

Bob Martinez, Governor | Dale Twachtmann, Secretary | John Shearer, Assistant Secretary | Scott Benson, Deputy Assistant Secretary

PERMITTEE:
Mr. T. R. Fair, Manager
Environmental Permitting & Programs
Florida Power & Light
P. O. Box 14000
Juno Beach, FL 33408

I.D. NUMBER: 50/BRO/06/0037/01
PERMIT/CERTIFICATION NUMBER: AO 06-146594 *
DATE OF ISSUE: AUG 05 1993
EXPIRATION DATE: May 15, 1993
COUNTY: Broward
LATITUDE/LONGITUDE: 26°04'06"N/80°12'00"W
UTM: Zone 17; 600.0 Km. E; 2883.2 Km. N
PROJECT: Florida Power & Light Co.
Lauderdale Unit 4

This permit is issued under the provisions of Chapter 403, Florida Statutes, and Florida Administrative Code Rule 17-2, and in conformance with all existing regulations of the Florida Department of Environmental Regulation. The above named permittee is hereby authorized to perform the work or operate the facility shown on the application and approved drawing(s), plans, and other documents attached hereto or on file with the Department and made a part hereof and specifically described as follows:

OPERATE: An air pollution source consisting of a 161 MW (gross capacity) steam generating unit (#4) burning a variable combination of natural gas, used oil fuel from FP & L operations, and No. 6 fuel oil with a maximum heat input rate of 1725 million BTU/hr., discharging pollutants through a stack 151 feet above ground level.

IN ACCORDANCE WITH: Application for Renewal of Permit to Operate Air Pollution Sources dated March 10, 1988, and Application to Operate Air Pollution Sources received September 23, 1977 (none are attached).

LOCATED AT: Griffin Road, Dania, Broward County, Florida.

TO SERVE: An electric service utility facility (SIC # 4911)

SUBJECT TO: General Conditions 1-15 and Specific Conditions 1-10.

* This permit is a renewal of AO 06-60682 issued May 26, 1983, and a modification of AO 06-146594 issued May 31, 1988.

PERMITTEE:
Mr. T. R. Fair, Manager
Environmental Permitting & Programs
Florida Power & Light

I.D. NUMBER: 50/BRO/06/0037/01
PERMIT/CERTIFICATION NUMBER: AO 06-146594 *
DATE OF ISSUE: [illegible]
EXPIRATION DATE: May 15, 1993

GENERAL CONDITIONS:

1. The terms, conditions, requirements, limitations, and restrictions set forth herein are "Permit Conditions" and as such are binding upon the permittee and enforceable pursuant to the authority of Sections 403.161, 403.727, or 403.859 through 403.861, Florida Statutes. The permittee is hereby placed on notice that the Department will review this permit periodically and may initiate enforcement action for any violation of the "Permit Conditions" by the permittee, its agents, employees, servants or representatives.

2. This permit is valid only for the specific processes and operations applied for and indicated in the approved drawings or exhibits. Any unauthorized deviation from the approved drawings, exhibits, specifications, or conditions of this permit may constitute grounds for revocation and enforcement action by the Department.

3. As provided in Subsections 403.087(6) and 403.722(5), Florida Statutes, the issuance of this permit does not convey any vested rights or any exclusive privileges. Nor does it authorize any injury to public or private property or any invasion of personal rights, nor any infringement of federal, state, or local laws or regulations. This permit does not constitute a waiver of or approval of any other Department permit that may be required for other aspects of the total project which are not addressed in the permit.

4. This permit conveys no title to land or water, does not constitute state recognition or acknowledgement of title, and does not constitute authority for the use of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the state. Only the Trustees of the Internal Improvement Trust Fund may express state opinion as to title.

5. This permit does not relieve the permittee from liability for harm or injury to human health or welfare, animal, plant or aquatic life or property and penalties therefore caused by the construction or operation of this permitted source, nor does it allow the permittee to cause pollution in contravention of Florida Statutes and Department rules, unless specifically authorized by an order from the Department.

6. The permittee shall at all times properly operate and maintain the facility and systems of treatment and control (and related appurtenances) that are installed or used by the permittee to achieve compliance with the conditions of this permit, as required by Department rules. This provision includes the operation of backup or auxiliary facilities or similar systems when necessary to achieve compliance with the conditions of the permit, and when required by Department rules.

7. The permittee, by accepting this permit, specifically agrees to allow authorized Department personnel, upon presentation of credentials or other documents as may be required by law, access to the premises, at reasonable times, where the permitted activity is located or conducted for the purpose of:

   a. Having access to and copying any records that must be kept under the conditions of the permit;

   b. Inspecting the facility, equipment, practices, or operations regulated or required under this permit; and

   c. Sampling or monitoring any substances or parameters at any location reasonably necessary to assure compliance with this permit or Department rules.

   Reasonable time may depend on the nature of the concern being investigated.

8. If, for any reason, the permittee does not comply with or will be unable to comply with any condition or limitation specified in the permit, the permittee shall immediately notify and provide the Department with the following information:

   a. a description of and cause of noncompliance; and

   b. the period of noncompliance, including exact dates and times; or, if not corrected, the anticipated time the noncompliance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence of the noncompliance.

GENERAL CONDITIONS:

The permittee shall be responsible for any and all damages which may result and may be subject to enforcement action by the Department for penalties or revocation of this permit.

9. In accepting this permit, the permittee understands and agrees that all records, notes, monitoring data and other information relating to the construction or operation of this permitted source, which are submitted to the Department, may be used by the Department as evidence in any enforcement case arising under the Florida Statutes or Department rules, except where such use is proscribed by Sections 403.73 and 403.111, Florida Statutes.

10. The permittee agrees to comply with changes in Department rules and Florida Statutes after a reasonable time for compliance, provided however, the permittee does not waive any other rights granted by Florida Statutes or Department rules.

11. This permit is transferable only upon Department approval in accordance with Florida Administrative Code Rules 17-4.12 and 17-30.30, as applicable. The permittee shall be liable for any noncompliance of the permitted activity until the transfer is approved by the Department.

12. This permit is required to be kept at the work site of the permitted activity during the entire period of construction or operation.

13. This permit also constitutes:

( ) Determination of Best Available Control Technology (BACT)
( ) Determination of Prevention of Significant Deterioration (PSD)
( ) Certification of Compliance with State Water Quality Standards (Section 401, PL 92-500)
( ) Compliance with New Source Performance Standards

14. The permittee shall comply with the following monitoring and record keeping requirements:

a. Upon request, the permittee shall furnish all records and plans required under Department rules. The retention period for all records will be extended automatically, unless otherwise stipulated by the Department, during the course of any unresolved enforcement action.

b. The permittee shall retain at the facility or other location designated by this permit records of all monitoring information (including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation), copies of all reports required by this permit, and records of all data used to complete the application for this permit. The time period of retention shall be at least three years from the date of the sample, measurement, report or application unless otherwise specified by Department rule.

c. Records of monitoring information shall include:

- the date, exact place, and time of sampling or measurements;
- the person responsible for performing the sampling or measurements;
- the date(s) analyses were performed;
- the person responsible for performing the analyses;
- the analytical techniques or methods used; and
- the results of such analyses.

15. When requested by the Department, the permittee shall within a reasonable time furnish any information required by law which is needed to determine compliance with the permit. If the permittee becomes aware that relevant facts were not submitted or were incorrect in the permit application or in any report to the Department, such facts or information shall be submitted or corrected promptly.

PERMITTEE:
Mr. T. R. Fair, Manager
Environmental Permitting & Programs
Florida Power & Light

I.D. NUMBER: 50/BRO/06/0037/01
PERMIT/CERTIFICATION NUMBER: AO 06-146594 *
DATE OF ISSUE: AUG 05 1988
EXPIRATION DATE: ~~May~~ 15, ~~1993~~

SPECIFIC CONDITIONS:

1. Compliance testing shall be conducted for the sources covered by this permit once each federal fiscal year in accordance with the methods specified below.

2. Emission limiting standards are as follows:

In accordance with Florida Administrative Code Rules 17-2.600(5)(b) and 17-2.250(3):

- SO_2 emissions shall not exceed 1.1 pounds per million BTU heat input.

- For steady state operations
  Visible emissions shall not exceed 20% opacity.
  Particulate emissions shall not exceed 0.1 pounds per million BTU heat input.

- For soot blowing and load changes

  Visible emissions shall not exceed 60% opacity during the 3 hour period of excess emissions allowed for soot blowing and load changes.

  Particulate emissions shall not exceed an average of 0.3 pounds per million BTU heat input during the three hour period of excess emissions allowed for soot blowing and load changes.

3. The compliance test report shall include results of tests by the following method:

Source/Emission Point	Pollutant	Test Method
Unit No. 4	Particulate (Steady State & Soot Blowing)	EPA Method 17 * or EPA Method 5
	Visible Emissions (Steady State & Soot Blowing)	DER Method 9
	SO_2	**

* EPA Method 17 may be used only if the stack temperature is less than 375°F.

** Stack testing for SO_2 is required if the equivalent sulfur content of the fuel exceeds 2.5% . Sulfur content shall be verified by submittal of monthly fuel analyses reports on a quarterly basis.

4. Emissions compliance testing should be conducted with the source firing No. 6 fuel oil and/or natural gas and operating within ten percent (10%) of its rated capacity; provided, however, that such testing may be conducted with the source operating at less than ninety percent (90%) of its rated capacity, in which case the source may subsequently be operated at any capacity up to one hundred ten percent (110%) of the average load at which compliance was demonstrated, and at higher capacities for up to fifteen days for purposes of additional compliance testing. A particulate test to show compliance must be conducted within sixty (60) days of the monthly fuel analysis if the equivalent sulfur content of the fuel burned (fuel oil and/or natural gas)is increased by 0.5 percentage points or more from that used during the previous test.

5. The Department shall be notified of expected test dates at least fifteen (15) days prior to compliance testing.

6. On or before March 1 of each calendar year, a completed DER Form 17-1.202(6), Annual Operations Report Form for Air Emissions Sources shall be submitted to the Department.

7. Copies of all reports, tests, notifications or other submittals required by this permit shall be submitted to both the Department of Environmental Regulation, Southeast District Office and Broward County Environmental Quality Control Board.

PERMITTEE:
Mr. T. R. Fair, Manager
Environmental Permitting & Programs
Florida Power & Light

I.D. NUMBER: 50/BRO/06/0037/01
PERMIT/CERTIFICATION NUMBER: AO 06-146594 *
DATE OF ISSUE: AUG 05 1988
EXPIRATION DATE: ~~May 15, 1993~~

SPECIFIC CONDITIONS CONT.:

See cond. letter dtd 7/15/88 NO CEM

8. In addition to the requirements of General Condition 8 of this permit, a written quarterly report shall be submitted to the Department of all opacity exceedances of emission limitations specified in Florida Administrative Code Rules 17-2.250(1) through (4) and 17-2.600(5)(b)1. The report shall state the cause, period of noncompliance, and steps taken for corrective action and/or prevention of recurrence. If the opacity level cannot be determined due to an opacity monitor malfunction or for any other reason, the report shall state the cause, duration and action taken - all recorded data shall be maintained on file by Florida Power & Light for no less than two years and made available to the Department upon request.

9. All present and future variance orders or rule changes which are applicable to this source take precedence over any affected condition of this permit.

10. Burning of used oil meeting EPA specifications (40 CFR S266.40) and generated from FPL operations shall be permitted under the following conditions:

(a) Each Batch of used oil to be burned shall be sampled and analyzed for: Arsenic, Chromium, Cadmium, total Halogens, and Lead using EPA/DER or ASTM approved methods. Split samples of the used oil shall be retained for three (3) months after analysis for further testing if necessary.

(b) Results of used oil sampling and analysis performed pursuant to Specific Condition 10(a) shall be retained by permittee for at least three (3) years and made available for inspection by DER upon request.

(c) An estimate of the total quantity of used oil burned during the applicable calender year shall be included in the Annual Operations Report (AOR) for Air Emissions Sources. The permittee will submit with the AOR a summary of the range of values for each constituent analyzed pursuant to Specific Condition 10(a).

Issued this 5th day of August, 1988

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

Donald B. White, P.E.
for J. Scott Benyon
District Manager

DER Form 17-1.201(5)
Effective November 30, 1982

P. O. BOX 14000, JUNO BEACH, FL 33408-0420

FPL

June 27, 1988

Ms. Stephanie Brooks
State of Florida
Department of Environmental Regulation
Southeast District
1900 South Congress Avenue, Suite A
West Palm Beach, Florida 33406

RE: **Lauderdale Plant, Unit No. 5**
DER Air Operating Permit No. AO-06-143213
Specific Condition No. 4 - Emissions Compliance Testing

Dear Ms. Brooks:

As we discussed by phone on Friday, May 27, 1988 and today, this letter is written in confirmation of the Department's agreement to allow emissions compliance testing of the above-captioned unit while firing a combination of fuel oil and natural gas with an equivalent sulfur content of one percent. All other testing conditions remain as written.

I am attaching a copy of this letter to our copy of the permit in question and hereby request that you attach this letter to your file copy so we have consistent records. This will prevent potential confusion.

If you have any questions, please call me at (407) 694-3648.

Sincerely,

FOR Elsa A. Bishop
Environmental Coordinator

EAB:jm

Enclosure

cc: Broward County Environmental Quality Control Board

bcc: R. A. Acosta - PPE
R. N. Allen - JEN
P. C. Cunningham - HBG&S
M. J. Martin - JEN
R. F. Messer - PRS/GO
W. M. Reichel - PRS/GO
H. M. Rosen - JEN
H. E. Sanders - PFL

an FPL Group company

P. O. BOX 14000, JUNO BEACH, FL 33408-0420

FPL

August 15, 1988

Ms. Stephanie Brooks
State of Florida
Department of Environmental Regulation
Southeast District
1900 South Congress Avenue, Suite A
West Palm Beach, Florida 33406

RE: **Lauderdale Plant, Unit No. 4**
DER Air Operating Permit No. AO-06-146594

Dear Ms. Brooks:

As we discussed by phone, this is confirmation that we will accept the above captioned permit. As we also discussed, this also clarifies that this unit is not equipped with a transmissometer. Thus, the reference to such in Specific Condition 8 of the permit does not apply to this unit.

I am attaching a copy of this letter to our copy of the permit in question and hereby request that you attach this letter to your file copy so we have consistent records. This will prevent potential confusion.

If you have any questions, please call me at 694-3648.

Sincerely,

Elsa A. Bishop

Elsa A. Bishop
Environmental Coordinator

EAB:jm

cc: Broward County Environmental Quality Control Board

bcc: R. A. Acosta - PPE
R. N. Allen - JEN
P. C. Cunningham - HBG&S
M. J. Martin - JEN
R. F. Messer - PRS/GO
W. M. Reichel - PRS/GO
H. E. Sanders - PFL
Control Document

an FPL Group company

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

SOUTHEAST FLORIDA DISTRICT
1900 SOUTH CONGRESS AVENUE, SUITE A
WEST PALM BEACH, FLORIDA 33406
(305) 964-9668

RECEIVED
MAY 13 1988
MANAGER
PERMITTING & PROGRAMS

BOB MARTINEZ
GOVERNOR
DALE TWACHTMANN
SECRETARY
J. SCOTT BENYON
DISTRICT MANAGER

RECEIVED
MAY 13 1988
ENV. PERMITTING

NOTICE OF PERMIT

Broward County
AP - Florida Power & Light -
Lauderdale Unit 5

Mr. T. R. Fair, Manager
Environmental Permitting & Programs
Florida Power & Light
P. O. Box 14000
Juno Beach, FL 33408

Dear Mr. Fair:

Enclosed is Permit Number AO 06-143213 to operate an air pollution source issued pursuant to Section 403.087, Florida Statutes.

When the Order (Permit) is final, any party to the Order has the right to seek judicial review of the Order pursuant to Section 120.68, Florida Statutes, by the filing of a Notice of Appeal pursuant to Rule 9.110, Florida Rules of Appellate Procedure, with the Clerk of the Department in the Office of General Counsel, 2600 Blair Stone Road, Tallahassee, FL 32399-2400; and by filing a copy of the Notice of Appeal accompanied by the applicable filing fees with the appropriate District Court of Appeal. The Notice of Appeal must be filed within 30 days from the Final Order is filed with the Clerk of the Department.

Executed in West Palm Beach, Florida

STATE OF FLORIDA
DEPARTMENT OF REGULATION

Stephanie S. Brooks

Stephanie S. Brooks
Engineer
Air Permitting
1900 South Congress Ave., Suite A
West Palm Beach, FL 33406
305/964-9668

SB:s/262

Copies furnished to:

Broward County Environmental Quality Control Board

CERTIFICATE OF SERVICE

This is to certify that this NOTICE OF PERMIT and all copies were mailed before the close of business on MAY 1 1989 to the listed persons.

Clerk Stamp

FILING AND ACKNOWLEDGEMENT FILED, on this date, pursuant to §120.52(10), Florida Statutes, with the designated Department Clerk, receipt of which is hereby acknowledged.

Mary A. Smith — Clerk

MAY 1 1989 — Date

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

SOUTHEAST FLORIDA DISTRICT
3900 SOUTH CONGRESS AVENUE, SUITE A
WEST PALM BEACH, FLORIDA 33406
(305) 964-9668

BOB MARTINEZ
GOVERNOR
DALE TWACHTMANN
SECRETARY
J. SCOTT BENYON
DISTRICT MANAGER

PERMITTEE:
Mr. T. R. Fair, Manager
Environmental Permitting & Programs
Florida Power & Light
P. O. Box 14000
Juno Beach, FL 33408

I.D. NUMBER: 50/BRO/06/0037/02
PERMIT/CERTIFICATION NUMBER: AO 06-143213 *
DATE OF ISSUE: MAY [illegible] 1990
EXPIRATION DATE: February 15, 1993
COUNTY: Broward
LATITUDE/LONGITUDE: 26°04'06"N/80°12'00"W
UTM: Zone 17; 600.0 Km. E; 2883.2 Km. N
PROJECT: Florida Power & Light
Lauderdale Unit 5

This permit is issued under the provisions of Chapter 403, Florida Statutes, and Florida Administrative Code Rule 17-2, and in conformance with all existing regulations of the Florida Department of Environmental Regulation. The above named permittee is hereby authorized to perform the work or operate the facility shown on the application and approved drawing(s), plans, and other documents attached hereto or on file with the Department and made a part hereof and specifically described as follows:

OPERATE: An air pollution source consisting of a 161 Megawatt (gross capacity) steam generating unit (#5) burning a variable combination of natural gas, used oil fuel from FP & L operations, and No. 6 fuel oil with a maximum heat input rate of 1725 million BTU/hr , discharging pollutants through a stack 151 feet above ground level.

IN ACCORDANCE WITH: Application for Renewal dated December 14, 1987, and Application to Operate Air Pollution Source dated October 7, 1977, (none are attached).

LOCATED AT: Griffin Road, Dania, Broward County, Florida.

TO SERVE: An electric service utility facility. (SIC # 4911)

SUBJECT TO: General Conditions 1-15 and Specific Conditions 1-10.

* This permit is a renewal of AO 06-60860 issued February 24, 1983, and a modification of AO 06-143213 issued March 9, 1988.

DER Form 17-1.201(5)
Effective November 30, 1982

GENERAL CONDITIONS:

1. The terms, conditions, requirements, limitations, and restrictions set forth herein are "Permit Conditions" and as such are binding upon the permittee and enforceable pursuant to the authority of Sections 403.161, 403.727, or 403.859 through 403.861, Florida Statutes. The permittee is hereby placed on notice that the Department will review this permit periodically and may initiate enforcement action for any violation of the "Permit Conditions" by the permittee, its agents, employees, servants or representatives.

2. This permit is valid only for the specific processes and operations applied for and indicated in the approved drawings or exhibits. Any unauthorized deviation from the approved drawings, exhibits, specifications, or conditions of this permit may constitute grounds for revocation and enforcement action by the Department.

3. As provided in Subsections 403.087(6) and 403.722(5), Florida Statutes, the issuance of this permit does not convey any vested rights or any exclusive privileges. Nor does it authorize any injury to public or private property or any invasion of personal rights, nor any infringement of federal, state, or local laws or regulations. This permit does not constitute a waiver of or approval of any other Department permit that may be required for other aspects of the total project which are not addressed in the permit.

4. This permit conveys no title to land or water, does not constitute state recognition or acknowledgement of title, and does not constitute authority for the use of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the state. Only the Trustees of the Internal Improvement Trust Fund may express state opinion as to title.

5. This permit does not relieve the permittee from liability for harm or injury to human health or welfare, animal, plant or aquatic life or property and penalties therefore caused by the construction or operation of this permitted source, nor does it allow the permittee to cause pollution in contravention of Florida Statutes and Department rules, unless specifically authorized by an order from the Department.

6. The permittee shall at all times properly operate and maintain the facility and systems of treatment and control (and related appurtenances) that are installed or used by the permittee to achieve compliance with the conditions of this permit, as required by Department rules. This provision includes the operation of backup or auxiliary facilities or similar systems when necessary to achieve compliance with the conditions of the permit, and when required by Department rules.

7. The permittee, by accepting this permit, specifically agrees to allow authorized Department personnel, upon presentation of credentials or other documents as may be required by law, access to the premises, at reasonable times, where the permitted activity is located or conducted for the purpose of:

   a. Having access to and copying any records that must be kept under the conditions of the permit;

   b. Inspecting the facility, equipment, practices, or operations regulated or required under this permit; and

   c. Sampling or monitoring any substances or parameters at any location reasonably necessary to assure compliance with this permit or Department rules.

   Reasonable time may depend on the nature of the concern being investigated.

8. If, for any reason, the permittee does not comply with or will be unable to comply with any condition or limitation specified in the permit, the permittee shall immediately notify and provide the Department with the following information:

   a. a description of and cause of noncompliance; and

   b. the period of noncompliance, including exact dates and times; or, if not corrected, the anticipated time the noncompliance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence of the noncompliance.

GENERAL CONDITIONS:

The permittee shall be responsible for any and all damages which may result and may be subject to enforcement action by the Department for penalties or revocation of this permit.

9. In accepting this permit, the permittee understands and agrees that all records, notes, monitoring data and other information relating to the construction or operation of this permitted source, which are submitted to the Department, may be used by the Department as evidence in any enforcement case arising under the Florida Statutes or Department rules, except where such use is proscribed by Sections 403.73 and 403.111, Florida Statutes.

10. The permittee agrees to comply with changes in Department rules and Florida Statutes after a reasonable time for compliance, provided however, the permittee does not waive any other rights granted by Florida Statutes or Department rules.

11. This permit is transferable only upon Department approval in accordance with Florida Administrative Code Rules 17-4.12 and 17-30.30, as applicable. The permittee shall be liable for any noncompliance of the permitted activity until the transfer is approved by the Department.

12. This permit is required to be kept at the work site of the permitted activity during the entire period of construction or operation.

13. This permit also constitutes:

( ) Determination of Best Available Control Technology (BACT)
( ) Determination of Prevention of Significant Deterioration (PSD)
( ) Certification of Compliance with State Water Quality Standards (Section 401, PL 92-500)
( ) Compliance with New Source Performance Standards

14. The permittee shall comply with the following monitoring and record keeping requirements:

a. Upon request, the permittee shall furnish all records and plans required under Department rules. The retention period for all records will be extended automatically, unless otherwise stipulated by the Department, during the course of any unresolved enforcement action.

b. The permittee shall retain at the facility or other location designated by this permit records of all monitoring information (including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation), copies of all reports required by this permit, and records of all data used to complete the application for this permit. The time period of retention shall be at least three years from the date of the sample, measurement, report or application unless otherwise specified by Department rule.

c. Records of monitoring information shall include:

- the date, exact place, and time of sampling or measurements;
- the person responsible for performing the sampling or measurements;
- the date(s) analyses were performed;
- the person responsible for performing the analyses;
- the analytical techniques or methods used; and
- the results of such analyses.

15. When requested by the Department, the permittee shall within a reasonable time furnish any information required by law which is needed to determine compliance with the permit. If the permittee becomes aware that relevant facts were not submitted or were incorrect in the permit application or in any report to the Department, such facts or information shall be submitted or corrected promptly.

PERMITTEE:
Mr. T. R. Fair, Manager
Environmental Permitting & Programs
Florida Power & Light

I.D. NUMBER: 50/BRO/06/0037/02
PERMIT/CERTIFICATION NUMBER: AO 06-143213
DATE OF ISSUE: MAY [illegible] 88
EXPIRATION DATE: February 15, 1993

SPECIFIC CONDITIONS:

1. Compliance testing shall be conducted for the sources covered by this permit once each federal fiscal year in accordance with the methods specified below.

2. Emission limiting standards are as follows:

In accordance with Florida Administrative Code Rule 17-2.250(3) and 17-2.600(5)(b):

- SO_2 emissions shall not exceed 1.1 pounds per million BTU heat input.

- For steady state operations
  Visible emissions shall not exceed 20% opacity.
  Particulate emissions shall not exceed 0.1 pounds per million BTU heat input.

- For soot blowing and load changes

  Visible emissions shall not exceed 60% opacity during the 3 hour period of excess emissions allowed for soot blowing and load changes.

  Particulate emissions shall not exceed an average of 0.3 pounds per million BTU heat input during the three hour period of excess emissions allowed for soot blowing and load changes.

3. The compliance test report shall include results of tests by the following method:

Source/Emission Point	Pollutant	Test Method
Unit No. 5	Particulate (Steady State & Soot Blowing)	EPA Method 17 * or EPA Method 5
	Visible Emissions (Steady State & Soot Blowing)	DER Method 9
	SO_2	**

* EPA Method 17 may be used only if the stack temperature is less than 375°F.

** Stack testing for SO_2 is required if the equivalent sulfur content of the fuel exceeds 2.5% . Sulfur content shall be verified by submittal of monthly fuel analyses reports on a quarterly basis. The compliance test report shall be submitted to the Department in accordance with FAC Rule 17-2.700(7).

4. Emissions compliance testing should be conducted with the source firing No. 6 fuel oil and operating within ten percent (10%) of its rated capacity; provided, however, that such testing may be conducted with the source operating at less than ninety percent (90%) of its rated capacity, in which case the source may subsequently be operated at any capacity up to one hundred ten percent (110%) of the average load at which compliance was demonstrated, and at higher capacities for up to fifteen days for purposes of additional compliance testing. A particulate test to show compliance must be conducted within sixty (60) days of the monthly fuel analysis if the equivalent sulfur content of the fuel burned (fuel oil and / or natural gas) is increased by 0.5 percentage points or more from that used during the previous test.

5. The Department shall be notified of expected test dates at least fifteen (15) days prior to compliance testing.

6. On or before March 1 of each calendar year, a completed DER Form 17-1.202(6), Annual Operations Report Form for Air Emissions Sources shall be submitted to the Department. Show formulas with input and output data.

PERMITTEE:
Mr. T. R. Fair, Manager
Environmental Permitting & Programs
Florida Power & Light

I.D. NUMBER: 50/BRO/06/0037/02
PERMIT/CERTIFICATION NUMBER: AO 06-143213
DATE OF ISSUE:
EXPIRATION DATE: February 15, 1993

SPECIFIC CONDITIONS:

7. Copies of all reports, tests, notifications or other submittals required by this permit shall be submitted to both the Department of Environmental Regulation, Southeast District Office and Broward County Environmental Quality Control Board.

8. In addition to the requirements of General Condition 8 of this permit, a written quarterly report shall be submitted to the Department of all opacity exceedances of emission limitations specified in Florida Administrative Code Rules 17-2.250(1) through (4) and 17-2.600(5)(b)1. The report shall state the cause, period of noncompliance, and steps taken for corrective action and/or prevention of recurrence. If the opacity level cannot be determined due to an opacity monitor malfunction or for any other reason, the report shall state the cause, duration and action taken - all recorded data shall be maintained on file by Florida Power & Light for no less than two years and made available to the Department upon request.

9. All present and future variance orders or rule changes which are applicable to this source take precedence over any affected condition of this permit.

10. Burning of used oil meeting EPA specifications (40 CFR S266.40) and generated from FPL operations shall be permitted under the following conditions:

(a) Each batch of used oil to be burned shall be sampled and analyzed for: Arsenic, Chromium, Cadmium, total Halogens, and Lead using EPA/DER or ASTM approved methods. Split samples of the used oil shall be retained for three (3) months after analysis for further testing if necessary.

(b) Results of used oil sampling and analysis performed pursuant to Specific Condition 10 (a) shall be retained by permittee for at least three (3) years and made available for inspection by DER upon request.

(c) An estimate of the total quantity of used oil burned during the applicable calender year shall be included in the Annual Operation Report (AOR) for Air Emissions Sources. The permittee will submit with the AOR a summary of the range of values for each constituent analyzed pursuant to Specific Condition 10(a).

Issued this 9th day of May, 1988

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

J. Scott Benyon
District Manager

R Form 17-1.201(5)
Effective November 30, 1982

P. O. BOX 14000, JUNO BEACH, FL 33408-0420

FPL

May 16, 1988

Ms. Stephanie Brooks
State of Florida
Department of Environmental Regulation
Southeast District
1900 South Congress Avenue, Suite A
West Palm Beach, Florida 33406

RE: **Lauderdale Plant, Unit No. 5**
DER Air Operating Permit No. AO-06-143213

Dear Ms. Brooks:

As we discussed by phone, this is confirmation that we will accept the above captioned permit. As we also discussed, this also clarifies that this unit is not equipped with a transmissometer. Thus, the reference to such in Specific Condition 8 of the permit does not apply to this unit.

I am attaching a copy of this letter to our copy of the permit in question and hereby request that you attach this letter to your file copy so we have consistent records. This will prevent potential confusion.

If you have any questions, please call me at 694-3648.

Sincerely,

Elsa A. Bishop
Environmental Coordinator

EAB:jm

cc: Broward County Environmental Quality Control Board

bcc: R. A. Acosta - PPE
R. N. Allen - JEN
P. C. Cunningham - HBG&S
M. J. Martin - JEN
R. F. Messer - PRS/GO
W. M. Reichel - PRS/GO
H. E. Sanders - PFL
Control Document

an FPL Group company

P. O. BOX 14000, JUNO BEACH, FL 33408-0420

FPL

June 27, 1988

Ms. Stephanie Brooks
State of Florida
Department of Environmental Regulation
Southeast District
1900 South Congress Avenue, Suite A
West Palm Beach, Florida 33406

RE: **Lauderdale Plant, Unit No. 5**
DER Air Operating Permit No. AO-06-143213
Specific Condition No. 4 - Emissions Compliance Testing

Dear Ms. Brooks:

As we discussed by phone on Friday, May 27, 1988 and today, this letter is written in confirmation of the Department's agreement to allow emissions compliance testing of the above-captioned unit while firing a combination of fuel oil and natural gas with an equivalent sulfur content of one percent. All other testing conditions remain as written.

I am attaching a copy of this letter to our copy of the permit in question and hereby request that you attach this letter to your file copy so we have consistent records. This will prevent potential confusion.

If you have any questions, please call me at (407) 694-3648.

Sincerely,

FOR Elsa A. Bishop
Environmental Coordinator

EAB:jm

Enclosure

cc: Broward County Environmental Quality Control Board

bcc: R. A. Acosta - PPE
R. N. Allen - JEN
P. C. Cunningham - HBG&S
M. J. Martin - JEN
R. F. Messer - PRS/GO
W. M. Reichel - PRS/GO
H. M. Rosen - JEN
H. E. Sanders - PFL

an FPL Group company

Florida Department of Environmental Regulation
Southeast District • 1900 S. Congress Ave., Suite A • West Palm Beach, Florida 33406 • 407-964-9668
Bob Martinez, Governor Dale Twachtmann, Secretary Jon Steverer, Assistant Secretary
[illegible], Deputy Assistant Secretary

RECEIVED
AUG 0 9 1988
MANAGER
PERMITTING & PROGRAMS

RECEIVED
AUG 0 9 1988
ENV. PERMITTING

NOTICE OF PERMIT

Broward County
AP - Florida Power & Light Co. -
Lauderdale Gas Turbines Nos. 1-12

Mr. T. R. Fair, Manager
Environmental Permitting & Programs
Florida Power & Light
P. O. Box 14000
Juno Beach, FL 33408

Dear Mr. Fair:

Enclosed is Permit Number AO 06-148760 to operate an air pollution source issued pursuant to Section 403.087, Florida Statutes.

Persons whose substantial interests are affected by this permit have a right, pursuant to Section 120.57, Florida Statutes, to petition for an administrative determination (hearing) on it. The petition must conform to the requirements of Chapters 17-103 and 28-5.201, FAC, and must be filed (received) in the Department's Office of General Counsel, 2600 Blair Stone Road, Tallahassee, FL 32399-2400, within fourteen (14) days of receipt of this notice. Failure to file a petition within the fourteen (14) days constitutes a waiver of any right such person has to an administrative determination (hearing) pursuant to Section 120.57, Florida Statutes. This permit is final and effective on the date filed with the Clerk of the Department unless a petition is filed in accordance with this paragraph or unless a request for extension of time in which to file a petition is filed within the time specified for filing a petition and conforms to Rule 17-103.070, FAC. Upon timely filing of a petition or a request for an extension of time this permit will not be effective until further Order of the Department.

When the Order (Permit) is final, any party to the Order has the right to seek judicial review of the Order pursuant to Section 120.68, Florida Statutes, by the filing of a Notice of Appeal pursuant to Rule 9.110, Florida Rules of Appellate Procedure, with the Clerk of the Department in the Office of General Counsel, 2600 Blair Stone Road, Tallahassee, FL 32399-2400; and by filing a copy of the Notice of Appeal accompanied by the applicable filing fees with the appropriate District Court of Appeal. The Notice of Appeal must be filed within 30 days from the Final Order is filed with the Clerk of the Department.

Executed in West Palm Beach, Florida

STATE OF FLORIDA
DEPARTMENT OF REGULATION

Stephanie S. Brooks
Engineer
Air Permitting
1900 South Congress Ave., Suite A
West Palm Beach, FL 33406
407/964-9668

SB:s/184

Copies furnished to:
Broward County Environmental Quality Control Board

CERTIFICATE OF SERVICE

This is to certify that this NOTICE OF PERMIT and all copies were mailed before the close of business on AUG [illegible] to the listed persons.

Clerk Stamp

FILING AND ACKNOWLEDGEMENT FILED, on this date, pursuant to §120.52(10), Florida Statutes, with the designated Department Clerk, receipt of which is hereby acknowledged.

Clerk

AUG 0 8 1983
Date

Florida Department of Environmental Regulation

Southeast District ● 1000 S. Congress Ave., Suite A ● West Palm Beach, Florida 33406 ● 407-964-9668

Bob Martinez, Governor | Dale Twachtmann, Secretary | Jon Shearer, Assistant Secretary | [illegible] Benyon, Deputy Assistant Secretary

PERMITTEE:
Mr. T. R. Fair, Manager
Environmental Permitting & Programs
Florida Power & Light
P. O. Box 14000
Juno Beach, FL 33408

I.D. NUMBER: 50/BRO/06/0037/03
PERMIT/CERTIFICATION NUMBER: AO 06-148760 *
DATE OF ISSUE: AUG [illegible] 1988
EXPIRATION DATE: June 30, 1993
COUNTY: Broward
LATITUDE/LONGITUDE: 26°04'16"N/80°11'56"W
UTM: Zone 17; 580.4 Km. E; 2883.5 Km. N
PROJECT: Florida Power & Light Co.
Lauderdale Gas Turbines Nos. 1-12

This permit is issued under the provisions of Chapter 403, Florida Statutes, and Florida Administrative Code Rule 17-2, and in conformance with all existing regulations of the Florida Department of Environmental Regulation. The above named permittee is hereby authorized to perform the work or operate the facility shown on the application and approved drawing(s), plans, and other documents attached hereto or on file with the Department and made a part hereof and specifically described as follows:

OPERATE: An air pollution source consisting of gas turbine Units 1 through 12 with a 486 MW gross capacity burning natural gas and/or No. 2 distillate oil, exhausting through seperate stacks 45 feet above ground level. The heat input rate per unit is 702 mm BTU/hr.

IN ACCORDANCE WITH: Application for Renewal of Permit to Operate Air Pollution Sources received April 26, 1988 as modified by letter May 9, 1988, Application to Operate Air Pollution Sources dated October 7, 1977 and letter dated June 13, 1983 (none are attached).

LOCATED AT: Griffin Road, Dania, Broward County, Florida.

TO SERVE: An electric service utility facility (SIC # 4911)

SUBJECT TO: General Conditions 1-15 and Specific Conditions 1-5.

* This permit is a renewal of AO 06-62932 issued June 27, 1983.

DER Form 17-1.201(5)
Effective November 30, 1982

PERMITTEE:
Mr. J. R. Fair, Manager
Environmental Permitting & Programs
Florida Power & Light

I.D. NUMBER: 50/BRO/06/0037/03
PERMIT/CERTIFICATION NUMBER: AO 06-148760 *
DATE OF ISSUE: [illegible]
EXPIRATION DATE: June 30, 1993

GENERAL CONDITIONS:

1. The terms, conditions, requirements, limitations, and restrictions set forth herein are "Permit Conditions" and as such are binding upon the permittee and enforceable pursuant to the authority of Sections 403.161, 403.727, or 403.859 through 403.861, Florida Statutes. The permittee is hereby placed on notice that the Department will review this permit periodically and may initiate enforcement action for any violation of the "Permit Conditions" by the permittee, its agents, employees, servants or representatives.

2. This permit is valid only for the specific processes and operations applied for and indicated in the approved drawings or exhibits. Any unauthorized deviation from the approved drawings, exhibits, specifications, or conditions of this permit may constitute grounds for revocation and enforcement action by the Department.

3. As provided in Subsections 403.087(6) and 403.722(5), Florida Statutes, the issuance of this permit does not convey any vested rights or any exclusive privileges. Nor does it authorize any injury to public or private property or any invasion of personal rights, nor any infringement of federal, state, or local laws or regulations. This permit does not constitute a waiver of or approval of any other Department permit that may be required for other aspects of the total project which are not addressed in the permit.

4. This permit conveys no title to land or water, does not constitute state recognition or acknowledgement of title, and does not constitute authority for the use of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the state. Only the Trustees of the Internal Improvement Trust Fund may express state opinion as to title.

5. This permit does not relieve the permittee from liability for harm or injury to human health or welfare, animal, plant or aquatic life or property and penalties therefore caused by the construction or operation of this permitted source, nor does it allow the permittee to cause pollution in contravention of Florida Statutes and Department rules, unless specifically authorized by an order from the Department.

6. The permittee shall at all times properly operate and maintain the facility and systems of treatment and control (and related appurtenances) that are installed or used by the permittee to achieve compliance with the conditions of this permit, as required by Department rules. This provision includes the operation of backup or auxiliary facilities or similar systems when necessary to achieve compliance with the conditions of the permit, and when required by Department rules.

7. The permittee, by accepting this permit, specifically agrees to allow authorized Department personnel, upon presentation of credentials or other documents as may be required by law, access to the premises, at reasonable times, where the permitted activity is located or conducted for the purpose of:

   a. Having access to and copying any records that must be kept under the conditions of the permit;

   b. Inspecting the facility, equipment, practices, or operations regulated or required under this permit; and

   c. Sampling or monitoring any substances or parameters at any location reasonably necessary to assure compliance with this permit or Department rules.

   Reasonable time may depend on the nature of the concern being investigated.

8. If, for any reason, the permittee does not comply with or will be unable to comply with any condition or limitation specified in the permit, the permittee shall immediately notify and provide the Department with the following information:

   a. a description of and cause of noncompliance; and

   b. the period of noncompliance, including exact dates and times; or, if not corrected, the anticipated time the noncompliance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence of the noncompliance.

PERMITTEE:
Mr. T. F. Fair, Manager
Environmental Permitting & Programs
Florida Power & Light

I.D. NUMBER: [illegible]/BRO/06/0037/03
PERMIT/CERTIFICATION NUMBER: [illegible] 06-148760 *
DATE OF ISSUE: [illegible]
EXPIRATION DATE: June 30, 1993

GENERAL CONDITIONS:

The permittee shall be responsible for any and all damages which may result and may be subject to enforcement action by the Department for penalties or revocation of this permit.

9. In accepting this permit, the permittee understands and agrees that all records, notes, monitoring data and other information relating to the construction or operation of this permitted source, which are submitted to the Department, may be used by the Department as evidence in any enforcement case arising under the Florida Statutes or Department rules, except where such use is proscribed by Sections 403.73 and 403.111, Florida Statutes.

10. The permittee agrees to comply with changes in Department rules and Florida Statutes after a reasonable time for compliance, provided however, the permittee does not waive any other rights granted by Florida Statutes or Department rules.

11. This permit is transferable only upon Department approval in accordance with Florida Administrative Code Rules 17-4.12 and 17-30.30, as applicable. The permittee shall be liable for any noncompliance of the permitted activity until the transfer is approved by the Department.

12. This permit is required to be kept at the work site of the permitted activity during the entire period of construction or operation.

13. This permit also constitutes:

( ) Determination of Best Available Control Technology (BACT)
( ) Determination of Prevention of Significant Deterioration (PSD)
( ) Certification of Compliance with State Water Quality Standards (Section 401, PL 92-500)
( ) Compliance with New Source Performance Standards

14. The permittee shall comply with the following monitoring and record keeping requirements:

a. Upon request, the permittee shall furnish all records and plans required under Department rules. The retention period for all records will be extended automatically, unless otherwise stipulated by the Department, during the course of any unresolved enforcement action.

b. The permittee shall retain at the facility or other location designated by this permit records of all monitoring information (including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation), copies of all reports required by this permit, and records of all data used to complete the application for this permit. The time period of retention shall be at least three years from the date of the sample, measurement, report or application unless otherwise specified by Department rule.

c. Records of monitoring information shall include:

- the date, exact place, and time of sampling or measurements;
- the person responsible for performing the sampling or measurements;
- the date(s) analyses were performed;
- the person responsible for performing the analyses;
- the analytical techniques or methods used; and
- the results of such analyses.

15. When requested by the Department, the permittee shall within a reasonable time furnish any information required by law which is needed to determine compliance with the permit. If the permittee becomes aware that relevant facts were not submitted or were incorrect in the permit application or in any report to the Department, such facts or information shall be submitted or corrected promptly.

PERMITTEE:
Mr. J. R. Fair, Manager
Environmental Permitting & Programs
Florida Power & Light

I.D. NUMBER: 50/BRO/06/0037/03
PERMIT/CERTIFICATION NUMBER: AO 06-148760 *
DATE OF ISSUE: DEC 0 8 1989
EXPIRATION DATE: June 30, 1993

SPECIFIC CONDITIONS:

(1) Permitted Fuels:

These sources shall be fired with No. 2 Distillate fuel oil and/or natural gas.

(2) Source Emission Limiting Standards and Compliance Testing Requirements:

POLLUTANT	EMISSION [1] LIMITING STDS.	TESTING FREQUENCY ANNUAL	QUARTERLY	OTHER	TEST [2] METHOD
Visible Emissions	20% Opacity	------	-------	✓ If fuel oil consumption in any unit reaches 23,810 bbls (1,000,000 gal.) in a fiscal year, within that fiscal year*	EPA Method 9

1. - FAC 17-2.610(2)
2. - FAC 17-2.700(1)(d), Table 700-1

* NOTE: Usage may be determined on the basis of proportionate time of operation versus total fuel consumption for the block of 12 units. If fuel consumption testing threshold is achieved in September, then visible emissions testing may be conducted prior to October 31 of the same calendar year.

(3) Compliance Testing Related Requirements:

(a) Notification - FAC 17-2.700(2)(a)5

Notification of scheduled test dates shall be given to the Department Southeast District Office and the Broward County Environmental Quality Control Board at least 15 days prior to testing unless otherwise agreed to by the Department.

(b) Conditions

Testing of emissions should be conducted with the source operating within 10% of its rated capacity. Testing may be conducted at less than 90% of rated capacity; however, if so, subsequent source operation is limited to up to 110% of the test load. Once the unit is so limited, then operation at higher capacities is allowed for purposes of additional compliance testing to regain rated capacity in permit, with prior notification to the Department.

PERMITTEE:
Mr. T. R. Fair, Manager
Environmental Permitting & Programs
Florida Power & Light

I.D. NUMBER: 50/BRO/06/0037/03
PERMIT/CERTIFICATION NUMBER: AO 06-148760 *
DATE OF ISSUE: AUG 05 1988
EXPIRATION DATE: June 30, 1993

SPECIFIC CONDITIONS:

(c) Report Submittal - FAC 17-2.700(7)

A copy of the test results shall be submitted to the Department Southeast District Office and the Broward County Environmental Quality Control Board, including formulas with input and output data.

(4) Annual Operations Report - FAC 17-4.14:

On or before March 1 of each calendar year, a completed DER Form 17-1.202(6), Annual Operations Report Form for Air Emissions Sources shall be submitted to the Department Southeast District Office and the Broward County Environmental Quality Control Board, including formulas with input and output data.

(5) Excess Emissions - FAC 17-2.250(1):

Excess emissions resulting from start-up, shut-down or malfunction shall be permitted providing (1) best operational practices to minimize emissions are adhered to and (2) the duration of excess emissions shall be minimized but in no case exceed two hours in any 24-hour period unless specifically authorized by the Department for longer duration.

Issued this 5th day of August, 1988

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

Donald B. White, P.E.
for J. Scott Benyon
Deputy Assistant Secretary

DER Form 17-1.201(5)
Effective November 30, 1982

Florida Department of Environmental Regulation
Southeast District • 1900 S. Congress Ave., Suite A • West Palm Beach, Florida 33406 • 407-964-9668
Bob Martinez, Governor Dale Twachtmann, Secretary [illegible] Shealer, Assistant Secretary [illegible] Duty Assistant Secretary

RECEIVED
AUG 09 1988
MANAGER
PERMITTING & PROGRAMS

RECEIVED
AUG 0 9 1988
ENV. PERMITTING

NOTICE OF PERMIT

Broward County
AP - Florida Power & Light Co. -
Lauderdale Gas Turbines Nos. 13-24

Mr. T. R. Fair, Manager
Environmental Permitting & Programs
Florida Power & Light
P. O. Box 14000
Juno Beach, FL 33408

Dear Mr. Fair:

Enclosed is Permit Number AO 06-148761 to operate an air pollution source issued pursuant to Section 403.087, Florida Statutes.

Persons whose substantial interests are affected by this permit have a right, pursuant to Section 120.57, Florida Statutes, to petition for an administrative determination (hearing) on it. The petition must conform to the requirements of Chapters 17-103 and 28-5.201, FAC, and must be filed (received) in the Department's Office of General Counsel, 2600 Blair Stone Road, Tallahassee, FL 32399-2400, within fourteen (14) days of receipt of this notice. Failure to file a petition within the fourteen (14) days constitutes a waiver of any right such person has to an administrative determination (hearing) pursuant to Section 120.57, Florida Statutes. This permit is final and effective on the date filed with the Clerk of the Department unless a petition is filed in accordance with this paragraph or unless a request for extension of time in which to file a petition is filed within the time specified for filing a petition and conforms to Rule 17-103.070, FAC. Upon timely filing of a petition or a request for an extension of time this permit will not be effective until further Order of the Department.

When the Order (Permit) is final, any party to the Order has the right to seek judicial review of the Order pursuant to Section 120.68, Florida Statutes, by the filing of a Notice of Appeal pursuant to Rule 9.110, Florida Rules of Appellate Procedure, with the Clerk of the Department in the Office of General Counsel, 2600 Blair Stone Road, Tallahassee, FL 32399-2400; and by filing a copy of the Notice of Appeal accompanied by the applicable filing fees with the appropriate District Court of Appeal. The Notice of Appeal must be filed within 30 days from the Final Order is filed with the Clerk of the Department.

Executed in West Palm Beach, Florida

STATE OF FLORIDA
DEPARTMENT OF REGULATION

Stephanie S. Brooks
Engineer
Air Permitting
1900 South Congress Ave., Suite A
West Palm Beach, FL 33406
407/964-9668

SB:s/184

Copies furnished to:
Broward County Environmental Quality Control Board

CERTIFICATE OF SERVICE

This is to certify that this NOTICE OF PERMIT and all copies were mailed before the close of business on AUG [illegible] 1989 to the listed persons.

Clerk Stamp

FILING AND ACKNOWLEDGEMENT FILED, on this date, pursuant to §120.52(10), Florida Statutes, with the designated Department Clerk, receipt of which is hereby acknowledged.

[signature] Clerk

AUG 0 8 1989 Date

Florida Department of Environmental Regulation

Southeast District ● 1900 S. Congress Ave., Suite A ● West Palm Beach, Florida 33406 ● 407-964-9668

Bob Martinez, Governor | Dale Twachtmann, Secretary | John Shearer, Assistant Secretary | Scott Benson, Deputy Assistant Secretary

PERMITTEE:
Mr. T. R. Fair, Manager
Environmental Permitting & Programs
Florida Power & Light
P. O. Box 14000
Juno Beach, FL 33408

I.D. NUMBER: 50/BRO/06/0037/04
PERMIT/CERTIFICATION NUMBER: AO 06-148761 *
DATE OF ISSUE: AUG [illegible] 1988
EXPIRATION DATE: June 30, 1993
COUNTY: Broward
LATITUDE/LONGITUDE: 26°04'16"N/80°11'56"W
UTM: Zone 17; 580.4 Km. E; 2884.1 Km. N
PROJECT: Florida Power & Light Co.
Lauderdale Gas Turbines Nos. 13-24

This permit is issued under the provisions of Chapter 403, Florida Statutes, and Florida Administrative Code Rule 17-2, and in conformance with all existing regulations of the Florida Department of Environmental Regulation. The above named permittee is hereby authorized to perform the work or operate the facility shown on the application and approved drawing(s), plans, and other documents attached hereto or on file with the Department and made a part hereof and specifically described as follows:

OPERATE: An air pollution source consisting of gas turbine Units 13 through 24 with a 486 MW gross capacity burning natural gas and/or No. 2 distillate oil, exhausting through seperate stacks 45 feet above ground level. The heat input rate per unit is 702 mm BTU/hr.

IN ACCORDANCE WITH: Application for Renewal of Permit to Operate Air Pollution Sources received April 28, 1988 as modified by letter May 9, 1988, Application to Operate Air Pollution Sources dated March 1, 1978 and letter dated June 13, 1983 (none are attached).

LOCATED AT: Griffin Road, Dania, Broward County, Florida.

TO SERVE: An electric service utility facility (SIC # 4911)

SUBJECT TO: General Conditions 1-15 and Specific Conditions 1-5.

* This permit is a renewal of AO 06-62939 issued June 27, 1983.

DER Form 17-1.201(5)
Effective November 30, 1982

PERMITTEE:
Mr. T. R. Fair, Manager
Environmental Permitting & Programs
Florida Power & Light

I.D. NUMBER: 50/BRO/06/0037/04
PERMIT/CERTIFICATION NUMBER: AO 06-148761 *
DATE OF ISSUE: AUG [illegible]
EXPIRATION DATE: June 30, 1993

GENERAL CONDITIONS:

1. The terms, conditions, requirements, limitations, and restrictions set forth herein are "Permit Conditions" and as such are binding upon the permittee and enforceable pursuant to the authority of Sections 403.161, 403.727, or 403.859 through 403.861, Florida Statutes. The permittee is hereby placed on notice that the Department will review this permit periodically and may initiate enforcement action for any violation of the "Permit Conditions" by the permittee, its agents, employees, servants or representatives.

2. This permit is valid only for the specific processes and operations applied for and indicated in the approved drawings or exhibits. Any unauthorized deviation from the approved drawings, exhibits, specifications, or conditions of this permit may constitute grounds for revocation and enforcement action by the Department.

3. As provided in Subsections 403.087(6) and 403.722(5), Florida Statutes, the issuance of this permit does not convey any vested rights or any exclusive privileges. Nor does it authorize any injury to public or private property or any invasion of personal rights, nor any infringement of federal, state, or local laws or regulations. This permit does not constitute a waiver of or approval of any other Department permit that may be required for other aspects of the total project which are not addressed in the permit.

4. This permit conveys no title to land or water, does not constitute state recognition or acknowledgement of title, and does not constitute authority for the use of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the state. Only the Trustees of the Internal Improvement Trust Fund may express state opinion as to title.

5. This permit does not relieve the permittee from liability for harm or injury to human health or welfare, animal, plant or aquatic life or property and penalties therefore caused by the construction or operation of this permitted source, nor does it allow the permittee to cause pollution in contravention of Florida Statutes and Department rules, unless specifically authorized by an order from the Department.

6. The permittee shall at all times properly operate and maintain the facility and systems of treatment and control (and related appurtenances) that are installed or used by the permittee to achieve compliance with the conditions of this permit, as required by Department rules. This provision includes the operation of backup or auxiliary facilities or similar systems when necessary to achieve compliance with the conditions of the permit, and when required by Department rules.

7. The permittee, by accepting this permit, specifically agrees to allow authorized Department personnel, upon presentation of credentials or other documents as may be required by law, access to the premises, at reasonable times, where the permitted activity is located or conducted for the purpose of:

   a. Having access to and copying any records that must be kept under the conditions of the permit;

   b. Inspecting the facility, equipment, practices, or operations regulated or required under this permit; and

   c. Sampling or monitoring any substances or parameters at any location reasonably necessary to assure compliance with this permit or Department rules.

   Reasonable time may depend on the nature of the concern being investigated.

8. If, for any reason, the permittee does not comply with or will be unable to comply with any condition or limitation specified in the permit, the permittee shall immediately notify and provide the Department with the following information:

   a. a description of and cause of noncompliance; and

   b. the period of noncompliance, including exact dates and times; or, if not corrected, the anticipated time the noncompliance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence of the noncompliance.

PERMITTEE:
Mr. T. R. Fair, Manager
Environmental Permitting & Programs
Florida Power & Light

I.D. NUMBER: 50/BRO/06/0037/04
PERMIT/CERTIFICATION NUMBER: AO 06-148761 *
DATE OF ISSUE: AUG [illegible] 1990
EXPIRATION DATE: June 30, 1993

GENERAL CONDITIONS:

The permittee shall be responsible for any and all damages which may result and may be subject to enforcement action by the Department for penalties or revocation of this permit.

9. In accepting this permit, the permittee understands and agrees that all records, notes, monitoring data and other information relating to the construction or operation of this permitted source, which are submitted to the Department, may be used by the Department as evidence in any enforcement case arising under the Florida Statutes or Department rules, except where such use is proscribed by Sections 403.73 and 403.111, Florida Statutes.

10. The permittee agrees to comply with changes in Department rules and Florida Statutes after a reasonable time for compliance, provided however, the permittee does not waive any other rights granted by Florida Statutes or Department rules.

11. This permit is transferable only upon Department approval in accordance with Florida Administrative Code Rules 17-4.12 and 17-30.30, as applicable. The permittee shall be liable for any noncompliance of the permitted activity until the transfer is approved by the Department.

12. This permit is required to be kept at the work site of the permitted activity during the entire period of construction or operation.

13. This permit also constitutes:

( ) Determination of Best Available Control Technology (BACT)
( ) Determination of Prevention of Significant Deterioration (PSD)
( ) Certification of Compliance with State Water Quality Standards (Section 401, PL 92-500)
( ) Compliance with New Source Performance Standards

14. The permittee shall comply with the following monitoring and record keeping requirements:

a. Upon request, the permittee shall furnish all records and plans required under Department rules. The retention period for all records will be extended automatically, unless otherwise stipulated by the Department, during the course of any unresolved enforcement action.

b. The permittee shall retain at the facility or other location designated by this permit records of all monitoring information (including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation), copies of all reports required by this permit, and records of all data used to complete the application for this permit. The time period of retention shall be at least three years from the date of the sample, measurement, report or application unless otherwise specified by Department rule.

c. Records of monitoring information shall include:

- the date, exact place, and time of sampling or measurements;
- the person responsible for performing the sampling or measurements;
- the date(s) analyses were performed;
- the person responsible for performing the analyses;
- the analytical techniques or methods used; and
- the results of such analyses.

15. When requested by the Department, the permittee shall within a reasonable time furnish any information required by law which is needed to determine compliance with the permit. If the permittee becomes aware that relevant facts were not submitted or were incorrect in the permit application or in any report to the Department, such facts or information shall be submitted or corrected promptly.

PERMITTEE:
Mr. T. R. Fair, Manager
Environmental Permitting & Programs
Florida Power & Light

I.D. NUMBER: 50/BRO/06/0037/04
PERMIT/CERTIFICATION NUMBER: AO 06-148761 *
DATE OF ISSUE: AUG 0 5 1988
EXPIRATION DATE: June 30, 1993

SPECIFIC CONDITIONS:

(1) Permitted Fuels:

These sources shall be fired with No. 2 Distillate fuel Oil and/or natural gas.

(2) Source Emission Limiting Standards and Compliance Testing Requirements:

POLLUTANT	EMISSION [1] LIMITING STDS.	TESTING FREQUENCY ANNUAL	QUARTERLY	OTHER	TEST [2] METHOD
Visible Emissions	20% Opacity	------	-------	✓ If fuel oil consumption in any unit reaches 23,810 bbls (1,000,000 gal.) in a fiscal year, within that fiscal year*	EPA Method 9

1. - FAC 17-2.610(2)
2. - FAC 17-2.700(1)(d), Table 700-1

* NOTE: Usage may be determined on the basis of proportionate time of operation versus total fuel consumption for the block of 12 units. If fuel consumption testing threshold is achieved in September, then visible emissions testing may be conducted prior to October 31 of the same calendar year.

(3) Compliance Testing Related Requirements:

(a) Notification - FAC 17-2.700(2)(a)5

Notification of scheduled test dates shall be given to the Department Southeast District Office and the Broward County Environmental Quality Control Board at least 15 days prior to testing unless otherwise agreed to by the Department.

(b) Conditions

Testing of emissions should be conducted with the source operating within 10% of its rated capacity. Testing may be conducted at less than 90% of rated capacity; however, if so, subsequent source operation is limited to up to 110% of the test load. Once the unit is so limited, then operation at higher capacities is allowed for purposes of additional compliance testing to regain rated capacity in permit, with prior notification to the Department.

PERMITTEE:
Mr. T. R. Fair, Manager
Environmental Permitting & Programs
Florida Power & Light

I.D. NUMBER: 50/BRO/06/0037/04
PERMIT/CERTIFICATION NUMBER: AO 06-148761 *
DATE OF ISSUE: AUG 05 1988
EXPIRATION DATE: June 30, 1993

SPECIFIC CONDITIONS:

(c) Report Submittal - FAC 17-2.700(7)

A copy of the test results shall be submitted to the Department Southeast District Office and the Broward County Environmental Quality Control Board, including formulas with input and output data.

(4) Annual Operations Report - FAC 17-4.14:

On or before March 1 of each calendar year, a completed DER Form 17-1.202(6), Annual Operations Report Form for Air Emissions Sources shall be submitted to the Department Southeast District Office and the Broward County Environmental Quality Control Board, including formulas with input and output data.

(5) Excess Emissions - FAC 17-2.250(1):

Excess emissions resulting from start-up, shut-down or malfunction shall be permitted providing (1) best operational practices to minimize emissions are adhered to and (2) the duration of excess emissions shall be minimized but in no case exceed two hours in any 24-hour period unless specifically authorized by the Department for longer duration.

Issued this 5th day of August, 1988

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

for Donald B. White, P.E.
J. Scott Benyon
Deputy Assistant Secretary

DER Form 17-1.201(5)
Effective November 30, 1982

FDER INDUSTRIAL WASTEWATER PERMIT

Florida Department of Environmental Regulation

Southeast District • 1900 S. Congress Ave., Suite A • West Palm Beach, Florida 33406 • 407-964-9668

Bob Martinez, Governor

Dale Twachtmann, Secretary

John Shearer, Assistant Secretary

Scott Benyon, Deputy Assistant Secretary

RECEIVED

FEB 21 1989

ENV. PERMITTING

February 17, 1989

Mr. T. R. Fair, Manager
Environmental Permitting & Programs
Florida Power & Light Company
P. O. Box 14000
Juno Beach, FL 33408

Broward County
IW-Lauderdale Plant

RE: Modification to Permit Number IO 06-158722

Dear Mr. Fair:

Your request to amend Specific Condition 4 of the referenced permit issued on January 30, 1989 is hereby approved. In order to clarify our water quality standards Permit Condition 4 shall now read as follows:

4. The permittee shall maintain the quality and quantity of effluent discharged such that the water quality standards of the State of Florida are not exceeded. These shall include the following parameters:

A. Surface Water Quality Standards

Parameter	Water Quality Standards
Discharge temperature	In accordance with FAC Rule 17-3.050
Temperature Rise	In accordance with FAC Rule 17-3.050

B. Groundwater Quality Standards

Parameter	Water Quality Standards
Chromium (total)	0.05 mg/l
Lead	0.05 mg/l
Mercury	0.002 mg/l
Nitrate (as N)	10.0 mg/l
Sodium	160 mg/l
Silver	0.05 mg/l
Arsenic	0.05 mg/l

Sampling and analysis of the effluent shall be conducted in accordance with FAC Rule 17-4.246, as per the attached schedule starting upon receipt of this permit and reports of the analysis shall be submitted to the Department by the 15th day of the succeeding month. Additional sampling and analyses may be required as conditions warrant in order to further assess the water quality.

Please note that compliance with the following secondary groundwater standards is not required unless the Department has made a determination pursuant to FAC Rule 17-28.700(8):

Parameter	Water Quality Standards
Copper	1.0 mg/l
Iron	0.3 mg/l
Zinc	5.0 mg/l
pH	6.5 S.U. (minimum)
Chloride	250 mg/l
Manganese	0.05 mg/l
Fluoride	0.5 mg/l

All other conditions of the permit remain unchanged and this letter shall be attached to the original permit. Should you have any questions, please call Mr. Vivek Kamath at 407/964-9668.

Sincerely,

J. Scott Benyon
Deputy Assistant Secretary

JSB:VK

cc: BCEQCB
Mr. W. H. Rogers, Jr., P.E., FPL

Enclosure

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

SAMPLING AND ANALYSIS SCHEDULE
FLORIDA POWER & LIGHT CO. - LAUDERDALE PLANT
Permit No. IO06-158722

1. Sampling and analyses of once through cooling water (all units) discharge to surface waters shall be conducted as follows prior to mixing with the receiving waters:

Parameter	Frequency
(1) Flow	(1) Daily
(2) Discharge temperature	(2) Daily
(3) Temperature Rise	(3) Every four hours

2. The groundwater monitoring wells U1, OB-2, OB-3, M-2, M-3 and M-4 shall be sampled and analysed as stated below.

Parameter	Frequency
(1) Copper	(1) Quarterly
(2) Iron	(2) Quarterly
(3) Oil and Grease	(3) Quarterly
(4) Chromium	(4) Semi-annually
(5) Sodium	(5) Quarterly
(6) Zinc	(6) Semi-annually
(7) Nickel	(7) Quarterly
(8) Fluoride	(8) Quarterly
(9) Silver	(9) Quarterly
(10) Sulfates	(10) Quarterly
(11) Manganese	(11) Semi-annually
(12) pH	(12) Quarterly
(13) Chlorides	(13) Quarterly
(14) Arsenic	(14) Quarterly

RECEIVED
FEB 8 1989
MANAGER
PERMITTING & PROGRAMS

Florida Department of Environmental Regulation

Southeast District ● 1900 S. Congress Ave., Suite A ● West Palm Beach, Florida 33406 ● 407-964-9668

Bob Martinez, Governor Dale Twachtmann, Secretary Scott Benyon, Deputy Assistant Secretary

FEB 0 6 1989

NOTICE OF PERMIT

Broward County
IW - FP&L Lauderdale Plant

Mr.T.R. Fair, Manager
Environmental Permitting & Programs
Florida Power & Light Company
P.O. Box 14000
Juno Beach, Fl. 33408

Dear Mr. Fair:

Enclosed is Permit Number IO 06-158722 to operate an Industrial Wastewater treatment/disposal system at the Lauderdale Plant, issued pursuant to Section 403.087, Florida Statutes.

Persons whose substantial interests are affected by this permit have a right, pursuant to Section 120.57, Florida Statutes, to petition for an administrative determination (hearing) on it. The petition must conform to the requirements of Chapters 17-103, FAC, and must be filed (received) in the Department's Office of General Counsel, 2600 Blair Stone Road, Tallahassee, FL 32399-2400, within fourteen (14) days of receipt of this notice. Failure to file a petition within the fourteen (14) days constitutes a waiver of any right such person has to an administrative determination (hearing) pursuant to Section 120.57, Florida Statutes. This permit is final and effective on the date filed with the Clerk of the Department unless a petition is filed in accordance with this paragraph or unless a request for extension of time in which to file a petition is filed within the time specified for filing a petition and conforms to Rule 17-103.070, FAC. Upon timely filing of a petition or a request for an extension of time this permit will not be effective until further Order of the Department.

When the Order (Permit) is final, any party to the Order has the right to seek judicial review of the Order pursuant to Section 120.68, Florida Statutes, by the filing of a Notice of Appeal pursuant to Rule 9.110, Florida Rules of Appellate Procedure, with the Clerk of the Department in the Office of General Counsel, 2600 Blair Stone Road, Tallahassee, FL 32399-2400; and by filing a copy of the Notice of Appeal accompanied by the applicable filing fees with the appropriate District Court of Appeal. The Notice of Appeal must be filed within 30 days from the Final Order is filed with the Clerk of the Department.

Executed in West Palm Beach, Florida

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

Vivek Kamath

Vivek Kamath
Engineer
1900 South Congress Ave.
West Palm Beach, FL 33406
407/964-9668

VK:b/291

Copies furnished to:
BCEQCB
Mr. W.H. Rogers, Jr., P.E., FPL

Mr. T.R. Fair, Manager
Florida Power & Light.

CERTIFICATE OF SERVICE

This is to certify that this NOTICE OF PERMIT and all copies were mailed before the close of business on _____ to the listed persons.

Clerk Stamp

FILING AND ACKNOWLEDGEMENT FILED, on this date, pursuant to §120.52(10), Florida Statutes, with the designated Department Clerk, receipt of which is hereby acknowledged.

_____ FEB 0 6 1990
Clerk Date

Florida Department of Environmental Regulation

Southeast District ● 1900 S. Congress Ave., Suite A ● West Palm Beach, Florida 33406 ● 407-964-9668

Bob Martinez, Governor | Dale Twachtmann, Secretary | John Shearer, Assistant Secretary | Scott Benyon, Deputy Assistant Secretary

PERMITTEE:
Mr. T.R. Fair, Manager
Environmental Permitting & Programs
Florida Power & Light Co.
Post Office Box 14000
Juno Beach, Florida 33408

I.D. NUMBER: 5006P00657
PERMIT/CERTIFICATION NUMBER: IO 06-158722
DATE OF ISSUE: JAN 30 1989
EXPIRATION DATE:
COUNTY: Broward JAN 30 1994
LATITUDE/LONGITUDE: 26°03'45"N/80°11'40"W
SECTION/TOWNSHIP/RANGE: 30/T50S/R42E
PROJECT: Lauderdale Steam Electric Plant

This permit is issued under the provisions of Chapter 403, Florida Statutes, and Florida Administrative Code Rule(s) 17-4 and 17-6. The above named permittee is hereby authorized to perform the work or operate the facility shown on the application and approved drawing(s), plans, and other documents attached hereto or on file with the Department and made a part hereof and specifically described as follows:

OPERATE: A liquid industrial waste treatment and disposal system for treating and disposing of industrial waste from the generation of electricity by steam. A volume of 343 MGD of once through cooling water is discharging to the south fork of New River Canal, classified as Class III surface waters,with a Zone of Mixing in accordance with Section 17-2.444, F.A.C. and as described in Specific Condition 3. A second volume of liquid waste consisting of wash waters from stacks, air preheater, economizer, boiler fireside and from boiler tube cleaning operations is discharging to two settling basins (B1A and B1B) each with a capacity of 0.259 MGAL and a 1.9 MGAL evaporation/percolation pond to Class G-II Groundwaters. Water treatment wastewater, floor and storm drains and boiler blowdown are discharged to the on-site stub canal (evaporation/percolation Pond). The Zone of Discharge for groundwater discharge shall be in accordance with Section 17-28.700, F.A.C. and as described in Specific Condition No. 2.

IN ACCORDANCE WITH: Your application to renew Permit No. IO06-78916, submitted on December 23, 1988 and additional information submitted on January 6, 1989.

LOCATED AT: S.W. 42 Street, 2 miles west of Ravenswood Road, Fort Lauderdale, Florida 33314.

TO SERVE: A steam electric power plant (SIC 4911).

SUBJECT TO: General Conditions 1-15 and Specific Conditions 1-10.

DER Form 17-1.201(5)
Effective November 30, 1982

GENERAL CONDITIONS:

1. The terms, conditions, requirements, limitations and restrictions set forth in this permit, are "permit conditions" and are binding and enforceable pursuant to Sections 403.141, 403.727, or 403.859 through 403.861, F.S. The permittee is placed on notice that the Department will review this permit periodically and may initiate enforcement action for any violation of these conditions.

2. This permit is valid only for the specific processes and operations applied for and indicated in the approved drawings or exhibits. Any unauthorized deviation from the approved drawings, exhibits, specifications, or conditions of this permit may constitute grounds for revocation and enforcement action by the Department.

3. As provided in subsections 403.087(6) and 403.722(5), F.S., the issuance of this permit does not convey any vested rights or any exclusive privileges. Neither does it authorize any injury to public or private property or any invasion of personal rights, nor any infringement of federal, state, or local laws or regulations. This permit is not a waiver of or approval of any other Department permit that may be required for other aspects of the total project which are not addressed in this permit.

4. This permit conveys no title to land or water, does not constitute State recognition or acknowledgement of title, and does not constitute authority for the use of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the State. Only the Trustees of the Internal Improvement Trust Fund may express State opinion as to title.

5. This permit does not relieve the permittee from liability for harm or injury to human health or welfare, animal, or plant life, or property caused by the construction or operation of this permitted source, or from penalties therefore; nor does it allow the permittee to cause pollution in contravention of Florida Statutes and Department rules, unless specifically authorized by an order from the Department.

6. The permittee shall properly operate and maintain the facility and systems of treatment and control (and related appurtenances) that are installed and used by the permittee to achieve compliance with the conditions of this permit, are required by Department rules. This provision includes the operation of backup or auxiliary facilities or similar systems when necessary to achieve compliance with the conditions of the permit and when required by Department rules.

7. The permittee, by accepting this permit, specifically agrees to allow authorized Department personnel, upon presentation of credentials or other documents as may be required by law and at reasonable times, access to the premises where the permitted activity is located or conducted to:

(a) Have access to and copy any records that must be kept under conditions of the permit;

(b) Inspect the facility, equipment, practices, or operations regulated or required under this permit; and

(c) Sample or monitor any substances or parameters at any location reasonable necessary to assure compliance with this permit or Department rules.

Reasonable time may depend on the nature of the concern being investigated.

8. If, for any reason, the permittee does not comply with or will be unable to comply with any condition or limitation specified in this permit, the permittee shall immediately provide the Department with the following information:

(a) A description of and cause of noncompliance; and

(b) The period of noncompliance, including dates and times; or, if not corrected, the anticipated time the noncompliance is expected to continue, and steps being taken tor educe, eliminate, and prevent recurrence of the noncompliance. The permittee shall be responsible for any and all damages which may result anf may be subject to enforcement action by the Department for penalties or for revocation of this permit.

9. In accepting this permit, the permittee understands and agrees that all records, notes, monitoring data and other information relating to the construction or operation of this permitted source which are submitted to the Department may be used by the Department as evidence in any enforcement case involving the permitted source arising under the Florida Statutes or Department rules, except where such use is prescribed by Section 403.111 and 403.73, F.S. Such evidence shall only be used to the extent it is consistent with the Florida Rules of Civil Procedure and appropriate evidentiary rules.

GENERAL CONDITIONS:

10. The permittee agrees to comply with changes in Department rules and Florida Statutes after a reasonable time for compliance; provided, however, the permittee does not waive any other rights granted by Florida Statutes or Department rules.

11. This permit is transferable only upon Department approval in accordance with Rule 17-4.120 and 17-30.300, F.A.C., as applicable. The permittee shall be liable for any non-compliance of the permitted activity until the transfer is approved by the Department.

12. This permit or a copy thereof shall be kept at the work site of the permitted activity.

13. This permit also constitutes:

( ) Determination of Best Available Control Technology (BACT)

( ) Determination of Prevention of Significant Deterioration (PSD)

( ) Certification of compliance with state Water Quality Standards (Section 401, PL 92-500)

( ) Compliance with New Source Performance Standards

14. The permittee shall comply with the following:

(a) Upon request, the permittee shall furnish all records and plans required under Department rules. During enforcement actions, the retention period for all records will be extended automatically unless otherwise stipulated by the Department.

(b) The permittee shall hold at the facility or other location designated by this permit records of all monitoring information (including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation) required by the permit, copies of all reports required by this permit, and records of all data used to complete the application for this permit. These materials shall be retained at least three years from the date of the sample, measurement, report, or application unless otherwise specified by Department rule.

(c) Records of monitoring information shall include:

1. the date, exact place, and time of sampling or measurements;
2. the person responsible for performing the sampling or measurements;
3. the dates analyses were performed;
4. the person responsible for performing the analyses;
5. the analytical techniques or methods used;
6. the results of such analyses.

15. When requested by the Department, the permittee shall within a reasonable time furnish any information required by law which is needed to determine compliance with the permit. If the permittee becomes aware the relevant facts were not submitted or were incorrect in the permit application or in any report to the Department, such facts or information shall be corrected promptly.

16. In the case of an underground injection control permit, the following permit conditions also shall apply:

(a) All reports or information required by the Department shall be certified as being true, accurate and complete.

(b) Reports of compliance or noncompliance with, or any progress reports on, requirements contained in any compliance schedule of this permit shall be submitted no later than 14 days following each schedule date.

(c) Notification of any noncompliance which may endanger health or the environment shall be reported verbally to the Department within 24 hours and again within 72 hours, and a final written report provided within two weeks.

1. The verbal reports shall contain any monitoring or other information which indicate that any contaminant may endanger an underground source of drinking water and any noncompliance with a permit condition or malfunction of the injection system which may cause fluid migration into or between underground sources of drinking water.

GENERAL CONDITIONS:

2. The written submission shall contain a description of and a discussion of the cause of the noncompliance and, if it has not been corrected, the anticipated time the noncompliance is expected to continue, the steps being taken to reduce, eliminate, and prevent recurrence of the noncompliance and all information required by Rule 17-28.230(4)(b), F.A.C.

(d) The Department shall be notified at least 180 days before conversion or abandonment of an injection well, unless abandonment within a lesser period of time is necessary to protect waters of the state.

17. The following conditions also shall apply to a hazardous waste facility permit.

(a) The following reports shall be submitted to the Department:

1. Manifest discrepancy report. If a significant discrepancy in a manifest is discovered, the permittee shall attempt to rectify the discrepancy. If not resolved within 15 days after the waste is received, the permittee shall immediately submit a letter report, including a copy of the manifest, to the Department.

2. Unmanifested waste report. The permittee shall submit an unmanifested waste report to the Department within 15 days of receipt of unmanifested waste.

3. Annual report. An annual report covering facility activities during the previous calendar year shall be submitted pursuant to Chapter 17-30, F.A.C.

(b) Notification of any noncompliance which may endanger health or the environment, including the release of any hazardous waste that may endanger public drinking water supplies or the occurence of a fire or explosion from the facility which could threaten the environment or human health outside the facility, shall be reported verbally to the Department within 24 hours, and a written report shall be provided within 5 days. The verbal report shall include the name, address, I.D. number, and telephone number of the facility, its owner or operator, the name and quantity of materials involved, the extent of any injuries, an assessment of actual or potential hazards, and the estimated quantity and disposition of recovered material. The written submission shall contain:

1. A description and cause of the noncompliance.

2. If not corrected, the expected time of correction, and the steps being taken to reduce, eliminate, and prevent recurrence of the noncompliance.

(c) Reports of compliance or noncompliance with, or any progress reports on, requirements in any compliance schedule shall be submitted no later than 14 days after each schedule date.

(d) All reports or information required by the Department by a hazardous waste permittee shall be signed by a person authorized to sign a permit application.

PERMITTEE:
Mr. T.R. Fair, Manager
Florida Power & Light

I.D. NUMBER: 5006P00657
PERMIT/CERTIFICATION NUMBER: IO 06-158722
DATE OF ISSUE:
EXPIRATION DATE: JAN 30 1989
JAN 30 1994

SPECIFIC CONDITIONS:

1. The water quality at the perimeter of the Zone of Discharge and the Mixing Zone shall be consistent at all times with the water quality standards set forth in Chapter 17-3, Florida Administrative Code (F.A.C.). Should conditions of the waters within the Zone of Discharge or the Mixing Zone warrant, the permittee may be required by the Department to upgrade, reduce or cease the discharge of effluent into the Zone of Discharge and adopt an alternate method of disposal.

2. The Zone of Discharge shall be in accordance with Section 17-28.700, and extend to the property limits as described in drawing No. C-27338-5 (not attached).

3. The Mixing Zone shall be in accordance with Section 17-4.244 F.A.C. and will extend from the discharge point and be in the direction of normal flow (easterly) for a distance of 800 meters.

4. The permittee shall maintain the quality and quantity of the effluent discharged such that the water quality standards of the State of Florida are not exceeded. These shall include the following parameters:

A. Surface Water Quality Standards

Parameter	Water Quality Standards
(1) Discharge temperature	(In accordance with Section 17-3.050, F.A.C.).
(2) Temperature Rise	(In accordance with Section 17-3.050, F.A.C.).

B. Groundwater Quality Standards

Parameter	Water Quality Standards
(1) Copper	1.0 mg/l
(2) Iron	0.3 mg/l
(3) Chromium (total)	0.05 mg/l
(4) Zinc	5.0 mg/l
(5) Lead	0.05 mg/l
(6) Mercury	0.002 mg/l
(7) Nitrate	10.0 mg/l
(8) pH	6.5 S.U. (min.)
(9) Chloride	250 mg/l

See Modification Dated February 17, 1988 Specific Condition Number 4

Sampling and analysis of the effluents and monitoring wells shall be conducted in accordance with Section 17-4.246, F.A.C., as per the attached schedule starting upon receipt of this permit and reports on the analysis shall be submitted to the Department by the 15th of the succeeding month. Additional sampling and analyses may be required as conditions warrant in order to further assess the water quality.

5. There shall be no discharge of free available chlorine or total residual chlorine. Floating solids or visible foam shall not be discharged in any quantities that could create a nuisance.

6. No wastewater shall be allowed to deliberately bypass the treatment facility, except in cases of emergency, without the prior approval of the Department. The Department shall be promptly notified, in writing, of the emergency and all information as to the cause of the problem and the corrective measures to be taken to prevent its recurrence.

7. The treatment facilities are to be operated in such a manner that the maximum level of efficiency is maintained at all times.

8. Waste sludge or other solid waste shall not be discharged into the waters of the State either directly or indirectly. Records of the amount of solid waste generated and the method of disposal shall be maintained on-site and made available to the Department staff.

DER Form 17-1.201(5)
Effective November 30, 1982

PERMITTEE:
Mr. T.R. Fair, Manager
Florida Power & Light

I.D. NUMBER: 5006P00657
PERMIT/CERTIFICATION NUMBER: IO 06-158722
DATE OF ISSUE: JAN 30 1989
EXPIRATION DATE: JAN 30 1994

SPECIFIC CONDITIONS:

9. All records and data relating to this permit shall be made available for inspection by the staff of the Department at the permitted facility. Copies of all reports, tests, notifications or other submittal required by this permit shall be submitted to both the Department of Environmental Regulation, Southeast Florida District Office and Broward County Environmental Quality Control Board.

10. The discharges from this facility shall comply with Broward County Code, Chapter 27, as applicable.

Issued this 30th day of January 1989

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

J. Scott Benyon
Deputy Assistant Secretary

DER Form 17-1.201(5)
Effective November 30, 1982

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

SAMPLING AND ANALYSIS SCHEDULE
FLORIDA POWER & LIGHT CO. - LAUDERDALE PLANT
Permit No. IO06-158722

1. Sampling and analyses of once through cooling water (all units) discharge to surface waters shall be conducted as follows prior to mixing with the receiving waters:

Parameter	Frequency
(1) Flow	(1) Daily
(2) Discharge temperature	(2) Daily
(3) Temperature Rise	(3) Every four hours

2. The groundwater monitoring wells U1, OB-2, OB-3, M-2, M-3 and M-4 shall be sampled and analysed as stated below.

Parameter	Frequency
(1) Copper	(1) Quarterly
(2) Iron	(2) Quarterly
(3) Oil and Grease	(3) Quarterly
(4) Chromium	(4) Semi-annually
(5) Sodium	(5) Quarterly
(6) Zinc	(6) Semi-annually
(7) Nickel	(7) Quarterly
(8) Fluoride	(8) Quarterly
(9) Silver	(9) Quarterly
(10) Sulfates	(10) Quarterly
(11) Manganese	(11) Semi-annually
(12) pH	(12) Quarterly
(13) Chlorides	(13) Quarterly
(14) Arsenic	(14) Quarterly

SFWMD CONSUMPTIVE USE PERMITS

FORM PA-31
REV. 11/79

South Florida
Water Management District
WATER USE PERMIT NO. 06-00503-W

(NON-ASSIGNABLE)

DATE ISSUED: December 15, 1983 EXPIRATION DATE December 15, 1993

AUTHORIZING: THE CONTINUATION OF AN EXISTING USE OF GROUNDWATER FROM THE BISCAYNE AQUIFER FOR INDUSTRIAL USE WITH AN ANNUAL ALLOCATION OF 135.16 MILLION GALLONS.

LOCATED IN: BROWARD COUNTY, SECTION 30 TWP. 50S RGE. 42E

ISSUED TO: Florida Power and Light Company
(Lauderdale Steam Electric Plant)
P. O. Box 14000
Juno Beach, Florida 33408

This Permit is issued pursuant to Application for Permit No. 09133-A dated September 7, 1983 for the Use of Water as specified above and subject to the Special Conditions set forth below. Said application, including all plans and specifications attached thereto, is by reference made a part hereof.

Upon written notice to the permitee, this permit may be temporarily modified, or restricted under a Declaration of Water Shortage or a Declaration of Emergency due to Water Shortage in accordance with provisions of Ch. 373, Fla. Statutes, 1973 and applicable rules and regulations of the South Florida Water Management District.

This Permit may be permanently or temporarily revoked, in whole or in part, for the violation of the conditions of the permit or for the violation of any provision of the Water Resources Act and regulations thereunder.

This Permit does not convey to permittee any property rights nor any privileges other than those specified herein, nor relieve the permittee from complying with any law, regulation, or requirement affecting the rights of other bodies or agencies.

SPECIAL CONDITIONS ARE AS FOLLOWS:

SEE SHEETS 2 AND 3 OF 3 - 12 GROUNDWATER SPECIAL CONDITIONS.

SOUTH FLORIDA WATER MANAGEMENT DISTRICT, BY ITS GOVERNING BOARD

By Thomas E. Huser
Assistant Secretary

10.4-58

GROUNDWATER SPECIAL CONDITIONS

1. APPLICATION FOR A PERMIT MODIFICATION MAY BE MADE AT ANY TIME.

2. PERMIT SHALL EXPIRE 10 YEARS FROM THE DATE OF ISSUANCE.

3. MAXIMUM DAY PUMPAGE SHALL NOT EXCEED 0.432 MG.

4. IN THE EVENT OF A DECLARED WATER SHORTAGE, WATER WITHDRAWAL REDUCTIONS SHALL BE MADE AS SPECIFIED BY THE DISTRICT.

5. USE CLASSIFICATION IS INDUSTRIAL.

6. SOURCE CLASSIFICATION IS GROUNDWATER FROM THE BISCAYNE AQUIFER.

7. PERMITTEE SHALL RECORD PUMPAGE ON A DAILY BASIS. THE RECORDED DATA SHALL BE SUBMITTED TO THE DISTRICT EVERY MONTH STARTING THE MONTH FOLLOWING BOTH PERMIT ISSUANCE AND INITIATION OF WATER USE.

8. THE DIRECTOR OF THE RESOURCE CONTROL DEPARTMENT OR HIS AUTHORIZED REPRESENTATIVES SHALL BE PERMITTED TO ENTER, INSPECT AND OBSERVE THE INDUSTRIAL WATER USE UPON DISTRICT STAFF IDENTIFICATION IN ORDER TO DETERMINE COMPLIANCE WITH SPECIAL CONDITIONS.

9. PERMITTEE SHALL MITIGATE ANY ADVERSE IMPACT CAUSED BY WITHDRAWALS ON LEGAL USES WHICH EXISTED AT THE TIME OF PERMIT APPLICATION. DISTRICT RESERVES THE RIGHT TO CURTAIL FUTURE PUMPAGE RATES IF PUMPAGE CAUSES AN ADVERSE IMPACT ON LEGAL USES OF WATER WHICH EXISTED AT THE TIME OF APPLICATION. ADVERSE IMPACTS ARE EXEMPLIFIED BY BUT NOT LIMITED TO THE FOLLOWING: 1) REDUCTION IN WELL WATER LEVELS RESULTING IN A REDUCTION OF 10% IN THE ABILITY OF AN ADJACENT WELL TO PRODUCE WATER (AN ADJACENT WELL MAY BE A DOMESTIC WELL, LAWN IRRIGATION WELL, PUBLIC WATER SUPPLY WELL, ETC.), 2) SIGNIFICANT REDUCTION IN WATER LEVELS IN AN ADJACENT WATER BODY SUCH AS A LAKE, POND, OR A CANAL SYSTEM, RESULTING IN A SIGNIFICANT IMPAIRMENT OF THE USE OF WATER IN THAT WATER BODY, 3) SALINE WATER INTRUSION OR INDUCTION OF POLLUTANTS INTO THE WATER SUPPLY OF AN ADJACENT WATER USE RESULTING IN A SIGNIFICANT REDUCTION IN WATER QUALITY.

10. PERMITTEE SHALL MITIGATE ANY ADVERSE IMPACT ON OFF-SITE LAND USE WHICH EXISTED AT THE TIME OF APPLICATION, AS A CONSEQUENCE OF WITHDRAWALS PERMITTED HEREIN TO THE SATISFACTION OF THE DISTRICT. THE DISTRICT RESERVES THE RIGHT TO CURTAIL FUTURE PUMPAGE RATES IF INCREASED WITHDRAWALS CAUSE AN ADVERSE IMPACT ON LAND USE WHICH EXISTED AT THE TIME OF APPLICATION. ADVERSE IMPACTS ARE EXEMPLIFIED BY BUT NOT LIMITED TO THE FOLLOWING: 1) SIGNIFICANT REDUCTION IN WATER LEVELS IN AN ADJACENT WATER BODY SUCH AS A LAKE, POND OR CANAL SYSTEM WHICH IS NOT BEING USED AS A SOURCE OF WATER; 2) LAND COLLAPSE OR SUBSIDENCE CAUSED BY REDUCTION IN WATER LEVELS; 3) DAMAGE TO CROPS AND OTHER TYPES OF VEGATATION,

THE ELIMINATION OF WHICH WOULD CAUSE FINANCIAL HARM TO THE LANDOWNER.

11. IF ANY CONDITIONS OF THIS PERMIT ARE VIOLATED, THE PERMIT SHALL BE SUBJECT TO REVIEW AND POSSIBLE REVOCATION AND MODIFICATION, OR ENFORCEMENT ACTION.

12. PERMITTEE SHALL NOT CAUSE SIGNIFICANT SALINE WATER INTRUSION. THE DISTRICT RESERVES THE RIGHT TO CURTAIL FUTURE PUMPAGE RATES IF INCREASED WITHDRAWALS CAUSE SIGNIFICANT SALINE WATER INTRUSION.

South Florida Water Management District

John R. Wodraska, Executive Director
Tilford C. Creel, Deputy Executive Director

Post Office Box 24680 3301 Gun Club Road
West Palm Beach, Florida 33416-4680
Telephone (407) 686-8800
Florida WATS Line 1-800-432-2045

IN REPLY REFER TO:

RECEIVED

APR 2 2 1988

MANAGER
PERMITTING & PROGRAMS

CERTIFIED MAIL NO. P 796 950 075
GP #88-137W

April 21, 1988

Florida Power & Light Company
P.O. Box 14000
Juno Beach, FL 33408

Dear Mr. Fair:

SUBJECT: Water Use General Permit: 88-137W
Project: Lauderdale Plant Pavillion
Type of Use: Irrigation
County: Broward; Sec. 30, Twp. 50S, Rge. 42E.
Permittee: Florida Power & Light Company

This letter is to notify you of the District's agency action concerning your Notice of Intent to Use Water. This action is taken pursuant to Rule 40E-20.042 and Chapter 40E-20, Florida Administrative Code. Based on the information provided, District rules have been adhered to and a General Water Use Permit is in effect for this project subject to:

1. Not receiving a filed request for a Chapter 120, Florida Statutes, administrative hearing and

2. The attached Limiting Conditions on Exhibit 1.

This permit is for use of 1200 gallons per day on the average or 4200 gallons per day on a maximum day. Groundwater withdrawals will be from one existing 6-inch X 53-foot Biscayne aquifer well cased to 45 feet and pumped at 250 GPM. Prior to exceeding these quantities, a modification to this permit will be necessary.

This project is for a total of 2 acres, of which 0.5 acres will be irrigated.

Nancy H. Roen, Chairman - Plantation
J.D. York, Vice Chairman - Palm City
Nathaniel P. Reed, Hobe Sound
Oscar M. Corbin, Jr., Ft. Myers
Arsenio Milian, Miami
Fritz Stein, Belle Glade
James F. Garner, Ft. Myers
Mike Stout, Windermere
Doran A. Jason, Key Biscayne

EXHIBIT 1

LIMITING CONDITIONS

1. THE PERMITTEE SHALL OBTAIN ALL NECESSARY FEDERAL, STATE AND LOCAL AND SPECIAL DISTRICT AUTHORIZATIONS PRIOR TO THE USE OR WITHDRAWAL OF WATER.

2. IN THE EVENT OF A DECLARED WATER SHORTAGE, WATER WITHDRAWAL REDUCTIONS WILL BE ORDERED BY THE DISTRICT IN ACCORDANCE WITH THE WATER SHORTAGE PLAN, CHAPTER 40E-21, FLORIDA ADMINISTRATIVE CODE.

3. PERMITTEE SHALL MITIGATE TO THE SATISFACTION OF THE DISTRICT ANY ADVERSE IMPACT ON EXISTING LEGAL USES CAUSED BY WITHDRAWALS. WHEN ADVERSE IMPACTS OCCUR, OR ARE IMMINENT, DISTRICT RESERVES THE RIGHT TO CURTAIL WITHDRAWAL RATES. ADVERSE IMPACTS ARE: A) REDUCTION IN WELL WATER LEVELS THAT IMPAIRS THE ABILITY OF AN ADJACENT WELL TO PRODUCE WATER (AN ADJACENT WELL MAY BE DOMESTIC WELL, LAWN IRRIGATION WELL, PUBLIC WATER SUPPLY WELL, ETC.), B) SIGNIFICANT REDUCTION IN LEVELS IN AN ADJACENT WATER BODY SUCH AS A LAKE, POND, WETLAND OR A CANAL SYSTEM, C) SALINE WATER INTRUSION OR INDUCTION OF POLLUTANTS INTO THE WATER SUPPLY OF AN ADJACENT WATER USE, RESULTING IN A SIGNIFICANT REDUCTION IN WATER QUALITY, AND D) CHANGE IN WATER QUALITY THAT CAUSES IMPAIRMENT OR LOSS OF USE OF A WELL OR WATER BODY.

4. PERMITTEE SHALL MITIGATE TO THE SATISFACTION OF THE DISTRICT ANY ADVERSE IMPACT ON EXISTING OFF-SITE LAND USE AS A CONSEQUENCE OF WITHDRAWALS PERMITTED HEREIN. IF INCREASED WITHDRAWALS CAUSE AN ADVERSE IMPACT ON EXISTING LAND USE THE DISTRICT RESERVES THE RIGHT TO CURTAIL FUTURE WITHDRAWAL RATES. ADVERSE IMPACTS ARE: A) SIGNIFICANT REDUCTION IN WATER LEVELS IN AN ADJACENT WATER BODY (SUCH AS A LAKE, POND, WETLAND OR A CANAL SYSTEM), B) LAND COLLAPSE OR SUBSIDENCE CAUSED BY REDUCTION IN WATER LEVELS, C) DAMAGE TO CROPS AND OTHER VEGETATION, CAUSING FINANCIAL HARM TO THE LANDOWNER, AND D) DAMAGE TO HABITAT OF RARE, ENDANGERED OR THREATENED SPECIES.

5. PERMITTEE SHALL NOT REFUSE IMMEDIATE ENTRY OR ACCESS TO ANY AUTHORIZED REPRESENTATIVE OF THE DISTRICT WHO REQUESTS ENTRY FOR PURPOSES OF INSPECTION AND PRESENTS APPROPRIATE CREDENTIALS.

6. IF ANY CONDITION OF THE PERMIT IS VIOLATED, THE PERMIT SHALL BE SUBJECT TO REVIEW AND POSSIBLE MODIFICATION, ENFORCEMENT ACTION, OR REVOCATION.

7. APPLICATION FOR A PERMIT MODIFICATION MAY BE MADE AT ANY TIME.

8. THE PERMIT DOES NOT CONVEY ANY PROPERTY RIGHT TO THE PERMITTEE, NOR ANY RIGHTS AND PRIVILEGES OTHER THAN THOSE SPECIFIED IN THE PERMIT AND CHAPTER 40E-2, F.A.C.

FORM 0537
10 87

South Florida Water Management District
GENERAL PERMIT
NOTICE OF RIGHTS

This Notice of Rights is intended to inform the recipient of the administrative and judicial review which may be available as mandated by section 120.60(3), Florida Statutes. Be advised that although this notice is intended to be comprehensive, the review procedures set forth herein have been the subject of judicial construction and interpretation which may affect the administrative of judicial review available. Recipients are therefore advised to become familiar with Chapters 120 and 373, Florida Statutes, and the judicial interpretation of the provisions of these chapters.

1. If a substantially affected person objects to the staff's recommendation, that person has the right to request an administrative hearing on the proposed agency action. The substantially affected person may request either a formal or an informal hearing, as set forth below. Failure to comply with the prescribed time periods shall constitute a waiver of the right to a hearing.

2. If a substantially affected person believes a genuine issue of material fact is in dispute, that person may request a formal hearing pursuant to section 120.57(1), Florida Statutes, by filing a petition not later than:
   a. IF NOTICE OF THE APPLICATION WAS PUBLISHED BY THE APPLICANT, within fourteen (14) days after mailing of the proposed agency action or
   b. IF NOTICE OF THE APPLICATION WAS NOT PUBLISHED, within fourteen days after receipt of actual notice.

   The request for a section 120.57(1), F.S., formal hearing must comply with the requirements of Rule 40E-1.521, Florida Administrative Code, a copy of which is attached. Petitions are deemed filed upon receipt by the District. Failure to substantially comply with the provisions of Rule 40E-1.521, Florida Administrative Code, shall constitute a waiver of the right to a 120.57(1) hearing. If a petition for administrative hearing is not timely filed, the staff's proposed agency will automatically mature into final agency action.

3. If a substantially affected person believes that no issues of material fact are in dispute, that person may request an informal hearing pursuant to section 120.57(2), F.S., by filing a petition for hearing not later than:
   a. IF NOTICE OF THE APPLICATION WAS PUBLISHED BY THE APPLICANT, within fourteen (14) days after mailing of the proposed agency action or
   b. IF NOTICE OF THE APPLICATION WAS NOT PUBLISHED, within fourteen days after receipt of actual notice.

   A request for informal hearing shall be considered as a waiver of the right to request a formal section 120.57(1), F.S., hearing. A request for a section 120.57(1), F.S., formal hearing not in substantial compliance with the provisions of rule 40E-1.521, F.A.C., may be considered by the District as a request for informal hearing. If a petition for administrative hearing is not timely filed, the staff's proposed agency action will automatically mature into final agency action.

4. Pursuant to section 373.114, Florida Statutes, a party to the proceeding below may seek review of a Final Order rendered on the permit application before the Land and Water Adjudicatory Commission, as provided therein. Review under this section is initiated by filing a request for review with the Land and Water Adjudicatory Commission and serving a copy on the Department of Environmental Regulation and any person named in the Order within 20 days after rendering of the District's Order. However, when the order to be reviewed has statewide or regional significance, as determined by the Land and Water Adjudicatory Commission within 60 days after receipt of a request for review, the commission may accept a request for review from any affected person within 30 days after the rendering of the order. Review under section 373.114, Florida Statutes, is limited solely to a determination of consistency with the provisions and purposes of Chapter 373, Florida Statutes. This review is appellate in nature and limited to the record below.

5. A party who is adversely affected by final agency action on the permit application is entitled to judicial review in the District Court of Appeal pursuant to section 120.68, Florida Statutes, as provided therein. Review under section 120.68, Florida Statutes in the District Court of Appeal is initiated by filing a petition in the appropriate District Court of Appeal in accordance with Florida rule of appellate Procedure 9.110. The Notice of Appeal must be filed within 30 days of the final agency action.

6. Section 373.617(2), Florida Statutes, provides:

   > Any person substantially affected by a final action of any agency with respect to a permit may seek review within 90 days of the rendering of such decision and request monetary damages and other relief in the circuit court in the judicial circuit in which the affected property is located; however, circuit court review shall be confined solely to determining whether final agency action is an unreasonable exercise of the state's police power constituting a taking without just compensation. Review of final agency action for the purpose of determining whether the action is in accordance with existing statutes or rules and based on component substantial evidence shall proceed in accordance with Chapter 120.

7. Please be advised that exhaustion of administrative remedies is generally a prerequisite to appeal to the District Court of Appeal or the seeking of Circuit Court review of final agency action by the District on the permit application. There are, however, exceptions to the exhaustion requirement. The applicant is advised to consult the case law as to the requirements of exhaustion exceptions.

40E-1.521 Initiation of Formal Proceedings.

(1) Initiation of formal proceedings shall be made by petition to the District. The term petition as used herein includes any application or other document which expresses a request for formal proceedings. Each petition should be printed, typewritten or otherwise duplicated in legible form on white paper or standard legal size. Unless printed, the impression shall be on one side of the paper only and lines shall be double-spaced and indented.

(2) All petitions filed under these rules shall contain:

(a) The name and address of the District and the District's file or identification number, if known;

(b) The name and address of the petitioner or petitioners;

(c) An explanation of how each petitioner's substantial interests will be affected by the District's determination;

(d) A statement of when and how petitioner received notice of the District's decision or intent to render a decision;

(e) A statement of all disputed issues of material fact. If there are none, the petition must so indicate;

(f) A concise statement of the ultimate facts which petitioner believes entitle petitioner to the relief sought as well as the rules and statutes which support petitioner's claim for relief;

(g) A demand for the relief to which the petitioner deems himself entitled; and

(h) Other information which the petitioner contends is material.

(3) Upon receipt of a petition for formal proceedings, the District shall review the petition for the degree of compliance with subsection (2) and shall accept those petitions in substantial compliance therewith which have been timely filed and which state a dispute which is within the jurisdiction of the District to resolve. If accepted, the District shall designate the presiding officer. The District shall promptly give written notice to all parties of the action taken on the petition, and shall state with particularity its reasons therefor.

(4) If the District designates a Hearing Officer assigned by the Division of Administrative Hearings as the presiding officer, the District Clerk shall forward the petition and all materials filed with the District to the Division of Administrative Hearings, and shall notify all parties of its action.

Specific Authority 373.044, 373.113 F.S.
Law Implemented 120.53(1), 120.57 F.S.
History — New 9-3-81.
Formerly 16K-1.09(1), 16K-1.112(1) through (3), 16K-1.12

SFWMD RIGHTS-OF-WAY PERMITS

Summary of SFWMD Right-of-Way Occupancy Permits for FPL Lauderdale Plant Site (Page 1 of 2)

The following is a chronological list of right-of-way occupancy permits issued by the South Florida Water Management District for various features of the FPL plant site, which enter or cross canals around the site. First is a list of permits along the Dania Cut-Off Canal, followed by a list of permits along the South New River Canal.

I. Dania Cut-Off Canal

1. Permit No. 1927-15, issued July 12, 1927--Permit for construction and operation of a bridge across the Dania Cut-Off Canal.

2. Permit No. 1939-4, issued August 15, 1939--Permit for construction and operation of a tide gate (since removed and relocated) in the Dania Cut-Off Canal, and for construction and operation of an intake and discharge canal from and into the Dania Cut-Off Canal.

3. Permit No. 1941-21, dated January 28, 1941--Permit for operation of oil unloading dock and construction and operation of extension of that dock in the Dania Cut-Off Canal.

4. Permit No. 1941-22, dated January 21, 1941--Permit for construction and operation of a trash screen in the Dania Cut-Off Canal for the original intake; for an intake canal between the South New River Canal and an existing on-site pond connecting to the original intake canal; for a bridge and roadway over the newly excavated canal; and for construction of a trash screen at this newly excavated canal.

5. Permit No. 483, dated December 28, 1955--Permit for construction of concrete oil unloading docks and dolphins and a portion of a road on the north side of the Dania Cut-Off Canal.

6. Permit No. 502, issued February 15, 1956--Permit for construction and operation of tide gate in Dania Cut-Off Canal, upstream from intake canals for Units 4 and 5.

7. Permit No. 552, dated June 8, 1956, and modified March 9, 1989--Permit for original dredging, and later maintenance dredging, of intake canals for Units 4 and 5, along the Dania Cut-Off Canal.

8. Permit no. 6564, dated October 7, 1976--Permit for construction of seawall along north and south shore of Dania Cut-Off Canal around existing tide gate.

9. Permit No. 7055, dated July 12, 1979--Permit for aerial messenger and control cable over the Dania Cut-Off Canal.

Summary of SFWMD Right-of-Way Occupancy Permits for FPL Lauderdale Plant Site (Page 2 of 2)

II. South New River Canal

1. Permit No. 6720, dated August 11, 1977--Permit for replacement of wooden bridge with culvert for the canal connecting old intake pond to South New River Canal.

2. Permit no. 83, dated May 1, 1953 (and subsequently modified)--Permit for three 138-kV transmission lines running north/south, across the South New River Canal.

3. Permit No. 1943, dated June 11, 1962--Permit for five transmission lines crossing the South New River Canal, running east and west.

4. Permit NO. 2269, issued November 1, 1963--Permit for single transmission line crossing South New River Canal, running east/west.

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FDNR TERMINAL FACILITY PERMIT

DEPARTMENT OF NATURAL RESOURCES

FLORIDA MARINE PATROL

TALLAHASSEE, FLORIDA

REGISTRATION

0534

REGISTRATION CERTIFICATE TO OPERATE A TERMINAL FACILITY

ISSUED TO TERMINAL NAME: F.P.L. LAUDERDALE POWER PLANT

LOCATION: 3801 S.W. 43RD. COURT

CITY: FT. LAUDERDALE, FLA. 33314

STORAGE CAPACITY 366548 BBLS.

MAILING ADDRESS:
F.P.L. LAUDERDALE POWER PLANT
FPL T.R. FAIR, MGR. BX14000
JUNO BEACH, FLORIDA 33408

1989

COUNTY BROWARD

Date JANUARY 2, 1989

REGISTRATION CERTIFICATE APPLICATION FEE.....$ 250.00

This registration certificate authorizes the holder to store, pump, handle, or transfer pollutants according to the provisions of Chapter 376, Florida Statutes, at the terminal facility location listed above.

A terminal facility failing to possess a current registration certificate or that fails to comply with the terms of such, shall be subject to a civil penalty of up to $50,000 per day pursuant to Chapter 376, Florida Statutes, or to suspension or revocation of their license as provided in Chapter 120, Florida Statutes.

THIS REGISTRATION CERTIFICATE EXPIRES:

DECEMBER 31,1989

RECEIVED JAN

J896

BCEQCB AIR PERMITS

BROWARD COUNTY ENVIRONMENTAL QUALITY CONTROL BOARD

500 S.W. 14th Court
Fort Lauderdale, Florida 33315
(305) 765-5881

December 4, 1987

FLORIDA POWER & LIGHT
RECEIVED
DEC 11 1987
LAUDERDALE PLANT

Florida Power & Light Co.
P.O. Box 8248
Ft. Lauderdale, Fl. 33310

Gentlemen:

Enclosed is your Broward County Air Pollution Licenses.

Broward County Environmental Quality Control Board Air Pollution licenses must be posted at the work site and be available for inspection by Broward County personnel at all times.

Broward County Environmental Quality Control Board Air Pollution licenses are not transferable. The Board must be notified in writing within 30 days of any change of ownership or location.

The enclosed license is based upon the information supplied to the Board prior to initiation of the changes.

If no objection to this license is received within 14 days, you will be deemed to have accepted it and all the enclosed conditions.

If you have any questions concerning these matters, please contact Ms. Daniela Banu at 765-4442.

Sincerely,

Gary D. Carlson
Chief, Air Section

GDC/mm
encl.

RECEIVED
FLORIDA POWER & LIGHT CO.
DEC 08 1987
PORT EVERGLADES PLANT

BROWARD COUNTY ENVIRONMENTAL QUALITY CONTROL BOARD
500 S.W. 14th Court
Fort Lauderdale, Florida 33315
(305) 765-5881
AIR SECTION
621 S. Andrews Avenue
Fort Lauderdale, Florida 33301
(305) 765-4436

Air License

LICENSE TO OPERATE AN AIR POLLUTION SOURCE ISSUED UNDER THE PROVISIONS OF BROWARD COUNTY ENVIRONMENTAL QUALITY CONTROL BOARD CODE OF REGULATIONS, CHAPTERS 27-3 AND 27-4, AND FLORIDA ADMINISTRATIVE CODE, CHAPTER 17-2.

LICENSE NO. AO-42503R-1 DATE OF ISSUE December 4, 1987

DATE OF EXPIRATION December 31, 1989

LICENSE ISSUED TO: NAME Florida Power & Light Co.

ADDRESS P.O. Box 8248
Ft. Lauderdale, Fl. 33310

TELEPHONE 765-3111

TO BE KNOWN AS Same as Above

TO BE LOCATED AT Griffin Road, Ft. Lauderdale

FOR THE Operation of Unit #4 Fossil Fuel Steam Generator
Maximum Heat Input: 1390 MBtu/hr - Unit Load: 156 MW
Fuel: Combination of natural gas and #5 fuel oil (%SL1)
Stack height: 151 Feet above ground level

WORK SCHEDULE N/A

EMISSION LIMITING STANDARDS B.C.E.Q.C.B. Code of Regulations 27-4 Table II - Emission Limiting Standards - E. Fossil Fuel Steam Generators and 27-4.03.13 FAC Rule 17-2.600 (5) (b) and 17-2.250 (3)

IN ACCORDANCE WITH THE LICENSE APPLICATION WHICH IS CONSIDERED PART OF THIS LICENSE. THIS LICENSE IS SUBJECT TO ALL FLORIDA STATE, BROWARD COUNTY AND LOCAL LAWS, REGULATIONS, RULES, AND THE CONDITIONS ATTACHED HERETO.

POST THIS LICENSE IN A PROMINENT PLACE ON THE PLANT PREMISES.

Gary Barlow for

Victor N. Howard, P.E.
Pollution Control Officer

10.4-74

AIR LICENSE

LICENSEE: Florida Power & Light Co.

LICENSE NO. AO-42503R-1
DATE OF ISSUE: December 4, 1987
EXPIRATION DATE: December 31, 1989

GENERAL CONDITIONS:

1. The terms, conditions, requirements, limitations and restrictions set forth herein are accepted by the licensee and enforceable by the EQCB pursuant to Chapter 27 of the Broward County Environmental Quality Control Board (EQCB) Code. The EQCB will review this license periodically and may revoke the license, initiate administrative and/or judicial action for any violation of the conditions by the licensee, its agents, employees, servants or representatives.

2. This license is valid only for the specific uses set forth in the license application and any deviation from the approved uses may constitute grounds for revocation and enforcement action by the EQCB.

3. In the event the licensee is temporarily unable to comply with any of the conditions of the license, the licensee shall notify the PCO within 12 hours. Within 5 working days of the event, the licensee shall submit a written report to the PCO that describes the incident, its cause, the measures being taken to correct the problem and prevent its reoccurrence, the owner's intention toward repair, replacement, and reconstruction of destroyed facilities, and a schedule of events leading toward operation within the license condition.

4. The issuance of this license does not convey any vested rights or exclusive privileges, nor does it authorize any injury to public or private property or any invasion of personal rights, or any violations of federal, state or local laws or regulations.

5. This license must be available for inspection on licensee's premises during the entire life of the license.

6. By accepting this license, the licensee understands and agrees that all records, notes, monitoring data and other information relating to the construction or operation of this permitted source, that are submitted to the EQCB, may be used by the EQCB as evidence in any enforcement proceeding arising under EQCB rules and regulations, except where such use is prohibited by Section 403.111, Florida Statutes.

7. The licensee agrees to comply with Chapter 27, Code of Regulations of the EQCB.

8. Any new owner of a licensed facility shall apply by letter for a transfer of license within thirty (30) days after sale or legal transfer. The transferor shall remain liable for performance in accordance with the license until the transferee applies for, and is granted a transfer of license.

9. The licensee, by acceptance of this license, specifically agrees to allow access to the licensed source at reasonable times by EQCB personnel for the purpose of inspection and testing to determine compliance with this license and EQCB rules and regulations.

10. This license does not constitute a waiver or approval of any other license that may be required for other aspects of the total project.

11. If the licensee wishes to renew the license or extend its term, he shall make application 60 days prior to its expiration. Expired licenses are not renewable.

12. In addition to the general conditions set forth above, each license issued by the EQCB shall contain specific conditions determined by site conditions and requirements pursuant to the regulations as determined by the PCO. Licensee agrees that specific conditions are enforceable by the EQCB for any violation thereof.

13. When requested by the EQCB, the licensee shall within a reasonable time furnish any information required by law which is needed to determine compliance with the license. If the licensee becomes aware that relevant facts were not submitted or were incorrect in the license application or in any report to the EQCB, such facts or information shall be submitted or corrected promptly.

BROWARD COUNTY
ENVIRONMENTAL QUALITY CONTROL BOARD

RECEIVED
DEC 6 1982

LICENSE TO Operate Air POLLUTION SOURCE, ACCORDING TO REGULATIONS TO CHAPTER 27-3, BROWARD COUNTY ENVIRONMENTAL QUALITY CONTROL ACT.

LICENSE NO. AO-26609R-1 DATE November 30, 1982

LICENSE ISSUED TO: NAME Florida Power & Light Company

ADDRESS P. O. Box 013100
Miami, Florida 33101

TELEPHONE 552-4060

FOR THE Operation OF Fossil Fuel Steam Generator #4

WITH THE FOLLOWING AIR POLLUTION CONTROL EQUIPMENT:

Maximum Heat Input 1390 MBtu/hr
Exhaust Stack 151 Feet Above Ground Level
Burning Natural Gas and/or #6 Fuel Oil

TO BE KNOWN AS Same as above

AND TO BE LOCATED AT Griffin Road
Dania, Florida

IN ACCORDANCE WITH THE State Operational APPLICATION, DATED September 27, 1982, WHICH IS CONSIDERED PART OF THIS LICENSE. THIS LICENSE EXPIRES November 30, 1987.

THIS LICENSE IS SUBJECT TO ALL FLORIDA STATE, BROWARD COUNTY, AND LOCAL LAWS, REGULATIONS, RULES, AND THE CONDITIONS ATTACHED HERETO.

POST THIS LICENSE IN A PROMINENT PLACE ON THE PLANT PREMISES.

Victor N Howard
NAME: VICTOR N. HOWARD, P.E.

Pollution Control Officer
TITLE

10.4-76

50-PC 104

BROWARD COUNTY ENVIRONMENTAL QUALITY CONTROL BOARD
500 S.W. 14th Court
Fort Lauderdale, Florida 33315
(305) 765-5881
AIR SECTION
621 S. Andrews Avenue
Fort Lauderdale, Florida 33301
(305) 765-4436

Air License

LICENSE TO OPERATE AN AIR POLLUTION SOURCE ISSUED UNDER THE PROVISIONS OF BROWARD COUNTY ENVIRONMENTAL QUALITY CONTROL BOARD CODE OF REGULATIONS, CHAPTERS 27-3 AND 27-4, AND FLORIDA ADMINISTRATIVE CODE, CHAPTER 17-2.

LICENSE NO. AO-42503R-2 DATE OF ISSUE December 4, 1987

DATE OF EXPIRATION December 31, 1989

LICENSE ISSUED TO: NAME Florida Power & LIght Co.

ADDRESS P.O. Box 8248
Ft. Lauderdale, Fl. 33310

TELEPHONE 765-3111

TO BE KNOWN AS Same as Above

TO BE LOCATED AT Griffin Road, Ft. Lauderdale

FOR THE Operation of Unit #5 Fossil Fuel Steam Generator
Maximum Heat Input: 1390 MBtu/hr. - Unit Load: 156 MW
Fuel: combination of natural gas and #6 fuel oil (%SL1)
Stack height: 151 feet above ground level

WORK SCHEDULE N/A

EMISSION LIMITING STANDARDS B.C.E.Q.C.B. Code of REgulations 27-4 Table II - Emission Limiting Standards - E. Fossil Fuel Steam Generators and 27-4.03.13 FAC Rule 17-2.600 (5) (b) and 17-2.250 (3)

IN ACCORDANCE WITH THE LICENSE APPLICATION WHICH IS CONSIDERED PART OF THIS LICENSE. THIS LICENSE IS SUBJECT TO ALL FLORIDA STATE, BROWARD COUNTY AND LOCAL LAWS, REGULATIONS, RULES, AND THE CONDITIONS ATTACHED HERETO.

POST THIS LICENSE IN A PROMINENT PLACE ON THE PLANT PREMISES.

Gary Barbosa for

Victor N. Howard, P.E.
Pollution Control Officer

10.4-77

AIR LICENSE

LICENSEE: Florida Power & Light Co.

LICENSE NO. AO-42503R-2
DATE OF ISSUE: December 4, 1987
EXPIRATION DATE: December 31, 1989

GENERAL CONDITIONS:

1. The terms, conditions, requirements, limitations and restrictions set forth herein are accepted by the licensee and enforceable by the EQCB pursuant to Chapter 27 of the Broward County Environmental Quality Control Board (EQCB) Code. The EQCB will review this license periodically and may revoke the license, initiate administrative and/or judicial action for any violation of the conditions by the licensee, its agents, employees, servants or representatives.

2. This license is valid only for the specific uses set forth in the license application and any deviation from the approved uses may constitute grounds for revocation and enforcement action by the EQCB.

3. In the event the licensee is temporarily unable to comply with any of the conditions of the license, the licensee shall notify the PCO within 12 hours. Within 5 working days of the event, the licensee shall submit a written report to the PCO that describes the incident, its cause, the measures being taken to correct the problem and prevent its reoccurrence, the owner's intention toward repair, replacement, and reconstruction of destroyed facilities, and a schedule of events leading toward operation within the license condition.

4. The issuance of this license does not convey any vested rights or exclusive privileges, nor does it authorize any injury to public or private property or any invasion of personal rights, or any violations of federal, state or local laws or regulations.

5. This license must be available for inspection on licensee's premises during the entire life of the license.

6. By accepting this license, the licensee understands and agrees that all records, notes, monitoring data and other information relating to the construction or operation of this permitted source, that are submitted to the EQCB, may be used by the EQCB as evidence in any enforcement proceeding arising under EQCB rules and regulations, except where such use is prohibited by Section 403.111, Florida Statutes.

7. The licensee agrees to comply with Chapter 27, Code of Regulations of the EQCB.

8. Any new owner of a licensed facility shall apply by letter for a transfer of license within thirty (30) days after sale or legal transfer. The transferor shall remain liable for performance in accordance with the license until the transferee applies for, and is granted a transfer of license.

9. The licensee, by acceptance of this license, specifically agrees to allow access to the licensed source at reasonable times by EQCB personnel for the purpose of inspection and testing to determine compliance with this license and EQCB rules and regulations.

10. This license does not constitute a waiver or approval of any other license that may be required for other aspects of the total project.

11. If the licensee wishes to renew the license or extend its term, he shall make application 60 days prior to its expiration. Expired licenses are not renewable.

12. In addition to the general conditions set forth above, each license issued by the EQCB shall contain specific conditions determined by site conditions and requirements pursuant to the regulations as determined by the PCO. Licensee agrees that specific conditions are enforceable by the EQCB for any violation thereof.

13. When requested by the EQCB, the licensee shall within a reasonable time furnish any information required by law which is needed to determine compliance with the license. If the licensee becomes aware that relevant facts were not submitted or were incorrect in the license application or in any report to the EQCB, such facts or information shall be submitted or corrected promptly.

BROWARD COUNTY
ENVIRONMENTAL QUALITY CONTROL BOARD

LICENSE TO Operate Air POLLUTION SOURCE, ACCORDING TO CHAPTER 27-3, BROWARD COUNTY ENVIRONMENTAL QUALITY CONTROL ACT.

LICENSE NO. AO-26609R-2 DATE November 30, 1982

LICENSE ISSUED TO: NAME Florida Power & Light Company

ADDRESS P. O. Box 013100
Miami, Florida 33101

TELEPHONE 552-4060

FOR THE Operation OF Fossil Fuel Steam Generator #5

WITH THE FOLLOWING AIR POLLUTION CONTROL EQUIPMENT:

Maximum Heat Input 1390 MBtu/hr
Exhaust Stack 151 Feet Above Ground Level
Burning Natural Gas and/or #6 Fuel Oil

TO BE KNOWN AS Same as above

AND TO BE LOCATED AT Griffin Road
Dania, Florida

IN ACCORDANCE WITH THE State Operational APPLICATION, DATED September 27, 1982, WHICH IS CONSIDERED PART OF THIS LICENSE. THIS LICENSE EXPIRES November 30, 1987.

THIS LICENSE IS SUBJECT TO ALL FLORIDA STATE, BROWARD COUNTY, AND LOCAL LAWS, REGULATIONS, RULES, AND THE CONDITIONS ATTACHED HERETO.

POST THIS LICENSE IN A PROMINENT PLACE ON THE PLANT PREMISES.

Victor N. Howard Pollution Control Officer

NAME: VICTOR N. HOWARD, P.E. TITLE

10.4-79

50-PC 104

BROWARD COUNTY ENVIRONMENTAL QUALITY CONTROL BOARD
500 S.W. 14th Court
Fort Lauderdale, Florida 33315
(305) 765-5881
AIR SECTION
621 S. Andrews Avenue
Fort Lauderdale, Florida 33301
(305) 765-4436

Air License

LICENSE TO OPERATE AN AIR POLLUTION SOURCE ISSUED UNDER THE PROVISIONS OF BROWARD COUNTY ENVIRONMENTAL QUALITY CONTROL BOARD CODE OF REGULATIONS, CHAPTERS 27-3 AND 27-4, AND FLORIDA ADMINISTRATIVE CODE, CHAPTER 17-2.

LICENSE NO. AO-42503R-3 thru 15 DATE OF ISSUE December 4, 1987

DATE OF EXPIRATION December 31, 1989

LICENSE ISSUED TO: NAME Florida Power & Light Co.

ADDRESS P.O. Box 8248
Ft. Lauderdale, Fl. 33310

TELEPHONE 765-3111

TO BE KNOWN AS Same as Above

TO BE LOCATED AT Griffin Road, Ft. Lauderdale

FOR THE Operation of Fossil Fuel Turbine Generator Units #1 thru #12.
Maximum Heat Input: 552 MBtu/hr.
Fuel: combination of natural gas and fuel oil #2
Stack height 43.5 foot above ground level

WORK SCHEDULE N/A

EMISSION LIMITING STANDARDS B.C.E.Q.C.B. Code of Regulations 27-4.03.1
FAC Rule 17-2.610 (2) (a)

IN ACCORDANCE WITH THE LICENSE APPLICATION WHICH IS CONSIDERED PART OF THIS LICENSE. THIS LICENSE IS SUBJECT TO ALL FLORIDA STATE, BROWARD COUNTY AND LOCAL LAWS, REGULATIONS, RULES, AND THE CONDITIONS ATTACHED HERETO.

POST THIS LICENSE IN A PROMINENT PLACE ON THE PLANT PREMISES.

Gary Carlson for
Victor N. Howard, P.E.
Pollution Control Officer

10.4-80

AIR LICENSE

LICENSEE: Florida Power & Light Co.

LICENSE NO. AO-42503R-3 thru 15
DATE OF ISSUE: December 4, 1987
EXPIRATION DATE: December 31, 1989

GENERAL CONDITIONS:

1. The terms, conditions, requirements, limitations and restrictions set forth herein are accepted by the licensee and enforceable by the EQCB pursuant to Chapter 27 of the Broward County Environmental Quality Control Board (EQCB) Code. The EQCB will review this license periodically and may revoke the license, initiate administrative and/or judicial action for any violation of the conditions by the licensee, its agents, employees, servants or representatives.

2. This license is valid only for the specific uses set forth in the license application and any deviation from the approved uses may constitute grounds for revocation and enforcement action by the EQCB.

3. In the event the licensee is temporarily unable to comply with any of the conditions of the license, the licensee shall notify the PCO within 12 hours. Within 5 working days of the event, the licensee shall submit a written report to the PCO that describes the incident, its cause, the measures being taken to correct the problem and prevent its reoccurrence, the owner's intention toward repair, replacement, and reconstruction of destroyed facilities, and a schedule of events leading toward operation within the license condition.

4. The issuance of this license does not convey any vested rights or exclusive privileges, nor does it authorize any injury to public or private property or any invasion of personal rights, or any violations of federal, state or local laws or regulations.

5. This license must be available for inspection on licensee's premises during the entire life of the license.

6. By accepting this license, the licensee understands and agrees that all records, notes, monitoring data and other information relating to the construction or operation of this permitted source, that are submitted to the EQCB, may be used by the EQCB as evidence in any enforcement proceeding arising under EQCB rules and regulations, except where such use is prohibited by Section 403.111, Florida Statutes.

7. The licensee agrees to comply with Chapter 27, Code of Regulations of the EQCB.

8. Any new owner of a licensed facility shall apply by letter for a transfer of license within thirty (30) days after sale or legal transfer. The transferor shall remain liable for performance in accordance with the license until the transferee applies for, and is granted a transfer of license.

9. The licensee, by acceptance of this license, specifically agrees to allow access to the licensed source at reasonable times by EQCB personnel for the purpose of inspection and testing to determine compliance with this license and EQCB rules and regulations.

10. This license does not constitute a waiver or approval of any other license that may be required for other aspects of the total project.

11. If the licensee wishes to renew the license or extend its term, he shall make application 60 days prior to its expiration. Expired licenses are not renewable.

12. In addition to the general conditions set forth above, each license issued by the EQCB shall contain specific conditions determined by site conditions and requirements pursuant to the regulations as determined by the PCO. Licensee agrees that specific conditions are enforceable by the EQCB for any violation thereof.

13. When requested by the EQCB, the licensee shall within a reasonable time furnish any information required by law which is needed to determine compliance with the license. If the licensee becomes aware that relevant facts were not submitted or were incorrect in the license application or in any report to the EQCB, such facts or information shall be submitted or corrected promptly.

BROWARD COUNTY
ENVIRONMENTAL QUALITY CONTROL BOARD

LICENSE TO Operate Air POLLUTION SOURCE, ACCORDING TO CHAPTER 27-3, BROWARD COUNTY ENVIRONMENTAL QUALITY CONTROL ACT.

LICENSE NO. AO-27368R-1 thru 12 DATE February 4, 1983

LICENSE ISSUED TO: NAME Florida Power & Light Company

ADDRESS P. O. Box 013100

Miami, Florida 33101

TELEPHONE 552-4060

FOR THE Operation OF Twelve Turbine Generators Nos. 1-12 Fossil Fuel Turbine Generator peaking units, burning natural gas and/or No. 2 distillate oil, exhausting 50 feet above ground level. Each unit when operating at maximum heat input of 552 MBtu/hr. emits 18 #/hr. of particulates, 24 #/hr. of SO_2 and 415 #/hr. of NO_x when burning 100% oil. Units operate when required - about 10% of time. The conditions of the State Permit also apply to this permit.

TO BE KNOWN AS Same as above

AND TO BE LOCATED AT Griffin Road

Dania, Florida

IN ACCORDANCE WITH THE renewal letter and operational APPLICATION, DATED January 26, 1983, WHICH IS CONSIDERED PART OF THIS LICENSE. THIS LICENSE EXPIRES January 31, 1988.

THIS LICENSE IS SUBJECT TO ALL FLORIDA STATE, BROWARD COUNTY, AND LOCAL LAWS, REGULATIONS, RULES, AND THE CONDITIONS ATTACHED HERETO.

POST THIS LICENSE IN A PROMINENT PLACE ON THE PLANT PREMISES.

Victor N. Howard — Pollution Control Officer

NAME: VICTOR N. HOWARD, P.E. TITLE

BROWARD COUNTY ENVIRONMENTAL QUALITY CONTROL BOARD
500 S.W. 14th Court
Fort Lauderdale, Florida 33315
(305) 765-5881
AIR SECTION
621 S. Andrews Avenue
Fort Lauderdale, Florida 33301
(305) 765-4436

Air License

LICENSE TO OPERATE AN AIR POLLUTION SOURCE ISSUED UNDER THE PROVISIONS OF BROWARD COUNTY ENVIRONMENTAL QUALITY CONTROL BOARD CODE OF REGULATIONS, CHAPTERS 27-3 AND 27-4, AND FLORIDA ADMINISTRATIVE CODE, CHAPTER 17-2.

LICENSE NO. AO-42503R-16 thru 28 DATE OF ISSUE December 4, 1987

DATE OF EXPIRATION December 31, 1989

LICENSE ISSUED TO: NAME Florida Power & Light Co.

ADDRESS P.O. Box 8248
Ft. Lauderdale, Fl. 33310

TELEPHONE 765-3111

TO BE KNOWN AS Same as Above

TO BE LOCATED AT Griffin Road, Fort Lauderdale

FOR THE Operation of Fossil Fuel Turbine Generator Units #13 thru #24.
Maximum Heat Input: 552 MBtu/hr.
Fuel: combination of natural gas and fuel oil #2
Stack height: 43.5 feet above ground level

WORK SCHEDULE N/A

EMISSION LIMITING STANDARDS B.C.E.Q.C.B. Code of Regulations 27-4.03.1
FAC Rule 17-2.610 (2) (a)

IN ACCORDANCE WITH THE LICENSE APPLICATION WHICH IS CONSIDERED PART OF THIS LICENSE. THIS LICENSE IS SUBJECT TO ALL FLORIDA STATE, BROWARD COUNTY AND LOCAL LAWS, REGULATIONS, RULES, AND THE CONDITIONS ATTACHED HERETO.

POST THIS LICENSE IN A PROMINENT PLACE ON THE PLANT PREMISES.

Gary Carlson for

Victor N. Howard, P.E.
Pollution Control Officer

10.4-83

AIR LICENSE

LICENSEE: Florida Power & Light Co.

LICENSE NO. AO-42503R-16 thru 28
DATE OF ISSUE: December 4, 1987
EXPIRATION DATE: December 31, 1989

GENERAL CONDITIONS:

1. The terms, conditions, requirements, limitations and restrictions set forth herein are accepted by the licensee and enforceable by the EQCB pursuant to Chapter 27 of the Broward County Environmental Quality Control Board (EQCB) Code. The EQCB will review this license periodically and may revoke the license, initiate administrative and/or judicial action for any violation of the conditions by the licensee, its agents, employees, servants or representatives.

2. This license is valid only for the specific uses set forth in the license application and any deviation from the approved uses may constitute grounds for revocation and enforcement action by the EQCB.

3. In the event the licensee is temporarily unable to comply with any of the conditions of the license, the licensee shall notify the PCO within 12 hours. Within 5 working days of the event, the licensee shall submit a written report to the PCO that describes the incident, its cause, the measures being taken to correct the problem and prevent its reoccurrence, the owner's intention toward repair, replacement, and reconstruction of destroyed facilities, and a schedule of events leading toward operation within the license condition.

4. The issuance of this license does not convey any vested rights or exclusive privileges, nor does it authorize any injury to public or private property or any invasion of personal rights, or any violations of federal, state or local laws or regulations.

5. This license must be available for inspection on licensee's premises during the entire life of the license.

6. By accepting this license, the licensee understands and agrees that all records, notes, monitoring data and other information relating to the construction or operation of this permitted source, that are submitted to the EQCB, may be used by the EQCB as evidence in any enforcement proceeding arising under EQCB rules and regulations, except where such use is prohibited by Section 403.111, Florida Statutes.

7. The licensee agrees to comply with Chapter 27, Code of Regulations of the EQCB.

8. Any new owner of a licensed facility shall apply by letter for a transfer of license within thirty (30) days after sale or legal transfer. The transferor shall remain liable for performance in accordance with the license until the transferee applies for, and is granted a transfer of license.

9. The licensee, by acceptance of this license, specifically agrees to allow access to the licensed source at reasonable times by EQCB personnel for the purpose of inspection and testing to determine compliance with this license and EQCB rules and regulations.

10. This license does not constitute a waiver or approval of any other license that may be required for other aspects of the total project.

11. If the licensee wishes to renew the license or extend its term, he shall make application 60 days prior to its expiration. Expired licenses are not renewable.

12. In addition to the general conditions set forth above, each license issued by the EQCB shall contain specific conditions determined by site conditions and requirements pursuant to the regulations as determined by the PCO. Licensee agrees that specific conditions are enforceable by the EQCB for any violation thereof.

13. When requested by the EQCB, the licensee shall within a reasonable time furnish any information required by law which is needed to determine compliance with the license. If the licensee becomes aware that relevant facts were not submitted or were incorrect in the license application or in any report to the EQCB, such facts or information shall be submitted or corrected promptly.

BROWARD COUNTY

ENVIRONMENTAL QUALITY CONTROL BOARD

LICENSE TO Operate Air POLLUTION SOURCE, ACCORDING TO CHAPTER 27-3, BROWARD COUNTY ENVIRONMENTAL QUALITY CONTROL ACT.

LICENSE NO. AO-28095R-13 thru 24 DATE March 23, 1983

LICENSE ISSUED TO: NAME Florida Power & Light Company

ADDRESS P. O. Box 013100

Miami, Florida 33101

TELEPHONE 552-4060

FOR THE Operation OF Twelve Turbine Generators Nos. 13-24

Fossil Fuel Turbine Generator peaking units, burning natural gas and/or No. 2 distillate oil, exhausting 50 feet above ground level. Each unit when operating at maximum heat input of 552 MEtu/hr. emits 18 #/hr. of particulates, 24 #/hr. of SO_2 and 415 #/hr. of NO_x when burning 100% oil. Units operate when required - about 10% of time. Conditions of the State Permit also apply to this permit.

TO BE KNOWN AS Same as above

AND TO BE LOCATED AT Griffin Road

Dania, Florida

IN ACCORDANCE WITH THE renewal letter and operational APPLICATION, DATED March 14, 1983, WHICH IS CONSIDERED PART OF THIS LICENSE. THIS LICENSE EXPIRES March 31, 1988.

THIS LICENSE IS SUBJECT TO ALL FLORIDA STATE, BROWARD COUNTY, AND LOCAL LAWS, REGULATIONS, RULES, AND THE CONDITIONS ATTACHED HERETO.

NO CONDITIONS ATTACHED.

POST THIS LICENSE IN A PROMINENT PLACE ON THE PLANT PREMISES.

Victor N. Howard Pollution Control Officer

NAME: VICTOR N. HOWARD, P.E. TITLE

10.4-85

50-PC 104

APPENDIX 10.5

MONITORING PROGRAMS

APPENDIX 10.5.1

AIR QUALITY

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AIR MONITORING

This appendix presents the ambient air and meteorological monitoring data obtained from a two station network established as part of the Lauderdale Repowering Project. The design of the monitoring network is described in the Air Quality Monitoring Plan. This plan was submitted to the Florida Department of Environmental Regulation (FDER) in August, 1988 to fulfill the Prevention of Significant Deterioration (PSD) monitoring requirements codified in Rule 17-2.500(5)(f) Florida Administrative Code (F.A.C.). This monitoring plan was subsequently approved by FDER. The Quality Assurance Manual Including Standard Operating Procedures for Continuous Ambient Air/Meteorological Monitoring and Performance Audits have been submitted separately to FDER.

Air and Meteorological Data
October - December 1988

FPL-Davie
Ft. Lauderdale, FL - Site 004

HOURLY AVERAGES FOR SO2 in PPB

OCTOBER 1988

DAY	HOUR (EST) 00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVG
1																									
2																									
3																									
4																									
5																									
6	1	1	Cal	2	2	2	3	2	2	3	10	9	22	25	7	3	4	3	4	2	2	2	1	1	5
7	1	1	Cal	1	1	2	3	Cal	Cal	3	2	2	2	2	3	2	2	2	1	1	1	1	1	1	2
8	1	1	Cal	1	1	1	1	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1
9	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1
10	1	1	Cal	1	1	2	3	4	3	3	3	2	2	2	3	3	3	2	3	6	7	8	6	5	3
11	4	2	2	1	2	3	5	Cal	Cal	3	3	3	2	12	34	20	12	3	2	2	3	2	2	1	6
12	1	2	Cal	2	3	3	5	4	5	7	5	4	3	2	2	2	2	3	2	2	3	2	3	2	3
13	2	1	1	1	1	2	4	4	3	3	2	2	3	2	2	2	2	2	2	2	1	1	1	1	2
14	1	1	Cal	1	1	2	3	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
15	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
16	1	1	Cal	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
17	1	1	1	1	1	1	2	3	3	2	2	3	2	2	1	2	1	1	1	2	2	2	1	1	2
18	1	1	Cal	1	1	2	4	4	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
19	0	0	Cal	Cal	0	2	2	4	4	Down	Down	2	2	2	2	2	2	2	3	1	1	1	4	3	2
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22	1	1	1	2	2	2	3	3	3	2	2	2	2	2	2	2	3	3	3	3	3	3	2	2	2
23	2	2	2	2	3	3	2	2	3	4	4	3	3	2	2	18	20	6	4	3	3	3	2	2	4
24	2	2	0	1	1	1	4	5	4	3	3	2	3	2	1	1	2	9	4	3	3	2	1	1	2
25	1	1	1	1	1	1	2	2	2	7	6	3	4	4	7	9	7	3	2	1	2	2	1	1	3
26	1	1	Cal	1	1	3	5	5	5	3	2	2	2	2	2	2	2	1	1	2	2	2	2	2	2
27	2	2	1	2	2	5	8	9	3	5	7	2	2	3	4	2	2	1	2	1	1	2	2	1	3
28	1	1	1	1	2	1	3	3	3	3	3	2	2	1	2	2	2	1	1	1	1	1	1	1	1
29	1	1	1	1	1	1	4	4	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
30	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1
31	1	1	1	1	1	1	2	3	3	3	2	4	8	14	11	4	5	14	10	5	2	1	0	0	4

TOTAL HOURS 624 TOTAL GOOD HOURS 607 DATA CAPTURE 97.3%

MAX. 1HR AVG 34 10/11/88 14:00:00 2ND MAX. 1 HR AVG 25 10/06/88 13:00:00

MIN. 1HR AVG 0 10/19/88 00:00:00 ARITHMETIC MEAN 2 STANDARD DEV. 3

NAAQS Comparison: MAX. 3 HR AVG 22 (500) 10/11/88 16:00:00
MAX. 24 HR AVG 7 (140) 10/11/88 17:00:00

KEY FOR MISSING CODES
Bad< - To few samples for valid average, Cal - calibration, OCal - Analyzer out of calibration
BadS - Bad Analyzer Status, PwrF - Power Failure, Down - Operator downed channel, Miss - Missing Data
Qad - Data questionable insufficient documentation, Qai - Data questionable external influence, Purg - Analyzer in Purge

FPL-Davie
Ft. Lauderdale, FL - Site 004

HOURLY AVERAGES FOR SO2 in PPB

NOVEMBER 1988

DAY	HOUR (EST) 00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVG
1	0	1	0	0	0	0	1	1	2	2	1	2	1	2	2	3	2	1	1	1	1	1	1	1	1
2	1	1	Cal	8	31	59	68	48	25	15	10	8	7	6	5	6	5	4	4	5	5	5	4	4	14
3	4	3	2	2	2	3	9	5	12	2	1	1	1	1	1	1	2	2	2	1	1	1	2	1	3
4	1	1	0	0	1	1	1	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	1	1	1	1	1	1
6	0	0	1	1	1	1	1	1	1	0	1	1	1	1	0	1	0	1	1	1	1	1	1	1	1
7	1	1	1	1	1	2	4	8	8	4	6	6	4	3	3	4	4	4	4	4	4	3	2	2	3
8	2	2	2	2	2	2	4	5	5	5	3	2	2	2	2	2	2	2	3	3	3	3	3	2	3
9	2	1	Cal	1	1	1	3	5	6	3	2	2	2	2	2	2	2	1	1	1	1	1	1	1	2
10	1	1	1	1	1	1	2	5	4	4	2	2	3	3	2	2	2	2	2	2	2	2	2	2	2
11	2	2	2	2	1	1	2	2	2	2	2	2	2	2	2	2	2	1	2	2	3	3	3	2	2
12	2	2	2	2	2	1	2	3	2	2	2	1	1	1	1	1	1	1	1	1	1	2	2	2	1
13	2	1	2	1	1	1	1	1	1	1	2	8	7	2	1	1	1	1	1	1	1	1	1	1	2
14	1	1	1	1	1	1	2	3	3	3	2	1	1	1	1	1	1	1	1	1	1	0	0	0	1
15	0	0	1	1	1	2	2	4	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
16	2	2	Cal	2	2	3	4	4	4	3	2	17	29	22	15	6	4	5	3	2	2	2	2	2	6
17	2	2	2	2	2	3	3	5	5	3	3	16	10	6	18	3	9	14	3	4	2	2	2	2	5
18	2	2	2	3	2	2	3	3	3	3	3	3	2	2	2	2	2	2	2	2	2	2	2	2	2
19	5	2	2	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	2
20	1	1	1	1	1	1	1	1	5	4	7	8	11	8	8	5	2	2	2	2	2	2	2	2	3
21	1	1	2	0	0	1	4	8	5	3	2	3	9	4	2	1	1	1	1	1	1	1	1	1	2
22	0	0	0	0	0	0	0	1	1	1	2	1	1	1	1	1	1	1	0	0	0	0	0	0	0
23	0	0	Cal	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	3	2	2	1
24	3	2	2	2	4	2	1	1	1	2	2	2	1	2	2	2	2	2	2	2	2	2	1	1	2
25	1	1	2	1	1	1	1	2	2	2	1	1	1	3	1	1	1	1	1	1	2	2	2	1	1
26	0	0	0	0	0	0	0	0	0	0	1	0	1	1	1	0	1	0	0	0	0	0	0	0	0
27	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0
28	0	0	1	1	1	0	0	1	2	1	2	1	1	1	0	1	2	2	1	1	1	2	2	1	1
29	1	1	1	2	2	2	2	3	4	5	5	3	2	3	2	2	2	2	2	2	2	2	2	1	2
30	1	2	Cal	2	2	1	2	4	3	3	2	2	3	6	4	2	2	2	2	2	3	3	4	2	2

TOTAL HOURS 720 TOTAL GOOD HOURS 715 DATA CAPTURE 99.3%

MAX. 1HR AVG 68 11/02/88 06:00:00 2ND MAX. 1 HR AVG 59 11/02/88 05:00:00

MIN. 1HR AVG 0 11/22/88 04:00:00 ARITHMETIC MEAN 2 STANDARD DEV. 5

NAAQS Comparison: MAX. 3 HR AVG 58 (500) 11/02/88 07:00:00
MAX. 24 HR AVG 15 (140) 11/03/88 01:00:00

KEY FOR MISSING CODES
Bad< - To few samples for valid average, Cal - calibration, OCal - Analyzer out of calibration
BadS - Bad Analyzer Status, PwrF - Power Failure, Down - Operator downed channel, Miss - Missing Data
Qad - Data questionable insufficient documentation, Qai - Data questionable external influence, Purg - Analyzer in Purge

FPL-Davie
Ft. Lauderdale, FL - Site 004

HOURLY AVERAGES FOR SO2 in PPB

DECEMBER 1988

DAY	HOUR (EST) 00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVG
1	2	2	2	2	2	2	3	3	2	2	2	2	2	2	3	3	3	3	2	2	2	2	2	2	2
2	2	2	3	3	3	2	3	4	4	4	4	3	4	4	4	4	4	3	3	3	3	2	2	2	3
3	2	2	2	2	2	2	2	3	2	3	3	3	3	4	4	4	3	4	3	3	2	2	2	2	3
4	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3	3	3	2	2	2	2	2
5	2	2	3	2	2	3	4	6	7	7	7	7	5	4	3	4	4	5	5	5	5	4	3	2	4
6	2	2	1	1	2	2	3	5	5	5	6	4	3	3	2	3	3	3	3	3	2	2	2	2	3
7	1	1	Cal	1	1	1	2	8	4	3	3	2	2	2	2	3	5	2	2	8	2	2	2	3	3
8	3	3	3	3	3	3	5	7	10	6	3	3	3	3	3	3	5	2	4	5	6	3	3	4	4
9	2	2	2	2	2	2	3	5	6	6	6	4	3	3	3	3	3	3	3	3	3	4	3	3	3
10	2	2	2	2	4	4	4	5	5	4	4	6	5	4	3	14	12	6	4	3	2	3	3	3	4
11	3	2	4	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	1	2	1	1	1	1	1
12	0	1	0	0	0	0	0	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	0	0	1
13	0	0	1	2	1	1	1	2	2	1	1	1	1	2	2	2	2	2	2	1	1	1	4	2	1
14	1	1	Cal	1	1	2	7	5	7	6	6	6	5	5	4	4	4	4	3	2	2	2	5	3	4
15	3	2	5	0	7	3	4	7	11	9	6	5	5	3	2	1	1	1	2	4	3	3	3	1	4
16	1	0	0	0	0	0	1	3	4	3	3	2	1	1	2	1	Cal	Cal	Cal	Cal	Cal	Cal	Cal	Cal	Bad<
17	Cal	Cal	Cal	Cal	Cal	Cal	Cal	Cal	Cal	Cal	Cal	3	Cal	Cal	2	2	2	2	3	3	4	6	5	3	Bad<
18	2	1	1	4	3	2	2	2	3	3	3	3	2	2	1	1	2	3	3	2	2	2	2	2	2
19	2	2	3	2	2	2	3	4	5	7	8	5	3	3	2	2	2	2	1	1	1	1	1	1	3
20	2	4	1	0	0	0	0	3	2	2	2	2	5	2	2	2	2	6	2	2	1	2	0	0	2
21	0	0	Cal	0	0	0	1	1	1	1	1	1	1	1	1	1	1	0	0	0	1	2	2	1	1
22	1	0	1	0	0	0	1	2	3	2	1	1	1	1	1	2	3	2	2	3	2	1	1	1	1
23	0	0	0	0	0	0	1	2	3	2	3	4	2	3	2	2	1	1	0	1	1	0	0	0	1
24	0	0	3	1	1	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0
25	1	0	1	1	1	0	1	0	0	1	1	0	0	0	0	0	0	0	0	1	1	1	1	1	0
26	1	1	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27	0	0	0	1	1	1	1	2	2	2	2	3	7	7	7	6	4	2	2	2	1	1	1	1	2
28	1	1	Cal	1	1	1	1	1	2	2	2	2	1	1	8	32	8	3	2	2	2	1	1	1	3
29	1	2	1	1	1	1	1	2	2	2	5	18	16	3	8	2	2	2	1	2	1	1	1	1	3
30	1	1	1	1	1	1	2	5	2	1	1	1	1	1	3	22	15	2	1	1	1	1	2	2	3
31	2	2	2	2	2	2	2	2	2	1	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1

TOTAL HOURS 744 TOTAL GOOD HOURS 719 DATA CAPTURE 96.6%

MAX. 1HR AVG 32 12/28/88 15:00:00 2ND MAX. 1 HR AVG 22 12/30/88 15:00:00

MIN. 1HR AVG 0 12/16/88 03:00:00 ARITHMETIC MEAN 2 STANDARD DEV. 2

NAAQS Comparison: MAX. 3 HR AVG 16 (500) 12/28/88 16:00:00
MAX. 24 HR AVG 5 (140) 12/29/88 13:00:00

KEY FOR MISSING CODES
Bad< - To few samples for valid average, Cal - calibration, OCal - Analyzer out of calibration
BadS - Bad Analyzer Status, PwrF - Power Failure, Down - Operator downed channel, Miss - Missing Data
Qad - Data questionable insufficient documentation, Qai - Data questionable external influence, Purg - Analyzer in Purge

FPL-Pinehurst
Ft. Lauderdale, FL - Site 003

HOURLY AVERAGES FOR SO2 in PPB

OCTOBER 1988

DAY	HOUR (EST) 00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVG
1																									
2																									
3																									
4																									
5																									
6	2	7	Cal	1	1	1	2	1	2	2	3	21	57	2	4	PwrF	2	1	1	3	3	2	1	1	5
7	1	1	1	1	1	1	1	1	Cal	Cal	1	1	1	1	1	1	1	1	4	1	1	1	1	1	1
8	1	1	Cal	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	0	0	1	1
9	0	1	1	0	1	1	1	2	1	1	1	1	1	1	1	1	0	1	1	1	0	0	0	0	1
10	0	0	Cal	0	1	1	2	2	2	2	1	1	1	1	1	1	1	1	2	2	2	4	4	2	1
11	2	2	1	1	1	1	2	4	4	2	1	1	1	3	3	5	11	2	2	2	1	1	1	1	2
12	1	1	Cal	1	1	1	2	2	3	4	3	1	1	1	1	1	1	1	1	1	1	1	2	2	1
13	2	2	Cal	2	2	2	2	3	3	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	2
14	2	2	Cal	1	1	1	1	2	2	1	1	2	1	1	2	1	1	1	1	2	1	1	1	1	1
15	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	1
16	2	2	Cal	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
17	1	1	1	1	1	2	2	3	2	2	2	2	1	1	1	1	2	1	1	1	1	1	2	2	1
18	1	1	Cal	1	1	1	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	4	3	5	2
19	2	1	5	2	1	2	3	4	2	2	2	1	1	0	Cal	Cal	Cal	Cal	1	0	0	4	9	2	2
20	1	1	1	0	1	1	1	3	Cal	Cal	Cal	Cal	Cal	Cal	Cal	1	0	0	1	6	5	5	1	1	Bad<
21	1	0	0	0	1	1	2	4	3	8	22	4	35	7	2	1	3	2	2	2	2	1	1	2	4
22	1	0	0	0	0	0	0	1	1	0	0	0	0	Cal	Cal	11	2	2	2	3	3	3	2	2	2
23	1	1	1	1	1	2	2	2	2	2	3	2	12	26	5	10	8	4	3	3	2	3	2	1	4
24	1	1	1	1	1	1	2	4	5	3	7	25	3	Cal	Cal	12	4	3	4	4	4	3	2	1	4
25	1	1	1	1	1	1	1	1	2	7	4	3	3	4	4	6	5	2	2	1	1	2	2	2	2
26	2	2	1	1	1	1	2	2	2	2	1	1	Cal	Cal	1	1	1	1	1	1	1	1	3	6	2
27	3	2	Cal	4	3	3	4	3	5	3	1	1	1	1	1	1	1	2	1	1	2	2	6	2	2
28	2	2	Cal	4	2	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
29	1	1	Cal	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
30	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1
31	1	1	Cal	1	1	1	1	2	2	1	3	4	2	3	3	4	2	3	2	1	0	1	0	0	1

TOTAL HOURS 624 TOTAL GOOD HOURS 592 DATA CAPTURE 94.9%

MAX. 1HR AVG 57 10/06/88 12:00:00 2ND MAX. 1 HR AVG 35 10/21/88 12:00:00

MIN. 1HR AVG 0 10/31/88 22:00:00 ARITHMETIC MEAN 2 STANDARD DEV. 4

NAAQS Comparison: MAX. 3 HR AVG 27 (500) 10/06/88 12:00:00
MAX. 24 HR AVG 5 (140) 10/24/88 11:00:00

KEY FOR MISSING CODES
Bad< - To few samples for valid average, Cal - calibration, OCal - Analyzer out of calibration
BadS - Bad Analyzer Status, PwrF - Power Failure, Down - Operator downed channel, Miss - Missing Data
Qad - Data questionable insufficient documentation, Qai - Data questionable external influence, Purg - Analyzer in Purge

FPL-Pinehurst
Ft. Lauderdale, FL - Site 003

HOURLY AVERAGES FOR SO2 in PPB

NOVEMBER 1988

DAY	HOUR (EST) 00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVG
1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	2	2	2	2	2	2	2	2	1	2	1
2	2	1	Cal	1	1	1	1	1	2	2	3	2	2	2	1	1	1	2	2	2	2	3	2	3	2
3	2	2	2	1	1	2	3	5	8	7	2	2	2	1	3	5	1	1	1	2	2	5	3	1	3
4	1	1	Cal	1	1	3	2	2	2	1	1	1	1	1	1	1	Cal	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	Cal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	2	4	1	2	2	1	0	1	1	1	1	0	1	0	1	0	0	0
8	0	0	Cal	0	0	0	0	1	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	Cal	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
11	0	0	Cal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	Cal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	37	18	9	2	0	0	0	0	0	0	0	0	0	0	2
14	0	0	Cal	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16	1	1	Cal	0	0	0	0	3	4	10	4	0	0	0	0	0	0	0	0	0	0	0	0	1	1
17	0	0	0	0	0	0	1	0	7	6	3	0	1	1	0	0	0	0	2	1	0	0	0	0	0
18	7	2	Cal	7	7	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
19	11	10	11	30	17	8	11	6	7	6	22	24	9	21	24	15	4	5	6	6	2	7	9	8	12
20	2	0	Cal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0
21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	6	0
22	0	0	Cal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24	0	0	Cal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25	0	0	Cal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	2	3	0
26	8	7	Cal	5	12	18	21	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	0	0	Cal	0	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0
29	0	0	0	0	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	0	0	Cal	0	0	0	0	0	0	0	0	0	0	7	0	0	0	0	0	0	0	0	0	0	0

TOTAL HOURS 720 TOTAL GOOD HOURS 702 DATA CAPTURE 97.5%

MAX. 1HR AVG 37 11/13/88 10:00:00 2ND MAX. 1 HR AVG 30 11/19/88 03:00:00

MIN. 1HR AVG 0 11/05/88 02:00:00 ARITHMETIC MEAN 0 STANDARD DEV. 4

NAAQS Comparison: MAX. 3 HR AVG 21 (500) 11/13/88 12:00:00
MAX. 24 HR AVG 12 (140) 11/19/88 23:00:00

KEY FOR MISSING CODES
Bad< - To few samples for valid average, Cal - calibration, OCal - Analyzer out of calibration
BadS - Bad Analyzer Status, PwrF - Power Failure, Down - Operator downed channel, Miss - Missing Data
Qad - Data questionable insufficient documentation, Qai - Data questionable external influence, Purg - Analyzer in Purge

FPL-Pinehurst
Ft. Lauderdale, FL - Site 003

HOURLY AVERAGES FOR SO2 in PPB

DECEMBER 1988

DAY	HOUR (EST) 00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVG
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	Cal	1	0	0	0	1	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	Cal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	1	2	2	2	2	1	1	0	0	0	0	1	1	1	1	1	0	0	1
6	0	0	Cal	0	0	0	0	0	2	3	4	1	3	46	15	7	7	2	1	2	3	6	1	6	4
7	7	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	Cal	0	0	0	0	1	4	9	12	8	29	16	16	11	4	9	16	11	0	4	7	0	7
9	0	0	Cal	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	1	1	1	0	2	1	0
10	0	0	Cal	0	0	0	0	0	1	1	0	1	0	1	4	14	8	1	1	0	0	0	0	0	1
11	0	0	0	0	0	0	0	0	1	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	1	0	Cal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	8	1	0
14	0	0	Cal	0	0	1	4	7	4	3	2	Cal	Cal	Cal	Cal	0	0	0	0	0	0	0	0	0	1
15	0	0	0	0	0	0	0	2	2	1	1	2	1	Cal	Cal	Cal	Cal	Cal	Cal	Cal	Cal	Cal	Cal	2	Bad<
16	1	1	Cal	0	0	0	1	Cal	Cal	Cal	1	1	Cal	1	0	0	0	1	2	1	1	0	0	0	1
17	0	0	0	0	0	0	0	0	0	0	1	1	2	1	1	1	2	2	3	3	6	6	5	2	1
18	1	1	2	3	2	2	1	2	2	2	2	2	Cal	1	1	1	1	1	2	2	2	2	2	2	2
19	2	2	2	2	2	1	1	2	6	6	5	2	1	1	1	1	0	0	0	0	0	0	0	4	2
20	3	3	8	3	17	12	14	16	12	35	15	13	Cal	13	22	22	5	10	10	6	5	2	0	0	11
21	0	1	6	5	0	0	0	1	1	1	1	1	1	0	1	0	1	0	0	1	12	5	0	0	1
22	0	0	0	0	0	0	0	1	1	2	0	0	Cal	0	0	4	1	0	8	10	4	1	0	1	1
23	0	0	Cal	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24	0	1	3	4	4	13	3	4	1	0	0	0	Cal	0	0	0	0	0	1	1	1	1	0	0	2
25	1	1	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	0	0	0	0	0	0	0	0	0	0	0	0	Cal	0	0	0	0	0	0	0	0	0	0	0	0
27	0	0	0	0	0	0	0	0	0	1	1	0	0	0	1	3	3	4	1	1	6	4	2	2	1
28	0	0	0	0	0	0	0	0	0	0	0	0	Cal	0	0	1	0	0	1	1	1	0	0	1	0
29	1	0	0	0	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	1	1	1	0	0
30	1	1	Cal	2	1	1	1	1	1	3	13	18	Cal	4	4	4	6	5	5	1	1	1	0	0	3
31	1	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0

TOTAL HOURS 744 TOTAL GOOD HOURS 708 DATA CAPTURE 95.2%

MAX. 1HR AVG 46 12/06/88 13:00:00 2ND MAX. 1 HR AVG 35 12/20/88 09:00:00

MIN. 1HR AVG 0 12/08/88 03:00:00 ARITHMETIC MEAN 1 STANDARD DEV. 4

NAAQS Comparison: MAX. 3 HR AVG 23 (500) 12/06/88 15:00:00
MAX. 24 HR AVG 11 (140) 12/20/88 22:00:00

KEY FOR MISSING CODES
Bad< - To few samples for valid average, Cal - calibration, OCal - Analyzer out of calibration
BadS - Bad Analyzer Status, PwrF - Power Failure, Down - Operator downed channel, Miss - Missing Data
Qad - Data questionable insufficient documentation, Qai - Data questionable external influence, Purg - Analyzer in Purge

ESE # 89 509 400

FPL PINEHURST

SO2 PRECISION CALCULATIONS

1ST SAMPLING QUARTER

OCTOBER 1988 - DECEMBER 1988

DATE	AIR QUALITY SAMPLER(X) PPB	DUPLICATE SAMPLER(Y) PPB	% DIFFERENCE(D)
OCT 7, 1988	94.00	104.00	+ 10.64
OCT 13, 1988	94.00	106.00	+ 12.77
OCT 19, 1988	94.00	106.00	+ 12.77
OCT 26, 1988	94.00	100.00	+ 6.38
OCT 28, 1988	94.00	102.00	+ 8.51
NOV 11, 1988	94.00	104.00	+ 10.64
NOV 25, 1988	94.00	106.00	+ 12.77
DEC 9, 1988	94.00	106.00	+ 12.77
DEC 16, 1988	94.00	108.00	+ 14.89
DEC 23, 1988	94.00	94.00	0.00
DEC 30, 1988	94.00	94.00	0.00

SUM OF D(I) = 102.13

MEAN OF D(I) = 9.28

STD. DEV. = 5.15

UPPER 95% PROBABILITY LIMIT = 16.42

LOWER 95% PROBABILITY LIMIT = 2.15

FPL-Pinehurst
Ft. Lauderdale, FL - Site 003

HOURLY AVERAGES FOR NO2 in PPB

OCTOBER 1988

DAY	HOUR (EST) 00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVG
1																									
2																									
3																									
4																									
5																									
6	8	6	6	10	Cal	19	21	21	21	13	13	22	25	9	9	PwrF	24	12	16	23	21	19	16	16	16
7	12	10	6	11	12	16	19	18	16	12	7	6	6	11	7	8	10	11	19	14	10	11	10	8	11
8	6	5	6	6	Cal	11	21	23	19	15	5	4	4	3	6	6	5	7	7	7	5	4	4	4	8
9	2	2	3	1	3	3	6	7	4	4	4	4	3	3	4	3	4	7	8	8	5	4	5	3	4
10	2	2	2	3	Cal	29	29	32	27	18	11	12	6	6	7	9	14	14	17	20	29	48	41	35	18
11	41	38	31	22	31	33	38	47	Cal	27	9	8	8	11	15	10	11	12	13	15	15	15	15	15	21
12	12	9	8	8	Cal	12	16	15	13	10	9	8	7	7	7	7	7	8	10	12	15	15	16	16	11
13	16	13	10	8	Cal	10	13	16	15	12	10	10	8	8	8	9	10	9	9	7	6	6	8	12	10
14	11	8	7	5	Cal	5	7	8	7	6	6	7	7	6	7	8	8	8	7	7	6	5	6	6	7
15	5	5	4	4	4	5	5	6	6	6	6	6	6	6	6	6	6	6	7	6	6	6	5	5	5
16	5	5	4	4	Cal	4	4	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	5
17	4	4	4	5	6	7	10	12	13	10	8	8	6	6	6	7	8	9	9	8	8	7	9	9	8
18	7	5	6	5	Cal	7	9	10	10	7	5	5	4	4	5	6	7	6	6	5	5	5	5	5	6
19	5	4	4	5	4	6	9	10	11	9	6	5	5	7	Cal	Cal	Cal	Cal	10	6	6	6	6	6	6
20	5	5	5	5	7	9	10	22	Cal	Cal	Cal	Cal	Cal	Cal	Cal	7	7	8	8	8	8	9	10	9	Bad<
21	8	7	6	8	10	11	11	13	16	14	14	11	15	11	10	9	10	10	11	11	12	12	13	13	11
22	11	10	8	7	8	8	9	11	11	7	6	6	6	Cal	Cal	13	10	9	12	14	17	15	16	13	10
23	11	10	10	10	9	8	8	8	9	8	7	7	8	12	9	9	10	12	12	13	15	16	12	10	10
24	9	8	8	8	9	11	12	15	18	14	10	12	8	Cal	Cal	18	15	12	15	17	14	15	14	10	12
25	8	7	7	7	7	9	11	12	12	11	9	9	9	8	8	8	9	9	9	9	8	11	12	12	9
26	11	9	8	7	7	10	13	14	10	8	7	7	7	8	7	7	8	12	14	11	13	10	14	12	10
27	9	7	6	10	Cal	15	26	19	15	10	6	6	5	5	6	8	11	11	11	9	9	9	17	7	10
28	10	9	6	9	Cal	24	26	19	9	7	7	7	5	7	7	7	10	12	12	10	6	4	5	5	10
29	4	4	2	2	Cal	4	8	10	6	6	5	5	5	5	5	7	7	7	10	6	5	5	6	5	5
30	5	3	3	3	2	3	5	13	5	5	3	4	4	4	4	5	9	12	19	23	32	34	16	20	10
31	28	23	16	11	Cal	17	17	26	32	15	6	6	7	8	9	11	18	31	39	39	45	29	11	16	20

TOTAL HOURS 624 TOTAL GOOD HOURS 595 DATA CAPTURE 95.4%

MAX. 1HR AVG 48 10/10/88 21:00:00 2ND MAX. 1 HR AVG 47 10/11/88 07:00:00

MIN. 1HR AVG 1 10/09/88 03:00:00 ARITHMETIC MEAN 10 STANDARD DEV. 7

KEY FOR MISSING CODES
Bad< - To few samples for valid average, Cal - calibration, OCal - Analyzer out of calibration
BadS - Bad Analyzer Status, PwrF - Power Failure, Down - Operator downed channel, Miss - Missing Data
Qad - Data questionable insufficient documentation, Qai - Data questionable external influence, Purg - Analyzer in Purge

FPL-Pinehurst
Ft. Lauderdale, FL - Site 003

HOURLY AVERAGES FOR NO2 in PPB

NOVEMBER 1988

DAY	HOUR (EST) 00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVG
1	21	22	12	10	16	13	18	20	21	22	13	11	7	7	16	23	16	25	25	21	26	27	28	31	19
2	26	11	9	7	Cal	10	14	18	18	19	18	16	15	11	6	9	12	22	27	23	21	42	25	10	17
3	11	8	7	3	4	6	13	18	Cal	Cal	22	21	15	16	17	21	25	25	23	27	20	33	18	8	16
4	4	2	6	3	Cal	24	21	23	Cal	Cal	9	10	13	8	7	8	Cal	16	18	21	23	30	26	24	15
5	24	23	16	13	6	7	10	10	8	7	7	4	4	5	8	6	10	13	15	16	21	22	23	21	12
6	19	18	17	16	Cal	9	12	12	7	3	5	4	4	4	4	5	8	15	13	14	14	15	14	18	11
7	19	11	13	21	25	22	22	32	40	17	11	7	8	8	12	14	16	33	43	51	41	42	39	34	24
8	31	32	31	31	Cal	30	35	38	43	32	7	7	7	7	7	8	15	26	31	22	19	12	12	10	21
9	20	34	31	30	28	27	27	24	12	7	7	5	6	6	7	10	11	14	10	9	8	7	9	8	15
10	8	8	7	8	Cal	24	25	31	38	5	4	4	5	6	6	7	10	19	17	14	13	13	12	24	13
11	21	18	19	17	Cal	15	18	24	25	17	12	6	7	6	7	6	10	19	19	19	17	13	13	13	15
12	10	8	9	9	Cal	24	22	27	17	8	7	5	4	6	5	6	9	12	14	14	13	13	15	16	12
13	14	19	14	18	23	21	19	23	28	15	24	18	12	7	6	6	6	10	12	8	6	5	5	3	13
14	3	2	3	19	Cal	19	19	22	28	21	5	5	3	4	5	5	10	9	7	5	4	3	3	3	9
15	3	2	1	1	1	3	6	12	9	5	6	4	5	4	4	8	10	11	12	10	4	6	11	14	6
16	10	10	9	10	Cal	12	16	20	17	13	9	5	6	6	6	10	14	13	10	4	5	11	17	14	11
17	8	9	9	4	13	14	18	17	16	9	6	5	7	5	4	5	7	12	14	12	5	7	8	6	9
18	14	9	13	11	Cal	11	16	15	10	7	4	4	5	5	6	6	10	13	9	6	4	6	6	8	9
19	12	9	12	19	14	11	19	15	14	10	15	17	13	17	16	15	14	17	18	17	12	15	17	13	14
20	8	4	2	2	Cal	4	4	4	4	4	4	5	4	5	5	7	6	12	18	20	19	15	15	9	8
21	4	4	5	3	5	8	17	22	14	7	8	11	9	11	11	14	17	18	20	18	17	15	12	15	12
22	6	5	4	4	Cal	7	7	11	12	8	9	8	8	7	8	10	11	10	10	8	6	5	4	5	7
23	5	3	3	3	5	6	8	11	10	12	12	6	7	9	7	8	9	9	10	9	8	9	8	7	8
24	7	5	4	4	Cal	5	4	6	6	6	6	5	6	5	5	5	7	15	20	22	28	27	23	25	11
25	22	17	5	2	Cal	4	10	16	10	8	7	6	7	7	7	10	10	12	10	10	13	19	18	13	10
26	16	13	7	6	Cal	19	19	17	6	7	6	8	7	7	8	9	10	10	8	7	7	4	4	4	9
27	3	2	2	2	1	2	4	5	6	4	4	7	5	5	7	7	10	13	14	11	10	9	7	7	6
28	6	5	4	4	Cal	15	15	23	26	24	26	25	10	16	17	17	12	20	18	12	13	17	19	12	15
29	9	8	7	8	9	14	24	27	26	30	10	6	8	9	11	12	15	16	11	9	7	6	6	5	12
30	3	3	2	1	Cal	4	12	22	26	9	8	10	12	13	10	12	16	24	24	26	26	25	25	26	15

TOTAL HOURS 720 TOTAL GOOD HOURS 698 DATA CAPTURE 96.9%

MAX. 1HR AVG 51 11/07/88 19:00:00 2ND MAX. 1 HR AVG 43 11/07/88 18:00:00

MIN. 1HR AVG 1 11/15/88 02:00:00 ARITHMETIC MEAN 12 STANDARD DEV. 8

KEY FOR MISSING CODES
Bad< - To few samples for valid average, Cal - calibration, OCal - Analyzer out of calibration
BadS - Bad Analyzer Status, PwrF - Power Failure, Down - Operator downed channel, Miss - Missing Data
Qad - Data questionable insufficient documentation, Qai - Data questionable external influence, Purg - Analyzer in Purge

FPL-Pinehurst
Ft. Lauderdale, FL - Site 003

HOURLY AVERAGES FOR NO2 in PPB

DECEMBER 1988

DAY	HOUR (EST) 00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVG
1	21	21	19	14	12	14	18	19	18	13	12	8	9	15	15	24	26	33	35	23	28	24	15	10	18
2	8	8	7	7	Cal	9	18	26	21	15	12	10	14	10	10	11	17	31	21	20	19	20	21	23	16
3	25	23	14	12	13	15	19	25	25	26	25	24	27	26	21	10	16	13	31	29	25	24	24	30	22
4	27	20	11	9	Cal	5	5	8	9	12	10	8	7	6	7	11	15	27	44	37	23	36	37	21	17
5	19	17	14	27	16	26	29	36	39	35	26	20	20	14	14	17	32	55	52	50	49	46	43	35	30
6	22	20	17	15	Cal	20	23	25	39	54	16	13	13	33	21	17	25	32	25	18	18	18	11	14	22
7	13	4	3	5	8	10	19	24	18	12	9	9	11	9	10	13	17	21	18	11	10	12	13	10	12
8	18	19	16	11	Cal	23	22	27	34	14	14	13	16	10	14	13	15	30	34	30	12	18	21	10	19
9	10	7	13	13	Cal	17	23	19	30	24	15	9	10	10	11	15	18	30	38	38	34	34	36	35	21
10	31	27	23	13	Cal	19	18	20	24	22	16	11	9	14	17	20	27	43	48	43	51	50	46	47	28
11	39	35	30	27	25	20	17	23	36	20	16	9	9	10	10	12	8	14	22	25	26	26	26	26	21
12	23	16	8	8	Cal	7	13	19	19	12	11	10	8	8	9	13	14	19	23	23	15	11	8	6	13
13	5	5	5	5	4	5	10	14	13	9	9	7	8	7	8	9	14	24	29	32	32	30	35	34	15
14	24	18	15	12	Cal	16	27	29	25	21	21	Cal	Cal	Cal	Cal	12	15	19	16	21	15	13	10	8	18
15	8	5	5	5	8	11	23	38	42	17	9	11	9	Cal	Cal	Cal	Cal	Cal	Cal	Cal	Cal	Cal	Cal	34	Bad<
16	31	29	26	26	Cal	24	26	Cal	Cal	Cal	Cal	Cal	Cal	Cal	7	7	13	36	49	46	39	24	25	23	Bad<
17	30	14	5	4	3	2	4	7	6	5	4	4	7	5	5	7	11	19	33	31	26	20	19	16	12
18	18	17	11	9	Cal	6	7	9	8	7	8	9	8	6	5	7	11	23	39	39	41	40	36	27	17
19	22	12	10	7	8	12	28	34	39	40	34	11	7	7	6	8	12	17	13	7	6	7	5	9	15
20	11	6	11	4	Cal	18	26	29	22	26	16	16	18	21	27	19	17	20	16	11	9	10	6	7	16
21	6	11	13	10	7	7	18	22	16	14	11	11	10	11	11	11	16	19	18	21	27	30	21	15	15
22	19	24	21	17	Cal	18	20	21	25	30	12	9	10	7	11	13	15	16	22	26	13	24	12	8	17
23	4	3	3	2	Cal	10	12	12	11	9	8	6	7	6	7	8	11	14	16	20	9	11	8	7	9
24	8	12	15	9	Cal	15	13	17	11	8	5	6	8	7	6	8	12	16	26	24	24	24	16	19	13
25	16	20	15	14	10	15	12	12	21	22	15	8	5	3	3	4	4	8	12	10	7	9	8	9	11
26	7	3	2	3	Cal	2	6	11	6	4	4	2	3	4	4	4	5	7	6	6	5	4	4	3	4
27	2	2	1	1	1	2	4	7	7	8	8	7	7	6	9	12	11	17	12	9	17	13	11	9	8
28	6	4	7	5	Cal	6	8	12	12	9	8	8	10	9	7	12	16	21	29	24	23	23	24	29	13
29	27	22	20	17	17	15	15	15	25	29	25	9	9	6	5	9	11	18	28	14	13	12	17	10	16
30	11	9	10	8	Cal	21	22	24	16	13	13	11	15	9	10	11	16	18	23	18	19	22	20	20	15
31	19	20	14	11	14	18	23	25	13	7	6	6	5	5	6	8	9	15	24	28	26	24	25	17	15

TOTAL HOURS 744 TOTAL GOOD HOURS 706 DATA CAPTURE 94.9%

MAX. 1HR AVG 55 12/05/88 17:00:00 2ND MAX. 1 HR AVG 54 12/06/88 09:00:00

MIN. 1HR AVG 1 12/27/88 03:00:00 ARITHMETIC MEAN 16 STANDARD DEV. 10

KEY FOR MISSING CODES
Bad< - To few samples for valid average, Cal - calibration, OCal - Analyzer out of calibration
BadS - Bad Analyzer Status, PwrF - Power Failure, Down - Operator downed channel, Miss - Missing Data
Qad - Data questionable insufficient documentation, Qai - Data questionable external influence, Purg - Analyzer in Purge

ESE # 89 509 400

FPL PINEHURST

NO2 PRECISION CALCULATIONS

SAMPLING QUARTER

OCTOBER 1988 - DECEMBER 1988

DATE	AIR QUALITY SAMPLER(X) PPB	DUPLICATE SAMPLER(Y) PPB	% DIFFERENCE(D)
OCT 11, 1988	92.00	104.00	+ 13.04
OCT 13, 1988	92.00	107.00	+ 16.30
OCT 20, 1988	96.00	106.00	+ 10.42
OCT 28, 1988	92.00	96.00	+ 4.35
NOV 4, 1988	92.00	97.00	+ 5.43
NOV 11, 1988	92.00	94.00	+ 2.17
NOV 25, 1988	92.00	98.00	+ 6.52
DEC 9, 1988	92.00	93.00	+ 1.09
DEC 16, 1988	92.00	89.00	- 3.26
DEC 23, 1988	92.00	89.00	- 3.26

SUM OF D(I) = 52.81

MEAN OF D(I) = 5.28

STD. DEV. = 6.53

UPPER 95% PROBABILITY LIMIT = 14.33

LOWER 95% PROBABILITY LIMIT = -3.77

FPL-Davie
Ft. Lauderdale, FL - Site 004

HOURLY AVERAGES FOR WD in DGS

DECEMBER 1988

DAY	HOUR (EST) 00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVG
1	287	300	294	306	322	336	342	334	330	340	346	348	3	1	352	5	7	8	10	4	0	352	350	349	222
2	346	343	350	346	343	345	347	345	344	343	351	355	11	23	25	37	21	10	357	355	353	343	345	346	266
3	344	340	336	337	340	344	335	331	340	339	340	348	351	349	352	355	350	349	359	359	355	351	351	345	346
4	341	349	351	349	343	344	357	1	3	352	348	351	354	337	357	334	352	340	347	353	358	351	342	1	305
5	353	350	348	340	341	339	335	340	341	335	343	348	3	356	341	317	309	303	339	347	344	334	342	333	324
6	349	341	347	336	336	325	307	304	327	339	306	136	123	122	123	119	120	122	124	81	129	123	127	119	216
7	120	134	127	128	129	130	140	125	125	130	126	129	129	125	121	128	123	125	128	138	134	130	109	123	127
8	281	4	23	12	1	358	343	347	35	112	122	122	116	113	119	113	118	123	98	89	73	82	97	67	124
9	121	316	265	173	334	78	75	319	325	329	220	140	154	149	152	141	137	147	156	153	162	212	212	266	197
10	271	291	301	307	311	317	321	321	343	349	349	343	295	21	159	107	121	118	135	192	195	3	292	312	241
11	252	169	343	221	191	245	201	199	208	190	182	187	194	199	214	226	232	221	213	220	227	221	206	230	216
12	212	225	213	256	248	258	251	265	295	335	327	316	310	322	300	301	311	312	302	299	317	317	314	310	288
13	326	333	335	336	347	337	334	331	336	327	328	329	329	319	327	330	332	337	337	336	340	343	331	327	333
14	329	323	322	325	335	343	351	345	352	344	331	331	28	50	73	90	86	88	80	110	102	111	134	146	214
15	143	121	125	152	131	130	352	194	50	67	88	96	103	129	119	125	133	126	112	294	359	308	327	352	172
16	333	336	337	338	345	338	333	345	355	335	322	314	303	308	309	303	298	275	260	279	274	278	275	276	311
17	281	305	322	329	329	333	333	335	334	334	332	328	324	323	328	332	334	333	323	327	320	317	317	313	325
18	310	317	341	351	354	349	346	346	346	350	338	349	354	353	349	1	351	337	336	340	341	340	340	342	329
19	348	346	349	351	353	350	345	353	9	14	37	78	83	81	73	78	66	74	73	78	84	82	85	100	162
20	107	106	122	125	121	122	119	121	123	118	117	109	117	118	120	114	109	101	93	94	92	99	92	85	110
21	73	62	103	123	125	123	123	126	129	133	125	124	129	127	130	123	123	123	119	114	348	309	250	190	144
22	324	296	350	353	32	16	333	342	353	19	41	78	88	84	82	99	94	88	91	80	93	115	79	86	151
23	86	87	81	83	88	90	93	76	88	87	88	90	94	101	76	70	73	61	56	45	57	60	87	87	79
24	71	66	96	108	114	108	47	313	299	126	137	127	137	123	121	128	133	118	129	123	57	84	75	321	132
25	319	120	55	172	323	326	278	336	344	359	352	38	52	85	89	88	94	78	75	60	47	73	54	67	162
26	342	336	3	344	348	340	340	341	9	66	77	68	73	78	74	78	65	68	64	67	62	74	75	75	144
27	69	69	76	71	73	74	79	86	89	93	94	100	98	100	111	109	107	116	114	110	118	120	121	123	97
28	130	136	137	131	132	137	143	152	147	148	149	156	156	151	142	123	122	123	131	66	124	127	130	124	134
29	129	71	324	346	347	345	53	330	346	9	31	115	116	116	108	85	96	93	77	88	71	36	47	78	144
30	45	57	10	30	30	25	343	7	130	118	122	118	113	117	120	110	115	121	123	126	129	95	61	40	96
31	2	9	16	74	22	349	358	34	53	130	128	132	130	135	128	137	139	133	121	95	325	357	155	136	137

TOTAL HOURS 744 TOTAL GOOD HOURS 744 DATA CAPTURE 100.0%

MAX. 1HR AVG 359 12/15/88 20:00:00 2ND MAX. 1 HR AVG 359 12/03/88 18:00:00

MIN. 1HR AVG 0 12/01/88 20:00:00 ARITHMETIC MEAN 202 STANDARD DEV. 120

KEY FOR MISSING CODES
Bad< - To few samples for valid average, Cal - calibration, OCal - Analyzer out of calibration
BadS - Bad Analyzer Status, PwrF - Power Failure, Down - Operator downed channel, Miss - Missing Data
Qad - Data questionable insufficient documentation, Qai - Data questionable external influence, Purg - Analyzer in Purge

FPL-Davie
Ft. Lauderdale, FL - Site 004

HOURLY AVERAGES FOR WS in MPH

DECEMBER 1988

DAY	HOUR (EST) 00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVG
1	1.9	2.5	3.8	4.5	4.1	3.7	2.3	3.6	7.2	8.5	8.7	10.1	10.4	7.1	7.0	7.3	6.9	5.4	5.9	5.7	5.7	6.5	7.9	8.8	6.0
2	8.2	9.1	9.2	9.5	9.1	9.7	9.8	9.1	9.4	9.2	9.7	10.5	9.9	11.4	10.6	11.4	10.2	8.4	8.2	8.2	7.8	6.6	5.9	6.1	9.0
3	4.4	5.0	5.2	4.5	5.3	4.8	5.8	5.3	5.2	5.7	5.4	5.3	5.5	5.2	4.4	5.3	4.9	4.5	5.1	5.1	4.8	5.2	4.4	3.7	5.0
4	5.2	5.7	7.2	5.4	5.5	4.2	7.3	7.9	8.1	6.5	4.9	5.7	5.2	5.3	5.0	5.7	4.0	4.3	3.7	5.0	4.6	4.1	4.5	4.1	5.4
5	4.5	3.9	2.9	4.5	4.1	4.5	3.9	4.5	4.9	4.4	4.7	5.6	4.6	2.0	1.0	1.6	4.9	4.8	5.0	3.9	2.3	2.7	3.1	3.6	3.8
6	2.8	3.8	2.9	2.8	3.5	3.1	3.0	3.2	2.9	2.7	1.3	8.3	7.5	8.9	9.0	9.1	8.2	6.5	4.4	3.0	5.1	8.5	7.3	8.6	5.2
7	8.0	8.1	7.6	7.5	4.9	5.0	3.3	0.7	7.1	9.3	9.5	9.2	9.6	10.2	10.7	10.0	9.2	8.8	8.2	6.3	7.7	5.6	3.0	0.7	7.1
8	1.4	2.4	2.0	2.9	2.0	2.1	1.9	1.9	1.8	5.9	8.7	8.8	9.0	8.3	7.5	7.2	6.7	4.5	2.8	2.4	1.9	2.3	2.4	1.6	4.1
9	2.1	2.5	2.0	3.7	1.1	2.0	1.6	2.6	2.3	2.1	0.5	5.8	5.7	5.4	5.5	4.3	6.7	5.1	3.5	3.4	2.3	1.7	2.0	2.7	3.2
10	2.9	4.0	4.4	5.0	4.6	3.6	2.9	2.7	3.5	4.3	5.0	3.4	2.0	0.4	2.2	5.3	5.3	3.2	1.8	2.1	3.2	1.1	3.5	2.1	3.2
11	2.7	4.3	1.1	1.3	1.9	2.4	1.8	1.8	2.7	5.2	10.3	9.9	10.5	10.1	10.4	10.2	9.1	6.9	6.5	6.0	3.8	3.3	4.1	3.7	5.4
12	4.4	3.7	5.0	3.2	3.0	3.8	4.2	4.3	4.4	4.3	4.7	5.9	4.7	5.2	5.4	6.3	7.0	6.9	4.5	6.3	8.1	7.0	7.7	8.7	5.3
13	8.3	8.2	8.8	7.5	7.9	7.0	8.6	9.1	8.8	12.8	13.2	11.9	11.7	11.2	11.8	12.3	10.2	8.6	7.6	6.2	6.3	5.6	3.6	4.6	8.8
14	5.1	5.0	4.4	4.7	5.3	5.6	6.2	5.8	7.3	6.6	5.1	5.3	4.2	5.4	7.8	8.0	6.7	5.9	3.6	5.8	7.7	7.6	7.6	6.8	6.0
15	4.2	6.8	6.2	3.4	3.7	3.4	0.8	0.8	0.9	2.8	5.7	5.3	6.2	5.9	6.3	5.8	5.5	4.5	2.5	1.2	1.6	1.2	2.5	2.8	3.7
16	2.1	2.2	2.8	2.7	2.0	2.4	2.8	2.7	2.8	4.6	6.5	7.0	6.8	7.2	9.5	8.4	6.7	4.1	2.7	4.6	4.7	4.3	4.2	4.2	4.5
17	4.7	9.3	11.1	9.6	10.7	11.3	10.9	10.9	10.6	10.8	12.1	13.7	15.2	14.9	12.8	10.3	9.3	7.4	6.5	6.6	8.5	12.1	10.6	7.9	10.3
18	5.9	5.8	7.1	6.5	7.5	7.2	8.9	9.1	10.0	9.2	9.1	7.7	8.6	7.9	7.4	6.9	6.2	6.5	6.4	4.9	4.2	4.0	4.7	5.1	6.9
19	5.3	4.4	5.3	5.7	4.5	4.0	3.4	4.1	5.4	5.2	4.8	7.7	9.8	9.5	8.7	9.0	8.3	7.8	6.4	8.0	9.3	8.6	8.4	9.0	6.7
20	8.9	10.3	10.4	11.2	10.6	9.2	9.0	9.7	11.3	13.7	14.3	15.1	10.7	11.1	12.0	12.2	11.0	9.3	9.2	9.0	8.2	8.7	7.2	5.9	10.3
21	5.4	3.6	4.1	6.8	6.7	6.3	5.2	3.8	7.1	10.5	9.2	9.8	10.3	10.8	9.6	10.4	9.0	7.4	5.5	3.4	1.6	0.5	2.0	1.0	6.2
22	2.4	2.1	1.3	2.2	2.0	3.8	3.0	3.3	3.0	5.1	7.5	8.6	9.7	8.3	6.3	8.0	7.3	6.5	5.7	3.0	6.3	4.9	4.0	4.4	4.9
23	6.2	5.7	5.3	5.3	4.4	4.9	5.2	4.2	7.0	8.4	10.3	9.1	9.0	8.5	7.4	5.9	6.5	4.2	4.7	3.5	4.1	4.2	5.2	6.8	6.1
24	4.3	2.8	4.9	6.3	5.2	4.6	1.8	2.8	3.1	5.2	6.9	7.0	5.5	5.9	6.9	6.1	4.9	5.6	4.9	2.9	1.2	1.9	1.5	3.4	4.4
25	3.5	1.9	0.7	1.6	3.2	5.2	2.9	2.6	3.9	3.4	3.3	3.2	3.5	7.2	7.3	6.3	6.4	5.0	2.9	2.4	2.4	2.5	2.8	2.4	3.6
26	1.9	3.1	2.2	2.2	2.0	1.9	1.9	2.0	2.2	4.8	6.9	6.9	7.9	9.3	9.3	10.3	8.9	7.9	5.6	5.0	5.0	7.3	7.2	7.6	5.4
27	6.2	6.8	7.0	6.1	7.3	8.3	9.4	9.6	11.5	12.2	12.8	12.6	12.4	12.5	12.6	10.6	11.7	10.1	9.0	8.7	10.1	9.8	10.0	9.4	9.8
28	8.1	7.4	8.2	8.9	11.4	11.0	9.7	7.9	7.0	9.2	9.1	8.5	7.2	5.6	5.3	6.3	7.1	5.8	5.6	1.3	4.7	3.7	3.5	3.2	6.9
29	3.7	1.7	2.7	2.3	2.0	3.4	3.0	3.7	4.3	3.7	3.0	5.3	7.0	7.3	6.9	6.1	6.8	6.3	2.7	3.4	2.5	2.4	2.3	2.8	3.9
30	2.1	3.5	1.9	5.4	3.9	2.4	2.0	1.0	5.2	9.1	9.1	9.1	9.7	9.6	9.4	7.4	7.8	7.6	6.6	4.6	2.9	2.7	5.5	5.0	5.5
31	2.1	2.1	4.9	2.5	2.4	2.2	2.3	4.0	3.6	6.5	8.1	7.6	8.1	8.7	8.6	7.3	6.7	4.5	3.7	2.3	3.7	2.2	3.2	3.4	4.6

TOTAL HOURS 744 TOTAL GOOD HOURS 744 DATA CAPTURE 100.0%

MAX. 1HR AVG 15.2 12/17/88 12:00:00 2ND MAX. 1 HR AVG 15.1 12/20/88 11:00:00

MIN. 1HR AVG 0.4 12/10/88 13:00:00 ARITHMETIC MEAN 5.8 STANDARD DEV. 2.9

KEY FOR MISSING CODES
Bad< - To few samples for valid average, Cal - calibration, OCal - Analyzer out of calibration
BadS - Bad Analyzer Status, PwrF - Power Failure, Down - Operator downed channel, Miss - Missing Data
Qad - Data questionable insufficient documentation, Qai - Data questionable external influence, Purg - Analyzer in Purge

FPL-Davie
Ft. Lauderdale, FL - Site 004

HOURLY AVERAGES FOR TEMP in DGC

DECEMBER 1988

DAY	HOUR (EST) 00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVG
1	20.8	20.3	20.2	20.3	20.1	20.0	20.0	20.1	19.9	19.4	19.9	21.2	20.8	21.4	21.4	21.3	21.0	20.5	20.0	19.4	18.6	17.9	16.9	15.9	19.9
2	15.0	14.1	13.1	11.7	11.0	10.6	10.4	10.7	12.0	14.2	16.6	18.5	20.1	20.5	20.5	20.6	19.5	18.2	17.0	16.4	16.2	15.7	15.2	14.8	15.5
3	14.8	14.6	14.6	14.6	14.7	14.6	14.5	14.4	14.7	15.7	15.9	16.8	17.7	18.6	19.7	20.4	20.0	19.3	18.7	18.1	17.7	17.4	17.2	17.0	16.7
4	16.8	16.7	16.3	16.3	16.3	16.6	16.7	16.8	17.4	18.5	20.2	21.3	22.3	22.8	23.1	22.6	22.3	20.6	18.9	18.3	18.0	17.2	16.5	16.1	18.7
5	15.5	15.0	14.2	14.1	13.6	12.9	12.4	12.7	15.4	18.0	20.2	22.0	23.1	23.6	24.0	24.1	23.8	22.2	20.6	19.3	18.2	17.1	16.8	16.2	18.1
6	15.4	15.0	15.0	15.2	15.5	15.5	14.8	14.8	17.1	20.5	22.5	24.4	24.8	24.7	24.6	24.1	23.5	22.5	21.6	21.5	21.5	22.0	21.9	21.8	20.0
7	21.7	21.6	21.6	21.5	20.9	20.9	20.2	19.6	22.2	23.7	24.2	24.6	24.6	24.7	24.8	24.3	23.7	22.9	22.5	22.1	21.8	21.6	21.1	19.2	22.3
8	17.9	17.4	17.2	16.8	16.9	16.8	17.0	17.7	20.5	24.2	25.2	25.7	25.9	25.9	25.7	25.3	24.3	23.2	22.7	22.1	21.5	22.0	21.7	21.3	21.4
9	22.2	21.5	20.8	21.0	20.9	20.4	20.3	20.0	20.8	22.0	23.5	25.1	25.8	26.1	26.3	25.8	24.8	23.2	21.9	21.0	20.4	19.8	19.4	18.9	22.1
10	18.2	17.8	17.8	17.9	17.7	17.4	16.9	17.0	18.4	21.1	23.2	24.5	25.4	25.7	25.6	25.3	24.2	23.7	23.0	22.5	21.7	20.6	19.9	19.5	21.0
11	18.8	18.2	17.8	17.3	17.1	16.8	16.5	17.1	20.0	23.2	24.9	25.8	26.2	26.3	26.6	26.3	25.7	24.3	23.0	22.3	21.6	21.0	20.8	20.9	21.6
12	20.8	20.8	20.9	20.9	20.7	20.6	20.8	20.9	21.1	21.8	22.9	23.2	23.2	23.6	23.1	23.2	22.7	21.8	21.0	20.1	19.5	19.2	19.0	18.7	21.2
13	18.2	17.5	17.0	16.4	15.6	14.3	13.1	12.6	13.6	14.2	13.1	13.2	13.8	15.7	17.5	17.3	16.7	15.2	13.9	12.8	12.1	11.4	10.3	9.3	14.3
14	8.9	8.5	7.5	7.2	7.6	7.8	8.0	8.5	10.3	12.4	14.8	16.8	18.8	19.6	20.3	20.4	20.2	19.9	19.7	19.7	20.0	20.1	20.0	20.0	14.9
15	19.5	20.1	20.2	19.7	20.1	20.1	19.5	19.3	20.7	22.0	23.1	23.3	24.0	23.5	23.3	23.1	22.6	21.8	20.9	19.9	19.8	18.7	17.8	17.3	20.8
16	16.5	16.3	16.3	16.3	16.3	16.2	16.1	16.3	18.1	20.5	22.1	23.3	24.0	24.4	24.4	24.6	24.1	22.7	21.3	20.4	19.5	18.4	17.7	17.2	19.7
17	17.1	17.7	16.8	16.0	15.1	14.3	13.8	13.3	13.1	13.7	14.2	15.2	16.0	16.2	16.1	15.7	14.9	13.6	12.5	11.5	10.6	9.7	8.8	8.2	13.9
18	7.6	7.1	6.7	6.1	6.0	5.9	6.0	6.0	7.1	9.1	11.0	12.9	14.5	15.3	16.0	16.2	15.8	14.0	11.9	10.5	9.6	9.2	9.2	9.0	10.1
19	9.1	9.1	8.9	8.6	8.4	8.2	8.4	9.1	11.5	15.1	17.9	20.1	21.1	21.0	20.8	20.9	20.2	19.4	19.0	19.4	19.7	19.5	19.8	20.2	15.6
20	20.1	20.5	20.7	20.9	20.7	20.8	20.7	21.2	22.3	23.1	23.8	24.1	23.6	23.2	23.8	23.7	23.2	22.9	22.8	22.8	22.8	22.1	21.8	21.6	22.2
21	21.3	21.1	21.2	22.1	22.1	22.0	21.8	21.9	23.2	24.2	24.9	25.0	25.0	25.2	25.5	24.3	24.2	23.3	22.8	22.5	21.7	21.2	21.1	20.8	22.8
22	20.5	20.4	19.8	19.4	19.3	19.2	18.8	18.7	19.3	21.7	23.5	24.1	23.8	23.5	24.6	24.3	23.8	23.3	22.3	21.9	22.1	21.4	21.4	20.7	21.6
23	21.3	21.5	21.7	21.7	21.1	21.1	21.1	21.5	22.6	22.9	23.9	24.4	24.5	24.8	24.8	24.1	23.8	23.0	22.3	21.4	21.0	20.5	21.1	20.6	22.3
24	20.4	20.5	21.4	21.7	21.6	21.4	20.8	19.8	21.0	23.8	24.7	25.0	25.9	26.5	26.4	25.8	25.4	24.1	22.8	22.2	21.2	20.7	20.1	19.9	22.6
25	19.7	19.3	18.7	18.6	18.3	18.5	18.0	18.2	19.4	22.2	24.2	25.5	25.5	25.9	26.1	26.0	25.2	24.3	23.3	22.6	22.4	22.0	20.9	20.3	21.9
26	19.8	20.3	20.6	20.1	19.4	18.7	18.3	18.2	20.0	23.5	25.0	25.6	25.9	25.6	25.3	25.0	24.2	23.4	22.8	22.5	22.3	22.3	22.1	22.0	22.2
27	21.9	22.0	21.9	21.9	22.2	22.1	22.0	22.2	23.0	23.6	24.2	24.9	24.8	24.9	24.7	24.1	24.2	23.5	23.0	22.8	22.9	22.9	22.9	22.7	23.1
28	22.4	22.1	22.2	22.3	22.4	22.4	22.6	22.5	23.3	24.2	25.3	25.9	26.6	27.2	27.2	26.6	25.3	23.9	22.9	22.2	22.1	21.7	21.0	20.8	23.5
29	20.7	19.6	18.8	18.3	17.8	17.4	16.9	17.5	18.4	21.3	23.6	25.4	25.5	26.0	26.0	26.1	25.5	24.1	23.1	22.5	22.1	20.9	20.6	20.9	21.6
30	20.1	19.2	18.9	18.5	18.4	18.6	18.7	19.4	21.8	23.9	24.7	25.1	25.2	25.2	25.3	25.3	24.6	23.4	22.6	22.0	21.2	21.0	20.2	19.8	21.8
31	19.4	19.1	18.8	18.4	18.6	18.5	18.7	18.9	21.3	23.9	25.2	26.0	26.4	26.3	25.8	25.9	25.1	23.8	22.8	21.9	21.0	20.1	19.4	19.7	21.9

TOTAL HOURS 744 TOTAL GOOD HOURS 744 DATA CAPTURE 100.0%

MAX. 1HR AVG 27.2 12/28/88 13:00:00 2ND MAX. 1 HR AVG 27.2 12/28/88 14:00:00

MIN. 1HR AVG 5.9 12/18/88 05:00:00 ARITHMETIC MEAN 19.8 STANDARD DEV. 4.3

KEY FOR MISSING CODES
Bad< - To few samples for valid average, Cal - calibration, OCal - Analyzer out of calibration
BadS - Bad Analyzer Status, PwrF - Power Failure, Down - Operator downed channel, Miss - Missing Data
Qad - Data questionable insufficient documentation, Qai - Data questionable external influence, Purg - Analyzer in Purge

FPL-Davie
Ft. Lauderdale, FL - Site 004

HOURLY AVERAGES FOR SigÕ1 in deg

DECEMBER 1988

DAY	HOUR (EST) 00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVG
1	21.8	13.2	8.9	9.4	9.0	13.2	15.3	12.4	13.5	14.7	16.5	18.1	18.2	19.4	17.4	18.3	18.1	16.3	17.5	16.0	16.0	15.7	16.8	15.9	15.5
2	15.5	14.3	18.0	15.9	13.5	14.8	15.2	15.4	16.0	16.5	18.3	19.7	20.3	19.8	19.4	17.4	17.2	17.0	17.4	17.2	16.4	15.9	14.4	13.9	16.6
3	15.0	12.6	11.7	13.1	13.3	14.2	11.7	10.9	16.0	13.3	15.4	16.8	16.3	18.0	19.0	18.2	13.8	14.6	15.8	14.9	15.4	14.9	14.2	14.6	14.7
4	12.7	13.8	15.3	16.4	15.0	19.6	17.0	18.6	18.6	18.7	18.6	22.3	26.3	27.4	26.9	14.4	19.3	11.2	12.1	14.3	14.1	13.6	12.7	15.3	17.3
5	15.2	14.1	10.8	12.4	14.3	11.5	11.2	13.7	15.2	15.7	23.1	22.0	26.5	62.7	44.0	47.0	16.9	8.1	12.1	12.6	11.4	12.7	14.7	16.8	19.4
6	13.9	12.4	15.9	16.6	18.7	11.7	11.4	8.7	15.3	25.6	40.1	15.2	19.7	16.0	13.6	13.0	13.8	11.5	11.4	31.1	28.7	11.6	13.2	11.9	16.7
7	11.2	13.0	13.1	12.6	13.0	13.0	11.1	52.5	12.5	14.2	13.9	16.3	13.2	15.2	14.9	13.7	11.6	11.2	12.5	12.8	12.7	13.0	13.0	59.5	16.7
8	35.0	20.9	13.5	12.0	14.9	15.2	18.7	21.4	32.6	24.1	14.9	16.0	17.4	16.4	16.9	20.4	14.2	11.9	15.9	19.0	23.7	20.1	24.7	54.7	20.6
9	27.4	28.4	19.4	17.1	56.1	49.4	32.4	18.1	15.5	18.0	48.4	21.4	17.6	20.4	18.0	18.2	12.7	10.1	8.3	7.0	15.9	15.8	28.1	12.0	22.3
10	12.8	6.6	4.0	6.5	6.0	7.2	9.2	11.9	16.4	19.7	22.1	36.2	43.4	48.1	28.9	15.7	11.7	12.5	22.4	43.0	8.4	47.8	8.4	11.1	19.2
11	21.8	22.7	70.1	14.2	15.5	34.6	33.3	20.3	42.3	16.0	15.0	15.4	16.4	17.2	16.5	15.4	16.5	15.2	13.6	18.5	17.4	16.6	16.8	22.5	21.8
12	17.5	18.7	16.9	18.8	17.4	16.6	18.8	16.1	16.8	18.2	18.1	14.9	17.1	17.0	15.9	14.1	12.0	8.8	11.6	11.7	10.1	10.3	9.2	9.2	14.8
13	12.5	12.6	12.6	13.7	17.0	13.9	13.7	11.7	12.7	12.1	12.7	13.9	13.2	13.3	14.3	14.3	14.3	13.7	12.2	11.7	12.8	14.1	10.6	9.8	13.1
14	9.7	10.5	7.8	9.7	11.0	12.5	16.1	14.8	16.5	16.5	21.4	21.6	31.7	21.8	19.3	17.0	15.7	14.8	15.9	13.8	11.5	11.5	13.5	12.4	15.3
15	11.7	11.9	12.5	10.8	14.1	14.2	54.9	42.1	42.8	24.6	19.3	26.0	21.0	18.0	15.7	14.6	13.2	11.7	18.1	61.8	39.7	22.7	9.8	12.6	22.7
16	15.0	8.7	10.8	9.8	12.2	13.5	10.8	16.3	19.1	16.1	16.0	17.4	21.4	16.6	11.7	13.1	12.5	10.4	8.9	10.6	12.2	11.5	10.0	10.0	13.1
17	9.8	9.8	11.0	12.2	12.0	12.8	12.6	12.7	14.7	15.7	14.9	14.2	13.0	13.2	14.1	15.2	13.8	11.9	10.5	9.8	9.5	9.4	9.8	9.0	12.1
18	8.4	9.2	13.0	16.4	16.4	16.1	15.2	17.6	17.4	18.2	14.2	19.8	19.9	21.8	19.8	21.9	19.2	12.7	11.6	12.4	12.1	13.1	11.9	11.9	15.4
19	14.9	14.6	15.0	15.3	17.5	15.9	15.3	16.6	15.9	18.6	23.5	18.7	16.8	18.7	19.2	18.3	20.8	16.3	15.9	15.4	12.8	13.8	13.1	13.0	16.5
20	9.5	11.0	12.0	12.2	11.0	11.4	10.9	11.4	13.0	12.2	12.8	12.2	13.3	13.9	12.4	13.9	11.9	11.7	11.5	11.2	12.7	10.1	11.1	12.7	11.9
21	15.4	18.1	18.8	12.0	12.4	11.5	11.1	11.1	13.2	13.3	13.9	12.7	13.2	12.4	13.5	11.9	12.8	11.7	10.9	13.3	24.3	57.5	40.0	45.0	17.9
22	27.4	20.7	50.4	40.7	48.7	12.5	17.9	14.7	16.9	18.0	18.5	18.6	12.2	16.4	19.6	14.1	13.7	14.4	16.1	16.0	13.3	10.4	25.9	14.2	20.5
23	12.0	11.7	13.7	13.0	11.4	11.4	10.8	16.5	13.7	13.9	15.2	17.6	15.4	16.4	19.2	19.4	18.0	21.6	20.2	20.8	21.2	20.7	15.4	15.0	16.0
24	17.0	19.7	9.5	8.3	7.9	10.5	32.4	9.7	13.5	54.7	15.0	15.2	17.7	19.8	17.2	16.3	14.2	9.4	11.1	11.1	52.8	30.6	27.4	19.8	19.2
25	7.7	32.8	29.3	32.8	10.1	12.7	28.5	11.7	12.4	21.0	29.2	33.4	23.0	16.3	14.6	14.2	13.3	13.7	14.9	23.0	31.4	17.9	29.3	17.4	20.4
26	14.2	14.1	15.7	11.2	14.7	9.9	9.5	12.5	20.1	24.8	19.8	21.3	20.1	18.1	18.3	16.5	18.1	17.5	19.7	20.7	20.5	16.0	14.9	15.9	16.8
27	18.0	17.7	14.6	15.9	16.0	15.3	13.8	13.3	13.3	12.6	12.0	13.0	13.8	13.0	12.0	12.8	11.9	11.2	10.9	10.1	11.0	10.5	11.5	12.4	13.2
28	12.2	12.7	13.2	13.1	12.7	13.2	12.5	10.6	12.0	12.7	13.9	15.9	16.9	19.0	20.2	15.4	11.6	11.0	31.2	68.8	11.1	11.6	9.5	9.0	16.3
29	11.6	45.0	12.6	17.0	15.0	12.1	66.8	11.0	14.6	22.9	35.8	26.5	16.9	16.1	18.7	17.1	14.1	12.0	16.3	14.7	20.8	35.7	39.1	14.4	21.9
30	18.3	23.2	19.3	17.6	35.9	14.6	42.3	35.9	12.0	13.3	13.1	14.8	15.2	13.5	13.3	17.2	14.1	11.2	10.0	11.1	9.3	16.5	31.3	43.2	19.4
31	14.2	13.1	26.2	21.2	27.3	13.0	15.4	31.9	42.7	14.2	13.9	17.9	16.5	15.3	14.7	14.4	13.8	12.2	9.9	26.8	30.0	42.1	7.1	35.5	20.4

TOTAL HOURS 744 TOTAL GOOD HOURS 744 DATA CAPTURE 100.0%

MAX. 1HR AVG 70.1 12/11/88 02:00:00 2ND MAX. 1 HR AVG 68.8 12/28/88 19:00:00

MIN. 1HR AVG 4.0 12/10/88 02:00:00 ARITHMETIC MEAN 17.3 STANDARD DEV. 9.1

KEY FOR MISSING CODES
Bad< - To few samples for valid average, Cal - calibration, OCal - Analyzer out of calibration
BadS - Bad Analyzer Status, PwrF - Power Failure, Down - Operator downed channel, Miss - Missing Data
Qad - Data questionable insufficient documentation, Qai - Data questionable external influence, Purg - Analyzer in Purge

FPL-Davie
Ft. Lauderdale, FL - Site 004

HOURLY AVERAGES FOR RNFL in INCH

DECEMBER 1988

DAY	HOUR (EST) 00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVG
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.16	0.10	0.01
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.05	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

TOTAL HOURS 744 TOTAL GOOD HOURS 744 DATA CAPTURE 100.0%

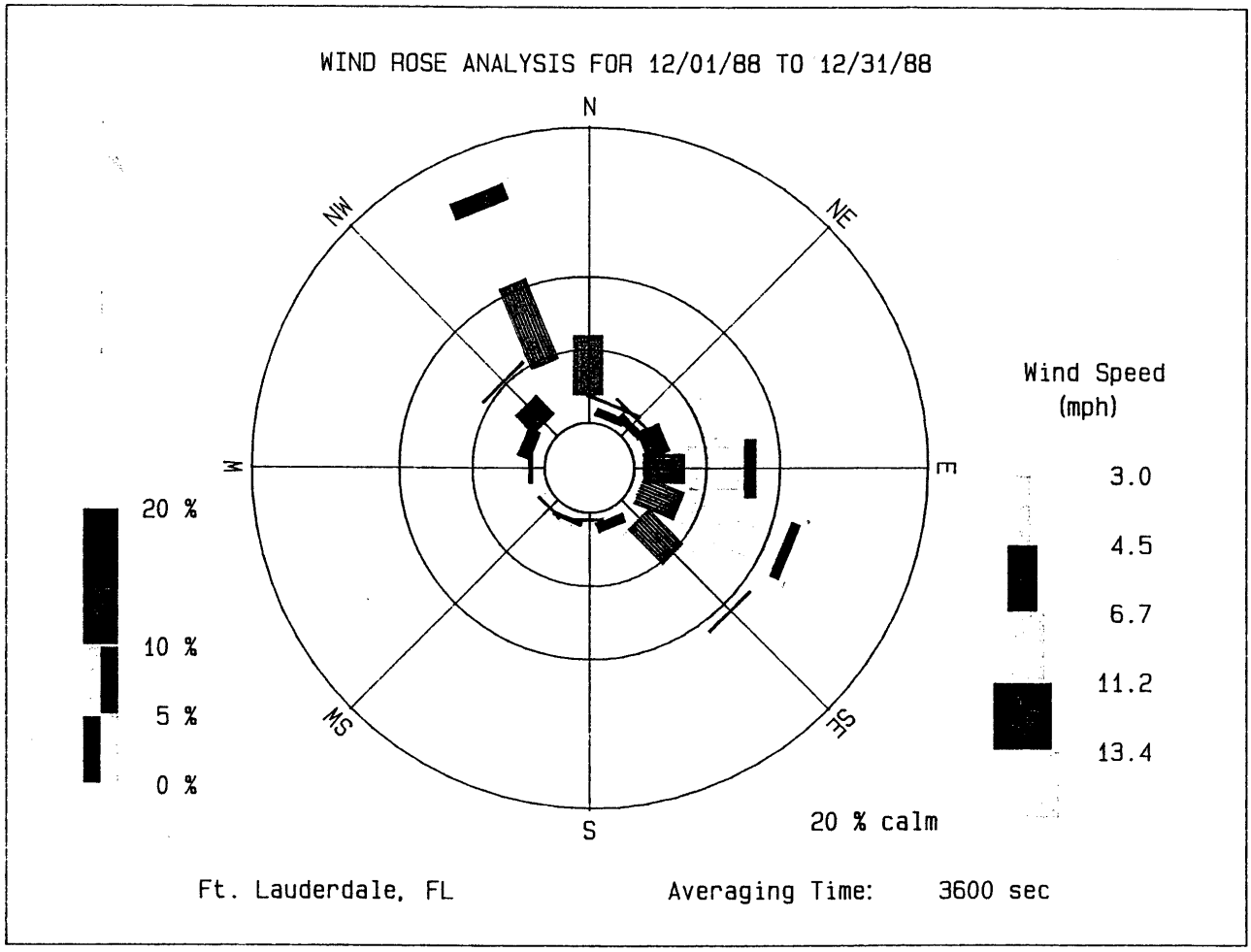
MAX. 1HR AVG 0.16 12/22/88 22:00:00 2ND MAX. 1 HR AVG 0.10 12/22/88 23:00:00

MIN. 1HR AVG 0.00 12/01/88 00:00:00 ARITHMETIC MEAN 0.00 STANDARD DEV. 0.01

KEY FOR MISSING CODES
Bad< - To few samples for valid average, Cal - calibration, OCal - Analyzer out of calibration
BadS - Bad Analyzer Status, PwrF - Power Failure, Down - Operator downed channel, Miss - Missing Data
Qad - Data questionable insufficient documentation, Qai - Data questionable external influence, Purg - Analyzer in Purge

FPL DAVIE PERCIPITATION
DECEMBER 1988

DATE	TIME	AMOUNT
12/21/88	0400	.01
12/22/88	2200	.16
	2300	.10
12/23/88	2200	.01
	2300	.05
TOTAL		.33


WIND ROSE ANALYSIS FOR 12/01/88 TO 12/31/88
N
NE
E
SE
S
SW
W
NW
20 %
10 %
5 %
0 %
Wind Speed
(mph)
3.0
4.5
6.7
11.2
13.4
20 % calm
Ft. Lauderdale, FL
Averaging Time: 3600 sec

WIND ROSE ANALYSIS FOR 12/01/88 TO 12/31/88

Wind Speed (mph)	DIRECTION																A
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	
> 13.4	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.1	
13.4-11.2	0.0	0.1	0.1	0.0	0.8	0.7	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.2	
11.2- 6.7	3.8	0.3	0.1	3.2	3.9	7.4	5.2	0.8	0.3	0.3	0.5	0.0	0.0	0.3	2.0	5.2	
6.7- 4.5	4.0	0.5	0.5	1.6	2.8	3.0	3.4	0.7	0.1	0.3	0.1	0.0	0.3	0.9	1.7	5.9	
4.5- 3.0	1.9	0.4	0.7	0.9	0.7	0.7	1.7	0.5	0.3	0.4	0.5	0.4	0.7	0.8	1.2	4.6	
3.0 <																	
All Speed	9.7	1.3	1.5	5.8	8.2	12.	10.	2.0	0.7	0.9	1.2	0.4	0.9	2.0	5.4	17.	

EA-1

Ft. Lauderdale, FL Averaging Time: 3600 sec

FPL-Davie
Ft. Lauderdale, FL - Site 004

HOURLY AVERAGES FOR WD in DGS

NOVEMBER 1988

DAY	HOUR (EST) 00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVG
1	196	221	268	271	273	227	264	271	293	306	308	310	315	322	310	321	326	337	355	7	57	54	340	342	262
2	337	346	343	351	349	352	357	351	347	350	13	349	358	55	66	64	62	51	49	27	6	5	26	8	193
3	9	311	346	14	47	87	107	140	108	138	146	153	143	158	125	129	39	44	67	100	127	81	84	75	116
4	135	144	156	135	78	99	139	199	233	239	260	275	236	260	253	241	239	253	245	229	205	213	203	204	203
5	190	182	188	201	212	208	208	217	223	214	220	232	244	245	225	218	218	228	227	218	210	208	198	221	215
6	218	231	200	209	197	197	245	232	239	305	316	317	317	288	282	283	285	305	306	307	314	320	328	332	274
7	326	335	347	330	337	347	22	12	17	5	359	344	349	327	355	68	62	71	64	347	339	345	1	7	213
8	3	2	343	345	346	344	351	358	0	16	55	75	72	68	70	72	69	54	48	21	13	3	356	340	143
9	341	342	341	347	344	347	354	343	40	90	75	82	77	74	72	71	82	68	63	68	76	75	65	67	163
10	59	1	347	1	8	11	2	8	19	48	92	95	100	97	109	78	79	81	89	80	53	90	104	349	83
11	311	334	349	339	336	343	333	356	0	0	24	52	54	82	88	86	79	82	74	47	21	357	333	333	184
12	7	13	354	324	336	349	333	349	7	95	107	99	101	105	90	85	78	73	64	66	67	74	69	10	136
13	312	295	319	335	337	336	297	323	344	326	18	47	49	30	95	90	79	66	68	55	64	67	69	62	170
14	347	343	337	346	352	327	334	348	3	28	55	56	55	49	62	53	52	48	53	63	71	71	74	74	150
15	77	76	70	75	66	61	32	30	63	70	77	81	84	82	85	85	82	82	81	93	97	99	109	108	78
16	116	107	98	118	76	89	112	117	118	117	118	105	94	96	99	117	114	99	92	92	87	104	108	113	104
17	114	88	74	99	93	69	75	38	89	107	109	113	110	116	101	84	99	97	89	90	88	89	90	94	92
18	103	74	67	83	79	104	101	87	88	92	96	91	92	92	93	82	84	81	84	90	94	95	96	96	89
19	104	106	113	118	112	112	111	111	115	119	116	111	120	116	118	119	108	108	108	117	114	117	118	121	114
20	122	126	127	129	126	130	127	136	137	137	141	137	139	138	136	126	120	117	116	115	100	105	118	121	126
21	126	117	128	149	133	97	34	91	137	143	147	138	139	141	140	132	117	117	118	111	110	108	114	120	121
22	124	129	130	133	139	141	140	143	144	143	143	151	154	152	155	155	149	152	151	155	155	155	156	167	146
23	176	177	184	190	194	201	208	217	226	238	250	272	263	262	271	271	276	283	291	301	311	307	302	290	248
24	286	294	298	306	317	314	311	326	351	351	324	330	336	333	334	339	336	322	324	310	335	338	342	338	325
25	350	348	356	335	314	323	302	317	331	54	89	92	89	98	81	84	83	79	93	93	98	111	95	103	180
26	126	112	117	123	120	116	120	122	124	127	130	132	128	129	133	139	127	126	131	134	135	141	144	147	128
27	145	144	146	146	149	145	142	144	148	153	153	154	154	153	159	160	163	163	159	159	157	159	162	165	153
28	167	166	168	169	185	191	204	270	165	183	198	239	250	247	247	314	332	335	333	345	3	18	7	352	212
29	349	344	341	342	344	342	341	350	350	10	60	81	75	76	76	70	70	73	74	76	76	75	86	87	174
30	85	78	76	68	80	68	33	5	274	159	348	28	29	70	112	120	121	123	133	121	327	294	281	270	138

TOTAL HOURS 720 TOTAL GOOD HOURS 720 DATA CAPTURE 100.0%

MAX. 1HR AVG 359 11/07/88 10:00:00 2ND MAX. 1 HR AVG 358 11/08/88 07:00:00

MIN. 1HR AVG 0 11/08/88 08:00:00 ARITHMETIC MEAN 164 STANDARD DEV. 108

KEY FOR MISSING CODES
Bad< - To few samples for valid average, Cal - calibration, OCal - Analyzer out of calibration
BadS - Bad Analyzer Status, PwrF - Power Failure, Down - Operator downed channel, Miss - Missing Data
Qad - Data questionable insufficient documentation, Qai - Data questionable external influence, Purg - Analyzer in Purge

FPL-Davie
Ft. Lauderdale, FL - Site 004

HOURLY AVERAGES FOR WS in MPH

NOVEMBER 1988

DAY	HOUR (EST) 00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVG
1	1.9	1.9	2.8	2.7	2.7	1.8	2.7	3.4	4.1	5.1	4.6	4.0	6.2	5.6	8.6	8.4	9.1	8.3	7.4	5.0	2.6	1.4	2.4	2.6	4.4
2	3.7	4.4	3.7	4.4	4.6	5.1	4.2	5.9	5.8	5.6	4.6	5.6	5.6	5.7	8.5	9.1	8.1	5.9	2.9	2.2	3.7	3.6	2.2	2.2	4.9
3	2.9	1.6	2.5	2.9	2.9	4.0	6.1	2.3	7.8	6.3	7.0	6.3	9.0	7.9	8.4	4.9	1.1	1.5	3.1	3.0	4.7	2.8	3.3	3.0	4.4
4	4.3	9.3	7.5	7.0	1.2	3.6	3.1	4.2	5.2	8.4	9.3	6.5	10.9	10.1	10.1	11.4	11.3	7.3	5.2	3.9	4.9	5.2	5.1	3.9	6.6
5	4.6	5.3	5.4	6.0	6.3	7.2	7.7	9.0	10.1	11.7	12.1	13.5	10.1	9.4	12.1	10.9	8.7	7.8	5.9	5.0	5.7	5.9	4.5	3.6	7.8
6	4.6	4.7	4.2	4.3	4.1	4.8	2.9	3.7	5.1	6.9	7.7	9.8	7.9	7.6	7.7	7.9	7.0	7.1	7.7	8.7	7.3	5.9	4.9	4.7	6.1
7	5.0	3.7	2.3	2.2	2.3	1.8	2.0	2.6	4.6	7.1	6.2	6.1	5.6	5.5	4.8	6.1	4.8	4.0	2.2	2.2	2.7	2.9	2.1	2.4	3.8
8	3.6	3.1	2.8	3.1	3.3	3.8	3.8	4.5	5.1	6.2	7.2	7.8	7.3	7.8	8.0	7.3	7.0	4.6	2.7	2.6	2.5	2.0	2.3	2.7	4.6
9	2.9	2.5	2.8	2.7	2.7	2.5	2.5	2.1	2.6	9.9	9.5	10.0	9.1	8.7	8.4	8.8	9.0	7.0	4.7	4.8	5.6	5.4	3.8	2.8	5.4
10	2.5	2.5	2.3	2.9	3.1	3.5	3.5	3.3	3.6	4.6	5.7	6.8	6.0	7.2	8.1	6.8	7.3	5.1	4.3	3.3	2.4	2.3	2.3	2.1	4.2
11	1.9	2.6	2.5	1.9	2.3	2.4	2.8	3.7	4.4	5.2	4.8	4.5	4.5	6.4	8.1	8.4	6.7	5.8	3.1	1.7	2.0	2.3	1.8	1.9	3.8
12	2.3	2.4	2.4	3.1	2.1	2.4	2.1	1.9	2.1	6.2	7.3	6.7	6.8	7.1	7.0	6.7	5.7	4.3	2.9	2.1	2.1	2.5	2.2	2.2	3.8
13	1.9	4.1	2.2	2.2	2.9	2.4	3.0	2.0	3.4	2.6	1.3	2.8	2.2	4.0	4.9	6.7	6.2	5.1	4.1	3.3	3.7	3.7	3.4	2.9	3.4
14	2.5	2.3	2.2	2.4	2.3	2.7	3.6	3.9	4.6	5.9	8.1	9.6	10.2	10.3	10.4	10.9	9.4	10.8	8.7	7.8	9.8	9.8	8.8	8.0	6.9
15	7.4	7.3	5.5	6.0	4.8	4.6	3.1	3.0	6.7	8.7	10.3	10.5	9.9	10.1	10.5	10.3	7.9	7.9	6.3	6.1	5.9	6.0	6.3	5.7	7.1
16	6.3	5.1	3.6	4.7	2.4	2.4	5.8	9.0	10.4	11.1	10.2	8.7	9.6	10.1	9.8	9.4	9.0	6.3	5.5	5.3	3.7	6.2	5.7	5.6	6.9
17	4.4	2.4	2.1	2.6	2.8	2.1	2.5	1.7	4.7	7.5	8.3	7.9	9.2	9.1	9.0	8.9	8.7	7.4	6.7	5.3	5.4	6.4	6.1	7.2	5.7
18	6.7	4.1	2.9	4.0	3.0	6.8	6.3	5.6	8.1	10.2	11.2	12.0	11.9	11.6	11.4	10.1	9.1	8.6	7.6	8.2	9.2	11.1	11.5	11.2	8.4
19	12.2	12.2	12.4	12.4	10.9	10.8	10.6	9.9	10.9	13.9	15.3	14.5	13.6	13.6	13.7	13.4	11.8	11.0	10.2	10.5	10.0	11.2	10.9	12.0	12.0
20	11.5	10.4	9.4	8.2	7.6	7.0	7.0	6.9	10.1	10.9	11.1	10.4	10.4	9.5	7.8	7.5	7.4	5.3	4.4	4.0	3.2	4.9	6.2	6.4	7.8
21	6.3	3.5	3.4	4.1	2.7	1.8	2.4	2.5	5.7	8.1	8.7	8.3	8.0	7.3	7.5	7.0	8.4	7.0	6.4	5.4	6.6	7.4	9.6	10.7	6.2
22	10.3	9.7	9.4	9.0	9.3	10.9	11.7	12.3	14.6	14.9	15.7	17.4	17.5	17.4	14.8	15.3	14.5	15.1	14.2	15.7	15.7	17.2	16.6	17.3	14.0
23	17.9	18.5	18.0	18.9	18.4	15.2	16.6	14.8	16.3	14.8	14.6	15.2	12.2	11.8	12.3	13.5	12.4	11.0	10.7	10.8	11.6	10.3	12.2	11.4	14.1
24	10.3	10.0	12.0	11.8	10.0	12.0	9.5	8.5	7.4	7.4	7.4	9.2	9.1	7.9	8.2	7.1	6.7	6.9	6.1	6.3	5.2	5.2	5.0	5.1	8.1
25	3.5	3.1	3.1	3.3	3.6	3.4	3.7	3.9	4.1	3.2	8.5	10.7	10.4	9.3	8.7	9.4	10.2	7.0	8.1	6.1	6.5	7.9	4.6	5.8	6.1
26	6.4	7.8	9.2	9.3	8.1	7.7	9.7	11.6	13.6	14.4	15.4	14.3	14.1	13.3	12.9	11.5	11.4	10.4	9.8	10.7	10.4	10.0	9.6	10.8	10.9
27	9.6	9.9	10.2	8.6	8.9	7.1	6.7	7.9	9.8	12.9	12.9	13.5	12.9	13.2	13.5	12.2	12.0	10.5	7.6	8.3	8.8	8.4	8.3	6.3	10.0
28	4.0	6.5	7.6	5.8	6.5	3.9	3.3	3.0	3.3	5.1	4.8	6.4	8.3	7.6	8.2	9.7	9.4	7.7	10.2	9.0	8.5	9.3	7.4	7.8	6.8
29	7.4	7.2	7.8	6.5	7.2	6.6	6.1	5.8	4.9	4.8	6.4	10.5	9.9	9.0	9.1	7.6	6.4	5.8	6.7	6.2	5.8	5.7	7.0	6.8	6.9
30	7.0	6.0	5.2	4.5	4.2	4.3	3.5	2.5	0.2	4.0	0.7	6.0	6.2	5.4	6.3	7.5	6.8	5.2	4.4	4.0	2.6	4.7	1.6	2.6	4.4

TOTAL HOURS 720 TOTAL GOOD HOURS 720 DATA CAPTURE 100.0%

MAX. 1HR AVG 18.9 11/23/88 03:00:00 2ND MAX. 1 HR AVG 18.5 11/23/88 01:00:00

MIN. 1HR AVG 0.2 11/30/88 08:00:00 ARITHMETIC MEAN 6.8 STANDARD DEV. 3.7

KEY FOR MISSING CODES
Bad< - To few samples for valid average, Cal - calibration, OCal - Analyzer out of calibration
BadS - Bad Analyzer Status, PwrF - Power Failure, Down - Operator downed channel, Miss - Missing Data
Qad - Data questionable insufficient documentation, Qai - Data questionable external influence, Purg - Analyzer in Purge

FPL-Davie
Ft. Lauderdale, FL - Site 004

HOURLY AVERAGES FOR TEMP in DGC

NOVEMBER 1988

DAY	HOUR (EST) 00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVG
1	20.7	20.4	20.2	20.2	20.0	20.0	20.0	20.4	21.9	23.5	24.4	25.3	27.0	27.5	27.6	26.7	25.4	24.2	23.1	22.2	22.0	21.8	21.7	21.4	22.8
2	21.0	20.5	19.8	19.3	18.8	18.1	17.8	18.2	19.4	21.0	23.5	24.8	25.8	26.6	26.3	25.3	24.3	23.3	22.5	21.5	20.6	19.9	19.3	18.9	21.5
3	18.6	18.3	18.7	19.5	20.3	22.4	23.3	22.0	23.3	23.3	22.3	23.4	25.4	24.4	24.6	22.9	22.5	22.6	22.4	22.2	22.0	21.5	21.5	22.4	22.1
4	22.9	22.2	22.0	21.1	20.9	21.1	21.9	23.0	23.9	25.5	26.9	26.1	28.3	28.3	28.9	29.0	28.4	26.8	25.6	25.1	24.5	24.3	24.1	23.8	24.8
5	23.5	23.6	23.5	23.5	23.7	23.8	23.8	24.6	26.1	27.4	28.6	28.7	26.2	26.2	27.2	27.8	27.7	26.9	26.1	25.4	25.1	25.0	24.7	24.5	25.5
6	24.5	24.1	23.9	23.7	23.2	23.0	22.8	23.3	24.7	25.2	25.6	25.9	26.5	27.2	27.8	27.9	27.1	26.2	24.6	23.2	21.7	20.7	20.1	19.4	24.2
7	19.1	18.5	17.5	16.6	16.3	16.2	16.6	17.7	20.0	21.5	22.3	23.1	23.8	24.1	24.4	24.1	23.4	22.2	20.9	19.7	18.8	18.2	17.4	16.7	19.9
8	16.6	16.2	15.4	16.0	16.0	16.2	16.3	17.5	19.9	22.5	24.4	25.1	25.4	25.1	25.0	24.8	24.1	23.0	21.8	20.7	19.7	18.6	18.3	17.9	20.2
9	17.6	17.2	16.9	16.7	16.4	16.5	16.7	17.5	20.9	24.2	24.6	25.4	25.7	25.8	25.8	25.2	24.7	23.8	23.3	23.1	22.9	22.7	22.4	21.8	21.5
10	20.7	19.4	19.0	18.9	18.9	18.9	19.0	19.9	22.9	25.2	26.6	27.1	27.8	27.7	27.4	26.8	26.1	25.2	24.4	24.0	23.2	22.5	22.2	21.3	23.1
11	20.5	20.1	20.0	19.4	19.3	19.2	19.1	20.1	22.7	24.8	26.0	26.7	27.6	27.4	27.2	26.8	26.1	25.0	24.2	23.5	22.6	21.5	21.3	20.9	23.0
12	20.7	20.3	19.5	19.0	18.8	18.9	18.7	19.8	22.4	24.9	26.2	26.7	27.0	26.9	26.6	26.3	25.6	24.7	24.0	23.4	22.9	22.5	21.7	20.9	22.8
13	20.0	19.4	18.9	18.8	18.8	18.2	18.0	19.4	21.8	23.8	25.3	26.0	27.0	27.4	27.5	27.2	26.2	25.1	24.3	23.8	23.8	23.5	23.1	22.6	22.9
14	20.7	19.7	19.0	18.7	18.9	18.6	18.7	19.4	21.7	25.0	26.6	27.0	26.7	27.2	26.9	26.5	25.8	25.4	25.1	24.9	25.0	24.9	24.7	24.4	23.4
15	24.2	24.1	23.9	24.1	24.1	23.8	23.0	23.7	25.0	25.8	26.6	26.9	26.8	27.0	27.5	26.5	25.1	25.1	24.7	24.5	24.4	24.4	24.3	24.1	25.0
16	24.1	23.6	23.4	23.3	22.9	22.0	23.7	24.7	25.7	26.1	27.0	27.9	28.0	28.0	28.0	27.1	26.7	26.1	25.2	25.0	25.1	24.9	24.5	24.5	25.3
17	24.3	23.6	23.1	23.4	23.5	23.0	23.3	23.6	25.8	26.6	27.3	28.1	28.5	28.4	28.6	27.8	26.8	26.0	25.6	25.3	25.4	25.6	25.5	25.4	25.6
18	24.3	23.1	23.1	23.8	23.6	24.1	23.4	24.2	25.5	26.1	27.0	27.3	27.5	27.5	27.4	26.7	26.4	25.9	25.6	25.5	25.3	25.3	25.2	25.2	25.4
19	25.1	25.0	24.9	24.9	24.7	24.7	24.8	24.5	25.5	26.4	26.8	27.2	27.4	27.4	27.0	26.7	26.2	25.4	25.2	25.0	24.9	25.0	25.0	25.1	25.6
20	25.1	25.0	24.7	24.7	24.7	24.7	24.5	24.7	25.9	26.5	27.0	27.1	27.4	27.5	27.3	26.7	26.1	25.6	25.0	24.7	24.5	24.5	24.7	24.8	25.5
21	24.7	24.4	23.7	23.2	22.8	22.6	22.3	23.4	25.8	26.7	27.2	27.5	27.3	26.4	26.4	25.9	25.5	25.2	25.0	24.9	24.8	24.9	25.1	25.2	25.0
22	25.1	25.0	24.9	25.1	24.6	24.8	25.0	25.3	25.8	26.3	26.6	27.3	27.5	27.7	26.9	26.4	26.0	25.9	25.8	25.8	25.7	25.5	25.0	25.5	25.8
23	25.8	25.5	25.3	25.2	24.8	24.5	24.1	23.9	24.7	24.3	25.6	25.2	24.7	24.5	24.3	23.9	23.3	22.7	22.4	22.2	21.8	21.2	20.9	20.1	23.8
24	19.5	19.7	19.7	19.1	19.0	18.2	17.5	17.2	16.8	16.7	18.3	19.5	20.2	21.4	22.0	22.4	22.3	21.2	20.5	19.5	19.1	18.4	18.0	17.9	19.3
25	18.0	18.0	18.4	18.9	18.9	19.0	18.7	19.1	20.4	23.3	24.8	24.9	25.0	25.2	24.8	24.3	23.6	23.4	23.3	22.8	22.5	22.6	22.3	22.7	21.8
26	22.4	22.0	22.0	22.3	22.1	22.0	22.5	23.0	23.9	24.6	25.2	25.4	25.0	24.7	25.0	24.7	24.5	24.3	24.2	24.5	24.5	24.4	24.1	24.0	23.8
27	23.8	24.0	24.1	23.7	23.6	23.5	23.6	24.0	24.5	25.4	26.0	26.3	27.0	26.5	26.4	26.0	25.6	25.2	24.8	24.8	24.5	24.4	24.4	24.2	24.8
28	24.1	24.1	24.3	24.0	24.1	23.9	23.7	23.0	23.8	25.3	26.4	27.8	29.1	29.7	30.0	27.1	23.8	22.7	21.6	21.2	21.0	20.4	19.7	18.6	24.1
29	16.9	16.3	15.3	14.2	13.5	13.1	12.8	13.1	14.6	18.1	22.1	23.5	23.2	23.1	22.8	22.7	22.8	22.8	22.8	22.7	22.7	22.9	23.1	23.1	19.5
30	23.1	23.1	23.2	22.9	23.0	22.9	22.6	22.6	23.9	25.3	25.5	24.5	25.8	26.7	25.8	25.5	25.0	24.3	23.7	23.4	22.7	21.9	21.5	21.4	23.7

TOTAL HOURS 720 TOTAL GOOD HOURS 720 DATA CAPTURE 100.0%

MAX. 1HR AVG 30.0 11/28/88 14:00:00 2ND MAX. 1 HR AVG 29.7 11/28/88 13:00:00

MIN. 1HR AVG 12.8 11/29/88 06:00:00 ARITHMETIC MEAN 23.4 STANDARD DEV. 3.0

KEY FOR MISSING CODES
Bad< - To few samples for valid average, Cal - calibration, OCal - Analyzer out of calibration
BadS - Bad Analyzer Status, PwrF - Power Failure, Down - Operator downed channel, Miss - Missing Data
Qad - Data questionable insufficient documentation, Qai - Data questionable external influence, Purg - Analyzer in Purge

FPL-Davie
Ft. Lauderdale, FL - Site 004

HOURLY AVERAGES FOR SigÕ1 in deg

NOVEMBER 1988

DAY	HOUR (EST) 00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVG
1	23.8	21.9	15.2	19.4	13.0	23.7	17.7	15.7	17.1	15.5	18.5	26.9	20.2	25.8	12.2	12.7	12.1	13.6	17.6	17.6	25.4	43.3	32.0	16.6	19.9
2	12.2	13.2	14.1	14.1	13.6	14.2	16.6	15.9	15.8	19.6	25.6	26.9	26.7	30.1	21.0	19.6	20.1	19.8	29.3	24.8	13.3	12.0	35.0	35.0	20.3
3	13.7	40.0	22.0	13.7	20.7	14.1	11.9	47.3	12.0	14.8	17.7	13.8	13.9	14.2	13.6	40.6	55.3	54.0	24.1	23.4	12.6	24.6	30.2	15.8	23.5
4	11.2	13.0	10.6	13.5	37.9	16.9	15.2	13.5	14.6	15.5	19.7	17.9	15.4	17.6	19.4	17.9	16.8	17.5	16.0	16.0	12.5	13.9	12.7	13.8	16.2
5	10.3	10.8	12.0	12.4	14.1	14.7	13.8	15.2	15.8	15.4	16.3	20.3	19.4	18.3	15.3	16.3	14.4	15.5	15.5	14.4	14.3	13.9	11.0	22.3	15.1
6	15.7	18.5	16.6	14.7	18.1	13.1	20.1	15.3	16.0	15.3	13.5	12.6	16.4	17.2	20.5	17.0	12.1	9.7	7.6	7.7	8.2	9.2	10.9	10.9	14.0
7	8.8	9.3	17.2	10.4	18.7	11.4	21.2	19.8	18.8	18.3	26.0	22.1	28.7	27.1	26.7	23.2	27.1	19.3	26.9	21.0	9.5	9.7	13.6	12.0	18.6
8	10.9	12.0	9.4	9.3	9.5	11.1	14.8	14.8	17.1	18.7	21.9	22.0	22.3	22.5	21.6	20.7	19.4	20.9	23.7	17.2	25.8	28.7	13.6	9.4	17.4
9	9.0	10.1	11.0	11.1	10.6	12.6	14.8	18.3	24.5	15.5	16.5	19.6	21.9	20.8	22.9	19.8	16.0	18.3	19.9	19.0	14.8	14.3	18.0	17.4	16.5
10	16.3	10.5	9.5	11.0	11.6	10.9	13.5	15.5	19.9	21.6	23.6	18.2	24.9	18.8	14.7	18.6	16.8	16.3	13.7	16.3	35.0	21.5	23.1	29.1	18.0
11	14.4	9.0	11.0	14.1	8.6	10.3	11.4	14.7	17.9	20.7	25.7	27.1	28.1	20.3	17.4	14.4	17.0	13.9	22.1	29.1	23.8	34.8	11.5	10.1	17.8
12	11.2	11.7	13.0	22.4	10.5	12.4	18.0	15.5	25.2	14.6	17.4	19.0	16.9	18.6	18.0	19.0	19.3	19.1	24.1	25.8	25.6	16.1	17.9	28.5	18.3
13	25.2	17.5	9.5	9.0	11.1	12.6	17.7	10.6	10.9	23.8	52.5	42.2	50.5	34.4	32.5	18.0	17.7	20.1	19.6	22.1	21.2	20.7	16.1	19.3	22.3
14	10.9	16.4	9.3	12.1	12.6	9.7	9.5	14.3	17.1	19.8	20.9	20.5	18.7	22.4	19.8	18.2	19.2	17.2	19.1	20.8	16.1	15.3	16.3	16.9	16.4
15	14.6	15.0	17.0	15.0	19.7	20.1	20.7	22.5	19.3	17.7	17.4	16.4	16.3	14.4	15.0	14.8	15.7	14.9	14.3	11.1	10.0	9.8	10.9	9.5	15.5
16	10.3	9.9	12.7	9.2	16.1	31.5	11.9	10.9	12.6	14.7	15.5	17.2	12.7	12.6	14.4	16.3	13.5	15.0	12.0	11.6	14.4	9.5	9.3	10.4	13.5
17	10.9	19.2	19.0	18.8	25.2	22.9	25.7	40.2	18.7	14.7	15.2	16.6	14.8	14.4	15.5	14.7	13.6	12.1	12.7	12.8	12.6	12.5	11.9	11.4	16.9
18	17.9	15.9	17.5	15.5	18.3	11.0	13.0	13.3	13.2	13.7	13.8	13.5	14.4	14.2	12.7	15.2	14.6	14.9	13.8	12.8	11.6	11.7	11.0	11.5	14.0
19	10.0	10.8	10.5	11.0	11.2	10.8	10.8	10.6	11.6	13.3	11.7	13.5	14.8	13.8	12.7	12.6	12.4	10.4	11.6	11.0	10.6	10.4	10.5	11.4	11.6
20	11.2	12.5	12.2	12.6	12.1	12.5	12.6	13.3	13.3	13.8	13.7	14.3	13.7	13.7	12.7	12.4	11.9	10.5	8.4	9.7	11.2	10.6	10.6	12.0	12.2
21	11.6	17.9	9.7	7.8	7.6	25.6	39.1	19.0	14.8	13.5	12.5	13.9	13.6	14.4	13.5	12.6	11.6	10.9	10.6	9.7	9.3	10.4	10.5	11.7	13.8
22	12.2	12.6	12.8	13.0	13.5	13.0	13.1	13.1	13.2	13.5	13.3	11.7	12.1	12.2	12.6	11.4	12.0	11.5	11.5	11.0	10.8	10.6	10.6	11.0	12.2
23	12.1	13.0	12.2	12.5	13.3	14.2	14.8	16.0	15.9	16.4	18.1	16.0	18.6	18.7	16.3	15.9	14.4	12.6	11.5	11.1	9.9	11.2	10.6	11.9	14.1
24	11.6	10.9	10.0	9.2	9.8	10.0	8.7	12.6	16.4	15.5	15.5	14.9	14.2	18.2	18.1	18.3	13.0	9.8	11.1	8.6	11.2	11.9	13.7	11.4	12.7
25	17.4	15.9	13.9	13.3	22.4	14.8	8.7	8.8	12.4	26.3	16.1	14.4	16.9	17.0	16.8	16.0	15.2	15.0	12.0	11.4	10.1	10.5	12.2	16.8	14.8
26	12.4	9.3	9.0	11.4	10.8	9.8	10.8	11.5	12.2	13.2	13.8	14.6	13.1	13.1	13.7	13.5	12.7	12.8	13.0	13.1	13.9	13.2	13.1	11.9	12.3
27	12.5	12.7	12.2	12.4	10.8	11.7	12.2	12.1	11.5	11.1	11.0	11.9	13.6	12.0	10.9	11.4	10.6	10.3	10.6	10.1	9.5	10.5	9.4	9.0	11.3
28	8.6	9.0	10.4	9.5	12.6	24.7	14.4	34.7	28.0	17.5	23.2	18.0	21.5	20.9	20.8	20.3	13.9	12.7	13.0	15.3	18.1	16.9	17.9	16.3	17.4
29	15.4	14.7	14.4	15.2	14.3	12.8	13.9	17.1	17.6	19.6	24.0	16.8	17.6	18.3	17.0	17.9	19.2	18.0	15.3	16.4	16.4	15.9	12.1	12.5	16.3
30	13.9	14.9	14.9	16.9	15.8	18.3	20.1	23.1	28.7	28.1	45.0	17.6	18.6	22.0	17.2	11.5	12.2	10.8	13.0	11.6	33.1	20.1	33.1	12.7	19.7

TOTAL HOURS 720 TOTAL GOOD HOURS 720 DATA CAPTURE 100.0%

MAX. 1HR AVG 55.3 11/03/88 16:00:00 2ND MAX. 1 HR AVG 54.0 11/03/88 17:00:00

MIN. 1HR AVG 7.6 11/06/88 18:00:00 ARITHMETIC MEAN 16.1 STANDARD DEV. 6.4

KEY FOR MISSING CODES
Bad< - To few samples for valid average, Cal - calibration, OCal - Analyzer out of calibration
BadS - Bad Analyzer Status, PwrF - Power Failure, Down - Operator downed channel, Miss - Missing Data
Qad - Data questionable insufficient documentation, Qai - Data questionable external influence, Purg - Analyzer in Purge

FPL-Davie
Ft. Lauderdale, FL - Site 004

HOURLY AVERAGES FOR RNFL in INCH

NOVEMBER 1988

DAY	HOUR (EST) 00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVG
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.11	0.03	0.00	0.00	0.01	0.10	0.06	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.02
4	0.00	0.00	0.02	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.19	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.09	0.00	0.00	0.01	0.00	0.05	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

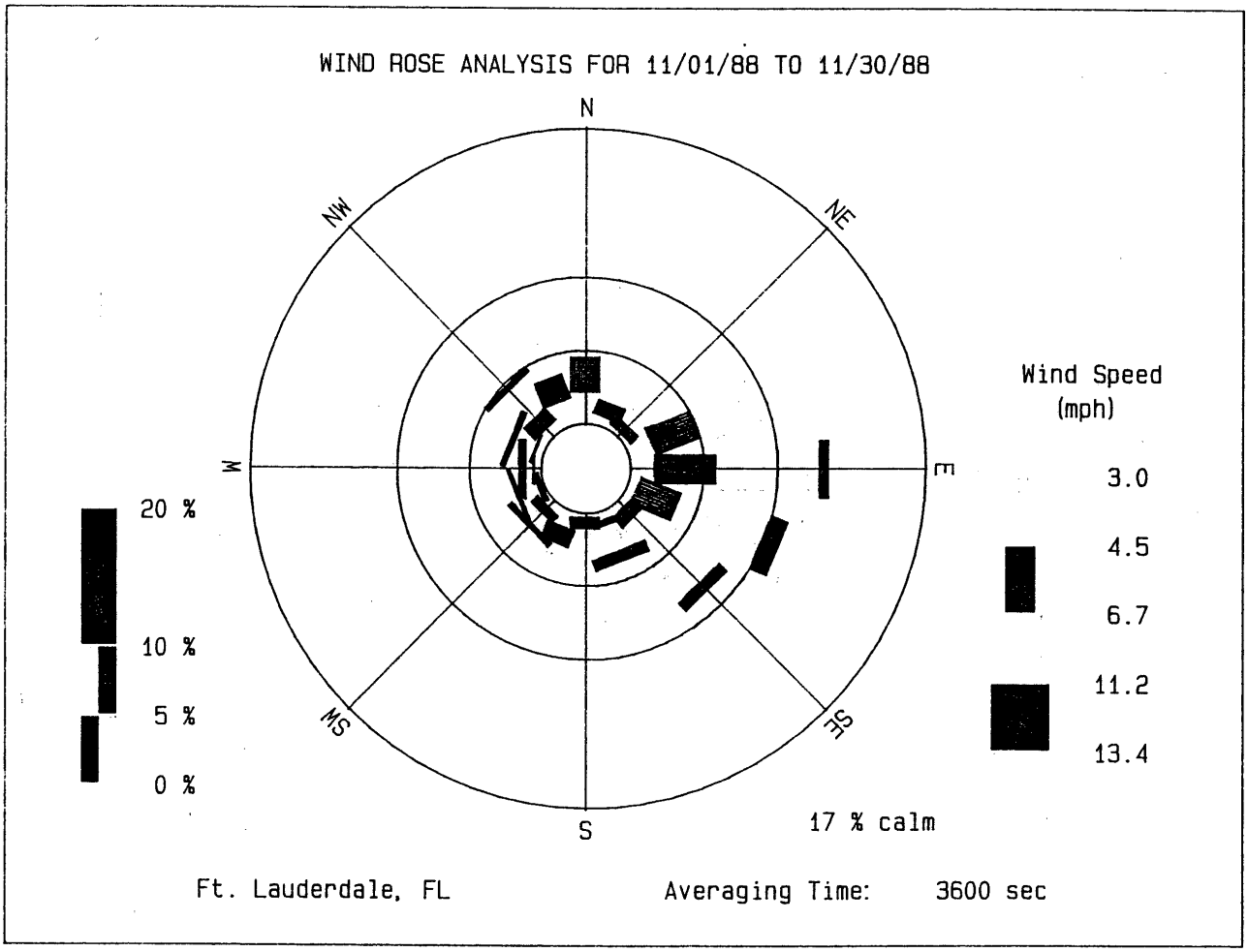
TOTAL HOURS 720 TOTAL GOOD HOURS 720 DATA CAPTURE 100.0%

MAX. 1HR AVG 0.31 11/18/88 06:00:00 2ND MAX. 1 HR AVG 0.19 11/05/88 12:00:00

MIN. 1HR AVG 0.00 11/01/88 00:00:00 ARITHMETIC MEAN 0.00 STANDARD DEV. 0.02

KEY FOR MISSING CODES
Bad< - To few samples for valid average, Cal - calibration, OCal - Analyzer out of calibration
BadS - Bad Analyzer Status, PwrF - Power Failure, Down - Operator downed channel, Miss - Missing Data
Qad - Data questionable insufficient documentation, Qai - Data questionable external influence, Purg - Analyzer in Purge

FPL DAVIE PERCIPITATION NOVEMBER 1988		
DATE	TIME	AMOUNT
11/3/88	0700	.02
	1000	.11
	1100	.03
	1400	.01
	1500	.10
	1600	.06
	1700	.07
11/4/88	0200	.02
	0300	.11
11/5/88	1100	.02
	1200	.19
	1300	.03
11/15/88	1600	.02
11/16/88	1700	.01
11/18/88	0000	.09
	0300	.01
	0500	.05
	0600	.31
11/19/88	0700	.03
11/22/88	0400	.02
	1200	.01
TOTAL		1.32


WIND ROSE ANALYSIS FOR 11/01/88 TO 11/30/88
N
NE
E
SE
S
SW
W
NW
20 %
10 %
5 %
0 %
Wind Speed
(mph)
3.0
4.5
6.7
11.2
13.4
17 % calm
Ft. Lauderdale, FL
Averaging Time: 3600 sec

WIND ROSE ANALYSIS FOR 11/01/88 TO 11/30/88

Wind Speed (mph)	DIRECTION															
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW
> 13.4	0.0	0.0	0.0	0.0	0.0	0.8	1.1	2.1	0.6	0.4	0.4	0.3	0.3	0.0	0.0	0.0
13.4-11.2	0.0	0.0	0.0	0.0	0.7	1.3	0.8	0.8	0.0	0.0	0.4	0.3	0.6	0.4	0.4	0.0
11.2- 6.7	1.1	0.1	1.3	4.2	6.8	6.0	6.1	1.8	0.0	0.3	0.8	1.1	0.3	1.3	2.4	1.9
6.7- 4.5	2.4	1.0	0.8	3.2	4.2	2.9	1.0	0.4	0.8	1.3	0.7	0.4	0.1	0.1	1.1	1.8
4.5- 3.0	2.1	0.7	0.3	1.8	1.7	0.7	0.6	0.6	0.1	1.0	0.4	0.0	0.3	0.4	0.7	1.8
3.0 <																
All Speed	5.6	1.8	2.4	9.2	13.	12.	9.6	5.7	1.5	2.9	2.8	2.1	1.5	2.2	4.6	5.6

Ft. Lauderdale, FL Averaging Time: 3600 sec

FPL-Davie
Ft. Lauderdale, FL - Site 004

HOURLY AVERAGES FOR WD in DGS

OCTOBER 1988

DAY	HOUR (EST) 00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVG
1																									
2																									
3																									
4																									
5																									
6	26	314	331	328	334	332	333	348	8	43	111	152	132	122	61	16	35	41	25	10	7	358	340	340	173
7	332	344	354	334	317	320	317	PwrF	332	335	319	323	333	23	74	61	49	27	18	9	11	3	353	355	215
8	353	347	340	346	344	344	349	352	0	11	60	68	63	60	68	52	50	53	48	43	47	47	61	71	149
9	70	77	83	84	81	69	329	323	88	88	89	86	96	91	83	84	84	70	57	56	60	66	67	62	98
10	62	7	343	343	343	340	351	350	346	355	8	3	39	67	74	68	63	45	48	41	16	4	351	263	164
11	347	349	343	348	343	359	349	350	5	9	357	84	115	124	116	126	128	130	143	157	164	217	257	274	216
12	293	310	317	317	326	326	334	355	359	6	352	317	322	317	305	312	309	320	354	1	17	11	3	359	260
13	5	348	345	351	350	343	345	346	351	6	3	18	33	50	45	43	41	44	28	27	38	18	339	343	161
14	335	339	339	333	332	325	51	71	76	69	70	71	62	60	60	64	46	43	33	36	14	61	50	348	137
15	334	323	328	323	74	72	71	71	61	66	68	69	58	50	58	56	56	53	57	56	58	68	77	85	108
16	82	83	78	79	72	69	69	72	77	73	73	76	74	69	78	76	70	67	66	69	68	47	54	353	83
17	335	334	343	350	355	3	5	1	13	5	9	12	65	72	74	79	73	53	59	8	340	333	340	345	150
18	13	6	359	6	2	32	16	35	55	75	72	81	89	84	80	80	78	75	75	79	86	91	89	83	73
19	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	Down	Down	74	101	101	99	105	97	100	91	91	94	97	105	0	Bad<
20	217	98	301	315	328	336	342	16	26	38	70	81	81	97	92	100	97	93	95	105	88	118	122	54	138
21	95	14	313	301	307	314	330	347	330	161	149	232	100	129	122	123	123	139	158	186	192	197	218	277	202
22	296	306	309	315	317	312	289	306	334	335	324	319	321	291	296	283	139	120	135	151	144	186	208	233	261
23	264	272	289	314	321	317	324	315	317	324	323	305	251	221	227	156	133	155	172	184	202	222	247	257	255
24	236	243	253	276	267	280	311	276	253	279	290	283	300	301	282	286	268	141	146	164	191	258	290	309	258
25	300	303	304	307	314	314	317	336	356	351	346	358	4	61	86	79	84	72	53	38	0	359	1	0	198
26	357	353	359	1	19	13	1	359	28	55	65	65	63	63	72	75	80	83	74	62	16	18	62	37	99
27	118	14	72	75	28	345	74	100	119	113	106	97	92	94	100	88	91	94	90	83	94	84	358	78	109
28	103	103	87	87	80	20	32	55	87	87	85	79	82	79	81	69	69	65	56	62	58	64	72	75	72
29	84	82	80	76	72	69	44	14	69	77	77	78	78	57	63	61	58	57	66	63	64	69	76	75	67
30	79	73	51	64	61	357	334	1	43	65	66	86	72	59	69	72	59	54	37	2	341	338	28	353	115
31	315	15	347	318	338	355	354	345	34	47	105	100	103	104	110	97	95	93	101	113	212	250	257	270	187

TOTAL HOURS 624 TOTAL GOOD HOURS 612 DATA CAPTURE 98.1%

MAX. 1HR AVG 359 10/12/88 23:00:00 2ND MAX. 1 HR AVG 359 10/12/88 08:00:00

MIN. 1HR AVG 0 10/08/88 08:00:00 ARITHMETIC MEAN 156 STANDARD DEV. 125

KEY FOR MISSING CODES
Bad< - To few samples for valid average, Cal - calibration, OCal - Analyzer out of calibration
BadS - Bad Analyzer Status, PwrF - Power Failure, Down - Operator downed channel, Miss - Missing Data
Qad - Data questionable insufficient documentation, Qai - Data questionable external influence, Purg - Analyzer in Purge

FPL-Davie
Ft. Lauderdale, FL - Site 004

HOURLY AVERAGES FOR WS in MPH

OCTOBER 1988

DAY	HOUR (EST) 00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVG
1																									
2																									
3																									
4																									
5																									
6	1.8	2.3	2.6	2.8	3.0	2.9	3.9	5.1	6.4	6.2	7.3	5.6	3.2	4.4	5.4	7.5	6.7	7.0	7.1	6.5	5.5	5.1	4.7	4.2	4.9
7	4.6	4.3	3.9	3.9	4.7	4.3	5.1	PwrF	5.7	5.7	6.0	5.4	5.6	4.6	8.4	7.5	6.4	5.1	8.5	8.8	8.0	8.0	7.7	8.1	6.1
8	7.9	7.0	6.9	6.4	6.3	5.7	6.2	6.2	5.4	5.2	7.1	8.3	10.1	8.5	8.8	8.5	8.6	7.6	6.4	6.8	6.2	5.0	4.7	6.1	6.9
9	5.6	5.2	6.6	7.0	5.8	3.3	1.7	2.8	6.9	6.7	5.8	6.6	7.4	7.8	7.5	7.7	7.5	6.2	4.4	3.5	2.9	3.0	2.1	2.1	5.2
10	2.5	2.0	2.9	2.9	3.1	3.5	3.9	4.4	5.6	5.2	5.1	5.4	4.1	6.3	6.3	6.9	6.0	6.7	5.0	3.2	3.1	3.9	3.0	1.3	4.2
11	2.8	3.0	3.1	2.6	2.7	3.1	2.8	3.1	4.4	4.0	3.7	2.4	2.4	2.6	5.9	5.1	5.0	5.2	4.3	2.8	3.4	2.8	3.1	3.9	3.5
12	4.9	5.8	5.0	3.6	2.8	3.3	4.3	6.0	6.6	6.6	4.9	7.1	7.7	7.8	7.7	7.0	7.4	6.5	3.9	3.4	2.9	2.5	3.2	3.4	5.2
13	4.5	4.1	3.9	4.1	4.0	4.3	4.4	4.9	5.9	7.5	8.3	7.2	7.8	9.3	10.5	10.7	10.8	9.8	5.4	6.2	8.8	5.2	4.7	4.0	6.5
14	4.5	5.5	4.8	4.4	4.7	4.4	4.4	9.3	11.6	11.4	12.4	13.1	12.9	12.3	13.2	11.7	13.5	12.6	10.3	8.5	5.1	8.8	6.7	3.7	8.7
15	4.1	4.1	4.0	3.4	7.4	8.3	7.2	8.2	10.4	10.5	11.3	10.4	9.8	11.5	10.5	10.0	9.9	8.4	7.2	4.9	4.3	4.4	6.3	6.3	7.6
16	6.2	6.6	6.2	6.4	5.5	4.7	4.4	6.6	9.3	9.9	9.5	10.6	10.1	9.6	9.5	10.0	9.2	8.2	6.6	6.4	5.7	4.4	2.8	2.8	7.1
17	3.1	3.7	4.6	4.1	4.0	5.9	3.9	3.6	5.1	6.5	7.0	6.7	7.0	7.3	8.1	7.0	6.8	5.0	2.5	2.6	2.5	3.8	3.8	3.6	4.9
18	3.8	4.3	4.4	4.3	3.4	2.8	2.5	4.0	4.7	8.1	7.9	7.9	8.6	8.0	8.1	7.6	8.0	7.9	6.2	5.1	6.2	5.7	4.1	3.4	5.7
19	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	Down	Down	4.0	7.5	8.5	9.7	9.6	8.7	7.8	5.4	4.4	4.6	4.0	3.0	1.5	Bad<
20	0.8	2.1	3.0	2.4	2.7	3.1	3.0	4.1	5.0	4.1	4.2	6.1	7.2	8.4	8.3	9.1	9.1	7.9	5.8	5.7	3.0	3.3	2.0	2.5	4.7
21	2.7	0.6	2.2	2.3	2.6	3.3	2.2	2.4	2.1	1.8	0.9	2.0	2.5	4.6	6.0	5.8	7.1	5.9	5.6	4.5	3.5	3.6	4.0	3.9	3.4
22	4.6	5.3	5.3	4.4	5.4	4.4	2.9	3.4	5.9	6.4	5.2	6.2	4.4	4.2	7.1	5.0	1.5	7.5	4.7	4.2	3.0	3.4	2.7	2.1	4.5
23	2.4	2.7	3.4	4.4	4.8	4.9	4.4	5.1	5.5	5.0	4.6	3.6	2.3	5.0	3.9	3.7	7.3	5.7	6.2	4.9	4.6	4.7	3.6	2.7	4.4
24	2.9	2.5	2.6	2.7	2.9	3.8	5.1	2.6	3.2	4.3	3.6	3.8	4.7	5.8	4.6	3.1	3.1	5.3	4.6	3.6	3.2	2.7	5.4	5.7	3.8
25	4.1	4.0	4.6	5.1	4.8	4.7	5.2	4.3	4.6	6.5	5.7	4.8	4.5	4.0	7.9	7.6	7.9	5.9	4.4	3.4	3.1	3.1	3.9	3.9	4.9
26	3.7	3.0	3.9	4.4	3.3	2.8	2.7	2.8	4.6	5.7	7.0	6.3	5.9	6.9	7.8	7.6	7.3	6.4	3.8	2.0	2.0	2.4	1.3	1.3	4.3
27	0.8	1.8	2.5	2.4	2.0	1.7	2.9	5.2	9.5	11.0	11.6	10.2	9.6	9.1	8.7	8.6	8.9	7.9	5.0	3.9	4.5	2.8	1.6	0.9	5.5
28	3.1	7.7	5.2	4.1	5.3	3.1	2.9	2.2	6.9	8.9	9.1	8.7	8.2	9.5	8.7	7.4	7.3	6.2	5.0	4.9	4.4	5.4	5.4	5.6	6.0
29	6.5	5.0	5.4	4.5	3.9	3.6	2.1	2.1	6.6	8.8	9.0	9.3	10.2	9.3	9.0	9.5	9.0	7.7	6.2	5.5	5.4	6.1	5.9	6.2	6.5
30	4.9	4.0	2.2	2.8	2.9	1.7	2.3	2.4	3.9	6.4	6.7	7.8	7.3	6.3	7.2	7.2	5.4	4.7	2.8	2.9	2.6	3.6	3.4	3.0	4.3
31	4.1	1.9	2.7	4.3	3.1	3.4	2.8	3.2	4.3	3.4	7.3	7.5	7.1	7.3	6.6	5.9	4.8	3.4	2.9	2.2	3.3	4.9	3.3	2.6	4.2

TOTAL HOURS 624 TOTAL GOOD HOURS 612 DATA CAPTURE 98.1%

MAX. 1HR AVG 13.5 10/14/88 16:00:00 2ND MAX. 1 HR AVG 13.2 10/14/88 14:00:00

MIN. 1HR AVG 0.6 10/21/88 01:00:00 ARITHMETIC MEAN 5.3 STANDARD DEV. 2.4

KEY FOR MISSING CODES
Bad< - To few samples for valid average, Cal - calibration, OCal - Analyzer out of calibration
BadS - Bad Analyzer Status, PwrF - Power Failure, Down - Operator downed channel, Miss - Missing Data
Qad - Data questionable insufficient documentation, Qai - Data questionable external influence, Purg - Analyzer in Purge

FPL-Davie
Ft. Lauderdale, FL - Site 004

HOURLY AVERAGES FOR TEMP in DGC

OCTOBER 1988

DAY	HOUR (EST) 00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVG
1																									
2																									
3																									
4																									
5																									
6	25.5	24.8	24.4	24.0	23.9	23.9	23.7	23.7	25.7	27.4	27.7	26.7	29.1	30.6	29.1	26.7	27.0	27.4	26.5	25.7	25.2	24.8	24.3	23.9	25.9
7	23.6	23.3	23.3	23.1	22.7	22.5	22.4	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	Bad<
8	22.9	22.4	21.2	20.8	20.7	20.3	20.2	20.7	22.5	24.9	26.7	27.9	28.2	28.2	28.1	27.6	26.9	26.2	25.8	25.4	25.2	25.0	24.7	25.1	24.5
9	24.7	24.4	24.3	24.4	24.2	23.9	22.5	22.4	25.9	27.1	27.4	28.0	27.8	28.1	28.1	27.8	27.3	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	Bad<
10	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	23.0	22.2	21.7	20.4	Bad<
11	20.3	20.1	19.7	19.3	18.9	18.8	18.9	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	Bad<
12	21.1	20.6	20.4	19.9	19.7	19.9	20.0	20.4	21.9	23.5	24.9	26.0	26.7	27.2	27.6	27.9	27.7	26.8	25.0	23.7	22.8	22.0	21.3	20.8	23.2
13	20.7	20.6	20.1	19.9	19.6	19.2	18.7	19.5	21.7	24.2	25.7	26.6	27.1	26.8	26.7	26.1	25.6	25.1	24.0	24.1	24.3	23.3	21.1	19.8	22.9
14	19.1	18.6	18.9	19.2	19.0	18.5	21.5	23.5	24.6	25.4	25.3	25.6	25.6	25.5	25.1	24.8	24.4	23.5	22.6	22.5	21.8	22.6	22.7	21.0	22.5
15	19.1	18.7	18.6	18.7	23.0	23.2	23.1	24.0	25.0	26.0	26.6	27.1	26.8	26.0	26.1	26.0	25.6	25.2	24.6	24.2	23.9	23.9	24.2	24.0	23.9
16	24.0	24.0	23.9	23.9	23.8	23.7	23.6	24.7	25.9	27.1	27.4	27.8	28.1	28.4	28.5	27.7	27.0	26.1	25.4	25.2	25.0	24.4	23.9	22.6	25.5
17	21.1	20.7	20.4	20.2	20.5	20.9	20.9	22.0	24.5	26.2	27.2	27.6	28.4	28.5	28.4	28.1	27.3	26.1	25.1	24.1	23.4	23.0	22.2	21.8	24.1
18	22.0	22.4	22.4	22.6	22.5	22.1	21.7	23.1	25.5	27.3	27.7	28.6	29.0	29.1	29.0	28.6	27.9	26.8	26.1	25.7	25.5	25.3	25.1	25.0	25.4
19	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	Down	Down	28.9	28.8	28.5	28.1	27.6	27.0	26.0	25.4	24.9	24.5	24.2	23.8	23.2	Bad<
20	22.3	21.8	20.9	20.8	20.6	20.7	20.4	21.9	24.7	26.5	27.5	28.7	28.9	28.7	28.6	27.9	27.0	26.1	25.3	24.7	24.5	23.8	23.0	22.0	24.5
21	21.6	21.3	20.8	20.4	20.3	20.5	20.7	21.8	24.2	26.4	27.3	28.7	28.6	28.7	28.2	27.5	27.1	25.9	25.0	24.6	24.5	24.4	23.8	22.9	24.4
22	22.9	22.2	21.3	20.6	20.2	19.9	19.5	20.6	22.6	24.5	25.9	26.9	27.4	28.2	28.6	28.7	27.7	25.7	24.8	24.1	23.9	23.7	22.9	22.1	23.9
23	21.3	20.7	20.3	20.7	20.1	19.4	19.1	19.7	21.8	24.0	25.6	27.0	28.1	29.5	29.7	29.0	27.7	26.5	25.5	24.7	24.3	23.8	22.8	22.1	23.9
24	21.5	21.0	20.6	19.9	19.6	19.3	19.3	20.1	22.5	24.6	26.1	27.7	28.8	29.5	29.8	29.9	29.4	27.2	25.6	24.8	24.5	23.7	23.0	22.6	24.2
25	21.7	21.2	20.9	20.8	20.7	20.6	20.5	21.0	22.2	24.7	26.3	27.6	28.3	28.3	27.3	27.4	26.8	26.0	25.6	24.8	23.8	23.0	22.3	21.8	23.9
26	21.3	21.4	21.6	21.2	21.6	21.3	20.8	21.7	24.2	25.5	26.9	27.4	27.8	28.2	28.0	27.0	26.1	24.9	24.0	23.1	22.3	21.9	21.4	20.6	23.7
27	20.3	20.1	20.9	21.3	20.6	20.3	22.0	24.2	25.7	26.6	27.5	28.1	28.5	28.1	28.0	27.7	27.2	26.2	25.6	25.1	24.8	24.4	22.9	22.7	24.5
28	22.2	22.8	23.0	22.9	22.5	22.0	22.3	24.2	26.3	26.9	27.5	27.9	28.2	28.0	28.1	27.8	27.1	25.9	25.2	24.8	24.6	24.6	24.4	24.1	25.1
29	23.9	23.6	23.5	23.3	23.0	22.8	22.2	22.5	25.7	26.4	26.9	27.4	28.0	27.4	27.6	27.2	26.5	25.6	25.2	24.9	24.7	24.6	24.4	24.2	25.0
30	23.8	23.6	22.3	22.2	22.4	20.4	19.5	20.7	23.9	26.0	26.8	27.7	27.6	27.3	27.3	26.6	25.9	25.0	24.1	23.3	22.8	22.5	22.5	22.0	24.0
31	21.9	21.6	21.3	20.7	20.2	20.1	19.9	20.6	23.1	25.4	26.7	27.4	28.0	27.8	27.2	26.7	25.9	25.4	25.0	24.5	23.9	22.8	21.7	21.2	23.7

TOTAL HOURS 624 TOTAL GOOD HOURS 552 DATA CAPTURE 88.5%

MAX. 1HR AVG 30.6 10/06/88 13:00:00 2ND MAX. 1 HR AVG 29.9 10/24/88 15:00:00

MIN. 1HR AVG 18.5 10/14/88 05:00:00 ARITHMETIC MEAN 24.2 STANDARD DEV. 2.8

KEY FOR MISSING CODES
Bad< - To few samples for valid average, Cal - calibration, OCal - Analyzer out of calibration
BadS - Bad Analyzer Status, PwrF - Power Failure, Down - Operator downed channel, Miss - Missing Data
Qad - Data questionable insufficient documentation, Qai - Data questionable external influence, Purg - Analyzer in Purge

FPL-Davie
Ft. Lauderdale, FL - Site 004

HOURLY AVERAGES FOR Sigθ1 in deg

OCTOBER 1988

DAY	HOUR (EST) 00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVG
1																									
2																									
3																									
4																									
5																									
6	31.3	15.5	13.7	16.5	11.0	16.6	12.6	14.1	17.2	20.1	15.0	12.0	31.2	32.4	23.6	18.6	17.5	19.2	18.0	16.6	16.5	16.5	12.4	13.1	18.0
7	11.9	13.3	14.7	12.2	9.4	9.2	8.8	PwrF	19.9	15.8	17.1	22.5	21.5	24.1	17.9	19.3	21.9	21.2	16.5	16.9	18.3	18.2	16.5	15.5	16.6
8	16.5	14.7	13.2	14.7	13.9	13.2	15.7	16.3	19.2	19.2	21.5	19.9	19.0	21.6	20.3	20.9	19.7	20.1	19.1	17.0	16.4	18.6	18.6	17.0	17.8
9	17.4	14.3	14.3	14.6	14.2	21.2	24.3	13.7	30.1	19.6	20.2	23.1	22.6	21.5	21.8	19.1	17.7	17.6	19.8	22.3	24.3	23.1	26.0	24.5	20.3
10	23.8	17.5	10.5	12.0	13.1	11.7	15.2	16.9	15.8	20.7	27.9	27.4	30.2	23.5	22.4	19.1	20.9	18.1	19.3	21.4	8.4	11.4	17.2	34.0	19.1
11	9.2	9.5	10.6	10.5	10.0	13.5	15.9	15.4	17.4	25.9	29.3	54.9	44.6	62.2	23.2	22.4	16.4	13.6	9.7	15.3	6.7	11.7	12.8	11.2	19.7
12	7.3	6.1	6.8	9.2	8.8	7.8	9.5	15.9	18.7	22.7	24.5	18.1	22.6	22.1	19.6	18.5	15.9	11.0	13.5	13.3	15.4	13.3	11.5	12.8	14.4
13	13.8	13.2	13.6	14.2	14.4	12.2	13.9	15.0	15.8	20.1	19.4	21.3	22.7	19.7	19.3	17.9	17.2	15.9	15.2	17.5	18.1	15.5	10.6	11.6	16.2
14	10.0	12.4	11.5	11.1	10.0	9.3	26.3	16.9	16.6	18.3	18.1	18.7	21.2	19.7	20.3	19.3	16.6	16.8	16.4	17.2	16.3	22.4	18.5	15.2	16.6
15	11.9	8.8	9.0	31.2	15.9	14.9	16.1	17.0	18.8	20.8	19.8	20.4	21.6	18.6	17.9	21.0	19.2	19.3	19.7	21.5	19.6	22.0	15.4	13.1	18.1
16	14.4	14.3	13.8	14.8	14.8	16.4	16.9	16.6	17.5	20.7	20.9	18.8	21.4	19.9	19.0	17.4	19.3	19.1	20.2	18.3	18.3	17.6	21.5	17.0	17.9
17	9.8	9.5	12.4	12.7	14.1	16.4	15.7	17.4	19.3	21.5	21.5	22.9	24.8	20.1	20.7	21.9	18.0	21.0	26.4	17.5	10.3	9.8	10.5	13.7	17.0
18	17.5	15.4	14.7	14.3	15.7	19.2	19.8	18.7	19.9	18.5	23.4	19.6	16.1	17.7	19.3	17.7	16.3	17.4	16.9	15.0	13.6	12.0	13.0	17.5	17.0
19	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	Down	Down	32.8	18.6	19.8	14.7	15.0	14.3	11.7	13.2	12.6	10.5	11.2	12.5	27.1	Bad<
20	52.1	35.9	15.5	7.6	9.8	12.5	15.3	17.2	19.9	29.7	24.0	24.5	21.3	19.3	20.4	16.4	14.7	13.7	12.1	9.8	17.6	10.3	25.2	31.4	19.8
21	12.5	23.1	10.9	10.8	8.7	8.1	13.9	17.6	27.6	56.2	71.8	53.6	46.2	26.9	17.0	15.5	13.5	11.7	8.7	11.2	14.6	11.1	14.8	14.3	21.7
22	10.3	6.6	6.4	7.3	7.7	8.8	13.5	13.0	14.1	15.9	28.5	20.8	44.3	34.6	19.7	19.7	37.4	11.4	11.6	8.6	8.1	11.6	14.2	17.9	16.3
23	11.9	18.1	8.2	7.8	9.4	9.4	11.1	10.0	12.0	19.9	23.8	48.7	49.9	26.5	41.6	34.5	13.6	12.8	9.7	9.8	12.1	14.3	16.0	17.9	18.7
24	14.3	18.1	14.9	10.8	16.1	14.2	7.3	19.1	20.8	24.3	30.7	41.2	33.5	23.1	28.6	41.3	33.3	19.6	10.0	9.0	17.0	15.4	8.1	6.6	19.9
25	9.9	10.0	7.6	7.6	6.7	7.9	9.5	14.4	20.1	16.5	21.8	33.4	38.8	30.7	16.8	18.0	15.7	19.2	21.8	18.6	13.6	13.3	14.3	14.1	16.7
26	15.0	14.1	13.8	13.8	15.4	17.1	17.1	19.2	19.9	23.0	23.6	24.7	29.0	25.4	19.6	19.9	18.8	14.8	20.2	27.6	21.3	17.6	44.0	24.2	20.8
27	33.4	19.3	19.3	18.2	20.1	32.9	19.9	16.3	13.9	14.9	15.2	15.2	16.6	17.0	16.8	15.7	14.2	13.3	12.8	13.5	11.4	17.1	31.4	27.6	18.6
28	56.5	12.6	15.3	13.9	18.2	21.4	20.2	31.9	14.9	15.7	16.8	18.5	18.8	19.1	17.2	21.8	20.2	20.4	21.3	21.3	21.2	19.0	17.7	14.8	20.4
29	14.1	13.1	13.0	13.2	15.7	17.9	21.3	20.9	21.9	18.3	19.3	18.6	18.0	20.5	20.9	21.2	20.3	18.6	20.1	19.4	19.4	17.4	15.0	14.2	18.0
30	13.6	17.4	21.9	19.4	20.1	21.9	9.9	15.5	18.5	20.7	21.0	18.2	22.6	23.7	22.5	18.1	21.5	20.3	21.3	11.5	10.0	9.7	20.8	18.5	18.3
31	9.4	40.7	23.2	8.8	14.6	12.7	14.6	16.9	20.7	34.5	20.2	20.3	20.3	19.4	19.0	18.2	23.0	19.2	18.1	21.9	13.1	17.9	16.0	19.1	19.2

TOTAL HOURS 624 TOTAL GOOD HOURS 612 DATA CAPTURE 98.1%

MAX. 1HR AVG 71.8 10/21/88 10:00:00 2ND MAX. 1 HR AVG 62.2 10/11/88 13:00:00

MIN. 1HR AVG 6.1 10/12/88 01:00:00 ARITHMETIC MEAN 18.2 STANDARD DEV. 7.8

KEY FOR MISSING CODES
Bad< - To few samples for valid average, Cal - calibration, OCal - Analyzer out of calibration
BadS - Bad Analyzer Status, PwrF - Power Failure, Down - Operator downed channel, Miss - Missing Data
Qad - Data questionable insufficient documentation, Qai - Data questionable external influence, Purg - Analyzer in Purge

FPL-Davie
Ft. Lauderdale, FL - Site 004

HOURLY AVERAGES FOR RNFL in INCH

OCTOBER 1988

DAY	HOUR (EST) 00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVG
1																									
2																									
3																									
4																									
5																									
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	PwrF	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	Down	Down	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Bad<
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.00
28	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

TOTAL HOURS 624 TOTAL GOOD HOURS 612 DATA CAPTURE 98.1%

MAX. 1HR AVG 0.21 10/07/88 16:00:00 2ND MAX. 1 HR AVG 0.09 10/27/88 23:00:00

MIN. 1HR AVG 0.00 10/06/88 00:00:00 ARITHMETIC MEAN 0.00 STANDARD DEV. 0.01

KEY FOR MISSING CODES
Bad< - To few samples for valid average, Cal - calibration, OCal - Analyzer out of calibration
BadS - Bad Analyzer Status, PwrF - Power Failure, Down - Operator downed channel, Miss - Missing Data
Qad - Data questionable insufficient documentation, Qai - Data questionable external influence, Purg - Analyzer in Purge

FPL DAVIE PERCIPITATION OCTOBER 1988		
DATE	TIME	AMOUNT
10/7/88	1600	.21
10/19/88	1200	.01
10/27/88	2300	.09
10/28/88	0100	.06
TOTAL		.37

ESE # 89 509 400

FPL DAVIE

SO2 PRECISION CALCULATIONS

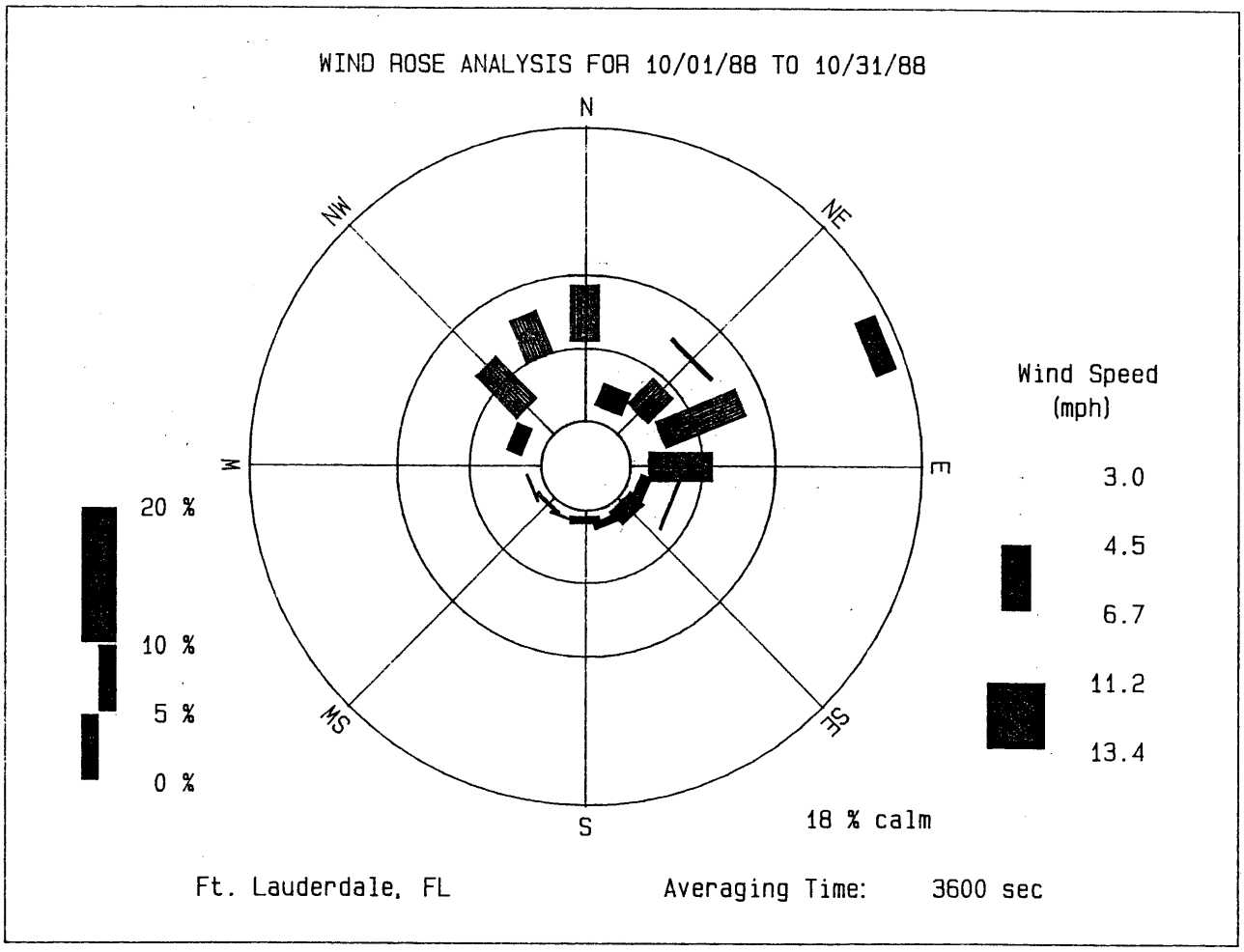
SAMPLING QUARTER

OCTOBER 1988 - DECEMBER 1988

DATE	AIR QUALITY SAMPLER(X) PPB	DUPLICATE SAMPLER(Y) PPB	% DIFFERENCE(D)
OCT 7, 1988	90.00	96.00	+ 6.67
OCT 11, 1988	90.00	97.00	+ 7.78
OCT 19, 1988	90.00	95.00	+ 5.56
NOV 3, 1988	90.00	97.00	+ 7.78
NOV 16, 1988	90.00	96.00	+ 6.67
NOV 30, 1988	90.00	97.00	+ 7.78
DEC 14, 1988	90.00	94.00	+ 4.44
DEC 17, 1988	90.00	95.00	+ 5.56
DEC 28, 1988	90.00	94.00	+ 4.44
		SUM OF D(I) =	56.67
		MEAN OF D(I) =	6.30
		STD. DEV. =	1.36

UPPER 95% PROBABILITY LIMIT = 8.18

LOWER 95% PROBABILITY LIMIT = 4.41


WIND ROSE ANALYSIS FOR 10/01/88 TO 10/31/88
N
NE
E
SE
S
SW
W
NW
20 %
10 %
5 %
0 %
Wind Speed
(mph)
3.0
4.5
6.7
11.2
13.4
18 % calm
Ft. Lauderdale, FL
Averaging Time: 3600 sec

WIND ROSE ANALYSIS FOR 10/01/88 TO 10/31/88

Wind Speed (mph)	DIRECTION																A
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	C
> 13.4	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
13.4-11.2	0.0	0.0	0.3	1.5	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
11.2- 6.7	1.5	1.0	2.5	9.2	7.2	1.6	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.0	0.3	
6.7- 4.5	3.8	1.6	2.5	6.0	4.4	0.8	1.3	0.5	0.5	0.2	0.3	0.2	0.0	1.1	4.1	3.1	
4.5- 3.0	5.4	1.0	2.0	2.5	1.3	0.7	0.3	0.7	0.3	0.5	0.3	0.7	0.8	1.1	2.5	4.9	
3.0 >																	
All Speed	11.	3.6	7.4	19.	13.	3.3	1.8	1.1	0.8	0.7	0.7	0.8	0.8	2.5	7.5	8.3	1

EA-2

Ft. Lauderdale, FL Averaging Time: 3600 sec

Air and Meteorological Data
January - March 1989

FPL-Pinehurst
Ft. Lauderdale, FL - Site 003

HOURLY AVERAGES FOR SO2 in PPB

JANUARY 1989

DAY	HOUR (EST) 00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVG
1	0	0	0	0	0	0	0	0	0	0	0	0	Cal	0	0	0	0	0	0	0	1	1	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0	0	11	25	4	2	1	1	1	1	1	1	1	2
3	0	0	0	0	0	0	0	0	1	3	3	6	Cal	1	1	0	0	0	0	0	0	0	0	0	1
4	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	2	2	1	1	1
5	1	1	1	0	0	1	1	2	3	2	2	2	Cal	5	6	9	8	7	4	1	1	1	0	0	2
6	0	0	Cal	0	0	0	1	2	1	1	0	0	0	0	0	0	0	1	2	2	1	2	1	1	1
7	1	0	0	0	0	0	0	0	1	1	0	0	Cal	0	0	0	1	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0	0	0	4	1	1	2	7	14	1	1	1	1	3	0	1
9	0	0	0	0	0	0	1	1	2	5	1	1	Cal	23	11	6	1	1	4	2	0	0	0	0	3
10	0	0	0	0	0	0	0	1	1	0	0	2	0	1	1	0	0	0	0	3	11	16	14	6	2
11	1	0	0	1	0	0	4	2	1	3	2	4	Cal	0	0	1	1	4	3	1	3	2	3	1	1
12	2	3	2	0	0	0	0	2	7	7	3	0	0	0	0	0	0	0	1	1	1	0	2	1	1
13	1	1	Cal	0	0	0	0	2	3	9	21	12	Cal	4	2	10	24	9	1	0	0	0	0	0	4
14	8	14	16	10	10	15	13	13	19	19	13	8	8	14	10	11	14	5	2	2	3	3	2	1	10
15	0	0	0	0	0	0	0	0	0	0	0	0	Cal	0	0	0	0	0	1	1	0	0	0	0	0
16	0	0	0	0	0	0	0	1	2	3	1	0	0	0	0	0	0	1	1	1	1	1	1	0	1
17	0	0	0	0	0	0	0	1	2	1	1	11	Cal	1	1	1	1	0	1	1	0	1	2	1	1
18	1	0	0	0	0	0	1	2	3	6	13	29	19	35	33	3	0	1	1	1	1	2	1	1	6
19	1	1	0	0	0	0	0	1	1	10	9	9	Cal	2	0	0	0	1	12	7	13	3	4	2	3
20	3	5	Cal	1	1	0	0	1	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	0	1
21	0	0	0	0	0	0	0	0	0	0	0	0	Cal	23	2	0	0	1	1	0	0	0	0	3	1
22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	1	0
23	0	0	0	0	0	0	0	0	0	0	0	0	Cal	0	0	1	0	1	1	1	0	0	0	0	0
24	0	0	0	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0	0	1	2	1	0	0
25	0	0	0	0	0	0	0	0	0	0	0	0	Cal	0	0	0	0	0	0	0	0	1	0	0	0
26	0	2	3	2	3	2	1	6	10	6	8	8	14	9	3	1	5	8	2	1	1	0	0	0	4
27	0	1	Cal	0	0	0	1	3	4	Cal	Cal	Cal	Cal	Cal	Cal	Cal	Cal	Cal	Cal	1	2	1	1	1	Bad<
28	1	1	2	1	1	0	0	1	1	1	2	3	6	3	3	1	1	1	0	1	1	1	0	0	1
29	5	3	1	1	0	0	0	0	0	0	0	0	Cal	0	0	0	0	4	12	12	1	0	0	0	2
30	0	0	0	0	0	0	1	2	1	1	1	0	0	1	1	1	1	1	1	0	1	1	1	0	1
31	0	0	0	0	0	0	0	1	1	1	1	2	3	3	Cal	2	4	3	3	1	1	1	1	1	1

TOTAL HOURS 744 TOTAL GOOD HOURS 715 DATA CAPTURE 96.1%

MAX. 1HR AVG 35 01/18/89 13:00:00 2ND MAX. 1 HR AVG 33 01/18/89 14:00:00

MIN. 1HR AVG 0 01/01/89 00:00:00 ARITHMETIC MEAN 2 STANDARD DEV. 4

NAAQS Comparison: MAX. 3 HR AVG 29 (500) 01/18/89 14:00:00
MAX. 24 HR AVG 10 (140) 01/14/89 15:00:00

KEY FOR MISSING CODES
Bad< - To few samples for valid average, Cal - calibration, OCal - Analyzer out of calibration
BadS - Bad Analyzer Status, PwrF - Power Failure, Down - Operator downed channel, Miss - Missing Data
Qad - Data questionable insufficient documentation, Qai - Data questionable external influence, Purg - Analyzer in Purge

FPL-Pinehurst
Ft. Lauderdale, FL - Site 003 .

HOURLY AVERAGES FOR SO2 in PPB

FEBRUARY 1989

DAY	HOUR (EST) 00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVG
1	2	2	2	1	1	1	2	3	4	4	3	8	91	53	72	10	2	2	2	3	3	3	2	2	11
2	2	1	1	2	2	2	2	3	3	3	2	1	1	2	Cal	5	8	7	2	2	1	1	1	1	2
3	2	3	Cal	4	4	1	2	3	2	2	3	2	1	1	2	1	1	2	2	2	1	2	2	2	2
4	1	1	1	1	1	1	2	2	2	1	1	1	1	1	Cal	1	1	1	1	1	2	2	1	1	1
5	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
6	1	1	1	1	1	1	1	3	3	11	1	1	1	1	Cal	1	1	1	1	1	2	2	1	1	2
7	1	1	1	1	1	1	2	2	2	1	1	1	1	1	1	1	1	1	1	2	2	2	1	1	1
8	1	1	1	1	1	1	1	2	4	4	5	31	21	32	Cal	2	2	1	1	2	2	1	1	2	5
9	1	1	1	1	1	1	1	1	2	2	2	3	3	3	3	2	2	2	2	1	1	1	1	1	2
10	1	1	Cal	1	1	1	1	1	1	1	1	1	1	1	Cal	1	2	1	1	3	3	2	2	2	1
11	1	1	1	1	1	1	1	1	1	2	5	6	26	6	2	2	2	2	1	1	1	1	1	5	3
12	10	16	13	9	7	6	5	5	4	4	4	4	3	3	Cal	3	2	2	2	2	2	2	2	2	5
13	2	2	2	1	2	2	4	18	15	12	8	2	2	4	4	7	16	6	3	5	5	4	3	4	5
14	5	9	12	13	12	8	3	2	2	3	3	8	12	35	Cal	3	11	11	7	12	9	9	8	10	9
15	2	4	2	11	5	2	2	8	10	6	3	2	4	4	4	7	7	9	6	2	1	2	2	1	4
16	5	16	4	1	1	1	6	8	2	2	1	1	1	1	Cal	1	1	1	1	1	1	1	1	1	3
17	1	1	Cal	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
18	1	1	2	2	1	1	1	2	3	3	5	4	4	4	Cal	2	3	4	6	2	1	1	1	1	2
19	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	7	1
20	4	3	2	4	9	6	4	2	4	2	2	6	9	13	Cal	24	14	11	12	7	4	3	2	1	6
21	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
22	1	1	1	1	1	1	1	1	1	1	1	1	1	1	Cal	1	1	1	1	1	2	2	2	2	1
23	3	3	4	3	4	3	3	2	2	3	2	2	2	2	2	1	1	1	1	1	1	1	1	1	2
24	2	3	Cal	3	3	4	4	6	7	7	4	4	4	4	Cal	3	4	4	5	6	7	3	2	3	4
25	6	6	4	2	3	4	4	4	5	3	3	3	3	3	3	3	3	5	5	6	5	6	6	5	4
26	4	3	3	4	4	3	3	3	4	5	6	6	5	5	Cal	8	7	6	5	5	5	5	4	3	5
27	3	4	3	2	1	1	2	6	9	13	5	3	3	2	2	2	2	2	3	3	2	2	2	2	3
28	1	1	1	1	1	1	2	4	3	3	2	2	2	2	Cal	1	1	2	1	13	4	2	2	2	2

TOTAL HOURS 672 TOTAL GOOD HOURS 654 DATA CAPTURE 97.3%

MAX. 1HR AVG 91 02/01/89 12:00:00 2ND MAX. 1 HR AVG 72 02/01/89 14:00:00

MIN. 1HR AVG 1 02/17/89 00:00:00 ARITHMETIC MEAN 3 STANDARD DEV. 6

NAAQS Comparison: MAX. 3 HR AVG 72 (500) 02/01/89 14:00:00
MAX. 24 HR AVG 14 (140) 02/01/89 17:00:00

KEY FOR MISSING CODES
Bad< - To few samples for valid average, Cal - calibration, OCal - Analyzer out of calibration
BadS - Bad Analyzer Status, PwrF - Power Failure, Down - Operator downed channel, Miss - Missing Data
Qad - Data questionable insufficient documentation, Qai - Data questionable external influence, Purg - Analyzer in Purge

FPL-Pinehurst
Ft. Lauderdale, FL - Site 003

HOURLY AVERAGES FOR SO2 in PPB

MARCH 1989

DAY	HOUR (EST) 00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVG
1	2	3	3	2	2	1	2	3	5	8	6	3	2	1	1	1	1	1	1	1	1	1	1	1	2
2	1	1	1	1	1	1	1	2	3	2	1	1	1	1	Cal	1	1	1	1	2	1	1	1	1	1
3	1	1	Cal	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1
4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	Cal	10	4	2	2	1	1	1	1	1	1
5	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1
6	1	1	1	1	1	1	1	1	1	1	1	1	1	1	Cal	12	6	4	2	2	3	2	1	1	2
7	1	1	1	1	1	1	2	2	Cal	14	4	3	3	1	1	1	1	1	1	1	1	1	1	1	2
8	1	1	1	1	1	1	1	1	1	1	1	1	1	1	Cal	1	1.	2	1	1	1	1	2	1	1
9	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
10	1	1	Cal	1	1	1	1	1	2	2	2	3	3	2	Cal	2	1	1	1	1	1	1	2	2	1
11	2	1	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	2	1	1	1	1	1	1
12	1	1	1	1	1	1	1	1	1	1	3	4	4	3	Cal	12	23	10	4	5	5	5	4	3	4
13	3	2	2	1	1	1	1	2	2	2	2	3	3	3	4	4	3	3	4	3	3	2	2	1	2
14	1	1	1	1	1	1	1	1	1	5	6	2	2	2	Cal	2	1	1	2	2	2	2	2	2	2
15	1	1	1	1	1	1	2	3	2	1	2	1	2	1	1	1	1	2	3	1	2	2	2	1	1
16	1	1	1	1	1	1	2	2	2	1	2	1	1	4	Cal	3	6	2	2	3	2	2	2	1	2
17	3	3	Cal	1	1	3	4	3	6	5	3	8	5	1	3	2	2	3	2	2	2	3	2	4	3
18	3	3	2	3	1	5	5	4	2	3	2	2	2	3	Cal	2	1	1	1	1	1	1	1	1	2
19	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	3	1
20	6	9	13	24	20	14	13	10	4	3	6	19	16	1	Cal	7	3	2	2	1	2	1	1	1	8
21	1	1	1	1	1	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
22	1	1	1	1	1	1	1	2	2	1	1	1	1	1	Cal	1	1	1	1	1	1	2	2	1	1
23	1	1	1	1	1	1	1	2	2	1	1	1	1	1	1	1	2	2	3	3	2	2	2	2	1
24	2	2	Cal	1	1	1	1	1	1	2	1	1	1	1	Cal	1	1	1	3	5	4	2	1	1	1
25	1	1	2	3	3	2	2	2	1	1	3	7	16	36	35	2	3	2	1	2	4	4	2	1	6
26	1	1	1	1	1	1	1	1	2	2	1	1	1	2	Cal	1	1	1	1	1	1	1	1	1	1
27	1	1	1	2	3	6	6	8	5	2	2	1	1	2	2	1	1	1	1	1	1	1	1	3	2
28	4	4	4	2	2	2	4	2	2	1	1	1	2	2	Cal	3	4	2	3	2	2	2	2	1	2
29	9	5	7	2	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2
30	1	1	1	1	1	1	1	1	1	1	1	1	1	1	Cal	1	2	2	1	1	1	2	1	1	1
31	1	1	Cal	1	1	1	1	3	1	2	2	2	1	1	1	2	3	4	3	2	1	1	1	1	2

TOTAL HOURS 744 TOTAL GOOD HOURS 723 DATA CAPTURE 97.2%

MAX. 1HR AVG 36 03/25/89 13:00:00 2ND MAX. 1 HR AVG 35 03/25/89 14:00:00

MIN. 1HR AVG 1 03/03/89 04:00:00 ARITHMETIC MEAN 2 STANDARD DEV. 3

NAAQS Comparison: MAX. 3 HR AVG 29 (500) 03/25/89 14:00:00
MAX. 24 HR AVG 8 (140) 03/20/89 20:00:00

KEY FOR MISSING CODES
Bad< - To few samples for valid average, Cal - calibration, OCal - Analyzer out of calibration
BadS - Bad Analyzer Status, PwrF - Power Failure, Down - Operator downed channel, Miss - Missing Data
Qad - Data questionable insufficient documentation, Qai - Data questionable external influence, Purg - Analyzer in Purge

ESE # 89 509 100

FPL PINEHURST

SO2 PRECISION CALCULATIONS

2ND SAMPLING QUARTER

JANUARY 1,1989 - MARCH 31,1989

DATE	EXPECTED PPB	ACTUAL PPB	% DIFFERENCE(D)
JAN 6, 1989	94.00	95.00	+ 1.06
JAN 13, 1989	94.00	95.00	+ 1.06
JAN 20, 1989	94.00	95.00	+ 1.06
FEB 3, 1989	94.00	96.00	+ 2.13
FEB 17, 1989	94.00	90.00	- 4.26
FEB 24, 1989	94.00	94.00	0.00
MAR 3, 1989	94.00	95.00	+ 1.06
MAR 7, 1989	94.00	95.00	+ 1.06
MAR 7, 1989	94.00	104.00	+ 10.64
MAR 10, 1989	94.00	95.00	+ 1.06
MAR 17, 1989	94.00	96.00	+ 2.13
MAR 23, 1989	94.00	95.00	+ 1.06
MAR 30, 1989	94.00	95.00	+ 1.06

SUM OF D(I) = 19.15

MEAN OF D(I) = 1.47

STD. DEV. = 3.18

UPPER 95% PROBABILITY LIMIT = 5.88

LOWER 95% PROBABILITY LIMIT = -2.93

FPL-Pinehurst
Ft. Lauderdale, FL - Site 003

HOURLY AVERAGES FOR NO2 in PPB

JANUARY 1989

DAY	HOUR (EST) 00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVG
1	18	18	16	16	Cal	17	12	13	10	5	5	6	6	5	5	5	7	13	18	22	24	27	23	20	13
2	20	17	14	14	12	11	16	19	23	14	9	6	5	15	30	24	23	27	51	54	51	47	47	46	25
3	40	31	19	18	Cal	13	12	23	32	39	22	12	7	6	6	9	11	15	28	13	11	11	11	6	17
4	6	3	3	3	4	5	9	16	15	8	6	8	12	14	16	15	21	23	34	45	47	40	41	37	18
5	17	18	22	17	Cal	20	34	35	37	31	26	15	10	8	8	13	18	25	34	28	22	21	14	22	21
6	10	7	17	18	Cal	15	32	35	26	13	12	11	14	12	10	15	19	28	38	35	35	35	35	30	22
7	28	28	24	26	Cal	17	22	24	23	10	8	8	7	8	8	12	13	14	17	17	14	10	11	11	16
8	5	6	5	3	7	6	11	16	9	5	6	6	8	9	10	8	13	15	14	15	8	10	10	6	9
9	5	3	5	5	Cal	10	29	31	25	19	11	10	9	16	12	12	16	16	23	24	27	31	30	30	17
10	10	16	20	18	16	16	19	23	23	15	8	12	9	9	9	10	14	16	19	15	14	14	15	11	14
11	10	6	8	9	Cal	11	19	22	19	12	7	6	7	5	7	10	11	15	13	14	9	9	14	10	11
12	13	8	8	4	8	7	14	21	20	14	13	11	10	8	9	11	16	20	27	24	21	17	18	17	14
13	18	17	19	15	Cal	22	24	24	33	22	25	15	10	8	10	15	17	19	21	20	17	13	10	12	18
14	16	18	16	12	13	17	16	21	17	14	12	9	13	14	12	14	20	16	17	11	11	11	10	12	14
15	6	5	3	4	Cal	5	5	10	10	6	4	5	6	4	6	6	9	15	31	32	18	11	14	16	10
16	15	20	18	16	10	16	21	18	31	43	14	9	9	9	10	12	15	23	25	31	32	28	28	27	20
17	23	20	17	13	Cal	11	10	14	30	34	24	38	20	15	13	12	14	21	29	26	28	32	33	32	22
18	29	25	20	18	13	13	17	21	32	44	22	22	18	22	22	11	13	23	26	30	29	30	27	26	23
19	24	25	20	17	Cal	17	17	20	23	13	8	11	10	7	6	11	10	10	18	18	13	13	14	8	14
20	12	12	12	6	Cal	8	13	16	13	10	8	7	8	13	16	13	16	29	29	28	24	23	20	21	15
21	19	18	17	15	Cal	16	16	17	18	21	12	6	19	26	17	22	30	35	36	30	16	16	26	33	21
22	30	25	20	23	26	16	9	13	14	7	11	8	4	4	5	4	6	10	8	9	6	9	9	6	12
23	3	3	3	3	Cal	4	6	11	12	10	7	8	6	7	8	10	11	19	31	30	25	19	23	20	12
24	13	8	7	6	7	13	30	29	26	20	17	16	16	7	8	9	15	17	24	28	37	37	31	23	18
25	18	13	11	15	Cal	2	5	11	15	10	8	9	7	6	5	5	8	12	8	6	5	5	6	6	8
26	7	8	9	7	7	10	11	21	19	14	12	13	13	12	13	10	14	16	19	21	17	14	11	14	13
27	13	12	11	11	Cal	22	22	25	35	Cal	Cal	Cal	Cal	Cal	Cal	Cal	Cal	Cal	Cal	Cal	32	31	28	27	Bad<
28	28	22	28	27	25	23	22	29	36	33	20	13	10	6	7	14	14	12	20	25	29	18	10	13	20
29	21	11	10	15	Cal	5	8	10	8	6	4	4	5	5	4	6	8	13	16	18	12	9	9	8	9
30	5	4	5	4	7	9	24	34	21	14	16	9	10	PwrF	Cal	Cal	15	22	21	21	29	30	27	23	17
31	20	20	14	13	Cal	12	12	19	25	29	23	14	16	17	12	13	22	27	35	47	42	40	36	36	24

TOTAL HOURS 744 TOTAL GOOD HOURS 712 DATA CAPTURE 95.7%

MAX. 1HR AVG 54 01/02/89 19:00:00 2ND MAX. 1 HR AVG 51 01/02/89 20:00:00

MIN. 1HR AVG 2 01/25/89 05:00:00 ARITHMETIC MEAN 16 STANDARD DEV. 9

KEY FOR MISSING CODES
Bad< - To few samples for valid average, Cal - calibration, OCal - Analyzer out of calibration
BadS - Bad Analyzer Status, PwrF - Power Failure, Down - Operator downed channel, Miss - Missing Data
Qad - Data questionable insufficient documentation, Qai - Data questionable external influence, Purg - Analyzer in Purge

FPL-Pinehurst
Ft. Lauderdale, FL - Site 003

HOURLY AVERAGES FOR NO2 in PPB

FEBRUARY 1989

DAY	HOUR (EST) 00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVG
1	32	29	33	28	24	22	25	26	44	57	23	14	42	35	42	21	14	19	28	30	27	31	31	27	29
2	22	14	15	19	Cal	16	14	16	34	42	14	7	5	5	5	8	13	16	18	15	16	13	12	13	15
3	14	9	7	8	Cal	11	19	25	16	11	9	7	8	6	6	10	9	13	20	21	21	24	23	17	14
4	12	14	19	18	Cal	15	13	16	15	7	7	8	7	7	7	6	8	10	17	18	20	20	20	19	13
5	13	7	6	3	4	7	11	9	7	4	5	4	4	4	4	4	6	11	16	19	17	18	22	23	9
6	21	20	13	5	Cal	11	20	25	15	13	7	7	7	9	7	8	11	13	18	23	24	21	13	10	14
7	6	11	4	6	9	15	28	29	16	9	8	8	8	7	10	9	10	15	19	23	23	24	20	14	14
8	11	11	15	21	Cal	14	17	20	25	26	15	16	16	16	11	10	11	11	19	22	20	18	13	16	16
9	15	16	14	13	11	13	16	24	23	19	19	16	16	15	16	16	21	27	28	16	12	13	14	14	17
10	12	10	8	9	Cal	12	27	36	30	24	27	39	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Bad<
11	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	25	17	24	26	14	14	17	19	24	22	34	31	9	12	Bad<
12	15	18	16	15	Cal	7	10	10	9	8	10	9	9	9	12	11	10	13	19	28	36	34	41	32	16
13	7	6	5	6	7	7	19	30	22	13	12	11	9	14	12	17	23	19	19	18	16	13	9	12	14
14	6	8	9	8	Cal	10	12	17	16	12	11	10	14	13	8	9	10	15	17	16	9	8	8	7	11
15	4	4	3	8	5	4	12	18	16	11	8	6	10	8	7	11	13	13	13	10	6	7	8	6	9
16	8	9	5	4	Cal	6	12	17	13	9	7	7	5	6	4	7	10	10	9	7	6	5	3	3	7
17	1	1	2	2	Cal	2	5	9	8	6	6	5	6	5	5	6	8	14	10	9	9	7	9	9	6
18	7	5	7	7	Cal	5	16	19	11	6	7	7	5	5	3	4	6	10	13	16	16	18	15	9	9
19	8	9	10	17	15	15	12	13	12	7	2	2	3	3	2	4	4	6	8	8	6	6	7	12	8
20	7	6	8	8	Cal	15	16	14	11	9	7	9	9	7	6	11	11	13	13	13	9	7	7	6	10
21	3	1	3	2	2	4	10	14	10	6	4	8	10	9	10	9	10	12	13	13	15	12	9	6	8
22	4	4	2	3	Cal	7	10	15	16	16	12	9	11	12	17	18	16	13	15	26	18	14	7	7	12
23	7	6	6	5	6	8	15	19	12	8	6	5	6	7	6	6	7	8	10	10	8	7	7	6	8
24	6	5	4	4	Cal	6	13	21	18	13	7	6	8	5	6	7	7	12	25	41	41	23	19	16	14
25	15	17	15	9	7	10	16	19	14	10	8	8	7	7	7	8	8	14	26	42	46	43	47	46	19
26	41	29	29	30	Cal	13	21	22	20	14	11	10	7	8	14	21	21	27	49	48	67	39	22	18	25
27	23	31	31	21	25	32	29	45	54	52	16	11	12	13	13	13	14	14	24	29	23	22	16	13	24
28	11	10	18	2	Cal	7	23	29	21	15	15	16	14	17	14	8	11	22	24	34	31	23	17	20	17

TOTAL HOURS 672 TOTAL GOOD HOURS 634 DATA CAPTURE 94.3%

MAX. 1HR AVG 67 02/26/89 20:00:00 2ND MAX. 1 HR AVG 57 02/01/89 09:00:00

MIN. 1HR AVG 1 02/17/89 00:00:00 ARITHMETIC MEAN 14 STANDARD DEV. 9

KEY FOR MISSING CODES
Bad< - To few samples for valid average, Cal - calibration, OCal - Analyzer out of calibration
BadS - Bad Analyzer Status, PwrF - Power Failure, Down - Operator downed channel, Miss - Missing Data
Qad - Data questionable insufficient documentation, Qai - Data questionable external influence, Purg - Analyzer in Purge

FPL-Pinehurst
Ft. Lauderdale, FL - Site 003

HOURLY AVERAGES FOR NO2 in PPB

MARCH 1989

DAY	HOUR (EST) 00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVG
1	21	20	19	20	20	17	14	20	31	54	34	15	12	12	12	11	14	18	17	16	16	16	17	18	19
2	11	15	12	12	Cal	11	13	15	21	12	7	10	7	8	12	14	21	24	21	28	19	19	16	16	15
3	16	9	7	3	Cal	8	16	21	20	13	13	11	16	14	13	14	15	20	19	23	25	23	22	16	15
4	12	9	10	12	Cal	13	15	17	12	6	6	5	4	5	5	5	4	8	13	16	11	6	7	6	9
5	4	4	3	3	2	3	5	4	4	3	4	3	3	2	3	4	3	6	11	14	16	13	8	9	5
6	6	4	2	3	Cal	7	14	18	11	9	8	12	19	22	21	22	18	17	18	25	20	18	13	9	14
7	5	4	14	16	12	13	25	25	22	14	13	14	12	9	14	15	16	16	16	15	16	14	11	8	14
8	8	6	5	4	Cal	7	14	19	18	15	13	15	16	14	11	10	15	15	16	19	14	11	12	9	12
9	8	6	6	6	6	7	10	13	13	11	10	9	8	8	9	12	14	17	18	16	13	12	10	10	10
10	9	8	7	6	Cal	6	10	14	16	11	8	8	8	6	8	13	13	15	14	15	13	12	11	11	10
11	9	7	6	6	6	7	12	14	13	9	11	10	8	8	9	9	10	12	21	21	15	21	18	13	11
12	18	18	12	14	Cal	12	20	13	9	8	7	6	7	5	9	13	23	24	46	68	76	77	76	37	26
13	21	16	11	9	10	18	28	39	36	23	11	9	10	15	28	25	27	36	42	43	51	25	32	36	25
14	23	22	16	18	Cal	22	27	37	41	54	26	11	11	11	9	11	11	16	21	30	33	28	25	20	23
15	8	7	5	5	8	10	29	27	15	8	8	9	10	8	8	9	10	13	19	16	14	11	9	10	11
16	9	7	7	5	Cal	8	21	22	16	8	10	9	6	9	9	10	10	13	14	20	12	10	14	9	11
17	18	11	8	6	Cal	19	28	22	15	10	11	12	10	10	11	7	13	16	17	10	13	10	10	12	13
18	12	9	6	7	Cal	15	21	13	10	10	6	7	6	7	6	5	5	7	9	10	11	9	10	11	9
19	14	14	25	23	20	18	18	17	13	6	5	8	6	5	4	5	5	5	8	10	9	8	8	13	11
20	15	23	23	20	Cal	17	21	15	11	9	9	12	11	6	7	9	10	11	11	11	11	11	6	7	12
21	6	5	7	6	7	16	28	25	11	9	7	6	8	8	7	7	6	9	10	14	11	10	11	9	10
22	11	9	9	7	Cal	11	24	26	13	8	6	6	7	7	8	8	13	12	15	22	20	19	20	16	13
23	9	5	4	4	5	5	11	16	11	6	6	8	10	9	9	13	16	21	23	26	29	28	28	28	14
24	26	27	25	23	Cal	19	17	17	16	15	8	9	14	9	11	11	12	19	23	32	31	29	25	26	19
25	14	13	13	11	13	13	15	16	12	16	15	14	29	32	28	13	14	12	21	25	25	28	27	11	18
26	10	20	20	19	Cal	16	19	25	25	12	3	3	11	9	6	3	4	5	10	10	7	8	6	6	11
27	5	4	8	6	12	18	20	17	10	4	4	3	3	3	3	4	4	5	7	8	5	6	6	13	7
28	13	14	13	11	Cal	7	17	15	9	6	4	4	5	7	8	7	9	11	13	12	12	9	9	6	9
29	11	6	8	3	5	5	12	14	9	7	6	8	6	5	6	5	8	8	12	13	13	8	7	8	8
30	5	1	1	1	Cal	3	10	9	9	5	8	9	11	10	6	10	11	13	13	17	20	19	12	8	9
31	7	3	4	4	Cal	18	21	25	17	13	14	12	12	15	14	16	22	26	31	30	12	16	19	19	16

TOTAL HOURS 744 TOTAL GOOD HOURS 726 DATA CAPTURE 97.6%

MAX. 1HR AVG 77 03/12/89 21:00:00 2ND MAX. 1 HR AVG 76 03/12/89 22:00:00

MIN. 1HR AVG 1 03/30/89 03:00:00 ARITHMETIC MEAN 13 STANDARD DEV. 9

KEY FOR MISSING CODES
Bad< - To few samples for valid average, Cal - calibration, OCal - Analyzer out of calibration
BadS - Bad Analyzer Status, PwrF - Power Failure, Down - Operator downed channel, Miss - Missing Data
Qad - Data questionable insufficient documentation, Qai - Data questionable external influence, Purg - Analyzer in Purge

ESE # 89 509 100

FPL PINEHURST

NO2 PRECISION CALCULATIONS

2ND SAMPLING QUARTER

JANUARY 1,1989 - MARCH 31,1989

DATE	EXPECTED PPB	ACTUAL PPB	% DIFFERENCE(D)
JAN 6, 1989	92.00	94.00	+ 2.17
JAN 20, 1989	92.00	87.00	- 5.43
FEB 3, 1989	92.00	88.00	- 4.35
FEB 17, 1989	92.00	85.00	- 7.61
MAR 3, 1989	92.00	87.00	- 5.43
MAR 17, 1989	92.00	93.00	+ 1.09
MAR 30, 1989	92.00	92.00	0.00

SUM OF D(I) = -19.57

MEAN OF D(I) = -2.80

STD. DEV. = 3.81

UPPER 95% PROBABILITY LIMIT = 2.49

LOWER 95% PROBABILITY LIMIT = -8.08

FPL-Davie
Ft. Lauderdale, FL - Site 004

HOURLY AVERAGES FOR SO2 in PPB

JANUARY 1989

DAY	HOUR (EST) 00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVG
1	1	2	1	1	1	1	1	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
2	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
3	0	0	0	0	0	0	1	2	3	4	3	2	2	2	1	2	1	1	0	0	0	0	0	0	1
4	2	5	Cal	1	1	1	1	2	2	1	2	2	2	2	2	1	1	1	2	2	2	2	2	1	2
5	1	1	1	1	1	1	2	3	4	7	6	6	13	10	5	4	4	3	2	1	2	2	1	2	3
6	2	1	Cal	0	0	1	3	8	8	5	2	4	2	1	0	0	0	0	0	0	0	0	0	0	2
7	2	1	1	1	1	1	2	3	5	6	4	3	2	1	1	1	0	0	0	0	0	0	0	Cal	2
8	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	1	4	9	5	3	3	2	1	1	1	1	2	1	1	1	1	1	1	0	2
10	0	0	Cal	1	1	1	2	4	5	3	3	3	2	3	2	2	2	2	2	2	3	3	3	3	2
11	3	2	2	2	2	3	3	7	9	3	6	42	13	4	4	3	8	7	3	2	2	2	1	1	5
12	1	1	Cal	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0
13	0	0	0	0	0	0	2	6	5	5	5	7	4	2	2	2	7	10	5	2	2	1	1	0	3
14	0	0	Cal	4	2	3	2	9	6	3	2	2	1	1	1	0	0	0	1	0	0	1	0	0	2
15	0	0	Cal	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	1	1	1	2	0
16	2	2	Cal	1	0	0	1	3	4	3	2	1	1	0	0	1	0	0	0	0	0	0	0	0	1
17	0	0	0	0	0	0	1	4	2	2	1	1	1	1	1	1	0	0	0	0	0	0	0	0	1
18	0	0	Cal	0	0	0	1	4	4	2	2	2	1	1	1	0	0	0	0	0	1	1	1	2	1
19	1	0	0	0	0	0	1	3	4	4	5	13	13	4	2	1	2	1	2	3	4	2	1	0	3
20	0	0	Cal	0	0	0	0	1	1	1	1	1	1	1	1	1	1	2	1	0	1	1	1	1	1
21	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	1	1	1	1	1
22	1	1	Cal	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	3	1	0
23	0	0	0	0	0	0	1	1	1	1	1	1	1	2	2	2	2	2	2	1	1	1	1	1	1
24	0	0	Cal	0	0	0	1	1	2	2	2	2	2	2	2	1	1	1	0	0	1	0	0	0	1
25	0	0	0	0	0	0	0	2	3	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0
26	0	0	Cal	0	0	0	1	6	7	6	4	2	3	2	2	1	1	0	0	0	0	0	0	0	2
27	0	0	0	0	0	0	2	4	4	4	3	2	2	1	2	1	0	0	0	0	1	2	2	2	1
28	2	1	1	1	0	0	1	2	2	2	2	Cal	Cal	Cal	Cal	Cal	1	0	0	0	0	0	1	0	1
29	0	1	Cal	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0
30	0	0	Cal	1	0	1	3	9	9	4	3	3	2	3	3	2	3	2	1	1	1	1	1	1	2
31	0	0	1	1	0	1	2	2	2	2	2	4	5	4	3	3	6	28	9	3	3	3	3	2	4

TOTAL HOURS 744 TOTAL GOOD HOURS 724 DATA CAPTURE 97.3%

MAX. 1HR AVG 42 01/11/89 11:00:00 2ND MAX. 1 HR AVG 28 01/31/89 17:00:00

MIN. 1HR AVG 0 01/01/89 10:00:00 ARITHMETIC MEAN 1 STANDARD DEV. 3

NAAQS Comparison: MAX. 3 HR AVG 20 (500) 01/11/89 12:00:00
MAX. 24 HR AVG 6 (140) 01/11/89 18:00:00

KEY FOR MISSING CODES
Bad< - To few samples for valid average, Cal - calibration, OCal - Analyzer out of calibration
BadS - Bad Analyzer Status, PwrF - Power Failure, Down - Operator downed channel, Miss - Missing Data
Qad - Data questionable insufficient documentation, Qai - Data questionable external influence, Purg - Analyzer in Purge

ESE # 89 509 100

FPL DAVIE

SO2 PRECISION CALCULATIONS

2ND SAMPLING QUARTER

JANUARY 1,1989 - MARCH 31,1989

DATE	EXPECTED PPB	ACTUAL PPB	%DIFFERENCE(D)
JAN 15, 1989	90.00	95.00	+ 5.56
JAN 29, 1989	90.00	96.00	+ 6.67
FEB 12, 1989	90.00	95.00	+ 5.56
FEB 26, 1989	90.00	95.00	+ 5.56
MAR 12, 1989	90.00	96.00	+ 6.67
MAR 26, 1989	90.00	97.00	+ 7.78

SUM OF D(I) = 37.78

MEAN OF D(I) = 6.30

STD. DEV. = 0.91

UPPER 95% PROBABILITY LIMIT = 7.55

LOWER 95% PROBABILITY LIMIT = 5.04

FPL-Davie
Ft. Lauderdale, FL - Site 004

HOURLY AVERAGES FOR WD in DGS

JANUARY 1989

DAY	HOUR (EST) 00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVG
1	10	345	346	89	113	9	357	31	13	160	153	146	152	136	137	134	137	145	150	155	154	233	286	293	162
2	269	263	316	8	347	0	339	340	342	339	327	296	311	16	230	274	137	128	136	142	120	110	231	210	218
3	237	263	261	265	268	301	330	322	292	309	295	278	288	272	278	292	286	280	286	285	276	269	262	260	282
4	334	333	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Bad<
5	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	351	6	59	96	117	119	113	115	121	122	141	67	143	161	255	Bad<
6	143	77	21	358	315	97	2	84	155	155	160	45	134	127	129	133	127	120	112	121	125	126	110	112	129
7	115	121	119	129	132	134	141	113	113	91	78	133	131	132	122	111	125	115	117	115	111	120	112	116	119
8	120	126	130	132	123	110	97	101	168	336	348	111	125	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Bad<
9	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	126	124	121	119	118	116	102	112	100	351	357	338	318	322	Bad<
10	10	344	359	35	36	18	28	43	54	72	73	82	74	58	41	51	71	77	70	84	82	95	84	69	84
11	79	116	83	56	47	56	354	9	114	120	119	97	92	104	93	97	104	112	96	113	107	101	119	124	105
12	122	113	114	118	120	124	126	120	120	119	114	127	126	134	132	135	128	124	117	101	111	115	111	114	120
13	105	89	49	84	110	149	11	335	345	326	18	340	9	91	94	95	93	105	71	69	76	57	72	68	119
14	83	92	94	96	94	92	98	82	102	106	109	110	122	116	116	118	119	120	118	113	112	108	119	113	106
15	131	141	147	141	125	131	123	140	313	140	138	136	130	137	135	121	122	128	124	120	113	16	93	310	140
16	331	19	58	79	326	334	340	36	357	10	97	119	106	136	120	117	123	131	140	147	136	148	235	271	163
17	322	293	83	43	270	289	231	282	311	313	314	273	19	112	140	141	139	147	150	121	347	15	135	248	197
18	271	233	155	27	33	47	336	346	326	359	118	114	127	118	118	128	122	123	120	129	30	17	17	341	156
19	326	346	330	341	352	340	345	1	353	97	97	103	101	90	91	84	90	94	98	100	96	103	105	107	175
20	115	110	115	123	143	134	136	139	145	150	153	159	149	151	125	148	155	156	255	270	234	202	294	307	170
21	293	253	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Bad<
22	54	141	328	224	163	188	206	203	206	217	200	224	243	250	308	255	241	235	309	308	307	307	304	308	239
23	312	316	295	286	294	293	300	292	299	311	310	325	320	322	327	322	332	335	336	333	339	354	333	316	317
24	327	334	337	342	336	323	334	312	312	327	326	349	12	38	60	72	59	47	36	18	12	6	10	8	181
25	3	351	353	338	349	340	342	331	348	78	80	80	80	80	83	79	83	78	67	76	79	90	86	90	165
26	94	100	106	103	108	109	94	101	106	112	115	119	118	118	120	125	121	117	118	121	120	115	119	125	113
27	94	349	17	35	356	342	317	304	320	113	117	118	118	124	122	126	131	126	120	135	143	58	334	29	169
28	333	334	358	339	339	11	322	326	334	334	285	Bad<	Bad<	Bad<	Bad<	Bad<	118	125	131	138	151	136	103	116	228
29	63	60	333	280	289	340	327	323	130	135	133	129	126	124	125	137	125	117	100	117	98	104	114	116	164
30	118	101	113	122	127	134	99	328	296	235	202	192	166	169	160	166	172	166	169	181	201	262	267	262	184
31	282	300	308	315	285	279	299	274	301	331	323	324	345	23	39	102	103	104	82	78	272	226	159	143	221

TOTAL HOURS 744 TOTAL GOOD HOURS 665 DATA CAPTURE 89.4%

MAX. 1HR AVG 359 01/18/89 09:00:00 2ND MAX. 1 HR AVG 359 01/10/89 02:00:00

MIN. 1HR AVG 0 01/02/89 05:00:00 ARITHMETIC MEAN 170 STANDARD DEV. 102

KEY FOR MISSING CODES
Bad< - To few samples for valid average, Cal - calibration, OCal - Analyzer out of calibration
BadS - Bad Analyzer Status, PwrF - Power Failure, Down - Operator downed channel, Miss - Missing Data
Qad - Data questionable insufficient documentation, Qai - Data questionable external influence, Purg - Analyzer in Purge

FPL-Davie
Ft. Lauderdale, FL - Site 004

HOURLY AVERAGES FOR WS in MPH

JANUARY 1989

DAY	HOUR (EST) 00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVG
1	2.2	3.9	2.3	1.0	3.0	3.2	5.6	3.3	1.6	4.7	6.3	6.6	5.8	6.0	7.9	6.8	6.8	6.3	5.1	3.9	2.6	2.7	3.0	2.3	4.3
2	2.0	7.3	2.0	3.6	4.6	5.0	2.5	2.4	2.4	3.5	4.8	3.5	2.5	2.3	1.2	2.9	4.9	4.1	3.6	3.2	2.6	3.5	2.7	4.2	3.4
3	3.3	2.2	2.0	3.3	2.1	3.5	3.8	3.1	2.6	3.6	4.5	5.7	8.3	8.3	9.9	10.7	10.7	8.3	8.6	9.7	5.8	3.8	4.8	5.2	5.5
4	4.1	4.2	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Bad<
5	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	4.9	4.4	4.5	7.4	8.9	8.8	8.9	8.3	6.2	5.2	3.4	1.3	1.3	2.7	4.2	Bad<
6	5.4	2.0	2.2	2.1	2.4	2.7	3.3	0.9	3.1	7.2	10.9	2.3	7.4	10.1	9.8	10.3	9.4	9.7	9.3	8.8	6.5	4.3	3.8	5.2	5.8
7	6.1	8.2	7.6	6.8	5.1	5.2	4.5	2.5	2.5	2.9	3.9	4.4	10.2	9.3	9.6	10.1	10.0	10.1	8.9	8.4	6.3	4.8	4.4	4.5	6.5
8	5.0	6.5	6.0	5.3	3.7	3.6	2.8	2.7	1.3	1.9	1.4	2.4	9.3	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Bad<
9	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	11.5	10.7	10.3	9.9	8.7	8.5	7.5	6.8	2.9	2.1	1.4	2.5	2.4	2.7	Bad<
10	2.5	2.4	3.1	3.1	2.6	4.1	3.0	2.1	2.4	4.7	5.8	5.3	5.8	5.1	4.8	5.0	6.1	5.0	3.4	2.8	2.7	3.9	2.5	2.1	3.7
11	2.2	3.6	2.5	2.2	3.2	3.2	2.0	2.3	4.4	8.7	9.7	8.3	8.5	7.2	7.6	8.0	7.3	8.1	5.7	5.4	4.8	8.2	9.6	7.5	5.8
12	6.2	4.9	5.2	5.6	4.7	5.3	5.6	6.9	9.4	12.3	12.5	12.0	13.4	11.8	10.8	9.2	9.8	8.3	4.8	3.1	4.4	4.9	5.4	5.8	7.6
13	4.0	2.5	3.0	2.9	4.5	2.8	3.3	2.0	2.0	1.2	1.1	2.7	2.3	7.3	7.4	8.2	7.0	5.3	2.7	2.6	2.7	3.0	2.4	2.6	3.5
14	3.5	4.5	5.8	6.0	5.4	4.5	4.1	3.0	8.4	12.1	13.1	13.4	12.3	11.9	12.0	13.3	12.2	10.2	9.8	8.9	8.6	8.2	9.0	5.2	8.5
15	2.7	6.2	5.5	4.7	3.0	4.6	3.5	2.3	1.4	6.6	8.0	8.2	8.6	8.9	8.5	8.4	7.3	6.2	4.9	4.5	4.4	1.7	2.6	3.6	5.2
16	5.1	6.3	2.4	4.0	2.1	3.6	2.1	1.5	1.2	1.1	1.9	3.0	3.2	4.7	6.7	8.4	7.9	5.7	4.1	3.4	2.9	2.4	2.5	2.9	3.7
17	5.6	4.0	5.4	6.0	3.4	5.0	0.9	4.2	4.8	4.1	3.1	1.7	0.4	3.3	7.1	8.2	7.9	7.0	4.9	0.9	4.0	1.9	1.8	2.2	4.0
18	2.0	3.5	3.4	3.9	3.6	3.0	2.1	2.1	2.4	1.7	2.9	4.5	6.2	7.1	6.8	7.9	7.2	6.5	3.9	3.2	2.0	2.3	1.4	1.3	3.8
19	2.3	2.2	3.1	2.6	2.7	2.2	2.1	2.8	2.1	7.1	10.5	10.5	11.8	11.7	11.6	10.5	11.6	11.5	8.6	8.9	7.8	9.4	9.3	8.8	7.1
20	7.7	8.7	9.5	7.4	3.3	6.4	6.4	4.8	6.7	11.1	10.3	11.3	10.5	8.6	7.7	7.6	7.3	4.4	2.7	2.9	1.9	2.3	4.8	4.6	6.6
21	2.0	2.1	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Bad<
22	2.1	0.6	1.8	2.5	5.7	7.5	6.0	7.6	6.8	10.6	10.0	11.8	14.1	14.0	9.7	8.0	9.8	7.6	10.7	5.8	10.4	8.9	9.4	13.3	8.1
23	13.1	13.0	10.3	8.1	10.0	10.6	14.7	12.2	13.1	13.0	12.9	12.0	11.7	11.9	11.0	10.2	8.3	7.6	6.1	6.5	6.8	6.8	5.6	6.8	10.1
24	6.8	6.8	6.4	5.9	5.6	4.5	3.8	6.1	6.9	6.5	6.1	5.3	5.6	5.8	7.0	7.7	6.9	6.6	5.0	4.4	4.2	4.2	4.9	4.6	5.7
25	4.1	3.6	3.5	3.2	3.8	3.2	3.3	2.7	2.5	9.5	11.3	11.1	11.4	11.3	10.9	10.8	12.3	10.0	7.6	9.4	9.9	10.0	9.8	9.3	7.7
26	8.6	9.3	11.7	9.4	9.2	8.8	9.1	8.6	11.3	13.2	14.5	13.3	13.5	12.4	13.3	12.1	11.0	9.0	6.3	6.2	5.1	4.6	3.3	3.7	9.5
27	2.2	2.7	2.4	2.9	3.0	2.0	2.1	2.1	0.9	1.2	2.3	2.3	4.8	5.2	6.1	7.2	6.6	5.5	4.3	2.1	2.5	4.4	5.2	5.6	3.5
28	6.5	2.2	2.8	2.2	1.1	5.9	3.4	2.5	2.9	3.5	2.5	Bad<	Bad<	Bad<	Bad<	Bad<	7.5	6.7	3.7	2.4	2.8	5.0	4.4	2.9	3.7
29	5.3	7.1	5.0	2.7	4.3	2.1	3.5	4.7	5.8	8.0	9.7	8.7	9.6	9.5	9.9	9.3	7.9	7.2	5.0	4.1	2.9	3.9	3.6	2.9	5.9
30	4.5	3.1	5.2	5.9	5.5	3.6	3.1	2.6	2.1	4.2	5.2	6.6	8.0	8.7	10.8	10.2	8.9	8.9	6.7	4.3	3.4	3.2	3.4	3.2	5.4
31	3.9	3.5	3.8	3.7	3.5	4.4	2.3	2.4	3.7	4.3	4.7	6.1	4.1	1.9	1.9	6.2	6.1	5.7	3.5	2.0	1.9	1.0	2.4	4.5	3.6

TOTAL HOURS 744 TOTAL GOOD HOURS 665 DATA CAPTURE 89.4%

MAX. 1HR AVG 14.7 01/23/89 06:00:00 2ND MAX. 1 HR AVG 14.5 01/26/89 10:00:00

MIN. 1HR AVG 0.4 01/17/89 12:00:00 ARITHMETIC MEAN 5.7 STANDARD DEV. 3.2

KEY FOR MISSING CODES
Bad< - To few samples for valid average, Cal - calibration, OCal - Analyzer out of calibration
BadS - Bad Analyzer Status, PwrF - Power Failure, Down - Operator downed channel, Miss - Missing Data
Qad - Data questionable insufficient documentation, Qai - Data questionable external influence, Purg - Analyzer in Purge

FPL-Davie
Ft. Lauderdale, FL - Site 004

HOURLY AVERAGES FOR Sig01 in deg

JANUARY 1989

DAY	HOUR (EST) 00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVG
1	15.2	18.1	10.6	34.5	65.3	14.9	16.1	46.7	52.2	15.3	17.6	17.6	20.9	16.8	17.4	15.9	13.6	10.5	6.6	7.3	8.8	10.5	6.1	12.7	19.6
2	19.3	22.6	17.9	15.3	13.3	12.0	10.3	13.1	16.4	20.1	17.2	32.2	46.8	37.3	45.2	40.1	22.6	12.0	8.6	8.9	7.7	45.7	20.8	13.2	21.6
3	14.8	10.6	29.1	18.1	13.1	11.2	12.1	12.7	16.1	16.6	20.4	21.0	14.1	19.6	16.0	15.9	12.0	12.6	10.6	11.2	13.3	14.6	16.4	16.9	15.4
4	10.5	12.4	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Bad<
5	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	21.9	24.3	28.2	20.4	18.0	18.1	16.9	15.7	13.2	10.3	8.1	41.1	26.3	10.0	48.7	Bad<
6	21.0	20.5	19.6	22.5	12.8	42.7	52.0	60.4	10.6	12.5	12.5	38.2	13.1	14.2	15.4	14.3	15.3	16.4	15.5	12.7	10.9	12.0	11.9	10.3	20.3
7	9.0	10.8	10.3	12.7	12.2	12.2	9.7	11.5	24.6	25.1	26.9	13.2	13.7	13.9	15.0	13.5	14.7	14.1	14.2	13.6	11.4	11.1	9.3	9.3	13.8
8	10.1	11.6	12.6	12.4	10.8	7.6	14.8	16.6	47.1	17.2	52.9	44.9	13.5	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Bad<
9	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	9.0	16.0	14.6	17.4	16.0	17.4	15.9	13.3	40.6	29.6	50.9	12.0	8.4	11.2	Bad<
10	27.5	31.9	15.0	27.8	12.4	9.9	26.2	21.9	26.5	20.7	20.3	20.4	21.4	20.5	19.7	20.2	17.0	16.9	20.1	21.2	22.3	10.1	16.1	44.3	21.3
11	27.9	11.5	15.4	19.9	15.3	23.0	22.7	38.0	26.8	14.1	13.6	16.5	14.3	17.1	16.6	16.5	15.0	12.4	13.3	11.5	10.8	11.2	10.4	11.2	16.9
12	10.5	8.2	8.7	10.1	9.8	11.7	11.9	10.9	12.6	13.0	13.0	13.0	13.7	14.6	13.7	15.8	13.6	11.4	10.6	12.5	9.2	9.2	8.4	8.7	11.4
13	8.3	28.7	40.5	25.2	25.8	8.7	25.1	17.4	20.4	52.0	50.9	36.1	44.6	17.6	20.1	15.3	15.4	13.9	23.4	34.1	18.6	25.9	17.0	15.7	25.0
14	10.1	12.6	9.7	9.2	9.7	9.0	10.8	19.4	11.2	11.9	13.2	14.6	14.7	14.7	14.7	12.5	10.9	11.5	11.1	12.8	10.5	9.9	11.2	13.6	12.1
15	12.1	12.0	9.7	9.9	36.4	18.6	40.7	31.7	44.1	14.4	14.2	17.1	13.9	15.8	17.7	14.6	13.9	11.5	9.7	8.2	14.8	40.8	47.1	33.1	20.9
16	19.4	23.6	50.4	17.9	8.3	13.8	17.1	58.2	53.8	41.0	53.3	44.9	38.3	33.1	17.1	14.2	11.4	13.2	11.1	9.3	8.8	18.2	16.6	13.0	25.3
17	11.2	47.9	41.1	23.0	24.8	28.7	70.2	27.4	10.8	15.5	30.0	56.1	66.9	51.2	15.0	13.5	13.0	11.1	9.0	37.5	16.4	29.1	50.7	46.8	31.1
18	12.4	18.3	35.7	30.2	24.9	47.3	15.7	22.3	23.7	45.2	25.2	32.0	18.8	21.9	18.3	17.1	14.3	12.4	15.5	16.9	29.1	18.3	48.5	37.1	25.1
19	8.3	14.9	17.4	12.4	13.1	14.3	18.6	28.7	22.0	21.5	14.2	15.2	13.8	14.7	14.4	15.2	13.6	11.5	11.0	9.9	10.5	10.9	10.0	10.5	14.4
20	11.9	9.9	10.5	11.5	13.8	12.6	12.4	12.4	12.5	12.7	14.3	13.6	13.7	15.8	12.0	13.3	11.5	12.5	22.7	21.0	19.7	18.7	18.8	8.3	14.0
21	18.2	20.5	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Bad<
22	37.7	58.0	35.1	18.1	8.8	11.5	13.3	12.7	13.9	15.3	13.5	16.8	18.0	20.1	12.2	21.5	17.4	18.3	11.0	20.9	11.4	9.4	9.8	9.4	18.1
23	10.6	10.6	11.7	12.5	12.0	11.4	9.7	11.4	10.4	9.7	11.5	14.7	16.1	14.8	13.1	13.2	16.3	14.1	13.6	12.5	12.8	16.3	12.4	8.9	12.5
24	10.8	11.7	12.7	14.3	13.3	11.0	13.2	8.4	8.9	13.1	15.8	22.4	24.9	25.4	20.8	19.9	20.7	18.8	18.2	15.3	13.9	13.7	17.0	15.3	15.8
25	16.4	16.1	14.9	12.1	14.9	13.3	16.1	14.9	35.0	15.5	16.4	16.1	17.7	16.3	16.9	17.4	15.3	16.1	19.2	15.2	14.1	13.1	12.8	12.2	16.2
26	12.2	10.4	10.1	9.4	10.1	9.5	11.4	11.1	11.6	12.6	13.6	15.2	14.1	15.9	13.3	13.7	12.5	11.9	10.9	10.4	9.5	8.9	12.6	12.6	11.8
27	30.0	18.2	21.9	26.5	23.7	16.1	24.0	40.0	58.8	34.5	53.2	54.3	45.6	19.6	20.4	14.6	14.9	12.0	11.2	9.7	17.2	57.6	28.1	42.2	28.9
28	15.5	21.9	12.0	9.3	48.9	31.5	18.5	11.0	13.3	18.5	50.0	Bad<	Bad<	Bad<	Bad<	Bad<	13.6	12.4	12.0	5.7	10.8	14.9	52.9	14.3	20.4
29	24.7	44.6	14.4	13.6	19.4	14.9	22.1	56.1	13.8	13.6	14.8	16.3	15.0	14.1	15.4	13.9	13.5	11.9	12.0	10.0	14.9	10.9	13.5	15.3	17.9
30	10.4	11.5	11.0	12.0	12.5	9.3	40.5	33.7	21.4	18.1	25.8	20.8	18.5	18.0	14.2	14.7	13.9	10.4	9.8	10.0	11.0	14.4	18.3	13.8	16.4
31	8.8	9.4	7.0	7.6	25.9	29.8	37.3	17.1	12.6	13.8	17.1	17.9	34.2	60.5	62.0	24.5	17.5	14.3	15.5	26.4	45.9	19.0	6.5	59.4	24.6

TOTAL HOURS 744 TOTAL GOOD HOURS 665 DATA CAPTURE 89.4%

MAX. 1HR AVG 70.2 01/17/89 06:00:00 2ND MAX. 1 HR AVG 66.9 01/17/89 12:00:00

MIN. 1HR AVG 5.7 01/28/89 19:00:00 ARITHMETIC MEAN 19.0 STANDARD DEV. 11.6

KEY FOR MISSING CODES
Bad< - To few samples for valid average, Cal - calibration, OCal - Analyzer out of calibration
BadS - Bad Analyzer Status, PwrF - Power Failure, Down - Operator downed channel, Miss - Missing Data
Qad - Data questionable insufficient documentation, Qai - Data questionable external influence, Purg - Analyzer in Purge

FPL-Davie
Ft. Lauderdale, FL - Site 004

HOURLY AVERAGES FOR TEMP in DGC

JANUARY 1989

DAY	HOUR (EST) 00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVG
1	19.5	19.0	19.0	18.6	18.5	18.3	17.9	18.2	21.0	24.0	25.5	26.1	26.5	26.1	26.4	26.1	25.3	23.8	22.4	21.6	20.8	20.5	19.7	19.6	21.8
2	19.6	18.9	18.5	18.5	17.9	17.7	17.9	18.1	19.7	22.1	23.6	24.7	24.8	25.9	26.7	27.1	26.0	24.3	22.9	22.1	21.5	20.8	20.4	20.5	21.6
3	19.4	18.6	17.9	17.4	17.2	16.8	17.2	17.8	18.8	21.3	23.4	24.9	25.4	26.1	26.4	27.0	26.4	25.0	23.4	21.7	20.6	19.6	19.1	18.8	21.2
4	11.4	12.0	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Bad<
5	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	16.9	19.2	21.4	22.5	22.4	22.6	22.3	21.7	20.7	19.8	18.8	18.5	18.2	17.3	16.6	Bad<
6	15.8	16.2	15.7	15.3	15.1	15.4	15.9	16.6	19.3	22.6	23.7	19.6	23.1	24.2	25.0	25.1	25.3	25.2	24.9	24.1	23.1	22.2	21.9	22.2	20.7
7	22.3	22.5	22.5	22.4	21.8	21.5	21.0	20.0	18.9	18.9	18.9	21.9	24.5	25.3	25.9	26.1	25.9	25.7	25.4	24.5	23.6	22.8	22.4	22.2	22.8
8	22.2	22.5	22.2	21.8	21.2	20.6	18.6	17.9	17.9	17.8	18.5	22.2	24.3	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Bad<
9	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	24.9	25.5	25.6	26.0	26.0	25.7	25.3	24.1	23.3	22.3	22.0	21.2	20.7	20.1	Bad<
10	20.4	20.5	20.4	20.4	20.1	19.7	19.6	19.6	21.6	24.1	25.1	23.9	24.0	24.1	23.5	23.9	24.2	23.8	23.3	22.7	21.9	22.2	21.7	20.3	22.1
11	20.2	21.2	20.6	19.2	18.9	18.7	18.8	19.3	22.5	24.4	25.5	26.4	26.4	25.7	26.4	25.7	25.0	24.4	23.8	23.2	23.0	23.4	22.9	22.6	22.8
12	22.5	22.0	22.1	22.2	22.1	22.6	22.4	22.5	23.6	24.5	24.9	25.1	25.3	25.7	25.4	25.5	24.8	23.8	23.0	22.4	22.1	22.0	21.9	21.6	23.3
13	21.1	19.5	18.1	17.7	17.2	16.9	17.5	17.5	19.6	22.7	25.0	26.1	26.6	26.2	26.4	26.1	25.7	24.5	23.3	22.3	21.8	21.1	20.8	20.7	21.8
14	20.5	21.5	22.1	21.9	21.8	21.3	21.4	21.1	23.7	25.0	25.4	26.1	25.8	26.3	26.2	25.8	24.9	24.1	23.6	23.8	23.5	23.3	23.0	21.9	23.5
15	21.9	22.3	22.1	21.6	21.1	20.8	21.5	21.1	22.2	24.4	25.3	26.1	26.1	26.3	26.3	25.7	25.2	24.1	22.9	22.3	22.1	21.0	20.2	19.7	23.0
16	19.4	19.1	18.3	18.2	17.9	17.9	17.6	17.6	19.6	23.0	24.9	26.1	26.6	27.1	27.1	26.6	25.1	24.1	23.2	22.3	21.8	21.1	20.4	19.6	21.8
17	19.4	19.1	18.8	18.5	18.0	18.1	17.8	18.2	19.4	21.4	23.2	24.7	25.8	26.7	25.9	25.9	25.3	24.1	22.9	22.9	22.2	21.5	21.5	21.4	21.8
18	20.7	19.9	19.2	19.0	19.0	18.4	18.7	18.9	20.6	23.2	24.4	25.5	26.3	26.7	26.3	25.7	24.9	23.8	23.0	22.2	21.4	20.6	19.9	19.6	22.0
19	19.6	19.9	19.5	19.0	18.8	18.7	18.7	19.0	20.7	24.0	25.0	25.5	25.8	26.2	26.0	25.3	24.7	23.9	23.6	23.7	23.5	23.4	22.9	22.7	22.5
20	22.4	22.4	22.4	22.6	22.0	22.4	22.8	22.8	23.6	25.0	25.7	26.2	26.6	22.8	23.7	25.0	24.9	24.3	23.2	22.0	21.7	21.3	20.8	20.4	23.2
21	20.1	19.5	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Bad<
22	19.6	19.6	19.7	19.4	19.9	20.8	21.4	21.5	21.4	20.0	22.0	24.0	25.3	25.9	22.8	24.7	24.6	23.6	21.8	20.0	19.3	18.0	17.4	16.0	21.2
23	14.5	13.1	12.3	12.5	12.7	12.8	12.6	12.0	12.0	12.1	13.4	15.9	16.9	18.1	19.1	19.9	19.7	18.4	17.5	16.7	15.9	15.3	15.0	14.3	15.1
24	14.0	13.6	13.4	13.9	14.0	13.6	13.3	13.0	14.0	16.3	18.7	21.3	23.3	24.0	24.3	24.4	23.7	22.6	21.3	20.4	19.5	18.6	18.4	18.3	18.2
25	18.3	17.6	17.3	17.5	18.1	18.0	17.7	17.5	19.2	22.3	23.5	23.7	24.3	24.6	24.6	24.2	23.5	22.8	22.3	22.0	21.9	21.6	21.2	21.3	21.0
26	21.1	21.2	20.8	20.8	20.9	20.7	21.2	21.4	22.3	23.1	23.8	24.1	24.2	24.6	24.4	23.8	23.3	22.6	21.9	21.4	21.2	21.1	20.9	20.5	22.1
27	19.9	18.6	18.5	18.2	18.0	18.6	18.8	18.5	19.3	22.5	24.0	25.2	25.4	25.1	25.0	24.5	24.1	23.0	22.4	21.6	20.7	19.9	19.4	18.9	21.2
28	18.4	17.9	17.8	17.7	18.2	18.2	18.4	18.3	19.5	21.7	22.7	Bad<	Bad<	Bad<	Bad<	Bad<	23.8	23.1	22.0	21.1	20.8	20.9	21.0	20.6	20.1
29	19.5	18.6	18.1	18.4	18.8	18.9	19.1	19.2	21.5	23.3	24.0	24.7	24.9	24.8	24.5	24.6	23.9	23.0	22.3	21.5	21.2	21.1	20.8	19.8	21.5
30	20.7	20.5	21.0	21.4	21.1	20.0	19.2	19.6	21.1	22.8	24.5	25.6	26.7	26.6	26.5	26.2	25.6	24.2	22.7	21.7	21.1	20.3	19.7	19.3	22.4
31	18.6	18.1	17.6	17.1	16.6	15.9	15.9	15.9	16.1	16.9	18.9	21.2	22.0	23.6	25.1	25.2	24.6	23.6	22.5	21.4	20.3	19.2	18.7	19.1	19.7

TOTAL HOURS 744 TOTAL GOOD HOURS 665 DATA CAPTURE 89.4%

MAX. 1HR AVG 27.1 01/16/89 13:00:00 2ND MAX. 1 HR AVG 27.1 01/16/89 14:00:00

MIN. 1HR AVG 11.4 01/04/89 00:00:00 ARITHMETIC MEAN 21.4 STANDARD DEV. 3.2

KEY FOR MISSING CODES
Bad< - To few samples for valid average, Cal - calibration, OCal - Analyzer out of calibration
BadS - Bad Analyzer Status, PwrF - Power Failure, Down - Operator downed channel, Miss - Missing Data
Qad - Data questionable insufficient documentation, Qai - Data questionable external influence, Purg - Analyzer in Purge

FPL-Davie
Ft. Lauderdale, FL - Site 004

HOURLY AVERAGES FOR RNFL in INCH

JANUARY 1989

DAY	HOUR (EST) 00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVG
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Bad<
5	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Bad<
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Bad<
9	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Bad<
10	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Bad<
22	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.04	0.09	0.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Bad<	Bad<	Bad<	Bad<	Bad<	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

TOTAL HOURS 744 TOTAL GOOD HOURS 665 DATA CAPTURE 89.4%

MAX. 1HR AVG 0.46 01/22/89 09:00:00 2ND MAX. 1 HR AVG 0.11 01/20/89 13:00:00

MIN. 1HR AVG 0.00 01/01/89 00:00:00 ARITHMETIC MEAN 0.00 STANDARD DEV. 0.02

KEY FOR MISSING CODES
Bad< - To few samples for valid average, Cal - calibration, OCal - Analyzer out of calibration
BadS - Bad Analyzer Status, PwrF - Power Failure, Down - Operator downed channel, Miss - Missing Data
Qad - Data questionable insufficient documentation, Qai - Data questionable external influence, Purg - Analyzer in Purge

FPL DAVIE PRECIPITATION

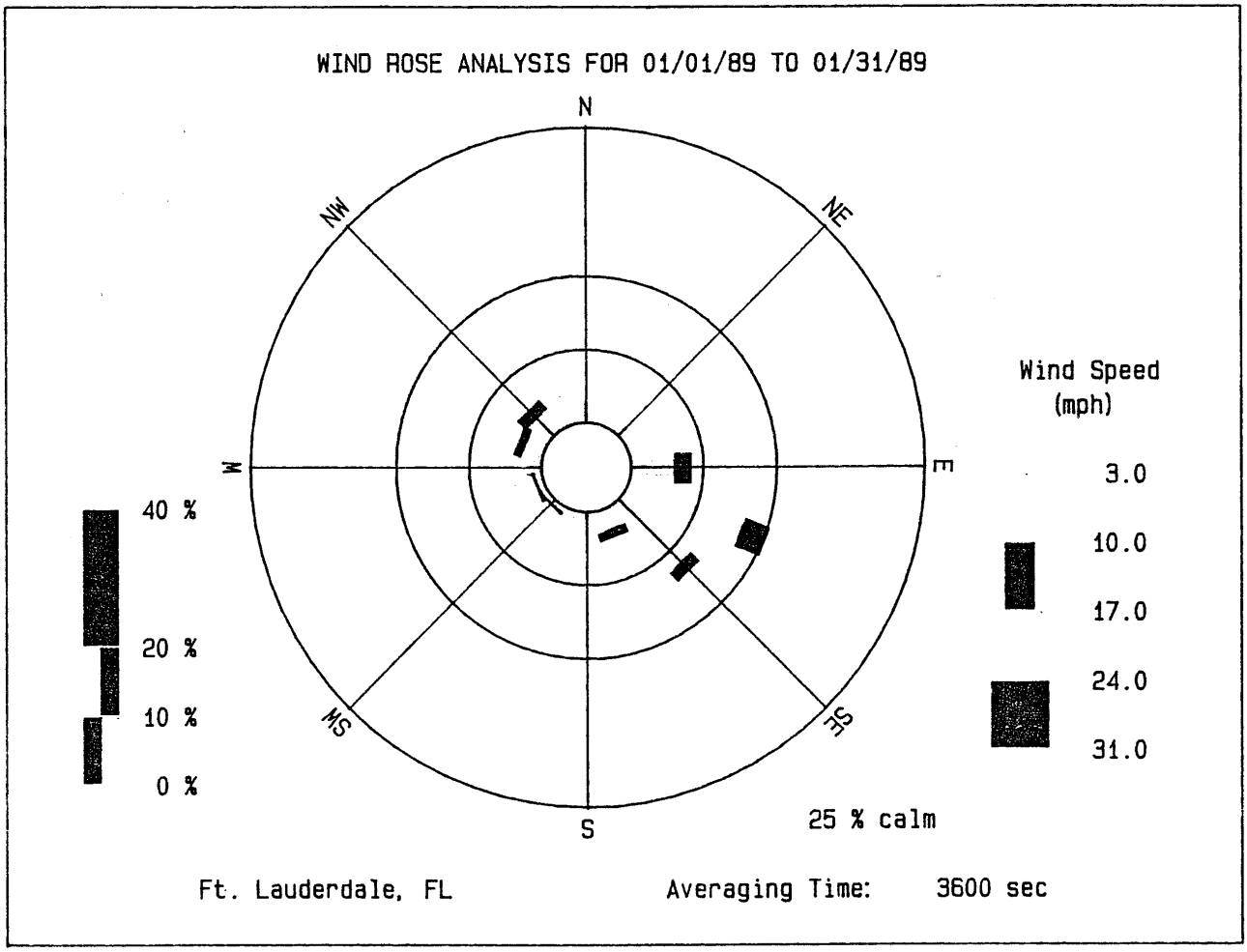
DATE	TIME	AMOUNT
01-10-89	0100	.01
	1100	.02
01-14-89	2200	.05
01-20-89	1300	.11
01-22-89	0500	.01
	0700	.04
	0800	.09
	0900	.46
	T O T A L - - -	.79

WIND ROSE ANALYSIS FOR 01/01/89 TO 01/31/89

Wind Speed (mph)	DIRECTION															
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW
> 31.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
31.0-24.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
24.0-17.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
17.0-10.0	0.0	0.0	0.0	0.2	2.3	3.6	1.5	1.1	0.0	0.0	0.3	0.3	0.0	1.2	1.7	0.2
10.0- 3.0	2.9	1.4	1.5	2.9	5.9	17.	12.	2.9	0.8	1.2	0.5	0.6	2.3	2.6	3.3	5.3
3.0 <																
All Speed	2.9	1.4	1.5	3.0	8.1	20.	14.	3.9	0.8	1.2	0.8	0.9	2.3	3.8	5.0	5.4

EV-1

Press Esc to exit analysis, or any other key to continue...


WIND ROSE ANALYSIS FOR 01/01/89 TO 01/31/89
N
NE
E
SE
S
SW
W
NW
40 %
20 %
10 %
0 %
Wind Speed
(mph)
3.0
10.0
17.0
24.0
31.0
25 % calm
Ft. Lauderdale, FL
Averaging Time: 3600 sec

FPL-Davie
Ft. Lauderdale, FL - Site 004

HOURLY AVERAGES FOR SO2 in PPB

FEBRUARY 1989

DAY	HOUR (EST) 00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVG
1	2	1	Cal	1	1	1	2	5	5	5	4	3	3	3	3	3	3	1	1	1	1	1	2	2	2
2	2	2	2	1	1	1	2	4	4	6	38	27	28	25	11	4	2	2	1	2	1	2	2	2	7
3	2	2	Cal	1	1	2	4	7	7	3	2	2	1	1	1	1	1	1	1	1	1	1	1	2	2
4	2	2	2	2	1	2	1	2	2	1	1	1	1	1	0	3	3	0	0	0	0	1	1	0	1
5	0	0	Cal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0
6	0	0	0	0	0	0	3	5	3	1	1	1	0	0	0	0	0	0	0	0	0	0	0	1	0
7	1	1	Cal	0	0	0	1	5	3	1	0	0	0	0	2	10	4	6	3	2	2	0	0	1	2
8	0	0	0	0	0	0	1	2	2	1	1	3	2	1	1	1	0	0	0	0	0	0	1	0	1
9	0	0	Cal	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	1	1	1	1	2	2	1	1	2	1	1	2	4	2	1	2	1	1
11	0	0	Cal	0	0	0	0	0	1	2	2	3	2	1	0	1	1	0	0	1	0	0	1	3	1
12	8	11	Cal	8	5	3	3	4	4	3	3	3	3	2	1	1	2	1	1	1	1	0	0	0	3
13	0	0	Cal	1	0	1	3	6	5	3	1	1	1	1	1	0	1	0	0	0	0	0	0	0	1
14	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	3	3	3	2	2	2	3	0	2	1
15	0	0	Cal	0	0	0	0	4	6	3	1	5	6	4	4	10	5	3	2	0	0	0	0	0	2
16	0	4	2	0	0	0	0	5	4	3	1	2	1	1	1	1	1	0	0	0	0	0	0	0	1
17	0	0	Cal	0	0	0	0	0	0	1	1	1	1	1	2	2	1	0	0	0	0	0	0	0	0
18	0	0	0	0	0	0	1	1	1	1	11	13	16	26	37	27	31	14	1	1	1	0	1	1	7
19	0	0	Cal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	1	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	0	0	Cal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	1	2	Cal	2	2	2	2	3	3	2	2	2	2	2	1	1	1	0	0	0	0	0	0	0	1
24	1	1	2	2	2	2	4	5	7	6	5	4	4	4	4	4	4	5	6	6	5	3	1	2	4
25	6	5	Cal	2	3	6	3	7	3	2	3	3	2	3	3	3	3	5	5	5	5	5	5	4	4
26	3	3	Cal	5	3	2	2	3	5	5	6	6	6	4	3	2	2	6	4	4	4	4	3	2	4
27	2	4	Cal	1	1	2	2	8	9	11	5	2	3	2	2	3	2	2	1	2	2	1	1	1	3
28	2	2	1	2	0	0	1	4	3	2	1	1	1	2	2	1	1	1	1	1	2	1	1	1	1

TOTAL HOURS 672 TOTAL GOOD HOURS 656 DATA CAPTURE 97.6%

MAX. 1HR AVG 38 02/02/89 10:00:00 2ND MAX. 1 HR AVG 37 02/18/89 14:00:00

MIN. 1HR AVG 0 02/22/89 02:00:00 ARITHMETIC MEAN 2 STANDARD DEV. 4

NAAQS Comparison: MAX. 3 HR AVG 32 (500) 02/18/89 16:00:00
MAX. 24 HR AVG 8 (140) 02/19/89 02:00:00

KEY FOR MISSING CODES
Bad< - To few samples for valid average, Cal - calibration, OCal - Analyzer out of calibration
BadS - Bad Analyzer Status, PwrF - Power Failure, Down - Operator downed channel, Miss - Missing Data
Qad - Data questionable insufficient documentation, Qai - Data questionable external influence, Purg - Analyzer in Purge

FPL-Davie
Ft. Lauderdale, FL - Site 004

HOURLY AVERAGES FOR WD in DGS

FEBRUARY 1989

DAY	HOUR (EST) 00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVG
1	307	293	278	307	314	314	330	310	327	321	144	105	164	115	113	125	126	117	125	126	115	119	49	96	197
2	289	273	330	331	345	308	329	341	359	62	98	99	92	106	116	121	111	116	112	96	118	48	57	1	177
3	78	92	108	93	98	47	17	324	71	126	120	124	125	124	135	133	128	127	133	127	216	148	143	26	119
4	212	17	323	341	328	359	338	323	342	153	139	136	128	116	124	121	129	132	137	135	46	92	103	120	183
5	119	296	118	129	149	32	337	360	83	135	137	132	138	147	143	146	144	147	147	133	63	56	48	40	141
6	23	38	98	110	113	111	25	115	116	119	127	127	130	124	130	136	140	137	136	127	124	112	100	52	107
7	90	316	54	94	74	126	143	117	145	150	143	128	133	135	129	123	124	131	134	132	127	123	114	125	130
8	154	309	341	349	35	358	357	341	37	8	328	78	106	119	118	121	129	132	132	124	111	290	211	270	190
9	276	321	325	15	337	359	4	1	4	9	10	2	6	9	4	5	2	1	1	356	358	349	337	336	143
10	332	331	325	328	334	334	333	332	334	338	348	6	1	2	14	51	51	42	34	22	10	357	350	345	206
11	344	345	339	335	331	330	331	331	317	317	317	132	237	273	264	150	133	151	177	233	287	295	307	306	274
12	312	313	312	316	316	336	337	335	339	330	326	334	337	352	347	71	63	55	40	26	360	3	3	358	247
13	353	328	22	82	70	31	10	111	110	112	122	132	121	116	119	116	113	122	117	114	115	112	112	115	120
14	116	116	112	115	113	119	121	123	124	122	122	117	114	115	109	109	108	104	91	99	97	100	104	100	111
15	103	105	111	112	109	109	102	102	106	110	110	111	100	100	92	98	96	94	90	89	87	88	89	87	100
16	87	99	87	80	77	72	83	92	85	85	76	83	80	91	85	78	82	75	73	75	74	74	74	73	81
17	76	77	77	82	82	76	76	72	78	81	84	83	93	88	94	90	89	91	85	86	89	84	86	87	84
18	81	63	81	85	48	10	57	353	345	91	105	100	105	98	100	104	95	93	92	79	72	18	48	19	98
19	5	4	5	3	2	349	345	354	14	40	69	80	82	80	83	81	80	76	76	80	79	89	83	85	93
20	87	87	83	63	69	102	112	113	116	124	123	117	121	123	113	122	116	112	109	118	117	119	120	123	109
21	132	140	131	148	148	152	149	154	150	153	158	162	168	171	164	162	158	167	171	180	172	172	170	170	158
22	182	182	212	198	205	210	207	198	203	208	212	208	194	274	149	303	289	294	304	301	302	301	310	312	240
23	312	316	315	310	311	315	316	314	316	320	309	302	301	300	293	290	287	285	293	298	310	315	311	319	307
24	316	318	317	320	344	350	354	1	359	326	313	312	316	306	310	308	300	307	308	315	315	309	311	310	306
25	315	332	331	340	334	327	324	325	321	321	321	305	313	311	313	315	323	310	309	320	332	334	330	333	323
26	300	316	317	325	331	325	325	316	303	305	307	310	301	306	290	287	186	136	151	174	204	232	231	266	273
27	297	316	323	339	331	311	301	143	56	142	171	172	176	171	162	152	154	155	159	170	165	161	145	113	199
28	99	28	115	115	157	154	148	154	181	175	191	198	164	132	71	86	66	12	47	125	154	169	276	57	128

TOTAL HOURS 672 TOTAL GOOD HOURS 672 DATA CAPTURE 100.0%

MAX. 1HR AVG 360 02/12/89 20:00:00 2ND MAX. 1 HR AVG 360 02/05/89 07:00:00

MIN. 1HR AVG 1 02/02/89 23:00:00 ARITHMETIC MEAN 173 STANDARD DEV. 108

KEY FOR MISSING CODES
Bad< - To few samples for valid average, Cal - calibration, OCal - Analyzer out of calibration
BadS - Bad Analyzer Status, PwrF - Power Failure, Down - Operator downed channel, Miss - Missing Data
Qad - Data questionable insufficient documentation, Qai - Data questionable external influence, Purg - Analyzer in Purge

FPL-Davie
Ft. Lauderdale, FL - Site 004

HOURLY AVERAGES FOR WS in MPH

FEBRUARY 1989

DAY	HOUR (EST) 00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVG
1	2.4	3.3	3.1	2.2	1.9	2.2	2.2	2.8	2.2	2.5	2.9	2.1	2.0	7.2	7.4	7.1	6.7	5.8	3.6	2.8	2.8	2.3	3.8	2.7	3.5
2	1.2	2.9	2.7	2.1	5.2	1.9	2.1	2.0	2.4	2.3	6.4	7.7	8.2	7.1	7.9	8.9	7.8	6.2	5.0	3.0	3.0	2.7	2.8	6.0	4.5
3	2.3	2.4	2.2	3.2	2.5	1.9	4.8	2.4	1.8	7.9	7.8	9.3	9.0	9.2	8.7	8.7	8.9	8.0	5.0	3.5	1.7	1.8	2.0	2.7	4.9
4	0.7	2.3	3.1	3.5	2.4	2.3	2.4	2.9	1.1	5.9	6.1	5.1	7.1	8.0	7.5	8.9	9.5	7.6	5.1	3.7	2.6	2.3	2.6	3.1	4.4
5	2.8	2.2	4.6	3.8	4.6	2.9	2.4	3.0	2.0	8.4	10.0	9.9	11.5	12.8	11.6	10.6	9.3	8.4	5.8	2.8	3.1	4.5	3.2	4.6	6.0
6	6.1	7.4	2.7	3.1	3.5	2.7	3.0	3.7	5.8	8.2	9.5	9.4	10.7	11.3	11.4	10.2	9.1	7.7	5.1	3.4	4.1	3.1	2.7	4.2	6.2
7	2.8	3.0	2.4	5.6	2.9	2.6	2.6	2.7	3.6	7.8	7.9	8.2	7.7	9.2	9.5	8.5	8.6	7.2	5.9	4.2	4.4	4.0	3.0	3.4	5.3
8	1.6	3.1	2.7	2.8	2.5	2.5	3.0	3.0	2.5	3.0	2.0	2.6	7.0	7.6	7.8	7.8	6.8	7.0	5.9	4.1	1.8	1.8	2.0	3.0	3.9
9	3.2	2.5	2.4	1.4	3.3	3.3	3.9	4.7	6.8	7.6	8.6	8.5	8.0	8.6	9.6	9.6	9.6	7.9	7.7	9.2	6.4	7.1	7.4	7.0	6.4
10	6.9	6.5	7.1	7.7	7.5	7.4	6.7	6.6	7.1	7.7	7.7	7.5	5.9	5.4	5.4	6.6	8.2	8.1	7.7	7.0	5.7	4.6	4.4	3.9	6.6
11	4.6	3.8	3.7	4.1	4.1	3.7	3.7	3.6	3.5	3.8	4.1	1.9	1.9	3.8	5.1	4.6	6.6	5.0	3.9	3.2	5.2	8.1	10.5	8.9	4.6
12	8.3	8.3	6.8	5.8	7.7	5.9	5.5	6.9	8.2	9.3	8.0	6.1	6.0	5.1	3.4	4.7	7.3	6.6	6.2	3.8	3.7	3.8	3.3	2.5	5.9
13	2.4	2.3	1.1	4.3	2.7	3.1	2.3	2.4	8.5	11.1	11.3	11.2	10.5	11.6	12.3	12.3	11.2	9.6	7.7	7.2	8.2	7.4	6.8	7.0	7.2
14	7.5	8.4	8.5	8.6	9.9	9.9	10.0	10.1	11.4	13.8	13.3	13.8	13.0	13.0	11.8	12.1	10.3	10.2	8.2	9.7	9.1	9.3	9.6	12.1	10.5
15	13.3	13.6	13.6	13.7	13.2	11.4	11.2	10.3	12.9	14.2	13.0	11.9	11.4	12.6	12.6	13.0	13.8	11.1	8.6	8.7	8.0	8.4	10.5	7.9	11.6
16	9.5	9.1	6.0	6.5	7.1	4.9	7.5	9.1	7.4	12.0	11.9	12.3	12.8	13.2	11.8	10.7	10.9	10.0	9.0	9.0	8.4	9.6	9.6	9.9	9.5
17	10.8	10.6	9.9	9.3	9.4	8.5	10.2	10.3	11.9	14.7	15.2	13.8	13.7	12.3	12.1	11.0	10.9	9.9	8.4	8.1	9.1	7.5	6.5	6.5	10.4
18	4.7	2.7	3.0	3.0	2.7	2.8	3.1	2.8	2.3	6.1	7.7	7.6	9.6	9.5	9.4	8.4	9.5	8.8	6.6	4.4	2.6	2.8	2.8	2.5	5.2
19	2.5	3.3	3.2	3.2	3.4	3.9	2.9	3.9	4.6	5.2	5.7	7.8	9.3	8.6	9.3	9.4	10.1	8.8	7.8	6.1	6.2	5.9	5.0	4.0	5.8
20	4.6	4.8	3.5	2.4	2.7	3.5	4.9	6.4	9.8	11.3	12.0	13.4	13.0	12.8	14.1	13.2	13.5	12.5	11.0	10.1	10.2	10.8	9.6	10.4	9.2
21	9.5	9.3	8.5	8.7	9.9	7.6	7.0	7.6	9.5	12.3	13.0	12.1	13.4	13.6	13.9	15.0	16.1	14.2	7.9	8.4	5.5	6.7	7.8	9.3	10.3
22	9.6	9.8	7.4	7.0	5.7	6.4	8.1	7.6	7.8	9.2	10.3	11.5	9.8	5.0	3.5	7.8	10.1	11.5	11.0	5.1	9.1	10.0	14.5	12.7	8.7
23	13.5	12.1	9.4	9.7	8.3	10.7	11.2	10.8	11.7	12.3	13.8	14.8	12.6	16.7	14.5	16.3	18.5	16.8	15.6	11.8	14.2	13.0	12.8	13.7	13.1
24	15.1	14.8	13.4	12.9	9.4	8.1	7.8	6.5	7.0	9.3	13.2	15.6	13.8	13.6	13.6	12.2	12.6	11.1	8.5	6.1	6.5	9.6	10.7	11.3	10.9
25	8.4	5.6	5.1	6.6	6.2	7.4	7.1	7.5	8.9	10.5	9.4	8.5	8.4	7.6	9.0	8.2	6.9	8.9	8.0	5.3	4.2	2.9	3.6	2.7	6.9
26	6.0	6.0	5.5	4.8	4.6	4.0	4.5	4.6	5.1	5.6	5.6	4.0	5.6	3.6	4.1	3.7	3.8	7.1	5.2	4.6	5.0	4.3	3.0	3.4	4.7
27	2.8	4.7	3.7	2.6	2.0	3.0	5.6	2.5	1.8	2.9	6.5	8.9	8.4	7.5	7.1	7.6	10.5	11.6	9.1	9.1	6.6	4.6	4.0	3.6	5.7
28	2.7	3.5	6.2	2.7	5.5	5.4	3.8	2.4	5.2	8.0	9.1	8.2	9.5	6.3	1.4	7.0	7.1	7.0	3.3	2.2	3.2	1.4	1.6	2.4	4.8

TOTAL HOURS 672 TOTAL GOOD HOURS 672 DATA CAPTURE 100.0%

MAX. 1HR AVG 18.5 02/23/89 16:00:00 2ND MAX. 1 HR AVG 16.8 02/23/89 17:00:00

MIN. 1HR AVG 0.7 02/04/89 00:00:00 ARITHMETIC MEAN 7.0 STANDARD DEV. 3.6

KEY FOR MISSING CODES
Bad< - To few samples for valid average, Cal - calibration, OCal - Analyzer out of calibration
BadS - Bad Analyzer Status, Pwrf - Power Failure, Down - Operator downed channel, Miss - Missing Data
Qad - Data questionable insufficient documentation, Qai - Data questionable external influence, Purg - Analyzer in Purge

FPL-Davie
Ft. Lauderdale, FL - Site 004

HOURLY AVERAGES FOR Sig01 in deg

FEBRUARY 1989

DAY	HOUR (EST) 00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVG
1	32.9	6.4	6.8	11.2	7.5	7.0	13.8	18.2	13.8	23.4	36.3	49.6	55.1	21.0	16.8	16.8	14.7	13.0	10.3	7.3	8.2	11.5	39.6	12.1	18.9
2	47.0	11.2	14.2	11.2	11.2	7.8	12.2	17.6	20.1	33.4	19.0	17.1	13.1	19.1	19.0	14.1	16.1	13.8	11.4	12.5	11.6	27.3	42.6	24.7	18.6
3	21.0	17.2	16.4	9.8	9.9	51.2	35.5	24.3	39.4	14.7	15.0	14.3	13.9	14.4	14.4	13.7	13.1	12.5	11.6	9.9	38.6	54.5	9.2	44.1	21.6
4	38.9	44.9	10.4	13.2	11.4	28.1	15.2	19.0	37.7	13.9	18.3	27.6	17.0	16.4	18.0	16.1	14.3	13.1	11.7	9.8	33.4	26.4	13.6	10.6	20.0
5	33.9	22.9	7.2	7.9	8.3	28.4	13.2	19.2	39.6	14.3	13.9	14.6	13.5	13.9	14.4	14.9	13.6	11.5	10.1	11.5	25.9	39.5	25.4	25.9	18.5
6	23.7	34.6	17.1	9.0	11.4	15.3	35.0	9.5	13.2	14.3	14.4	15.9	13.2	14.4	15.8	14.1	14.3	13.5	13.0	10.6	9.8	13.1	17.7	39.9	16.8
7	26.3	26.8	33.1	34.8	20.4	13.0	36.4	33.9	12.8	13.3	15.0	16.1	17.4	16.1	15.8	14.8	13.8	13.2	12.6	11.7	12.0	11.1	13.6	10.1	18.5
8	29.7	7.3	12.5	14.3	44.8	22.4	17.1	14.3	35.5	24.2	35.1	34.1	17.5	18.7	16.5	16.6	15.3	13.3	12.4	10.1	18.3	39.0	18.1	19.7	21.1
9	20.2	9.2	9.9	37.2	10.5	20.1	16.9	16.5	18.1	17.9	18.6	19.9	23.1	21.4	19.7	18.6	19.4	20.2	18.6	19.3	16.8	16.4	13.0	12.7	18.1
10	13.0	12.8	10.1	10.9	12.6	12.1	12.4	11.5	13.1	15.3	19.2	19.4	26.7	26.8	28.4	23.5	21.0	17.9	16.0	16.3	15.9	14.7	14.1	14.4	16.6
11	13.2	13.2	13.7	11.7	10.6	11.0	11.1	13.3	15.3	16.3	24.1	47.6	50.6	47.1	29.8	34.5	13.3	13.6	19.6	19.2	10.4	10.1	8.4	8.6	19.4
12	10.0	9.8	9.7	10.5	9.4	11.9	13.0	14.8	13.9	14.7	17.5	24.2	25.6	29.0	39.9	30.0	20.3	20.5	15.9	16.9	14.3	15.9	13.7	14.9	17.3
13	12.2	13.9	28.0	11.4	15.5	31.3	44.0	36.2	13.3	12.8	13.7	14.6	14.3	13.0	13.8	13.3	13.9	12.0	10.8	9.9	10.1	10.1	10.6	9.7	16.2
14	10.1	9.9	10.1	9.8	10.1	10.9	11.6	11.9	13.1	12.7	14.2	12.8	16.6	13.7	15.4	14.6	15.2	12.5	11.5	10.8	9.7	9.8	10.0	10.4	12.0
15	10.1	9.9	10.3	11.1	10.6	10.3	11.0	10.9	12.1	12.6	13.9	14.3	14.4	12.7	14.6	13.2	11.0	11.6	11.5	11.5	11.5	12.4	11.9	12.0	11.9
16	12.1	9.9	11.0	13.5	14.3	16.0	14.7	11.7	14.4	13.3	15.8	17.4	17.5	15.5	15.9	16.9	15.3	15.8	15.9	15.3	15.8	14.6	14.9	15.7	14.7
17	14.2	14.1	13.9	13.0	13.1	14.4	15.0	15.7	14.8	14.3	13.8	14.9	14.9	15.2	14.7	14.6	13.3	12.6	13.3	13.3	11.7	11.7	11.7	11.5	13.7
18	13.2	51.7	26.2	30.9	20.4	25.1	15.3	19.8	22.3	21.2	15.9	17.4	15.5	16.1	14.6	17.7	12.2	12.7	14.9	14.9	25.4	17.9	29.0	28.6	20.8
19	17.0	17.5	14.8	13.2	12.7	13.6	14.9	13.5	17.4	19.9	22.9	18.0	16.0	19.0	16.4	18.6	14.7	16.1	13.7	14.6	14.1	10.9	11.7	13.5	15.6
20	12.5	10.4	10.6	13.9	16.1	11.5	10.6	11.7	12.7	13.6	13.8	12.6	14.8	13.6	12.1	13.6	12.6	12.6	11.2	11.5	10.6	11.1	12.2	11.2	12.4
21	12.8	12.4	13.1	11.2	9.7	8.9	9.3	9.2	11.6	10.6	11.9	12.6	13.2	13.5	12.4	12.1	10.1	10.9	11.2	11.0	10.5	10.3	10.9	11.1	11.3
22	12.2	13.1	18.3	14.1	14.7	14.7	14.1	13.0	14.8	14.8	16.8	15.8	13.5	31.5	45.0	33.9	11.2	10.4	9.0	11.5	7.6	8.4	9.7	9.9	15.7
23	9.5	10.4	9.9	8.3	9.2	9.5	10.1	10.3	11.2	12.6	12.0	13.1	12.7	10.5	13.8	12.6	12.5	12.2	11.0	9.9	9.7	10.1	9.5	11.1	10.9
24	10.3	10.6	11.1	12.5	18.0	17.6	17.4	18.7	17.0	15.4	15.4	13.6	13.9	13.9	14.9	13.8	11.5	11.4	8.7	8.8	9.5	8.1	8.8	8.2	12.9
25	10.5	12.5	12.5	14.3	13.8	11.2	10.6	11.9	12.4	11.7	14.1	17.1	20.5	24.9	14.8	18.0	18.0	12.4	7.0	9.4	11.1	10.1	8.3	10.0	13.2
26	12.1	8.3	9.3	9.4	10.8	9.8	9.0	8.9	9.8	11.2	16.0	41.5	32.0	49.4	49.2	35.8	36.8	13.3	8.3	9.2	10.6	15.9	13.1	12.6	18.4
27	24.2	6.4	8.9	9.8	10.4	15.0	27.0	38.5	60.2	35.7	19.6	19.8	21.8	26.0	19.8	17.4	13.3	9.5	9.9	9.8	8.2	7.1	8.6	25.6	18.9
28	21.8	31.9	18.7	23.5	7.6	7.3	6.4	14.7	14.2	13.0	15.3	18.3	18.5	28.0	42.6	50.5	26.0	49.4	39.6	37.4	10.6	48.5	41.1	18.0	25.1

TOTAL HOURS 672 TOTAL GOOD HOURS 672 DATA CAPTURE 100.0%

MAX. 1HR AVG 60.2 02/27/89 08:00:00 2ND MAX. 1 HR AVG 55.1 02/01/89 12:00:00

MIN. 1HR AVG 6.4 02/01/89 01:00:00 ARITHMETIC MEAN 16.8 STANDARD DEV. 9.1

KEY FOR MISSING CODES
Bad< - To few samples for valid average, Cal - calibration, OCal - Analyzer out of calibration
BadS - Bad Analyzer Status, PwrF - Power Failure, Down - Operator downed channel, Miss - Missing Data
Qad - Data questionable insufficient documentation, Qa[illegible] - Data questionable external influence, Purg - Analyzer in Purge

FPL-Davie
Ft. Lauderdale, FL - Site 004

HOURLY AVERAGES FOR TEMP in DGC

FEBRUARY 1989

DAY	HOUR (EST) 00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVG
1	18.7	17.9	17.2	16.9	16.8	16.8	17.1	17.2	18.4	21.7	23.9	25.0	26.1	26.5	26.0	25.8	25.2	24.0	22.7	21.5	21.2	20.3	19.9	19.5	21.1
2	19.0	18.3	18.0	17.7	17.3	17.0	17.3	17.5	19.1	22.4	24.8	25.3	25.8	26.3	26.2	25.6	25.0	24.1	23.1	22.5	21.6	21.1	20.0	19.6	21.4
3	19.0	18.9	18.9	19.8	18.9	18.6	18.8	19.1	21.9	24.1	24.9	25.6	26.1	26.0	26.2	25.8	25.2	24.1	22.9	22.1	21.5	20.8	20.1	20.0	22.0
4	19.8	19.0	18.9	18.7	18.6	18.3	18.1	18.3	20.4	24.0	25.6	26.4	26.7	26.9	26.8	26.2	25.2	24.0	22.8	21.8	21.3	20.4	20.7	20.5	22.0
5	20.6	19.3	20.6	20.5	20.0	19.3	18.5	18.4	21.1	24.1	25.2	25.8	26.0	26.4	26.4	26.2	25.4	24.2	22.8	22.0	21.7	21.3	20.7	19.9	22.3
6	19.4	19.1	18.9	19.5	20.6	20.2	19.3	20.4	22.9	24.3	25.3	25.9	25.7	25.8	25.6	25.5	25.5	24.3	23.0	22.4	22.0	21.6	20.8	20.8	22.4
7	20.5	19.9	19.9	19.4	19.0	19.2	19.0	19.9	22.3	24.4	25.4	26.1	26.7	26.9	26.9	26.5	25.6	24.6	23.3	22.6	22.3	21.9	21.5	21.2	22.7
8	20.6	19.5	18.9	18.6	18.4	18.3	18.2	18.5	19.4	21.2	24.0	25.0	25.9	26.7	26.7	26.7	26.2	24.9	23.7	23.1	22.3	21.5	20.8	20.5	22.0
9	20.2	20.0	19.6	19.2	19.0	19.1	19.2	19.5	20.5	21.4	22.4	22.8	23.3	22.8	22.1	21.7	20.9	20.0	18.9	18.0	17.3	17.1	16.4	15.7	19.8
10	15.1	14.2	13.3	12.7	12.8	12.6	12.4	12.3	13.7	15.8	18.7	21.3	22.6	23.4	23.2	22.9	21.6	20.2	19.0	17.5	16.4	15.4	15.1	14.7	16.9
11	14.3	14.0	13.6	13.2	13.0	12.8	12.8	13.1	15.0	17.8	20.4	22.4	23.3	24.1	24.7	24.0	22.8	22.5	22.1	21.9	21.5	20.2	18.5	17.2	18.5
12	16.7	15.6	14.5	13.5	11.8	11.0	10.8	11.2	12.4	14.1	16.1	18.3	19.9	21.2	22.1	22.5	21.9	20.8	19.8	18.8	17.9	17.2	16.5	16.0	16.7
13	15.6	15.3	15.8	19.2	18.3	16.4	16.6	18.6	22.0	23.2	23.5	24.7	24.9	24.7	24.7	24.1	24.1	23.3	22.5	22.1	22.0	21.8	21.6	21.6	21.1
14	21.6	21.6	21.5	21.4	21.3	21.3	21.3	21.7	22.6	23.5	24.4	24.8	25.1	25.3	25.1	25.0	24.6	23.8	23.3	23.0	22.8	22.6	22.6	22.9	23.0
15	22.6	22.5	22.4	22.3	22.2	22.1	22.1	22.3	23.2	24.1	24.7	25.2	24.8	24.9	25.2	24.9	24.4	23.8	23.0	22.7	22.5	22.5	22.8	22.5	23.3
16	22.4	22.0	21.7	22.1	22.1	22.2	22.2	22.7	23.4	24.4	24.1	25.4	25.4	25.6	25.7	25.2	24.8	23.9	23.3	23.0	22.8	22.9	22.6	22.7	23.4
17	22.5	22.5	22.2	22.3	22.0	22.1	22.4	22.6	23.2	24.3	24.7	25.6	25.4	25.4	25.9	25.8	25.0	24.2	23.8	23.6	23.4	23.0	22.7	22.5	23.6
18	22.2	22.0	21.5	20.7	20.6	20.1	20.1	19.7	21.3	24.1	24.7	24.7	25.3	25.7	25.9	25.4	25.0	24.4	23.7	23.1	22.3	21.4	21.1	20.4	22.7
19	20.0	19.6	19.2	18.7	18.5	18.4	18.4	18.3	20.1	23.3	25.1	26.0	26.2	26.3	26.3	26.0	25.3	24.5	23.6	23.3	23.2	22.6	22.3	22.1	22.4
20	22.1	21.9	21.3	20.8	20.5	21.1	21.6	22.4	23.6	24.4	25.0	25.2	25.5	25.3	25.3	25.0	24.7	24.1	23.4	23.0	23.1	23.3	22.7	22.5	23.2
21	22.7	22.7	22.8	22.6	22.7	22.5	22.5	23.0	24.1	25.0	26.2	27.0	27.9	28.6	28.7	28.0	27.4	26.1	24.9	24.3	23.7	23.6	23.8	24.1	24.8
22	24.2	24.0	22.7	22.6	22.8	22.8	22.8	22.9	23.5	24.3	25.4	26.3	21.5	22.2	22.6	23.9	23.8	21.8	19.3	18.3	18.5	18.4	16.8	15.6	21.9
23	15.0	14.0	13.2	12.7	12.1	11.6	11.1	11.3	11.8	13.0	14.1	14.8	15.5	15.3	15.9	16.7	15.9	14.5	12.7	11.8	10.3	8.9	8.5	7.3	12.8
24	6.5	5.9	5.7	5.5	4.3	3.6	3.0	3.1	4.6	6.2	7.9	9.8	10.8	11.8	12.9	13.6	13.7	13.3	12.4	11.4	10.6	9.1	7.6	6.7	8.3
25	6.3	5.5	4.6	4.2	4.1	3.6	2.9	3.4	5.5	8.2	10.8	12.8	14.2	15.2	15.9	16.3	16.5	15.9	14.2	12.7	11.7	10.8	10.4	9.5	9.8
26	8.1	7.6	7.1	6.5	6.3	6.3	6.2	6.7	9.6	12.7	15.3	16.9	18.3	19.3	19.8	20.2	20.6	18.6	16.8	15.6	15.3	14.0	12.3	11.3	12.9
27	10.4	10.3	10.5	10.3	9.6	9.4	9.0	10.7	14.1	17.7	20.6	21.6	21.9	22.7	22.5	22.5	22.2	21.1	19.7	19.1	18.4	17.6	17.4	17.0	16.5
28	16.2	15.8	16.2	16.7	19.1	20.1	19.6	20.4	22.3	23.8	26.0	27.2	25.3	23.4	22.9	19.8	19.9	19.7	19.4	19.7	19.8	19.4	19.0	18.9	20.4

TOTAL HOURS 672 TOTAL GOOD HOURS 672 DATA CAPTURE 100.0%

MAX. 1HR AVG 28.7 02/21/89 14:00:00 2ND MAX. 1 HR AVG 28.6 02/21/89 13:00:00

MIN. 1HR AVG 2.9 02/25/89 06:00:00 ARITHMETIC MEAN 19.9 STANDARD DEV. 5.3

KEY FOR MISSING CODES
Bad< - To few samples for valid average, Cal - calibration, OCal - Analyzer out of calibration
BadS - Bad Analyzer Status, PwrF - Power Failure, Down - Operator downed channel, Miss - Missing Data
Qad - Data questionable insufficient documentation, Qai - Data questionable external influence, Purg - Analyzer in Purge

FPL-Davie
Ft. Lauderdale, FL - Site 004

HOURLY AVERAGES FOR RNFL in INCH

FEBRUARY 1989

DAY	HOUR (EST) 00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVG
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.07	0.21	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.03	0.47	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.24	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.31	0.60	2.68	0.20	1.13	0.02	0.00	0.00	0.00	0.00	0.00	0.21

TOTAL HOURS 672 TOTAL GOOD HOURS 672 DATA CAPTURE 100.0%

MAX. 1HR AVG 2.68 02/28/89 15:00:00 2ND MAX. 1 HR AVG 1.13 02/28/89 17:00:00

MIN. 1HR AVG 0.00 02/01/89 00:00:00 ARITHMETIC MEAN 0.01 STANDARD DEV. 0.12

KEY FOR MISSING CODES
Bad< - To few samples for valid average, Cal - calibration, OCal - Analyzer out of calibration
BadS - Bad Analyzer Status, PwrF - Power Failure, Down - Operator downed channel, Miss - Missing Data
Qad - Data questionable insufficient documentation, Qai - Data questionable external influence, Purg - Analyzer in Purge

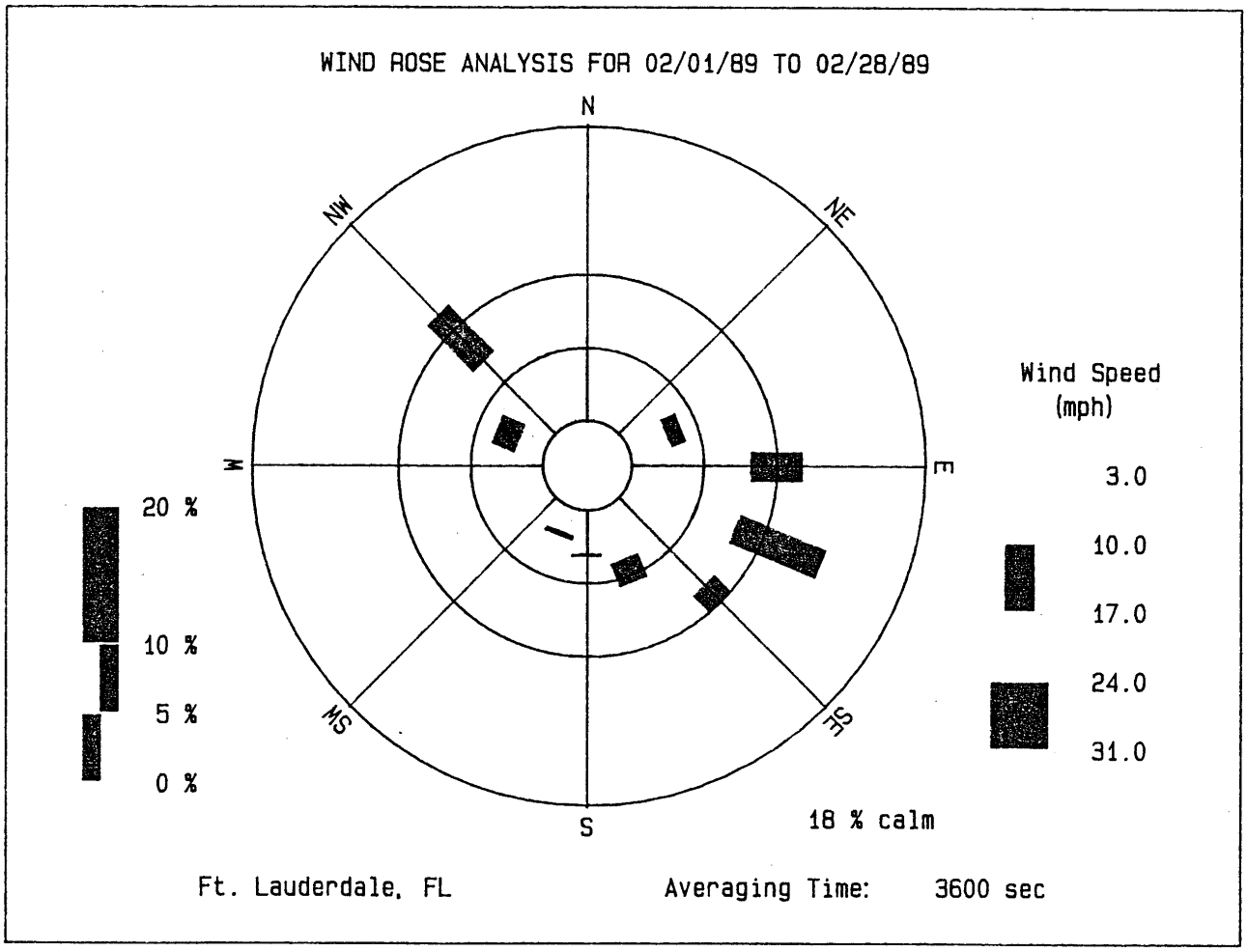
FPC DAVIE PRECIPITATION		
DATE	TIME	AMOUNT
02-08-89	0800	.03
	0900	.01
02-18-89	0200	.07
	0300	.21
	0400	.02
	0500	.01
02-20-89	2200	.04
02-22-89	0100	.03
	0200	.47
	1100	.01
	1200	.24
	1300	.13
02-28-89	1200	.07
	1300	.31
	1400	.60
	1500	2.68
	1600	.20
	1700	1.13
	1800	.02
	T O T A L - -	6.28
	10.5.1-65	

WIND ROSE ANALYSIS FOR 02/01/89 TO 02/28/89

Wind Speed (mph)	DIRECTION																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	I
> 31.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
31.0-24.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
24.0-17.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	
17.0-10.0	0.0	0.0	0.0	1.0	3.4	6.3	1.5	1.6	0.1	0.3	0.0	0.0	0.0	1.6	4.5	0.0	
10.0- 3.0	5.8	1.5	2.1	2.8	8.2	7.9	8.3	3.7	2.8	1.6	0.4	0.0	1.0	1.9	7.0	6.3	
3.0 <																	
All Speed	5.8	1.5	2.1	3.9	12.	14.	9.8	5.4	3.0	1.9	0.4	0.0	1.0	3.7	11.	6.3	

EV-

Ft. Lauderdale, FL Averaging Time: 3600 sec


WIND ROSE ANALYSIS FOR 02/01/89 TO 02/28/89
N
NE
E
SE
S
SW
W
NW
20 %
10 %
5 %
0 %
Wind Speed
(mph)
3.0
10.0
17.0
24.0
31.0
18 % calm
Ft. Lauderdale, FL
Averaging Time: 3600 sec

FPL-Davie
Ft. Lauderdale, FL - Site 004

HOURLY AVERAGES FOR SO2 in PPB

MARCH 1989

DAY	HOUR (EST) 00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVG
1	2	2	Cal	3	2	2	2	6	12	13	10	10	2	2	2	1	1	1	0	0	0	0	0	1	3
2	1	1	0	0	0	0	1	2	1	1	1	0	0	0	0	0	0	0	0	1	1	1	1	1	0
3	0	0	Cal	0	0	0	1	2	2	2	2	2	1	1	2	1	2	2	1	1	1	1	1	1	1
4	0	0	0	0	0	0	0	2	2	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
5	0	0	Cal	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	2	0	0
6	0	0	0	0	0	0	0	2	1	0	0	0	1	3	1	1	1	1	2	1	1	1	1	0	1
7	0	0	Cal	0	0	0	1	2	6	10	4	2	1	0	0	0	1	1	0	0	1	0	0	0	1
8	1	0	1	0	0	0	1	2	2	3	2	1	1	1	1	1	1	1	1	1	0	0	2	0	1
9	0	0	Cal	0	0	0	0	1	1	1	1	1	1	1	1	1	2	1	1	0	0	0	0	0	1
10	0	0	0	0	0	0	0	1	1	2	3	3	3	3	3	3	2	1	1	0	0	0	0	0	1
11	0	0	Cal	1	1	0	1	1	2	2	2	2	1	1	1	0	0	1	1	0	0	0	0	0	1
12	0	0	Cal	0	0	0	0	0	0	0	2	4	4	3	3	3	5	4	2	3	3	3	2	2	2
13	1	1	Cal	0	0	0	1	3	3	3	4	3	2	2	2	4	3	4	2	2	1	0	0	0	2
14	0	0	0	0	0	0	0	1	1	3	7	2	1	1	1	1	1	1	0	0	1	1	1	1	1
15	0	0	Cal	0	0	0	2	8	3	1	2	1	0	0	0	1	1	0	0	0	0	0	0	0	1
16	0	0	0	0	1	2	5	10	4	4	1	2	1	1	1	1	2	28	5	2	1	1	1	1	3
17	1	1	Cal	1	1	2	3	6	4	2	3	2	1	0	1	2	3	2	2	1	1	0	1	1	2
18	0	0	0	0	1	1	2	2	2	3	1	1	1	1	0	0	0	0	0	0	0	0	0	1	1
19	1	1	Cal	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0
20	0	1	3	3	2	3	4	6	3	2	1	1	1	0	0	1	1	0	0	0	0	9	0	0	2
21	0	0	Cal	0	1	3	4	6	2	1	1	1	0	0	0	1	0	0	0	0	0	0	0	0	1
22	0	1	0	1	1	1	2	4	3	2	1	1	0	1	2	1	1	0	0	0	0	1	1	1	1
23	0	0	Cal	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	2	1	1	1	1	1	0
24	1	1	1	0	0	0	1	1	0	1	1	1	0	1	1	1	1	1	0	0	2	1	1	1	1
25	0	0	Cal	2	2	1	1	1	0	0	1	1	1	1	4	1	2	1	1	2	1	1	0	0	1
26	0	0	Cal	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27	0	0	Cal	0	0	1	2	7	4	23	45	32	29	32	27	16	3	1	1	0	0	0	0	1	10
28	1	0	1	1	0	1	3	6	11	11	20	12	9	2	2	5	2	1	0	0	1	1	0	0	4
29	0	0	Cal	0	0	0	0	1	1	0	0	0	0	1	1	0	1	1	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0	1	2	0	1	1	1	0	0	1	1	1	0	0	0	0
31	0	0	Cal	0	0	1	1	1	2	1	1	1	3	0	1	1	1	3	3	0	0	0	0	0	1

TOTAL HOURS 744 TOTAL GOOD HOURS 726 DATA CAPTURE 97.6%

MAX. 1HR AVG 45 03/27/89 10:00:00 2ND MAX. 1 HR AVG 32 03/27/89 13:00:00

MIN. 1HR AVG 0 03/01/89 18:00:00 ARITHMETIC MEAN 1 STANDARD DEV. 4

NAAQS Comparison: MAX. 3 HR AVG 35 (500) 03/27/89 12:00:00
MAX. 24 HR AVG 10 (140) 03/28/89 01:00:00

KEY FOR MISSING CODES
Bad< - To few samples for valid average, Cal - calibration, OCal - Analyzer out of calibration
BadS - Bad Analyzer Status, PwrF - Power Failure, Down - Operator downed channel, Miss - Missing Data
Qad - Data questionable insufficient documentation, Qai - Data questionable external influence, Purg - Analyzer in Purge

FPL-Davie
Ft. Lauderdale, FL - Site 004

HOURLY AVERAGES FOR WD in DGS

MARCH 1989

DAY	HOUR (EST) 00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVG
1	43	88	81	56	43	342	18	131	161	325	326	108	134	116	117	121	146	147	143	135	130	159	142	192	142
2	136	267	284	294	295	349	67	149	162	164	162	160	171	151	146	156	217	276	142	142	162	162	186	124	188
3	140	135	134	156	144	163	163	158	163	166	233	184	200	173	163	179	164	177	175	165	140	150	129	136	162
4	151	134	135	132	126	146	130	139	138	147	141	137	142	137	129	126	128	141	141	130	119	118	119	116	133
5	114	120	125	126	130	135	136	133	142	147	149	150	149	148	148	154	136	134	136	136	126	123	124	145	136
6	150	142	146	149	153	155	142	158	166	173	168	179	PwrF	216	195	PwrF	169	145	155	129	139	141	145	145	157
7	147	140	117	135	150	172	173	194	186	195	195	205	270	268	235	247	309	311	313	338	342	332	339	344	236
8	334	321	327	334	337	335	329	335	337	334	336	332	328	333	333	332	337	341	340	332	330	324	319	313	331
9	325	322	322	326	323	318	318	321	325	323	317	321	313	321	309	310	313	317	318	320	322	320	311	307	319
10	309	309	306	307	307	306	306	309	309	315	322	324	329	328	329	323	0	3	358	350	343	341	336	331	296
11	331	331	334	336	332	331	327	325	334	341	349	17	18	12	15	18	16	22	7	1	353	344	343	343	216
12	342	337	341	335	346	349	321	331	330	313	337	340	324	345	323	313	1	120	126	175	190	192	241	279	277
13	268	262	253	257	263	258	224	258	290	303	308	284	218	231	216	132	133	153	165	187	229	231	233	236	233
14	230	246	264	221	243	295	323	327	246	347	176	156	157	159	140	143	143	146	138	135	131	126	127	132	198
15	124	121	124	120	130	137	131	127	136	135	129	122	127	129	125	132	140	128	121	118	118	117	116	119	126
16	125	82	217	104	135	121	308	336	133	124	122	127	124	123	113	116	121	99	99	96	81	74	77	79	131
17	75	31	21	294	42	13	287	334	112	113	112	110	110	133	110	114	106	99	101	103	104	107	99	110	118
18	83	108	120	119	102	22	349	33	96	109	96	98	99	97	89	78	82	79	73	70	57	76	77	49	94
19	334	302	301	299	326	327	320	336	332	353	1	27	73	75	69	56	65	75	77	73	83	84	88	89	174
20	90	92	84	88	102	100	89	98	109	111	118	117	119	122	121	116	119	119	114	121	125	131	130	127	111
21	130	120	126	116	97	16	121	142	146	143	149	148	150	141	143	140	136	142	146	145	145	143	144	137	132
22	108	4	74	304	331	325	305	355	147	146	137	147	151	142	134	140	141	141	143	140	127	111	83	119	165
23	119	126	127	136	145	149	157	158	168	160	168	157	157	169	168	167	174	180	188	181	177	187	182	192	162
24	220	206	202	187	199	264	309	250	253	282	267	259	241	165	160	170	171	102	49	168	64	315	240	305	210
25	315	321	327	325	318	329	310	326	327	308	304	268	277	149	121	127	131	142	161	179	174	196	234	258	247
26	266	187	250	308	312	292	331	2	206	149	127	126	117	120	129	126	122	125	128	120	121	123	119	119	168
27	128	73	322	338	338	346	0	14	98	98	94	95	94	100	102	101	86	84	81	78	80	86	86	96	126
28	100	102	100	98	106	104	92	92	94	106	99	107	103	107	109	109	108	106	113	117	111	106	103	115	104
29	116	118	116	118	121	125	123	135	132	129	131	128	123	129	128	129	126	132	133	135	130	135	134	125	127
30	131	142	147	150	153	148	155	155	163	159	160	152	157	158	153	166	166	174	172	177	166	165	162	156	158
31	162	170	181	185	170	244	168	196	200	207	219	254	180	173	176	191	199	193	201	254	241	218	210	223	201

TOTAL HOURS 744 TOTAL GOOD HOURS 742 DATA CAPTURE 99.7%

MAX. 1HR AVG 358 03/10/89 18:00:00 2ND MAX. 1 HR AVG 355 03/22/89 07:00:00

MIN. 1HR AVG 0 03/10/89 16:00:00 ARITHMETIC MEAN 180 STANDARD DEV. 91

KEY FOR MISSING CODES
Bad< - To few samples for valid average, Cal - calibration, OCal - Analyzer out of calibration
BadS - Bad Analyzer Status, PwrF - Power Failure, Down - Operator downed channel, Miss - Missing Data
Qad - Data questionable insufficient documentation, Qai - Data questionable external influence, Purg - Analyzer in Purge

FPL-Davie
Ft. Lauderdale, FL - Site 004

HOURLY AVERAGES FOR WS in MPH

MARCH 1989

DAY	HOUR (EST) 00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVG
1	3.4	4.0	4.2	2.3	3.9	3.3	2.3	1.8	2.5	2.1	2.6	3.1	6.4	5.9	8.5	7.8	7.2	5.3	4.9	4.5	3.7	3.1	2.1	2.3	4.0
2	3.3	2.1	3.0	3.4	3.1	2.3	2.1	2.5	5.1	9.5	10.2	8.6	8.1	9.0	10.7	6.4	3.5	4.5	2.8	3.7	5.8	3.5	3.1	4.4	5.0
3	4.0	3.6	4.9	5.5	4.8	4.7	2.5	4.1	6.7	7.0	2.4	4.8	7.7	5.9	8.8	10.0	10.9	9.8	7.7	5.1	3.9	3.5	2.2	2.9	5.5
4	3.3	3.5	3.6	3.3	2.2	2.6	3.3	2.7	5.4	9.1	9.5	9.8	9.4	9.2	9.9	10.4	10.8	8.0	6.3	5.2	6.3	7.2	7.8	6.7	6.5
5	8.3	8.5	8.1	7.8	7.1	6.5	6.8	7.3	12.0	13.7	14.6	15.4	14.9	14.4	12.6	11.3	9.3	9.1	7.4	4.4	3.6	4.6	5.1	4.5	9.0
6	4.1	4.2	5.0	5.9	5.2	3.7	4.1	4.6	9.4	12.1	13.5	11.1	PwrF	7.2	5.9	PwrF	8.5	5.6	3.7	2.9	2.7	3.6	3.8	5.9	6.0
7	8.8	8.4	4.7	4.6	4.0	2.9	4.1	5.1	8.4	10.2	8.7	7.2	9.1	7.1	4.8	4.7	8.7	10.3	10.7	8.3	6.0	8.1	7.3	5.2	6.9
8	6.3	9.0	8.2	8.2	10.0	10.1	8.2	7.9	9.8	11.6	12.1	12.4	11.0	11.6	12.8	12.4	12.0	9.2	7.6	7.9	8.0	9.5	9.4	8.8	9.7
9	10.0	10.6	10.5	10.7	12.2	11.5	12.5	12.3	12.8	11.7	12.7	11.3	12.4	11.8	14.4	14.4	13.5	12.5	12.5	11.6	12.9	13.2	13.8	13.1	12.3
10	13.7	15.3	15.3	15.1	14.8	15.2	14.9	13.7	12.8	12.3	14.8	13.6	12.7	12.6	12.1	12.7	10.7	10.9	10.9	11.0	10.4	9.9	11.7	11.5	12.8
11	12.9	11.4	10.1	11.3	11.0	9.8	8.8	9.0	9.8	9.4	9.9	12.5	12.4	10.6	10.9	10.3	9.4	9.3	7.5	6.4	5.8	5.7	6.0	5.1	9.4
12	4.7	4.7	4.5	3.9	4.4	4.0	5.9	6.4	7.3	7.1	7.1	7.4	6.9	5.7	4.5	5.0	2.3	6.2	5.1	3.5	3.9	3.6	3.8	3.7	5.0
13	3.4	3.1	2.6	2.5	2.1	3.0	5.1	2.4	4.7	6.7	5.8	4.1	5.5	3.3	2.5	7.6	6.7	9.2	7.6	5.6	5.1	3.5	3.5	2.5	4.5
14	2.5	2.8	3.9	2.6	2.3	3.2	2.5	3.1	2.2	1.6	3.7	9.0	8.5	8.7	8.0	8.9	8.3	8.3	7.7	5.4	4.8	4.0	4.3	4.4	5.0
15	4.6	5.1	5.3	6.7	5.0	3.8	7.5	2.7	6.7	9.9	9.4	10.5	9.8	10.8	12.0	12.0	11.5	9.9	9.0	6.8	6.3	6.5	6.2	5.5	7.6
16	5.1	2.9	2.7	5.7	4.7	4.3	2.6	0.8	7.8	8.2	7.9	8.3	9.2	8.6	9.2	9.3	7.2	7.5	6.7	6.0	4.3	3.3	4.3	3.5	5.8
17	3.0	3.1	2.6	1.7	2.1	1.7	2.0	1.7	7.4	8.2	10.0	10.9	13.5	10.4	11.3	12.2	10.1	9.5	9.0	7.6	8.9	7.9	6.6	5.1	6.9
18	2.9	4.5	6.8	5.2	3.1	4.0	2.7	2.5	6.5	7.8	7.9	7.9	8.8	9.4	9.1	8.5	8.2	8.0	6.9	5.4	3.1	3.7	3.4	3.0	5.8
19	2.5	3.5	2.7	2.9	2.8	2.8	3.9	3.9	4.2	5.2	5.3	5.9	8.6	10.1	9.3	8.8	8.4	9.8	8.6	5.3	5.0	3.6	4.9	5.6	5.5
20	6.0	5.6	3.8	4.0	5.6	4.1	3.5	6.0	10.2	10.0	9.7	11.1	11.3	11.3	11.5	11.7	11.0	9.8	9.9	7.4	7.8	6.4	7.0	6.9	8.0
21	5.3	5.1	4.7	3.3	3.1	6.6	6.4	3.0	7.2	9.1	10.3	9.4	10.1	11.0	10.9	10.9	10.5	10.3	9.2	8.0	5.2	4.4	4.0	3.5	7.1
22	2.0	6.8	5.6	3.0	2.5	1.9	2.2	1.8	4.1	8.6	9.4	10.7	10.8	10.6	10.4	9.8	10.1	8.8	7.9	5.1	4.0	2.9	3.1	3.8	6.1
23	6.1	6.7	6.8	6.1	8.1	8.5	8.1	8.3	11.0	13.2	10.6	11.7	12.9	12.4	13.9	13.8	13.1	10.7	7.7	5.4	3.3	4.0	4.1	3.8	8.7
24	2.9	3.8	3.7	2.6	3.9	3.0	4.1	2.4	2.7	4.6	5.2	4.6	6.0	6.9	10.1	9.8	9.5	4.3	4.8	3.1	2.7	3.1	2.2	8.3	4.7
25	8.8	6.4	6.5	5.8	5.0	3.9	5.7	6.7	6.1	6.2	5.5	0.3	1.3	1.4	8.8	8.6	8.1	7.8	7.1	5.7	5.6	4.8	4.6	3.9	5.6
26	3.6	3.4	2.5	3.0	4.1	3.2	2.5	1.9	1.7	3.7	5.0	6.8	8.5	8.7	8.7	8.9	10.0	9.7	7.0	7.3	6.3	3.3	4.0	4.7	5.3
27	3.7	1.2	2.1	2.9	3.9	2.3	2.9	3.0	7.2	9.1	9.5	10.1	9.7	10.0	9.5	9.2	9.1	8.6	8.5	7.3	6.5	6.6	6.8	8.6	6.6
28	8.9	8.6	7.6	8.2	6.8	5.9	5.4	7.1	9.6	10.9	10.5	10.9	12.2	13.4	12.6	11.9	10.8	11.9	11.1	9.9	8.4	8.5	9.4	9.0	9.5
29	9.3	9.2	9.2	8.0	8.7	8.7	7.7	9.9	11.8	11.8	12.2	11.3	11.8	10.6	10.4	10.2	9.4	9.3	9.6	8.0	6.5	6.3	6.5	7.7	9.3
30	7.0	8.3	10.3	10.3	9.0	7.9	8.3	9.7	12.7	12.0	11.3	12.5	14.6	13.6	14.0	14.1	13.5	11.9	9.3	7.0	6.0	6.0	5.9	4.5	10.0
31	5.0	6.4	5.4	3.6	2.4	2.9	6.1	3.7	8.7	8.4	6.9	5.1	8.7	14.3	14.5	13.8	11.7	10.4	5.7	5.4	4.7	3.2	3.7	3.1	6.8

TOTAL HOURS 744 TOTAL GOOD HOURS 742 DATA CAPTURE 99.7%

MAX. 1HR AVG 15.4 03/05/89 11:00:00 2ND MAX. 1 HR AVG 15.3 03/10/89 01:00:00

MIN. 1HR AVG 0.3 03/25/89 11:00:00 ARITHMETIC MEAN 7.1 STANDARD DEV. 3.4

KEY FOR MISSING CODES
Bad< - To few samples for valid average, Cal - calibration, OCal - Analyzer out of calibration
BadS - Bad Analyzer Status, PwrF - Power Failure, Down - Operator downed channel, Miss - Missing Data
Qad - Data questionable insufficient documentation, Qai - Data questionable external influence, Purg - Analyzer in Purge

FPL-Davie
Ft. Lauderdale, FL - Site 004

HOURLY AVERAGES FOR Sig01 in deg

MARCH 1989

DAY	HOUR (EST) 00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVG
1	23.8	35.6	22.0	15.4	22.6	79.4	28.2	33.3	86.2	49.3	43.3	34.8	13.2	14.8	12.7	12.5	11.9	11.2	12.4	12.0	10.4	8.8	18.0	10.6	25.9
2	19.1	40.2	10.9	11.2	7.7	23.6	26.5	16.0	10.1	11.6	12.0	15.3	17.0	13.7	12.1	20.7	35.0	41.1	36.6	10.1	8.8	8.9	24.6	11.5	18.5
3	9.2	11.7	11.4	11.7	11.2	15.7	14.7	8.2	10.9	15.4	33.7	30.7	19.6	18.8	16.5	15.8	13.0	12.4	11.1	11.5	9.7	6.1	8.7	7.9	14.0
4	10.3	10.8	10.8	10.8	15.3	7.8	9.7	11.0	13.0	12.8	14.4	13.9	14.7	15.0	13.9	13.0	12.2	12.6	11.6	10.6	10.0	10.1	10.5	9.3	11.8
5	9.7	10.9	11.5	11.4	12.2	12.5	11.7	12.7	11.9	12.1	11.5	11.7	11.7	12.5	12.4	15.7	14.4	13.0	11.6	11.0	9.4	9.7	10.4	9.0	11.7
6	8.3	8.6	10.1	10.8	11.7	10.4	8.8	8.8	10.8	12.1	11.7	13.0	PwrF	23.2	14.7	PwrF	11.9	12.8	11.5	17.5	24.5	11.4	10.8	10.3	12.4
7	10.8	11.6	15.9	15.5	9.5	10.0	9.8	13.7	14.1	14.8	16.1	18.0	22.7	18.2	18.7	19.6	14.7	10.5	10.5	16.6	24.7	15.4	17.9	23.7	15.5
8	15.5	12.2	12.2	16.0	16.5	17.7	14.8	17.0	15.5	13.9	14.7	12.7	12.6	14.3	14.9	14.1	14.7	15.9	15.7	14.2	13.2	12.8	11.5	10.3	14.3
9	11.4	12.0	12.4	11.2	11.5	11.0	10.9	12.4	12.4	12.7	11.0	12.7	13.8	11.6	9.3	9.8	10.9	10.6	11.4	11.6	12.4	11.9	9.9	9.9	11.4
10	8.9	8.4	8.9	8.1	9.0	7.7	8.2	9.0	9.0	10.4	12.8	14.6	15.7	14.1	16.6	14.7	20.7	20.4	19.6	17.6	16.8	16.3	13.5	12.7	13.1
11	12.0	12.8	12.7	13.0	12.0	11.5	10.8	10.5	13.2	15.9	18.5	21.4	21.3	22.1	19.8	21.3	19.9	17.1	17.6	17.4	16.8	15.0	15.0	13.9	15.9
12	14.9	13.6	13.3	11.1	15.3	14.7	12.4	11.4	11.7	11.1	18.7	18.7	23.1	25.8	36.4	33.3	43.7	13.2	9.4	11.6	11.1	8.2	13.8	8.7	16.9
13	12.4	12.8	14.2	12.0	13.2	11.4	20.1	16.1	10.4	12.4	18.6	38.5	25.8	49.0	51.6	18.3	14.8	11.2	9.3	13.3	15.8	17.2	15.9	16.9	18.8
14	15.9	15.2	25.2	20.1	23.2	19.3	14.7	19.9	70.4	36.3	44.9	17.4	16.3	15.3	21.2	17.1	13.9	12.8	12.4	10.9	9.2	8.9	9.9	9.0	20.0
15	10.3	10.1	10.5	9.7	10.3	9.5	22.3	17.5	13.7	13.8	15.2	13.2	15.0	14.4	13.3	12.6	13.2	12.6	10.4	9.7	9.3	9.7	9.8	10.0	12.3
16	11.0	23.2	52.6	21.9	22.9	13.9	43.9	39.0	14.3	16.0	13.9	14.1	15.7	18.2	14.6	14.6	16.4	13.8	11.6	10.9	12.7	16.4	12.5	13.2	19.0
17	19.1	16.0	17.7	26.0	42.2	29.0	39.4	42.9	15.4	13.3	14.7	13.5	12.7	14.6	14.8	11.6	14.1	10.5	9.9	10.8	10.3	11.1	11.1	12.2	18.0
18	17.7	13.0	10.5	9.7	10.5	26.5	25.6	24.1	14.2	17.0	14.6	21.8	16.4	15.2	19.1	21.3	20.3	17.1	14.8	17.5	21.9	15.9	15.0	27.5	17.8
19	14.6	6.5	9.9	7.7	7.6	9.3	8.8	12.6	12.8	20.2	25.9	24.8	21.6	20.1	20.7	23.7	20.1	16.1	14.9	15.4	13.2	11.6	10.5	10.5	15.0
20	9.3	8.6	11.6	10.6	6.2	8.2	12.6	15.9	14.2	15.7	15.9	14.6	14.3	14.1	13.2	11.6	14.1	12.6	10.6	11.2	11.9	11.9	11.7	12.2	12.2
21	12.2	9.4	11.4	10.5	36.7	52.0	34.0	11.7	13.3	14.4	13.9	15.4	16.3	16.9	14.9	15.2	13.9	13.3	11.4	11.2	9.3	7.6	8.2	9.5	15.9
22	27.9	20.7	25.3	11.0	13.5	17.5	21.9	29.8	25.7	12.7	15.8	14.7	16.5	13.8	15.8	14.6	14.2	12.8	11.1	10.0	10.8	7.6	35.5	11.9	17.1
23	9.7	11.2	12.1	11.9	9.9	10.4	9.4	10.1	13.0	12.2	14.7	13.9	11.5	12.6	13.5	12.4	12.6	12.4	12.5	11.9	7.8	7.2	7.7	11.2	11.3
24	16.0	13.6	13.3	11.4	24.9	14.4	10.9	44.4	30.7	18.0	25.6	38.4	26.9	27.4	13.0	14.9	15.0	37.2	52.6	18.2	17.0	44.9	22.6	9.8	23.4
25	8.9	10.5	10.1	11.6	10.6	12.8	8.2	14.1	12.8	14.6	18.8	40.1	75.6	44.3	13.8	13.7	14.2	12.5	11.2	11.7	11.7	13.3	15.9	17.1	17.8
26	16.9	17.4	15.9	16.0	31.7	15.3	26.0	37.9	67.1	28.6	22.5	20.5	17.4	16.6	15.9	14.7	13.1	13.6	13.0	10.3	11.7	15.4	11.0	11.5	20.0
27	11.6	41.3	10.6	12.2	17.6	19.1	29.5	30.2	18.0	14.9	15.3	14.8	16.6	16.1	17.5	15.8	16.1	15.7	13.7	13.8	12.6	12.2	11.7	10.6	17.0
28	9.0	9.3	9.4	8.8	9.4	9.3	12.4	13.6	13.3	14.2	14.2	15.3	15.5	13.8	13.5	15.2	14.9	12.7	11.6	11.1	10.5	10.6	10.4	11.1	12.0
29	10.5	10.8	9.8	11.5	11.5	12.6	12.4	14.2	13.3	13.6	14.3	14.4	15.9	15.9	16.1	16.3	15.8	14.4	12.6	13.5	12.6	13.2	13.0	12.6	13.4
30	13.3	12.4	10.8	10.1	9.3	9.3	9.9	11.0	12.6	12.8	14.9	15.7	12.2	14.2	13.8	13.6	12.0	12.4	10.6	12.2	10.3	9.4	9.5	8.1	11.7
31	9.9	10.4	11.5	10.8	12.2	24.7	11.7	19.6	15.8	18.1	22.4	32.0	22.0	12.1	12.1	12.8	15.8	13.8	14.4	17.5	15.3	17.2	13.7	15.5	15.9

TOTAL HOURS 744 TOTAL GOOD HOURS 742 DATA CAPTURE 99.7%

MAX. 1HR AVG 86.2 03/01/89 08:00:00 2ND MAX. 1 HR AVG 79.4 03/01/89 05:00:00

MIN. 1HR AVG 6.1 03/03/89 21:00:00 ARITHMETIC MEAN 15.8 STANDARD DEV. 8.9

KEY FOR MISSING CODES
Bad< - To few samples for valid average, Cal - calibration, OCal - Analyzer out of calibration
BadS - Bad Analyzer Status, PwrF - Power Failure, Down - Operator downed channel, Miss - Missing Data
Qad - Data questionable insufficient documentation, Qai - Data questionable external influence, Purg - Analyzer in Purge

FPL-Davie
Ft. Lauderdale, FL - Site 004

HOURLY AVERAGES FOR TEMP in DGC

MARCH 1989

DAY	HOUR (EST) 00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVG
1	18.8	19.0	19.1	19.0	19.0	18.6	18.7	19.1	20.3	21.4	22.6	24.0	24.7	25.2	25.5	25.1	24.2	23.9	23.4	22.8	22.4	21.6	21.3	21.1	21.7
2	20.6	20.2	20.2	20.7	20.5	20.0	20.2	20.4	21.6	23.5	25.9	27.4	27.7	28.1	25.6	24.1	22.0	20.2	19.7	19.7	21.2	21.6	21.6	21.5	22.2
3	21.2	21.1	21.3	21.5	21.5	21.7	21.7	21.9	23.5	24.8	25.2	26.9	28.0	28.4	28.4	28.6	28.4	27.1	25.2	23.9	23.0	22.2	22.1	21.7	24.1
4	21.9	22.0	22.0	22.1	22.0	21.5	21.5	22.1	24.3	25.9	26.7	27.3	27.7	28.0	27.4	26.9	26.2	25.1	24.1	23.6	23.6	23.5	23.3	23.1	24.2
5	23.3	23.2	23.1	22.9	22.8	22.7	22.6	23.3	24.7	25.4	26.1	27.0	27.4	27.4	27.1	27.1	26.7	25.5	24.2	23.4	22.9	22.8	22.8	22.4	24.4
6	22.2	22.1	22.3	22.8	22.5	22.3	22.2	23.1	24.9	26.0	26.5	24.1	PwrF	24.9	25.9	PwrF	25.3	24.7	23.5	23.2	22.8	22.8	22.9	23.2	23.6
7	22.1	21.1	22.4	22.0	21.5	21.0	21.3	22.4	24.4	26.2	27.0	26.9	25.2	21.6	22.4	22.9	21.1	19.2	17.5	16.6	16.3	15.8	15.6	15.3	21.1
8	15.2	14.7	14.5	14.1	13.7	13.4	13.2	12.6	12.5	12.4	12.9	13.2	13.6	13.8	14.2	14.8	14.4	14.5	14.5	14.3	13.9	13.4	12.9	12.5	13.7
9	12.4	12.2	11.6	11.0	11.0	11.2	11.0	11.0	11.1	11.4	11.7	12.7	13.7	13.3	12.8	12.7	11.9	11.6	11.2	10.9	10.8	10.3	10.0	9.7	11.5
10	8.8	8.5	8.5	8.7	8.8	8.7	8.8	9.4	10.4	12.1	15.0	17.3	18.9	20.0	20.6	20.6	20.2	19.5	17.8	16.5	15.4	14.2	13.0	12.2	13.9
11	11.2	11.3	11.6	11.5	11.2	11.1	10.9	11.7	14.1	17.3	19.6	21.3	22.0	21.8	22.3	22.4	21.9	21.0	19.7	18.6	17.6	16.8	15.9	15.2	16.6
12	14.7	14.0	13.5	13.3	13.3	13.3	12.5	12.7	14.9	17.5	20.0	21.9	23.0	23.9	24.4	24.7	24.6	22.7	20.9	19.1	18.7	17.7	17.0	15.6	18.1
13	14.8	14.3	13.8	13.1	12.7	12.3	12.2	13.3	15.9	18.8	20.9	22.6	24.7	25.6	26.2	26.0	25.4	24.0	22.1	20.8	19.8	18.3	17.5	16.8	18.8
14	16.1	15.5	15.0	14.2	13.9	13.5	13.3	13.9	15.0	16.3	21.9	24.8	25.3	25.7	25.9	25.5	25.0	23.9	22.1	20.9	20.1	19.7	19.4	19.1	19.4
15	19.4	19.7	19.7	19.8	19.4	18.3	17.7	19.8	22.5	23.9	24.4	23.8	24.2	25.0	24.6	24.4	24.5	23.5	22.5	22.0	21.8	21.7	21.6	21.5	21.9
16	21.3	20.8	19.8	19.7	19.5	19.2	19.2	20.6	22.8	24.2	24.2	24.1	25.3	26.1	25.9	25.3	24.5	23.8	23.0	22.6	22.5	22.1	22.1	21.6	22.5
17	21.0	20.1	19.9	19.1	19.3	18.9	18.8	20.9	23.6	24.1	24.5	25.2	25.2	25.5	25.5	25.0	24.2	23.8	23.3	22.9	22.8	22.7	22.7	22.3	22.5
18	21.9	21.4	21.6	21.3	20.9	19.8	19.4	20.8	23.6	25.0	25.3	25.8	26.2	26.4	26.2	26.0	25.5	24.7	23.5	22.8	22.4	22.0	21.8	21.4	23.1
19	20.1	19.0	18.3	18.0	17.7	17.3	17.0	18.0	20.8	23.1	24.8	26.3	27.2	27.5	26.9	26.3	25.8	24.8	23.8	23.2	22.7	22.1	21.8	21.9	22.2
20	21.6	21.2	21.0	20.5	20.5	20.4	20.8	22.6	23.8	24.9	25.3	25.6	25.8	26.2	25.8	25.3	24.7	24.0	23.3	22.8	22.5	22.2	22.1	22.0	23.1
21	21.7	21.4	21.1	20.7	19.6	18.8	18.5	20.7	23.6	25.0	26.4	26.7	27.3	27.4	27.4	26.8	26.0	25.0	23.6	22.8	22.3	21.8	21.4	21.2	23.2
22	20.9	20.4	19.9	19.5	19.5	19.2	19.1	20.5	23.6	25.3	26.4	27.1	27.5	27.3	27.2	27.0	26.3	25.0	23.5	22.5	22.2	21.9	21.5	21.4	23.1
23	21.8	21.8	21.9	21.7	22.0	22.2	22.1	23.5	24.9	25.8	27.0	27.6	26.0	27.2	27.7	27.2	26.7	26.8	25.9	24.5	23.1	22.5	21.9	21.8	24.3
24	22.0	21.9	21.7	21.4	21.4	21.3	21.1	21.0	22.0	23.5	26.0	27.6	29.2	29.2	28.1	27.8	25.6	24.9	22.2	22.8	22.6	21.3	21.0	20.6	23.6
25	20.0	18.9	18.0	17.6	16.8	16.5	16.3	16.3	17.2	19.2	22.2	25.1	26.8	27.7	26.5	26.5	26.4	25.7	24.6	23.8	23.3	22.9	22.2	20.8	21.7
26	19.9	18.7	18.3	17.7	17.4	17.1	16.9	18.3	21.3	25.0	26.6	27.6	27.6	27.8	27.6	27.4	26.6	25.5	24.2	23.7	23.5	23.2	22.9	23.1	22.8
27	22.6	22.3	21.3	20.6	20.2	20.0	20.1	21.4	24.4	25.7	26.2	26.7	27.2	27.0	27.0	26.9	26.5	25.6	24.6	24.0	23.7	23.5	23.4	23.4	23.9
28	23.2	23.0	22.8	22.7	22.4	22.2	22.6	23.6	24.5	25.2	25.8	26.4	26.6	26.5	26.2	25.4	25.6	24.9	23.9	23.5	23.4	23.3	23.3	23.1	24.1
29	22.9	22.8	22.8	22.7	22.7	22.8	22.8	23.3	24.5	25.5	26.4	26.8	27.1	27.4	27.3	26.9	26.3	25.4	24.2	23.6	23.3	23.2	23.3	23.5	24.5
30	23.4	23.2	23.1	23.0	22.8	22.5	22.8	24.2	25.4	26.5	26.8	26.9	27.9	28.3	29.0	28.6	27.5	26.5	25.5	24.8	24.0	23.5	23.3	22.7	25.1
31	22.8	23.0	22.9	22.5	21.9	21.5	21.5	23.5	25.6	27.3	28.4	28.9	28.4	24.8	27.0	28.4	28.6	27.3	26.0	25.6	24.4	23.5	22.9	22.4	24.9

TOTAL HOURS 744 TOTAL GOOD HOURS 742 DATA CAPTURE 99.7%

MAX. 1HR AVG 29.2 03/24/89 13:00:00 2ND MAX. 1 HR AVG 29.2 03/24/89 12:00:00

MIN. 1HR AVG 8.5 03/10/89 01:00:00 ARITHMETIC MEAN 21.6 STANDARD DEV. 4.5

KEY FOR MISSING CODES
Bad< - To few samples for valid average, Cal - calibration, OCal - Analyzer out of calibration
BadS - Bad Analyzer Status, PwrF - Power Failure, Down - Operator downed channel, Miss - Missing Data
Qad - Data questionable insufficient documentation, Qai - Data questionable external influence, Purg - Analyzer in Purge

FPL-Davie
Ft. Lauderdale, FL - Site 004

HOURLY AVERAGES FOR RNFL in INCH

MARCH 1989

DAY	HOUR (EST) 00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVG
1	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.17	0.01	0.00	0.00	0.00	0.00	0.00	0.01
3	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	PwrF	0.01	0.00	PwrF	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.00	0.00	0.02	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.01
8	0.00	0.00	0.00	0.02	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.14	0.01
9	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

TOTAL HOURS 744 TOTAL GOOD HOURS 742 DATA CAPTURE 99.7%

MAX. 1HR AVG 0.17 03/02/89 17:00:00 2ND MAX. 1 HR AVG 0.14 03/08/89 23:00:00

MIN. 1HR AVG 0.00 03/01/89 00:00:00 ARITHMETIC MEAN 0.00 STANDARD DEV. 0.01

KEY FOR MISSING CODES
Bad< - To few samples for valid average, Cal - calibration, OCal - Analyzer out of calibration
BadS - Bad Analyzer Status, PwrF - Power Failure, Down - Operator downed channel, Miss - Missing Data
Qad - Data questionable insufficient documentation, Qai - Data questionable external influence, Purg - Analyzer in Purge

FPL DAVIE PRECIPITATION

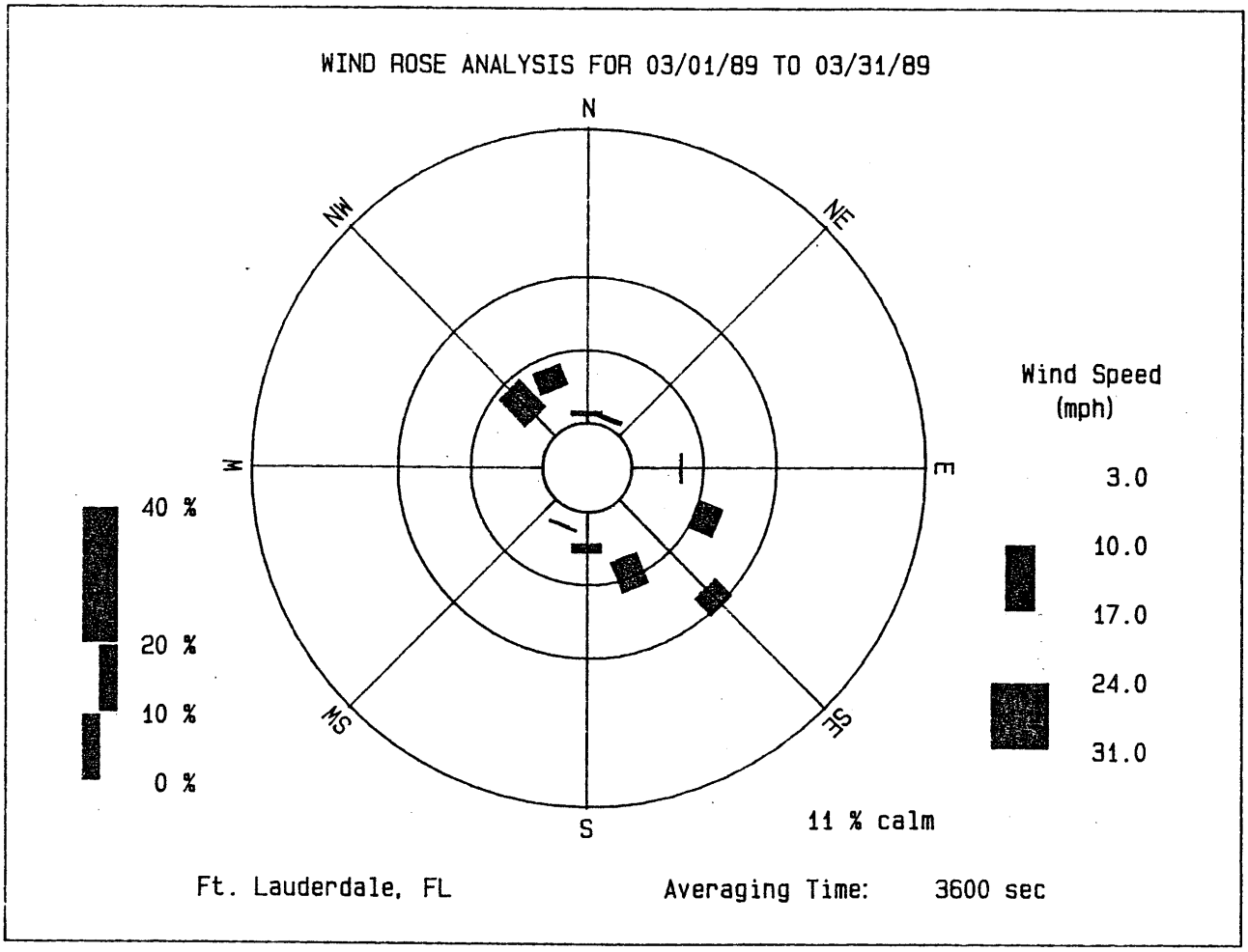
DATE	TIME	AMOUNT
03-01-89	0500	.01
03-02-89	1600	.04
	1700	.17
	1800	.01
03-03-89	0000	.01
	0600	.01
03-06-89	1300	.01
03-07-89	1300	.09
	1600	.02
	1900	.01
03-08-89	0300	.02
	0500	.01
	0700	.01
	2200	.05
	2300	.14
03-09-89	0000	.09
03-24-89	1600	.12
	T O T A L - - -	.82
	10.5.1-74	

WIND ROSE ANALYSIS FOR 03/01/89 TO 03/31/89

Wind Speed (mph)	DIRECTION															
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW
> 31.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
31.0-24.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
24.0-17.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
17.0-10.0	0.5	0.7	0.0	0.1	0.4	3.2	3.2	4.4	1.3	0.4	0.0	0.0	0.0	0.0	5.1	3.0
10.0- 3.0	1.1	0.9	0.7	2.2	6.6	10.	17.	7.0	3.9	2.2	1.8	1.1	1.5	1.3	3.6	5.5
3.0 <																
All Speed	1.6	1.6	0.7	2.3	7.0	13.	20.	11.	5.3	2.6	1.8	1.1	1.5	1.3	8.8	8.5

EV-

Press Esc to exit analysis, or any other key to continue...


WIND ROSE ANALYSIS FOR 03/01/89 TO 03/31/89
N
NE
E
SE
S
SW
W
NW
40 %
20 %
10 %
0 %
Wind Speed
(mph)
3.0
10.0
17.0
24.0
31.0
11 % calm
Ft. Lauderdale, FL
Averaging Time: 3600 sec

AIR AND METEOROLOGICAL DATA

APRIL - SEPTEMBER 1989

HUNTER/ESE PROJECT NUMBER 89 101 100

FPL PINEHURST

NO2 PRECISION CALCULATIONS

3RD & 4TH SAMPLING QUARTERS

APRIL 1,1989 - SEPTEMBER 30,1989

DATE	DESIRED PPB	ACTUAL PPB	% DIFFERENCE (D(I))
APR 14, 1989	92.0	83.0	-9.8
APR 17, 1989	92.0	89.0	-3.3
MAY 5, 1989	92.0	85.0	-7.6
MAY 16, 1989	92.0	85.0	-7.6
MAY 30, 1989	92.0	85.0	-7.6
JUN 7, 1989	73.0	85.0	16.4
JUN 13, 1989	71.0	65.0	-8.5
JUN 27, 1989	71.0	70.0	-1.4
AUG 22, 1989	91.0	108.0	18.7
SEP 5, 1989	91.0	90.0	-1.1

SUM OF D(I) = -11.7

MEAN OF D(I) = -1.2

STD. DEV. = 10.3

UPPER 95% PROBABILITY LIMIT = 19.1

LOWER 95% PROBABILITY LIMIT = -21.4

FPL-Pinehurst
Ft. Lauderdale, FL - Site 001

HOURLY AVERAGES FOR NO2 in PPB

APRIL 1989

DAY	HOUR (EST) 00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVG
1	16	15	14	9	Cal	6	13	10	10	13	13	12	11	10	10	9	9	12	12	15	14	10	11	9	11
2	7	6	6	5	5	7	9	10	8	8	7	7	7	7	6	8	10	13	15	16	22	16	13	9	9
3	7	8	7	5	Cal	10	15	12	12	14	10	10	5	15	15	12	11	12	12	10	9	9	8	7	10
4	7	8	8	7	7	7	7	12	12	14	13	12	13	9	9	8	8	9	12	14	12	10	8	7	10
5	6	6	7	7	Cal	7	9	12	20	19	16	12	12	13	13	12	15	15	20	25	28	30	35	35	16
6	32	37	41	31	21	23	27	30	54	63	38	17	17	16	16	15	12	8	7	9	15	22	15	14	24
7	11	13	13	21	27	27	27	30	33	20	18	20	41	16	14	13	13	17	20	25	36	48	41	47	25
8	38	30	27	23	20	18	16	25	52	30	11	10	10	8	6	7	5	9	9	11	10	12	9	10	17
9	12	7	11	10	11	12	16	21	12	9	8	8	8	8	7	7	7	7	8	9	7	8	7	7	9
10	10	7	8	8	9	10	12	21	20	15	7	6	7	Cal	8	10	10	8	11	14	14	9	8	6	10
11	7	14	17	23	Cal	19	20	130	165	69	62	56	115	130	154	135	66	27	16	14	13	17	16	11	56
12	11	8	7	7	13	22	28	26	26	20	8	9	7	7	8	10	10	8	9	11	9	9	7	7	12
13	8	13	11	13	Cal	26	32	22	14	17	12	18	19	10	15	10	11	12	11	10	9	10	10	8	14
14	5	8	8	19	15	23	23	13	12	14	15	Cal	9	8	8	10	13	10	11	11	10	11	9	9	12
15	6	5	4	4	Cal	7	10	8	7	8	7	7	7	7	9	9	8	7	19	22	20	18	22	21	10
16	17	16	13	13	12	11	12	18	21	12	9	13	20	25	38	36	34	29	16	26	31	20	11	12	19
17	10	8	4	8	Cal	21	18	14	11	10	12	10	10	13	16	14	18	10	15	10	13	9	10	13	12
18	10	11	22	15	Cal	20	21	15	8	7	9	7	8	7	5	6	12	9	9	13	11	11	9	13	11
19	9	12	9	10	Cal	17	23	28	8	6	6	5	6	6	5	5	6	7	10	10	10	8	15	21	10
20	25	19	21	21	19	24	26	33	43	34	20	16	12	26	31	43	48	33	17	29	22	25	34	35	27
21	29	28	24	23	Cal	22	21	29	30	12	8	7	7	6	6	8	14	15	15	20	23	27	14	11	17
22	13	12	9	9	11	15	19	21	19	15	13	6	8	7	6	7	8	8	13	12	10	10	13	9	11
23	5	7	10	9	Cal	14	24	27	20	12	11	12	8	7	7	6	8	10	13	19	17	16	13	8	12
24	8	9	13	17	24	43	49	22	21	12	34	24	22	10	13	10	12	9	10	13	13	15	17	12	18
25	17	19	15	23	Cal	31	38	53	30	28	33	32	15	13	21	27	22	13	15	23	27	31	31	31	25
26	31	29	27	26	24	27	29	40	28	26	23	25	19	24	19	18	19	18	25	35	30	42	47	36	28
27	19	9	8	11	Cal	21	25	24	21	21	13	12	24	24	19	22	17	18	24	25	32	35	39	32	21
28	15	12	12	15	16	24	28	26	20	12	10	11	18	23	19	15	15	13	16	17	20	19	26	27	18
29	24	21	20	18	Cal	14	17	29	23	11	8	7	8	7	7	7	8	9	11	16	23	21	24	25	15
30	17	13	5	10	17	18	15	7	11	9	17	17	10	9	13	11	11	10	10	18	19	13	9	5	12

TOTAL HOURS 720 TOTAL GOOD HOURS 704 DATA CAPTURE 97.8%

MAX. 1HR AVG 165 04/11/89 08:00:00 2ND MAX. 1 HR AVG 154 04/11/89 14:00:00

MIN. 1HR AVG 4 04/15/89 02:00:00 ARITHMETIC MEAN 17 STANDARD DEV. 15

KEY FOR MISSING CODES
BadC - To few samples for valid average, Cal - calibration, OCal - Analyzer out of calibration
BadS - Bad Analyzer Status, PwrF - Power Failure, Down - Operator downed channel, Miss - Missing Data
Qad - Data questionable insufficient documentation, Qai - Data questionable external influence, Purg - Analyzer in Purge

FPL PINEHURST
FT. LAUDERDALE, FL - Site 001

HOURLY AVERAGES FOR NO2 in PPB

MAY 1989

DAY	HOUR (EST) 00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVG
1	4	4	3	3	7	9	12	11	8	8	5	7	7	7	7	9	9	11	13	12	15	21	14	9	9
2	7	5	5	7	Cal	14	21	21	12	5	5	5	5	7	8	8	10	10	15	12	7	11	14	13	10
3	8	11	14	20	Cal	34	38	46	24	9	7	9	8	9	11	11	15	15	14	18	19	16	12	13	17
4	9	10	10	8	10	15	18	15	10	7	8	9	6	7	8	10	13	11	18	12	12	12	8	10	11
5	9	9	7	8	Cal	25	22	20	23	18	10	12	22	22	25	23	20	18	16	16	10	11	12	10	16
6	20	19	16	15	12	11	20	19	15	9	8	7	5	5	5	6	7	10	12	16	21	20	21	22	13
7	25	25	13	9	Cal	14	13	9	8	7	8	6	7	8	8	8	9	9	13	22	24	31	36	30	15
8	35	25	12	10	12	20	25	35	35	25	24	23	18	15	10	10	7	9	9	8	9	10	15	10	17
9	8	8	8	8	Cal	24	28	14	10	8	7	8	12	10	16	11	11	13	15	17	14	16	13	11	13
10	10	10	17	31	31	38	41	41	26	26	16	15	12	12	9	10	14	16	16	18	12	12	14	9	19
11	7	10	10	16	Cal	75	54	30	18	8	8	7	6	5	8	11	23	12	16	13	17	20	28	21	18
12	10	9	10	11	15	23	29	30	33	28	30	40	27	14	16	13	13	11	11	12	14	17	24	23	19
13	23	18	9	20	Cal	23	23	20	37	45	15	15	12	10	7	7	9	8	7	9	8	9	9	10	15
14	20	20	19	17	17	13	18	20	6	5	5	5	5	5	4	6	8	8	9	12	13	13	11	11	11
15	10	12	5	7	Cal	15	21	27	18	12	9	11	10	17	15	16	24	26	20	26	27	24	26	25	18
16	23	19	15	16	Cal	15	20	24	23	21	13	8	26	20	15	16	17	23	22	24	25	25	20	11	19
17	10	10	10	18	Cal	18	25	30	40	15	9	15	13	10	9	9	10	15	20	24	25	30	25	30	18
18	20	10	9	13	14	12	16	23	31	20	13	16	9	8	8	8	10	9	8	7	5	4	4	3	12
19	2	6	5	5	Cal	12	16	12	13	9	7	7	7	6	9	8	9	9	10	11	11	13	11	10	9
20	12	15	15	13	21	35	41	41	9	10	8	8	9	14	15	15	10	9	7	7	8	8	9	19	15
21	18	20	17	27	Cal	22	22	20	10	7	8	20	45	30	24	25	18	7	11	12	14	14	23	25	19
22	28	21	15	10	10	23	28	23	9	7	9	8	8	7	9	8	11	16	17	11	17	16	14	9	14
23	12	9	9	11	Cal	26	26	21	12	11	11	10	8	7	8	9	10	11	12	14	12	16	20	17	13
24	20	16	8	10	12	17	23	26	15	10	11	13	15	10	11	20	34	24	31	32	34	32	32	31	20
25	35	25	20	19	Cal	18	20	19	15	10	11	10	12	89	8	9	8	8	8	15	20	25	23	20	19
26	30	30	25	25	20	20	18	20	25	40	15	10	7	8	5	7	8	9	10	12	15	15	13	13	17
27	22	17	21	20	Cal	19	22	36	15	13	10	6	4	5	5	6	4	8	6	8	10	15	14	14	13
28	14	13	13	5	4	13	8	15	10	5	6	6	4	4	2	5	4	4	8	10	9	10	10	8	8
29	7	8	9	9	Cal	9	10	9	7	5	5	6	5	6	5	5	5	5	6	6	7	6	6	7	7
30	7	8	9	6	Cal	11	13	13	10	5	8	5	4	6	4	6	5	5	7	7	6	6	7	6	7
31	8	4	4	6	Cal	10	10	8	7	6	5	6	4	10	6	4	5	4	6	7	6	4	5	4	6

TOTAL HOURS 744 TOTAL GOOD HOURS 726 DATA CAPTURE 97.6%

MAX. 1HR AVG 89 05/25/89 13:00:00 2ND MAX. 1 HR AVG 75 05/11/89 05:00:00

MIN. 1HR AVG 2 05/19/89 00:00:00 ARITHMETIC MEAN 14 STANDARD DEV. 9

KEY FOR MISSING CODES
Bad< - To few samples for valid average, Cal - calibration, OCal - Analyzer out of calibration
BadS - Bad Analyzer Status, PwrF - Power Failure, Down - Operator downed channel, Miss - Missing Data
Qad - Data questionable insufficient documentation, Qai - Data questionable external influence, Purg - Analyzer in Purge

FPL PINEHURST
FT. LAUDERDALE, FL - Site 001

HOURLY AVERAGES FOR NO2 in PPB

JUNE 1989

DAY	HOUR (EST) 00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVG
1	4	4	4	3	7	12	15	11	6	7	6	7	5	5	8	6	6	7	7	8	10	7	7	8	7
2	8	7	7	7	Cal	14	16	11	8	5	5	4	4	4	6	4	7	5	6	9	8	9	10	8	7
3	4	5	5	7	6	12	12	7	5	6	4	5	5	4	4	6	7	8	9	7	6	8	8	7	6
4	7	4	3	3	Cal	8	10	5	5	4	6	4	6	5	9	6	5	6	6	7	7	6	5	4	6
5	5	6	7	6	12	24	21	11	8	7	6	5	6	5	6	6	8	9	9	11	9	8	6	5	8
6	4	5	4	6	Cal	15	17	16	9	6	6	6	6	5	7	7	12	18	25	14	19	13	18	24	11
7	24	24	15	15	18	Cal	Cal	Cal	Cal	Cal	Cal	Cal	Cal	Cal	Cal	Cal	Cal	16	19	26	18	11	9	10	Bad<
8	12	14	16	9	Cal	19	24	16	10	8	11	11	10	11	11	10	10	8	10	10	10	9	8	7	11
9	6	4	3	2	4	8	11	10	7	5	5	7	5	5	5	6	7	8	8	12	15	19	21	18	8
10	14	16	13	11	Cal	12	9	7	4	5	5	5	3	4	4	3	4	5	6	11	14	11	6	6	8
11	4	3	4	6	3	9	9	5	3	4	4	4	3	8	7	9	5	5	7	7	7	8	8	6	6
12	5	5	7	8	Cal	12	13	8	7	6	5	5	5	5	6	4	6	6	6	6	7	6	8	10	7
13	12	11	12	11	Cal	14	20	13	9	6	6	6	5	6	4	4	6	4	7	9	7	10	7	11	9
14	8	10	14	13	Cal	12	15	23	8	5	7	6	5	4	6	5	6	5	9	7	9	11	13	11	9
15	13	7	6	2	4	7	10	10	8	6	6	6	5	6	6	6	6	6	5	10	9	8	9	5	7
16	5	3	4	4	Cal	8	11	8	6	5	6	7	5	4	6	6	6	6	6	7	9	7	7	5	6
17	6	4	4	6	7	8	8	6	5	6	4	6	5	8	6	6	6	7	8	9	11	11	8	8	7
18	12	7	9	12	Cal	8	7	6	3	4	4	4	4	3	3	4	4	3	5	5	6	9	7	11	6
19	6	4	8	10	12	16	15	8	7	8	9	9	9	9	7	11	11	14	13	13	13	9	8	5	10
20	5	6	5	6	Cal	18	20	14	9	7	8	6	6	6	8	8	10	7	10	11	13	11	11	9	9
21	9	10	7	8	11	13	15	9	6	6	6	7	5	7	9	6	10	8	10	12	14	7	21	18	10
22	22	20	16	13	Cal	14	16	10	14	15	18	22	25	12	13	11	10	10	25	20	11	8	7	9	15
23	12	11	8	9	12	17	18	14	8	7	9	21	12	8	12	13	12	11	13	16	22	18	21	17	13
24	14	13	12	10	Cal	22	20	13	15	18	18	19	15	13	9	12	9	11	12	19	25	27	25	23	16
25	23	21	25	23	22	19	20	22	25	24	17	16	10	8	11	10	13	19	19	21	17	31	33	20	19
26	12	11	7	6	Cal	24	27	23	13	10	9	22	30	22	40	37	35	37	41	39	33	26	27	28	24
27	26	21	21	24	Cal	26	28	30	25	16	13	24	20	23	27	23	24	27	22	34	34	31	31	30	25
28	28	16	17	17	Cal	16	21	30	21	29	24	16	18	24	20	24	28	29	30	27	26	28	27	23	23
29	19	20	18	14	14	12	20	27	32	23	19	16	16	15	10	22	24	24	24	27	27	24	21	23	20
30	17	16	15	14	Cal	14	22	40	38	22	13	49	28	23	28	30	44	23	22	36	33	28	20	16	26

TOTAL HOURS 720 TOTAL GOOD HOURS 691 DATA CAPTURE 96.0%

MAX. 1HR AVG 49 06/30/89 11:00:00 2ND MAX. 1 HR AVG 44 06/30/89 16:00:00

MIN. 1HR AVG 2 06/15/89 03:00:00 ARITHMETIC MEAN 12 STANDARD DEV. 8

KEY FOR MISSING CODES
Bad< - To few samples for valid average, Cal - calibration, OCal - Analyzer out of calibration
BadS - Bad Analyzer Status, PwrF - Power Failure, Down - Operator downed channel, Miss - Missing Data
Qad - Data questionable insufficient documentation, Qai - Data questionable external influence, Purg - Analyzer in Purge

FPL PINEHURST
FT. LAUDERDALE, FL - Site 001

HOURLY AVERAGES FOR NO2 in PPB

JULY 1989

DAY	HOUR (EST) 00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVG
1	11	9	10	8	8	11	14	15	16	12	9	10	10	25	15	10	19	18	22	20	19	18	20	21	15
2	18	18	18	11	Cal	6	6	9	11	11	10	20	16	9	8	11	14	14	9	12	19	13	20	24	13
3	22	23	22	24	21	16	20	21	28	20	13	15	25	17	12	21	26	32	19	18	15	17	21	24	20
4	22	23	21	17	Cal	11	13	11	5	5	5	7	15	11	10	10	19	24	31	43	43	40	37	36	20
5	30	12	12	15	20	32	25	37	37	37	32	38	29	13	11	13	25	12	13	19	23	24	18	15	22
6	12	17	21	17	Cal	20	32	31	15	19	12	8	7	5	7	9	9	8	7	11	16	18	12	13	14
7	7	6	6	8	6	9	13	16	14	14	19	11	14	15	14	9	7	7	7	8	12	15	15	15	11
8	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Miss
9	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Miss
10	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Miss
11	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Miss
12	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Miss
13	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Miss
14	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Miss
15	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Miss
16	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Miss
17	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Miss
18	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Miss
19	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Miss
20	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Miss
21	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Miss
22	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Miss
23	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Miss
24	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Miss
25	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Miss
26	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Miss
27	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Miss
28	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Miss
29	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Miss
30	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Miss
31	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Miss

TOTAL HOURS 744 TOTAL GOOD HOURS 165 DATA CAPTURE 22.2%

MAX. 1HR AVG 43 07/04/89 20:00:00 2ND MAX. 1 HR AVG 43 07/04/89 19:00:00

MIN. 1HR AVG 5 07/04/89 08:00:00 ARITHMETIC MEAN 16 STANDARD DEV. 8

KEY FOR MISSING CODES
Bad< - To few samples for valid average, Cal - calibration, OCal - Analyzer out of calibration
BadS - Bad Analyzer Status, PwrF - Power Failure, Down - Operator downed channel, Miss - Missing Data
Qad - Data questionable insufficient documentation, Qai - Data questionable external influence, Purg - Analyzer in Purge

FPL PINEHURST
FT. LAUDERDALE, FL - Site 001

HOURLY AVERAGES FOR NO2 in PPB

AUGUST 1989

DAY	HOUR (EST) 00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVG
1	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Miss
2	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Miss
3	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Miss
4	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Miss
5	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Miss
6	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Miss
7	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Miss
8	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Miss
9	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Miss
10	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Miss
11	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Miss
12	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Miss
13	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Miss
14	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Cal	Cal	Cal	Cal	Cal	49	44	38	34	30	Bad<
15	24	31	29	32	Cal	Cal	Cal	Cal	Cal	Cal	17	13	11	10	16	24	24	22	26	26	28	33	31	31	Bad<
16	27	25	23	21	19	20	23	26	24	22	17	24	26	21	19	24	54	59	42	19	13	21	19	16	25
17	13	22	25	14	Cal	32	33	39	38	27	24	36	37	11	11	10	12	12	15	15	12	15	27	17	21
18	9	10	14	11	13	22	26	31	26	17	12	11	9	12	9	17	18	13	16	11	11	12	10	15	15
19	10	10	8	13	Cal	12	19	13	20	10	13	12	20	19	14	18	12	13	11	9	13	17	11	8	13
20	10	9	7	9	9	10	13	9	15	20	12	8	7	7	6	6	7	7	10	12	11	10	10	10	10
21	8	7	7	13	Cal	22	23	36	29	21	15	12	12	16	14	11	8	11	13	14	18	29	29	27	17
22	27	24	11	14	Cal	21	30	18	11	12	10	12	17	8	8	11	10	9	9	11	11	9	9	9	13
23	11	12	10	5	Cal	17	20	16	11	9	6	7	6	6	7	7	8	6	10	8	7	12	12	12	10
24	12	10	8	10	9	15	19	14	9	11	6	7	8	8	13	11	7	7	11	10	12	10	9	12	10
25	7	6	7	11	Cal	23	23	13	9	8	8	12	16	13	10	8	8	6	8	6	12	12	10	9	11
26	7	9	10	14	12	18	20	20	19	17	14	9	11	24	11	14	9	9	16	15	14	14	18	15	14
27	15	16	18	18	Cal	19	18	24	12	7	14	20	18	10	10	6	10	10	8	10	10	11	10	11	13
28	11	9	11	19	16	19	20	16	9	7	5	6	7	4	6	4	7	5	8	7	7	8	13	12	10
29	10	7	5	6	Cal	17	23	16	6	5	6	5	5	6	6	6	6	7	6	9	6	6	6	8	8
30	8	8	10	9	16	19	24	16	10	11	12	10	12	13	10	10	16	17	11	10	18	13	17	16	13
31	19	13	12	12	Cal	18	19	15	16	8	7	10	15	10	8	7	10	10	12	13	12	9	11	11	12

TOTAL HOURS 744 TOTAL GOOD HOURS 398 DATA CAPTURE 53.5%

MAX. 1HR AVG 59 08/16/89 17:00:00 2ND MAX. 1 HR AVG 54 08/16/89 16:00:00

MIN. 1HR AVG 4 08/28/89 15:00:00 ARITHMETIC MEAN 14 STANDARD DEV. 8

KEY FOR MISSING CODES
Bad< - To few samples for valid average, Cal - calibration, OCal - Analyzer out of calibration
BadS - Bad Analyzer Status, PwrF - Power Failure, Down - Operator downed channel, Miss - Missing Data
Qad - Data questionable insufficient documentation, Qai - Data questionable external influence, Purg - Analyzer in Purge

FPL PINEHURST
FT. LAUDERDALE, FL - Site 001

HOURLY AVERAGES FOR NO2 in PPB

SEPTEMBER 1989

DAY	HOUR (EST) 00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVG
1	8	9	4	5	10	19	16	19	17	7	7	10	9	14	10	10	8	8	11	11	12	11	11	8	10
2	11	17	19	19	Cal	17	16	20	21	11	12	10	7	5	4	7	12	14	13	18	27	26	26	23	15
3	18	20	21	19	13	10	15	17	23	13	6	5	3	3	4	5	4	4	7	10	14	12	14	17	11
4	12	8	8	5	Cal	17	13	9	7	6	5	8	10	6	6	4	7	12	17	8	8	11	14	15	9
5	12	7	19	12	Cal	24	22	18	16	13	12	8	8	8	13	9	8	11	11	16	10	8	6	7	12
6	5	11	14	12	Cal	18	22	20	8	7	10	5	5	6	5	6	3	6	7	5	5	6	5	5	8
7	5	4	3	4	7	9	17	19	5	4	3	3	4	5	5	6	5	6	7	8	9	7	5	4	6
8	3	4	3	3	Cal	24	25	29	25	18	12	10	5	6	9	11	6	8	13	14	16	24	27	28	14
9	25	21	14	8	10	11	19	17	5	5	5	4	4	6	6	6	5	5	9	8	6	22	24	23	11
10	20	20	20	18	Cal	15	15	10	6	4	4	6	4	5	4	5	6	5	8	8	7	6	6	4	9
11	7	8	6	6	9	16	30	22	7	6	5	4	4	6	5	5	7	6	8	8	7	8	6	6	8
12	5	6	7	4	Cal	15	23	13	8	5	5	6	5	5	7	6	7	8	5	8	6	5	6	5	7
13	3	4	4	4	10	19	31	18	7	6	5	5	5	6	5	4	7	6	8	7	9	13	10	7	8
14	7	13	14	13	Cal	20	27	30	16	12	24	6	7	6	8	7	7	4	6	5	5	6	6	6	11
15	5	4	2	3	8	8	10	6	4	3	4	3	3	4	5	7	6	6	6	8	6	7	8	7	5
16	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Miss
17	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Miss
18	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Miss
19	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Miss
20	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Miss
21	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Miss
22	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Miss
23	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Miss
24	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Miss
25	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Miss
26	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Miss
27	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Miss
28	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Miss
29	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Miss
30	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Qai	Miss

TOTAL HOURS 720 TOTAL GOOD HOURS 352 DATA CAPTURE 48.9%

MAX. 1HR AVG 31 09/13/89 06:00:00 2ND MAX. 1 HR AVG 30 09/14/89 07:00:00

MIN. 1HR AVG 2 09/15/89 02:00:00 ARITHMETIC MEAN 10 STANDARD DEV. 6

KEY FOR MISSING CODES
Bad< - To few samples for valid average, Cal - calibration, OCal - Analyzer out of calibration
BadS - Bad Analyzer Status, PwrF - Power Failure, Down - Operator downed channel, Miss - Missing Data
Qad - Data questionable insufficient documentation, Qai - Data questionable external influence, Purg - Analyzer in Purge

HUNTER/ESE PROJECT NUMBER 89 101 100

FPL PINEHURST

SO2 PRECISION CALCULATIONS

3RD & 4TH SAMPLING QUARTERS

APRIL 1,1989 - AUGUST 31,1989

DATE	DESIRED PPB	ACTUAL PPB	% DIFFERENCE (D(I))
APR 11, 1989	94.0	95.0	1.1
APR 13, 1989	94.0	97.0	3.2
APR 18, 1989	94.0	95.0	1.1
APR 21, 1989	94.0	95.0	1.1
APR 24, 1989	94.0	96.0	2.1
APR 25, 1989	94.0	96.0	2.1
APR 26, 1989	94.0	96.0	2.1
MAY 2, 1989	94.0	97.0	3.2
MAY 9, 1989	94.0	97.0	3.2
MAY 16, 1989	94.0	98.0	4.3
MAY 23, 1989	94.0	96.0	2.1
MAY 30, 1989	94.0	101.0	7.4
JUN 6, 1989	94.0	96.0	2.1
JUN 13, 1989	98.0	98.0	0.0
JUN 20, 1989	98.0	98.0	0.0
JUN 27, 1989	98.0	98.0	0.0
JUL 4, 1989	98.0	97.0	-1.0
JUL 11, 1989	98.0	98.0	0.0
JUL 18, 1989	98.0	81.0	-17.3
JUL 25, 1989	98.0	97.0	-1.0
AUG 1, 1989	98.0	98.0	0.0
AUG 8, 1989	98.0	97.0	-1.0
		SUM OF D(I) =	14.7
		MEAN OF D(I) =	0.7
		STD. DEV. =	4.5

UPPER 95% PROBABILITY LIMIT = 9.5

LOWER 95% PROBABILITY LIMIT = -8.1

FPL-Pinehurst
Ft. Lauderdale, FL - Site 001

HOURLY AVERAGES FOR SO2 in PPB

APRIL 1989

DAY	HOUR (EST) 00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVG
1	0	0	0	0	0	0	1	1	1	1	1	1	1	1	Cal	1	1	1	1	1	1	0	0	0	0
2	0	0	0	0	0	0	0	1	3	1	1	2	2	2	4	3	8	10	6	4	8	1	1	1	2
3	4	7	10	10	8	5	5	2	5	5	2	2	2	12	Cal	10	6	5	5	5	5	5	4	4	6
4	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	4	6	2	2	4	4	2	2	2
5	0	0	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	2	2	2	2	2	2	2	1
6	0	0	1	1	0	0	0	1	5	5	3	1	1	1	1	1	1	0	0	1	0	0	0	0	1
7	0	0	0	0	0	0	0	1	1	3	3	6	46	6	4	2	2	2	2	2	2	2	1	2	4
8	1	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1
10	1	1	1	1	1	1	1	1	1	1	1	0	Cal	Cal	Cal	1	1	0	0	1	0	0	0	0	1
11	0	0	Cal	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0
12	1	0	0	0	0	0	1	1	2	1	0	1	1	1	Cal	1	1	0	0	0	0	0	0	1	1
13	5	13	18	18	11	8	14	10	11	29	18	36	Cal	Cal	15	7	8	6	2	0	0	0	0	1	10
14	1	2	2	8	5	14	18	8	13	22	18	2	4	5	Cal	1	0	1	0	1	1	1	2	1	5
15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	1	0	0	0	0
16	0	0	0	0	0	0	1	0	0	0	0	0	0	0	Cal	0	0	0	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0	0	0	2	2	1	0	1	1	1	0	0	0	2	0	0	4	1
18	3	3	Cal	0	0	0	1	1	0	0	1	0	0	0	Cal	0	0	0	0	2	1	0	0	1	0
19	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	1	2	3	16	8	6	7	2	Cal	0	17	2	0	0	0	0	1	0	3
21	0	0	0	0	0	0	1	Cal	2	1	0	2	3	1	1	1	0	0	1	3	4	4	1	0	1
22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Cal	0	0	0	0	0	0	0	0	0	0
23	0	2	2	1	0	0	0	1	12	8	7	3	1	0	2	1	2	2	4	3	2	2	1	1	2
24	1	2	3	3	4	6	21	6	17	3	53	26	26	Cal	Cal	2	1	1	1	1	1	1	2	1	8
25	1	0	Cal	0	1	2	4	5	12	11	43	40	12	6	22	43	12	1	1	1	1	1	1	1	9
26	1	1	0	0	1	1	2	Cal	Cal	3	5	4	3	7	Cal	3	3	3	3	3	2	2	3	2	2
27	1	0	0	0	0	0	1	1	4	8	6	4	9	21	11	14	2	2	3	4	3	7	5	2	4
28	0	0	0	0	0	1	1	2	2	1	2	8	3	2	Cal	1	1	1	1	1	1	1	1	1	1
29	1	1	1	1	1	1	2	2	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
30	0	0	0	0	0	1	1	1	0	0	0	0	0	0	Cal	0	0	0	0	2	0	0	0	0	0

TOTAL HOURS 720 TOTAL GOOD HOURS 696 DATA CAPTURE 96.7%

MAX. 1HR AVG 53 04/24/89 10:00:00 2ND MAX. 1 HR AVG 46 04/07/89 12:00:00

MIN. 1HR AVG 0 04/01/89 00:00:00 ARITHMETIC MEAN 2 STANDARD DEV. 5

NAAQS Comparison: MAX. 3 HR AVG 35 (500) 04/24/89 12:00:00
MAX. 24 HR AVG 10 (140) 04/13/89 18:00:00

KEY FOR MISSING CODES
Bad< - To few samples for valid average, Cal - calibration, OCal - Analyzer out of calibration
BadS - Bad Analyzer Status, PwrF - Power Failure, Down - Operator downed channel, Miss - Missing Data
Qad - Data questionable insufficient documentation, Qai - Data questionable external influence, Purg - Analyzer in Purge

FPL PINEHURST
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HOURLY AVERAGES FOR SO2 in PPB

MAY 1989

DAY	HOUR (EST) 00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVG
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	Cal	0	0	0	0	1	0	0	0	0	0	0	Cal	0	1	1	1	1	0	1	3	2	1
3	1	1	3	2	2	2	2	2	2	1	1	1	1	2	2	2	3	5	7	13	14	13	7	10	4
4	4	5	1	1	2	4	2	1	0	0	0	1	0	1	Cal	2	6	4	7	4	0	1	0	1	2
5	0	0	0	3	10	15	10	8	5	5	0	12	15	25	22	47	10	0	0	0	0	0	0	0	8
6	0	0	0	0	0	0	1	0	2	0	0	0	0	0	Cal	0	0	0	1	0	1	0	0	1	0
7	1	1	0	0	0	1	3	5	4	3	2	1	1	1	1	1	1	0	1	0	1	2	2	1	1
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Cal	0	0	0	0	0	0	0	2	3	0
9	4	2	Cal	8	8	5	8	2	3	1	1	1	2	1	4	2	2	6	6	2	1	1	1	0	3
10	1	0	0	0	1	1	4	3	1	1	1	1	1	1	Cal	1	1	1	1	1	0	0	0	0	1
11	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	21	1	0	1	0	0	0	0	1
12	0	1	3	4	4	4	3	4	3	5	13	14	14	5	Cal	3	2	1	1	1	1	1	2	1	4
13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Cal	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16	0	0	Cal	1	0	0	0	0	0	1	1	0	4	1	Cal	0	0	0	2	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0	0	0	1	1	0	0	Cal	3	1	1	1	0	0	0	0	0	0
19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	1	0	0	0	0
20	0	0	0	0	0	1	2	3	2	1	2	1	5	11	Cal	0	0	0	0	0	0	0	0	3	1
21	3	1	0	0	1	1	1	1	1	1	1	16	66	46	32	45	29	1	1	1	1	1	1	1	11
22	1	1	1	1	0	1	3	2	1	1	1	1	0	0	Cal	0	0	1	1	0	1	1	1	1	1
23	1	1	Cal	0	0	0	1	2	2	1	1	1	0	0	0	0	1	1	1	1	1	1	1	0	1
24	1	1	0	0	0	0	1	1	0	0	0	0	0	0	Cal	0	0	0	0	0	0	1	1	1	0
25	0	0	0	0	0	0	0	0	2	15	13	10	5	0	0	0	0	0	5	0	0	0	0	0	2
26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Cal	0	0	0	0	0	0	0	0	0	0
27	4	1	2	1	0	1	1	1	1	5	2	0	0	0	0	0	0	0	0	1	5	8	8	5	2
28	6	10	10	1	0	0	1	0	0	3	1	0	0	0	Cal	4	1	1	2	5	3	2	5	1	2
29	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	0	0	Cal	3	0	1	3	2	5	2	8	1	1	6	Cal	1	1	1	2	3	6	6	7	1	3
31	11	4	5	7	7	7	6	3	2	3	1	4	1	3	1	0	1	0	1	3	2	0	0	0	3

TOTAL HOURS 744 TOTAL GOOD HOURS 724 DATA CAPTURE 97.3%

MAX. 1HR AVG 66 05/21/89 12:00:00 2ND MAX. 1 HR AVG 47 05/05/89 15:00:00

MIN. 1HR AVG 0 05/01/89 00:00:00 ARITHMETIC MEAN 2 STANDARD DEV. 5

NAAQS Comparison: MAX. 3 HR AVG 48 (500) 05/21/89 14:00:00
MAX. 24 HR AVG 11 (140) 05/21/89 22:00:00

KEY FOR MISSING CODES
Bad< - To few samples for valid average, Cal - calibration, OCal - Analyzer out of calibration
BadS - Bad Analyzer Status, PwrF - Power Failure, Down - Operator downed channel, Miss - Missing Data
Qad - Data questionable insufficient documentation, Qai - Data questionable external influence, Purg - Analyzer in Purge

FPL PINEHURST
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HOURLY AVERAGES FOR SO2 in PPB

JUNE 1989

DAY	HOUR (EST) 00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVG
1	0	0	0	0	0	1	5	5	3	4	1	1	0	0	Cal	0	0	0	0	0	1	2	1	2	1
2	2	3	4	2	2	2	4	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Cal	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	3	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Cal	0	0	0	0	0	0	0	0	0	0
6	0	0	Cal	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	Cal	Cal	Cal	Cal	Cal	Cal	Cal	Cal	Cal	Cal	Cal	Cal	0	0	0	0	0	0	0	Bad<
8	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	1	1	0	0	0	0	0	0	Cal	0	0	0	0	0	0	1	1	1	0
10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0	0	0	2	12	Cal	14	13	3	3	6	5	4	10	5	3
12	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	Cal	0	0	0	1	0	0	0	0	0	0	0	Cal	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Cal	0	0	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
17	0	0	0	0	0	0	0	0	0	0	0	2	0	15	Cal	6	11	3	3	4	10	14	4	2	3
18	5	2	5	15	2	1	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	2
19	0	0	1	1	0	1	1	0	0	10	15	11	18	26	Cal	0	2	6	4	1	1	0	0	0	4
20	0	0	Cal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	0	0	0	0	0	0	1	0	0	0	0	0	0	0	Cal	0	0	0	0	0	0	0	0	0	0
22	0	0	0	0	0	0	7	4	0	2	0	0	3	2	3	12	8	0	0	0	0	0	0	0	2
23	1	2	0	0	5	6	7	5	3	2	2	1	6	3	Cal	5	5	5	3	6	7	10	10	13	4
24	2	1	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0	1	1	0	0	Cal	0	0	0	1	0	0	0	0	0	0
26	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0
27	0	0	Cal	0	0	0	1	1	0	0	0	0	0	0	Cal	5	3	0	0	0	0	0	0	0	0
28	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	0	0
29	0	0	0	0	0	0	2	3	3	0	0	0	0	0	Cal	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	1	3	1	0	0	8	2	4	0	1	1	0	0	0	0	0	0	0	1

TOTAL HOURS 720 TOTAL GOOD HOURS 690 DATA CAPTURE 95.8%

MAX. 1HR AVG 26 06/19/89 13:00:00 2ND MAX. 1 HR AVG 18 06/19/89 12:00:00

MIN. 1HR AVG 0 06/01/89 00:00:00 ARITHMETIC MEAN 1 STANDARD DEV. 2

NAAQS Comparison: MAX. 3 HR AVG 18 (500) 06/19/89 13:00:00
MAX. 24 HR AVG 5 (140) 06/18/89 07:00:00

KEY FOR MISSING CODES
Bad< - To few samples for valid average, Cal - calibration, OCal - Analyzer out of calibration
BadS - Bad Analyzer Status, PwrF - Power Failure, Down - Operator downed channel, Miss - Missing Data
Qad - Data questionable insufficient documentation, Qai - Data questionable external influence, Purg - Analyzer in Purge

FPL PINEHURST
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HOURLY AVERAGES FOR SO2 in PPB

JULY 1989

DAY	HOUR (EST) 00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVG
1	0	0	0	0	0	0	0	1	1	1	1	1	1	9	Cal	0	0	0	0	0	0	0	0	0	1
2	0	0	0	0	0	0	0	0	0	0	0	1	2	0	0	0	0	1	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Cal	0	0	0	0	0	0	0	0	0	0
4	0	0	Cal	1	0	0	0	0	0	0	0	0	2	1	1	1	1	1	1	1	1	1	1	1	1
5	1	0	0	0	0	1	1	2	1	1	1	1	1	0	Cal	1	11	1	1	1	1	1	1	1	1
6	1	1	1	1	0	1	2	3	2	11	4	1	1	1	2	7	5	3	2	12	4	5	3	3	3
7	1	1	1	1	1	1	1	1	11	8	21	12	13	20	Cal	4	1	1	3	1	6	18	18	20	7
8	3	2	1	1	2	2	2	5	4	10	6	5	20	7	3	2	4	3	6	2	5	5	2	2	4
9	5	2	6	5	3	9	8	5	4	6	23	12	3	1	Cal	1	1	2	3	1	2	2	1	1	4
10	1	1	1	1	1	4	6	2	1	1	2	5	5	1	2	4	9	3	3	1	2	2	3	4	3
11	4	10	Cal	1	1	1	3	4	3	7	19	22	1	2	Cal	16	61	9	2	1	2	1	1	1	8
12	1	1	1	1	1	1	3	6	35	45	46	50	36	22	34	17	1	1	1	1	1	2	1	1	13
13	1	1	1	0	0	1	3	3	2	2	1	3	2	1	Cal	1	1	1	1	1	1	5	3	2	1
14	1	1	1	1	1	2	3	3	2	1	1	1	0	0	0	0	0	0	1	1	1	1	0	0	1
15	0	0	0	0	1	1	1	0	0	0	0	0	0	0	Cal	0	0	0	0	0	0	0	0	0	0
16	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	0	0	0	0	0	0	1	0	1	0	0	0	0	0	Cal	2	2	1	1	0	0	0	0	0	0
18	0	0	Cal	4	2	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	0	0	0	1	1	2	2	0	0	0	0	0	0	0	Cal	2	1	0	0	0	0	1	1	1	0
20	1	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	0	0	0	0	0	0	1	0	0	0	0	0	0	0	Cal	2	1	0	0	0	0	0	0	0	0
22	0	0	1	0	0	0	0	6	1	2	0	1	1	0	1	1	2	3	2	2	2	1	2	1	1
23	1	1	1	1	1	2	1	2	1	1	1	3	1	1	Cal	1	3	3	1	1	1	2	1	1	1
24	1	0	0	1	2	5	6	11	8	8	2	4	2	3	8	3	1	1	1	1	1	1	2	2	3
25	1	1	Cal	1	1	1	1	1	1	1	1	1	1	1	Cal	1	1	1	1	1	1	1	1	1	1
26	1	1	1	1	0	1	2	5	7	3	5	3	3	5	3	4	13	4	4	1	1	1	1	1	3
27	1	0	0	0	0	0	1	4	12	18	PwrF	5	11	19	Cal	1	1	1	1	1	1	1	1	1	4
28	1	1	1	1	1	1	2	2	4	13	36	22	11	1	1	1	1	1	1	1	1	1	1	1	4
29	1	1	1	1	1	1	1	1	1	0	1	2	1	7	Cal	2	1	1	1	1	1	1	0	0	1
30	0	0	1	1	1	1	1	1	1	1	5	1	1	1	1	1	1	1	1	1	1	1	1	1	1
31	1	1	1	1	1	1	3	4	7	5	8	6	11	12	Cal	2	1	0	1	1	1	1	1	1	3

TOTAL HOURS 744 TOTAL GOOD HOURS 723 DATA CAPTURE 97.2%

MAX. 1HR AVG 61 07/11/89 16:00:00 2ND MAX. 1 HR AVG 50 07/12/89 11:00:00

MIN. 1HR AVG 0 07/01/89 03:00:00 ARITHMETIC MEAN 2 STANDARD DEV. 6

NAAQS Comparison: MAX. 3 HR AVG 47 (500) 07/12/89 11:00:00
MAX. 24 HR AVG 16 (140) 07/12/89 15:00:00

KEY FOR MISSING CODES
Bad< - To few samples for valid average, Cal - calibration, OCal - Analyzer out of calibration
BadS - Bad Analyzer Status, PwrF - Power Failure, Down - Operator downed channel, Miss - Missing Data
Qad - Data questionable insufficient documentation, Qai - Data questionable external influence, Purg - Analyzer in Purge

10.5.1-89

FPL PINEHURST
FT. LAUDERDALE, FL - Site 001

HOURLY AVERAGES FOR SO2 in PPB

AUGUST 1989

DAY	HOUR (EST) 00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVG
1	1	1	Cal	1	1	1	2	3	5	6	9	2	7	4	1	2	3	3	2	2	1	15	2	2	3
2	8	3	1	1	1	2	2	1	1	1	1	3	2	1	Cal	1	1	1	1	1	1	1	1	1	1
3	1	1	1	1	1	1	3	6	3	PwrF	2	14	14	8	4	4	3	4	2	3	2	3	3	1	4
4	1	1	0	1	0	1	2	2	3	3	3	3	1	1	Cal	1	1	1	1	1	1	1	1	1	1
5	1	1	1	1	1	1	1	2	2	1	1	1	1	3	3	4	4	1	1	2	1	6	5	3	2
6	6	3	2	3	2	1	1	2	8	4	3	5	8	11	Cal	3	44	2	1	1	1	1	1	1	5
7	1	1	1	1	1	2	2	2	1	1	1	10	16	5	1	2	2	1	1	1	4	3	1	1	2
8	1	1	Cal	1	1	1	2	3	2	1	1	1	1	1	Cal	1	2	1	1	1	1	2	2	1	1
9	1	2	2	3	2	3	2	2	2	1	2	1	1	1	2	2	1	1	1	1	1	1	1	1	1
10	1	1	1	1	1	2	2	3	4	2	2	2	Cal	Bad<	Cal	1	2	1	1	1	1	0	0	1	1
11	1	1	1	2	1	1	3	4	3	1	1	1	2	12	9	1	1	1	1	1	3	12	8	7	3
12	5	3	3	1	1	1	2	3	4	2	10	4	5	3	Cal	1	1	1	1	0	0	1	1	0	2
13	0	0	0	0	3	2	9	7	6	5	1	1	1	1	1	1	1	1	1	1	1	1	1	0	2
14	0	0	0	0	1	1	1	2	3	1	2	2	1	1	Cal	2	2	1	1	1	1	1	1	1	1
15	1	1	Cal	1	1	2	2	4	3	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1
16	1	1	1	1	1	1	2	3	4	4	3	6	5	3	Cal	1	2	2	2	2	1	2	1	0	2
17	0	0	1	0	1	1	2	2	2	2	22	42	52	3	4	4	1	1	1	1	3	2	1	3	6
18	1	1	2	4	2	2	1	2	2	1	1	1	1	2	Cal	3	7	5	1	1	1	2	1	2	2
19	1	5	5	17	11	3	1	3	42	5	24	4	10	7	5	6	1	1	1	1	2	7	2	6	7
20	6	2	8	10	7	2	1	1	3	2	1	1	0	0	Cal	1	1	0	1	1	1	0	1	1	2
21	0	0	0	1	0	1	2	4	2	6	11	9	15	23	13	3	2	2	7	6	5	1	1	1	5
22	1	1	Cal	1	0	1	1	1	1	1	1	1	26	6	Cal	8	5	1	2	2	3	2	3	4	3
23	2	2	1	1	3	2	3	4	1	1	1	0	0	0	0	0	0	0	1	0	1	2	1	1	1
24	3	6	2	2	1	1	2	1	1	6	2	1	1	1	Cal	17	1	3	2	1	5	5	4	2	3
25	2	1	1	1	1	1	2	2	1	1	1	24	18	19	12	7	2	2	1	1	5	4	2	1	4
26	1	1	1	1	1	1	1	2	1	2	1	4	15	36	Cal	20	2	5	5	4	7	1	2	1	5
27	1	1	1	1	1	1	1	1	1	2	16	38	33	21	12	12	19	18	4	2	3	3	2	1	8
28	3	4	1	1	1	1	2	2	3	2	1	1	1	1	Cal	1	1	1	1	1	1	1	1	2	1
29	2	1	Cal	1	0	1	2	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	2	1
30	1	1	1	1	1	1	2	2	1	1	6	3	10	44	Cal	10	1	1	1	1	1	1	1	1	4
31	1	1	1	0	1	1	2	1	1	1	1	27	32	2	1	4	10	1	3	2	3	1	1	1	4

TOTAL HOURS 744 TOTAL GOOD HOURS 721 DATA CAPTURE 96.9%

MAX. 1HR AVG 52 08/17/89 12:00:00 2ND MAX. 1 HR AVG 44 08/30/89 13:00:00

MIN. 1HR AVG 0 08/13/89 03:00:00 ARITHMETIC MEAN 3 STANDARD DEV. 6

NAAQS Comparison: MAX. 3 HR AVG 39 (500) 08/17/89 12:00:00
MAX. 24 HR AVG 8 (140) 08/28/89 08:00:00

KEY FOR MISSING CODES
Bad< - To few samples for valid average, Cal - calibration, OCal - Analyzer out of calibration
BadS - Bad Analyzer Status, PwrF - Power Failure, Down - Operator downed channel, Miss - Missing Data
Qad - Data questionable insufficient documentation, Qai - Data questionable external influence, Purg - Analyzer in Purge

FPL PINEHURST
FT. LAUDERDALE, FL - Site 001

HOURLY AVERAGES FOR SO2 in PPB

SEPTEMBER 1989

DAY	HOUR (EST) 00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVG
1	1	1	1	1	1	1	1	1	1	1	1	4	28	40	Cal	3	1	1	1	1	1	1	1	1	4
2	0	1	1	1	0	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	4	1
3	4	2	2	2	1	0	1	3	5	2	1	1	1	1	Cal	1	1	1	1	1	7	4	5	5	2
4	11	3	1	1	1	4	13	2	4	2	4	16	9	13	4	2	1	1	1	1	7	2	2	5	4
5	3	4	Cal	2	8	13	15	7	5	9	5	7	8	6	Cal	4	2	4	3	2	6	2	1	1	5
6	1	7	3	1	1	1	2	2	1	2	9	2	1	1	1	1	1	1	1	1	1	1	1	1	2
7	0	0	1	1	1	1	1	2	1	1	1	1	1	1	Cal	1	1	1	1	1	1	1	1	1	1
8	0	0	0	0	1	1	2	3	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
9	1	1	2	2	2	1	1	1	1	1	1	1	1	1	Cal	1	1	1	2	4	1	3	2	1	1
10	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1
11	2	1	1	3	4	5	3	3	2	2	1	1	1	1	Cal	1	1	1	1	1	1	1	1	1	2
12	1	1	Cal	1	1	2	2	3	2	2	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1
13	0	0	1	1	1	2	3	2	1	1	1	1	1	1	Cal	1	1	1	1	2	3	3	2	2	1
14	1	1	1	1	1	2	3	6	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
15	1	1	1	1	1	2	2	2	1	1	1	1	1	1	Cal	4	1	1	1	2	2	2	1	2	1
16	1	2	1	1	9	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	2	2	1	2	1
17	1	1	1	1	1	1	1	1	4	4	3	20	43	13	Cal	7	7	5	5	2	1	1	1	1	5
18	1	2	2	1	2	1	1	2	1	1	1	1	1	5	5	1	8	4	5	1	1	1	1	1	2
19	1	1	Cal	1	0	1	1	1	1	1	1	1	1	1	Cal	2	1	2	1	1	1	1	1	1	1
20	1	1	1	1	1	1	2	2	2	2	1	1	1	1	1	1	1	1	3	3	5	2	1	1	1
21	1	1	1	1	1	1	1	1	1	1	1	1	1	1	Cal	1	1	2	2	2	2	2	2	1	1
22	1	1	1	1	1	2	3	6	7	Cal	Cal	Cal	Cal	Cal	Cal	Cal	Cal	Cal	Cal	2	2	1	1	1	Bad<
23	1	1	1	1	1	4	5	4	2	1	3	1	1	1	Cal	1	1	1	1	1	1	1	1	1	1
24	1	1	1	1	1	1	1	2	2	1	4	3	1	1	1	1	1	1	1	1	1	1	1	1	1
25	1	1	1	1	1	1	1	2	2	1	1	1	1	1	Cal	1	1	1	1	1	1	1	1	0	1
26	0	0	Cal	0	0	1	1	1	1	1	0	0	1	1	1	1	1	1	1	1	1	1	2	1	1
27	0	1	1	1	0	0	1	1	1	1	0	9	4	1	Cal	3	1	1	2	4	6	3	2	3	2
28	2	1	1	1	1	2	2	2	2	4	1	1	1	1	1	1	1	1	1	1	1	2	3	6	2
29	6	9	11	5	11	4	12	7	11	16	19	32	16	8	Cal	5	4	4	6	7	6	8	7	6	9
30	9	5	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	5	7	2	2

TOTAL HOURS 720 TOTAL GOOD HOURS 691 DATA CAPTURE 96.0%

MAX. 1HR AVG 43 09/17/89 12:00:00 2ND MAX. 1 HR AVG 40 09/01/89 13:00:00

MIN. 1HR AVG 0 09/02/89 00:00:00 ARITHMETIC MEAN 2 STANDARD DEV. 4

NAAQS Comparison: MAX. 3 HR AVG 25 (500) 09/17/89 13:00:00
MAX. 24 HR AVG 10 (140) 09/30/89 00:00:00

KEY FOR MISSING CODES
Bad< - To few samples for valid average, Cal - calibration, OCal - Analyzer out of calibration
BadS - Bad Analyzer Status, PwrF - Power Failure, Down - Operator downed channel, Miss - Missing Data
Qad - Data questionable insufficient documentation, Qai - Data questionable external influence, Purg - Analyzer in Purge

FPL PINEHURST
FT. LAUDERDALE, FL - Site 001

HOURLY AVERAGES FOR SO2 in PPB

SEPTEMBER 1989

DAY	HOUR (EST) 00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVG
1	1	1	1	1	1	1	1	1	1	1	1	4	28	40	Cal	3	1	1	1	1	1	1	1	1	4
2	0	1	1	1	0	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	4	1
3	4	2	2	2	1	0	1	3	5	2	1	1	1	1	Cal	1	1	1	1	1	7	4	5	5	2
4	11	3	1	1	1	4	13	2	4	2	4	16	9	13	4	2	1	1	1	1	7	2	2	5	4
5	3	4	Cal	2	8	13	15	7	5	9	5	7	8	6	Cal	4	2	4	3	2	6	2	1	1	5
6	1	7	3	1	1	1	2	2	1	2	9	2	1	1	1	1	1	1	1	1	1	1	1	1	2
7	0	0	1	1	1	1	1	2	1	1	1	1	1	1	Cal	1	1	1	1	1	1	1	1	1	1
8	0	0	0	0	1	1	2	3	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
9	1	1	2	2	2	1	1	1	1	1	1	1	1	1	Cal	1	1	1	2	4	1	3	2	1	1
10	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1
11	2	1	1	3	4	5	3	3	2	2	1	1	1	1	Cal	1	1	1	1	1	1	1	1	1	2
12	1	1	Cal	1	1	2	2	3	2	2	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1
13	0	0	1	1	1	2	3	2	1	1	1	1	1	1	Cal	1	1	1	1	2	3	3	2	2	1
14	1	1	1	1	1	2	3	6	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
15	1	1	1	1	1	2	2	2	1	1	1	1	1	1	Cal	4	1	1	1	2	2	2	1	2	1
16	1	2	1	1	9	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	2	2	1	2	1
17	1	1	1	1	1	1	1	1	4	4	3	20	43	13	Cal	7	7	5	5	2	1	1	1	1	5
18	1	2	2	1	2	1	1	2	1	1	1	1	1	5	5	1	8	4	5	1	1	1	1	1	2
19	1	1	Cal	1	0	1	1	1	1	1	1	1	1	1	Cal	2	1	2	1	1	1	1	1	1	1
20	1	1	1	1	1	1	2	2	2	2	1	1	1	1	1	1	1	1	3	3	5	2	1	1	1
21	1	1	1	1	1	1	1	1	1	1	1	1	1	1	Cal	1	1	2	2	2	2	2	2	1	1
22	1	1	1	1	1	2	3	6	7	Cal	Cal	Cal	Cal	Cal	Cal	Cal	Cal	Cal	Cal	2	2	1	1	1	Bad<
23	1	1	1	1	1	4	5	4	2	1	3	1	1	1	Cal	1	1	1	1	1	1	1	1	1	1
24	1	1	1	1	1	1	1	2	2	1	4	3	1	1	1	1	1	1	1	1	1	1	1	1	1
25	1	1	1	1	1	1	1	2	2	1	1	1	1	1	Cal	1	1	1	1	1	1	1	1	0	1
26	0	0	Cal	0	0	1	1	1	1	1	0	0	1	1	1	1	1	1	1	1	1	1	2	1	1
27	0	1	1	1	0	0	1	1	1	1	0	9	4	1	Cal	3	1	1	2	4	6	3	2	3	2
28	2	1	1	1	1	2	2	2	2	4	1	1	1	1	1	1	1	1	1	1	1	2	3	6	2
29	6	9	11	5	11	4	12	7	11	16	19	32	16	8	Cal	5	4	4	6	7	6	8	7	6	9
30	9	5	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	5	7	2	2

TOTAL HOURS 720 TOTAL GOOD HOURS 691 DATA CAPTURE 96.0%

MAX. 1HR AVG 43 09/17/89 12:00:00 2ND MAX. 1 HR AVG 40 09/01/89 13:00:00

MIN. 1HR AVG 0 09/02/89 00:00:00 ARITHMETIC MEAN 2 STANDARD DEV. 4

NAAQS Comparison: MAX. 3 HR AVG 25 (500) 09/17/89 13:00:00
MAX. 24 HR AVG 10 (140) 09/30/89 00:00:00

KEY FOR MISSING CODES
Bad< - To few samples for valid average, Cal - calibration, OCal - Analyzer out of calibration
BadS - Bad Analyzer Status, PwrF - Power Failure, Down - Operator downed channel, Miss - Missing Data
Qad - Data questionable insufficient documentation, Qai - Data questionable external influence, Purg - Analyzer in Purge

HUNTER/ESE PROJECT NUMBER 89 101 100

FPL DAVIE

SO2 PRECISION CALCULATIONS

3RD & 4TH SAMPLING QUARTERS

APRIL 1,1989 - SEPTEMBER 30,1989

DATE	DESIRED PPB	ACTUAL PPB	% DIFFERENCE (D(I))
APR 9, 1989	90.0	97.0	7.8
APR 23, 1989	90.0	97.0	7.8
MAY 21, 1989	90.0	100.0	11.1
JUN 4, 1989	90.0	100.0	11.1
JUN 18, 1989	90.0	95.0	5.6
JUL 2, 1989	91.0	106.0	16.5
JUL 30, 1989	91.0	94.0	3.3
AUG 13, 1989	91.0	97.0	6.6
AUG 27, 1989	91.0	97.0	6.6
SEP 10, 1989	91.0	97.0	6.6

SUM OF D(I) = 82.9

MEAN OF D(I) = 8.3

STD. DEV. = 3.7

UPPER 95% PROBABILITY LIMIT = 15.6

LOWER 95% PROBABILITY LIMIT = 1.0

FPL-Davie
Ft. Lauderdale, FL - Site 002

HOURLY AVERAGES FOR RNFL in INCH

APRIL 1989

DAY	HOUR (EST) 00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVG
1	0.00	0.00	0.00	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00
4	0.01	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.86	0.00	0.00	0.00	0.00	0.00	0.00	0.05
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.11	0.00	0.00	0.00	0.00	0.00	0.01
18	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.04	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.18	0.01	0.07	0.01	0.69	0.00	0.05	0.01	0.00	0.00	0.00	0.04
21	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.67	0.13	0.10	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04

TOTAL HOURS 720 TOTAL GOOD HOURS 720 DATA CAPTURE 100.0%

MAX. 1HR AVG 0.86 04/15/89 17:00:00 2ND MAX. 1 HR AVG 0.69 04/20/89 17:00:00

MIN. 1HR AVG 0.00 04/01/89 00:00:00 ARITHMETIC MEAN 0.01 STANDARD DEV. 0.05

KEY FOR MISSING CODES
Bad< - To few samples for valid average, Cal - calibration, OCal - Analyzer out of calibration
BadS - Bad Analyzer Status, PwrF - Power Failure, Down - Operator downed channel, Miss - Missing Data
Qad - Data questionable insufficient documentation, Qai - Data questionable external influence, Purg - Analyzer in Purge

FPL DAVIE PRECIPITATION		
DATE	TIME	AMOUNT
4-1-89	0300	0.30
4-4-89	0000	0.01
	0100	0.04
	0800	0.03
	1800	0.01
4-15-89	1600	0.23
	1700	0.86
4-16-89	1400	0.32
4-17-89	1700	0.03
	1800	0.11
4-18-89	0500	0.03
	0900	0.04
	1000	0.01
	1900	0.01
4-20-89	1300	0.18
	1400	0.01
	1500	0.07
	1600	0.01
	1700	0.69
	1900	0.05
	2000	0.01
4-21-89	0000	0.01
4-30-89	0800	0.67
	0900	0.13
	1000	0.10
	1200	0.01
	TOTAL	3.97

FPL-Davie
Ft. Lauderdale, FL - Site 002

HOURLY AVERAGES FOR WD in DGS

APRIL 1989

DAY	HOUR (EST) 00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVG
1	249	225	227	284	283	303	313	340	349	8	8	5	28	58	57	60	60	43	44	31	23	7	7	7	126
2	11	349	353	1	7	9	58	87	90	87	92	99	91	102	95	109	99	111	102	85	69	68	344	32	106
3	84	115	117	118	116	119	123	117	120	123	123	123	122	115	121	115	118	112	103	107	106	115	124	137	116
4	145	155	123	127	132	132	125	129	128	127	125	128	128	125	124	129	127	121	116	119	118	120	126	133	128
5	123	127	139	147	148	146	145	143	139	148	151	149	140	140	145	160	209	179	164	193	211	223	229	277	166
6	300	262	260	206	211	228	285	318	341	330	339	339	333	329	326	65	62	72	70	70	72	65	347	293	230
7	322	307	311	317	300	280	299	344	323	160	231	230	241	220	222	248	263	268	283	281	283	298	303	303	277
8	310	308	250	200	203	316	298	301	349	350	156	107	128	140	134	132	142	154	158	169	187	215	257	236	217
9	238	167	97	129	344	353	13	95	152	153	153	130	126	128	140	145	144	143	140	149	148	141	112	18	148
10	60	42	45	86	102	145	145	149	158	161	155	153	138	139	131	131	135	139	140	139	143	147	149	153	129
11	215	215	257	256	274	285	282	300	327	20	359	3	15	73	116	70	66	64	64	39	42	5	347	2	154
12	3	359	352	357	344	343	343	347	351	25	54	106	107	116	99	95	86	91	87	82	77	81	76	84	169
13	90	95	95	76	30	2	353	38	115	113	123	119	128	118	115	116	113	98	87	87	77	72	52	46	98
14	48	72	92	108	72	9	98	92	116	115	118	121	134	130	120	126	128	122	120	118	117	117	117	103	105
15	136	130	153	156	150	148	151	157	156	163	169	166	163	163	182	197	295	273	218	101	146	142	248	250	176
16	251	145	70	133	337	296	90	265	296	299	299	293	315	125	141	117	56	31	38	49	21	28	64	63	159
17	21	45	58	106	82	48	58	80	89	89	113	119	119	158	115	99	95	89	56	74	77	84	62	52	83
18	348	324	322	336	337	1	27	77	82	53	85	85	80	75	70	71	77	73	68	85	68	47	40	336	132
19	24	63	36	343	316	335	356	27	56	65	76	76	81	69	80	86	83	82	84	91	79	84	31	324	123
20	281	319	32	325	331	328	302	196	342	183	167	141	125	104	352	60	317	327	18	68	85	134	175	253	207
21	295	280	270	288	293	316	313	308	309	314	314	323	308	302	320	341	358	353	34	41	25	8	3	352	253
22	332	334	338	336	332	334	342	347	330	336	21	77	91	90	89	73	76	80	68	64	52	47	16	354	190
23	55	102	57	253	284	305	344	24	129	114	113	98	101	99	98	94	95	95	87	90	87	83	66	60	122
24	66	356	57	63	87	50	37	109	120	114	121	127	126	119	92	96	95	93	92	93	94	108	129	102	106
25	315	306	340	355	16	344	4	5	166	48	10	337	98	114	114	117	120	126	123	132	160	177	175	188	162
26	188	175	162	195	169	264	294	270	238	192	293	31	356	116	124	122	122	133	147	158	176	186	203	208	188
27	228	269	278	284	307	310	304	308	344	349	327	339	296	90	108	128	141	147	167	180	191	208	219	233	240
28	251	255	274	306	327	340	317	297	288	284	274	253	209	168	138	145	155	155	163	167	169	187	243	238	234
29	246	333	62	283	332	293	1	15	92	147	137	139	137	141	128	123	133	145	147	143	100	39	71	105	145
30	158	107	53	174	125	138	150	135	141	210	118	108	137	159	153	151	130	132	133	124	132	133	133	136	136

TOTAL HOURS 720 TOTAL GOOD HOURS 720 DATA CAPTURE 100.0%

MAX. 1HR AVG 359 04/11/89 10:00:00 2ND MAX. 1 HR AVG 359 04/12/89 01:00:00

MIN. 1HR AVG 1 04/02/89 03:00:00 ARITHMETIC MEAN 161 STANDARD DEV. 100

KEY FOR MISSING CODES
Bad< - To few samples for valid average, Cal - calibration, OCal - Analyzer out of calibration
BadS - Bad Analyzer Status, PwrF - Power Failure, Down - Operator downed channel, Miss - Missing Data
Qad - Data questionable insufficient documentation, Qai - Data questionable external influence, Purg - Analyzer in Purge

FPL-Davie
Ft. Lauderdale, FL - Site 002

HOURLY AVERAGES FOR WS in MPH

APRIL 1989

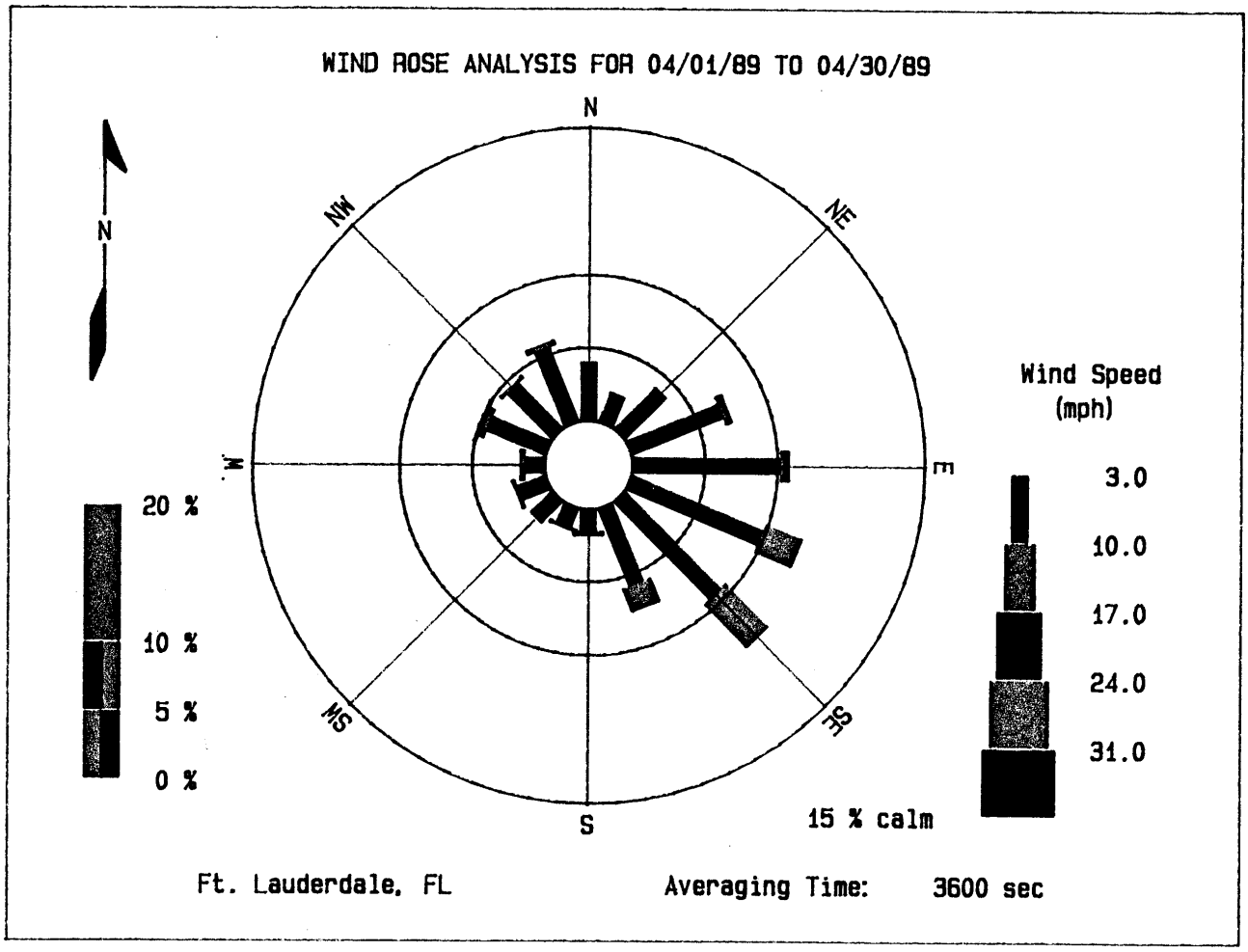
DAY	HOUR (EST) 00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVG
1	3	4	5	6	6	8	7	7	8	7	7	7	7	8	10	10	9	9	8	7	4	4	4	4	7
2	3	2	3	2	3	3	3	7	9	10	10	11	10	10	9	9	10	9	7	4	3	2	5	5	6
3	3	7	7	7	5	6	6	9	11	12	12	12	12	12	13	12	13	11	12	11	13	13	11	10	10
4	5	5	7	8	9	8	9	9	11	14	14	13	13	14	13	13	12	9	8	8	8	8	9	9	10
5	9	10	9	10	7	7	7	9	10	12	13	11	11	13	13	10	6	5	7	5	4	4	3	3	8
6	3	3	2	2	2	3	4	7	10	11	10	9	8	8	7	8	6	7	5	4	3	4	2	9	6
7	5	5	4	3	5	3	3	3	3	2	3	7	8	9	9	11	11	11	12	8	8	9	9	8	7
8	5	4	3	2	2	3	2	4	4	3	2	5	6	5	6	10	10	9	7	6	5	3	3	3	5
9	3	6	3	6	7	6	6	5	4	6	5	7	9	11	11	11	12	10	9	8	6	4	1	3	7
10	2	3	4	6	6	4	3	4	8	10	9	7	9	8	9	10	10	10	7	5	4	4	4	4	6
11	3	3	3	3	4	6	6	7	4	3	3	2	2	0	7	6	8	9	7	8	7	7	7	7	5
12	6	5	6	5	5	5	4	5	5	4	4	7	8	8	8	8	8	8	7	4	5	6	4	6	6
13	5	6	5	4	2	3	3	3	7	8	8	7	7	8	9	9	10	10	9	8	5	4	3	5	6
14	3	3	4	4	3	3	1	6	8	9	10	11	12	12	13	13	11	9	9	9	8	9	8	5	8
15	6	9	7	7	8	7	8	12	13	14	14	15	15	15	15	11	19	10	5	4	3	4	2	3	9
16	3	3	5	3	7	3	1	1	4	5	4	3	4	8	4	5	3	3	4	3	3	3	4	3	4
17	2	4	3	5	4	3	3	5	8	8	9	9	9	5	7	8	7	6	5	8	5	5	5	3	6
18	1	4	3	4	3	3	3	4	8	8	6	8	9	10	11	11	10	8	6	4	3	3	5	5	6
19	3	4	3	5	3	2	2	3	4	5	5	6	8	8	10	9	10	8	7	6	4	3	3	4	5
20	3	3	2	3	3	3	3	3	3	2	2	3	9	8	5	2	3	9	7	4	6	2	2	4	4
21	6	4	3	4	4	5	3	4	6	7	8	9	10	11	9	9	8	8	8	5	6	6	6	5	6
22	5	6	5	5	5	6	5	5	5	4	4	4	7	9	11	9	9	7	6	4	5	3	3	4	6
23	5	4	4	4	3	6	5	1	3	5	8	8	8	9	9	9	9	8	7	5	4	3	4	4	6
24	3	1	6	5	7	4	4	5	6	4	5	5	5	6	7	8	9	9	7	5	4	4	3	3	5
25	7	8	9	6	3	3	2	3	1	2	3	3	4	8	8	8	8	7	7	5	3	2	2	3	5
26	3	3	2	3	8	6	3	3	3	3	0	2	2	7	10	9	8	6	6	5	3	4	5	5	5
27	4	4	5	4	6	6	6	6	5	5	5	4	2	2	9	9	8	8	8	8	5	5	4	4	5
28	3	3	4	4	4	4	4	4	5	5	5	4	3	4	10	11	12	11	9	8	6	4	3	4	6
29	4	4	2	5	4	7	5	5	5	6	9	10	10	11	11	10	8	10	7	4	4	3	6	6	6
30	3	4	6	3	3	6	7	5	10	4	4	9	10	8	7	8	7	8	6	3	3	5	5	5	6

TOTAL HOURS 720 TOTAL GOOD HOURS 720 DATA CAPTURE 100.0%

MAX. 1HR AVG 19 04/15/89 16:00:00 2ND MAX. 1 HR AVG 15 04/15/89 13:00:00

MIN. 1HR AVG 0 04/11/89 13:00:00 ARITHMETIC MEAN 6 STANDARD DEV. 3

KEY FOR MISSING CODES
Bad< - To few samples for valid average, Cal - calibration, OCal - Analyzer out of calibration
BadS - Bad Analyzer Status, PwrF - Power Failure, Down - Operator downed channel, Miss - Missing Data
Qad - Data questionable insufficient documentation, Qai - Data questionable external influence, Purg - Analyzer in Purge


WIND ROSE ANALYSIS FOR 04/01/89 TO 04/30/89
N
NE
E
SE
S
SW
W
NW
N
20 %
10 %
5 %
0 %
Wind Speed
(mph)
3.0
10.0
17.0
24.0
31.0
15 % calm
Ft. Lauderdale, FL
Averaging Time: 3600 sec

WIND ROSE ANALYSIS FOR 04/01/89 TO 04/30/89

Wind Speed (mph)	DIRECTION																All
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Dir
> 31.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	C
31.0-24.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	C
24.0-17.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	C
17.0-10.0	0.0	0.0	0.0	0.4	0.6	2.6	4.0	1.7	0.3	0.1	0.0	0.1	0.3	0.3	0.1	0.3	1
10.0- 3.0	3.9	2.1	3.9	6.7	10.	9.7	9.3	5.7	1.4	1.3	1.9	1.9	1.3	4.3	4.3	5.4	7
3.0 <																	1
All Speed	3.9	2.1	3.9	7.1	11.	12.	13.	7.4	1.7	1.4	1.9	2.1	1.5	4.7	4.4	5.7	10

EV-23-

Ft. Lauderdale, FL Averaging Time: 3600 sec

Poor Original

FPL-Davie
Ft. Lauderdale, FL - Site 002

HOURLY AVERAGES FOR TEMP in DGC

APRIL 1989

DAY	HOUR (EST) 00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVG
1	22	21	22	21	21	20	19	19	20	22	23	24	25	25	23	22	22	21	21	20	19	18	17	17	21
2	17	16	16	16	16	16	16	20	22	22	23	24	24	24	25	24	24	23	23	22	21	21	20	20	21
3	21	22	22	22	22	22	22	23	24	25	26	26	27	27	26	26	25	24	24	24	24	23	23	22	24
4	21	21	22	23	23	23	23	23	24	25	26	26	27	27	26	26	26	24	24	23	23	23	23	23	24
5	23	24	23	23	23	23	23	24	25	26	27	27	27	27	26	24	23	24	24	22	21	21	21	20	24
6	20	19	19	19	18	18	19	20	21	22	23	24	25	26	27	25	25	24	23	22	21	20	19	18	22
7	18	17	16	15	15	14	14	17	20	23	25	26	27	28	29	29	28	27	24	22	21	20	19	18	21
8	18	18	17	16	15	16	16	17	19	21	23	25	26	27	28	27	26	25	23	22	22	21	20	19	21
9	19	18	18	17	17	17	17	20	23	26	27	28	28	28	29	28	27	26	24	24	23	22	22	21	23
10	21	21	20	20	20	20	20	23	25	27	28	29	30	30	29	29	28	26	25	24	24	24	23	23	25
11	23	22	21	21	20	20	20	21	22	24	27	28	30	30	28	28	27	26	25	24	23	22	20	20	24
12	19	19	19	18	18	18	18	19	21	24	26	27	27	28	28	27	26	26	25	24	24	24	24	24	23
13	23	23	23	22	22	21	21	23	25	26	27	28	29	29	28	28	27	26	25	25	25	24	24	23	25
14	23	23	23	23	22	22	23	25	26	27	28	28	28	28	28	26	25	25	25	25	25	24	24	23	25
15	23	24	23	23	23	23	24	25	26	27	28	29	29	28	29	27	22	22	23	22	22	22	22	22	25
16	22	22	22	22	22	22	22	23	24	25	26	28	29	25	23	23	24	24	23	23	22	22	22	23	24
17	23	23	23	23	22	22	22	24	25	26	25	25	26	24	24	24	24	24	23	21	21	22	22	21	23
18	21	21	20	20	20	20	21	23	25	24	25	26	26	27	27	26	26	25	25	24	23	23	22	22	23
19	22	22	22	21	21	20	21	23	25	26	27	28	28	28	28	28	27	26	25	24	24	24	24	23	24
20	22	22	22	22	21	21	21	21	24	26	27	28	28	24	21	21	22	20	19	19	19	19	19	19	22
21	19	19	19	18	18	18	18	19	21	23	24	25	26	27	27	27	26	26	24	23	22	21	20	20	22
22	19	18	17	17	17	16	16	18	20	23	24	26	26	26	26	25	25	24	24	23	23	23	22	22	22
23	21	21	21	20	19	19	19	21	23	25	25	25	25	26	26	26	26	25	24	23	23	22	22	23	23
24	22	20	20	20	19	20	20	23	25	26	26	27	28	28	28	28	27	26	24	23	23	22	21	21	24
25	20	19	19	19	18	18	19	22	24	25	26	27	28	28	28	27	27	26	25	24	23	22	22	21	23
26	21	20	20	20	20	20	20	22	23	25	27	28	30	30	29	28	28	27	26	25	24	24	24	23	24
27	22	21	20	20	20	19	19	21	23	25	27	29	30	31	30	29	28	27	26	26	25	25	24	23	25
28	22	21	20	20	20	20	20	21	23	25	27	28	30	31	30	30	29	27	26	26	25	25	24	24	25
29	23	22	22	22	22	22	22	23	25	27	28	29	30	30	29	28	27	27	26	25	25	25	24	24	25
30	24	24	23	23	23	23	24	25	22	21	20	20	22	24	25	25	25	25	25	24	24	24	24	24	24

TOTAL HOURS 720 TOTAL GOOD HOURS 720 DATA CAPTURE 100.0%

MAX. 1HR AVG 31 04/28/89 13:00:00 2ND MAX. 1 HR AVG 31 04/27/89 13:00:00

MIN. 1HR AVG 14 04/07/89 05:00:00 ARITHMETIC MEAN 23 STANDARD DEV. 3

KEY FOR MISSING CODES
Bad< - To few samples for valid average, Cal - calibration, OCal - Analyzer out of calibration
BadS - Bad Analyzer Status, PwrF - Power Failure, Down - Operator downed channel, Miss - Missing Data
Qad - Data questionable insufficient documentation, Qai - Data questionable external influence, Purg - Analyzer in Purge

FPL-Davie
Ft. Lauderdale, FL - Site 002

HOURLY AVERAGES FOR SO2 in PPB

APRIL 1989

DAY	HOUR (EST) 00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVG
1	0	0	0	0	0	0	1	2	1	1	1	1	2	2	1	1	1	1	1	1	1	1	1	1	1
2	1	1	Cal	1	0	1	1	1	1	1	1	1	1	1	2	1	10	9	5	3	1	2	2	1	2
3	1	0	0	0	0	0	2	2	2	1	1	0	0	1	0	1	0	0	0	0	0	0	0	0	0
4	0	0	Cal	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	2	2	1	1	2	4	5	3	3	2	1	2	1	1	1	1	1	1	1
6	1	1	Cal	0	0	1	4	2	4	2	2	1	1	1	1	2	2	1	1	1	2	2	2	3	2
7	4	2	1	1	1	2	4	4	4	3	2	2	2	1	2	1	0	1	1	0	0	0	1	1	2
8	0	0	Cal	0	0	1	2	1	2	3	2	4	7	3	2	2	2	2	1	1	1	1	1	1	2
9	1	1	Cal	1	1	2	3	2	2	1	1	1	1	1	1	0	0	0	0	0	0	0	0	2	1
10	1	1	Cal	1	1	1	4	5	2	1	1	1	1	1	1	1	1	1	0	1	0	0	0	0	1
11	0	1	2	1	0	0	3	7	4	3	2	2	2	1	1	0	0	0	0	0	0	0	1	0	1
12	0	0	Cal	0	0	1	2	2	3	3	3	3	24	16	37	31	3	1	1	1	1	0	0	0	6
13	1	1	2	2	2	3	5	7	3	2	1	1	1	1	1	1	0	0	1	0	0	0	0	1	1
14	0	1	Cal	1	2	3	5	3	2	1	2	1	1	1	0	0	0	0	0	0	0	0	0	0	1
15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16	0	0	Cal	6	2	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	0	0	Cal	Cal	2	1	2	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	1	1	1	1	1	1	1	2	2	1	1	0	0	0	0	1	1	1	1
20	0	0	Cal	1	1	1	4	3	4	22	8	8	13	12	3	2	1	0	0	0	0	0	1	1	4
21	1	1	0	1	1	1	4	4	3	3	3	5	5	3	3	2	1	1	1	3	2	1	0	0	2
22	0	0	Cal	0	0	0	1	1	1	1	1	1	1	1	1	0	0	0	0	1	1	1	1	0	0
23	0	1	Cal	0	0	0	0	1	1	14	2	22	23	21	11	1	1	4	2	2	3	2	1	1	5
24	1	1	Cal	2	3	5	11	7	3	5	6	20	32	38	5	3	2	7	15	2	3	3	2	2	8
25	2	2	1	2	2	3	6	8	3	3	5	4	28	36	41	20	7	5	4	0	1	1	1	1	8
26	1	1	Cal	1	1	2	6	1	2	4	7	6	5	5	5	6	18	8	3	2	2	2	2	2	4
27	1	1	0	1	1	1	2	2	4	7	9	7	6	15	71	20	5	2	2	3	3	5	1	1	7
28	1	0	Cal	1	1	1	2	2	3	2	1	1	1	2	2	2	1	1	1	1	1	1	0	2	1
29	1	1	1	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	0	0	Cal	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

TOTAL HOURS 720 TOTAL GOOD HOURS 702 DATA CAPTURE 97.5%

MAX. 1HR AVG 71 04/27/89 14:00:00 2ND MAX. 1 HR AVG 41 04/25/89 14:00:00

MIN. 1HR AVG 0 04/01/89 00:00:00 ARITHMETIC MEAN 2 STANDARD DEV. 5

NAAQS Comparison: MAX. 3 HR AVG 36 (500) 04/27/89 15:00:00
MAX. 24 HR AVG 9 (140) 04/25/89 16:00:00

KEY FOR MISSING CODES
Bad< - To few samples for valid average, Cal - calibration, OCal - Analyzer out of calibration
BadS - Bad Analyzer Status, PwrF - Power Failure, Down - Operator downed channel, Miss - Missing Data
Qad - Data questionable insufficient documentation, Qai - Data questionable external influence, Purg - Analyzer in Purge

FPL-Davie
Ft. Lauderdale, FL - Site 002

HOURLY AVERAGES FOR SigÕ1 in deg

APRIL 1989

DAY	HOUR (EST) 00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVG
1	15.8	15.8	15.9	17.5	13.7	8.3	9.4	15.7	18.5	22.9	22.0	28.5	22.7	24.7	21.2	20.2	19.8	18.1	18.8	15.3	15.3	14.8	15.9	15.7	17.8
2	18.5	16.8	18.5	13.6	13.5	13.6	18.7	11.2	14.4	16.8	17.2	18.1	16.3	17.2	17.2	17.6	14.8	13.3	15.2	13.0	16.5	59.8	32.6	26.8	18.8
3	30.6	10.0	10.5	10.6	11.0	11.6	12.1	12.5	12.8	13.8	13.8	13.9	15.7	14.4	13.1	13.3	12.1	12.7	10.8	11.0	9.9	10.4	12.5	13.0	13.0
4	10.8	15.5	13.3	12.1	13.2	12.4	12.6	13.1	13.5	13.0	14.3	14.1	13.9	14.8	13.2	15.0	13.5	13.5	12.4	13.5	11.5	11.4	12.8	13.2	13.2
5	12.4	13.1	12.7	10.9	9.8	9.9	9.9	11.5	13.9	12.6	13.7	14.9	13.8	13.8	13.5	13.9	20.1	39.4	10.1	11.1	15.9	18.8	20.1	24.2	15.0
6	46.2	24.0	16.1	15.2	18.5	25.8	11.5	13.2	18.1	13.6	19.6	21.3	21.0	22.3	31.2	20.1	25.2	20.4	17.6	17.6	23.4	29.3	52.2	12.6	22.3
7	9.9	7.2	8.8	11.6	12.7	9.5	11.7	16.1	29.0	56.6	39.7	25.1	21.9	24.0	20.3	20.3	18.3	16.5	12.4	12.1	10.6	8.6	7.2	7.0	17.4
8	6.2	6.2	20.9	14.9	27.0	9.9	12.4	13.9	23.1	28.1	54.9	40.0	19.8	39.1	25.9	13.8	13.8	10.4	10.8	9.5	11.4	13.6	15.2	13.8	18.9
9	9.7	18.7	49.2	41.2	13.3	17.5	36.4	41.1	20.8	18.6	26.4	21.2	18.7	14.6	15.7	13.7	12.6	12.5	11.9	9.8	8.4	8.8	46.0	41.0	22.0
10	35.2	35.9	31.3	48.5	23.1	6.0	11.1	11.9	14.4	13.7	15.0	22.3	19.7	20.2	17.7	14.3	13.6	12.7	12.4	11.1	8.6	8.6	6.5	7.1	17.5
11	14.2	21.5	15.2	14.8	9.2	9.2	9.4	13.0	23.5	32.4	47.3	57.6	60.5	53.9	14.9	20.8	19.3	18.7	19.7	17.0	18.7	19.2	17.1	17.4	23.5
12	16.8	16.5	16.5	17.6	15.0	15.2	15.9	17.0	18.3	26.7	29.8	17.4	21.5	20.3	21.0	15.0	13.5	15.7	13.2	14.8	15.8	13.9	14.1	11.9	17.2
13	10.3	11.1	9.7	16.1	18.6	25.8	32.4	37.2	15.0	16.9	19.8	19.8	20.1	17.7	18.8	15.4	13.7	12.8	12.2	12.6	16.6	15.2	23.5	28.9	18.3
14	24.1	17.0	10.6	9.7	15.7	30.3	47.0	24.8	15.9	14.2	16.4	15.2	15.3	14.3	13.2	13.6	14.2	12.8	12.5	10.8	11.1	10.6	12.5	13.2	16.5
15	12.8	13.2	10.0	9.5	9.4	10.8	9.3	10.4	10.9	12.2	14.4	12.5	13.2	12.2	13.9	15.7	12.7	28.5	21.8	22.7	29.1	12.2	14.1	39.1	15.4
16	51.1	24.0	42.4	37.5	27.6	53.1	38.4	51.5	14.7	16.6	23.2	46.5	39.6	28.6	42.1	16.0	18.5	34.4	21.3	24.3	22.6	26.3	32.5	20.5	31.4
17	21.6	30.0	25.1	15.3	27.0	27.4	24.3	17.9	13.6	15.3	13.5	13.2	14.7	17.9	14.4	13.9	17.1	14.1	18.7	18.3	18.3	12.6	25.6	35.6	19.4
18	41.5	9.8	13.0	12.1	13.7	19.0	22.3	22.0	14.9	21.3	16.0	18.7	16.0	17.5	18.7	18.1	15.2	17.2	20.9	17.7	22.5	33.7	30.4	29.1	20.1
19	24.2	43.3	30.8	16.3	14.7	13.2	21.4	22.1	25.8	24.0	28.6	28.0	20.1	22.4	18.1	17.1	17.7	15.5	13.1	13.5	16.9	15.2	36.1	10.5	21.2
20	19.4	40.7	31.4	12.2	12.7	14.9	17.4	48.1	21.6	54.0	52.0	32.9	18.3	15.3	19.4	47.1	37.3	24.5	18.1	20.2	15.3	43.4	14.2	30.1	27.5
21	15.4	20.2	49.2	20.8	12.7	10.9	12.1	12.6	11.7	13.3	17.0	15.7	14.7	16.0	18.7	18.7	20.2	18.5	19.3	21.0	15.4	16.3	16.5	16.6	17.6
22	12.2	11.6	13.5	13.1	12.6	12.5	13.7	16.8	16.3	25.9	38.9	36.1	18.5	15.3	17.9	18.8	15.9	15.5	18.2	19.3	20.8	21.5	12.6	14.3	18.0
23	20.8	27.0	26.2	24.3	17.1	12.2	16.3	67.0	33.5	32.2	17.0	15.5	14.3	19.4	15.3	16.3	15.9	14.7	12.2	10.9	12.7	15.7	20.3	22.3	20.8
24	19.7	42.6	27.6	20.7	25.8	43.7	53.9	21.5	16.3	32.6	28.5	33.6	28.2	23.8	22.5	18.5	15.2	13.8	11.0	10.8	11.7	18.1	12.7	57.1	25.4
25	45.0	12.4	13.6	14.8	21.6	15.9	18.6	27.1	46.7	65.4	40.4	47.3	40.4	18.6	16.4	16.9	15.4	14.3	13.7	10.9	10.8	9.3	6.7	16.9	23.3
26	5.0	4.8	6.8	8.3	8.8	35.7	13.7	18.1	26.3	31.4	67.9	53.3	69.6	40.6	12.5	13.3	15.7	13.9	11.1	9.7	9.8	8.7	11.6	12.5	21.2
27	16.0	13.7	10.6	9.5	8.2	8.1	7.9	11.5	20.1	24.1	25.8	43.0	57.0	55.1	14.2	14.9	13.5	12.2	12.1	11.9	12.0	12.4	14.3	15.3	18.5
28	17.1	15.3	10.3	8.4	12.7	12.8	13.0	14.9	21.2	23.2	27.9	52.7	51.7	35.0	16.5	13.5	11.5	10.9	10.8	10.0	10.9	13.0	16.5	17.1	18.6
29	17.5	31.1	30.9	13.3	66.2	19.9	22.4	33.6	44.8	18.2	15.9	15.8	17.1	15.4	16.0	14.8	13.9	11.7	11.9	11.4	20.9	32.6	44.9	12.0	23.0
30	9.3	20.3	34.8	15.2	11.2	11.9	25.1	14.2	15.8	17.9	30.0	11.9	14.1	12.5	13.3	12.1	13.9	13.6	13.8	11.4	9.9	11.7	12.1	11.9	15.3

TOTAL HOURS 720 TOTAL GOOD HOURS 720 DATA CAPTURE 100.0%

MAX. 1HR AVG 69.6 04/26/89 12:00:00 2ND MAX. 1 HR AVG 67.9 04/26/89 10:00:00

MIN. 1HR AVG 4.8 04/26/89 01:00:00 ARITHMETIC MEAN 19.6 STANDARD DEV. 11.0

KEY FOR MISSING CODES
Bad< - To few samples for valid average, Cal - calibration, OCal - Analyzer out of calibration
BadS - Bad Analyzer Status, PwrF - Power Failure, Down - Operator downed channel, Miss - Missing Data
Qad - Data questionable insufficient documentation, Qai - Data questionable external influence, Purg - Analyzer in Purge

FPL-Davie
Ft. Lauderdale, FL - Site 002

HOURLY AVERAGES FOR RNFL in INCH

MAY 1989

DAY	HOUR (EST) 00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVG
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.11	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	PwrF	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.02	0.00	0.00	0.00	0.00
12	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	0.00	0.00	0.00	0.00	0.00	0.00	Bad<
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.49	0.12	0.00	0.16	0.02	0.74	0.00	0.00	0.00	0.00	0.00	0.00	0.06
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.77	0.18	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.04
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

TOTAL HOURS 744 TOTAL GOOD HOURS 701 DATA CAPTURE 94.2%

MAX. 1HR AVG 0.77 05/24/89 15:00:00 2ND MAX. 1 HR AVG 0.74 05/15/89 17:00:00

MIN. 1HR AVG 0.00 05/01/89 00:00:00 ARITHMETIC MEAN 0.00 STANDARD DEV. 0.05

KEY FOR MISSING CODES
Bad< - To few samples for valid average, Cal - calibration, OCal - Analyzer out of calibration
BadS - Bad Analyzer Status, PwrF - Power Failure, Down - Operator downed channel, Miss - Missing Data
Qad - Data questionable insufficient documentation, Qai - Data questionable external influence, Purg - Analyzer in Purge

FPL DAVIE PRECIPITATION		
DATE	**TIME**	**AMOUNT**
5-2-89	0000	0.11
	0100	0.02
5-6-89	1600	0.01
5-11-89	1900	0.04
	2000	0.02
5-15-89	0500	0.02
	1200	0.49
	1300	0.12
	1500	0.16
	1600	0.02
	1700	0.74
5-17-89	1900	0.05
5-24-89	1500	0.77
	1600	0.18
	1700	0.01
5-31-89	1400	0.03
	TOTAL	2.79
	10.5.1-104	

FPL-Davie
Ft. Lauderdale, FL - Site 002

HOURLY AVERAGES FOR WD in DGS

MAY 1989

DAY	HOUR (EST) 00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVG
1	134	137	160	147	142	142	145	142	146	148	148	160	169	162	164	164	166	173	173	179	184	185	184	182	160
2	263	241	213	232	253	250	275	282	309	310	303	303	PwrF	313	330	335	350	91	99	96	90	96	100	98	227
3	112	114	96	74	5	332	358	18	33	63	93	106	101	99	91	90	92	95	95	101	101	104	100	99	107
4	96	93	83	81	91	90	87	84	82	87	93	91	94	96	93	97	100	100	106	87	81	88	88	91	91
5	91	92	91	93	111	110	109	114	122	124	121	116	116	114	116	121	129	139	144	146	143	167	158	202	125
6	185	267	115	321	307	305	359	131	144	153	129	126	140	150	157	158	137	155	145	166	176	208	225	205	190
7	229	257	291	306	312	323	330	339	346	353	341	346	334	329	336	330	340	25	91	84	355	337	321	314	290
8	319	312	318	305	304	306	307	307	306	310	22	86	95	97	90	86	84	89	87	86	86	86	92	95	178
9	92	96	98	96	109	105	73	94	101	94	101	120	119	119	121	113	111	111	117	128	135	135	147	141	111
10	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss
11	249	203	226	251	258	259	284	289	278	275	280	296	282	274	280	296	338	14	4	278	33	224	296	306	241
12	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	75	67	59	60	67	267	Bad<
13	281	293	289	221	165	167	192	197	161	167	168	175	173	164	149	137	135	138	150	160	170	159	206	187	184
14	244	292	303	317	287	324	36	48	140	135	137	136	129	133	127	136	142	139	129	144	143	143	138	126	168
15	7	46	127	303	351	128	142	150	166	174	172	170	173	78	173	189	166	251	132	181	218	254	243	254	177
16	29	326	338	289	274	258	253	269	285	254	262	287	262	100	105	102	134	136	120	148	121	134	144	148	199
17	152	193	203	235	216	227	241	232	220	231	205	186	156	120	149	159	153	162	187	245	250	148	157	199	193
18	251	291	256	201	172	151	225	264	277	300	271	330	93	91	80	77	74	79	58	63	65	66	74	76	162
19	80	91	89	90	85	83	82	87	88	79	87	88	97	95	93	91	81	73	74	78	76	69	67	51	82
20	41	27	16	347	305	317	336	334	117	118	129	122	126	100	98	104	88	73	74	77	83	95	92	113	139
21	223	295	281	278	275	267	282	282	274	258	187	342	112	117	118	116	114	131	134	146	168	233	166	165	207
22	155	127	150	150	238	310	299	141	142	137	132	130	137	137	137	144	148	156	148	150	147	153	146	165	162
23	166	176	169	256	169	175	166	174	197	194	221	183	158	135	143	146	159	165	160	167	184	198	227	237	180
24	234	264	273	298	58	315	167	177	255	237	238	255	246	142	149	151	102	128	203	199	214	226	216	255	208
25	267	302	317	300	295	302	317	332	335	343	330	315	18	105	88	96	100	109	129	145	155	152	165	173	216
26	171	301	282	317	53	353	43	63	60	54	80	84	90	84	91	92	88	87	85	85	76	82	81	89	120
27	115	96	339	294	300	330	310	332	326	330	13	90	88	84	97	95	94	92	89	94	97	96	114	105	168
28	95	94	102	96	297	318	337	346	359	203	115	102	96	95	98	87	93	93	97	96	97	92	94	103	150
29	108	106	97	81	72	107	87	84	91	101	95	102	89	95	92	89	83	85	92	90	90	90	96	102	93
30	104	112	114	119	104	81	103	109	106	99	105	106	97	101	96	101	94	96	96	102	100	99	106	116	103
31	97	106	109	98	101	92	102	107	105	110	105	105	103	101	108	96	101	91	93	90	93	99	96	99	100

TOTAL HOURS 744 TOTAL GOOD HOURS 701 DATA CAPTURE 94.2%

MAX. 1HR AVG 359 05/06/89 06:00:00 2ND MAX. 1 HR AVG 359 05/28/89 08:00:00

MIN. 1HR AVG 4 05/11/89 18:00:00 ARITHMETIC MEAN 163 STANDARD DEV. 86

KEY FOR MISSING CODES
Bad< - To few samples for valid average, Cal - calibration, OCal - Analyzer out of calibration
BadS - Bad Analyzer Status, PwrF - Power Failure, Down - Operator downed channel, Miss - Missing Data
Qad - Data questionable insufficient documentation, Qai - Data questionable external influence, Purg - Analyzer in Purge

FPL-Davie
Ft. Lauderdale, FL - Site 002

HOURLY AVERAGES FOR WS in MPH

MAY 1989

DAY	HOUR (EST) 00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVG
1	5	8	7	6	6	6	8	11	13	14	14	13	14	15	14	13	12	11	9	7	6	5	5	5	9
2	6	5	4	4	5	3	4	5	10	11	10	11	PwrF	9	8	7	5	8	9	7	7	7	7	5	7
3	4	3	4	8	3	4	5	5	4	5	7	9	8	9	10	9	9	10	10	11	10	9	8	7	7
4	6	6	4	6	7	7	7	9	11	12	13	13	12	13	12	12	11	10	9	7	6	7	6	7	9
5	9	10	8	7	8	7	8	10	10	9	9	11	11	11	12	10	9	9	8	6	4	4	4	3	8
6	6	4	7	5	9	6	3	4	3	2	5	9	9	9	9	6	6	7	5	4	4	3	3	5	6
7	4	3	4	6	5	4	5	7	8	9	7	8	8	10	9	10	8	4	6	3	4	3	3	6	6
8	5	8	5	5	6	6	6	6	6	5	2	4	8	9	9	10	11	10	10	8	7	6	5	5	7
9	5	5	4	3	4	4	3	7	8	7	8	9	9	8	9	10	9	9	9	6	4	4	7	7	7
10	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss
11	4	4	4	7	4	6	4	5	7	8	8	8	7	7	8	9	9	7	3	1	1	5	5	9	6
12	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	8	5	4	4	4	4	Bad<
13	3	4	3	3	3	3	7	3	7	10	10	9	8	8	10	9	9	9	10	8	6	5	6	9	7
14	8	6	7	6	5	3	3	3	6	8	10	11	11	10	11	10	9	7	6	5	5	4	4	6	7
15	6	5	4	7	7	2	3	4	4	4	5	6	6	7	8	10	8	1	2	3	3	6	4	2	5
16	4	5	3	9	8	4	4	4	4	4	4	4	3	6	9	9	10	4	4	4	3	4	3	3	5
17	3	4	3	3	3	3	3	3	4	4	2	2	4	7	10	9	9	11	9	5	1	3	4	3	5
18	5	5	3	5	7	2	2	3	3	4	3	3	8	8	9	8	10	9	8	10	9	9	10	9	6
19	10	10	7	6	7	6	7	9	9	9	8	9	9	9	8	8	8	8	7	6	6	4	3	3	7
20	5	3	3	5	10	5	2	2	2	4	4	5	6	7	7	8	9	8	7	6	5	4	4	3	5
21	4	6	2	3	3	3	3	3	4	3	1	2	6	8	7	9	10	9	7	6	5	3	1	3	5
22	4	3	3	3	2	2	1	5	7	8	9	10	9	9	9	9	9	5	6	5	3	3	3	3	5
23	2	2	4	6	4	3	4	4	5	3	3	4	6	10	11	11	11	10	9	8	6	5	4	3	6
24	4	4	4	2	1	2	3	2	3	4	3	4	4	5	14	7	4	5	4	4	4	3	3	3	4
25	3	4	7	4	4	5	4	6	7	5	4	4	3	7	8	7	8	9	6	5	2	3	2	5	5
26	3	4	3	5	2	3	3	2	2	2	6	7	8	9	10	10	10	9	8	6	4	3	3	2	5
27	8	2	10	11	7	7	4	5	4	4	3	7	7	9	10	9	10	9	9	7	6	5	4	4	7
28	3	3	1	7	4	4	4	4	3	1	4	8	9	10	11	11	10	9	9	9	8	7	9	8	6
29	7	7	6	4	3	3	5	8	9	10	10	11	11	12	12	11	11	11	11	10	9	10	10	12	9
30	11	10	9	9	5	5	8	10	11	12	12	12	12	12	12	13	13	12	13	11	11	10	9	9	10
31	9	8	7	10	9	9	10	11	12	13	13	13	12	13	10	11	12	11	11	8	8	9	8	8	10

TOTAL HOURS 744 TOTAL GOOD HOURS 701 DATA CAPTURE 94.2%

MAX. 1HR AVG 15 05/01/89 13:00:00 2ND MAX. 1 HR AVG 14 05/01/89 14:00:00

MIN. 1HR AVG 1 05/15/89 17:00:00 ARITHMETIC MEAN 7 STANDARD DEV. 3

KEY FOR MISSING CODES
Bad< - To few samples for valid average, Cal - calibration, OCal - Analyzer out of calibration
BadS - Bad Analyzer Status, PwrF - Power Failure, Down - Operator downed channel, Miss - Missing Data
Qad - Data questionable insufficient documentation, Qai - Data questionable external influence, Purg - Analyzer in Purge

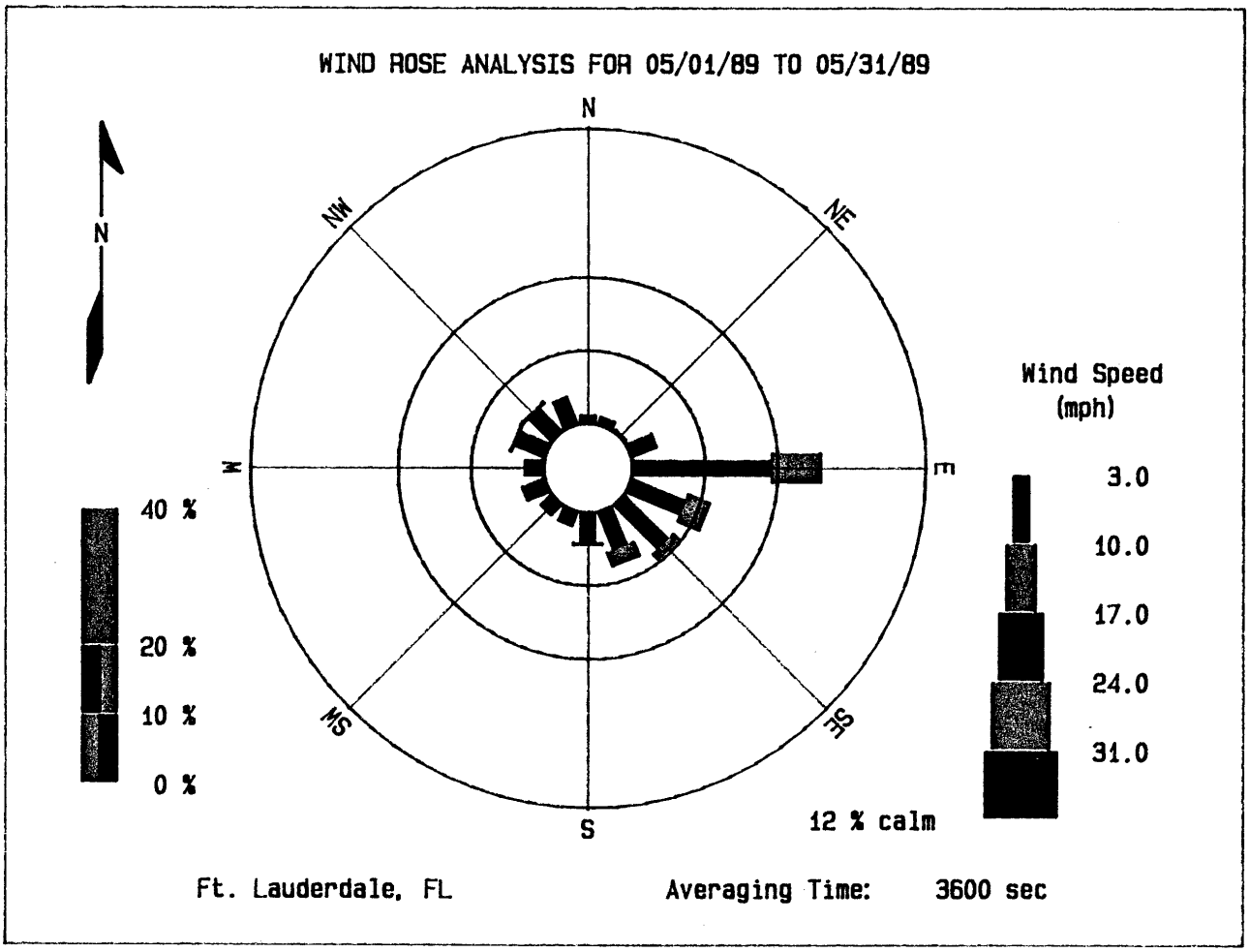

WIND ROSE ANALYSIS FOR 05/01/89 TO 05/31/89
N
NW
NE
W
E
SW
SE
S
N
40 %
20 %
10 %
0 %
Wind Speed
(mph)
3.0
10.0
17.0
24.0
31.0
12 % calm
Ft. Lauderdale, FL
Averaging Time: 3600 sec

Image Quality
As you review the next group of images, Please note that the original documents
were of poor quality.

WIND ROSE ANALYSIS FOR 05/01/89 TO 05/31/89

Wind Speed (mph)	DIRECTION																All
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Dir
> 31.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	C
31.0-24.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	C
24.0-17.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	C
17.0-10.0	0.0	0.0	0.0	0.1	6.6	3.3	1.1	2.0	0.4	0.0	0.0	0.0	0.0	0.4	0.3	0.0	14
10.0- 3.0	1.0	1.0	0.4	3.7	19.	7.8	8.4	5.4	4.0	2.0	2.0	3.3	2.6	4.1	4.3	4.0	73
3.0 <																	13
All Speed	1.0	1.0	0.4	3.9	26.	11.	9.6	7.4	4.4	2.0	2.0	3.3	2.6	4.6	4.6	4.0	10C

EV-23-

Ft. Lauderdale, FL Averaging Time: 3600 sec

FPL-Davie
Ft. Lauderdale, FL - Site 002

HOURLY AVERAGES FOR TEMP in DGC

MAY 1989

DAY	HOUR (EST) 00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVG
1	24	24	24	23	23	23	24	25	26	27	28	29	29	29	29	29	29	28	27	26	26	25	25	25	26
2	24	21	22	22	21	20	21	22	24	25	26	27	PwrF	28	29	29	29	27	25	25	24	24	24	23	24
3	23	22	22	21	21	20	21	22	25	26	27	27	28	28	27	27	26	26	25	25	25	25	24	24	24
4	24	24	24	24	24	24	24	25	26	26	27	27	27	28	27	27	26	26	25	25	24	24	24	24	25
5	24	23	23	23	23	23	24	25	26	27	27	28	28	28	28	27	26	26	26	25	25	25	24	24	25
6	24	23	23	23	23	22	23	25	27	28	28	28	29	30	29	30	28	26	26	25	25	24	24	23	26
7	22	21	21	21	21	20	21	22	24	26	28	29	30	31	31	31	30	29	26	26	26	25	23	22	25
8	21	19	18	17	16	15	15	17	20	23	25	27	28	27	27	27	26	26	25	24	24	24	23	23	22
9	23	22	22	21	22	22	22	24	25	26	26	27	27	27	27	26	26	25	24	24	23	23	22	22	24
10	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss
11	21	20	20	20	19	20	20	.22	24	26	28	30	30	32	32	32	30	28	26	24	23	22	23	22	25
12	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	25	25	24	24	24	22	Bad<
13	21	21	20	19	19	19	19	22	25	27	29	30	30	30	30	30	29	28	27	26	26	26	25	24	25
14	24	24	23	23	22	22	22	25	27	28	30	30	30	29	30	28	27	27	27	26	26	25	25	25	26
15	24	24	24	23	23	23	24	26	28	29	30	32	28	23	24	22	22	22	22	22	22	22	22	22	24
16	22	22	21	21	21	21	21	23	25	28	29	30	31	31	30	30	27	26	27	26	25	25	25	25	25
17	25	24	24	23	22	22	23	25	27	28	30	31	32	31	30	30	30	29	27	25	24	24	24	24	26
18	24	24	24	23	23	23	23	24	26	28	30	31	30	30	30	29	29	28	27	26	26	26	25	25	26
19	25	25	24	24	24	24	24	25	25	26	27	27	27	27	27	27	27	26	26	25	25	24	24	23	25
20	22	22	21	21	20	20	21	23	25	26	27	27	28	28	29	28	28	27	26	25	25	24	24	23	25
21	23	22	21	21	20	20	21	23	25	27	28	29	30	30	30	30	29	28	26	25	25	25	24	24	25
22	23	23	23	22	22	22	23	25	27	28	28	29	29	30	30	30	28	26	26	26	25	25	25	25	26
23	24	24	23	23	23	22	24	26	27	29	30	31	31	31	31	30	30	29	28	27	26	26	26	25	27
24	25	25	24	23	23	23	23	25	27	28	29	31	31	32	29	22	21	23	23	23	23	23	23	22	25
25	22	22	22	21	21	21	22	24	25	27	28	30	31	30	29	29	29	28	27	26	25	25	25	25	25
26	24	24	24	23	23	23	24	25	28	29	30	31	31	31	31	30	30	29	28	27	27	26	26	25	27
27	24	24	24	23	23	23	23	25	27	28	29	29	30	31	31	30	29	29	28	27	26	26	26	25	27
28	25	24	24	23	23	23	22	24	26	27	29	30	30	30	30	30	29	28	27	27	26	26	26	26	27
29	26	26	26	25	25	25	26	27	28	28	29	30	30	30	30	30	29	28	27	27	27	26	26	26	27
30	26	26	26	26	25	25	26	27	27	28	29	29	29	30	29	29	29	28	27	27	27	26	26	26	27
31	26	25	24	25	25	25	26	27	28	28	29	29	29	29	28	29	28	28	27	27	26	26	26	26	27

TOTAL HOURS 744 TOTAL GOOD HOURS 701 DATA CAPTURE 94.2%

MAX. 1HR AVG 32 05/11/89 14:00:00 2ND MAX. 1 HR AVG 32 05/11/89 15:00:00

MIN. 1HR AVG 15 05/08/89 05:00:00 ARITHMETIC MEAN 26 STANDARD DEV. 3

KEY FOR MISSING CODES
Bad< - To few samples for valid average, Cal - calibration, OCal - Analyzer out of calibration
BadS - Bad Analyzer Status, PwrF - Power Failure, Down - Operator downed channel, Miss - Missing Data
Qad - Data questionable insufficient documentation, Qai - Data questionable external influence, Purg - Analyzer in Purge

FPL-Davie
Ft. Lauderdale, FL - Site 002

HOURLY AVERAGES FOR SO2 in PPB

MAY 1989

DAY	HOUR (EST) 00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVG
1	0	0	0	0	0	0	0	0	0	0	Cal	Cal	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	Cal	Cal	0	0	0	0	0	0	0	0	PwrF	1	1	1	1	0	1	0	0	0	0	0	0
3	0	0	1	1	1	1	2	2	4	3	2	2	2	8	17	2	2	5	10	2	2	1	3	1	3
4	4	6	Cal	1	1	3	5	3	2	2	2	2	2	8	7	10	12	8	6	3	0	0	0	0	4
5	0	0	0	6	2	1	3	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
6	0	0	Cal	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	Cal	Cal	2	1	1	3	4	3	2	2	1	1	0	0	0	0	0	1	3	4	3	2	1
8	2	8	Cal	5	4	4	6	5	5	4	3	2	3	2	2	2	1	1	0	0	0	0	4	2	3
9	2	3	1	1	1	3	7	8	15	16	9	1	1	1	1	1	5	7	0	0	0	0	0	0	3
10	0	0	Cal	0	0	1	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	1	0	0	0	0	0	Bad<
13	0	0	0	0	0	0	0	0	1	3	3	0	0	1	1	0	0	0	0	0	0	0	0	0	0
14	0	0	Cal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16	0	0	Cal	Cal	5	1	1	0	0	0	0	0	0	0	15	7	1	4	2	1	0	0	0	0	2
17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	0	0	Cal	Cal	5	2	1	0	0	0	1	2	1	1	0	0	0	0	0	0	0	0	0	0	1
19	0	0	0	0	0	0	0	0	1	2	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0
20	0	0	Cal	4	2	2	2	1	3	20	16	7	17	15	12	1	0	0	0	0	0	0	3	4	5
21	0	0	Cal	Cal	3	1	1	1	1	1	0	0	1	8	7	15	15	1	0	0	0	0	0	0	2
22	0	0	Cal	3	3	5	7	4	2	1	1	1	0	1	0	1	1	1	1	0	0	0	0	0	1
23	0	0	0	0	1	1	3	2	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
24	0	0	Cal	1	1	2	2	2	0	0	0	0	0	3	5	1	5	9	1	0	0	0	1	1	1
25	0	0	0	0	0	1	2	2	20	22	8	5	6	4	2	2	1	9	0	0	0	0	0	0	3
26	0	0	Cal	2	2	2	2	1	1	2	4	2	1	1	0	0	0	0	0	0	0	0	0	0	1
27	0	0	Cal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	0	0	Cal	4	1	1	0	0	0	0	10	2	0	0	0	0	0	0	7	2	1	0	0	1	1
29	0	0	0	0	0	0	0	0	0	6	1	8	1	0	0	0	0	0	0	0	0	0	0	0	1
30	0	0	Cal	4	1	2	2	2	11	13	3	7	17	13	3	2	1	0	0	0	0	0	0	0	3
31	0	0	0	3	1	4	5	2	1	0	1	1	9	11	2	4	1	1	0	0	0	0	0	0	2

TOTAL HOURS 744 TOTAL GOOD HOURS 701 DATA CAPTURE 94.2%

MAX. 1HR AVG 22 05/25/89 09:00:00 2ND MAX. 1 HR AVG 20 05/20/89 09:00:00

MIN. 1HR AVG 0 05/01/89 00:00:00 ARITHMETIC MEAN 1 STANDARD DEV. 3

NAAQS Comparison: MAX. 3 HR AVG 16 (500) 05/25/89 10:00:00
MAX. 24 HR AVG 5 (140) 05/21/89 04:00:00

KEY FOR MISSING CODES
Bad< - To few samples for valid average, Cal - calibration, OCal - Analyzer out of calibration
BadS - Bad Analyzer Status, PwrF - Power Failure, Down - Operator downed channel, Miss - Missing Data
Qad - Data questionable insufficient documentation, Qai - Data questionable external influence, Purg - Analyzer in Purge

FPL-Davie
Ft. Lauderdale, FL - Site 002

HOURLY AVERAGES FOR Sigθ1 in deg

MAY 1989

DAY	HOUR (EST) 00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVG
1	12.7	13.1	11.0	9.4	11.7	11.5	11.5	13.1	12.8	12.1	13.9	14.3	14.4	13.5	12.8	15.0	13.3	12.5	11.5	11.7	11.1	11.6	12.1	12.5	12.5
2	14.9	19.9	18.2	22.6	19.6	18.2	16.0	14.6	11.7	11.0	14.8	13.5	PwrF	22.7	19.2	18.3	22.5	20.1	12.6	11.0	11.0	10.9	8.6	8.1	15.7
3	8.6	8.6	13.9	18.1	27.9	11.1	16.0	16.1	24.3	27.0	22.7	16.9	19.3	15.9	16.5	16.0	14.3	13.3	11.7	9.5	10.0	13.0	10.8	11.2	15.5
4	10.3	9.2	12.2	12.2	11.1	13.2	12.8	14.1	13.8	15.4	14.1	14.6	15.9	15.3	15.0	14.3	15.9	15.5	13.3	13.2	14.7	11.9	11.2	10.4	13.3
5	10.8	10.6	11.4	10.0	10.9	10.9	12.2	13.6	14.8	15.3	15.0	13.9	15.7	15.3	14.7	15.0	15.3	13.2	12.6	13.5	10.6	10.4	10.6	12.6	12.9
6	33.4	55.1	27.8	19.4	12.4	22.3	24.1	35.7	30.8	44.3	32.6	13.6	15.7	16.5	15.4	20.4	16.9	14.1	11.5	10.6	11.5	17.2	19.1	15.9	22.3
7	19.4	16.8	14.3	7.3	8.3	10.3	11.9	14.1	17.4	19.0	17.7	20.7	23.1	17.5	18.0	15.7	20.9	23.7	17.6	55.9	29.3	12.4	11.5	13.5	18.2
8	8.9	7.5	9.9	8.3	7.0	6.7	10.3	11.9	13.3	21.2	59.7	42.3	16.5	19.6	17.0	18.7	15.5	17.0	13.5	12.2	12.0	12.1	9.9	9.7	15.9
9	10.4	9.0	9.9	11.1	9.4	13.7	17.9	14.3	15.3	20.2	19.3	20.2	17.9	18.2	21.0	19.3	17.7	15.7	13.1	12.8	12.4	12.1	9.8	11.0	14.7
10	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss
11	17.1	12.8	17.4	12.6	13.2	16.4	11.5	15.4	16.9	19.0	19.8	24.7	48.5	27.4	25.4	18.7	19.8	19.6	32.9	55.8	62.5	55.9	11.1	7.7	24.3
12	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	PwrF	14.8	26.9	27.5	28.7	34.2	16.0	Bad<
13	9.5	8.8	8.4	19.2	12.5	8.2	17.1	21.3	13.1	13.5	15.7	19.1	19.4	16.1	14.4	14.4	13.5	13.7	11.2	9.2	11.1	11.7	19.2	18.8	14.1
14	13.3	19.0	18.7	10.8	24.0	12.4	21.4	34.7	16.0	16.5	15.7	15.5	15.4	14.6	14.3	13.8	12.5	13.5	13.1	11.4	10.6	12.5	14.6	11.9	15.7
15	32.3	50.0	23.2	24.1	24.6	41.0	28.6	16.0	23.6	21.3	20.9	29.3	28.6	19.3	15.2	14.6	16.3	56.4	47.9	34.7	42.4	29.1	19.9	47.7	29.5
16	28.9	25.2	48.8	28.5	8.9	31.3	17.9	16.8	19.2	37.2	38.5	34.5	52.6	47.7	14.2	17.7	14.2	13.6	19.8	11.2	16.6	10.8	8.9	7.5	23.8
17	8.6	11.5	12.5	15.0	13.6	18.5	20.1	19.3	24.8	31.1	54.9	54.3	45.6	15.2	14.8	13.2	12.0	13.0	13.9	16.3	36.7	19.6	15.9	13.6	21.4
18	16.1	9.8	28.0	21.9	49.6	52.3	20.8	23.2	31.8	28.2	40.7	46.2	26.0	17.6	16.0	18.0	16.1	16.0	21.4	19.1	19.2	17.9	14.6	14.8	24.4
19	13.8	11.0	11.4	10.8	10.9	13.0	14.2	13.6	13.8	16.1	18.5	16.4	16.5	17.7	16.1	15.5	16.8	18.1	15.5	14.9	14.3	17.4	18.1	29.2	15.6
20	25.7	16.5	16.0	20.5	17.1	23.4	15.7	30.0	56.7	36.6	26.4	45.4	27.6	24.5	22.3	19.2	15.3	16.4	14.9	15.4	13.6	10.1	14.3	19.6	22.6
21	28.4	26.0	16.4	15.4	8.6	11.5	15.7	19.6	29.5	43.5	54.2	51.6	38.2	15.3	17.9	17.2	14.4	14.1	13.8	11.1	13.3	20.5	80.5	14.1	24.6
22	11.9	15.8	11.7	13.6	20.9	16.0	33.0	12.8	16.5	15.2	15.4	15.0	18.1	16.0	15.7	15.9	12.1	12.6	10.9	12.1	11.6	10.4	8.2	8.6	14.6
23	10.6	8.8	24.7	25.8	10.0	22.1	20.7	26.3	24.7	36.2	43.0	41.5	28.4	15.9	14.3	13.7	13.3	12.6	12.2	10.3	12.6	12.7	16.0	16.5	19.7
24	16.4	16.4	14.1	15.0	50.7	32.2	13.8	35.2	32.8	29.6	44.8	40.1	49.9	26.4	16.8	28.5	19.6	47.0	24.3	10.6	10.8	15.0	12.6	16.8	25.8
25	13.2	11.6	13.5	9.3	11.7	12.2	10.1	13.3	16.6	22.1	39.3	43.0	36.8	18.1	15.2	16.5	15.3	13.7	12.8	11.2	14.2	7.8	9.5	10.9	16.6
26	7.2	19.0	8.9	29.3	47.2	24.6	37.8	51.2	48.1	50.1	29.3	21.4	18.2	19.2	17.5	17.2	14.1	13.2	12.7	12.7	15.0	17.6	15.8	14.6	23.4
27	17.6	30.3	12.7	17.7	12.5	32.6	8.6	13.1	20.1	34.5	32.6	16.1	23.2	18.7	12.7	18.2	16.8	15.4	11.5	11.0	11.6	12.0	14.4	10.6	17.7
28	18.5	17.4	55.5	16.5	47.6	8.2	11.6	19.3	27.3	39.0	25.3	17.9	18.0	14.8	14.1	13.6	14.7	13.3	12.4	11.5	10.6	11.7	10.8	10.4	19.2
29	11.1	11.6	11.7	12.2	16.8	18.2	18.6	13.7	13.5	13.9	15.8	14.6	17.7	15.2	15.7	15.0	14.8	14.8	12.0	12.7	12.0	11.6	11.4	10.4	14.0
30	10.6	11.6	10.9	12.2	21.0	13.3	14.9	13.5	15.8	14.2	15.7	15.5	13.6	14.9	15.9	14.7	14.4	13.9	11.2	10.9	10.1	10.0	11.9	12.1	13.5
31	10.6	12.1	13.3	10.9	10.1	11.1	11.6	13.9	14.9	15.7	13.6	14.4	13.3	12.2	15.4	14.7	13.2	13.6	10.8	11.4	13.2	10.4	9.9	10.0	12.5

TOTAL HOURS 744 TOTAL GOOD HOURS 701 DATA CAPTURE 94.2%

MAX. 1HR AVG 80.5 05/21/89 22:00:00 2ND MAX. 1 HR AVG 62.5 05/11/89 20:00:00

MIN. 1HR AVG 6.7 05/08/89 05:00:00 ARITHMETIC MEAN 18.5 STANDARD DEV. 10.4

KEY FOR MISSING CODES
Bad< - To few samples for valid average, Cal - calibration, OCal - Analyzer out of calibration
BadS - Bad Analyzer Status, PwrF - Power Failure, Down - Operator downed channel, Miss - Missing Data
Qad - Data questionable insufficient documentation, Qai - Data questionable external influence, Purg - Analyzer in Purge

FPL-Davie
Ft. Lauderdale, FL - Site 002

HOURLY AVERAGES FOR RNFL in INCH

JUNE 1989

DAY	HOUR (EST) 00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVG
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.43	0.09	0.05	0.56	0.47	0.01	0.00	0.00	0.07
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss
19	0.00	0.00	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.57	1.60	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.02	0.07	0.03	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.65	0.00	0.00	0.00	0.00	0.46	0.00	0.08	0.01	0.00	0.00	0.00	0.05
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.41	0.26	0.05	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.03
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.53	1.11	0.01	0.05	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.07
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.04	0.00	0.46	0.02	0.02	0.01	0.00	0.00	0.00	0.03

TOTAL HOURS 720 TOTAL GOOD HOURS 696 DATA CAPTURE 96.7%

MAX. 1HR AVG 1.60 06/22/89 10:00:00 2ND MAX. 1 HR AVG 1.11 06/29/89 14:00:00

MIN. 1HR AVG 0.00 06/01/89 00:00:00 ARITHMETIC MEAN 0.01 STANDARD DEV. 0.10

KEY FOR MISSING CODES
Bad< - To few samples for valid average, Cal - calibration, OCal - Analyzer out of calibration
BadS - Bad Analyzer Status, PwrF - Power Failure, Down - Operator downed channel, Miss - Missing Data
Qad - Data questionable insufficient documentation, Qai - Data questionable external influence, Purg - Analyzer in Purge

FPL DAVIE PRECIPITATION		
DATE	**TIME**	**AMOUNT**
6-6-89	1600	0.43
	1700	0.09
	1800	0.05
	1900	0.56
	2000	0.47
	2100	0.01
6-7-89	1100	0.03
	1500	0.31
6-20-89	0200	0.30
6-21-89	2100	0.04
6-22-89	0800	0.11
	0900	0.57
	1000	1.60
	1100	0.02
6-24-89	1500	0.07
	1600	0.05
6-26-89	1000	0.01
	1300	0.02
	1400	0.07
	1500	0.03
	1600	0.06
6-27-89	1200	0.65
	1700	0.46
	1900	0.08
	2000	0.01
	10.5.1-113	

FPL DAVIE PRECIPITATION		
DATE	TIME	AMOUNT
6-28-89	1400	0.41
	1500	0.26
	1600	0.05
	2200	0.01
6-29-89	1300	0.53
	1400	1.11
	1500	0.01
	1600	0.05
	1800	0.01
6-30-89	1400	0.13
	1500	0.04
	1700	0.46
	1800	0.02
	1900	0.02
	2000	0.01
	TOTAL	9.22
	10.5.1-114	

FPL-Davie
Ft. Lauderdale, FL - Site 002

HOURLY AVERAGES FOR WD in DGS

JUNE 1989

DAY	HOUR (EST) 00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVG
1	103	110	106	104	112	120	99	102	111	115	116	112	99	94	92	90	91	85	80	85	93	94	93	91	100
2	93	100	93	82	87	76	63	97	90	105	94	95	109	100	106	108	112	115	109	98	96	103	109	117	98
3	117	124	121	117	140	170	177	159	152	149	123	133	134	132	129	141	137	142	143	138	144	131	128	137	138
4	139	138	143	150	150	139	142	137	151	145	129	122	114	116	119	116	120	119	128	124	123	125	129	125	131
5	122	132	320	316	82	325	148	144	143	137	130	129	137	137	136	143	142	143	148	151	148	152	143	144	161
6	175	147	159	274	4	40	143	172	149	154	160	161	156	163	156	190	219	193	12	61	11	4	116	185	134
7	156	205	221	168	172	240	157	160	187	188	200	195	180	200	210	237	135	133	155	165	141	146	151	165	178
8	174	158	160	151	150	158	154	156	163	161	161	166	166	176	173	162	156	160	169	166	163	157	141	140	160
9	147	157	159	160	158	149	151	154	155	157	159	168	155	157	148	151	154	157	155	147	140	115	120	123	150
10	103	53	92	145	116	155	137	143	137	136	135	127	129	134	137	127	133	127	116	119	121	127	129	128	125
11	131	137	116	136	151	291	306	345	143	136	127	118	115	120	116	118	116	119	113	97	102	107	97	110	144
12	95	101	112	121	131	145	141	147	136	142	129	128	139	133	141	142	145	137	136	144	143	148	153	154	135
13	158	150	98	150	145	43	152	168	163	151	146	150	136	139	137	132	140	148	148	145	145	144	151	143	141
14	336	302	170	327	20	343	9	128	151	140	135	136	128	136	144	141	143	146	145	136	146	140	115	127	160
15	145	150	129	148	147	143	144	145	149	149	146	148	158	155	139	139	143	145	140	149	146	131	126	131	144
16	129	132	136	132	135	140	144	144	141	144	145	134	131	142	137	138	130	136	133	121	118	116	120	125	133
17	127	130	134	136	133	134	130	121	126	124	128	124	124	124	116	112	110	115	109	103	100	99	106	113	120
18	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss
19	30	6	58	72	333	348	0	75	116	109	105	114	117	112	117	121	126	316	6	45	102	122	117	119	116
20	113	130	78	115	129	212	238	142	148	139	129	126	125	130	131	126	304	310	136	140	183	160	119	112	153
21	163	293	89	353	316	37	51	124	126	127	132	134	141	141	135	130	131	127	140	141	122	108	125	58	144
22	47	50	44	44	48	76	65	99	110	185	286	137	118	110	111	113	115	100	111	85	77	89	82	78	99
23	70	37	65	80	61	56	77	105	110	103	114	105	108	118	111	115	116	117	118	118	96	89	83	64	93
24	65	33	56	60	121	152	332	164	213	146	145	149	152	156	185	223	248	252	278	351	39	177	237	255	175
25	320	1	12	7	299	275	348	336	358	13	57	115	118	158	165	132	172	200	163	162	179	211	211	219	176
26	233	235	229	223	208	218	229	227	225	236	220	236	345	210	142	177	190	195	207	190	195	188	162	182	213
27	194	181	216	236	242	215	220	254	229	228	269	261	272	206	245	296	163	266	202	206	204	206	220	231	228
28	157	212	186	163	145	294	252	203	215	193	216	217	266	179	197	212	212	199	126	345	237	244	266	319	219
29	341	344	50	41	215	146	169	250	290	204	218	232	193	220	221	243	258	218	245	336	337	223	141	195	222
30	230	211	322	327	313	291	300	316	304	298	304	294	302	18	146	92	183	293	206	207	253	282	240	249	249

TOTAL HOURS 720 TOTAL GOOD HOURS 696 DATA CAPTURE 96.7%

MAX. 1HR AVG 358 06/25/89 08:00:00 2ND MAX. 1 HR AVG 353 06/21/89 03:00:00

MIN. 1HR AVG 0 06/19/89 06:00:00 ARITHMETIC MEAN 153 STANDARD DEV. 66

KEY FOR MISSING CODES
Bad< - To few samples for valid average, Cal - calibration, OCal - Analyzer out of calibration
BadS - Bad Analyzer Status, PwrF - Power Failure, Down - Operator downed channel, Miss - Missing Data
Qad - Data questionable insufficient documentation, Qai - Data questionable external influence, Purg - Analyzer in Purge

WIND ROSE ANALYSIS FOR 06/01/89 TO 06/30/89

Wind Speed (mph)	DIRECTION																All
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Dir
> 31.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
31.0-24.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
24.0-17.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
17.0-10.0	0.0	0.0	0.0	0.0	0.7	2.9	5.6	4.2	0.4	0.3	0.0	0.1	0.0	0.0	0.1	0.1	15
10.0- 3.0	0.6	0.1	0.6	0.9	5.2	13.	22.	11.	2.9	4.0	4.6	2.3	0.9	1.9	1.6	1.0	71
3.0 <																	14
All Speed	0.6	0.1	0.6	0.9	5.9	15.	27.	15.	3.3	4.3	4.6	2.4	0.9	1.9	1.7	1.1	100

EV-23-

Ft. Lauderdale, FL Averaging Time: 3600 sec

FPL-Davie
Ft. Lauderdale, FL - Site 002

HOURLY AVERAGES FOR WS in MPH

JUNE 1989

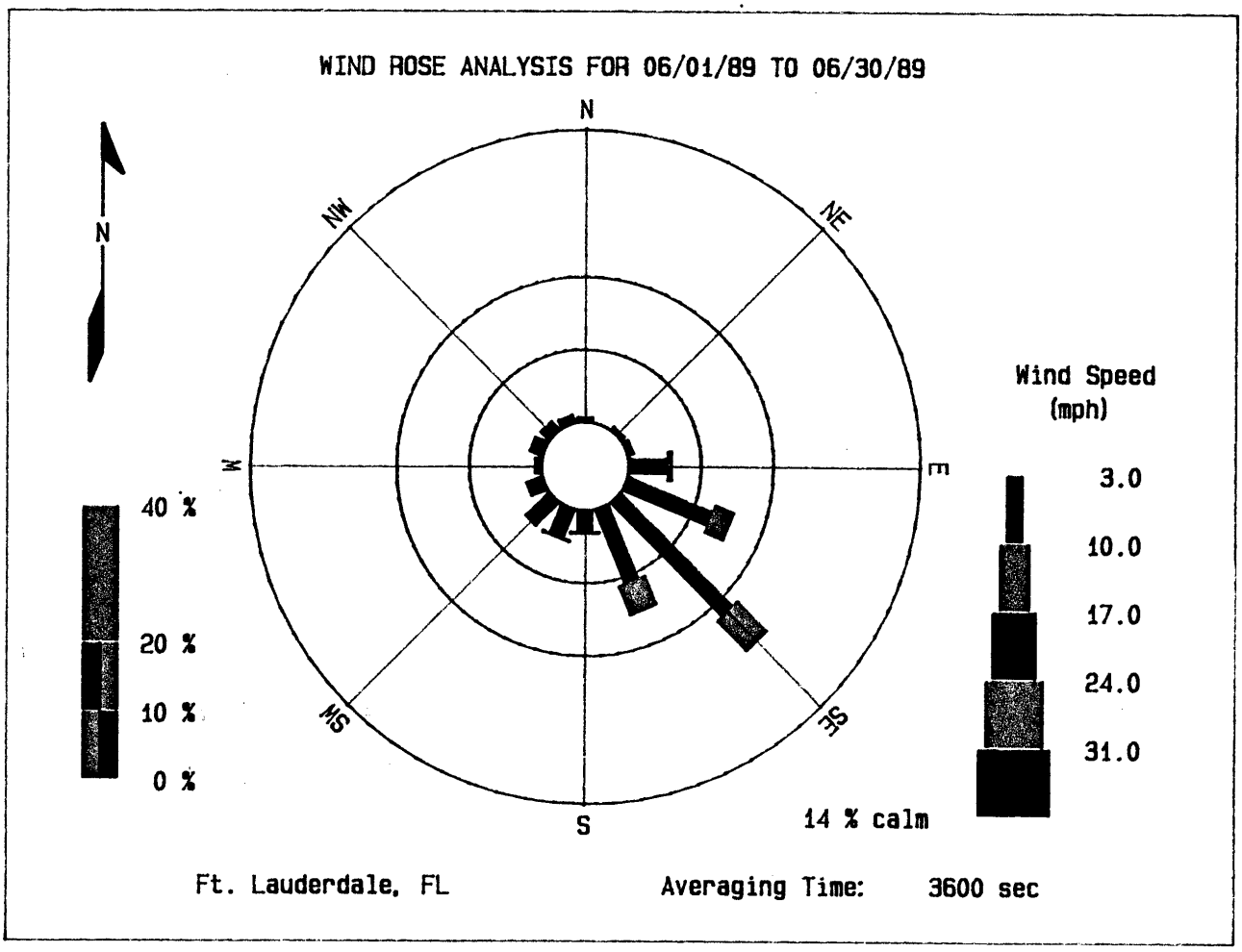
DAY	HOUR (EST) 00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVG
1	7	7	5	5	5	6	7	10	11	12	11	10	10	11	11	11	10	10	9	8	8	8	8	8	9
2	6	6	5	4	5	3	2	8	7	7	7	9	10	10	10	10	10	10	10	9	7	8	6	7	7
3	7	7	5	4	3	3	3	4	6	5	9	9	9	10	10	9	8	8	7	6	5	5	6	4	6
4	3	4	4	4	3	2	3	5	7	6	7	9	9	10	10	11	11	10	8	7	7	7	7	6	7
5	5	3	7	5	3	3	2	6	7	8	9	8	9	12	13	13	11	11	9	7	7	5	5	4	7
6	3	3	4	1	3	2	3	4	10	12	12	13	12	13	12	6	9	11	3	2	3	4	2	5	6
7	5	4	4	4	3	4	4	5	6	7	8	7	9	7	8	6	7	12	8	6	6	6	6	6	6
8	3	3	4	4	2	3	3	7	9	12	12	14	12	12	13	13	13	14	11	8	8	6	3	4	8
9	7	7	8	9	7	8	7	10	13	15	14	12	13	12	11	10	11	11	9	5	3	3	3	4	9
10	2	2	3	1	2	3	5	4	7	8	8	8	8	9	8	9	8	7	7	5	5	6	7	7	6
11	7	7	4	5	4	3	3	2	5	7	7	7	10	9	9	10	10	9	8	6	6	6	6	5	6
12	4	3	3	5	4	4	6	9	8	9	9	10	9	10	11	10	8	7	8	7	7	5	7	8	7
13	8	7	3	4	4	3	4	4	5	7	9	10	9	10	11	11	9	8	7	6	6	6	5	1	7
14	5	3	4	3	3	2	2	5	9	8	8	9	9	10	11	11	12	11	7	6	7	4	5	4	7
15	3	5	4	9	9	8	9	12	13	15	13	12	13	11	12	12	12	12	10	7	7	6	6	6	9
16	11	11	10	10	9	8	9	11	11	10	10	12	14	14	14	12	10	9	10	11	10	10	10	8	10
17	8	7	6	5	5	5	4	9	10	11	10	11	11	9	10	10	11	10	9	10	8	9	8	8	8
18	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss
19	2	2	2	3	2	2	3	3	7	8	7	10	10	11	10	9	6	3	3	2	4	5	5	5	5
20	6	4	2	4	5	4	3	4	7	8	9	9	10	10	8	5	5	4	6	5	1	0	4	3	5
21	2	3	3	5	5	2	2	6	8	8	9	9	9	8	8	8	6	6	4	3	3	9	4	3	5
22	3	2	3	4	3	4	2	6	8	2	3	1	6	7	9	9	9	8	6	4	3	4	3	3	5
23	3	2	3	3	2	2	4	7	9	8	9	10	10	10	10	10	8	7	6	5	3	4	3	2	6
24	3	2	3	2	3	3	3	6	3	3	7	7	5	5	6	6	5	3	4	2	1	2	4	4	4
25	3	3	3	2	2	3	2	2	2	2	2	7	10	9	8	5	4	6	7	5	3	3	4	4	4
26	3	3	4	3	3	3	5	4	5	5	4	1	4	3	6	5	5	5	4	3	5	6	7	3	4
27	4	3	6	5	5	5	3	3	3	4	4	2	7	3	4	4	4	4	4	5	4	5	7	4	4
28	4	6	7	10	11	4	7	7	5	5	6	8	9	6	10	6	4	5	2	6	11	3	6	6	6
29	4	3	2	2	4	6	4	4	3	3	4	5	5	3	7	4	4	5	0	3	4	7	7	9	4
30	5	2	5	11	11	10	4	3	3	3	5	4	3	2	6	7	5	4	7	5	3	4	3	4	5

TOTAL HOURS 720 TOTAL GOOD HOURS 696 DATA CAPTURE 96.7%

MAX. 1HR AVG 15 06/15/89 09:00:00 2ND MAX. 1 HR AVG 15 06/09/89 09:00:00

MIN. 1HR AVG 0 06/20/89 21:00:00 ARITHMETIC MEAN 6 STANDARD DEV. 3

KEY FOR MISSING CODES
Bad< - To few samples for valid average, Cal - calibration, OCal - Analyzer out of calibration
BadS - Bad Analyzer Status, PwrF - Power Failure, Down - Operator downed channel, Miss - Missing Data
Qad - Data questionable insufficient documentation, Qai - Data questionable external influence, Purg - Analyzer in Purge


WIND ROSE ANALYSIS FOR 06/01/89 TO 06/30/89
N
NE
E
SE
S
SW
W
NW
N
40 %
20 %
10 %
0 %
Wind Speed
(mph)
3.0
10.0
17.0
24.0
31.0
14 % calm
Ft. Lauderdale, FL
Averaging Time: 3600 sec

FPL-Davie
Ft. Lauderdale, FL - Site 002

HOURLY AVERAGES FOR TEMP in DGC

JUNE 1989

DAY	HOUR (EST) 00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVG
1	25	25	25	25	25	25	26	27	27	28	29	29	30	30	30	30	29	28	27	27	26	26	26	25	27
2	25	25	25	25	24	24	25	26	27	28	29	29	29	29	29	29	28	27	27	26	26	26	26	26	27
3	26	25	25	25	24	24	25	26	27	28	29	30	30	30	30	29	28	27	27	26	26	26	26	25	27
4	25	25	25	24	24	24	24	27	28	29	30	30	30	30	30	30	29	29	28	27	26	26	26	25	27
5	25	24	24	23	23	23	24	27	28	29	30	30	30	30	30	29	29	28	27	27	26	26	26	25	27
6	25	24	24	24	24	24	25	26	28	30	30	31	32	31	31	28	21	21	21	21	21	20	21	21	25
7	21	21	21	21	21	21	22	23	25	26	28	28	28	29	30	25	26	24	24	24	24	24	24	24	24
8	23	23	23	23	23	23	25	26	28	29	30	31	31	31	31	31	30	29	28	27	27	26	26	25	27
9	25	25	26	26	26	26	26	27	28	29	30	31	31	31	31	30	30	29	28	27	26	26	26	26	28
10	25	25	24	25	25	25	25	27	28	29	30	30	30	30	30	30	29	29	28	27	26	26	26	26	27
11	26	25	25	25	25	24	25	26	28	29	30	30	30	30	30	30	29	29	28	27	27	26	26	26	27
12	26	26	25	25	25	25	26	27	28	29	30	30	31	31	31	30	30	30	28	27	27	26	26	26	28
13	25	25	25	25	25	25	26	27	28	30	31	31	31	31	31	30	30	29	28	27	27	26	26	26	28
14	26	25	24	25	25	25	26	26	28	30	31	31	31	31	31	31	30	29	28	27	27	27	27	27	28
15	26	26	26	26	26	26	27	28	28	29	30	31	31	32	31	30	30	29	28	27	27	27	27	27	28
16	27	27	26	26	26	26	27	28	28	29	30	30	30	31	31	30	30	29	29	28	27	27	27	27	28
17	27	26	26	26	26	25	26	28	28	29	30	30	31	31	31	30	30	28	28	27	27	27	27	27	28
18	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss
19	25	25	24	24	24	24	24	26	27	28	28	29	29	29	28	28	27	26	26	26	26	26	26	26	26
20	26	25	25	25	24	24	25	27	28	29	30	30	31	30	29	29	27	26	27	27	26	26	26	26	27
21	25	25	24	24	24	24	25	28	29	29	29	28	30	29	28	28	27	27	27	27	26	24	23	23	26
22	23	23	24	24	24	24	25	27	26	24	21	23	25	27	27	28	28	28	26	26	26	26	26	25	25
23	25	24	24	24	24	24	25	27	27	28	28	27	29	29	29	29	28	28	27	26	26	26	26	26	27
24	25	25	25	25	25	25	25	24	24	25	26	26	27	27	28	27	24	24	24	24	24	23	23	23	25
25	23	23	22	23	23	23	23	23	24	25	26	25	26	25	25	27	27	26	25	24	24	24	24	24	24
26	23	23	23	23	22	22	23	24	27	28	28	27	25	23	22	22	22	23	24	23	23	23	23	22	24
27	22	23	23	23	23	23	23	24	25	28	28	28	23	23	26	28	28	24	23	22	22	22	22	23	24
28	22	23	22	22	22	22	23	25	26	28	29	29	26	25	23	21	21	22	22	23	22	22	22	22	23
29	22	22	22	22	22	22	22	24	26	28	29	30	31	30	22	22	23	24	24	24	23	23	22	22	24
30	22	22	22	22	22	22	23	25	27	28	29	30	31	28	25	23	24	22	22	22	22	22	22	22	24

TOTAL HOURS 720 TOTAL GOOD HOURS 696 DATA CAPTURE 96.7%

MAX. 1HR AVG 32 06/15/89 13:00:00 2ND MAX. 1 HR AVG 32 06/06/89 12:00:00

MIN. 1HR AVG 20 06/06/89 21:00:00 ARITHMETIC MEAN 26 STANDARD DEV. 3

KEY FOR MISSING CODES
Bad< - To few samples for valid average, Cal - calibration, OCal - Analyzer out of calibration
BadS - Bad Analyzer Status, PwrF - Power Failure, Down - Operator downed channel, Miss - Missing Data
Qad - Data questionable insufficient documentation, Qai - Data questionable external influence, Purg - Analyzer in Purge

FPL-Davie
Ft. Lauderdale, FL - Site 002

HOURLY AVERAGES FOR SO2 in PPB

JUNE 1989

DAY	HOUR (EST) 00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVG
1	0	0	Cal	3	0	0	3	2	2	2	3	12	22	9	3	2	1	0	0	0	1	1	1	1	3
2	2	1	1	1	1	3	5	4	15	13	15	6	5	12	10	11	7	6	1	0	1	1	0	0	5
3	0	0	Cal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	Cal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	Cal	0	1	3	3	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	1	2	2	1	1	Cal	Cal	Cal	Cal	Cal	Cal	Cal	Cal	0	0	0	0	0	0	0	Bad<
7	0	0	Cal	0	1	1	2	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	Cal	Cal	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	Cal	Cal	5	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
13	0	0	Cal	Cal	7	5	3	1	1	0	0	0	0	2	1	0	0	0	0	0	0	0	0	0	1
14	0	0	0	0	0	0	0	0	0	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	Cal	Cal	9	5	3	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	1
16	2	0	0	0	0	0	0	0	0	0	0	0	3	1	2	1	1	2	2	0	0	0	0	0	1
17	0	0	Cal	Cal	6	4	3	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
18	0	0	Cal	Cal	5	3	3	6	33	28	38	13	3	0	0	0	0	0	0	0	0	0	0	0	6
19	2	0	Cal	4	1	1	1	1	0	0	2	0	0	0	0	0	0	2	0	1	0	0	0	0	1
20	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	0	0	Cal	Cal	2	2	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	0	0	Cal	Cal	8	6	5	4	1	2	2	1	0	0	0	0	0	0	0	0	0	0	0	0	1
24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25	0	0	Cal	Cal	8	5	3	2	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1
26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0
27	0	0	Cal	Cal	8	5	3	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
28	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0
29	1	1	Cal	Cal	12	7	4	3	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
30	0	0	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

TOTAL HOURS 720 TOTAL GOOD HOURS 684 DATA CAPTURE 95.0%

MAX. 1HR AVG 38 06/18/89 10:00:00 2ND MAX. 1 HR AVG 33 06/18/89 08:00:00

MIN. 1HR AVG 0 06/01/89 00:00:00 ARITHMETIC MEAN 1 STANDARD DEV. 3

NAAQS Comparison: MAX. 3 HR AVG 33 (500) 06/18/89 10:00:00
MAX. 24 HR AVG 6 (140) 06/19/89 00:00:00

KEY FOR MISSING CODES
Bad< - To few samples for valid average, Cal - calibration, OCal - Analyzer out of calibration
BadS - Bad Analyzer Status, PwrF - Power Failure, Down - Operator downed channel, Miss - Missing Data
Qad - Data questionable insufficient documentation, Qai - Data questionable external influence, Purg - Analyzer in Purge

FPL-Davie
Ft. Lauderdale, FL - Site 002

HOURLY AVERAGES FOR Sig01 in deg

JUNE 1989

DAY	HOUR (EST) 00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVG
1	10.0	11.4	10.3	9.7	11.9	13.1	13.6	13.1	14.7	13.8	15.3	18.8	15.3	17.6	16.8	16.5	13.9	15.2	14.9	12.5	10.8	10.6	10.6	10.4	13.4
2	10.9	11.6	11.0	12.2	10.0	22.1	35.1	12.4	18.2	20.4	23.0	17.6	18.7	19.8	16.9	17.0	16.5	15.0	13.0	10.3	11.0	10.5	12.6	12.4	15.8
3	11.1	13.2	11.9	11.2	11.2	15.3	19.7	19.4	14.6	15.3	16.6	17.5	18.6	17.2	15.2	13.2	14.3	12.8	13.5	14.7	12.0	12.7	13.3	11.2	14.4
4	10.6	9.5	9.2	7.7	9.0	8.6	10.6	15.2	19.0	22.4	18.7	19.8	17.0	15.8	15.3	14.1	12.7	13.9	14.3	12.7	12.5	12.6	13.1	13.2	13.6
5	11.7	24.7	21.4	36.2	51.6	55.9	31.9	15.2	15.9	16.4	17.0	19.8	16.0	15.2	15.2	15.2	14.1	12.4	12.1	11.0	10.1	10.1	10.4	9.5	19.5
6	9.8	10.5	17.2	18.5	29.7	35.1	19.7	20.3	14.4	12.1	14.8	14.4	14.9	12.7	15.7	31.3	24.6	13.9	43.2	44.8	35.1	30.3	63.1	31.2	24.1
7	16.1	17.2	18.2	20.4	21.4	45.2	49.3	14.2	14.3	17.0	17.4	22.5	15.4	18.2	21.2	51.0	17.4	14.2	14.2	12.1	12.4	11.7	12.1	11.0	20.2
8	11.4	8.7	8.6	8.3	8.4	8.8	10.1	12.5	12.6	13.8	12.7	13.2	15.0	15.2	13.6	13.9	12.5	10.5	11.1	12.2	10.0	9.7	10.6	9.7	11.4
9	8.3	9.7	10.3	9.8	9.5	11.4	11.2	11.5	10.5	11.5	13.6	16.0	13.3	16.3	15.5	12.8	18.6	12.4	11.4	10.3	11.1	11.4	9.7	15.2	12.1
10	24.3	24.7	25.7	49.9	28.5	11.1	16.4	14.8	15.2	16.6	16.9	18.6	17.0	19.0	15.8	16.3	14.7	14.3	11.9	11.2	10.5	12.1	13.2	13.3	18.0
11	13.2	13.8	20.4	11.7	20.5	28.4	28.2	41.7	29.2	16.4	19.7	19.4	14.7	16.6	17.7	16.8	14.4	16.1	14.4	12.5	14.1	13.1	11.1	12.8	18.2
12	14.3	13.6	16.0	11.7	12.5	9.8	12.1	13.2	15.4	16.5	16.6	15.9	16.6	18.0	13.2	16.8	15.5	16.3	13.7	12.0	12.2	12.6	11.1	7.7	13.9
13	11.7	17.2	44.9	38.0	29.8	60.9	13.3	19.0	17.4	21.4	15.3	14.7	17.9	16.6	16.1	13.9	14.6	13.9	13.0	11.2	9.8	9.7	8.4	34.8	20.2
14	37.2	19.8	9.7	44.4	28.7	28.1	20.8	27.4	13.0	15.9	18.1	14.9	15.2	15.0	13.9	13.2	13.9	12.1	11.6	13.2	11.4	12.0	12.2	10.6	18.0
15	14.9	19.6	12.2	10.8	10.5	12.8	12.2	13.3	13.3	12.0	13.6	14.2	15.8	16.1	16.3	15.2	15.0	14.3	13.8	11.0	10.6	13.7	13.3	13.3	13.7
16	13.8	13.7	13.6	13.8	14.1	13.2	12.4	13.1	13.6	15.2	17.9	17.1	13.9	14.3	14.6	15.4	16.8	14.9	14.9	13.1	12.7	11.5	12.0	13.2	14.1
17	13.8	13.8	13.6	13.0	12.6	13.1	13.7	13.7	14.4	14.4	17.4	16.3	17.4	18.0	15.2	17.0	15.0	13.0	13.9	13.0	11.5	11.4	12.5	12.1	14.1
18	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss	Miss
19	23.0	18.3	48.7	30.6	14.6	22.1	23.0	46.1	14.4	17.4	18.1	17.1	14.7	14.6	13.5	13.2	14.3	23.4	20.5	28.4	15.8	11.7	11.5	11.4	20.3
20	9.9	13.3	49.6	14.8	18.3	33.9	37.5	21.3	19.7	15.4	16.0	19.6	17.9	16.9	16.9	33.3	21.6	25.9	30.3	13.6	29.6	47.4	12.1	13.5	22.8
21	14.2	33.7	67.4	38.2	40.5	32.8	33.0	16.9	15.5	15.9	14.9	14.3	15.3	13.9	13.3	14.1	15.0	13.2	14.8	13.0	22.7	15.2	20.7	18.1	21.9
22	15.4	27.4	18.3	17.6	19.0	19.4	33.1	17.4	22.0	43.7	30.6	24.0	15.8	16.6	14.8	14.7	14.2	14.8	12.7	15.2	13.8	12.6	12.5	20.3	19.4
23	19.2	24.2	19.7	18.6	26.9	24.1	16.8	16.0	11.6	14.9	15.9	12.0	15.9	16.3	15.9	14.9	15.4	14.7	13.7	13.9	17.7	11.6	14.3	21.9	16.9
24	22.1	15.7	23.1	22.7	13.1	48.9	21.4	46.0	34.8	27.8	14.2	12.8	14.9	18.1	19.2	19.7	17.5	15.8	11.6	19.8	22.5	12.6	17.4	11.9	21.0
25	19.1	14.7	14.4	17.2	15.4	11.2	29.6	15.7	29.7	24.3	32.3	14.4	14.1	14.3	14.7	20.8	15.3	13.5	11.0	10.4	14.3	15.2	15.0	15.4	17.2
26	15.3	17.2	17.5	22.4	16.5	24.8	14.9	19.1	20.8	23.6	31.9	53.1	32.0	24.0	12.2	10.5	13.2	14.9	17.5	12.8	24.2	23.2	18.3	8.2	20.3
27	9.4	9.9	19.1	11.9	29.6	12.8	14.1	19.4	20.1	26.5	24.5	52.6	25.1	22.9	33.9	28.7	41.6	41.1	16.8	22.9	15.5	15.4	21.9	34.1	23.7
28	10.8	14.2	14.1	17.4	10.8	24.9	16.3	16.1	17.0	22.5	22.5	20.1	16.6	32.2	13.9	15.9	18.7	22.5	40.7	27.4	16.4	15.7	21.0	30.4	19.9
29	23.2	27.0	56.9	39.4	35.2	8.8	17.0	22.6	32.0	39.0	26.2	30.7	24.0	53.7	28.9	19.2	37.5	38.6	62.9	14.7	18.3	58.6	29.0	12.1	31.5
30	16.4	24.5	22.0	7.6	13.0	14.4	13.5	15.0	29.0	24.8	26.9	45.6	51.5	41.6	43.8	16.9	34.1	40.2	44.5	15.2	15.2	13.9	15.3	14.9	25.0

TOTAL HOURS 720 TOTAL GOOD HOURS 696 DATA CAPTURE 96.7%

MAX. 1HR AVG 67.4 06/21/89 02:00:00 2ND MAX. 1 HR AVG 63.1 06/06/89 22:00:00

MIN. 1HR AVG 7.6 06/30/89 03:00:00 ARITHMETIC MEAN 18.4 STANDARD DEV. 9.5

KEY FOR MISSING CODES
Bad< - To few samples for valid average, Cal - calibration, OCal - Analyzer out of calibration
BadS - Bad Analyzer Status, PwrF - Power Failure, Down - Operator downed channel, Miss - Missing Data
Qad - Data questionable insufficient documentation, Qai - Data questionable external influence, Purg - Analyzer in Purge

FPL-Davie
Ft. Lauderdale, FL - Site 002

HOURLY AVERAGES FOR RNFL in INCH

JULY 1989

DAY	HOUR (EST) 00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVG
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.21	0.08	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.01
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.20	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
6	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.10	0.04	0.00	0.00	0.00	0.00	0.00	0.01
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15	0.00	0.10	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.34	0.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00
21	0.14	0.07	0.07	0.04	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
22	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.01	0.16	0.06	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
23	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.07	0.02	0.00	0.14	0.17	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.27	0.04	0.00	0.01
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

TOTAL HOURS 744 TOTAL GOOD HOURS 744 DATA CAPTURE 100.0%

MAX. 1HR AVG 0.46 07/17/89 13:00:00 2ND MAX. 1 HR AVG 0.34 07/17/89 12:00:00

MIN. 1HR AVG 0.00 07/01/89 00:00:00 ARITHMETIC MEAN 0.01 STANDARD DEV. 0.03

KEY FOR MISSING CODES
Bad< - To few samples for valid average, Cal - calibration, OCal - Analyzer out of calibration
BadS - Bad Analyzer Status, PwrF - Power Failure, Down - Operator downed channel, Miss - Missing Data
Qad - Data questionable insufficient documentation, Qai - Data questionable external influence, Purg - Analyzer in Purge

FPL DAVIE PRECIPITATION		
DATE	**TIME**	**AMOUNT**
7-1-89	1500	0.21
	1600	0.08
	1700	0.01
	1800	0.01
	1900	0.01
7-4-89	1500	0.20
	1600	0.04
7-5-89	0700	0.10
	0800	0.02
	0900	0.01
7-6-89	0400	0.06
7-13-89	1500	0.01
	1600	0.01
	1700	0.10
	1800	0.04
7-14-89	1400	0.15
	1600	0.10
	1700	0.01
7-17-89	1200	0.34
	1300	0.46
7-18-89	1200	0.03
	1300	0.01
7-19-89	1800	0.04
7-20-89	1800	0.02
	10.5.1-123	

FPL DAVIE PRECIPITATION		
DATE	**TIME**	**AMOUNT**
7-21-89	0000	0.14
	0100	0.07
	0200	0.07
	0300	0.04
	0700	0.01
7-22-89	0200	0.09
	0700	0.01
	0800	0.16
	0900	0.06
	1000	0.06
7-23-89	0500	0.01
	1200	0.02
7-24-89	0500	0.06
	0800	0.07
	0900	0.02
	1100	0.14
	1200	0.17
	1300	0.19
7-25-89	1000	0.01
	1100	0.18
7-29-89	2100	0.27
	2200	0.04
7-30-89	1000	0.03
	TOTAL	3.99
	10.5.1-124	

FPL-Davie
Ft. Lauderdale, FL - Site 002

HOURLY AVERAGES FOR WD in DGS

JULY 1989

DAY	HOUR (EST) 00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVG
1	258	277	282	289	301	305	305	314	310	300	308	340	299	291	218	253	269	251	287	271	274	244	244	250	281
2	246	283	274	245	273	268	294	181	165	226	219	191	220	163	179	198	208	224	250	224	264	227	219	211	227
3	204	179	272	240	254	246	213	206	214	235	243	204	173	186	197	204	221	258	291	298	297	241	246	262	233
4	203	234	276	270	269	260	286	274	276	306	302	318	85	117	121	39	161	184	165	194	286	305	305	317	231
5	309	259	297	269	178	137	226	161	177	199	225	192	154	156	148	134	122	143	146	149	155	244	293	237	196
6	140	102	125	118	171	178	74	118	123	117	99	106	117	112	113	111	109	99	104	98	103	104	103	103	114
7	116	108	114	116	119	121	121	118	114	124	116	104	115	120	116	105	90	92	91	86	96	98	103	105	109
8	118	121	122	112	90	100	112	117	112	115	116	119	116	106	105	98	103	98	98	95	97	100	111	95	107
9	93	81	80	86	75	337	52	112	106	109	108	113	99	110	99	93	92	92	91	86	91	94	96	101	104
10	105	119	112	108	123	57	37	100	105	106	107	112	116	105	101	115	115	106	103	94	92	92	95	95	101
11	98	92	339	49	348	326	326	40	127	126	100	114	115	120	120	113	113	113	120	106	138	127	143	126	147
12	257	274	301	343	348	353	7	44	119	121	119	124	119	120	118	115	120	126	143	238	172	205	286	280	185
13	309	28	13	79	290	200	131	145	182	230	229	234	154	124	137	170	300	261	213	200	141	67	195	192	176
14	213	187	208	257	240	215	242	222	227	226	227	240	119	141	185	42	277	150	211	55	159	157	134	179	188
15	173	176	299	246	310	342	142	136	154	140	121	124	122	130	134	130	133	131	196	223	244	205	294	143	185
16	235	246	322	29	47	344	33	130	125	142	150	346	286	132	135	133	142	146	157	292	274	212	225	317	192
17	11	24	132	118	10	304	250	139	176	178	181	194	127	170	30	109	137	125	137	149	137	140	108	6	129
18	120	210	324	299	226	157	186	149	155	193	231	266	229	314	132	135	134	137	245	314	181	298	316	8	207
19	343	37	37	30	282	68	26	149	154	175	155	151	153	143	144	152	146	343	326	151	190	148	122	90	155
20	92	103	156	181	40	333	320	132	155	152	145	187	162	161	145	155	238	295	264	261	287	350	5	47	182
21	293	211	348	46	53	61	313	149	146	149	139	130	132	127	136	128	123	121	122	122	136	137	122	119	148
22	137	139	115	107	118	114	105	121	135	120	124	103	115	154	139	123	117	108	100	95	104	26	45	70	110
23	78	89	100	97	95	105	89	101	94	96	98	109	106	106	100	99	97	98	96	88	84	89	96	79	95
24	77	74	76	86	90	94	93	99	107	103	101	115	107	125	113	98	85	90	90	83	85	87	87	89	94
25	73	76	69	73	87	80	66	91	87	89	92	97	90	90	88	94	87	92	86	86	74	80	67	29	81
26	350	346	338	22	340	300	339	24	103	110	110	105	112	111	116	115	122	122	125	133	129	157	181	305	176
27	313	10	331	342	13	13	341	94	122	119	118	117	120	121	121	132	135	136	138	146	151	143	88	43	142
28	305	341	341	8	340	332	338	1	151	111	170	136	124	128	135	134	148	156	151	170	175	218	276	296	195
29	273	322	41	25	8	351	345	347	290	108	169	140	136	120	132	178	264	268	258	209	342	161	176	91	198
30	14	54	163	334	359	342	331	312	308	181	123	339	340	13	113	122	122	122	137	139	158	130	119	64	185
31	2	48	70	124	285	324	340	28	112	114	112	117	119	117	124	126	128	125	113	104	118	115	78	85	126

TOTAL HOURS 744 TOTAL GOOD HOURS 744 DATA CAPTURE 100.0%

MAX. 1HR AVG 359 07/30/89 04:00:00 2ND MAX. 1 HR AVG 353 07/12/89 05:00:00

MIN. 1HR AVG 1 07/28/89 07:00:00 ARITHMETIC MEAN 161 STANDARD DEV. 85

KEY FOR MISSING CODES
Bad< - To few samples for valid average, Cal - calibration, OCal - Analyzer out of calibration
BadS - Bad Analyzer Status, PwrF - Power Failure, Down - Operator downed channel, Miss - Missing Data
Qad - Data questionable insufficient documentation, Qai - Data questionable external influence, Purg - Analyzer in Purge

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Ft. Lauderdale, FL - Site 002

HOURLY AVERAGES FOR WS in MPH

JULY 1989

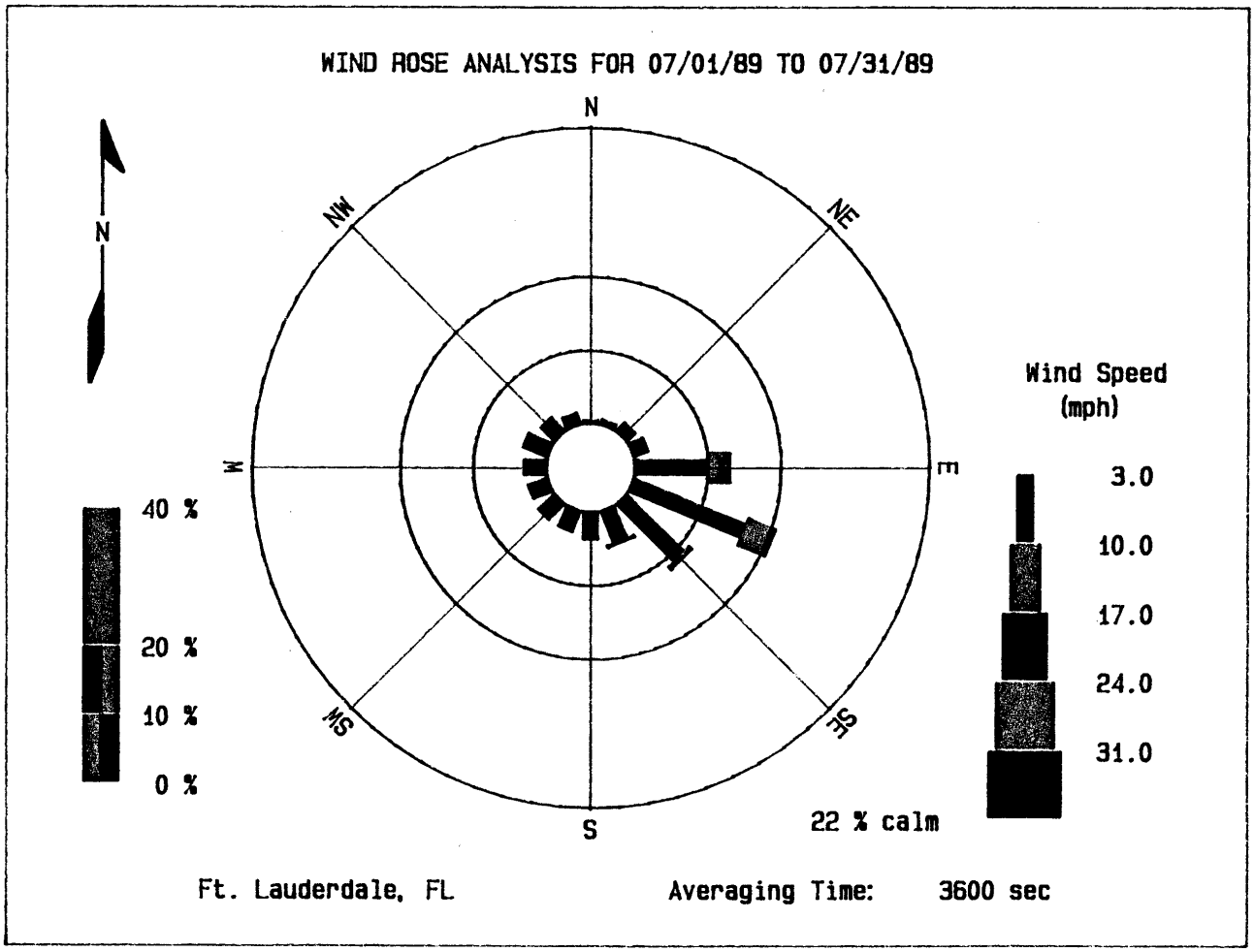
DAY	HOUR (EST) 00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVG
1	3	4	5	4	5	6	5	4	4	6	5	3	1	2	8	5	3	3	5	5	3	4	3	3	4
2	4	7	7	4	3	3	3	5	2	4	3	3	3	3	9	7	5	4	4	4	4	3	2	4	4
3	4	8	2	3	3	2	3	4	5	5	4	5	10	10	10	9	6	4	5	5	4	2	4	4	5
4	3	3	4	3	3	3	5	5	5	5	6	3	3	10	9	6	4	5	2	3	4	3	3	3	4
5	6	1	6	7	5	3	5	3	4	5	5	3	6	5	7	7	7	6	5	5	5	5	4	6	5
6	4	4	2	6	5	2	1	4	5	8	8	9	10	11	12	11	10	11	10	10	9	7	8	7	7
7	8	7	8	9	10	9	8	11	11	9	11	13	14	11	10	10	10	10	8	8	7	8	9	8	9
8	8	6	5	5	3	5	6	10	10	9	10	9	9	9	9	10	10	9	9	8	7	7	5	5	8
9	4	3	3	4	4	6	5	8	10	10	9	8	8	8	8	10	9	9	10	9	9	8	7	6	7
10	6	6	4	3	3	3	2	5	7	7	8	9	9	9	10	10	11	10	8	7	5	5	5	5	6
11	6	8	5	4	2	3	2	1	3	4	4	5	8	8	8	9	10	9	6	4	4	5	4	3	5
12	2	3	3	2	2	2	2	2	3	5	6	6	8	8	8	7	6	6	5	3	3	4	4	5	4
13	2	2	2	2	7	2	3	3	4	4	4	4	5	10	10	12	3	2	3	3	6	5	4	9	4
14	4	6	3	5	5	4	3	4	4	4	4	5	5	10	5	4	3	2	3	2	1	2	2	3	4
15	2	2	7	4	5	7	3	6	4	4	4	7	8	8	8	9	8	7	1	2	2	5	1	2	5
16	2	2	2	1	6	10	4	4	5	6	6	3	5	4	8	9	6	4	3	5	5	3	4	5	5
17	3	3	3	3	2	2	2	3	3	4	4	5	8	5	1	2	4	7	5	4	4	4	4	5	4
18	2	1	5	10	4	5	3	2	3	2	4	4	3	3	10	9	8	7	1	8	3	4	3	3	4
19	4	3	3	2	5	6	3	5	8	7	7	8	8	10	11	10	9	2	7	1	2	3	4	3	5
20	3	6	2	3	4	5	5	1	4	8	9	8	8	10	9	8	3	4	3	3	3	2	2	3	5
21	1	3	0	3	2	2	1	2	8	9	9	9	10	10	10	10	10	8	9	6	6	5	6	6	6
22	5	6	5	2	3	1	3	15	6	9	6	5	4	6	7	8	10	8	7	4	3	4	4	3	6
23	3	5	8	7	6	5	5	9	11	12	12	12	11	9	13	13	12	11	10	6	8	9	11	6	9
24	6	6	8	10	11	12	9	12	13	12	12	10	11	6	7	10	8	9	9	7	8	6	6	6	9
25	4	5	5	4	5	4	4	8	10	11	12	9	11	12	11	10	9	9	8	5	4	3	2	3	7
26	11	6	4	5	3	3	3	3	6	8	8	8	9	9	8	8	7	7	5	4	3	6	4	3	6
27	4	4	4	3	2	2	2	3	2	3	5	6	7	8	9	9	8	6	4	4	4	3	1	1	4
28	3	3	3	2	2	2	2	2	2	2	2	4	7	10	10	9	7	7	6	5	5	3	4	3	4
29	4	2	2	3	3	2	3	3	2	1	3	5	6	7	9	5	3	5	3	3	2	4	4	2	4
30	2	4	5	7	4	6	6	5	2	2	6	4	3	3	5	7	7	6	5	3	4	2	3	2	4
31	2	5	9	7	9	2	2	2	5	7	7	8	10	11	10	9	9	6	5	6	4	4	3	3	6

TOTAL HOURS 744 TOTAL GOOD HOURS 744 DATA CAPTURE 100.0%

MAX. 1HR AVG 15 07/22/89 07:00:00 2ND MAX. 1 HR AVG 14 07/07/89 12:00:00

MIN. 1HR AVG 0 07/21/89 02:00:00 ARITHMETIC MEAN 6 STANDARD DEV. 3

KEY FOR MISSING CODES
Bad< - To few samples for valid average, Cal - calibration, OCal - Analyzer out of calibration
BadS - Bad Analyzer Status, PwrF - Power Failure, Down - Operator downed channel, Miss - Missing Data
Qad - Data questionable insufficient documentation, Qai - Data questionable external influence, Purg - Analyzer in Purge


WIND ROSE ANALYSIS FOR 07/01/89 TO 07/31/89
N
NW
NE
W
E
SW
SE
S
N
40 %
20 %
10 %
0 %
Wind Speed
(mph)
3.0
10.0
17.0
24.0
31.0
22 % calm
Ft. Lauderdale, FL
Averaging Time: 3600 sec

WIND ROSE ANALYSIS FOR 07/01/89 TO 07/31/89

Wind Speed (mph)	DIRECTION																All
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Dir
> 31.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	C
31.0-24.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	C
24.0-17.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	C
17.0-10.0	0.1	0.0	0.0	0.0	3.1	4.0	0.7	0.3	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.1	9
10.0- 3.0	0.4	0.7	1.5	2.2	9.8	16.	11.	4.6	3.8	3.0	3.0	2.7	3.0	3.5	2.6	1.6	69
3.0 <																	22
All Speed	0.5	0.7	1.5	2.2	13.	20.	12.	4.8	3.9	3.0	3.0	2.7	3.0	3.6	2.6	1.7	100

EV-23-

Ft. Lauderdale, FL Averaging Time: 3600 sec

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Ft. Lauderdale, FL - Site 002

HOURLY AVERAGES FOR TEMP in DGC

JULY 1989

DAY	HOUR (EST) 00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVG
1	21	21	21	21	21	21	21	23	24	26	27	28	29	30	28	23	23	24	24	23	23	23	23	23	24
2	23	23	23	23	22	22	22	22	23	25	27	28	29	30	29	27	27	27	26	26	24	24	24	23	25
3	23	23	23	23	23	22	23	24	25	27	28	27	28	28	28	27	26	26	26	25	24	24	24	24	25
4	24	24	23	23	22	22	22	23	26	27	28	30	30	29	28	25	23	23	23	24	23	23	23	23	25
5	23	23	23	23	23	23	23	23	23	24	25	25	26	28	28	28	27	27	27	26	26	25	24	23	25
6	23	23	23	23	23	22	23	26	27	29	27	29	29	30	30	29	29	29	28	27	27	26	26	26	26
7	26	26	26	26	26	26	26	27	28	28	29	29	29	29	29	29	29	28	28	27	27	27	27	26	27
8	26	26	26	26	25	26	26	27	28	29	29	30	30	31	30	30	29	29	28	27	27	27	26	26	28
9	26	26	26	25	25	25	25	27	28	29	30	31	31	31	31	31	30	30	29	28	27	27	27	27	28
10	27	26	26	26	26	26	26	28	29	30	30	31	31	31	31	31	30	30	29	28	28	27	27	27	28
11	26	26	25	25	25	25	25	27	29	30	31	32	32	32	32	32	31	30	29	28	27	27	27	26	28
12	26	25	25	24	24	24	25	27	29	30	31	31	32	32	31	30	29	29	28	27	25	26	25	25	27
13	24	24	24	24	23	23	24	27	29	30	31	32	33	32	32	29	26	24	24	24	24	25	25	24	26
14	24	24	24	24	24	24	25	27	28	30	31	32	32	31	27	26	25	25	25	26	26	25	26	25	26
15	25	25	25	24	24	24	25	27	29	30	31	32	32	32	32	32	31	30	29	28	28	27	27	27	28
16	26	26	26	26	26	26	26	28	29	30	30	29	28	31	32	32	31	30	29	28	27	26	26	26	28
17	25	25	25	25	25	25	25	25	26	28	30	31	29	23	24	27	30	29	28	27	27	26	26	26	27
18	25	25	25	25	24	24	25	27	28	29	29	27	28	27	30	30	30	30	28	24	24	24	23	23	26
19	23	23	24	23	23	23	25	28	30	30	31	32	32	32	32	32	32	29	24	24	24	24	25	25	27
20	25	25	25	25	25	25	26	27	28	30	31	31	32	32	32	33	30	28	27	26	26	26	26	26	28
21	25	25	24	24	24	24	25	27	29	30	31	31	31	31	31	31	30	30	28	27	27	26	27	27	28
22	27	27	25	24	24	24	25	23	23	23	23	26	27	28	28	28	28	28	28	27	27	26	26	26	26
23	27	27	27	27	27	26	27	28	29	29	30	30	30	30	31	31	30	29	29	28	28	28	28	27	28
24	27	27	27	27	27	26	27	28	28	28	28	26	26	25	28	29	29	29	28	28	28	28	27	27	27
25	26	26	27	26	26	26	27	28	29	30	30	29	30	31	31	30	30	30	29	28	28	27	27	27	28
26	26	26	25	25	25	25	26	28	29	30	30	31	31	31	31	31	30	29	28	28	27	27	26	26	28
27	26	26	25	25	25	25	25	26	26	28	29	31	31	31	31	31	30	29	28	28	27	27	27	26	28
28	26	26	25	25	25	25	25	27	28	30	31	32	31	31	32	31	30	29	29	28	28	27	26	26	28
29	26	26	25	25	25	25	25	27	28	30	31	31	32	33	31	29	29	27	27	27	27	26	24	24	28
30	24	25	25	25	25	25	25	26	28	30	29	26	26	27	29	29	29	29	28	27	27	27	27	26	27
31	26	26	25	25	25	25	26	27	29	30	31	31	32	31	31	31	31	30	29	29	28	28	28	28	28

TOTAL HOURS 744 TOTAL GOOD HOURS 744 DATA CAPTURE 100.0%

MAX. 1HR AVG 33 07/13/89 12:00:00 2ND MAX. 1 HR AVG 33 07/29/89 13:00:00

MIN. 1HR AVG 21 07/01/89 04:00:00 ARITHMETIC MEAN 27 STANDARD DEV. 3

KEY FOR MISSING CODES
Bad< - To few samples for valid average, Cal - calibration, OCal - Analyzer out of calibration
BadS - Bad Analyzer Status, PwrF - Power Failure, Down - Operator downed channel, Miss - Missing Data
Qad - Data questionable insufficient documentation, Qai - Data questionable external influence, Purg - Analyzer in Purge

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HOURLY AVERAGES FOR SO2 in PPB

JULY 1989

DAY	HOUR (EST) 00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVG
1	0	0	Cal	Cal	8	4	3	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
2	0	0	Cal	Cal	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	Cal	Cal	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	Cal	Cal	4	2	2	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	Cal	Cal	4	2	1	0	0	0	0	0	0	0	0	3	11	3	1	0	0	1	0	0	1
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	15	7	20	16	4	2	1	0	0	3
9	0	0	Cal	Cal	9	5	3	1	0	0	0	0	1	17	14	1	0	0	0	0	0	0	0	0	2
10	0	0	0	0	0	0	1	1	6	11	10	2	1	4	21	12	4	2	6	2	1	0	0	0	3
11	0	0	Cal	Cal	8	6	5	3	2	1	2	6	11	25	30	24	25	21	15	8	5	3	2	1	9
12	0	0	0	0	0	0	1	1	1	0	0	2	3	2	1	1	0	0	0	0	0	0	0	0	0
13	0	0	Cal	Cal	7	5	6	4	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	Cal	Cal	7	5	4	2	2	1	0	0	0	0	0	.0	0	0	0	0	0	0	0	0	1
16	0	0	Cal	Cal	6	5	4	3	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
17	0	0	Cal	Cal	7	5	4	3	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	0	0	Cal	Cal	1	3	7	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
20	1	2	1	0	1	2	5	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
21	0	0	Cal	Cal	0	2	4	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0
23	0	0	Cal	0	0	0	0	0	0	0	1	0	5	7	14	11	16	9	1	0	0	0	0	1	3
24	0	0	0	0	0	1	4	9	4	2	10	0	0	1	3	10	1	0	0	0	0	0	0	0	2
25	0	0	Cal	0	0	2	3	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	0	0	0	0	0	1	2	2	3	6	10	15	18	24	17	14	0	0	0	0	0	0	0	0	5
27	0	0	Cal	0	0	1	2	3	8	17	38	6	2	1	0	0	0	0	0	0	0	0	0	1	3
28	0	0	0	0	0	1	2	2	2	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
29	0	0	Cal	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0
30	0	0	Cal	Cal	0	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31	0	0	Cal	0	1	2	4	4	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1

TOTAL HOURS 744 TOTAL GOOD HOURS 711 DATA CAPTURE 95.6%

MAX. 1HR AVG 38 07/27/89 10:00:00 2ND MAX. 1 HR AVG 30 07/11/89 14:00:00

MIN. 1HR AVG 0 07/01/89 00:00:00 ARITHMETIC MEAN 1 STANDARD DEV. 4

NAAQS Comparison: MAX. 3 HR AVG 27 (500) 07/11/89 15:00:00
MAX. 24 HR AVG 9 (140) 07/12/89 00:00:00

KEY FOR MISSING CODES
Bad< - To few samples for valid average, Cal - calibration, OCal - Analyzer out of calibration
BadS - Bad Analyzer Status, PwrF - Power Failure, Down - Operator downed channel, Miss - Missing Data
Qad - Data questionable insufficient documentation, Qai - Data questionable external influence, Purg - Analyzer in Purge

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HOURLY AVERAGES FOR SigÕ1 in deg

JULY 1989

DAY	HOUR (EST) 00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVG
1	17.6	12.6	11.2	12.2	9.2	7.5	10.4	12.6	15.4	15.3	21.4	43.9	61.5	43.0	19.2	23.0	18.8	21.9	13.2	13.2	14.7	13.7	13.0	15.5	19.2
2	14.9	23.6	19.7	18.8	22.1	19.7	26.7	58.9	45.4	23.1	45.1	44.1	51.5	49.3	21.9	14.4	17.4	19.7	19.0	16.6	16.4	18.8	19.0	23.0	27.0
3	24.0	20.3	12.6	25.7	18.1	21.2	21.6	20.3	20.3	20.9	29.2	15.0	12.7	15.7	16.8	13.1	18.5	21.2	12.4	12.5	11.4	22.0	16.9	12.4	18.1
4	17.1	19.3	15.5	13.9	19.3	19.1	9.2	16.1	21.5	23.6	16.6	48.5	39.3	12.7	13.7	26.4	50.3	16.3	35.8	40.1	23.4	30.7	10.8	18.8	23.3
5	7.8	39.5	39.4	17.2	18.8	10.6	36.6	9.5	11.2	33.9	23.0	29.6	22.1	14.8	13.1	14.1	14.7	12.6	11.4	9.3	11.7	17.2	10.8	30.7	19.2
6	38.5	12.0	28.6	15.4	22.1	37.9	33.5	16.5	19.1	17.6	14.2	17.1	15.9	13.3	13.1	13.9	13.0	11.7	12.2	10.6	10.6	10.1	9.2	10.9	17.4
7	11.6	10.6	10.8	10.8	11.5	12.4	12.6	13.2	15.4	16.0	14.6	13.1	14.3	15.8	17.2	16.4	14.4	15.8	13.8	12.1	11.9	10.5	10.8	11.2	13.2
8	12.6	12.1	11.4	10.5	12.8	12.0	11.6	12.6	14.4	14.9	14.9	16.5	15.9	17.9	15.9	15.0	13.8	14.2	13.1	11.2	11.7	11.1	11.2	9.5	13.2
9	10.9	14.7	16.4	13.8	29.5	56.4	28.1	13.6	12.4	15.0	17.6	21.3	19.2	19.0	18.2	15.0	15.3	13.1	11.4	11.9	11.7	10.4	11.2	10.6	17.4
10	11.5	11.7	12.2	9.4	10.6	26.5	24.7	16.5	16.0	17.0	18.8	18.3	16.9	19.4	16.0	16.3	15.3	14.1	12.7	11.1	11.0	11.2	11.4	10.3	15.0
11	14.4	26.0	32.3	29.3	18.3	13.7	20.5	33.6	31.2	22.1	36.3	28.7	18.8	17.2	16.9	16.5	15.8	14.1	15.3	19.3	11.4	12.4	12.0	14.6	20.5
12	16.3	12.7	9.5	19.1	23.2	22.4	22.4	35.3	36.4	23.2	23.5	23.7	18.2	18.1	19.3	19.1	15.7	14.8	12.1	27.9	28.1	14.7	9.2	10.4	19.8
13	20.1	23.7	28.6	45.1	20.1	25.9	40.8	47.6	19.8	36.1	34.7	45.6	31.1	15.9	14.8	12.6	50.5	27.8	33.7	19.9	19.3	26.4	26.0	23.6	28.7
14	12.8	11.2	14.4	18.6	21.9	11.9	19.0	16.6	21.6	27.6	26.9	31.2	38.0	14.7	22.4	24.1	31.2	70.4	39.5	31.5	56.4	13.3	11.9	8.6	24.8
15	8.4	12.4	25.2	21.5	19.4	24.3	49.2	22.9	22.9	20.1	27.8	22.7	18.0	16.1	14.2	14.6	14.2	13.5	55.1	21.6	16.9	26.8	26.7	11.4	21.9
16	17.7	16.5	38.0	47.9	30.4	20.7	25.1	15.2	21.6	18.6	28.6	56.2	22.6	27.6	18.0	15.0	24.0	34.4	31.2	20.1	13.2	23.4	30.1	8.8	25.2
17	29.8	25.9	38.2	72.9	56.5	21.4	26.2	22.0	26.5	18.0	27.8	28.0	26.9	25.9	53.9	35.7	32.0	14.4	13.1	8.9	10.9	13.7	15.4	34.5	28.3
18	44.3	49.4	40.8	11.7	24.8	13.0	21.8	19.0	20.3	39.3	30.8	24.8	63.2	46.8	15.2	15.2	15.0	14.2	27.6	29.8	17.2	27.9	20.8	21.2	27.1
19	17.6	32.2	30.9	41.5	26.7	36.4	47.3	12.4	14.9	14.8	12.6	15.2	17.5	16.1	15.2	15.2	13.9	37.3	16.6	41.5	29.2	12.1	22.3	12.8	23.0
20	11.7	21.2	9.4	12.8	45.1	17.9	27.3	51.6	22.6	17.2	16.4	20.7	24.5	14.7	17.2	15.7	22.5	28.6	47.9	14.6	14.6	43.0	21.4	33.0	23.8
21	66.8	48.8	37.9	35.3	43.0	23.7	41.8	32.2	14.2	14.9	14.8	15.2	16.1	15.9	15.8	16.0	13.2	14.4	12.0	13.8	13.9	13.2	13.2	12.8	23.3
22	13.1	13.0	24.1	37.3	31.3	35.7	16.9	15.3	15.5	13.6	14.4	15.4	17.5	14.7	15.2	14.1	12.8	16.0	11.7	11.6	16.1	42.4	31.4	15.0	19.3
23	14.1	11.9	10.5	10.3	9.3	13.8	12.0	12.4	12.5	12.0	12.5	15.9	14.1	15.7	12.2	12.0	13.6	13.2	11.1	12.7	12.2	11.2	11.9	16.5	12.6
24	13.6	15.3	14.2	12.1	11.9	10.9	11.5	10.9	12.5	12.7	13.2	13.0	15.9	24.0	15.7	13.5	14.4	12.2	11.5	12.5	12.6	12.0	11.9	11.7	13.3
25	15.7	14.1	16.0	21.0	12.0	17.1	25.6	13.7	14.2	12.6	14.3	33.6	14.7	14.2	14.7	14.1	14.3	12.5	12.7	13.8	14.7	13.5	21.6	21.4	16.3
26	14.4	16.3	12.2	23.4	35.3	35.6	25.3	28.1	16.8	16.4	16.8	19.1	17.1	15.2	18.0	17.2	16.3	13.1	12.6	11.6	11.4	11.0	23.2	18.2	18.5
27	16.5	37.8	17.1	13.1	31.9	37.1	34.1	32.9	25.1	33.5	17.0	24.5	19.4	17.6	15.8	16.1	14.7	13.7	12.7	9.2	7.6	8.6	35.5	72.1	23.5
28	10.8	14.9	13.5	23.7	18.6	14.8	23.0	34.4	41.0	45.2	51.8	48.9	16.4	14.8	14.6	15.2	14.2	13.0	13.0	11.0	11.5	16.4	9.9	12.5	21.0
29	16.9	20.4	31.4	27.8	28.0	23.1	16.6	26.9	40.5	41.2	30.4	26.8	22.6	18.5	15.3	27.0	17.4	17.2	16.6	34.4	19.7	30.8	23.1	51.0	26.0
30	42.1	43.9	43.2	16.1	25.2	19.4	24.6	26.7	73.9	52.7	19.4	24.2	21.0	22.3	16.5	15.0	13.3	13.2	13.5	11.1	15.5	9.9	8.7	35.8	25.3
31	48.1	30.0	26.0	38.5	19.0	14.2	21.8	27.1	19.6	16.3	20.5	17.7	15.9	15.5	14.8	15.8	16.1	15.7	11.9	12.5	13.5	13.0	46.0	13.3	20.9

TOTAL HOURS 744 TOTAL GOOD HOURS 744 DATA CAPTURE 100.0%

MAX. 1HR AVG 73.9 07/30/89 08:00:00 2ND MAX. 1 HR AVG 72.9 07/17/89 03:00:00

MIN. 1HR AVG 7.5 07/01/89 05:00:00 ARITHMETIC MEAN 20.8 STANDARD DEV. 11.2

KEY FOR MISSING CODES
Bad< - To few samples for valid average, Cal - calibration, OCal - Analyzer out of calibration
BadS - Bad Analyzer Status, PwrF - Power Failure, Down - Operator downed channel, Miss - Missing Data
Qad - Data questionable insufficient documentation, Qai - Data questionable external influence, Purg - Analyzer in Purge

FPL-Davie
Ft. Lauderdale, FL - Site 002

HOURLY AVERAGES FOR RNFL in INCH

AUGUST 1989

DAY	HOUR (EST) 00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVG
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.08	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.01
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.18	0.07	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.21	0.08	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.01	0.00	0.07	0.00	0.01
13	0.01	0.00	0.00	0.13	0.00	0.00	0.01	0.00	0.04	0.02	0.49	0.07	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.01	0.01	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0,00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.21	0.08	0.00	0.01
18	0.00	0.00	0.00	0.00	0.00	0.00	0.26	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.03	0.01	0.07	0.04	0.01	0.00	0.00	0.22	0.20	0.47	0.37	0.17	0.07
20	0.04	0.03	0.04	0.05	0.18	0.00	0.00	0.02	0.10	0.00	0.00	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.16	0.00	0.00	0.00	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

TOTAL HOURS 744 TOTAL GOOD HOURS 744 DATA CAPTURE 100.0%

MAX. 1HR AVG 0.49 08/13/89 10:00:00 2ND MAX. 1 HR AVG 0.47 08/19/89 21:00:00

MIN. 1HR AVG 0.00 08/01/89 00:00:00 ARITHMETIC MEAN 0.01 STANDARD DEV. 0.04

KEY FOR MISSING CODES
Bad< - To few samples for valid average, Cal - calibration, OCal - Analyzer out of calibration
BadS - Bad Analyzer Status, PwrF - Power Failure, Down - Operator downed channel, Miss - Missing Data
Qad - Data questionable insufficient documentation, Qai - Data questionable external influence, Purg - Analyzer in Purge

FPL DAVIE PRECIPITATION		
DATE	**TIME**	**AMOUNT**
8-3-89	1500	0.02
	1600	0.08
	1700	0.14
8-9-89	1000	0.05
	1100	0.18
	1200	0.07
	1300	0.07
8-10-89	1200	0.21
	1300	0.08
	1400	0.04
8-11-89	1100	0.22
8-12-89	1900	0.12
	2000	0.01
	2200	0.07
8-13-89	0000	0.01
	0300	0.13
	0600	0.01
	0800	0.04
	0900	0.02
	1000	0.49
	1100	0.07
	1200	0.05
8-14-89	1700	0.02
	1800	0.01
	1900	0.01
8-15-89	1500	0.01
	1600	0.01

FPL DAVIE PRECIPITATION		
DATE	TIME	AMOUNT
8-17-89	2100	0.21
	2200	0.08
8-18-89	0600	0.26
	0700	0.01
8-19-89	0800	0.01
	1100	0.01
	1200	0.03
	1300	0.01
	1400	0.07
	1500	0.04
	1600	0.01
	1900	0.22
	2000	0.20
	2100	0.47
	2200	0.37
	2300	0.17
8-20-89	0000	0.04
	0100	0.03
	0200	0.04
	0300	0.05
	0400	0.18
	0700	0.02
	0800	0.10
	1100	0.15
8-21-89	2000	0.03
8-22-89	0500	0.16
	0900	0.15

FPL DAVIE PRECIPITATION

DATE	TIME	AMOUNT
8-23-89	1800	0.01
8-30-89	0800	0.15
	0900	0.22
8-31-89	1300	0.02
	TOTAL	5.76

FPL-Davie
Ft. Lauderdale, FL - Site 002

HOURLY AVERAGES FOR WD in DGS

AUGUST 1989

DAY	HOUR (EST) 00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVG
1	84	108	101	98	46	142	154	99	56	116	102	105	137	120	117	111	111	112	121	117	117	96	116	114	108
2	56	35	111	126	127	131	239	138	137	129	126	130	128	125	125	130	127	135	150	154	156	159	260	228	140
3	184	235	316	237	238	40	116	208	258	283	330	277	320	103	122	127	213	239	208	221	234	256	282	302	223
4	329	16	216	295	314	323	329	350	0	350	3	352	69	41	69	77	77	68	55	57	59	63	353	351	176
5	350	357	11	6	328	298	305	317	340	345	39	98	97	101	100	96	101	89	88	87	91	90	106	124	165
6	77	53	45	140	311	303	302	294	349	348	30	86	112	104	121	118	117	124	136	142	156	172	188	217	169
7	232	238	219	225	219	215	224	273	278	308	290	230	273	140	128	141	143	185	225	236	133	189	261	160	215
8	175	224	182	196	179	172	181	209	234	230	234	216	240	220	240	204	179	159	204	235	230	201	200	220	207
9	214	207	218	210	211	192	196	201	200	217	227	233	195	179	180	213	244	256	262	267	240	253	280	213	221
10	195	182	150	136	271	304	298	268	204	198	168	127	61	131	142	142	148	212	289	322	8	32	52	359	183
11	71	101	11	36	353	304	308	338	337	128	141	95	350	3	9	337	50	94	66	82	100	85	84	34	147
12	66	48	346	332	308	341	327	349	141	112	111	121	112	111	94	88	84	77	301	3	7	344	315	323	186
13	346	9	359	349	336	323	335	339	23	220	158	350	42	46	33	358	24	285	296	303	350	322	301	324	243
14	343	9	316	347	312	311	231	264	190	175	215	233	257	264	263	185	252	279	71	61	75	149	220	49	211
15	171	174	266	238	221	292	276	271	271	277	259	268	269	245	265	227	275	271	280	306	345	229	230	239	257
16	273	271	278	269	288	315	306	305	282	222	257	257	250	274	28	93	107	57	85	111	97	98	142	211	203
17	266	263	268	241	317	340	333	18	15	53	97	164	106	113	112	103	89	74	56	294	283	288	9	92	166
18	116	302	295	287	344	273	204	189	195	192	161	146	150	130	121	99	102	114	74	68	76	86	97	93	163
19	100	102	104	110	129	114	308	93	115	118	113	113	119	109	99	114	74	44	37	71	78	116	143	92	109
20	91	89	92	89	87	96	121	113	137	109	134	148	145	138	135	133	138	134	128	131	137	145	144	125	122
21	159	136	148	253	317	12	306	336	118	129	94	105	121	107	118	115	134	122	44	287	338	315	320	313	185
22	346	30	343	339	24	134	75	113	130	127	123	124	89	109	116	113	119	100	93	100	97	101	98	91	131
23	75	62	61	66	94	89	77	95	94	94	99	100	102	93	91	87	86	84	76	79	91	92	94	87	86
24	77	96	118	118	114	117	124	120	115	119	118	123	118	114	114	114	112	109	117	117	116	98	115	115	113
25	118	116	125	147	155	128	26	132	172	159	127	110	120	118	111	113	105	91	85	89	101	117	125	135	118
26	134	142	118	344	15	339	330	341	6	35	48	101	110	130	121	114	116	116	109	115	111	124	145	140	142
27	237	293	334	349	241	319	327	276	144	141	135	108	117	115	111	120	121	115	106	121	127	125	109	157	181
28	132	281	329	261	303	352	313	11	128	113	107	105	104	97	101	93	92	91	92	89	86	96	85	54	146
29	61	38	50	358	2	351	357	11	67	80	96	107	98	94	99	81	73	69	68	69	72	78	80	87	106
30	111	113	69	118	35	291	352	337	1	340	35	174	124	159	121	156	244	223	235	210	212	253	7	332	177
31	356	312	14	58	132	334	333	117	164	162	142	105	143	259	118	120	127	114	118	116	123	126	127	94	159

TOTAL HOURS 744 TOTAL GOOD HOURS 744 DATA CAPTURE 100.0%

MAX. 1HR AVG 359 08/13/89 02:00:00 2ND MAX. 1 HR AVG 359 08/10/89 23:00:00

MIN. 1HR AVG 0 08/04/89 08:00:00 ARITHMETIC MEAN 166 STANDARD DEV. 95

KEY FOR MISSING CODES
Bad< - To few samples for valid average, Cal - calibration, OCal - Analyzer out of calibration
BadS - Bad Analyzer Status, PwrF - Power Failure, Down - Operator downed channel, Miss - Missing Data
Qad - Data questionable insufficient documentation, Qai - Data questionable external influence, Purg - Analyzer in Purge

FPL-Davie
Ft. Lauderdale, FL - Site 002

HOURLY AVERAGES FOR WS in MPH

AUGUST 1989

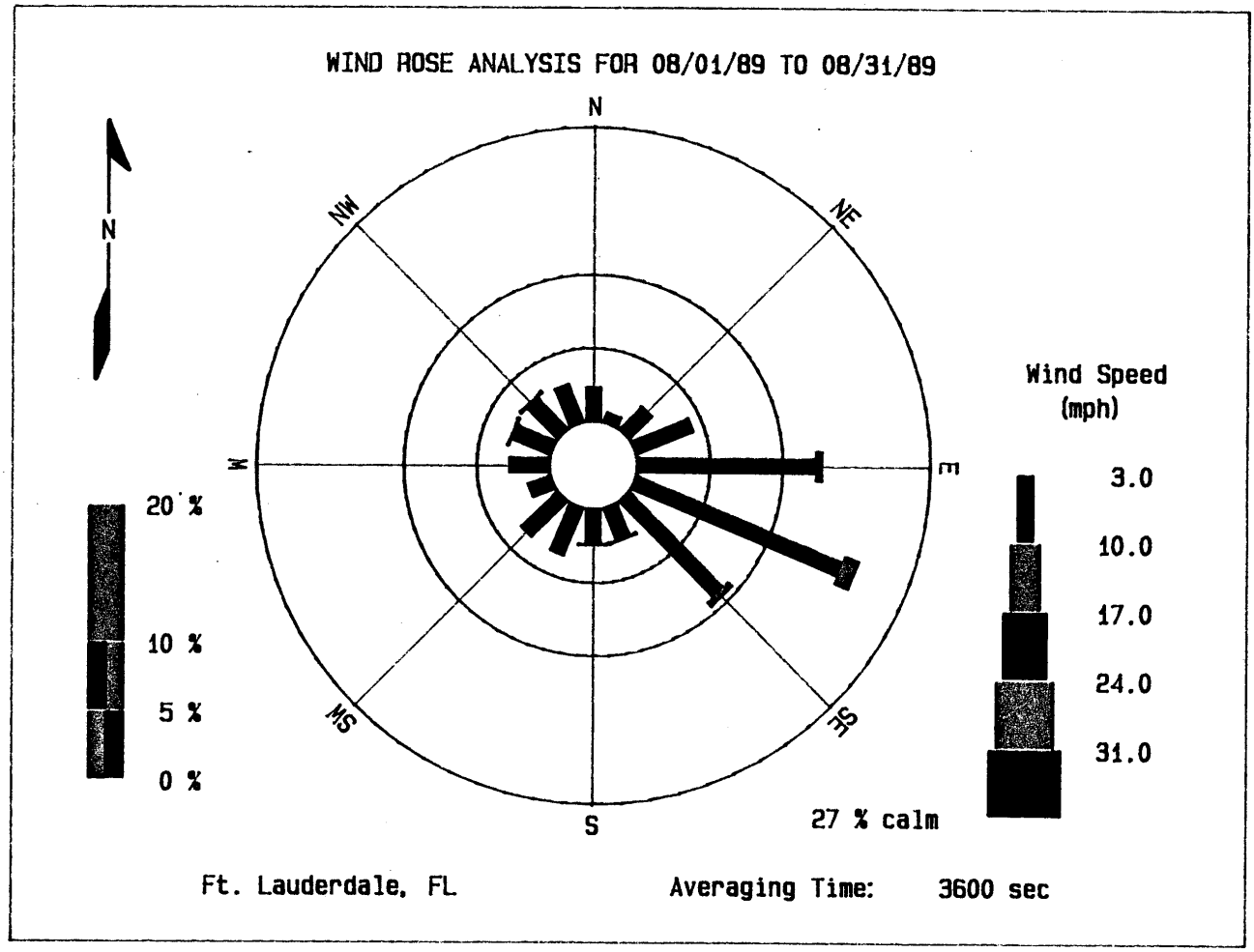
DAY	HOUR (EST) 00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVG
1	3	3	3	5	3	3	3	2	1	7	7	7	7	8	9	9	9	9	7	7	7	6	4	4	6
2	3	2	3	5	4	3	2	4	6	6	6	5	7	8	8	8	9	7	6	4	3	3	3	3	5
3	4	2	4	1	4	1	2	3	3	3	3	2	3	5	8	8	4	4	3	3	2	3	4	3	3
4	3	4	4	4	4	3	4	4	5	5	5	5	6	6	7	9	10	8	6	4	4	3	3	9	5
5	3	2	3	3	2	3	4	3	4	3	4	8	5	7	8	9	9	7	6	5	5	4	3	3	5
6	3	3	4	1	10	11	4	3	1	2	2	3	8	8	8	8	8	8	7	6	6	4	3	2	5
7	2	2	3	2	2	2	1	2	4	6	2	2	1	4	9	10	11	13	5	8	8	2	3	2	4
8	2	4	3	3	3	3	4	4	6	6	6	9	6	7	6	7	7	7	6	5	4	5	6	4	5
9	5	5	3	5	4	4	3	6	8	8	7	9	7	3	4	5	5	4	3	2	3	3	2	3	5
10	3	2	4	3	1	4	5	2	4	4	4	7	4	6	3	2	3	5	7	9	4	2	2	2	4
11	3	4	3	3	5	3	3	6	2	1	3	3	2	0	4	3	3	5	5	3	4	3	4	1	3
12	6	3	3	8	5	7	4	1	1	5	6	7	7	7	8	9	7	5	5	2	2	3	5	6	5
13	4	4	3	3	5	3	6	4	4	3	4	4	4	3	5	3	2	3	5	4	3	3	5	7	4
14	4	3	1	5	3	4	5	2	4	3	4	5	6	7	6	4	2	8	1	2	3	3	5	1	4
15	3	4	5	2	2	3	3	4	4	6	6	5	5	5	3	9	5	4	3	4	1	2	3	1	4
16	3	3	2	2	2	3	4	5	3	3	2	2	2	4	1	9	3	3	5	5	6	4	4	2	3
17	3	3	2	2	2	2	3	2	2	3	2	4	4	8	10	10	6	5	3	2	5	4	3	3	4
18	3	4	3	3	5	3	4	4	4	4	6	8	12	11	8	6	5	6	4	4	4	6	7	5	5
19	3	7	9	9	7	1	5	4	11	10	11	10	5	7	14	6	7	4	5	7	6	7	5	9	7
20	8	7	7	8	9	4	4	6	5	2	5	7	10	10	9	10	10	10	8	6	6	5	5	4	7
21	3	3	2	1	5	4	3	2	1	2	3	5	9	9	9	9	5	1	1	6	4	2	2	2	4
22	3	2	3	1	2	4	1	4	7	6	8	8	3	9	9	9	8	9	9	7	7	4	5	5	6
23	3	2	3	3	3	4	4	7	8	8	8	10	9	10	9	9	11	11	8	6	8	8	7	5	7
24	4	5	5	5	5	5	5	7	9	8	9	8	10	10	9	10	10	9	8	7	7	7	6	6	7
25	6	4	3	3	3	1	1	3	5	4	4	7	7	8	9	9	9	9	7	6	7	8	7	5	5
26	4	3	1	2	3	2	3	3	2	3	5	5	7	4	7	7	6	5	5	5	4	4	3	3	4
27	2	3	2	3	1	1	3	2	3	4	6	5	7	8	9	9	8	7	6	5	4	4	3	3	4
28	2	2	2	3	7	2	2	2	3	5	6	8	7	8	9	10	8	9	8	6	5	5	4	3	5
29	3	3	4	4	3	2	3	3	3	4	6	7	7	8	9	9	9	8	7	6	6	7	6	5	5
30	4	3	3	2	3	4	2	3	0	3	2	3	2	5	8	2	4	2	2	3	1	2	2	3	3
31	2	1	2	3	1	2	2	1	4	4	4	6	8	3	5	7	7	7	6	5	5	3	4	3	4

TOTAL HOURS 744 TOTAL GOOD HOURS 744 DATA CAPTURE 100.0%

MAX. 1HR AVG 14 08/19/89 14:00:00 2ND MAX. 1 HR AVG 13 08/07/89 17:00:00

MIN. 1HR AVG 0 08/11/89 13:00:00 ARITHMETIC MEAN 5 STANDARD DEV. 2

KEY FOR MISSING CODES
Bad< - To few samples for valid average, Cal - calibration, OCal - Analyzer out of calibration
BadS - Bad Analyzer Status, PwrF - Power Failure, Down - Operator downed channel, Miss - Missing Data
Qad - Data questionable insufficient documentation, Qai - Data questionable external influence, Purg - Analyzer in Purge


WIND ROSE ANALYSIS FOR 08/01/89 TO 08/31/89
N
NW
NE
W
E
SW
SE
S
N
20 %
10 %
5 %
0 %
Wind Speed
(mph)
3.0
10.0
17.0
24.0
31.0
27 % calm
Ft. Lauderdale, FL
Averaging Time: 3600 sec

WIND ROSE ANALYSIS FOR 08/01/89 TO 08/31/89

Wind Speed (mph)	DIRECTION																All
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Dir
> 31.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
31.0-24.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
24.0-17.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
17.0-10.0	0.0	0.0	0.0	0.0	0.4	1.1	0.4	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.0	2
10.0- 3.0	2.3	0.7	2.2	4.2	12.	15.	9.0	2.3	2.3	3.5	3.5	1.6	2.7	2.7	2.8	2.7	70
3.0 <																	28
All Speed	2.3	0.7	2.2	4.2	13.	16.	9.4	2.4	2.4	3.5	3.5	1.6	2.7	2.8	3.0	2.7	100

EV-23-

Ft. Lauderdale, FL Averaging Time: 3600 sec

FPL-Davie
Ft. Lauderdale, FL - Site 002

HOURLY AVERAGES FOR TEMP in DGC

AUGUST 1989

DAY	HOUR (EST) 00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVG
1	27	27	27	27	27	26	27	28	29	29	29	30	30	32	32	31	31	31	30	29	28	28	28	28	29
2	28	27	27	27	27	26	27	29	30	30	32	32	33	33	33	33	32	30	29	29	28	28	28	27	29
3	27	27	27	26	25	25	26	28	29	30	31	33	33	33	32	30	28	25	26	25	25	25	25	25	28
4	25	25	25	25	25	25	25	26	28	30	31	32	33	33	33	32	31	30	29	29	28	28	27	27	28
5	26	26	25	25	24	24	24	25	26	28	30	31	32	32	32	32	31	31	30	29	28	28	27	27	28
6	27	26	26	26	25	25	25	27	28	30	31	32	33	33	33	32	32	31	29	28	28	27	27	27	29
7	26	26	26	25	25	25	25	27	29	30	31	33	33	34	33	33	32	29	28	25	25	25	25	25	28
8	25	26	25	26	25	25	26	27	28	30	31	31	28	30	30	31	30	30	29	28	27	27	26	26	28
9	26	25	25	25	25	25	25	27	29	31	30	25	24	24	25	27	28	28	27	27	26	26	26	25	26
10	25	25	25	25	25	25	25	26	28	28	30	31	27	25	25	27	27	27	26	24	23	24	24	24	26
11	23	23	23	24	23	23	24	26	28	29	30	28	27	28	27	27	27	29	29	28	27	27	27	26	26
12	26	26	25	25	24	24	25	26	28	29	31	31	31	30	30	31	30	29	26	24	25	25	24	23	27
13	23	23	24	24	24	24	24	25	27	27	26	26	25	26	27	27	26	26	26	25	25	25	24	24	25
14	24	24	24	23	23	23	24	25	27	29	31	32	32	32	31	30	29	26	26	25	25	25	25	25	27
15	24	24	24	24	24	24	24	25	26	29	30	31	32	32	32	27	26	27	27	27	26	26	25	25	27
16	25	24	24	24	24	24	25	26	28	30	31	31	32	33	32	27	26	27	28	28	28	28	27	27	27
17	26	26	26	25	25	26	26	26	26	28	30	32	33	33	33	32	30	30	30	28	27	26	25	25	28
18	26	25	25	25	25	25	24	26	27	29	30	31	31	30	29	29	29	28	28	28	28	28	28	28	28
19	27	27	27	27	27	26	25	27	29	30	30	28	25	26	24	25	26	26	26	26	25	24	24	24	26
20	25	24	25	25	25	25	25	26	26	26	29	29	31	30	31	31	30	29	28	28	28	27	27	27	27
21	26	26	25	25	25	25	26	27	29	30	31	31	32	32	31	30	30	29	29	26	26	25	25	25	28
22	25	25	25	25	25	25	25	27	29	28	30	31	30	31	31	31	30	30	29	28	28	28	28	28	28
23	27	27	26	26	26	26	27	28	29	29	30	31	31	31	31	31	31	30	28	28	28	28	28	28	29
24	28	28	27	27	27	27	27	29	30	31	31	31	31	32	31	30	30	30	29	28	28	28	28	28	29
25	28	27	27	27	26	26	27	28	30	30	31	32	32	32	32	32	31	30	30	29	29	28	28	28	29
26	27	27	27	26	26	26	26	26	27	29	31	31	31	31	31	31	31	30	29	28	28	28	27	27	28
27	27	26	26	26	25	25	26	27	29	30	31	32	32	32	32	31	31	30	29	29	28	28	28	27	29
28	27	27	27	26	26	26	27	28	29	31	32	32	32	33	32	32	31	31	30	29	29	29	28	28	29
29	28	27	27	27	27	26	26	28	29	31	31	32	33	33	33	32	32	31	30	29	29	29	28	28	29
30	27	27	27	27	26	26	27	28	28	26	29	28	30	30	31	30	27	27	27	27	27	27	27	26	28
31	26	26	26	26	25	26	26	28	29	29	31	32	30	27	29	30	30	29	29	28	28	28	28	28	28

TOTAL HOURS 744 TOTAL GOOD HOURS 744 DATA CAPTURE 100.0%

MAX. 1HR AVG 34 08/07/89 13:00:00 2ND MAX. 1 HR AVG 33 08/07/89 12:00:00

MIN. 1HR AVG 23 08/14/89 04:00:00 ARITHMETIC MEAN 28 STANDARD DEV. 3

KEY FOR MISSING CODES
Bad< - To few samples for valid average, Cal - calibration, OCal - Analyzer out of calibration
BadS - Bad Analyzer Status, PwrF - Power Failure, Down - Operator downed channel, Miss - Missing Data
Qad - Data questionable insufficient documentation, Qai - Data questionable external influence, Purg - Analyzer in Purge

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HOURLY AVERAGES FOR SO2 in PPB

AUGUST 1989

DAY	HOUR (EST) 00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVG
1	0	0	0	0	0	0	3	4	3	1	3	3	1	0	0	0	0	1	0	0	0	0	0	0	1
2	0	1	Cal	0	0	0	3	1	0	0	0	0	0	0	1	6	2	0	0	0	0	0	0	0	1
3	0	0	0	0	0	1	2	3	4	1	1	0	1	4	2	3	1	0	0	0	1	2	0	0	1
4	0	0	Cal	0	0	0	2	2	2	2	2	2	2	2	1	1	0	0	0	0	0	0	0	0	1
5	0	0	0	0	0	0	1	0	1	0	0	0	1	7	11	7	23	0	0	0	0	1	1	0	2
6	0	1	Cal	0	0	0	1	0	1	7	1	0	1	4	27	14	22	13	0	0	0	0	0	0	4
7	0	0	0	0	0	0	2	1	1	1	0	0	0	3	6	3	0	0	0	0	2	0	0	0	1
8	0	0	Cal	0	0	1	2	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
9	2	2	4	3	1	4	5	5	2	1	1	0	0	2	1	0	0	0	0	0	0	0	0	0	1
10	0	0	Cal	0	1	3	3	2	2	2	2	2	1	0	0	1	1	0	1	0	0	0	0	0	1
11	0	0	0	0	1	2	8	5	2	1	1	1	1	2	2	3	2	1	0	0	1	2	2	1	1
12	1	0	Cal	0	0	1	2	2	1	1	0	0	0	5	12	1	0	0	0	0	0	0	0	0	1
13	0	0	Cal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	Cal	0	0	1	2	2	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	1	1	2	4	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16	0	0	Cal	0	0	1	3	3	2	1	1	1	0	0	1	1	1	2	1	1	1	0	0	0	1
17	0	0	0	0	0	2	3	4	5	4	2	1	21	75	56	24	4	1	0	0	0	0	0	0	8
18	0	0	Cal	0	0	1	0	1	0	0	0	0	0	0	0	1	20	1	5	0	0	0	2	3	1
19	2	0	0	0	0	0	0	0	0	0	0	4	1	2	13	0	0	0	0	0	2	0	0	7	1
20	3	4	Cal	6	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
21	0	0	0	0	1	2	4	4	1	1	1	19	8	4	1	0	0	0	0	0	0	0	0	0	2
22	0	0	Cal	0	0	0	1	1	1	0	0	0	0	0	0	0	0	2	2	3	1	1	0	0	0
23	0	0	0	0	0	0	1	1	1	1	0	0	0	1	1	1	0	0	0	0	1	0	0	0	0
24	0	0	Cal	0	0	0	0	0	0	0	0	0	0	0	0	1	3	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
26	0	0	Cal	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
27	0	0	Cal	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	0	0	Cal	0	0	0	1	1	1	1	0	0	0	1	1	2	2	2	0	0	0	0	0	0	0
29	0	0	0	0	0	0	1	1	1	2	2	2	0	1	0	0	0	0	0	0	0	0	0	0	0
30	0	0	Cal	0	0	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31	0	0	0	0	0	1	1	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

TOTAL HOURS 744 TOTAL GOOD HOURS 727 DATA CAPTURE 97.7%

MAX. 1HR AVG 75 08/17/89 13:00:00 2ND MAX. 1 HR AVG 56 08/17/89 14:00:00

MIN. 1HR AVG 0 08/01/89 01:00:00 ARITHMETIC MEAN 1 STANDARD DEV. 4

NAAQS Comparison: MAX. 3 HR AVG 52 (500) 08/17/89 15:00:00
MAX. 24 HR AVG 9 (140) 08/18/89 02:00:00

KEY FOR MISSING CODES
Bad< - To few samples for valid average, Cal - calibration, OCal - Analyzer out of calibration
BadS - Bad Analyzer Status, PwrF - Power Failure, Down - Operator downed channel, Miss - Missing Data
Qad - Data questionable insufficient documentation, Qai - Data questionable external influence, Purg - Analyzer in Purge

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HOURLY AVERAGES FOR Sigθ1 in deg

AUGUST 1989

DAY	HOUR (EST) 00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVG
1	13.1	12.4	14.7	30.6	29.8	8.1	29.8	63.7	39.7	18.6	14.7	18.2	15.5	16.9	18.0	15.4	13.5	14.2	11.9	12.6	11.2	12.7	15.5	15.2	19.4
2	27.3	39.6	13.8	12.2	11.5	20.2	55.8	15.5	14.6	19.4	17.7	26.3	23.5	18.0	16.9	16.1	13.6	13.3	12.8	12.6	18.5	20.9	17.2	35.2	20.5
3	11.9	23.8	9.0	35.1	42.3	28.6	48.8	22.5	29.2	31.7	51.7	64.8	41.3	41.0	13.5	13.3	20.4	16.8	21.8	23.1	19.1	20.1	27.8	17.0	28.1
4	17.6	33.1	21.2	14.7	9.2	12.0	11.5	18.7	19.1	22.3	25.8	30.4	30.2	26.7	24.5	17.1	15.2	18.7	20.5	21.3	22.7	19.9	48.9	18.3	21.6
5	13.0	12.4	13.6	15.5	13.7	15.3	7.5	13.7	16.9	31.4	30.6	18.0	26.9	23.0	20.2	18.6	14.3	17.1	13.0	13.0	10.5	10.5	18.5	10.0	16.5
6	20.8	21.0	41.3	38.2	16.0	14.3	9.2	16.8	44.0	53.4	43.8	52.8	16.9	19.0	17.7	15.3	15.8	14.7	13.0	12.6	9.8	10.5	11.5	12.7	22.5
7	21.5	13.0	14.2	15.4	11.9	18.7	20.9	30.6	23.6	22.6	46.2	61.5	63.7	40.7	16.6	15.2	14.4	14.7	25.7	21.3	16.0	22.0	16.9	21.2	24.5
8	14.1	26.5	9.9	13.0	9.4	7.0	11.7	17.9	21.2	22.6	23.6	20.2	20.1	21.5	23.8	24.5	14.4	12.4	16.9	17.6	15.7	14.8	16.3	16.8	17.1
9	14.2	16.9	17.2	13.8	17.7	14.3	17.5	14.7	15.5	20.3	21.2	19.9	13.8	22.5	15.9	18.1	22.9	20.4	17.7	13.7	17.1	19.3	21.0	13.8	17.5
10	13.5	31.4	18.3	11.4	39.5	7.7	9.5	25.1	19.0	18.3	30.1	26.5	34.8	44.8	34.2	29.3	19.2	17.6	11.1	12.8	19.3	38.5	26.4	21.9	23.3
11	50.4	31.7	20.5	41.8	27.8	8.7	9.9	25.2	58.3	71.8	36.9	30.2	60.9	25.9	20.5	24.5	44.5	19.2	18.0	18.0	12.1	14.3	19.9	18.2	29.6
12	30.2	23.7	49.4	14.9	7.5	18.5	13.8	23.6	42.3	32.5	21.0	18.3	18.7	16.0	15.8	18.5	16.4	20.5	28.6	22.3	26.5	17.6	20.4	15.7	22.2
13	16.6	16.6	17.7	29.6	21.0	33.6	18.1	19.4	68.6	33.9	50.7	30.0	24.1	29.3	35.9	32.4	23.5	38.9	9.0	10.4	22.1	15.2	10.6	10.5	25.7
14	17.5	24.3	55.3	19.2	20.1	29.3	30.6	28.5	35.0	24.3	29.1	32.6	27.0	20.7	17.1	18.0	26.0	19.8	34.2	21.3	22.3	24.5	40.6	38.5	27.3
15	45.7	9.2	31.7	47.6	31.5	14.2	10.4	12.4	18.8	19.0	23.6	29.0	26.8	27.3	47.7	15.5	19.9	15.3	17.0	16.5	46.2	27.6	24.5	22.0	25.0
16	8.8	25.2	12.5	9.3	15.5	13.3	11.5	13.7	30.4	42.8	55.5	52.0	61.8	37.9	42.4	19.7	21.4	26.5	14.4	13.0	9.7	16.8	11.0	19.8	24.4
17	16.8	14.9	24.3	45.2	51.4	15.4	17.9	20.2	26.0	30.8	56.9	27.9	26.4	17.7	16.6	15.7	16.1	19.0	22.6	20.7	17.6	40.5	28.1	23.4	25.5
18	56.4	7.9	12.8	32.2	35.5	16.4	31.3	20.1	24.1	25.2	17.2	15.9	13.5	14.7	16.1	19.3	16.3	13.9	15.9	17.9	19.2	15.3	11.0	12.0	20.0
19	16.6	10.1	11.2	10.6	18.1	46.3	12.2	19.4	13.1	14.8	15.2	16.1	19.6	12.6	10.5	15.8	16.5	19.8	20.1	22.3	18.1	17.6	28.9	13.3	17.5
20	12.5	14.4	11.7	11.1	12.6	15.8	11.9	14.1	16.0	21.2	24.6	24.1	14.9	13.7	14.1	13.9	14.7	13.7	13.3	13.7	13.2	11.5	11.4	10.5	14.5
21	10.8	10.1	15.4	25.3	22.3	37.9	34.7	29.2	50.0	57.8	44.3	22.4	15.4	17.0	15.8	14.6	17.5	43.9	40.8	9.3	28.5	34.5	18.5	24.3	26.7
22	19.2	18.7	27.8	35.2	32.8	17.6	69.8	19.7	14.3	48.1	14.8	17.9	43.3	21.5	16.0	15.4	16.4	13.7	12.5	14.9	11.0	12.0	11.0	13.8	22.4
23	12.8	13.0	16.4	17.2	18.5	13.9	18.3	14.8	14.7	14.8	15.5	14.9	17.5	14.4	16.9	17.6	12.8	12.7	13.3	12.8	10.5	11.1	11.7	11.9	14.5
24	13.6	12.2	12.5	11.7	11.4	11.2	13.1	15.3	14.2	16.4	15.3	16.0	15.4	14.2	13.8	14.7	13.5	12.4	12.8	11.7	12.2	11.6	13.0	10.9	13.3
25	11.6	13.8	13.6	16.3	9.7	34.8	44.0	18.1	20.2	22.1	33.5	19.4	18.6	17.6	16.9	16.9	16.9	13.7	13.3	13.3	13.1	11.9	13.1	12.8	18.1
26	12.2	11.5	43.0	17.9	16.6	26.0	13.3	19.0	52.3	28.2	23.5	29.1	29.2	32.2	20.4	17.6	18.2	18.8	13.7	12.7	14.9	13.8	8.8	12.2	21.1
27	27.6	13.0	11.4	25.3	55.6	38.0	17.6	31.7	39.6	33.1	19.3	29.1	22.9	19.1	18.7	15.9	14.7	16.9	16.4	12.4	13.1	12.5	16.6	29.1	22.9
28	37.4	48.5	41.8	51.1	32.9	18.8	25.4	28.7	27.8	23.0	22.1	20.9	21.9	18.5	18.2	18.2	16.5	14.3	12.1	12.0	13.2	12.8	12.5	19.9	23.7
29	20.2	26.5	36.7	20.4	16.1	18.1	19.2	22.9	29.8	36.8	28.0	23.8	21.9	20.4	18.0	17.2	18.1	18.7	19.4	17.2	16.5	15.0	14.7	12.2	21.2
30	12.8	13.7	23.0	47.9	44.5	18.0	20.2	21.0	47.7	33.9	35.5	30.6	59.5	14.8	16.0	30.4	24.7	37.3	48.3	14.2	51.5	21.9	22.9	22.5	29.7
31	16.1	35.9	66.5	37.1	51.2	18.7	23.2	35.1	30.4	15.3	47.6	25.7	15.4	31.9	19.1	16.6	14.1	12.4	11.1	11.4	12.6	13.6	14.6	22.4	24.9

TOTAL HOURS 744 TOTAL GOOD HOURS 744 DATA CAPTURE 100.0%

MAX. 1HR AVG 71.8 08/11/89 09:00:00 2ND MAX. 1 HR AVG 69.8 08/22/89 06:00:00

MIN. 1HR AVG 7.0 08/08/89 05:00:00 ARITHMETIC MEAN 22.0 STANDARD DEV. 11.6

KEY FOR MISSING CODES
Bad< - To few samples for valid average, Cal - calibration, OCal - Analyzer out of calibration
BadS - Bad Analyzer Status, PwrF - Power Failure, Down - Operator downed channel, Miss - Missing Data
Qad - Data questionable insufficient documentation, Qai - Data questionable external influence, Purg - Analyzer in Purge

FPL-Davie
Ft. Lauderdale, FL - Site 002

HOURLY AVERAGES FOR RNFL in INCH

SEPTEMBER 1989

DAY	HOUR (EST) 00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVG
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
3	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.11	0.27	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
9	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.26	0.01	0.03	0.01	0.00	0.01
18	0.02	0.47	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.02	0.00	0.02	0.00	0.00	0.02
19	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.01
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.10	0.00
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

TOTAL HOURS 720 TOTAL GOOD HOURS 720 DATA CAPTURE 100.0%

MAX. 1HR AVG 0.47 09/18/89 01:00:00 2ND MAX. 1 HR AVG 0.29 09/26/89 10:00:00

MIN. 1HR AVG 0.00 09/01/89 00:00:00 ARITHMETIC MEAN 0.00 STANDARD DEV. 0.03

KEY FOR MISSING CODES
Bad< - To few samples for valid average, Cal - calibration, OCal - Analyzer out of calibration
BadS - Bad Analyzer Status, PwrF - Power Failure, Down - Operator downed channel, Miss - Missing Data
Qad - Data questionable insufficient documentation, Qai - Data questionable external influence, Purg - Analyzer in Purge

FPL DAVIE PRECIPITATION		
DATE	**TIME**	**AMOUNT**
9-2-89	0900	0.19
9-3-89	0400	0.01
9-7-89	0400	0.11
	0500	0.27
	0700	0.01
9-8-89	1200	0.12
9-9-89	0400	0.05
9-12-89	0600	0.01
9-14-89	0900	0.26
9-17-89	1900	0.26
	2000	0.01
	2100	0.03
	2200	0.01
9-18-89	0000	0.02
	0100	0.47
	1800	0.01
	1900	0.02
	2100	0.02
9-19-89	0500	0.01
	1500	0.03
	1600	0.13
9-22-89	1600	0.01
9-23-89	0000	0.01
9-25-89	1000	0.11
	1700	0.18
9-26-89	1000	0.29
	10.5.1-144	

FPL DAVIE PRECIPITATION

DATE	TIME	AMOUNT
9-28-89	0200	0.03
	0700	0.02
9-29-89	2200	0.01
	2300	0.10
	TOTAL	2.81

FPL-Davie
Ft. Lauderdale, FL - Site 002

HOURLY AVERAGES FOR WD in DGS

SEPTEMBER 1989

DAY	HOUR (EST) 00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVG
1	344	146	146	216	339	328	343	13	137	158	145	132	121	109	241	140	132	128	139	149	159	171	257	199	183
2	90	339	294	59	7	1	317	8	296	134	149	153	115	150	301	308	293	265	243	175	61	60	93	56	165
3	320	320	325	320	30	8	61	47	126	130	148	136	130	126	131	118	127	125	123	102	336	23	5	234	148
4	10	119	146	121	112	33	48	68	91	99	103	114	104	112	115	68	339	9	48	76	82	137	111	108	99
5	27	91	82	79	57	4	332	76	83	104	107	103	112	102	109	104	100	96	86	79	77	74	88	84	94
6	94	98	83	46	7	9	2	20	74	98	125	106	96	85	88	82	76	64	68	62	53	55	58	74	68
7	77	77	45	351	312	348	346	320	353	4	66	87	85	90	90	83	79	72	74	66	51	49	60	60	135
8	52	46	336	333	330	342	333	325	334	356	12	61	54	35	40	76	70	66	64	50	9	18	268	286	162
9	344	347	310	321	4	8	355	11	57	77	74	98	84	69	75	78	89	93	89	85	78	155	230	221	140
10	299	314	326	353	354	16	46	60	92	91	106	107	106	101	96	89	73	84	67	67	68	78	85	78	132
11	78	65	25	301	305	342	345	11	53	88	90	90	97	93	90	92	91	80	73	77	79	83	79	77	117
12	90	75	41	35	54	11	348	348	97	99	101	99	102	104	94	90	88	72	71	67	79	79	72	37	98
13	61	34	2	349	332	327	322	13	77	82	105	90	100	120	95	95	103	90	93	91	100	117	117	124	127
14	141	153	355	351	1	356	59	51	137	90	63	101	128	122	127	132	137	134	135	135	142	140	134	130	144
15	150	256	125	358	49	346	346	11	120	125	125	120	143	142	149	120	121	118	122	118	124	136	129	134	154
16	43	71	296	6	35	298	310	156	164	157	149	130	122	134	144	122	142	139	144	248	219	142	312	323	167
17	52	25	268	299	239	326	280	264	257	283	292	325	351	103	116	124	96	94	124	273	195	317	294	296	221
18	342	69	358	277	287	285	285	301	324	326	309	303	310	292	7	55	106	200	229	296	319	48	50	347	239
19	213	254	289	303	304	309	330	331	326	332	321	303	301	319	333	335	85	115	169	29	17	1	324	342	250
20	2	351	344	319	325	323	321	334	352	20	41	39	50	54	68	58	54	43	21	15	1	359	338	314	173
21	316	324	316	315	313	305	299	303	301	306	306	296	293	288	296	290	273	273	279	244	251	247	223	188	285
22	202	246	136	180	118	66	47	83	108	117	135	122	127	122	132	115	134	125	63	116	284	314	312	313	155
23	67	75	59	34	10	18	82	115	124	128	125	135	134	151	137	135	134	178	289	329	332	342	4	10	131
24	7	16	25	47	56	33	31	94	116	119	111	111	127	113	116	133	126	132	145	146	153	142	154	157	100
25	168	250	159	160	159	159	162	144	164	162	218	254	343	154	6	86	161	184	338	357	359	95	144	144	189
26	161	155	138	143	278	8	229	172	192	181	196	165	158	148	136	129	131	123	129	116	102	110	108	117	147
27	100	114	123	132	135	125	124	127	132	124	116	117	133	117	106	91	86	87	91	97	98	104	111	116	113
28	113	109	123	116	113	107	105	70	96	97	103	101	93	92	95	91	92	90	87	93	95	98	105	112	100
29	111	114	112	117	114	113	114	117	119	114	111	116	118	108	113	117	113	113	113	106	94	99	103	106	111
30	112	112	122	119	121	124	124	128	134	130	126	130	143	135	139	137	131	125	120	121	114	101	92	118	123

TOTAL HOURS 720 TOTAL GOOD HOURS 720 DATA CAPTURE 100.0%

MAX. 1HR AVG 359 09/25/89 20:00:00 2ND MAX. 1 HR AVG 359 09/20/89 21:00:00

MIN. 1HR AVG 1 09/02/89 05:00:00 ARITHMETIC MEAN 149 STANDARD DEV. 100

KEY FOR MISSING CODES
Bad< - To few samples for valid average, Cal - calibration, OCal - Analyzer out of calibration
BadS - Bad Analyzer Status, PwrF - Power Failure, Down - Operator downed channel, Miss - Missing Data
Qad - Data questionable insufficient documentation, Qai - Data questionable external influence, Purg - Analyzer in Purge

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Ft. Lauderdale, FL - Site 002

HOURLY AVERAGES FOR WS in MPH

SEPTEMBER 1989

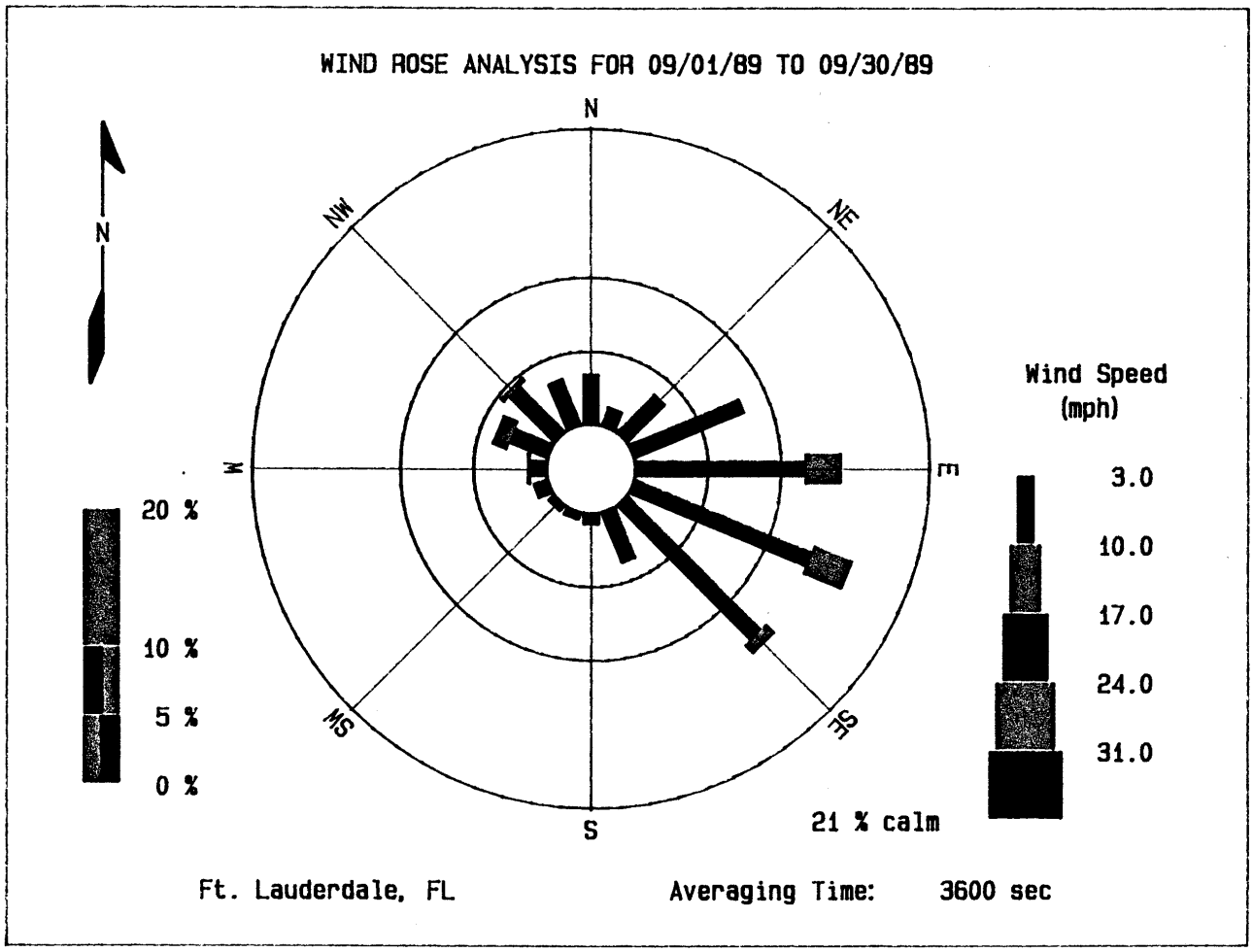
DAY	HOUR (EST) 00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVG
1	2	2	4	2	2	3	3	2	3	5	5	6	7	5	3	7	8	8	6	4	3	2	3	3	4
2	3	0	2	1	1	2	3	2	2	4	4	3	7	5	5	7	4	4	3	0	3	1	3	2	3
3	2	2	2	3	2	3	2	2	3	2	4	6	8	10	10	11	10	8	6	3	4	4	2	2	5
4	2	5	3	4	3	3	2	2	5	8	9	9	8	11	10	3	6	5	3	4	5	6	4	2	5
5	3	2	2	3	2	2	2	3	6	7	10	8	8	7	9	9	9	9	5	4	4	3	5	5	5
6	4	3	3	2	2	3	2	3	4	6	6	6	6	7	8	8	8	7	6	6	5	4	3	4	5
7	5	4	4	4	3	3	3	4	4	4	7	8	7	8	9	8	7	8	6	4	4	3	4	4	5
8	3	5	6	4	4	4	3	4	3	4	4	5	4	7	6	5	5	4	4	4	9	4	9	4	5
9	3	3	3	3	4	2	3	4	4	5	5	6	9	8	6	7	8	8	7	5	4	5	3	2	5
10	2	4	3	2	3	3	3	3	7	8	9	8	9	9	9	6	7	8	5	5	4	4	5	4	5
11	5	2	3	3	2	3	3	3	3	7	9	10	10	11	10	9	8	8	6	7	6	5	5	4	6
12	4	3	5	3	3	3	3	3	5	7	9	9	10	9	9	9	8	7	6	5	6	5	4	3	6
13	3	3	2	3	0	2	4	2	4	5	7	6	6	6	8	9	9	8	7	5	6	6	6	6	5
14	3	6	8	3	5	3	3	2	3	6	3	6	10	11	9	10	9	9	7	6	4	4	4	3	6
15	3	3	4	6	2	1	2	2	6	8	8	9	9	8	7	6	7	6	5	4	4	3	3	3	5
16	2	4	3	3	2	2	2	3	2	6	6	7	9	8	3	6	5	5	4	3	4	2	3	2	4
17	2	3	3	4	3	3	2	3	3	2	2	3	2	6	8	7	6	5	6	13	3	1	4	4	4
18	1	4	1	3	3	4	4	4	4	5	8	7	6	8	5	8	5	6	5	7	4	1	0	2	4
19	2	2	3	3	4	6	5	5	5	6	5	5	6	6	3	4	8	4	3	2	2	3	3	3	4
20	3	3	3	3	4	4	4	4	4	5	5	6	6	7	8	8	7	6	5	4	5	5	5	6	5
21	6	6	7	7	8	8	8	11	11	11	12	14	13	13	13	11	8	6	4	4	4	3	4	10	8
22	3	6	5	7	9	6	5	3	6	8	8	10	10	10	10	8	6	3	3	3	3	8	7	7	6
23	3	3	2	2	2	2	3	4	7	8	8	7	2	4	7	8	7	4	7	8	6	5	5	4	5
24	3	3	3	3	3	5	3	4	8	8	8	8	8	8	8	8	7	6	5	5	4	3	3	3	5
25	2	4	2	4	3	2	2	3	5	7	6	4	1	4	4	3	7	3	3	5	4	3	4	4	4
26	3	5	3	3	5	2	1	3	4	5	3	6	8	8	7	8	7	7	5	5	3	3	4	5	5
27	4	5	6	5	5	7	6	8	9	11	9	10	11	10	12	12	11	10	10	11	11	10	10	10	9
28	8	7	7	8	7	6	7	5	5	9	9	11	12	11	12	11	11	10	9	11	10	10	11	9	9
29	10	9	9	8	8	7	8	9	12	12	12	13	12	12	12	12	12	10	9	8	7	7	9	7	10
30	7	9	5	7	7	7	7	5	8	11	11	11	8	10	10	9	8	7	7	5	5	4	4	5	7

TOTAL HOURS 720 TOTAL GOOD HOURS 720 DATA CAPTURE 100.0%

MAX. 1HR AVG 14 09/21/89 11:00:00 2ND MAX. 1 HR AVG 13 09/21/89 13:00:00

MIN. 1HR AVG 0 09/02/89 19:00:00 ARITHMETIC MEAN 5 STANDARD DEV. 3

KEY FOR MISSING CODES
Bad< - To few samples for valid average, Cal - calibration, OCal - Analyzer out of calibration
BadS - Bad Analyzer Status, PwrF - Power Failure, Down - Operator downed channel, Miss - Missing Data
Qad - Data questionable insufficient documentation, Qai - Data questionable external influence, Purg - Analyzer in Purge


WIND ROSE ANALYSIS FOR 09/01/89 TO 09/30/89
N
NE
E
SE
S
SW
W
NW
N
20 %
10 %
5 %
0 %
Wind Speed
(mph)
3.0
10.0
17.0
24.0
31.0
21 % calm
Ft. Lauderdale, FL
Averaging Time: 3600 sec

WIND ROSE ANALYSIS FOR 09/01/89 TO 09/30/89

Wind Speed (mph)	DIRECTION																All
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Dir
> 31.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
31.0-24.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
24.0-17.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
17.0-10.0	0.0	0.0	0.0	0.0	2.4	2.8	0.8	0.0	0.0	0.0	0.0	0.0	0.1	1.0	0.3	0.0	7
10.0- 3.0	3.3	1.3	3.6	8.1	12.	13.	13.	3.8	0.8	0.6	0.6	1.0	1.0	2.8	4.3	3.3	72
3.0 <																	21
All Speed	3.3	1.3	3.6	8.1	14.	16.	14.	3.8	0.8	0.6	0.6	1.0	1.1	3.8	4.6	3.3	100

EV-23-

Ft. Lauderdale, FL Averaging Time: 3600 sec

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Ft. Lauderdale, FL - Site 002

HOURLY AVERAGES FOR TEMP in DGC

SEPTEMBER 1989

DAY	HOUR (EST) 00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVG
1	27	26	26	26	26	26	26	28	30	31	32	32	32	32	30	31	31	30	29	28	28	28	27	27	29
2	26	25	25	25	25	25	25	26	28	28	28	30	32	31	29	26	25	25	25	25	25	25	26	26	26
3	25	25	25	25	25	25	25	26	27	28	29	31	32	32	32	31	30	30	29	28	27	26	25	25	28
4	26	27	27	27	27	26	26	27	29	30	31	31	31	31	31	30	27	26	27	27	28	27	27	26	28
5	26	26	26	26	26	26	26	27	28	30	30	31	31	31	32	31	30	30	29	29	28	28	28	28	28
6	27	27	27	26	26	26	26	28	29	30	31	32	32	32	32	32	32	31	30	29	29	29	29	28	29
7	28	28	28	27	26	25	25	26	27	29	30	31	32	32	31	31	31	30	29	29	28	28	28	28	29
8	28	27	26	26	25	25	26	27	28	29	31	30	29	30	30	30	30	30	29	28	28	27	27	26	28
9	26	26	25	25	25	25	25	26	28	30	31	31	31	29	29	29	30	29	28	28	28	26	25	25	28
10	25	25	25	25	25	25	25	27	29	29	30	31	31	31	31	31	30	29	28	28	28	28	28	27	28
11	27	27	26	26	25	25	25	27	29	30	31	31	31	31	31	31	30	30	29	29	28	28	28	28	28
12	27	27	26	26	25	25	25	26	28	30	31	31	31	32	32	31	30	29	29	28	28	28	28	27	28
13	27	26	26	25	25	25	25	27	29	30	31	31	32	32	32	32	31	30	29	29	28	28	28	28	29
14	27	26	26	26	26	25	26	27	29	25	27	30	31	31	31	31	29	28	28	28	28	27	27	27	28
15	27	26	26	26	25	25	26	27	30	30	30	31	30	29	30	30	29	29	28	28	28	27	27	26	28
16	26	26	25	25	25	25	25	26	28	30	31	31	32	32	30	30	30	29	28	28	27	27	26	26	28
17	26	26	25	25	24	24	25	26	28	29	31	32	33	33	32	31	30	29	29	23	23	23	23	23	27
18	24	24	23	23	23	23	24	25	26	28	30	31	32	32	32	30	28	27	24	23	24	24	24	24	26
19	23	23	23	23	23	24	24	24	26	28	29	30	31	31	32	29	25	25	25	26	26	26	25	25	26
20	25	25	24	24	24	24	24	25	27	29	30	31	32	31	31	31	31	30	29	28	27	27	26	26	27
21	25	25	24	24	24	24	24	24	26	28	29	30	31	32	32	32	32	31	30	28	27	26	25	24	27
22	24	24	24	23	23	24	24	26	28	30	31	31	32	31	30	29	27	27	27	27	27	25	24	23	27
23	24	24	24	24	24	24	25	27	29	30	30	31	31	31	31	31	30	29	27	26	24	24	24	24	27
24	23	24	24	24	24	24	24	26	29	30	30	31	32	32	32	31	30	29	28	28	27	27	27	26	28
25	26	26	26	26	25	25	26	26	28	29	27	28	28	28	26	28	29	26	25	25	25	25	25	26	26
26	26	26	25	25	25	25	25	27	28	30	27	30	31	31	31	31	30	29	28	28	28	28	28	27	28
27	27	27	27	27	27	27	27	28	29	29	30	30	29	30	31	31	30	29	28	28	28	28	28	28	28
28	28	27	26	27	27	27	27	27	27	28	29	30	31	31	31	30	29	29	28	28	28	28	27	27	28
29	27	27	27	27	27	27	27	28	29	29	30	30	30	30	29	29	28	28	28	28	27	27	26	25	28
30	26	26	26	26	26	26	26	27	28	29	29	30	29	30	30	30	29	28	28	27	27	27	27	26	28

TOTAL HOURS 720 TOTAL GOOD HOURS 720 DATA CAPTURE 100.0%

MAX. 1HR AVG 33 09/17/89 12:00:00 2ND MAX. 1 HR AVG 33 09/17/89 13:00:00

MIN. 1HR AVG 23 09/17/89 20:00:00 ARITHMETIC MEAN 28 STANDARD DEV. 2

KEY FOR MISSING CODES
Bad< - To few samples for valid average, Cal - calibration, OCal - Analyzer out of calibration
BadS - Bad Analyzer Status, PwrF - Power Failure, Down - Operator downed channel, Miss - Missing Data
Qad - Data questionable insufficient documentation, Qai - Data questionable external influence, Purg - Analyzer in Purge

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HOURLY AVERAGES FOR SO2 in PPB

SEPTEMBER 1989

DAY	HOUR (EST) 00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVG
1	0	0	Cal	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	1	1	Cal	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	Cal	0	0	0	1	2	1	1	1	0	0	0	1	1	1	1	0	0	0	0	0	0	0
6	0	0	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	Cal	0	0	0	1	1	1	0	0	1	0	1	3	1	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	1	1	0	0	0	1	0	0	1	1	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	Cal	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	1	1	1	2	2	2	2	1	1	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	1	1	1	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0
14	0	0	0	0	0	0	1	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	1	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	0	1	Cal	1	0	0	0	0	0	0	0	0	0	1	2	2	1	1	0	0	0	0	0	0	0
18	0	0	0	0	0	0	1	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	0	0
20	0	0	0	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
22	0	0	0	0	0	1	2	3	2	1	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0
23	0	0	1	0	0	0	1	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
24	0	0	Cal	0	0	0	0	0	0	0	0	0	0	Cal	Cal	Cal	Cal	Cal	Cal	Cal	1	0	0	0	Bad<
25	0	0	4	0	0	0	1	2	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
26	0	0	0	0	0	1	2	1	1	0	0	0	0	0	0	0	Cal	0	0	0	0	0	0	0	0
27	0	0	1	0	1	2	4	5	4	3	2	0	11	3	8	18	2	1	1	2	2	1	0	0	3
28	0	0	0	0	0	0	2	2	2	6	13	28	20	31	15	12	7	2	1	1	3	4	1	0	6
29	0	0	1	0	0	0	1	1	0	1	1	0	0	0	0	0	0	0	0	0	2	1	2	2	0
30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

TOTAL HOURS 720 TOTAL GOOD HOURS 705 DATA CAPTURE 97.9%

MAX. 1HR AVG 31 09/28/89 13:00:00 2ND MAX. 1 HR AVG 28 09/28/89 11:00:00

MIN. 1HR AVG 0 09/01/89 00:00:00 ARITHMETIC MEAN 1 STANDARD DEV. 2

NAAQS Comparison: MAX. 3 HR AVG 26 (500) 09/28/89 13:00:00
MAX. 24 HR AVG 6 (140) 09/29/89 03:00:00

KEY FOR MISSING CODES
Bad< - To few samples for valid average, Cal - calibration, OCal - Analyzer out of calibration
BadS - Bad Analyzer Status, PwrF - Power Failure, Down - Operator downed channel, Miss - Missing Data
Qad - Data questionable insufficient documentation, Qai - Data questionable external influence, Purg - Analyzer in Purge

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HOURLY AVERAGES FOR Sigθ1 in deg

SEPTEMBER 1989

DAY	HOUR (EST) 00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	DAILY AVG
1	48.7	37.5	10.6	21.4	62.1	19.0	17.7	51.8	24.8	23.7	19.1	22.7	19.6	31.2	22.7	16.1	15.9	14.1	13.2	10.8	10.1	24.3	19.3	18.3	24.0
2	33.3	27.6	19.2	41.6	59.5	43.4	15.0	36.9	57.5	21.4	20.7	31.1	19.3	30.8	21.2	18.1	20.8	14.3	22.3	43.3	22.7	60.4	14.7	21.4	29.9
3	31.2	23.7	25.8	15.3	28.6	29.5	49.6	23.4	20.3	36.9	28.7	18.8	16.8	15.8	15.5	13.9	14.1	14.6	12.7	26.0	14.8	14.8	30.9	30.9	23.0
4	27.1	14.1	10.4	12.1	22.9	22.7	46.7	42.9	28.0	16.1	14.6	17.2	19.6	16.3	14.2	22.7	20.2	17.9	28.5	18.2	27.3	14.4	12.4	44.9	22.1
5	20.3	24.2	37.4	16.9	24.1	38.5	21.6	22.6	15.3	18.6	15.3	17.1	17.5	19.0	18.0	15.5	14.6	13.9	14.1	15.7	14.4	25.2	13.7	11.7	19.4
6	14.9	14.2	14.7	23.5	31.8	17.6	19.9	24.5	25.4	20.5	20.4	34.1	26.5	28.0	19.4	18.6	19.3	19.7	18.2	19.6	21.9	22.7	24.6	15.5	21.5
7	13.5	15.7	29.2	20.9	35.9	31.5	17.0	13.7	20.4	26.0	19.3	18.3	22.3	21.5	18.5	17.0	17.6	17.4	17.7	23.2	24.9	24.1	22.7	22.3	21.3
8	21.4	27.1	28.5	11.9	10.5	15.0	16.8	15.4	27.6	26.0	31.4	28.0	31.8	21.3	20.7	17.0	25.9	23.7	20.9	21.5	32.4	47.4	20.2	8.6	23.0
9	15.0	15.5	21.2	12.6	16.8	20.1	14.9	16.4	22.9	24.8	26.2	24.0	18.0	18.8	17.9	17.0	14.6	14.2	13.0	13.6	15.5	17.6	51.4	42.4	20.2
10	30.6	26.7	18.3	11.2	19.3	23.8	25.8	22.5	15.7	18.2	17.2	21.8	18.3	19.6	17.1	18.6	18.1	14.9	18.0	19.2	18.5	15.0	12.5	13.6	18.9
11	13.1	21.3	19.7	34.5	17.1	16.0	16.5	22.1	34.6	19.7	17.4	17.7	15.4	16.0	18.0	17.1	18.6	15.7	17.9	14.8	14.1	13.0	13.6	15.4	18.3
12	11.7	16.5	27.8	18.7	23.0	21.6	40.0	20.2	32.3	17.4	17.7	15.4	18.3	19.6	21.0	16.5	18.2	18.2	17.7	20.8	13.3	13.7	17.6	32.6	20.4
13	22.5	28.0	20.4	19.1	47.8	15.2	20.1	30.2	27.6	25.8	23.5	23.5	23.1	28.2	22.1	17.9	18.7	17.0	13.3	13.9	11.9	10.8	10.9	12.8	21.0
14	10.9	19.1	42.8	28.5	30.0	22.6	56.6	29.0	31.9	19.4	20.3	20.5	16.0	16.1	17.0	14.9	14.2	14.3	13.9	14.8	11.5	11.1	11.6	12.6	20.8
15	14.3	16.8	35.8	25.9	26.9	54.7	25.2	26.5	24.6	17.1	16.4	16.0	13.7	15.0	15.2	19.8	14.4	13.7	13.6	11.5	11.2	11.6	12.7	12.5	19.4
16	22.1	52.3	64.1	19.6	38.0	22.6	55.5	40.2	65.8	17.2	21.6	19.8	17.2	17.2	25.7	13.3	15.2	12.8	10.0	17.7	27.4	58.1	17.2	15.4	28.6
17	33.1	24.8	11.0	26.4	33.0	58.7	24.0	19.1	30.0	48.3	63.7	59.2	65.3	26.4	18.8	15.3	14.7	16.5	17.5	19.1	33.6	42.7	19.3	16.3	30.7
18	36.9	27.6	35.5	14.7	12.6	13.3	12.2	15.0	16.8	20.5	16.1	17.7	24.3	15.7	22.9	22.5	22.6	18.2	50.4	13.0	23.1	31.4	48.4	43.9	24.0
19	27.8	55.3	10.9	11.0	12.6	8.3	13.2	14.9	13.8	19.2	21.6	28.1	24.3	21.2	40.1	30.1	13.2	16.4	30.2	40.6	23.8	16.6	13.5	13.6	21.7
20	14.8	18.8	14.7	11.9	9.5	12.0	12.7	15.2	23.7	26.8	25.4	26.2	27.0	20.1	21.4	22.4	22.6	19.9	17.2	16.5	17.6	17.6	13.9	9.5	18.2
21	10.1	11.2	11.2	10.1	9.8	7.7	8.6	8.7	10.1	11.1	12.8	12.4	14.7	13.9	14.2	16.6	19.0	14.4	11.7	15.8	16.6	18.1	15.3	17.7	13.0
22	14.1	26.3	24.0	19.4	16.9	41.2	44.8	15.8	17.1	16.6	16.6	16.1	16.8	16.5	15.3	17.0	15.0	18.0	27.5	35.2	26.3	12.2	11.2	18.1	20.8
23	27.3	16.1	20.3	33.3	29.3	21.5	19.9	35.6	13.9	17.0	16.9	32.4	78.0	68.6	17.2	15.9	15.2	19.6	13.5	13.2	14.9	16.8	17.6	20.9	24.8
24	18.6	21.3	18.8	24.6	22.5	41.1	48.8	38.8	13.8	15.7	20.4	17.5	16.9	17.4	17.2	16.3	14.9	15.8	11.4	9.9	8.2	9.5	9.3	8.4	19.0
25	15.3	22.6	16.0	11.6	9.9	12.2	14.3	13.0	13.2	14.3	15.9	37.2	25.2	38.9	27.4	24.5	11.7	42.3	22.3	23.8	32.9	28.6	9.9	9.9	20.5
26	12.1	9.7	8.8	12.0	24.5	53.9	46.7	21.0	20.1	24.2	50.5	21.6	14.3	16.6	15.4	15.0	14.7	12.8	12.7	10.9	15.4	16.0	13.3	10.5	19.7
27	12.2	15.0	13.0	14.2	13.6	13.8	13.0	13.8	14.4	16.4	17.7	15.0	15.3	15.3	15.2	15.8	13.1	13.0	12.5	11.0	11.5	11.6	11.7	12.2	13.8
28	13.1	11.4	12.7	11.4	11.7	12.1	14.3	15.2	23.8	17.7	15.3	16.4	12.8	15.4	15.0	13.6	13.5	13.6	11.9	11.2	11.4	11.0	11.7	12.2	13.7
29	12.0	12.4	11.6	12.4	11.1	12.0	12.4	13.1	13.7	14.7	14.7	14.1	14.2	14.7	13.2	13.0	13.3	11.7	11.2	12.6	10.5	12.5	12.2	14.1	12.8
30	11.4	10.5	13.2	12.5	13.3	13.3	13.3	13.8	15.4	14.6	15.4	14.3	15.8	15.3	14.9	15.8	15.5	14.4	12.8	12.4	12.1	15.4	11.2	11.9	13.7

TOTAL HOURS 720 TOTAL GOOD HOURS 720 DATA CAPTURE 100.0%

MAX. 1HR AVG 78.0 09/23/89 12:00:00 2ND MAX. 1 HR AVG 68.6 09/23/89 13:00:00

MIN. 1HR AVG 7.7 09/21/89 05:00:00 ARITHMETIC MEAN 20.6 STANDARD DEV. 10.5

KEY FOR MISSING CODES
Bad< - To few samples for valid average, Cal - calibration, OCal - Analyzer out of calibration
BadS - Bad Analyzer Status, PwrF - Power Failure, Down - Operator downed channel, Miss - Missing Data
Qad - Data questionable insufficient documentation, Qai - Data questionable external influence, Purg - Analyzer in Purge

APPENDIX 10.5.2

SURFACE WATER

10.5.2 Surface Water

10.5.2.1 Dye Dispersion Study

A dye dispersion study was conducted in the existing Lauderdale Plant cooling canal/pond system to establish the baseline thermal conditions, to provide data for the assessment of the cooling pond's cooling efficiency, and to estimate the travel time of the effluent. The study was conducted according to the guidelines for dye dispersion study methodology as outlined in Florida Department of Natural Resources (FDNR), 1988.

The cooling pond system basically consists of a discharge canal, two large ponds, three deadend finger canals, and a shallow peripheral canal (see Section 2.3.4 for description). There are two narrow and shallow cuts in the system, connecting two ponds and the discharge canal.

The study was conducted February 7-10, 1989 during the new moon spring tide. Two tide gauges were installed in the cooling pond system, as shown in Figure 2.3.9, to continuously record the water level. The tide data indicated that the tide in the cooling canal/pond system ranged from 0.6 ft to 1.5 ft during the study. The tidal fluctuation proved to be a significant factor to dye movement and the change in dye concentration during the study.

METHODOLOGY

Prior to the dye injection, 44 monitoring stations were established in the cooling pond/canal system (see Figure 10.5.2-1). The station locations were identified by either permanent landmark or an anchored buoy to accurately position the monitoring location. The numbers shown in the Figure 10.5.2-1 represent monitoring station number; the open circles represent buoys that were placed on a grid in the pond system, and the dots represent stations that were readily determinable by landmark. The buoys were held in place by concrete blocks with enough rope to account for the water depth and tidal variation. The buoys were all labeled with their corresponding station number with reflective numbers to make them readily identifiable at night.

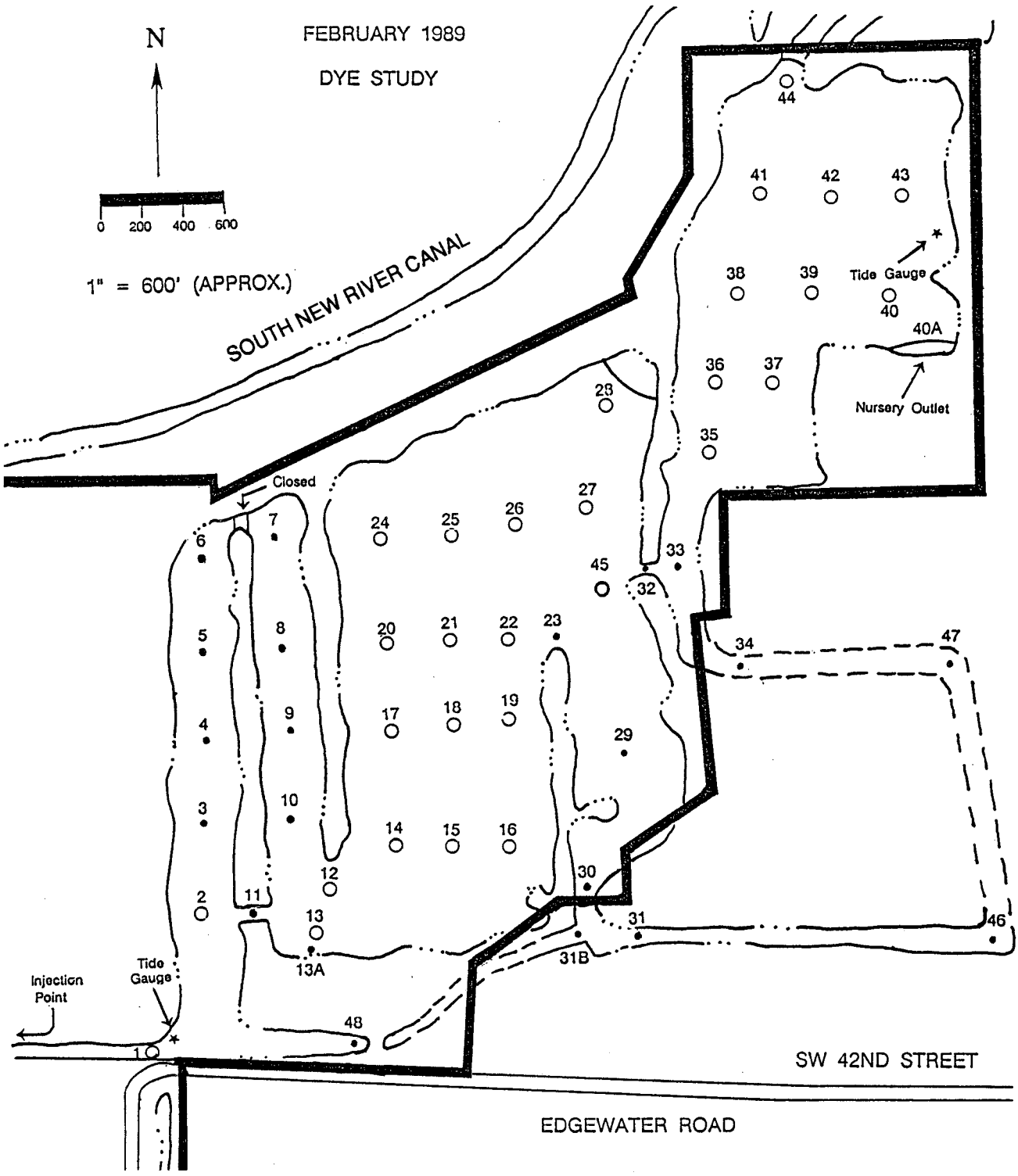


Figure 10.5.2-1 **COOLING POND/CANAL SYSTEM — MONITORING STATION LOCATIONS**

Lauderdale Repowering Project

FPL

Rhodamine WT fluorescent dye was used as the tracer for the dye study. The dye was introduced to the canal/pond system by a single slug injection of 10 liters of Rhodamine WT. The dye was injected at the plant discharge flume at 7:49 a.m., February 7, 1989, in very turbulent water which mixed the dye slug across the cross-section.

The monitoring instrumentation included the Turner Designs® fluorometer, flexible Teflon® intake tubing, an electric diaphragm pump, and an Atkins® digital thermometer installed in-line to the flow-through system for temperature adjustment of the fluorescence. Data were collected continuously around the clock for the period of the study. Collection was accomplished by two teams of two members each working 12-hour shifts. The rotations were staggered to provide continuity to the effort--one member of the previous team would spend 4 to 6 hours with the next team. All data were logged by hand and later keyed into a computer for reduction and analysis. The monitoring parameters included: date, time, temperature profile, fluorescence profile, and the corresponding depths.

Prior to injection, fluorescence in the pond/canal system was monitored to account for the background conditions. The fluorometer was carefully calibrated using standard solutions immediately after the dye study.

In addition to the fluorescent dye monitoring, 50 citrus surface drogues were released at Station 1 at 9:00 p.m. on February 8, 1989, to provide a second indicator of surface travel time. The drogues proved to be a simple but reliable backup for dye dispersion monitoring.

The dye monitoring concluded at 6:38 a.m. on February 10, 1989, about 71 hours after the injection.

RESULTS

Tables 10.5.2-1 and 10.5.2-2 present the dye data for the duration of the study including the calibrated result in parts per billion (ppb). The data are divided into two tables because the measurements were taken with different instruments. The original fluorometer malfunctioned during the

Table 10.5.2-1. Lauderdale Plant Cooling Canal Pond System Dye Study--Uncalibrated Data
(Page 1 of 5)

Sta #	Date	Time (real)	Time (elapsed)	Depth (ft)	Temp (oC)	Fluorescence				
						F	Scale	Multiplier	F'	Fo
1	07-Feb-89	07:29	-0.33	1	25	3.2	31.6	100	3.2	3.19
1	07-Feb-89	07:40	-0.14	2	25.1	3	31.6	100	3	3.00
1	07-Feb-89	07:49	0.01	2	25.1	2.9	31.6	100	2.9	2.90
1	07-Feb-89	07:53	0.08	2	25.2	4.4	31.6	100	4.4	4.41
1	07-Feb-89	07:53	0.08	6	25.2	3.2	31.6	100	3.2	3.21
1	07-Feb-89	08:06	0.29	2	25.1	3.1	1.0	100	97.96	97.96
1	07-Feb-89	08:08	0.33	2	25.1	1.6	31.6	100	1.6	1.60
1	07-Feb-89	08:09	0.34	2	25.4	3	1.0	100	94.8	95.54
1	07-Feb-89	08:10	0.36	2	25.4	7.3	1.0	100	230.68	232.49
1	07-Feb-89	08:11	0.38	2	25.4	7	31.6	100	7	7.05
1	07-Feb-89	08:11	0.38	2	25.4	9	31.6	100	9	9.07
1	07-Feb-89	08:12	0.39	2	25.4	3.8	10.0	1	1200.8	1210.20
1	07-Feb-89	08:12	0.39	2	25.4	3	10.0	1	948	955.42
1	07-Feb-89	08:12	0.39	2	25.4	4.7	10.0	1	1485.2	1496.83
1	07-Feb-89	08:13	0.41	2	25.4	4.2	10.0	1	1327.2	1337.59
1	07-Feb-89	08:13	0.41	2	25.4	4.2	10.0	1	1327.2	1337.59
1	07-Feb-89	08:14	0.43	5	25.5	4.8	10.0	1	1516.8	1532.66
1	07-Feb-89	08:14	0.43	2	25.5	5.1	10.0	1	1611.6	1628.45
1	07-Feb-89	08:14	0.43	2	25.5	4.9	10.0	1	1548.4	1564.59
1	07-Feb-89	08:14	0.43	3	25.5	5	10.0	1	1580	1596.52
1	07-Feb-89	08:14	0.43	4	25.5	5	10.0	1	1580	1596.52
1	07-Feb-89	08:14	0.43	2	25.5	5.2	10.0	1	1643.2	1660.38
1	07-Feb-89	08:14	0.43	6	25.5	4.8	10.0	1	1516.8	1532.66
1	07-Feb-89	08:16	0.46	2	25.6	4.4	10.0	1	1390.4	1408.59
1	07-Feb-89	08:19	0.51	2	25.5	1.6	10.0	1	505.6	510.89
1	07-Feb-89	08:19	0.51	2	25.5	5.2	31.6	100	5.2	5.25
1	07-Feb-89	08:25	0.61	2	26.8	2.8	31.6	100	2.8	2.93
11	07-Feb-89	08:28	0.66	2	27	2.6	31.6	100	2.6	2.73
11	07-Feb-89	08:30	0.69	2	27.1	3	31.6	100	3	3.16
11	07-Feb-89	08:31	0.71	2	27.1	4.1	31.6	100	4.1	4.32
11	07-Feb-89	08:32	0.73	2	27.1	9	31.6	100	9	9.48
11	07-Feb-89	08:32	0.73	2	27.1	4.5	31.6	100	4.5	4.74
11	07-Feb-89	08:33	0.74	2	27.1	4.5	10.0	100	14.22	14.98
11	07-Feb-89	08:34	0.76	2	27	3	10.0	100	9.48	9.96
11	07-Feb-89	08:35	0.78	2	27	3.5	10.0	100	11.06	11.62
11	07-Feb-89	08:36	0.79	2	27	9	3.2	100	90	94.56
11	07-Feb-89	08:37	0.81	2	27.1	2.6	3.2	1	2600	2738.78
11	07-Feb-89	08:38	0.83	2	27.1	5	3.2	1	5000	5266.88
11	07-Feb-89	08:40	0.86	2	27.1	2.6	3.2	1	2600	2738.78
11	07-Feb-89	08:40	0.86	2	26.9	3.4	3.2	1	3400	3562.90
11	07-Feb-89	08:41	0.88	2	26.9	3.2	3.2	1	3200	3353.32
11	07-Feb-89	08:42	0.89	2	26.9	3.5	3.2	1	3500	3667.69
11	07-Feb-89	08:43	0.91	2	26.9	3.2	3.2	1	3200	3353.32
11	07-Feb-89	08:44	0.93	2	26.9	3.5	3.2	1	3500	3667.69
11	07-Feb-89	08:45	0.94	2	26.9	3.4	3.2	1	3400	3562.90
11	07-Feb-89	08:46	0.96	2	26.9	2.8	3.2	1	2800	2934.15
11	07-Feb-89	08:47	0.98	2	26.9	1.3	3.2	1	1300	1362.29
11	07-Feb-89	08:47	0.98	2	27	2.6	1.0	100	82.16	86.32
11	07-Feb-89	08:48	0.99	3	27	2.2	1.0	100	69.52	73.04
11	07-Feb-89	08:48	0.99	4	27	0.8	1.0	100	25.28	26.56
11	07-Feb-89	08:48	0.99	7	27	0.9	1.0	100	28.44	29.88
11	07-Feb-89	08:48	0.99	5	27	1	1.0	100	31.6	33.20
11	07-Feb-89	08:48	0.99	6	27	1.7	1.0	100	53.72	56.44
11	07-Feb-89	08:48	0.99	2	27	2.7	1.0	100	85.32	89.64
11	07-Feb-89	08:50	1.03	2	27	2.1	1.0	100	66.36	69.72
11	07-Feb-89	08:51	1.04	2	27	2	1.0	100	63.2	66.40
3	07-Feb-89	08:53	1.08	2	26.9	2	31.6	100	2	2.10
2	07-Feb-89	08:55	1.11	2	26.9	3.2	31.6	100	3.2	3.35
2	07-Feb-89	08:57	1.14	2	26.9	3.2	31.6	100	3.2	3.35
13	07-Feb-89	09:00	1.19	2	26.5	3.8	31.6	100	3.8	3.94
13	07-Feb-89	09:03	1.24	2	26.5	3.2	10.0	100	10.112	10.49

Table 10.5.2-1. Lauderdale Plant Cooling Canal Pond System Dye Study--Uncalibrated Data
(Page 2 of 5)

Sta #	Date	Time (real)	Time (elapsed)	Depth (ft)	Temp (oC)	Fluorescence				
						F	Scale	Multiplier	F'	Fo
13	07-Feb-89	09:04	1.26	2	26.7	4.7	10.0	100	14.852	15.48
13	07-Feb-89	09:19	1.51	2	26.9	3	10.0	100	9.48	9.93
11	07-Feb-89	09:22	1.56	2	26.9	3.3	10.0	1	1042.8	1092.76
11	07-Feb-89	09:22	1.56	3	26.9	3.1	10.0	1	979.6	1026.53
11	07-Feb-89	09:22	1.56	4	26.9	3.1	10.0	1	979.6	1026.53
11	07-Feb-89	09:22	1.56	5	26.9	3.2	10.0	1	1011.2	1059.65
11	07-Feb-89	09:22	1.56	6	26.9	2.9	10.0	1	916.4	960.31
11	07-Feb-89	09:22	1.56	7	26.9	2.9	10.0	1	916.4	960.31
11	07-Feb-89	09:22	1.56	8	26.9	3.3	10.0	1	1042.8	1092.76
11	07-Feb-89	09:22	1.56	9	26.9	2.7	10.0	1	853.2	894.08
8	07-Feb-89	09:27	1.64	2	26.6	4	31.6	100	4	4.16
8	07-Feb-89	09:38	1.83	2	26.6	4	31.6	100	4	4.16
11	07-Feb-89	09:38	1.83	2	26.9	2.3	1.0	1	7268	7616.23
13	07-Feb-89	09:39	1.84	2	27	6.2	3.2	1	6200	6513.97
12	07-Feb-89	09:40	1.86	2	27	5.6	3.2	1	5600	5883.59
14	07-Feb-89	09:41	1.88	2	27	4.9	3.2	1	4900	5148.14
15	07-Feb-89	09:43	1.91	2	27.1	4.6	3.2	1	4600	4845.53
16	07-Feb-89	09:43	1.91	2	27.1	4.6	3.2	1	4600	4845.53
15	07-Feb-89	09:50	2.03	2	27.1	4.5	3.2	1	4500	4740.19
14	07-Feb-89	09:52	2.06	2	27.2	4.5	3.2	1	4500	4752.53
12	07-Feb-89	09:56	2.13	2	27.1	4.6	3.2	1	4600	4845.53
13	07-Feb-89	10:02	2.23	2	27.2	5.9	3.2	1	5900	6231.10
13	07-Feb-89	10:03	2.24	2	27.3	8	3.2	1	8000	8470.94
8	07-Feb-89	10:06	2.29	2	27.3	4.5	3.2	1	4500	4764.90
2	07-Feb-89	12:51	5.04	27	28.3	19:12	3.2	100	28	30.43
1	07-Feb-89	14:01	6.21	2	28.9	0.6	3.2	1	600	662.31
2	07-Feb-89	14:04	6.26	2	28.5	4.6	3.2	1	4600	5025.16
3	07-Feb-89	14:07	6.31	2	28.5	3.8	3.2	1	3800	4151.22
4	07-Feb-89	14:07	6.31	2	28.5	2	3.2	1	2000	2184.85
5	07-Feb-89	14:10	6.36	2	28.3	1.2	3.2	1	1200	1304.11
6	07-Feb-89	14:12	6.39	2	29.1	5	3.2	1	5000	5548.00
11	07-Feb-89	14:15	6.44	2	28.3	6.8	3.2	1	6800	7389.96
13	07-Feb-89	14:16	6.46	2	27.9	0.9	3.2	1	900	967.96
12	07-Feb-89	14:19	6.51	2	28	0.7	3.2	1	700	754.82
14	07-Feb-89	14:20	6.53	2	28	0.3	31.6	100	0.3	0.32
15	07-Feb-89	14:22	6.56	2	27.9	0.3	31.6	100	0.3	0.32
16	07-Feb-89	14:23	6.58	2	28	0.2	31.6	100	0.2	0.22
19	07-Feb-89	14:24	6.59	2	27.7	0	31.6	100	0	0.00
18	07-Feb-89	14:27	6.64	2	27.9	0.1	31.6	100	0.1	0.11
17	07-Feb-89	14:28	6.66	2	27.8	0.1	31.6	100	0.1	0.11
12	07-Feb-89	14:29	6.68	2	28	0.3	31.6	100	0.3	0.32
13	07-Feb-89	14:31	6.71	2	28.3	0.7	31.6	100	0.7	0.76
13	07-Feb-89	14:32	6.73	2	28.3	1.3	31.6	100	1.3	1.41
11	07-Feb-89	14:35	6.78	2	28.5	6.1	10.0	100	19.276	21.06
11	07-Feb-89	14:37	6.81	10	28.5	9.8	10.0	100	30.968	33.83
11	07-Feb-89	14:37	6.81	9	28.5	9.9	10.0	100	31.284	34.18
11	07-Feb-89	14:37	6.81	8	28.5	8.5	10.0	100	26.86	29.34
11	07-Feb-89	14:37	6.81	3	28.5	8.8	10.0	100	27.808	30.38
11	07-Feb-89	14:37	6.81	6	28.5	8.5	10.0	100	26.86	29.34
11	07-Feb-89	14:37	6.81	1	28.5	8.8	10.0	100	27.808	30.38
11	07-Feb-89	14:37	6.81	4	28.5	9	10.0	100	28.44	31.07
11	07-Feb-89	14:37	6.81	7	28.6	9.6	10.0	100	30.336	33.23
11	07-Feb-89	14:37	6.81	2	28.5	8.8	10.0	100	27.808	30.38
11	07-Feb-89	14:37	6.81	11	28.4	3.2	10.0	100	10.112	11.02
11	07-Feb-89	14:37	6.81	5	28.5	9	10.0	100	28.44	31.07
11	07-Feb-89	14:41	6.88	12	28.4	3.8	10.0	100	12.008	13.08
2	07-Feb-89	14:43	6.91	13	28.1	5.8	3.2	100	58	62.71
2	07-Feb-89	14:43	6.91	8	28.6	3.3	3.2	100	33	36.14
2	07-Feb-89	14:43	6.91	12	28.1	4.9	3.2	100	49	52.98
2	07-Feb-89	14:43	6.91	20	28.1	2.8	3.2	100	28	30.27
2	07-Feb-89	14:43	6.91	4	28.8	2.8	3.2	100	28	30.83
2	07-Feb-89	14:43	6.91	6	28.8	3	3.2	100	30	33.03

Table 10.5.2-1. Lauderdale Plant Cooling Canal Pond System Dye Study--Uncalibrated Data
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Sta #	Date	Time (real)	Time (elapsed)	Depth (ft)	Temp (oC)	Fluorescence				
						F	Scale	Multiplier	F'	Fo
2	07-Feb-89	14:43	6.91	14	28.1	5.1	3.2	100	51	55.14
2	07-Feb-89	14:43	6.91	25	28.3	2.8	3.2	100	28	30.43
2	07-Feb-89	14:43	6.91	7	28.6	3.2	3.2	100	32	35.05
2	07-Feb-89	14:43	6.91	10	28.3	3.8	3.2	100	38	41.30
2	07-Feb-89	14:43	6.91	15	28.1	5.5	3.2	100	55	59.46
2	07-Feb-89	14:43	6.91	11	28.1	4.8	3.2	100	48	51.89
2	07-Feb-89	14:43	6.91	14	28.1	4.1	3.2	100	41	44.33
2	07-Feb-89	14:43	6.91	5	28.7	3.1	3.2	100	31	34.04
2	07-Feb-89	14:43	6.91	1	29.1	1.9	3.2	100	19	21.08
2	07-Feb-89	14:43	6.91	9	28.6	3.5	3.2	100	35	38.33
2	07-Feb-89	14:43	6.91	2	29.2	2.1	3.2	100	21	23.36
2	07-Feb-89	14:43	6.91	3	29.1	2.5	3.2	100	25	27.74
11	07-Feb-89	14:56	7.13	2	28.3	3.2	3.16	100	32	34.78
13	07-Feb-89	14:59	7.18	15	28.3	6	10	100	18.96	20.60
13	07-Feb-89	14:59	7.18	2	28.5	2.8	10	100	8.848	9.67
13	07-Feb-89	14:59	7.18	5	28.5	3.7	10	100	11.692	12.77
13	07-Feb-89	14:59	7.18	10	28.3	5.6	10	100	17.696	19.23
13	07-Feb-89	14:59	7.18	25	28.4	6.3	10	100	19.908	21.69
13	07-Feb-89	14:59	7.18	20	28.3	5.7	10	100	18.012	19.57
13	07-Feb-89	14:59	7.18	1	28.5	2.8	10	100	8.848	9.67
12	07-Feb-89	15:07	7.31	1	28.5	2.5	10	100	7.9	8.63
12	07-Feb-89	15:07	7.31	15	27.9	4.7	10	100	14.852	15.97
12	07-Feb-89	15:07	7.31	10	27.9	4.8	10	100	15.168	16.31
12	07-Feb-89	15:07	7.31	5	27.9	2.6	10	100	8.216	8.84
12	07-Feb-89	15:07	7.31	20	27.8	4.5	10	100	14.22	15.25
14	07-Feb-89	15:14	7.43	1	28.4	2.3	10	100	7.268	7.92
14	07-Feb-89	15:14	7.43	5	28	2.6	10	100	8.216	8.86
14	07-Feb-89	15:14	7.43	10	27.9	4.4	10	100	13.904	14.95
14	07-Feb-89	15:14	7.43	15	27.7	4.3	10	100	13.588	14.54
14	07-Feb-89	15:14	7.43	20	27.6	3.6	10	100	11.376	12.14
14	07-Feb-89	15:14	7.43	25	27.4	6.4	10	100	20.224	21.47
14	07-Feb-89	15:14	7.43	30	27.3	2.2	10	100	6.952	7.36
15	07-Feb-89	15:27	7.64	1	28.3	2.8	10	100	8.848	9.62
15	07-Feb-89	15:27	7.64	5	28.1	2.8	10	100	8.848	9.57
15	07-Feb-89	15:27	7.64	10	28.1	4.5	10	100	14.22	15.37
15	07-Feb-89	15:27	7.64	15	27.8	3.3	10	100	10.428	11.19
15	07-Feb-89	15:29	7.68	20	27.8	5.3	10	100	16.748	17.97
15	07-Feb-89	15:29	7.68	25	27	2.9	10	100	9.164	9.63
16	07-Feb-89	15:34	7.76	5	28	3.1	10	100	9.796	10.56
16	07-Feb-89	15:34	7.76	10	28.1	4.8	10	100	15.168	16.40
16	07-Feb-89	15:34	7.76	1	28.2	2.9	10	100	9.164	9.93
16	07-Feb-89	15:34	7.76	15	28.2	6.1	10	100	19.276	20.89
16	07-Feb-89	15:34	7.76	20	28	6.3	10	100	19.908	21.47
16	07-Feb-89	15:34	7.76	25	27.5	4	10	100	12.64	13.45
16	07-Feb-89	15:34	7.76	30	27	2	10	100	6.32	6.64
19	07-Feb-89	15:39	7.84	1	27.8	2.6	10	100	8.216	8.81
19	07-Feb-89	15:39	7.84	10	27.9	5.4	10	100	17.064	18.35
19	07-Feb-89	15:39	7.84	20	27.9	5.4	10	100	17.064	18.35
18	07-Feb-89	15:43	7.91	10	27.8	4.6	10	100	14.536	15.59
18	07-Feb-89	15:43	7.91	1	27.8	1.9	10	100	6.004	6.44
18	07-Feb-89	15:43	7.91	20	27.4	4.3	10	100	13.588	14.43
17	07-Feb-89	16:04	8.26	1	28.1	3.1	10	100	9.796	10.59
17	07-Feb-89	16:04	8.26	32	26.5	2.9	10	100	9.164	9.50
17	07-Feb-89	16:11	8.38	20	27.6	5.3	10	100	16.748	17.87
17	07-Feb-89	16:11	8.38	10	27.6	4.2	10	100	13.272	14.16
21	07-Feb-89	16:19	8.51	33	26.8	2.3	10	100	7.268	7.60
21	07-Feb-89	16:20	8.53	20	27.4	6	10	100	18.96	20.13
21	07-Feb-89	16:21	8.54	10	27.8	5.5	10	100	17.38	18.64
21	07-Feb-89	16:21	8.54	1	27.9	6.2	10	100	19.592	21.07
40	07-Feb-89	16:25	8.61	1	27.7	6.2	10	100	19.592	20.96
22	07-Feb-89	16:29	8.68	1	27.6	3.2	10	100	10.112	10.79
22	07-Feb-89	16:29	8.68	10	27.4	3.8	10	100	12.008	12.75

Table 10.5.2-1. Lauderdale Plant Cooling Canal Pond System Dye Study--Uncalibrated Data
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Sta #	Date	Time (real)	Time (elapsed)	Depth (ft)	Temp (oC)	Fluorescence				
						F	Scale	Multiplier	F'	Fo
22	07-Feb-89	16:29	8.68	1	27.6	3.2	10	100	10.112	10.79
22	07-Feb-89	16:29	8.68	30	26.5	6.8	31.6	100	6.8	7.05
22	07-Feb-89	16:29	8.68	20	26.8	3.3	10	100	10.428	10.90
23	07-Feb-89	16:34	8.76	1	27.9	3	10	100	9.48	10.20
23	07-Feb-89	16:34	8.76	10	27.5	3.3	10	100	10.428	11.10
23	07-Feb-89	16:34	8.76	5	27.4	3	10	100	9.48	10.06
23	07-Feb-89	16:34	8.76	1	27.8	2.7	10	100	8.532	9.15
23	07-Feb-89	16:34	8.76	16	27	8.5	10	100	26.86	28.22
24	07-Feb-89	16:42	8.89	10	27.7	5.5	10	100	17.38	18.60
24	07-Feb-89	16:42	8.89	20	27.7	6.9	10	100	21.804	23.33
24	07-Feb-89	16:42	8.89	30	26.7	4.3	10	100	13.588	14.17
24	07-Feb-89	16:42	8.89	1	27.7	4.2	10	100	13.272	14.20
25	07-Feb-89	16:49	9.01	20	27.2	5.5	10	100	17.38	18.36
25	07-Feb-89	16:49	9.01	10	27.4	3.7	10	100	11.692	12.41
25	07-Feb-89	16:49	9.01	1	27.8	3.8	10	100	12.008	12.88
25	07-Feb-89	16:49	9.01	30	26.4	2	10	100	6.32	6.54
26	07-Feb-89	16:57	9.14	10	27.3	3.2	10	100	10.112	10.71
26	07-Feb-89	16:57	9.14	1	27.7	2.8	10	100	8.848	9.47
26	07-Feb-89	16:57	9.14	20	27.4	6.2	10	100	19.592	20.80
27	07-Feb-89	17:02	9.23	20	27	6.5	10	100	20.54	21.58
27	07-Feb-89	17:02	9.23	30	26.4	2.6	10	100	8.216	8.50
27	07-Feb-89	17:03	9.24	10	27.3	5.4	10	100	17.064	18.07
27	07-Feb-89	17:04	9.26	1	27.7	3.1	10	100	9.796	10.48
28	07-Feb-89	17:13	9.41	20	26.9	8	10	100	25.28	26.49
28	07-Feb-89	17:15	9.44	25	26.2	3.2	10	100	10.112	10.41
28	07-Feb-89	17:15	9.44	20	26	2.4	10	100	7.584	7.76
28	07-Feb-89	17:15	9.44	10	27	4.2	10	100	13.272	13.94
28	07-Feb-89	17:15	9.44	10	26.9	2.8	10	100	8.848	9.27
28	07-Feb-89	17:15	9.44	10	26.9	2.7	10	100	8.532	8.94
28	07-Feb-89	17:15	9.44	1	27.2	6.4	10	100	20.224	21.36
28	07-Feb-89	17:15	9.44	1	27.1	2.8	10	100	8.848	9.32
32	07-Feb-89	17:28	9.66	5	27.2	6.2	10	100	19.592	20.69
32	07-Feb-89	17:28	9.66	1	27.3	3.6	10	100	11.376	12.05
33	07-Feb-89	17:32	9.73	1	27.2	5.6	10	100	17.696	18.69
34	07-Feb-89	17:36	9.79	3	26.9	2.9	10	100	9.164	9.60
34	07-Feb-89	17:37	9.81	1	26.9	2.9	10	100	9.164	9.60
35	07-Feb-89	17:41	9.88	30	25.6	2.4	10	100	7.584	7.68
35	07-Feb-89	17:41	9.88	20	26.5	3.7	10	100	11.692	12.13
35	07-Feb-89	17:42	9.89	1	26.8	3.1	10	100	9.796	10.24
35	07-Feb-89	17:42	9.89	10	26.6	3.2	10	100	10.112	10.51
44	07-Feb-89	17:46	9.96	20	26.3	3.1	10	100	9.796	10.11
44	07-Feb-89	17:48	9.99	10	26.5	3.4	10	100	10.744	11.14
44	07-Feb-89	17:49	10.01	1	26.7	3.3	10	100	10.428	10.87
44	07-Feb-89	17:49	10.01	1	26.7	3.3	10	100	10.428	10.87
40	07-Feb-89	17:55	10.11	20	25.9	2.4	10	100	7.584	7.74
40	07-Feb-89	17:55	10.11	1	26.2	3.1	10	100	9.796	10.08
40	07-Feb-89	17:55	10.11	10	26.1	2.7	10	100	8.532	8.76
40	07-Feb-89	18:12	10.39	1	23.9	6.9	31.6	100	6.9	6.69
40	07-Feb-89	18:12	10.39	1	23.9	2.3	10	100	7.268	7.04
18	07-Feb-89	18:35	10.78	1	26.8	4.2	10	100	13.272	13.87
18	07-Feb-89	18:35	10.78	10	27.2	7.1	10	100	22.436	23.70
18	07-Feb-89	18:35	10.78	20	27.1	9.1	10	100	28.756	30.29
18	07-Feb-89	18:35	10.78	30	25.9	3.1	10	100	9.796	10.00
11	07-Feb-89	18:42	10.89	9	29.5	2.8	3.16	100	28	31.39
11	07-Feb-89	18:42	10.89	5	29.7	2.9	3.16	100	29	32.68
11	07-Feb-89	18:42	10.89	1	30.1	2.7	3.16	100	27	30.75
2	07-Feb-89	18:48	10.99	20	27.3	6	3.16	100	60	63.53
2	07-Feb-89	18:48	10.99	10	28.7	3	3.16	100	30	32.94
2	07-Feb-89	18:48	10.99	1	29.2	3	3.16	100	30	33.37
1	07-Feb-89	18:57	11.14	5	31.7	5.2	10	100	16.432	19.51
1	07-Feb-89	18:57	11.14	1	32	4.8	10	100	15.168	18.15
1	07-Feb-89	19:03	11.24	1	29.4	6.9	10	100	21.804	24.38

Table 10.5.2-1. Lauderdale Plant Cooling Canal Pond System Dye Study--Uncalibrated Data
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Sta #	Date	Time (real)	Time (elapsed)	Depth (ft)	Temp (oC)	Fluorescence				
						F	Scale	Multiplier	F'	Fo
1	07-Feb-89	19:03	11.24	1	29.2	2.4	3.16	100	24	26.70
11	07-Feb-89	19:11	11.38	1	29.5	2.5	3.16	100	25	28.03
11	07-Feb-89	19:11	11.38	5	29.7	2.4	3.16	100	24	27.05
13	07-Feb-89	19:21	11.54	10	28.1	6.8	10	100	21.488	23.23
12	07-Feb-89	19:22	11.56	10	27.2	6	10	100	18.96	20.02
14	07-Feb-89	19:24	11.59	10	27	7.6	10	100	24.016	25.23
15	07-Feb-89	19:25	11.61	10	27	7.4	10	100	23.384	24.57
16	07-Feb-89	19:26	11.63	10	27.2	5.8	10	100	18.328	19.36
19	07-Feb-89	19:29	11.68	10	27.6	8.4	10	100	26.544	28.33
18	07-Feb-89	19:30	11.69	10	27.6	6.9	10	100	21.804	23.27
17	07-Feb-89	19:32	11.73	10	27.1	6.6	10	100	20.856	21.97
20	07-Feb-89	19:34	11.76	10	27.5	8.1	10	100	25.596	27.24
21	07-Feb-89	19:35	11.78	10	26.9	6.3	10	100	19.908	20.86
22	07-Feb-89	19:37	11.81	10	27	6.3	10	100	19.908	20.92
23	07-Feb-89	19:39	11.84	10	27.2	7.1	10	100	22.436	23.70
27	07-Feb-89	19:42	11.89	10	26.5	5	10	100	15.8	16.39
26	07-Feb-89	19:44	11.93	10	26.5	6.1	10	100	19.276	19.99
25	07-Feb-89	19:46	11.96	10	26.7	7.2	10	100	22.752	23.72
24	07-Feb-89	19:48	11.99	10	26.9	6.8	10	100	21.488	22.52
24	07-Feb-89	19:57	12.14	5	27	8.8	10	100	27.808	29.22
25	07-Feb-89	20:00	12.19	5	26.8	8.4	10	100	26.544	27.74
26	07-Feb-89	20:02	12.23	5	26.7	7.3	10	100	23.068	24.05
27	07-Feb-89	20:04	12.26	5	26.5	7.4	10	100	23.384	24.25
23	07-Feb-89	20:06	12.29	5	26.7	9.6	10	100	30.336	31.62
22	07-Feb-89	20:09	12.34	5	26.7	9.5	10	100	30.02	31.30
21	07-Feb-89	20:11	12.38	5	26.7	6.4	10	100	20.224	21.08
20	07-Feb-89	20:12	12.39	5	27.1	8.8	10	100	27.808	29.29
17	07-Feb-89	20:16	12.46	5	26.9	7.3	10	100	23.068	24.17
18	07-Feb-89	20:18	12.49	5	26.9	7.4	10	100	23.384	24.50
19	07-Feb-89	20:19	12.51	5	27.1	9	10	100	28.44	29.96
16	07-Feb-89	20:22	12.56	5	27.2	8	10	100	25.28	26.70
15	07-Feb-89	20:25	12.61	5	27.4	8.8	10	100	27.808	29.52
14	07-Feb-89	20:26	12.63	5	27	8.3	10	100	26.228	27.56
12	07-Feb-89	20:29	12.68	5	26.7	7.9	10	100	24.964	26.02
10	07-Feb-89	20:32	12.73	5	26.4	6	10	100	18.96	19.61
9	07-Feb-89	20:34	12.76	5	26.1	5.2	10	100	16.432	16.86
8	07-Feb-89	20:37	12.81	5	26.4	6.5	10	100	20.54	21.25
13	07-Feb-89	20:42	12.89	5	27.5	7.8	10	100	24.648	26.24
13	07-Feb-89	20:44	12.93	5	28.2	9	10	100	28.44	30.83
11	07-Feb-89	20:49	13.01	2	28.9	3.7	10	100	11.692	12.91
2	07-Feb-89	20:50	13.03	5	29.4	3.5	10	100	11.06	12.37
1	07-Feb-89	20:55	13.11	5	30.4	2.8	31.6	100	2.8	3.21
1	07-Feb-89	21:24	13.59	5	23	0	31.6	100	0	0.00
1	07-Feb-89	21:28	13.66	1	29.7	2.6	31.6	100	2.6	2.93

Table 10.5.2-2. Lauderdale Plant Cooling Canal/Pond System Dye Study--Calibrated Data (Page 1 of 31)

Sta No.	Date	Time (real)	Time (elapsed)	Depth (ft)	Temp (°C)	Fluorescence					
						F	Scale	Mult	F'	Fo	C (ppb)
1	07-Feb-89	07:29	-0.33	1	25.0	3.2	31.6	100	3.20	3.19	0.93
1	07-Feb-89	07:40	-0.14	2	25.1	3.0	31.6	100	3.00	3.00	0.88
1	07-Feb-89	07:49	0.01	2	25.1	2.9	31.6	100	2.90	2.90	0.85
1	07-Feb-89	07:53	0.08	2	25.2	4.4	31.6	100	4.40	4.41	1.29
1	07-Feb-89	07:53	0.08	6	25.2	3.2	31.6	100	3.20	3.21	0.94
1	07-Feb-89	08:06	0.29	2	25.1	3.1	1.0	100	97.96	97.96	28.63
1	07-Feb-89	08:08	0.33	2	25.1	1.6	31.6	100	1.60	1.60	0.47
1	07-Feb-89	08:09	0.34	2	25.4	3.0	1.0	100	94.80	95.54	27.92
1	07-Feb-89	08:10	0.36	2	25.4	7.3	1.0	100	230.68	232.49	67.94
1	07-Feb-89	08:11	0.38	2	25.4	7.0	31.6	100	7.00	7.05	2.06
1	07-Feb-89	08:11	0.38	2	25.4	9.0	31.6	100	9.00	9.07	2.65
1	07-Feb-89	08:12	0.39	2	25.4	3.8	10.0	1	1,200.80	1,210.20	353.67
1	07-Feb-89	08:12	0.39	2	25.4	3.0	10.0	1	948.00	955.42	279.22
1	07-Feb-89	08:12	0.39	2	25.4	4.7	10.0	1	1,485.20	1,496.83	437.44
1	07-Feb-89	08:13	0.41	2	25.4	4.2	10.0	1	1,327.20	1,337.59	390.90
1	07-Feb-89	08:13	0.41	2	25.4	4.2	10.0	1	1,327.20	1,337.59	390.90
1	07-Feb-89	08:14	0.43	5	25.5	4.8	10.0	1	1,516.80	1,532.66	447.91
1	07-Feb-89	08:14	0.43	2	25.5	5.1	10.0	1	1,611.60	1,628.45	475.90
1	07-Feb-89	08:14	0.43	2	25.5	4.9	10.0	1	1,548.40	1,564.59	457.24
1	07-Feb-89	08:14	0.43	3	25.5	5.0	10.0	1	1,580.00	1,596.52	466.57
1	07-Feb-89	08:14	0.43	4	25.5	5.0	10.0	1	1,580.00	1,596.52	466.57
1	07-Feb-89	08:14	0.43	2	25.5	5.2	10.0	1	1,643.20	1,660.38	485.24
1	07-Feb-89	08:14	0.43	6	25.5	4.8	10.0	1	1,516.80	1,532.66	447.91
1	07-Feb-89	08:16	0.46	2	25.6	4.4	10.0	1	1,390.40	1,408.59	411.65
1	07-Feb-89	08:19	0.51	2	25.5	1.6	10.0	1	505.60	510.89	149.30
1	07-Feb-89	08:19	0.51	2	25.5	5.2	31.6	100	5.20	5.25	1.54
1	07-Feb-89	08:25	0.61	2	26.8	2.8	31.6	100	2.80	2.93	0.86
11	07-Feb-89	08:28	0.66	2	27.0	2.6	31.6	100	2.60	2.73	0.80
11	07-Feb-89	08:30	0.69	2	27.1	3.0	31.6	100	3.00	3.16	0.92
11	07-Feb-89	08:31	0.71	2	27.1	4.1	31.6	100	4.10	4.32	1.26
11	07-Feb-89	08:32	0.73	2	27.1	9.0	31.6	100	9.00	9.48	2.77
11	07-Feb-89	08:32	0.73	2	27.1	4.5	31.6	100	4.50	4.74	1.39
11	07-Feb-89	08:33	0.74	2	27.1	4.5	10.0	100	14.22	14.98	4.38
11	07-Feb-89	08:34	0.76	2	27.0	3.0	10.0	100	9.48	9.96	2.91
11	07-Feb-89	08:35	0.78	2	27.0	3.5	10.0	100	11.06	11.62	3.40
11	07-Feb-89	08:36	0.79	2	27.0	9.0	3.2	100	90.00	94.56	27.38
11	07-Feb-89	08:37	0.81	2	27.1	2.6	3.2	1	2,600.00	2,738.78	793.06
11	07-Feb-89	08:38	0.83	2	27.1	5.0	3.2	1	5,000.00	5,266.88	1,525.11
11	07-Feb-89	08:40	0.86	2	27.1	2.6	3.2	1	2,600.00	2,738.78	793.06
11	07-Feb-89	08:40	0.86	2	26.9	3.4	3.2	1	3,400.00	3,562.90	1,031.70
11	07-Feb-89	08:41	0.88	2	26.9	3.2	3.2	1	3,200.00	3,353.32	971.01
11	07-Feb-89	08:42	0.89	2	26.9	3.5	3.2	1	3,500.00	3,667.69	1,062.04
11	07-Feb-89	08:43	0.91	2	26.9	3.2	3.2	1	3,200.00	3,353.32	971.01
11	07-Feb-89	08:44	0.93	2	26.9	3.5	3.2	1	3,500.00	3,667.69	1,062.04
11	07-Feb-89	08:45	0.94	2	26.9	3.4	3.2	1	3,400.00	3,562.90	1,031.70
11	07-Feb-89	08:46	0.96	2	26.9	2.8	3.2	1	2,800.00	2,934.15	849.63
11	07-Feb-89	08:47	0.98	2	26.9	1.3	3.2	1	1,300.00	1,362.29	394.47
11	07-Feb-89	08:47	0.98	2	27.0	2.6	1.0	100	82.16	86.32	25.23
11	07-Feb-89	08:48	0.99	3	27.0	2.2	1.0	100	69.52	73.04	21.35
11	07-Feb-89	08:48	0.99	4	27.0	0.8	1.0	100	25.28	26.56	7.76
11	07-Feb-89	08:48	0.99	7	27.0	0.9	1.0	100	28.44	29.88	8.73
11	07-Feb-89	08:48	0.99	5	27.0	1.0	1.0	100	31.60	33.20	9.70
11	07-Feb-89	08:48	0.99	6	27.0	1.7	1.0	100	53.72	56.44	16.49
11	07-Feb-89	08:48	0.99	2	27.0	2.7	1.0	100	85.32	89.64	26.20
11	07-Feb-89	08:50	1.03	2	27.0	2.1	1.0	100	66.36	69.72	20.38
11	07-Feb-89	08:51	1.04	2	27.0	2.0	1.0	100	63.20	66.40	19.41
3	07-Feb-89	08:53	1.08	2	26.9	2.0	31.6	100	2.00	2.10	0.61

Table 10.5.2-2. Lauderdale Plant Cooling Canal/Pond System Dye Study--Calibrated Data (Page 2 of 31)

Sta No.	Date	Time (real)	Time (elapsed)	Depth (ft)	Temp (°C)	Fluorescence					
						F	Scale	Mult	F'	Fo	C (ppb)
2	07-Feb-89	08:55	1.11	2	26.9	3.2	31.6	100	3.20	3.35	0.98
2	07-Feb-89	08:57	1.14	2	26.9	3.2	31.6	100	3.20	3.35	0.98
13	07-Feb-89	09:00	1.19	2	26.5	3.8	31.6	100	3.80	3.94	1.15
13	07-Feb-89	09:03	1.24	2	26.5	3.2	10.0	100	10.11	10.49	3.06
13	07-Feb-89	09:04	1.26	2	26.7	4.7	10.0	100	14.85	15.48	4.52
13	07-Feb-89	09:19	1.51	2	26.9	3.0	10.0	100	9.48	9.93	2.90
11	07-Feb-89	09:22	1.56	2	26.9	3.3	10.0	1	1,042.80	1,092.76	319.35
11	07-Feb-89	09:22	1.56	3	26.9	3.1	10.0	1	979.60	1,026.53	300.00
11	07-Feb-89	09:22	1.56	4	26.9	3.1	10.0	1	979.60	1,026.53	300.00
11	07-Feb-89	09:22	1.56	5	26.9	3.2	10.0	1	1,011.20	1,059.65	309.68
11	07-Feb-89	09:22	1.56	6	26.9	2.9	10.0	1	916.40	960.31	280.64
11	07-Feb-89	09:22	1.56	7	26.9	2.9	10.0	1	916.40	960.31	280.64
11	07-Feb-89	09:22	1.56	8	26.9	3.3	10.0	1	1,042.80	1,092.76	319.35
11	07-Feb-89	09:22	1.56	9	26.9	2.7	10.0	1	853.20	894.08	261.29
8	07-Feb-89	09:27	1.64	2	26.6	4.0	31.6	100	4.00	4.16	1.22
8	07-Feb-89	09:38	1.83	2	26.6	4.0	31.6	100	4.00	4.16	1.22
11	07-Feb-89	09:38	1.83	2	26.9	2.3	1.0	1	7,268.00	7,616.23	2,225.80
13	07-Feb-89	09:39	1.84	2	27.0	6.2	3.2	1	6,200.00	6,513.97	1,886.23
12	07-Feb-89	09:40	1.86	2	27.0	5.6	3.2	1	5,600.00	5,883.59	1,703.69
14	07-Feb-89	09:41	1.88	2	27.0	4.9	3.2	1	4,900.00	5,148.14	1,490.73
15	07-Feb-89	09:43	1.91	2	27.1	4.6	3.2	1	4,600.00	4,845.53	1,403.11
16	07-Feb-89	09:43	1.91	2	27.1	4.6	3.2	1	4,600.00	4,845.53	1,403.11
15	07-Feb-89	09:50	2.03	2	27.1	4.5	3.2	1	4,500.00	4,740.19	1,372.60
14	07-Feb-89	09:52	2.06	2	27.2	4.5	3.2	1	4,500.00	4,752.53	1,376.18
12	07-Feb-89	09:56	2.13	2	27.1	4.6	3.2	1	4,600.00	4,845.53	1,403.11
13	07-Feb-89	10:02	2.23	2	27.2	5.9	3.2	1	5,900.00	6,231.10	1,804.32
13	07-Feb-89	10:03	2.24	2	27.3	8.0	3.2	1	8,000.00	8,470.94	2,452.90
8	07-Feb-89	10:06	2.29	2	27.3	4.5	3.2	1	4,500.00	4,764.90	1,379.76
2	07-Feb-89	12:51	5.04	27	28.3	2.8	3.2	100	28.00	30.43	8.81
1	07-Feb-89	14:01	6.21	2	28.9	0.6	3.2	1	600.00	662.31	191.78
2	07-Feb-89	14:04	6.26	2	28.5	4.6	3.2	1	4,600.00	5,025.16	1,455.12
3	07-Feb-89	14:07	6.31	2	28.5	3.8	3.2	1	3,800.00	4,151.22	1,202.05
4	07-Feb-89	14:07	6.31	2	28.5	2.0	3.2	1	2,000.00	2,184.85	632.66
5	07-Feb-89	14:10	6.36	2	28.3	1.2	3.2	1	1,200.00	1,304.11	377.63
6	07-Feb-89	14:12	6.39	2	29.1	5.0	3.2	1	5,000.00	5,548.00	1,606.52
11	07-Feb-89	14:15	6.44	2	28.3	6.8	3.2	1	6,800.00	7,389.96	2,139.89
13	07-Feb-89	14:16	6.46	2	27.9	0.9	3.2	1	900.00	967.96	280.29
12	07-Feb-89	14:19	6.51	2	28.0	0.7	3.2	1	700.00	754.82	218.57
14	07-Feb-89	14:20	6.53	2	28.0	0.3	31.6	100	0.30	0.32	0.09
15	07-Feb-89	14:22	6.56	2	27.9	0.3	31.6	100	0.30	0.32	0.09
16	07-Feb-89	14:23	6.58	2	28.0	0.2	31.6	100	0.20	0.22	0.06
19	07-Feb-89	14:24	6.59	2	27.7	0.0	31.6	100	0.00	0.00	0.00
18	07-Feb-89	14:27	6.64	2	27.9	0.1	31.6	100	0.10	0.11	0.03
17	07-Feb-89	14:28	6.66	2	27.8	0.1	31.6	100	0.10	0.11	0.03
12	07-Feb-89	14:29	6.68	2	28.0	0.3	31.6	100	0.30	0.32	0.09
13	07-Feb-89	14:31	6.71	2	28.3	0.7	31.6	100	0.70	0.76	0.22
13	07-Feb-89	14:32	6.73	2	28.3	1.3	31.6	100	1.30	1.41	0.41
11	07-Feb-89	14:35	6.78	2	28.5	6.1	10.0	100	19.28	21.06	6.15
11	07-Feb-89	14:37	6.81	10	28.5	9.8	10.0	100	30.97	33.83	9.89
11	07-Feb-89	14:37	6.81	9	28.5	9.9	10.0	100	31.28	34.18	9.99
11	07-Feb-89	14:37	6.81	8	28.5	8.5	10.0	100	26.86	29.34	8.58
11	07-Feb-89	14:37	6.81	3	28.5	8.8	10.0	100	27.81	30.38	8.88
11	07-Feb-89	14:37	6.81	6	28.5	8.5	10.0	100	26.86	29.34	8.58
11	07-Feb-89	14:37	6.81	1	28.5	8.8	10.0	100	27.81	30.38	8.88
11	07-Feb-89	14:37	6.81	4	28.5	9.0	10.0	100	28.44	31.07	9.08
11	07-Feb-89	14:37	6.81	7	28.6	9.6	10.0	100	30.34	33.23	9.71
11	07-Feb-89	14:37	6.81	2	28.5	8.8	10.0	100	27.81	30.38	8.88

Table 10.5.2-2. Lauderdale Plant Cooling Canal/Pond System Dye Study--Calibrated Data (Page 3 of 31)

Sta No.	Date	Time (real)	Time (elapsed)	Depth (ft)	Temp (°C)	Fluorescence					
						F	Scale	Mult	F'	Fo	C (ppb)
11	07-Feb-89	14:37	6.81	11	28.4	3.2	10.0	100	10.11	11.02	3.22
11	07-Feb-89	14:37	6.81	5	28.5	9.0	10.0	100	28.44	31.07	9.08
11	07-Feb-89	14:41	6.88	12	28.4	3.8	10.0	100	12.01	13.08	3.82
2	07-Feb-89	14:43	6.91	13	28.1	5.8	3.2	100	58.00	62.71	18.16
2	07-Feb-89	14:43	6.91	8	28.6	3.3	3.2	100	33.00	36.14	10.47
2	07-Feb-89	14:43	6.91	12	28.1	4.9	3.2	100	49.00	52.98	15.34
2	07-Feb-89	14:43	6.91	20	28.1	2.8	3.2	100	28.00	30.27	8.77
2	07-Feb-89	14:43	6.91	4	28.8	2.8	3.2	100	28.00	30.83	8.93
2	07-Feb-89	14:43	6.91	6	28.8	3.0	3.2	100	30.00	33.03	9.56
2	07-Feb-89	14:43	6.91	14	28.1	5.1	3.2	100	51.00	55.14	15.97
2	07-Feb-89	14:43	6.91	25	28.3	2.8	3.2	100	28.00	30.43	8.81
2	07-Feb-89	14:43	6.91	7	28.6	3.2	3.2	100	32.00	35.05	10.15
2	07-Feb-89	14:43	6.91	10	28.3	3.8	3.2	100	38.00	41.30	11.96
2	07-Feb-89	14:43	6.91	15	28.1	5.5	3.2	100	55.00	59.46	17.22
2	07-Feb-89	14:43	6.91	11	28.1	4.8	3.2	100	48.00	51.89	15.03
2	07-Feb-89	14:43	6.91	14	28.1	4.1	3.2	100	41.00	44.33	12.84
2	07-Feb-89	14:43	6.91	5	28.7	3.1	3.2	100	31.00	34.04	9.86
2	07-Feb-89	14:43	6.91	1	29.1	1.9	3.2	100	19.00	21.08	6.10
2	07-Feb-89	14:43	6.91	9	28.6	3.5	3.2	100	35.00	38.33	11.10
2	07-Feb-89	14:43	6.91	2	29.2	2.1	3.2	100	21.00	23.36	6.76
2	07-Feb-89	14:43	6.91	3	29.1	2.5	3.2	100	25.00	27.74	8.03
11	07-Feb-89	14:56	7.13	2	28.3	3.2	3.16	100	32.00	34.78	10.07
13	07-Feb-89	14:59	7.18	15	28.3	6.0	10	100	18.96	20.60	6.02
13	07-Feb-89	14:59	7.18	2	28.5	2.8	10	100	8.85	9.67	2.82
13	07-Feb-89	14:59	7.18	5	28.5	3.7	10	100	11.69	12.77	3.73
13	07-Feb-89	14:59	7.18	10	28.3	5.6	10	100	17.70	19.23	5.62
13	07-Feb-89	14:59	7.18	25	28.4	6.3	10	100	19.91	21.69	6.34
13	07-Feb-89	14:59	7.18	20	28.3	5.7	10	100	18.01	19.57	5.72
13	07-Feb-89	14:59	7.18	1	28.5	2.8	10	100	8.85	9.67	2.82
12	07-Feb-89	15:07	7.31	1	28.5	2.5	10	100	7.90	8.63	2.52
12	07-Feb-89	15:07	7.31	15	27.9	4.7	10	100	14.85	15.97	4.67
12	07-Feb-89	15:07	7.31	10	27.9	4.8	10	100	15.17	16.31	4.77
12	07-Feb-89	15:07	7.31	5	27.9	2.6	10	100	8.22	8.84	2.58
12	07-Feb-89	15:07	7.31	20	27.8	4.5	10	100	14.22	15.25	4.46
14	07-Feb-89	15:14	7.43	1	28.4	2.3	10	100	7.27	7.92	2.31
14	07-Feb-89	15:14	7.43	5	28.0	2.6	10	100	8.22	8.86	2.59
14	07-Feb-89	15:14	7.43	10	27.9	4.4	10	100	13.90	14.95	4.37
14	07-Feb-89	15:14	7.43	15	27.7	4.3	10	100	13.59	14.54	4.25
14	07-Feb-89	15:14	7.43	20	27.6	3.6	10	100	11.38	12.14	3.55
14	07-Feb-89	15:14	7.43	25	27.4	6.4	10	100	20.22	21.47	6.27
14	07-Feb-89	15:14	7.43	30	27.3	2.2	10	100	6.95	7.36	2.15
15	07-Feb-89	15:27	7.64	1	28.3	2.8	10	100	8.85	9.62	2.81
15	07-Feb-89	15:27	7.64	5	28.1	2.8	10	100	8.85	9.57	2.80
15	07-Feb-89	15:27	7.64	10	28.1	4.5	10	100	14.22	15.37	4.49
15	07-Feb-89	15:27	7.64	15	27.8	3.3	10	100	10.43	11.19	3.27
15	07-Feb-89	15:29	7.68	20	27.8	5.3	10	100	16.75	17.97	5.25
15	07-Feb-89	15:29	7.68	25	27.0	2.9	10	100	9.16	9.63	2.81
16	07-Feb-89	15:34	7.76	5	28.0	3.1	10	100	9.80	10.56	3.09
16	07-Feb-89	15:34	7.76	10	28.1	4.8	10	100	15.17	16.40	4.79
16	07-Feb-89	15:34	7.76	1	28.2	2.9	10	100	9.16	9.93	2.90
16	07-Feb-89	15:34	7.76	15	28.2	6.1	10	100	19.28	20.89	6.11
16	07-Feb-89	15:34	7.76	20	28.0	6.3	10	100	19.91	21.47	6.27
16	07-Feb-89	15:34	7.76	25	27.5	4.0	10	100	12.64	13.45	3.93
16	07-Feb-89	15:34	7.76	30	27.0	2.0	10	100	6.32	6.64	1.94
19	07-Feb-89	15:39	7.84	1	27.8	2.6	10	100	8.22	8.81	2.58
19	07-Feb-89	15:39	7.84	10	27.9	5.4	10	100	17.06	18.35	5.36
19	07-Feb-89	15:39	7.84	20	27.9	5.4	10	100	17.06	18.35	5.36

Table 10.5.2-2. Lauderdale Plant Cooling Canal/Pond System Dye Study--Calibrated Data (Page 4 of 31)

Sta No.	Date	Time (real)	Time (elapsed)	Depth (ft)	Temp (°C)	Fluorescence					
						F	Scale	Mult	F'	Fo	C (ppb)
18	07-Feb-89	15:43	7.91	10	27.8	4.6	10	100	14.54	15.59	4.56
18	07-Feb-89	15:43	7.91	1	27.8	1.9	10	100	6.00	6.44	1.88
18	07-Feb-89	15:43	7.91	20	27.4	4.3	10	100	13.59	14.43	4.22
17	07-Feb-89	16:04	8.26	1	28.1	3.1	10	100	9.80	10.59	3.10
17	07-Feb-89	16:04	8.26	32	26.5	2.9	10	100	9.16	9.50	2.78
17	07-Feb-89	16:11	8.38	20	27.6	5.3	10	100	16.75	17.87	5.22
17	07-Feb-89	16:11	8.38	10	27.6	4.2	10	100	13.27	14.16	4.14
21	07-Feb-89	16:19	8.51	33	26.8	2.3	10	100	7.27	7.60	2.22
21	07-Feb-89	16:20	8.53	20	27.4	6.0	10	100	18.96	20.13	5.88
21	07-Feb-89	16:21	8.54	10	27.8	5.5	10	100	17.38	18.64	5.45
21	07-Feb-89	16:21	8.54	1	27.9	6.2	10	100	19.59	21.07	6.16
40	07-Feb-89	16:25	8.61	1	27.7	6.2	10	100	19.59	20.96	6.13
22	07-Feb-89	16:29	8.68	1	27.6	3.2	10	100	10.11	10.79	3.15
22	07-Feb-89	16:29	8.68	10	27.4	3.8	10	100	12.01	12.75	3.73
22	07-Feb-89	16:29	8.68	1	27.6	3.2	10	100	10.11	10.79	3.15
22	07-Feb-89	16:29	8.68	30	26.5	6.8	31.6	100	6.80	7.05	2.06
22	07-Feb-89	16:29	8.68	20	26.8	3.3	10	100	10.43	10.90	3.19
23	07-Feb-89	16:34	8.76	1	27.9	3.0	10	100	9.48	10.20	2.98
23	07-Feb-89	16:34	8.76	10	27.5	3.3	10	100	10.43	11.10	3.24
23	07-Feb-89	16:34	8.76	5	27.4	3.0	10	100	9.48	10.06	2.94
23	07-Feb-89	16:34	8.76	1	27.8	2.7	10	100	8.53	9.15	2.67
23	07-Feb-89	16:34	8.76	16	27.0	8.5	10	100	26.86	28.22	8.25
24	07-Feb-89	16:42	8.89	10	27.7	5.5	10	100	17.38	18.60	5.43
24	07-Feb-89	16:42	8.89	20	27.7	6.9	10	100	21.80	23.33	6.82
24	07-Feb-89	16:42	8.89	30	26.7	4.3	10	100	13.59	14.17	4.14
24	07-Feb-89	16:42	8.89	1	27.7	4.2	10	100	13.27	14.20	4.15
25	07-Feb-89	16:49	9.01	20	27.2	5.5	10	100	17.38	18.36	5.36
25	07-Feb-89	16:49	9.01	10	27.4	3.7	10	100	11.69	12.41	3.63
25	07-Feb-89	16:49	9.01	1	27.8	3.8	10	100	12.01	12.88	3.76
25	07-Feb-89	16:49	9.01	30	26.4	2.0	10	100	6.32	6.54	1.91
26	07-Feb-89	16:57	9.14	10	27.3	3.2	10	100	10.11	10.71	3.13
26	07-Feb-89	16:57	9.14	1	27.7	2.8	10	100	8.85	9.47	2.77
26	07-Feb-89	16:57	9.14	20	27.4	6.2	10	100	19.59	20.80	6.08
27	07-Feb-89	17:02	9.23	20	27.0	6.5	10	100	20.54	21.58	6.31
27	07-Feb-89	17:02	9.23	30	26.4	2.6	10	100	8.22	8.50	2.48
27	07-Feb-89	17:03	9.24	10	27.3	5.4	10	100	17.06	18.07	5.28
27	07-Feb-89	17:04	9.26	1	27.7	3.1	10	100	9.80	10.48	3.06
28	07-Feb-89	17:13	9.41	20	26.9	8.0	10	100	25.28	26.49	7.74
28	07-Feb-89	17:15	9.44	25	26.2	3.2	10	100	10.11	10.41	3.04
28	07-Feb-89	17:15	9.44	20	26.0	2.4	10	100	7.58	7.76	2.27
28	07-Feb-89	17:15	9.44	10	27.0	4.2	10	100	13.27	13.94	4.08
28	07-Feb-89	17:15	9.44	10	26.9	2.8	10	100	8.85	9.27	2.71
28	07-Feb-89	17:15	9.44	10	26.9	2.7	10	100	8.53	8.94	2.61
28	07-Feb-89	17:15	9.44	1	27.2	6.4	10	100	20.22	21.36	6.24
28	07-Feb-89	17:15	9.44	1	27.1	2.8	10	100	8.85	9.32	2.72
32	07-Feb-89	17:28	9.66	5	27.2	6.2	10	100	19.59	20.69	6.05
32	07-Feb-89	17:28	9.66	1	27.3	3.6	10	100	11.38	12.05	3.52
33	07-Feb-89	17:32	9.73	1	27.2	5.6	10	100	17.70	18.69	5.46
34	07-Feb-89	17:36	9.79	3	26.9	2.9	10	100	9.16	9.60	2.81
34	07-Feb-89	17:37	9.81	1	26.9	2.9	10	100	9.16	9.60	2.81
35	07-Feb-89	17:41	9.88	30	25.6	2.4	10	100	7.58	7.68	2.25
35	07-Feb-89	17:41	9.88	20	26.5	3.7	10	100	11.69	12.13	3.54
35	07-Feb-89	17:42	9.89	1	26.8	3.1	10	100	9.80	10.24	2.99
35	07-Feb-89	17:42	9.89	10	26.6	3.2	10	100	10.11	10.51	3.07
44	07-Feb-89	17:46	9.96	20	26.3	3.1	10	100	9.80	10.11	2.95
44	07-Feb-89	17:48	9.99	10	26.5	3.4	10	100	10.74	11.14	3.26
44	07-Feb-89	17:49	10.01	1	26.7	3.3	10	100	10.43	10.87	3.18

Table 10.5.2-2. Lauderdale Plant Cooling Canal/Pond System Dye Study--Calibrated Data (Page 5 of 31)

Sta No.	Date	Time (real)	Time (elapsed)	Depth (ft)	Temp (°C)	Fluorescence					
						F	Scale	Mult	F'	Fo	C (ppb)
44	07-Feb-89	17:49	10.01	1	26.7	3.3	10	100	10.43	10.87	3.18
40	07-Feb-89	17:55	10.11	20	25.9	2.4	10	100	7.58	7.74	2.26
40	07-Feb-89	17:55	10.11	1	26.2	3.1	10	100	9.80	10.08	2.95
40	07-Feb-89	17:55	10.11	10	26.1	2.7	10	100	8.53	8.76	2.56
40	07-Feb-89	18:12	10.39	1	23.9	6.9	31.6	100	6.90	6.69	1.95
40	07-Feb-89	18:12	10.39	1	23.9	2.3	10	100	7.27	7.04	2.06
18	07-Feb-89	18:35	10.78	1	26.8	4.2	10	100	13.27	13.87	4.05
18	07-Feb-89	18:35	10.78	10	27.2	7.1	10	100	22.44	23.70	6.92
18	07-Feb-89	18:35	10.78	20	27.1	9.1	10	100	28.76	30.29	8.85
18	07-Feb-89	18:35	10.78	30	25.9	3.1	10	100	9.80	10.00	2.92
11	07-Feb-89	18:42	10.89	9	29.5	2.8	3.16	100	28.00	31.39	9.09
11	07-Feb-89	18:42	10.89	5	29.7	2.9	3.16	100	29.00	32.68	9.46
11	07-Feb-89	18:42	10.89	1	30.1	2.7	3.16	100	27.00	30.75	8.90
2	07-Feb-89	18:48	10.99	20	27.3	6.0	3.16	100	60.00	63.53	18.40
2	07-Feb-89	18:48	10.99	10	28.7	3.0	3.16	100	30.00	32.94	9.54
2	07-Feb-89	18:48	10.99	1	29.2	3.0	3.16	100	30.00	33.37	9.66
1	07-Feb-89	18:57	11.14	5	31.7	5.2	10	100	16.43	19.51	5.70
1	07-Feb-89	18:57	11.14	1	32.0	4.8	10	100	15.17	18.15	5.30
1	07-Feb-89	19:03	11.24	1	29.4	6.9	10	100	21.80	24.38	7.13
1	07-Feb-89	19:03	11.24	1	29.2	2.4	3.16	100	24.00	26.70	7.73
11	07-Feb-89	19:11	11.38	1	29.5	2.5	3.16	100	25.00	28.03	8.12
11	07-Feb-89	19:11	11.38	5	29.7	2.4	3.16	100	24.00	27.05	7.83
13	07-Feb-89	19:21	11.54	10	28.1	6.8	10	100	21.49	23.23	6.79
12	07-Feb-89	19:22	11.56	10	27.2	6.0	10	100	18.96	20.02	5.85
14	07-Feb-89	19:24	11.59	10	27.0	7.6	10	100	24.02	25.23	7.37
15	07-Feb-89	19:25	11.61	10	27.0	7.4	10	100	23.38	24.57	7.18
16	07-Feb-89	19:26	11.63	10	27.2	5.8	10	100	18.33	19.36	5.66
19	07-Feb-89	19:29	11.68	10	27.6	8.4	10	100	26.54	28.33	8.28
18	07-Feb-89	19:30	11.69	10	27.6	6.9	10	100	21.80	23.27	6.80
17	07-Feb-89	19:32	11.73	10	27.1	6.6	10	100	20.86	21.97	6.42
20	07-Feb-89	19:34	11.76	10	27.5	8.1	10	100	25.60	27.24	7.96
21	07-Feb-89	19:35	11.78	10	26.9	6.3	10	100	19.91	20.86	6.10
22	07-Feb-89	19:37	11.81	10	27.0	6.3	10	100	19.91	20.92	6.11
23	07-Feb-89	19:39	11.84	10	27.2	7.1	10	100	22.44	23.70	6.92
27	07-Feb-89	19:42	11.89	10	26.5	5.0	10	100	15.80	16.39	4.79
26	07-Feb-89	19:44	11.93	10	26.5	6.1	10	100	19.28	19.99	5.84
25	07-Feb-89	19:46	11.96	10	26.7	7.2	10	100	22.75	23.72	6.93
24	07-Feb-89	19:48	11.99	10	26.9	6.8	10	100	21.49	22.52	6.58
24	07-Feb-89	19:57	12.14	5	27.0	8.8	10	100	27.81	29.22	8.54
25	07-Feb-89	20:00	12.19	5	26.8	8.4	10	100	26.54	27.74	8.11
26	07-Feb-89	20:02	12.23	5	26.7	7.3	10	100	23.07	24.05	7.03
27	07-Feb-89	20:04	12.26	5	26.5	7.4	10	100	23.38	24.25	7.09
23	07-Feb-89	20:06	12.29	5	26.7	9.6	10	100	30.34	31.62	9.24
22	07-Feb-89	20:09	12.34	5	26.7	9.5	10	100	30.02	31.30	9.15
21	07-Feb-89	20:11	12.38	5	26.7	6.4	10	100	20.22	21.08	6.16
20	07-Feb-89	20:12	12.39	5	27.1	8.8	10	100	27.81	29.29	8.56
17	07-Feb-89	20:16	12.46	5	26.9	7.3	10	100	23.07	24.17	7.06
18	07-Feb-89	20:18	12.49	5	26.9	7.4	10	100	23.38	24.50	7.16
19	07-Feb-89	20:19	12.51	5	27.1	9.0	10	100	28.44	29.96	8.76
16	07-Feb-89	20:22	12.56	5	27.2	8.0	10	100	25.28	26.70	7.80
15	07-Feb-89	20:25	12.61	5	27.4	8.8	10	100	27.81	29.52	8.63
14	07-Feb-89	20:26	12.63	5	27.0	8.3	10	100	26.23	27.56	8.05
12	07-Feb-89	20:29	12.68	5	26.7	7.9	10	100	24.96	26.02	7.61
10	07-Feb-89	20:32	12.73	5	26.4	6.0	10	100	18.96	19.61	5.73
9	07-Feb-89	20:34	12.76	5	26.1	5.2	10	100	16.43	16.86	4.93
8	07-Feb-89	20:37	12.81	5	26.4	6.5	10	100	20.54	21.25	6.21
13	07-Feb-89	20:42	12.89	5	27.5	7.8	10	100	24.65	26.24	7.67

Table 10.5.2-2. Lauderdale Plant Cooling Canal/Pond System Dye Study--Calibrated Data (Page 6 of 31)

Sta No.	Date	Time (real)	Time (elapsed)	Depth (ft)	Temp (°C)	Fluorescence					
						F	Scale	Mult	F'	Fo	C (ppb)
13	07-Feb-89	20:44	12.93	5	28.2	9.0	10	100	28.44	30.83	9.01
11	07-Feb-89	20:49	13.01	2	28.9	3.7	10	100	11.69	12.91	3.77
2	07-Feb-89	20:50	13.03	5	29.4	3.5	10	100	11.06	12.37	3.61
1	07-Feb-89	20:55	13.11	5	30.4	2.8	31.6	100	2.80	3.21	0.94
1	07-Feb-89	21:24	13.59	5	23.0	0.0	31.6	100	0.00	0.00	0.00
1	07-Feb-89	21:28	13.66	1	29.7	2.6	31.6	100	2.60	2.93	0.86
1	07-Feb-89	22:46	14.96	1	28.0	2.0	31.6	100	2.00	2.16	0.63
2	07-Feb-89	23:12	15.39	1	28.0	0.0	31.6	100	0.00	0.00	0.00
2	07-Feb-89	23:15	15.44	20	28.8	4.2	31.6	100	4.20	4.62	1.35
2	07-Feb-89	23:15	15.44	10	28.7	2.8	10	100	8.85	9.72	2.84
2	07-Feb-89	23:15	15.44	1	28.2	3.9	10	100	12.32	13.36	3.90
11	07-Feb-89	23:19	15.51	2	28.4	4.4	10	100	13.90	15.15	4.43
13	07-Feb-89	23:21	15.54	1	26.2	1.0	31.6	100	1.00	1.03	0.30
13	07-Feb-89	23:21	15.54	5	27.4	7.4	31.6	100	7.40	7.86	2.30
13	07-Feb-89	23:21	15.54	10	27.6	8.2	31.6	100	8.20	8.75	2.56
13	07-Feb-89	23:21	15.54	20	27.8	3.3	10	100	10.43	11.19	3.27
13	07-Feb-89	23:21	15.54	25	27.3	2.7	10	100	8.53	9.03	2.64
12	07-Feb-89	23:27	15.64	20	27.3	4.4	10	100	13.90	14.72	4.30
12	07-Feb-89	23:27	15.64	5	27.1	2.8	10	100	8.85	9.32	2.72
12	07-Feb-89	23:27	15.64	10	27.4	3.5	10	100	11.06	11.74	3.43
12	07-Feb-89	23:27	15.64	1	26.7	2.7	10	100	8.53	8.89	2.60
14	07-Feb-89	23:33	15.74	1	26.8	3.9	10	100	12.32	12.88	3.76
14	07-Feb-89	23:33	15.74	5	26.8	3.4	10	100	10.74	11.23	3.28
14	07-Feb-89	23:33	15.74	10	27.0	5.2	10	100	16.43	17.26	5.05
14	07-Feb-89	23:33	15.74	20	26.7	4.8	10	100	15.17	15.81	4.62
14	07-Feb-89	23:33	15.74	30	25.7	2.1	10	100	6.64	6.74	1.97
15	07-Feb-89	23:37	15.81	10	26.9	5.3	10	100	16.75	17.55	5.13
15	07-Feb-89	23:37	15.81	1	26.2	3.8	31.6	100	3.80	3.91	1.14
15	07-Feb-89	23:37	15.81	20	26.7	4.9	10	100	15.48	16.14	4.72
15	07-Feb-89	23:37	15.81	30	25.8	3.1	10	100	9.80	9.98	2.92
16	07-Feb-89	23:40	15.86	10	27.2	4.4	10	100	13.90	14.68	4.29
16	07-Feb-89	23:40	15.86	1	26.6	2.3	10	100	7.27	7.56	2.21
16	07-Feb-89	23:40	15.86	20	26.9	4.5	10	100	14.22	14.90	4.35
16	07-Feb-89	23:40	15.86	30	25.7	6.5	31.6	100	6.50	6.60	1.93
19	07-Feb-89	23:47	15.98	1	27.2	4.8	10	100	15.17	16.02	4.68
19	07-Feb-89	23:47	15.98	10	27.8	9.5	10	100	30.02	32.20	9.41
19	07-Feb-89	23:47	15.98	20	27.7	3.2	10	100	10.11	10.82	3.16
18	07-Feb-89	23:49	16.01	10	27.7	9.4	31.6	100	9.40	10.06	2.94
18	07-Feb-89	23:49	16.01	1	27.5	1.5	31.6	100	1.50	1.60	0.47
18	07-Feb-89	23:49	16.01	20	27.3	4.0	10	100	12.64	13.38	3.91
18	07-Feb-89	23:49	16.01	30	26.1	1.3	31.6	100	1.30	1.33	0.39
17	07-Feb-89	23:53	16.08	20	27.1	4.0	10	100	12.64	13.31	3.89
17	07-Feb-89	23:53	16.08	10	27.1	3.5	10	100	11.06	11.65	3.40
17	07-Feb-89	23:53	16.08	1	26.3	1.8	31.6	100	1.80	1.86	0.54
17	07-Feb-89	23:53	16.08	25	25.9	2.2	10	100	6.95	7.10	2.07
20	07-Feb-89	23:56	16.13	30	25.7	2.4	31.6	100	2.40	2.44	0.71
20	07-Feb-89	23:56	16.13	10	27.6	9.7	31.6	100	9.70	10.35	3.03
20	07-Feb-89	23:56	16.13	20	26.8	4.0	10	100	12.64	13.21	3.86
20	07-Feb-89	23:56	16.13	1	26.3	1.5	31.6	100	1.50	1.55	0.45
21	08-Feb-89	00:00	16.19	10	27.6	9.3	31.6	100	9.30	9.92	2.90
21	08-Feb-89	00:00	16.19	1	26.0	2.2	31.6	100	2.20	2.25	0.66
21	08-Feb-89	00:00	16.19	20	26.3	3.2	10	100	10.11	10.43	3.05
21	08-Feb-89	00:00	16.19	30	25.6	4.5	31.6	100	4.50	4.56	1.33
22	08-Feb-89	00:03	16.24	10	26.7	9.2	31.6	100	9.20	9.59	2.80
22	08-Feb-89	00:03	16.24	1	26.0	1.4	31.6	100	1.40	1.43	0.42
22	08-Feb-89	00:03	16.24	15	26.4	3.0	10	100	9.48	9.81	2.87
23	08-Feb-89	00:06	16.29	1	26.7	1.1	31.6	100	1.10	1.15	0.34

Table 10.5.2-2. Lauderdale Plant Cooling Canal/Pond System Dye Study--Calibrated Data (Page 7 of 31)

Sta No.	Date	Time (real)	Time (elapsed)	Depth (ft)	Temp (°C)	Fluorescence					
						F	Scale	Mult	F'	Fo	C (ppb)
23	08-Feb-89	00:06	16.29	7	26.9	3.8	10	100	12.01	12.58	3.68
27	08-Feb-89	00:10	16.36	20	26.5	4.2	10	100	13.27	13.76	4.02
27	08-Feb-89	00:10	16.36	10	27.0	3.4	10	100	10.74	11.29	3.30
27	08-Feb-89	00:10	16.36	1	26.6	7.5	31.6	100	7.50	7.80	2.28
27	08-Feb-89	00:10	16.36	30	25.8	2.3	31.6	100	2.30	2.34	0.68
26	08-Feb-89	00:13	16.41	10	27.4	3.3	10	100	10.43	11.07	3.24
26	08-Feb-89	00:13	16.41	1	26.1	2.6	31.6	100	2.60	2.67	0.78
26	08-Feb-89	00:13	16.41	20	26.7	4.8	10	100	15.17	15.81	4.62
26	08-Feb-89	00:13	16.41	30	25.8	2.8	31.6	100	2.80	2.85	0.83
25	08-Feb-89	00:17	16.48	20	26.7	3.7	10	100	11.69	12.19	3.56
25	08-Feb-89	00:17	16.48	10	27.1	9.6	31.6	100	9.60	10.11	2.96
25	08-Feb-89	00:17	16.48	1	26.3	1.5	31.6	100	1.50	1.55	0.45
25	08-Feb-89	00:17	16.48	30	25.7	1.4	31.6	100	1.40	1.42	0.42
24	08-Feb-89	00:20	16.53	10	26.7	3.1	10	100	9.80	10.21	2.98
24	08-Feb-89	00:20	16.53	1	26.3	2.7	31.6	100	2.70	2.79	0.81
24	08-Feb-89	00:20	16.53	20	27.0	3.3	10	100	10.43	10.96	3.20
24	08-Feb-89	00:20	16.53	30	25.8	0.9	31.6	100	0.90	0.92	0.27
32	08-Feb-89	00:36	16.79	2	26.7	3.4	10	100	10.74	11.20	3.27
33	08-Feb-89	00:37	16.81	2	26.7	3.0	10	100	9.48	9.88	2.89
35	08-Feb-89	00:40	16.86	20	26.1	6.6	10	100	20.86	21.41	6.26
35	08-Feb-89	00:40	16.86	10	26.0	3.1	31.6	100	3.10	3.17	0.93
35	08-Feb-89	00:40	16.86	1	25.9	1.4	31.6	100	1.40	1.43	0.42
35	08-Feb-89	00:40	16.86	30	25.8	1.9	10	100	6.00	6.11	1.79
36	08-Feb-89	00:43	16.91	1	25.9	3.0	31.6	100	3.00	3.06	0.90
36	08-Feb-89	00:43	16.91	10	26.0	4.6	31.6	100	4.60	4.71	1.38
36	08-Feb-89	00:43	16.91	20	26.1	6.0	31.6	100	6.00	6.16	1.80
36	08-Feb-89	00:43	16.91	30	25.8	5.3	31.6	100	5.30	5.40	1.58
37	08-Feb-89	00:47	16.98	1	25.6	3.6	31.6	100	3.60	3.65	1.07
37	08-Feb-89	00:47	16.98	10	26.1	6.4	31.6	100	6.40	6.57	1.92
37	08-Feb-89	00:47	16.98	20	26.1	2.9	10	100	9.16	9.41	2.75
38	08-Feb-89	00:47	16.98	30	25.6	2.4	10	100	7.58	7.68	2.25
38	08-Feb-89	00:53	17.08	10	25.9	6.5	31.6	100	6.50	6.64	1.94
38	08-Feb-89	00:53	17.08	30	25.9	2.3	31.6	100	2.30	2.35	0.69
38	08-Feb-89	00:53	17.08	20	26.0	8.4	31.6	100	8.40	8.60	2.51
38	08-Feb-89	00:53	17.08	1	25.8	6.3	31.6	100	6.30	6.42	1.87
38	08-Feb-89	00:53	17.08	20	26.0	9.5	31.6	100	9.50	9.72	2.84
39	08-Feb-89	00:57	17.14	30	25.7	7.2	31.6	100	7.20	7.31	2.14
39	08-Feb-89	00:57	17.14	10	25.9	7.5	31.6	100	7.50	7.66	2.24
39	08-Feb-89	00:57	17.14	20	25.9	7.8	31.6	100	7.80	7.96	2.33
39	08-Feb-89	00:57	17.14	1	25.9	7.0	31.6	100	7.00	7.15	2.09
40	08-Feb-89	01:01	17.21	10	25.9	5.4	31.6	100	5.40	5.51	1.61
40	08-Feb-89	01:01	17.21	1	25.8	4.4	31.6	100	4.40	4.48	1.31
40	08-Feb-89	01:01	17.21	20	25.9	6.6	31.6	100	6.60	6.74	1.97
40	08-Feb-89	01:01	17.21	30	25.6	6.5	31.6	100	6.50	6.59	1.92
Nurs	08-Feb-89	01:06	17.29	1	25.9	3.5	31.6	100	3.50	3.57	1.04
Nurs	08-Feb-89	01:06	17.29	10	26.0	3.8	31.6	100	3.80	3.89	1.14
43	08-Feb-89	01:10	17.36	20	26.0	5.0	31.6	100	5.00	5.12	1.50
43	08-Feb-89	01:10	17.36	10	26.0	4.1	31.6	100	4.10	4.20	1.23
43	08-Feb-89	01:10	17.36	1	26.1	3.6	31.6	100	3.60	3.69	1.08
43	08-Feb-89	01:10	17.36	30	25.6	4.5	31.6	100	4.50	4.56	1.33
42	08-Feb-89	01:12	17.39	1	26.0	3.5	31.6	100	3.50	3.58	1.05
42	08-Feb-89	01:12	17.39	10	26.1	3.8	31.6	100	3.80	3.90	1.14
42	08-Feb-89	01:12	17.39	20	26.0	4.8	31.6	100	4.80	4.91	1.44
42	08-Feb-89	01:12	17.39	30	25.8	5.2	31.6	100	5.20	5.30	1.55
41	08-Feb-89	01:15	17.44	30	25.8	4.3	31.6	100	4.30	4.38	1.28
41	08-Feb-89	01:15	17.44	10	26.1	3.0	31.6	100	3.00	3.08	0.90
41	08-Feb-89	01:15	17.44	20	26.0	3.5	31.6	100	3.50	3.58	1.05

Table 10.5.2-2. Lauderdale Plant Cooling Canal/Pond System Dye Study--Calibrated Data (Page 8 of 31)

Sta No.	Date	Time (real)	Time (elapsed)	Depth (ft)	Temp (°C)	Fluorescence					
						F	Scale	Mult	F'	Fo	C (ppb)
41	08-Feb-89	01:15	17.44	1	26.0	2.9	31.6	100	2.90	2.97	0.87
44	08-Feb-89	01:18	17.49	1	26.0	2.7	31.6	100	2.70	2.76	0.81
44	08-Feb-89	01:18	17.49	10	26.0	2.4	31.6	100	2.40	2.46	0.72
44	08-Feb-89	01:18	17.49	20	26.1	4.3	31.6	100	4.30	4.41	1.29
44	08-Feb-89	01:18	17.49	30	25.8	3.2	31.6	100	3.20	3.26	0.95
32	08-Feb-89	01:27	17.64	2	26.7	2.4	10	100	7.58	7.91	2.31
27	08-Feb-89	01:29	17.68	20	26.4	4.4	10	100	13.90	14.38	4.20
27	08-Feb-89	01:29	17.68	10	26.8	3.4	10	100	10.74	11.23	3.28
27	08-Feb-89	01:29	17.68	1	26.0	2.8	31.6	100	2.80	2.87	0.84
27	08-Feb-89	01:29	17.68	30	25.6	3.5	31.6	100	3.50	3.55	1.04
26	08-Feb-89	01:33	17.74	1	25.9	2.0	31.6	100	2.00	2.04	0.60
26	08-Feb-89	01:33	17.74	10	27.1	3.0	10	100	9.48	9.99	2.92
26	08-Feb-89	01:33	17.74	20	26.5	4.0	10	100	12.64	13.11	3.83
26	08-Feb-89	01:33	17.74	30	25.7	2.8	31.6	100	2.80	2.84	0.83
25	08-Feb-89	01:59	18.18	10	27.6	2.4	10	100	7.58	8.09	2.37
24	08-Feb-89	02:01	18.21	10	27.1	3.0	10	100	9.48	9.99	2.92
20	08-Feb-89	02:03	18.24	10	27.1	2.4	10	100	7.58	7.99	2.33
21	08-Feb-89	02:06	18.29	10	27.4	2.8	10	100	8.85	9.39	2.75
22	08-Feb-89	02:07	18.31	10	27.3	2.7	10	100	8.53	9.03	2.64
19	08-Feb-89	02:10	18.36	10	27.5	2.6	10	100	8.22	8.75	2.56
18	08-Feb-89	02:12	18.39	10	27.4	4.1	10	100	12.96	13.75	4.02
17	08-Feb-89	02:14	18.43	10	27.4	3.4	10	100	10.74	11.41	3.33
14	08-Feb-89	02:17	18.48	10	27.3	3.4	10	100	10.74	11.38	3.32
15	08-Feb-89	02:18	18.49	10	27.1	3.5	10	100	11.06	11.65	3.40
16	08-Feb-89	02:19	18.51	10	27.3	3.6	10	100	11.38	12.05	3.52
12	08-Feb-89	02:22	18.56	10	27.5	2.9	10	100	9.16	9.75	2.85
13	08-Feb-89	02:23	18.58	10	27.5	2.2	10	100	6.95	7.40	2.16
11	08-Feb-89	02:25	18.61	10	27.3	2.4	10	100	7.58	8.03	2.35
2	08-Feb-89	02:27	18.64	10	27.0	2.2	10	100	6.95	7.30	2.13
1	08-Feb-89	02:30	18.69	2	25.9	1.7	31.6	100	1.70	1.74	0.51
1	08-Feb-89	03:59	20.18	2	25.6	0.6	31.6	100	0.60	0.61	0.18
2	08-Feb-89	04:01	20.21	1	27.0	0.0	10	100	0.00	0.00	0.00
2	08-Feb-89	04:01	20.21	10	26.2	1.8	10	100	5.69	5.85	1.71
2	08-Feb-89	04:01	20.21	20	26.9	2.7	10	100	8.53	8.94	2.61
11	08-Feb-89	04:07	20.31	1	26.3	2.6	10	100	8.22	8.48	2.48
11	08-Feb-89	04:07	20.31	5	26.3	2.5	10	100	7.90	8.15	2.38
12	08-Feb-89	04:11	20.38	20	26.9	2.6	10	100	8.22	8.61	2.52
12	08-Feb-89	04:11	20.38	10	27.0	3.3	10	100	10.43	10.96	3.20
12	08-Feb-89	04:11	20.38	1	25.4	1.0	31.6	100	1.00	1.01	0.29
13	08-Feb-89	04:16	20.46	26	26.5	6.2	31.6	100	6.20	6.43	1.88
13	08-Feb-89	04:16	20.46	10	26.5	6.3	31.6	100	6.30	6.53	1.91
13	08-Feb-89	04:16	20.46	20	26.4	6.2	31.6	100	6.20	6.41	1.87
13	08-Feb-89	04:16	20.46	1	25.5	1.4	31.6	100	1.40	1.41	0.41
14	08-Feb-89	04:22	20.56	10	26.7	3.7	10	100	11.69	12.19	3.56
14	08-Feb-89	04:22	20.56	1	25.5	1.9	31.6	100	1.90	1.92	0.56
14	08-Feb-89	04:22	20.56	20	26.8	2.8	10	100	8.85	9.25	2.70
14	08-Feb-89	04:22	20.56	30	25.7	1.8	31.6	100	1.80	1.83	0.53
15	08-Feb-89	04:26	20.63	30	25.8	3.2	31.6	100	3.20	3.26	0.95
15	08-Feb-89	04:26	20.63	10	26.8	7.6	31.6	100	7.60	7.94	2.32
15	08-Feb-89	04:26	20.63	20	26.8	8.4	31.6	100	8.40	8.78	2.57
15	08-Feb-89	04:26	20.63	1	25.7	2.8	31.6	100	2.80	2.84	0.83
16	08-Feb-89	04:31	20.71	10	26.9	8.3	31.6	100	8.30	8.70	2.54
16	08-Feb-89	04:31	20.71	1	25.5	1.9	31.6	100	1.90	1.92	0.56
16	08-Feb-89	04:31	20.71	20	26.8	7.2	31.6	100	7.20	7.53	2.20
16	08-Feb-89	04:31	20.71	30	25.8	1.8	31.6	100	1.80	1.83	0.54
19	08-Feb-89	04:36	20.79	1	25.5	3.3	31.6	100	3.30	3.33	0.97
19	08-Feb-89	04:36	20.79	10	27.2	8.6	31.6	100	8.60	9.08	2.65

Table 10.5.2-2. Lauderdale Plant Cooling Canal/Pond System Dye Study--Calibrated Data (Page 9 of 31)

Sta No.	Date	Time (real)	Time (elapsed)	Depth (ft)	Temp (°C)	Fluorescence					
						F	Scale	Mult	F'	Fo	C (ppb)
19	08-Feb-89	04:36	20.79	20	26.7	6.4	31.6	100	6.40	6.67	1.95
18	08-Feb-89	04:39	20.84	10	27.1	7.5	31.6	100	7.50	7.90	2.31
18	08-Feb-89	04:39	20.84	1	25.9	2.8	31.6	100	2.80	2.86	0.84
18	08-Feb-89	04:39	20.84	20	26.8	6.3	31.6	100	6.30	6.58	1.92
18	08-Feb-89	04:39	20.84	30	25.7	3.3	31.6	100	3.30	3.35	0.98
17	08-Feb-89	04:44	20.93	20	26.8	3.2	10	100	10.11	10.57	3.09
17	08-Feb-89	04:44	20.93	10	26.9	4.0	10	100	12.64	13.25	3.87
17	08-Feb-89	04:44	20.93	1	25.6	3.4	31.6	100	3.40	3.44	1.01
17	08-Feb-89	04:44	20.93	30	25.5	0.4	31.6	100	0.40	0.40	0.12
20	08-Feb-89	04:49	21.01	10	26.8	8.4	31.6	100	8.40	8.78	2.57
20	08-Feb-89	04:49	21.01	1	25.6	3.3	31.6	100	3.30	3.34	0.98
20	08-Feb-89	04:49	21.01	20	26.8	6.7	31.6	100	6.70	7.00	2.05
20	08-Feb-89	04:49	21.01	30	25.6	0.5	31.6	100	0.50	0.51	0.15
21	08-Feb-89	04:53	21.08	1	25.5	2.9	31.6	100	2.90	2.93	0.86
21	08-Feb-89	04:53	21.08	10	26.6	9.6	31.6	100	9.60	9.98	2.92
21	08-Feb-89	04:53	21.08	20	26.5	2.7	10	100	8.53	8.85	2.59
21	08-Feb-89	04:53	21.08	30	25.6	0.6	31.6	100	0.60	0.61	0.18
22	08-Feb-89	04:56	21.13	1	25.7	3.3	31.6	100	3.30	3.35	0.98
22	08-Feb-89	04:56	21.13	10	26.7	9.5	31.6	100	9.50	9.90	2.89
22	08-Feb-89	04:56	21.13	15	26.3	9.2	31.6	100	9.20	9.49	2.77
23	08-Feb-89	05:00	21.19	1	26.1	5.6	31.6	100	5.60	5.75	1.68
23	08-Feb-89	05:00	21.19	10	26.5	3.7	10	100	11.69	12.13	3.54
29	08-Feb-89	05:04	21.26	20	25.9	2.8	10	100	8.85	9.03	2.64
29	08-Feb-89	05:04	21.26	10	26.6	4.0	10	100	12.64	13.14	3.84
29	08-Feb-89	05:04	21.26	1	25.7	2.9	31.6	100	2.90	2.95	0.86
29	08-Feb-89	05:04	21.26	30	25.5	0.7	31.6	100	0.70	0.71	0.21
27	08-Feb-89	05:11	21.38	20	27.1	8.1	31.6	100	8.10	8.53	2.49
27	08-Feb-89	05:11	21.38	10	27.2	9.3	31.6	100	9.30	9.82	2.87
27	08-Feb-89	05:11	21.38	1	26.4	8.2	31.6	100	8.20	8.48	2.48
27	08-Feb-89	05:11	21.38	30	25.7	0.5	31.6	100	0.50	0.51	0.15
26	08-Feb-89	05:17	21.48	10	27.1	8.6	31.6	100	8.60	9.06	2.65
26	08-Feb-89	05:17	21.48	1	25.8	6.8	31.6	100	6.80	6.92	2.02
26	08-Feb-89	05:17	21.48	20	26.9	8.4	31.6	100	8.40	8.80	2.57
26	08-Feb-89	05:17	21.48	30	25.7	0.4	31.6	100	0.40	0.41	0.12
25	08-Feb-89	05:21	21.54	10	26.7	9.0	31.6	100	9.00	9.38	2.74
25	08-Feb-89	05:21	21.54	1	25.8	3.1	31.6	100	3.10	3.16	0.92
25	08-Feb-89	05:21	21.54	20	26.8	2.4	31.6	100	2.40	2.51	0.73
25	08-Feb-89	05:21	21.54	30	25.5	0.4	31.6	100	0.40	0.40	0.12
28	08-Feb-89	05:29	21.68	1	25.7	4.0	31.6	100	4.00	4.06	1.19
28	08-Feb-89	05:29	21.68	10	26.9	3.0	10	100	9.48	9.93	2.90
28	08-Feb-89	05:29	21.68	20	26.3	3.4	10	100	10.74	11.08	3.24
28	08-Feb-89	05:29	21.68	26	25.3	0.4	31.6	100	0.40	0.40	0.12
32	08-Feb-89	05:29	21.68	2	25.9	1.8	10	100	5.69	5.81	1.70
35	08-Feb-89	05:37	21.81	1	25.5	0.9	31.6	100	0.90	0.91	0.27
35	08-Feb-89	05:39	21.84	10	25.5	1.5	31.6	100	1.50	1.52	0.44
35	08-Feb-89	05:39	21.84	20	25.5	3.5	31.6	100	3.50	3.54	1.03
35	08-Feb-89	05:39	21.84	30	25.9	4.2	31.6	100	4.20	4.29	1.25
36	08-Feb-89	05:43	21.91	10	25.6	2.3	31.6	100	2.30	2.33	0.68
36	08-Feb-89	05:43	21.91	1	25.4	0.9	31.6	100	0.90	0.91	0.27
36	08-Feb-89	05:43	21.91	20	25.7	3.0	31.6	100	3.00	3.05	0.89
36	08-Feb-89	05:48	21.99	30	25.7	3.5	31.6	100	3.50	3.56	1.04
37	08-Feb-89	05:48	21.99	1	25.3	0.8	31.6	100	0.80	0.80	0.24
37	08-Feb-89	05:48	21.99	10	25.7	2.3	31.6	100	2.30	2.34	0.68
37	08-Feb-89	05:48	21.99	20	25.8	3.2	31.6	100	3.20	3.26	0.95
37	08-Feb-89	05:48	21.99	30	25.7	3.0	31.6	100	3.00	3.05	0.89
40	08-Feb-89	05:54	22.09	10	25.3	2.0	31.6	100	2.00	2.01	0.59
40	08-Feb-89	05:58	22.16	10	25.6	1.7	31.6	100	1.70	1.72	0.50

Table 10.5.2-2. Lauderdale Plant Cooling Canal/Pond System Dye Study--Calibrated Data (Page 10 of 31)

Sta No.	Date	Time (real)	Time (elapsed)	Depth (ft)	Temp (°C)	Fluorescence					
						F	Scale	Mult	F'	Fo	C (ppb)
39	08-Feb-89	06:00	22.19	10	25.5	1.1	31.6	100	1.10	1.11	0.32
39	08-Feb-89	06:00	22.19	15	25.7	2.5	31.6	100	2.50	2.54	0.74
39	08-Feb-89	06:00	22.19	20	25.7	2.7	31.6	100	2.70	2.74	0.80
44	08-Feb-89	06:08	22.33	13	25.6	2.7	31.6	100	2.70	2.74	0.80
44	08-Feb-89	06:08	22.33	10	25.6	2.7	31.6	100	2.70	2.74	0.80
44	08-Feb-89	06:08	22.33	1	25.6	2.5	31.6	100	2.50	2.53	0.74
27	08-Feb-89	06:17	22.48	15	26.9	7.1	31.6	100	7.10	7.44	2.17
26	08-Feb-89	06:24	22.59	15	26.7	3.4	10	100	10.74	11.20	3.27
26	08-Feb-89	06:24	22.59	1	25.9	6.7	31.6	100	6.70	6.84	2.00
24	08-Feb-89	06:26	22.63	15	26.6	2.6	10	100	8.22	8.54	2.50
25	08-Feb-89	06:26	22.63	15	26.8	7.2	31.6	100	7.20	7.53	2.20
20	08-Feb-89	06:32	22.73	15	26.9	7.1	31.6	100	7.10	7.44	2.17
21	08-Feb-89	06:34	22.76	15	26.7	9.4	31.6	100	9.40	9.80	2.86
22	08-Feb-89	06:35	22.78	15	26.4	6.3	10	100	19.91	20.59	6.02
23	08-Feb-89	06:38	22.83	8	26.3	3.3	10	100	10.43	10.76	3.14
19	08-Feb-89	06:40	22.86	15	26.6	7.1	31.6	100	7.10	7.38	2.16
18	08-Feb-89	06:42	22.89	15	26.5	7.5	31.6	100	7.50	7.78	2.27
17	08-Feb-89	06:43	22.91	15	26.6	3.4	10	100	10.74	11.17	3.26
14	08-Feb-89	06:45	22.94	15	26.6	8.1	316	100	0.81	0.84	0.25
15	08-Feb-89	06:48	22.99	15	26.5	7.1	31.6	100	7.10	7.36	2.15
16	08-Feb-89	06:49	23.01	15	26.5	7.0	31.6	100	7.00	7.26	2.12
12	08-Feb-89	06:52	23.06	15	26.6	8.7	31.6	100	8.70	9.05	2.64
13	08-Feb-89	06:54	23.09	15	26.4	8.4	31.6	100	8.40	8.69	2.54
11	08-Feb-89	06:57	23.14	8	26.5	2.3	10	100	7.27	7.54	2.20
2	08-Feb-89	06:58	23.16	15	27.1	5.0	10	100	15.80	16.64	4.86
3	08-Feb-89	06:59	23.18	5	27.0	4.0	10	100	12.64	13.28	3.88
4	08-Feb-89	07:02	23.23	2	27.6	7.5	10	100	23.70	25.29	7.39
5	08-Feb-89	07:06	23.29	4	27.5	5.4	10	100	17.06	18.16	5.31
1	08-Feb-89	07:52	24.06	2	24.9	0.2	31.6	100	0.20	0.20	0.06
2	08-Feb-89	07:58	24.16	10	26.7	2.5	10	100	7.90	8.24	2.41
2	08-Feb-89	07:58	24.16	1	27.1	6.4	10	100	20.22	21.30	6.23
2	08-Feb-89	07:58	24.16	20	26.1	2.1	10	100	6.64	6.81	1.99
3	08-Feb-89	08:05	24.28	1	27.1	7.2	10	100	22.75	23.97	7.00
3	08-Feb-89	08:05	24.28	10	26.3	1.7	10	100	5.37	5.54	1.62
3	08-Feb-89	08:05	24.28	20	26.3	2.1	10	100	6.64	6.85	2.00
4	08-Feb-89	08:24	24.59	10	26.4	1.7	10	100	5.37	5.56	1.62
4	08-Feb-89	08:24	24.59	1	27.1	6.8	10	100	21.49	22.63	6.61
4	08-Feb-89	08:24	24.59	20	26.3	1.5	10	100	4.74	4.89	1.43
4	08-Feb-89	08:24	24.59	30	26.3	1.5	10	100	4.74	4.89	1.43
5	08-Feb-89	08:29	24.68	10	27.1	3.5	10	100	11.06	11.65	3.40
5	08-Feb-89	08:29	24.68	1	27.2	7.4	10	100	23.38	24.70	7.22
5	08-Feb-89	08:29	24.68	20	26.8	2.0	10	100	6.32	6.61	1.93
5	08-Feb-89	08:29	24.68	30	26.8	1.5	10	100	4.74	4.95	1.45
6	08-Feb-89	08:35	24.78	10	27.2	2.6	10	100	8.22	8.68	2.54
6	08-Feb-89	08:35	24.78	1	27.1	3.4	31.6	100	3.40	3.58	1.05
6	08-Feb-89	08:35	24.78	20	26.8	1.5	10	100	4.74	4.95	1.45
6	08-Feb-89	08:35	24.78	27	26.4	1.5	10	100	4.74	4.90	1.43
11	08-Feb-89	08:55	25.11	1	27.5	4.0	10	100	12.64	13.45	3.93
11	08-Feb-89	08:55	25.11	8	26.9	1.8	10	100	5.69	5.96	1.74
10	08-Feb-89	09:02	25.23	20	27.0	2.4	10	100	7.58	7.97	2.33
10	08-Feb-89	09:02	25.23	10	26.9	2.9	10	100	9.16	9.60	2.81
10	08-Feb-89	09:02	25.23	1	25.6	0.7	31.6	100	0.70	0.71	0.21
10	08-Feb-89	09:02	25.23	27	25.8	0.1	31.6	100	0.10	0.10	0.03
9	08-Feb-89	09:07	25.31	10	26.6	2.9	10	100	9.16	9.53	2.78
9	08-Feb-89	09:07	25.31	1	25.5	0.8	31.6	100	0.80	0.81	0.24
9	08-Feb-89	09:07	25.31	20	26.8	2.3	10	100	7.27	7.60	2.22
9	08-Feb-89	09:07	25.31	30	25.8	0.4	31.6	100	0.40	0.41	0.12

Table 10.5.2-2. Lauderdale Plant Cooling Canal/Pond System Dye Study--Calibrated Data (Page 11 of 31)

Sta No.	Date	Time (real)	Time (elapsed)	Depth (ft)	Temp (°C)	Fluorescence					
						F	Scale	Mult	F'	Fo	C (ppb)
8	08-Feb-89	09:25	25.61	1	26.3	0.8	10	100	2.53	2.61	0.76
8	08-Feb-89	09:25	25.61	10	26.8	2.5	10	100	7.90	8.26	2.41
8	08-Feb-89	09:25	25.61	20	27.3	2.4	10	100	7.58	8.03	2.35
8	08-Feb-89	09:29	25.68	30	26.2	4.5	31.6	100	4.50	4.63	1.35
12	08-Feb-89	09:34	25.76	1	26.7	4.5	31.6	100	4.50	4.69	1.37
12	08-Feb-89	09:34	25.76	10	27.2	3.4	10	100	10.74	11.35	3.32
12	08-Feb-89	09:34	25.76	20	27.6	2.8	10	100	8.85	9.44	2.76
13	08-Feb-89	09:38	25.83	1	27.2	2.0	10	100	6.32	6.67	1.95
13	08-Feb-89	09:38	25.83	10	27.5	3.1	10	100	9.80	10.43	3.05
13	08-Feb-89	09:38	25.83	20	27.7	3.2	10	100	10.11	10.82	3.16
14	08-Feb-89	09:42	25.89	10	27.9	3.7	10	100	11.69	12.57	3.67
14	08-Feb-89	09:42	25.89	1	27.8	3.2	10	100	10.11	10.85	3.17
14	08-Feb-89	09:42	25.89	20	27.8	3.4	10	100	10.74	11.53	3.37
14	08-Feb-89	09:42	25.89	30	27.3	3.2	10	100	10.11	10.71	3.13
15	08-Feb-89	09:48	25.99	1	27.5	3.9	10	100	12.32	13.12	3.83
15	08-Feb-89	09:48	25.99	10	27.9	4.2	10	100	13.27	14.27	4.17
15	08-Feb-89	09:48	25.99	20	27.8	4.3	10	100	13.59	14.58	4.26
16	08-Feb-89	09:51	26.04	1	27.4	3.7	10	100	11.69	12.41	3.63
16	08-Feb-89	09:51	26.04	10	27.9	4.3	10	100	13.59	14.61	4.27
16	08-Feb-89	09:51	26.04	20	27.9	4.4	10	100	13.90	14.95	4.37
16	08-Feb-89	09:51	26.04	30	27.7	4.2	10	100	13.27	14.20	4.15
17	08-Feb-89	09:55	26.11	30	27.0	2.6	10	100	8.22	8.63	2.52
17	08-Feb-89	09:55	26.11	10	28.4	4.3	10	100	13.59	14.81	4.33
17	08-Feb-89	09:55	26.11	20	28.1	4.4	10	100	13.90	15.03	4.39
17	08-Feb-89	09:55	26.11	1	28.3	4.8	10	100	15.17	16.48	4.82
18	08-Feb-89	09:58	26.16	10	28.3	4.1	10	100	12.96	14.08	4.11
18	08-Feb-89	09:58	26.16	1	28.6	4.5	10	100	14.22	15.57	4.55
18	08-Feb-89	09:58	26.16	20	28.1	4.0	10	100	12.64	13.67	3.99
18	08-Feb-89	09:58	26.16	30	27.6	3.5	10	100	11.06	11.80	3.45
19	08-Feb-89	10:02	26.23	10	28.4	4.4	10	100	13.90	15.15	4.43
19	08-Feb-89	10:02	26.23	1	27.9	3.9	10	100	12.32	13.25	3.87
19	08-Feb-89	10:02	26.23	20	28.1	4.0	10	100	12.64	13.67	3.99
20	08-Feb-89	10:06	26.29	30	27.1	2.6	10	100	8.22	8.65	2.53
20	08-Feb-89	10:06	26.29	10	28.7	4.3	10	100	13.59	14.92	4.36
20	08-Feb-89	10:06	26.29	20	28.2	4.0	10	100	12.64	13.70	4.00
20	08-Feb-89	10:06	26.29	1	28.6	4.5	10	100	14.22	15.57	4.55
21	08-Feb-89	10:09	26.34	10	28.4	5.4	10	100	17.06	18.59	5.43
21	08-Feb-89	10:09	26.34	1	28.4	4.3	10	100	13.59	14.81	4.33
21	08-Feb-89	10:09	26.34	20	28.2	4.1	10	100	12.96	14.04	4.10
21	08-Feb-89	10:09	26.34	30	27.1	2.8	10	100	8.85	9.32	2.72
22	08-Feb-89	10:13	26.41	16	28.2	4.7	10	100	14.85	16.10	4.70
22	08-Feb-89	10:13	26.41	10	28.5	5.0	10	100	15.80	17.26	5.04
22	08-Feb-89	10:13	26.41	1	28.7	4.5	10	100	14.22	15.62	4.56
24	08-Feb-89	10:17	26.48	10	28.6	4.4	10	100	13.90	15.23	4.45
24	08-Feb-89	10:17	26.48	1	28.7	4.0	10	100	12.64	13.88	4.06
24	08-Feb-89	10:17	26.48	20	28.3	4.0	10	100	12.64	13.74	4.01
24	08-Feb-89	10:17	26.48	30	27.2	2.1	10	100	6.64	7.01	2.05
25	08-Feb-89	10:21	26.54	10	28.4	4.2	10	100	13.27	14.46	4.23
25	08-Feb-89	10:21	26.54	1	28.2	4.0	10	100	12.64	13.70	4.00
25	08-Feb-89	10:21	26.54	20	28.0	3.6	10	100	11.38	12.27	3.58
25	08-Feb-89	10:21	26.54	30	27.1	2.1	10	100	6.64	6.99	2.04
26	08-Feb-89	10:26	26.63	1	28.2	4.0	10	100	12.64	13.70	4.00
26	08-Feb-89	10:26	26.63	10	28.1	3.9	10	100	12.32	13.32	3.89
26	08-Feb-89	10:26	26.63	20	28.0	3.6	10	100	11.38	12.27	3.58
27	08-Feb-89	10:28	26.66	30	26.9	1.9	10	100	6.00	6.29	1.84
27	08-Feb-89	10:28	26.66	10	28.1	3.7	10	100	11.69	12.64	3.69
27	08-Feb-89	10:28	26.66	20	27.9	3.4	10	100	10.74	11.56	3.38

Table 10.5.2-2. Lauderdale Plant Cooling Canal/Pond System Dye Study--Calibrated Data (Page 12 of 31)

Sta No.	Date	Time (real)	Time (elapsed)	Depth (ft)	Temp (°C)	Fluorescence					
						F	Scale	Mult	F'	Fo	C (ppb)
27	08-Feb-89	10:28	26.66	1	28.1	3.9	10	100	12.32	13.32	3.89
28	08-Feb-89	10:32	26.73	10	27.8	4.8	10	100	15.17	16.27	4.76
28	08-Feb-89	10:32	26.73	1	27.7	3.9	10	100	12.32	13.19	3.85
28	08-Feb-89	10:32	26.73	20	27.7	3.8	10	100	12.01	12.85	3.75
28	08-Feb-89	10:32	26.73	30	26.8	1.9	10	100	6.00	6.28	1.83
29	08-Feb-89	10:37	26.81	1	27.3	3.2	10	100	10.11	10.71	3.13
29	08-Feb-89	10:37	26.81	10	27.9	4.3	10	100	13.59	14.61	4.27
29	08-Feb-89	10:37	26.81	20	27.4	3.3	10	100	10.43	11.07	3.24
29	08-Feb-89	10:37	26.81	30	26.6	1.9	10	100	6.00	6.24	1.82
30	08-Feb-89	10:41	26.88	1	26.9	2.7	10	100	8.53	8.94	2.61
30	08-Feb-89	10:41	26.88	10	27.1	4.0	10	100	12.64	13.31	3.89
30	08-Feb-89	10:41	26.88	20	26.8	3.9	10	100	12.32	12.88	3.76
23	08-Feb-89	10:45	26.94	10	27.9	3.9	10	100	12.32	13.25	3.87
23	08-Feb-89	10:45	26.94	1	27.7	3.4	10	100	10.74	11.50	3.36
45	08-Feb-89	10:48	26.99	30	26.7	1.7	10	100	5.37	5.60	1.64
45	08-Feb-89	10:48	26.99	10	28.0	3.8	10	100	12.01	12.95	3.78
45	08-Feb-89	10:48	26.99	20	27.7	3.1	10	100	9.80	10.48	3.06
45	08-Feb-89	10:48	26.99	1	28.0	3.6	10	100	11.38	12.27	3.58
32	08-Feb-89	10:51	27.04	1	27.7	3.9	10	100	12.32	13.19	3.85
32	08-Feb-89	10:51	27.04	8	27.8	3.9	10	100	12.32	13.22	3.86
33	08-Feb-89	10:53	27.08	1	27.3	1.5	10	100	4.74	5.02	1.47
33	08-Feb-89	10:53	27.08	5	27.8	3.4	10	100	10.74	11.53	3.37
34	08-Feb-89	11:02	27.23	1	27.3	1.4	10	100	4.42	4.68	1.37
35	08-Feb-89	11:05	27.28	10	27.2	2.2	10	100	6.95	7.34	2.15
35	08-Feb-89	11:05	27.28	1	27.6	1.9	10	100	6.00	6.41	1.87
35	08-Feb-89	11:05	27.28	20	27.4	2.9	10	100	9.16	9.73	2.84
35	08-Feb-89	11:05	27.28	30	27.1	2.6	10	100	8.22	8.65	2.53
36	08-Feb-89	11:08	27.33	10	27.1	2.4	10	100	7.58	7.99	2.33
36	08-Feb-89	11:08	27.33	1	27.4	2.0	10	100	6.32	6.71	1.96
36	08-Feb-89	11:08	27.33	20	27.1	2.6	10	100	8.22	8.65	2.53
36	08-Feb-89	11:08	27.33	30	27.1	3.1	10	100	9.80	10.32	3.02
37	08-Feb-89	11:11	27.38	35	26.8	2.5	10	100	7.90	8.26	2.41
37	08-Feb-89	11:11	27.38	30	27.0	3.0	10	100	9.48	9.96	2.91
37	08-Feb-89	11:11	27.38	20	27.0	2.7	10	100	8.53	8.96	2.62
37	08-Feb-89	11:11	27.38	10	27.0	2.4	10	100	7.58	7.97	2.33
37	08-Feb-89	11:11	27.38	1	27.3	2.1	10	100	6.64	7.03	2.05
38	08-Feb-89	11:16	27.46	1	27.3	2.0	10	100	6.32	6.69	1.96
38	08-Feb-89	11:16	27.46	10	27.1	2.3	10	100	7.27	7.66	2.24
38	08-Feb-89	11:16	27.46	20	27.1	2.7	10	100	8.53	8.99	2.63
38	08-Feb-89	11:16	27.46	30	27.0	2.7	10	100	8.53	8.96	2.62
38	08-Feb-89	11:16	27.46	35	27.0	2.7	10	100	8.53	8.96	2.62
39	08-Feb-89	11:20	27.53	1	27.6	2.0	10	100	6.32	6.74	1.97
39	08-Feb-89	11:20	27.53	10	27.2	2.3	10	100	7.27	7.68	2.24
39	08-Feb-89	11:20	27.53	20	27.1	2.5	10	100	7.90	8.32	2.43
39	08-Feb-89	11:20	27.53	30	27.0	2.5	10	100	7.90	8.30	2.43
40	08-Feb-89	11:24	27.59	30	27.0	2.6	10	100	8.22	8.63	2.52
40	08-Feb-89	11:24	27.59	10	27.1	2.5	10	100	7.90	8.32	2.43
40	08-Feb-89	11:24	27.59	20	27.1	2.7	10	100	8.53	8.99	2.63
40	08-Feb-89	11:24	27.59	1	27.6	1.9	10	100	6.00	6.41	1.87
41	08-Feb-89	11:28	27.66	1	27.4	2.1	10	100	6.64	7.04	2.06
41	08-Feb-89	11:28	27.66	10	27.2	2.5	10	100	7.90	8.34	2.44
41	08-Feb-89	11:28	27.66	20	27.1	2.5	10	100	7.90	8.32	2.43
41	08-Feb-89	11:28	27.66	30	27.1	2.9	10	100	9.16	9.65	2.82
41	08-Feb-89	11:28	27.66	35	27.0	2.4	10	100	7.58	7.97	2.33
42	08-Feb-89	11:31	27.71	10	27.2	2.4	10	100	7.58	8.01	2.34
42	08-Feb-89	11:31	27.71	1	27.5	2.4	10	100	7.58	8.07	2.36
42	08-Feb-89	11:31	27.71	20	27.2	2.5	10	100	7.90	8.34	2.44

Table 10.5.2-2. Lauderdale Plant Cooling Canal/Pond System Dye Study--Calibrated Data (Page 13 of 31)

Sta No.	Date	Time (real)	Time (elapsed)	Depth (ft)	Temp (°C)	Fluorescence					
						F	Scale	Mult	F'	Fo	C (ppb)
42	08-Feb-89	11:31	27.71	30	27.0	2.5	10	100	7.90	8.30	2.43
43	08-Feb-89	11:34	27.76	35	27.0	2.2	10	100	6.95	7.30	2.13
43	08-Feb-89	11:34	27.76	30	27.1	2.7	10	100	8.53	8.99	2.63
43	08-Feb-89	11:34	27.76	20	27.1	2.5	10	100	7.90	8.32	2.43
43	08-Feb-89	11:34	27.76	10	27.2	2.4	10	100	7.58	8.01	2.34
43	08-Feb-89	11:34	27.76	1	27.3	2.1	10	100	6.64	7.03	2.05
44	08-Feb-89	11:38	27.83	20	27.2	2.4	10	100	7.58	8.01	2.34
44	08-Feb-89	11:38	27.83	1	27.6	2.1	10	100	6.64	7.08	2.07
44	08-Feb-89	11:38	27.83	34	26.6	2.5	10	100	7.90	8.21	2.40
44	08-Feb-89	11:38	27.83	30	27.1	2.7	10	100	8.53	8.99	2.63
44	08-Feb-89	11:38	27.83	10	27.3	2.3	10	100	7.27	7.70	2.25
1	08-Feb-89	13:07	29.31	1	30.9	0.7	10	100	2.21	2.57	0.75
2	08-Feb-89	13:10	29.36	1	29.5	3.1	31.6	100	3.10	3.48	1.02
2	08-Feb-89	13:10	29.36	10	29.1	1.7	10	100	5.37	5.96	1.74
2	08-Feb-89	13:10	29.36	20	28.5	1.7	10	100	5.37	5.87	1.72
2	08-Feb-89	13:10	29.36	30	27.8	1.7	10	100	5.37	5.76	1.68
11	08-Feb-89	13:13	29.41	1	29.6	0.7	10	100	2.21	2.49	0.73
11	08-Feb-89	13:13	29.41	9	29.0	1.1	10	100	3.48	3.85	1.12
12	08-Feb-89	13:15	29.44	10	28.2	2.5	10	100	7.90	8.56	2.50
12	08-Feb-89	13:15	29.44	1	28.7	2.1	10	100	6.64	7.29	2.13
12	08-Feb-89	13:15	29.44	20	28.6	1.8	10	100	5.69	6.23	1.82
13	08-Feb-89	13:19	29.51	10	28.1	2.3	10	100	7.27	7.86	2.30
13	08-Feb-89	13:19	29.51	1	28.5	1.8	10	100	5.69	6.21	1.82
13	08-Feb-89	13:19	29.51	20	28.7	1.7	10	100	5.37	5.90	1.72
13	08-Feb-89	13:19	29.51	30	29.2	1.4	10	100	4.42	4.92	1.44
14	08-Feb-89	13:22	29.56	1	28.6	2.1	10	100	6.64	7.27	2.12
14	08-Feb-89	13:22	29.56	10	27.9	2.2	10	100	6.95	7.48	2.19
14	08-Feb-89	13:22	29.56	20	28.5	2.0	10	100	6.32	6.90	2.02
14	08-Feb-89	13:22	29.56	30	28.6	1.8	10	100	5.69	6.23	1.82
15	08-Feb-89	13:25	29.61	30	28.5	1.7	10	100	5.37	5.87	1.72
15	08-Feb-89	13:25	29.61	10	28.0	2.1	10	100	6.64	7.16	2.09
15	08-Feb-89	13:25	29.61	20	28.1	2.4	10	100	7.58	8.20	2.40
15	08-Feb-89	13:25	29.61	1	28.4	2.1	10	100	6.64	7.23	2.11
16	08-Feb-89	13:29	29.68	10	28.0	2.1	10	100	6.64	7.16	2.09
16	08-Feb-89	13:29	29.68	1	28.3	2.3	10	100	7.27	7.90	2.31
16	08-Feb-89	13:29	29.68	20	28.4	2.0	10	100	6.32	6.89	2.01
16	08-Feb-89	13:29	29.68	30	28.8	1.7	10	100	5.37	5.91	1.73
17	08-Feb-89	13:34	29.76	30	27.7	1.6	10	100	5.06	5.41	1.58
17	08-Feb-89	13:34	29.76	10	28.2	2.2	10	100	6.95	7.54	2.20
17	08-Feb-89	13:34	29.76	20	28.0	2.1	10	100	6.64	7.16	2.09
17	08-Feb-89	13:34	29.76	1	28.9	2.0	10	100	6.32	6.98	2.04
18	08-Feb-89	13:37	29.81	10	28.1	2.5	10	100	7.90	8.54	2.50
18	08-Feb-89	13:37	29.81	1	28.5	2.0	10	100	6.32	6.90	2.02
18	08-Feb-89	13:37	29.81	20	28.0	2.3	10	100	7.27	7.84	2.29
18	08-Feb-89	13:37	29.81	30	28.4	1.9	10	100	6.00	6.54	1.91
19	08-Feb-89	13:40	29.86	10	28.1	2.6	10	100	8.22	8.88	2.60
19	08-Feb-89	13:40	29.86	1	28.5	2.2	10	100	6.95	7.59	2.22
19	08-Feb-89	13:40	29.86	20	28.0	2.3	10	100	7.27	7.84	2.29
19	08-Feb-89	13:40	29.86	30	28.2	2.0	10	100	6.32	6.85	2.00
20	08-Feb-89	13:43	29.91	10	28.2	2.5	10	100	7.90	8.56	2.50
20	08-Feb-89	13:43	29.91	1	28.8	2.1	10	100	6.64	7.31	2.14
20	08-Feb-89	13:43	29.91	20	27.8	2.1	10	100	6.64	7.12	2.08
20	08-Feb-89	13:43	29.91	30	27.6	1.5	10	100	4.74	5.06	1.48
21	08-Feb-89	13:46	29.96	1	28.5	2.1	10	100	6.64	7.25	2.12
21	08-Feb-89	13:46	29.96	10	28.1	2.3	10	100	7.27	7.86	2.30
21	08-Feb-89	13:46	29.96	20	27.9	2.0	10	100	6.32	6.80	1.99
21	08-Feb-89	13:46	29.96	30	27.4	1.2	10	100	3.79	4.03	1.18

Table 10.5.2-2. Lauderdale Plant Cooling Canal/Pond System Dye Study--Calibrated Data (Page 14 of 31)

Sta No.	Date	Time (real)	Time (elapsed)	Depth (ft)	Temp (°C)	Fluorescence					
						F	Scale	Mult	F'	Fo	C (ppb)
22	08-Feb-89	14:01	30.21	1	29.2	2.1	10	100	6.64	7.38	2.16
22	08-Feb-89	14:01	30.21	10	28.4	2.3	10	100	7.27	7.92	2.31
22	08-Feb-89	14:01	30.21	17	28.1	2.0	10	100	6.32	6.83	2.00
23	08-Feb-89	14:04	30.26	10	28.1	2.5	10	100	7.90	8.54	2.50
23	08-Feb-89	14:04	30.26	1	28.9	1.8	10	100	5.69	6.28	1.83
23	08-Feb-89	14:04	30.26	18	28.0	2.1	10	100	6.64	7.16	2.09
24	08-Feb-89	14:07	30.31	10	28.4	2.2	10	100	6.95	7.57	2.21
24	08-Feb-89	14:07	30.31	1	29.0	2.5	10	100	7.90	8.74	2.56
24	08-Feb-89	14:07	30.31	20	28.0	2.0	10	100	6.32	6.81	1.99
24	08-Feb-89	14:07	30.31	30	27.6	1.6	10	100	5.06	5.40	1.58
25	08-Feb-89	14:10	30.36	1	28.7	2.3	10	100	7.27	7.98	2.33
25	08-Feb-89	14:10	30.36	10	28.2	2.7	10	100	8.53	9.25	2.70
25	08-Feb-89	14:10	30.36	20	27.9	1.9	10	100	6.00	6.46	1.89
25	08-Feb-89	14:10	30.36	30	27.6	1.1	10	100	3.48	3.71	1.08
26	08-Feb-89	14:14	30.43	30	27.0	0.7	31.6	100	0.70	0.74	0.21
26	08-Feb-89	14:14	30.43	10	28.2	2.5	10	100	7.90	8.56	2.50
26	08-Feb-89	14:14	30.43	20	28.0	2.2	10	100	6.95	7.50	2.19
26	08-Feb-89	14:14	30.43	1	28.8	2.3	10	100	7.27	8.00	2.34
27	08-Feb-89	14:17	30.48	10	28.0	2.4	10	100	7.58	8.18	2.39
27	08-Feb-89	14:17	30.48	1	28.6	2.0	10	100	6.32	6.92	2.02
27	08-Feb-89	14:17	30.48	20	27.9	1.9	10	100	6.00	6.46	1.89
27	08-Feb-89	14:17	30.48	30	27.9	0.5	31.6	100	0.50	0.54	0.16
28	08-Feb-89	14:21	30.54	10	28.1	2.6	10	100	8.22	8.88	2.60
28	08-Feb-89	14:21	30.54	1	28.7	1.8	10	100	5.69	6.25	1.83
28	08-Feb-89	14:21	30.54	20	27.7	1.7	10	100	5.37	5.75	1.68
29	08-Feb-89	14:25	30.61	30	26.8	0.9	31.6	100	0.90	0.94	0.27
29	08-Feb-89	14:25	30.61	10	28.0	2.4	10	100	7.58	8.18	2.39
29	08-Feb-89	14:25	30.61	20	27.8	1.7	10	100	5.37	5.76	1.68
29	08-Feb-89	14:25	30.61	1	28.7	2.6	10	100	8.22	9.02	2.64
32	08-Feb-89	14:29	30.68	60	27.7	1.5	10	100	4.74	5.07	1.48
32	08-Feb-89	14:29	30.68	1	28.5	2.4	10	100	7.58	8.28	2.42
33	08-Feb-89	14:32	30.73	1	28.3	2.0	10	100	6.32	6.87	2.01
33	08-Feb-89	14:32	30.73	7	28.1	2.4	10	100	7.58	8.20	2.40
35	08-Feb-89	14:35	30.78	30	27.7	1.4	10	100	4.42	4.73	1.38
35	08-Feb-89	14:35	30.78	10	27.9	1.4	10	100	4.42	4.76	1.39
35	08-Feb-89	14:35	30.78	20	27.8	1.6	10	100	5.06	5.42	1.59
35	08-Feb-89	14:35	30.78	1	28.6	0.8	10	100	2.53	2.77	0.81
36	08-Feb-89	14:39	30.84	10	28.0	1.3	10	100	4.11	4.43	1.29
36	08-Feb-89	14:39	30.84	1	28.4	0.6	10	100	1.90	2.07	0.60
36	08-Feb-89	14:39	30.84	20	27.9	1.7	10	100	5.37	5.78	1.69
36	08-Feb-89	14:39	30.84	30	27.8	1.9	10	100	6.00	6.44	1.88
37	08-Feb-89	14:42	30.89	10	27.6	4.5	31.6	100	4.50	4.80	1.40
37	08-Feb-89	14:42	30.89	1	28.3	3.0	31.6	100	3.00	3.26	0.95
37	08-Feb-89	14:42	30.89	20	27.8	6.0	31.6	100	6.00	6.44	1.88
37	08-Feb-89	14:42	30.89	30	27.7	6.4	31.6	100	6.40	6.85	2.00
38	08-Feb-89	14:46	30.96	10	27.6	4.3	31.6	100	4.30	4.59	1.34
38	08-Feb-89	14:46	30.96	1	28.5	6.7	31.6	100	6.70	7.32	2.14
38	08-Feb-89	14:46	30.96	20	27.5	5.8	31.6	100	5.80	6.17	1.80
38	08-Feb-89	14:46	30.96	30	27.5	6.8	31.6	100	6.80	7.24	2.12
39	08-Feb-89	14:51	31.04	20	27.8	6.2	31.6	100	6.20	6.65	1.94
39	08-Feb-89	14:51	31.04	10	27.8	4.7	31.6	100	4.70	5.04	1.47
39	08-Feb-89	14:51	31.04	1	28.2	2.5	31.6	100	2.50	2.71	0.79
39	08-Feb-89	14:51	31.04	30	27.7	6.0	31.6	100	6.00	6.42	1.88
40	08-Feb-89	14:54	31.09	30	27.7	6.4	31.6	100	6.40	6.85	2.00
40	08-Feb-89	14:54	31.09	10	27.7	5.7	31.6	100	5.70	6.10	1.78
40	08-Feb-89	14:54	31.09	20	27.6	6.1	31.6	100	6.10	6.51	1.90
40	08-Feb-89	14:54	31.09	1	28.0	4.2	31.6	100	4.20	4.53	1.32

Table 10.5.2-2. Lauderdale Plant Cooling Canal/Pond System Dye Study--Calibrated Data (Page 15 of 31)

Sta No.	Date	Time (real)	Time (elapsed)	Depth (ft)	Temp (°C)	Fluorescence					
						F	Scale	Mult	F'	Fo	C (ppb)
41	08-Feb-89	14:58	31.16	10	27.7	4.5	31.6	100	4.50	4.81	1.41
41	08-Feb-89	14:58	31.16	1	28.2	3.5	31.6	100	3.50	3.79	1.11
41	08-Feb-89	14:58	31.16	20	27.4	5.5	31.6	100	5.50	5.84	1.71
41	08-Feb-89	14:58	31.16	30	27.4	6.2	31.6	100	6.20	6.58	1.92
42	08-Feb-89	15:02	31.23	30	27.4	5.7	31.6	100	5.70	6.05	1.77
42	08-Feb-89	15:02	31.23	10	27.6	5.0	31.6	100	5.00	5.34	1.56
42	08-Feb-89	15:02	31.23	20	27.5	6.0	31.6	100	6.00	6.39	1.87
42	08-Feb-89	15:02	31.23	1	27.9	4.3	31.6	100	4.30	4.62	1.35
43	08-Feb-89	15:05	31.28	10	27.6	5.0	31.6	100	5.00	5.34	1.56
43	08-Feb-89	15:05	31.28	1	27.9	4.5	31.6	100	4.50	4.84	1.41
43	08-Feb-89	15:05	31.28	20	27.5	5.6	31.6	100	5.60	5.96	1.74
43	08-Feb-89	15:05	31.28	30	27.4	5.4	31.6	100	5.40	5.73	1.68
44	08-Feb-89	15:09	31.34	10	27.8	4.5	31.6	100	4.50	4.83	1.41
44	08-Feb-89	15:09	31.34	1	28.2	3.2	31.6	100	3.20	3.47	1.01
44	08-Feb-89	15:09	31.34	20	27.5	4.5	31.6	100	4.50	4.79	1.40
44	08-Feb-89	15:09	31.34	30	27.5	5.4	31.6	100	5.40	5.75	1.68
5	08-Feb-89	15:20	31.53	1	31.6	3.0	10	100	9.48	11.23	3.28
5	08-Feb-89	15:20	31.53	10	30.7	4.4	10	100	13.90	16.08	4.70
5	08-Feb-89	15:20	31.53	20	29.1	2.4	10	100	7.58	8.42	2.46
5	08-Feb-89	15:20	31.53	30	29.1	2.4	10	100	7.58	8.42	2.46
1	08-Feb-89	16:12	32.39	1	31.0	0.7	31.6	100	0.70	0.82	0.24
2	08-Feb-89	16:17	32.48	1	30.4	1.8	31.6	100	1.80	2.07	0.60
2	08-Feb-89	16:17	32.48	10	29.8	4.0	31.6	100	4.00	4.52	1.32
2	08-Feb-89	16:17	32.48	20	28.1	5.0	31.6	100	5.00	5.41	1.58
2	08-Feb-89	16:17	32.48	30	27.8	5.9	31.6	100	5.90	6.33	1.85
11	08-Feb-89	16:20	32.53	1	29.4	2.6	31.6	100	2.60	2.91	0.85
11	08-Feb-89	16:20	32.53	10	28.7	5.0	31.6	100	5.00	5.49	1.60
11	08-Feb-89	16:20	32.53	20	29.1	4.8	31.6	100	4.80	5.33	1.56
13	08-Feb-89	16:27	32.64	10	28.6	1.7	10	100	5.37	5.88	1.72
13	08-Feb-89	16:27	32.64	1	28.7	2.2	10	100	6.95	7.63	2.23
13	08-Feb-89	16:27	32.64	20	28.7	1.6	10	100	5.06	5.55	1.62
13	08-Feb-89	16:27	32.64	25	28.7	1.8	10	100	5.69	6.25	1.83
12	08-Feb-89	16:32	32.73	1	28.6	2.3	10	100	7.27	7.96	2.33
12	08-Feb-89	16:32	32.73	10	28.5	2.5	10	100	7.90	8.63	2.52
12	08-Feb-89	16:32	32.73	20	28.3	1.7	10	100	5.37	5.84	1.71
14	08-Feb-89	16:36	32.79	1	28.6	2.4	10	100	7.58	8.31	2.43
14	08-Feb-89	16:36	32.79	10	28.0	2.2	10	100	6.95	7.50	2.19
14	08-Feb-89	16:36	32.79	20	28.4	1.9	10	100	6.00	6.54	1.91
14	08-Feb-89	16:36	32.79	30	28.4	1.4	10	100	4.42	4.82	1.41
15	08-Feb-89	16:40	32.86	30	28.6	1.7	10	100	5.37	5.88	1.72
15	08-Feb-89	16:40	32.86	10	28.0	2.2	10	100	6.95	7.50	2.19
15	08-Feb-89	16:40	32.86	20	28.5	1.8	10	100	5.69	6.21	1.82
15	08-Feb-89	16:40	32.86	1	28.6	2.6	10	100	8.22	9.00	2.63
16	08-Feb-89	16:45	32.94	10	28.1	2.2	10	100	6.95	7.52	2.20
16	08-Feb-89	16:45	32.94	1	28.5	2.5	10	100	7.90	8.63	2.52
16	08-Feb-89	16:45	32.94	20	28.6	1.7	10	100	5.37	5.88	1.72
16	08-Feb-89	16:45	32.94	30	28.6	1.8	10	100	5.69	6.23	1.82
17	08-Feb-89	16:50	33.03	20	27.9	1.9	10	100	6.00	6.46	1.89
17	08-Feb-89	16:50	33.03	10	28.1	2.1	10	100	6.64	7.17	2.10
17	08-Feb-89	16:50	33.03	1	29.1	2.3	10	100	7.27	8.06	2.36
17	08-Feb-89	16:50	33.03	30	27.7	3.9	31.6	100	3.90	4.17	1.22
18	08-Feb-89	16:55	33.11	10	28.0	2.1	10	100	6.64	7.16	2.09
18	08-Feb-89	16:55	33.11	1	28.7	2.3	10	100	7.27	7.98	2.33
18	08-Feb-89	16:55	33.11	20	28.5	1.8	10	100	5.69	6.21	1.82
18	08-Feb-89	16:55	33.11	25	28.5	1.7	10	100	5.37	5.87	1.72
19	08-Feb-89	17:00	33.19	1	28.8	2.2	10	100	6.95	7.65	2.24
19	08-Feb-89	17:00	33.19	10	28.4	2.0	10	100	6.32	6.89	2.01

Table 10.5.2-2. Lauderdale Plant Cooling Canal/Pond System Dye Study--Calibrated Data (Page 16 of 31)

Sta No.	Date	Time (real)	Time (elapsed)	Depth (ft)	Temp (°C)	Fluorescence					
						F	Scale	Mult	F'	Fo	C (ppb)
19	08-Feb-89	17:00	33.19	20	28.4	1.9	10	100	6.00	6.54	1.91
20	08-Feb-89	17:05	33.28	10	28.0	2.2	10	100	6.95	7.50	2.19
20	08-Feb-89	17:05	33.28	1	29.0	2.3	10	100	7.27	8.04	2.35
20	08-Feb-89	17:05	33.28	20	28.4	2.0	10	100	6.32	6.89	2.01
20	08-Feb-89	17:05	33.28	25	28.6	1.7	10	100	5.37	5.88	1.72
21	08-Feb-89	17:11	33.38	1	28.8	2.2	10	100	6.95	7.65	2.24
21	08-Feb-89	17:11	33.38	10	28.1	2.2	10	100	6.95	7.52	2.20
21	08-Feb-89	17:11	33.38	20	27.9	1.9	10	100	6.00	6.46	1.89
21	08-Feb-89	17:11	33.38	30	27.7	2.8	31.6	100	2.80	3.00	0.88
22	08-Feb-89	17:15	33.44	1	28.4	2.1	10	100	6.64	7.23	2.11
22	08-Feb-89	17:15	33.44	10	27.6	2.0	10	100	6.32	6.74	1.97
22	08-Feb-89	17:15	33.44	15	27.5	2.0	10	100	6.32	6.73	1.97
23	08-Feb-89	17:17	33.48	1	28.4	2.2	10	100	6.95	7.57	2.21
23	08-Feb-89	17:17	33.48	5	27.7	2.2	10	100	6.95	7.44	2.17
24	08-Feb-89	17:20	33.53	20	28.0	1.9	10	100	6.00	6.47	1.89
24	08-Feb-89	17:20	33.53	10	28.2	2.3	10	100	7.27	7.88	2.30
24	08-Feb-89	17:20	33.53	1	29.0	2.4	10	100	7.58	8.39	2.45
24	08-Feb-89	17:20	33.53	30	27.4	1.1	10	100	3.48	3.69	1.08
25	08-Feb-89	17:25	33.61	20	28.2	1.8	10	100	5.69	6.17	1.80
25	08-Feb-89	17:25	33.61	10	27.8	2.2	10	100	6.95	7.46	2.18
25	08-Feb-89	17:25	33.61	1	28.7	2.3	10	100	7.27	7.98	2.33
25	08-Feb-89	17:25	33.61	30	27.9	1.5	10	100	4.74	5.10	1.49
26	08-Feb-89	17:30	33.69	30	26.5	0.8	31.6	100	0.80	0.83	0.24
26	08-Feb-89	17:30	33.69	10	27.6	2.2	10	100	6.95	7.42	2.17
26	08-Feb-89	17:30	33.69	20	27.8	1.9	10	100	6.00	6.44	1.88
26	08-Feb-89	17:30	33.69	1	28.3	2.3	10	100	7.27	7.90	2.31
27	08-Feb-89	17:35	33.78	10	27.5	2.1	10	100	6.64	7.06	2.06
27	08-Feb-89	17:35	33.78	1	28.3	2.2	10	100	6.95	7.56	2.21
27	08-Feb-89	17:35	33.78	20	27.4	1.8	10	100	5.69	6.04	1.76
27	08-Feb-89	17:35	33.78	30	26.5	0.4	31.6	100	0.40	0.41	0.12
28	08-Feb-89	17:40	33.86	20	27.1	1.5	10	100	4.74	4.99	1.46
28	08-Feb-89	17:40	33.86	10	27.5	1.9	10	100	6.00	6.39	1.87
28	08-Feb-89	17:40	33.86	1	28.4	2.1	10	100	6.64	7.23	2.11
28	08-Feb-89	17:40	33.86	30	26.5	0.5	31.6	100	0.50	0.52	0.15
29	08-Feb-89	17:47	33.98	10	27.1	2.1	10	100	6.64	6.99	2.04
29	08-Feb-89	17:47	33.98	1	27.5	2.8	10	100	8.85	9.42	2.75
29	08-Feb-89	17:47	33.98	20	26.8	1.5	10	100	4.74	4.95	1.45
29	08-Feb-89	17:47	33.98	30	26.1	0.7	31.6	100	0.70	0.72	0.21
31	08-Feb-89	17:50	34.03	1	27.3	2.2	10	100	6.95	7.36	2.15
31	08-Feb-89	17:50	34.03	8	26.6	1.5	10	100	4.74	4.93	1.44
34	08-Feb-89	18:05	34.28	1	26.6	1.6	10	100	5.06	5.26	1.54
34	08-Feb-89	18:05	34.28	2	26.7	1.5	10	100	4.74	4.94	1.44
32	08-Feb-89	18:07	34.31	1	27.1	2.4	10	100	7.58	7.99	2.33
32	08-Feb-89	18:07	34.31	5	27.0	2.1	10	100	6.64	6.97	2.04
33	08-Feb-89	18:08	34.33	2	27.2	1.6	10	100	5.06	5.34	1.56
33	08-Feb-89	18:08	34.33	1	27.3	2.3	10	100	7.27	7.70	2.25
35	08-Feb-89	18:10	34.36	20	26.7	1.6	10	100	5.06	5.27	1.54
35	08-Feb-89	18:10	34.36	10	26.7	4.5	31.6	100	4.50	4.69	1.37
35	08-Feb-89	18:10	34.36	1	26.8	2.6	31.6	100	2.60	2.72	0.79
35	08-Feb-89	18:10	34.36	30	26.7	1.6	10	100	5.06	5.27	1.54
36	08-Feb-89	18:15	34.44	20	26.6	1.4	10	100	4.42	4.60	1.34
36	08-Feb-89	18:15	34.44	10	26.7	1.3	10	100	4.11	4.28	1.25
36	08-Feb-89	18:15	34.44	1	26.6	1.9	31.6	100	1.90	1.98	0.58
36	08-Feb-89	18:15	34.44	30	26.6	1.4	10	100	4.42	4.60	1.34
37	08-Feb-89	18:20	34.53	20	26.4	1.3	10	100	4.11	4.25	1.24
37	08-Feb-89	18:20	34.53	30	26.4	1.4	10	100	4.42	4.58	1.34
37	08-Feb-89	18:20	34.53	10	26.5	1.3	10	100	4.11	4.26	1.25

Table 10.5.2-2. Lauderdale Plant Cooling Canal/Pond System Dye Study--Calibrated Data (Page 17 of 31)

Sta No.	Date	Time (real)	Time (elapsed)	Depth (ft)	Temp (°C)	Fluorescence					
						F	Scale	Mult	F'	Fo	C (ppb)
37	08-Feb-89	18:20	34.53	1	26.7	2.4	31.6	100	2.40	2.50	0.73
38	08-Feb-89	18:32	34.73	1	26.6	1.2	31.6	100	1.20	1.25	0.36
38	08-Feb-89	18:32	34.73	10	26.4	3.2	31.6	100	3.20	3.31	0.97
38	08-Feb-89	18:32	34.73	20	26.2	3.8	31.6	100	3.80	3.91	1.14
38	08-Feb-89	18:32	34.73	30	26.1	4.0	31.6	100	4.00	4.11	1.20
39	08-Feb-89	18:40	34.86	30	26.0	3.0	31.6	100	3.00	3.07	0.90
39	08-Feb-89	18:40	34.86	10	26.3	3.8	31.6	100	3.80	3.92	1.15
39	08-Feb-89	18:40	34.86	20	26.4	3.8	31.6	100	3.80	3.93	1.15
39	08-Feb-89	18:40	34.86	1	26.1	2.0	31.6	100	2.00	2.05	0.60
40	08-Feb-89	18:45	34.94	10	26.4	4.0	31.6	100	4.00	4.14	1.21
40	08-Feb-89	18:45	34.94	1	26.3	2.9	31.6	100	2.90	2.99	0.87
40	08-Feb-89	18:45	34.94	20	26.4	4.0	31.6	100	4.00	4.14	1.21
40	08-Feb-89	18:45	34.94	30	26.2	3.8	31.6	100	3.80	3.91	1.14
41	08-Feb-89	18:47	34.98	20	26.4	4.2	31.6	100	4.20	4.34	1.27
41	08-Feb-89	18:47	34.98	10	26.5	3.7	31.6	100	3.70	3.84	1.12
41	08-Feb-89	18:47	34.98	1	26.0	1.4	31.6	100	1.40	1.43	0.42
41	08-Feb-89	18:47	34.98	30	26.4	3.9	31.6	100	3.90	4.03	1.18
42	08-Feb-89	18:51	35.04	30	26.2	3.6	31.6	100	3.60	3.70	1.08
42	08-Feb-89	18:51	35.04	10	26.3	3.7	31.6	100	3.70	3.82	1.12
42	08-Feb-89	18:51	35.04	20	26.4	3.0	31.6	100	3.00	3.10	0.91
42	08-Feb-89	18:51	35.04	1	26.2	1.5	31.6	100	1.50	1.54	0.45
43	08-Feb-89	18:53	35.08	10	26.0	3.6	31.6	100	3.60	3.69	1.08
43	08-Feb-89	18:53	35.08	1	25.9	2.4	31.6	100	2.40	2.45	0.72
43	08-Feb-89	18:53	35.08	20	26.2	3.2	31.6	100	3.20	3.29	0.96
43	08-Feb-89	18:53	35.08	30	26.1	3.5	31.6	100	3.50	3.59	1.05
44	08-Feb-89	18:58	35.16	10	26.5	3.9	31.6	100	3.90	4.04	1.18
44	08-Feb-89	18:58	35.16	30	26.3	3.9	31.6	100	3.90	4.02	1.18
44	08-Feb-89	18:58	35.16	20	26.5	4.3	31.6	100	4.30	4.46	1.30
44	08-Feb-89	18:58	35.16	1	26.2	1.4	31.6	100	1.40	1.44	0.42
1	08-Feb-89	20:20	36.53	1	31.2	0.6	31.6	100	0.60	0.70	0.21
2	08-Feb-89	20:27	36.64	1	29.7	2.2	31.6	100	2.20	2.48	0.72
2	08-Feb-89	20:27	36.64	10	30.2	2.0	31.6	100	2.00	2.28	0.67
2	08-Feb-89	20:27	36.64	20	30.4	3.8	31.6	100	3.80	4.36	1.27
11	08-Feb-89	20:30	36.69	2	30.3	1.6	31.6	100	1.60	1.83	0.54
12	08-Feb-89	20:31	36.71	1	27.3	2.3	10	100	7.27	7.70	2.25
12	08-Feb-89	20:31	36.71	10	27.4	1.7	10	100	5.37	5.70	1.67
12	08-Feb-89	20:31	36.71	18	27.6	1.8	10	100	5.69	6.07	1.77
13	08-Feb-89	20:35	36.78	10	28.0	1.5	10	100	4.74	5.11	1.49
13	08-Feb-89	20:35	36.78	1	27.1	2.3	10	100	7.27	7.66	2.24
13	08-Feb-89	20:35	36.78	20	28.2	1.4	10	100	4.42	4.80	1.40
13	08-Feb-89	20:35	36.78	28	27.9	1.7	10	100	5.37	5.78	1.69
14	08-Feb-89	20:40	36.86	1	27.3	2.6	10	100	8.22	8.70	2.54
14	08-Feb-89	20:40	36.86	10	27.1	2.2	10	100	6.95	7.32	2.14
14	08-Feb-89	20:40	36.86	20	27.6	1.7	10	100	5.37	5.73	1.68
14	08-Feb-89	20:40	36.86	30	27.4	1.6	10	100	5.06	5.37	1.57
15	08-Feb-89	20:43	36.91	30	27.5	1.6	10	100	5.06	5.38	1.57
15	08-Feb-89	20:43	36.91	10	27.0	2.2	10	100	6.95	7.30	2.13
15	08-Feb-89	20:43	36.91	20	27.6	1.7	10	100	5.37	5.73	1.68
15	08-Feb-89	20:43	36.91	1	27.2	2.5	10	100	7.90	8.34	2.44
16	08-Feb-89	20:45	36.94	20	27.8	1.8	10	100	5.69	6.10	1.78
16	08-Feb-89	20:45	36.94	30	27.7	1.6	10	100	5.06	5.41	1.58
16	08-Feb-89	20:45	36.94	10	27.8	1.7	10	100	5.37	5.76	1.68
16	08-Feb-89	20:45	36.94	1	27.6	2.3	10	100	7.27	7.76	2.27
17	08-Feb-89	20:48	36.99	20	27.5	1.6	10	100	5.06	5.38	1.57
17	08-Feb-89	20:48	36.99	10	27.5	2.0	10	100	6.32	6.73	1.97
17	08-Feb-89	20:48	36.99	20	27.1	2.3	31.6	100	2.30	2.42	0.71
17	08-Feb-89	20:48	36.99	30	27.0	3.0	31.6	100	3.00	3.15	0.92

Table 10.5.2-2. Lauderdale Plant Cooling Canal/Pond System Dye Study--Calibrated Data (Page 18 of 31)

Sta No.	Date	Time (real)	Time (elapsed)	Depth (ft)	Temp (°C)	Fluorescence					
						F	Scale	Mult	F'	Fo	C (ppb)
18	08-Feb-89	20:50	37.03	10	27.2	2.0	10	100	6.32	6.67	1.95
18	08-Feb-89	20:50	37.03	1	27.2	2.3	10	100	7.27	7.68	2.24
18	08-Feb-89	20:50	37.03	20	27.5	1.6	10	100	5.06	5.38	1.57
18	08-Feb-89	20:50	37.03	30	27.1	3.0	31.6	100	3.00	3.16	0.92
19	08-Feb-89	20:58	37.16	20	27.8	1.4	10	100	4.42	4.75	1.39
19	08-Feb-89	20:58	37.16	10	28.2	1.4	10	100	4.42	4.80	1.40
19	08-Feb-89	20:58	37.16	1	27.8	2.2	10	100	6.95	7.46	2.18
20	08-Feb-89	21:00	37.19	10	27.9	1.6	10	100	5.06	5.44	1.59
20	08-Feb-89	21:00	37.19	1	27.4	2.4	10	100	7.58	8.05	2.35
20	08-Feb-89	21:00	37.19	20	27.4	1.6	10	100	5.06	5.37	1.57
20	08-Feb-89	21:00	37.19	30	26.2	1.5	31.6	100	1.50	1.54	0.45
21	08-Feb-89	21:03	37.24	10	27.2	2.0	10	100	6.32	6.67	1.95
21	08-Feb-89	21:03	37.24	20	27.1	1.8	10	100	5.69	5.99	1.75
21	08-Feb-89	21:03	37.24	30	27.1	1.4	10	100	4.42	4.66	1.36
21	08-Feb-89	21:03	37.24	1	27.5	2.6	10	100	8.22	8.75	2.56
22	08-Feb-89	21:05	37.28	1	27.3	2.4	10	100	7.58	8.03	2.35
22	08-Feb-89	21:05	37.28	10	27.2	2.0	10	100	6.32	6.67	1.95
22	08-Feb-89	21:05	37.28	12	27.0	2.2	10	100	6.95	7.30	2.13
23	08-Feb-89	21:10	37.36	1	27.1	2.4	10	100	7.58	7.99	2.33
23	08-Feb-89	21:10	37.36	7	27.0	2.2	10	100	6.95	7.30	2.13
25	08-Feb-89	21:15	37.44	20	27.2	1.9	10	100	6.00	6.34	1.85
25	08-Feb-89	21:15	37.44	10	27.8	1.6	10	100	5.06	5.42	1.59
25	08-Feb-89	21:15	37.44	1	27.5	2.3	10	100	7.27	7.74	2.26
25	08-Feb-89	21:15	37.44	30	26.4	1.8	31.6	100	1.80	1.86	0.54
24	08-Feb-89	21:20	37.53	30	26.1	2.2	31.6	100	2.20	2.26	0.66
24	08-Feb-89	21:20	37.53	20	27.2	1.6	10	100	5.06	5.34	1.56
24	08-Feb-89	21:20	37.53	10	27.2	2.0	10	100	6.32	6.67	1.95
24	08-Feb-89	21:20	37.53	1	27.4	2.3	10	100	7.27	7.72	2.25
26	08-Feb-89	21:25	37.61	30	26.5	2.8	31.6	100	2.80	2.90	0.85
26	08-Feb-89	21:25	37.61	10	27.4	2.0	10	100	6.32	6.71	1.96
26	08-Feb-89	21:25	37.61	20	27.3	1.9	10	100	6.00	6.36	1.86
26	08-Feb-89	21:25	37.61	1	27.4	2.2	10	100	6.95	7.38	2.16
27	08-Feb-89	21:28	37.66	20	27.1	1.9	10	100	6.00	6.32	1.85
27	08-Feb-89	21:28	37.66	30	26.2	1.6	31.6	100	1.60	1.65	0.48
27	08-Feb-89	21:28	37.66	10	27.1	2.1	10	100	6.64	6.99	2.04
27	08-Feb-89	21:28	37.66	1	27.2	2.4	10	100	7.58	8.01	2.34
28	08-Feb-89	21:32	37.73	25	26.4	1.6	10	100	5.06	5.23	1.53
28	08-Feb-89	21:32	37.73	10	26.8	2.0	10	100	6.32	6.61	1.93
28	08-Feb-89	21:32	37.73	20	26.6	1.8	10	100	5.69	5.91	1.73
28	08-Feb-89	21:32	37.73	1	27.1	2.4	10	100	7.58	7.99	2.33
29	08-Feb-89	21:50	38.03	30	25.7	0.6	31.6	100	0.60	0.61	0.18
29	08-Feb-89	21:50	38.03	1	26.7	2.6	10	100	8.22	8.56	2.50
29	08-Feb-89	21:50	38.03	20	26.2	1.5	10	100	4.74	4.88	1.43
29	08-Feb-89	21:50	38.03	10	26.4	1.9	10	100	6.00	6.21	1.81
30	08-Feb-89	22:02	38.23	10	26.0	1.9	10	100	6.00	6.15	1.80
32	08-Feb-89	22:07	38.31	2	26.8	2.0	10	100	6.32	6.61	1.93
32	08-Feb-89	22:07	38.31	5	26.5	1.8	10	100	5.69	5.90	1.72
33	08-Feb-89	22:10	38.36	1	27.0	2.3	10	100	7.27	7.64	2.23
33	08-Feb-89	22:10	38.36	5	27.0	2.0	10	100	6.32	6.64	1.94
35	08-Feb-89	22:12	38.39	20	26.4	4.4	31.6	100	4.40	4.55	1.33
35	08-Feb-89	22:12	38.39	10	26.2	4.1	31.6	100	4.10	4.22	1.23
35	08-Feb-89	22:12	38.39	1	26.1	2.0	31.6	100	2.00	2.05	0.60
35	08-Feb-89	22:12	38.39	30	26.4	4.9	31.6	100	4.90	5.07	1.48
36	08-Feb-89	22:16	38.46	20	26.5	4.8	31.6	100	4.80	4.98	1.45
36	08-Feb-89	22:16	38.46	30	26.4	4.5	31.6	100	4.50	4.65	1.36
36	08-Feb-89	22:16	38.46	10	26.4	4.2	31.6	100	4.20	4.34	1.27
36	08-Feb-89	22:16	38.46	1	26.4	1.9	31.6	100	1.90	1.97	0.57

Table 10.5.2-2. Lauderdale Plant Cooling Canal/Pond System Dye Study--Calibrated Data (Page 19 of 31)

Sta No.	Date	Time (real)	Time (elapsed)	Depth (ft)	Temp (°C)	Fluorescence					
						F	Scale	Mult	F'	Fo	C (ppb)
37	08-Feb-89	22:20	38.53	10	26.1	4.0	31.6	100	4.00	4.11	1.20
37	08-Feb-89	22:20	38.53	1	25.9	2.2	31.6	100	2.20	2.25	0.66
37	08-Feb-89	22:20	38.53	20	26.1	4.2	31.6	100	4.20	4.31	1.26
37	08-Feb-89	22:20	38.53	30	26.0	4.0	31.6	100	4.00	4.09	1.20
38	08-Feb-89	22:25	38.61	20	26.3	4.8	31.6	100	4.80	4.95	1.45
38	08-Feb-89	22:25	38.61	30	26.5	4.8	31.6	100	4.80	4.98	1.45
38	08-Feb-89	22:25	38.61	10	26.2	4.1	31.6	100	4.10	4.22	1.23
38	08-Feb-89	22:25	38.61	1	26.2	2.7	31.6	100	2.70	2.78	0.81
39	08-Feb-89	22:30	38.69	20	26.1	3.6	31.6	100	3.60	3.69	1.08
39	08-Feb-89	22:30	38.69	10	26.0	4.1	31.6	100	4.10	4.20	1.23
39	08-Feb-89	22:30	38.69	1	25.7	1.9	31.6	100	1.90	1.93	0.56
39	08-Feb-89	22:30	38.69	30	26.0	3.4	31.6	100	3.40	3.48	1.02
40	08-Feb-89	22:35	38.78	1	26.2	2.8	31.6	100	2.80	2.88	0.84
40	08-Feb-89	22:35	38.78	20	25.9	3.5	31.6	100	3.50	3.57	1.04
40	08-Feb-89	22:35	38.78	10	26.1	3.8	31.6	100	3.80	3.90	1.14
40	08-Feb-89	22:35	38.78	30	26.0	3.6	31.6	100	3.60	3.69	1.08
41	08-Feb-89	22:40	38.86	10	25.9	3.5	31.6	100	3.50	3.57	1.04
41	08-Feb-89	22:40	38.86	1	25.8	2.6	31.6	100	2.60	2.65	0.77
41	08-Feb-89	22:40	38.86	20	26.2	3.8	31.6	100	3.80	3.91	1.14
41	08-Feb-89	22:40	38.86	30	26.2	2.8	31.6	100	2.80	2.88	0.84
42	08-Feb-89	22:43	38.91	1	26.0	4.2	31.6	100	4.20	4.30	1.26
42	08-Feb-89	22:43	38.91	20	26.1	4.2	31.6	100	4.20	4.31	1.26
42	08-Feb-89	22:43	38.91	10	26.0	4.4	31.6	100	4.40	4.50	1.32
42	08-Feb-89	22:43	38.91	30	26.1	2.6	31.6	100	2.60	2.67	0.78
43	08-Feb-89	22:46	38.96	10	25.9	3.9	31.6	100	3.90	3.98	1.16
43	08-Feb-89	22:46	38.96	1	25.6	4.5	31.6	100	4.50	4.56	1.33
43	08-Feb-89	22:46	38.96	20	26.2	3.3	31.6	100	3.30	3.40	0.99
43	08-Feb-89	22:46	38.96	30	26.0	2.8	31.6	100	2.80	2.87	0.84
44	08-Feb-89	22:50	39.03	1	25.8	2.9	31.6	100	2.90	2.95	0.86
44	08-Feb-89	22:50	39.03	10	26.0	4.0	31.6	100	4.00	4.09	1.20
44	08-Feb-89	22:50	39.03	20	26.2	4.7	31.6	100	4.70	4.84	1.41
44	08-Feb-89	22:50	39.03	30	26.2	3.4	31.6	100	3.40	3.50	1.02
1	09-Feb-89	00:14	40.43	1	25.6	0.3	31.6	100	0.30	0.30	0.09
2	09-Feb-89	00:17	40.48	1	28.4	3.0	31.6	100	3.00	3.27	0.96
2	09-Feb-89	00:17	40.48	10	27.7	2.2	31.6	100	2.20	2.35	0.69
2	09-Feb-89	00:17	40.48	20	27.3	1.7	31.6	100	1.70	1.80	0.53
11	09-Feb-89	00:21	40.54	8	28.0	2.7	31.6	100	2.70	2.91	0.85
11	09-Feb-89	00:21	40.54	2	28.6	2.4	31.6	100	2.40	2.63	0.77
12	09-Feb-89	00:24	40.59	10	27.4	6.1	31.6	100	6.10	6.48	1.89
12	09-Feb-89	00:24	40.59	1	27.2	7.3	31.6	100	7.30	7.71	2.25
12	09-Feb-89	00:24	40.59	20	27.7	5.0	31.6	100	5.00	5.35	1.56
13	09-Feb-89	00:27	40.64	20	27.9	4.5	31.6	100	4.50	4.84	1.41
13	09-Feb-89	00:27	40.64	10	27.7	4.7	31.6	100	4.70	5.03	1.47
13	09-Feb-89	00:27	40.64	1	27.3	7.3	31.6	100	7.30	7.73	2.26
13	09-Feb-89	00:27	40.64	30	27.9	4.0	31.6	100	4.00	4.30	1.26
14	09-Feb-89	00:32	40.73	10	27.6	5.9	31.6	100	5.90	6.30	1.84
14	09-Feb-89	00:32	40.73	1	27.5	6.7	31.6	100	6.70	7.13	2.08
14	09-Feb-89	00:32	40.73	20	27.7	5.4	31.6	100	5.40	5.78	1.69
14	09-Feb-89	00:32	40.73	30	27.0	4.5	31.6	100	4.50	4.73	1.38
15	09-Feb-89	00:35	40.78	20	27.6	5.5	31.6	100	5.50	5.87	1.72
15	09-Feb-89	00:35	40.78	10	27.8	5.1	31.6	100	5.10	5.47	1.60
15	09-Feb-89	00:35	40.78	1	27.1	7.5	31.6	100	7.50	7.90	2.31
15	09-Feb-89	00:35	40.78	30	27.0	4.7	31.6	100	4.70	4.94	1.44
16	09-Feb-89	00:38	40.83	10	27.7	5.4	31.6	100	5.40	5.78	1.69
16	09-Feb-89	00:38	40.83	1	27.4	6.7	31.6	100	6.70	7.11	2.08
16	09-Feb-89	00:38	40.83	20	27.8	5.0	31.6	100	5.00	5.36	1.57
16	09-Feb-89	00:38	40.83	30	27.2	4.7	31.6	100	4.70	4.96	1.45

Table 10.5.2-2. Lauderdale Plant Cooling Canal/Pond System Dye Study--Calibrated Data (Page 20 of 31)

Sta No.	Date	Time (real)	Time (elapsed)	Depth (ft)	Temp (°C)	Fluorescence					
						F	Scale	Mult	F'	Fo	C (ppb)
17	09-Feb-89	00:44	40.93	1	27.4	6.7	31.6	100	6.70	7.11	2.08
17	09-Feb-89	00:44	40.93	10	27.7	5.2	31.6	100	5.20	5.56	1.63
17	09-Feb-89	00:44	40.93	20	27.5	5.3	31.6	100	5.30	5.64	1.65
18	09-Feb-89	00:48	40.99	10	28.0	4.6	31.6	100	4.60	4.96	1.45
18	09-Feb-89	00:48	40.99	1	27.3	7.6	31.6	100	7.60	8.05	2.35
18	09-Feb-89	00:48	40.99	20	28.0	4.7	31.6	100	4.70	5.07	1.48
18	09-Feb-89	00:48	40.99	30	26.7	3.4	31.6	100	3.40	3.54	1.04
19	09-Feb-89	00:53	41.08	30	27.1	4.2	31.6	100	4.20	4.42	1.29
19	09-Feb-89	00:53	41.08	10	28.1	4.2	31.6	100	4.20	4.54	1.33
19	09-Feb-89	00:53	41.08	20	28.0	4.4	31.6	100	4.40	4.74	1.39
19	09-Feb-89	00:53	41.08	1	27.6	6.2	31.6	100	6.20	6.62	1.93
20	09-Feb-89	00:59	41.18	10	27.8	4.5	31.6	100	4.50	4.83	1.41
20	09-Feb-89	00:59	41.18	1	27.4	6.2	31.6	100	6.20	6.58	1.92
20	09-Feb-89	00:59	41.18	20	27.9	4.8	31.6	100	4.80	5.16	1.51
20	09-Feb-89	00:59	41.18	30	26.6	3.4	31.6	100	3.40	3.54	1.03
21	09-Feb-89	01:02	41.23	1	27.0	7.6	31.6	100	7.60	7.98	2.33
21	09-Feb-89	01:02	41.23	10	27.6	5.1	31.6	100	5.10	5.44	1.59
21	09-Feb-89	01:02	41.23	20	27.6	4.9	31.6	100	4.90	5.23	1.53
21	09-Feb-89	01:02	41.23	30	26.3	3.1	31.6	100	3.10	3.20	0.93
22	09-Feb-89	01:05	41.28	1	27.0	8.0	31.6	100	8.00	8.41	2.46
22	09-Feb-89	01:05	41.28	0	27.4	5.8	31.6	100	5.80	6.16	1.80
22	09-Feb-89	01:05	41.28	15	27.2	6.3	31.6	100	6.30	6.65	1.94
23	09-Feb-89	01:10	41.36	1	27.0	7.5	31.6	100	7.50	7.88	2.30
23	09-Feb-89	01:10	41.36	8	27.1	6.0	31.6	100	6.00	6.32	1.85
24	09-Feb-89	01:14	41.43	20	27.4	5.6	31.6	100	5.60	5.95	1.74
24	09-Feb-89	01:14	41.43	10	27.7	5.2	31.6	100	5.20	5.56	1.63
24	09-Feb-89	01:14	41.43	1	27.3	6.2	31.6	100	6.20	6.56	1.92
24	09-Feb-89	01:14	41.43	30	26.1	2.8	31.6	100	2.80	2.87	0.84
25	09-Feb-89	01:18	41.49	20	27.2	5.4	31.6	100	5.40	5.70	1.67
25	09-Feb-89	01:18	41.49	10	27.1	6.0	31.6	100	6.00	6.32	1.85
25	09-Feb-89	01:18	41.49	1	27.2	6.6	31.6	100	6.60	6.97	2.04
25	09-Feb-89	01:18	41.49	30	26.4	3.6	31.6	100	3.60	3.72	1.09
26	09-Feb-89	01:23	41.58	10	27.3	5.8	31.6	100	5.80	6.14	1.79
26	09-Feb-89	01:23	41.58	1	27.1	7.2	31.6	100	7.20	7.58	2.22
26	09-Feb-89	01:23	41.58	20	27.4	5.4	31.6	100	5.40	5.73	1.68
26	09-Feb-89	01:23	41.58	30	26.1	3.0	31.6	100	3.00	3.08	0.90
27	09-Feb-89	01:27	41.64	1	27.1	7.2	31.6	100	7.20	7.58	2.22
27	09-Feb-89	01:27	41.64	10	27.8	4.7	31.6	100	4.70	5.04	1.47
27	09-Feb-89	01:27	41.64	20	27.4	5.6	31.6	100	5.60	5.95	1.74
27	09-Feb-89	01:27	41.64	30	26.5	3.4	31.6	100	3.40	3.53	1.03
28	09-Feb-89	01:32	41.73	10	26.5	6.6	31.6	100	6.60	6.84	2.00
28	09-Feb-89	01:32	41.73	1	26.7	6.7	31.6	100	6.70	6.98	2.04
28	09-Feb-89	01:32	41.73	20	26.4	6.0	31.6	100	6.00	6.21	1.81
28	09-Feb-89	01:32	41.73	30	26.1	3.5	31.6	100	3.50	3.59	1.05
29	09-Feb-89	01:39	41.84	1	26.5	2.3	31.6	100	2.30	2.39	0.70
29	09-Feb-89	01:39	41.84	10	26.9	6.1	31.6	100	6.10	6.39	1.87
29	09-Feb-89	01:39	41.84	20	26.4	5.4	31.6	100	5.40	5.59	1.63
29	09-Feb-89	01:39	41.84	30	25.5	1.7	31.6	100	1.70	1.72	0.50
32	09-Feb-89	01:46	41.96	1	27.2	5.6	31.6	100	5.60	5.91	1.73
32	09-Feb-89	01:46	41.96	8	27.1	5.8	31.6	100	5.80	6.11	1.79
33	09-Feb-89	01:48	41.99	1	26.8	7.1	31.6	100	7.10	7.42	2.17
35	09-Feb-89	01:50	42.03	20	26.3	5.1	31.6	100	5.10	5.26	1.54
35	09-Feb-89	01:50	42.03	10	26.2	4.3	31.6	100	4.30	4.42	1.29
35	09-Feb-89	01:50	42.03	1	26.1	3.9	31.6	100	3.90	4.00	1.17
35	09-Feb-89	01:50	42.03	30	26.4	5.0	31.6	100	5.00	5.17	1.51
36	09-Feb-89	01:54	42.09	20	26.3	4.8	31.6	100	4.80	4.95	1.45
36	09-Feb-89	01:54	42.09	10	26.1	4.3	31.6	100	4.30	4.41	1.29

Table 10.5.2-2. Lauderdale Plant Cooling Canal/Pond System Dye Study--Calibrated Data (Page 21 of 31)

Sta No.	Date	Time (real)	Time (elapsed)	Depth (ft)	Temp (°C)	Fluorescence					
						F	Scale	Mult	F'	Fo	C (ppb)
36	09-Feb-89	01:54	42.09	1	25.9	3.4	31.6	100	3.40	3.47	1.01
36	09-Feb-89	01:54	42.09	30	26.6	5.1	31.6	100	5.10	5.30	1.55
37	09-Feb-89	01:58	42.16	10	26.1	4.0	31.6	100	4.00	4.11	1.20
37	09-Feb-89	01:58	42.16	1	26.0	3.4	31.6	100	3.40	3.48	1.02
37	09-Feb-89	01:58	42.16	20	26.2	4.7	31.6	100	4.70	4.84	1.41
37	09-Feb-89	01:58	42.16	30	26.2	4.8	31.6	100	4.80	4.94	1.44
38	09-Feb-89	02:04	42.26	10	26.0	4.7	31.6	100	4.70	4.81	1.41
38	09-Feb-89	02:04	42.26	1	25.8	3.2	31.6	100	3.20	3.26	0.95
38	09-Feb-89	02:04	42.26	20	26.0	4.2	31.6	100	4.20	4.30	1.26
38	09-Feb-89	02:04	42.26	30	26.1	4.7	31.6	100	4.70	4.82	1.41
39	09-Feb-89	02:09	42.34	30	25.9	3.4	31.6	100	3.40	3.47	1.01
39	09-Feb-89	02:09	42.34	10	26.1	4.0	31.6	100	4.00	4.11	1.20
39	09-Feb-89	02:09	42.34	20	26.0	4.2	31.6	100	4.20	4.30	1.26
39	09-Feb-89	02:09	42.34	1	25.7	3.0	31.6	100	3.00	3.05	0.89
40	09-Feb-89	02:13	42.41	10	25.9	4.0	31.6	100	4.00	4.08	1.19
40	09-Feb-89	02:13	42.41	1	25.7	3.0	31.6	100	3.00	3.05	0.89
40	09-Feb-89	02:13	42.41	20	26.1	4.4	31.6	100	4.40	4.52	1.32
40	09-Feb-89	02:13	42.41	30	25.9	3.8	31.6	100	3.80	3.88	1.13
41	09-Feb-89	02:19	42.51	30	26.0	4.3	31.6	100	4.30	4.40	1.29
41	09-Feb-89	02:19	42.51	10	26.1	4.2	31.6	100	4.20	4.31	1.26
41	09-Feb-89	02:19	42.51	20	26.1	4.4	31.6	100	4.40	4.52	1.32
41	09-Feb-89	02:19	42.51	1	25.7	3.2	31.6	100	3.20	3.25	0.95
42	09-Feb-89	02:23	42.58	10	26.1	4.3	31.6	100	4.30	4.41	1.29
42	09-Feb-89	02:23	42.58	1	26.0	3.9	31.6	100	3.90	3.99	1.17
42	09-Feb-89	02:23	42.58	20	26.0	4.2	31.6	100	4.20	4.30	1.26
42	09-Feb-89	02:23	42.58	30	26.0	4.3	31.6	100	4.30	4.40	1.29
43	09-Feb-89	02:27	42.64	10	25.9	4.0	31.6	100	4.00	4.08	1.19
43	09-Feb-89	02:27	42.64	1	25.7	3.0	31.6	100	3.00	3.05	0.89
43	09-Feb-89	02:27	42.64	20	26.1	4.5	31.6	100	4.50	4.62	1.35
43	09-Feb-89	02:27	42.64	30	26.2	4.3	31.6	100	4.30	4.42	1.29
44	09-Feb-89	02:35	42.78	1	25.6	3.4	31.6	100	3.40	3.44	1.01
44	09-Feb-89	02:35	42.78	10	25.3	3.7	31.6	100	3.70	3.72	1.09
44	09-Feb-89	02:35	42.78	20	26.0	4.6	31.6	100	4.60	4.71	1.38
44	09-Feb-89	02:35	42.78	30	25.9	4.0	31.6	100	4.00	4.08	1.19
2	09-Feb-89	03:16	43.46	10	23.8	1.6	31.6	100	1.60	1.55	0.45
3	09-Feb-89	03:17	43.48	10	26.1	1.9	31.6	100	1.90	1.95	0.57
4	09-Feb-89	03:18	43.49	10	27.0	2.0	31.6	100	2.00	2.10	0.61
5	09-Feb-89	03:20	43.53	10	26.7	3.0	31.6	100	3.00	3.13	0.91
6	09-Feb-89	03:22	43.56	10	27.0	2.2	31.6	100	2.20	2.31	0.68
11	09-Feb-89	03:29	43.68	10	27.3	2.2	31.6	100	2.20	2.33	0.68
9	09-Feb-89	03:31	43.71	10	26.7	5.9	31.6	100	5.90	6.15	1.80
10	09-Feb-89	03:35	43.78	10	26.7	5.7	31.6	100	5.70	5.94	1.74
12	09-Feb-89	03:37	43.81	10	26.7	5.8	31.6	100	5.80	6.05	1.77
13	09-Feb-89	03:40	43.86	10	27.3	4.7	31.6	100	4.70	4.98	1.45
14	09-Feb-89	03:43	43.91	10	27.4	5.0	31.6	100	5.00	5.31	1.55
15	09-Feb-89	03:44	43.93	10	27.4	5.1	31.6	100	5.10	5.41	1.58
16	09-Feb-89	03:45	43.94	10	27.6	4.2	31.6	100	4.20	4.48	1.31
18	09-Feb-89	03:47	43.98	10	27.4	5.1	31.6	100	5.10	5.41	1.58
19	09-Feb-89	03:50	44.03	10	27.7	4.4	31.6	100	4.40	4.71	1.38
20	09-Feb-89	03:52	44.06	10	27.6	5.0	31.6	100	5.00	5.34	1.56
21	09-Feb-89	03:54	44.09	10	27.4	5.9	31.6	100	5.90	6.26	1.83
22	09-Feb-89	03:56	44.13	10	27.2	5.9	31.6	100	5.90	6.23	1.82
23	09-Feb-89	03:58	44.16	10	26.9	5.7	31.6	100	5.70	5.97	1.75
24	09-Feb-89	04:28	44.66	10	27.4	2.5	31.6	100	2.50	2.65	0.78
25	09-Feb-89	04:29	44.68	10	27.4	4.1	31.6	100	4.10	4.35	1.27
26	09-Feb-89	04:31	44.71	10	27.7	4.1	31.6	100	4.10	4.39	1.28
17	09-Feb-89	03:46	43.96	10	27.2	5.2	31.6	100	5.20	5.49	1.60

Table 10.5.2-2. Lauderdale Plant Cooling Canal/Pond System Dye Study--Calibrated Data (Page 22 of 31)

Sta No.	Date	Time (real)	Time (elapsed)	Depth (ft)	Temp (°C)	Fluorescence					
						F	Scale	Mult	F'	Fo	C (ppb)
27	09-Feb-89	04:33	44.74	10	27.4	4.2	31.6	100	4.20	4.46	1.30
28	09-Feb-89	04:35	44.78	10	27.1	5.1	31.6	100	5.10	5.37	1.57
29	09-Feb-89	04:44	44.93	10	26.3	6.1	31.6	100	6.10	6.29	1.84
32	09-Feb-89	04:48	44.99	10	27.5	4.6	31.6	100	4.60	4.90	1.43
33	09-Feb-89	04:49	45.01	1	27.4	5.2	31.6	100	5.20	5.52	1.61
35	09-Feb-89	04:51	45.04	10	26.0	4.2	31.6	100	4.20	4.30	1.26
36	09-Feb-89	04:53	45.08	10	26.0	4.6	31.6	100	4.60	4.71	1.38
37	09-Feb-89	04:54	45.09	10	26.0	4.6	31.6	100	4.60	4.71	1.38
38	09-Feb-89	04:57	45.14	10	25.8	4.6	31.6	100	4.60	4.68	1.37
39	09-Feb-89	04:59	45.18	10	25.9	4.2	31.6	100	4.20	4.29	1.25
40	09-Feb-89	05:01	45.21	10	25.9	4.2	31.6	100	4.20	4.29	1.25
43	09-Feb-89	05:05	45.28	10	25.8	4.2	31.6	100	4.20	4.28	1.25
42	09-Feb-89	05:08	45.33	10	25.9	4.0	31.6	100	4.00	4.08	1.19
41	09-Feb-89	05:10	45.36	10	26.0	4.4	31.6	100	4.40	4.50	1.32
44	09-Feb-89	05:12	45.39	1	25.6	3.6	31.6	100	3.60	3.65	1.07
44	09-Feb-89	05:12	45.39	10	25.9	4.4	31.6	100	4.40	4.49	1.31
39	09-Feb-89	05:18	45.49	35	25.9	4.0	31.6	100	4.00	4.08	1.19
39	09-Feb-89	05:18	45.49	1	25.6	3.6	31.6	100	3.60	3.65	1.07
39	09-Feb-89	05:18	45.49	10	25.8	4.2	31.6	100	4.20	4.28	1.25
39	09-Feb-89	05:18	45.49	30	25.9	4.4	31.6	100	4.40	4.49	1.31
39	09-Feb-89	05:18	45.49	20	26.0	4.6	31.6	100	4.60	4.71	1.38
32	09-Feb-89	05:26	45.63	1	26.7	6.8	31.6	100	6.80	7.09	2.07
45	09-Feb-89	05:28	45.66	1	27.4	5.2	31.6	100	5.20	5.52	1.61
45	09-Feb-89	05:28	45.66	10	26.9	5.4	31.6	100	5.40	5.66	1.65
45	09-Feb-89	05:28	45.66	20	26.7	4.0	31.6	100	4.00	4.17	1.22
45	09-Feb-89	05:28	45.66	25	26.6	3.8	31.6	100	3.80	3.95	1.15
29	09-Feb-89	05:33	45.74	1	26.2	7.6	31.6	100	7.60	7.82	2.29
29	09-Feb-89	05:33	45.74	10	26.4	5.6	31.6	100	5.60	5.79	1.69
29	09-Feb-89	05:33	45.74	20	26.0	3.8	31.6	100	3.80	3.89	1.14
29	09-Feb-89	05:33	45.74	23	25.6	2.8	31.6	100	2.80	2.84	0.83
21	09-Feb-89	05:41	45.88	10	27.0	5.4	31.6	100	5.40	5.67	1.66
21	09-Feb-89	05:41	45.88	1	26.5	6.8	31.6	100	6.80	7.05	2.06
21	09-Feb-89	05:41	45.88	20	27.4	4.2	31.6	100	4.20	4.46	1.30
21	09-Feb-89	05:41	45.88	30	26.7	3.0	31.6	100	3.00	3.13	0.91
22	09-Feb-89	05:47	45.98	1	26.8	5.8	31.6	100	5.80	6.06	1.77
22	09-Feb-89	05:47	45.98	5	27.1	5.6	31.6	100	5.60	5.90	1.72
22	09-Feb-89	05:47	45.98	10	26.9	3.4	31.6	100	3.40	3.56	1.04
22	09-Feb-89	05:47	45.98	14	26.9	6.2	31.6	100	6.20	6.50	1.90
21	09-Feb-89	05:53	46.08	15	27.3	4.6	31.6	100	4.60	4.87	1.42
11	09-Feb-89	05:57	46.14	3	26.1	1.6	31.6	100	1.60	1.64	0.48
2	09-Feb-89	06:00	46.19	20	27.1	1.6	31.6	100	1.60	1.69	0.49
2	09-Feb-89	06:00	46.19	24	27.0	1.6	31.6	100	1.60	1.68	0.49
2	09-Feb-89	06:00	46.19	1	26.4	2.0	31.6	100	2.00	2.07	0.60
2	09-Feb-89	06:00	46.19	10	26.5	1.6	31.6	100	1.60	1.66	0.48
1	09-Feb-89	06:06	46.29	1	25.9	1.2	31.6	100	1.20	1.23	0.36
1	09-Feb-89	07:19	47.51	1	26.9	0.4	31.6	100	0.40	0.42	0.12
2	09-Feb-89	07:35	47.78	1	27.1	1.4	31.6	100	1.40	1.47	0.43
1	09-Feb-89	07:37	47.81	2	27.1	0.2	31.6	100	0.20	0.21	0.06
2	09-Feb-89	07:39	47.84	1	26.9	1.4	31.6	100	1.40	1.47	0.43
2	09-Feb-89	07:39	47.84	10	26.9	0.9	31.6	100	0.90	0.94	0.28
2	09-Feb-89	07:39	47.84	20	26.9	1.2	31.6	100	1.20	1.26	0.37
11	09-Feb-89	07:42	47.89	1	26.8	1.1	31.6	100	1.10	1.15	0.34
12	09-Feb-89	07:44	47.93	10	27.0	3.8	31.6	100	3.80	3.99	1.17
13	09-Feb-89	07:46	47.96	10	27.0	4.2	31.6	100	4.20	4.41	1.29
14	09-Feb-89	07:49	48.01	10	27.7	3.9	31.6	100	3.90	4.17	1.22
15	09-Feb-89	07:51	48.04	10	27.6	3.9	31.6	100	3.90	4.16	1.22
16	09-Feb-89	07:53	48.08	10	27.5	3.8	31.6	100	3.80	4.04	1.18

Table 10.5.2-2. Lauderdale Plant Cooling Canal/Pond System Dye Study--Calibrated Data (Page 23 of 31)

Sta No.	Date	Time (real)	Time (elapsed)	Depth (ft)	Temp (°C)	Fluorescence					
						F	Scale	Mult	F'	Fo	C (ppb)
19	09-Feb-89	07:55	48.11	10	27.7	3.9	31.6	100	3.90	4.17	1.22
18	09-Feb-89	07:57	48.14	10	27.0	4.1	31.6	100	4.10	4.31	1.26
17	09-Feb-89	07:58	48.16	10	27.6	4.2	31.6	100	4.20	4.48	1.31
20	09-Feb-89	08:01	48.21	10	27.6	4.3	31.6	100	4.30	4.59	1.34
21	09-Feb-89	08:03	48.24	10	27.6	4.2	31.6	100	4.20	4.48	1.31
22	09-Feb-89	08:06	48.29	10	27.0	4.7	31.6	100	4.70	4.94	1.44
24	09-Feb-89	08:10	48.36	10	27.7	3.9	31.6	100	3.90	4.17	1.22
25	09-Feb-89	08:12	48.39	10	27.4	4.2	31.6	100	4.20	4.46	1.30
26	09-Feb-89	08:14	48.43	10	27.7	4.2	31.6	100	4.20	4.49	1.31
27	09-Feb-89	08:15	48.44	10	27.8	4.1	31.6	100	4.10	4.40	1.29
28	09-Feb-89	08:17	48.48	10	27.3	4.1	31.6	100	4.10	4.34	1.27
23	09-Feb-89	08:20	48.53	10	27.8	4.4	31.6	100	4.40	4.72	1.38
22	09-Feb-89	08:22	48.56	15	27.6	3.7	31.6	100	3.70	3.95	1.15
22	09-Feb-89	08:22	48.56	1	27.3	5.7	31.6	100	5.70	6.04	1.76
22	09-Feb-89	08:22	48.56	10	27.5	4.6	31.6	100	4.60	4.90	1.43
22	09-Feb-89	08:22	48.56	5	27.3	5.0	31.6	100	5.00	5.29	1.55
29	09-Feb-89	08:28	48.66	10	27.7	4.0	31.6	100	4.00	4.28	1.25
30	09-Feb-89	08:32	48.73	10	26.6	3.5	31.6	100	3.50	3.64	1.06
31	09-Feb-89	08:35	48.78	1	26.6	5.7	31.6	100	5.70	5.93	1.73
46	09-Feb-89	08:49	49.01	1	26.6	5.2	31.6	100	5.20	5.41	1.58
32	09-Feb-89	09:07	49.31	1	26.9	5.2	31.6	100	5.20	5.45	1.59
33	09-Feb-89	09:10	49.36	1	26.9	5.1	31.6	100	5.10	5.34	1.56
35	09-Feb-89	09:11	49.38	10	26.4	4.0	31.6	100	4.00	4.14	1.21
36	09-Feb-89	09:13	49.41	10	26.5	4.1	31.6	100	4.10	4.25	1.24
37	09-Feb-89	09:15	49.44	10	26.5	4.0	31.6	100	4.00	4.15	1.21
38	09-Feb-89	09:18	49.49	10	26.5	3.8	31.6	100	3.80	3.94	1.15
39	09-Feb-89	09:20	49.53	10	26.8	3.7	31.6	100	3.70	3.87	1.13
40	09-Feb-89	09:22	49.56	10	26.6	4.0	31.6	100	4.00	4.16	1.22
43	09-Feb-89	09:24	49.59	10	26.6	4.2	31.6	100	4.20	4.37	1.28
42	09-Feb-89	09:25	49.61	10	26.8	4.0	31.6	100	4.00	4.18	1.22
41	09-Feb-89	09:26	49.63	10	27.1	4.1	31.6	100	4.10	4.32	1.26
44	09-Feb-89	09:28	49.66	10	26.7	3.9	31.6	100	3.90	4.07	1.19
1	09-Feb-89	10:03	50.24	1	30.6	0.0	31.6	100	0.00	0.00	0.00
2	09-Feb-89	10:07	50.31	20	28.2	1.0	31.6	100	1.00	1.08	0.32
2	09-Feb-89	10:07	50.31	10	28.2	0.8	31.6	100	0.80	0.87	0.25
2	09-Feb-89	10:07	50.31	1	28.2	1.4	31.6	100	1.40	1.52	0.44
2	09-Feb-89	10:07	50.31	25	17.0	1.2	31.6	100	1.20	0.97	0.28
4	09-Feb-89	10:14	50.43	1	27.5	1.8	31.6	100	1.80	1.92	0.56
6	09-Feb-89	10:16	50.46	1	27.5	2.2	31.6	100	2.20	2.34	0.68
11	09-Feb-89	10:19	50.51	1	28.9	0.6	31.6	100	0.60	0.66	0.19
9	09-Feb-89	10:22	50.56	1	27.3	6.0	31.6	100	6.00	6.35	1.86
8	09-Feb-89	10:25	50.61	1	27.3	6.0	31.6	100	6.00	6.35	1.86
12	09-Feb-89	10:28	50.66	10	28.0	3.2	31.6	100	3.20	3.45	1.01
13	09-Feb-89	10:29	50.68	10	27.7	4.0	31.6	100	4.00	4.28	1.25
14	09-Feb-89	10:31	50.71	10	27.8	4.6	31.6	100	4.60	4.93	1.44
15	09-Feb-89	10:33	50.74	10	27.7	4.4	31.6	100	4.40	4.71	1.38
16	09-Feb-89	10:35	50.78	10	28.0	4.0	31.6	100	4.00	4.31	1.26
19	09-Feb-89	10:37	50.81	10	28.0	3.4	31.6	100	3.40	3.67	1.07
18	09-Feb-89	10:39	50.84	10	28.1	3.7	31.6	100	3.70	4.00	1.17
17	09-Feb-89	10:41	50.88	10	27.9	4.0	31.6	100	4.00	4.30	1.26
20	09-Feb-89	10:43	50.91	10	27.7	3.4	31.6	100	3.40	3.64	1.06
21	09-Feb-89	10:44	50.93	20	27.6	3.2	31.6	100	3.20	3.41	1.00
21	09-Feb-89	10:44	50.93	30	27.4	2.8	31.6	100	2.80	2.97	0.87
21	09-Feb-89	10:44	50.93	10	27.2	3.6	31.6	100	3.60	3.80	1.11
21	09-Feb-89	10:44	50.93	1	27.6	4.8	31.6	100	4.80	5.12	1.50
22	09-Feb-89	10:49	51.01	10	27.7	3.4	31.6	100	3.40	3.64	1.06
23	09-Feb-89	10:51	51.04	5	27.5	4.5	31.6	100	4.50	4.79	1.40

Table 10.5.2-2. Lauderdale Plant Cooling Canal/Pond System Dye Study--Calibrated Data (Page 24 of 31)

Sta No.	Date	Time (real)	Time (elapsed)	Depth (ft)	Temp (°C)	Fluorescence					
						F	Scale	Mult	F'	Fo	C (ppb)
24	09-Feb-89	10:54	51.09	10	27.9	3.8	31.6	100	3.80	4.09	1.19
25	09-Feb-89	10:56	51.13	10	27.7	3.4	31.6	100	3.40	3.64	1.06
26	09-Feb-89	10:58	51.16	10	28.0	3.5	31.6	100	3.50	3.77	1.10
27	09-Feb-89	10:59	51.18	10	27.8	3.4	31.6	100	3.40	3.65	1.07
28	09-Feb-89	11:02	51.23	10	27.7	3.1	31.6	100	3.10	3.32	0.97
29	09-Feb-89	11:06	51.29	1	27.7	3.4	31.6	100	3.40	3.64	1.06
32	09-Feb-89	11:08	51.33	1	27.4	4.6	31.6	100	4.60	4.88	1.43
33	09-Feb-89	11:09	51.34	1	27.1	5.6	31.6	100	5.60	5.90	1.72
34	09-Feb-89	11:11	51.38	1	26.9	6.2	31.6	100	6.20	6.50	1.90
35	09-Feb-89	11:14	51.43	1	26.8	3.6	31.6	100	3.60	3.76	1.10
36	09-Feb-89	11:15	51.44	1	27.1	3.9	31.6	100	3.90	4.11	1.20
37	09-Feb-89	11:16	51.46	1	26.6	3.0	31.6	100	3.00	3.12	0.91
40	09-Feb-89	11:19	51.51	1	26.8	3.0	31.6	100	3.00	3.14	0.92
39	09-Feb-89	11:21	51.54	30	26.7	3.4	31.6	100	3.40	3.54	1.04
39	09-Feb-89	11:21	51.54	10	26.8	3.6	31.6	100	3.60	3.76	1.10
39	09-Feb-89	11:21	51.54	1	26.8	3.0	31.6	100	3.00	3.14	0.92
39	09-Feb-89	11:21	51.54	20	26.8	3.8	31.6	100	3.80	3.97	1.16
38	09-Feb-89	11:25	51.61	1	26.7	3.2	31.6	100	3.20	3.34	0.97
43	09-Feb-89	11:28	51.66	1	27.0	3.2	31.6	100	3.20	3.36	0.98
42	09-Feb-89	11:29	51.68	1	27.0	3.2	31.6	100	3.20	3.36	0.98
41	09-Feb-89	11:30	51.69	1	26.9	3.0	31.6	100	3.00	3.14	0.92
44	09-Feb-89	11:34	51.76	1	26.9	3.2	31.6	100	3.20	3.35	0.98
38	09-Feb-89	11:35	51.78	1	27.0	3.2	31.6	100	3.20	3.36	0.98
35	09-Feb-89	11:39	51.84	1	26.6	3.1	31.6	100	3.10	3.22	0.94
33A	09-Feb-89	11:42	51.89	1	27.1	4.2	31.6	100	4.20	4.42	1.29
33B	09-Feb-89	11:42	51.89	1	26.8	5.4	31.6	100	5.40	5.64	1.65
32	09-Feb-89	11:45	51.94	1	27.4	4.2	31.6	100	4.20	4.46	1.30
24	09-Feb-89	11:49	52.01	1	28.1	3.4	31.6	100	3.40	3.68	1.07
20	09-Feb-89	11:52	52.06	1	28.2	3.8	31.6	100	3.80	4.12	1.20
17	09-Feb-89	11:54	52.09	1	27.8	4.4	31.6	100	4.40	4.72	1.38
14	09-Feb-89	11:55	52.11	1	27.7	4.5	31.6	100	4.50	4.81	1.41
14A	09-Feb-89	11:57	52.14	1	27.8	4.5	31.6	100	4.50	4.83	1.41
13	09-Feb-89	11:59	52.18	1	27.9	4.6	31.6	100	4.60	4.95	1.45
13A	09-Feb-89	12:00	52.19	1	27.6	4.8	31.6	100	4.80	5.12	1.50
12	09-Feb-89	12:02	52.23	1	27.5	5.1	31.6	100	5.10	5.43	1.59
11	09-Feb-89	12:04	52.26	1	30.3	0.2	31.6	100	0.20	0.23	0.07
2	09-Feb-89	12:08	52.33	1	30.4	0.2	31.6	100	0.20	0.23	0.07
1	09-Feb-89	12:57	53.14	1	32.3	0.3	31.6	100	0.30	0.36	0.11
2	09-Feb-89	12:57	53.14	1	30.0	0.3	31.6	100	0.30	0.34	0.10
2	09-Feb-89	13:00	53.19	20	28.3	0.9	31.6	100	0.90	0.98	0.29
2	09-Feb-89	13:00	53.19	26	28.1	0.8	31.6	100	0.80	0.86	0.25
2	09-Feb-89	13:00	53.19	10	30.0	1.0	31.6	100	1.00	1.14	0.33
3	09-Feb-89	13:07	53.31	1	30.0	0.5	31.6	100	0.50	0.57	0.17
4	09-Feb-89	13:10	53.36	1	29.9	0.7	31.6	100	0.70	0.79	0.23
5	09-Feb-89	13:16	53.46	1	27.6	1.7	31.6	100	1.70	1.81	0.53
6	09-Feb-89	13:18	53.49	1	27.3	2.8	31.6	100	2.80	2.96	0.87
11	09-Feb-89	13:21	53.54	1	30.6	0.7	31.6	100	0.70	0.81	0.24
10	09-Feb-89	13:23	53.58	1	27.6	5.0	31.6	100	5.00	5.34	1.56
9	09-Feb-89	13:25	53.61	1	27.1	4.7	31.6	100	4.70	4.95	1.45
8	09-Feb-89	13:28	53.66	1	27.1	4.8	31.6	100	4.80	5.06	1.48
7	09-Feb-89	13:30	53.69	1	26.9	4.4	31.6	100	4.40	4.61	1.35
12	09-Feb-89	13:32	53.73	1	27.4	4.8	31.6	100	4.80	5.10	1.49
13	09-Feb-89	13:34	53.76	1	27.5	4.8	31.6	100	4.80	5.11	1.49
14A	09-Feb-89	13:36	53.79	1	27.6	4.6	31.6	100	4.60	4.91	1.43
14	09-Feb-89	13:37	53.81	1	27.5	4.7	31.6	100	4.70	5.00	1.46
15	09-Feb-89	13:39	53.84	1	27.4	4.8	31.6	100	4.80	5.10	1.49
16	09-Feb-89	13:40	53.86	1	27.4	4.9	31.6	100	4.90	5.20	1.52

Table 10.5.2-2. Lauderdale Plant Cooling Canal/Pond System Dye Study--Calibrated Data (Page 25 of 31)

Sta No.	Date	Time (real)	Time (elapsed)	Depth (ft)	Temp (°C)	Fluorescence					
						F	Scale	Mult	F'	Fo	C (ppb)
19	09-Feb-89	13:42	53.89	1	27.4	4.7	31.6	100	4.70	4.99	1.46
18	09-Feb-89	13:44	53.93	1	27.6	4.4	31.6	100	4.40	4.70	1.37
17	09-Feb-89	13:45	53.94	6	27.7	4.4	31.6	100	4.40	4.71	1.38
20	09-Feb-89	13:48	53.99	1	27.9	4.0	31.6	100	4.00	4.30	1.26
24	09-Feb-89	13:50	54.03	1	27.7	4.0	31.6	100	4.00	4.28	1.25
25	09-Feb-89	13:50	54.03	1	27.8	3.8	31.6	100	3.80	4.08	1.19
21	09-Feb-89	13:54	54.09	20	27.4	3.2	31.6	100	3.20	3.40	0.99
21	09-Feb-89	13:54	54.09	10	27.7	3.4	31.6	100	3.40	3.64	1.06
21	09-Feb-89	13:54	54.09	1	27.7	4.2	31.6	100	4.20	4.49	1.31
21	09-Feb-89	13:54	54.09	30	27.3	3.1	31.6	100	3.10	3.28	0.96
22	09-Feb-89	13:57	54.14	1	27.7	4.0	31.6	100	4.00	4.28	1.25
26	09-Feb-89	14:01	54.21	1	28.0	3.8	31.6	100	3.80	4.10	1.20
27	09-Feb-89	14:04	54.26	1	28.1	3.8	31.6	100	3.80	4.11	1.20
28	09-Feb-89	14:05	54.28	1	27.6	3.4	31.6	100	3.40	3.63	1.06
23	09-Feb-89	14:09	54.34	1	27.6	3.4	31.6	100	3.40	3.63	1.06
29	09-Feb-89	14:11	54.38	1	27.4	4.7	31.6	100	4.70	4.99	1.46
30	09-Feb-89	14:14	54.43	1	27.0	4.7	31.6	100	4.70	4.94	1.44
32	09-Feb-89	14:18	54.49	1	27.3	3.4	31.6	100	3.40	3.60	1.05
33	09-Feb-89	14:19	54.51	1	26.8	5.6	31.6	100	5.60	5.85	1.71
34	09-Feb-89	14:21	54.54	1	26.8	5.6	31.6	100	5.60	5.85	1.71
35	09-Feb-89	14:25	54.61	1	26.3	3.1	31.6	100	3.10	3.20	0.93
36	09-Feb-89	14:26	54.63	1	26.3	3.3	31.6	100	3.30	3.40	0.99
37	09-Feb-89	14:28	54.66	1	26.3	3.1	31.6	100	3.10	3.20	0.93
38	09-Feb-89	14:30	54.69	1	26.5	3.5	31.6	100	3.50	3.63	1.06
39	09-Feb-89	14:32	54.73	20	26.4	3.7	31.6	100	3.70	3.83	1.12
39	09-Feb-89	14:32	54.73	30	26.5	3.9	31.6	100	3.90	4.04	1.18
39	09-Feb-89	14:32	54.73	1	26.6	3.5	31.6	100	3.50	3.64	1.06
39	09-Feb-89	14:32	54.73	10	26.4	3.7	31.6	100	3.70	3.83	1.12
40	09-Feb-89	14:36	54.79	1	26.5	3.5	31.6	100	3.50	3.63	1.06
43	09-Feb-89	14:38	54.83	1	26.6	3.5	31.6	100	3.50	3.64	1.06
42	09-Feb-89	14:40	54.86	1	26.7	3.4	31.6	100	3.40	3.54	1.04
41	09-Feb-89	14:42	54.89	1	26.6	3.3	31.6	100	3.30	3.43	1.00
44	09-Feb-89	14:44	54.93	1	26.6	3.5	31.6	100	3.50	3.64	1.06
36	09-Feb-89	14:46	54.96	1	26.6	3.3	31.6	100	3.30	3.43	1.00
35	09-Feb-89	14:51	55.04	1	26.5	3.2	31.6	100	3.20	3.32	0.97
33	09-Feb-89	14:53	55.08	1	26.8	4.6	31.6	100	4.60	4.81	1.41
32	09-Feb-89	14:55	55.11	1	27.4	3.4	31.6	100	3.40	3.61	1.05
45	09-Feb-89	14:56	55.13	1	27.6	3.6	31.6	100	3.60	3.84	1.12
27	09-Feb-89	14:58	55.16	1	27.8	3.5	31.6	100	3.50	3.75	1.10
26	09-Feb-89	15:00	55.19	1	27.8	3.6	31.6	100	3.60	3.86	1.13
25	09-Feb-89	15:03	55.24	1	27.8	3.7	31.6	100	3.70	3.97	1.16
24	09-Feb-89	15:05	55.28	1	27.8	3.9	31.6	100	3.90	4.18	1.22
20	09-Feb-89	15:06	55.29	1	27.8	3.9	31.6	100	3.90	4.18	1.22
17	09-Feb-89	15:07	55.31	1	27.8	4.1	31.6	100	4.10	4.40	1.29
14A	09-Feb-89	15:09	55.34	1	27.7	4.3	31.6	100	4.30	4.60	1.34
11	09-Feb-89	15:10	55.36	1	29.7	0.8	31.6	100	0.80	0.90	0.26
12	09-Feb-89	15:10	55.36	1	27.6	4.5	31.6	100	4.50	4.80	1.40
2	09-Feb-89	15:16	55.46	1	30.5	0.9	31.6	100	0.90	1.04	0.30
1	09-Feb-89	15:19	55.51	1	32.0	0.7	31.6	100	0.70	0.84	0.24
1	09-Feb-89	15:52	56.06	1	31.7	0.9	31.6	100	0.90	1.07	0.31
44	09-Feb-89	16:05	56.28	1	26.4	3.5	31.6	100	3.50	3.62	1.06
41	09-Feb-89	16:06	56.29	1	26.6	3.3	31.6	100	3.30	3.43	1.00
42	09-Feb-89	16:06	56.29	1	26.5	3.4	31.6	100	3.40	3.53	1.03
43	09-Feb-89	16:07	56.31	1	26.1	3.3	31.6	100	3.30	3.39	0.99
40	09-Feb-89	16:12	56.39	1	25.8	3.3	31.6	100	3.30	3.36	0.98
39	09-Feb-89	16:14	56.43	20	26.5	3.6	31.6	100	3.60	3.73	1.09
39	09-Feb-89	16:14	56.43	1	26.3	3.3	31.6	100	3.30	3.40	0.99

Table 10.5.2-2. Lauderdale Plant Cooling Canal/Pond System Dye Study--Calibrated Data (Page 26 of 31)

Sta No.	Date	Time (real)	Time (elapsed)	Depth (ft)	Temp (°C)	Fluorescence					
						F	Scale	Mult	F'	Fo	C (ppb)
39	09-Feb-89	16:14	56.43	10	26.6	3.6	31.6	100	3.60	3.74	1.09
39	09-Feb-89	16:14	56.43	30	26.6	3.9	31.6	100	3.90	4.06	1.19
38	09-Feb-89	16:16	56.46	1	26.1	3.4	31.6	100	3.40	3.49	1.02
36	09-Feb-89	16:20	56.53	1	26.2	3.4	31.6	100	3.40	3.50	1.02
37	09-Feb-89	16:23	56.58	1	26.2	3.4	31.6	100	3.40	3.50	1.02
35	09-Feb-89	16:24	56.59	1	25.9	3.4	31.6	100	3.40	3.47	1.01
33	09-Feb-89	16:25	56.61	1	26.6	3.7	31.6	100	3.70	3.85	1.12
34	09-Feb-89	16:27	56.64	1	26.3	5.4	31.6	100	5.40	5.57	1.63
32	09-Feb-89	16:30	56.69	1	26.6	2.9	31.6	100	2.90	3.02	0.88
29	09-Feb-89	16:31	56.71	1	26.8	4.0	31.6	100	4.00	4.18	1.22
30	09-Feb-89	16:33	56.74	1	26.7	4.5	31.6	100	4.50	4.69	1.37
31	09-Feb-89	16:35	56.78	1	26.5	4.0	31.6	100	4.00	4.15	1.21
31B	09-Feb-89	16:40	56.86	1	26.4	5.2	31.6	100	5.20	5.38	1.57
28	09-Feb-89	16:43	56.91	1	26.7	3.0	31.6	100	3.00	3.13	0.91
27	09-Feb-89	16:45	56.94	1	26.9	3.3	31.6	100	3.30	3.46	1.01
26	09-Feb-89	16:46	56.96	1	27.1	3.4	31.6	100	3.40	3.58	1.05
25	09-Feb-89	16:47	56.98	1	26.7	3.6	31.6	100	3.60	3.75	1.10
24	09-Feb-89	16:48	56.99	.1	27.2	4.0	31.6	100	4.00	4.22	1.23
20	09-Feb-89	16:50	57.03	1	27.5	3.8	31.6	100	3.80	4.04	1.18
21	09-Feb-89	16:51	57.04	30	27.6	3.0	31.6	100	3.00	3.20	0.94
21	09-Feb-89	16:51	57.04	10	27.4	3.6	31.6	100	3.60	3.82	1.12
21	09-Feb-89	16:51	57.04	20	27.4	3.2	31.6	100	3.20	3.40	0.99
21	09-Feb-89	16:51	57.04	1	27.5	3.8	31.6	100	3.80	4.04	1.18
22	09-Feb-89	16:53	57.08	1	27.2	3.5	31.6	100	3.50	3.70	1.08
23	09-Feb-89	16:55	57.11	1	26.9	3.3	31.6	100	3.30	3.46	1.01
18	09-Feb-89	16:59	57.18	1	27.2	3.7	31.6	100	3.70	3.91	1.14
19	09-Feb-89	16:59	57.18	1	27.1	3.6	31.6	100	3.60	3.79	1.11
17	09-Feb-89	17:01	57.21	1	27.3	3.9	31.6	100	3.90	4.13	1.21
44	09-Feb-89	17:07	57.31	1	26.0	3.5	31.6	100	3.50	3.58	1.05
16	09-Feb-89	17:11	57.38	1	26.5	4.6	31.6	100	4.60	4.77	1.39
15	09-Feb-89	17:13	57.41	1	26.8	4.5	31.6	100	4.50	4.70	1.37
14	09-Feb-89	17:14	57.43	1	27.0	4.0	31.6	100	4.00	4.20	1.23
12	09-Feb-89	17:15	57.44	1	27.1	4.0	31.6	100	4.00	4.21	1.23
13	09-Feb-89	17:16	57.46	1	27.2	4.1	31.6	100	4.10	4.33	1.27
11	09-Feb-89	17:17	57.48	1	29.5	0.9	31.6	100	0.90	1.01	0.29
2	09-Feb-89	17:20	57.53	1	30.7	0.8	31.6	100	0.80	0.93	0.27
2	09-Feb-89	17:20	57.53	1	27.5	0.8	31.6	100	0.80	0.85	0.25
2	09-Feb-89	17:20	57.53	20	27.8	1.8	31.6	100	1.80	1.93	0.56
2	09-Feb-89	17:20	57.53	25	27.7	1.3	31.6	100	1.30	1.39	0.41
5	09-Feb-89	17:25	57.61	1	29.5	0.9	31.6	100	0.90	1.01	0.29
5	09-Feb-89	17:25	57.61	20	28.8	2.5	31.6	100	2.50	2.75	0.80
1	09-Feb-89	17:30	57.69	1	31.3	0.9	31.6	100	0.90	1.06	0.31
48	09-Feb-89	17:32	57.73	5	30.9	0.9	31.6	100	0.90	1.05	0.31
48	09-Feb-89	17:32	57.73	1	30.9	0.9	31.6	100	0.90	1.05	0.31
44	09-Feb-89	18:16	58.46	2	25.8	3.5	31.6	100	3.50	3.56	1.04
41	09-Feb-89	18:21	58.54	2	25.8	3.7	31.6	100	3.70	3.77	1.10
42	09-Feb-89	18:23	58.58	2	26.0	3.5	31.6	100	3.50	3.58	1.05
43	09-Feb-89	18:25	58.61	2	25.7	3.5	31.6	100	3.50	3.56	1.04
40	09-Feb-89	18:28	58.66	2	25.7	3.5	31.6	100	3.50	3.56	1.04
39	09-Feb-89	18:29	58.68	30	26.1	4.0	31.6	100	4.00	4.11	1.20
39	09-Feb-89	18:29	58.68	20	26.0	4.0	31.6	100	4.00	4.09	1.20
39	09-Feb-89	18:29	58.68	1	25.8	3.8	31.6	100	3.80	3.87	1.13
39	09-Feb-89	18:29	58.68	10	25.8	3.8	31.6	100	3.80	3.87	1.13
38	09-Feb-89	18:32	58.73	2	25.7	3.5	31.6	100	3.50	3.56	1.04
36	09-Feb-89	18:35	58.78	2	25.7	3.5	31.6	100	3.50	3.56	1.04
37	09-Feb-89	18:36	58.79	2	25.7	3.5	31.6	100	3.50	3.56	1.04
35	09-Feb-89	18:39	58.84	2	25.7	3.5	31.6	100	3.50	3.56	1.04

Table 10.5.2-2. Lauderdale Plant Cooling Canal/Pond System Dye Study--Calibrated Data (Page 27 of 31)

Sta No.	Date	Time (real)	Time (elapsed)	Depth (ft)	Temp (°C)	Fluorescence					
						F	Scale	Mult	F'	Fo	C (ppb)
33	09-Feb-89	18:41	58.88	2	26.3	3.5	31.6	100	3.50	3.61	1.06
34	09-Feb-89	18:42	58.89	2	26.1	5.4	31.6	100	5.40	5.54	1.62
32	09-Feb-89	18:43	58.91	2	26.4	2.9	31.6	100	2.90	3.00	0.88
29	09-Feb-89	18:45	58.94	2	26.4	3.9	31.6	100	3.90	4.03	1.18
28	09-Feb-89	18:50	59.03	2	26.2	3.2	31.6	100	3.20	3.29	0.96
27	09-Feb-89	18:51	59.04	2	26.5	3.5	31.6	100	3.50	3.63	1.06
26	09-Feb-89	18:52	59.06	2	26.8	3.5	31.6	100	3.50	3.66	1.07
24	09-Feb-89	18:54	59.09	2	26.7	3.9	31.6	100	3.90	4.07	1.19
25	09-Feb-89	18:54	59.09	2	26.9	3.7	31.6	100	3.70	3.88	1.13
20	09-Feb-89	18:56	59.13	2	27.1	3.8	31.6	100	3.80	4.00	1.17
21	09-Feb-89	18:58	59.16	20	27.4	3.4	31.6	100	3.40	3.61	1.05
21	09-Feb-89	18:58	59.16	30	27.3	3.3	31.6	100	3.30	3.49	1.02
21	09-Feb-89	18:58	59.16	1	26.4	3.8	31.6	100	3.80	3.93	1.15
21	09-Feb-89	18:58	59.16	10	27.0	3.4	31.6	100	3.40	3.57	1.04
22	09-Feb-89	19:00	59.19	2	26.7	3.4	31.6	100	3.40	3.54	1.04
23	09-Feb-89	19:01	59.21	2	26.3	3.1	31.6	100	3.10	3.20	0.93
19	09-Feb-89	19:03	59.24	2	27.0	3.6	31.6	100	3.60	3.78	1.11
18	09-Feb-89	19:04	59.26	2	27.0	3.8	31.6	100	3.80	3.99	1.17
17	09-Feb-89	19:05	59.28	2	26.9	3.7	31.6	100	3.70	3.88	1.13
14	09-Feb-89	19:06	59.29	2	26.7	4.0	31.6	100	4.00	4.17	1.22
15	09-Feb-89	19:07	59.31	2	26.9	3.9	31.6	100	3.90	4.09	1.19
16	09-Feb-89	19:08	59.33	2	27.1	3.7	31.6	100	3.70	3.90	1.14
12	09-Feb-89	19:10	59.36	2	26.8	3.8	31.6	100	3.80	3.97	1.16
13	09-Feb-89	19:11	59.38	2	27.6	3.0	31.6	100	3.00	3.20	0.94
2	09-Feb-89	19:12	59.39	10	30.6	0.8	31.6	100	0.80	0.92	0.27
2	09-Feb-89	19:12	59.39	20	28.2	0.9	31.6	100	0.90	0.98	0.29
2	09-Feb-89	19:12	59.39	30	27.8	1.0	31.6	100	1.00	1.07	0.31
2	09-Feb-89	19:12	59.39	1	30.6	0.9	31.6	100	0.90	1.04	0.30
11	09-Feb-89	19:12	59.39	2	30.0	0.8	31.6	100	0.80	0.91	0.27
1	09-Feb-89	19:16	59.46	2	31.4	0.5	31.6	100	0.50	0.59	0.17
44	09-Feb-89	20:20	60.53	2	25.8	2.8	31.6	100	2.80	2.85	0.83
41	09-Feb-89	20:22	60.56	2	25.5	3.4	31.6	100	3.40	3.44	1.00
42	09-Feb-89	20:23	60.58	2	25.6	3.6	31.6	100	3.60	3.65	1.07
43	09-Feb-89	20:25	60.61	2	25.5	3.7	31.6	100	3.70	3.74	1.09
40	09-Feb-89	20:26	60.63	2	25.4	3.8	31.6	100	3.80	3.83	1.12
34	09-Feb-89	20:28	60.66	10	25.4	4.0	31.6	100	4.00	4.03	1.18
34	09-Feb-89	20:28	60.66	30	25.8	3.8	31.6	100	3.80	3.87	1.13
34	09-Feb-89	20:28	60.66	20	25.7	4.0	31.6	100	4.00	4.06	1.19
34	09-Feb-89	20:28	60.66	1	25.2	4.0	31.6	100	4.00	4.01	1.17
38	09-Feb-89	20:30	60.69	2	25.4	4.0	31.6	100	4.00	4.03	1.18
36	09-Feb-89	20:35	60.78	2	25.5	3.8	31.6	100	3.80	3.84	1.12
37	09-Feb-89	20:36	60.79	2	25.5	3.8	31.6	100	3.80	3.84	1.12
35	09-Feb-89	20:37	60.81	2	25.5	3.9	31.6	100	3.90	3.94	1.15
33	09-Feb-89	20:38	60.83	2	26.1	3.8	31.6	100	3.80	3.90	1.14
34	09-Feb-89	20:40	60.86	2	25.6	5.3	31.6	100	5.30	5.37	1.57
32	09-Feb-89	20:43	60.91	2	26.0	3.5	31.6	100	3.50	3.58	1.05
29	09-Feb-89	20:45	60.94	2	25.9	3.5	31.6	100	3.50	3.57	1.04
30	09-Feb-89	20:46	60.96	2	25.6	4.0	31.6	100	4.00	4.05	1.18
26	09-Feb-89	20:50	61.03	2	26.6	3.6	31.6	100	3.60	3.74	1.09
27	09-Feb-89	20:50	61.03	2	26.1	3.7	31.6	100	3.70	3.80	1.11
28	09-Feb-89	20:50	61.03	2	25.2	2.9	31.6	100	2.90	2.91	0.85
25	09-Feb-89	20:55	61.11	2	26.7	3.7	31.6	100	3.70	3.86	1.13
24	09-Feb-89	20:56	61.13	2	26.8	3.6	31.6	100	3.60	3.76	1.10
20	09-Feb-89	20:58	61.16	2	26.5	3.5	31.6	100	3.50	3.63	1.06
21	09-Feb-89	20:59	61.18	30	27.2	3.2	31.6	100	3.20	3.38	0.99
21	09-Feb-89	20:59	61.18	10	26.9	3.4	31.6	100	3.40	3.56	1.04
21	09-Feb-89	20:59	61.18	20	26.6	3.6	31.6	100	3.60	3.74	1.09

Table 10.5.2-2. Lauderdale Plant Cooling Canal/Pond System Dye Study--Calibrated Data (Page 28 of 31)

Sta No.	Date	Time (real)	Time (elapsed)	Depth (ft)	Temp (°C)	Fluorescence					
						F	Scale	Mult	F'	Fo	C (ppb)
21	09-Feb-89	20:59	61.18	1	27.0	3.0	31.6	100	3.00	3.15	0.92
22	09-Feb-89	21:01	61.21	2	27.2	3.0	31.6	100	3.00	3.17	0.93
23	09-Feb-89	21:02	61.23	2	27.7	2.5	31.6	100	2.50	2.67	0.78
19	09-Feb-89	21:05	61.28	2	27.7	2.9	31.6	100	2.90	3.10	0.91
18	09-Feb-89	21:06	61.29	2	27.6	2.7	31.6	100	2.70	2.88	0.84
17	09-Feb-89	21:08	61.33	2	27.1	3.6	31.6	100	3.60	3.79	1.11
14	09-Feb-89	21:10	61.36	2	26.6	3.8	31.6	100	3.80	3.95	1.15
15	09-Feb-89	21:11	61.38	2	27.0	3.2	31.6	100	3.20	3.36	0.98
16	09-Feb-89	21:11	61.38	2	28.2	2.3	31.6	100	2.30	2.49	0.73
12	09-Feb-89	21:14	61.43	2	26.7	3.7	31.6	100	3.70	3.86	1.13
13	09-Feb-89	21:14	61.43	2	27.4	3.1	31.6	100	3.10	3.29	0.96
10	09-Feb-89	21:15	61.44	2	26.6	3.9	31.6	100	3.90	4.06	1.19
2	09-Feb-89	21:16	61.46	2	29.7	0.7	31.6	100	0.70	0.79	0.23
11	09-Feb-89	21:16	61.46	2	29.5	0.7	31.6	100	0.70	0.78	0.23
1	09-Feb-89	21:17	61.48	2	27.5	0.5	31.6	100	0.50	0.53	0.16
44	09-Feb-89	21:50	62.03	2	25.0	3.9	31.6	100	3.90	3.89	1.14
41	09-Feb-89	21:55	62.11	2	25.4	3.8	31.6	100	3.80	3.83	1.12
42	09-Feb-89	21:56	62.13	2	25.4	3.9	31.6	100	3.90	3.93	1.15
43	09-Feb-89	21:58	62.16	2	25.3	3.8	31.6	100	3.80	3.82	1.12
40	09-Feb-89	22:00	62.19	2	25.0	3.8	31.6	100	3.80	3.79	1.11
38	09-Feb-89	22:02	62.23	2	25.4	3.8	31.6	100	3.80	3.83	1.12
39	09-Feb-89	22:02	62.23	2	25.3	3.8	31.6	100	3.80	3.82	1.12
36	09-Feb-89	22:05	62.28	2	25.2	3.8	31.6	100	3.80	3.81	1.11
37	09-Feb-89	22:05	62.28	2	25.3	3.7	31.6	100	3.70	3.72	1.09
35	09-Feb-89	22:07	62.31	2	25.2	3.8	31.6	100	3.80	3.81	1.11
33	09-Feb-89	22:09	62.34	2	26.0	3.9	31.6	100	3.90	3.99	1.17
34	09-Feb-89	22:10	62.36	2	25.3	5.1	31.6	100	5.10	5.13	1.50
32	09-Feb-89	22:11	62.38	2	26.0	3.4	31.6	100	3.40	3.48	1.02
29	09-Feb-89	22:14	62.43	2	25.8	3.4	31.6	100	3.40	3.46	1.01
30	09-Feb-89	22:15	62.44	2	25.3	3.9	31.6	100	3.90	3.92	1.15
28	09-Feb-89	22:23	62.58	2	26.1	3.5	31.6	100	3.50	3.59	1.05
27	09-Feb-89	22:30	62.69	2	26.3	3.5	31.6	100	3.50	3.61	1.06
25	09-Feb-89	22:31	62.71	2	26.5	3.5	31.6	100	3.50	3.63	1.06
26	09-Feb-89	22:31	62.71	2	26.5	3.6	31.6	100	3.60	3.73	1.09
24	09-Feb-89	22:32	62.73	2	26.5	3.5	31.6	100	3.50	3.63	1.06
20	09-Feb-89	22:35	62.78	2	27.2	2.9	31.6	100	2.90	3.06	0.90
21	09-Feb-89	22:36	62.79	2	27.5	2.5	31.6	100	2.50	2.66	0.78
22	09-Feb-89	22:38	62.83	2	27.8	2.5	31.6	100	2.50	2.68	0.78
23	09-Feb-89	22:40	62.86	2	27.8	2.2	31.6	100	2.20	2.36	0.69
19	09-Feb-89	22:41	62.88	2	27.5	2.6	31.6	100	2.60	2.77	0.81
18	09-Feb-89	22:42	62.89	2	27.8	2.6	31.6	100	2.60	2.79	0.82
17	09-Feb-89	22:43	62.91	2	27.4	2.9	31.6	100	2.90	3.08	0.90
14	09-Feb-89	22:44	62.93	2	27.0	3.5	31.6	100	3.50	3.68	1.07
15	09-Feb-89	22:45	62.94	2	26.7	3.4	31.6	100	3.40	3.54	1.04
16	09-Feb-89	22:45	62.94	2	26.8	3.1	31.6	100	3.10	3.24	0.95
10	09-Feb-89	22:47	62.98	2	26.2	3.9	31.6	100	3.90	4.01	1.17
12	09-Feb-89	22:47	62.98	2	26.5	3.8	31.6	100	3.80	3.94	1.15
13	09-Feb-89	22:49	63.01	2	26.7	3.3	31.6	100	3.30	3.44	1.01
11	09-Feb-89	22:50	63.03	2	29.0	0.7	31.6	100	0.70	0.77	0.23
2	09-Feb-89	22:51	63.04	2	29.3	0.9	31.6	100	0.90	1.00	0.29
1	09-Feb-89	22:53	63.08	2	25.5	0.4	31.6	100	0.40	0.40	0.12
44	09-Feb-89	23:10	63.36	2	24.7	3.9	31.6	100	3.90	3.86	1.13
41	09-Feb-89	23:12	63.39	2	25.2	3.8	31.6	100	3.80	3.81	1.11
42	09-Feb-89	23:14	63.43	2	25.3	3.8	31.6	100	3.80	3.82	1.12
43	09-Feb-89	23:15	63.44	2	25.3	3.7	31.6	100	3.70	3.72	1.09
40	09-Feb-89	23:17	63.48	2	25.2	3.7	31.6	100	3.70	3.71	1.08
39	09-Feb-89	23:18	63.49	2	25.3	3.8	31.6	100	3.80	3.82	1.12

Table 10.5.2-2. Lauderdale Plant Cooling Canal/Pond System Dye Study--Calibrated Data (Page 29 of 31)

Sta No.	Date	Time (real)	Time (elapsed)	Depth (ft)	Temp (°C)	Fluorescence					
						F	Scale	Mult	F'	Fo	C (ppb)
38	09-Feb-89	23:19	63.51	2	25.4	3.7	31.6	100	3.70	3.73	1.09
36	09-Feb-89	23:21	63.54	2	25.2	3.8	31.6	100	3.80	3.81	1.11
37	09-Feb-89	23:22	63.56	2	25.2	3.8	31.6	100	3.80	3.81	1.11
35	09-Feb-89	23:24	63.59	2	25.2	3.7	31.6	100	3.70	3.71	1.08
33	09-Feb-89	23:26	63.63	2	26.1	3.4	31.6	100	3.40	3.49	1.02
34	09-Feb-89	23:27	63.64	2	25.1	5.1	31.6	100	5.10	5.10	1.49
32	09-Feb-89	23:28	63.66	2	26.4	3.1	31.6	100	3.10	3.21	0.94
29	09-Feb-89	23:31	63.71	2	25.6	3.3	31.6	100	3.30	3.34	0.98
28	09-Feb-89	23:34	63.76	2	25.6	3.2	31.6	100	3.20	3.24	0.95
27	09-Feb-89	23:36	63.79	2	26.1	3.3	31.6	100	3.30	3.39	0.99
26	09-Feb-89	23:37	63.81	2	26.2	3.4	31.6	100	3.40	3.50	1.02
25	09-Feb-89	23:38	63.83	2	26.4	3.4	31.6	100	3.40	3.52	1.03
24	09-Feb-89	23:39	63.84	2	26.3	3.5	31.6	100	3.50	3.61	1.06
20	09-Feb-89	23:41	63.88	2	27.0	2.9	31.6	100	2.90	3.05	0.89
21	09-Feb-89	23:42	63.89	2	27.2	2.7	31.6	100	2.70	2.85	0.83
22	09-Feb-89	23:43	63.91	2	27.4	2.6	31.6	100	2.60	2.76	0.81
23	09-Feb-89	23:44	63.93	2	27.6	2.4	31.6	100	2.40	2.56	0.75
19	09-Feb-89	23:46	63.96	2	27.1	3.0	31.6	100	3.00	3.16	0.92
18	09-Feb-89	23:47	63.98	2	27.4	2.6	31.6	100	2.60	2.76	0.81
17	09-Feb-89	23:48	63.99	2	27.3	2.8	31.6	100	2.80	2.96	0.87
16	09-Feb-89	23:50	64.03	2	27.1	3.0	31.6	100	3.00	3.16	0.92
15	09-Feb-89	23:51	64.04	2	27.0	3.1	31.6	100	3.10	3.26	0.95
14	09-Feb-89	23:52	64.06	2	27.2	2.8	31.6	100	2.80	2.96	0.86
12	09-Feb-89	23:53	64.08	2	26.8	3.1	31.6	100	3.10	3.24	0.95
13	09-Feb-89	23:54	64.09	2	27.0	3.1	31.6	100	3.10	3.26	0.95
11	09-Feb-89	23:55	64.11	2	28.4	0.5	31.6	100	0.50	0.54	0.16
2	09-Feb-89	23:56	64.13	2	29.0	0.6	31.6	100	0.60	0.66	0.19
1	10-Feb-89	00:36	64.79	2	24.4	0.4	31.6	100	0.40	0.39	0.11
2	10-Feb-89	00:38	64.83	2	28.6	0.8	31.6	100	0.80	0.88	0.26
11	10-Feb-89	00:40	64.86	2	28.6	0.6	31.6	100	0.60	0.66	0.19
12	10-Feb-89	00:41	64.88	2	26.4	3.4	31.6	100	3.40	3.52	1.03
13	10-Feb-89	00:41	64.88	2	27.1	2.8	31.6	100	2.80	2.95	0.86
10	10-Feb-89	00:42	64.89	2	26.2	3.7	31.6	100	3.70	3.81	1.11
14	10-Feb-89	00:43	64.91	2	26.9	2.7	31.6	100	2.70	2.83	0.83
15	10-Feb-89	00:45	64.94	2	27.2	2.8	31.6	100	2.80	2.96	0.86
16	10-Feb-89	00:46	64.96	2	27.1	2.7	31.6	100	2.70	2.84	0.83
19	10-Feb-89	00:48	64.99	2	27.2	2.6	31.6	100	2.60	2.75	0.80
18	10-Feb-89	00:49	65.01	2	27.8	2.7	31.6	100	2.70	2.90	0.85
17	10-Feb-89	00:50	65.03	2	27.4	2.8	31.6	100	2.80	2.97	0.87
20	10-Feb-89	00:52	65.06	2	27.0	3.0	31.6	100	3.00	3.15	0.92
21	10-Feb-89	00:53	65.08	2	27.3	2.7	31.6	100	2.70	2.86	0.84
0	10-Feb-89	00:54	65.09	2	27.5	2.7	31.6	100	2.70	2.87	0.84
23	10-Feb-89	00:55	65.11	2	27.5	2.5	31.6	100	2.50	2.66	0.78
24	10-Feb-89	00:57	65.14	2	26.5	3.3	31.6	100	3.30	3.42	1.00
25	10-Feb-89	00:59	65.18	2	26.4	3.3	31.6	100	3.30	3.41	1.00
26	10-Feb-89	01:00	65.19	2	26.4	3.2	31.6	100	3.20	3.31	0.97
27	10-Feb-89	01:01	65.21	2	26.4	3.2	31.6	100	3.20	3.31	0.97
28	10-Feb-89	01:02	65.23	2	26.4	3.1	31.6	100	3.10	3.21	0.94
29	10-Feb-89	01:04	65.26	2	25.2	3.1	31.6	100	3.10	3.11	0.91
36	10-Feb-89	01:07	65.31	2	25.3	3.5	31.6	100	3.50	3.52	1.03
32	10-Feb-89	01:10	65.36	2	26.6	3.0	31.6	100	3.00	3.12	0.91
33	10-Feb-89	01:10	65.36	2	26.6	3.3	31.6	100	3.30	3.43	1.00
34	10-Feb-89	01:12	65.39	2	25.4	5.1	31.6	100	5.10	5.14	1.50
35	10-Feb-89	01:14	65.43	2	25.1	3.8	31.6	100	3.80	3.80	1.11
36	10-Feb-89	01:15	65.44	2	25.1	3.8	31.6	100	3.80	3.80	1.11
37	10-Feb-89	01:16	65.46	2	25.1	3.9	31.6	100	3.90	3.90	1.14
40	10-Feb-89	01:19	65.51	2	25.0	3.6	31.6	100	3.60	3.59	1.05

Table 10.5.2-2. Lauderdale Plant Cooling Canal/Pond System Dye Study--Calibrated Data (Page 30 of 31)

Sta No.	Date	Time (real)	Time (elapsed)	Depth (ft)	Temp (°C)	Fluorescence					
						F	Scale	Mult	F'	Fo	C (ppb)
39	10-Feb-89	01:20	65.53	2	25.3	4.0	31.6	100	4.00	4.02	1.18
38	10-Feb-89	01:21	65.54	2	25.4	3.8	31.6	100	3.80	3.83	1.12
43	10-Feb-89	01:24	65.59	2	25.1	3.6	31.6	100	3.60	3.60	1.05
42	10-Feb-89	01:25	65.61	2	25.3	3.8	31.6	100	3.80	3.82	1.12
41	10-Feb-89	01:26	65.63	2	25.3	3.6	31.6	100	3.60	3.62	1.06
44	10-Feb-89	01:27	65.64	2	25.4	3.7	31.6	100	3.70	3.73	1.09
39	10-Feb-89	01:36	65.79	2	25.1	3.8	31.6	100	3.80	3.80	1.11
36	10-Feb-89	01:38	65.83	2	25.3	3.7	31.6	100	3.70	3.72	1.09
35	10-Feb-89	01:39	65.84	2	25.6	3.7	31.6	100	3.70	3.75	1.10
32	10-Feb-89	01:40	65.86	2	26.8	3.1	31.6	100	3.10	3.24	0.95
33	10-Feb-89	01:40	65.86	2	26.7	3.3	31.6	100	3.30	3.44	1.01
23	10-Feb-89	01:42	65.89	2	27.1	3.0	31.6	100	3.00	3.16	0.92
22	10-Feb-89	01:43	65.91	2	27.8	2.8	31.6	100	2.80	3.00	0.88
21	10-Feb-89	01:44	65.93	2	28.3	2.7	31.6	100	2.70	2.93	0.86
20	10-Feb-89	01:45	65.94	2	28.1	2.9	31.6	100	2.90	3.14	0.92
17	10-Feb-89	01:46	65.96	2	28.3	2.7	31.6	100	2.70	2.93	0.86
14	10-Feb-89	01:47	65.98	2	27.9	2.9	31.6	100	2.90	3.12	0.91
12	10-Feb-89	01:48	65.99	2	28.1	2.9	31.6	100	2.90	3.14	0.92
13	10-Feb-89	01:48	65.99	2	27.6	2.7	31.6	100	2.70	2.88	0.84
11	10-Feb-89	01:50	66.03	2	27.8	0.6	31.6	100	0.60	0.64	0.19
4	10-Feb-89	01:51	66.04	2	29.1	0.7	31.6	100	0.70	0.78	0.23
6	10-Feb-89	01:53	66.08	2	29.5	0.9	31.6	100	0.90	1.01	0.29
2	10-Feb-89	01:57	66.14	2	28.6	0.7	31.6	100	0.70	0.77	0.22
1	10-Feb-89	01:59	66.18	2	25.8	0.9	31.6	100	0.90	0.92	0.27
11	10-Feb-89	02:09	66.34	2	27.6	0.7	31.6	100	0.70	0.75	0.22
9	10-Feb-89	02:11	66.38	2	26.2	3.5	31.6	100	3.50	3.60	1.05
8	10-Feb-89	02:12	66.39	2	26.1	3.6	31.6	100	3.60	3.69	1.08
12	10-Feb-89	02:15	66.44	2	26.1	2.9	31.6	100	2.90	2.98	0.87
13	10-Feb-89	02:16	66.46	2	27.3	2.5	31.6	100	2.50	2.65	0.77
14	10-Feb-89	02:17	66.48	2	27.4	2.9	31.6	100	2.90	3.08	0.90
17	10-Feb-89	02:18	66.49	2	27.7	2.7	31.6	100	2.70	2.89	0.84
20	10-Feb-89	02:19	66.51	2	27.7	2.9	31.6	100	2.90	3.10	0.91
21	10-Feb-89	02:20	66.53	2	27.7	2.9	31.6	100	2.90	3.10	0.91
22	10-Feb-89	02:21	66.54	2	27.8	2.6	31.6	100	2.60	2.79	0.82
23	10-Feb-89	02:22	66.56	2	27.6	2.6	31.6	100	2.60	2.77	0.81
28	10-Feb-89	02:23	66.58	2	26.5	3.1	31.6	100	3.10	3.21	0.94
27	10-Feb-89	02:26	66.63	2	26.7	3.1	31.6	100	3.10	3.23	0.94
29	10-Feb-89	02:28	66.66	2	26.2	3.1	31.6	100	3.10	3.19	0.93
32	10-Feb-89	02:31	66.71	2	26.5	3.5	31.6	100	3.50	3.63	1.06
33	10-Feb-89	02:32	66.73	2	26.8	3.3	31.6	100	3.30	3.45	1.01
34	10-Feb-89	02:33	66.74	2	25.7	4.9	31.6	100	4.90	4.98	1.45
35	10-Feb-89	02:35	66.78	2	25.6	3.9	31.6	100	3.90	3.95	1.15
36	10-Feb-89	02:36	66.79	2	25.9	3.7	31.6	100	3.70	3.78	1.10
37	10-Feb-89	02:37	66.81	2	25.9	3.8	31.6	100	3.80	3.88	1.13
40	10-Feb-89	02:39	66.84	2	26.0	3.7	31.6	100	3.70	3.79	1.11
39	10-Feb-89	02:41	66.88	2	26.8	3.6	31.6	100	3.60	3.76	1.10
38	10-Feb-89	02:42	66.89	2	26.3	4.1	31.6	100	4.10	4.23	1.24
43	10-Feb-89	02:44	66.93	2	26.0	3.9	31.6	100	3.90	3.99	1.17
42	10-Feb-89	02:45	66.94	2	26.3	3.8	31.6	100	3.80	3.92	1.15
41	10-Feb-89	02:46	66.96	2	26.3	3.7	31.6	100	3.70	3.82	1.12
44	10-Feb-89	02:49	67.01	2	26.3	3.7	31.6	100	3.70	3.82	1.12
37	10-Feb-89	02:52	67.06	1	25.4	3.8	31.6	100	3.80	3.83	1.12
37	10-Feb-89	02:52	67.06	10	25.8	3.8	31.6	100	3.80	3.87	1.13
37	10-Feb-89	02:52	67.06	20	25.9	3.9	31.6	100	3.90	3.98	1.16
37	10-Feb-89	02:52	67.06	30	26.1	3.8	31.6	100	3.80	3.90	1.14
44	10-Feb-89	03:00	67.19	2	25.8	3.7	31.6	100	3.70	3.77	1.10
44	10-Feb-89	03:10	67.36	2	25.7	3.8	31.6	100	3.80	3.86	1.13

Table 10.5.2-2. Lauderdale Plant Cooling Canal/Pond System Dye Study--Calibrated Data (Page 31 of 31)

Sta No.	Date	Time (real)	Time (elapsed)	Depth (ft)	Temp (°C)	Fluorescence					
						F	Scale	Mult	F'	Fo	C (ppb)
44	10-Feb-89	03:22	67.56	2	25.8	3.8	31.6	100	3.80	3.87	1.13
44	10-Feb-89	03:32	67.73	2	26.1	3.8	31.6	100	3.80	3.90	1.14
41	10-Feb-89	03:35	67.78	2	25.9	3.7	31.6	100	3.70	3.78	1.10
38	10-Feb-89	03:37	67.81	2	26.5	3.7	31.6	100	3.70	3.84	1.12
36	10-Feb-89	03:39	67.84	2	26.1	3.8	31.6	100	3.80	3.90	1.14
35	10-Feb-89	03:40	67.86	2	26.3	3.9	31.6	100	3.90	4.02	1.18
33	10-Feb-89	03:41	67.88	2	27.1	3.4	31.6	100	3.40	3.58	1.05
32	10-Feb-89	03:42	67.89	2	27.1	3.2	31.6	100	3.20	3.37	0.99
23	10-Feb-89	03:43	67.91	2	27.8	2.9	31.6	100	2.90	3.11	0.91
22	10-Feb-89	03:44	67.93	2	27.9	2.9	31.6	100	2.90	3.12	0.91
21	10-Feb-89	03:45	67.94	2	27.9	2.9	31.6	100	2.90	3.12	0.91
20	10-Feb-89	03:46	67.96	2	27.8	3.1	31.6	100	3.10	3.33	0.97
19	10-Feb-89	03:48	67.99	2	28.1	2.9	31.6	100	2.90	3.14	0.92
14	10-Feb-89	03:53	68.08	2	27.2	2.9	31.6	100	2.90	3.06	0.90
12	10-Feb-89	03:54	68.09	2	27.5	2.8	31.6	100	2.80	2.98	0.87
13	10-Feb-89	03:55	68.11	2	27.6	2.7	31.6	100	2.70	2.88	0.84
11	10-Feb-89	03:56	68.13	2	27.1	1.2	31.6	100	1.20	1.26	0.37
2	10-Feb-89	03:57	68.14	2	27.5	1.2	31.6	100	1.20	1.28	0.37
1	10-Feb-89	03:59	68.18	2	25.5	1.5	31.6	100	1.50	1.52	0.44
1	10-Feb-89	04:42	68.89	2	24.2	0.4	31.6	100	0.40	0.39	0.11
2	10-Feb-89	04:45	68.94	2	24.2	1.7	31.6	100	1.70	1.66	0.49
1	10-Feb-89	05:59	70.18	2	30.0	2.1	31.6	100	2.10	2.39	0.70
2	10-Feb-89	06:00	70.19	2	24.9	2.1	31.6	100	2.10	2.09	0.61
11	10-Feb-89	06:01	70.21	2	25.2	2.0	31.6	100	2.00	2.01	0.59
12	10-Feb-89	06:03	70.24	2	25.9	3.8	31.6	100	3.80	3.88	1.13
13	10-Feb-89	06:04	70.26	2	26.0	3.7	31.6	100	3.70	3.79	1.11
14	10-Feb-89	06:06	70.29	2	26.0	3.5	31.6	100	3.50	3.58	1.05
17	10-Feb-89	06:07	70.31	2	25.8	3.9	31.6	100	3.90	3.97	1.16
20	10-Feb-89	06:09	70.34	2	25.7	3.9	31.6	100	3.90	3.96	1.16
22	10-Feb-89	06:11	70.38	2	25.6	4.2	31.6	100	4.20	4.25	1.24
21	10-Feb-89	06:13	70.41	2	26.3	4.1	31.6	100	4.10	4.23	1.24
23	10-Feb-89	06:14	70.43	2	25.6	4.0	31.6	100	4.00	4.05	1.18
32	10-Feb-89	06:17	70.48	2	25.5	4.3	31.6	100	4.30	4.34	1.27
33	10-Feb-89	06:18	70.49	2	25.3	4.6	31.6	100	4.60	4.62	1.35
35	10-Feb-89	06:19	70.51	2	24.5	4.8	31.6	100	4.80	4.73	1.38
36	10-Feb-89	06:21	70.54	2	24.5	4.9	31.6	100	4.90	4.82	1.41
38	10-Feb-89	06:23	70.58	2	24.2	4.9	31.6	100	4.90	4.79	1.40
41	10-Feb-89	06:25	70.61	2	24.8	4.8	31.6	100	4.80	4.76	1.39
44	10-Feb-89	06:27	70.64	2	24.4	4.7	31.6	100	4.70	4.62	1.35
1	10-Feb-89	06:38	70.83	2	25.2	2.0	31.6	100	2.00	2.01	0.59

first 15 hours of the study, and the decision was made to replace it with a backup. The nature of the meter malfunction made it impossible to calibrate the first instrument, so the data recorded in Table 10.5.2-1 have been left uncalibrated. The initial fluorescence data, although not calibrated, were valuable for travel time estimation.

Figure 10.5.2-2 qualitatively describes the general movement of the dye through the system. If it were not for the flood tide severely limiting and sometimes preventing discharge from the pond/canal system, a stream flow would exist throughout the entire system with a gradually widening mixing band.

DISCUSSION

A close comparison of the synoptic views with the tide data demonstrates the importance of the tidal fluctuation for mixing and utilization of the entire system. As was previously discussed, even though the existing canal/pond system has a fairly complex physical morphology, the dye and thermal effluent are primarily distributed on a riverine and superficial path through the system (Figure 10.5.2-2). During a retreating tide, the plant discharge moves through the system from Station 1 through the first and second cuts (Stations 11 and 32) and exits the outfall (Station 44). These cuts are critical because they allow the discharge to shortcut the vast majority of the system.

The tidal fluctuation is vital to usefulness of the rest of the system. During peak flood tide flow, when the system's discharge through the outlet is reduced, the effluent moves up the fingers and into the system canals.

The first synoptic view shows a higher concentration in the first finger (Stations 3 through 6) than the second (Stations 7 through 10). This differentiation is most likely the result of the first flood flow during the study (3.1 to 9.42 hours) which forced a great deal of the dye into the first finger and some (that which had already moved through the first cut) into the second. This was compounded by the closing of the northern

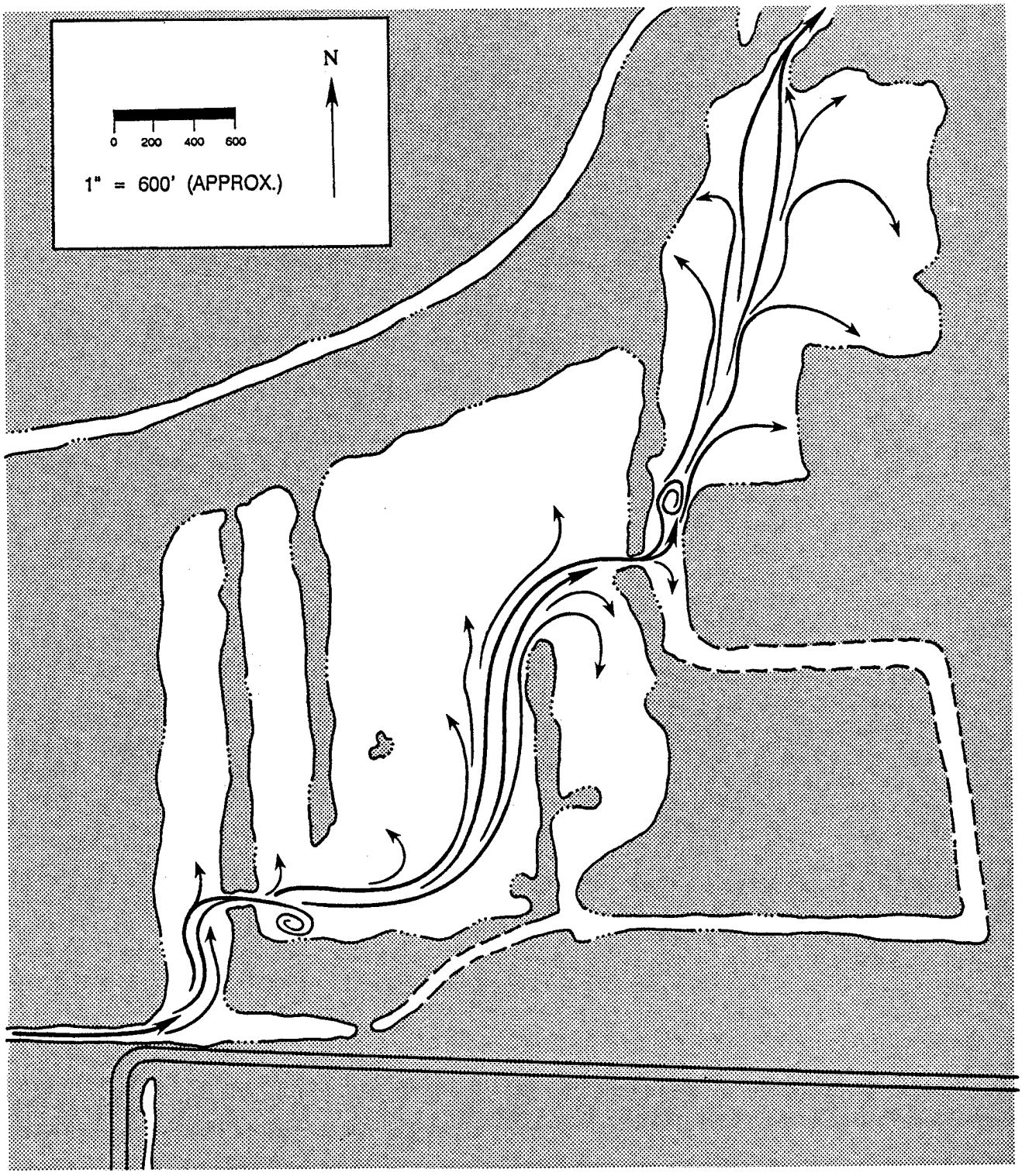


Figure 10.5.2-2 **DISTRIBUTION OF TRACER DYE PLUME AT EBB TIDAL FLOW**

Lauderdale Repowering Project

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connection between the fingers by the dredging operation during the period of the study.

It was these secondary movements of the dye into the fingers, canals and edges of the ponds that account for the fluctuation in the concentration and the apparently long holding time of the system. When the tide was going out, some of the dye moved out of the fingers and the canal and closer to the outlet. The incoming tide then diluted the overall concentrations of dye in the system and greatly reduced discharge.

The actual travel time of the primary plume in the system is much shorter than the synoptic views indicate. The highest concentration of the dye plume reached the first cut (Station 11) at 1.83 hours and the outlet (Station 44) by 27.83 hours. Figures 10.5.2-3 through 10.5.2-5 graphically illustrate the travel of the dye plume through three key stations (Stations 18, 39, and 44). The highest concentrations reached the middle of the first pond by 18.39 hours and the second by 27.53 hours.

The surface drogue study confirmed these results. Five of the drogues were spotted approximately 18 hours after their release at Station 35 in Pond 2. Winds were either calm or light easterly (against the flow direction) during the drogue study; therefore, the true travel time to the second pond would be less than 18 hours.

The study was concluded February 10, 1989, at 6:38 a.m., 70.83 hours after the injection. Fluorescence levels at Station 1 began to rise after they had long been reduced to what was considered to be the background condition (<0.30 ppb). At 3:59 a.m., February 10, the concentration climbed to 0.44 ppb and then to 0.70 ppb at 5:59 a.m. This situation indicated a possible recirculation condition.

The receiving water body (South New River) is joined to the source water body (Dania Cut-Off Canal) just west of the plant property by the South New River Canal. Although this connection is made west of the intake and west of the outfall, the canal flows south toward the Dania Cut-Off Canal during

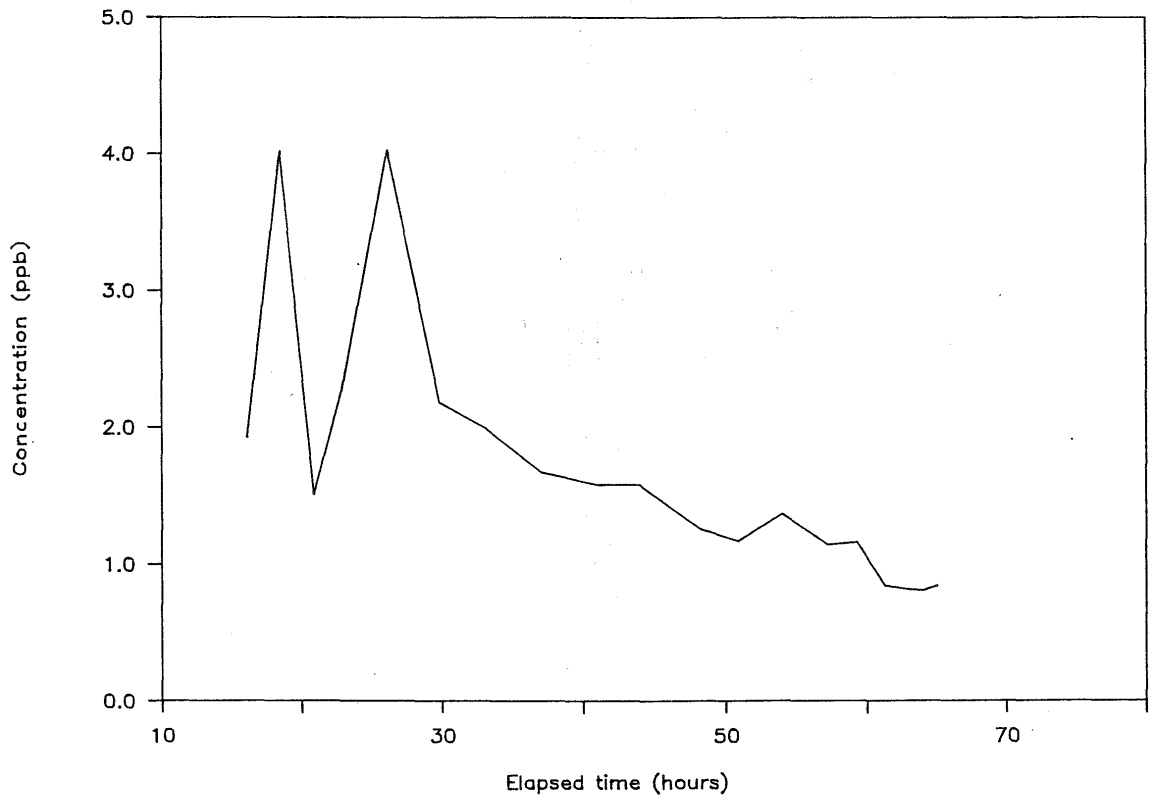


Figure 10.5.2-3 **CHANGE IN CONCENTRATION OVER TIME AT STATION 18**

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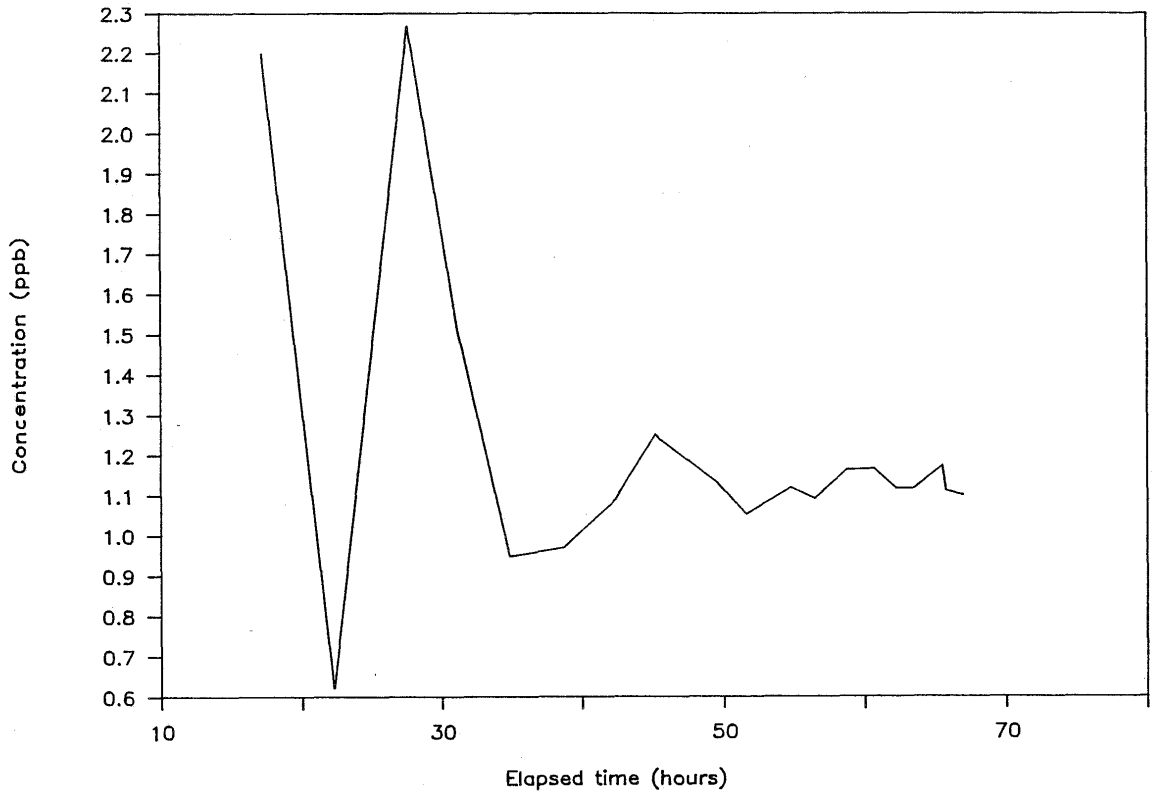


Figure 10.5.2-4 **CHANGE IN CONCENTRATION OVER TIME AT STATION 39**

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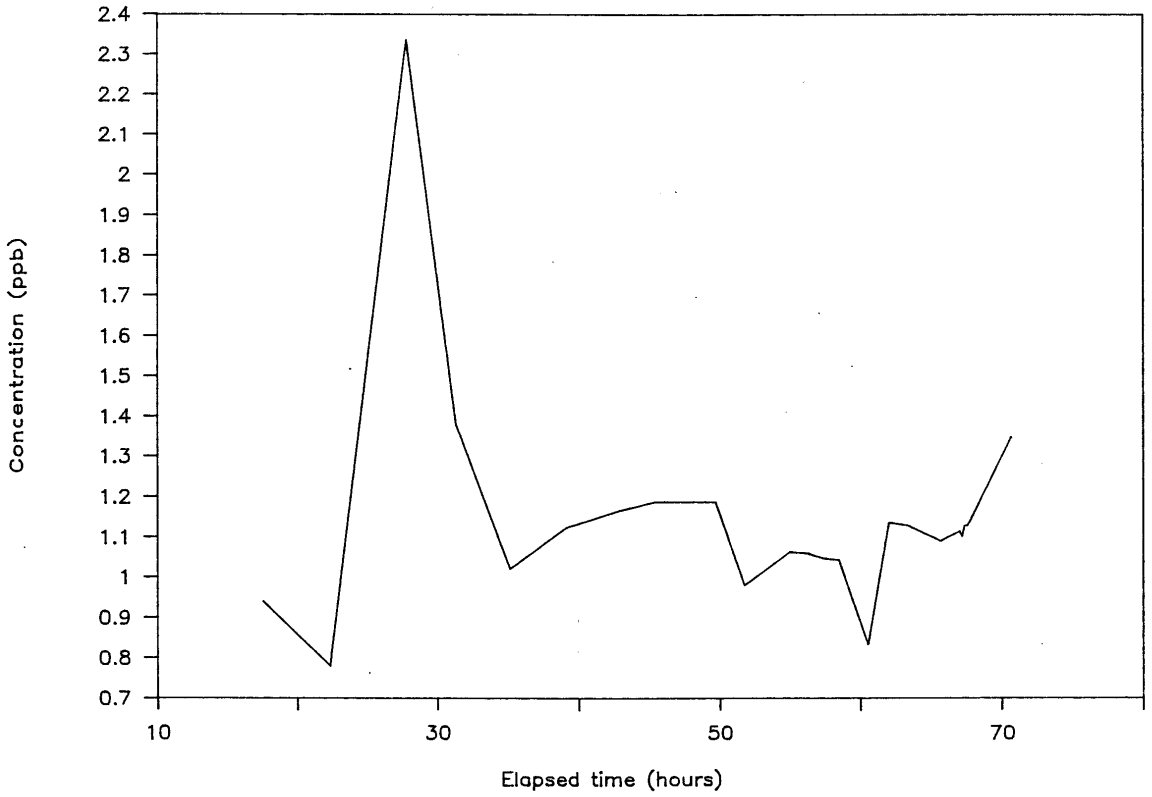


Figure 10.5.2-5 **CHANGE IN CONCENTRATION OVER TIME AT STATION 44**

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the flood tide. Since there doesn't seem to be any other leaks in the canal/pond system (one inflow and one outfall), the South New River Canal is the most likely source of recirculation.

The potential retention capacity and residence time of the cooling pond can be calculated as follows:

$$t = \frac{V}{Q \times 24 \times 3600 + P \times 2}$$

where: t = Residence time (days)

V = Pond volume

2.8×10^8 ft^3

Q = Discharge rate

= 517 cfs

P = Tidal prism

= A · H

A = Pond surface area

= 184 acres

= 8.0×10^6 ft^3

H = Average tide range

= 0.87 ft

The computed potential travel time was 4.6 days; however, the dye study data indicated that the actual travel time was approximately 30 hours, much less than the maximum capacity. Therefore, the existing cooling pond did not reach its potential efficiency. The cause of the reduced efficiency may be:

1. The pond configuration was not streamlined. Flow separation from the shoreline boundary would create pockets of relatively stagnant areas and cause a short circuit of the system.
2. There were deadend finger canals which did not allow direct flow through.
3. The bottom topography was irregular. Deep holes would reduce the usable volume of the cooling pond.

4. The connecting cuts between the cooling pond were shallow and narrow. The shallow cut would force the thermal discharge to be spread at the surface, therefore reducing the residence time.

10.5.2.2 RECEIV-II Setup and Calibration

METHODOLOGY

The water quality model RECEIV-II was used to simulate the hydraulic and water quality in the Lauderdale cooling pond and the adjacent receiving waters. RECEIV-II was originated from the Stormwater Management Model (SWMM-II) developed by Huber and Heaney (1975) and sponsored by EPA.

RECEIV-II is a dynamic, link-node hydrodynamic and water quality model. The governing equation and numerical scheme is one-dimensional in a strict sense; however, the model nodes can be linked to construct a two-dimensional vertically integrated physical system. The RECEIV-II model consisted of two major components: quantity and quality blocks. The quantity block simulates the hydrodynamics in tidal estuaries, and the quality block simulates the transport, mixing, physical, chemical, and biological processes in the water column.

An important feature of the model is that it can simulate dynamic tidal effects with multiple ocean boundary conditions. These dynamic properties of the RECEIV-II model enable adequate simulations at the project site.

The RECEIV-II model was modified to include heat exchange and thermal mixing in order to simulate the plant thermal discharge into the cooling pond and the receiving waters. The model was also modified to simulate flow augmentation and recirculation.

The heat dissipation was represented by the following formula:

$$Tt - Te = (Tt + t - Te)\, e^{-rt}$$

where: t = time,

t = numerical time step,

Tt = water temperature at time t,

Te = equilibrium temperature

$R = k/(\ \rho\ Cp\ d)$

k = heat exchange coefficient

ρ = water density

Cp = heat capacity of water, and

d = water depth

The input requirements for the RECEIV-II model are:

1. Channel depth, width, and length;
2. Manning's coefficients for each segment;
3. Surface storage area of nodes;
4. Discharge into nodes;
5. Equilibrium temperature;
6. Quantity and water quality of point sources;
7. Exchange coefficients at tidal boundaries; and
8. Water quality at ocean boundaries.

The model output includes:

1. Velocity within each segment,
2. Water surface elevation at each node, and
3. Water temperature at each node,
4. Salinity, and
5. Conservative substances.

MODEL SEGMENTATION

The FPL model consisted of 91 nodes and 100 channels including South Fork New River, North Fork New River, South New River Canal, Dania Cut-Off Canal, the Intracoastal Waterway, Port Everglade, and the FPL cooling pond. Three ocean boundaries were used in the model: Port Everglade entrance, Hillsborough Inlet, and Bakers Haulover Inlet. The model segmentation in the cooling pond and the adjacent receiving waters is shown in Figure 5.1-1.

To maintain numerical stability, the hydraulic time step of 12 seconds was used, and the water quality time step was 0.1 hour.

MODEL CALIBRATION

The FPL thermal model was calibrated using tide, current, salinity, and temperature data collected May 1 through May 3, 1989.

The monitoring program included:

1. Thirty-seven water quality stations for salinity and temperature,
2. Six stations for current measurements,
3. Three continuous water-level recorders,
4. Seven thermograph arrays for continuous temperature monitoring, and
5. Bathymetric surveys to determine the channel width and depth.

The complete data presentation of the model calibration data was shown in Appendix 10.5.2.5.

HYDRODYNAMIC CALIBRATION

The hydrodynamic component of the RECEIV-II model was initially calibrated using the tide and current data of May 1, 1989. The hydrodynamic model was further fine-tuned using the salinity data.

The calibrated model projected a tidal range of 1.55 ft in the cooling pond, while the recorded tide range was 1.54 ft. The model also projected a tide range of 0.95 ft at the plant intake which was identical with the recorded tide gauge data.

The model calibration showed that the South New River Canal had a net flow of 248 cfs toward the intake, and the current data indicated a net flow of about 210 cfs.

After the hydrodynamic model was complete, the temperature data were used to calibrate the thermal component of the model.

SALINITY CALIBRATION

The salinity calibration are shown in Figure 10.5.2-6 which indicated that the salinity prediction was within the range of calibration data. The data

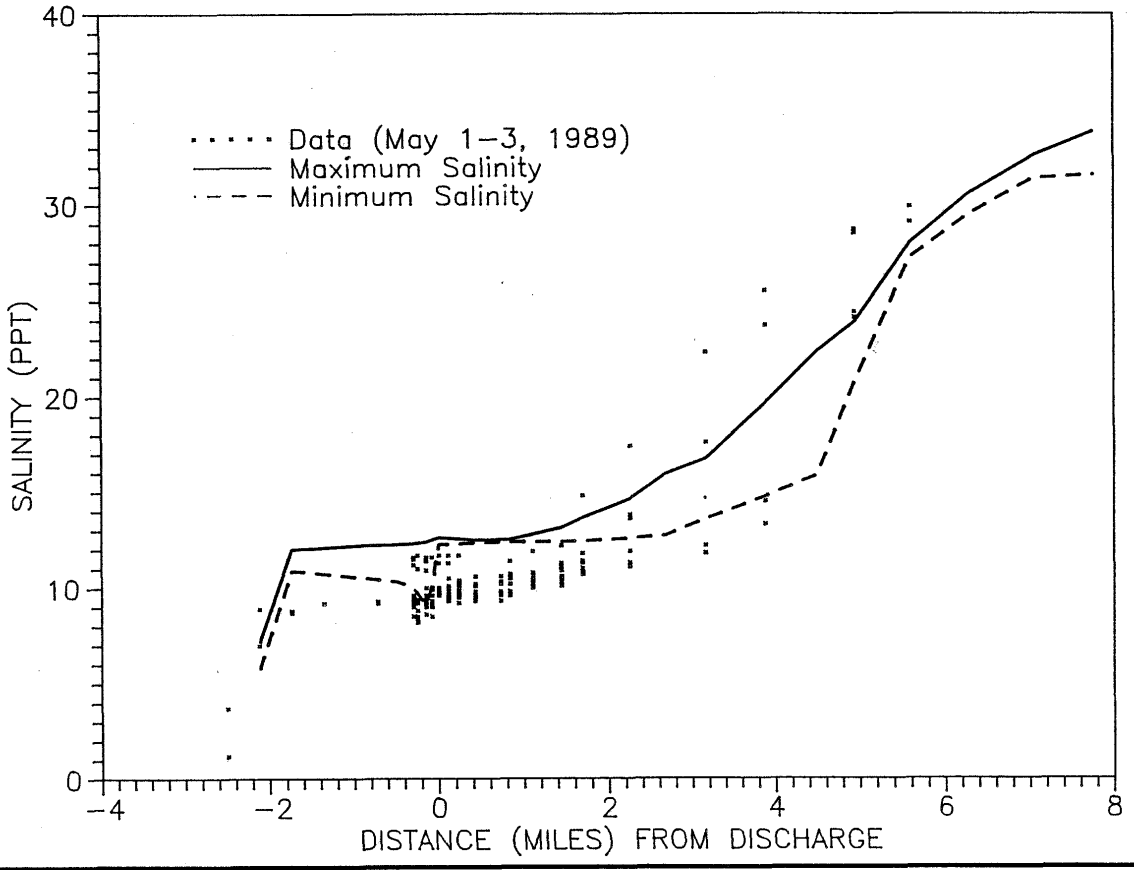


Figure 10.5.2-6 MODEL CALIBRATION FOR SALINITY SIMULATION

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points in the figure represent the vertical average salinity at a particular time and location.

TEMPERATURE CALIBRATION

The temperature calibration results are shown in Figure 10.5.2-7. The diurnal temperature data indicated a daily temperature fluctuation of about 1.5°F, probably caused by the diurnal change of the atmosphere temperature. Therefore, it was attempted to match the model predictions with the upper envelope of the data range for the purpose of being conservative.

The model calibration indicated that the effective depth of the cooling pond was about 13.5 ft, using a heat exchange coefficient of 197 Btu/ft^2/day/°F for the month of May.

MODEL SCENARIOS

Five scenarios were simulated for various seasonal and plant operation conditions (existing, repowered, and steam dump conditions). Winter and summer simulations were conducted for the existing and repowered conditions. In addition, a steam dump condition was simulated. The steam dump condition represents a short-term operation scenario described as follows:

1. Unit No. 1 has a constant discharge of 136,000 gpm with a 13.2°F temperature increase.
2. Unit No. 2 has variable discharge. It will discharge 116,000 gpm for 15 hours with a 23.0°F temperature increase; for the remaining 9 hours during the day, the unit will discharge 58,000 gpm without a temperature increase.
3. The duration of the steam dump operation will be 8 consecutive days.

The plant discharge has a constant temperature increase of 13.2°F for the existing and the repowered conditions.

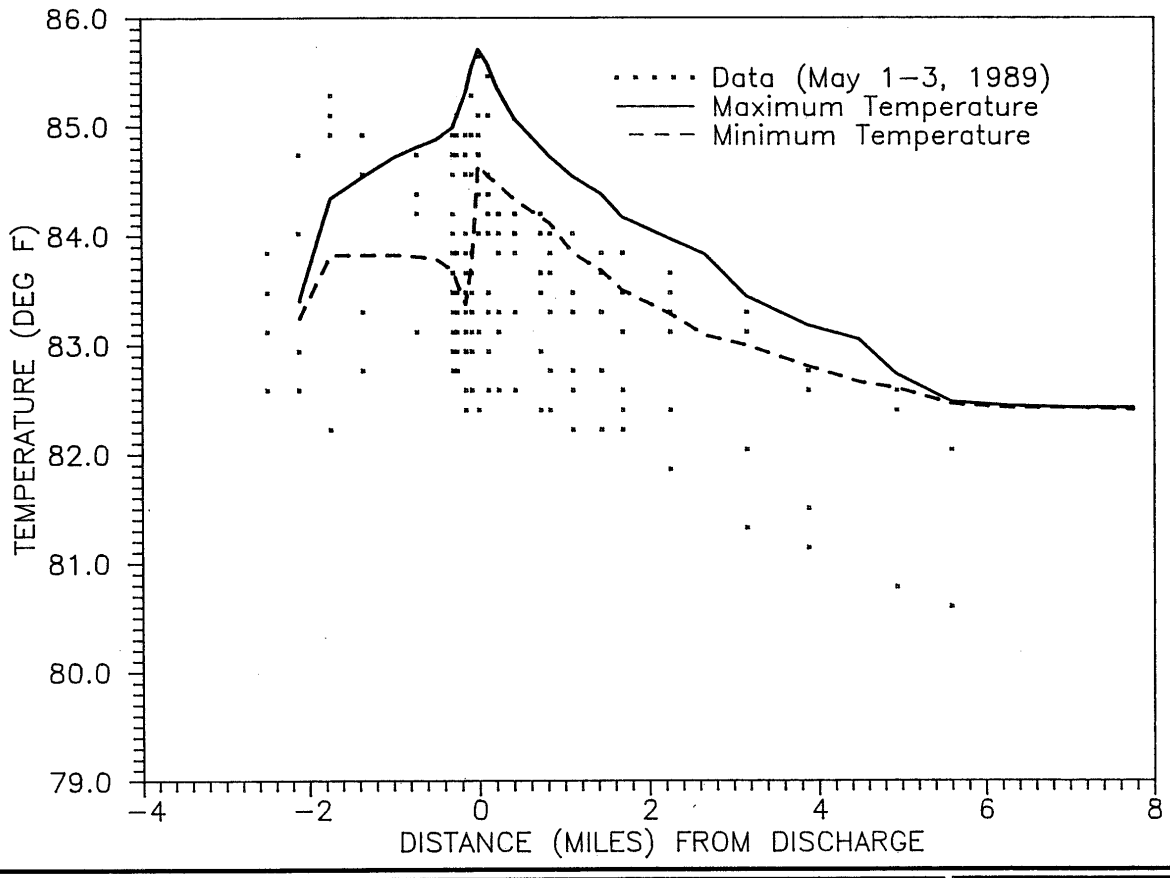


Figure 10.5.2-7 **MODEL CALIBRATION FOR TEMPERATURE SIMULATION**

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The heat exchange coefficients for various months are shown in Table 5.1-8 of the SCA. For the purpose of being conservative, the model used 90 percent of the literature values for heat exchange coefficients.

Table 5.1-2 of the SCA shows the environmental parameters for each scenario. An average tide range of 2.6 ft was used at ocean tidal boundaries, and the USGS long-term average flow data for August and January were used as upstream freshwater inflow for summer and winter conditions, respectively.

According to USGS flow data from 1957 through 1985, the following monthly average flows were used as the freshwater inflow for summer and winter simulations:

	Summer Condition (cfs)	Winter Condition (cfs)
Sewell Locks at South Fork New River	498	282
South New River Canal	199	171

10.5.2.3 Model Calibration Data

A temperature, salinity, and current study was conducted in surrounding water bodies to establish the baseline conditions of the present cooling system and to provide data for the calibration of a numerical model. Additionally, a bathymetric survey was conducted in portions of the New River where current measurements were taken to furnish additional data for these purposes. The synoptic study station locations are shown in Figure 10.5.2-8.

Temperature and specific conductivity profiles were taken May 1-3, 1989 amid clear and sunny conditions. Current measurements were taken May 2, 1989, and the bathymetric survey was conducted June 22, 1989. Ambient air temperature ranged from 23 to 31°C during the May 1-3 study.

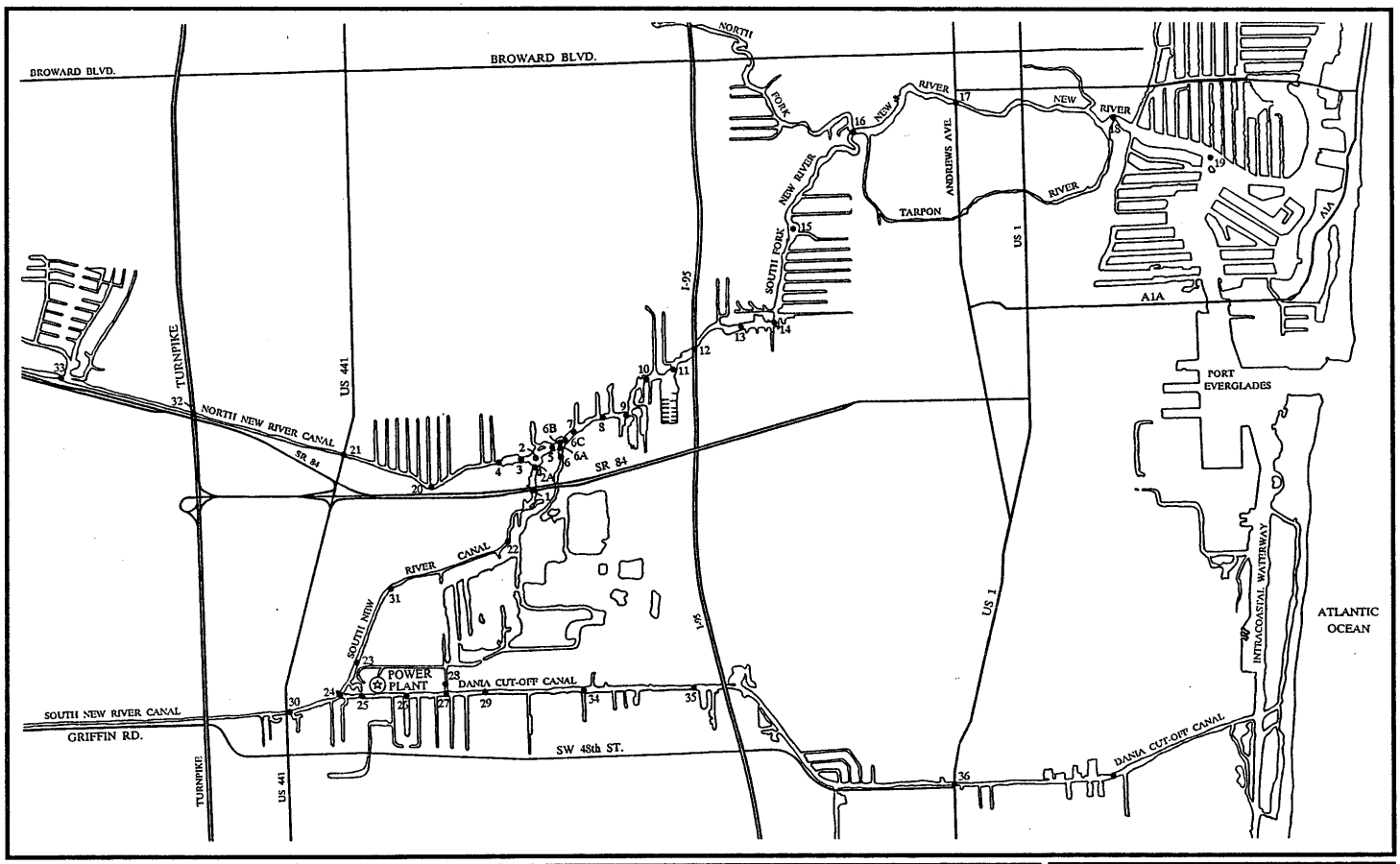


Figure 10.5.2-8 SYNOPTIC STUDY STATION LOCATIONS

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The Lauderdale Plant remained on-line for the duration of the study. The plant was operating with only one of its two units. Under this condition, the plant released a constant discharge of 116,000 gpm to the heat dissipation system.

METHODOLOGY

Due to the size of the study area, two crews of two persons each were employed to insure that a sufficient quantity of data was collected during the 3-day effort (May 1-3, 1989). Temperature and specific conductivity profiles were conducted in both the sources (SWB) and receiving water bodies (RWB) to the existing thermal dissipation system. Velocity profiles were conducted the second day by a single crew encompassing both the peak ebb and peak flood flow periods.

Temperature and specific conductivity were measured with two Hydrolab® Series 4000 instruments. Conductivity was calibrated daily to laboratory standards and checked at day's end before shutdown. Since the temperature sensor on these units is set at the factory, the calibration was established by checking both of the instruments against a single NBS thermometer over a range of temperatures. Velocity profiles were measured by a cable-suspended Teledyne Gurley® Model 622 Price Type AA current meter with a 15-pound lead weight. The bathymetric study employed a combination of a Raytheon® portable fathometer and manual sounding.

For the majority of measurements of the three parameters [temperature (°C), specific conductivity (umho/cm), and velocity (fps)] readings spanning the depth of the water body were taken at the surface, mid-depth, and near the bottom. The salinity values reported in this document were numerically converted by the conductivity and temperature data.

The monitoring effort encompassed the series of canals and rivers contiguous to the FPL cooling canal/pond system. These include the Dania Cut-Off Canal to the Atlantic Intracostal Waterway (AIWW), the South New River Canal, the South Fork New River, the New River east to the AIWW, and the North New River Canal.

Temperature and conductivity measurements were taken at seven locations along the Dania Cut-Off Canal from the Intracostal Waterway to its head at the South New River Canal. There are also seven stations associated with the South New River Canal from the control structure at US 441 to where it combines with the New River. Temperature and conductivity were also measured at 20 locations along the New River from its confluence with the North New River Canal in the west to the Intracostal Waterway in the east. Four stations were established along the reach of the North New River Canal from the Sewell's Locks in the west to the South Fork New River.

Velocity profiles were measured at six stations in a limited area around the outfall from the FPL cooling canal/pond system. The bathymetric survey incorporated seven locations in the vicinity of the discharge to the New River.

Ryan Instruments® Model J thermographs were continuously collecting data at seven locations in the cooling canal/pond system including one station at the intake and one just beyond the discharge point in the South Fork New River. These data are reported in Appendix 10.5.2.2.

Three Stevens Instruments® continuous water-level recorders were installed in the project area to monitor tidal effects. Two of these are located in the pond/canal cooling system and one outside (see Section 2.3.4 for these locations and Appendix 10.5.2.1 for the results of this monitoring).

TEMPERATURE AND SALINITY RESULTS

The data listing for the May 1-3, 1989, effort is divided into two tables. Table 10.5.2-3 presents the temperature and salinity along with the corresponding date, time, measurement depth, and ambient air temperature for the stations located in the New River system (South Fork New River and the North and South New River Canals). Table 10.5.2-4 presents the temperature and salinity data from the Dania Cut-Off Canal system. Tables 10.5.2-5 and 10.5.2-6 list the distances of the sampling stations from the discharge station and the intake station, respectively.

Table 10.5.2-3. Temperature and Salinity Study, South Fork New River and South New River Canal, May 1-3, 1989 (Page 1 of 17)

Station	Date	Time	Depth (ft)	Temp (oC)	Salinity (ppt)	Air Temp (oC)
1	01-May-89	10:19	1	28.5	9.3	26.8
			6	28.2	9.4	26.8
			12	28.2	9.7	26.8
4	01-May-89	10:30	1	28.1	7.6	
			6	28.2	8.8	
			13	28.3	8.9	
3	01-May-89	10:34	1	28.1	8.3	
			6	28.2	8.6	
			13	28.2	8.6	
2	01-May-89	10:38	1	28.1	8.1	27.4
			7	28.0	9.3	27.4
			15	28.0	9.6	27.4
5	01-May-89	10:44	1	28.2	8.8	
			7	28.0	9.3	
			14	28.0	9.7	
6	01-May-89	10:49	1	28.9	9.7	
			5	28.9	9.7	
			9	28.9	9.7	
6b	01-May-89	10:54	1	28.2		
6a	01-May-89	10:54	1	28.2		
7	01-May-89	10:56	1	28.5	9.2	
			4	28.5	9.7	
			8	28.4	9.7	
8	01-May-89	11:00	1	28.5	9.5	
			4	28.5	9.6	
			8	28.4	9.6	
9	01-May-89	11:04	1	28.5	9.5	
			4	28.5	9.6	
			8	28.4	9.6	
10	01-May-89	11:09	1	28.4	9.7	
			5	28.3	9.7	
			9	28.3	9.7	
11	01-May-89	11:14	1	28.2	10.1	
			7	28.2	10.4	
			14	28.1	11.5	
12	01-May-89	11:18	1	28.2	10.2	
			7	28.1	10.4	
			15	28.1	10.6	
13	01-May-89	11:28	1	28.2	10.5	
			3	28.1	10.5	
			6	28.2	10.5	
14	01-May-89	11:35	1	28.1	10.7	
			9	28.1	10.8	
			18	28.1	10.8	

Table 10.5.2-3. Temperature and Salinity Study, South Fork New River and South New River Canal, May 1-3, 1989 (Page 2 of 17)

Station	Date	Time	Depth (ft)	Temp (oC)	Salinity (ppt)	Air Temp (oC)
1	01-May-89	13:33	1	28.8	8.7	
			5	28.4	9.1	
			9	28.4	9.2	
2	01-May-89	13:37	1	28.5	7.2	
			7	28.3	9.0	
			14	28.1	9.7	
3	01-May-89	13:39	1	28.6	6.8	
			6	28.2	8.8	
			11	28.1	9.1	
4	01-May-89	13:42	1	28.6	6.3	
			6	28.4	8.1	
			11	28.5	9.3	
5	01-May-89	13:47	1	28.7	7.9	
			7	28.9	9.8	
			14	28.8	9.4	
6	01-May-89	13:50	1	29.3	9.7	
			6	29.3	9.7	
			12	29.3	9.7	
6a	01-May-89	13:52	1	28.8	8.6	
7	01-May-89	13:52	1	29.1	9.0	28.3
			5	29.0	9.4	28.3
			9	29.1	9.5	28.3
6a	01-May-89	13:52	9	29.1	9.4	
			18	29.1	9.5	
8	01-May-89	13:57	1	29.0	8.9	
			4	29.1	9.3	
			8	29.0	9.4	
9	01-May-89	14:01	1	29.1	9.0	
			4	29.0	9.3	
			7	29.0	9.4	
10	01-May-89	14:04	1	29.1	9.3	
			4	29.0	9.3	
			8	29.0	9.3	
11	01-May-89	14:06	1	29.0	9.3	
			7	28.8	9.5	
			14	28.6	10.1	
R/R	01-May-89	14:08	1	29.1	9.4	
			7	28.3	10.2	
			14	28.1	10.6	
12	01-May-89	14:11	1	28.9	9.5	28.1
			8	28.5	10.2	28.1
			17	28.4	10.4	28.1
13	01-May-89	14:12	1	28.7	10.0	
			3	28.7	10.0	
			6	28.7	10.2	

Table 10.5.2-3. Temperature and Salinity Study, South Fork New River and South New River Canal, May 1-3, 1989 (Page 3 of 17)

Station	Date	Time	Depth (ft)	Temp (oC)	Salinity (ppt)	Air Temp (oC)
14	01-May-89	14:20	1	29.2	10.0	
			7	28.5	10.5	
			15	28.2	11.4	
15	01-May-89	14:26	1	28.6	10.9	
			5	28.5	10.9	
			10	28.4	11.7	
16	01-May-89	14:35	1	28.5	11.7	
			4	28.4	11.8	
			8	28.3	12.0	
17	01-May-89	14:42	1	28.3	12.6	
			6	28.1	13.2	
			13	28.1	14.0	
18	01-May-89	14:45	1	28.5	19.4	
			6	27.8	26.0	
			12	27.7	26.9	
24	01-May-89	14:45	1	28.5	4.9	25.2
			3.5	28.2	9.5	25.2
			7	28.3	12.1	25.2
30	01-May-89	14:55	1	28.1	3.7	28.3
			4.5	28.1	3.7	28.3
			9	28.1	3.7	28.3
19	01-May-89	15:02	1	28.0	27.8	
			6	27.9	29.2	
			12	27.4	30.3	
18	01-May-89	15:07	1	28.6	20.0	
			9	27.9	26.0	
			18	27.7	27.1	
17	01-May-89	15:19	1	28.1	14.4	
			8	28.1	14.4	
			17	28.1	14.5	
16	01-May-89	15:28	1	28.5	12.2	
			7	28.5	12.3	
			14	28.5	12.3	
15	01-May-89	15:41	1	28.6	18.1	
			5	28.6	11.4	
			9	28.6	11.4	
14	01-May-89	15:47	1	28.7	10.7	
			6	28.6	11.1	
			12	28.6	11.3	
13	01-May-89	15:53	1	28.7	10.6	
			4	28.8	10.5	
			8	28.7	10.5	
12	01-May-89	15:56	1	28.6	10.2	
			7	28.5	10.1	
			14	28.5	10.2	

Table 10.5.2-3. Temperature and Salinity Study, South Fork New River and South New River Canal, May 1-3, 1989 (Page 4 of 17)

Station	Date	Time	Depth (ft)	Temp (oC)	Salinity (ppt)	Air Temp (oC)
11	01-May-89	15:59	1	28.7	10.3	
			5	28.7	10.2	
			9	28.7	10.2	
10	01-May-89	16:01	1	28.8	10.0	
			7	28.7	10.2	
			14	28.6	10.2	
9	01-May-89	16:06	1	29.1	9.7	
			3	28.9	9.8	
			6	28.8	9.9	
8	01-May-89	16:09	1	29.1	9.6	26.4
			4	29.0	9.5	26.4
			7	29.0	9.7	26.4
7	01-May-89	16:12	1	29.2	9.5	
			4	29.1	9.5	
			8	29.1	9.5	
6b	01-May-89	16:20	1	29.3	9.3	
			5	29.1	9.4	
			10	29.0	9.4	
6a	01-May-89	16:22	1	29.3	9.4	
			8	29.2	9.4	
			17	29.3	9.6	
6	01-May-89	16:24	1	29.5	9.3	
			5	29.5	9.6	
			11	29.5	9.7	
5	01-May-89	16:26	1	29.6	8.3	
			5	29.2	9.4	
			11	29.3	9.5	
2	01-May-89	16:28	1	29.5	9.1	
			8	29.3	9.4	
			15	29.3	9.5	27.0
3	01-May-89	16:31	1	29.3	9.0	
			5	29.3	9.4	
			10	29.3	9.5	
4	01-May-89	16:34	1	29.1	8.5	
			5	29.1	9.2	
			9	29.1	9.5	
20	01-May-89	16:38	1	28.9	8.3	
			3	28.9	8.4	
			6	28.8	8.7	
21	01-May-89	16:45	1	28.8	5.8	
			4	28.7	7.4	
			8	28.6	7.4	
1	01-May-89	17:02	1	29.3	8.8	
			4	29.3	9.3	
			9	29.3	9.5	

Table 10.5.2-3. Temperature and Salinity Study, South Fork New River and South New River Canal, May 1-3, 1989 (Page 5 of 17)

Station	Date	Time	Depth (ft)	Temp (oC)	Salinity (ppt)	Air Temp (oC)
1	02-May-89	07:59	1	28.3	9.2	
			4	28.2	9.7	
			9	28.1	9.9	
2	02-May-89	08:03	1	28.1	9.6	
			9	28.1	10.1	
			17	28.0	10.4	
5	02-May-89	08:06	1	28.1	9.3	
			7	28.0	10.1	
			14	28.1	10.4	
6	02-May-89	08:09	1	27.9	9.9	
			6	28.1	10.3	
			12	28.0	9.7	
7	02-May-89	08:11	1	28.1	10.4	
			4	28.1	10.5	
			8	28.1	10.5	
8	02-May-89	08:15	1	28.1	10.2	
			4	28.1	10.5	
			8	28.1	10.6	
9	02-May-89	08:19	1	28.1	10.5	
			5	28.1	10.6	
			10	28.1	10.8	
10	02-May-89	08:22	1	27.9	10.0	
			7	28.1	10.9	
			15	28.1	11.0	
11	02-May-89	08:26	1	28.1	10.4	
			5	27.9	11.7	
			10	27.9	12.1	
12	02-May-89	08:29	1	27.9	11.4	
			7	27.9	12.1	
			14	27.9	12.1	
13	02-May-89	08:33	1	27.9	11.0	
			4	27.9	12.7	
			7	27.9	12.8	
14	02-May-89	08:39	1	27.9	12.2	
			8	27.9	15.5	
			16	27.9	16.8	
1	02-May-89	08:40	1	28.5	11.4	23.0
			4.5	28.3	11.7	23.0
			9	28.2	11.7	23.0
15	02-May-89	08:45	1	27.7	12.3	25.4
			5	27.8	18.6	25.4
			10	27.7	21.4	25.4
2	02-May-89	08:50	1	28.4	11.3	25.5
			9	28.3	11.8	25.5
			17	28.3	11.8	25.5

Table 10.5.2-3. Temperature and Salinity Study, South Fork New River and South New River Canal, May 1-3, 1989 (Page 6 of 17)

Station	Date	Time	Depth (ft)	Temp (oC)	Salinity (ppt)	Air Temp (oC)
16	02-May-89	08:55	1	27.5	13.8	
			7	27.4	26.5	
			14	27.4	26.6	
3	02-May-89	09:00	1	28.0	11.7	
			6	28.4	11.7	
			13	28.3	11.7	
4	02-May-89	09:10	1	28.0	9.6	
			6	28.5	11.5	
			13	28.4	11.6	
17	02-May-89	09:12	1	27.4	22.0	
			9	27.3	26.6	
			18	27.2	27.8	
18	02-May-89	09:24	1	27.1	28.5	
			5	27.1	28.7	
			10	27.1	28.8	
5	02-May-89	09:30	1	28.3	11.3	
			9	28.3	11.7	
			17	28.3	11.9	
19	02-May-89	09:37	1	27.1	29.3	
			7	27.0	30.2	
			13	27.0	30.2	
6	02-May-89	09:40	1	28.4	11.7	
			6	28.4	11.8	
			11	28.3	11.7	
18	02-May-89	09:47	1	27.1	28.5	
			7	27.1	28.5	
			14	27.1	28.5	
7	02-May-89	09:50	1	28.4	11.5	28.0
			8	28.3	11.8	28.0
			16	28.3	11.8	28.0
17	02-May-89	10:03	1	27.5	22.4	
			6	27.5	23.2	
			11	27.4	25.3	
8	02-May-89	10:05	1	28.4	11.5	
			6	28.4	11.8	
			12	28.4	11.8	
16	02-May-89	10:15	1	27.8	15.4	
			5	27.8	18.4	
			9	27.7	19.0	
15	02-May-89	10:28	1	28.0	12.9	
			5	28.0	13.2	
			10	27.9	15.4	
20	02-May-89	10:35	1	28.2	8.4	25.9
			6	28.6	10.8	25.9
			13	28.6	11.0	25.9

Table 10.5.2-3. Temperature and Salinity Study, South Fork New River and South New River Canal, May 1-3, 1989 (Page 7 of 17)

Station	Date	Time	Depth (ft)	Temp (oC)	Salinity (ppt)	Air Temp (oC)
14	02-May-89	10:36	1	28.0	11.3	
			4	28.1	11.4	
			9	28.0	12.7	
13	02-May-89	10:41	1	28.2	10.9	
			4	28.2	10.9	
			8	28.1	11.0	
12	02-May-89	10:45	1	28.2	10.7	25.7
			4	28.2	10.8	25.7
			9	28.2	10.9	25.7
4	02-May-89	10:45	1	28.4	9.6	
			6	28.5	10.9	
			11	28.5	11.1	
11	02-May-89	10:50	1	28.3	9.4	
			5	28.2	10.0	
			10	28.2	10.0	
3	02-May-89	10:50	1	28.5	10.1	
			6	28.6	11.1	
			12	28.4	11.8	
8	02-May-89	10:55	1	28.5	9.6	
			4	28.4	9.7	
			8	28.4	10.0	
7	02-May-89	10:56	1	28.7	9.4	
			4	28.6	9.8	
			8	28.5	9.9	
6b	02-May-89	10:58	1	28.6	9.3	
			5	28.7	9.8	
			11	28.5	9.9	
6a	02-May-89	11:00	1	28.6	9.0	
			9	28.8	9.8	
			19	28.2	10.4	
2	02-May-89	11:00	1	28.5	10.7	
			9	28.4	11.7	
			18	28.3	11.8	
6	02-May-89	11:02	1	29.0	9.8	
			6	28.9	9.8	
			13	28.9	9.8	
5	02-May-89	11:04	1	28.3	8.3	
			5	28.3	8.8	
			10	28.2	10.0	
2	02-May-89	11:09	1	28.5	8.6	
			7	28.3	9.8	
			15	28.1	10.4	
1	02-May-89	11:15	1	28.5	9.2	
			4	28.3	9.6	
			8	28.2	10.1	

Table 10.5.2-3. Temperature and Salinity Study, South Fork New River and South New River Canal, May 1-3, 1989 (Page 8 of 17)

Station	Date	Time	Depth (ft)	Temp (oC)	Salinity (ppt)	Air Temp (oC)
1	02-May-89	11:17	1	28.7	11.3	
			5	28.6	11.5	
			10	28.4	11.7	
3	02-May-89	11:29	1	28.4	7.5	
			4	28.4	8.7	
			9	28.3	10.2	
4	02-May-89	11:33	1	28.4	7.0	
			4	28.4	8.0	
			9	28.4	8.4	
20	02-May-89	11:37	1	28.4	6.7	
			3	28.3	7.0	
			7	28.4	8.2	
4	02-May-89	11:44	1	28.4	7.0	
			4	28.4	8.0	
			9	28.5	8.5	
3	02-May-89	11:47	1	28.4	7.7	
			5	28.4	8.1	
			10	28.5	9.5	
2	02-May-89	11:49	1	28.4	7.9	
			7	28.3	9.4	
			15	28.2	10.4	
1	02-May-89	11:52	1	28.6	9.0	
			5	28.4	9.7	
			10	28.3	10.1	
5	02-May-89	12:00	1	28.5	8.4	
			7	28.4	9.2	
			14	28.2	10.4	
6	02-May-89	12:02	1	29.1	9.8	
			4	29.1	9.9	
			9	29.0	9.9	
6a	02-May-89	12:04	1	28.8	8.6	
			9	28.9	9.5	
			19	28.7	10.0	
7	02-May-89	12:06	1	28.9	9.3	
			4	28.9	9.7	
			9	28.8	9.8	
8	02-May-89	12:08	1	28.9	9.6	
			2.5	28.8	9.7	
			5	28.8	9.7	
9	02-May-89	12:10	1	28.9	9.6	
			4	28.9	9.6	
			8	28.9	9.7	
10	02-May-89	12:12	1	28.8	9.7	
			6	28.7	9.7	
			13	28.7	9.8	

Table 10.5.2-3. Temperature and Salinity Study, South Fork New River and South New River Canal, May 1-3, 1989 (Page 9 of 17)

Station	Date	Time	Depth (ft)	Temp (oC)	Salinity (ppt)	Air Temp (oC)
11	02-May-89	12:15	1	28.6	9.9	
			4	28.6	9.9	
			9	28.2	11.6	
12	02-May-89	12:17	1	28.6	10.3	
			5	28.5	10.5	
			11	28.4	10.5	
13	02-May-89	12:21	1	28.5	10.2	
			3	28.5	10.4	
			6	28.4	10.4	
14	02-May-89	12:26	1	28.4	10.6	
			9	28.4	10.7	
			18	28.4	10.7	
15	02-May-89	12:32	1	28.4	11.2	
			4	28.4	11.3	
			8	28.3	11.3	
14	02-May-89	12:38	1	28.4	10.6	25.3
			5	28.4	10.7	25.3
			10	28.3	11.1	25.3
13	02-May-89	12:43	1	28.5	10.4	
			4	28.5	10.5	
			7	28.4	10.7	
12	02-May-89	12:47	1	28.7	10.1	
			4	28.6	10.1	
			8	28.5	10.4	
10	02-May-89	12:51	1	28.9	9.6	
			4	28.9	9.6	
			9	28.8	9.7	
9	02-May-89	12:55	1	28.9	9.4	
			4	28.9	9.4	
			8	28.9	9.5	
8	02-May-89	13:01	1	29.0	9.4	
			3	28.9	9.5	
			6	28.9	9.5	
7	02-May-89	13:04	1	29.0	9.3	
			3	29.0	9.3	
			7	28.9	9.6	
6b	02-May-89	13:07	1	28.9	8.6	
			4	28.9	9.5	
			9	28.8	9.6	
6	02-May-89	13:09	1	29.3	9.8	
			5	29.3	9.8	
			10	29.3	9.8	
6a	02-May-89	13:10	1	29.0	9.1	
			9	29.0	9.5	
			18	28.9	9.8	

Table 10.5.2-3. Temperature and Salinity Study, South Fork New River and South New River Canal, May 1-3, 1989 (Page 10 of 17)

Station	Date	Time	Depth (ft)	Temp (oC)	Salinity (ppt)	Air Temp (oC)
5	02-May-89	13:16	1	28.8	7.9	
			5	28.8	8.2	
			10	28.4	9.5	
2	02-May-89	13:19	1	29.0	8.1	
			7	28.5	9.0	
			14	28.2	10.4	
3	02-May-89	13:23	1	28.7	6.7	
			4	28.6	8.3	
			9	28.4	9.6	
4	02-May-89	13:26	1	28.6	6.0	
			5	28.6	7.7	
			10	28.6	8.5	
1	02-May-89	13:32	1	28.9	8.8	27.7
			4	28.7	9.8	27.7
			8	28.4	9.8	27.7
22	02-May-89	14:22	1	29.4	9.2	31.4
			2.5	29.5	9.2	31.4
			5	29.0	9.4	31.4
1	02-May-89	14:27	1	29.1	8.5	
			4	28.8	9.1	
			8	28.6	9.6	
1	02-May-89	14:35	1	29.3	10.8	
			5	28.8	11.3	
			10	28.7	11.4	
2	02-May-89	14:45	1	29.4	9.7	
			8	28.6	11.3	
			16	28.4	11.8	
23	02-May-89	14:51	1	29.5	8.3	
			2.5	29.3	8.9	
			5	29.3	9.0	
24	02-May-89	14:53	1	28.5	2.1	
			3	28.8	10.4	
			7	29.4	8.5	
6	02-May-89	15:00	1	29.8	11.3	
			6	29.8	11.3	
			12	29.8	11.3	
30	02-May-89	15:19	1	28.4	0.3	
			3.5	28.4	0.3	
			7	28.3	0.7	
7	02-May-89	15:20	1	29.7	11.2	
			7	29.7	11.3	
			14	29.6	11.3	
23	02-May-89	15:27	1	29.6	8.7	
			5	29.5	9.0	

Table 10.5.2-3. Temperature and Salinity Study, South Fork New River and South New River Canal, May 1-3, 1989 (Page 11 of 17)

Station	Date	Time	Depth (ft)	Temp (oC)	Salinity (ppt)	Air Temp (oC)
31	02-May-89	15:32	1	29.2	9.2	
			6	29.1	9.2	
3	02-May-89	15:35	1	29.1	10.1	
			6	28.7	11.2	
			11	28.5	11.6	
22	02-May-89	15:38	1	29.4	9.1	
			4	28.8	9.4	
1	02-May-89	15:42	1	28.8	7.9	
			5	28.7	8.4	
			10	28.7	9.2	
2	02-May-89	15:46	1	29.5	7.4	
			8	28.9	9.5	
			16	28.2	10.4	
4	02-May-89	15:50	1	29.0	7.1	
			5	28.5	9.2	
			10	28.5	9.2	
20	02-May-89	15:54	1	28.7	4.8	
			4	28.7	8.0	
			8	28.7	8.1	
32	02-May-89	16:00	1		2.6	
21	02-May-89	16:00	1	28.6	3.8	
			4	28.7	7.5	
			8	28.6	7.8	
33	02-May-89	16:22	1	28.8	1.5	26.0
			4	27.6	2.1	26.0
			8	27.6	3.9	26.0
32	02-May-89	16:29	1	28.7	2.4	
			4	28.2	3.2	
			8	28.0	3.2	
21	02-May-89	16:37	1	28.8	3.9	
			4	28.7	6.9	
			9	28.6	7.5	
20	02-May-89	16:41	1	29.2	6.3	
			4	28.8	8.3	
			9	28.7	8.6	
4	02-May-89	16:46	1	29.2	8.2	
			4	29.0	9.2	
			9	29.0	9.4	
3	02-May-89	16:49	1	29.5	8.6	
			5	29.3	9.4	
			11	29.3	9.6	
2	02-May-89	16:52	1	29.8	8.4	
			8	29.5	9.5	
			16	28.5	9.4	

Table 10.5.2-3. Temperature and Salinity Study, South Fork New River and South New River Canal, May 1-3, 1989 (Page 12 of 17)

Station	Date	Time	Depth (ft)	Temp (oC)	Salinity (ppt)	Air Temp (oC)
5	02-May-89	16:54	1	29.6	9.4	
			8	29.5	9.4	
			16	29.5	9.5	
6	02-May-89	16:56	1	29.6	9.7	
			7	29.6	9.7	
			14	29.6	9.7	
1	02-May-89	17:00	1	29.3	8.3	
			5	29.2	9.4	
			10	29.1	9.5	
7	02-May-89	17:11	1	29.4	9.6	
			7	29.4	9.6	
			14	29.4	9.6	
8	02-May-89	17:14	1	29.1	9.9	
			4	29.2	9.9	
			8	29.1	9.9	
9	02-May-89	17:18	1	29.0	10.0	
			4	28.9	10.0	
			9	28.9	10.0	
10	02-May-89	17:20	1	29.0	10.1	24.7
			7	28.9	10.2	24.7
			14	28.9	10.2	24.7
11	02-May-89	17:24	1	28.9	10.4	
			12	28.9	10.4	
12	02-May-89	17:27	1	28.9	10.4	
			9	28.9	10.6	
			18	28.9	10.8	
13	02-May-89	17:30	1	28.8	11.1	
			3	28.8	11.1	
			6	28.8	11.1	
14	02-May-89	17:36	1	28.8	11.4	
			9	28.8	11.4	
			19	28.8	11.4	
15	02-May-89	17:41	1	28.7	11.8	
			5	28.7	11.9	
			11	28.6	11.9	
14	02-May-89	17:45	1	28.8	11.4	
			10	28.7	11.5	
13	02-May-89	17:48	1	28.8	11.1	
			9	28.7	11.2	
12	02-May-89	17:50	1	28.8	11.0	
			15	28.8	11.7	
11	02-May-89	17:53	1	29.0	10.6	
			5	28.8	10.7	
			10	28.8	10.8	

Table 10.5.2-3. Temperature and Salinity Study, South Fork New River and South New River Canal, May 1-3, 1989 (Page 13 of 17)

Station	Date	Time	Depth (ft)	Temp (oC)	Salinity (ppt)	Air Temp (oC)
10	02-May-89	17:54	1	29.3	9.9	
			7	28.9	10.4	
			14	28.9	10.5	
9	02-May-89	17:57	1	29.0	10.1	26.0
			4	29.0	10.2	26.0
			9	28.9	10.2	26.0
8	02-May-89	17:59	1	29.0	10.1	
			4	29.0	10.2	
			8	28.9	10.2	
7	02-May-89	18:01	1	29.1	10.0	
			4	29.0	10.0	
			8	29.0	10.0	
6	02-May-89	18:03	1	29.3	9.7	
			6	29.3	9.7	
			12	29.2	9.7	
5	02-May-89	18:06	1	29.6	9.3	
			5	29.3	9.7	
			10	29.2	9.8	
2	02-May-89	18:08	1	29.5	9.2	
			6	29.3	9.6	
			13	29.2	9.7	
1	02-May-89	18:12	1	29.5	8.6	
			5	29.4	9.4	
			9	29.3	9.5	
3	02-May-89	18:16	1	29.5	9.3	
			5	29.4	9.4	
			11	29.3	9.5	
4	02-May-89	18:17	1	29.4	8.7	
			5	29.4	9.2	
			9	29.4	9.3	
2	02-May-89	18:22	1	29.4	9.2	
			9	29.3	9.7	
			18	29.2	9.9	
5	02-May-89	18:26	1	29.3	9.8	
			7	29.2	9.9	
			14	29.1	10.0	
6	02-May-89	18:29	1	29.2	9.9	
			6	29.1	9.9	
			13	29.1	10.0	
7	02-May-89	18:31	1	29.1	10.1	25.3
			5	29.1	10.2	25.3
			11	29.0	10.0	25.3
8	02-May-89	18:35	1	29.0	10.3	
			2	29.0	10.4	
			5	29.0	10.3	

Table 10.5.2-3. Temperature and Salinity Study, South Fork New River and South New River Canal, May 1-3, 1989 (Page 14 of 17)

Station	Date	Time	Depth (ft)	Temp (oC)	Salinity (ppt)	Air Temp (oC)
1	03-May-89	09:10	1	28.3		
			6	28.3		
			11	28.2		
22	03-May-89	09:30	1	28.4		
			3	28.4		
			7	28.4		
31	03-May-89	09:50	1	28.2		
			5	28.2		
			10	28.2		
23	03-May-89	10:00	1	27.9		
			4	27.9		
			9	27.9		
24	03-May-89	10:10	1	28.2		
			4	27.9		
			9	28.1		
30	03-May-89	10:15	1	28.5		
			2	29.0		
			6	28.5		
30	03-May-89	10:15	11	28.3		
24	03-May-89	10:30	1	28.2		
			2	28.2		
			3	28.0		
			5	28.0		
			10	28.1		
24	03-May-89	11:15	1	28.5		
			5	28.3		
			10	28.2		
31	03-May-89	11:17	1	28.5		
			5	28.5		
			10	28.5		
1	03-May-89	11:25	1	29.1		27.8
			6	28.5		27.8
			11	28.4		27.8
2	03-May-89	11:35	1	28.4		
			9	28.4		
			17	28.3		
3	03-May-89	11:40	1	28.5		
			6	28.5		
			12	28.5		
4	03-May-89	11:45	1	28.5		
			6	28.5		
			13	28.5		
5	03-May-89	11:50	1	28.6		
			6	28.5		
			13	28.4		

Table 10.5.2-3. Temperature and Salinity Study, South Fork New River and South New River Canal, May 1-3, 1989 (Page 15 of 17)

Station	Date	Time	Depth (ft)	Temp (oC)	Salinity (ppt)	Air Temp (oC)
6	03-May-89	11:55	1	29.3		
			7	29.2		
			15	29.3		
6a	03-May-89	11:58	1	28.6		
			9	29.0		
			18	28.3		
6b	03-May-89	12:00	1	28.6		
			8	28.7		
			16	28.5		
7	03-May-89	12:05	1	29.0		
			5	29.1		
			10	28.7		
8	03-May-89	12:08	1	28.8		
			4	28.9		
			8	28.8		
9	03-May-89	12:10	1	28.7		
			5	28.8		
			10	28.8		
10	03-May-89	12:15	1	28.6		
			7	28.6		
			14	28.6		
7	03-May-89	12:18	1	29.0		
			5	28.9		
			10	28.8		
5	03-May-89	12:20	1	28.6		
			6	28.5		
			13	28.4		
6	03-May-89	12:22	1	29.3		
			6	29.3		
			12	29.3		
outfall	03-May-89	12:30	1	29.3		
			2	29.3		
			4	29.3		
6c	03-May-89	12:35	1	29.0		
			9	29.1		
			18	28.6		
7	03-May-89	12:38	1	29.0		
			5	28.9		
			10	28.8		
5	03-May-89	12:40	1	28.7		
			6	28.7		
			13	28.4		
2	03-May-89	12:43	1	29.1		
			9	28.5		
			18	28.3		

Table 10.5.2-3. Temperature and Salinity Study, South Fork New River and South New River Canal, May 1-3, 1989 (Page 16 of 17)

Station	Date	Time	Depth (ft)	Temp (oC)	Salinity (ppt)	Air Temp (oC)
2a	03-May-89	12:45	1	28.7		
			6	28.5		
			12	28.4		
3	03-May-89	12:50	1	28.8		
			6	28.6		
			12	28.5		
4	03-May-89	12:55	1	28.8		
			6	28.6		
			12	28.6		
1	03-May-89	13:00	1	28.8		
			6	28.7		
			12	28.4		
1	03-May-89	14:05	1	29.2		
			6	28.7		
			12	28.5		
22	03-May-89	14:15	1	29.8		
			3	28.7		
			7	28.7		
31	03-May-89	14:20	1	29.4		
			3	29.4		
			6	29.3		
23	03-May-89	14:25	1	29.6		
			3	29.5		
			6	29.5		
24	03-May-89	14:30	1	29.8		
			5	29.3		
			10	28.7		
30	03-May-89	14:35	1	29.4		
			2	28.6		
			5	28.8		
			10	28.4		
31	03-May-89	14:55	1	29.4		
			2.5	29.4		
			5	29.4		
22	03-May-89	15:05	1	29.7		
			3	28.7		
			6	28.7		
1	03-May-89	15:10	1	29.1		
			5	29.0		
			10	28.7		
6a	03-May-89	15:20	1	29.2		
			7	29.5		
			14	29.6		

Table 10.5.2-3. Temperature and Salinity Study, South Fork New River and South New River Canal, May 1-3, 1989 (Page 17 of 17)

Station	Date	Time	Depth (ft)	Temp (oC)	Salinity (ppt)	Air Temp (oC)
6	03-May-89	15:20	1	29.2		
			6	29.5		
			12	29.6		
6b	03-May-89	15:23	1	29.4		
			6	29.2		
			12	29.1		
7	03-May-89	15:25	1	29.5		
			3.5	29.4		
			7	29.5		
2	03-May-89	15:30	1	29.3		
			9	28.6		
			18	28.3		
3	03-May-89	15:32	1	29.2		
			6	28.8		
			11	28.5		
4	03-May-89	15:40	1	29.0		
			6	28.8		
			11	28.6		
20	03-May-89	15:45	1	29.1		
			4	28.8		
			8	28.8		

Table 10.5.2-4. Temperature and Salinity Study, Dania Cut-Off Canal, May 1-3, 1989 (Page 1 of 2)

Station	Date	Time	Depth (ft)	Temp (oC)	Salinity (ppt)	Air Temp (oC)
24	01-May-89	14:45	1	28.5	4.9	25.2
			3.5	28.2	9.5	25.2
			7	28.3	12.1	25.2
25	01-May-89	14:50	1	28.5	6.8	27.6
			3.5	28.3	9.3	27.6
			7	28.1	18.4	27.6
30	01-May-89	14:55	1	28.1	3.7	28.3
			4.5	28.1	3.7	28.3
			9	28.1	3.7	28.3
34	01-May-89	15:15	1	29.5	15.4	27.5
			2.5	28.7	17.8	27.5
			5	28.6	18.4	27.5
35	01-May-89	15:30	1	28.7	21.9	
			5	28.4	22.8	
			10	27.7	26.1	
36	01-May-89	16:20	1	28.3	30.3	
37	01-May-89	16:35	1	28.2	34.0	26.3
			10	27.2	37.0	26.3
			20	27.2	32.9	26.3
24	02-May-89	14:53	1	28.5	2.1	
			3	28.8	10.4	
			7	29.4	8.5	
25	02-May-89	14:56	1	28.6	2.7	
			2.5	28.7	10.6	
			5	28.9	7.9	
26	02-May-89	15:00	1	28.8	7.1	
			3	28.7	10.8	
			6	28.1	15.4	
27	02-May-89	15:03	1	29.6	7.9	
28	02-May-89	15:05	1	29.4	8.7	
29	02-May-89	15:09	1	29.6	9.5	
			2.5	29.0	11.2	
			5	28.5	16.2	
30	02-May-89	15:19	1	28.4	0.3	
			3.5	28.4	0.3	
			7	28.3	0.7	
24	03-May-89	10:10	1	28.2		
			4	27.9		
			9	28.1		
30	03-May-89	10:15	1	28.5		
			2	29.0		
			6	28.5		
			11	28.3		

Table 10.5.2-4. Temperature and Salinity Study, Dania Cut-Off Canal, May 1-3, 1989 (Page 2 of 2)

Station	Date	Time	Depth (ft)	Temp (oC)	Salinity (ppt)	Air Temp (oC)
24	03-May-89	10:30	1	28.2		
			2	28.2		
			3	28.0		
			5	28.0		
			10	28.1		
25	03-May-89	10:40	1	28.2		
			4	28.0		
			8.5	27.9		
26	03-May-89	10:45	1	28.1		
			5	28.1		
			10	27.8		
27	03-May-89	10:50	1	28.2		
			4	27.9		
			8	27.8		
28	03-May-89	10:55	1	27.6		
			2	28.4		
			4	28.2		
29	03-May-89	11:05	1	28.1		
			4	27.8		
			8	27.8		
26	03-May-89	11:10	1	28.2		
			5	28.1		
			10	27.9		
24	03-May-89	11:15	1	28.5		
			5	28.3		
			10	28.2		
24	03-May-89	14:30	1	29.8		
			5	29.3		
			10	28.7		
30	03-May-89	14:35	1	29.4		
			2	28.6		
			5	28.8		
30	03-May-89	14:35	10	28.4		
25	03-May-89	14:50	1	29.5		
			3	29.3		
			6.5	28.7		
26	03-May-89	14:50	1	29.6		
			5	28.8		
			9	28.4		

Table 10.5.2-5. Temperature and Salinity Study Corresponding Distances From Discharge (Station 6) South Fork New River and South New River Canal

Station	Distance from Discharge (river miles)
1	-0.30
2	-0.15
2a	-0.15
3	-0.25
4	-0.40
5	-0.08
6	0.0
7	0.11
8	0.42
9	1.69
10	0.72
11	0.83
12	1.10
13	1.44
15	2.25
16	3.16
17	3.88
18	4.94
19	5.59
20	-0.78
21	-1.31
22	-0.72
23	-1.74
24	-2.12
outfall	0.0
R/R	1.02

Table 10.5.2-6. Temperature and Salinity Study Corresponding Distances From Intake (Station 25) Dania Cut-Off Canal

Station	Distance from Intake (river miles)
24	-0.23
25	0.0
26	0.19
27	0.38
28	0.38
29	0.80
30	-0.61
34	1.25
35	1.99
36	3.64
37	4.55

CURRENT AND BATHYMETRIC RESULTS

Table 10.5.2-7 presents the results of the current measurements taken May 2, 1989 in feet per second (fps) along with the corresponding depth (ft) and time for six stations in the vicinity of the discharge in the South Fork New River. This includes one station in the South New River Canal (Station 1), three inland of the discharge in the South Fork New River (Stations 3-5) and one seaward on the discharge (Station 6) was also measured. Table 10.5.2-7 also presents a vertical profile average for each station and the tidal flow direction at the time of measurement.

The channel cross-sections from the June 22, 1989, bathymetric study are presented in Table 10.5.2-8. The average channel depth on the New River was 13.6 ft-MLW with a maximum of 17.3 ft (Station 5) and a minimum of 10.4 ft (Station 7). The South New River Canal is shallower, with a maximum depth of 9.3 ft-MLW at the one measurement location. The maximum depth of the discharge channel was 15.9 ft-MLW at the point of measurement.

10.5.2.4 Water Quality Data

The water quality data collected during the study period as described in Section 2.3.4 are presented in Tables 10.5.2-9 through 10.5.2-13. Priority pollutant data for all five stations is presented in Table 10.5.2-14.

Table 10.5.2-7. Results of Current Measurement Study, May 2, 1989 (Page 1 of 3)

Station	Time	Depth (ft)	Velocity (fps)	Vert. Avg. (fps)	Direction
4	09:15	13	0.32	0.54	ebb
		6	0.47		
		1	0.84		
5	09:30	17	0.17	0.32	ebb
		9	0.17		
		1	0.62		
6	09:45	11	0.47	0.47	ebb
		6	0.47		
		1	0.47		
7	09:50	16	0.17	0.40	ebb
		8	0.47		
		1	0.54		
4	10:45	11	0.25	0.64	ebb
		6	0.69		
		1	0.99		
1	11:15	9	0.03	0.13	flood
		4	0.17		
		1	0.17		
5	11:30	17	0.17	0.35	ebb
		9	0.40		
		1	0.47		
6	11:35	11	0.76	1.01	ebb
		6	1.28		
		1	0.99		
7	11:45	16	0.54	0.64	ebb
		8	0.54		
		1	0.84		
3	11:55	10	0.25	0.54	ebb
		5	0.47		
		1	0.91		
1	12:10	10	0.03	0.13	flood
		5	0.25		
		1	0.10		
5	12:20	15	0.17	0.27	ebb
		7	0.17		
		1	0.47		
6	12:30	10	1.13	1.18	ebb
		5	1.28		
		1	1.13		
7	12:40	15	0.76	0.89	ebb
		7	0.91		
		1	0.99		
3	12:50	10	0.17	0.54	ebb
		5	0.40		
		1	1.06		

Table 10.5.2-7. Results of Current Measurement Study, May 2, 1989 (Page 2 of 3)

Station	Time	Depth (ft)	Velocity (fps)	Vert. Avg. (fps)	Direction
1	13:00	10	0.03	0.03	flood
		5	0.03		
		1	0.03		
5	13:10	15	0.25	0.40	ebb
		7	0.47		
		1	0.47		
6	13:20	10	0.99	1.11	ebb
		5	1.28		
		1	1.06		
7	13:30	15	0.69	0.69	ebb
		7	0.76		
		1	0.62		
3	13:40	9	0.25	0.49	ebb
		4	0.47		
		1	0.76		
1	14:30	9	0.17	0.15	flood
		4	0.10		
		1	0.17		
5	14:50	15	0.17	0.08	ebb
		7	0.03		
		1	0.03		
6	15:15	12	0.54	0.74	ebb
		6	0.99		
		1	0.69		
7	15:25	14	0.17	0.08	ebb
		7	0.03		
		1	0.03		
3	15:40	11	0.47	0.57	flood
		6	0.62		
		1	0.62		
3	16:20	11	0.69	0.69	flood
		6	0.76		
		1	0.62		
1	16:30	9	0.54	0.57	flood
		4	0.69		
		1	0.47		
5	16:45	17	0.17	0.30	flood
		9	0.25		
		1	0.47		
6	16:50	10	0.25	0.25	ebb
		5	0.25		
		1	0.25		
7	17:00	15	0.76	0.59	flood
		7	0.62		
		1	0.40		

Table 10.5.2-7. Results of Current Measurement Study, May 2, 1989 (Page 3 of 3)

Station	Time	Depth (ft)	Velocity (fps)	Vert. Avg. (fps)	Direction
3	17:10	12	0.40	0.41	flood
		6	0.29		
		1	0.54		
1	17:15	10	0.69	0.69	flood
		5	0.76		
		1	0.62		
5	17:25	15	0.40	0.37	flood
		7	0.47		
		1	0.25		
6	17:30	10	0.03	0.15	flood
		5	0.17		
		1	0.25		
7	17:40	15	0.76	0.57	flood
		7	0.47		
		1	0.47		
4	17:45	12	0.47	0.52	flood
		6	0.54		
		1	0.54		
1	17:55	10	0.40	0.54	flood
		5	0.62		
		1	0.62		
5	18:10	15	0.47	0.42	flood
		7	0.40		
		1	0.40		
6	18:15	10	0.54	0.45	flood
		5	0.40		
		1	0.40		
3	18:30	12	0.32	0.40	flood
		6	0.40		
		1	0.47		

Table 10.5.2-8. Cross-Sectional Areas for Significant Stations on the South New River Canal and South Fork New River at Mean Low Water (MLW).

Station	Area (ft2)	Width (ft)	Maximum Depth (ft)
1	331	40	9.3
2	3,844	345	17.2
3	1,044	111	10.8
4	820	85	12.3
5	2,753	240	17.3
6	732	63	15.9
7	1,242	180	10.4

Table 10.5.2-9 . Water Quality Data for Station 1
August 1988 through July 1989

Parameters	Units	Month												Class III Standards
		Aug-88	Sep-88	Oct-88	Nov-88	Dec-88	Jan-89	Feb-89	Mar-89	Apr-89	May-89	Jun-89	Jul-89	
Dissolved oxygen	mg/L	4.9	4.4	3.7	4	4.4	5.1	6	4.7	3.8	3.5	3.4	2.8	4
pH Field	Std. Units	6.4	NA	7.3	7.3	7.3	7.4	7.9	7.7	7.5	7.3	7.5	7.3	6.5 to 8.5
Specific Conductance	umhos/cm	770	780	17200	18400	27700	21600	31000	25000	15500	15500	23700	10300	
Temperature	C	28.8	26.6	26.8	27	23.1	21.8	21.4	25.7	28.4	29.7	30.8	30.2	
Alkalinity Total	mg/L-CaCO3	245	267	214	220	194	202	457	153	195	207	178	208	
BOD5	mg/L	2.4	<1	0.6	1.6	2	2.5	1.4	1.4	<1.0	0.7	2.0	1.0	*
COD Low Level	mg/L	40	51	76	71.8	<50	<100	<50	<50.0	98	<50	573	216	
Fecal Coliforms	No./100 ML	<10	40	<10	140	<10	190	160	170	150	80	40	20	200
Total Coliforms	No./100 ML	<10	110	<10	200	<10	300	220	200	200	120	50	100	1000
Ammonia	mg/L as N	0.309	0.255	0.054	0.077	0.087	0.148	0.109	0.094	0.096	0.166	0.104	0.228	
Ammonia Unionized	mg/L as N	<0.001	0.004	0.050	0.001	<0.001	0.002	0.004	0.003	0.002	0.003	0.003	0.004	
NO2+NO3	mg/L as N	0.452	0.167	0.131	0.137	0.033	0.118	0.054	0.047	0.055	0.039	0.018	0.176	***
Nitrogen Total	mg/L as N	2.2	1.9	1.3	1.5	1.2	1.2	1.1	1.1	0.71	0.84	0.86	0.57	***
TKN	mg/L as N	1.8	1.7	1.1	1.3	0.9	1.10	1.0	1.1	0.65	0.80	0.84	0.40	***
Fluoride	mg/L	0.32	0.18	0.55	0.52	0.54	0.58	0.7	0.48	0.62	<0.1	0.55	0.26	5.0
Phosphorus Total	mg/L as P	0.087	0.054	0.022	0.02	0.061	0.03	0.039	0.043	0.042	0.053	0.036	0.029	***
Oil and Grease	mg/L	0.1	<0.1	0.02	0.60	1.6	0.70	<0.1	<0.1	<1.0	<1.8	<0.2	<.2	5.0
Turbidity	F/NTU	3.09	2.50	1.48	3	3.5	4	6.1	2.5	4.0	2.2	4.0	1.50	29 > bkgrd
Chloride	mg/L	86.6	94.2	6450	5100	9400	8190	11400	9350	5200	5440	8640	3010	10% > bkgrd
Sulfate	mg/L	16	<5	767	408	1190	1320	1620	12	769	813	1060	363	
Aluminum Total	ug/L	<147	<147	76.7	64.2	89.4	84.9	99.7	122	<74	<29	40.2	<29.0	1500
Beryllium Total	ug/L	<2	<2	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<3.3	<1.8	<1.8	<1.8	1100
Chromium Total	ug/L	<5.7	NA	<6.8	<6.8	<6.8	<6.8	<6.8	<6.3	<10.0	<6.3	<6.3	<6.3	50
Copper Total	ug/L	<3.8	<3.8	9.8	7.3	17.2	9.5	5.1	21.5	10.3	<4.5	<4.5	6.7	15
Iron Total	ug/L	685	494	1060	847	1380	1330	1620	482	116	79	84.4	138	300
Nickel Total	ug/L	<20	<20	<23	<23.0	<23	<23.0	<23.0	<16.0	<19	<16	<16.0	<16.0	100
Sodium Total	mg/L	51.6	56.2	3160	2460	1610	3780	4670	4510	2650	1980	3920	1270	
Zinc Total	ug/L	35.4	5.3	3.6	9.8	58.9	51.4	14.7	<2.9	7.6	<2.9	<2.9	<2.9	1000
Antimony Total	ug/L	<5	<4	<25	<25.0	<25	<20.0	<15.0	<25.0	<20.0	<25	<15.0	<15.0	200
Arsenic Total	ug/L	2.0	<2.7	1.8	<4.6	<4.6	<5.4	<6.3	<5.0	<12.4	<12	<9.2	<6.9	50
Cadmium Total	ug/L	<0.5	<0.2	<2.5	<1.0	<1	<1.5	<0.5	<1.5	<0.5	<0.5	<0.5	<1.5	5.0
Lead Total	ug/L	<2.3	<2.3	<7	<1.4	4.9	<1.4	<3.0	4.6	<2.0	<1.4	<1.4	<1.4	50
Selenium Total	ug/L	2.6	<2.6	<7.5	34.5	<12.5	<12.5	<7.5	<32.0	<10.0	<10	<12.5	8.4	25
Silver Total	ug/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<.5	0.05
Mercury total	ug/L	0.3	<0.2	2.4	1.0	0.5	0.7	0.8	<0.2	<0.2	0.2	0.4	<.2	0.1

* Shall not be increased to exceed values which would cause dissolved oxygen to be depressed below the limit established for Class III waters

*** In no case shall nutrient concentrations of a body of water be altered so as to cause an imbalance in natural populations of aquatic flora and fauna.

NA = Not Analyzed

Table 10.5.2-10. Water Quality Data for Station 2
August 1988 through July 1989

Parameters	Units	Month												Class III Standards
		Aug-88	Sep-88	Oct-88	Nov-88	Dec-88	Jan-89	Feb-89	Mar-89	Apr-89	May-89	Jun-89	Jul-89	
Dissolved oxygen	mg/L	2.4	NA	3.9	3.6	4.9	5.5	4.8	4.6	3.6	3.9	3.4	3.3	4
pH Field	Std. Units	6.9	NA	7.3	7.3	7.3	7.4	8.1	7.8	7.4	7.4	7.6	7.40	6.5 to 8.5
Specific Conductance	umhos/cm	894	862	17700	17700	28800	24900	31400	20900	18000	10600	23000	7450	
Temperature	C	31.6	26.9	33.3	29.9	28.1	25	28.2	31.2	29.4	33.9	31.9	36.2	
Alkalinity Total	mg/L-CaCO3	240	269	217	218	178	182	456	159	184	209	187	210	
BOD5	mg/L	1.8	<1	0.4	1.2	1.2	1.6	1.8	1.2	<1.0	0.7	1.8	1.4	*
COD Low Level	mg/L	55	51	40	98.8	<50	<100	<50	<50.0	<50	141	222	126	
Fecal Coliforms	No./100 ML	<10	90	30	30	<10	180	140	80	70	40	40	<10	200
Total Coliforms	No./100 ML	<10	140	50	70	<10	280	200	120	110	70	60	50	1000
Ammonia	mg/L as N	0.332	0.261	0.06	0.073	0.077	0.147	0.102	0.055	0.103	0.134	0.067	0.069	
Ammonia Unionized	mg/L as N	0.002	0.004	0.001	0.001	0.001	0.002	0.008	0.003	0.002	0.003	0.002	0.002	
NO2+NO3	mg/L as N	0.440	0.173	0.024	<.02	0.256	0.116	0.058	0.036	0.069	0.056	0.024	0.222	***
Nitrogen Total	mg/L as N	2.3	1.8	1.2	<1.1	1.0	1.2	1	1.2	0.78	1.00	1.00	0.65	***
TKN	mg/L as N	1.8	1.7	1.1	1.1	0.8	1.10	1.0	1.1	0.71	0.97	1.00	0.43	***
Fluoride	mg/L	0.33	0.21	0.58	0.57	0.54	0.65	0.68	0.5	0.67	<0.10	0.53	0.22	5.0
Phosphorus Total	mg/L as P	0.049	0.049	0.02	0.013	0.055	0.029	0.038	0.037	0.05	0.042	0.04	0.030	***
Oil and Grease	mg/L	<0.1	<0.1	0.0	1.2	2.2	2.1	<0.1	<0.1	<1.0	<1.8	<0.2	<.2	5.0
Turbidity	F/NTU	2.08	3.60	1.98	2.5	4	4.5	6	2.5	4.0	2.3	14.0	2.00	29 > bkgrd
Chloride	mg/L	124	127	6550	6400	10900	9420	11200	6850	7080	3260	7640	1930	10% > bkgrd
Sulfate	mg/L	18	<5	900	1020	25	1420	1450	11	1030	444	951	235	
Aluminum Total	ug/L	<147	<147	89.2	34.8	71.9	58.1	80.3	37	106.0	<29.0	75.3	45.3	1500
Beryllium Total	ug/L	<2	<2	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<3.3	<1.8	<1.8	<1.8	1100
Chromium Total	ug/L	<5.7	NA	<6.8	<6.8	<6.8	<6.8	<6.8	<6.3	<10.0	<6.3	<6.3	<6.3	50
Copper Total	ug/L	4.8	7.7	11.2	6.4	11.4	12.1	8.8	24.0	<8.4	<4.5	4.7	5.6	15
Iron Total	ug/L	497	625	1080	912	1720	1480	1600	255	140	74	206.0	228	300
Nickel Total	ug/L	<20	<20	<23	<23.0	<23	<23.0	<23.0	<16.0	<19	<16.0	<16.0	<16.0	100
Sodium Total	mg/L	77.9	75.9	3520	3050	1610	4200	4620	3710	3430	1260	3420	913	
Zinc Total	ug/L	45.3	11.6	2.4	5.3	33	30.8	16.7	<2.9	7.9	<2.9	<2.9	<2.9	1000
Antimony Total	ug/L	<5	<4	<25	<25.0	<25	<20.0	<15.0	<25.0	<20.0	<25.0	<30.0	<15.0	200
Arsenic Total	ug/L	2.8	<2.7	2.7	<4.6	<4.6	<5.4	<6.3	<5.0	<12.4	<24.0	<9.2	<6.9	50
Cadmium Total	ug/L	<0.5	<0.2	<2.5	<1.0	<1	<1.5	<0.5	<1.5	<0.5	<0.5	<0.5	<1.5	5.0
Lead Total	ug/L	5.9	<2.3	<7	<1.4	<1.4	<1.4	<6.0	<3.0	<2.0	<1.4	<1.4	<1.4	50
Selenium Total	ug/L	<2.6	<2.6	<7.5	37.0	<12.5	<12.5	<7.5	<16.0	<10.0	<10.0	<25.0	NA	25
Silver Total	ug/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<.5	0.05
Mercury total	ug/L	0.7	<0.2	1.3	0.8	0.2	1.3	0.5	<0.2	<0.2	<0.2	0.2	<.2	0.1

* Shall not be increased to exceed values which would cause dissolved oxygen to be depressed below the limit established for Class III waters and in no case shall be great enough to produce nuisance conditions.

*** In no case shall nutrient concentrations of a body of water be altered so as to cause an imbalance in natural populations of aquatic flora and fauna.

NA = Not Analyzed

Table 10.5.2-11. Water Quality Data for Station 3
August 1988 through July 1989

Parameters	Units	Month												Class III Standards
		Aug-88	Sep-88	Oct-88	Nov-88	Dec-88	Jan-89	Feb-89	Mar-89	Apr-89	May-89	Jun-89	Jul-89	
Dissolved oxygen	mg/L	3.9	NA	2.1	3.2	3.4	7	4.7	0.1	0.2	0.2	0.2	0.3	4
pH Field	Std. Units	7.0	NA	7.3	7.3	7.3	7.7	8.7	7.6	7.4	7.4	7.5	7.40	6.5 to 8.5
Specific Conductance	umhos/cm	985	1060	13300	16600	23700	23800	31800	27400	18600	18900	21700	9890	
Temperature	C	33.0	29.5	30.5	29.1	25.6	23.6	23.2	25.2	29.3	30.3	31.6	31.2	
Alkalinity Total	mg/L-CaCO3	230	256	232	221	192	196	460	191	188	184	188	204	
BOD5	mg/L	1.6	<1	0.4	1.4	1.4	2.4	2	2.8	1.2	0.6	0.4	1.2	*
COD Low Level	mg/L	40	51	25	80.5	<50	<100	<50	<50.0	<50	<50	382	156	
Fecal Coliforms	No./100 ML	<10	<10	20	30	<10	20	<10	10	<10	<10	<10	<10	200
Total Coliforms	No./100 ML	<10	80	40	80	<10	60	<10	40	40	<10	<10	20	1000
Ammonia	mg/L as N	0.337	0.019	0.104	0.258	0.056	<0.05	0.098	0.119	0.028	0.019	0.128	0.178	
Ammonia Unionized	mg/L as N	0.003	0.001	0.002	0.004	<0.001	<0.001	0.020	0.003	<0.001	<0.001	0.004	0.004	
NO2+NO3	mg/L as N	0.448	0.515	0.045	<.02	0.362	<0.050	<0.050	<0.010	0.018	<0.010	0.012	0.032	***
Nitrogen Total	mg/L as N	2.2	2.4	1.3	<1.2	1.2	<0.9	<0.96	<1.31	1.10	<0.46	0.76	0.49	***
TKN	mg/L as N	1.7	1.9	1.3	1.2	0.8	0.89	1.0	1.3	1.00	0.45	0.74	0.45	***
Fluoride	mg/L	0.31	0.22	0.52	0.55	0.48	0.64	0.71	0.56	0.62	<0.10	0.51	0.28	5.0
Phosphorus Total	mg/L as P	0.054	0.052	0.068	0.025	0.043	0.021	0.029	0.039	0.028	0.011	<0.020	0.025	***
Oil and Grease	mg/L	<0.1	<0.1	0.3	1.8	1.1	0.6	<0.1	<0.1	<1.0	<1.8	<0.2	<.2	5.0
Turbidity	F/NTU	1.88	3.60	1.58	3	6	7.5	6.5	3	3.5	1.5	2.2	2.20	29 > bkgrd
Chloride	mg/L	165	192	4400	11400	8680	9600	10900	8150	6360	7600	6960	3570	10% > bkgrd
Sulfate	mg/L	25	19	625	1030	1360	1480	1620	12	944	1060	951	477	
Aluminum Total	ug/L	<147	<147	81.4	51.8	56.2	35.5	78.9	106	91.7	<29.0	30.8	<29.0	1500
Beryllium Total	ug/L	<2	<2	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<3.3	<1.8	<1.8	<1.8	1100
Chromium Total	ug/L	<5.7	NA	<6.8	<6.8	<6.8	<6.8	<6.8	<6.3	<10.0	<6.3	<6.3	<6.3	50
Copper Total	ug/L	<3.8	<3.8	14.6	5.0	7.4	4.3	5.1	8.8	<8.4	<4.5	5.5	NA	15
Iron Total	ug/L	269	118	724	908	1240	1380	1600	162	64	<10.0	42.2	130	300
Nickel Total	ug/L	<20	<20	<23	<23.0	<23	<23.0	<23.0	<16.0	<19	<16.0	<16.0	<16.0	100
Sodium Total	mg/L	104	99.9	2240	2880	1610	4550	4640	4160	3280	3110	3360	2250	
Zinc Total	ug/L	14.4	3.2	19.1	10.7	20	12.4	10.4	<2.9	<6.8	<2.9	<2.9	<2.9	1000
Antimony Total	ug/L	<5	<4	<25	<25.0	<25	<20.0	<15.0	<25.0	<20.0	<25.0	<30.0	<15.0	200
Arsenic Total	ug/L	2.6	<2.7	3.2	<4.6	<4.6	<5.4	<6.3	<5.0	<12.4	<24.0	<9.2	<6.9	50
Cadmium Total	ug/L	<0.5	<0.2	2.3	<1.0	<1	<1.5	<0.5	<1.5	<0.5	<0.5	<0.5	<1.5	5.0
Lead Total	ug/L	<2.3	<2.3	<7	<1.4	<1.4	<1.4	<3.0	<3.0	<2.0	<1.4	<1.4	<1.4	50
Selenium Total	ug/L	<2.6	<2.6	<7.5	39.5	<12.5	<12.5	<7.5	<16.0	<10.0	<10.0	<25.0	NA	25
Silver Total	ug/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<.5	0.05
Mercury total	ug/L	0.7	0.4	0.4	1.8	<0.2	0.9	0.6	<0.2	<0.2	<0.2	0.4	<.2	0.1

* Shall not be increased to exceed values which would cause dissolved oxygen to be depressed below the limit established for Class III waters

*** In no case shall nutrient concentrations of a body of water be altered so as to cause an imbalance in natural populations of aquatic flora and fauna.

NA = Not Analyzed

Table 10.5.2-12. Water Quality Data for Station 4
August 1988 through July 1989

Parameters	Units	Month												Class III Standards
		Aug-88	Sep-88	Oct-88	Nov-88	Dec-88	Jan-89	Feb-89	Mar-89	Apr-89	May-89	Jun-89	Jul-89	
Dissolved oxygen	mg/L	4.0	NA	3.8	3.7	3.8	7.1	7.5	6.2	5.8	5.8	4.2	3.1	4
pH Field	Std. Units	7.2	NA	7.4	7.3	7.5	7.7	8.1	7.9	7.8	7.7	7.7	7.50	6.5 to 8.5
Specific Conductance	umhos/cm	1180	1140	12700	15800	22300	25200	31600	20900	16400	15000	19100	6770	
Temperature	C	32.4	28.7	27.7	28.5	24.1	23.2	22.9	26.2	29.2	31.3	31.9	31.2	
Alkalinity Total	mg/L-CaCO3	230	251	228	221	201	165	460	188	190	197	190	204	
BOD5	mg/L	1.5	<1	0.4	1	1.4	4.2	2.2	1.4	<1.0	2.0	0.6	1.5	*
COD Low Level	mg/L	37	41	9	125.4	<50	<100	<50	<50.0	<50	<50	139	216	
Fecal Coliforms	No./100 ML	<10	10	130	30	<10	40	<10	70	<10	<10	10	<10	200
Total Coliforms	No./100 ML	<10	110	150	100	<10	60	<10	150	30	<10	20	<10	1000
Ammonia	mg/L as N	0.214	0.037	0.095	0.067	0.046	0.068	0.08	0.043	0.026	0.082	0.148	0.079	
Ammonia Unionized	mg/L as N	0.003	0.002	0.002	0.001	<0.001	0.002	0.005	0.002	0.001	0.004	0.007	0.002	
NO2+NO3	mg/L as N	0.521	0.482	0.063	0.175	0.399	<0.050	<0.050	0.016	0.014	0.015	0.012	0.219	***
Nitrogen Total	mg/L as N	2.2	1.8	1.2	1.5	1.3	<1.0	<0.96	1.2	0.67	0.71	0.86	0.77	***
TKN	mg/L as N	1.6	1.3	1.2	1.3	0.9	0.99	1.0	1.1	0.65	0.69	0.84	0.55	***
Fluoride	mg/L	0.31	0.23	0.51	0.52	<0.1	0.65	0.71	0.55	0.62	<0.10	0.49	0.24	5.0
Phosphorus Total	mg/L as P	0.051	0.052	0.025	0.023	0.069	0.025	0.037	0.043	0.033	0.031	<0.020	0.027	***
Oil and Grease	mg/L	<0.1	<0.1	1.0	3.3	0.8	0.8	<0.1	<0.1	<1.0	<1.8	<0.2	<.2	5.0
Turbidity	F/NTU	2.89	3.80	1.48	3	6.6	2.5	6	2.2	3.0	2.0	3.6	1.80	29 > bkgrd
Chloride	mg/L	239	214	3500	6350	8400	9700	11400	7250	6380	5060	6300	2160	10% > bkgrd
Sulfate	mg/L	30	21	583	982	1410	1210	1410	10	944	602	793	288	
Aluminum Total	ug/L	151	<147	100.0	52.4	97.4	34.7	68.0	69	93.9	<29.0	<29.0	<29.0	1500
Beryllium Total	ug/L	<2	<2	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<3.3	<1.8	<1.8	<1.8	1100
Chromium Total	ug/L	<5.7	NA	<6.8	<6.8	<6.8	<6.8	<6.8	<6.3	<10.0	<6.3	<6.3	<6.3	50
Copper Total	ug/L	6.4	<3.8	14.8	4.5	6.2	6.4	<3.0	32.8	12.5	<4.5	<4.5	7.3	15
Iron Total	ug/L	220	92.4	756	837	1090	1480	1550	195	73	<10.0	<10.0	47.3	300
Nickel Total	ug/L	<20	<20	<23	<23.0	<23	<23.0	<23.0	<16.0	<19	<16.0	<16.0	<16.0	100
Sodium Total	mg/L	127	115	2240	2890	1580	4280	4660	3680	3130	2020	2940	1030	
Zinc Total	ug/L	24.0	6.4	26.1	5.1	40.4	26.3	9.3	<2.9	<6.8	<2.9	<2.9	<2.9	1000
Antimony Total	ug/L	<5	<4	<25	<25.0	<25	<20.0	<15.0	<25.0	<20.0	<25.0	<15.0	<15.0	200
Arsenic Total	ug/L	2.2	<2.7	2.8	<4.6	<4.6	<5.4	<6.3	<5.0	<12.4	<24.0	<9.2	<6.9	50
Cadmium Total	ug/L	<0.5	<0.2	1.7	<1.0	<1	<1.5	<0.5	<1.5	<0.5	<0.5	<0.5	<1.5	5.0
Lead Total	ug/L	3.2	<2.3	<7	<1.4	1.4	<1.4	<3.0	<3.0	<2.0	<1.4	<2.8	<1.4	50
Selenium Total	ug/L	<2.6	<2.6	<7.5	31.5	13.5	<12.5	<7.5	<16.0	<10.0	<10.0	<25.0	NA	25
Silver Total	ug/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<.5	0.05
Mercury total	ug/L	0.3	<0.2	2.7	1.5	0.2	0.4	1.2	<0.2	<0.2	<0.2	<0.2	<.2	0.1

* Shall not be increased to exceed values which would cause dissolved oxygen to be depressed below the limit established for Class III waters

*** In no case shall nutrient concentrations of a body of water be altered so as to cause an imbalance in natural populations of aquatic flora and fauna.

NA = Not Analyzed

Table 10.5.2-13. Water Quality Data for Station 5
August 1988 through July 1989

Parameters	Units	Month												Class III Standards
		Aug-88	Sep-88	Oct-88	Nov-88	Dec-88	Jan-89	Feb-89	Mar-89	Apr-89	May-89	Jun-89	Jul-89	
Dissolved oxygen	mg/L	4.1	NA	3.7	3.7	3.9	5.5	5.9	5.4	4.2	3.6	3.5	3.5	4
pH Field	Std. Units	7.1	NA	7.5	7.3	7.5	7.6	8.4	7.9	7.7	7.7	7.7	7.50	6.5 to 8.5
Specific Conductance	umhos/cm	1100	969	15400	15300	22500	26900	31100	21600	16100	14800	19900	7910	
Temperature	C	32.5	28.3	27.5	27.6	23.6	23	22.9	26.2	28.8	30.8	31.3	31.2	
Alkalinity Total	mg/L-CaCO3	220	248	222	219	198	179	464	185	186	195	189	202	
BOD5	mg/L	1.6	<1	0.4	1.2	1.2	3.5	2.4	1.6	<1.0	1.1	1.4	1.8	*
COD Low Level	mg/L	43	41	60	56	<50	<100	<50	<50.0	<50	96	530	148	
Fecal Coliforms	No./100 ML	<10	170	<10	140	<10	130	50	50	40	70	10	20	200
Total Coliforms	No./100 ML	<10	220	<10	180	<10	200	80	100	60	100	20	100	1000
Ammonia	mg/L as N	0.200	0.068	0.074	0.051	0.053	0.114	0.082	0.031	0.024	0.028	0.079	0.094	
Ammonia Unionized	mg/L as N	0.002	0.003	0.002	<0.001	<0.001	0.002	0.009	0.002	<0.001	0.001	0.003	0.003	
NO2+NO3	mg/L as N	0.442	0.439	0.037	0.034	0.382	0.066	<0.050	0.010	0.021	0.021	0.013	0.211	***
Nitrogen Total	mg/L as N	2.2	1.9	1.1	1.2	1.4	0.87	<0.91	1.2	0.64	0.75	0.86	<.31	***
TKN	mg/L as N	1.7	1.4	1.0	1.2	1.0	0.81	0.9	1.1	0.62	0.73	0.84	<.16	***
Fluoride	mg/L	0.32	0.22	0.55	0.48	0.48	0.65	0.67	0.55	0.6	<0.10	0.5	0.24	5.0
Phosphorus Total	mg/L as P	0.052	0.053	0.031	0.03	0.068	0.03	0.039	0.048	0.047	0.031	0.036	0.033	***
Oil and Grease	mg/L	<0.1	<0.1	0.0	2.2	5.6	2.2	<0.1	<0.1	<1.0	<1.8	<0.2	<.2	5.0
Turbidity	F/NTU	2.59	3.40	1.98	3.5	4.4	3.6	6.5	2.6	4.0	1.8	3.5	1.50	29 > bkgrd
Chloride	mg/L	200	152	5350	5900	8160	9680	11400	7350	6160	4640	6540	2340	10% > bkgrd
Sulfate	mg/L	27	14	767	849	829	1380	1430	11	927	673	863	306	
Aluminum Total	ug/L	212	<147	74.7	56.8	45.6	61.3	69.0	64	84.3	<29.0	41.9	<29.0	1500
Beryllium Total	ug/L	<2	<2	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<3.3	<1.8	<1.8	<1.8	1100
Chromium Total	ug/L	<5.7	NA	<6.8	<6.8	<6.8	<6.8	<6.8	<6.3	<10.0	<6.3	<6.3	<6.3	50
Copper Total	ug/L	4.0	<3.8	12.7	7.4	10.0	12.6	7.5	13.6	19.6	<4.5	6.0	8.4	15
Iron Total	ug/L	228	206	884	818	1250	1620	1520	155	89	<10.0	24.9	58.8	300
Nickel Total	ug/L	<20	<20	<23	<23.0	<23	<23.0	<23.0	<16.0	<19	<16.0	<16.0	<16.0	100
Sodium Total	mg/L	112	90.6	3180	2690	1610	5560	4510	3780	3120	1870	3090	1130	
Zinc Total	ug/L	36.5	<2	6.2	7.5	36.1	34.2	23.7	<2.9	12.9	<2.9	<2.9	<2.9	1000
Antimony Total	ug/L	<5	<4	<25	<25.0	<25	<20.0	<15.0	<25.0	<20.0	<25.0	<15.0	<15.0	200
Arsenic Total	ug/L	2.2	<2.7	3.2	<4.6	<4.6	<5.4	<6.3	<5.0	<12.4	<24.0	<9.2	<6.9	50
Cadmium Total	ug/L	<0.5	<0.2	2.5	<1.0	<1	<1.5	<0.5	<1.5	<0.5	<0.5	<0.5	<1.5	5.0
Lead Total	ug/L	<2.3	<2.3	<7	<1.4	<1.4	<1.4	<3.0	3.9	<2.0	<1.4	<2.8	<1.4	50
Selenium Total	ug/L	<2.6	<2.6	<7.5	32.5	<12.5	<12.5	<7.5	<16.0	<10.0	<10.0	<25.0	9.0	25
Silver Total	ug/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<.5	0.05
Mercury total	ug/L	<0.2	0.7	3.3	<0.4	0.4	2.2	1.6	<0.2	<0.2	0.2	<0.2	<.2	0.1

* Shall not be increased to exceed values which would cause dissolved oxygen to be depressed below the limit established for Class III waters

*** In no case shall nutrient concentrations of a body of water be altered so as to cause an imbalance in natural populations of aquatic flora and fauna.

NA = Not Analyzed

Table 10.5.2-14. Priority Pollutant Scan (Page 1 of 10)

PARAMETERS	UNITS	STORET METHOD	STA1 KBN12 1	STA2 KBN12 2	STA3 KBN12 3	STA4 KBN12 4	STA5 KBN12 5
DATE			08/02/89	08/02/89	08/02/89	08/02/89	08/02/89
TIME			09:00	13:45	14:30	11:00	12:15
CYANIDE	MG/L	720 I	<0.003	<0.003	<0.003	<0.003	<0.003
PHENOLS	UG/L	32730 I	6	2	<2	4	<2
THALLIUM,TOTAL	UG/L	1059 ICAP	<150	<150	<150	<150	<150
ALDRIN	UG/L	39330 EC	<0.006	<0.006	<0.006	<0.006	<0.006
BHC,A	UG/L	39337 EC	<0.006	<0.006	<0.006	<0.006	<0.006
BHC,B	UG/L	39338 EC	<0.006	<0.006	<0.006	<0.006	<0.006
BHC,D	UG/L	34259 EC	<0.006	<0.006	<0.006	<0.006	<0.006
BHC,G(LINDANE)	UG/L	39340 EC	<0.006	<0.006	<0.006	<0.006	<0.006
CHLORDANE	UG/L	39350 EC	<0.029	<0.029	<0.029	<0.029	<0.029
DDD,PP'	UG/L	39310 EC	<0.029	<0.029	<0.029	<0.029	<0.029
DDE,PP'	UG/L	39320 EC	<0.006	<0.006	<0.006	<0.006	<0.006
DDT,PP'	UG/L	39300 EC	<0.006	<0.006	<0.006	<0.006	<0.006
DIELDRIN	UG/L	39380 EC	<0.006	<0.006	<0.006	<0.006	<0.006

Table 10.5.2-14. Priority Pollutant Scan (Page 2 of 10)

PARAMETERS	UNITS	STORET METHOD	STA1 KBN12 1	STA2 KBN12 2	STA3 KBN12 3	STA4 KBN12 4	STA5 KBN12 5
DATE			08/02/89	08/02/89	08/02/89	08/02/89	08/02/89
TIME			09:00	13:45	14:30	11:00	12:15
ENDOSULFAN,A	UG/L	34361 EC	<0.006	<0.006	<0.006	<0.006	<0.006
ENDOSULFAN,B	UG/L	34356 EC	<0.006	<0.006	<0.006	<0.006	<0.006
ENDOSULFAN SULFATE	UG/L	34351 EC	<0.029	<0.029	<0.029	<0.029	<0.029
ENDRIN	UG/L	39390 EC	<0.006	<0.006	<0.006	<0.006	<0.006
ENDRIN ALDEHYDE	UG/L	34366 EC	<0.006	<0.006	<0.006	<0.006	<0.006
HEPTACHLOR	UG/L	39410 EC	<0.006	<0.006	<0.006	<0.006	<0.006
HEPTACHLOR EPOXIDE	UG/L	39420 EC	<0.006	<0.006	<0.006	<0.006	<0.006
TOXAPHENE	UG/L	39400 EC	<0.588	<0.588	<0.588	<0.588	<0.588
PCB-1016	UG/L	34671 EC	<0.118	<0.118	<0.118	<0.118	<0.118
PCB-1260	UG/L	39508 EC	<0.118	<0.118	<0.118	<0.118	<0.118
PCB-1221	UG/L	39488 EC	<0.118	<0.118	<0.118	<0.118	<0.118
PCB-1232	UG/L	39492 EC	<0.118	<0.118	<0.118	<0.118	<0.118
PCB-1242	UG/L	39496 EC	<0.118	<0.118	<0.118	<0.118	<0.118
PCB 1248	UG/L	39500 EC	<0.118	<0.118	<0.118	<0.118	<0.118
PCB-1254	UG/L	39504 EC	<0.118	<0.118	<0.118	<0.118	<0.118
BENZENE	UG/L	34030 GMS	<1.0	<1.0	<1.0	<1.0	<1.0

Table 10.5.2-14. Priority Pollutant Scan (Page 3 of 10)

PARAMETERS	STORET	STA1 KBN12	STA2 KBN12	STA3 KBN12	STA4 KBN12	STA5 KBN12
UNITS	METHOD	1	2	3	4	5
DATE		08/02/89	08/02/89	08/02/89	08/02/89	08/02/89
TIME		09:00	13:45	14:30	11:00	12:15
BROMODICHLOROMETHANE	32101	<2.2	<2.2	<2.2	<2.2	<2.2
UG/L	GMS					
BROMOFORM	32104	<4.7	<4.7	<4.7	<4.7	<4.7
UG/L	GMS					
BROMOMETHANE	34413	<5.8	<5.8	<5.8	<5.8	<5.8
UG/L	GMS					
CARBON TETRACHLORIDE	32102	<2.8	<2.8	<2.8	<2.8	<2.8
UG/L	GMS					
CHLOROBENZENE	34301	<6.0	<6.0	<6.0	<6.0	<6.0
UG/L	GMS					
CHLOROETHANE	34311	<8.2	<8.2	<8.2	<8.2	<8.2
UG/L	GMS					
2-CHLOROETHYLVINYL	34576	<15	<15	<15	<15	<15
ETHER UG/L	GMS					
CHLOROFORM	32106	<1.6	<1.6	<1.6	<1.6	<1.6
UG/L	GMS					
CHLOROMETHANE	34418	<4.3	<4.3	<4.3	<4.3	<4.3
UG/L	GMS					
DIBROMOCHLOROMETHANE	32105	<3.1	<3.1	<3.1	<3.1	<3.1
UG/L	GMS					
1,1-DICHLOROETHANE	34496	<4.7	<4.7	<4.7	<4.7	<4.7
UG/L	GMS					
1,2-DICHLOROETHANE	34531	<2.8	<2.8	<2.8	<2.8	<2.8
UG/L	GMS					
1,1-DICHLOROETHYLENE	34501	<2.8	<2.8	<2.8	<2.8	<2.8
UG/L	GMS					
TRANS-1,2-DICHLORO	34546	<1.6	<1.6	<1.6	<1.6	<1.6
ETHENE UG/L	GMS					
1,2-DICHLOROPROPANE	34541	<6.0	<6.0	<6.0	<6.0	<6.0
UG/L	GMS					
CIS-1,3-DICHLORO	34704	<5.0	<5.0	<5.0	<5.0	<5.0
PROPENE UG/L	GMS					

Table 10.5.2-14. Priority Pollutant Scan (Page 4 of 10)

PARAMETERS	UNITS	STORET METHOD	STA1 KBN12 1	STA2 KBN12 2	STA3 KBN12 3	STA4 KBN12 4	STA5 KBN12 5
DATE			08/02/89	08/02/89	08/02/89	08/02/89	08/02/89
TIME			09:00	13:45	14:30	11:00	12:15
TRANS-1,3-DICHLORO PROPENE	UG/L	34699 GMS	<6.4	<6.4	<6.4	<6.4	<6.4
ETHYLBENZENE	UG/L	34371 GMS	<6.2	<6.2	<6.2	<6.2	<6.2
METHYLENE CHLORIDE	UG/L	34423 GMS	<5.0	<5.0	<5.0	<5.0	<5.0
1,1,2,2-TETRACHLORO ETHANE	UG/L	34516 GMS	<4.1	<4.1	<4.1	<4.1	<4.1
TETRACHLOROETHENE	UG/L	34475 GMS	<3.0	<3.0	<3.0	<3.0	<3.0
TOLUENE	UG/L	34010 GMS	<6.0	<6.0	<6.0	<6.0	<6.0
1,1,1-TRICHL'ETHANE	UG/L	34506 GMS	<3.8	<3.8	<3.8	<3.8	<3.8
1,1,2-TRICHL'ETHANE	UG/L	34511 GMS	<5.0	<5.0	<5.0	<5.0	<5.0
TRICHLOROETHENE	UG/L	39180 GMS	<1.0	<1.0	<1.0	<1.0	<1.0
TRICHLOROFLUORO-METHANE	UG/L	34488 GMS	<3.2	<3.2	<3.2	<3.2	<3.2
VINYL CHLORIDE	UG/L	39175 GMS	<1.0	<1.0	<1.0	<1.0	<1.0
ACROLEIN	UG/L	34210 GMS	<100	<100	<100	<100	<100
ACRYLONITRILE	UG/L	34215 GMS	<100	<100	<100	<100	<100
DICHLORODIFLUORO-METHANE	UG/L	34668 GMS	<10	<10	<10	<10	<10
ACENAPHTHENE	UG/L	34205 GMS	<1.0	<1.0	<1.0	<1.0	<1.0
ACENAPHTHYLENE	UG/L	34200 GMS	<1.0	<1.0	<1.0	<1.0	<1.0

Table 10.5.2-14. Priority Pollutant Scan (Page 5 of 10)

PARAMETERS	UNITS	STORET METHOD	STA1 KBN12 1	STA2 KBN12 2	STA3 KBN12 3	STA4 KBN12 4	STA5 KBN12 5
DATE			08/02/89	08/02/89	08/02/89	08/02/89	08/02/89
TIME			09:00	13:45	14:30	11:00	12:15
ANTHRACENE	UG/L	34220 GMS	<1.0	<1.0	<1.0	<1.0	<1.0
BENZIDINE	UG/L	39120 GMS	<5.0	<5.0	<5.0	<5.0	<5.0
BENZO(A)ANTHRACENE	UG/L	34526 GMS	<1.0	<1.0	<1.0	<1.0	<1.0
BENZO(B)FLUORANTHENE	UG/L	34230 GMS	<1.5	<1.5	<1.5	<1.5	<1.5
BENZO(K)FLUORANTHENE	UG/L	34242 GMS	<1.5	<1.5	<1.5	<1.5	<1.5
BENZO(A)PYRENE	UG/L	34247 GMS	<2.0	<2.0	<2.0	<2.0	<2.0
BENZO(GHI)PERYLENE	UG/L	34521 GMS	<2.5	<2.5	<2.5	<2.5	<2.5
BUTYLBENZYLPHTHALATE	UG/L	34292 GMS	<1.5	<1.5	<1.5	<1.5	<1.5
BIS(2-CHLOROETHYL) ETHER	UG/L	34273 GMS	<1.0	<1.0	<1.0	<1.0	<1.0
BIS(2-CHLOROETHOXY) METHANE	UG/L	34278 GMS	<1.0	<1.0	<1.0	<1.0	<1.0
BIS(2-ETHYLHEXYL) PHTHALATE	UG/L	39100 GMS	<1.0	<1.0	<1.0	<1.0	<1.0
BIS(2-CHL'ISOPROPYL) ETHER	UG/L	34283 GMS	<1.0	<1.0	<1.0	<1.0	<1.0
4-BROMOPHENYLPHENYL ETHER	UG/L	34636 GMS	<2.0	<2.0	<2.0	<2.0	<2.0
2-CHLORONAPHTHALENE	UG/L	34581 GMS	<1.0	<1.0	<1.0	<1.0	<1.0
2-CHLOROPHENOL	UG/L	34586 GMS	<2.0	<2.0	<2.0	<2.0	<2.0
4-CHLORO-3-METHYL PHENOL	UG/L	34452 GMS	<2.0	<2.0	<2.0	<2.0	<2.0

Table 10.5.2-14. Priority Pollutant Scan (Page 6 of 10)

PARAMETERS	UNITS	STORET METHOD	STA1 KBN12 1	STA2 KBN12 2	STA3 KBN12 3	STA4 KBN12 4	STA5 KBN12 5
DATE			08/02/89	08/02/89	08/02/89	08/02/89	08/02/89
TIME			09:00	13:45	14:30	11:00	12:15
4-CHLOROPHENYLPHENYL ETHER	UG/L	34641 GMS	<1.5	<1.5	<1.5	<1.5	<1.5
CHRYSENE	UG/L	34320 GMS	<1.0	<1.0	<1.0	<1.0	<1.0
DIBEN'(A,H)ANTH'CENE	UG/L	34556 GMS	<2.5	<2.5	<2.5	<2.5	<2.5
DI-N-BUTYLPHTHALATE	UG/L	39110 GMS	<1.0	<1.0	1.1	<1.0	<1.0
1,3,DICHLOROBENZENE	UG/L	34566 GMS	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-DICHLOROBENZENE	UG/L	34536 GMS	<1.0	<1.0	<1.0	<1.0	<1.0
1,4-DICHLOROBENZENE	UG/L	34571 GMS	<1.0	<1.0	<1.0	<1.0	<1.0
3,3'-DICHL'BENZIDINE	UG/L	34631 GMS	<3.0	<3.0	<3.0	<3.0	<3.0
2,4-DICHLOROPHENOL	UG/L	34601 GMS	<2.0	<2.0	<2.0	<2.0	<2.0
DIETHYLPHTHALATE	UG/L	34336 GMS	<1.0	<1.0	<1.0	<1.0	<1.0
2,4-DIMETHYLPHENOL	UG/L	34606 GMS	<2.0	<2.0	<2.0	<2.0	<2.0
DIMETHYLPTHALATE	UG/L	34341 GMS	<1.0	<1.0	<1.0	<1.0	<1.0
2,4-DINITROPHENOL	UG/L	34616 GMS	<30	<30	<30	<30	<30
2,4-DINITROTOLUENE	UG/L	34611 GMS	<2.0	<2.0	<2.0	<2.0	<2.0
2,6-DINITROTOLUENE	UG/L	34626 GMS	<2.0	<2.0	<2.0	<2.0	<2.0
DI-N-OCTYLPHTHALATE	UG/L	34596 GMS	<2.0	<2.0	<2.0	<2.0	<2.0

Table 10.5.2-14. Priority Pollutant Scan (Page 7 of 10)

PARAMETERS UNITS	STORET METHOD	STA1 KBN12 1	STA2 KBN12 2	STA3 KBN12 3	STA4 KBN12 4	STA5 KBN12 5
DATE		08/02/89	08/02/89	08/02/89	08/02/89	08/02/89
TIME		09:00	13:45	14:30	11:00	12:15
1,2-DIPHEN'HYDRAZINE UG/L	34346 GMS	<1.0	<1.0	<1.0	<1.0	<1.0
FLUORANTHENE UG/L	34376 GMS	<1.0	<1.0	<1.0	<1.0	<1.0
FLUORENE UG/L	34381 GMS	<1.0	<1.0	<1.0	<1.0	<1.0
HEXACHLOROBENZENE UG/L	39700 GMS	<1.0	<1.0	<1.0	<1.0	<1.0
HEXACHLOROBUTADIENE UG/L	34391 GMS	<2.0	<2.0	<2.0	<2.0	<2.0
HEXACHLOROCYCLOPENTA DIENE UG/L	34386 GMS	<2.0	<2.0	<2.0	<2.0	<2.0
HEXACHLOROETHANE UG/L	34396 GMS	<1.0	<1.0	<1.0	<1.0	<1.0
INDENO(1,2,3-CD) PYRENE UG/L	34403 GMS	<2.5	<2.5	<2.5	<2.5	<2.5
ISOPHORONE UG/L	34408 GMS	<1.0	<1.0	<1.0	<1.0	<1.0
2-METHYL-4,6-DINITRO PHENOL UG/L	34657 GMS	<20	<20	<20	<20	<20
NAPHTHALENE UG/L	34696 GMS	<1.0	<1.0	<1.0	<1.0	<1.0
NITROBENZENE UG/L	34447 GMS	<1.0	<1.0	<1.0	<1.0	<1.0
2-NITROPHENOL UG/L	34591 GMS	<2.0	<2.0	<2.0	<2.0	<2.0
4-NITROPHENOL UG/L	34646 GMS	<10	<10	<10	<10	<10
N-NITROSODIMET'AMINE UG/L	34438 GMS	<1.5	<1.5	<1.5	<1.5	<1.5
N-NITROSODI-N-PROPYL AMINE UG/L	34428 GMS	<1.0	<1.0	<1.0	<1.0	<1.0

Table 10.5.2-14. Priority Pollutant Scan (Page 8 of 10)

PARAMETERS UNITS	STORET METHOD	STA1 KBN12 1	STA2 KBN12 2	STA3 KBN12 3	STA4 KBN12 4	STA5 KBN12 5
DATE		08/02/89	08/02/89	08/02/89	08/02/89	08/02/89
TIME		09:00	13:45	14:30	11:00	12:15
N-NITROSODIPHE'AMINE UG/L	34433 GMS	<1.0	<1.0	<1.0	<1.0	<1.0
PENTACHLOROPHENOL UG/L	39032 GMS	<10	<10	<10	<10	<10
PHENANTHRENE UG/L	34461 GMS	<1.0	<1.0	<1.0	<1.0	<1.0
PHENOL UG/L	34694 GMS	<2.0	<2.0	<2.0	<2.0	<2.0
PYRENE UG/L	34469 GMS	<1.0	<1.0	<1.0	<1.0	<1.0
1,2,4-TRICH'BENZENE UG/L	34551 GMS	<1.0	<1.0	<1.0	<1.0	<1.0
2,4,6-TRICHL'PHENOL UG/L	34621 GMS	<3.0	<3.0	<3.0	<3.0	<3.0
2,3,7,8-TCDD UG/L	34675 GMS	<2.0	<2.0	<2.0	<2.0	<2.0

Table 10.5.2-14. Priority Pollutant Scan (Page 9 of 10)

PARAMETERS	UNITS	STORET METHOD	KBN12 8
DATE			08/02/89
TIME			00:00
BENZENE	UG/L	34030 GMS	<1.0
BROMODICHLOROMETHANE	UG/L	32101 GMS	<2.2
BROMOFORM	UG/L	32104 GMS	<4.7
BROMOMETHANE	UG/L	34413 GMS	<5.8
CARBON TETRACHLORIDE	UG/L	32102 GMS	<2.8
CHLOROBENZENE	UG/L	34301 GMS	<6.0
CHLOROETHANE	UG/L	34311 GMS	<8.2
2-CHLOROETHYLVINYL ETHER	UG/L	34576 GMS	<15
CHLOROFORM	UG/L	32106 GMS	<1.6
CHLOROMETHANE	UG/L	34418 GMS	<4.3
DIBROMOCHLOROMETHANE	UG/L	32105 GMS	<3.1
1,1-DICHLOROETHANE	UG/L	34496 GMS	<4.7
1,2-DICHLOROETHANE	UG/L	34531 GMS	<2.8
1,1-DICHLOROETHYLENE	UG/L	34501 GMS	<2.8
TRANS-1,2-DICHLORO ETHENE	UG/L	34546 GMS	<1.6
1,2-DICHLOROPROPANE	UG/L	34541 GMS	<6.0

Table 10.5.2-14. Priority Pollutant Scan (Page 10 of 10)

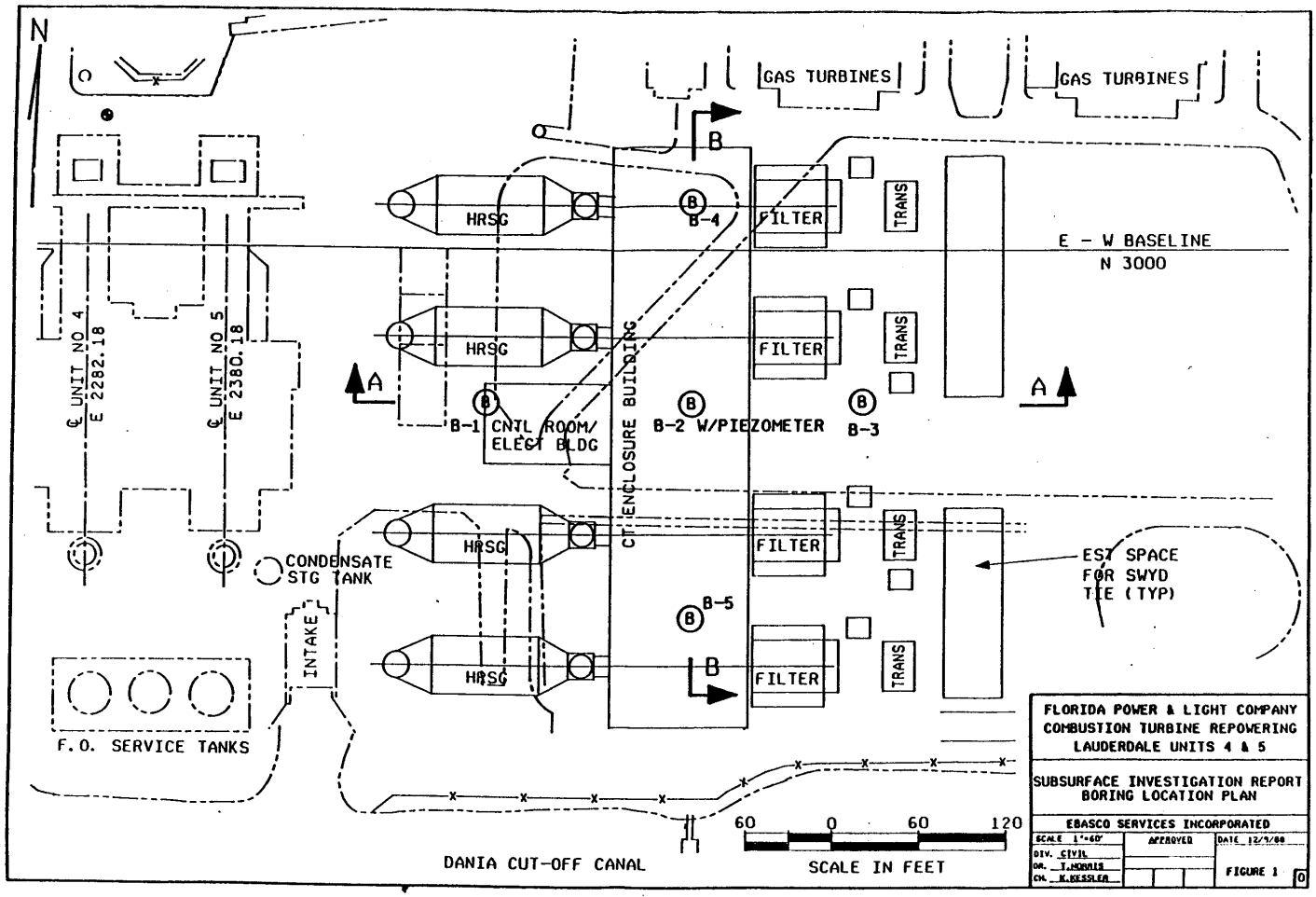
PARAMETERS UNITS	STORET METHOD	TRPBLK KBN12 8
DATE		08/02/89
TIME		00:00
CIS-1,3-DICHLORO PROPENE UG/L	34704 GMS	<5.0
TRANS-1,3-DICHLORO PROPENE UG/L	34699 GMS	<6.4
ETHYLBENZENE UG/L	34371 GMS	<6.2
METHYLENE CHLORIDE UG/L	34423 GMS	<5.0
1,1,2,2-TETRACHLORO ETHANE UG/L	34516 GMS	<4.1
TETRACHLOROETHENE UG/L	34475 GMS	<3.0
TOLUENE UG/L	34010 GMS	<6.0
1,1,1-TRICHL'ETHANE UG/L	34506 GMS	<3.8
1,1,2-TRICHL'ETHANE UG/L	34511 GMS	<5.0
TRICHLOROETHENE UG/L	39180 GMS	<1.0
TRICHLOROFLUORO-METHANE UG/L	34488 GMS	<3.2
VINYL CHLORIDE UG/L	39175 GMS	<1.0

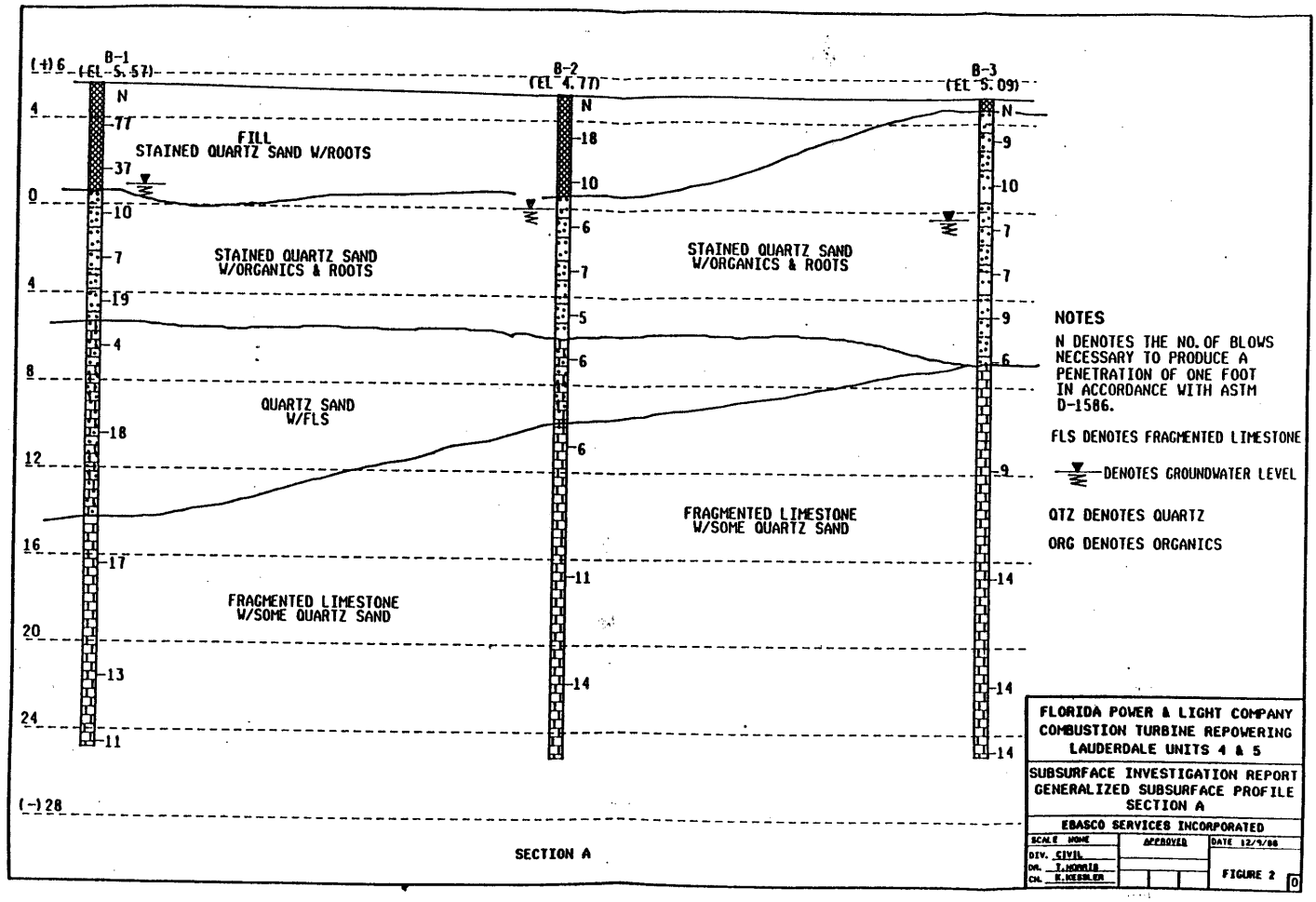
Table 10.5.2-15. Water Quality Data--March 22, 1990

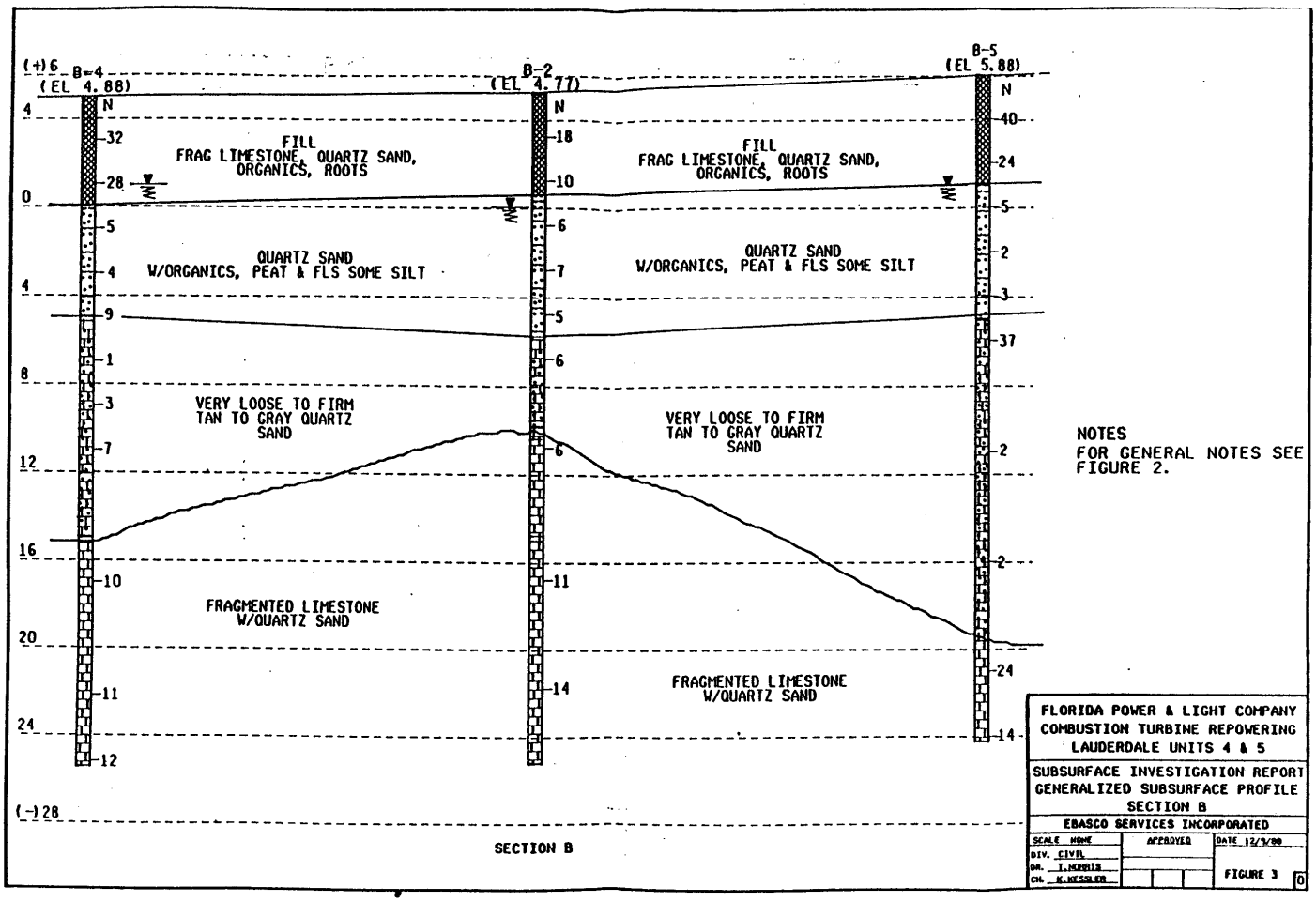
Station	Concentration (mg/L) Bromide	Bromates
1	20.87	<12.50
2	18.47	<12.50
3	22.45	<12.50
4	24.20	<12.50
5	23.83	<12.50
Equipment Blank	<0.050	<0.050

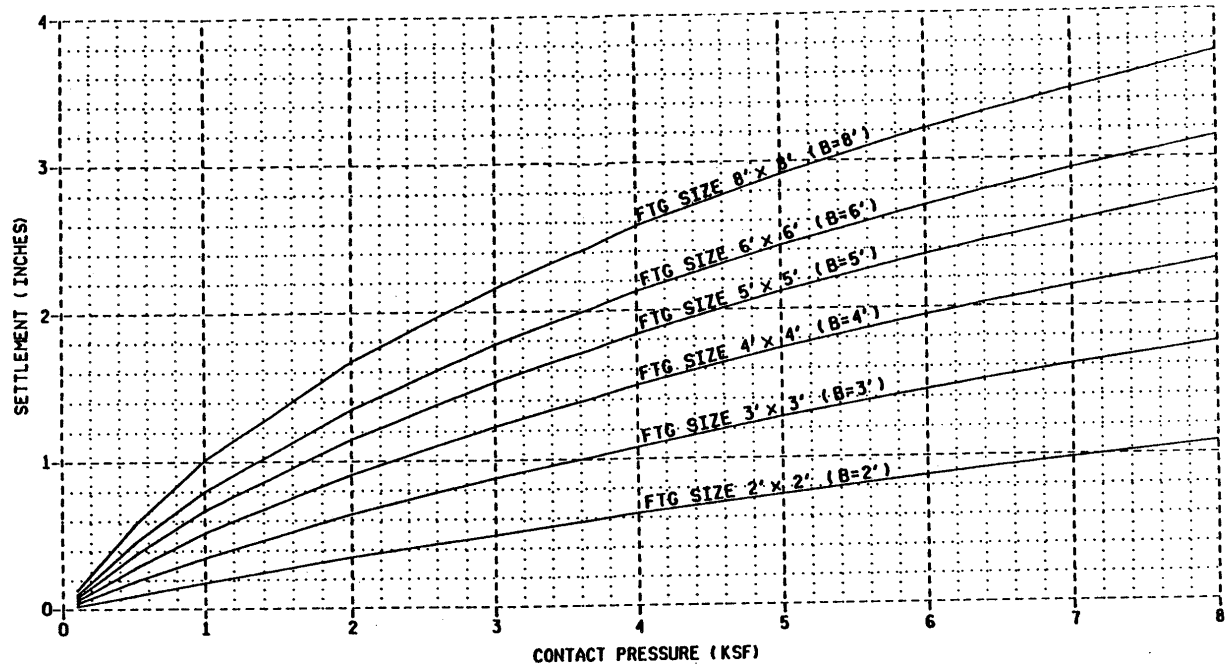
APPENDIX 10.5.3

GEOTECHNICAL


N
GAS TURBINES
GAS TURBINES
B
B-4
HRSG
FILTER
TRANS
E - W BASELINE
N 3000
HRSG
FILTER
TRANS
A
A
℄ UNIT NO 4
E 2282.18
℄ UNIT NO 5
E 2380.18
B-1 CNTL ROOM/
ELECT BLDG
B-2 W/PIEZOMETER
B-3
CT ENCLOSURE BUILDING
HRSG
FILTER
TRANS
EST SPACE
FOR SWYD
TIE (TYP)
CONDENSATE
STG TANK
B-5
INTAKE
HRSG
FILTER
TRANS
B
F.O. SERVICE TANKS
60 0 60 120
DANIA CUT-OFF CANAL
SCALE IN FEET
FLORIDA POWER & LIGHT COMPANY
COMBUSTION TURBINE REPOWERING
LAUDERDALE UNITS 4 & 5
SUBSURFACE INVESTIGATION REPORT
BORING LOCATION PLAN
EBASCO SERVICES INCORPORATED
SCALE 1"=60'
APPROVED
DATE 12/1/80
DR. T.MORRIS
CH. K.KESSLER
FIGURE 1
0


B-1
(EL 5.57)
B-2
(EL 4.77)
B-3
(EL 5.09)
(+)6
4
0
4
8
12
16
20
24
(-)28
N
77
37
10
7
19
4
18
17
13
11
18
10
6
7
5
6
6
11
14
14
9
10
7
7
9
6
9
14
14
FILL
STAINED QUARTZ SAND W/ROOTS
STAINED QUARTZ SAND W/ORGANICS & ROOTS
QUARTZ SAND W/FLS
FRAGMENTED LIMESTONE W/SOME QUARTZ SAND
STAINED QUARTZ SAND W/ORGANICS & ROOTS
FRAGMENTED LIMESTONE W/SOME QUARTZ SAND
SECTION A
NOTES
N DENOTES THE NO. OF BLOWS NECESSARY TO PRODUCE A PENETRATION OF ONE FOOT IN ACCORDANCE WITH ASTM D-1586.
FLS DENOTES FRAGMENTED LIMESTONE
DENOTES GROUNDWATER LEVEL
QTZ DENOTES QUARTZ
ORG DENOTES ORGANICS
FLORIDA POWER & LIGHT COMPANY
COMBUSTION TURBINE REPOWERING
LAUDERDALE UNITS 4 & 5
SUBSURFACE INVESTIGATION REPORT
GENERALIZED SUBSURFACE PROFILE
SECTION A
EBASCO SERVICES INCORPORATED
SCALE NONE
APPROVED
DATE 12/5/88
DIV. CIVIL
DR. T.HORRIS
CH. K.WESSLER
FIGURE 2
0


(+)6
B-4
(EL 4.88)
B-2
(EL 4.77)
B-5
(EL 5.88)
N
FILL
FRAG LIMESTONE, QUARTZ SAND, ORGANICS, ROOTS
QUARTZ SAND W/ORGANICS, PEAT & FLS SOME SILT
VERY LOOSE TO FIRM TAN TO GRAY QUARTZ SAND
FRAGMENTED LIMESTONE W/QUARTZ SAND
(-)28
SECTION B
NOTES
FOR GENERAL NOTES SEE FIGURE 2.
FLORIDA POWER & LIGHT COMPANY
COMBUSTION TURBINE REPOWERING
LAUDERDALE UNITS 4 & 5
SUBSURFACE INVESTIGATION REPORT
GENERALIZED SUBSURFACE PROFILE
SECTION B
EBASCO SERVICES INCORPORATED
SCALE NONE
APPROVED
DATE 12/5/90
DIV. CIVIL
DR. T.MORRIS
CH. K.KESSLER
FIGURE 3
0



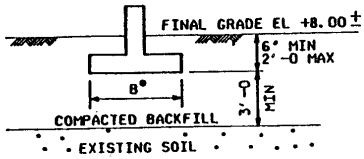
NOTES :

1 - FOOTINGS SHALL BE SIZED TO LIMIT SETTLEMENT TO ONE (1) INCH.

2 - INTERPOLATION BETWEEN CURVES IS NOT PERMITTED. FOR INTERMEDIATE FOOTING SIZES, THE CURVE SHOWN ASSOCIATED WITH THE NEXT LARGEST FOOTING SIZE SHALL BE USED.

3 - ALL FOOTINGS SHALL BE FOUNDED ON COMPACTED BACKFILL (MINIMUM 3'-0 THICK).

4 - COMPACTED BACKFILL SHALL HAVE A DENSITY OF 95% OF THE MAXIMUM DENSITY ESTABLISHED BY ASTM D1557.



TYPICAL SECTION

B* DENOTES WIDTH OF FOOTING (FT)

FLORIDA POWER & LIGHT COMPANY
COMBUSTION TURBINE REPOWERING
LAUDERDALE UNITS 4 & 5

SUBSURFACE INVESTIGATION REPORT
SPREAD FOOTING DESIGN CHART

EBASCO SERVICES INCORPORATED

SCALE NONE	APPROVED	DATE 12/1/88
DIV. CIVIL		
DR. T.MORRIS		FIGURE 4
CH. K.KESSLER		0

APPENDIX A -- BORING LOGS

SOIL TEST BORINGS

FPL LAUDERDALE REPOWERING PROJECT GEOTECHNICAL EXPLORATION SERVICES CONTRACT #AE-88031

FORT LAUDERDALE, FLORIDA

SEPTEMBER 1988

Prepared for:

EBASCO SERVICES, INC.

NORCROSS, GEORGIA

WINGERTER LABORATORIES, INC.
1820 N.E. 144th Street
North Miami, Florida

WINGERTER LABORATORIES, INC.

Engineering Testing & Inspection Service
1820 N.E. 144th Street
North Miami, Florida 33181

EPORTS (NO. B-1 thru B-5) OF: TEST BORINGS ORDER NO. 19184.1(1002)
LIENT: Ebasco Services, Inc.
PROJECT: FPL Lauderdale Repowering Proj. Geotechnical Exploration Serv. Cont.#AE-88031
LOCATION: SW 42nd Avenue, Ft. Lauderdale, Florida
ARCHITECT: Not Furnished
ENGINEER: Not Furnished
DATE: September 12 and 13, 1988
REPORTED TO: Ebasco Services, Inc.
145 Technology Park/Atlanta
Norcross, Georgia 33092

Gentlemen:

ubmitted herewith are logs of test borings performed by **WINGERTER LABORATORIES, INC.** at the project location under authorization of the client. The logs present factual information on the subsurface conditions at the specific test boring locations; no warrantee is expressed or implied that materials or conditions other than those described will not be encountered at the project site.

These logs are submitted as the confidential property of the client; for our mutual protection, authorization for publication or extraction of information contained on the logs is reserved pending our written approval.

Field work was performed using standard drilling equipment. Soil samples (disturbed) were obtained in accordance with ASTM D-1586 by which method a 2-foot long, 2-inch diameter split spoon sampler is advanced by successive blows of a 140 pound hammer free-falling 30 inches. The number of blows for each 6 inches of penetration is recorded; the sum of the second and third blow counts for each 2-foot mpling interval constitutes the Standard Penetration Resistance in blows per foot.

Soil samples will be retained by **WINGERTER LABORATORIES, INC.** for a period of 90 days only unless specifically requested otherwise by the client.

The number and locations of the test borings were determined by the client.

Test borings were staked in the field by the client.

Borings were terminated at depths as determined by the client.

Elevations of the test borings were furnished by the client.

terpretation and recommendations based upon these data will be made if requested.

Respectfully submitted,
WINGERTER LABORATORIES, INC.

Felix A. Peguero 9/15/88
Felix A. Peguero-Guerrero, P.E.
Florida Registration No. 34473

The original of this report was signed and sealed by the above registered engineer in accordance with Rule 21H-18.11, Chapter 471, Florida Statute.

As mutual protection to clients, the public and ourselves, all reports are submitted as the confidential roperty of clients, and authorization for publication of statements, conclusions or extracts from or garding our reports is reserved pending our written approval.

WINGERTER LABORATORIES, INC.
Engineering Testing & Inspection Service
1820 N.E. 144th Street
North Miami, Florida 33181

REPORT OF: TEST BORING

CLIENT: Ebasco Services, Inc. ORDER NO. 19184.1(1002)

145 Technology Park/Atlanta, Norcross, Georgia HOLE NO.: B-1

PROJECT: FPL Lauderdale Repowering Proj. Geotechnical Exploration Serv. Contr. #AE-88031

LOCATION: Staked in field by client, shown on boring location sketch

DATE START: 9-13-88

DRILLER: E. Adderly DRILL NO.: 164 DATE COMPLETE: 9-13-88

Depth	El.	Description of Materials	SMP No.	Hammer Blows on Sampler	Penetration (Foot)	Hammer Blows on Casing
0.0	+5.57	Tan to gray calcareous SAND and fragmented LIMESTONE with trace asphalt		49 30 35	1	HOLLOW STEM AUGER
2.0			1	42	2	
		Brown to black quartz SAND with some fragmented limestone		32 20 19	3	
4.0			2	18	4	
		Brown quartz SAND with some fragmented limestone		12 18 7	5	
6.0			3	3	6	
		Brown quartz SAND and fragmented LIMESTONE with trace silt		3 2 4	7	
8.0			4	3	8	
		Gray to black organic stained quartz SAND and SILT with some fragmented limestone		8 13 11	9	
10.0			5	8	10	
		Tan to gray quartz SAND with some fragmented limestone		5 2 2	11	
			6	2	12	
					13	
					14	
15.0					15	

---continued---

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Reported By:

Bruce Khosrozadeh, E.I.
Geotechnical Engineer

WINGERTER LABORATORIES, INC.

Florida Registration No. 34473

The original of this report was signed and sealed by the above registered engineer in accordance with Rule 21H-18.11, Chapter 471, Florida Statute.

WINGERTER LABORATORIES, INC.
Engineering Testing & Inspection Service
1829 N.E. 144th Street
North Miami, Florida 33181

No. 1 — 9-14-88 nn

REPORT OF: TEST BORING
CLIENT: Ebasco Services, Inc. — ORDER NO. 19184.1(1002)
145 Technology Park/Atlanta, Norcross, Georgia — HOLE NO.: B-1
PROJECT: FPL Lauderdale Repowering Proj. Geotechnical Exploration Serv. Contr. #AE-88031
LOCATION: Staked in field by client, shown on boring location sketch — DATE START: 9-13-88
DRILLER: E. Adderly — DRILL NO.: 164 — DATE COMPLETE: 9-13-88

Depth	El.	Description of Materials	SMP No.	Hammer Blows on Sampler	Penetration (Feet)	Hammer Blows on Casing
15.0	-9.43	Tan to gray calcareous SAND with some fragmented limestone		12 6 7	16	HOLLOW STEM AUGER
			7	11	17	
					18	
					19	
20.0					20	
		Tan to gray fragmented LIMESTONE with some calcareous sand		4 7 7	21	
			8	10	22	
					23	
					24	
					25	
				6 6 5	26	
			9	8	27	
					28	
				5 4 5	29	
30.0		Boring terminated at 30.0'	10	6	30	

Hammer Weight: Casing - lbs.; Spoon 140 lbs. // Hammer Drop: Casing -"; Spoon 30 " //
Split Sampler: 1.5 " I.D.; 2.0 " O.D.; 24 " Long // Casing: - " I.D.; - " O.D.
Type HSA// Water Level 4'7" Below Surface at - Date 9-13-88

As mutual protection to the owners and ourselves, the engineer in the owner's behalf shall check this report with the samples submitted prior to the purchase of property, or designing of structures.

As further protection to clients, the public and ourselves, all reports are submitted as the confidential property of clients, and authorization for publication of statements, conclusions or extracts from or regarding our reports is reserved pending our written approval.

Reported By:
B. Kosrozadeh
Bruce Kosrozadeh, E.I.
Geotechnical Engineer

WINGERTER LABORATORIES, INC.
Felix A. Peguero-Guerrero, P. E.
Florida Registration No. 34473
9/15/88

The original of this report was signed and sealed by the above registered engineer in accordance with Rule 21H-18.11, Chapter 471, Florida Statute.

WINGERTER LABORATORIES, INC.
Engineering Testing & Inspection Service
1820 N.E. 144th Street
North Miami, Florida 33181

REPORT OF: TEST BORING
CLIENT: Ebasco Services, Inc. ORDER NO. 19184.1(1002)
145 Technology Park/Atlanta, Norcross, Georgia HOLE NO.: B-2
JECT: FPL Lauderdale Repowering Proj. Geotechnical Exploration Serv. Contr. #AE-88031
LOCATION: Staked in field by client, shown on boring location sketch (Off-set 14' East)
DATE START: 9-12-88
DRILLER: J. Cooper DRILL NO.: 152 DATE COMPLETE: 9-12-88

Depth	El.	Description of Materials	SMP No.	Hammer Blows on Sampler	Penetration (Foot)	Hammer Blows on Casing
0.0	+4.77					
		Tan to brown organic stained quartz SAND with some roots and fragmented limestone		5 5 5	1	HOLLOW STEM AUGER
2.0			1	13	2	
		Tan to gray calcareous SAND and fragmented		15		
3.0		LIMESTONE	2	10	3	
		Gray to black organic stained quartz SAND		5		
			3	5	4	
				3		
				3	5	
				3		
6.0			4	3	6	
		Black organic stained semi-plastic quartz		2		
7.0		SAND with trace roots	5	2	7	
		Gray to black organic stained quartz SAND		3		
8.0			6	4	8	
				4		
		Tan to gray quartz SAND		3	9	
				2		
10.0			7	3	10	
		Black organic stained semi-plastic quartz		2		
11.0		SAND and ROOTS	8	2	11	
		Light brown quartz SAND		3		
12.0			9	3	12	
		Tan to gray fragmented LIMESTONE with some quartz sand			13	
					14	
					15	

---continued---

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Reported By:

Bruce Kosrozadeh, E.I.
Geotechnical Engineer

WINGERTER LABORATORIES, INC.

Florida Registration No. 34473

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WINGERTER LABORATORIES, INC.
Engineering Testing & Inspection Service
1820 N.E. 144th Street
North Miami, Florida 33181

REPORT OF: TEST BORING

CLIENT: Ebasco Services, Inc. ORDER NO. 19184.1(1002)

PROJECT: 145 Technology Park/Atlanta, Norcross, Georgia HOLE NO.: B-2

LOCATION: FPL Lauderdale Repowering Proj. Geotechnical Exploration Serv. Contr. #AE-88031
Staked in field by client, shown on boring location sketch (Off-set 14' East)

DATE START: 9-12-88

DRILLER: J. Cooper DRILL NO.: 152 DATE COMPLETE: 9-12-88

Depth	El.	Description of Materials	SMP No.	Hammer Blows on Sampler	Penetration (Feet)	Hammer Blows on Casing
15.0	-10.23					
		Tan to gray fragmented LIMESTONE with some quartz sand		3		HOLLOW
				3	16	STEM
				4		AUGER
			10	4	17	
					18	
					19	
					20	
				12		
				6	21	
				6		
			11	5	22	
					23	
					24	
					25	
				25		
				10	26	
				7		
			12	7	27	
28.0					28	
		Tan to gray quartz SAND and fragmented LIMESTONE		7		
				5	29	
				4		
30.0			13	4	30	
		Boring terminated at 30.0'				

Hammer Weight: Casing - lbs.; Spoon 140 lbs. // Hammer Drop: Casing - "; Spoon 30 " //
Split Sampler: 1.5 " I.D.; 2.0 " O.D.; 24 " Long // Casing: - " I.D.; - " O.D.
Type HSA Water Level 5'0" Below Surface at 2:30PM Date 9-12-88

As mutual protection to the owners and ourselves, the engineer in the owner's behalf shall check this report with the samples submitted prior to the purchase of property, or designing of structures.

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Reported By:
B. Kosrozadeh
Bruce Kosrozadeh, E.I.
Geotechnical Engineer

WINGERTER LABORATORIES, INC.
Felix A. Pegueró-Guerrero, P. E. 9/15/88
Florida Registration No. 34473

The original of this report was signed and sealed by the above registered engineer in accordance with Rule 21H-18.11, Chapter 471, Florida Statute.

WINGERTER LABORATORIES, INC.
Engineering Testing & Inspection Service
1820 N.E. 144th Street
North Miami, Florida 33181

REPORT OF: TEST BORING

CLIENT: Ebasco Services, Inc. ORDER NO. 19184.1(1002)

PROJECT: 145 Technology Park/Atlanta, Norcross, Georgia HOLE NO.: B-3
FPL Lauderdale Repowering Proj. Geotechnical Exploration Serv. Contr. #AE-88031

LOCATION: Staked in field by client, shown on boring location sketch

DATE START: 9-12-88

DRILLER: J. Cooper DRILL NO.: 152 DATE COMPLETE: 9-12-88

Depth	El.	Description of Materials	SMP No.	Hammer Blows on Sampler	Penetration (Foot)	Hammer Blows on Casing
0.0	+5.09					
		Brown to black organic stained quartz SAND		2		HOLLOW
1.0		with some roots	1	3	1	STEM
		Gray to black organic stained semi-plastic		4		AUGER
2.0		quartz SAND with some organics and trace roots	2	5	2	
		Tan to gray quartz SAND		5		
				6	3	
				6		
4.0			3	4	4	
		Brown quartz SAND with some fragmented		4		
		limestone		4	5	
				4		
6.0			4	3	6	
		Gray to black semi-plastic quartz SAND		1		
7.0		with some organics	5	2	7	
		Tan to gray quartz SAND with trace organics		3		
8.0			6	4	8	
		Brown quartz SAND with trace fragmented		4		
		limestone		4	9	
				4		
10.0			7	5	10	
		Black organic stained semi-plastic quartz		3		
		SAND with some fragmented limestone		3	11	
				3		
12.0			8	3	12	
		Tan to gray fragmented LIMESTONE with some			13	
		quartz sand				
					14	
					15	

---continued---

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Reported By:

B. Kosrozadeh

Bruce Kosrozadeh, E.I.
Geotechnical Engineer

WINGERTER LABORATORIES, INC.

Florida Registration No. 34473

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WINGERTER LABORATORIES, INC.
Engineering Testing & Inspection Service
1829 N.E. 144th Street
North Miami, Florida 33181

No. 3 | 9-14-88 nn | Page 7 of 13

REPORT OF: TEST BORING
CLIENT: Ebasco Services, Inc. ORDER NO. 19184.1(1002)
PROJECT: 145 Technology Park/Atlanta, Norcross, Georgia HOLE NO.: B-3
LOCATION: FPL Lauderdale Repowering Proj. Geotechnical Exploration Serv. Contr. #AE-88031
Staked in field by client, shown on boring location sketch
DATE START: 9-12-88
DRILLER: J. Cooper DRILL NO.: 152 DATE COMPLETE: 9-12-88

Depth	El.	Description of Materials	SMP No.	Hammer Blows on Sampler	Penetration (Feet)	Hammer Blows on Casing
15.0	-9.91	Tan to gray fragmented LIMESTONE with some quartz sand		4		HOLLOW
				4	16	STEM
				5		AUGER
			9	4	17	
					18	
					19	
					20	
				6		
				8	21	
				7		
			10	7	22	
					23	
					24	
					25	
				14		
				8	26	
				6		
			11	8	27	
					28	
				20		
				8	29	
				7		
30.0		Boring terminated at 30.0'	12	7	30	

Hammer Weight: Casing - lbs.; Spoon 140 lbs. // Hammer Drop: Casing -"; Spoon 30 " //
Split Sampler: 1.5 " I.D.; 2.0 " O.D.; 24 " Long // Casing: - " I.D.; - " O.D.
Type HSA// Water Level 5'0" Below Surface at 11:30AM Date 9-12-88

As mutual protection to the owners and ourselves, the engineer in the owner's behalf shall check this report with the samples submitted prior to the purchase of property, or designing of structures.

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orted By:
B. Kosrozadeh
Bruce Kosrozadeh, E.I.
Geotechnical Engineer

WINGERTER LABORATORIES, INC.
Felix A. Peguero-Guerrero
9/15/88
Felix A. Peguero-Guerrero, P. E.
Florida Registration No. 34473

The original of this report was signed and sealed by the above registered engineer in accordance with Rule 21H-18.11, Chapter 471, Florida Statute.

WINGERTER LABORATORIES, INC.
Engineering Testing & Inspection Service
1820 N.E. 144th Street
North Miami, Florida 33181

REPORT OF: TEST BORING
CLIENT: Ebasco Services, Inc.
145 Technology Park/Atlanta, Norcross, Georgia
PROJECT: FPL Lauderdale Repowering Proj. Geotechnical Exploration Serv. Contr. #AE-88031
LOCATION: Staked in field by client, shown on boring location sketch(Off-set 4' North)

ORDER NO. 19184.1(1002)
HOLE NO.: B-4
DATE START: 9-13-88
DATE COMPLETE: 9-13-88

DRILLER: E. Adderly DRILL NO.: 164

Depth	El.	Description of Materials	SMP No.	Hammer Blows on Sampler	Penetration (Foot)	Hammer Blows on Casing
0.0	+4.88					
0.5		Brown to black organic stained quartz SAND with some roots and fragmented limestone	1	6 12 15	1	HOLLOW STEM AUGER
..0		Tan to gray quartz SAND with some fragmented limestone	2	17 16	2	
		Brown to black quartz SAND with some fragmented limestone		17 16	3	
4.0			3	12 11	4	
		Brown to black organic stained quartz SAND with some silt and roots with trace fragmented limestone		6 2	5	
6.0			4	3 4	6	
		Brown to black organic rich SILT and ROOTS		3 2	7	
?.0			5	2 1	8	
		Tan to gray quartz SAND				
9.0			6	1 2	9	
10.0		Brown to black organic stained semi plastic clayey silty quartz SAND	7	7 4	10	
		Tan to gray quartz SAND		2 1	11	
12.0			8	WOH 1	12	
		Tan to gray semi plastic clayey silty quartz SAND		1 1	13	
			9	2	14	
:.0					15	

---continued---

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Reported By:

Bruce Kosrozadeh, E.I.
Geotechnical Engineer

WINGERTER LABORATORIES, INC.

Florida Registration No. 34473

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WINGERTER LABORATORIES, INC.
Engineering Testing & Inspection Service
1823 N.E. 144th Street
North Miami, Florida 33181

REPORT OF: TEST BORING
CLIENT: Ebasco Services, Inc. ORDER NO. 19184.1(1002)
145 Technology Park/Atlanta, Norcross, Georgia HOLE NO.: B-4
PROJECT: FPL Lauderdale Repowering Proj. Geotechnical Exploration Serv. Contr. #AE-88031
LOCATION: Staked in field by client, shown on boring location sketch(Off-set 4' North)
DATE START: 9-13-88
DRILLER: E. Adderly DRILL NO.: 164 DATE COMPLETE: 9-13-88

Depth	El.	Description of Materials	SMP No.	Hammer Blows on Sampler	Penetration (Feet)	Hammer Blows on Casing
15.0	-10.12	Brown quartz SAND with trace fragmented limestone		1 6 5	16	HOLLOW STEM AUGER
			10	4	17	
					18	
					19	
20.0					20	
		Tan to gray fragmented LIMESTONE with some calcareous sand		9 6 5	21	
			11	5	22	
					23	
					24	
					25	
				14 9 6	26	
			12	5	27	
					28	
				3 5 7	29	
30.0		Boring terminated at 30.0'	13	5	30	
		WOH = WEIGHT OF HAMMER				

Hammer Weight: Casing - lbs.; Spoon 140 lbs. // Hammer Drop: Casing -"; Spoon 30 " //
Split Sampler: 1.5 " I.D.; 2.0 " O.D.; 24 " Long // Casing: - " I.D.; - " O.D.
Type HSA // Water Level 4'0" Below Surface at 9:30AM Date 9-13-88

As mutual protection to the owners and ourselves, the engineer in the owner's behalf shall check this report with the samples submitted prior to the purchase of property, or designing of structures.

As further protection to clients, the public and ourselves, all reports are submitted as the confidential property of clients, and authorization for publication of statements, conclusions or extracts from or regarding our reports is reserved pending our written approval.

Reported By:
B. Kosrozadeh
Bruce Kosrozadeh, E.I.
Geotechnical Engineer

WINGERTER LABORATORIES, INC.
Felix A. Peguero-Guerrero, P. E. 9/15/88
Florida Registration No. 34473

The original of this report was signed and sealed by the above registered engineer in accordance with Rule 21H-18.11, Chapter 471, Florida Statute.

WINGERTER LABORATORIES, INC.
Engineering Testing & Inspection Service
1820 N.E. 144th Street
North Miami, Florida 33181

REPORT OF: TEST BORING
CLIENT: Ebasco Services, Inc. ORDER NO. 19184.1(1002)
JECT: 145 Technology Park/Atlanta, Norcross, Georgia HOLE NO.: B-5
CATION: FPL Lauderdale Repowering Proj. Geotechnical Exploration Serv. Contr. #AE-88031
Staked in field by client, shown on boring location sketch
DATE START: 9-13-88
DRILLER: T. Cooper DRILL NO.: 152 DATE COMPLETE: 9-13-88

Depth	El.	Description of Materials	SMP No.	Hammer Blows on Sampler	Penetration (Foot)	Hammer Blows on Casing
0.0	+5.88					
0.5		Tan to gray fragmented LIMESTONE with some calcareous sand with trace asphalt	1	30 20	1	HOLLOW STEM AUGER
2.0		Tan to gray quartz SAND with some fragmented limestone	2	15 25	2	
4.0		Tan to gray quartz SAND with trace fragmented limestone	3	25 15 15 9	3 4	
6.0		Gray to black organic stained quartz SAND with trace fragmented limestone	4	4 4 3 2	5 6	
7.0		Brown to black fibrous decomposed ORGANIC MATERIAL (PEAT) with trace fragmented limestone	5	2 2 1	7	
10.0		Brown to black fibrous ROOT MAT with some organic rich silt	6	1 1 1 1	8 9	
		Tan to gray quartz SAND	7	2 3 10 17	10 11	
			8	20	12 13 14 15	

---continued---

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Reported By:

B. Kosrozadeh

...ce Kosrozadeh, E.I.
Geotechnical Engineer

WINGERTER LABORATORIES, INC.

Florida Registration No. 34473

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WINGERTER LABORATORIES, INC.
Engineering Testing & Inspection Service
1829 N.E. 144th Street
North Miami, Florida 33181

REPORT OF: TEST BORING

CLIENT: Ebasco Services, Inc. ORDER NO. 19184.1(1002)

PROJECT: 145 Technology Park/Atlanta, Norcross, Georgia HOLE NO.: B-5
FPL Lauderdale Repowering Proj. Geotechnical Exploration Serv. Contr. #AE-88031

LOCATION: Staked in field by client, shown on boring location sketch

DATE START: 9-13-88

DRILLER: J. Cooper DRILL NO.: 152 DATE COMPLETE: 9-13-88

Depth	El.	Description of Materials	SMP No.	Hammer Blows on Sampler	Penetration (Feet)	Hammer Blows on Casing
15.0	-9.12	Tan to gray quartz SAND		3		HOLLOW
				2	16	STEM
				1		AUGER
			9	1	17	
					18	
					19	
					20	
				5		
				1	21	
				1		
			10	1	22	
					23	
					24	
					25	
				9		
				8	26	
				12		
			11	12	27	
					28	
				6		
				7	29	
				7		
0.0		Boring terminated at 30.0'	12	7	30	

Hammer Weight: Casing - lbs.; Spoon 140 lbs. // Hammer Drop: Casing - "; Spoon 30 " //
Split Sampler: 1.5 " I.D.; 2.0 " O.D.; 24 " Long // Casing: - " I.D.; - " O.D.
Type HSA// Water Level 5'3" Below Surface at - Date 9-13-88

As mutual protection to the owners and ourselves, the engineer in the owner's behalf shall check this report with the samples submitted prior to the purchase of property, or designing of structures.

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Reported By:

B. Kosrozadeh

Bruce Kosrozadeh, E.I.
Geotechnical Engineer

WINGERTER LABORATORIES, INC.

Felix A. Peguero-Guerrero 9/15/88

Felix A. Peguero-Guerrero, P. E.
Florida Registration No. 34473

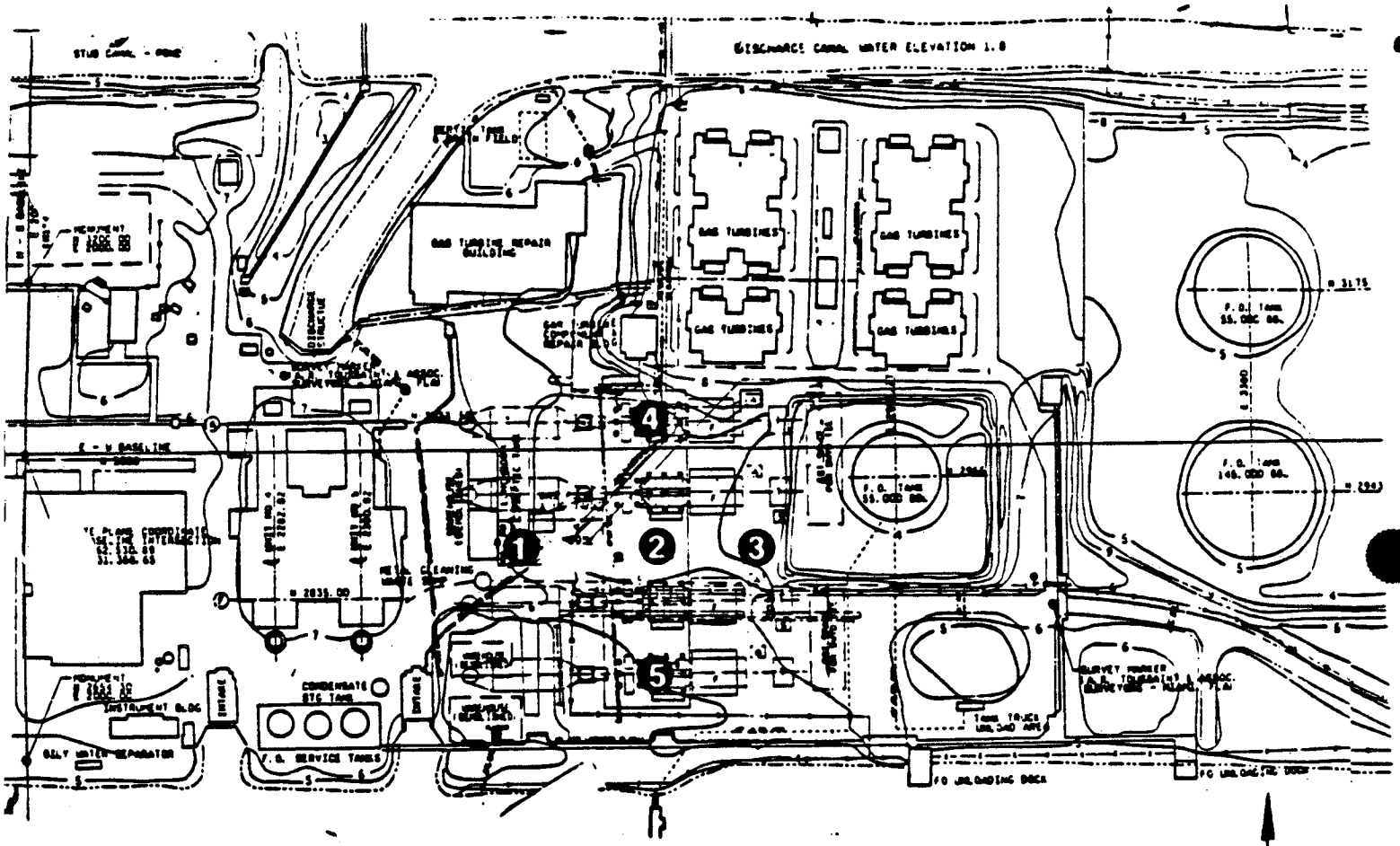
The original of this report was signed and sealed by the above registered engineer in accordance with Rule 21H-18.11, Chapter 471, Florida Statute. 10.5.3-17

WINGERTER LABORATORIES, INC.
Engineering Testing & Inspection Service
1820 N.E. 144 St., No. Miami, FL 33181
Miami (305) 944-3401 FT Myers (813) 334-4230

ORDER NO. 19184.1(1002)

CLIENT: EBASCO SERVICES, INC.
PROJECT: FPL CO., LAUDERDALE RE-POWERING PROJ. GEOTECHNICAL EXPLORATION CONTR. #AE-88031
LOCATION: SW 42nd Avenue, Ft. Lauderdale, Florida

TEST BORING LOCATION SKETCH



N

NO SCALE

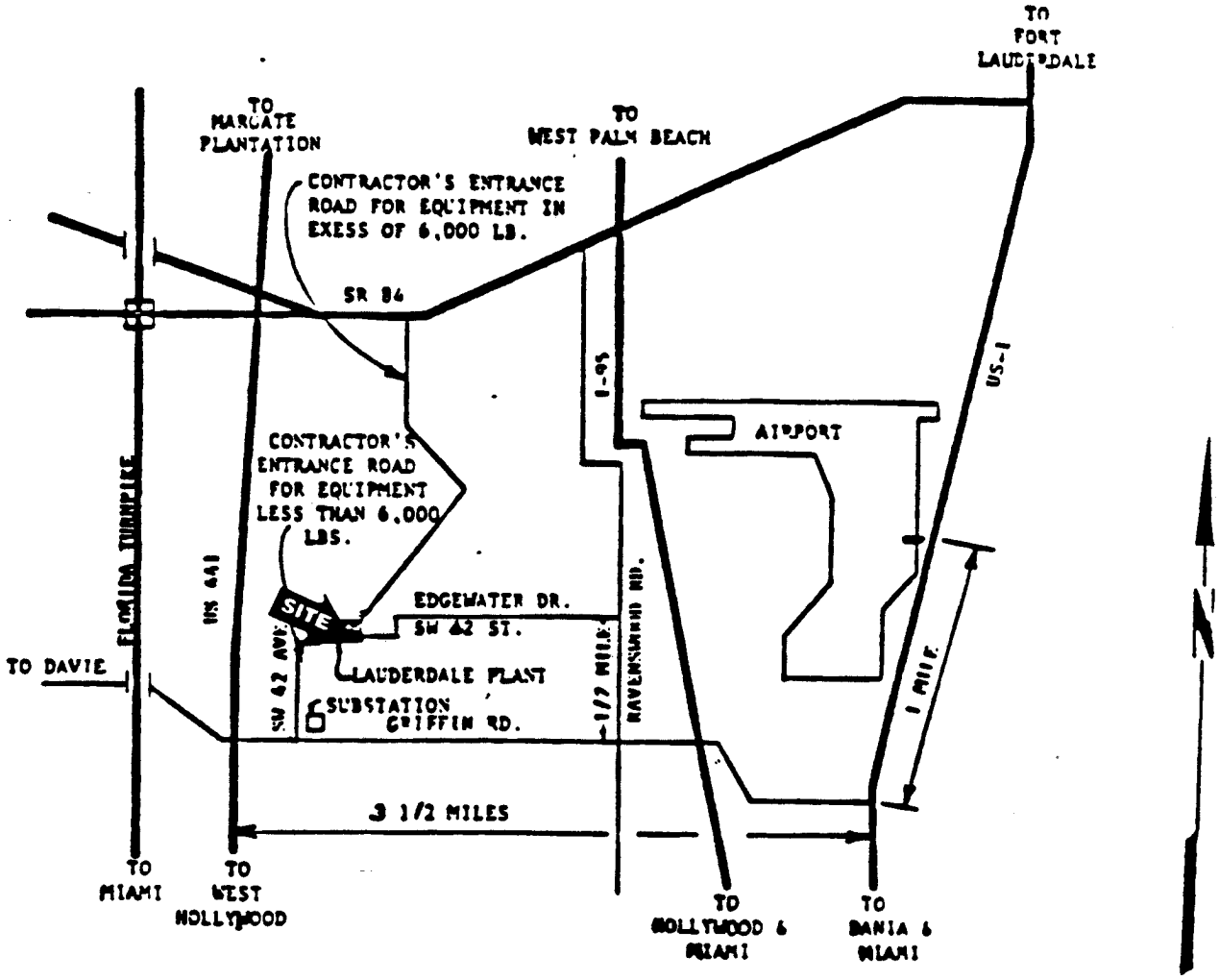
● TEST BORING LOCATION

DRAWN BY: CMA
DATE: 9/15/88

WINGERTER LABORATORIES, INC.
Engineering Testing & Inspection Service
1820 N.E. 144 St., No. Miami, FL 33181
Miami (305) 944-3401 FT Myers (813) 334-4230

CLIENT: EBASCO SERVICES, INC.
PROJECT: FPL, LAUDERDALE REPOWERING PROJ. GEOTECHNICAL EXPLORATION SERV. CONTR. #AE-880
LOCATION: SW 42nd AVENUE, FT. LAUDERDALE, FLORIDA

TEST BORING LOCATION MAP



NO SCALE

DRAWN BY: CMA
DATE: 9/15/88

APPENDIX B -- SOIL TEST RESULTS

WINGERTER LABORATORIES, INC.

Engineering Testing & Inspection Service
1820 N.E. 144 St., No. Miami, FL 33181
Miami (305) 944-3401 Ft. Myers (813) 334-4230

9-20-88 hr

No. 1 (Page 1 of 7)

Order No. 19184.1(1002)

SOILS LABORATORY TEST REPORT

REPORT OF: **WASHED SIEVE ANALYSIS OF SOIL**

CLIENT: Ebasco Services, Inc.
PROJECT: FP & L Co., Lauderdale Re-powering Project Geotechnical Exploration Services Contract #AE-88031
LOCATION: S.W. 42 Avenue, Ft. Lauderdale, FL
DATE TESTED: 9-19-88
REPORTED TO: Ebasco Services, Inc.
145 Technology Park/Atlanta
Norcross, Georgia 30092 Attn: Moin Durrani

RESULTS OF TESTS:

Laboratory No.	5555	5556	5557
Sample No.:	1	2	3
Sample Source:	Boring No. B-1, Sample No. 2, Depth 2'-4'	Boring No. B-1 Sample No. 6, Depth 10'-12'	Boring No. B-1 Sample No. 7, Depth 15'-17'
Description:	Tan to gray calcareous sand and fragmented limestone with a trace of asphalt.	Tan to gray quartz sand with some fragmented limestone.	Tan to gray calcareous sand with some fragmented limestone.

WASHED SIEVE SIZE	PERCENT PASSING		
1½"		100.0	
1"	100.0	90.2	
3/4"	92.8	84.5	100.0
1/2"	79.3	82.5	94.2
3/8"	74.5	81.4	92.2
No. 4	65.4	76.3	83.0
No. 10	62.0	68.0	76.2
No. 20	60.1	67.0	71.8
No. 40	48.6	58.2	60.2
No. 60	30.8	40.7	42.2
No. 80	14.4	19.1	24.8
No. 140	7.7	1.5	12.1
No. 200	3.8	1.0	9.7

- continued -

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WINGERTER LABORATORIES, INC.

Engineering Testing & Inspection Service
1820 N.E. 144 St., No. Miami, FL 33181
Miami (305) 944-3401 Ft. Myers (813) 334-4230

9-20-88 hr

Order No. 19184.1(1002)

SOILS LABORATORY TEST REPORT

REPORT OF: **WASHED SIEVE ANALYSIS OF SOIL**

CLIENT: Ebasco Services, Inc.
PROJECT: FP & L Co., Lauderdale Re-powering Project Geotechnical Exploration Services Contract #AE-88031
LOCATION: S.W. 42 Avenue, Ft. Lauderdale, FL

RESULTS OF TESTS:

Laboratory No.	5558	5559	5560
Sample No.:	4	5	6
Sample Source:	Boring No. B-1, Sample No. 9, Depth 25'-27'	Boring No. B-2 Sample No. 3, Depth 3'-4'	Boring No. B-2 Sample No. 5, Depth 6'-7'
Description:	Tan to gray fragmented limestone with some calcareous sand.	Gray to black organic stained quartz sand.	Black organic stained semi-plastic quartz sand with trace roots.

WASHED SIEVE SIZE	PERCENT PASSING		
1½"	100.0		
1"	71.6		100.0
3/4"	58.1		71.4
1/2"	52.3		71.4
3/8"	45.5	100.0	71.4
No. 4	31.1	97.8	70.0
No. 10	23.0	92.2	60.0
No. 20	20.3	87.8	52.9
No. 40	18.5	74.4	41.4
No. 60	14.9	42.2	28.6
No. 80	8.6	17.8	14.3
No. 140	3.6	3.3	2.9
No. 200	2.3	2.2	1.4

- continued -

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WINGERTER LABORATORIES, INC.

Engineering Testing & Inspection Service
1820 N.E. 144 St., No. Miami, FL 33181
Miami (305) 944-3401 Ft. Myers (813) 334-4230

9-20-88 hr

Order No. 19184.1(1002)

SOILS LABORATORY TEST REPORT

REPORT OF: **WASHED SIEVE ANALYSIS OF SOIL**

CLIENT: Ebasco Services, Inc.
PROJECT: FP & L Co., Lauderdale Re-powering Project Geotechnical Exploration Services Contract #AE-88031
LOCATION: S.W. 42 Avenue, Ft. Lauderdale, FL

RESULTS OF TESTS:

Laboratory No.	5561	5562	5563
Sample No.:	7	8	9
Sample Source:	Boring No. B-2, Sample No. 7, Depth 8'-10'	Boring No. B-2 Sample No. 10, Depth 15'-17'	Boring No. B-3 Sample No. 2, Depth 1'-2'
Description:	Tan to gray quartz sand.	Tan to gray fragmented lime-stone with some quartz sand.	Gray to black organic stained semi-plastic quartz sand with some organics and trace roots.

WASHED SIEVE SIZE	PERCENT PASSING		
1½"		100.0	
1"		65.9	
3/4"		65.9	
1/2"		58.9	
3/8"	100.0	48.9	100.0
No. 4	98.8	39.2	96.1
No. 10	97.9	33.0	86.8
No. 20	95.2	29.7	77.6
No. 40	83.7	16.5	60.5
No. 60	74.0	3.8	36.8
No. 80	26.0	1.4	17.1
No. 140	1.2	0.5	2.6
No. 200	0.3	0.3	1.3

- continued -

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WINGERTER LABORATORIES, INC.

Engineering Testing & Inspection Service
1820 N.E. 144 St., No. Miami, FL 33181
Miami (305) 944-3401 Ft. Myers (813) 334-4230

9-20-88 hr

Order No. 19184.1(1002)

SOILS LABORATORY TEST REPORT

REPORT OF: **WASHED SIEVE ANALYSIS OF SOIL**

CLIENT: Ebasco Services, Inc.
PROJECT: FP & L Co., Lauderdale Re-powering Project Geotechnical Exploration Services Contract #AE-88031
LOCATION: S.W. 42 Avenue, Ft. Lauderdale, FL

RESULTS OF TESTS:

Laboratory No.	5564	5565	5566
Sample No.:	10	11	12
Sample Source:	Boring No. B-3, Sample No. 4, Depth 4'-6'	Boring No. B-3 Sample No. 7, Depth 8'-10'	Boring No. B-3 Sample No. 11, Depth 25'-27'
Description:	Brown quartz sand with some fragmented limestone.	Brown quartz sand with trace fragmented limestone.	Tan to gray fragmented limestone with some quartz sand.

WASHED SIEVE SIZE	PERCENT PASSING		
1½"		100.0	100.0
1"		93.4	71.7
3/4"		93.4	65.2
1/2"	100.0	92.4	51.8
3/8"	97.3	92.4	49.0
No. 4	94.6	91.8	37.7
No. 10	92.0	90.9	31.2
No. 20	88.4	89.7	30.0
No. 40	61.6	71.0	24.3
No. 60	33.0	43.8	18.2
No. 80	13.4	18.4	10.5
No. 140	4.5	1.8	4.9
No. 200	2.7	0.9	3.6

- continued -

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WINGERTER LABORATORIES, INC.

Engineering Testing & Inspection Service
1820 N.E. 144 St., No. Miami, FL 33181
Miami (305) 944-3401 Ft. Myers (813) 334-4230

9-20-88 hr

Order No. 19184.1(1002)

SOILS LABORATORY TEST REPORT

REPORT OF: **WASHED SIEVE ANALYSIS OF SOIL**

CLIENT: Ebasco Services, Inc.

PROJECT: FP & L Co., Lauderdale Re-powering Project Geotechnical Exploration Services Contract #AE-88031

LOCATION: S.W. 42 Avenue, Ft. Lauderdale, FL

RESULTS OF TESTS:

Laboratory No.	5567	5568	5569
Sample No.:	13	14	15
Sample Source:	Boring No. B-4, Sample No. 2, Depth 0.5'-2'	Boring No. B-4 Sample No. 8, Depth 10'-12'	Boring No. B-4 Sample No. 10, Depth 15'-17'
Description:	Tan to gray quartz sand with some fragmented limestone.	Tan to gray quartz sand.	Brown quartz sand with a trace of fragmented lime-stone.

WASHED SIEVE SIZE	PERCENT PASSING		
1½"	100.0		
1"	95.2		100.0
3/4"	84.4	100.0	92.1
1/2"	70.3	98.2	85.1
3/8"	69.2	97.2	83.2
No. 4	57.3	96.8	79.2
No. 10	49.7	96.5	76.2
No. 20	46.4	95.8	74.3
No. 40	32.6	83.1	61.4
No. 60	15.1	56.0	39.6
No. 80	5.6	26.4	16.8
No. 140	2.1	2.1	4.0
No. 200	1.6	0.7	2.0

- continued -

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9-20-88 hr

Order No. 19184.1(1002)

SOILS LABORATORY TEST REPORT

REPORT OF: **WASHED SIEVE ANALYSIS OF SOIL**

CLIENT: Ebasco Services, Inc.

PROJECT: FP & L Co., Lauderdale Re-powering Project Geotechnical Exploration Services Contract #AE-88031

LOCATION: S.W. 42 Avenue, Ft. Lauderdale, FL

RESULTS OF TESTS:

Laboratory No.	5570	5571	5572
Sample No.:	16	17	18
Sample Source:	Boring No. B-4, Sample No. 11, Depth 20'-22'	Boring No. B-5 Sample No. 2, Depth 0.5'-2'	Boring No. B-5 Sample No. 8, Depth 10'-12'
Description:	Tan to gray fragmented lime-stone with some calcareous sand.	Tan to gray quartz sand with some fragmented lime-stone.	Tan to gray quartz sand.

WASHED SIEVE SIZE	PERCENT PASSING		
1½"	100.0		
1"	86.8	100.0	
3/4"	65.4	99.6	
1/2"	55.9	88.4	
3/8"	45.7	84.7	
No. 4	32.5	75.3	
No. 10	24.4	70.2	100.0
No. 20	20.0	66.9	99.4
No. 40	15.3	51.9	84.9
No. 60	10.4	28.2	54.0
No. 80	5.8	12.1	24.0
No. 140	2.3	5.1	3.7
No. 200	1.6	3.5	2.3

- continued -

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WINGERTER LABORATORIES, INC.

Engineering Testing & Inspection Service
1820 N.E. 144 St., No. Miami, FL 33181
Miami (305) 944-3401 Ft. Myers (813) 334-4230

9-20-88 hr

No. 1 (Page 7 of 7)

Order No. 19184.1(1002)

SOILS LABORATORY TEST REPORT
WASHED SIEVE ANALYSIS OF SOIL

REPORT OF:

CLIENT: Ebasco Services, Inc.

PROJECT: FP & L Co., Lauderdale Re-powering Project Geotechnical Exploration Services Contract #AE-88031

LOCATION: S.W. 42 Avenue, Ft. Lauderdale, FL

RESULTS OF TESTS:

Laboratory No.	5573	5574
Sample No.:	19	20
Sample Source:	Boring No. B-5, Sample No. 9, Depth 15'-17'	Boring No. B-5 Sample No. 11, Depth 25'-27'
Description:	Tan to gray quartz sand.	Tan to gray quartz sand.
WASHED SIEVE SIZE	PERCENT PASSING	
1½"		
1"		
3/4"		
1/2"		
3/8"		
No. 4		
No. 10	100.0	100.0
No. 20	99.1	99.5
No. 40	83.3	85.7
No. 60	51.3	51.4
No. 80	20.8	19.6
No. 140	1.2	1.2
No. 200	0.6	0.5

Tested by: ND

No. of Tests: 20

Reported by:

Bruce Kosrozadeh, E.I.

Respectfully submitted,
WINGERTER LABORATORIES, INC.

9/20/88

Felix A. Peguero-Guerrero, P. E.
Florida Registration No. 34473

The original of this report was signed and sealed by the above registered engineer in accordance with Rule 21H-18.11, Chapter 471, Florida Statute.

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APPENDIX 10.5.4

AQUATIC ECOLOGY

Table 10.5.4-1. Fish and Epibenthic Fauna Collected or Observed at Stations in the Vicinity of FPL's Lauderdale Plant, August 23 through 25, 1988

Scientific Name	Common Name	Station 1	2	3	4	5	6	7
FISH								
Carangidae sp.	Jack						O	
Cicehlidae spp.	Cichlids	X		O		X		
Diapterus rhombeus	Caitipa mojarra						X	
Eucinostomus argenteus	Spotfin mojarra						X	
Eucinostomus gula	Silver jenny		X					
Eugerres plumeri	Striped mojarra		X					
Etheostoma sp.	Darter		X					
Gambusia affinis	Mosquitofish		X					
Lophogobius cyprinoides	Crested goby						X	
Mugil cephalus	Striped mullet			X	X	X	X	
Strongylura marina	Atlantic needlefish			X	O	O	X	O
Tilapia sp.	Tilapia	X		O		X		
Trinectes maculatus	Hogchoker	X						
INVERTEBRATES								
Callinectes sapidus	Blue crab	X						
Macrobrachium carcinus	River shrimp	X		O		X		
Neritina reclivata	Neritina		X					
Palaemonetes pugio	Grass shrimp		X					
Rhithropanopeus harrisii	Mud crab	X						
REPTILES								
Pseudemys floridana peninsularis	Peninsular cooter	X						
Trionyx ferox	Florida softshell turtle	X						

Note: X = collected.
O = observed.

Table 10.5.4-2. Fish and Epibenthic Fauna Collected or Observed at Stations in the Vicinity of FPL's Lauderdale Plant, November 28 through December 1, 1988

Scientific Name	Common Name	Station 1	2	3	4	5	6	7
FISH								
Arius felis	Sea catfish	O		O				
Centropomus undecimilis	Snook			O				
Cichlidae sp.	Cichlids	X		X				
Eugerres plumeri	Striped mojarra	X	X	O				
Gerres cinereus	Yellowfin mojarra		X					
Lophogobius cyprinoides	Crested goby		X	X	X	X	X	
Mugil cephalus	Mullet	O		O	O	O	O	
INVERTEBRATES								
Callinectes sapidus	Blue Crab	X	X				X	
Macrobrachium carcinus	River shrimp					X		
Penaeus duorarum	Pink shrimp	X				X		
Rhithropanopeus harrisii	Mud crab	X						
Sesarma cinereium	Wharf crab		X	O				
REPTILES								
Alligator mississippiensis	Alligator		O					

Note: X = collected.
O = observed.

Table 10.5.4-3. Fish and Epibenthic Fauna Collected or Observed at Stations in the Vicinity of FPL's Lauderdale Plant, February 27 through March 2, 1989

Scientific Name	Common Name	Station 1	2	3	4	5	6	7
FISH								
Anchoa hepsetus	Striped anchovy	X						
Archosargus probatocephalus	Sheepshead			O				
Arius felis	Sea catfish				X		X	
Bairdiella chrysura	Silver perch	X						
Centropomus undecimalis	Snook			O	X		X	
Cichlidae spp.	Cichlids	X		O				
Cyprinodontidae sp.	Killifish	X						
Eucinostomus argenteus	Spotfin mojarra				X		X	
Eugerres plumieri	Striped mojarra	X	X					
Gerres cinereus	Yellowfin mojarra		X			X	X	
Gerridae spp.	Mojarras			O				
Lophogobius cyprinoides	Crested goby		X	O	X		X	
Monacanthidae sp.	Filefish	X						
Mugil curema	White mullet						X	
Strongylura marina	Atlantic needlefish				O			
Trinectes maculatus	Hogchoker	X						
Unidentified spp.		X						
INVERTEBRATES								
Callinectes sapidus	Blue crab						X	
Penaeus duorarum	Pink shrimp	X	X					
Rhithropanopeus harrisi	Mud crab	X						

Note: X = collected.
O = observed.

Table 10.5.4-4. Fish and Epibenthic Fauna Collected or Observed at Stations in the Vicinity of FPL's Lauderdale Plant, May 30 through June 1, 1989

Scientific Name	Common Name	Station 1	2	3	4	5	6	7
FISH								
Anchoa spp.	Anchovies	X						
Arius felis	Sea catfish				X		X	
Caranx hippos	Crevalle jack						X	
Centropomus undecimalis	Snook				X		X	
Cichlidae spp.	Cichlids			X				
Clupeidae sp.	Clupeids	X						
Elops saurus	Ladyfish				X			
Eucinostomus argenteus	Spotfin mojarra		X		X		X	
Gerres cinereus	Yellowfin mojarra				X		X	
Gerridae spp.	Mojarras	O					O	
Gobiidae spp.	Gobies						O	
Lagodon rhomboides	Pinfish		X	X				X
Leiostomus xanthurus	Spot				X			
Lophogobius cyprinoides	Crested goby	X	X	X		X		
Mugil cephalus	Striped mullet	X					X	
Sphyraena sp.	Barracuda						O	
Strongylura marina	Atlantic needlefish						O	
Syngnathus sp.	Pipefish	X						
Trinectes maculatus	Hogchoker	X						
INVERTEBRATES								
Callinectes sapidus	Blue crab	X	X		X		X	
Penaeus aztecus	Brown shrimp	X						X
Penaeus setiferus	White shrimp	X						
Rhithropanopeus harrisii	Mud crab	X						

Note: X = collected.
O = observed.

Table 10.5.4-5. Temperature, Conductivity/Salinity, pH, and Dissolved Oxygen Measurements Taken at Stations in the Vicinity of the FPL's Lauderdale Plant, August 24 and 25, 1988 (Page 1 of 4)

Station	Date	Time	Depth (m)	Temperature (°C)	Conductivity (µmho/cm)	Salinity (ppt)	pH	Dissolved Oxygen (ppm)	Percent Dissolved Oxygen Saturation
Dania Cut-Off Canal/Intake Vicinity									
1	8-24	1500	2.0	28.8	778	<1	6.4	4.9	62.8
	8-25	1300	S	30.0	740	<1	7.0	3.2	42.0
			1.0	29.8	708	<1	7.0	2.9	37.9
			2.0	29.7	708	<1	7.0	2.9	37.8
	8-25	1800	S	30.5	754	<1	7.1	3.6	47.6
			1.0	30.4	738	<1	7.0	3.2	42.2
Discharge Canal/Cooling Pond									
2	8-24	1015	S	31.6	894	<1	6.9	2.4	32.4
			1.0	31.5	893	<1	6.9	2.3	31.0
			2.0	31.7	891	<1	6.9	2.4	32.4
	8-24	1905	S	37.5	1,060	<1	7.1	4.6	69.6
			2.0	34.9	910	<1	7.0	3.5	50.2
			4.0	32.2	880	<1	7.0	2.3	31.4
	8-25	0750	S	30.0	1,380	<1	7.1	3.0	39.4
	8-25	1437	S	37.0	744	<1	7.0	3.3	49.4
			1.0	37.1	745	<1	7.0	3.1	46.5
			2.0	37.1	744	<1	7.0	3.1	46.5
	8-24	1112	S	33.0	985	<1	7.0	3.9	54.0
			0.5	31.6	1,182	<1	6.9	1.4	18.9
			1.0	30.1	1,316	<1	7.1	2.9	38.1
3	8-24	1735	S	32.6	1,183	<1	7.1	3.7	50.9
			2.0	32.6	1,181	<1	7.1	3.6	49.5
			4.0	32.6	1,182	<1	7.1	3.4	46.8

Table 10.5.4-5. Temperature, Conductivity/Salinity, pH, and Dissolved Oxygen Measurements Taken at Stations in the Vicinity of the FPL's Lauderdale Plant, August 24 and 25, 1988 (Page 2 of 4)

Station	Date	Time	Depth (m)	Temperature (°C)	Conductivity (µmho/cm)	Salinity (ppt)	pH	Dissolved Oxygen (ppm)	Percent Dissolved Oxygen Saturation
Discharge Canal/Cooling Pond, (cont.)									
3 (cont.)	8-24	1950	S	32.4	1,177	<1	7.2	4.0	54.8
			1.0	32.5	1,177	<1	7.2	3.6	49.4
			2.0	32.5	1,177	<1	7.2	3.1	42.6
			3.0	32.5	1,177	<1	7.1	3.3	45.3
	8-25	0715	S	30.7	1,028	<1	7.1	3.3	43.8
			1.0	30.9	1,029	<1	7.1	3.1	41.3
			2.0	30.9	1,029	<1	7.1	2.9	38.7
	8-25	0900	S	30.9	1,057	<1	7.2	3.0	40.0
			1.0	30.9	1,061	<1	7.2	2.9	38.7
			2.0	30.9	1,061	<1	7.2	2.8	37.3
			3.0	30.9	1,060	<1	7.1	2.8	37.3
	8-25	1415	S	33.3	1,031	<1	7.1	4.1	57.1
			1.0	33.3	1,036	<1	7.1	3.8	52.9
	8-25	1800	S	32.6	1,145	<1	7.3	4.2	57.8
			1.0	32.7	1,144	<1	7.2	4.0	55.1
			2.0	32.7	1,144	<1	7.2	3.8	52.4
South New River Canal									
4	8-24	1745	S	30.6	831	<1	7.1	3.5	46.4
			1.5	30.6	832	<1	7.2	3.2	42.4
			2.5	30.6	835	<1	7.2	3.2	42.4
	8-25	0820	S	30.1	866	<1	7.2	2.6	34.1
			1.0	30.2	869	<1	7.1	2.6	34.2
			2.0	30.2	872	<1	7.1	2.5	32.9
	8-25	1700	S	31.7	1,052	<1	7.2	4.4	59.5
			1.0	31.3	1,050	<1	7.2	3.9	52.4
			2.0	31.2	1,054	<1	7.2	3.8	50.9

Table 10.5.4-5. Temperature, Conductivity/Salinity, pH, and Dissolved Oxygen Measurements Taken at Stations in the Vicinity of the FPL's Lauderdale Plant, August 24 and 25, 1988 (Page 3 of 4)

Station	Date	Time	Depth (m)	Temperature (°C)	Conductivity (µmho/cm)	Salinity (ppt)	pH	Dissolved Oxygen (ppm)	Percent Dissolved Oxygen Saturation
North New River Canal									
5	8-24	1700	S	30.9	723	<1	7.1	3.5	46.6
			1.5	30.2	724	<1	7.1	2.5	32.9
			2.5	30.1	724	<1	7.1	2.3	30.2
	8-25	0845	S	30.1	848	<1	7.2	2.7	35.5
			1.0	29.9	827	<1	7.1	2.3	30.1
			2.0	29.7	773	<1	7.1	2.0	26.1
			3.0	29.7	766	<1	7.1	1.9	24.8
	8-25	1630	S	30.3	738	<1	7.2	2.4	31.6
			1.0	30.0	738	<1	7.1	2.2	28.8
			2.0	30.0	737	<1	7.1	2.0	26.2
South Fork New River									
6	8-24	1715	S	32.5	1,100	<1	7.1	4.1	56.3
			2.0	32.4	1,130	<1	7.1	4.0	54.8
			4.0	32.4	1,130	<1	7.1	3.9	53.4
	8-25	0830	S	30.8	1,062	<1	7.2	3.4	45.2
			1.0	30.8	1,076	<1	7.2	3.2	42.6
			2.0	30.8	1,069	<1	7.2	3.2	42.6
			3.0	30.9	1,084	<1	7.2	3.2	42.7
			4.0	30.8	1,086	<1	7.2	3.2	42.6
	8-25	1618	S	32.7	1,142	<1	7.2	4.0	55.1
			1.0	31.8	1,066	<1	7.2	3.8	51.5
			2.0	31.5	1,040	<1	7.2	3.6	48.5
			3.0	31.5	1,090	<1	7.1	2.9	39.1
			4.0	30.7	1,085	<1	7.2	2.8	37.2
7	8-24	1720	S	31.8	1,037	<1	7.2	4.7	63.7
			1.5	31.8	1,039	<1	7.2	4.7	63.7
			2.5	31.8	1,038	<1	7.2	4.4	59.6

Table 10.5.4-5. Temperature, Conductivity/Salinity, pH, and Dissolved Oxygen Measurements Taken at Stations in the Vicinity of the FPL's Lauderdale Plant, August 24 and 25, 1988 (Page 4 of 4)

Station	Date	Time	Depth (m)	Temperature (°C)	Conductivity (µmho/cm)	Salinity (ppt)	pH	Dissolved Oxygen (ppm)	Percent Dissolved Oxygen Saturation
South Fork New River (cont.)									
7 (cont.)	8-25	0840	S	30.9	1,156	<1	7.2	3.5	46.7
			1.0	30.9	1,162	<1	7.2	3.4	45.3
			2.0	30.9	1,161	<1	7.2	3.4	45.3
			3.0	30.9	1,161	<1	7.2	3.2	42.7
	8-25	1600	S	32.1	1,019	<1	7.2	4.0	54.5
			1.0	31.8	1,011	<1	7.1	3.7	50.1
			2.0	31.8	1,007	<1	7.2	3.6	48.8

Note: S = surface.

Table 10.5.4-6. Temperature, Conductivity/Salinity, pH, and Dissolved Oxygen Measurements Taken at Stations in the Vicinity of the FPL's Lauderdale Plant, November 29 through December 1, 1988 (Page 1 of 3)

Station	Date	Time	Depth (m)	Temperature (°C)	Conductivity (µmho/cm)	Salinity (ppt)	pH	Dissolved Oxygen (ppm)	Percent Dissolved Oxygen Saturation
Dania Cut-Off Canal/Intake Vicinity									
1	11-30	0740	S	25.5	17,600	10.4	7.4	ND	ND
			1.0	25.5	18,550	11.0	ND	ND	ND
	12-01	0830	S	26.0	17,970	10.6	6.7	4.5	58.1
			1.0	25.8	18,440	10.9	7.0	4.2	54.1
			3.0	25.8	18,690	11.1	7.1	3.9	50.3
	12-01	1035	S	26.0	18,230	10.8	ND	4.5	58.2
			1.0	25.8	18,370	10.9	ND	4.3	55.4
			2.0	25.7	19,500	11.6	ND	3.9	50.4
Discharge Canal/Cooling Pond									
2	11-30	0715	S	28.9	19,060	11.3	7.2	3.9	53.4
	12-01	0800	S	29.1	19,140	11.4	7.3	3.7	50.8
			1.0	29.4	19,120	11.4	7.8	3.8	52.5
			2.0	29.6	19,110	11.4	7.9	3.7	51.3
3	12-01	0930	S	26.8	18,260	10.8	7.0	4.4	57.7
			1.0	26.9	18,240	10.8	7.7	ND	ND
South New River Canal									
4	11-30	0855	S	25.8	17,500	10.3	8.2	4.7	60.4
			1.0	25.9	17,870	10.6	8.2	4.4	56.7
	12-01	0855	S	26.0	17,950	10.6	6.8	4.4	56.8
			1.0	26.0	17,960	10.6	6.9	4.3	55.5
			2.0	26.0	18,010	10.7	7.1	4.1	53.0

Table 10.5.4-6. Temperature, Conductivity/Salinity, pH, and Dissolved Oxygen Measurements Taken at Stations in the Vicinity of the FPL's Lauderdale Plant, November 29 through December 1, 1988 (Page 2 of 3)

Station	Date	Time	Depth (m)	Temperature (°C)	Conductivity (µmho/cm)	Salinity (ppt)	pH	Dissolved Oxygen (ppm)	Percent Dissolved Oxygen Saturation
North New River Canal									
5	11-29	1710	S	24.3	13,730	8.0	ND	ND	ND
	12-01	0945	S	25.3	11,790	6.8	7.2	5.4	67.4
			1.0	26.1	16,350	9.6	7.0	4.2	54.0
			2.0	26.3	17,260	10.2	7.2	4.1	53.1
			3.0	26.5	18,250	10.8	7.3	ND	ND
South Fork New River									
6	11-29	1650	S	26.0	17,860	10.6	ND	ND	ND
			1.0	25.9	17,940	10.6	ND	ND	ND
			2.0	25.4	18,640	11.1	ND	ND	ND
			3.0	25.2	19,290	11.5	ND	ND	ND
			4.0	25.2	19,330	11.5	ND	ND	ND
	12-01	0920	S	26.1	17,990	10.6	6.5	4.4	56.9
			1.0	26.5	18,050	10.7	6.8	4.1	53.4
			2.0	26.6	18,140	10.7	7.0	3.8	49.6
			3.0	26.7	18,180	10.8	7.3	3.9	51.1
			4.0	26.7	18,240	10.8	7.5	3.7	48.4
			5.0	26.5	18,550	11.0	7.7	3.8	49.6
7	11-29	1630	S	25.5	18,680	11.1	7.1	ND	ND
			1.0	25.4	19,040	11.3	7.6	ND	ND
			2.0	25.4	19,450	11.6	7.6	ND	ND
			3.0	25.2	19,410	11.6	7.6	ND	ND
	11-30	1320	S	26.1	19,300	11.5	8.0	4.4	57.2
			1.0	26.1	19,390	11.5	ND	ND	ND

Table 10.5.4-6. Temperature, Conductivity/Salinity, pH, and Dissolved Oxygen Measurements Taken at Stations in the Vicinity of the FPL's Lauderdale Plant, November 29 through December 1, 1988 (Continued, Page 3 of 3)

Station	Date	Time	(Depth) (m)	Temperature (°C)	Conductivity (μmho/cm)	Salinity (ppt)	pH	Dissolved Oxygen (ppm)	Percent Dissolved Oxygen Saturation
South Fork New River (cont.)									
7 (cont.)	12-01	1000	S	26.6	18,160	10.8	6.5	4.4	57.5
			1.0	26.6	18,230	10.8	6.7	4.2	54.9
			2.0	26.6	18,280	10.8	6.8	4.0	52.3
			3.0	26.6	18,290	10.8	7.0	3.9	51.0

Note: ND = no data.
S = surface.

Table 10.5.4-7. Temperature, Conductivity/Salinity, pH, and Dissolved Oxygen Measurements Taken at Stations in the Vicinity of FPL's Lauderdale Plant, March 1, 1989

Station	Date	Time	Depth (m)	Temperature (°C)	Conductivity (µmho/cm)	Salinity (ppt)	pH	Dissolved Oxygen (ppm)	Percent Dissolved Oxygen Saturation
Dania Cut-Off Canal/Intake Vicinity									
1	3-1	0725	S	20.0	2,500	1.3	7.3	5.3	58.2
			1.0	20.2	7,020	3.9	7.3	5.3	59.2
			2.0	21.0	16,500	9.7	7.3	5.2	60.9
	3-1	0945	S	20.2	1,560	<1	7.3	5.2	57.1
			1.0	20.5	7,250	4.0	7.2	4.9	55.1
			2.0	20.8	11,200	6.4	7.2	4.7	53.9
	3-1	1705	S	21.7	4,200	4.4	7.3	5.1	58.8
			1.0	21.7	8,800	5.3	7.3	5.0	57.9
			2.0	21.7	15,500	9.8	7.2	4.5	53.4
Discharge Canal/Cooling Pond									
2	3-1	1000	S	25.4	5,710	3.1	7.3	4.8	58.8
			1.0	25.5	5,760	3.2	7.3	4.4	54.0
			2.0	25.6	5,760	3.2	7.2	4.3	52.9
	3-1	1430	S	24.7	5,700	3.1	7.5	5.0	60.5
			1.0	24.6	6,000	3.3	7.3	4.5	54.4
			2.0	24.0	8,300	4.6	7.3	4.8	57.8
			3.0	26.2	27,400	16.8	7.3	4.9	65.8
			4.0	25.0	29,200	18.1	7.3	4.1	54.2
			5.0	23.8	29,600	18.3	7.2	3.1	40.2
	3-1	1730	S	27.9	7,500	4.2	7.4	4.7	60.6
			1.0	27.9	7,600	4.2	7.3	4.6	59.3
			2.0	27.9	7,600	4.2	7.2	4.5	58.0
3	3-1	0820	S	20.8	9,000	5.1	7.6	6.2	70.5
			1.0	22.5	21,300	12.8	7.5	6.0	73.5
			2.0	22.9	26,500	16.2	7.5	5.8	73.0
			3.0	22.9	26,700	16.4	7.5	5.8	73.1
			4.0	22.9	27,300	16.8	7.4	5.3	66.9

Table 10.5.4-7. Temperature, Conductivity/Salinity, pH, and Dissolved Oxygen Measurements Taken at Stations in the Vicinity of FPL's Lauderdale Plant, March 1, 1989 (Continued, Page 2 of 3)

Station	Date	Time	Depth (m)	Temperature (°C)	Conductivity (µmho/cm)	Salinity (ppt)	pH	Dissolved Oxygen (ppm)	Percent Dissolved Oxygen Saturation
Discharge Canal/Cooling Pond (cont.)									
3 (cont.)	3-1	1300	S	24.3	25,700	15.7	7.6	6.7	86.3
			1.0	24.2	25,700	15.7	7.5	6.5	83.6
	3-1	1635	S	24.0	25,200	15.4	7.5	7.4	94.6
			1.0	24.1	25,700	15.7	7.5	7.0	89.8
			2.0	24.1	25,800	15.8	7.5	6.7	86.0
South New River Canal									
4	3-1	0740	S	20.1	11,620	6.6	7.4	6.3	71.3
			1.0	21.1	16,520	9.7	7.4	6.0	70.4
			2.0	22.3	25,800	15.8	7.4	5.6	69.6
	3-1	1230	S	21.6	10,400	5.9	7.5	5.8	67.3
			1.0	21.1	14,500	8.4	7.5	5.5	64.1
			2.0	22.3	25,700	15.7	7.3	4.5	55.9
	3-1	1655	S	21.8	12,600	7.3	7.4	6.7	78.6
			1.0	21.8	15,200	8.9	7.5	6.2	73.4
			2.0	22.6	25,200	15.4	7.3	4.7	58.6
North New River Canal									
5	3-1	0850	S	20.1	3,560	1.9	7.8	6.6	72.8
			1.0	20.1	4,800	2.6	7.6	6.1	67.6
			2.0	21.7	23,500	14.2	7.3	5.0	60.9
			3.0	22.3	27,500	16.9	7.3	4.3	53.8
	3-1	1210	S	20.6	3,010	1.6	7.6	6.6	73.4
			1.0	20.6	7,900	4.4	7.4	5.5	62.1
			2.0	22.5	23,300	14.1	7.3	5.5	67.9
	3-1	1645	S	20.9	3,700	2.0	7.6	6.6	74.0
			1.0	20.8	7,300	4.1	7.5	5.7	64.5
			2.0	22.8	25,000	15.2	7.3	5.2	65.0
			3.0	23.2	25,800	15.8	7.4	5.2	65.7

Table 10.5.4-7. Temperature, Conductivity/Salinity, pH, and Dissolved Oxygen Measurements Taken at Stations in the Vicinity of FPL's Lauderdale Plant, March 1, 1989 (Continued, Page 3 of 3)

Station	Date	Time	Depth (m)	Temperature (°C)	Conductivity (µmho/cm)	Salinity (ppt)	pH	Dissolved Oxygen (ppm)	Percent Dissolved Oxygen Saturation
South Fork New River									
6	3-1	1140	S	20.8	8,000	4.5	7.5	6.4	72.6
			1.0	22.8	22,500	13.6	7.4	6.1	75.5
			2.0	23.2	24,700	15.0	7.5	6.1	76.7
	3-1	1625	S	21.8	9,900	5.6	7.5	7.0	81.4
			1.0	22.9	19,000	11.3	7.5	6.2	75.9
			2.0	23.5	24,700	15.0	7.4	5.9	74.6
			3.0	23.4	25,800	15.8	7.4	5.7	72.2
			4.0	23.5	26,500	16.2	7.4	5.7	72.6
			5.0	23.1	26,800	16.4	7.4	5.2	65.8
7	3-1	0825	S	20.7	11,100	6.3	7.5	6.2	70.9
			1.0	22.3	21,200	12.7	7.5	6.1	74.5
			2.0	22.7	25,200	15.4	7.5	5.6	69.9
	3-1	1130	S	21.4	11,600	6.6	7.5	6.4	74.3
			1.0	22.5	20,400	12.2	7.4	6.2	75.7
			2.0	23.2	24,200	14.7	7.5	6.0	75.3
	3-1	1610	S	23.0	13,600	ND	7.6	7.0	ND
			1.0	22.4	18,400	ND	7.5	5.9	ND
			2.0	22.5	23,100	ND	7.4	5.4	ND

Note: ND = no data.
S = surface.

Table 10.5.4-8. Temperature, Conductivity/Salinity, pH, and Dissolved Oxygen Measurements Taken at Stations in the Vicinity of FPL's Lauderdale Plant, June 1, 1989

Station	Date	Time	Depth (m)	Temperature (°C)	Conductivity (µmho/cm)	Salinity (ppt)	pH	Dissolved Oxygen (ppm)	Percent Dissolved Oxygen Saturation
Dania Cut-Off Canal/Intake Vicinity									
1	6-1	0645	S	28.8	10,850	6.2	7.5	3.2	42.4
			1.0	30.1	15,600	9.1	7.5	3.7	51.1
			2.0	30.5	24,500	14.9	7.3	2.0	28.8
	6-1	1325	S	30.8	8,620	4.8	7.9	4.9	66.9
			1.0	30.6	12,880	7.4	7.7	3.4	46.9
			2.0	30.6	13,510	7.8	7.7	2.9	40.1
	6-1	1853	S	31.4	12,170	7.0	8.0	6.1	85.3
			1.0	31.5	14,480	8.4	7.9	5.6	79.1
			2.0	31.6	19,850	11.8	7.8	6.5	94.0
Discharge Canal/Cooling Pond									
2	6-1	0615	S	28.9	13,930	8.1	7.0	2.3	30.9
			1.0	29.7	15,010	8.8	7.1	2.8	38.3
			2.0	29.9	15,330	9.0	7.2	2.3	31.6
	6-1	1300	S	36.6	12,110	6.9	7.7	3.5	54.4
			1.0	36.6	12,090	6.9	7.6	3.4	52.8
			2.0	36.6	12,140	7.0	7.5	3.1	48.2
	6-1	1930	S	37.6	16,400	9.6	8.0	6.5	105.5
			1.0	37.8	16,400	9.6	7.9	6.2	101.1
			2.0	37.8	16,550	9.7	7.8	6.0	97.9
3	6-1	0712	S	29.9	15,640	9.1	7.8	4.6	63.3
			1.0	30.1	15,720	9.2	7.8	4.2	58.0
			2.0	30.1	15,740	9.2	7.8	4.3	59.4
			3.0	30.1	15,740	9.2	7.8	4.3	59.4

Table 10.5.4-8. Temperature, Conductivity/Salinity, pH, and Dissolved Oxygen Measurements Taken at Stations in the Vicinity of FPL's Lauderdale Plant, June 1, 1989 (Continued, Page 2 of 4)

Station	Date	Time	Depth (m)	Temperature (°C)	Conductivity (µmho/cm)	Salinity (ppt)	pH	Dissolved Oxygen (ppm)	Percent Dissolved Oxygen Saturation
Discharge Canal/Cooling Pond (cont.)									
3 (cont.)	6-1	1130	S	30.8	14,830	8.6	8.1	4.9	68.4
			1.0	30.8	14,840	8.6	8.0	4.8	67.0
			2.0	30.8	14,860	8.7	7.9	4.5	62.8
	6-1	1455	S	31.3	14,730	8.6	8.0	5.9	83.1
			1.0	31.2	14,720	8.6	8.0	5.7	80.1
			2.0	31.2	14,730	8.6	8.0	5.7	80.1
	6-1	1823	S	31.4	14,770	8.6	8.0	5.6	79.0
			1.0	31.4	14,770	8.6	8.0	5.0	70.6
			2.0	31.4	14,770	8.6	8.0	5.4	76.2
			3.0	31.4	14,760	8.6	8.0	5.2	73.4
			4.0	31.4	14,760	8.6	8.0	5.0	70.6
South New River Canal									
4	6-1	0655	S	29.5	14,190	8.2	7.7	4.1	55.7
			1.0	29.6	14,450	8.4	7.7	3.7	50.4
			2.0	29.7	14,530	8.5	7.7	3.7	50.5
	6-1	1350	S	32.2	13,840	8.0	7.9	6.6	94.3
			1.0	30.9	14,120	8.2	7.9	5.5	76.7
			2.0	30.7	15,040	8.8	7.9	4.0	55.8
	6-1	1840	S	31.0	13,680	7.9	8.0	5.9	82.3
			1.0	31.0	13,700	7.9	8.0	5.7	79.5
			2.0	31.0	13,680	7.9	8.0	5.7	79.5
			3.0	31.0	13,710	7.9	8.0	5.2	72.5

Table 10.5.4-8. Temperature, Conductivity/Salinity, pH, and Dissolved Oxygen Measurements Taken at Stations in the Vicinity of FPL's Lauderdale Plant, June 1, 1989 (Continued, Page 3 of 4)

Station	Date	Time	Depth (m)	Temperature (°C)	Conductivity (µmho/cm)	Salinity (ppt)	pH	Dissolved Oxygen (ppm)	Percent Dissolved Oxygen Saturation
North New River Canal									
5	6-1	0725	S	30.0	13,640	7.9	7.9	4.7	64.3
			1.0	30.1	14,040	8.1	7.8	4.4	60.4
			2.0	30.3	14,740	8.6	7.8	4.3	59.4
			3.0	30.3	14,940	8.7	7.8	4.3	59.5
	6-1	1425	S	30.9	9,700	5.5	7.9	5.2	71.4
			1.0	30.6	10,570	6.0	7.8	4.5	61.6
			2.0	30.6	11,770	6.7	7.8	4.5	61.9
			3.0	30.6	12,400	7.1	7.8	4.3	59.3
	6-1	1750	S	31.4	13,400	7.7	8.0	6.1	85.7
			1.0	31.3	13,940	8.1	8.0	5.5	77.2
			2.0	31.3	14,080	8.2	8.0	5.4	75.9
			3.0	31.3	14,160	8.2	8.0	5.2	73.1
South Fork New River									
6	6-1	0705	S	30.0	15,870	9.3	7.8	4.6	63.5
			1.0	30.1	15,930	9.3	7.8	4.4	60.9
			2.0	30.1	16,150	9.5	7.8	4.3	59.5
			3.0	30.1	16,340	9.6	7.8	4.3	59.6
			4.0	30.1	16,350	9.6	7.8	4.2	58.2
	6-1	1445	S	31.0	13,600	7.9	7.9	5.6	78.1
			1.0	31.0	14,060	8.2	7.9	5.4	75.4
			2.0	30.9	14,410	8.4	7.9	4.5	62.8
			3.0	31.0	14,410	8.4	7.9	4.5	62.9
			4.0	30.8	14,490	8.4	7.9	4.3	59.9
			5.0	30.7	14,530	8.5	7.9	4.1	57.1
	6-1	1810	S	31.3	15,100	8.8	8.0	6.3	88.9
			1.0	31.3	15,120	8.8	8.0	6.1	86.1
			2.0	31.3	15,340	9.0	8.0	6.1	86.1
			3.0	31.3	15,300	8.9	8.0	6.2	87.5
			4.0	31.2	15,580	9.1	8.0	6.1	86.0
			5.0	31.2	15,580	9.1	8.0	6.1	86.0

Table 10.5.4-8. Temperature, Conductivity/Salinity, pH, and Dissolved Oxygen Measurements Taken at Stations in the Vicinity of FPL's Lauderdale Plant, June 1, 1989 (Continued, Page 4 of 4)

Station	Date	Time	Depth (m)	Temperature (°C)	Conductivity (µmho/cm)	Salinity (ppt)	pH	Dissolved Oxygen (ppm)	Percent Dissolved Oxygen Saturation
South Fork New River (cont.)									
7	6-1	0740	S	30.0	16,570	9.7	7.9	4.7	65.0
			1.0	30.0	16,630	9.8	7.8	4.6	63.7
			2.0	30.1	16,550	9.7	7.8	4.5	62.4
	6-1	1525	S	31.3	14,340	8.3	8.0	5.7	80.2
			1.0	31.2	14,350	8.3	8.0	5.2	73.0
			2.0	31.2	14,360	8.3	8.0	5.6	78.6
	6-1	1803	S	31.1	15,980	9.4	8.0	6.5	91.6
			1.0	31.1	15,990	9.4	8.0	6.2	87.4
			2.0	31.1	15,990	9.4	8.0	6.1	86.0
			3.0	31.1	15,990	9.4	8.0	6.3	88.8

Note: S = surface.

Table 10.5.4-9. Benthic Macroinvertebrates Collected from Station 2, August 1988

Phylum Class Order	Genus species	Density (number/m^2)	Relative Abundance (percent)
Mollusca Pelecypoda	Mytilopsis leucophaeta	14	50
Arthropoda Insecta Chaoboridae	Chaoborus sp.	14	50
Total Abundance		29	
Number of Taxa	2		
Shannon-Weaver Diversity	1.0		

Table 10.5.4-10. Benthic Macroinvertebrates Collected from Station 3, August 1988

Phylum Class Order	Genus species	Density (number/m^2)	Relative Abundance (percent)
Porifera	Porifera spp.	14	
Annelida			
Polychaeta	Neanthes succinea	545	21
Oligochaeta	Limnodrilus hoffmeisteri	273	11
Mollusca			
Pelecypoda	Mytilopsis leucophaeta	775	30
Arthropoda			
Crustacea			
Cirripedia	Balanus amphitrite	445	17
Isopoda	Cirolana gracilis	14	1
Amphipoda	Melita nitida	57	2
Decapoda	Rhithropanopeus harrisii	474	18
Total Abundance		2,598	
Number of Taxa	8		
Shannon-Weaver Diversity	2.42		

Table 10.5.4-11. Benthic Macroinvertebrates Collected from Station 4, August 1988

Phylum Class Order	Genus species	Density (number/m^2)	Relative Abundance (percent)
Annelida			
Polychaeta	Boccardiella sp.	57	8
	Laeoneris culveri	158	23
	Nereidae spp.	14	2
Oligochaeta	Limnodrilus hoffmeisteri	301	44
Arthropoda			
Crustacea			
Decapoda	Rhithropanopeus harrisii	14	2
Insecta			
Chironomidae	Chironomidae spp.	29	4
	Polypedilum spp.	100	15
	Tanytarsis sp.	14	2
Total Abundance		689	
Number of Taxa	8		
Shannon-Weaver Diversity	2.25		

Table 10.5.4-12. Benthic Macroinvertebrates Collected from Station 5, August 1988

Phylum Class Order	Genus species	Density (number/m^2)	Relative Abundance (percent)
Annelida			
Oligochaeta	Limnodrilus hoffmeisteri	1,823	76
Mollusca			
Pelecypoda	Mytilopsis leucophaeta	72	3
Arthropoda			
Insecta			
Collembola	Collembola sp.	14	1
Chironomidae	Chironomidae sp. A	14	1
	Paratanytarsis sp.	14	1
	Polypedilum spp.	230	10
	Tanytarsis sp.	230	10
Total Abundance		2,397	
Number of Taxa	7		
Shannon-Weaver Diversity	1.23		

Table 10.5.4-13. Benthic Macroinvertebrates Collected from Station 6, August 1988

Phylum Class Order	Genus species	Density (number/m^2)	Relative Abundance (percent)
Annelida			
Polychaeta	Streblospio benedicti	29	2
Oligochaeta	Limnodrilus hoffmeisteri	344	29
	Nadidae sp.	14	1
Mollusca			
Pelecypoda	Mytilopsis leucophaeta	545	46
Arthropoda			
Crustacea			
Cladocera	Cladocera spp.	14	1
Isopoda	Cyathura polita	29	2
Insecta			
Chironomidae	Chironomidae sp. B	14	1
	Cryptochironomus sp.	14	1
	Polypedilum spp.	144	12
	Tanytarsis sp.	29	2
Total Abundance		1,177	
Number of Taxa	10		
Shannon-Weaver Diversity	2.11		

Table 10.5.4-14. Benthic Macroinvertebrates Collected from Station 7, August 1988

Phylum Class Order	Genus species	Density (number/m^2)	Relative Abundance (percent)
Annelida			
Polychaeta	Laeoneris culveri	100	23
Oligochaeta	Oligochaeta spp.	86	20
Mollusca			
Pelecypoda	Mytilopsis leucophaeta	29	7
Arthropoda			
Crustacea			
Tanaidacea	Hargeria rapax	14	3
Isopoda	Edotea sp.	14	3
Amphipoda	Corophium spp.	14	3
Insecta			
Chironomidae	Chironomidae spp.	144	33
	Polypedilum spp.	29	7
Total Abundance		431	
Number of Taxa	8		
Shannon-Weaver Diversity	2.49		

Table 10.5.4-15. Benthic Macroinvertebrates Collected from Station 2, November 1988

Phylum Class Order	Genus species	Density (number/m^2)	Relative Abundance (percent)
Cnidaria			
Hydrozoa	Hydrozoa spp.	14	5
Annelida			
Polychaeta	Laeoneris culveri	29	9
	Nereidae spp.	14	5
	Streblospio benedicti	43	14
Oligochaeta	Limnodrilus hoffmeisteri	144	45
Mollusca			
Pelecypoda	Mytilopsis leucophaeta	14	5
Arthropoda			
Crustacea			
Mysidacea	Bowmaniella dissimilis	29	9
Insecta			
Chironomidae	Polypedilum spp.	29	9
Total Abundance		316	
Number of Taxa	8		
Shannon-Weaver Diversity	2.46		

Table 10.5.4-16. Benthic Macroinvertebrates Collected from Station 3, November 1988

Phylum Class Order	Genus species	Density (number/m^2)	Relative Abundance (percent)
Porifera	Porifera spp.	29	1
Cnidaria			
Hydrozoa	Hydrozoa spp.	43	1
Annelida			
Polychaeta	Neanthes succinea	215	5
	Stenoninereis martini	129	3
Mollusca			
Pelecypoda	Mytilopsis leucophaeta	574	13
Arthropoda			
Crustacea			
Cirripedia	Balanus amphitrite	316	7
Mysidacea	Mysidopsis sp.	72	2
Isopoda	Cirolana gracilis	29	1
Amphipoda	Gitanopsis sp. A	2,110	46
Decapoda	Rhithropanopeus harrisii	1,077	23
Total Abundance		4,593	
Number of Taxa	10		
Shannon-Weaver Diversity	2.25		

Table 10.5.4-17. Benthic Macroinvertebrates Collected from Station 4, November 1988

Phylum Class Order	Genus species	Density (number/m^2)	Relative Abundance (percent)
Annelida			
Polychaeta	Nereidae spp.	14	9
Oligochaeta	Limnodrilus hoffmeisteri	14	9
Arthropoda			
Insecta			
Chironomidae	Chironomidae sp. C	14	9
	Chironomus attenuatus	14	9
	Polypedilum spp.	100	64
Total Abundance		158	
Number of Taxa	5		
Shannon-Weaver Diversity	1.67		

Table 10.5.4-18. Benthic Macroinvertebrates Collected from Station 5, November 1988

Phylum Class Order	Genus species	Density (number/m^2)	Relative Abundance (percent)
Cnidaria			
Hydrozoa	Hydrozoa spp.	14	1
Annelida			
Polychaeta	Stenoninereis martini	72	3
	Streblospio benedicti	804	32
Oligochaeta	Limnodrilus hoffmeisteri	1,407	55
Mollusca			
Pelecypoda	Mytilopsis leucophaeta	57	2
Arthropoda			
Crustacea			
Mysidacea	Bowmaniella dissimilis	14	1
	Mysidopsis bigelowi	72	3
Amphipoda	Gitanopsis sp. A	14	1
Insecta			
Chironomidae	Polypedilum spp.	86	3
Total Abundance		2,541	
Number of Taxa	9		
Shannon-Weaver Diversity	1.70		

Table 10.5.4-19. Benthic Macroinvertebrates Collected from Station 6, November 1988

Phylum Class Order	Genus species	Density (number/m^2)	Relative Abundance (percent)
Annelida Oligochaeta	Limnodrilus hoffmeisteri	57	100
Total Abundance		57	
Number of Taxa	1		
Shannon-Weaver Diversity	0.00		

Table 10.5.4-20. Benthic Macroinvertebrates Collected from Station 7, November 1988

Phylum Class Order	Genus species	Density (number/m^2)	Relative Abundance (percent)
Nemertea	Nemertea spp.	14	1
Annelida			
Polychaeta	Laeoneris culveri	1,536	60
	Streblospio benedicti	72	3
Oligochaeta	Oligochaeta spp.	617	24
Mollusca			
Pelecypoda	Mytilopsis leucophaeta	100	4
Arthropoda			
Crustacea			
Cumacea	Cyclaspis varians	14	1
Mysidacea	Bowmaniellia dissimilis	14	1
	Mysidopsis bigelowi	14	1
Isopoda	Cyathura polita	29	1
Amphipoda	Grandidierella bonneroides	43	2
	Corophium spp.	57	2
Insecta	Unidentified spp.	14	1
Total Abundance		2,526	
Number of Taxa	12		
Shannon-Weaver Diversity	1.77		

Table 10.5.4-21. Benthic Macroinvertebrates Collected from Station 2, February 1989

Phylum Class Order	Genus species	Density (number/m^2)	Relative Abundance (percent)
Chaetognatha	Chaetognatha spp.	72	1
Annelida			
Polychaeta	Capitomastus aciculatus	632	11
	Eteone heteropoda	14	<1
	Nereida spp.	14	<1
	Nereidae sp. A	14	<1
	Stenoninereis martini	43	<1
	Streblospio benedicti	4,048	73
Mollusca			
Pelecypoda	Mytilopsis leucophaeta	72	1
Arthropoda			
Crustacea			
Cumacea	Cumacea spp.	57	1
Mysidacea	Mysidopsis bahia	187	3
Amphipoda	Grandidierolla bonneroides	29	<1
	Caprellidae spp.	43	<1
	Corophium spp.	72	1
	Gitanopsis sp. A	43	<1
Decapoda	Megalopa larvae	14	<1
	Zoea larvae	201	4
Insecta			
Chaoboridae	Chaoborus sp.	29	<1
Total Abundance		5,583	
Number of Taxa	17		
Shannon-Weaver Diversity	1.67		

Table 10.5.4-22. Benthic Macroinvertebrates Collected from Station 3, February 1989

Phylum Class Order	Genus species	Density (number/m^2)	Relative Abundance (percent)
Platyhelminthes			
Turbellaria	Turbellaria spp.	330	26
Annelida			
Polychaeta	Capitellidae spp.	14	1
	Stenoninereis martini	29	2
	Streblospio benedicti	29	2
Mollusca			
Pelecypoda	Mytilopsis leucophaeta	115	9
Gastropoda	Nudibranchia spp.	100	8
Arthropoda			
Crustacea			
Cirripedia	Balanus amphitrite	29	2
Isopoda	Cirolana gracilis	14	1
Amphipoda	Gitanopsis sp. A	129	10
	Melita nitida	402	31
Decapoda	Rhithropanopeus harrisii	86	7
Total Abundance		1,277	
Number of Taxa	11		
Shannon-Weaver Diversity	2.74		

Table 10.5.4-23. Benthic Macroinvertebrates Collected from Station 4, February 1989

Phylum Class Order	Genus species	Density (number/m^2)	Relative Abundance (percent)
Nemertea	Nemertes spp.	29	1
Annelida			
Polychaeta	Capitomastus aciculatus	201	5
	Laeoneris culveri	29	1
	Serpulidae spp.	14	<1
	Stenoninereis martini	14	<1
	Streblospio benedicti	2,009	48
Oligochaeta	Hargeria rapax	14	<1
Mollusca			
Pelecypoda	Mytilopsis leucophaeta	832	20
	Bivalvia spp.	14	<1
Gastropoda	Nudibranchia spp.	100	2
Arthropoda			
Crustacea			
Cirripedia	Balanus amphitrite	14	<1
Mysidacea	Bowmaniella dissimilis	43	1
Amphipoda	Grandidierella bonneroides	373	9
	Caprellidae spp.	57	1
	Corophium spp.	144	3
	Gitanopsis sp. A	14	<1
	Melita nitida	100	2
Decapoda	Rhithropanopeus harrisii	57	1
Insecta			
Chironomidae	Polypedilum spp.	100	2
Total Abundance		4,162	
Number of Taxa	19		
Shannon-Weaver Diversity	2.56		

Table 10.5.4-24. Benthic Macroinvertebrates Collected from Station 6, February 1989

Phylum Class Order	Genus species	Density (number/m^2)	Relative Abundance (percent)
Nemertea	Nemertea spp.	29	1
Annelida			
Polychaeta	Capitomastus aciculatus	29	1
	Eteone heteropoda	14	<1
	Glycera spp.	14	<1
	Stenoninereis martini	43	1
	Streblospio benedicti	531	17
Mollusca			
Pelecypoda	Mytilopsis leucophaeta	2,253	70
	Tagelus spp.	86	3
Arthropoda			
Crustacea			
Cumacea	Cumacea spp.	29	1
Mysidacea	Bowmaniella dissimilis	43	1
	Mysidopsis bahia	43	1
Isopoda	Cyathura polita	14	<1
Amphipoda	Grandidierella bonneroides	14	<1
	Corophium spp.	29	1
	Gitanopsis sp. A	14	<1
Insecta			
Chironomidae	Chironomidae spp.	14	<1
	Cryptochironomus sp.	14	<1
Total Abundance		3,215	
Number of Taxa	17		
Shannon-Weaver Diversity	1.67		

Table 10.5.4-25. Benthic Macroinvertebrates Collected from Station 5, February 1989

Phylum Class Order	Genus species	Density (number/m^2)	Relative Abundance (percent)
Annelida			
Polychaeta	Capitomastus aciculatus	2,053	40
	Streblospio benedicti	2,555	49
Mollusca			
Pelecypoda	Mytilopsis leucophaeta	43	1
Arthropoda			
Crustacea			
Cumacea	Cumacea spp.	72	1
Mysidacea	Mysidopsis bahia	86	2
Amphipoda	Grandidierella bonneroides	72	1
Decapoda	Megalopa larvae	14	<1
	Zoea larvae	273	5
Insecta			
Chaoboridae	Chaoborus sp.	29	1
Total Abundance		5,196	
Number of Taxa	9		
Shannon-Weaver Diversity	1.65		

Table 10.5.4-26. Benthic Macroinvertebrates Collected from Station 7, February 1989

Phylum Class Order	Genus species	Density (number/m^2)	Relative Abundance (percent)
Nemertea	Nemertea spp.	14	1
Annelida			
Polychaeta	Capitomastus aciculatus	100	6
	Laeoneris culveri	100	6
	Streblospio benedicti	890	49
Mollusca			
Pelecypoda	Mytilopsis leucophaeta	29	2
	Tagelus plebius	57	3
Arthropoda			
Crustacea			
Cumacea	Cyclaspis varians	287	16
	Oxyurostylis smithi	29	2
Mysidacea	Bowmaniella dissimilis	57	3
	Mysidopsis bigelowi	14	1
	Mysidopsis bahia	29	2
Isopoda	Cyathura polita	57	3
Amphipoda	Grandidierella bonneroides	14	1
	Corophium spp.	129	7
	Gitanopsis sp. A	14	1
Total Abundance		1,823	
Number of Taxa	15		
Shannon-Weaver Diversity	2.63		

Table 10.5.4-27. Benthic Macroinvertebrates Collected from Station 2, May 1989

Phylum Class Order	Genus species	Density (number/m^2)	Relative Abundance (percent)
Cnidaria			
Hydrozoa	Hydrozoa spp.	14	2
Annelida			
Polychaeta	Leitoscoloplos sp.	14	2
	Stenoninereis martini	29	3
	Streblospio benedicti	287	32
Oligochaeta	Oligochaeta spp.	29	3
Mollusca			
Pelecypoda	Tagelus plebius	43	5
Arthropoda			
Crustacea			
Mysidacea	Mysidopsis bigelowi	14	2
	Mysidopsis bahia	29	3
Amphipoda	Grandidierella bonneroides	416	46
Insecta			
Chironomidae	Polypedilum spp.	14	2
Echinodermata			
Holothurioidea	Holothurioidea sp.	14	2
Total Abundance		904	
Number of Taxa	11		
Shannon-Weaver Diversity	2.20		

Table 10.5.4-28. Benthic Macroinvertebrates Collected from Station 3, May 1989

Phylum Class Order	Genus species	Density (number/m^2)	Relative Abundance (percent)
Annelida			
Polychaeta	Capitellidae spp.	14	<1
	Neanthes succinea	14	<1
	Stenoninereis martini	14	<1
	Streblospio benedicti	29	<1
Oligochaeta	Oligochaeta spp.	129	2
Mollusca			
Pelecypoda	Tagelus plebius	72	1
Arthropoda			
Crustacea			
Tanaidacea	Tanaidae sp.	646	10
Isopoda	Cirolana gracitis	244	4
Amphipoda	Corophium spp.	258	4
	Gitanopsis sp.A	4,650	70
	Grandidierella bonneroides	158	2
	Melita nitida	388	6
Decapoda	Eurypanopeus depressus	14	<1
	Rhithropanopeus harrisii	14	<1
Total Abundance		6,660	
Number of Taxa	15		
Shannon-Weaver Diversity	1.74		

Table 10.5.4-29. Benthic Macroinvertebrates Collected from Station 4, May 1989

Phylum Class Order	Genus species	Density (number/m^2)	Relative Abundance (percent)
Platyhelminthes	Platyhelminthes spp.	14	1
Annelida			
Polychaeta	Eteone heteropoda	43	2
	Laeoneris culveri	14	1
	Streblospio benedicti	431	16
Oligochaeta	Oligochaeta spp.	29	1
Mollusca			
Pelecypoda	Mytilopsis leucophaeta	29	1
	Tagelus plebius	172	6
Arthropoda			
Crustacea			
Cumacea	Cyclaspis varians	43	2
Tanaidacea	Hargeria rapax	57	2
Mysidacea	Bowmaniella dissimilis	14	1
	Mysidopsis bahia	187	7
Isopoda	Cyathura polita	14	1
Amphipoda	Corophium spp.	1,033	37
	Gitanopsis sp.A	144	5
	Grandidierella bonneroides	531	19
Total Abundance		2,756	
Number of Taxa	15		
Shannon-Weaver Diversity	2.74		

Table 10.5.4-30. Benthic Macroinvertebrates Collected from Station 5, May 1989

Phylum Class Order	Genus species	Density (number/m^2)	Relative Abundance (percent)
Cnidaria			
Hydrozoa	Hydrozoa spp.	29	1
Annelida			
Polychaeta	Capitellidae spp.	14	<1
	Laeoneris culveri	57	2
	Streblospio benedicti	1,981	66
Mollusca			
Pelecypoda	Tagelus plebius	43	1
Arthropoda			
Crustacea			
Tanaidacea	Hargeria rapax	14	<1
Mysidacea	Mysidopsis bahia	14	<1
Amphipoda	Cerapus tubularis	115	4
	Corophium spp.	29	1
	Gitanopsis sp.A	100	3
	Grandidierella bonneroides	344	11
Decapoda	Zoea larvae	144	5
Insecta			
Chironomidae	Polypedilum spp.	115	4
Total Abundance		3,000	
Number of Taxa	13		
Shannon-Weaver Diversity	1.92		

Table 10.5.4-31. Benthic Macroinvertebrates Collected from Station 6, May 1989

Phylum Class Order	Genus species	Density (number/m^2)	Relative Abundance (percent)
Platyhelminthes	Platyhelminthes spp.	14	<1
Nemertea	Nemertea spp.	14	<1
Annelida			
Polychaeta	Eteone heteropoda	57	1
	Neanthes succinea	14	<1
	Stenoninereis martini	72	2
	Streblospio benedicti	761	17
Oligochaeta	Oligochaeta spp.	72	2
Mollusca			
Pelecypoda	Mytilopsis leucophaeta	617	14
	Tagelus plebius	502	11
Arthropoda			
Crustacea			
Mysidacea	Mysidopsis bahia	14	<1
Isopoda	Edotea spp.	14	<1
	Cyathura polita	86	2
Amphipoda	Corophium spp.	1,077	25
	Gitanopsis sp.A	187	4
	Grandidierella bonneroides	574	13
	Melita nitida	258	6
Decapoda	Rhithropanopeus harrisii	57	1
Total Abundance		4,392	
Number of Taxa	17		
Shannon-Weaver Diversity	3.11		

Table 10.5.4-32. Benthic Macroinvertebrates Collected from Station 7, May 1989

Phylum Class Order	Genus species	Density (number/m^2)	Relative Abundance (percent)
Cnidaria			
Anthozoa	Anthozoa spp.	14	<1
Hydrozoa	Hydrozoa spp.	14	<1
Annelida			
Polychaeta	Eteone heteropoda	29	1
	Streblospio benedicti	545	16
Oligochaeta	Oligochaeta spp.	14	<1
Mollusca			
Pelecypoda	Tagelus plebius	1,608	46
Arthropoda			
Crustacea			
Cumacea	Cyclaspis varians	344	10
Tanaidacea	Hargeria rapax	115	3
Mysidacea	Bowmaniella dissimilis	14	<1
	Mysidopsis bahia	14	<1
Isopoda	Edotea spp.	29	1
	Cyathura polita	115	3
Amphipoda	Crandidierella bonneroides	14	<1
	Cerapus tubularis	14	<1
	Corophium spp.	588	17
	Melita nitida	14	<1
Insecta			
Chironomidae	Chironomidae spp.	14	<1
Total Abundance		3,502	
Number of Taxa	17		
Shannon-Weaver Diversity	2.42		

Table 10.5.4-33. Summary of Crocodile Surveys in and Adjacent to the Lauderdale Power Plant Site. South Fork New River (SFNR), Pond Apple Slough (PAS) (Page 1 of 3)

Date	Location of Survey	Crocodilians Sighted	Other Wildlife Sighted
01/07/86	Cooling Ponds	1 Alligator	Adult Manatee w/young, wading bird roost (about 50 Little Blue and Tricolor herons)
	SFNR	0	Several wading birds
	PAS	0	2 Raccoons
07/23/86	Cooling ponds	4 Alligators 1 Caiman	Active wading bird roost (w/Anhingas and Green herons) and 4 Ospreys
07/30/86	Cooling ponds	5 Alligators	Roost active
08/06/86	Cooling ponds	2 Alligators 3 eyeshine	
08/13/86	Cooling Ponds	1 eyeshine	
12/12/86	Cooling Ponds	4 Alligators 1 eyeshine	
04/13/87	Cooling ponds	1 Alligator 1 Caiman* 1 eyeshine	1 Manatee 3 Grey foxes
05/18/87	Cooling ponds	6 Alligators 5 eyeshine	
	SFNR	1 eyeshine	
	PAS	0	
07/07/87	Cooling ponds	2 Alligators	
09/14/87	Cooling ponds	2 Alligators 2 eyeshine	
10/29/87	Cooling ponds	2 Alligators 2 eyeshine	
12/17/87	Cooling ponds	2 Alligators 2 eyeshine	2-3 Manatees, 1 Great Blue heron, and 1 Osprey

Table 10.5.4-33. Summary of Crocodile Surveys in and Adjacent to the Lauderdale Power Plant Site. South Fork New River (SFNR), Pond Apple Slough (PAS) (Page 2 of 3)

Date	Location of Survey	Crocodilians Sighted	Other Wildlife Sighted
01/08/89	PAS	1 Caiman	1 Great blue heron, and 2 green back herons
01/15/89	PAS	1 Caiman	1 Great blue heron, 3 green back heron, 1 yellow crowned night heron, 1 moor hen
02/17/89	PAS	1 eyeshine	1 night hawk
	SFNR	0	10 raccoons, 3 moor hens, 2 green back herons
	Cooling Ponds	0	Active wading bird roost (w/Cattle Egrets, and and tricolor herons) 3 osprey
02/24/89	PAS	1 eyeshine	
	SFNR	0	15 raccoons, 1 opossum, 2 yellow crowned night herons, 3 moor hens
02/24/89	Cooling Ponds	0	1 raccoon, active wading bird roost (w/cattle egrets, tricolor herons)
03/02/89	Cooling Ponds	0	4 osprey, 2 great blue herons, 2 moor hens, 1 yellow crowned night heron, 3 anhingas, 1 green iguana
04/06/89	PAS	1 Alligator	
	SFNR	0	12 raccoons, 1 wood rat, 3 moor hens, 2 great blue herons
	Cooling Ponds	1 eyeshine	2 gray foxes, 3 raccoons, 3 osprey active wading bird roost (w/ 25 cattle egrets, 15 little blue herons, 10 tricolor herons, 4 great blue herons)
04/13/89	Cooling Ponds	0	Active wading bird roost (w/ 3 great blue herons, 2 green back heron, 1 yellow-crowned night heron, anhinga)

Table 10.5.4-33. Summary of Crocodile Surveys in and Adjacent to the Lauderdale Power Plant Site. South Fork New River (SFNR), Pond Apple Slough (PAS) (Page 3 of 3)

Date	Location of Survey	Crocodilians Sighted	Other Wildlife Sighted
04/17/89 (Daytime)	OSP	1 Alligator	
04/20/89	SFNR	1 Alligator, 1 eyeshine	8 raccoons
	DCOC	0	
	OSP	1 Caiman	1 gray fox
05/04/89	DCOC	1 Aligator	1 opossum, 2 giant toads, 1 cuban tree frog, 1 night hawk
	OSP	1 Caiman	1 gray fox, 2 raccoons, 1 night hawk
07/12/89	PAS	0	2 green back herons
07/18/89	Cooling Ponds	0	6 turtles active roost
	SFNR	0	
	PAS	0	
	DCOC	0	Wading birds, muscovy ducks
	West Lake	0	Roseatte spoonbill
07/19/89	CP	0	Manatee, 12 turtles
	PAS	0	
	Hollywood Indian Reservation	0	
	West Lake	0	Wading birds
07/26/89	CP		Active roost turtles
	PAS	0	
	SFNR	1 Alligator	
	DCOC	0	Muscovy ducks
	West Lake	0	

* Captured

DRAFT

PROJECT REPORT

The status of the American crocodile (*Crocodylus acutus*) at the Lauderdale Power Plant Site.

(Contract # 89023-C)

Submitted to: KBN Engineering and Applied Science
P.O. Box 14288
Gainesville, Florida 32604

Submitted by: Frank J. Mazzotti
and
Laura A. Brandt

Department of Wildlife and Ranges Sciences
University of Florida
3245 College Ave.
Davie, Florida 33314
(305) 370-3725

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Introduction

The American crocodile (Crocodylus acutus) is listed as endangered by the U.S. Fish and Wildlife Service and the International Union for the Conservation of Nature (USFWS, 1979; IUCN, 1986). It occurs throughout the Carribean, in Central and South Americas, and along the extreme southern tip of Florida. Historically, crocodiles nested as far north as Lake Worth on the east coast (Kushlan and Mazzotti, 1989) and just south of Naples on the west coast (P. Moler, pers. comm.). Currently there are three known crocodile nesting areas in Florida: within Everglades National Park, on North Key Largo, and at Florida Power and Light Company's (FPL) Turkey Point Power site in Homestead.

Crocodiles have been reported to occur in Broward County since 1919 (Barbour, 1923; Mazzotti, 1983), and since the 1960s have been observed continually but infrequently in Broward County (Table 1). These sightings have usually been in the West Lake area or near the FPL Lauderdale power plant, either in the cooling ponds, the South Fork of the New River (SFNR) or at the intersection of SR-84 and 441 (Figure 1). As recently as 1986 a crocodile was reported in the pond apple slough, opposite the cooling ponds, northwest of the SFNR (Browne, 1986).

As FPL seeks to develop land resources (including relicensing the Lauderdale power plant) learning the status of endangered species on the site and in the adjacent area becomes important. The purpose of this study was to determine the status

of the American crocodile on and around the Lauderdale power plant site.

Methods

The main study area consisted of all bodies of water within the area bounded on the east by Ravenswood Road, the north by SR 84, and the west by 441 and the south by Griffin Road (Figure 1). This included the 4 major creeks and numberous smaller creeks in the pond apple slough area (PAS) just south of I-595, the South Fork of the New River Canal (SFNR) and the Dania Cut off Canal (DCOC), (a man-made canal system with steep banks and boat slips), the cooling ponds (CP), a series of ponds on the FPL property boardered by Cocoa Plums (Chrysobalanus icaco), Pond Apple (Annona glabra), and Australian Pine (Casurinia equisetifolia), and a number of ponds outside the FPL property (OSP). Outside of this area we also surveyed West Lake (WL), a mangrove lined lake west of the Intercoastal Waterway and south of the DCOC. The status of crocodiles in these areas was determined by conducting diurnal foot surveys, nocturnal boat surveys, and diurnal helicopter surveys. All three methods have been shown to be effective in determing the presence of crocodilians, as well as for obtaining an index of abundance (Parker and Watson, 1970; Woodward and Marion, 1978; Wood et al, 1985; Bayliss et al 1986; Bayliss, 1987, Brandt 1989).

Foot surveys were conducted mainly in PAS. During these surveys the presence of any crocodilan, crocodilan sign (tail drags or slides) or other wildlife was noted.

One of the most widely used methods for determining the status of crocodilians in an area is through the use of night

time eyeshine counts (Chabreck, 1966; Woodward and Marion, 1978; Taylor and Neal, 1984). The tapetum of crocodilians eyes reflects red to orange/yellow when hit with a light, and for this reason crocodilians can be easily located at night. Eyeshine counts are conducted by by shining a strong light along the shoreline and counting the number of eyeshines observed. Nocturnal surveys were conducted in this manor in the CP, SFNR, DCOC (all by canoe with a 5 hp motor) and in the OSP (by vehicle). When an eyeshine was spotted the animal was approached to obtain a size estimate and a positive species identification (American crocodile, Crocodylus acutus, American alligator, Alligator mississippiensis, or spectacled caiman, Caiman crocodylus). An attempt was made to capture all crocodilians sighted in order to weigh, measure (snout-vent length, total length, and skull length), mark and release them (crocodiles and alligators) or to remove them (caimans).

Aerial surveys were conducted of the CP, the PAS, SFNR, DCOC, West Lake, the Seminole Indian reservation between 441 and the Turnpike, and of various ponds outside of the power plant site. Surveys were flow in a Robinson 22 helicopter at an altitude of 30-50 m and an air speed of < 40 knots between 0800 and 1100.

Results

Fourteen surveys were conducted from January 1989 through July 1989 (Table 2). In addition, results from surveys conducted during 1986 and 1987 are presented (Table 3). Of the 14 surveys conducted during this study, 4 were day time surveys, 3 aerial surveys and the remainder night surveys. Pond apple slough was surveyed 8 times, DCOC 4 times, SFNR 6 times, CP 7 times, OSP 6 times, and West Lake 3 times. Twelve sightings of crocodilians were made. Eight of these were positively identified, 4 alligators and 4 caimans. The remainder were unidentified eyeshines, and we can not rule out the possibility that some were American crocodiles. One of the caimans, a 1.83 m male, was captured and removed from the pond apple slough area. No evidence of crocodilian nesting was observed. In addition to crocodilians, numerous other wildlife was observed including manatees (in the cooling ponds), racoons, foxes, wading birds (including an active roost in the cooling ponds), turtles and a green iguana (Table 2).

Discussion

No crocodiles were sighted in the study area during this study or during 12 surveys conducted during 1986 and 1987. In addition, there was no evidence of crocodilian (alligator, crocodile, or caiman) nesting in the area. That no crocodiles were observed during this study suggests that either crocodiles are not present on the site, are present in only very low numbers, or are transient. However, the techniques used in this study are reliable methods for determining the status of crocodilians in an area (Bayliss, 1987) so it is unlikely that there are resident crocodiles in the area that were missed in the years (1986, 1987, and 1989) of systematic surveys. In addition to the results reported here, M. McMahon reported sighting Alligator mississippiensis and Caiman crocodilus but no Crocodylus acutus in or around the cooling system during surveys conducted in 1985 (McMahon, unpub. data).

The recent reports of crocodiles in the area probably represent the presence of transient individuals and not an established population. Crocodiles are know to move long distances, and, one individual reported in Table 1(c) made several long distance movements (20, 100, and 150 km) between captures in 1978 (Kushlan and Mazzotti, 1989).

In addition, the absence of nesting activity in the study area, even in prime nesting sites (sandy berms) within the cooling ponds indicates that if there are a few crocodiles in the area they are not breeding.

It is interesting to note that during 1986 and 1987 1-11 crocodilians were observed during the night time surveys of the cooling ponds while during this study only one sighting of a crocodilian was made in 5 night time surveys of the same area. There is suitable habitat adjacent to the cooling ponds, and the ponds themselves (particularly in the south western portion) also appear to be suitable. Why there has been a decrease in the number of crocodilians sighted within the cooling ponds is unknown.

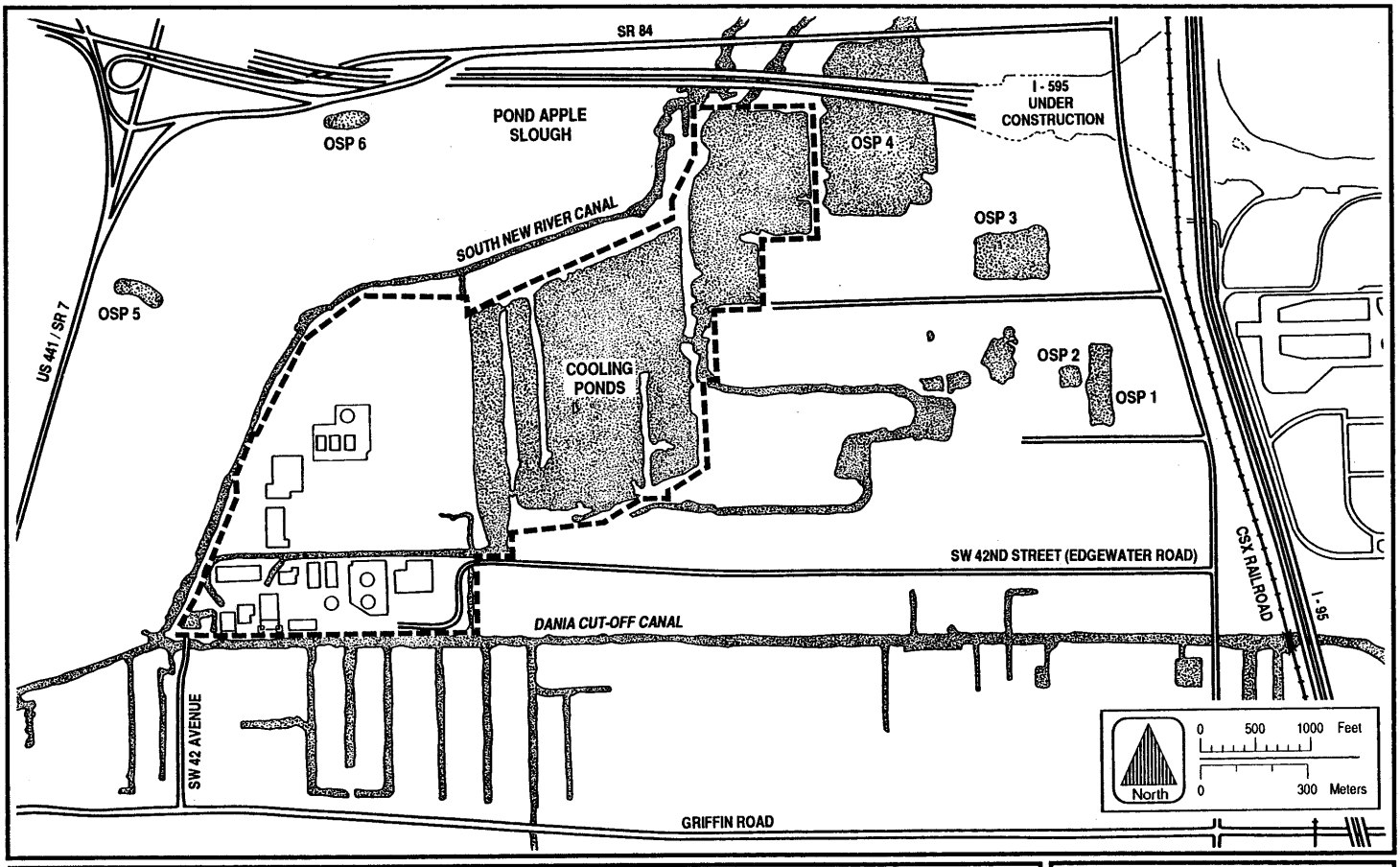


Figure 1 CROCODILIAN STUDY AREA

Lauderdale Repowering Project

FPL

Table 1. Historical sightings of Crocodylus acutus in Broward County. Superscripts after dates represent probable sightings of the same animal. SFNR = South Fork of the New River Canal.

Date	Location	Comments	Source
1 Feb 1919	Ojus Creek	Dead	Barbour, 1923
c. 1920	Hallandale		Barbour, 1923
early 1960s	West Lake		McMahon, unpub. data (Jones,pc)
1968	Cooling Ponds	Captured taken to Spykes grove	McMahon, unpub. data (Jones,pc)
1974-75[a]	SFNR		McMahon, unpub. data (Jones,pc)
1974-75[a]	SFNR		McMahon, unpub. data (Jones,pc)
1974-75[a]	SFNR		McMahon, unpub. data (Jones,pc)
28 Jul 1978[b]	FPL plant	Photographed	Wilcox, pers. comm.
24 Oct 1978[c]	Ocean at Hollywood	FGFWFC obs.	Grimm and Buhman, 1978
25 Oct 1978[c]	Ocean at Ft. Lauderdale	FGFWFC obs.	Grimm and Buhman, 1978
Oct 1978[c]	Ocean at Ft. Lauderdale	Caught & tagged by FGFWFC; released on Key Largo	Mazzotti, 1983
Jan 1979[c]	Canal 4	Caught and radio collared	Wilcox, pers. comm.
26 Jan 1979[c]	FPL plant	Dead, shot	Wilcox, pers. comm.
1 Mar 1979[c]	FPL plant		Wilcox, pers. comm.

Table 1 (cont.)

Date	Location	Comments	Source
Summer 1979[c]	Hollywood	Caught & taken to Naples by FGFWFC	Mazzotti, 1983
1980	West Lake		McMahon, unpub. data (Jones,pc)
1982	Hallandale	Caught and released	McMahon, unpub. data (Jones,pc)
1982	441 & SR 84	Caught & released on Key Largo	Moler, pers. comm.
1985	Lake east of Turnpike	may be breeding optimal nesting habitat	McMahon, unpub. data (Jones,pc)
1985	Lake east of Turnpike	at least 2 animals	McMahon, unpub. data (Jones,pc)
Mar 1986	Pond Apple Slough		Browne, 1986
Oct 1986	Alligator Alley, west of Turnpike canal	Dead (178 cm) Marked on Key Largo as hatchling in 1980	Moler, pers. comm.

Table 2. Summary of crocodile surveys in and adjacent to the Lauderdale power plant site Jan 1989 - July 1989. SFNR = South Fork of the New River, PAS = Pond Apple Slough, DCOC = Dania Cut-Off Canal, CP = Cooling Ponds, and OSP = Off Site Ponds (see Figure 1). All surveys are night surveys unless otherwise noted.

Date	Location of Surveys	Crocodilians Sighted	Other Wildlife
		1989	
8 Jan (Foot)	PAS	1 Caiman	1 Great Blue Heron and 2 Green Back Herons
15 Jan (Foot)	PAS	1 Caiman	1 Great Blue, 3 Green Back Heron, 1 Yellow Crowned Night Heron, 1 Moor Hen
17 Feb	PAS	1 Eye Shine	1 Night Hawk
	SFNR	0	10 Raccoons,3 Moor Hens, 2 Green Back Herons
	CP	0	Active wading bird roost(w/ Cattle Egrets, and Tricolor Herons) 3 Osprey
24 Feb	PAS	1 Eye Shine	
	SFNR	0	15 Raccoons, 1 Opossum, 2 Yellow Yellow Crowned Night Herons, 3 Moor Hens

Table 2 (cont.)

Date	Location of Surveys	Crocodilians Sighted	Other Wildlife
24 Feb	CP	0	1 Raccoon, Active wading bird roost (w/ Cattle Egrets, Tricolor Herons)
2 Mar	CP	0	4 Osprey, 2 Great Blue Herons, 2 Moor Hens, 1 Yellow Crowned Night Heron, 3 Anhingas, 1 Green Iguana
6 Apr	PAS	1 Alligator	
	SFNR	0	12 Raccoons, 1 Wood Rat, 3 Moor Hens, 2 Great Blue Herons
	CP	1 Eye Shine	2 Gray Foxes, 3 Raccoons, 3 Osprey Active wading bird roost (w/ 25 Cattle Egrets, 15 Little Blue Herons, 10 Tricolor Herons, 4 Great Blue Herons)

Table 2 (cont.)

Date	Location of Surveys	Crocodilians Sighted	Other Wildlife
13 Apr	CP	0	Active wading bird roost (w/ 3 Great Blue Herons, 2 Green Back Heron, 1 Yellow-Crowned Night Heron, Anhinga)
17 Apr (Day time)	OSP	1 Alligator	
20 Apr	SFNR	1 Alligator, 1 Eye Shine	8 Raccoons
	DCOC	0	
	OSP	1 Caiman	1 Gray Fox
4 May	DCOC	1 Alligator	1 Opossum, 2 Giant Toads, 1 Cuban Tree Frog, 1 Night Hawk
	OSP	1 Caiman	1 Gray Fox, 2 Raccoons, 1 Night Hawk
12 July (Foot)	PAS	0	2 Green back Herons
18 July (Aerial)	CP	0	6 Turtles Active roost
	SFNR	0	
	PAS	0	
	DCOC	0	Wading birds Muscovy ducks
	West Lake	0	Roseatte spoonbill

Table 2 (cont.)

Date	Location of Surveys	Crocodilians Sighted	Other Wildlife
19 July (Aerial)	CP	0	Manatee 12 Turtles
	PAS	0	
	Hollywood Indian Reservation	0	
	West Lake	0	Wading birds
26 July (Aerial)	CP		Active roost Turtles
	PAS	0	
	SFNR	1 Alligator	
	DCOC	0	Muscovy Ducks
	West Lake	0	

Table 3. Summary of crocodile surveys in and adjacent to the Laurderdale power plant site during 1986 and 1987. CP = Cooling ponds, SFNR = South Fork of the New River, PAS = Pond Apple Slough.

Date	Location of Surveys	Crocodilians Sighted	Other Wildlife
		1986	
7 Jan	CP	1 Alligator	Adult Manatee with young, wading bird roost (about fo mixed Little Blue and Tricolor herons).
	SFNR	0	Several wading birds
	PAS	0	2 Raccoons.
23 July	CP	4 Alligators 1 Caiman	Active wading bird roost (Anhingas and Green herons) and 4 Ospreys.
30 July	CP	5 Alligators	Roost active.
6 Aug	CP	2 Alligators 3 Eyeshine	
13 Aug	CP	1 Eyeshine	
12 Dec	CP	4 Alligators 1 Eyeshine	
		1987	
13 Apr	CP	1 Alligator 1 Caiman (captured) 1 Eyeshine	1 Manatee 3 Grey foxes
18 May	CP	6 Alligators 5 Eyeshine	
	SFNR	1 Eyeshine	
	PAS	0	

Table 3 (Cont.)

Date	Location of Surveys	Crocodilians Sighted	Other Wildlife
7 July	CP	2 Alligators	
14 Sept	CP	2 Alligators 2 Eyeshine	
29 Oct	CP	2 Alligators 1 Eyeshine	
17 Dec	CP	2 Alligators	2-3 Manatees, 1 Great Blue Heron, and 1 Osprey.

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APPENDIX 10.5.5

SOCIOECONOMICS

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Impact Analyses--Operational Phase 10.5.5-16

BASELINE INTERSECTION ANALYSES

IDENTIFYING INFORMATION

AVERAGE RUNNING SPEED, MAJOR STREET..... 40

PEAK HOUR FACTOR..... .9

AREA POPULATION..... 150000

NAME OF THE EAST/WEST STREET..... S.W. 42ND STREET

NAME OF THE NORTH/SOUTH STREET..... RAVENSWOOD ROAD

NAME OF THE ANALYST..... RA

DATE OF THE ANALYSIS (mm/dd/yy)..... 01/12/89

TIME PERIOD ANALYZED..... 1989 PM PEAK HOUR

OTHER INFORMATION:

INTERSECTION TYPE AND CONTROL

INTERSECTION TYPE: T-INTERSECTION

MAJOR STREET DIRECTION: NORTH/SOUTH

CONTROL TYPE EASTBOUND: STOP SIGN

TRAFFIC VOLUMES

	EB	WB	NB	SB
LEFT	11	---	69	0
THRU	0	---	364	355
RIGHT	58	---	0	18

NUMBER OF LANES

	EB	WB	NB	SB
LANES	1	--	1	1

	PERCENT GRADE	RIGHT TURN ANGLE	CURB RADIUS (ft) FOR RIGHT TURNS	ACCELERATION LANE FOR RIGHT TURNS
EASTBOUND	0.00	90	20	N
WESTBOUND	------	---	---	-
NORTHBOUND	0.00	90	20	N
SOUTHBOUND	0.00	90	20	N

VEHICLE COMPOSITION

	% SU TRUCKS AND RV'S	% COMBINATION VEHICLES	% MOTORCYCLES
EASTBOUND	5	0	0
WESTBOUND	---	---	---
NORTHBOUND	5	0	0
SOUTHBOUND	5	0	0

CRITICAL GAPS

	TABULAR VALUES (Table 10-2)	ADJUSTED VALUE	SIGHT DIST. ADJUSTMENT	FINAL CRITICAL GAP
MINOR RIGHTS EB	5.90	5.90	0.00	5.90
MAJOR LEFTS NB	5.20	5.20	0.00	5.20
MINOR LEFTS EB	7.10	7.10	0.00	7.10

MOVEMENT	FLOW-RATE v(pcph)	POTENTIAL CAPACITY c_p (pcph)	ACTUAL MOVEMENT CAPACITY c_M (pcph)	SHARED CAPACITY c_{SH} (pcph)	RESERVE CAPACITY $c_R = c_{SH} - v$	LOS
MINOR STREET						
EB LEFT	13	233	219	219	206	C
				478	400	B
RIGHT	66	617	617	617	551	A
MAJOR STREET						
NB LEFT	79	783	783	783	705	A

IDENTIFYING INFORMATION

AVERAGE RUNNING SPEED, MAJOR STREET..... 40

PEAK HOUR FACTOR..... .9

AREA POPULATION..... 150000

NAME OF THE EAST/WEST STREET..... GRIFFIN ROAD

NAME OF THE NORTH/SOUTH STREET..... S.W. 42ND AVENUE

NAME OF THE ANALYST..... RA

DATE OF THE ANALYSIS (mm/dd/yy)..... 01/12/89

TIME PERIOD ANALYZED..... 1989 PM PEAK HOUR

OTHER INFORMATION:

INTERSECTION TYPE AND CONTROL

INTERSECTION TYPE: T-INTERSECTION

MAJOR STREET DIRECTION: EAST/WEST

CONTROL TYPE SOUTHBOUND: STOP SIGN

TRAFFIC VOLUMES

	EB	WB	NB	SB
LEFT	32	0	--	10
THRU	484	704	--	355
RIGHT	58	5	--	18

NUMBER OF LANES

	EB	WB	NB	SB
LANES	2	1	--	1

	PERCENT GRADE	RIGHT TURN ANGLE	CURB RADIUS (ft) FOR RIGHT TURNS	ACCELERATION LANE FOR RIGHT TURNS
EASTBOUND	0.00	90	20	N
WESTBOUND	0.00	90	20	N
NORTHBOUND	------	----	----	--
SOUTHBOUND	0.00	90	20	N

VEHICLE COMPOSITION

	% SU TRUCKS AND RV'S	% COMBINATION VEHICLES	% MOTORCYCLES
EASTBOUND	5	0	0
WESTBOUND	5	0	0
NORTHBOUND	----	----	----
SOUTHBOUND	5	0	0

CRITICAL GAPS

		TABULAR VALUES (Table 10-2)	ADJUSTED VALUE	SIGHT DIST. ADJUSTMENT	FINAL CRITICAL GAP
MINOR RIGHTS	SB	5.90	5.90	0.00	5.90
MAJOR LEFTS	EB	5.20	5.20	0.00	5.20
MINOR LEFTS	SB	7.10	7.10	0.00	7.10

MOVEMENT	FLOW-RATE v(pcph)	POTENTIAL CAPACITY c_p (pcph)	ACTUAL MOVEMENT CAPACITY c_M (pcph)	SHARED CAPACITY c_{SH} (pcph)	RESERVE CAPACITY $c_R = c_{SH} - v$	LOS
MINOR STREET						
SB LEFT	12	112	107	107	95	E
				198	164	D
RIGHT	22	374	374	374	352	B
MAJOR STREET						
EB LEFT	39	508	508	508	469	A

IMPACT ANALYSES--CONSTRUCTION PHASE

****

IDENTIFYING INFORMATION

AVERAGE RUNNING SPEED. MAJOR STREET.. 40

PEAK HOUR FACTOR..... .95

AREA POPULATION..... 150000

NAME OF THE EAST/WEST STREET..... S.W. 42ND STREET

NAME OF THE NORTH/SOUTH STREET..... RAVENSWOOD ROAD

NAME OF THE ANALYST..... RA

DATE OF THE ANALYSIS (mm/dd/yy)..... 05/10/89

TIME PERIOD ANALYZED..... 1992 PM PEAK HOUR

OTHER INFORMATION.... PEAK CONSTRUCTION PERIOD

INTERSECTION TYPE AND CONTROL

INTERSECTION TYPE: T-INTERSECTION

MAJOR STREET DIRECTION: NORTH/SOUTH

CONTROL TYPE EASTBOUND: STOP SIGN

TRAFFIC VOLUMES

	EB	WB	NB	SB
LEFT	7	--	70	0
THRU	0	--	365	356
RIGHT	81	--	0	18

NUMBER OF LANES

	EB	WB	NB	SB
LANES	1	--	1	1

ADJUSTMENT FACTORS

	PERCENT GRADE	RIGHT TURN ANGLE	CURB RADIUS (ft) FOR RIGHT TURNS	ACCELERATION LANE FOR RIGHT TURNS
EASTBOUND	0.00	90	20	N
WESTBOUND	-----	---	---	-
NORTHBOUND	0.00	90	20	N
SOUTHBOUND	0.00	90	20	N

VEHICLE COMPOSITION

	% SU TRUCKS AND RV'S	% COMBINATION VEHICLES	% MOTORCYCLES
EASTBOUND	5	0	0
WESTBOUND	---	---	---
NORTHBOUND	5	0	0
SOUTHBOUND	5	0	0

CRITICAL GAPS

		TABULAR VALUES (Table 10-2)	ADJUSTED VALUE	SIGHT DIST. ADJUSTMENT	FINAL CRITICAL GAP
MINOR RIGHTS	EB	5.90	5.90	0.00	5.90
MAJOR LEFTS	NB	5.20	5.20	0.00	5.20
MINOR LEFTS	EB	7.10	7.10	0.00	7.10

IDENTIFYING INFORMATION

NAME OF THE EAST/WEST STREET..... S.W. 42ND STREET
NAME OF THE NORTH/SOUTH STREET.... RAVENSWOOD ROAD
DATE AND TIME OF THE ANALYSIS..... 05/10/89 : 1992 PM PEAK HOUR
OTHER INFORMATION.... PEAK CONSTRUCTION PERIOD

MOVEMENT	FLOW-RATE v(pcph)	POTENTIAL CAPACITY c_p (pcph)	ACTUAL MOVEMENT CAPACITY c_M (pcph)	SHARED CAPACITY c_{SH} (pcph)	RESERVE CAPACITY $c_R = c_{SH} - v$	LOS
MINOR STREET						
EB LEFT	8	243	229	> 229 > 567	> 221 > 472	C >A
RIGHT	87	650	650	> 650	> 563	A
MAJOR STREET						
NB LEFT	76	763	763	763	687	A

IDENTIFYING INFORMATION

NAME OF THE EAST/WEST STREET..... S.W. 42ND STREET
NAME OF THE NORTH/SOUTH STREET.... RAVENSWOOD ROAD
DATE AND TIME OF THE ANALYSIS..... 05/10/89 : 1992 PM PEAK HOUR
OTHER INFORMATION.... PEAK CONSTRUCTION PERIOD

****

IDENTIFYING INFORMATION

AVERAGE RUNNING SPEED, MAJOR STREET..... 40

PEAK HOUR FACTOR..... .95

AREA POPULATION..... 150000

NAME OF THE EAST/WEST STREET..... GRIFFIN ROAD

NAME OF THE NORTH/SOUTH STREET..... S.W. 42ND AVENUE

NAME OF THE ANALYST..... RA

DATE OF THE ANALYSIS (mm/dd/yy)..... 05/10/89

TIME PERIOD ANALYZED..... 1992 PM PEAK HOUR

OTHER INFORMATION: PEAK CONSTRUCTION PERIOD

INTERSECTION TYPE AND CONTROL

INTERSECTION TYPE: T-INTERSECTION

MAJOR STREET DIRECTION: EAST/WEST

CONTROL TYPE SOUTHBOUND: STOP SIGN

TRAFFIC VOLUMES

	EB	WB	NB	SB
LEFT	32	0	--	23
THRU	486	707	--	0
RIGHT	0	5	--	31

NUMBER OF LANES

	EB	WB	NB	SB
LANES	2	1	--	1

	PERCENT GRADE	RIGHT TURN ANGLE	CURB RADIUS (ft) FOR RIGHT TURNS	ACCELERATION LANE FOR RIGHT TURNS
EASTBOUND	0.00	90	20	N
WESTBOUND	0.00	90	20	N
NORTHBOUND	-----	---	---	-
SOUTHBOUND	0.00	90	20	N

VEHICLE COMPOSITION

	% SU TRUCKS AND RV'S	% COMBINATION VEHICLES	% MOTORCYCLES
EASTBOUND	5	0	0
WESTBOUND	5	0	0
NORTHBOUND	---	---	---
SOUTHBOUND	5	0	0

CRITICAL GAPS

		TABULAR VALUES (Table 10-2)	ADJUSTED VALUE	SIGHT DIST. ADJUSTMENT	FINAL CRITICAL GAP
MINOR RIGHTS	SB	5.90	5.90	0.00	5.90
MAJOR LEFTS	EB	5.20	5.20	0.00	5.20
MINOR LEFTS	SB	7.10	7.10	0.00	7.10

MOVEMENT	FLOW-RATE v(pcph)	POTENTIAL CAPACITY c_p (pcph)	ACTUAL MOVEMENT CAPACITY c_M (pcph)	SHARED CAPACITY c_{SH} (pcph)	RESERVE CAPACITY $c_R = c_{SH} - v$	LOS
MINOR STREET						
SB LEFT	27	124	119	119	92	E
				198	136	D
RIGHT	36	396	396	396	360	B
MAJOR STREET						
EB LEFT	37	533	533	533	496	A

1985 HCM: SIGNALIZED INTERSECTIONS
SUMMARY REPORT

****

INTERSECTION..SR 84/S.W. 26TH TERR.(TRAM RD.)
AREA TYPE.....OTHER
ANALYST.....RA
DATE.....05/10/89
TIME.....1992 PM PEAK HOUR
COMMENT.....PEAK CONSTRUCTION PERIOD

	VOLUMES					GEOMETRY							
	EB	WB	NB	SB	:	EB		WB		NB		SB	
LT	0	111	612	0	: T	12.0	L	12.0	L	12.0		12.0	
TH	624	927	0	0	: T	12.0	T	12.0	LR	12.0		12.0	
RT	145	0	288	0	: T	12.0	T	12.0		12.0		12.0	
RR	0	0	0	0	: TR	12.0		12.0		12.0		12.0	
					:	12.0		12.0		12.0		12.0	
					:	12.0		12.0		12.0		12.0	

ADJUSTMENT FACTORS

	GRADE (%)	HV (%)	ADJ Y/N	PKG Nm	BUSES Nb	PHF	PEDS	PED. Y/N	BUT. min T	ARR. TYPE
EB	0.00	5.00	N	0	0	0.90	0	N	11.5	3
WB	0.00	5.00	N	0	0	0.90	0	N	11.5	3
NB	0.00	5.00	N	0	0	0.90	0	N	23.5	3
SB	0.00	0.00	N	0	0	0.90	0	N	23.5	3

SIGNAL SETTINGS — CYCLE LENGTH = 60.0

		PH-1	PH-2	PH-3	PH-4			PH-1	PH-2	PH-3	PH-4
EB	LT					NB	LT	X			
	TH		X				TH				
	RT		X				RT	X			
	PD						PD				
WB	LT	X	X			SB	LT				
	TH	X	X				TH				
	RT						RT				
	PD						PD				
GREEN		8.0	20.0	0.0	0.0	GREEN		20.0	0.0	0.0	0.0
YELLOW		4.0	4.0	0.0	0.0	YELLOW		4.0	0.0	0.0	0.0

LEVEL OF SERVICE

	LANE GRP.	V/C	G/C	DELAY	LOS	APP. DELAY	APP. LOS
EB	TR	0.385	0.358	9.3	B	9.3	B
WB	L	0.030	0.558	4.5	A	5.6	B
	T	0.552	0.558	5.7	B		
NB	L	0.890	0.358	25.7	D	29.4	D
	LR	0.974	0.358	32.7	D		

INTERSECTION: Delay = 14.3 (sec/veh) V/C = 0.717 LOS = B

IMPACT ANALYSES--OPERATIONAL PHASE

****

IDENTIFYING INFORMATION

AVERAGE RUNNING SPEED, MAJOR STREET..... 40

PEAK HOUR FACTOR..... .95

AREA POPULATION..... 150000

NAME OF THE EAST/WEST STREET..... S.W. 42ND STREET

NAME OF THE NORTH/SOUTH STREET..... RAVENSWOOD ROAD

NAME OF THE ANALYST..... RA

DATE OF THE ANALYSIS (mm/dd/yy)..... 05/10/89

TIME PERIOD ANALYZED..... 1993 PM PEAK HOUR

OTHER INFORMATION: OPERATIONAL PHASE

INTERSECTION TYPE AND CONTROL

INTERSECTION TYPE: T-INTERSECTION

MAJOR STREET DIRECTION: NORTH/SOUTH

CONTROL TYPE EASTBOUND: STOP SIGN

TRAFFIC VOLUMES

	EB	WB	NB	SB
LEFT	8	--	73	0
THRU	0	--	380	370
RIGHT	37	--	0	19

NUMBER OF LANES

	EB	WB	NB	SB
LANES	1	---	1	1

1985 HCM: SIGNALIZED INTERSECTIONS
SUMMARY REPORT

****

INTERSECTION..SR 84/S.W. 26TH TERR.(TRAM RD.)
AREA TYPE.....OTHER
ANALYST.....RA
DATE.....05/10/89
TIME.....1993 PM PEAK HOUR
COMMENT.....OPERATIONAL PHASE

	VOLUMES					GEOMETRY							
	EB	WB	NB	SB	:		EB		WB		NB		SB
LT	0	115	425	0	: T	12.0		L	12.0	L	12.0		12.0
TH	649	964	0	0	: T	12.0		T	12.0	R	12.0		12.0
RT	151	0	89	0	: T	12.0		T	12.0		12.0		12.0
RR	0	0	0	0	: TR	12.0			12.0		12.0		12.0
					:	12.0			12.0		12.0		12.0
					:	12.0			12.0		12.0		12.0

ADJUSTMENT FACTORS

	GRADE (%)	HV (%)	ADJ Y/N	PKG Nm	BUSES Nb	PHF	PEDS	PED. Y/N	BUT. min T	ARR. TYPE
EB	0.00	5.00	N	0	0	0.90	0	N	14.3	3
WB	0.00	5.00	N	0	0	0.90	0	N	14.3	3
NB	0.00	5.00	N	0	0	0.90	0	N	28.8	3
SB	0.00	0.00	N	0	0	0.90	0	N	28.8	3

SIGNAL SETTINGS — CYCLE LENGTH = 60.0

		PH-1	PH-2	PH-3	PH-4			PH-1	PH-2	PH-3	PH-4
EB	LT					NB	LT	X			
	TH		X				TH				
	RT		X				RT	X			
	PD						PD				
WB	LT	X	X			SB	LT				
	TH	X	X				TH				
	RT						RT				
	PD						PD				
GREEN		8.0	20.0	0.0	0.0	GREEN		20.0	0.0	0.0	0.0
YELLOW		4.0	4.0	0.0	0.0	YELLOW		4.0	0.0	0.0	0.0

LEVEL OF SERVICE

	LANE GRP.	V/C	G/C	DELAY	LOS	APP. DELAY	APP. LOS
EB	TR	0.410	0.350	9.6	B	9.6	B
WB	L	0.030	0.550	4.7	A	5.9	B
	T	0.583	0.550	6.1	B		
NB	L	0.809	0.350	19.2	C	16.8	C
	R	0.133	0.500	5.2	B		

INTERSECTION: Delay = 9.4 (sec/veh) V/C = 0.671 LOS = B

IDENTIFYING INFORMATION

AVERAGE RUNNING SPEED, MAJOR STREET..... 40

PEAK HOUR FACTOR..... .95

AREA POPULATION..... 150000

NAME OF THE EAST/WEST STREET..... GRIFFIN ROAD

NAME OF THE NORTH/SOUTH STREET..... S.W. 42ND AVENUE

NAME OF THE ANALYST..... RA

DATE OF THE ANALYSIS (mm/dd/yy)..... 05/10/89

TIME PERIOD ANALYZED..... 1993 PM PEAK HOUR

OTHER INFORMATION: OPERATIONAL PHASE

INTERSECTION TYPE AND CONTROL

INTERSECTION TYPE: T-INTERSECTION

MAJOR STREET DIRECTION: EAST/WEST

CONTROL TYPE SOUTHBOUND: STOP SIGN

TRAFFIC VOLUMES

	EB	WB	NB	SB
LEFT	33	0	--	28
THRU	505	735	--	0
RIGHT	0	6	--	37

NUMBER OF LANES

	EB	WB	NB	SB
LANES	2	1	---	1

	PERCENT GRADE	RIGHT TURN ANGLE	CURB RADIUS (ft) FOR RIGHT TURNS	ACCELERATION LANE FOR RIGHT TURNS
EASTBOUND	0.00	90	20	N
WESTBOUND	0.00	90	20	N
NORTHBOUND	---	---	---	---
SOUTHBOUND	0.00	90	20	N

VEHICLE COMPOSITION

	% SU TRUCKS AND RV'S	% COMBINATION VEHICLES	% MOTORCYCLES
EASTBOUND	5	0	0
WESTBOUND	5	0	0
NORTHBOUND	---	---	---
SOUTHBOUND	5	0	0

CRITICAL GAPS

		TABULAR VALUES (Table 10-2)	ADJUSTED VALUE	SIGHT DIST. ADJUSTMENT	FINAL CRITICAL GAP
MINOR RIGHTS	SB	5.90	5.90	0.00	5.90
MAJOR LEFTS	EB	5.20	5.20	0.00	5.20
MINOR LEFTS	SB	7.10	7.10	0.00	7.10

MOVEMENT	FLOW-RATE v(pcph)	POTENTIAL CAPACITY c_p (pcph)	ACTUAL MOVEMENT CAPACITY c_M (pcph)	SHARED CAPACITY c_{SH} (pcph)	RESERVE CAPACITY $c_R = c_{SH} - v$	LOS
MINOR STREET						
SB LEFT	30	115	110	> 110 > 185	> 80 > 115	E >D
RIGHT	40	378	378	> 378	> 338	B
MAJOR STREET						
EB LEFT	36	513	513	513	477	A

1985 HCM: SIGNALIZED INTERSECTIONS
SUMMARY REPORT

****

INTERSECTION..SR 84/S.W. 26TH TERR.(TRAM RD.)
AREA TYPE.....OTHER
ANALYST.....RA
DATE.....05/10/89
TIME.....1993 PM PEAK HOUR
COMMENT.....OPERATIONAL PHASE

	VOLUMES					GEOMETRY							
	EB	WB	NB	SB		EB		WB		NB		SB	
LT	0	115	425	0	T	12.0	L	12.0	L	12.0		12.0	
TH	649	964	0	0	T	12.0	T	12.0	LR	12.0		12.0	
RT	151	0	89	0	T	12.0	T	12.0		12.0		12.0	
RR	0	0	0	0	TR	12.0		12.0		12.0		12.0	
						12.0		12.0		12.0		12.0	
						12.0		12.0		12.0		12.0	

ADJUSTMENT FACTORS

	GRADE (%)	HV (%)	ADJ Y/N	PKG Nm	BUSES Nb	PHF	PEDS	PED. BUT. Y/N	PED. BUT. min T	ARR. TYPE
EB	0.00	5.00	N	0	0	0.90	0	N	11.5	3
WB	0.00	5.00	N	0	0	0.90	0	N	11.5	3
NB	0.00	5.00	N	0	0	0.90	0	N	23.5	3
SB	0.00	0.00	N	0	0	0.90	0	N	23.5	3

SIGNAL SETTINGS CYCLE LENGTH = 60.0

		PH-1	PH-2	PH-3	PH-4			PH-1	PH-2	PH-3	PH-4
EB	LT					NB	LT	X			
	TH		X				TH				
	RT		X				RT	X			
	PD						PD				
WB	LT	X	X			SB	LT				
	TH	X	X				TH				
	RT						RT				
	PD						PD				
GREEN		8.0	20.0	0.0	0.0	GREEN		20.0	0.0	0.0	0.0
YELLOW		4.0	4.0	0.0	0.0	YELLOW		4.0	0.0	0.0	0.0

LEVEL OF SERVICE

	LANE GRP.	V/C	G/C	DELAY	LOS	APP. DELAY	APP. LOS
EB	TR	0.400	0.358	9.4	B	9.4	B
WB	L	0.030	0.558	4.5	A	5.7	B
	T	0.574	0.558	5.8	B		
NB	L	0.618	0.358	13.6	B	12.0	B
	LR	0.447	0.358	9.9	B		

INTERSECTION: Delay = 8.3 (sec/veh) V/C = 0.591 LOS = B

APPENDIX 10.5.6

NOISE

10.5.6 Noise

The noise monitoring presented in Section 2.3.8.2 was performed with equipment meeting the specifications in this appendix. Prior to these measurements, preliminary surveys were performed using a Computer Engineering Limited (CEL) impulse sound level meter and analyzer (Model CEL-228) and CEL calibrator. The results of these surveys are presented in Table 10.5.6-1. These survey results were used to locate the monitoring sites presented in Section 2.3.8.2.

Table 10.5.6-2 presents the noise levels used to simulate various construction equipment. The impact analysis is presented in Section 4.6.1.

Table 10.5.6-1 Preliminary Noise Survey

Site Description	Date/Time	Noise Levels (dBA) Maximum	Minimum	Average	Median	Std. Dev.	Comments
Plant - West Interior Fence	12 May 88/ 2:52 PM	63	58	59.35	59.0	1.04	Highest due to jet landings.
Plant - Unit 5 Intake	12 May 88/ 3:12 PM	66	62	63.05	63.0	0.90	Highest due to jet landings.
Plant - Salinity Gate	12 May 88/ 3:26 PM	64	58.5	59.93	60.0	1.08	Highest due to speaker.
Plant - Oil Terminal	12 May 88/ 3:46 PM	61	56	57.74	57.5	1.26	Highest due to jet landings.
Boatarama on 441	20 Oct. 88/ 3:04 PM	70	60	65.95	66.0	2.78	Highest due to traffic.
4409 SW 35th Ave.	20 Oct. 88/ 3:18 PM	62	42	49.40	46.0	6.70	Highest due to jet landings.
SW 35th Ave. @ Griffin Rd.	20 Oct. 88/ 3:04 PM	66	52	60.30	61.0	3.93	Highest due to traffic.
Davis Isles West Corner	20 Oct. 88/ 3:46 PM	60	48	52.90	52.0	3.60	Highest due to jet landings.
Davis Isles Entrance	20 Oct. 88/ 3:54 PM	64	53	57.35	57.0	2.31	Highest due to traffic.
Aqua Isles 4702 39th Terr	20 Oct. 88/ 4:05 PM	52	46	48.35	48.0	1.65	Highest due to jet landings.
39th Ave. Across from Plant	20 Oct. 88/ 4:15 PM	63	51	53.75	53.0	3.01	Highest due to jet landings.
Hills Mobile Home Park-Entrance	20 Oct. 88/ 4:22 PM	70	52	61.05	60.0	6.16	Highest due to traffic.
SW 42nd St. @ Plant Entrance	20 Oct. 88/ 4:30 PM	60	49	52.90	52.0	3.21	Highest due to jet landings.
SW 42nd St. Gate 2B	20 Oct. 88/ 4:46 PM	58	42	47.55	45.0	5.20	Highest due to jet landings.

Table 10.5.6-2. Sound Pressure Levels of Major Construction Noise Sources at the Lauderdale Plant Site

Source	Level (dBA at 50 ft)	Octave SPL (dB)										SPL (dB)	SPL(A) (dBA)
		31.5	63	125	250	500	1000	2000	4000	8000	16000		
1	88	0	114.6	128.5	123.5	113.5	113.5	106.4	96.2	86.2	0	130.1	119.5
2	84	0	111.6	118.6	116.6	114.6	109.6	104.6	98.6	92.6	0	122.5	115.6
3	78	0	102.6	102.6	106.6	106.6	102.6	104.6	97.6	89.6	0	112.6	109.7
4	74	0	106.6	104.6	101.6	102.6	99.6	96.6	95.6	96.6	0	111.2	105.5
5	73	0	109.6	102.6	99.6	95.6	102.6	96.6	87.6	79.6	0	111.7	104.6
6	70	0	103.6	101.6	96.6	96.6	99.6	93.6	82.6	78.6	0	107.7	102.0

EQUIPMENT SPECIFICATIONS

SPECIFICATION FOR BRUEL & KJAER SOUND LEVEL CALIBRATOR

Summarized Specifications Type 4155

The 4155 satisfies the requirements for frequency response given in IEC 651 for Type 1. Nominal specifications are summarized below:

Open Circuit Sensitivity: -26 dB re 1 V/Pa, equivalent to 50 mV/Pa
Frequency Response Characteristic: Frequency ranges for flat 0°-incidence free field response (ref. 250 Hz)
6 Hz – 5 kHz: flat within ± 1 dB
4 Hz – 16 kHz: flat within ± 2 dB
Lower Limiting Frequency (–3 dB): 1 – 3 Hz (vent exposed to sound field)
Pressure Equalization Time Constant: 0.16 – 0.053 s. The cartridge is back-vented
Diaphragm Resonance Frequency: 14 kHz (90° phase shift)
Cartridge Thermal Noise: 1.2 x 10^{-6} Pa/$\sqrt{Hz}$. 14.5 dB(A). 15.5 dB(Lin)
Upper Limit of Dynamic Range: 146 dB SPL (dist. < 3% at 100 Hz). Safety limit: 160 dB (peak)
Polarized Cartridge Capacitance: 15 pF at 250 Hz with the external polarization voltage of 0 V applied
Equivalent Air Volume: 40 mm^3 at 250 Hz, 1013 mbar
Ambient Pressure Coefficient: –0.001 dB/mbar at 250 Hz, 1013 mbar
Ambient Temperature Coefficient: –0.006 dB/°C at 250 Hz between –10° and +50°C
Humidity Coefficient: 0.004 dB/%R.H. at 250 Hz, 23°C
Long Term Stability: >400 years/dB at 20°C
Diaphragm Protection: Quartz

Typical Gain with B & K Preamplifiers or input stages of Sound Level Meters

½" Microphones (app. 17 pF)	2230	2233	2614 2615	2619 Serial no. up to 751076	2619 Serial no. from 751077	2639 2645	2660 "0 dB"
G (approx.)	0.0 dB	0.0 dB	–2.2 dB	–0.4 dB	–0.2 dB	–0.05 dB	–0.1 dB

To obtain the overall correction factor, K, subtract G from the open-circuit correction factor, K_0, given on the face side of this chart. The K-factor is used when calibrating B & K Measuring Amplifiers and Analyzers which have an internal reference voltage.

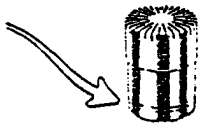
$$K = K_0 - G$$

For example, if K_0 is +0.8 dB and G is –0.2 dB (for a 4155 with a 2619 preamp.), then the correction factor is calculated as follows:

$$K = +0.8\ dB - (-0.2\ dB) = +1.0\ dB$$

Polarization: The two grooves engraved on the microphone cartridge indicate that the microphone is prepolarized. For measurements complying with calibration data on this chart the polarization circuit of the measuring system should be set to "0 V" (or grounded). See relevant B & K literature.

Caution: When mounting a prepolarized microphone on input terminals which are not designed for it, there is a risk that the charge-carrying element of the cartridge could be damaged if static electricity is stored on the person or on the measuring set-up. Prevention is easy – Either the user or the cartridge housing must always touch the preamplifier housing (or sound level meter case) before the centre terminal of the cartridge makes contact.



Dimensions:
Diameter with protecting grid: 13.2 mm (0.52")
Diameter without protecting grid: 12.7 mm (0.50")
Height with protecting grid: 17.3 mm (0.68")
Height without protecting grid: 16.2 mm (0.64")
Thread for coupler/grid mounting: 12.7 – 60 UNS
Thread for Preamp. mounting: 11.7 – 50 UNS

SPECIFICATION FOR BRUEL & KJAER MICROPHONE PREAMPLIFIER AND PREPOLARIZED CONDENSER MICROPHONE

Specifications 4230

Sound Pressure Level:
94 dB re 2 × 10^{-5} Pa (or 1 Pa)

Accuracy of SPL:
At 1013 mbar when loaded with 1,333 cm^3 (corresponding to B & K microphones with protecting grid, and their respective adaptors)
± 0,3 dB at 23°C ± 3°C (68 to 79°F)
± 0,4 dB between 10 and 40°C (50 to 104°F)
± 0,5 dB between 0 and 50°C (32 to 122°F)

Frequency:
1000 Hz ± 1,5%

Equivalent Coupler Volume:
|V| > 140 cm^3 at 23°C (73,4°F)
|V| > 70 cm^3 between 10 and 40°C (50 to 104°F)
|V| > 35 cm^3 between 0 and 50°C (32 to 122°F)

Distortion:
< 1%

Influence of Static Pressure:
± 0,05 dB/100 mbar from 500 mbar to 1100 mbar

Long Term Stability:
Better than ± 0,1 dB/year (expected for normal field use)

Microphone Types:
1" directly
1/2" with supplied adaptor

Power Supply:
Internal supply from 1 × 9 V transistor (IEC 6LF22, NEDA 1604) battery

Operation:
With a new battery the signal will last for up to one minute after contact is released

Battery Check:
As long as the signal continues for a few seconds after the contact is released the change in SPL is less than 0,05 dB

Dimensions:
(Including leather case)
Length: 115 mm (4,5")
Diameter: 44 mm (1,7")

Weight:
(Including leather case)
260 g (0,57 lb)

Accessories Included:
Adaptor for 1/2" microphones DB 0311
Leather case KE 0065
Battery 9 V transistor IEC 6LF22 (B & K order No. QB 0016)

Accessories Available:
1/2" to 1/4" Adaptor DB 0310
1/2" to 1/8" Adaptor DB 0352

SPECIFICATION FOR BRUEL & KJAER OCTAVE BAND FILTER SET

Specifications 1624 and 1625

Filter Set Type	1624 Octave	1625 Third-Octave and Octave
Frequency Range		
Selective	22 Hz to 22 kHz	18 Hz to 22 kHz (1/3 oct.), 14 Hz to 28 kHz (1/1 oct.)
Linear	Typical 5 Hz to 75 kHz (–1 dB)	Typical 3 Hz to 75 kHz (–1 dB)
Band-Pass Filters	10 active 6-pole Butterworth octave filters	31 active 6-pole Butterworth third-octave filters and 31 overlapping 1/1 oct. filters at 1/3 oct. intervals covering 11 octaves
In accordance with standard	IEC R 225–1966, DIN 45 651 and ANSI S 1.11-1966, Class II	IEC R 225–1966, DIN 45 652, DIN 45 651 and ANSI S1.11-1966, Class II & III
Centre Frequencies	31,5 Hz to 16 kHz	20 Hz to 20 kHz
Attenuation at Centre Frequency	0 dB ± 0,5 dB	0 dB ± 0,5 dB
Peak-to-valley Ripple	< 0,5 dB	< 0,5 dB
Attenuation outside Pass Band	See Fig.2 & 3, > 60 dB at 8 f_o and 1/8 f_o	See Fig.6, > 75 dB at 5 f_o and 1/5 f_o (1/3 oct.) > 60 dB at 8 f_o and 1/8 f_o (1/1 oct.)
Filter Shift	Slider switch Green lamp indicates time for filter switching when used with Level Recorder	Manual or Automatic with Level Recorder. 1/3 oct. or 1/1 Oct. steps for 1/1 oct. analysis
Remote Control	Semi automatic of Level Recorders Types 2317 and 2309 via cable AQ 0034	Automatic to/from Level Recorders Types 2317 and 2309 via cable AQ 0034
Input Impedance	10 kΩ in series with 5 μF	10 kΩ in series with 15 μF
Input Terminating Impedance	⩽ 100 Ω	⩽ 100 Ω
Input Voltage	Max. 2 V sinus (2,8 V peak)	Max. 2 V sinus (2,8 V peak)
Output Impedance	< 5 Ω in series with 15 μF	< 5 Ω in series with 2,2 μF
Output Terminating Impedance	⩾ 10 kΩ // 1 nF	⩾ 10 kΩ // 1 nF
Inherent Noise	f_o Hz — max. μV 31,5 Hz — 200 (typ. 140) 63 Hz–16 kHz — 150 (typ. 70) Lin — 250 (typ. 120)	f_o Hz (oct. or 1/3 oct.) — max. μV 20 Hz–40 kHz — 250 (typ. 170) 50 Hz–10 kHz — 150 (typ. 80) 12,5 kHz–20 kHz — 200 (typ.110) Lin — 250 (typ. 120)
Magnetic Sensitivity (50 Hz)	Approximately 1 mV output for 100 A/m field strength	
Operating Temperature	–10 to + 50°C (+ 14 to +122°F)	
Storage Temperature	–20 to +50°C (–4 to +122°F) Batteries Removed	
Influence of Temperature on Attenuation	< 0,5 dB (–10 to +50°C)	
Influence of Humidity on Attenuation	< 0,5 dB for 0 to 90% relative humidity at ⩽ 40°C without condensation	
Batteries	4 × 1,5 V IEC Type LR6 (QB 0013). Batteries used as extra supply for SLM	
Dimensions	Length 105 mm (4,1 in) – Width 85 mm (3,3 in) – Height 47 mm (1,8 in)	
Weight	450 g (1 lb) including batteries	
Accessories Included	4 Alkaline batteries — QB 0013 1 Plug — JP 0802	
Accessories Available	1,5 m control cable — AQ 0034 Mains Power Supply and Charger — ZG 0254	

T00517GB2

SPECIFICATION FOR BRUEL & KJAER
PRECISION INTEGRATING SOUND LEVEL METER

Specifications 2230

MEASURING RANGE:

FSD[1]	Measuring Range: Lower limit for S/N ratio >5 dB (A-weighting)	Measuring Range: Max. peak level[3]	Measuring Range: Upper limit for signals of crest factor =10 (20 dB)[3]
70	24	83	63
80	24	93	73
90	30	103	83
100	40	113	93
110	50	123	103
120	60	133	113
130[2]	70	143	123
140[2]	80	153	133

[1] FSD on quasi analogue display

[2] Only with attenuator ZF 0020 employed

[3] Values may diverge slightly from nominal value depending on microphone K_0 factor

FREQUENCY RESPONSE:
See Figs.3 and 4

FREQUENCY WEIGHTING:
A, C weighting to IEC 651 Type 1
Linear (20 Hz -20 kHz)
All-pass (10 Hz -50 kHz)

DETECTOR:
Characteristics: RMS, peak
Linearity range: 70 dB
Pulse range: 73 dB
Crest factor capability: 13 dB at FSD

TIME WEIGHTING CHARACTERISTICS:
"I": to IEC 651 Type 1
"F": to IEC 651 Type 1
"S": to IEC 651 Type 1
"Peak": rise time <50 μs
Max. Hold decay rate: 0 dB/s (digital)

L_{eq} RESPONSE TIME FOR CONSTANT INPUT SIGNAL:
1 s after reset

MAXIMUM MEASUREMENT PERIOD:
Only limited by battery life

DISPLAY:
Digital: 4 digits 7 segments, liquid crystal, 8 mm high, resolution 0,1 dB
Quasi-analogue: 60 dB scale with 2 dB resolution for monitoring current SPL

Additional functions:
Overload occurring: †
Overload has occurred: *
Battery near low level: BAT flashing
Battery low level: BAT (flash.) † (non-reset.)
Illegal setting: †

AC OUTPUT:
1 V RMS for full scale, output impedance ≤120 Ω, short circuit protected, mini-jack socket

DC OUTPUT:
3 V for full scale, 0 V bottom scale, 50 mV/dB, output impedance ≤500 Ω, short circuit protected, mini-jack socket

RESET FUNCTION:
Automatic reset all occurs when changing FSD setting.
Reset all: Max./min. detectors, L_{eq}, $L_{EA,T}$ and overload detector are reset
Reset max./min.: Only max./min detectors are reset

MICROPHONE:
Type: ½ inch B & K Prepolarized Condenser Microphone Type 4155
Sensitivity: 50 mV/Pa
Capacitance: 15 pF
Windscreen effect: <0,9 dB up to 10 kHz

CALIBRATION:
Acoustical: With Sound Level Calibrator Type 4230 or Pistonphone Type 4220 by potentiometer adjustment
Electrical: With internal reference source by potentiometer adjustment

REFERENCE CONDITIONS FOR ACOUSTICAL CALIBRATION WITH TYPE 4230:
Type of Sound Field: Free
Reference Incidence Direction: Perpendicular to microphone diaphragm
Reference SPL: 94 dB (re 20 μPa)
Reference Frequency: 1 kHz
Reference Temperature: 20°C
Reference Measuring Range: 110 dB FSD

WARM-UP TIME:
<5 s for 0,5 dB; <10 s for 0,1 dB

EFFECT OF HUMIDITY (AT 40°C AND 1000 Hz):
<0,5 dB for 30%<RH<90%

EFFECT OF TEMPERATURE:
Microphone: -0,006 dB/°C typically
Complete instrument:
<0,5 dB -10 to +50°C
Operating range: -10 to +50°C (+14 to 122°F)
Storage without batteries: -20 to +70°C (-4 to 158°F)

EFFECT OF MAGNETIC FIELD:
80 A/m (1 Ørsted) at 50 Hz gives:
<25 dB (A) or <44 dB (Lin)

VIBRATION SENSITIVITY: 72 dB max. at 40 Hz and 1 ms^{-2}.

BATTERIES:
Type: Four 1,5 V Alkaline cells IEC type LR 6 (B&K order No. QB 0013)
Life: approx. 8 hours

OVERALL DIMENSIONS AND WEIGHT:
370 × 85 × 47 mm (14,7 × 3,3 × 1,8 in)
860 g (1,9 lb) with batteries

ACCESSORIES INCLUDED:
Half-inch Prepolarized Condenser Microphone ..... Type 4155
2,5 mm mini-jack plug (×2) ..... JP 0213
Windscreen ..... UA 0237
Input Adaptor ..... JJ 2614
Screwdriver ..... QA 0001
Cells (×4) ..... QB 0013
20 dB Attenuator ..... ZF 0020

ACCESSORIES AVAILABLE:
Carrying case ..... KE 0226
Tripod ..... UA 0801
Sound Level Calibrator ..... Type 4230
Level Recorder Cable ..... AO 0173
3 m Microphone Extension cable ..... AO 0134
Mains Power Supply and Charger ..... ZG 0254

APPENDIX 10.6

NEED PETITION

AND

ORDER APPROVING NEED DETERMINATION AND DENYING MOTIONS FOR RECONSIDERATION

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

In Re: Petition of Florida Power & Light Company for Determination of Need for Proposed Electrical Power Plant and Related Facilities -- Lauderdale Repowering Project	)	Docket No. 890973-EI
	)	Filed: July 25, 1989

PETITION TO DETERMINE NEED FOR ELECTRICAL POWER PLANT -- LAUDERDALE REPOWERING PROJECT

Florida Power & Light Company ("FPL"), by and through its undersigned attorneys, hereby petitions the Florida Public Service Commission ("Commission") pursuant to Section 403.519, F.S., and Rule 25-22.081, F.A.C., to determine the need for the proposed electrical power plant and related facilities described herein, and to file its order making that determination with the Department of Environmental Regulation ("DER") pursuant to Section 403.507(1)(b), F.S. In support thereof, FPL states:

1. FPL's full name and business address is:

Florida Power & Light Company
P.O. Box 029100
9250 W. Flagler St.
Miami, Florida 33102-9100

2. The name and address of FPL's representative to receive communications regarding this docket is:

Richard D. Melson
Cheryl G. Stuart
Hopping Boyd Green & Sams
P.O. Box 6526
Tallahassee, Florida 32314

with a copy to:

Roberto R. Denis
Florida Power & Light Company
P.O. Box 029100
9250 W. Flagler St.
Miami, Florida 33102-9100

3. FPL is an investor owned electric utility that serves approximately 3,000,000 customers in thirty-five Florida counties.

4. FPL has determined a need to construct approximately 2,000 MW of new generating capacity on its system between 1993 and 1997. This capacity is needed to maintain adequate system reliability in the face of increasing demand for electrical energy, coupled with declining power purchases from the Southern Companies. This 2,000 MW reflects the need for new generating capacity that remains after implementation of all reasonably available, cost-effective alternatives to new construction. These alternatives, which total over 3,000 MW, include: incremental conservation (139 MW); load management and interruptible load (998 MW); firm purchases from qualifying facilities (1,016 MW, of which 505 MW are currently under contract); and power purchases from the Southern Companies (900 MW).

5. The first step in FPL's plan for meeting this 2,000 MW new capacity need is the repowering of FPL's existing Lauderdale Units No. 4 and No. 5, with the repowered units to be in commercial operation by December 31, 1992. Each of the units to be repowered is a 150 MW

class oil/gas fired steam unit with an existing net summer capacity of 137 MW. The repowering will convert these units to combined cycle operation by the addition of two new advanced combustion turbines (CTs) to each unit. These CTs will be fired primarily on natural gas with distillate oil as an alternate fuel, and the capability of future conversion to burn coal gas as an alternate fuel. The exhaust from the CTs will be captured in new heat recovery steam generators that will be used to drive the existing steam turbines. After repowering, each 400 MW class Lauderdale Unit will have a net summer capacity of 365 MW, or an increase in net capacity of 228 MW per unit (456 MW total).1/ These units and their associated facilities (collectively, the "Lauderdale Repowering Project") are subject to the Florida Electrical Power Plant Siting Act (the "Act"), Sections 403.501 to 403.519, F.S.

6. The Lauderdale Repowering Project is one part of FPL's overall power supply plan for the 1993 to 1997 time frame. FPL additionally proposes to construct four new 400 MW class units -- two 385 MW combined cycle units fired on natural gas (with future capability to use coal gas as an alternate fuel) and an integrated coal gasification combined cycle plant incorporating two 384 MW combined cycle units --

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1/ This MW estimate is conservative, and actual capacity could increase as much as 10-15% based on final design.

at its Martin site between 1994 and 1996 (the "Martin Expansion Project"). A separate petition to determine the need for the Martin Expansion Project is being filed simultaneously herewith. By separate motion, FPL will be requesting a consolidated hearing on the two need petitions.

7. Concurrently with this filing, FPL has also issued a solicitation that seeks proposals to provide up to 800 MW of non-FPL owned or constructed electric energy and capacity to meet part of FPL's additional capacity need in the 1994 to 1997 time frame. To the extent that the solicitation process produces reliable, cost-effective alternatives, the effect could be to delay completion of some portion of the Martin Expansion Project. Because the Lauderdale Repowering Project offers several unique advantages that make it ideal for FPL's first capacity addition, the solicitation process is not an alternative to that project. These advantages include:

(a) The Lauderdale Repowering site is strategically located close to FPL's major load center, which enhances system reliability.

(b) In addition to providing new capacity, the Lauderdale Repowering Project will convert existing steam units to combined cycle operation, thereby increasing the efficiency of the existing generation.

(c) The project is at a developed site, which minimizes land use and environmental concerns and enables the use of existing cooling facilities.

(d) No additional off-site transmission lines will be required to integrate the repowered plant into the electric grid.

(e) FPL has sufficient natural gas supplies and gas transportation capacity under contract to supply the fuel needs of the repowered units.

(f) The Lauderdale Repowering Project has a relatively short lead time, which enables it to be in-service to meet the 1993 capacity need.

8. Pursuant to the Act, including Section 403.519, F.S., and to Rules 25-22.080 to 25-22.081, F.A.C., the Commission has jurisdiction to determine the need for the Lauderdale Repowering Project, applying the standards set forth in Section 403.519, F.S.

9. As authorized by Rule 25-22.080(1), F.A.C., FPL has elected to commence this proceeding for determination of need prior to the filing with DER of an application for site certification of the Lauderdale Repowering Project. The filing with DER is currently scheduled for early December, 1989.

10. The information supporting this petition is contained in two documents titled "Petition to Determine Need for Electrical Power Plant 1993-1996" and "Petition to Determine Need for Electrical Power Plant 1993-1996 Appendices" (collectively, the "Need Study"), which are attached as Exhibits 1 and 2 to this petition, and

incorporated herein by reference. The Need Study contains FPL's analysis of the need for the Lauderdale Repowering Project and includes the information required by Rule 25-22.081, F.A.C.

11. The accompanying information demonstrates that the Lauderdale Repowering Project is the most cost effective alternative available to meet FPL's 1993 capacity requirements, taking into account the need for electric system reliability and integrity, the need for adequate reasonable cost electricity, and other relevant matters.

12. Because of the overall general public interest and the impact of this proceeding, including the magnitude of the proposed facility and the effect of the proceeding on the economy, public health, and safety of the service area involved, FPL requests that the hearing in this matter be held by the full Commission, as authorized by Section 350.01(6), F.S. and Rule 25-22.0355(4), F.A.C., and that it be conducted as a formal hearing pursuant to Section 120.57(1), F.S.

13. Since this Petition is being filed several months in advance of filing the site certification application with DER, FPL is willing to agree to a waiver of the provisions of Rule 25-22.080(2) which specify that a hearing shall be held within 90 days of receipt of a need determination petition, provided that the hearing is held no later than March 31, 1990.

WHEREFORE, FPL respectfully requests that:

(1) pursuant to Rule 25-22.080(2), F.A.C., the Commission within seven days set a date for a hearing on this petition not later than March 31, 1990;

(2) the hearing in this matter be assigned to the full Commission under Section 350.01(6), F.S., and be held as a formal hearing pursuant to Section 120.57(1), F.A.C.;

(3) the Commission give notice of the commencement of the proceeding as required by Rule 25-22.080(3), F.A.C.;

(4) the Commission submit a preliminary report to DER pursuant to Section 403.507(1)(b), F.S. no later than 60 days after the filing by FPL with DER of a site certification application; and

(5) the Commission determine that there is a need for the Lauderdale Repowering Project described in this petition, and file its order making such determination with the DER pursuant to Section 403.507(1)(b), F.S.

RESPECTFULLY SUBMITTED this 25th day of July, 1989.

HOPPING BOYD GREEN & SAMS

By: Richard D. Melson

Richard D. Melson
Cheryl G. Stuart
Post Office Box 6526
Tallahassee, Florida 32314
(904) 222-7500

Attorneys for
Florida Power & Light Company

Rev. 1

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

In re: Petition of Florida Power and Light Company to determine need for electrical power plant - Lauderdale repowering.	)	DOCKET NO. 890973-EI
	)	ORDER NO. 23079
	)	ISSUED: 06/15/90

The following Commissioners participated in the disposition of this matter:

MICHAEL McK. WILSON, Chairman
THOMAS M. BEARD*
BETTY EASLEY
GERALD L. GUNTER

*Commissioner Beard did not participate in the disposition of the Motion for Reconsideration filed by Broward County or the Petition for Clarification and/or Reconsideration filed by Florida Power and Light Company.

ORDER APPROVING NEED DETERMINATION
and DENYING MOTIONS FOR RECONSIDERATION

BY THE COMMISSION:

On July 25, 1989, Florida Power and Light Company (FPL) filed its petition for a need determination for the repowering of its Ft. Lauderdale plant simultaneous with the filing of a motion to consolidate this need determination petition with FPL's need determination petition for the construction of Martin Units 3, 4, 5, and 6 (Docket No. 890974-EI). Order No. 22267, issued on December 5, 1989, partially denied FPL's request for consolidation of the two dockets and limited the factual findings in this proceeding to those associated with the Lauderdale repowering and Martin Units 3 and 4. Although evidence was presented on Martin Units 5 and 6, it was for informational purposes only, per Order No. 22267 at 3, 5.

Direct testimony was filed by FPL on December 8, 1989; by Hadson Development Corporation, Charles Bronson, and the Office of Public Counsel (OPC) on January 29, 1990; and by Broward County (Broward) on February 7, 1990. Prehearing statements were filed by Broward, OPC, Staff, Charles Bronson, Hadson Development Corporation and FPL on February 12, 1990. Rebuttal testimony was filed by FPL and Broward on February 16, 1990.

DOCUMENT NUMBER-DATE
05314 JUN 15 1990
FPSC-RECORDS/REPORTING

At the prehearing conference in this docket held on February 23, 1990, Commissioner Easley granted joint intervention status to Hadson Development Corporation and Charles Bronson (Bronson-Hadson) until such time as their interests became noncompatible. The issues and positions enumerated in the draft prehearing order were also reviewed at the prehearing conference and additional issues were considered. Commissioner Easley ruled that certain of Broward's and Bronson-Hadson's issues would be excluded from consideration in this proceeding. At the prehearing conference, at the request of FPL and Bronson-Hadson, all parties agreed to an expedited schedule for the consideration by the full panel of the prehearing officer's ruling. This expedited schedule was approved by Chairman Wilson on Friday, February 23, 1990.

Pursuant to that schedule, Broward and Bronson-Hadson filed their written motions for reconsideration of the ruling on Monday, February 26, 1990; the response of FPL opposing reversal of the ruling was filed on Wednesday, February 28, 1990; and Staff's recommendation was filed on Friday, March 2, 1990. Simultaneous with the filing of the motions for reconsideration, Broward and Bronson-Hadson also filed requests for oral argument before the full panel. Pursuant to Commission procedure, Commissioner Easley denied that request on Thursday, March 2, 1990, in Order No. 22631. When Broward was notified of this ruling, counsel indicated that Broward wished to seek full panel review of this decision also.

At its March 6, 1990 agenda conference, the full Commission voted to affirm Commissioner's Easley's ruling denying oral argument and excluding certain issues from consideration in this docket. [Order No. 22826, issued On April 16, 1990.] The hearing in this docket was held on March 21-23, 1990 with testimony offered on behalf of FPL, Broward, Bronson-Hadson and OPC. Briefs were filed by the parties on April 6, 1990.

In addition to its nonconfidential brief filed on April 6, 1990, Broward also filed Appendix C to its brief. Appendix C contains references to material which was the subject of a pending request for confidentiality on April 6, 1990. Subsequent to the filing of Appendix C, Commissioner Easley, as prehearing officer, ruled that the materials referred to in Appendix C are not confidential. [Order No.

22850, issued on April 23, 1990.] Likewise, Commissioner Easley ruled on the confidentiality of the other documents contained in Composite Exhibit 33 entered into the record in this proceeding. [Order No. 22851, issued on April 23, 1990.] All of the documents, with the exception of portions of the Strategic Energy Information, Tropicana Products, Inc., Florida Power and Light Study, dated June 6, 1988, were found by Commissioner Easley to be nonconfidential. [Order No. 22851 at 2- 5.]

The Commission voted on FPL's need determination applications in this docket and Docket No. 890974-EI at a properly noticed special agenda conference held on April 23, 1990. Pursuant to Commission rules, FPL and Broward filed timely motions for reconsideration/clarification on April 30, 1990. Responses to the motions for reconsideration were filed on May 2, 1990 by FPL, Broward and Bronson-Hadson. The Staff recommendation addressing the motions for reconsideration was filed on May 4, 1990 and the matter was considered by the full Commission at its regularly scheduled agenda conference on May 15, 1990. This order will reflect the Commission's initial vote on April 23, and its May 15 vote on the motions for reconsideration.

NEED

In its petition of July 25, 1989, FPL requested that it be allowed to repower its existing Lauderdale Units 4 and 5 with an in-service date of December 31, 1992. Each of the units to be repowered is a 150 MW class oil/gas fired steam unit with an existing net summer capacity of 137 MW. The repowering will convert these units to combined cycle operation by the addition of two new advanced combustion turbines (CTs) to each unit. These CTs will be fired primarily by natural gas with distillate oil as an alternate fuel, and will have the capability of future conversion to burn coal gas. The exhaust from the CTs will be captured in new heat recovery steam generators that will be used to drive the existing steam turbines. After repowering, each unit will have a net summer capacity of 423 MW, or an increase in net capacity of 286 MW per unit (572 MW total).

Reliability and integrity

FPL's 15% summer reserve margin and 0.1 day/year loss of load probability (LOLP) are satisfactory reliability criterion given their individual system configuration and interconnections with other utilities. LOLP is the criteria driving the need for power in the 1993 timeframe, and appropriately so, as it is calculated on peak loads for all twelve months. Thus, it reflects the adequacy of capacity to serve both summer and winter peak needs. That being the case, we find that the reliability criterion used by FPL to determine its need for 572 MW of capacity in 1993 to be reasonable for planning purposes.

FPL's load forecast is based on historical demand and customer growth in their service territory. FPL's projections take into account the uncertainties of future economic conditions and population estimates through the use of high, low and mid-band forecasts of energy and demand. Thus, we find that the mid-band load forecast used by FPL to determine its need for the Lauderdale repowering is adequate for planning purposes.

FPL's Base Plan, set forth in this docket and the companion need determination docket, Docket 890974-EI, proposes 572 MW of capacity installation by 1993 (the Lauderdale repowering); 770 MW of new capacity construction (Martin Units 3 and 4); and over 3,000 MW of non-construction alternatives, including load management, interruptible load, purchases from QFs, Southern Company purchases, and additional conservation. No party to this docket disputes the fact that FPL has a need for capacity in the 1993 to 1995 timeframe. The only disagreement is how that need is most economically filled.

A one-year delay in the in-service date of the Lauderdale repowering would cause FPL's 1993 LOLP to fall to 0.25, a level significantly above the acceptable reliability criteria of 0.1. An LOLP of 0.25 would represent an unacceptable reliability risk to FPL's customers. Thus, we find that FPL does exhibit a need for additional capacity in 1993 and would suffer an unacceptable level of risk should the Lauderdale repowering not be approved.

Witness Gillette testified on behalf of the Florida Electric Power Coordinating Group (FCG) that Peninsular Florida has a need for approximately 3,015 MW of new generating capacity in the 1992-1995 timeframe, comprised of 2,640 MW of combined cycle capacity and 375 MW of combustion turbine capacity. FPL's 1993 need for the Lauderdale repowering is consistent with Peninsular Florida generation needs. Based on the facts stated above, we find that the proposed Lauderdale repowering would provide for electric system reliability and integrity to both FPL and Peninsular Florida.

Adequate Electricity at Reasonable Cost

FPL's Base Plan, which includes the subject units, Martin Units 3 and 4, Martin Units 5 and 6, and over 3,000 MW of non-construction alternatives, shows the best present value of revenue requirements of any plan examined using FPL's PROSCREEN analysis. FPL's Base Case is also the optimum plan when analyzed using methods similar to those used in the last annual planning hearing. That is, the Lauderdale repowering followed by Martin Units 3 and 4 remains the best combination of generating additions for 1993-1995, even if Martin Units 5 and 6 are removed from the Base Plan for purposes of analysis.

The estimated total installed cost of the Lauderdale repowering is $450.6 million, or $788/incremental KW. On-site transmission facilities are estimated at an additional $6.5 million. The total project cost is $457.1 million. Because repowering involves the replacement of an existing oil/gas fired boiler with heat recovery steam generators that utilize waste heat from the new combustion turbine units to produce steam, FPL obtains a 45% increase in efficiency from repowering, in addition to the incremental capacity represented by the new combustion turbine.

Both Broward and Bronson-Hadson argue that the units' reliance on natural gas and oil causes them to be subject to fuel supply disruption. The record indicates that FPL has firm gas supply and transportation contracts in place to provide adequate fuel for the units. FPL also has the ability to buy interruptible gas from the pipeline. Thus, we find, based on the record before us, that there is no significant risk of fuel interruption.

Broward further argues that FPL should be required to immediately install coal gasification facilities at the proposed Lauderdale units. There is no evidence in the record of the cost of Broward's proposal. FPL's Base Plan is modeled with gasification facilities being constructed in conjunction with the installation of Martin Units 5 and 6. When coal gasification is modeled in FPL's generation expansion plan at an earlier date, the results are not an optimal least-cost generation expansion plan for FPL or Peninsular Florida. For this reason, given current projections of fuel availability and price, we find that the proposed Lauderdale repowering will provide adequate electricity to FPL and Peninsular Florida at a reasonable cost.

FPL's fuel forecasts are consistent with other contemporaneous fuel forecasts. The 30-year scenario analysis reflects the relationship among crude, distillate and residual oils, natural gas, and coal under assumed conditions in the energy markets. The most-likely fuel forecast used by FPL in its Present Value Revenue Requirement (PVRR) analysis shows the expected differential between coal prices and the price of natural gas and oil. It also accounts for the termination of FPL's firm gas supply contracts in 2002.

We note, however, that the best fuel forecasts are only that: educated estimates of future market conditions. And, we observe that the only thing which is absolutely predictable in this area is that no matter who does it or how carefully it is done, the forecast will be incorrect. It is with this caveat that we make the finding that FPL's fuel forecast is reasonably adequate for planning purposes based upon the record developed at the hearing in this docket.

FPL has entered into 15-year firm gas supply and transportation contracts with Citrus Trading Corporation and Florida Gas Transmission (FGT), respectively, to provide 327 million cubic feet (mcf)/day annually to FPL's system. This quantity of gas is sufficient to fuel the repowered Lauderdale units and Martin Units 3 and 4. After these contracts terminate, FPL anticipates that similar quantities of gas will be available on a firm or interruptible basis.

The repowered Lauderdale units and Martin Units 3 and 4 will burn 292 mcf/day at 100% capacity (net summer capability). Since the units will not run at 100% capacity

factor, their actual burn will be somewhat less. Broward argues that these units will consume the bulk of FPL's natural gas supplies, causing existing units to rely on oil as their primary fuel. This is true. FPL will use the available supplies of natural gas in its most efficient units, including repowered Lauderdale and Martin 3 and 4. Other existing units, formerly run primarily on natural gas, will then burn oil.

Nonetheless, the projected oil burn on FPL's system in 1999 will remain less than 1980-81 levels and below FPL's share of the Florida Energy and Efficiency Act (FEECA) oil use reduction goals. These oil consumption levels assume the addition of coal-gas fired capacity after 1996; increased performance of Turkey Point nuclear units; and more efficient fuel use in the repowered Lauderdale and Martin 3 and 4 units.

An upgraded gas lateral is being constructed by FGT at the Lauderdale site. This is being done independently of the repowering project, but will allow all gas turbines at the site to operate simultaneously without unacceptable drops in gas pressure. The existing Everglades pipelines will continue to provide distillate oil for backup fuel. As with the fuel forecasts, however, our experience in this area has been that fuel availability is subject to rapid change when there is a substantial change in market conditions. However, based on the testimony in this proceeding, we find that adequate assurances have been provided regarding the availability of fuel to serve FPL's needs at a reasonable cost.

Through the year 2000, FPL's gas usage is projected to remain constant; oil usage is expected to decline slightly; and with the addition of coal-gas fired capacity after 1996, coal usage will increase significantly. When purchases from Southern and JEA are included, over 50% of FPL's energy requirements will come from coal and nuclear generation, with the remainder from natural gas and oil. This configuration of fuel usage, assuming that fuel is available in the quantities FPL projects, provides adequate fuel diversity for FPL's system.

Broward argues that the Lauderdale repowering and Martin 3 and 4 rely on natural gas which is not stable as to price or availability. As discussed above, FPL has contracts in place for firm gas supply and transportation. Barring a breach of the FGT pipeline into the state or some Presidentially-declared emergency, availability and price are

assured under such an arrangement. Further, FPL's planned addition of gasified coal units (IGCC's) to its system after 1996 allows the flexibility to retrofit repowered Lauderdale and Martin 3 and 4 to burn gasified coal. This ensures fuel availability for those units after the firm gas contracts terminate.

Based on the record, we conclude that FPL will have adequate supplies of natural gas to operate its units efficiently. That being the case, we find that with the addition of the proposed Lauderdale units FPL will also have adequate fuel diversity on its system.

With regard to fuel diversity on the Peninsular Florida system, the Lauderdale repowering will be the first such project in the state and the first use of advanced combined cycle technology. As such, it will add to Florida's generation technology base and industry operational experience. Thus, we find that the proposed Lauderdale repowering will also provide for adequate fuel diversity for Peninsular Florida.

Cost-Effective Alternative

As discussed above, FPL's Base Plan includes 572 MW of capacity installation by 1993 (the Lauderdale repowering); 770 MW of new capacity construction (Martin Units 3 and 4); and over 3,000 MW of non-construction alternatives, including load management, interruptible load, purchases from QFs, Southern Company purchases, and additional conservation. This plan is designed to meet FPL's projected load growth of approximately 350 MW per year in the 1990's.

The ongoing Request for Proposals (RFP) process seeks 800 MW of capacity to be supplied in the 1994 to 1997 time period, preferably in 1996. If this is successful, the most likely effect on FPL's Base Plan will be to delay the proposed Martin Units 5 and 6 in-service date (1996) for approximately two years.

The analysis of the Base Plan shows that, over 25- and 30-year planning horizons, the Base Plan has the best economics of any expansion plan studied. FPL's choice of combined cycle technology also allows some scheduling flexibility should load growth be faster or slower than forecast. For example, the

in-service date of Martin 4 and/or the combined cycle portion of Martin 5 and 6 can be accelerated by one year as required to meet changing assumptions regarding load or non-construction alternatives. Likewise, the units can be delayed as required. The Base Plan also has the flexibility to support substitution of coal gas for natural gas as changes in fuel prices warrant.

Broward argues that "increased emissions from FPL's planned units, if not adequately controlled..." (emphasis added) may affect the construction of additional generating capacity in FPL's load center. We expect that the Florida Department of Environmental Regulation (DER) will determine adequate levels of emission control and require FPL to meet these emission control requirements for both new and existing units. Nonetheless, FPL's Base Plan analysis takes such considerations into account. The proposed IGCC units, for example, have lower levels of pollutant emissions and use less water than pulverized coal units.
The Lauderdale repowering itself, FPL's chosen generating technology for 1993, represents two "firsts" for the utility. It will be the first repowering of an existing unit undertaken by FPL, and its first use of advanced combined cycle units.

FPL chose the Lauderdale plant after evaluating environmental criteria and site-specific costs relating to fuel supply, cooling system design, and transmission and site development. That evaluation showed that Lauderdale, Port Everglades, and Turkey Point were essentially equally appropriate for repowering from environmental and cost bases. Lauderdale became the candidate site because of its proximity to FPL's load center; its access to natural gas; its ease of integration into the transmission grid; and the existing units' relatively small size. The latter reduces the number of new combustion turbines required to fully replace the existing boiler, thereby somewhat simplifying this first effort at repowering.

Broward has argued that the Lauderdale repowering represents undue technical risks to FPL and its ratepayers. We note that while this is the first time FPL will repower a unit, such repowerings have been successfully completed by other electric utilities. Further, FPL's Witness Fries has testified that reuse of the existing steam turbine generator should have no effect on the reliability of the repowered plant. In our opinion, the greatest impact of a successful repowering will be

the demonstration that FPL, and other utilities in the state, can place additional efficient generating capacity at existing plant sites. This factor will become increasingly important as continued population growth and concomitant land development make siting power plants more and more difficult. In this light, the Lauderdale repowering, brought on-line on-time, will provide substantial long-term benefits to FPL and its ratepayers.

The first use of advanced combined cycle technology should present no undue technical risks. Advanced combined cycles incorporate advanced combustion turbine units (CTs). These CTs differ from conventional CTs principally in their higher firing temperatures and improved heat rates. Witness Fries testified that recently-completed full load tests of these units show no unusual problems. In addition, the advanced CT manufacturer is providing performance guarantees backed by substantial liquidated damages provisions.

In light of the uncertainties, environmental, economic, and demographic, facing FPL and the electric industry in general, we find that the record shows that the Lauderdale repowering is the appropriate generating alternative for supplying capacity to FPL in 1993. We further find that, as discussed above, the proposed repowering is reasonably consistent with the capacity needs of Peninsular Florida.

FPL has identified the technical characteristics of the repowered units and provided a detailed cost estimate for the project. At hearing, FPL corrected that estimate to remove the $17.4 million cost associated with the natural gas lateral upgrade being constructed at the Lauderdale site independent of this project. Dismantlement costs for the existing boiler and other plant components have also been included in the project estimate.

Information on the undepreciated balance of Lauderdale Units 4 and 5, in addition to capital and maintenance costs incurred since the last Commission-approved depreciation study (1985), has been presented. While we have questions regarding the treatment of certain costs, we do not believe there will be significant stranded investment associated with any undepreciated balances accruing to Lauderdale Units 4 and 5 by the January 1, 1993 repowering in-service date. Further, it is our intention to address in detail any needed adjustments to

FPL's depreciation study in Docket No. 900164-EI. The record developed at hearing also shows that FPL has the financial capability to finance construction of the proposed units under any reasonable set of economic assumptions.

Broward argues that FPL has failed to apprise the Commission of the full cost of environmental controls for the project and costs associated with the new technology of advanced combined cycle units. Having reviewed the record before us, we find that FPL has provided sufficient information on the site, design and engineering characteristics of the Lauderdale repowering to enable us to evaluate its proposal.

FPL's Base Plan includes 911 MW of purchased power from the Southern Company on its existing Unit Power Sales (UPS) contracts and 374 MW of purchases from JEA's share of the St. John's River Power Park unit. In addition, FPL presented testimony that it contacted every major utility with which it was interconnected to inquire about the availability of power in the amount and at the times needed. Testimony was given at the hearing that the Southern Company was among those so contacted in 1988. We note that on January 5, 1990 the Southern Company responded to FPL's RFP with an offer to provide 848 MW of capacity from its existing Scherer Unit 4 coal plant subject to the rights of first refusal of other existing UPS contract customers starting January 1, 1994. [Exhibit No. 45 at page 9.] With that fact in mind, we qualify our finding that FPL has adequately pursued the purchase of existing capacity from other utilities to fill its capacity needs as of 1988.

In addition to pursuing the purchase of existing capacity from other utilities to meet its needs, FPL is also required to explore and evaluate the availability of capacity from qualifying facilities (QFs) and non-utility generators (independent power producers). We conclude, based on this record, that FPL has failed to adequately encourage cogeneration and small power production and thus to adequately pursue this option to meet its present capacity needs.

Based upon the record developed in this proceeding, it appears that FPL's policies treat QF power as a last-choice option, despite its duty under Rule 25-17.001(3)(d), Florida Administrative Code, to "aggressively" seek to integrate QF capacity into its system where cost-effective.

FPL's approach as outlined in its Strategic Energy Business Study is to: promote energy sales [Exhibit 30 at 24-55], "facilitate" solid waste generation, and "compete" with self-generation [Exhibit 30 at 13]. Self-generation is described as a major "threat" to FPL [Exhibit 31 at 4, 13, 15]. The only mention of deferring generation is through expansion of load management. [Exhibit 31 at 27] Noticeably absent is any concept that conservation of energy is a desirable goal or that QF capacity in any form should be encouraged so as to defer generating capacity.

Exhibit 42 indicates that FPL requested bids for approximately 800 MW of capacity in the timeframe 1994-1996; it received bids for 34 projects with a total of 10,793 MW over that same time period. As the response to FPL's recent RFP demonstrates, substantial amounts of viable non-utility capacity are available to a receptive utility.

Of concern also is the testimony of Broward's Witness Henderson that FPL made negotiations so difficult that Broward was forced to accept the current standard offer in order to sell the capacity from its solid waste facilities. And, even after tendering the standard offer, Broward had to petition the Commission to enforce FPL's acceptance of that standard offer. [T. 608]

The conclusion which we draw from this record is that FPL has placed itself in the position of having to build capacity which it may have been able to avoid had it more aggressively pursued QF capacity on its system.

Broward has argued that, in light of the facts brought out during this proceeding, we should require FPL to file a cogeneration development plan in its conservation/cogeneration docket, Docket 900091-EG, within 90 days of the date of the final order in this docket. Having reviewed Order No. 22176, issued in Docket No. 890737-PU, we find this to be unnecessary. Order No. 22176 states, in part:

> Each utility shall submit a program for attracting qualifying facilities, including its yearly estimates of nontraditional generation over a ten-year planning horizon.

Order No. 22176 at 5.

Should FPL or any other utility subject to FEECA not provide such a program, the Commission has the jurisdiction to propose a program for them. However, the utility must be given an opportunity to do so first. For these reasons, we find that Docket No. 900091-EG is the appropriate docket to address this issue and we reject Broward's request.

This is not to say, however, that we do not consider FPL's treatment of cogenerators to be an area of much concern. We will be looking in greater detail at FPL's treatment of cogeneration and cogenerators not only in Docket No. 900091-EG as discussed above, but also in FPL's rate case docket, Docket No. 900038-EI, and in our review of cogeneration pricing, Docket No. 891049-EU.

As discussed in this order, based on the record before us, we have found that FPL has not aggressively pursued the acquisition of power from qualifying facilities and promoted conservation in its service territory. These activities might have delayed the in-service dates of the proposed Lauderdale repowering. The fact is, however, that FPL now has an undisputed need for power in 1993, 1994, and 1995. While the ongoing RFP process may provide capacity as early as 1995, that process will not effect the need for the units at issue here. Under these circumstances and for the reasons discussed above, we find that the Lauderdale repowering is FPL's and Peninsular Florida's most cost-effective alternative to provide power to its customers in 1993.

Conservation

FPL's demand-side activities have reduced summer peak demand by 636.8 MW through 1989. It is interesting to note that of the 636.8 MW of conservation-induced demand reduction achieved by FPL, 355.2 MW was achieved by the year 1985. [Exhibit 54] It is also interesting to note that the additional impact of FPL's conservation programs has steadily decreased from 1985 to 1989 such that for 1989 only 35.9 MW of summer peak demand was reduced by FPL's conservation efforts. [Exhibit 54] Exhibit 55 also indicates that even if the "revenue losses" associated with conservation were excluded from FPL's Base Plan, there would be no change in that plan. Thus, the revenue losses attributable to conservation as projected by FPL are necessarily negligible. Put another way, the amount of peak load actually being reduced by FPL's

conservation programs is quite small when compared to FPL's total load.

It should be noted, however, that during this time period the real price of electricity declined. We cannot ignore the effect that this declining real price had on demand during this same time period. Declining real prices may have caused an increase in demand and a concomitant lessening of conservation efforts by customers. This phenomenon may have had an impact on FPL's conservation efforts.

Based on this record, we conclude that FPL did not pursue all of the conservation and demand-side reduction programs which it could have. Consequently, FPL might have been able to either completely or partially defer its need for the Lauderdale units. It is clear that FPL does not have sufficient conservation and other non-generating alternatives reasonably available to it at this time to defer the proposed units. And it is also clear that, given these conditions, the Lauderdale repowering constitutes the most cost-effective alternative available to FPL and to Peninsular Florida to supply its capacity needs in 1993.

Associated Facilities

No new off-site transmission lines will be required to integrate the repowered Lauderdale plant into the existing electric system, although some on-site transmission work will be required. No new off-site fuel delivery facilities will be required, although a new east-west natural gas lateral is planned along the northern boundary of the Lauderdale plan site sized to accommodate the gas requirements of the repowered units.

Environmental compliance

FPL has included the capital and operating costs of meeting all presumed local, state and federal environmental regulations in the project costs used as the basis for FPL's economic analysis of the proposed units. These costs are reflected in the Site Certification Application filed with DER.

It is DER which will ultimately determine the Best Available Control Technology (BACT) for the Lauderdale repowering and Martin Units 3 and 4, taking into account

technical, environmental, and economic impacts. It is that agency which exercises jurisdiction over environmental compliance of utility operating units. Should DER find that selective catalytic reduction (SCR) technology is required for emissions control, as both Broward and OPC have argued, then the record indicates that the effect of SCR would be to increase the overall PVRR of the expansion plan, but the Base Plan would remain the most cost-effective for meeting FPL's capacity needs. Thus, we find that FPL has taken into account the reasonably anticipated costs of environmental compliance in the unit selection process.

Future generation siting

As discussed in more detail below, it is our opinion that making findings of fact involving the environmental impacts on present or future generating capacities is the responsibility of the Hearing Officer at the DER Certification Hearing, and ultimately the Governor and Cabinet, sitting as the Power Plant Siting Board. Based upon that decision, we find this factual issue to be moot.

Costs related to natural resources

FPL did not attempt to quantify societal costs associated with use of natural resources, such as water, or impacts on air quality or other environmental resources. These impacts were considered in a qualitative manner through the application of strategic considerations in the generation planning process. While these strategic considerations did not cause any change to FPL's Base Plan, FPL's witnesses testified that in situations in which the economics of the alternative plans were closer, these types of factors might tip the balance.

No testimony was presented nor record developed by any party, including intervenor Bronson/Hadson who raised this issue, which would enable the Commission to quantify the dollar costs associated with such societal impacts. However, as is discussed below we are of the opinion that the Commission cannot and should not consider these types of environmental and natural resource costs in making need determinations pursuant to the Power Plant Siting Act. As such, we find that this factual issue is moot.

Authority to place conditions

Pursuant to Section 403.519, Florida Statutes, the Commission has the inherent authority to place conditions on need determinations supported by the record developed in the proceeding. Such conditions are similar in effect to those placed on the applicants by the Department of Environmental Regulation (DER) or any of the other statutory parties to proceedings under the Power Plant Siting Act (Sections 403.501-.517, Florida Statutes). A violation of any of the conditions placed upon a need determination would result in appropriate action being taken by this agency. Such action could include a hearing and the subsequent modification, revocation or suspension of the need certification if the evidence developed so indicates.

The imposition of conditions on a need determination issued by this body should not be construed as resulting in the automatic invalidation of a need determination should those conditions not be met. Rather, conditions imposed on a need determination are a tool by which this agency can meet its statutory requirements to assure that any additional generating capacity to be constructed in this state is indeed the most cost-effective means of meeting the state's energy needs. This is consistent with this body's recent decision in the Seminole Electric Cooperative docket, Docket No. 880309-EC, Order No. 22590, issued on February 21, 1990.

Compliance with FEECA

Broward has argued that this Commission can not certify as needed a plant which is fueled by natural gas or oil since such plants are contrary to FEECA. This is but another rehash of Issue No. 37 in the Planning Hearing docket, Docket No. 890004-EU: Should the Commission accept as reasonable generation expansion plans which would increase Florida utilities' consumption of and reliance on natural gas and oil? In answering that question affirmatively, the Commission stated as follows:

> The initial language of Sections 366.81 and 366.82 [FEECA] could have been read as an expression of the Legislature's intent that no increase in the consumption of natural gas or oil be allowed in the state. We did so interpret it in Order No. 17480, issued on April 30, 1987, in the last planning hearing docket. Order No. 17480 at 10. Historically, cogeneration facilities which are not refuse burners have been fueled in whole or in part by natural gas. Their inclusion in the list of activities to be encouraged by this Commission indicates that the Legislature is interested in the most economic use of natural gas and oil, not in an absolute ban on increased gas and oil usage no matter what.
>
> Likewise,the addition of language which indicates that the growth rate of both peak demand and electric consumption should be reduced and controlled indicates that an absolute prohibition against increased use of petroleum fuels is not what is intended. Peaker units are fueled exclusively by natural gas and oil.
>
> Based on these changes to both the Fuel Use Act and FEECA, we are now of the opinion that the mandate of this Commission given by both the Congress and Legislature is to encourage the most economic use of natural gas and oil, not to prohibit its use completely.

Order No. 22341 at 16-17 [Emphasis added.]

The key to the development of a least-cost generation expansion plan is to select the units which are the most cost-effective while maintaining a reasonable reliability factor. Based on the record before us, it appears that a plan which begins with the addition of natural gas-fired combined cycle units is more cost-effective than one which begins with the addition of any coal-based alternative. Even with the inclusion of the repowered Lauderdale units, the construction

of Martin Units 3 and 4 result in FPL's projected oil burn remaining below FPL's share of the FEECA goal of 58,734,000 barrels per year throughout the study period.

FPL correctly points out that Section 403.519 was enacted as part of FEECA and directs the Commission to consider whether the proposed plant is the most cost-effective alternative available and whether there are conservation measures that might mitigate the need for the proposed plant. Nowhere does any section of FEECA prohibit the certification of a proposed unit which burns natural gas or petroleum fuels, provided that the unit is the most cost-effective generating alternative.

For these reasons, we find that FPL's proposed Lauderdale repowering complies with the provisions of FEECA.

Environmental impacts

The Siting Act sets forth a comprehensive licensing scheme for new and expanded steam-fired generating capacity. Under the Siting Act there are several divisions of responsibility. The final decision on certification is made by the Governor and Cabinet sitting as the Power Plant Siting Board. Section 403.509, Florida Statutes. The Governor and Cabinet are charged with the responsibility of:

> [effecting] a reasonable balance between the need for the facility and the environmental impact resulting from construction and opera- tion of the facility, including air and water quality, fish and wildlife, and the water resources of the state.

Section 403.502(2), Florida Statutes.

The decision of the Governor and Cabinet is made based upon the record developed at the final certification hearing conducted by a designated hearing officer from the Division of Administrative Hearings (DOAH). It is this hearing officer who is charged with the responsibility of preparing a recommended order based on all of the evidence of record presented at the certification hearing. Section 403.508, Florida Statutes. The

Commission is a statutory party to the final certification hearing and a positive determination of need pursuant to Sections 403.507 and 403.519, Florida Statutes, is a prerequisite to the conduct of the final certification hearing.

The Commission's role in the power plant siting process is found in three sections of the Siting Act. Section 403.507(1)(b) requires the Commission to prepare a report as to the present and future need for the proposed electrical generating capacity which is the subject of the application. The report "may include the comments of the commission with respect to any matters within its jurisdiction." As discussed previously, Section 403.519 indicates in more detail the issues to be considered by the Commission in making a need determination. This list also includes "other matters within its [Commission's] jurisdiction which it deems relevant." Last, Section 403.508 makes the Commission a statutory party to the final certification hearing.

The Commission does not have statutory jurisdiction over the environment or natural resources in the State of Florida. The responsibility for those areas is divided among numerous state and local agencies: DER, the Department of Natural Resources, local Water Management Districts, the Game and Fresh Water Fish Commission, local zoning boards to name but a few. These are the agencies which are charged with the evaluation of the environmental impacts of this or any future proposed plants. These matters are simply not within the jurisdiction of this body and therefore, not properly considered in the need determination at issue here.

The environmental impacts of these proposed units are properly litigated before the hearing officer in the final certification hearing. And, under Section 403.507(2), Florida Statutes, DER is charged with the responsibility and authority to conduct or contract for studies in the following areas:

> (e) Impact on suitable present and projected water supplies for this and other competing land uses.
> (f) Impact on surrounding land uses.
> (h) Environmental impacts.

The intervenors have raised several environmental issues: the depletion of potable water by the proposed power

plants; the ability of cogenerators, municipalities or FPL itself to site plants in the same area in subsequent years as the need arises for additional generation; and levels of NOx and SOx emissions which would require the installation of Selective Catalytic Reduction to the facility. These are within the areas covered by Section 403.507(2) quoted above and can be raised in the final certification hearing before the hearing officer. These are matters within the specific technical expertise of the environmental agencies mentioned above.

The forum in which the Legislature intended the record to be developed on the environmental impacts of proposed power plants is the forum in which the agencies charged with environmental matters have the greatest input: the final certification hearing. Given the existence of this forum and the lack of jurisdiction over the subject matter, the Commission should not seek to expand its need determination proceedings to cover environmental and natural resource issues.

This does not mean that the Commission should not consider the cost of equipment reasonably believed to be required to actually operate the proposed plants. These costs were developed in the record of this proceeding and are discussed in Issue 23. Externalities which involve a balancing of public good versus need for new generation are the matters which are properly excluded from consideration by this body and best left to the environmental agencies and ultimately the Governor and Cabinet. Therefore, we find that the Commission can not and should not consider the cost to the state and its citizens of the environmental and natural resource impacts of the proposed Lauderdale units.

Grant of need determination

Broward County has suggested that the Commission grant FPL's petition for need for the Lauderdale repowering subject to certain conditions. First, Broward would require that the combined cycle units be converted to coal gasificiation as soon as feasible. We reject this condition of need certification for several reasons. First, as discussed above, it appears from this record that generating capacity which burns natural gas and petroleum fuels, where cost-effective, does not violate FEECA or federal conservation mandates. The record developed in this proceeding indicates that combined cycle units burning

natural gas are the most cost-effective generating alternative available to FPL. Thus, we will not impose this condition on FPL's Lauderdale repowering need determination.

Second, Broward has requested that FPL be required to take whatever steps are necessary so as to minimize the environmental impact of the proposed units, e.g., install SCR and burn low-sulfur oil as a back-up fuel. We find that this condition involves environmental matters which are not within the jurisdiction of the Commission but within the jurisdiction and expertise of the environmental agencies identified in the Siting Act.

Finally, Broward County has suggested that FPL be required to make a "proactive effort" to encourage QF capacity. While we are of the opinion that FPL may not have done all that it might have to develop either cogeneration or conservation in its service territory, and, while we agree that FPL should be required to develop a comprehensive plan for the cost-effective integration of cogeneration on its system, this plan should be developed in FPL's conservation docket, Docket No. 900091-EG; it should not be made a condition of this need determination.

That being the case, we find that no conditions should be imposed on this need determination. We further find that based upon the resolution of the factual and legal issues raised in this proceeding, FPL's petition for determination of need for the proposed repowering of its Lauderdale Units 4 and 5 should be granted.

MOTIONS FOR RECONSIDERATION

Broward

Broward has essentially raised two issues in its motion for reconsideration: 1) that there is not enough gas to run FPL's system with the Lauderdale repowering and Martin Units 3 and 4 (Issues 10, 5-8, 18 and 19) and 2) that the Commission should require FPL to submit a cogeneration development plan in Docket No. 900091-EQ based upon FPL's demonstrated anti-cogeneration conduct over the last eight years (Issue 17).

Issue 10:

In its motion Broward points out that Staff has compared annual average firm gas commitments with the summer peak demand of the Lauderdale Repowering and Martin Units 3 and 4 to erroneously reach the conclusion that natural gas will be available to economically dispatch the proposed units in the manner assumed by FPL in its PROMOD runs. Broward correctly states that FPL's average commitment for firm gas is 327 mcf/day [T. 708] while its consumption of natural gas for the Lauderdale Repowering and Martin Units 3 and 4 is 292 mcf/day at summer peak [T. 693] and 320-350 mcf/day at winter peak [T. 694]. Since FPL's available firm gas capacity is 280 mcf/day during winter peak periods [T. 694], Broward argues that FPL will be "short" on gas during winter peak periods by roughly 40-70 mcf/day. Motion at 2-3.

Having reviewed again the testimony of FPL Witness Silva and Exhibits 71 and 72, we are still of the opinion, that notwithstanding these facts, there will be enough gas to fuel the Lauderdale and Martin Units 3 and 4 as predicted. The 40-70 mcf/day of gas which will be short will be supplied by interruptible gas. [Exhibit 72] This seems a reasonable assumption given the past availability of natural gas to FPL.

In 1989, FPL had a contract for 19 mcf/day of firm gas. [Exhibit 1 at Appendix D, page 23] In January of that year FPL burned 317 mcf/day of natural gas. [Exhibit 71] Since only 19 mcf/day was provided pursuant to firm contracts, 298 mcf/day was supplied to FPL under interruptible contracts. This is an amount far in excess of the 40-70 mcf/day which is questioned by Broward County. It is an amount which can be delivered by the Phase I natural gas facilities which are currently in place. There is no reason to believe that that small quantity of gas will not be available in the future. We would also point out that this "shortage" will be reduced by another 20mcf/day if the Phase II expansion goes as planned. [Exhibit 72]. As currently proposed to the FERC, the completion date for the Phase II expansion is July of 1991 or approximately two years prior to the in-service date of the first of the units certified in these dockets.

The record developed in these dockets does support the Commission's vote that adequate assurances have been provided regarding available fuel to service both the Lauderdale and

Martin Units 3 and 4. That being the case, we will deny Broward's motion with regard to Issue 10.

Issues 5-8, 18 and 19

Next Broward urges us to reconsider its vote on Issues 5, 6, 7, 8, 18 and 19. These are the issues which address adequate electricity at a reasonable cost, system reliability and integrity, and most cost-effective alterative. Broward argues that since natural gas will not be available in sufficient quantities, there is some question whether the combined cycle units are the most cost-effective units available to meet FPL's need. This would be true, they contend, since the units will not be able to maintain 63-78% capacity factors modeled in the Proscreen analysis through the year 1999. Motion at 3. Having already concluded that the record does establish that adequate gas will be available to maintain these capacity factors, we find this argument to be unpersuasive.

Broward also contends that the higher than historic availabilities for FPL's Turkey Point nuclear units modeled in the generation expansion plans would also result in the cost-effectiveness of the combined cycle units being suspect. Motion at 4. However, as Exhibit 25 demonstrates, when a capacity factor of 65% (close to Turkey Point's historic capacity factor) is used for Turkey Point, the least-cost generation expansion plan for FPL remains the same until the year 1995 when 300 additional MW of power are needed. [T. 265]. Broward further argues that the inclusion of Martin Units 5 and 6 in the generation expansion plan skews the economic dispatch of Units 3 and 4. Motion at 4-5. We would refer Broward to Exhibit 27 which indicates that even if Martin Units 5 and 6 were removed completely from the generation expansion plan, the Lauderdale Repowering and Martin Units 3 and 4 would still offer FPL's ratepayers the most cost-effective option up until 1995. [T. 267-68].

We would finally take exception with Broward's statement that "certifying the Lauderdale units and Martin Units 3 and 4 may lead FPL to later argue that Units 5 and 6 have been tacitly certified." Motion at 4. Given the specific ruling by the prehearing officer in the order on consolidation that no factual findings would be made in either of the above dockets regarding Martin Units 5 and 6, as well as the

reiteration of that ruling at the prehearing conference, we would be incredulous if anyone could, or would, make an argument that any legal or factual finding regarding Martin Units 5 and 6 was made in these dockets. [Order 22267 at 3, 5] As was stated repeatedly during the hearing, all factual findings on Martin Units 5 and 6 will be made at a later date when the RFP process is complete. For these reasons, we deny Broward's motion to reconsider our findings on Issues 5-8, 18 and 19.

Cogeneration development plan

Broward finally argues that the record developed in these dockets would support the imposition of the requirement on FPL that it file a cogeneration development plan in its conservation/cogeneration docket, Docket 900091-EG, within 90 days of the final order in this docket. As discussed above, we have determined that this would be redundant given our decision in Order No. 22176. That being the case, we will also deny Broward's motion on this point.

FPL

FPL's petition for reconsideration deals with only two issues: Issue 17, "Has the availability of purchased power from qualifying facilities and non-utility generators been adequately explored and evaluated?" and Issue 20, "Are there sufficient conservation or other non-generating alternatives reasonably available to FPL to mitigate the need for the proposed Lauderdale repowering [Martin Units 3 and 4]?" FPL takes issue with the Commission's findings that FPL has not adequately pursued either conservation or cogeneration as an alternative to the construction of the Lauderdale repowering or Martin Units 3 and 4.

FPL's arguments can be divided into four groups: 1) that the issues of conservation and cogeneration were "secondary" and of marginal relevance to the main issue of need determination addressed in the dockets; 2) that FPL was somehow denied due process by the "surprise" use of the materials contained in Exhibit 33 by Broward and Staff; 3) that if FPL did not vigorously encourage cogeneration it was the result of "mixed" signals given by the Commission and 4) that the record developed in this proceeding does not support the finding that

FPL did not adequately seek to avoid construction of capacity through conservation measures or cogeneration.

Conservation and cogeneration

Contrary to the position taken by FPL, the use of conservation and cogeneration to mitigate the need for the construction of power plants is not a "secondary" issue in need determination dockets. Section 403.519, Florida Statutes, states as follows:

> The Commission shall also expressly consider the conservation measures taken by or reasonably available to the applicant or its members which might mitigate the need for the proposed plant . . .

[Emphasis added.]

In addition, Rule 25-22.081(4), Florida Administrative Code, states that a petition for a need determination shall contain:

> 4) A summary discussion of the major available generating alternatives which were examined and evaluated in arriving at the decision to pursue the proposed generating unit. The discussion shall include a general description of the generating unit alternatives, including purchases where appropriate; and an evaluation of each alternative in terms of economics, reliability, long term flexibility and usefulness and any other relevant factors.
>
> . . .
>
> (5) A discussion of viable nongenerating alternatives including an evaluation of the nature and extent of reductions in the growth rates of peak demand, KWH consumption and oil consumption resulting from the goals and programs adopted pursuant to the Florida Energy Efficiency and Conservation Act both historically and prospectively and the effects on the timing and size of the plant.

Clearly, the intent of the Legislature is for the Commission to explore other means of meeting the demonstrated need of the applicant. And where such means are available and are cost-effective, it is the express desire of the Legislature to require the applicant to avail itself of those nonconstruction alternatives. This is consistent with the overall purpose of the Power Plant Siting Act: to balance the need for reliable electric capacity with the environmental impacts of power plants. One can best avoid the detrimental environmental effects of building power plants by not constructing those plants in the first place.

We are not of the opinion, however, that the legislative mandate prohibits the construction of power plants. This is clearly illustrated by the legislative mandate to encourage the development of cogeneration facilties. Such facilities may minimize the environmental impacts because of their high efficiency.

Further, cogeneration is another form of purchased power which should be adequately explored before a utility can be certified to build its own capacity. See: Rule 25-22.081, Florida Administrative Code.

For these reasons, we are of the view that the issues of available cogeneration and conservation are not "secondary" to this proceeding but an integral part of the determination that FPL and this Commission have met their respective statutory obligations under the Power Plant Siting Act.

Denial of due process

FPL appears to be arguing against the admission of the materials contained in Exhibits 29, 30, 31, 32 and 33 after the fact essentially on the grounds that Staff and Broward used them to FPL's disadvantage. Petition at 4-5. The basic rule of law is that any objection not made to an exhibit at the time it is offered into evidence is waived. Our Staff properly identified and tendered the exhibits into evidence and FPL made no objection to them. [T. 270-74; 382-83; 1094-97] In fact, FPL conducted extensive voir dire (inquiry of the witness) on the exhibits, intended apparently to place the exhibits in the "perspective" which FPL now claims it was denied the opportunity to provide. Further, when asked by the Chairman specifically if FPL had an objection to the admission of

Exhibits 29-32, FPL's counsel answered that FPL had no objection to their admission. [T. 383] With regard to Exhibit 33, FPL's counsel again specifically represented that he had no objection to the exhibit's admission into evidence. [T. 1096]

FPL has absolutely no basis for its statement that it was somehow prejudiced by the introduction of this evidence when it twice agreed to its admission. Whatever the infirmities of the materials contained in the exhibits, they existed at the time of their admission. We would also point out that no cross examination of these exhibits was conducted at hearing because a substantial number of the documents were the subject of a request for confidentiality made by FPL. Since this request, made the day before the hearing started, could not be disposed of until after the hearing, it would have been virtually impossible to cross examine on those documents even if there had been a witness produced who knew something about them.

Whatever the intentions of Broward, FPL could not have been surprised by any parties' reliance on these documents in regards to the issues dealing with conservation and cogeneration. Obviously our Staff believed them to be relevant since they specifically requested them by formal discovery, traveled to Miami to review them, identified the documents they considered germane, and identified them as exhibits at hearing. One does not go to all of that expense and effort not to use the materials entered into the record.

We are willing to let the documents speak for themselves. FPL's procedural and due process rights have been fully protected by this body. Thus, are unpersuaded that this is a basis for reconsideration.

Mixed signals

FPL cites a long string of various Commission orders in which the Commission indicates that "lost revenues" to an electric utility are a concern of this body. Petition at 8-10. The appropriate forum to discuss this issue is in the cogeneration rules docket, planning hearing docket and conservation/cogeneration programs docket. These are the dockets in which it is appropriate for this body to discuss and resolve the often conflicting policy issues surrounding cogeneration. Thus, we are unpersuaded that this is a basis for reconsideration.

Competent and substantial testimony

Having reviewed the record developed in this proceeding, we find that there is competent substantial testimony to support our findings. We have not found nor do we suggest that FPL has failed to carry its burden in establishing its need for the capacity it seeks to certify, but it appears based on this record, that FPL did not adequately pursue non-utility construction alternatives which might have mitigated that need. Thus, based upon the record developed at hearing, we will deny FPL's motion for reconsideration.

Therefore, it is

ORDERED By the Florida Public Service Commission that the petition of Florida Power & Light Company filed on July 25, 1989 for a determination of need for the repowering of its Ft. Lauderdale Units 4 and 5 is hereby granted. It is further

ORDERED that the Motions for reconsideration/ clarification filed by Broward County and Florida Power & Light Company are hereby denied as discussed above.

ORDERED that this order constitutes the final report required by Section 403.507(1)(b), Florida Statutes, the report concluding that a need exists, within the meaning of Section 403.519, Florida Statutes, for the repowering of Ft. Lauderdale Units 4 and 5 and the addition of 572 MW of capacity on Florida Power & Light Company's system. It is further

ORDERED that a copy of this order be furnished to the Department of Environmental Regulation, as required by Section 403.507(1)(b), Florida Statutes, on or before June 15, 1990.

BY ORDER of the Florida Public Service Commission this 15th day of JUNE 1990.

STEVE TRIBBLE, Director
Division of Records and Reporting

(S E A L)

SBr

NOTICE OF JUDICIAL REVIEW

The Florida Public Service Commission is required by Section 120.59(4), Florida Statutes, to notify parties of any administrative hearing or judicial review of Commission orders that is available under Sections 120.57 or 120.68, Florida Statutes, as well as the procedures and time limits that apply. This notice should not be construed to mean all requests for judicial review will be granted or result in the relief sought.

Any party adversely affected by the Commission's final action in this matter may request judicial review by the Florida Supreme Court in the case of an electric, gas or telephone utility or the First District Court of Appeal in the case of a water or sewer utility by filing a notice of appeal with the Director, Division of Records and Reporting and filing a copy of the notice of appeal and the filing fee with the appropriate court. This filing must be completed within thirty (30) days after the issuance of this order, pursuant to Rule 9.110, Florida Rules of Appellate Procedure. The notice of appeal must be in the form specified in Rule 9.900(a), Florida Rules of Appellate Procedure.

APPENDIX 10.7

DRAINAGE AND RUNOFF CALCULATIONS

10.7 DRAINAGE AND RUNOFF CALCULATIONS

Attached are the calculations that support the program described in Section 3.8, On-site Drainage.

EBASCO SERVICES INCORPORATED

BY HAFredianiDATE 11/4/89 SHEET 1 OF 6
CHKD. BY KM DATE 11/6/89 OFS NO. 7918.017 DEPT. NO. 941
CLIENT FPL
PROJECT Lauderdale Repowering
SUBJECT Site Drainage

Divide into contaminated vs Un Contaminated per "Permit Information Manual, SFWMD, Basis of Review ..." (BOR) see p 3.8-3 of SCA

"contaminated" per section 3.2.2.2 (3) (b) refers to "hazardous materials". Since SFWMD does not define hazardous materials, we assume they use state/federal definition

Note: all potentially oily wastewaters are collected and sent to a central wastewater treatment facility - see section 3.6 of SCA. This calculation deals with non-contaminated, non-oily runoff.

Reference Drawings - Figures 3.8-1, -2 & -3 from SCA (attached)

Note: This calculation proceeds in same order as sub-section 3.8.2 of the SCA

Based Figure C-I-5 (see Calc 27, p.2) of BOR

design storm:

24 hour 10 year precip = 11 in.

thus 72 hour 10 year = 1.359 * 11

= 15 inches (1.359 from Table C-I-2 of BOR)

EBASCO SERVICES INCORPORATED

BY HAP DATE 11/4/81 SHEET 2 OF 6
CHKD. BY KM DATE 11/6/89 OFS NO. 2918.017 DEPT. NO. 941
CLIENT FPL
PROJECT Lauderdale Repowering
SUBJECT Site Drainage

to look at entire site

pre-existing runoff

Divide site into two land areas (see AH 1, Figure 2.1-3 from SCA) - Area 1 bounded by South New River Canal (w), stub canal/ Discharge Canal (N), Davie Cut-Off Canal (s) and unnamed dead-end canal (e)

Area 2 - North of Discharge Canal

Area 1 ≈ 2880' * 816' = 2,350,080 ft²
2,350,080 / 43560 = 54 acres

surface imperviousness of this area varies from pavement to grass, overall estimate it as follows:

50% grass @ 0.10 } average = 0.50
50% paved @ 0.90 }

per rational method

$$Q = c\,i\,a$$
$$= 0.50 * i * a$$

a = 54 acres
c = 0.50

per SFWMD BOR design storm, peak hourly intensity (see Figure C-I-7) = 0.42 * 24 hr value
= 0.42 * 11 = 4.62 inches/hour

max flow Q = c i a = 0.5 * 4.62 in/hr * 54 ac

581/8-81

EBASCO SERVICES INCORPORATED

BY HAP DATE 11/4/89 SHEET 3 OF 6

CHKD. BY KM DATE 11/6/89 OFS NO. 7918.017 DEPT. NO. 941

CLIENT FPL

PROJECT Lauderdale Repowering

SUBJECT Site Drainage

$Q = .5 * 4.62 * 54 = 124.74$ in-acres/hour

Only a portion of this drains to Davie Cut-Off Canal - see ATT 1, shaded area

shaded area $\cong \frac{1200 * 500 + 400 * 180}{43560}$

$= 15.4$ acres

$Q = C i a = .5 * 4.62 * 15.4 = 35.6$

35.6 in-acres/hour $* \frac{43560}{12 * 3600} = 35.9$ cfs ✓

say 36 cfs

Note: Area 2 will not be affected by the Project - drains to cooling pond/canal system anyway

After Repowering

West portion of site: ATT 3

per p. 3.8-9 of SCA

West Construction Area and Water Treatment Area - these drain to Stub Canal

Total drainage to Stub Canal

$\frac{720 * 630}{43560} \cong 10.4$ acres ✓

EBASCO SERVICES INCORPORATED

BY NAF DATE 11/4/81 SHEET 4 OF 6

CHKD. BY KM DATE 11/6/89 OFS NO. 7918.017 DEPT. NO. 94

CLIENT FPL

PROJECT Lauderdale Repowering

SUBJECT Site Drainage

Total design storm = 15 inches

15 inches * 10.4 acres = 156.2 in-acres

Stub Canal Area $\cong \frac{60' * 1081'}{43560}$ = 1.5 acres

$\frac{156.2}{1.5} \frac{\text{in-acres}}{\text{acres}}$ = 105 inches

to percolate $\frac{105 \text{ inches}}{72 \text{ hours}}$ = 1.46 inch/hour

per SCA Section 2.3.2

vertical permeability ≥ .01 cm/sec

$.01 \frac{\text{cm}}{\text{sec}} * \frac{60 * 60}{2.54}$ = 14.2 inch/hour

OK by a factor of 10

entire storm can be percolated

Power Block / Runoff Pond area

per SCA = 10 acres

per BOR 3.2.2 a)

1 Wet Detention = 1" or 2.5 * .65 = 1.63"

(.65 = % impervious)

EBASCO SERVICES INCORPORATED

BY HAP DATE 11/4/89 SHEET 5 OF 6
CHKD. BY KM DATE 11/6/89 OFS NO. 7918.017 DEPT. NO. 941
CLIENT FPL
PROJECT Lauderdale Repowering
SUBJECT Site Drainage

b) Wet Retention = 50% = 0.82 inches

0.82 inches * 10 acres = 8.2 inch-acres

$8.2 * \frac{43560}{12} = 29,800$ cubic feet

East Portion of Site Att. 4

Area = $\frac{846 * 792}{43560} = 15.4$ acres

Total Storm = 15.4 acres * 15 inches = 230.7 in-acres

EP Pond = $\frac{324 * 180}{43560} = 1.34$ acres

$\frac{230.7 \text{ in-acres}}{1.34 \text{ acres} * 72 \text{ hours}} = 2.4$ inches/hour

this is only 1/5 of estimated percolation rate
so is OK

Construction Parking & East Construction Laydown

3.7 + 4.6 = 8.3 acres * 15" = 124.5 inch-acres

Swale = 100' * (930 * 2 + 540 * 2)
= 100 * 2940 = 294000 ft²
= 6.8 acres

$\frac{124.5 \text{ in-acres}}{6.8 \text{ acres} * 72 \text{ hours}} = .25$ inches/hour OK

10.7-7

581/8-81

Calc. No. 47

EBASCO SERVICES INCORPORATED

BY HAP DATE 11/4/89

CHKD. BY KM DATE 11/6/89

SHEET 6 OF 6

OFS NO. 7918.017 DEPT. NO. 941

CLIENT FPL

PROJECT Lauderdale Repowering

SUBJECT Site Drainage

North Portion of Site AH 5

no change from pre-existing conditions

581/8-81

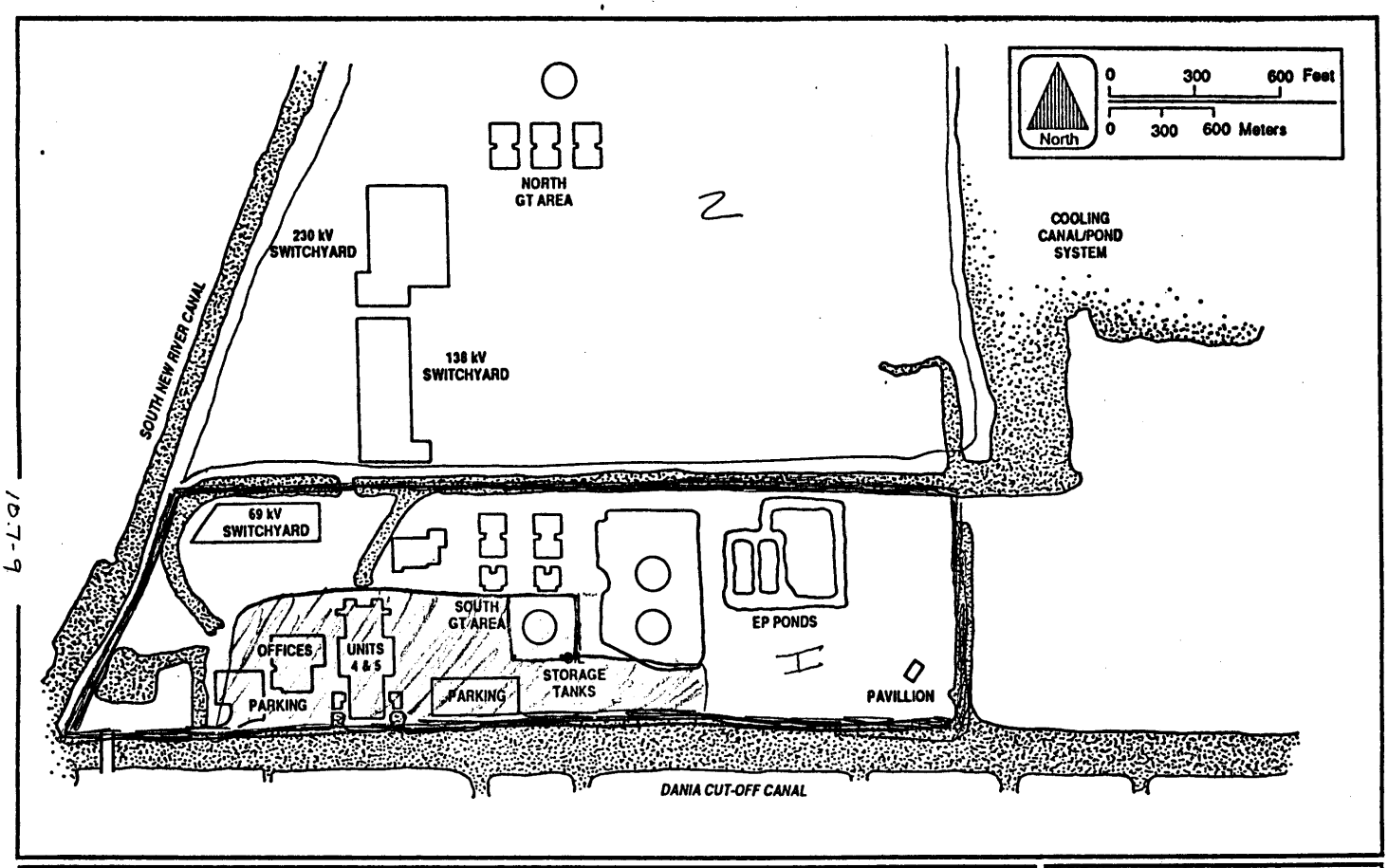


Figure 2.1-3 LAUDERDALE SITE - EXISTING USES

Lauderdale Repowering Project

FPL

Attachment 1

Calc. No. 47

10.7-9

$$t_c = \frac{41bL_o^{1/3}}{(ki)^{2/3}} \tag{7.11}$$

where t_c = time of concentration, min
b = coefficient
L_o = overland flow length, ft
k = rational runoff coefficient (see Table 7.6)
i = rainfall intensity, in./hr, during time t_c

The equation is valid only for laminar flow conditions where the product iL_o is less than 500. The coefficient b is found using

$$b = \frac{0.0007i + C_r}{S_o^{1/3}} \tag{7.12}$$

where S_o = surface slope
C_r = coefficient of retardance

Values of C_r are given in Table 7.5. Note that reliability of this equation is also strongly influenced by the selection of parameters.

The runoff coefficient c is the component of the rational formula that requires the greatest exercise of judgment by the engineer. It is not amenable to exact determination, since it includes the influence of a number of variables, such as infiltration-capacity, interception by vegetation, depression storage, and antecedent conditions. As used in the rational equation, the coefficient c represents a fixed ratio of runoff to rainfall, while in actuality it is not fixed and may vary for a specific drainage basin with time during a particular storm, from storm to storm, and with change in season. Fortunately, the closer the area comes to being impervious, the more reasonable the selection of c becomes. This is true since for highly impervious areas c approaches unity, and for these areas the nature of the surface is much less variable for changing seasonal, meteorological, or antecedent conditions. The rational method therefore is best suited for use on urban areas, where a high percentage of imperviousness is common.

At present there is no precise method for evaluating the runoff coefficient c, although some research has been directed toward that end [12]. Common engineering practice is to make use of average values of the coefficient for various surface types normally found in urban regions. Table 7.6 lists some values of the runoff coefficient as reported in the American

TABLE 7.5 IZZARD'S RETARDANCE COEFFICIENT C_r

Surface	C_r
Smooth asphalt	0.007
Concrete paving	0.012
Tar and gravel paving	0.017
[illegible]	0.046

10.7-10

from Water Supply & Pollution Control 4th Edit Viessman & Hammer, Harper & Row, NY, NY, 1985

Attachment 2 Calc. No. 47

TABLE 7.6 SOME VALUES OF THE RATIONAL COEFFICIENT C

Surface Type	C Value[a]
Bituminous streets	0.70–0.95
Concrete streets	0.80–0.95
Driveways, walks	0.75–0.85
Roofs	0.75–0.95
Lawns; sandy soil	
Flat, 2%	0.05–0.10
Average, 2%–7%	0.10–0.15
Steep, 7%	0.15–0.20
Lawns, heavy soil	
Flat, 2%	0.13–0.17
Average, 2%–7%	0.18–0.22
Steep, 7%	0.25–0.35

[a] See Ref. 10.

Society of Civil Engineers' *Manual on the Design and Construction of Sa and Storm Sewers* [10].

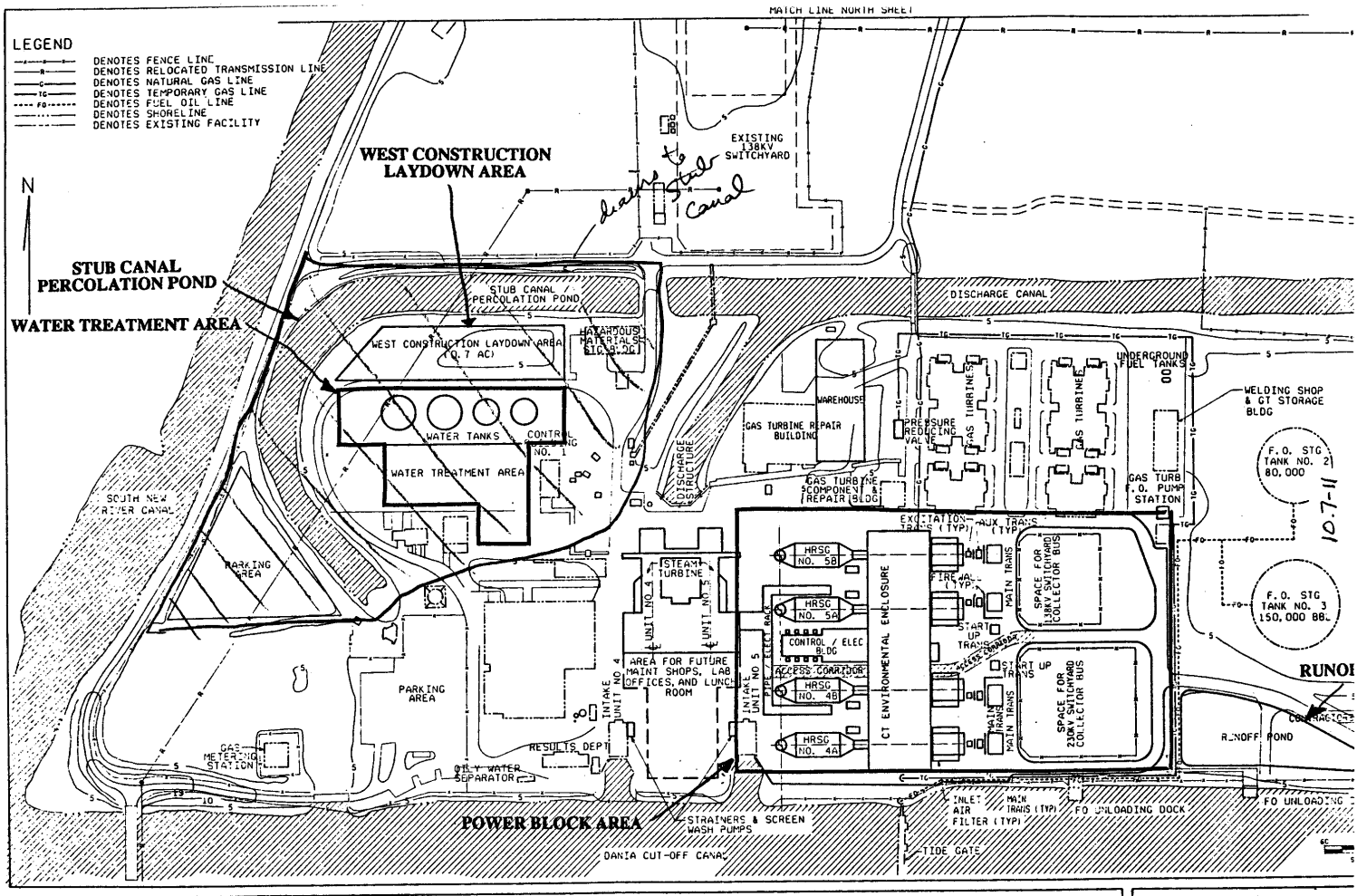
Figure 7.10 relates the rational C to imperviousness, soil type, and slope. This graph is used in designing storm drains in Baltimore Co Maryland. Most engineering designers make use of information report similar tabular or graphical form, inserting local conditions following experience and practice.

In applying the rational method, a rainfall intensity i must be that represents the average intensity of a storm of given frequency fo time of concentration. The frequency chosen is largely a matter of econo Factors related to the choice of a design frequency have already discussed. Frequencies of 1–10 yr are commonly used where residential are to be protected. For higher-value districts, 10–20-yr or higher r periods often are selected. Local conditions and practice normally dictat selection of these design criteria.

After t_c and the rainfall frequency have been ascertained, the ra intensity i is usually obtained by making use of a set of rainfall inter duration-frequency curves such as those shown in Fig. 7.11. Enterin curves on the abscissa with the appropriate value of t_c and then proje upward to an intersection with the desired frequency curve allows i found by projecting this intersection point horizontally to an intersection the ordinate. If an adequate number of years of local rainfall reco available, curves similar to Fig. 7.11 may be developed. Otherwise, compiled by the Weather Bureau, the Department of Commerce, Department of Agriculture, and other government agencies, data tha available for numerous localities and regions, can be used.

Generally, the rational method should be used only on areas tha smaller than about 2 mi² (approximately 1280 acres) in size. For areas l

Image Quality
As you review the next group of images, Please note that the original documents
were of poor quality.



Calc. No. 47
Attachment 3

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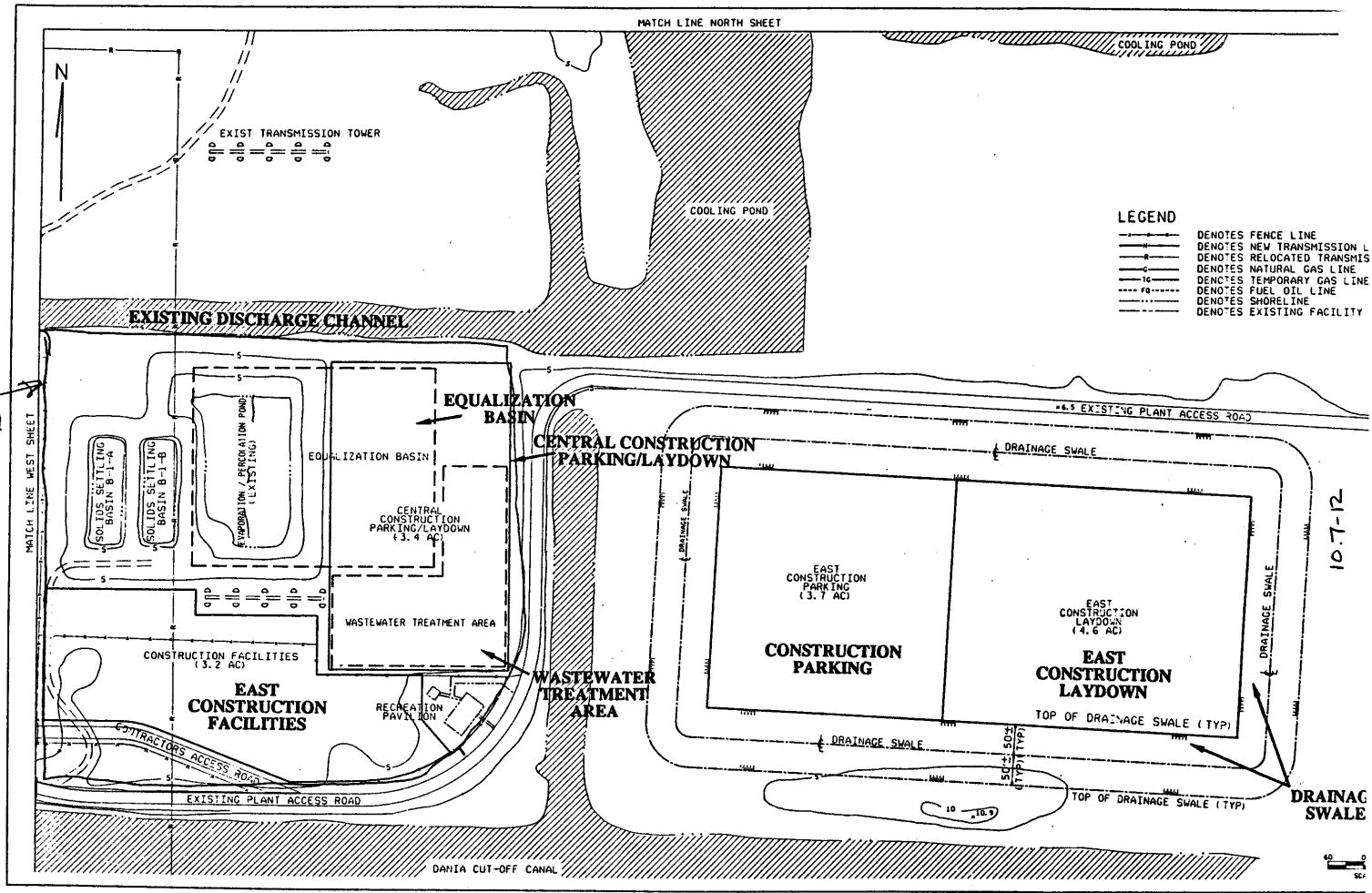


Figure 3.8-2 **Site Drainage - Eastern Portion of Site**

Attachment 4
Calc. No. 47

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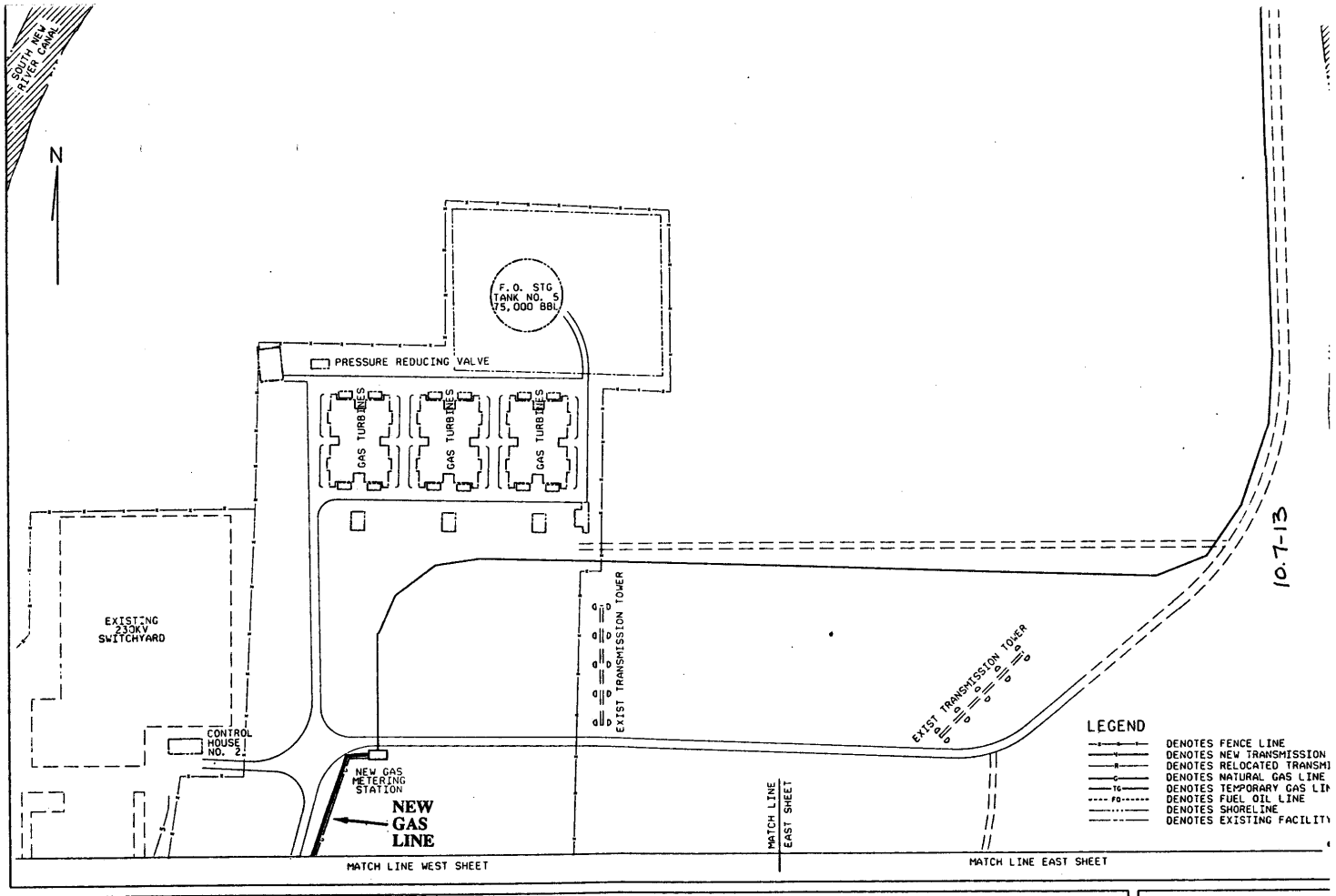


Figure 3.8-3 Northern Portion of Site

Attachment 5
Calc. No. 47

FPL

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Calc. 56

Rev. 1

EBASCO SERVICES INCORPORATED

BY HAP DATE 3/25/90 SHEET 1 OF 13

CHKD. BY KM DATE 3/26/90 OFS NO. 7918.017 DEPT. NO. 941

CLIENT FPL

PROJECT PFLR

SUBJECT Existing and Proposed Stormwater Runoff Acreage

Breakdown

Page 2 is based on SCA Figure 2.3-2

east-west division based on Figure 2.1-6

East half = 202.2 acres (Figure 2.1-6)
West half = 189.7 acres " "

391.9 ≈ 392 acres

From each half, have 7 land areas (see p. 2) numbered I through VII

by planimeter of areas on p 2

Area	Square Inches	Acres
I	.2325004	3.46
II	.2635005	3.92
III	.6975013	10.39
IV	.1085002	1.62
V	.2480004	3.69
VI	.0930001	1.38
VII	.0775001	1.15
East Half	13.578027	202.2 *

* known

Total I thru VII 25.61

202.2
- 25.6
176.6 acres lake

next ↓

EBASCO SERVICES INCORPORATED

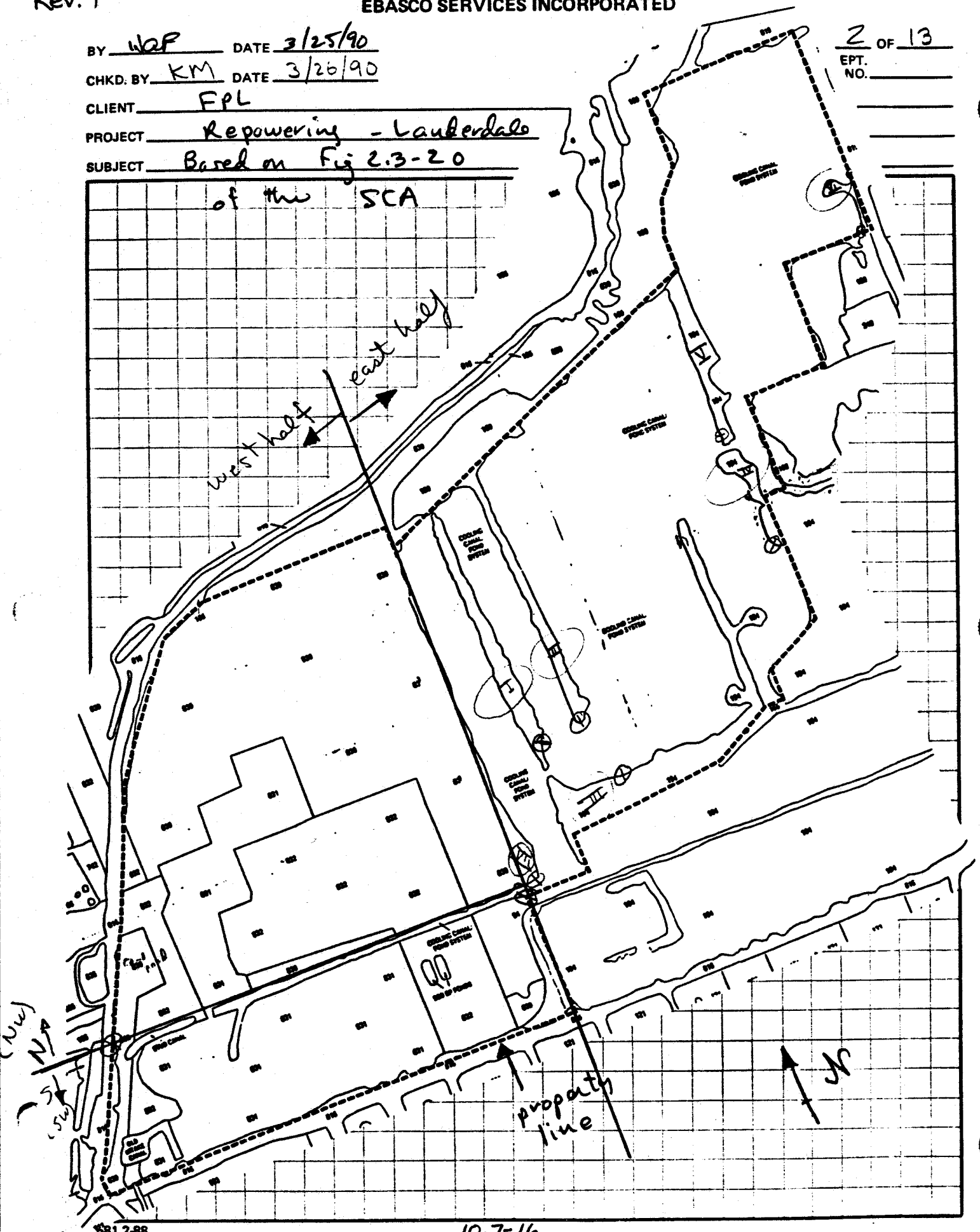
BY WAP DATE 3/25/90

CHKD. BY KM DATE 3/26/90

CLIENT FPL

PROJECT Repowering - Lauderdale

SUBJECT Based on Fig 2.3-20 of the SCA



EBASCO SERVICES INCORPORATED

BY NAP DATE 3/25/90 SHEET 3 OF 13

CHKD. BY KM DATE 3/26/90 OFS NO. 7918.017 DEPT. NO. 941

CLIENT FPL

PROJECT PFLR

SUBJECT Existing + Proposed Stormwater Runoff Acreage Breakdown

SFWMD sufficiency question 20 only gives four types of areas:

pervious areas
water management areas
building (rooted) areas
other impervious areas

So, for east half of site

176.6 acres of water management area
25.6 acres of pervious area

---

for the west half of the site, divide into 2 sections; north-west & south-west

Northwest is north of existing discharge canal southwest is south of existing discharge canal (& including canal)

see p. 4

of the Northwest Portion, only the GT area (3 banks of 4, each - see p. 5 for enlarged view) and the oil tank are impervious and they are not buildings, so are "other" impervious areas

from page 5 impervious → $206 * 469 + 120^2 * \pi/4$

$= 96,614 + 11,310 = 107924$ ft²

$= 2.5$ acres

Calc. 56

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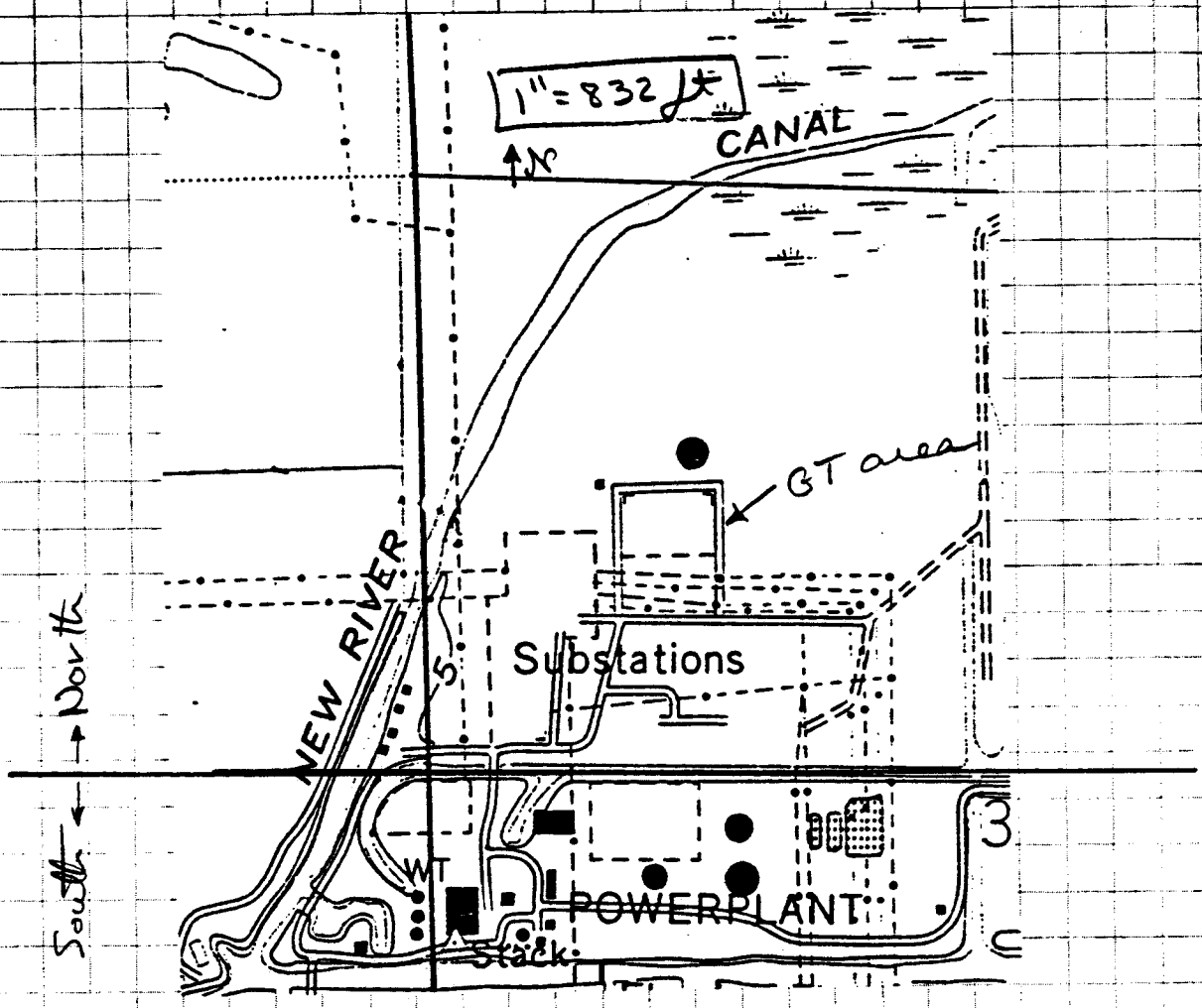
BY NOR DATE 3/25/90 SHEET 4 OF 13

CHKD. BY KM DATE 3/26/90 OFS NO. 7918.017 DEPT. NO. 941

CLIENT FPL

PROJECT PFLR

SUBJECT Acreage Breakdown on site



Based on USGS 7½' Quad Sheet
Lauderdale S. multiplied 2.4 times

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Calc. 56

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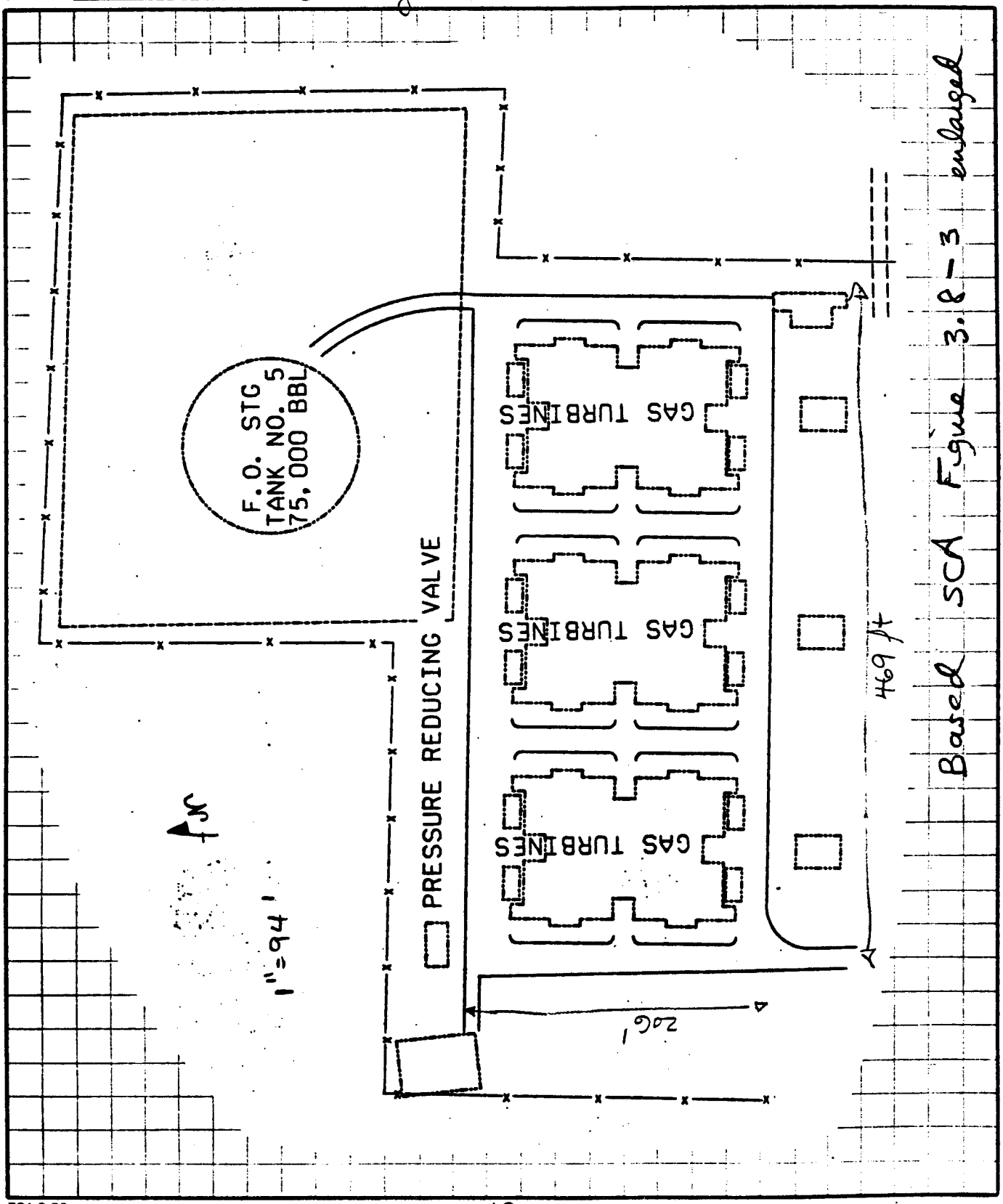
SHEET 5 OF 13

OFS NO. 7918.017 DEPT. NO. 941

CLIENT FPL

PROJECT PFLR

SUBJECT Site Drainage



Based on SCA Figure 3.8-3 enlarged

581 2-88

10.7-19

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BY NAP DATE 3/25/90 SHEET 6 OF 13

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CLIENT FPL

PROJECT PFLR

SUBJECT Site Drainage

Planimeter from p 2, the Northwest area

= 9.501519 in^2 = 141.5 acres

of this, 2.5 is other impervious

thus 141.5 - 2.5 = 139.0 acres is pervious

Southwest portion is all that's left

West half = 189.7 acres

Northwest part = 141.5

48.2 = remainder at south-west

Summary thus far:

	east half	north-west	Total
pervious areas	25.6	139	164.6
water man. areas	176.6		176.6
building areas			
other imp. areas		2.5	2.5
			343.7

these values are unchanged between existing and proposed

---

all the differences between proposed and existing will occur in the "southwest" portion

(go to page 9)

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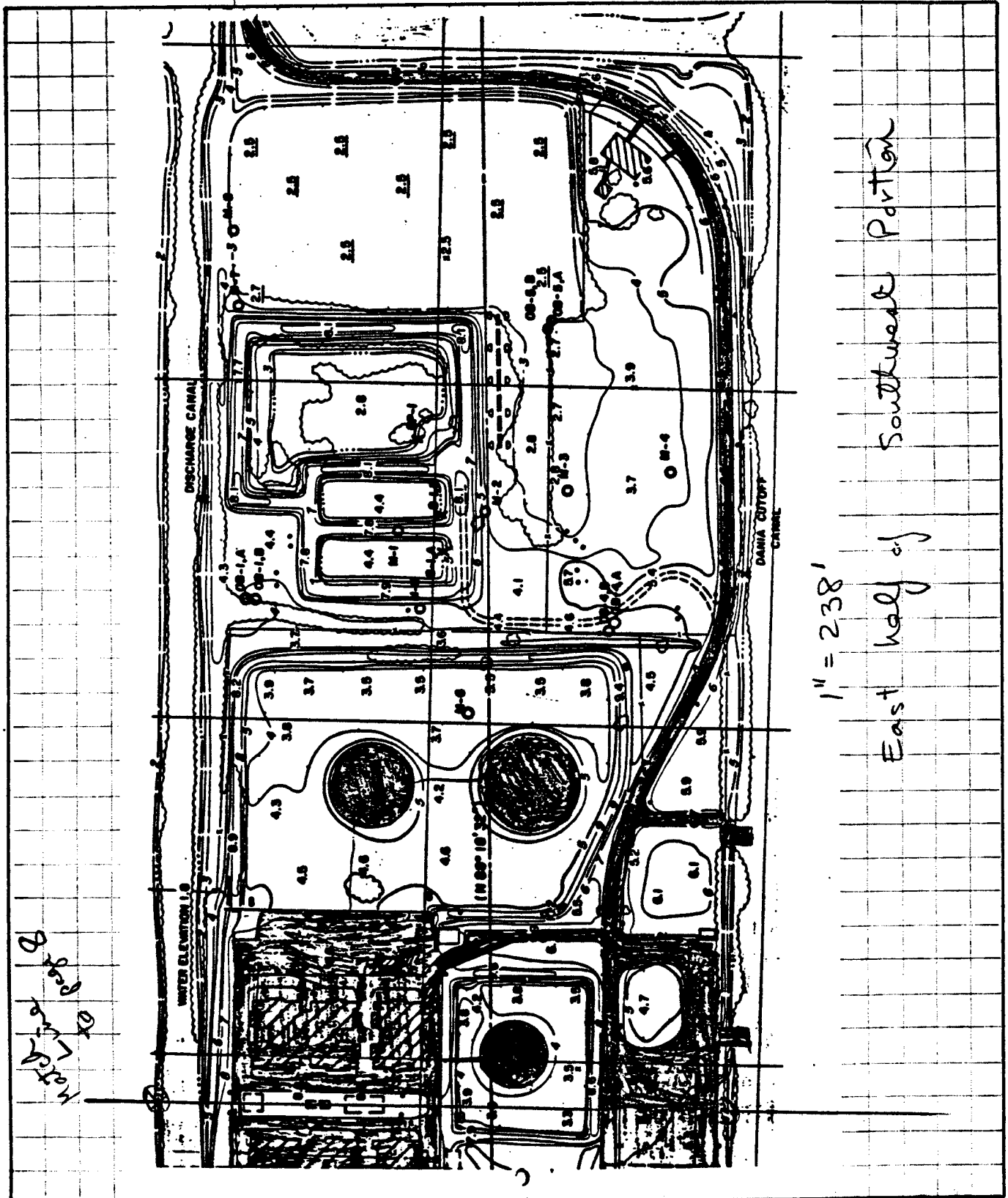
SHEET 7 OF 13

OFS NO. 7918.017 DEPT. NO. 941

CLIENT FPL

PROJECT PFLR

SUBJECT Existing & Proposed Stormwater Runoff Acreage Breakdown



10.7-21

581/8-81

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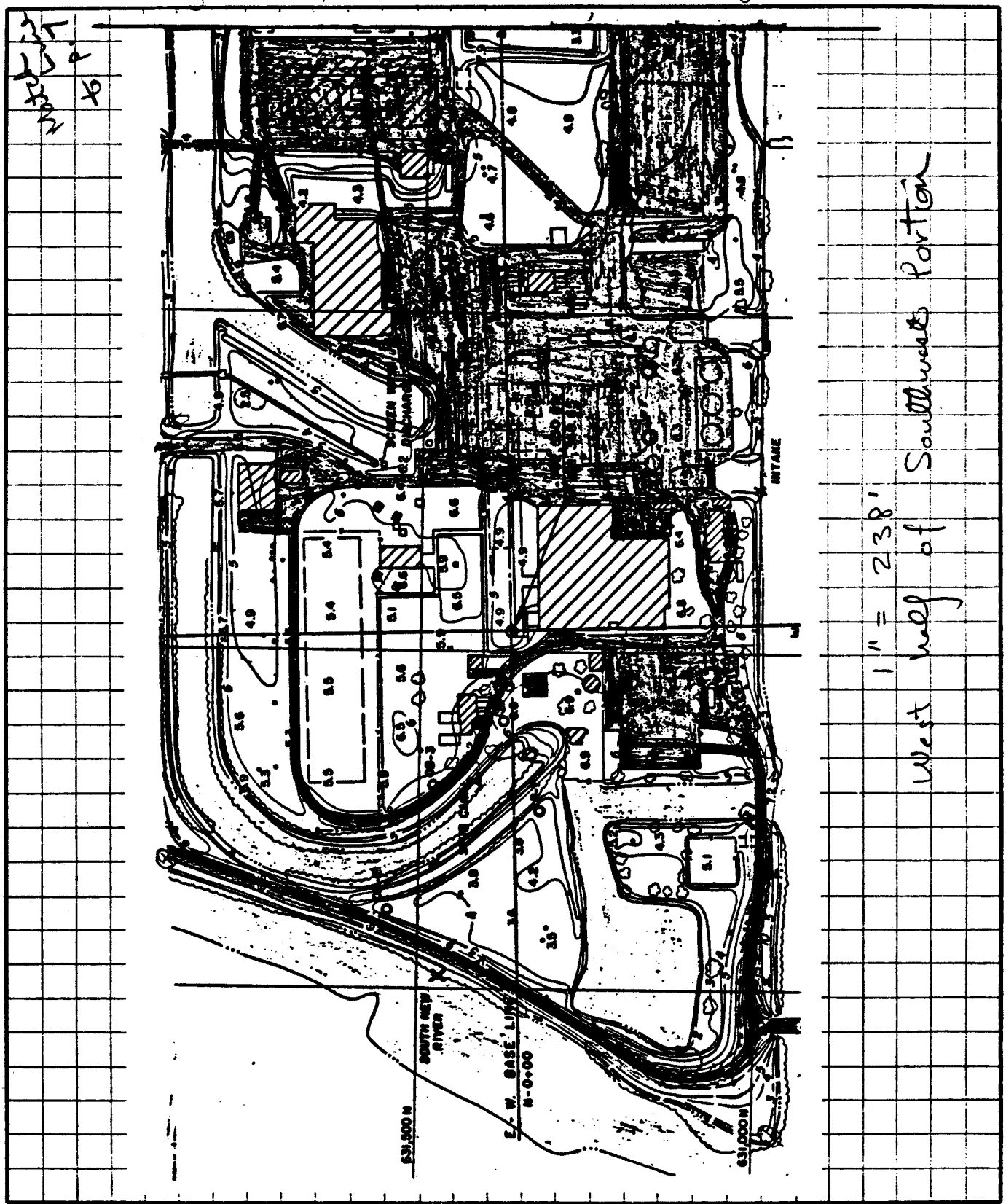
SHEET 8 OF 13

OFS NO. 7918.017 DEPT. NO. 941

CLIENT FPL

PROJECT PFLR

SUBJECT Existing and Proposed Stormwater Runoff Acreage Breakdown



1" = 238'

West half of Southwest Portion

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BY NAT DATE 3/25/90 SHEET 9 OF 13

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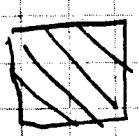
CLIENT FPL

PROJECT PFLR

SUBJECT Site Drainage

Pages 7 & 8 depict southwest Portion of site with areas designated as follows:

shaded – other impervious

 – buildings

blank – pervious

inside — — — water management areas

by planimeter, per sheet

	p8 in²	p7 in²	Total in²	Acres
other impervious	10.05952	4.96 00099	15.02	11.4
building	1.5810031	0.1550003	1.74	1.3
water management (dbl intake) (stub) (ditch, channel)	1.3020026 1.5500031 1.4260038 4.2780085	2.1390042	6.42	4.9
pervious (calc. by subtract from totals)			40.25	30.6
Total	30.876061	32.550065	63.43	48.2 (from p. 6)

EBASCO SERVICES INCORPORATED

BY HdP DATE 3/25/90 SHEET 10 OF 13

CHKD. BY KM DATE 3/26/90 OFS NO. 7918.017 DEPT. NO. 941

CLIENT FPL

PROJECT PFLR

SUBJECT Site Drainage

Summary – Existing Acreage

	East & Northwest Portions	Southwest Portion	Total Existing
Pervious Areas	164.6	30.6	195.2
Water Management Areas	176.6	4.9	181.5
Building Areas	–	1.3	1.3
Other Impervious Areas	2.5	11.4	13.9

Total = 391.9 Acres

EBASCO SERVICES INCORPORATED

BY N2P DATE 3/25/90 SHEET 11 OF 13

CHKD. BY KM DATE 3/26/90 OFS NO. 7918.017 DEPT. NO. 941

CLIENT FPL

PROJECT PFLR

SUBJECT Site Drainage - Acres

Acreage Breakdown for Proposed Site Usage is the same except for the Southwest Portion - from Section 3.8.2 of SCA & New Areas

Water Management Areas

Eq Basin - 3 Acres
Runoff Pond 0.7

Existing

pervious - 3
pervious 0.7
3.7

Buildings

CT Enclosure
370 x 105 = .9 acres
(sect 3.7.2)
43560

rest of Power Block 8.4
other Impervious

New Warehouse 0.4 acres
1.3

4.6 pervious
4.7 other imp.
(by inspection of p. 12)
other → 0.4

Other Impervious

Wat Treatment Area	1.1	1.1 perv
Wastewater Trt Area	1.5	1.5 perv
	8.4	
Triangular Parking Lot on West End	0.8	0.8 perv
	11.8	

Pervious

New area of old intake canal	1.0	1.0 wat man. area

10.7-25

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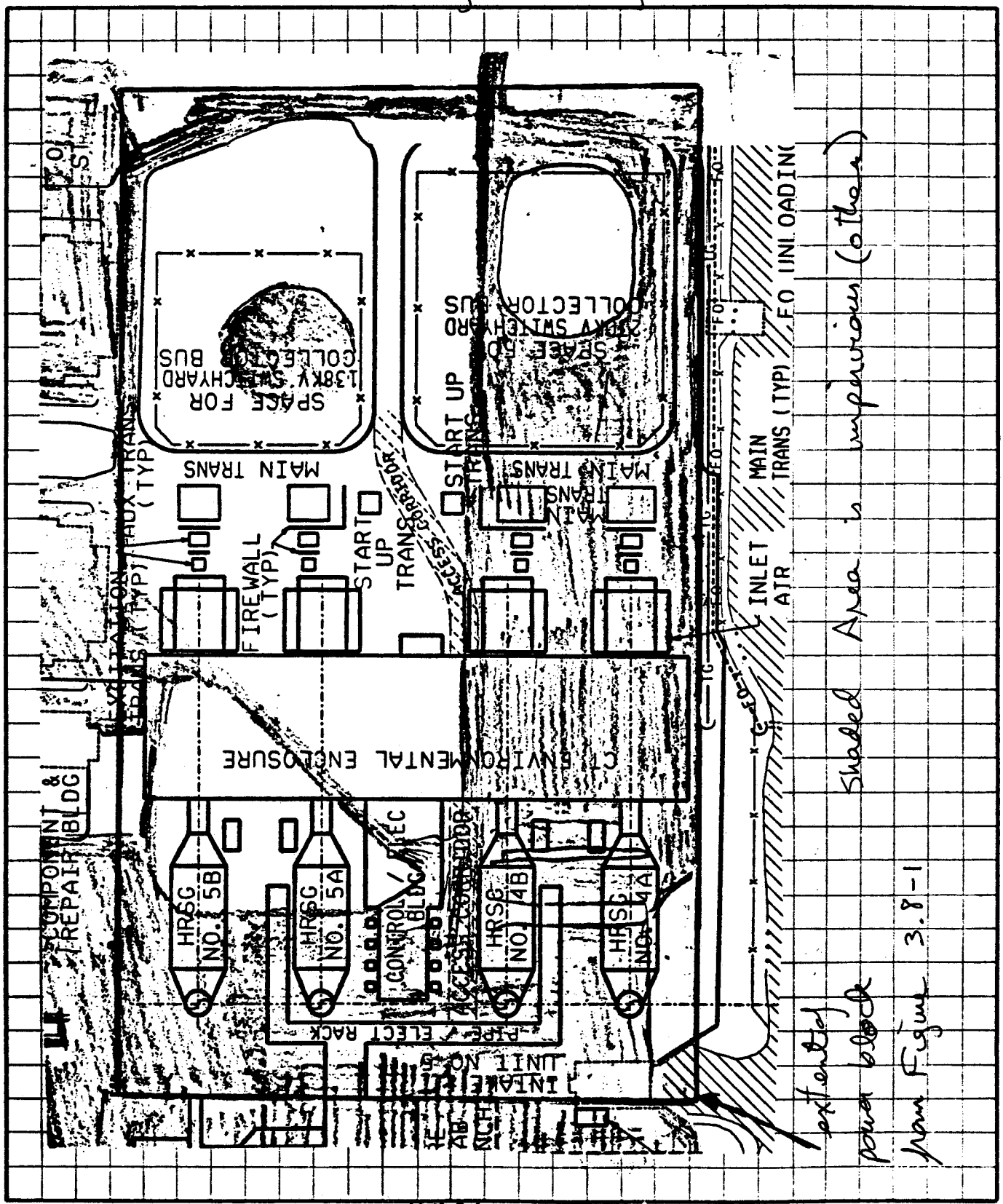
SHEET 12 OF 13

OFS NO. 7918.017 DEPT. NO. 941

CLIENT FPL

PROJECT PFLR

SUBJECT site drainage - acreage



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10.7-26

EBASCO SERVICES INCORPORATED

BY HAF DATE 3/25/90 SHEET 13 OF 13
CHKD. BY KM DATE 3/26/90 OFS NO. 7918.017 DEPT. NO. 941
CLIENT FPL
PROJECT PFLR
SUBJECT Existing and Proposed Stormwater Runoff Acreage Breakdown

Summary of changes

	Existing (p. 10)	Add (p 11) with Proposed Use	Delete ⊛ with Proposed Use	Under Proposed Use
Pervious Areas	195.2	1.0	11.7	184.5
Water Management Areas	181.5	3.7	1.0	184.2
Building Areas	1.3	1.3	0	2.6
Other Impervious Areas	13.9	11.8	5.1	20.6
Total	391.9	17.8	17.8	391.9

⊛ from p 11

delete per p. 11

pervious		other
3.0	9.1	4.7
0.7	1.1	0.4
4.6	1.5	
0.8	11.7	5.1
9.1		

10.7-27

581/8-81

Rev. 1

LAUDERDALE REPOWERING
SUMMARY OF DRAINAGE REPORT

I. INTRODUCTION

During the SCA review cycle, SFWMD and FPL have been jointly reviewing the question of overall Lauderdale site drainage. Through written questions and answers, meetings and telephone conversations, the questions have been answered satisfactorily for all of the site, except the portion south of the plant discharge canal, and west of the finger canal at the western edge of the Alandco property. This portion of the site has been divided into six sub-basins.

This report provides six calculations which describe site drainage, after Repowering, for each of the sub-basins, in a format requested by SFWMD personnel.

As support, six additional calculations which document the existing drainage for each sub-basin are also provided, as well as six other supporting calculations. They are presented in the order described.

II. RESULTS

Roads and buildings are adequately protected from flooding.

Parking lots, except the west lot (not a part of Repowering) are adequately protected.

Allowable peak discharges are not exceeded.

No variances from District Criteria are required.

Rev. 1

The following table summarizes discharge and runoff quantities:

Sub Basin	Acres	Existing* Runoff Inches	Existing* Peak Flow Cfs	After Repowering* Runoff Inches	After Repowering* Peak Flow Cfs
1	7.48	11.73	77.9	13.15	0
2	4.44	NA	0	NA	0
3	11.76	12.09	1.6	11.96	1.6
4	8.38	6.67	12.2	14.61	28.1
5	4.70	NA	0	NA	0
6	8.68	NA	0	NA	0
Total	45.44	--	91.7	--	29.7

*Flows are to Dania Cut-Off Canal only.

Rev. 1

LAUDERDALE REPOWERING
DRAINAGE REPORT
TABLE OF CALCULATIONS

Calc No.	Subject
57	SFWMD Sufficiency/Drainage
61	Overall Drainage Factors
62	Sub-Basin 1
63	Sub-Basin 2
64	Sub-Basin 3
65	Sub-Basin 4
66	Sub-Basin 5
67	Sub-Basin 6
58	Sub-Basin 1 Existing
59	Sub-Basin 2 Existing
60	Sub-Basin 3 Existing
68	Sub-Basin 4 Existing
69	Sub-Basin 5 Existing
70	Sub-Basin 6 Existing
71	Backup to Calc 64
72	Backup to Calc 71
73	Backup to Calc 65
74	Wastewater Treatment Flow and Basin Sizing

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Calc. 57

EBASCO SERVICES INCORPORATED

BY NAF DATE 5/15/90 SHEET 1 OF 9

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CLIENT FPL

PROJECT PFLR

SUBJECT SFWMD Sufficiency / Drainage

Per Attachment 1, letter from SFWMD to N.S. Oven, dated 4/18/90, there are 4 outstanding items relevant to site surface water management; questions from Att 1 are

3) Revised Design including
   a) flood-routing of 6 sub-basins
   b) design details of 6 sub-basins
   c) BMP's at control structures
   d) revisions to SCA 3.8 drawings

4) revised site plan for wastewater treatment facility to avoid wetlands

7) This question allows use of a separate Engineering report in response to 3) above

8) Followup response to District sufficiency question 28
   a) is there an equalization basin for waste waters not transported off-site
   b) if a) is yes, demonstrate that paragraph 3.2.2.8 of the manual is met

10.7-32

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BY NAP DATE 5/15/90 SHEET 2 OF 9

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CLIENT FPL

PROJECT PFLR

SUBJECT SFWMD Sufficiency / Drainage

This calculation serves as the introduction to the Engineering Report which satisfies items 3) and 7)

The sketch on page 3 locates the 6 sub-basins as agreed between FPL and SFWMD at the April 11, 1990 meeting at the District office. The 6 areas are characterized as follows:

Area No.	Description	Sketch on page # of this calc
1	West Parking Area	4
2	Water Treatment Area	5
3	Existing Plant Area	6
4	Power Block Area	7
5	Fuel Storage Area	8
6	Wetland Area	9

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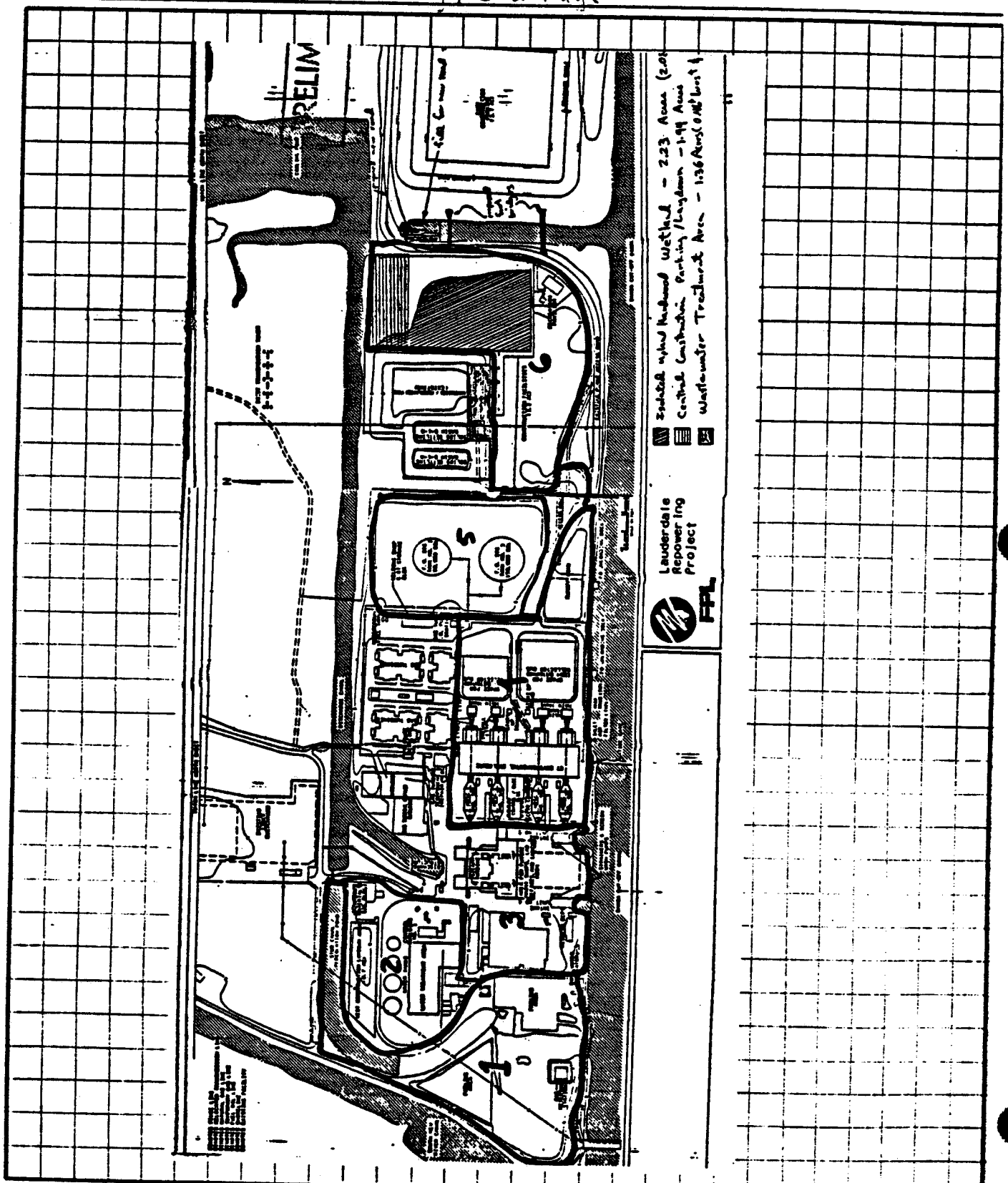
SHEET 3 OF 9

OFS NO. 7918.017 DEPT. NO. 941

CLIENT FPL

PROJECT PFLR

SUBJECT SFWMD Sufficiency / Drainage



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Calc. 57

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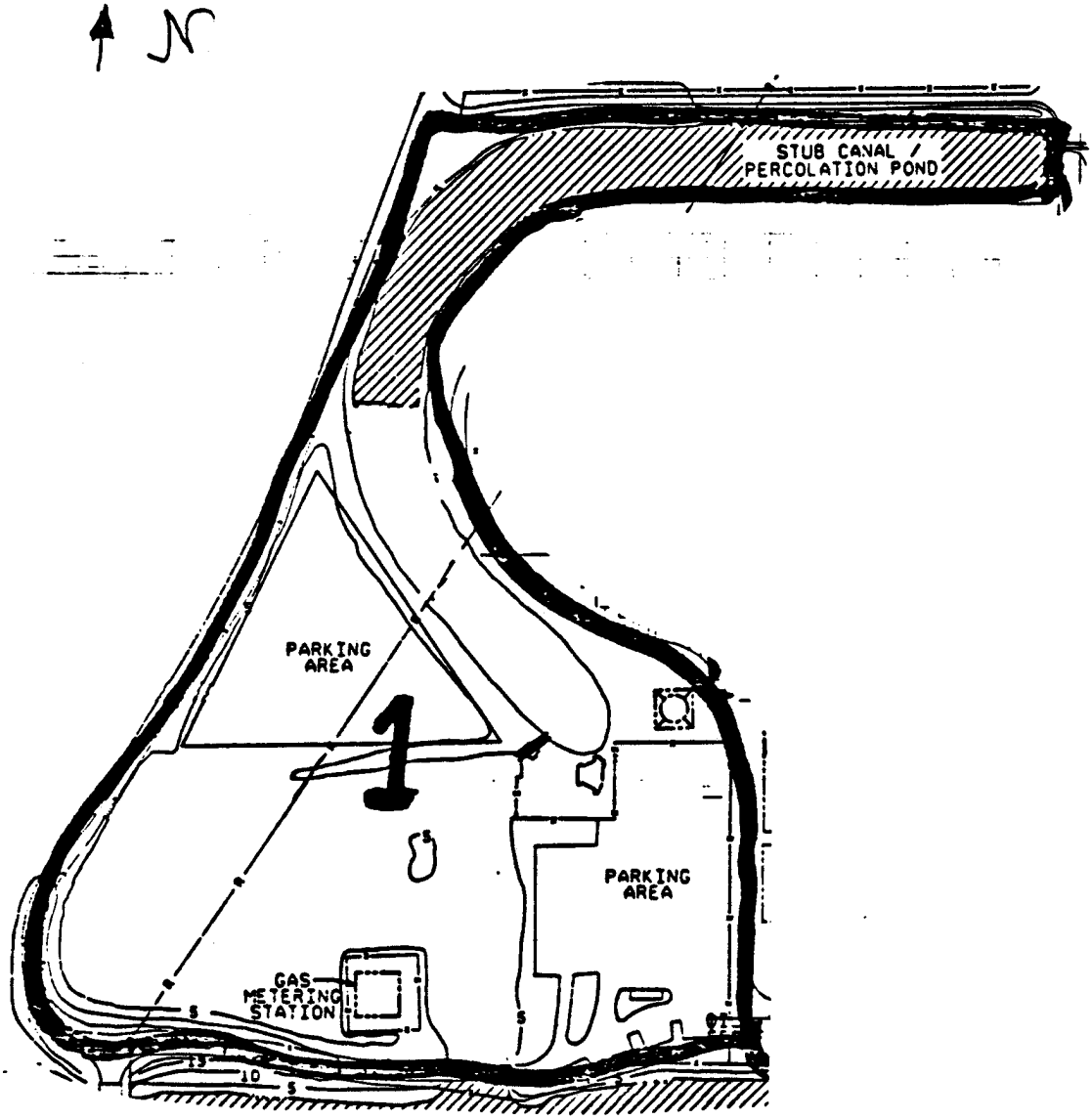
BY HOP DATE 5/15/90 SHEET 4 OF 9

CHKD. BY KM DATE 5/15/90 OFS NO. 7918.017 DEPT. NO. 941

CLIENT FPL

PROJECT PFLR

SUBJECT SFWMD Sufficiency / Drainage



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SHEET 5 OF 9

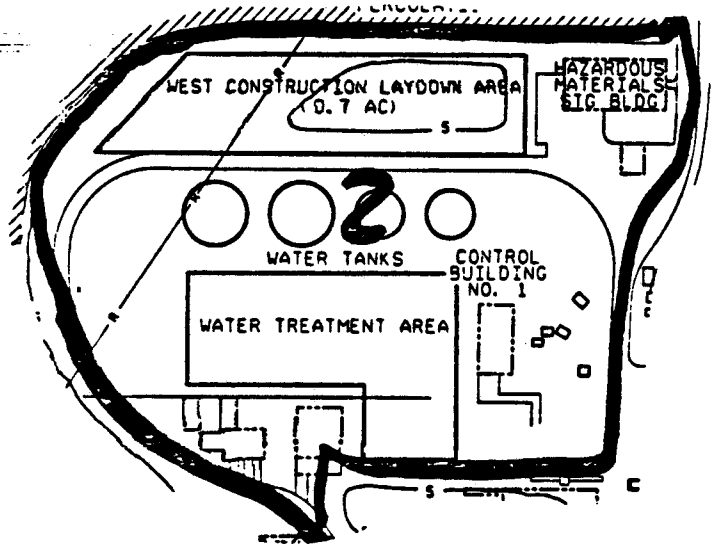
OFS NO. 7918.017 DEPT. NO. 941

CLIENT FPL

PROJECT PFLR

SUBJECT SFWMD Sufficiency / Drainage

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Calc. 5

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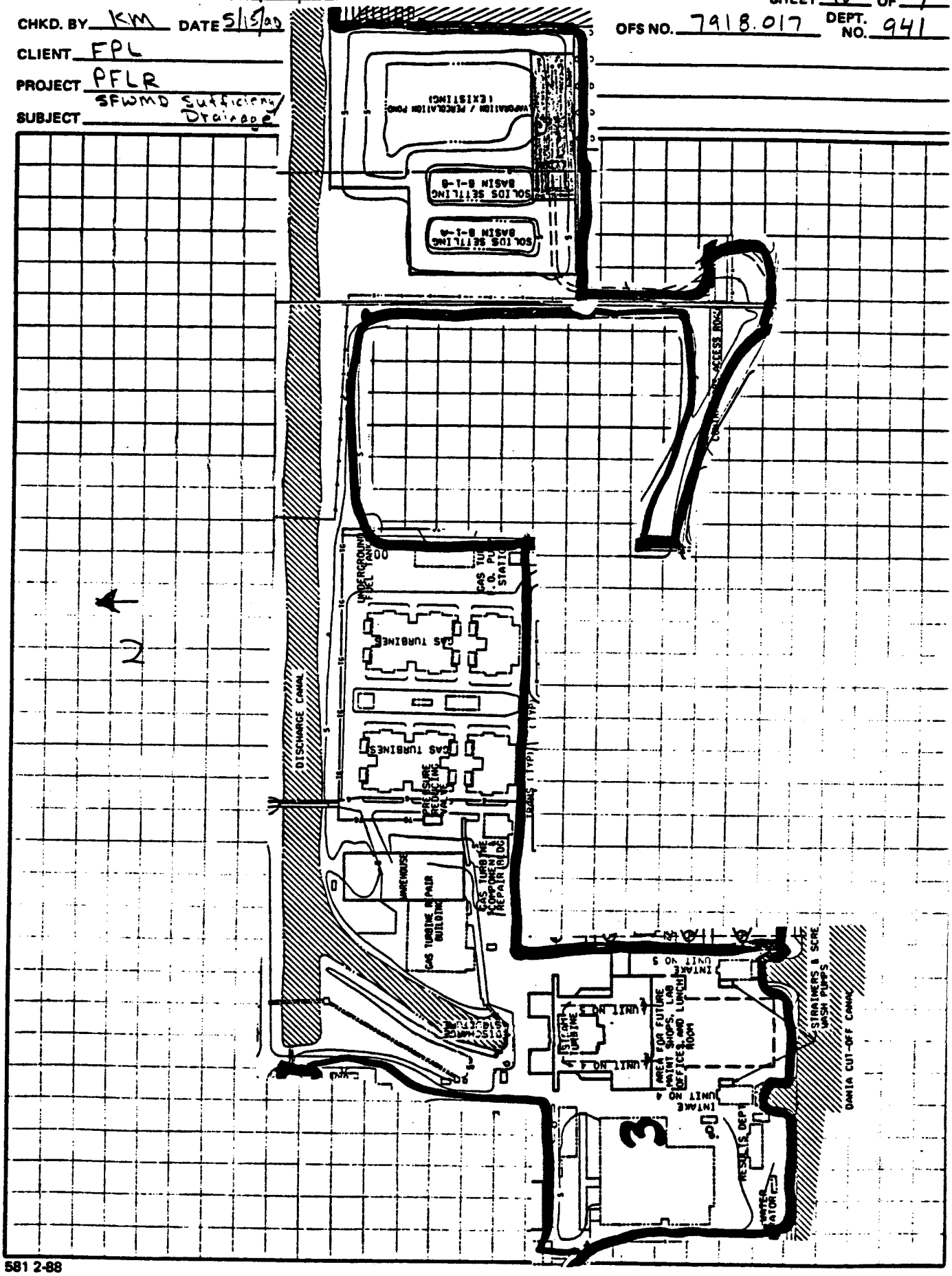
SHEET 6 OF 9

CLIENT FPL

OFS NO. 7918.017 DEPT. NO. 941

PROJECT PFLR

SUBJECT SFWMD Sufficiency Drainage



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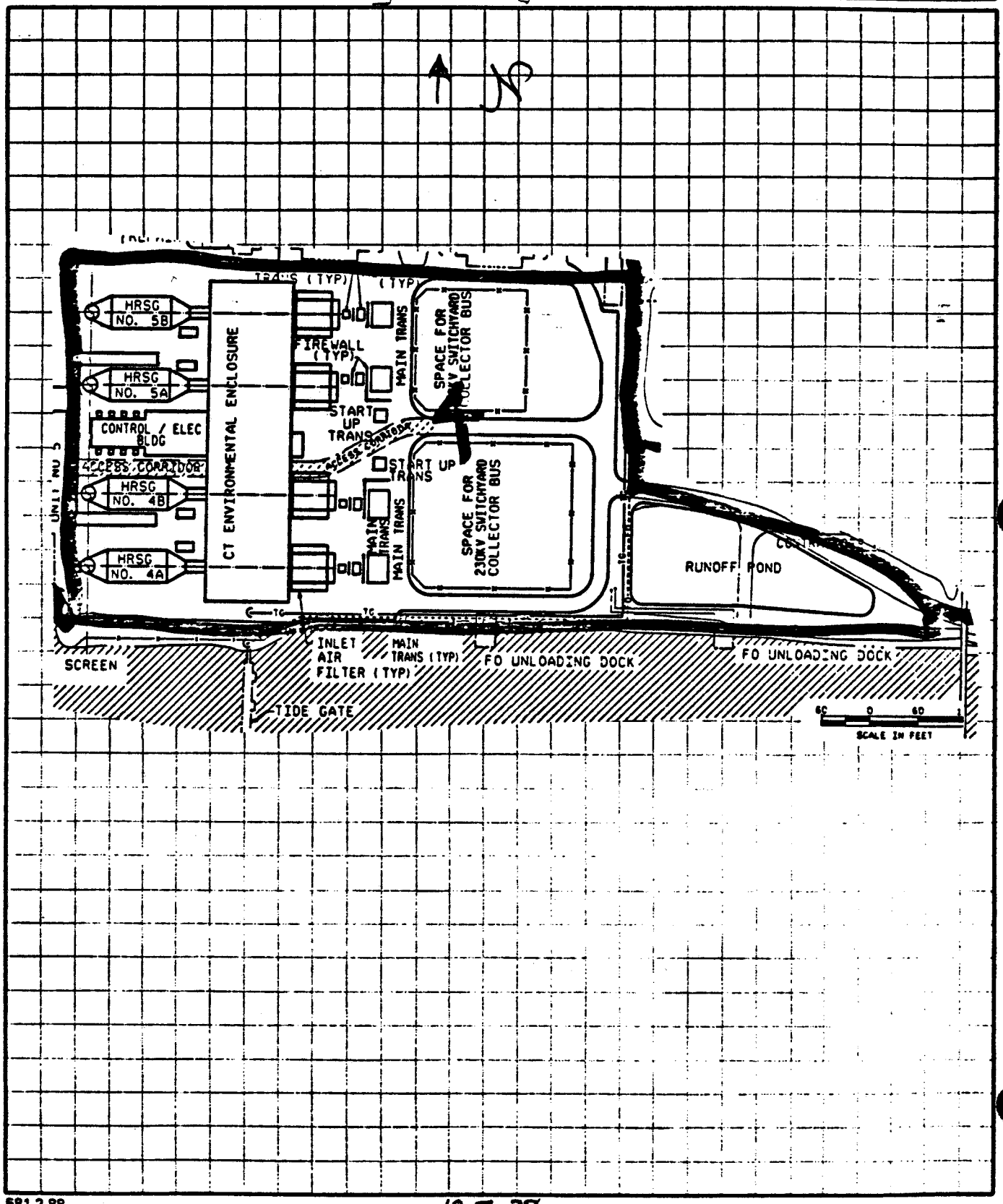
SHEET 7 OF 9

OFS NO. 7918.017 DEPT. NO. 941

CLIENT FPL

PROJECT PFLR

SUBJECT SFWMD Sufficiency / Drainage



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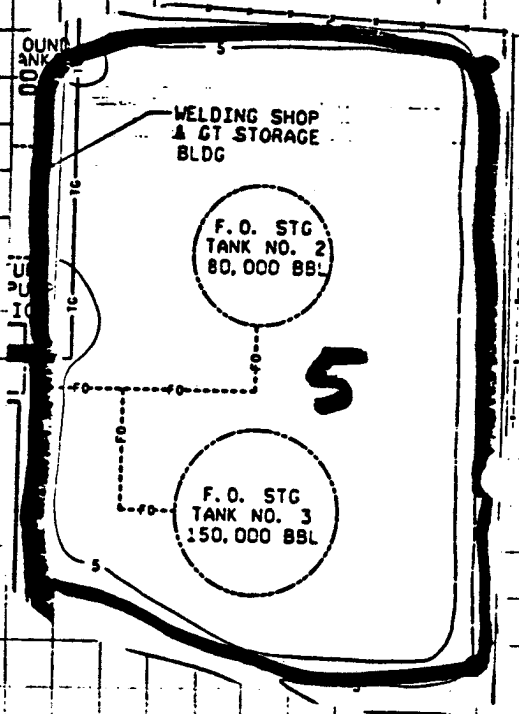
SHEET 8 OF 9

OFS NO. 7918.017 DEPT. NO. 941

CLIENT FPL

PROJECT PFLR

SUBJECT SFWMD Sufficiency / Drainage



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BY Nap DATE 5/15/90

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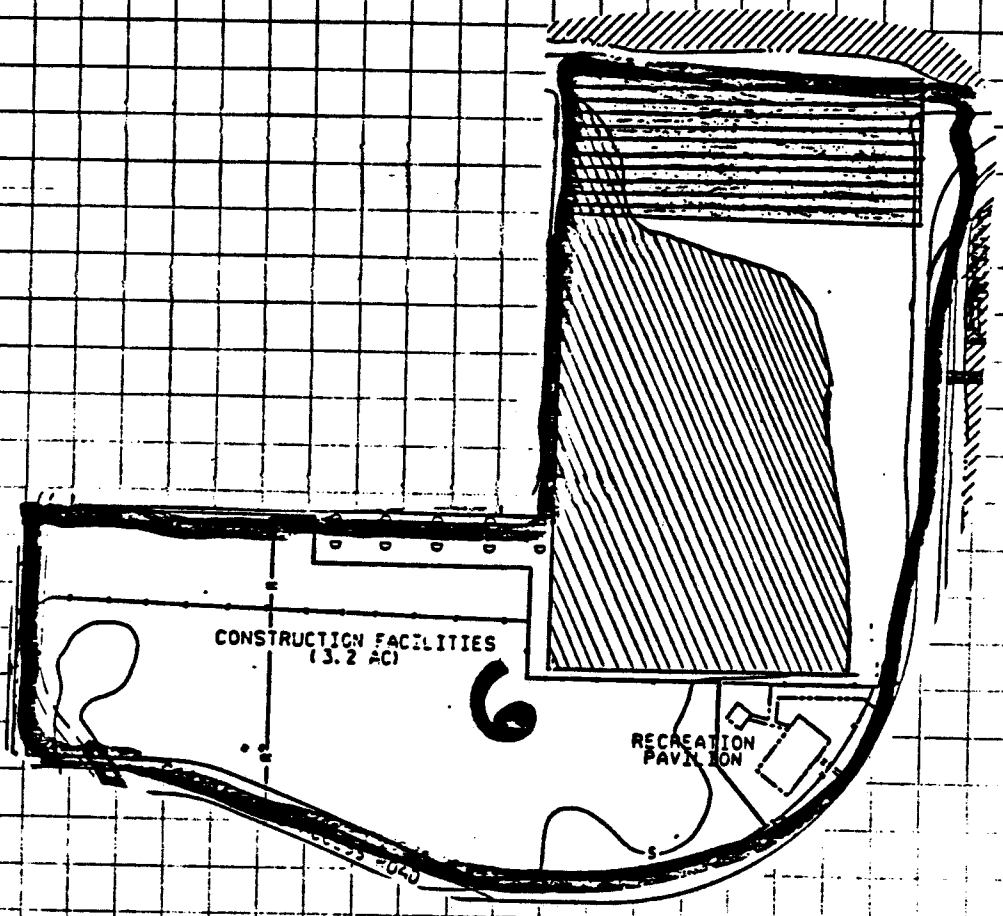
SHEET 9 OF 9

OFS NO. 7918.017 DEPT. NO. 941

CLIENT FPL

PROJECT PFLR

SUBJECT SFWMD Sufficiency / Drainage



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Rev. 1 Att. 1- Sheet 1

South Florida Water Management District

Calc. 57

P.O. Box 24680 • 3301 Gun Club Road • West Palm Beach, FL 33416-4680 • (407) 686-8800 • FL WATS 1-800-432-2045

April 18, 1990

Mr. Hamilton S. Oven, Jr., P.E.
Administrator, Office of Siting Coordination
Division of Air Resources Management
Department of Environmental Regulation
2600 Blair Stone Road
Tallahassee, Florida 32399

Re: FP&L Fort Lauderdale Repowering Project
Power Plant Site Certification Application PA 89-26
Second Sufficiency Review

Dear Mr. Oven:

District staff has reviewed FP&L's April 5, 1990 Response to the District's February 8, 1990 sufficiency comments and questions on the above referenced project. As noted in the document, responses to the following items will be provided at a later date and, thus, remain an outstanding sufficiency issue at this time:

(1) Resolution of the right-of-way permitting issues discussed in District questions 3 and 4 under subsection 2.2.4 (Easements, Titles, Agency Works) and 4 (Appendix 10.4-65) to be addressed by June 1, 1990 through a consolidated right-of-way permit application.

(2) Final results of the hydrogeologic investigation discussed in District questions 7, 8, 9, 14, 30, 32, 34, and 39 (all related to subsection 2.3.3 Site Water Budget and Area Users), the April 5, 1990 meeting of District staff and FP&L representatives, and the District's April 13, 1990 follow-up letter, to be provided by May 7, 1990 in a Final Hydrogeologic Investigation Report.

(3) A revised surface water management system design for the site which demonstrates compliance with the District's water quality and quantity permitting criteria through submission of flood routings and the appropriate design details for each of the six sub-basins, including dry pre-treatment area design features, other best management practices such as baffles on all control structures, and the appropriate revisions to drawings/figures/cross-sections, as discussed in District questions 20, 21, 22, 23, 24, 25, 26, 27, and 29 (all related to subsection 3.8 On-Site Drainage and Appendix 10.7 Drainage and Runoff Calculations) and the April 11, 1990 meeting of District staff and FP&L representatives, to be provided by May 7, 1990.

(4) A possible revised site plan for the wastewater treatment facility proposed to be located in the vicinity of the existing on-site 2.5 acre forested wetland, including the appropriate revisions to the mitigation options discussed in the response to District question 31, in follow-up to the issues raised during the April 11, 1990 combined agencies' site visit, to be submitted by May 7, 1990.

Governing Board:
James F. Garner, Chairman - Fort Myers
Doran A. Jason, Vice Chairman - Key Biscayne
J.D. York - Palm City
Arsenio Millan - Miami
Fritz Stein - Belle Glade
Mike Stout - Windermere
Ken Adams - West Palm Beach
Valerie Boyd - Naples
James E. Nall - Fort Lauderdale
John R. Wodraska, Executive Director
Tilford C. Creel, Deputy Executive Director
Thomas K. MacVicar, Deputy Executive Director

Att. 1 Sheet
Calc. 57

In addition to the above noted items, the following items require additional clarification in order for the District to complete its review of the proposed project:

(5) In follow-up to FP&L's response to the District's sufficiency question 11, please provide copies of the daily Dania Cut-off Canal withdrawal records submitted to DER on a monthly basis for the last three years, with particular emphasis on the last several months.

(6) If not provided in the Hydrogeologic Investigation Report noted above under question 2, please explain the circumstances (frequency, length of time, average/maximum day withdrawal, etc.) under which the existing off-site wells would be used for backup purposes.

(7) If not provided as a separate Engineering Report in response to question 3 above, the responses provided by FP&L to District questions 20 through 27 will need to be amended to reflect the revised surface water management system design discussed in the April 11, 1990 meeting.

(8) In follow-up to FP&L's response to the District's sufficiency question 28, please clarify if an equalization pond is included as part of the on-site wastewater treatment facility proposed for treating those wastewaters not transported to an off-site sewage treatment plant. If so, then the response should be revised to demonstrate that the minimum separation criteria noted in this question can be met.

Should any of the above questions/comments require clarification, please give me a call.

Sincerely,

Susan M. Coughanour
Senior Review Coordinator
Regulation Department

SMC:sk

Rev. 1

Calc 61

EBASCO SERVICES INCORPORATED

BY NAP DATE 5/18/90

CHKD. BY km DATE 5/30/90

SHEET 1 OF 6

OFS NO. FLO 7918.012 DEPT. NO. 941

CLIENT FPL

PROJECT PFLR

SUBJECT Overall Drainage Factors

Per telephone conversation on 5/18/90 with Eduardo Lopez and Orlando Rubio, who reviewed calc's 57, 58 and 59, the following agreement was reached:

1. The design example in Appendix D-M will be used as the basis for each of the 6 basin calculations to be presented to the District

2. Dry retention basins need to be a foot above the expected high water Table

3. Except for the Power Block area, emphasis should not be put on the existing floors

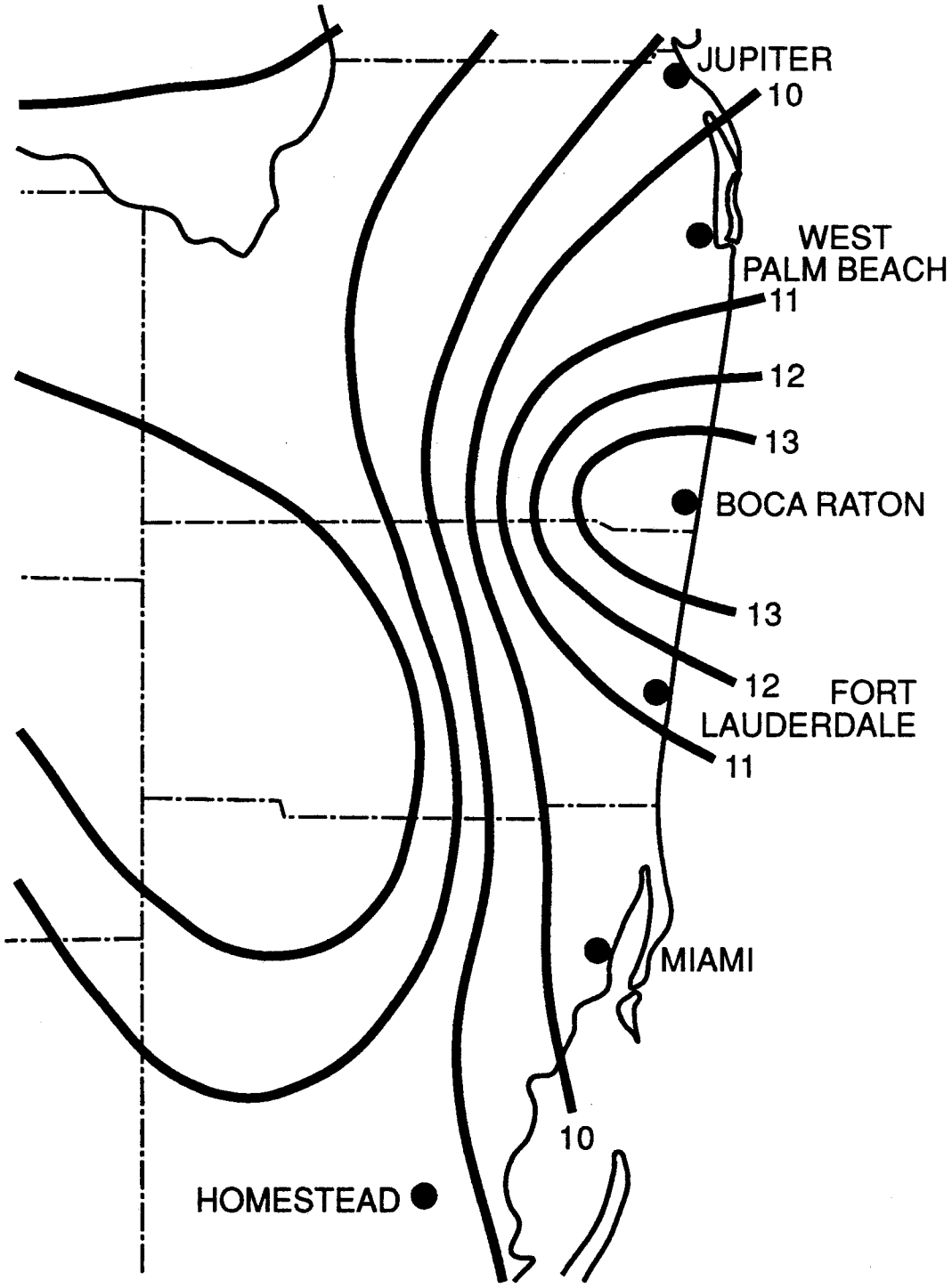
The remainder of this calculation will develop parameters common for all 6 basins

It is necessary for this surface water management system to meet Broward County EQCB Chapter 27-14

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581 2-88

Rev. 1



CALC 61 SHEET 2

Lauderdale
Repowering
Project

FPL

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EBASCO SERVICES INCORPORATED

Calc 61

BY HAP DATE 5/18/90

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SHEET 3 OF 6

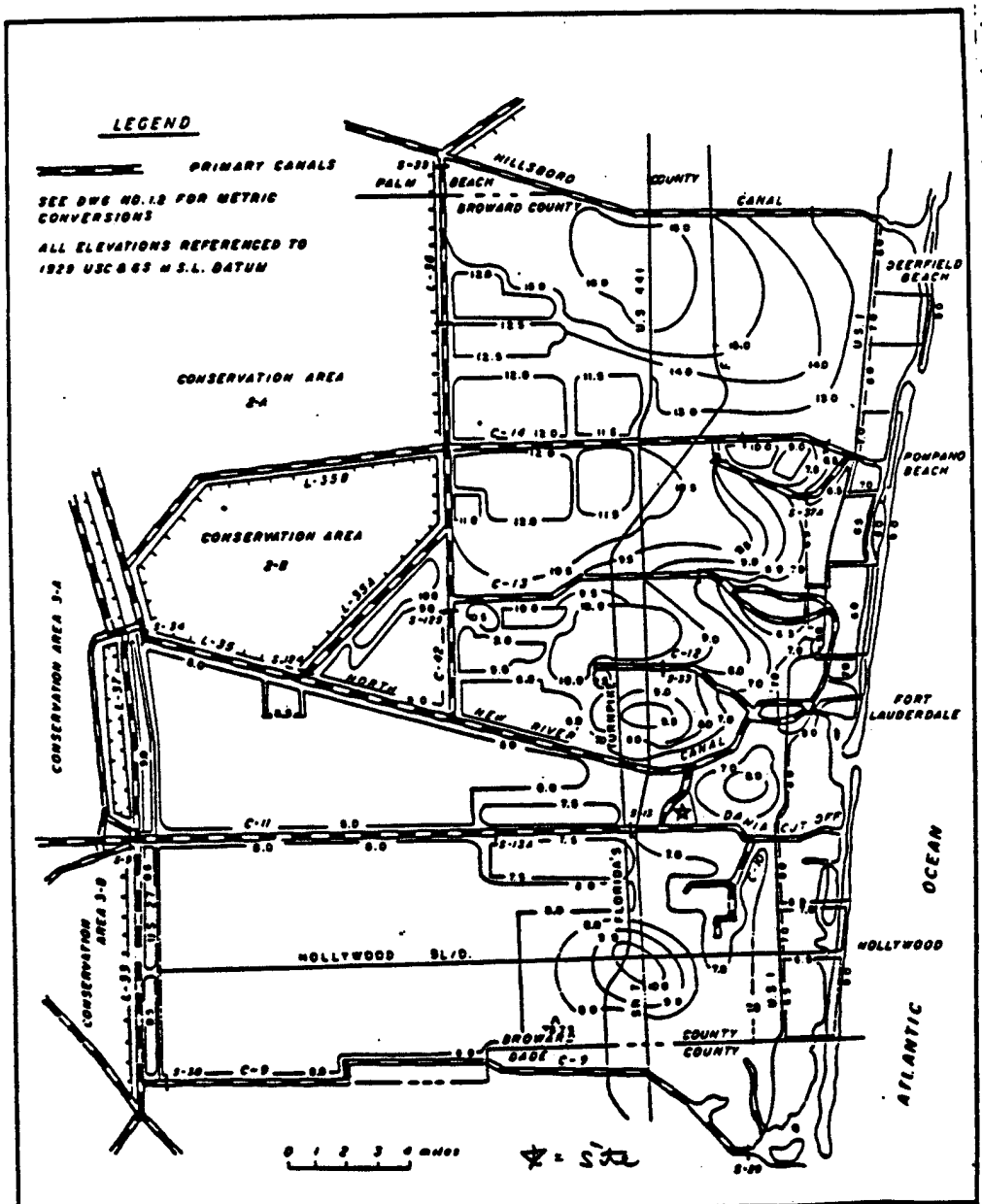
OFS NO. FLO 7918.017 DEPT. NO. 941

CLIENT FPL

PROJECT PFLR

SUBJECT Overall Drainage Factors

Minimum Elevations -
Based on Broward County map below:
Minimum elevation for building floors
= 7.0 ft MSL



BROWARD COUNTY TRANSPORTATION DEPARTMENT WATER MANAGEMENT DIVISION	APPROVED 7-19-77 REVISED	100 YEAR FLOOD ELEVATION MAP	W.M. 13.1 1 OF 1 SHEETS

10.7-45

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EBASCO SERVICES INCORPORATED

Calc 61

BY NAP DATE 5/18/90

SHEET 4 OF 6

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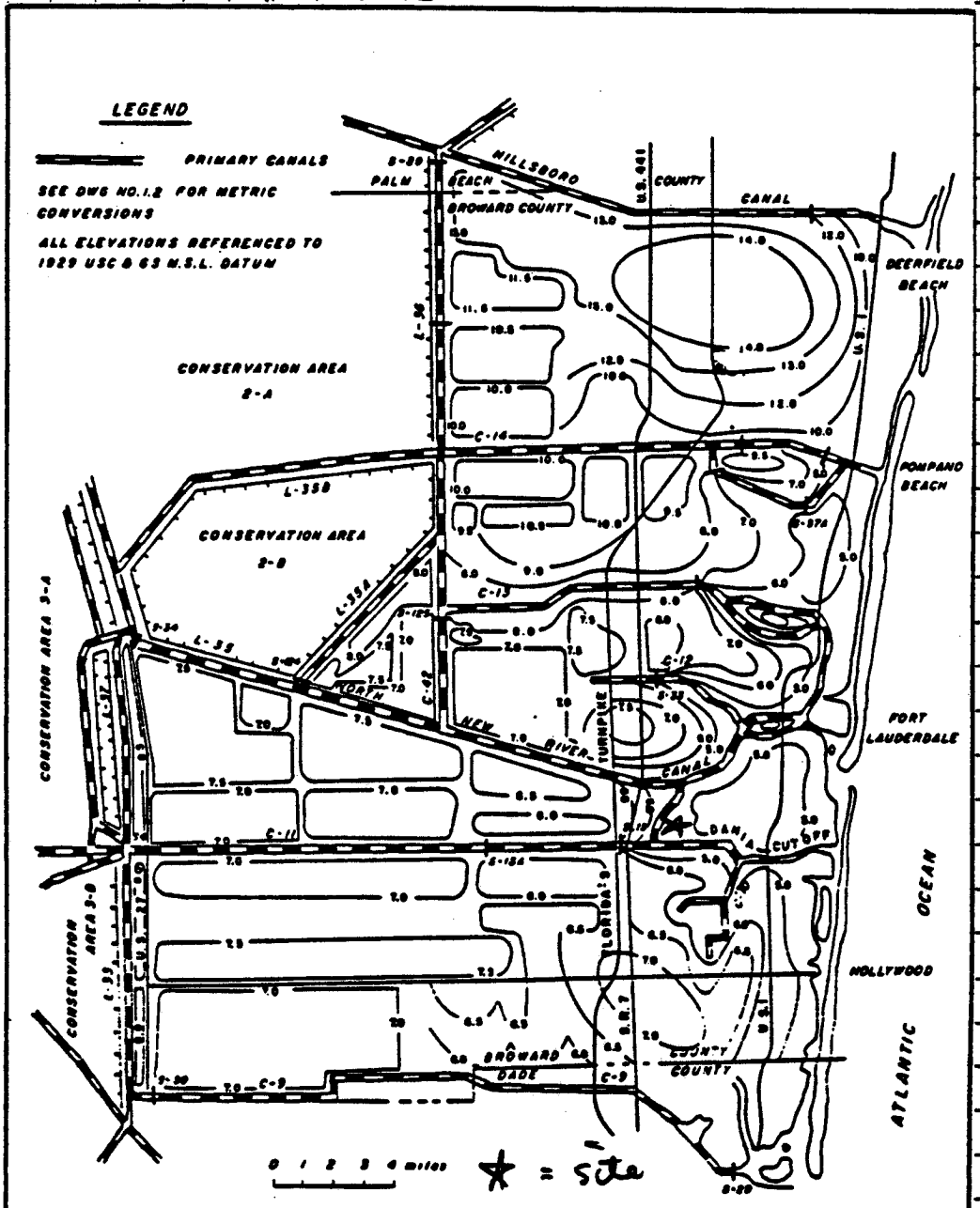
OFS NO. FL07918.017 DEPT. NO. 941

CLIENT FPL

PROJECT PFLR

SUBJECT Overall Drainage Factors

Minimum Elevation
Based on Broward County map below:
Minimum Elevation for road and parking is = El 5.9



BROWARD COUNTY TRANSPORTATION DEPARTMENT WATER MANAGEMENT DIVISION	APPROVED 7-19-77 REVISED	FLOOD CRITERIA MAP	W.M. 12.1 1 OF 1 SHEETS

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10.7-46

Rev. 1

Calc 61

EBASCO SERVICES INCORPORATED

BY HAP DATE 5/18/90

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SHEET 5 OF 6

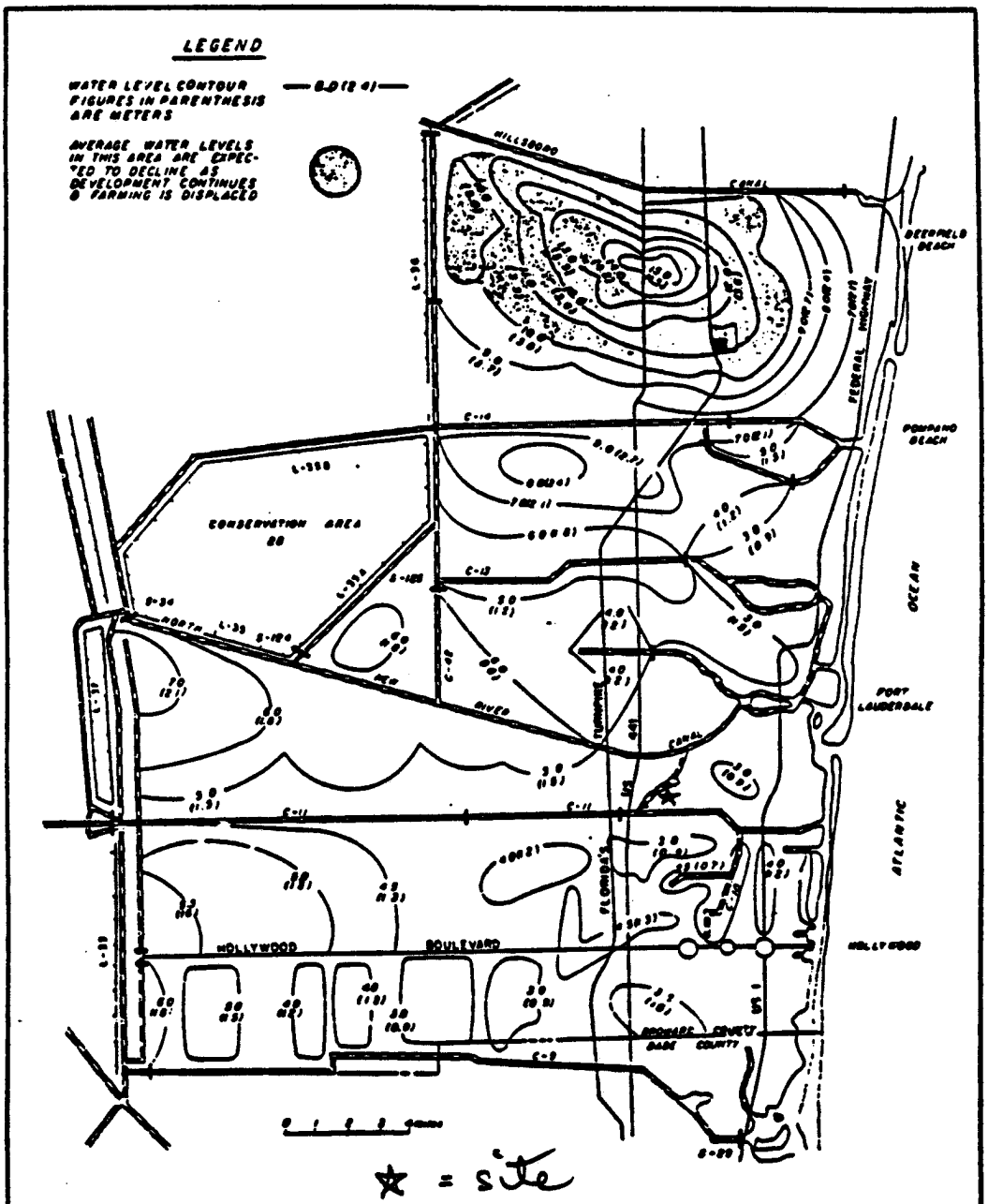
OFS NO. FLO 7918.017 DEPT. NO. 941

CLIENT FPL

PROJECT PFLR

SUBJECT Overall Drainage Factors

Water Level Elevations: Based on Broward Co map below, wet season water table ± 3.0



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BY NAP DATE 5/18/90

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PROJECT PFLR

SUBJECT Overall Drainage Factors

Soil Storage will be computed per page C-III-1 of manual, for compacted soil

Since high water table = +3 following storage is calculated:

El	Inches of Storage
4	0.45
5	1.88
6	4.95
7	8.18

Pre-existing Discharge Summary

Basin	Peak Disch to Dania	Peak Disch to Cooling Pond
1	77.9	—
2	0	0
3	1.6	68.4
4	12.2	0
5	0	0
6	0	0
Total	91.7	68.4

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BY HCF DATE 5/18/90
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PROJECT PFLR
SUBJECT Drainage - Sub-basin 1

Conversation with W.M.D. (Eduardo Lopez and Orlando Rubio) indicates that Calc No 58 had an error for the post-project flood routing. It is still accurate for the existing condition

BASIN I: Given

A. Acreage
1. Total = 7.482 Acres
2. Impervious
a) Roads and Parking = 1.904 Acres
b) Buildings = 0
3. Lakes (old stub canal area) = 1.611 Acres
4. Pervious = 5.578 Acres

B. Minimum Elevations
1. Roads and Parking = EL 5.3 east lot, 4.0 west lot 2. Floors - No buildings

C. Design Storm allowable discharge
pre-existing discharge = 78 cfs (Calc 58, page 11)

D. Water Level Elevations
1. Wet season water table = EL +3.0
2. Receiving water body is tidal

E. Rainfall Amounts

Under paragraph 3.2.1.2 of the Manual, the design storm is the 25 year 72 hour storm = 14.95 inches

10.7-49

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Calc 62

BY NAP DATE 5/18/90

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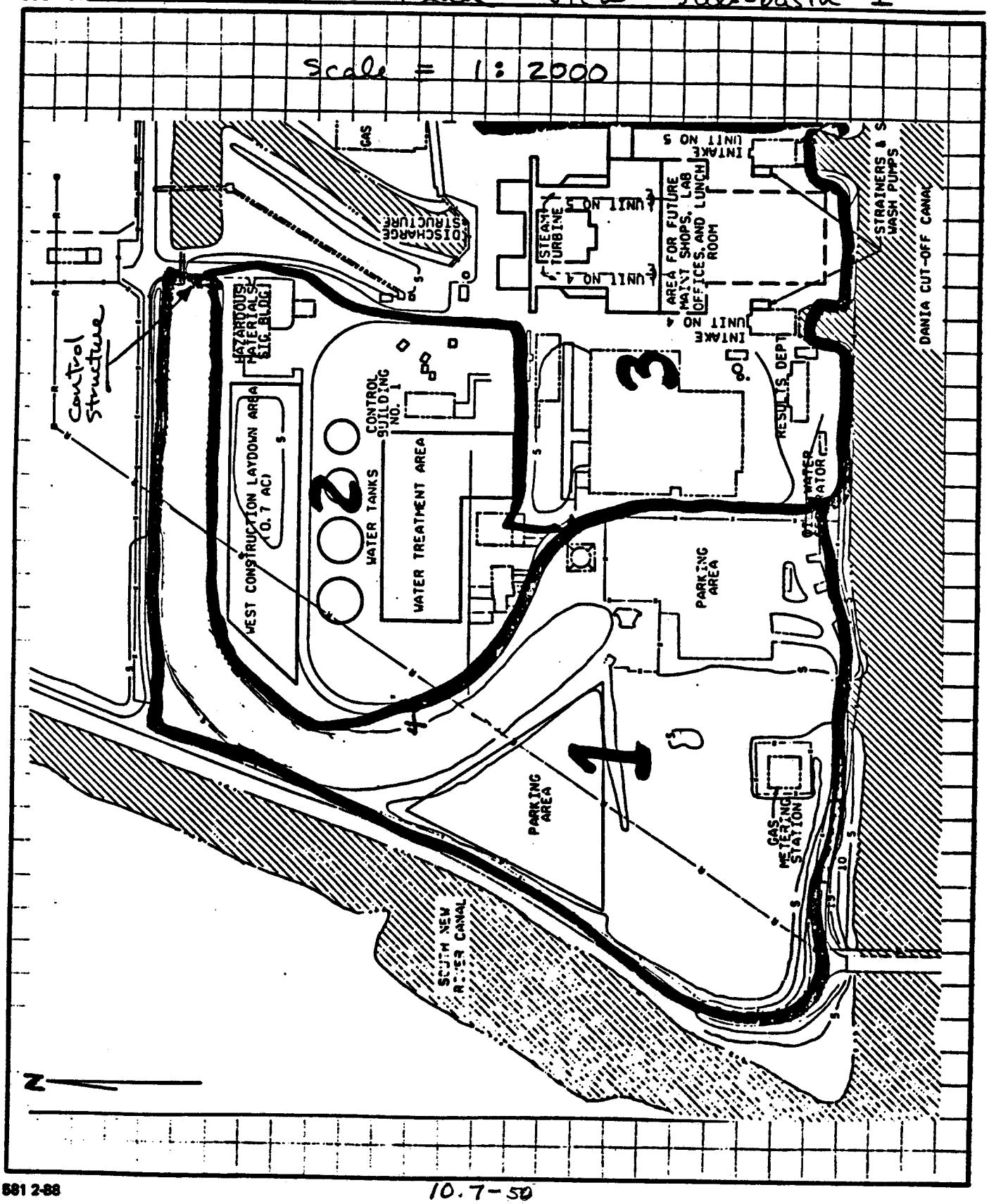
SHEET 2 OF 12

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SUBJECT Site Plan View - Sub-basin 1



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BY HAR DATE 5/18/90 SHEET 3 OF 12

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SUBJECT Drainage - Sub Basin 1

II Design Criteria

A. Quality

from Calc #8 page 20

Wet detention = 1" or 2.5" * perviousness

Dry detention = .75 * wet detention

Retention = 50% of wet detention

This sub-basin will have dry detention

Because this sub-basin will discharge to the existing cooling pond there are no limits on the rapidity of the discharge

B. Quantity

Allowable peak discharge needs to be calculated for all six sub-basins cumulatively, i.e. the total discharge to the Davie Cut-Off Canal can not exceed 91.7 cfs, which is the pre-existing or historical discharge

BY NAP DATE 5/18/90 SHEET 4 OF 12

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SUBJECT Drainage - Sub Basin 1

III Computations

A. Quality

Dry Detention - assume old intake canal filled to El +5, stub canal to El +4

1. first inch

$$7.482 \text{ acres} * \frac{1 \text{ in}}{12} = 0.624 \text{ acre-ft}$$

2. 2.5 inches * % impervious need

$$\text{impervious} = \frac{1.904}{7.482} = .254 \text{ or } 25\%$$

$$2.5 * .254 = 0.636 \text{ inches}$$

this is less than 1 inch.

so the first inch governs

Since it is dry detention, can reduce to 75%

$$0.624 \text{ Ac-ft} * .75 = .468 \text{ acre-ft}$$

Note: no pretreatment necessary

B. Soil Storage

We have:

El	(Acres) Total Area	Incremental Storage		S* factor		Storage in-ac
4	1.611	1.611	*	.45	=	.725
5	6.513	4.902	*	1.88	=	9.216
6 1/2	7.482	0.969	*	6.565	=	6.361
					Σ =	16.302

* from page 6, calc 61

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Lake 6 –

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PROJECT PFLR

SUBJECT Drainage - SubBasin 1

16.302 inch-acres / 7.482 acres = 2.18 inches

2.18 inches * .75 (parabola) = 1.64 inches

C. Project Surface Storage using end-average area method

El	Area	Incremental Storage (Ac-ft)	Total Storage
4	1.611	0	0
5	6.513	4.062	4.062
6½	7.482	10.496	14.558

Assume storage is linear between above elevations

D. Control Structure weir crest Elevation

detention is only 0.468 Ac-ft

$\frac{0.468}{4.062} = .115$, elevation of weir crest at 4.115

Assume a 90° V-notch weir, crest at El 4.115

from Engineering Fluid Mechanics by Olson p. 360

$Q = 2.5 H^{2.5}$

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SUBJECT Drainage - Sub Basin 1

E, F & G Control Structure Details

Need to run flood-routing program to compute

1. Runoff = 13.15 in
2. Max Water Surface El = 4.39 ft
3. Max Outflow = ~~1.13~~ .10 cfs
4. Height of Weir

set to El 6.50 for 2 feet of freeboard - See Attachment 1 for details of outlet structure

Values of rainfall, runoff, stage and discharge are shown on pages 7-12

IV Check storm stages and discharges

A. Building floor elevations

There are no buildings.

B. Roads vs local criteria

Broward County criteria is 5.0 and is met in east lot. West lot predicted to be susceptible to flooding by 0.39 ft however, lot needs to be raised to meet county criteria of 5.0. See Paul Barbieri/FPL as is not Repowering

C. Allowable peak discharge

Has been decreased below pre-existing

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PROJECT PFLR

SUBJECT Drainage - Sub Basin 1

TIME HOURS	CUM RAINFALL INCHES	CUM RUNOFF INCHES	INCR RAINFALL INCHES	INCR RUNOFF INCHES	TOTAL DISCHARGE CFS	STORAGE AC-FT	WATER LEVEL FT MSL	DISCHARGE FROM STORAGE-AC-FT
0.25	0.02	0.02	0.02	0.02	0.00	0.01	4.11	0.00
0.50	0.03	0.03	0.01	0.01	0.00	0.01	4.11	0.00
0.75	0.05	0.05	0.02	0.02	0.00	0.01	4.11	0.00
1.00	0.07	0.05	0.01	0.00	0.00	0.00	4.11	0.00
1.25	0.09	0.04	0.02	0.00	0.00	0.00	4.11	0.00
1.50	0.10	0.04	0.01	0.00	0.00	0.00	4.11	0.00
1.75	0.12	0.03	0.02	0.00	0.00	0.00	4.11	0.00
2.00	0.13	0.03	0.01	0.00	0.00	0.00	4.11	0.00
2.25	0.15	0.02	0.02	0.00	0.00	0.00	4.11	0.00
2.50	0.16	0.02	0.01	0.00	0.00	0.00	4.11	0.00
2.75	0.19	0.01	0.02	0.00	0.00	0.00	4.11	0.00
3.00	0.20	0.01	0.01	0.00	0.00	0.00	4.11	0.00
3.25	0.22	0.01	0.02	0.00	0.00	0.00	4.11	0.00
3.50	0.23	0.01	0.01	0.00	0.00	0.00	4.11	0.00
3.75	0.25	0.00	0.02	0.00	0.00	0.00	4.11	0.00
4.00	0.26	0.00	0.01	0.00	0.00	0.00	4.11	0.00
4.25	0.29	0.00	0.02	0.00	0.00	0.00	4.11	0.00
4.50	0.30	0.00	0.01	0.00	0.00	0.00	4.11	0.00
4.75	0.32	0.00	0.02	0.00	0.00	0.00	4.11	0.00
5.00	0.33	0.00	0.01	0.00	0.00	0.00	4.11	0.00
5.25	0.35	0.00	0.02	0.00	0.00	0.00	4.11	0.00
5.50	0.36	0.00	0.01	0.00	0.00	0.00	4.11	0.00
5.75	0.38	0.00	0.02	0.00	0.00	0.00	4.11	0.00
6.00	0.40	0.00	0.01	0.00	0.00	0.00	4.11	0.00
6.25	0.42	0.00	0.02	0.00	0.00	0.00	4.11	0.00
6.50	0.44	0.01	0.02	0.00	0.00	0.00	4.11	0.00
6.75	0.45	0.01	0.01	0.00	0.00	0.00	4.11	0.00
7.00	0.47	0.01	0.02	0.00	0.00	0.00	4.11	0.00
7.25	0.48	0.01	0.01	0.00	0.00	0.00	4.11	0.00
7.50	0.51	0.02	0.02	0.00	0.00	0.00	4.11	0.00
7.75	0.52	0.02	0.01	0.00	0.00	0.00	4.11	0.00
8.00	0.54	0.02	0.02	0.00	0.00	0.00	4.11	0.00
8.25	0.55	0.03	0.01	0.00	0.00	0.00	4.11	0.00
8.50	0.57	0.03	0.02	0.01	0.00	0.00	4.11	0.00
8.75	0.58	0.03	0.01	0.00	0.00	0.00	4.11	0.00
9.00	0.61	0.04	0.02	0.01	0.00	0.00	4.11	0.00
9.25	0.62	0.04	0.01	0.00	0.00	0.00	4.11	0.00
9.50	0.64	0.05	0.02	0.01	0.00	0.00	4.11	0.00
9.75	0.65	0.05	0.01	0.00	0.00	0.00	4.11	0.00
10.00	0.67	0.06	0.02	0.01	0.00	0.00	4.11	0.00
10.25	0.68	0.06	0.01	0.00	0.00	0.00	4.11	0.00
10.50	0.70	0.07	0.02	0.01	0.00	0.00	4.11	0.00
10.75	0.71	0.07	0.01	0.00	0.00	0.00	4.11	0.00
11.00	0.74	0.08	0.02	0.01	0.00	0.00	4.11	0.00
11.25	0.75	0.09	0.01	0.00	0.00	0.00	4.11	0.00
11.50	0.77	0.09	0.02	0.01	0.00	0.01	4.11	0.00
11.75	0.78	0.10	0.01	0.00	0.00	0.00	4.11	0.00
12.00	0.80	0.11	0.02	0.01	0.00	0.01	4.11	0.00
12.25	0.83	0.12	0.02	0.01	0.00	0.01	4.11	0.00
12.50	0.84	0.12	0.01	0.00	0.00	0.00	4.11	0.00
12.75	0.86	0.13	0.02	0.01	0.00	0.01	4.11	0.00
13.00	0.87	0.13	0.01	0.00	0.00	0.00	4.11	0.00

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Calc 62

EBASCO SERVICES INCORPORATED

BY NBP DATE 5/18/90

CHKD. BY KM DATE 5/30/90

SHEET 8 OF 12

OFS NO. FL07918.017 DEPT. NO. 941

CLIENT FPL

PROJECT PFLR

SUBJECT Drainage - Sub Basin 1

TIME HOURS	CUM RAINFALL INCHES	CUM RUNOFF INCHES	INCR RAINFALL INCHES	INCR RUNOFF INCHES	TOTAL DISCHARGE CFS	STORAGE AC-FT	WATER LEVEL FT MSL	DISCHARGE FROM STORAGE-AC-FT
13.25	0.89	0.14	0.02	0.01	0.00	0.01	4.11	0.00
13.50	0.90	0.15	0.01	0.00	0.00	0.00	4.11	0.00
13.75	0.92	0.16	0.02	0.01	0.00	0.01	4.11	0.00
14.00	0.94	0.16	0.01	0.01	0.00	0.00	4.11	0.00
14.25	0.96	0.17	0.02	0.01	0.00	0.01	4.11	0.00
14.50	0.97	0.18	0.01	0.01	0.00	0.00	4.11	0.00
14.75	0.99	0.19	0.02	0.01	0.00	0.01	4.11	0.00
15.00	1.00	0.20	0.01	0.01	0.00	0.00	4.11	0.00
15.25	1.02	0.21	0.02	0.01	0.00	0.01	4.11	0.00
15.50	1.03	0.21	0.01	0.01	0.00	0.00	4.11	0.00
15.75	1.06	0.22	0.02	0.01	0.00	0.01	4.11	0.00
16.00	1.07	0.23	0.01	0.01	0.00	0.00	4.11	0.00
16.25	1.09	0.24	0.02	0.01	0.00	0.01	4.11	0.00
16.50	1.10	0.25	0.01	0.01	0.00	0.00	4.11	0.00
16.75	1.12	0.26	0.02	0.01	0.00	0.01	4.11	0.00
17.00	1.13	0.27	0.01	0.01	0.00	0.00	4.11	0.00
17.25	1.15	0.28	0.02	0.01	0.00	0.01	4.11	0.00
17.50	1.17	0.28	0.01	0.01	0.00	0.00	4.11	0.00
17.75	1.19	0.30	0.02	0.01	0.00	0.01	4.11	0.00
18.00	1.21	0.31	0.02	0.01	0.00	0.01	4.11	0.00
18.25	1.22	0.31	0.01	0.01	0.00	0.00	4.11	0.00
18.50	1.24	0.33	0.02	0.01	0.00	0.01	4.11	0.00
18.75	1.25	0.33	0.01	0.01	0.00	0.00	4.11	0.00
19.00	1.28	0.35	0.02	0.01	0.00	0.01	4.11	0.00
19.25	1.29	0.35	0.01	0.01	0.00	0.00	4.11	0.00
19.50	1.31	0.37	0.02	0.01	0.00	0.01	4.11	0.00
19.75	1.32	0.37	0.01	0.01	0.00	0.00	4.11	0.00
20.00	1.34	0.39	0.02	0.01	0.00	0.01	4.11	0.00
20.25	1.35	0.39	0.01	0.01	0.00	0.00	4.11	0.00
20.50	1.38	0.41	0.02	0.01	0.00	0.01	4.11	0.00
20.75	1.39	0.41	0.01	0.01	0.00	0.00	4.11	0.00
21.00	1.41	0.43	0.02	0.01	0.00	0.01	4.11	0.00
21.25	1.42	0.44	0.01	0.01	0.00	0.00	4.11	0.00
21.50	1.44	0.45	0.02	0.01	0.00	0.01	4.11	0.00
21.75	1.45	0.46	0.01	0.01	0.00	0.00	4.11	0.00
22.00	1.47	0.47	0.02	0.01	0.00	0.01	4.11	0.00
22.25	1.49	0.48	0.01	0.01	0.00	0.00	4.11	0.00
22.50	1.51	0.49	0.02	0.01	0.00	0.01	4.11	0.00
22.75	1.52	0.50	0.01	0.01	0.00	0.00	4.11	0.00
23.00	1.54	0.52	0.02	0.01	0.00	0.01	4.11	0.00
23.25	1.55	0.52	0.01	0.01	0.00	0.00	4.11	0.00
23.50	1.57	0.54	0.02	0.01	0.00	0.01	4.11	0.00
23.75	1.58	0.54	0.01	0.01	0.00	0.00	4.11	0.00
24.00	1.61	0.56	0.02	0.01	0.00	0.01	4.11	0.00
24.25	1.63	0.57	0.02	0.02	0.00	0.01	4.11	0.00
24.50	1.65	0.59	0.02	0.02	0.00	0.01	4.11	0.00
24.75	1.68	0.61	0.03	0.02	0.00	0.01	4.11	0.00
25.00	1.71	0.63	0.02	0.02	0.00	0.01	4.11	0.00
25.25	1.73	0.64	0.02	0.02	0.00	0.01	4.11	0.00
25.50	1.75	0.66	0.02	0.02	0.00	0.01	4.11	0.00
25.75	1.78	0.68	0.03	0.02	0.00	0.01	4.11	0.00
26.00	1.80	0.70	0.02	0.02	0.00	0.01	4.11	0.00

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Case 6-

EBASCO SERVICES INCORPORATED

BY VDP DATE 5/18/90 SHEET 9 OF 12

CHKD. BY KM DATE 5/30/90 OFS NO. FLO 7918.017 DEPT. NO. 741

CLIENT FPL

PROJECT PFLR

SUBJECT Drainage - Sub Basin 1

TIME HOURS	CUM RAINFALL INCHES	CUM RUNOFF INCHES	INCR RAINFALL INCHES	INCR RUNOFF INCHES	TOTAL DISCHARGE CFS	STORAGE AC-FT	WATER LEVEL FT MSL	DISCHARGE FROM STORAGE-AC-FT
26.25	1.83	0.72	0.02	0.02	0.00	0.01	4.11	0.00
26.50	1.85	0.73	0.02	0.02	0.00	0.01	4.11	0.00
26.75	1.87	0.75	0.02	0.02	0.00	0.01	4.11	0.00
27.00	1.90	0.77	0.03	0.02	0.00	0.02	4.11	0.00
27.25	1.92	0.79	0.02	0.02	0.00	0.01	4.11	0.00
27.50	1.95	0.80	0.02	0.02	0.00	0.01	4.11	0.00
27.75	1.97	0.82	0.02	0.02	0.00	0.01	4.11	0.00
28.00	2.00	0.85	0.03	0.02	0.00	0.02	4.11	0.00
28.25	2.02	0.86	0.02	0.02	0.00	0.01	4.11	0.00
28.50	2.05	0.88	0.02	0.02	0.00	0.01	4.11	0.00
28.75	2.07	0.90	0.02	0.02	0.00	0.01	4.11	0.00
29.00	2.09	0.91	0.02	0.02	0.00	0.01	4.11	0.00
29.25	2.12	0.94	0.03	0.03	0.00	0.02	4.11	0.00
29.50	2.14	0.96	0.02	0.02	0.00	0.01	4.11	0.00
29.75	2.17	0.97	0.02	0.02	0.00	0.01	4.11	0.00
30.00	2.19	0.99	0.02	0.02	0.00	0.01	4.11	0.00
30.25	2.21	1.01	0.02	0.02	0.00	0.01	4.11	0.00
30.50	2.24	1.03	0.03	0.03	0.00	0.02	4.11	0.00
30.75	2.27	1.05	0.02	0.02	0.00	0.01	4.11	0.00
31.00	2.29	1.07	0.02	0.02	0.00	0.01	4.11	0.00
31.25	2.31	1.08	0.02	0.02	0.00	0.01	4.11	0.00
31.50	2.34	1.11	0.03	0.03	0.00	0.02	4.11	0.00
31.75	2.37	1.13	0.02	0.02	0.00	0.01	4.11	0.00
32.00	2.39	1.15	0.02	0.02	0.00	0.01	4.11	0.00
32.25	2.41	1.16	0.02	0.02	0.00	0.01	4.11	0.00
32.50	2.43	1.18	0.02	0.02	0.00	0.01	4.11	0.00
32.75	2.46	1.21	0.03	0.03	0.00	0.02	4.11	0.00
33.00	2.49	1.23	0.02	0.02	0.00	0.01	4.11	0.00
33.25	2.51	1.24	0.02	0.02	0.00	0.01	4.11	0.00
33.50	2.53	1.26	0.02	0.02	0.00	0.01	4.11	0.00
33.75	2.56	1.29	0.03	0.03	0.00	0.02	4.11	0.00
34.00	2.59	1.31	0.02	0.02	0.00	0.01	4.11	0.00
34.25	2.61	1.33	0.02	0.02	0.00	0.01	4.11	0.00
34.50	2.63	1.34	0.02	0.02	0.00	0.01	4.11	0.00
34.75	2.65	1.36	0.02	0.02	0.00	0.01	4.11	0.00
35.00	2.68	1.39	0.03	0.03	0.00	0.02	4.11	0.00
35.25	2.71	1.41	0.02	0.02	0.00	0.01	4.11	0.00
35.50	2.73	1.43	0.02	0.02	0.00	0.01	4.11	0.00
35.75	2.75	1.44	0.02	0.02	0.00	0.01	4.11	0.00
36.00	2.77	1.46	0.02	0.02	0.00	0.01	4.11	0.00
36.25	2.80	1.49	0.03	0.03	0.00	0.02	4.11	0.00
36.50	2.83	1.51	0.02	0.02	0.00	0.01	4.11	0.00
36.75	2.85	1.53	0.02	0.02	0.00	0.01	4.11	0.00
37.00	2.87	1.55	0.02	0.02	0.00	0.01	4.11	0.00
37.25	2.90	1.57	0.03	0.03	0.00	0.02	4.11	0.00
37.50	2.93	1.59	0.02	0.02	0.00	0.01	4.11	0.00
37.75	2.95	1.61	0.02	0.02	0.00	0.01	4.11	0.00
38.00	2.97	1.63	0.02	0.02	0.00	0.01	4.11	0.00
38.25	2.99	1.65	0.02	0.02	0.00	0.01	4.11	0.00
38.50	3.03	1.68	0.03	0.03	0.00	0.02	4.11	0.00
38.75	3.05	1.70	0.02	0.02	0.00	0.01	4.11	0.00
39.00	3.07	1.71	0.02	0.02	0.00	0.01	4.11	0.00

Rev. 1

EBASCO SERVICES INCORPORATED

Calc 62

BY NRP DATE 5/18/90

CHKD. BY KM DATE 5/30/90

SHEET 10 OF 12

OFS NO. FL07918.017 DEPT. NO. 941

CLIENT FPL

PROJECT PFLR

SUBJECT Drainage - Sub Basin 1

TIME HOURS	CUM RAINFALL INCHES	CUM RUNOFF INCHES	INCR RAINFALL INCHES	INCR RUNOFF INCHES	TOTAL DISCHARGE CFS	STORAGE AC-FT	WATER LEVEL FT MSL	DISCHARGE FROM STORAGE-AC-FT
39.25	3.09	1.73	0.02	0.02	0.00	0.01	4.11	0.00
39.50	3.12	1.76	0.03	0.03	0.00	0.02	4.11	0.00
39.75	3.15	1.78	0.02	0.02	0.00	0.01	4.11	0.00
40.00	3.17	1.80	0.02	0.02	0.00	0.01	4.11	0.00
40.25	3.19	1.82	0.02	0.02	0.00	0.01	4.11	0.00
40.50	3.21	1.84	0.02	0.02	0.00	0.01	4.11	0.00
40.75	3.24	1.87	0.03	0.03	0.00	0.02	4.11	0.00
41.00	3.27	1.89	0.02	0.02	0.00	0.01	4.11	0.00
41.25	3.29	1.91	0.02	0.02	0.00	0.01	4.11	0.00
41.50	3.31	1.92	0.02	0.02	0.00	0.01	4.11	0.00
41.75	3.34	1.95	0.03	0.03	0.00	0.02	4.11	0.00
42.00	3.37	1.97	0.02	0.02	0.00	0.01	4.11	0.00
42.25	3.39	1.99	0.02	0.02	0.00	0.01	4.11	0.00
42.50	3.41	2.01	0.02	0.02	0.00	0.01	4.11	0.00
42.75	3.43	2.03	0.02	0.02	0.00	0.01	4.11	0.00
43.00	3.46	2.06	0.03	0.03	0.00	0.02	4.11	0.00
43.25	3.49	2.08	0.02	0.02	0.00	0.01	4.11	0.00
43.50	3.51	2.10	0.02	0.02	0.00	0.01	4.11	0.00
43.75	3.53	2.12	0.02	0.02	0.00	0.01	4.11	0.00
44.00	3.56	2.15	0.03	0.03	0.00	0.02	4.11	0.00
44.25	3.59	2.17	0.02	0.02	0.00	0.01	4.11	0.00
44.50	3.61	2.19	0.02	0.02	0.00	0.01	4.11	0.00
44.75	3.63	2.21	0.02	0.02	0.00	0.01	4.11	0.00
45.00	3.65	2.23	0.02	0.02	0.00	0.01	4.11	0.00
45.25	3.69	2.26	0.03	0.03	0.00	0.02	4.11	0.00
45.50	3.71	2.27	0.02	0.02	0.00	0.01	4.11	0.00
45.75	3.73	2.29	0.02	0.02	0.00	0.01	4.11	0.00
46.00	3.75	2.31	0.02	0.02	0.00	0.01	4.11	0.00
46.25	3.77	2.33	0.02	0.02	0.00	0.01	4.11	0.00
46.50	3.81	2.36	0.03	0.03	0.00	0.02	4.11	0.00
46.75	3.83	2.38	0.02	0.02	0.00	0.01	4.11	0.00
47.00	3.85	2.40	0.02	0.02	0.00	0.01	4.11	0.00
47.25	3.87	2.42	0.02	0.02	0.00	0.01	4.11	0.00
47.50	3.90	2.45	0.03	0.03	0.00	0.02	4.11	0.00
47.75	3.93	2.47	0.02	0.02	0.00	0.01	4.11	0.00
48.00	3.95	2.49	0.02	0.02	0.00	0.01	4.11	0.00
48.25	3.98	2.52	0.03	0.03	0.00	0.02	4.11	0.00
48.50	4.00	2.54	0.02	0.02	0.00	0.01	4.11	0.00
48.75	4.04	2.57	0.03	0.03	0.00	0.02	4.11	0.00
49.00	4.06	2.59	0.02	0.02	0.00	0.01	4.11	0.00
49.25	4.09	2.62	0.03	0.03	0.00	0.02	4.11	0.00
49.50	4.11	2.64	0.02	0.02	0.00	0.01	4.11	0.00
49.75	4.15	2.67	0.03	0.03	0.00	0.02	4.11	0.00
50.00	4.17	2.69	0.02	0.02	0.00	0.01	4.11	0.00
50.25	4.20	2.72	0.03	0.03	0.00	0.02	4.11	0.00
50.50	4.23	2.75	0.03	0.03	0.00	0.02	4.11	0.00
50.75	4.27	2.78	0.03	0.03	0.00	0.02	4.11	0.00
51.00	4.30	2.81	0.03	0.03	0.00	0.02	4.11	0.00
51.25	4.33	2.84	0.03	0.03	0.00	0.02	4.11	0.00
51.50	4.37	2.87	0.03	0.03	0.00	0.02	4.11	0.00
51.75	4.40	2.90	0.03	0.03	0.00	0.02	4.11	0.00
52.00	4.44	2.94	0.04	0.04	0.00	0.03	4.11	0.00

EBASCO SERVICES INCORPORATED

BY WAP DATE 5/18/90

CHKD. BY KM DATE 5/30/90

OFS NO. FLO 7918.017 DEPT. NO. 941

CLIENT FPL

PROJECT PFLR

SUBJECT Drainage - SubBasin 1

TIME HOURS	CUM RAINFALL INCHES	CUM RUNOFF INCHES	INCR RAINFALL INCHES	INCR RUNOFF INCHES	TOTAL DISCHARGE CFS	STORAGE AC-FT	WATER LEVEL FT MSL	DISCHARGE FROM STORAGE-AC-F
52.25	4.49	2.98	0.04	0.04	0.00	0.03	4.11	0.00
52.50	4.53	3.02	0.04	0.04	0.00	0.03	4.11	0.00
52.75	4.59	3.07	0.05	0.05	0.00	0.03	4.11	0.00
53.00	4.63	3.12	0.04	0.04	0.00	0.03	4.11	0.00
53.25	4.69	3.17	0.05	0.05	0.00	0.03	4.11	0.00
53.50	4.74	3.22	0.06	0.05	0.00	0.03	4.11	0.00
53.75	4.81	3.28	0.07	0.06	0.00	0.04	4.11	0.00
54.00	4.86	3.33	0.05	0.05	0.00	0.03	4.11	0.00
54.25	4.93	3.39	0.07	0.06	0.00	0.04	4.11	0.00
54.50	4.99	3.45	0.07	0.06	0.00	0.04	4.11	0.00
54.75	5.07	3.52	0.08	0.07	0.00	0.04	4.11	0.00
55.00	5.14	3.59	0.07	0.06	0.00	0.04	4.11	0.00
55.25	5.21	3.66	0.08	0.07	0.00	0.04	4.11	0.00
55.50	5.29	3.73	0.08	0.07	0.00	0.05	4.11	0.00
55.75	5.37	3.80	0.08	0.07	0.00	0.05	4.11	0.00
56.00	5.46	3.89	0.09	0.08	0.00	0.05	4.11	0.00
56.25	5.54	3.97	0.09	0.08	0.00	0.05	4.11	0.00
56.50	5.63	4.05	0.09	0.08	0.00	0.05	4.11	0.00
56.75	5.73	4.14	0.10	0.09	0.00	0.06	4.11	0.00
57.00	5.83	4.24	0.10	0.09	0.00	0.06	4.11	0.00
57.25	5.94	4.34	0.11	0.10	0.00	0.07	4.11	0.00
57.50	6.05	4.45	0.11	0.10	0.00	0.07	4.11	0.00
57.75	6.17	4.56	0.12	0.12	0.00	0.07	4.11	0.00
58.00	6.29	4.68	0.12	0.12	0.00	0.07	4.11	0.00
58.25	6.42	4.80	0.13	0.13	0.00	0.08	4.11	0.00
58.50	6.56	4.93	0.13	0.13	0.00	0.08	4.11	0.00
58.75	6.73	5.10	0.18	0.17	0.00	0.11	4.11	0.00
59.00	6.91	5.27	0.18	0.17	0.00	0.11	4.11	0.00
59.25	7.18	5.53	0.28	0.26	0.00	0.16	4.11	0.00
59.50	7.46	5.80	0.27	0.27	0.00	0.17	4.11	0.00
59.75	9.32	7.60	1.86	1.81	0.01	1.13	4.22	0.00
60.00	11.16	9.41	1.85	1.81	0.10	1.19	4.39	0.00
60.25	11.57	9.81	0.41	0.40	0.08	0.25	4.36	0.00
60.50	11.97	10.20	0.40	0.39	0.01	0.24	4.24	0.00
60.75	12.18	10.41	0.21	0.21	0.00	0.13	4.17	0.00
61.00	12.39	10.61	0.21	0.21	0.00	0.13	4.11	0.00
61.25	12.54	10.77	0.15	0.15	0.00	0.09	4.11	0.00
61.50	12.69	10.92	0.15	0.15	0.00	0.09	4.11	0.00
61.75	12.83	11.05	0.13	0.13	0.00	0.08	4.11	0.00
62.00	12.95	11.17	0.12	0.12	0.00	0.07	4.11	0.00
62.25	13.05	11.27	0.10	0.10	0.00	0.06	4.11	0.00
62.50	13.13	11.35	0.09	0.09	0.00	0.05	4.11	0.00
62.75	13.22	11.44	0.09	0.09	0.00	0.05	4.11	0.00
63.00	13.30	11.52	0.08	0.08	0.00	0.05	4.11	0.00
63.25	13.39	11.60	0.09	0.09	0.00	0.05	4.11	0.00
63.50	13.46	11.68	0.08	0.08	0.00	0.05	4.11	0.00
63.75	13.55	11.76	0.09	0.09	0.00	0.05	4.11	0.00
64.00	13.63	11.84	0.08	0.08	0.00	0.05	4.11	0.00
64.25	13.67	11.88	0.04	0.04	0.00	0.03	4.11	0.00
64.50	13.73	11.94	0.06	0.05	0.00	0.03	4.11	0.00
64.75	13.78	11.99	0.05	0.05	0.00	0.03	4.11	0.00
65.00	13.83	12.04	0.04	0.04	0.00	0.03	4.11	0.00

Rev. 1

EBASCO SERVICES INCORPORATED

Calc 62

BY NAP DATE 5/18/90

CHKD. BY KM DATE 5/30/90

SHEET 12 OF 12

OFS NO. FLO 7918.017 DEPT. NO. 941

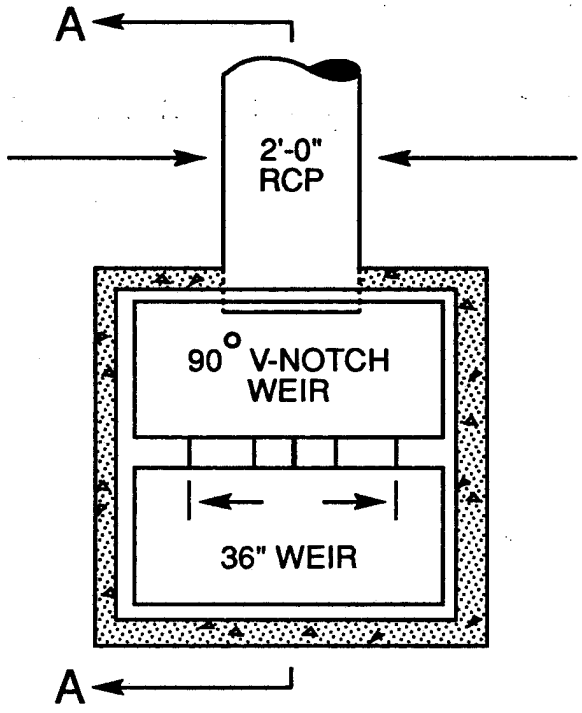
CLIENT FPL

PROJECT PFLR

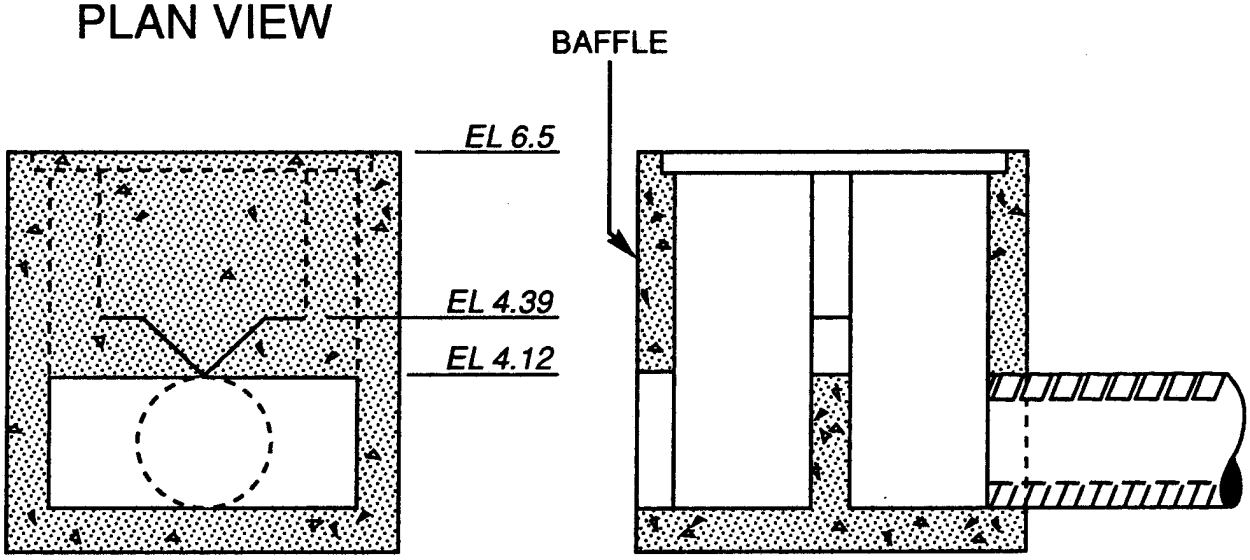
SUBJECT Drainage - Sub Basin 1

TIME HOURS	CUM RAINFALL INCHES	CUM RUNOFF INCHES	INCR RAINFALL INCHES	INCR RUNOFF INCHES	TOTAL DISCHARGE CFS	STORAGE AC-FT	WATER LEVEL FT MSL	DISCHARGE FROM STORAGE-AC-FT
65.25	13.88	12.09	0.06	0.05	0.00	0.03	4.11	0.00
65.50	13.93	12.13	0.04	0.04	0.00	0.03	4.11	0.00
65.75	13.98	12.19	0.05	0.05	0.00	0.03	4.11	0.00
66.00	14.02	12.23	0.04	0.04	0.00	0.03	4.11	0.00
66.25	14.08	12.29	0.06	0.05	0.00	0.03	4.11	0.00
66.50	14.12	12.33	0.04	0.04	0.00	0.03	4.11	0.00
66.75	14.18	12.38	0.06	0.05	0.00	0.03	4.11	0.00
67.00	14.22	12.43	0.04	0.04	0.00	0.03	4.11	0.00
67.25	14.28	12.48	0.06	0.05	0.00	0.03	4.11	0.00
67.50	14.32	12.53	0.04	0.04	0.00	0.03	4.11	0.00
67.75	14.38	12.58	0.06	0.05	0.00	0.03	4.11	0.00
68.00	14.42	12.62	0.04	0.04	0.00	0.03	4.11	0.00
68.25	14.45	12.66	0.03	0.03	0.00	0.02	4.11	0.00
68.50	14.49	12.69	0.03	0.03	0.00	0.02	4.11	0.00
68.75	14.52	12.72	0.03	0.03	0.00	0.02	4.11	0.00
69.00	14.55	12.75	0.03	0.03	0.00	0.02	4.11	0.00
69.25	14.59	12.79	0.03	0.03	0.00	0.02	4.11	0.00
69.50	14.62	12.82	0.03	0.03	0.00	0.02	4.11	0.00
69.75	14.65	12.85	0.03	0.03	0.00	0.02	4.11	0.00
70.00	14.69	12.89	0.03	0.03	0.00	0.02	4.11	0.00
70.25	14.72	12.92	0.03	0.03	0.00	0.02	4.11	0.00
70.50	14.75	12.95	0.03	0.03	0.00	0.02	4.11	0.00
70.75	14.78	12.98	0.03	0.03	0.00	0.02	4.11	0.00
71.00	14.82	13.02	0.03	0.03	0.00	0.02	4.11	0.00
71.25	14.85	13.05	0.03	0.03	0.00	0.02	4.11	0.00
71.50	14.88	13.08	0.03	0.03	0.00	0.02	4.11	0.00
71.75	14.92	13.11	0.03	0.03	0.00	0.02	4.11	0.00
72.00	14.95	13.15	0.03	0.03	0.00	0.02	4.11	0.00

Rev. 1



PLAN VIEW



FRONT VIEW

SECTION A-A

CALC 62 ATTACHMENT 1

Lauderdale
Repowering
Project

FPL

Rev. 1

EBASCO SERVICES INCORPORATED

Calc 6 3

BY HAF DATE 5/18/90

CHKD. BY KM DATE 5/30/90

SHEET 1 OF 7

OFS NO. 7918.017 DEPT. NO. 944

CLIENT FPL

PROJECT PFLR

SUBJECT Drainage — Sub-basin 2

This calculation details the sub-basin 2 calculations in the SFWMD format, based on Calc No 59

I Given

A. Acreage
1. Total 4.44 Acres
2. Impervious
a) Roads and Parking ≈ 0
b) Buildings/Equipment Pad = 1.72 Acres
3. Lakes (dry detention area) = 2.72 Acres
4. Pervious = 2.72 Acres

B. Minimum Elevations
1. Roads and Parking = El 5.3 ft
2. Floors = El 8.5 ft

C. Design Storm allowable discharge pre-existing is 0

D. Water Level Elevations
1. Wet season water table = El 3.0
2. Receiving water body - is none

E. Rainfall Amounts

25 year 72 hour storm = 14.95 in.

Rev. 1

EBASCO SERVICES INCORPORATED

Calc 63

BY HAP DATE 5/19/90

CHKD. BY KM DATE 5/30/90

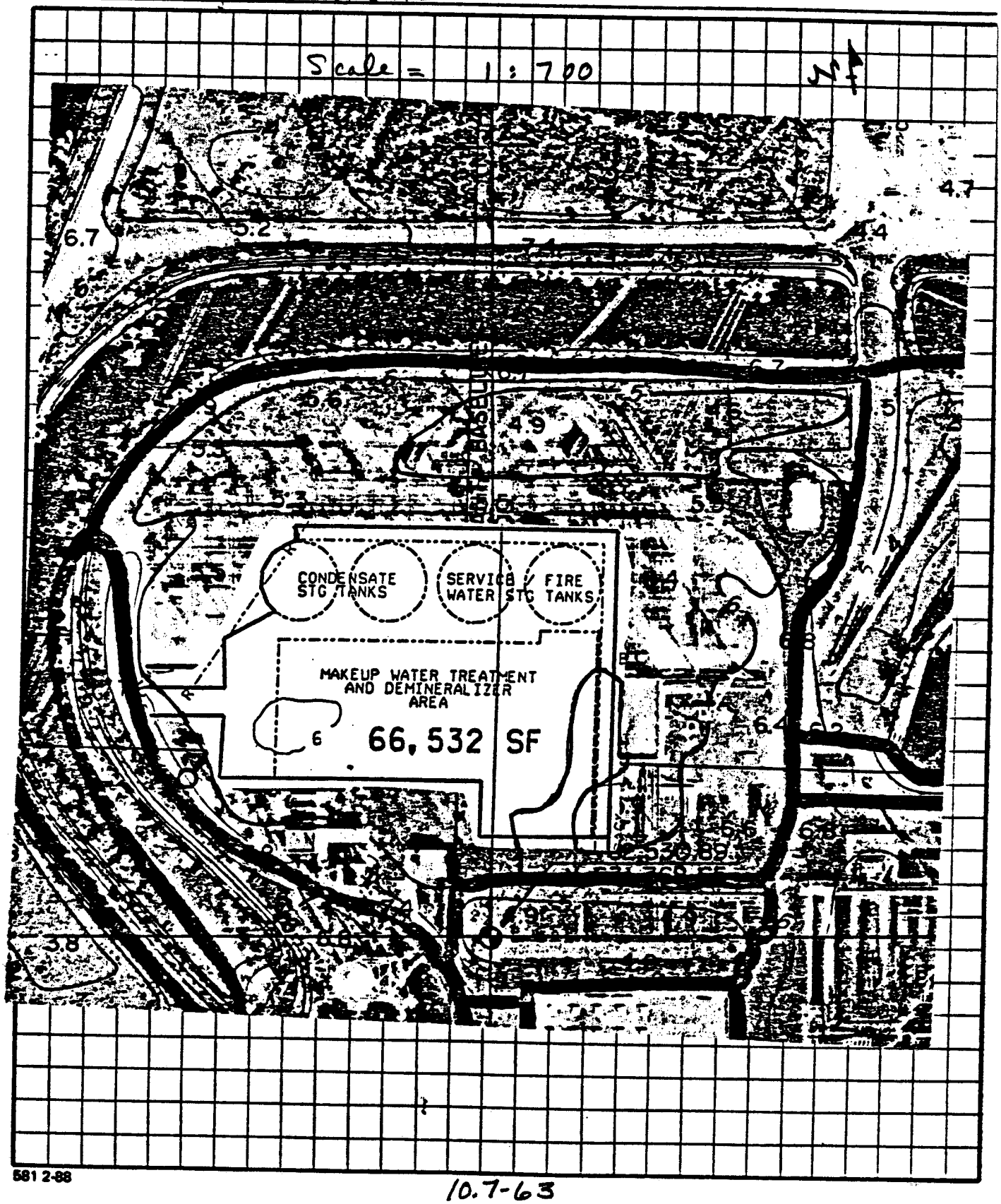
SHEET 2 OF 7

OFS NO. EL07918.017 DEPT. NO. 941

CLIENT FPL

PROJECT PFLR

SUBJECT Drainage - Sub Basin 2



581 2-88

EBASCO SERVICES INCORPORATED

Rev. 1

BY NAP DATE 5/18/90

CHKD. BY KM DATE 5/30/90

FLO SHEET 3 OF 7

OFS NO. 7918.017 DEPT. NO. 941

CLIENT FPL

PROJECT PFLR

SUBJECT Drainage - Sub Basin 2

II Design Criteria

A. Quality

Wet detention = 1" or 2.5" * perviousness

Dry detention = 0.75 of wet det.

Retention = 50% of detention

This sub-basin detains the entire storm and has no discharge

B. Quantity

This sub-basin will have no discharge

III Computations

A. Quality

worst case is dry detention

1 inch or 2.5 inches * $\frac{1.72}{4.44}$ = 0.97 inch

(39% impervious)

either way, it is 1 inch

$1/12 * 4.44 = 0.37$ Ac-ft

Note: no pre-treatment is necessary

Rev.1

EBASCO SERVICES INCORPORATED

Calc 63

BY NCF DATE 5/18/90 SHEET 4 OF 7

CHKD. BY KM DATE 5/30/90 OFS NO. FLO 7918.017 DEPT. NO. 941

CLIENT FPL

PROJECT PFLR

SUBJECT Drainage - Sub Basin 2

B. Soil Storage

El	Total Acres	Incremental Acres		S factor		in-acres Storage
5	0.40	0.4	*	1.88	=	0.752
6	3.37	2.97	*	4.95		14.702
7	4.44	~~1.47~~ 1.07	*	8.18	8.753	~~12.025~~ 9.370
						~~27.479~~ 24.207

~~24.207~~ ~~27.479~~ inch-acres / 4.44 acres = ~~6.189~~ 5.452 inches

61% pervious: ~~6.189~~ 5.452 * 2.72 / 4.44 = ~~3.791~~ 3.340 inches = S

C. Project Surface Storage

El	Area	Incremental Storage (Ac-Ft)	Total Storage
5	0.40	0	0
6	3.37	1.885	1.885
7	4.44	3.905	5.790

Assume storage is linear between above elevations

D Control Structure Weir Crest Elevations

No control structure

E, F, G Control Structure Details

No control structure

Run flood-routing program to compute

runoff = 11.57 ~~11.20~~ inches

max water surface el = 5.45 ~~5.44~~ inches

max outflow = 0

Height of weir = no control structure

Note: since all the information required from the flood routing occurs between hours 52 and 72 only those are presented (see pages 6 and 7)

IV Check storm stages and discharges

A. Building floor elevations

County Criteria is El 7.0 - flood routing shows max level = 5.44 ∴ is OK at 8.5

B. Roads vs local criteria

County criteria of El 5.0 is met (note: these are not publicly accessed roads)

C. Allowable peak discharge

There is no discharge

EBASCO SERVICES INCORPORATED

Lake 63

Rev.1 BY WAR DATE 5/18/90

CHKD. BY KM DATE 5/30/90

SHEET 6 OF 7

OFS NO. FL07918.017 DEPT. NO. 941

CLIENT FPL

PROJECT PFLR

SUBJECT Drainage - Sub Basin 2

TIME HOURS	CUM RAINFALL INCHES	CUM RUNOFF INCHES	INCR RAINFALL INCHES	INCR RUNOFF INCHES	TOTAL DISCHARGE CFS	STORAGE AC-FT	WATER LEVEL FT MSL	DISCHARGE FROM STORAGE-AC-F
52.25	4.49	1.85	0.04	0.03	0.00	0.01	5.01	0.00
52.50	4.53	1.88	0.04	0.03	0.00	0.01	5.01	0.00
52.75	4.59	1.92	0.05	0.04	0.00	0.02	5.01	0.00
53.00	4.63	1.96	0.04	0.03	0.00	0.01	5.01	0.00
53.25	4.69	2.00	0.05	0.04	0.00	0.02	5.01	0.00
53.50	4.74	2.04	0.06	0.04	0.00	0.02	5.02	0.00
53.75	4.81	2.09	0.07	0.05	0.00	0.02	5.02	0.00
54.00	4.86	2.13	0.05	0.04	0.00	0.02	5.02	0.00
54.25	4.93	2.18	0.07	0.05	0.00	0.02	5.02	0.00
54.50	4.99	2.24	0.07	0.05	0.00	0.02	5.02	0.00
54.75	5.07	2.30	0.08	0.06	0.00	0.02	5.02	0.00
55.00	5.14	2.35	0.07	0.05	0.00	0.02	5.02	0.00
55.25	5.21	2.41	0.08	0.06	0.00	0.02	5.02	0.00
55.50	5.29	2.47	0.08	0.06	0.00	0.02	5.02	0.00
55.75	5.37	2.53	0.08	0.06	0.00	0.02	5.02	0.00
56.00	5.46	2.60	0.09	0.07	0.00	0.03	5.02	0.00
56.25	5.54	2.67	0.09	0.07	0.00	0.03	5.03	0.00
56.50	5.63	2.74	0.09	0.07	0.00	0.03	5.03	0.00
56.75	5.73	2.82	0.10	0.08	0.00	0.03	5.03	0.00
57.00	5.83	2.90	0.10	0.08	0.00	0.03	5.03	0.00
57.25	5.94	2.99	0.11	0.09	0.00	0.03	5.03	0.00
57.50	6.05	3.08	0.11	0.09	0.00	0.03	5.03	0.00
57.75	6.17	3.18	0.12	0.10	0.00	0.04	5.04	0.00
58.00	6.29	3.28	0.12	0.10	0.00	0.04	5.04	0.00
58.25	6.42	3.39	0.13	0.11	0.00	0.04	5.04	0.00
58.50	6.56	3.51	0.13	0.11	0.00	0.04	5.04	0.00
58.75	6.73	3.65	0.18	0.15	0.00	0.06	5.05	0.00
59.00	6.91	3.80	0.18	0.15	0.00	0.06	5.05	0.00
59.25	7.18	4.04	0.28	0.24	0.00	0.09	5.06	0.00
59.50	7.46	4.28	0.27	0.24	0.00	0.09	5.08	0.00
59.75	9.32	5.93	1.86	1.65	0.00	0.61	5.22	0.00
60.00	11.16	7.63	1.85	1.70	0.00	0.63	5.44	0.00
60.25	11.57	8.01	0.41	0.38	0.00	0.14	5.42	0.00
60.50	11.97	8.38	0.40	0.37	0.00	0.14	5.29	0.00
60.75	12.18	8.57	0.21	0.20	0.00	0.07	5.20	0.00
61.00	12.39	8.77	0.21	0.20	0.00	0.07	5.14	0.00
61.25	12.54	8.91	0.15	0.14	0.00	0.05	5.10	0.00
61.50	12.69	9.06	0.15	0.14	0.00	0.05	5.08	0.00
61.75	12.83	9.18	0.13	0.12	0.00	0.05	5.07	0.00
62.00	12.95	9.30	0.12	0.11	0.00	0.04	5.06	0.00
62.25	13.05	9.39	0.10	0.09	0.00	0.03	5.05	0.00
62.50	13.13	9.47	0.09	0.08	0.00	0.03	5.04	0.00
62.75	13.22	9.56	0.09	0.08	0.00	0.03	5.04	0.00
63.00	13.30	9.63	0.08	0.07	0.00	0.03	5.03	0.00
63.25	13.39	9.71	0.09	0.08	0.00	0.03	5.03	0.00
63.50	13.46	9.79	0.08	0.07	0.00	0.03	5.03	0.00
63.75	13.55	9.87	0.09	0.08	0.00	0.03	5.03	0.00
64.00	13.63	9.94	0.08	0.07	0.00	0.03	5.03	0.00
64.25	13.67	9.98	0.04	0.04	0.00	0.02	5.03	0.00
64.50	13.73	10.04	0.06	0.05	0.00	0.02	5.02	0.00
64.75	13.78	10.09	0.05	0.05	0.00	0.02	5.02	0.00
65.00	13.83	10.13	0.04	0.04	0.00	0.02	5.02	0.00

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EBASCO SERVICES INCORPORATED

Calc 63

BY HP DATE 5/18/90

CHKD. BY KM DATE 5/30/90

SHEET 7 OF 7

OFS NO. FL07918.017 DEPT. NO. 941

CLIENT FPL

PROJECT PFLR

SUBJECT Drainage - SubBasin 2

TIME HOURS	CUM RAINFALL INCHES	CUM RUNOFF INCHES	INCR RAINFALL INCHES	INCR RUNOFF INCHES	TOTAL DISCHARGE CFS	STORAGE AC-FT	WATER LEVEL FT MSL	DISCHARGE FROM STORAGE-AC-FT
65.25	13.88	10.18	0.06	0.05	0.00	0.02	5.02	0.00
65.50	13.93	10.22	0.04	0.04	0.00	0.02	5.02	0.00
65.75	13.98	10.28	0.05	0.05	0.00	0.02	5.02	0.00
66.00	14.02	10.32	0.04	0.04	0.00	0.02	5.02	0.00
66.25	14.08	10.37	0.06	0.05	0.00	0.02	5.02	0.00
66.50	14.12	10.41	0.04	0.04	0.00	0.02	5.02	0.00
66.75	14.18	10.46	0.06	0.05	0.00	0.02	5.02	0.00
67.00	14.22	10.51	0.04	0.04	0.00	0.02	5.02	0.00
67.25	14.28	10.56	0.06	0.05	0.00	0.02	5.02	0.00
67.50	14.32	10.60	0.04	0.04	0.00	0.02	5.02	0.00
67.75	14.38	10.65	0.06	0.05	0.00	0.02	5.02	0.00
68.00	14.42	10.70	0.04	0.04	0.00	0.02	5.02	0.00
68.25	14.45	10.73	0.03	0.03	0.00	0.01	5.02	0.00
68.50	14.49	10.76	0.03	0.03	0.00	0.01	5.01	0.00
68.75	14.52	10.79	0.03	0.03	0.00	0.01	5.01	0.00
69.00	14.55	10.82	0.03	0.03	0.00	0.01	5.01	0.00
69.25	14.59	10.85	0.03	0.03	0.00	0.01	5.01	0.00
69.50	14.62	10.88	0.03	0.03	0.00	0.01	5.01	0.00
69.75	14.65	10.92	0.03	0.03	0.00	0.01	5.01	0.00
70.00	14.69	10.95	0.03	0.03	0.00	0.01	5.01	0.00
70.25	14.72	10.98	0.03	0.03	0.00	0.01	5.01	0.00
70.50	14.75	11.01	0.03	0.03	0.00	0.01	5.01	0.00
70.75	14.78	11.04	0.03	0.03	0.00	0.01	5.01	0.00
71.00	14.82	11.07	0.03	0.03	0.00	0.01	5.01	0.00
71.25	14.85	11.10	0.03	0.03	0.00	0.01	5.01	0.00
71.50	14.88	11.14	0.03	0.03	0.00	0.01	5.01	0.00
71.75	14.92	11.17	0.03	0.03	0.00	0.01	5.01	0.00
72.00	14.95	11.20	0.03	0.03	0.00	0.01	5.01	0.00

Rev. 1

EBASCO SERVICES INCORPORATED

Calc 64

BY NAR DATE 5/9/90

CHKD. BY KM DATE 5/31/90

SHEET 1 OF 8

OFS NO. 7918.017 DEPT. NO. 941

CLIENT FPL

PROJECT PFLR

SUBJECT Drainage - Sub-basin 3

I Given

A. Acreage

1. Total = 11.759 Acres

2. Impervious

a) Roads and Parking = 2.693 acres

b) Buildings = 2.692 acres

3. Lakes (dry detention area) = 9.310 acres

note: see attachment 2 & 3 for new det. area

4. Pervious = 6.374 acres

B. Minimum Elevations

1 Roads and Parking = El 7.5

2 Floors = El 8.0

C. Design Storm Allowable discharge

pre-existing discharge = 68.4 cfs per calc # 60

D. Water Level Elevations

1. Wet season water table = El + 3.0*

2. Receiving water body is tidal

E. Rainfall Amounts

25 year 72 hour storm = 14.95 inches

* Wet season water table near discharge channel is no more than EL + 2.0

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Calc 64

Rev. 1 BY NAF DATE 5/9/90

CHKD. BY KM DATE 5/31/90

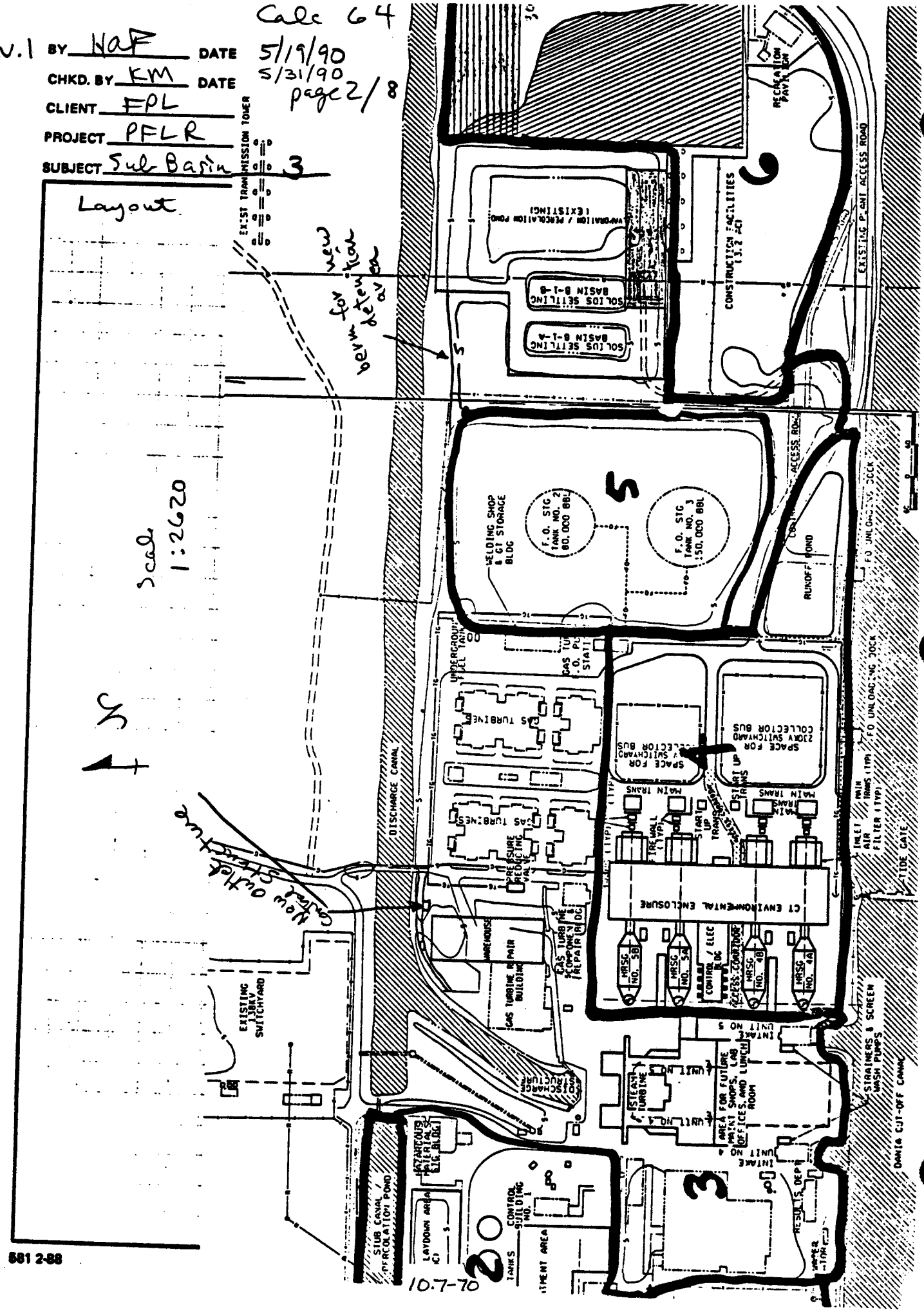
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PROJECT PFLR

SUBJECT Sub Basin 3

page 2/8

Layout



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EBASCO SERVICES INCORPORATED

BY HAR DATE 5/18/90 SHEET 3 OF 8

CHKD. BY KM DATE 5/31/90 OPS NO. FLO 7918.017 DEPT. NO. 941

CLIENT FPL

PROJECT PFLR

SUBJECT Drainage - SubBasin 3

II Design Criteria

A. Quality

From Calc 58 page 20

Wet detention = 1" or 2.5" * perviousness

Dry detention = .75 * Wet detention

Retention = 50% of detention

This sub-basin will have dry detention

Because this sub-basin will discharge to the existing cooling pond there are no limits on the rapidity of the discharge

B. Quantity

Allowable peak discharge needs to be calculated for all six sub-basins cumulatively, i.e. the total discharge to the Davie Cut-off canal can not exceed 91.7 cfs, which is the pre-existing or historical discharge

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EBASCO SERVICES INCORPORATED

Calc 64

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SHEET 4 OF 8

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CLIENT FPL

PROJECT PFLR

SUBJECT Drainage - SubBasin 3

III Computations

A. Quality

Dry detention

1. First inch 11.759 acres * 1/12 = 0.980 ac-ft

2. $\frac{2.5''}{12}$ * 11.759 acres * $\frac{6.374}{11.759}$ = 1.328

Criteria 2 governs, for dry detention reduce by 75%

1.328 * .75 = 0.996 acre-feet

Note: contaminated waters are segregated and treated, this counts for pretreatment

B. Soil Storage

We have:

EL	Incremental Storage		S factor		Storage inch-acres
4	1.587	*	0.45	=	.714
5	2.103	*	1.88	=	3.954
6	2.198	*	4.95	=	10.880
7	2.634	*	8.18	=	21.546
8 and above	3.132	*	8.18	=	25.620
					62.714

$\frac{62.714 \text{ in-acres}}{11.759 \text{ acres}}$ * $\frac{6.374 \text{ acres pervious}}{11.759 \text{ acres total}}$ = 2.891"

C. Project Surface Storage

El	Area	Incr. Storage	Cum. Storage Acre-ft
4	0.55	0.28	0.28
5	2.31	~~1.29~~ 1.43	~~1.57~~ 1.71
6	3.68	3.00	~~4.57~~ 4.71
7	2.15	1.84	~~6.41~~ 6.55

(Note; above is composite of 2 storage areas)

Assume storage is linear between above elevations

D. Control Structure Elevations

First Structure is an oval concrete culvert - see Attachment 1 for details

Second Structure is for a perc pond - see Att 2.

Discharge vs Stage has been estimated (see calc 71) to be approximated by the linear function

$$Q = 4.3 * Head$$

Control Elevation is culvert invert at upstream end = El 3.3 for first structure

E, F and G result from flood routing Program

Results

Runoff = 11.96 inches

Max Water Surface = 4.3 feet

Max Outflow = 56.8 cfs

Control Structure Dimensions are OK

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EBASCO SERVICES INCORPORATED

Calc 64

BY HAP DATE 5/28/90

CHKD. BY KM DATE 5/31/90

SHEET 5A OF 8

OFS NO. FLO 7918.017 DEPT. NO. 941

CLIENT FPL

PROJECT PFLR

SUBJECT Drainage - SubBasin 3

per discussion with Orlando Rubio of SFWMD have added a new outlet control structure at North end of new swale (AH 1)

Structure details are shown on Attachments 3 this calc

Values of rainfall, runoff, stage and discharge are shown on pages 7 & 8

Water Quality - need detain about 1 ac-ft
per flood-route, detain 0.57 ac-ft
per calc 72, pre-treat = 0.64 ac-ft
Total = 1.21
water quality criteria are met

III Check Storm Stages and Discharges

A. Building Floor Elevations
Flood routing indicates Elevation 8.0 is not exceeded. Also, county requirement of 7.0 is met

B. Roads vs local criteria

Roads at min El 7.5 are not flooded. Also, county requirement at 5.0 is met

C. Allowable peak discharge

Peak discharge to cooling pond is 56.8 cfs, below pre-existing level of 68.4

EBASCO SERVICES INCORPORATED

Lake 64

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SHEET 7 OF 8

OFS NO. FLO 7918.017 DEPT. NO. 941

CLIENT FPL

PROJECT PFLR

SUBJECT Drainage - SubBasin

TIME HOURS	CUM RAINFALL INCHES	CUM RUNOFF INCHES	INCR RAINFALL INCHES	INCR RUNOFF INCHES	TOTAL DISCHARGE CFS	STORAGE AC-FT	WATER LEVEL FT MSL	DISCHARGE FROM STORAGE-AC-FT
52.25	4.49	2.25	0.04	0.04	1.08	0.01	3.30	0.00000
52.50	4.53	2.28	0.04	0.04	1.08	0.01	3.30	0.00000
52.75	4.59	2.33	0.05	0.05	1.36	0.02	3.30	0.00000
53.00	4.63	2.37	0.04	0.04	1.09	0.01	3.30	0.00000
53.25	4.69	2.41	0.05	0.05	1.37	0.02	3.30	0.00000
53.50	4.74	2.46	0.06	0.05	1.37	0.02	3.30	0.00000
53.75	4.81	2.51	0.07	0.06	1.65	0.02	3.30	0.00000
54.00	4.86	2.56	0.05	0.05	1.38	0.02	3.30	0.00000
54.25	4.93	2.61	0.07	0.06	1.66	0.02	3.30	0.00000
54.50	4.99	2.67	0.07	0.06	1.67	0.02	3.30	0.00000
54.75	5.07	2.73	0.08	0.07	1.96	0.02	3.30	0.00000
55.00	5.14	2.79	0.07	0.06	1.68	0.02	3.30	0.00000
55.25	5.21	2.86	0.08	0.07	1.97	0.02	3.30	0.00000
55.50	5.29	2.92	0.08	0.07	1.98	0.02	3.30	0.00000
55.75	5.37	2.99	0.08	0.07	1.98	0.02	3.30	0.00000
56.00	5.46	3.06	0.09	0.08	2.27	0.03	3.30	0.00000
56.25	5.54	3.14	0.09	0.08	2.28	0.03	3.30	0.00000
56.50	5.63	3.21	0.09	0.08	2.29	0.03	3.30	0.00000
56.75	5.73	3.30	0.10	0.09	2.59	0.03	3.30	0.00000
57.00	5.83	3.39	0.10	0.09	2.59	0.03	3.30	0.00000
57.25	5.94	3.48	0.11	0.10	2.89	0.03	3.30	0.00000
57.50	6.05	3.58	0.11	0.10	2.90	0.03	3.30	0.00000
57.75	6.17	3.69	0.12	0.11	3.21	0.04	3.30	0.00000
58.00	6.29	3.79	0.12	0.11	3.22	0.04	3.30	0.00000
58.25	6.42	3.91	0.13	0.12	3.52	0.04	3.30	0.00000
58.50	6.56	4.03	0.13	0.12	3.54	0.04	3.30	0.00007
58.75	6.73	4.19	0.18	0.16	4.85	0.05	3.33	0.00238
59.00	6.91	4.35	0.18	0.16	5.01	0.05	3.36	0.00512
59.25	7.18	4.59	0.28	0.25	8.00	0.08	3.42	0.01081
59.50	7.46	4.84	0.27	0.25	8.34	0.07	3.49	0.01708
59.75	9.32	6.57	1.86	1.72	54.32	0.57	3.90	0.05321
60.00	11.16	8.32	1.85	1.75	56.79	0.54	4.28	0.08733
60.25	11.57	8.70	0.41	0.39	15.82	0.05	4.26	0.08555
60.50	11.97	9.08	0.40	0.38	13.63	0.09	3.82	0.04607
60.75	12.18	9.28	0.21	0.20	7.39	0.04	3.62	0.02813
61.00	12.39	9.49	0.21	0.20	6.74	0.06	3.47	0.01468
61.25	12.54	9.63	0.15	0.15	4.90	0.04	3.40	0.00924
61.50	12.69	9.78	0.15	0.15	4.71	0.05	3.36	0.00525
61.75	12.83	9.91	0.13	0.13	3.98	0.04	3.34	0.00332
62.00	12.95	10.03	0.12	0.12	3.56	0.04	3.31	0.00117
62.25	13.05	10.12	0.10	0.10	2.87	0.03	3.30	0.00000
62.50	13.13	10.21	0.09	0.08	2.55	0.03	3.30	0.00000
62.75	13.22	10.29	0.09	0.08	2.55	0.03	3.30	0.00000
63.00	13.30	10.37	0.08	0.07	2.23	0.03	3.30	0.00000
63.25	13.39	10.45	0.09	0.08	2.55	0.03	3.30	0.00000
63.50	13.46	10.52	0.08	0.07	2.24	0.03	3.30	0.00000
63.75	13.55	10.61	0.09	0.09	2.56	0.03	3.30	0.00000
64.00	13.63	10.68	0.08	0.07	2.24	0.03	3.30	0.00000
64.25	13.67	10.73	0.04	0.04	1.28	0.02	3.30	0.00000
64.50	13.73	10.78	0.06	0.05	1.60	0.02	3.30	0.00000
64.75	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
65.00	13.83	10.88	0.04	0.04	1.28	0.02	3.30	0.00000

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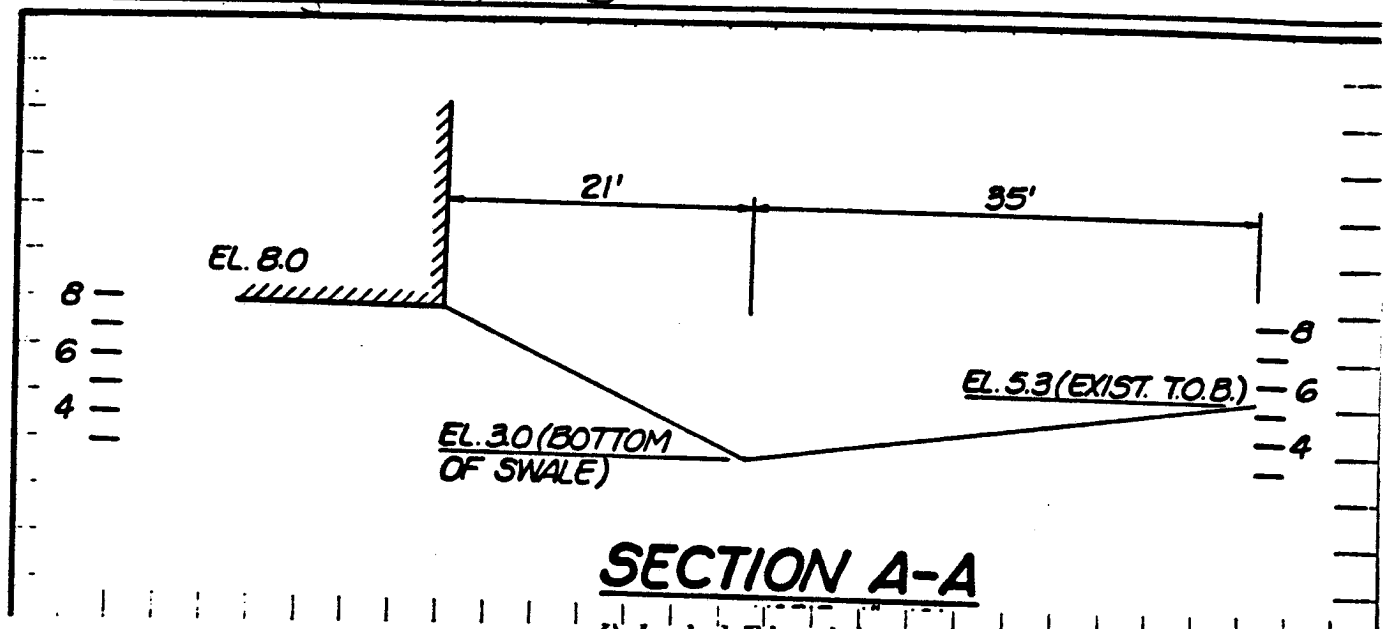
TIME HOURS	CUM RAINFALL INCHES	CUM RUNOFF INCHES	INCR RAINFALL INCHES	INCR RUNOFF INCHES	TOTAL DISCHARGE CFS	STORAGE AC-FT	WATER LEVEL FT MSL	DISCHARGE FROM STORAGE-AC-
65.25	13.88	10.93	0.06	0.05	1.60	0.02	3.30	0.00000
65.50	13.93	10.97	0.04	0.04	1.28	0.02	3.30	0.00000
65.75	13.98	11.02	0.05	0.05	1.60	0.02	3.30	0.00000
66.00	14.02	11.07	0.04	0.04	1.28	0.02	3.30	0.00000
66.25	14.08	11.12	0.06	0.05	1.60	0.02	3.30	0.00000
66.50	14.12	11.16	0.04	0.04	1.28	0.02	3.30	0.00000
66.75	14.18	11.22	0.06	0.05	1.60	0.02	3.30	0.00000
67.00	14.22	11.26	0.04	0.04	1.28	0.02	3.30	0.00000
67.25	14.28	11.31	0.06	0.05	1.60	0.02	3.30	0.00000
67.50	14.32	11.36	0.04	0.04	1.28	0.02	3.30	0.00000
67.75	14.38	11.41	0.06	0.05	1.60	0.02	3.30	0.00000
68.00	14.42	11.45	0.04	0.04	1.28	0.02	3.30	0.00000
68.25	14.45	11.48	0.03	0.03	0.96	0.01	3.30	0.00000
68.50	14.49	11.52	0.03	0.03	0.96	0.01	3.30	0.00000
68.75	14.52	11.55	0.03	0.03	0.96	0.01	3.30	0.00000
69.00	14.55	11.58	0.03	0.03	0.96	0.01	3.30	0.00000
69.25	14.59	11.61	0.03	0.03	0.96	0.01	3.30	0.00000
69.50	14.62	11.64	0.03	0.03	0.96	0.01	3.30	0.00000
69.75	14.65	11.68	0.03	0.03	0.96	0.01	3.30	0.00000
70.00	14.69	11.71	0.03	0.03	0.96	0.01	3.30	0.00000
70.25	14.72	11.74	0.03	0.03	0.96	0.01	3.30	0.00000
70.50	14.75	11.77	0.03	0.03	0.96	0.01	3.30	0.00000
70.75	14.78	11.80	0.03	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
71.00	14.82	11.84	0.03	0.03	0.96	0.01	3.30	0.00000
71.25	14.85	11.87	0.03	0.03	0.96	0.01	3.30	0.00000
71.50	14.88	11.90	0.03	0.03	0.96	0.01	3.30	0.00000
71.75	14.92	11.93	0.03	0.03	0.96	0.01	3.30	0.00000
72.00	14.95	11.96	0.03	0.03	0.96	0.01	3.30	0.00000

Rev. 1

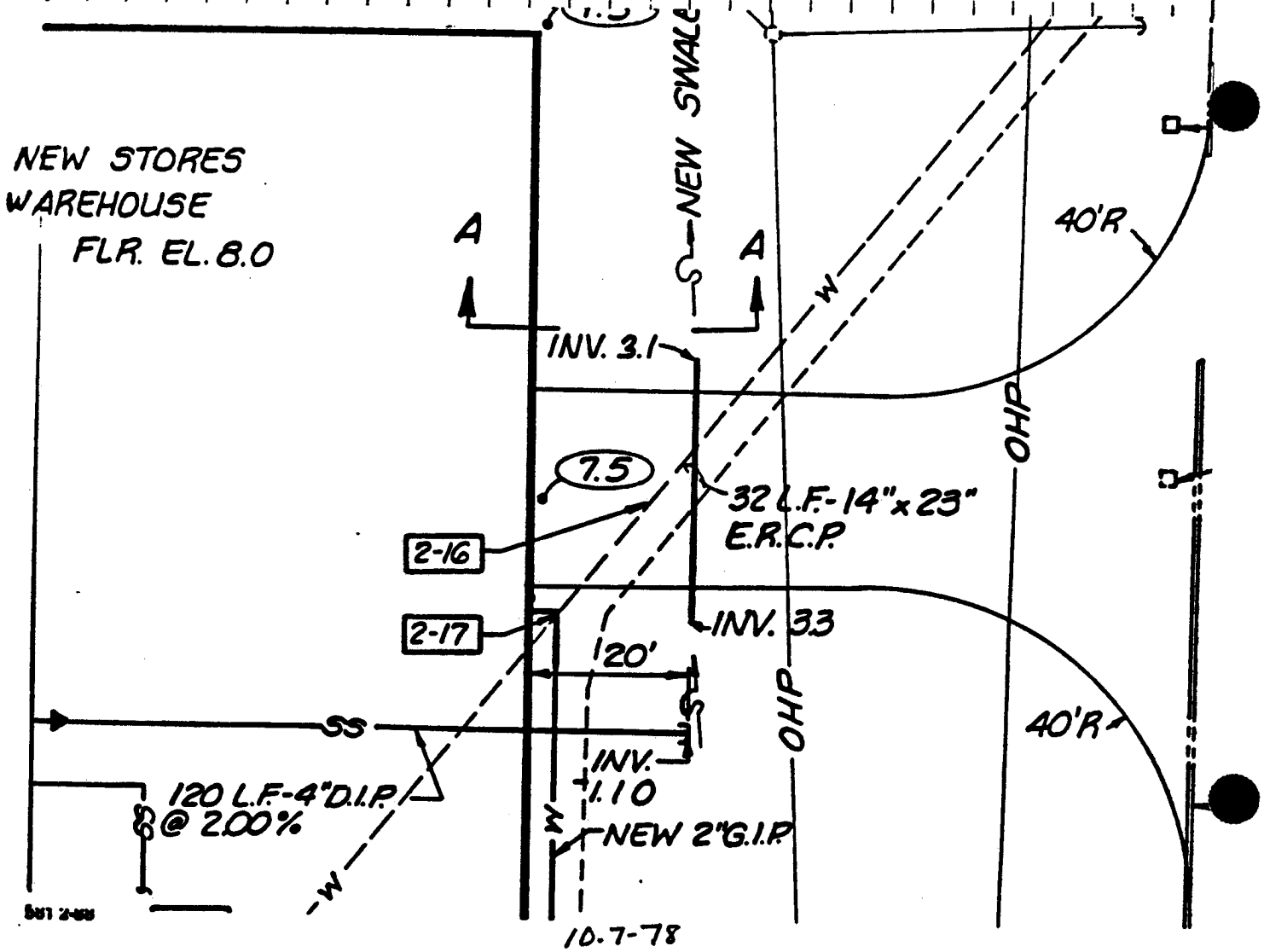
EBASCO SERVICES INCORPORATED

Calc 67
Attachment 1

BY HAP DATE 5/19/90
CHKD. BY KM DATE 5/31/90
SHEET ____ OF ____
OFS NO. 107918.017 DEPT. NO. 941
CLIENT FPL
PROJECT PFLR
SUBJECT Drainage - Sub Basin 3



SECTION A-A



10-7-78

Rev. 1

EBASCO SERVICES INCORPORATED

Attachment 2

BY NAP DATE 5/20/90

CHKD. BY KM DATE 5/31/90

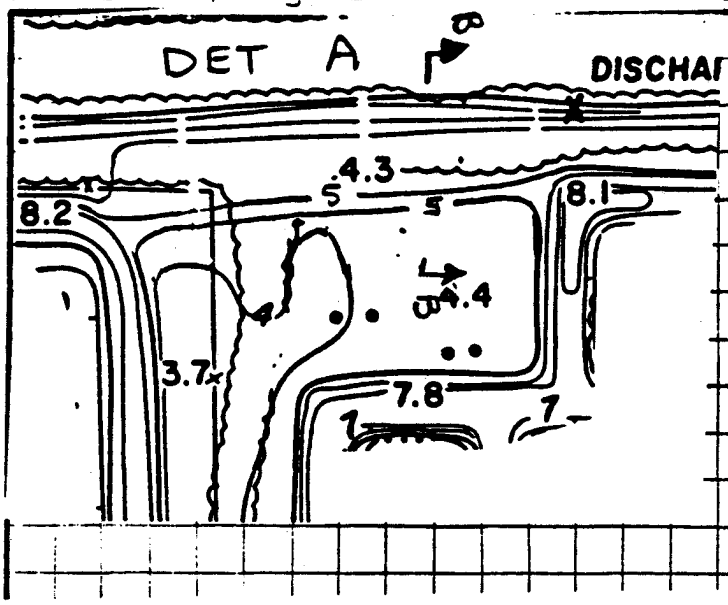
SHEET ____ OF ____

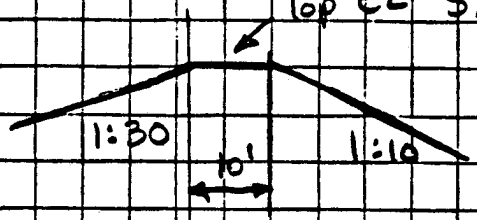
OFS NO. FLO 7918.017 DEPT. NO. 941

CLIENT FPL

PROJECT PFLR

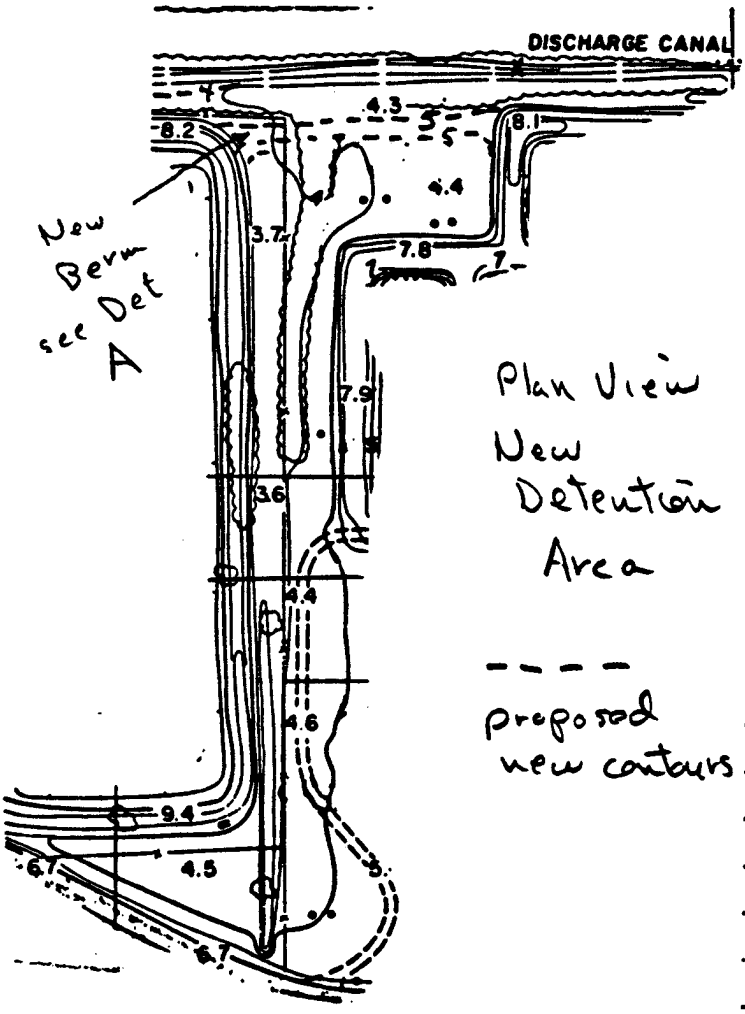
SUBJECT Drainage - Sub Basin 3





B - B

Typical Section thru berm



Plan View

New Detention Area

---- proposed new contours

Rev 1

Note: Fill in where necessary in new detention area so that minimum grade is at El + 4.0

5/28/90 NAP

10.7-79

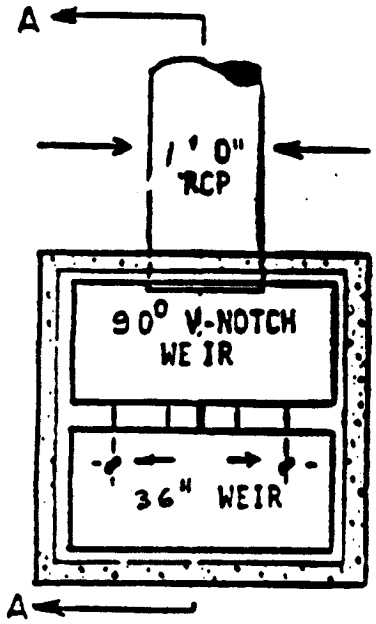
581 2-88

Rev.1

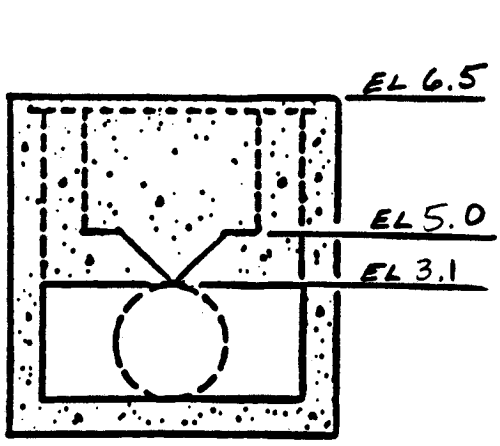
EBASCO SERVICES INCORPORATED

Calc 64
Attachment 3

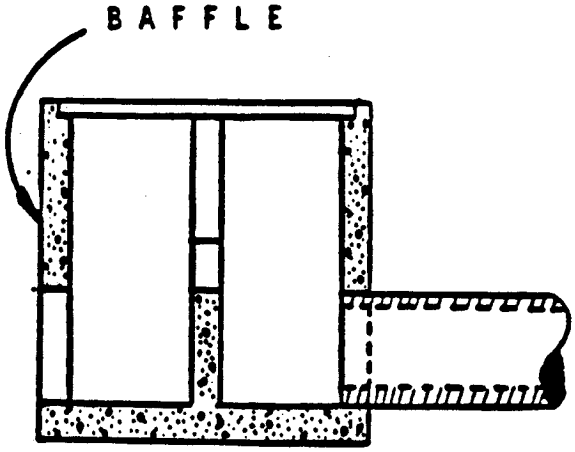
BY WBP DATE 5/18/90
CHKD. BY KM DATE 5/31/90
SHEET ____ OF ____
OFS NO. FLO 7918.013 DEPT. NO. 941
CLIENT FPL
PROJECT PFLR
SUBJECT Drainage - SubBasin 3



PLAN VIEW



FRONT VIEW



SECTION A-A

10.7-80

BY NAF DATE 5/19/90
CHKD. BY KM DATE 6/1/90
SHEET 1 OF 9
OFS NO. 7918.017 DEPT. NO. 941
CLIENT FPL
PROJECT PFLR
SUBJECT Drainage — Sub-Basin 4

This is the proposed Power Block (see Plan on pages 2 and 3)

I Given

A. Acreage
1. Total = 8.38 Acres
2. Impervious
a) Roads and parking = negligible
b) Buildings/Equipment = 7.77 acres
3. Lakes (dry detention) = 0.61 acres
4. Pervious = 0.61 acres

B. Minimum Elevations
1. Roads and parking = 6.7
2. Floors = 9.0

C. Design Storm Allowable Discharge
The 6 sub-basins have a pre-existing discharge to the Dania Cut-off canal of 91.7 cfs. The other 5, after Repowering, will discharge about 1.6 cfs. Thus the limit for this basin is 90 cfs

D. Water Level Elevations (see page 5 Calc 61)
Because of proximity to Dania Cut-Off Canal, and due to Aquifer Pump Test Results, Assume High Water Table = 1.5 ft MSL

E. Rainfall Amounts
Design Storm is 72 hour 25 year precipitation = 14.95 inches

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EBASCO SERVICES INCORPORATED

Calc 65

BY NAP DATE 5/20/90

CHKD. BY KM DATE 6/1/90

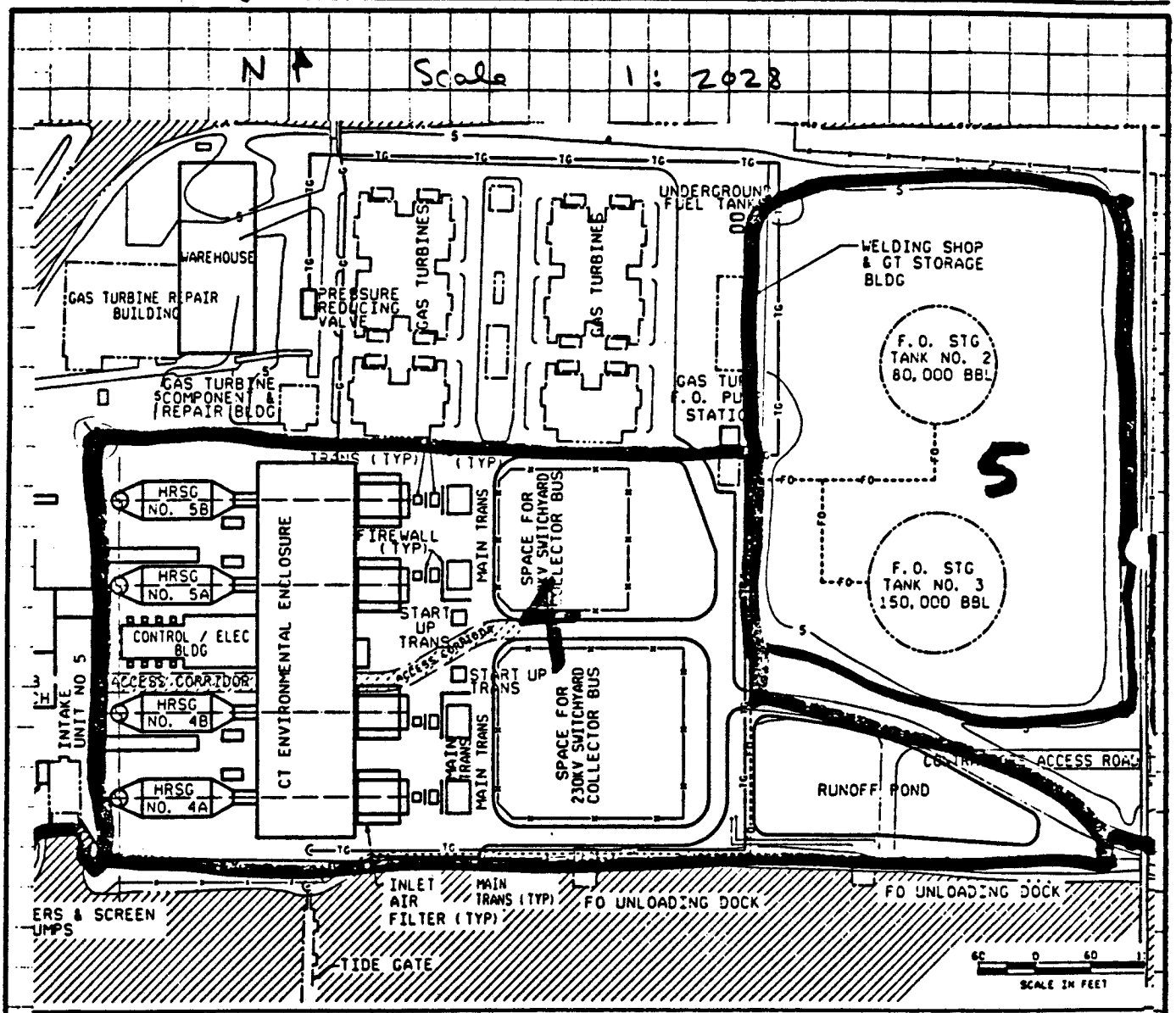
SHEET 2 OF 9

OFS NO. FLO 7918.017 DEPT. NO. 941

CLIENT FPL

PROJECT PFLR

SUBJECT Drainage - Sub Basin 4



Lauderdale Repowering Project

FPL

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10.7-82

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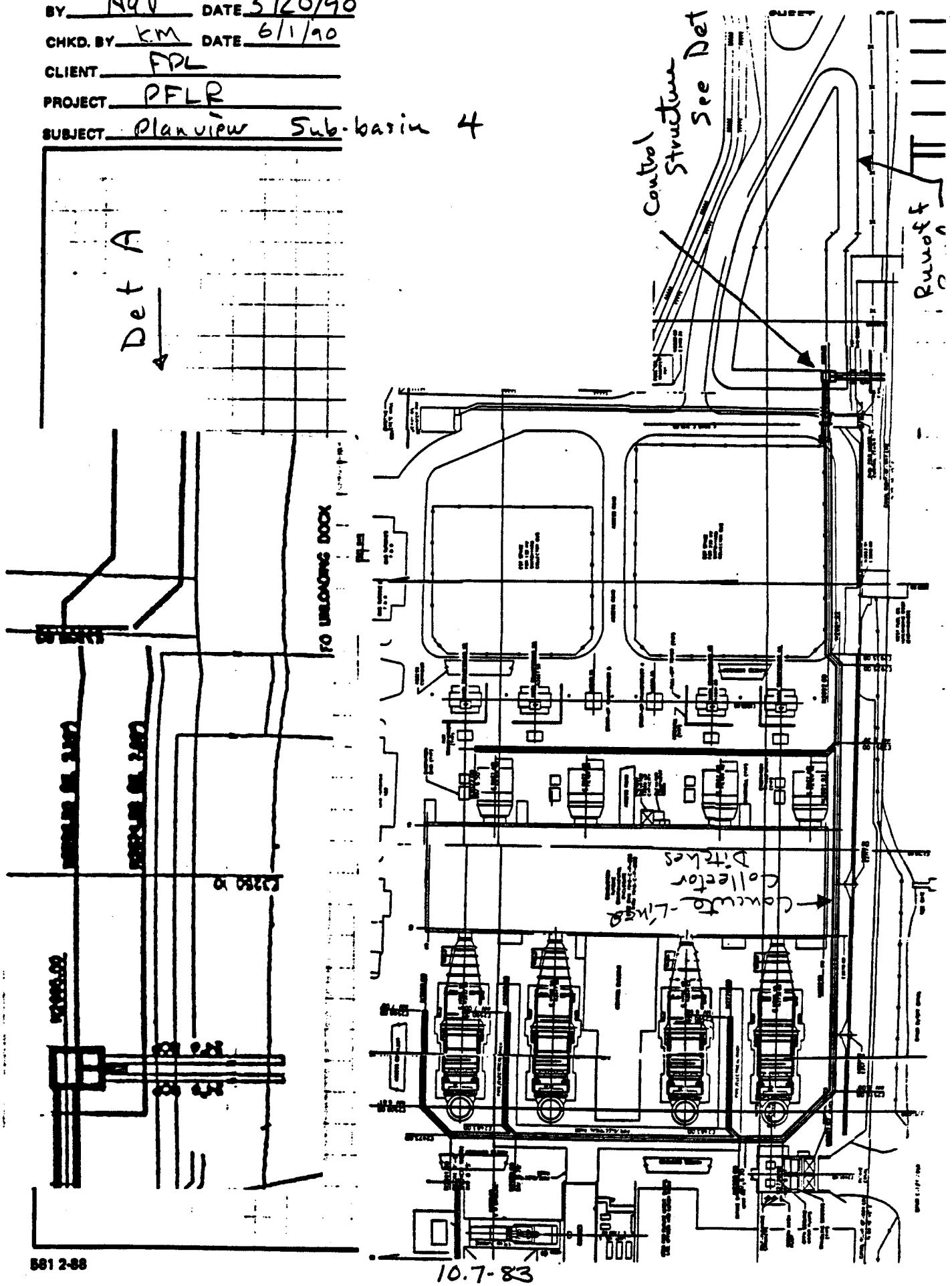
BY NQF DATE 5/20/90

CHKD. BY KM DATE 6/1/90

CLIENT FPL

PROJECT PFLR

SUBJECT Planview Sub-basin 4



581 2-88

10.7-83

EBASCO SERVICES INCORPORATED

BY HAR DATE 5/18/90

CHKD. BY KM DATE 6/1/90

SHEET 4 OF 9

OFS NO. FLO 7918.017 DEPT. NO. 941

CLIENT FPL

PROJECT PFLR

SUBJECT Drainage - SubBasin 4

II Design Criteria

A. Quality

from Calc 58 page 20

Wet detention = 1" or 2.5" * perviousness

Dry detention = .75 * wet detention

Retention = 50% of detention

This sub-basin will have dry detention

Because this sub-basin will discharge to the existing cooling pond there are no limits on the rapidity of the discharge

B. Quantity

Allowable peak discharge needs to be calculated for all six sub-basins cumulatively, i.e. the total discharge to the Davie Cut-off canal can not exceed 91.7 cfs, which is the pre-existing or historical discharge

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EBASCO SERVICES INCORPORATED

Calc 65

BY NAF DATE 5/20/90

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SHEET 5 OF 9

OFS NO. FLO 7918.017 DEPT. NO. 941

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PROJECT PFLR

SUBJECT Drainage - Sub Basin 4

III Computations

A. Quality

Dry detention

1. 1 inch * 8.38 acres /12 = 0.698

2. 2.5 inch * 8.38 * $\frac{7.77}{8.38}$ /12 = 1.619 Acre-feet

Second criteria governs

As retention, reduce to 50%

1.619 Ac-ft * .50 = 0.809 Acre-feet

Note: Pretreatment is provided - see Calc 73, page 1

B. Soil Storage - only look in runoff pond area (the only pervious area)

El	Area	Incr. Area		Storage Factor	Incr. Storage
3	.216	.216	*	0.45	.010
4	.300	.084	*	1.88	.158
5	.384	.084	*	4.95	.416
6.7	.608	.224	*	8.18	1.832
					2.416 inch-acres

$\frac{2.416}{8.38}$ = 0.288 = S

C. Project Surface Storage (see Calc. 73)

El	Storage
3	0
4	0.258
5	0.600
6.7	1.443

D. Control Structure Weir Crest Elevations

for details, see Attachment 1, sheets 1 & 2

Briefly, water enters the structure and passes through to the pond, until EL 4.8 is reached, then flow passes over the weir to 2 * 24" ϕ culverts which discharge to Davis Cut-Off Canal. The 2 culverts have been sized to have more capacity for flow than the weir. Thus, weir is 9 feet wide, crest at El 4.8

from Olson, p. 361

$$Q = 3.10 (\text{width})^{1.02} H^{1.47}$$

at width = 9 ft, $Q = 29.153 H^{1.47}$

E, F and G Control Structure Details

See Att 1 and Flood Routing Results

Runoff = 14.61 inches
Max Water Surface El = 7.0 feet
Max Outflow = 32 cfs
at Height of weir = 4.8

Water Surface too high, lower weir crest to 4.7

Runoff = 14.61 inches
Max Water Surface = 6.8
Max Outflow = 28.1 cfs
Height of Weir = 4.7

Values of Rainfall, Runoff, stage and discharge shown on pages 7 and 8

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BY NAP DATE 5/20/90 CHKD. BY KM DATE 6/1/90

CLIENT FPL

PROJECT PFLR

SUBJECT Drainage - SubBasin 4

SHEET 7 OF 9 DEPT. NO. 941 OFS NO. EC0 7918.017

Calc 65

SBI 2-88

TIME HOURS	CUM RAINFALL INCHES	CUM RUNOFF INCHES	INCR RAINFALL INCHES	INCR RUNOFF INCHES	TOTAL DISCHARGE CFS	STORAGE AC-FT	WATER LEVEL FT MSL	DISCHARGE FROM STORAGE-AC-FT
52.25	4.49	4.16	0.04	0.04	0.00	0.03	3.24	0.00000
52.50	4.53	4.20	0.04	0.04	0.00	0.03	3.24	0.00000
52.75	4.59	4.26	0.05	0.05	0.00	0.04	3.27	0.00000
53.00	4.63	4.30	0.04	0.04	0.00	0.03	3.27	0.00000
53.25	4.69	4.36	0.05	0.05	0.00	0.04	3.27	0.00000
53.50	4.74	4.41	0.06	0.05	0.00	0.04	3.30	0.00000
53.75	4.81	4.48	0.07	0.07	0.00	0.05	3.33	0.00000
54.00	4.86	4.53	0.05	0.05	0.00	0.04	3.33	0.00000
54.25	4.93	4.60	0.07	0.07	0.00	0.05	3.33	0.00000
54.50	4.99	4.66	0.07	0.07	0.00	0.05	3.36	0.00000
54.75	5.07	4.74	0.08	0.08	0.00	0.05	3.39	0.00000
55.00	5.14	4.81	0.07	0.07	0.00	0.05	3.39	0.00000
55.25	5.21	4.88	0.08	0.08	0.00	0.05	3.39	0.00000
55.50	5.29	4.96	0.08	0.08	0.00	0.05	3.42	0.00000
55.75	5.37	5.04	0.08	0.08	0.00	0.05	3.42	0.00000
56.00	5.46	5.12	0.09	0.09	0.00	0.06	3.45	0.00000
56.25	5.54	5.21	0.09	0.09	0.00	0.06	3.48	0.00000
56.50	5.63	5.30	0.09	0.09	0.00	0.06	3.48	0.00000
56.75	5.73	5.40	0.10	0.10	0.00	0.07	3.50	0.00000
57.00	5.83	5.50	0.10	0.10	0.00	0.07	3.53	0.00000
57.25	5.94	5.61	0.11	0.11	0.00	0.08	3.56	0.00000
57.50	6.05	5.72	0.11	0.11	0.00	0.08	3.59	0.00000
57.75	6.17	5.84	0.12	0.12	0.00	0.08	3.62	0.00000
58.00	6.29	5.96	0.12	0.12	0.00	0.08	3.65	0.00000
58.25	6.42	6.09	0.13	0.13	0.00	0.09	3.68	0.00000
58.50	6.56	6.22	0.13	0.13	0.00	0.09	3.71	0.00000
58.75	6.73	6.40	0.18	0.18	0.00	0.12	3.83	0.00000
59.00	6.91	6.57	0.18	0.18	0.00	0.12	3.95	0.00000
59.25	7.18	6.85	0.28	0.27	0.00	0.19	4.17	0.00000
59.50	7.46	7.12	0.27	0.27	0.00	0.19	4.37	0.00000
59.75	9.32	8.98	1.86	1.86	28.05	0.72	6.76	0.57960
60.00	11.16	10.83	1.85	1.85	24.99	0.77	6.58	0.51634
60.25	11.57	11.23	0.41	0.41	1.04	0.26	4.80	0.02149
60.50	11.97	11.63	0.40	0.40	0.01	0.28	4.73	0.00025
60.75	12.18	11.84	0.21	0.21	0.00	0.15	4.48	0.00000
61.00	12.39	12.05	0.21	0.21	0.00	0.15	4.10	0.00000
61.25	12.54	12.20	0.15	0.15	0.00	0.11	3.98	0.00000
61.50	12.69	12.35	0.15	0.15	0.00	0.11	3.83	0.00000
61.75	12.83	12.49	0.13	0.13	0.00	0.09	3.77	0.00000
62.00	12.95	12.61	0.12	0.12	0.00	0.08	3.68	0.00000
62.25	13.05	12.71	0.10	0.10	0.00	0.07	3.60	0.00000
62.50	13.13	12.79	0.09	0.09	0.00	0.06	3.51	0.00000
62.75	13.22	12.88	0.09	0.09	0.00	0.06	3.48	0.00000
63.00	13.30	12.96	0.08	0.08	0.00	0.05	3.45	0.00000
63.25	13.39	13.05	0.09	0.09	0.00	0.06	3.45	0.00000
63.50	13.46	13.12	0.08	0.08	0.00	0.05	3.45	0.00000
63.75	13.55	13.21	0.09	0.09	0.00	0.06	3.45	0.00000
64.00	13.63	13.29	0.08	0.08	0.00	0.05	3.45	0.00000
64.25	13.67	13.33	0.04	0.04	0.00	0.03	3.33	0.00000
64.50	13.73	13.39	0.06	0.05	0.00	0.04	3.27	0.00000
64.75	13.78	13.44	0.05	0.05	0.00	0.04	3.30	0.00000
65.00	13.83	13.49	0.04	0.04	0.00	0.03	3.27	0.00000

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EBASCO SERVICES INCORPORATED

BY NAP DATE 5/20/90 SHEET 8 OF 9

CHKD. BY KM DATE 6/1/90 OFS NO. FLO 7918.012 DEPT. NO. 9411

CLIENT FPL

PROJECT PFLR

SUBJECT Drainage - Sub Basin 4

Calc 65

TIME HOURS	CUM RAINFALL INCHES	CUM RUNOFF INCHES	INCR RAINFALL INCHES	INCR RUNOFF INCHES	TOTAL DISCHARGE CFS	STORAGE AC-FT	WATER LEVEL FT MSL	DISCHARGE FROM STORAGE-AC-FT
65.25	13.88	13.54	0.06	0.05	0.00	0.04	3.27	0.00000
65.50	13.93	13.59	0.04	0.04	0.00	0.03	3.27	0.00000
65.75	13.98	13.64	0.05	0.05	0.00	0.04	3.27	0.00000
66.00	14.02	13.69	0.04	0.04	0.00	0.03	3.27	0.00000
66.25	14.08	13.74	0.06	0.05	0.00	0.04	3.27	0.00000
66.50	14.12	13.78	0.04	0.04	0.00	0.03	3.27	0.00000
66.75	14.18	13.84	0.06	0.05	0.00	0.04	3.27	0.00000
67.00	14.22	13.88	0.04	0.04	0.00	0.03	3.27	0.00000
67.25	14.28	13.94	0.06	0.05	0.00	0.04	3.27	0.00000
67.50	14.32	13.98	0.04	0.04	0.00	0.03	3.27	0.00000
67.75	14.38	14.04	0.06	0.05	0.00	0.04	3.27	0.00000
68.00	14.42	14.08	0.04	0.04	0.00	0.03	3.27	0.00000
68.25	14.45	14.11	0.03	0.03	0.00	0.02	3.21	0.00000
68.50	14.49	14.15	0.03	0.03	0.00	0.02	3.18	0.00000
68.75	14.52	14.18	0.03	0.03	0.00	0.02	3.18	0.00000
69.00	14.55	14.21	0.03	0.03	0.00	0.02	3.18	0.00000
69.25	14.59	14.25	0.03	0.03	0.00	0.02	3.18	0.00000
69.50	14.62	14.28	0.03	0.03	0.00	0.02	3.18	0.00000
69.75	14.65	14.31	0.03	0.03	0.00	0.02	3.18	0.00000
70.00	14.69	14.34	0.03	0.03	0.00	0.02	3.18	0.00000
70.25	14.72	14.38	0.03	0.03	0.00	0.02	3.18	0.00000
70.50	14.75	14.41	0.03	0.03	0.00	0.02	3.18	0.00000
70.75	14.78	14.44	0.03	0.03	0.00	0.02	3.18	0.00000
71.00	14.82	14.48	0.03	0.03	0.00	0.02	3.18	0.00000
71.25	14.85	14.51	0.03	0.03	0.00	0.02	3.18	0.00000
71.50	14.88	14.54	0.03	0.03	0.00	0.02	3.18	0.00000
71.75	14.92	14.58	0.03	0.03	0.00	0.02	3.18	0.00000
72.00	14.95	14.61	0.03	0.03	0.00	0.02	3.18	0.00000

10.7-88

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BY HAF DATE 5/20/90
CHKD. BY KM DATE 6/1/90
SHEET 9 OF 9
OFS NO. FLO 7918.017 DEPT. NO. 9+1
CLIENT FPL
PROJECT PFLR
SUBJECT Drainage - SubBasin 4

IV Check storm stages and discharges

A. Building floor elevations

Flood routing indicates floor elevations at 9.0 are OK. They also meet county criteria of El 7.0

B. Roads vs local criteria

County criteria of El 5.0 is met

Flood routing indicates one road may be submerged for about 15 minutes, submergence is calculated at .06 feet (3/4 inch). Note that area across the road is a detention area for sub-basin 3 which discharges to the cooling pond

C. Allowable Peak Discharge

Peak discharge of 28.1 cfs is well below calculated allowable of 90 cfs

Water Quality

Required retention = 0.809 Ac-ft
from flood-routing, first 7.2 inches of runoff are percolated

in addition
volume of retention = 1.44 acre-feet
pretreatment = 0.37 acre-feet

Calc 65 EBASCO SERVICES INCORPORATED Attachment 1

Rev. 1

BY Hs Wang DATE 4-27-90

CHKD. BY _____ DATE _____

SHEET 1 OF 2

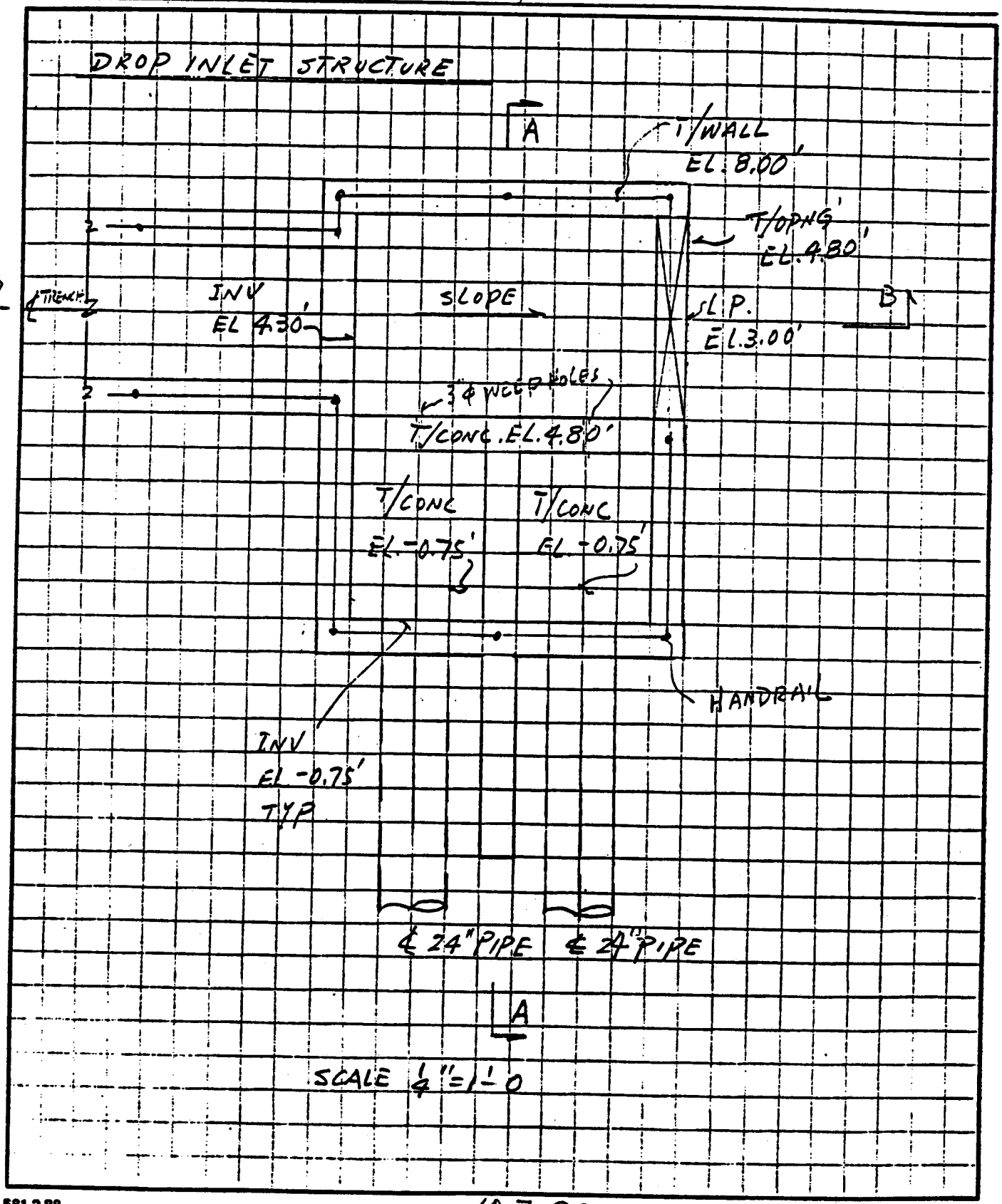
OFS NO. 1087.504 DEPT. NO. 503

CLIENT FPL

PROJECT LAUDERDALE UNITS 4&5

SUBJECT POWER BLOCK AREA DRAINAGE

DROP INLET STRUCTURE



581 2-88

10.7-90

- Rev. 1

BY HsWang DATE 4-26-90

CHKD. BY _____ DATE _____

CLIENT FPL

PROJECT LAUDERDALE UNITS 4&5

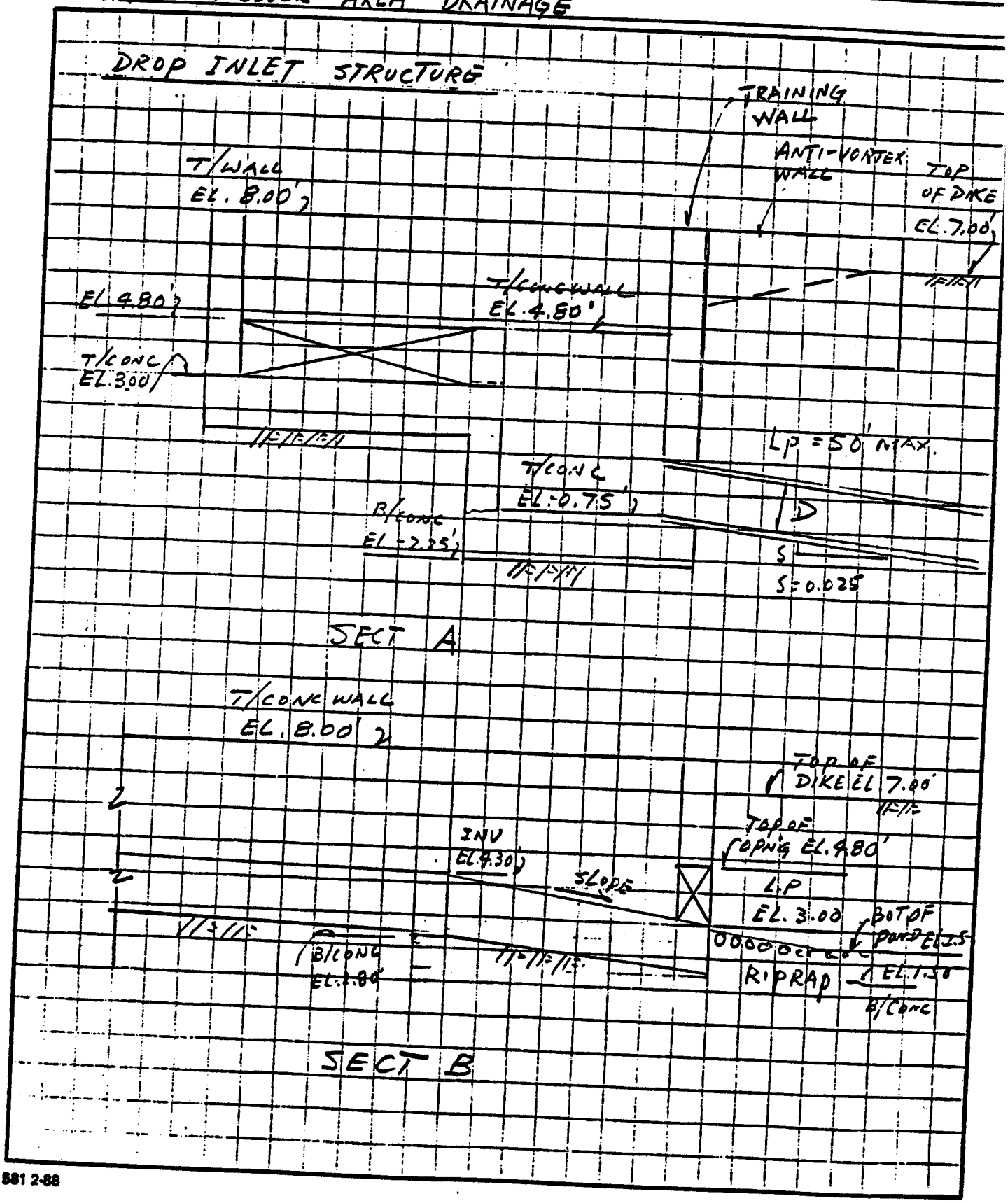
SUBJECT POWER BLOCK AREA DRAINAGE

Attachment

SHEET 2 OF 2

OFS NO. 1087.504 DEPT. NO. 503

CALC NO. 7918-C



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10.7-91

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EBASCO SERVICES INCORPORATED

Calc 66

BY NQF DATE 5/20/90

CHKD. BY KM DATE 6/4/90

SHEET 1 OF 2

OFS NO. FLO7918.017 DEPT. NO. 941

CLIENT FPL

PROJECT PFLR

SUBJECT Drainage from Sub-Basin 5

This Sub-Basin will be unchanged by Repowering. Based on Calculation No 69, it will have no discharge

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Calc 66

Rev. 1

BY NAF DATE 5/20/90

CHKD. BY FM DATE 6/4/90

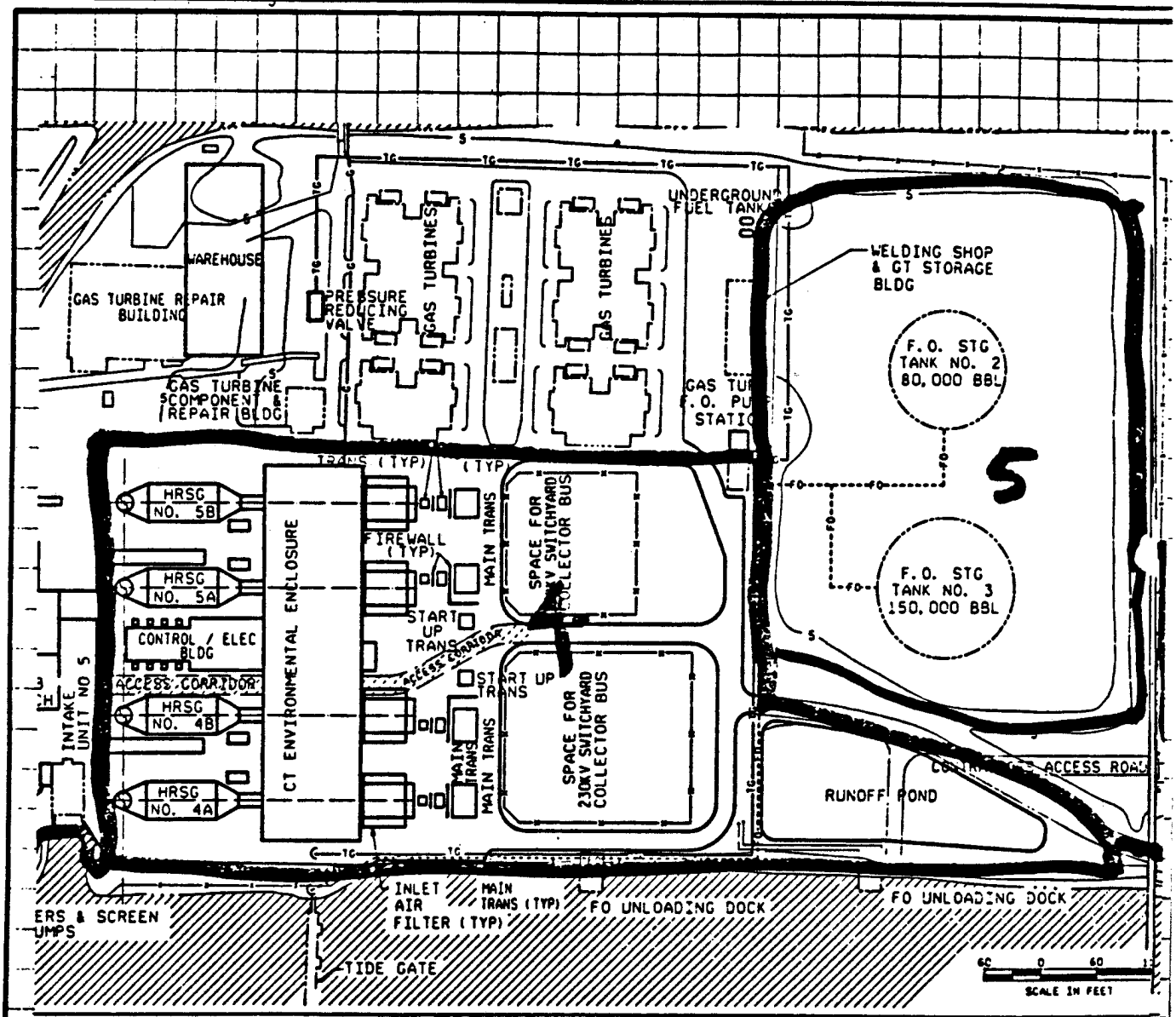
SHEET 2 OF 2

OFS NO. FLO 7918.017 DEPT. NO. 941

CLIENT FPL

PROJECT PFLR

SUBJECT Drainage - SubBasin 5



Lauderdale Repowering Project

FPL

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10.7-93

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EBASCO SERVICES INCORPORATED

Calc 67

BY HAF DATE 5/20/90 360 ×

CHKD. BY KM DATE 6/4/90

SHEET 1 OF 2

OFS NO. 7918.017 DEPT. NO. 941

CLIENT FPL

PROJECT PFLR

SUBJECT Drainage Sub-Basin 6

Repowering will affect this sub-basin slightly in that an impermeable area of about 0.9 acres will be added

% impervious will increase from 0% (see calc 70) to $\frac{0.9}{8.675} = .104$ or $\approx 10\%$

This will decrease soil storage slightly, from 1.22 inches to

$0.9 * 1.22 = 1.1$ inches

per calc 70.

$\frac{1.1}{12}$ inches * 8.675 acres = 0.794 acre-feet

at existing configuration max water surface was 3.21 at storage = 2.584 acre-feet

add 0.794 ⇒ 2.584 + .794 = 3.378 acre-ft

this corresponds to a stage of

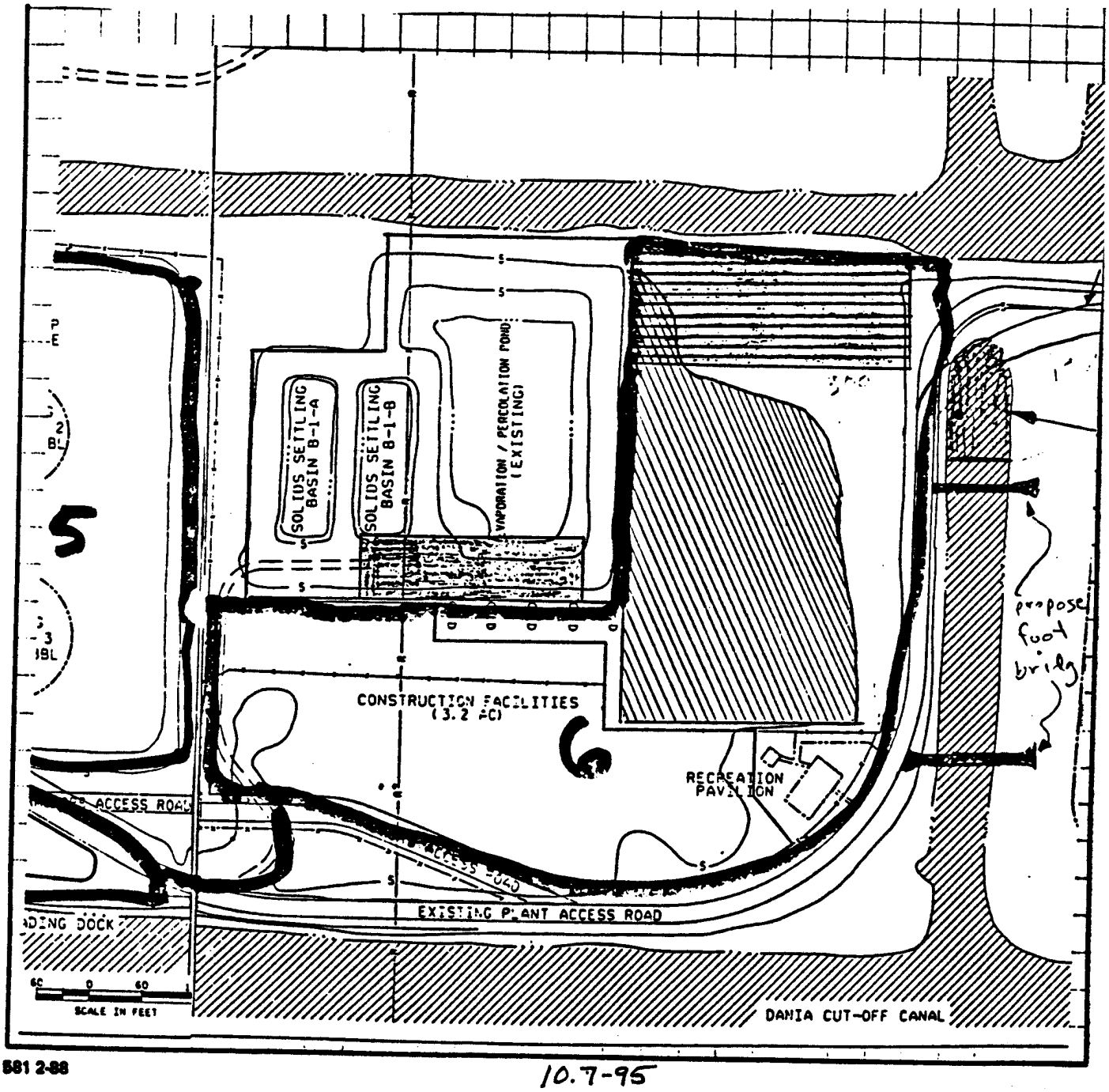
$3.0 + \frac{3.378 - 1.52}{6.84 - 1.52} = 3.35$ feet

Thus, there would still be no discharge

Isolated Upland Hardwood Wetland – 2.23 Acres (2.08 preserved & 0.15 fill

Central Construction Parking / Laydown – 1.44 Acres

Wastewater Treatment Area – 1.36 Acres (0.46 west & 0.90 east)



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EBASCO SERVICES INCORPORATED

BY HAP DATE 5/14/90 SHEET 1 OF 1

CHKD. BY KM DATE 5/15/90 OFS NO. 7918.017 DEPT. NO. 941

CLIENT FPL

PROJECT FFLR Summary Sheets - Drainage Basin 1

SUBJECT Existing

1 Existing Discharge — peak of 78 cfs at water level = 3.36 ft MSL

2 Post-Project

peak of 6.01 cfs at Water Level ≤ 5.32

New Structures

1) culvert 50' * 24" ∅ from old intake canal area to south end of filled-in stub canal

2) culvert from stub canal to discharge channel

not new, just need to lower discharge end so that is below El + 0

Image Quality
As you review the next group of images, Please note that the original documents
were of poor quality.

Rev. 1

EBASCO SERVICES INCORPORATED

BY HAP DATE 5/7/90
CHKD. BY KM DATE 5/15/90
SHEET 1 OF 36
OFS NO. 7918.017 DEPT. NO. 941
CLIENT FPL
PROJECT PFLR
SUBJECT Drainage Basin I

1) identify sub basins

There are 21 sub basins - see key maps pages 2 & 3 (these are existing sub-basins)

2) flood route for Basin I (sec. 4)
(Basin I is same as Basin 1 in Calc 57, after Repowering)
a) area vs stage curve, by planimeter

Elevation	Area		
			old intake canal
	Future Pk Lot	Int Canal	Sub.
+2	1.263		
+3	—	1.509	1.509
+4	0.598	1.822	2.420
+5	0.947	2.082	3.029
Top of Subbasin	1.210	4.569	5.779

to Int Canal: 3.726
to Stub. Canal: 0.843

Pervious -	3.313 acres	=	57 %
Impervious -	0.957 acres	=	17 %
Water Surface -	1.509 acres	=	26 %
	5.779		100 ✓

(Impervious is park lot east of old intake canal)

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10-7-98

Key Map west half of site

N

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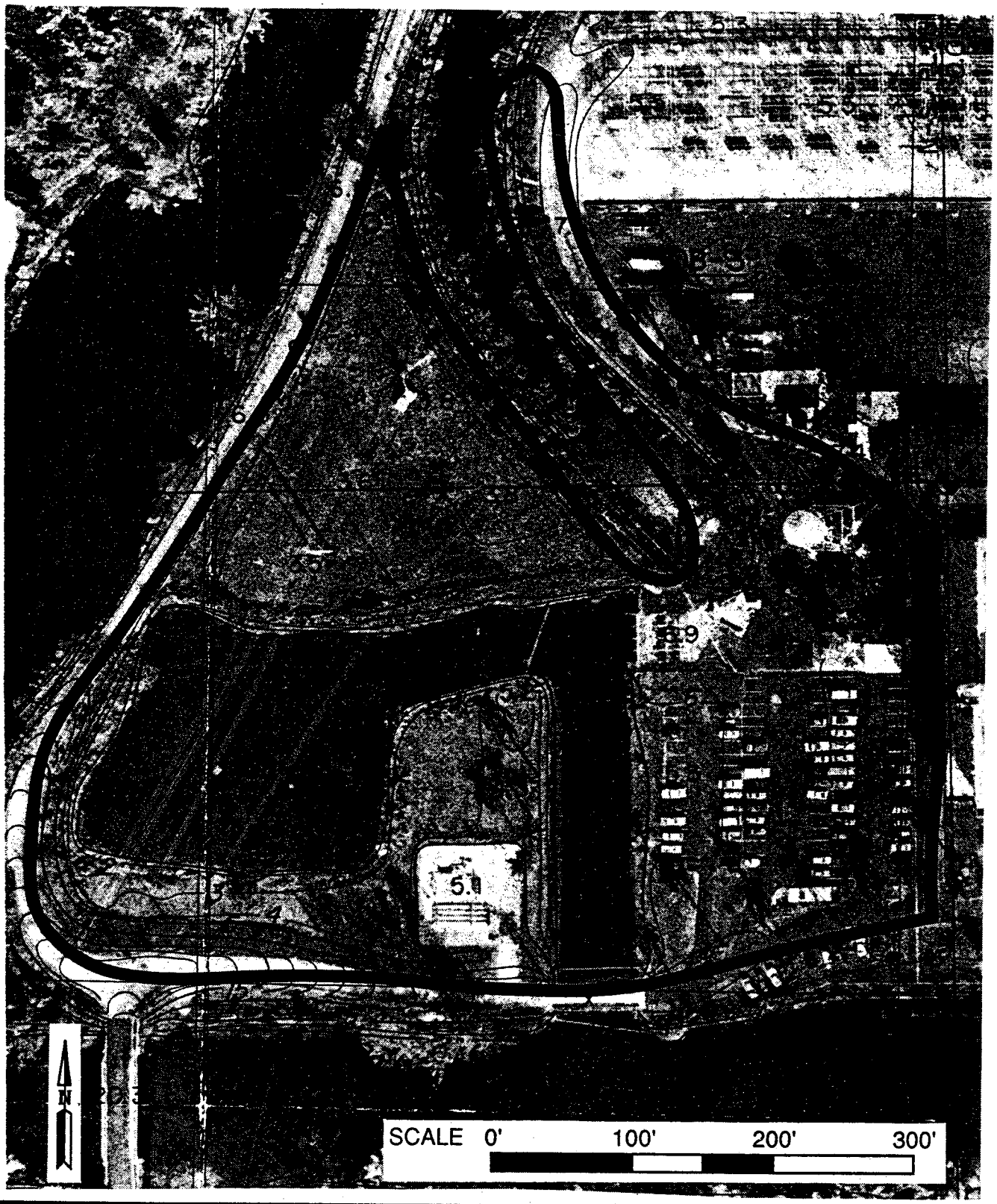
10-7-99

Key Map east half of site

N

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SUB-BASIN I

Lauderdale
Repowering
Project

FPL

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SUBJECT Drainage Basin I

b) assume we will use the SCS method
Need to Calculate S
based on Broward County W.M. 2.1
(see page 6)

High Water Table ≈ 3 / Based on page C-III-1 in BOR

El	Acres		Storage-ft		storage in ac-feet
3	1.509	*	0	=	0
4	0.911	*	.6/12	=	.0456
5	0.609	*	2.5/12	=	.1269
6½ (estimated)	2.750	*	10.9/12	=	2.4979
					2.6704

$$\frac{2.6704 \text{ Ac-ft}}{5.779 \text{ Acres}} = .462 \text{ feet} = 5.5 \text{ inches}$$

at 57% pervious

5.5 inches * 0.57 = 3.16 inches

Per SCS equation page C-II-1

runoff $Q = \dfrac{(P - 0.2S)^2}{(P + 0.8S)}$, all units are inches

for S = 3.16

$$Q = (P - .632)^2 / (P + 2.528)$$

Q is accumulated direct runoff

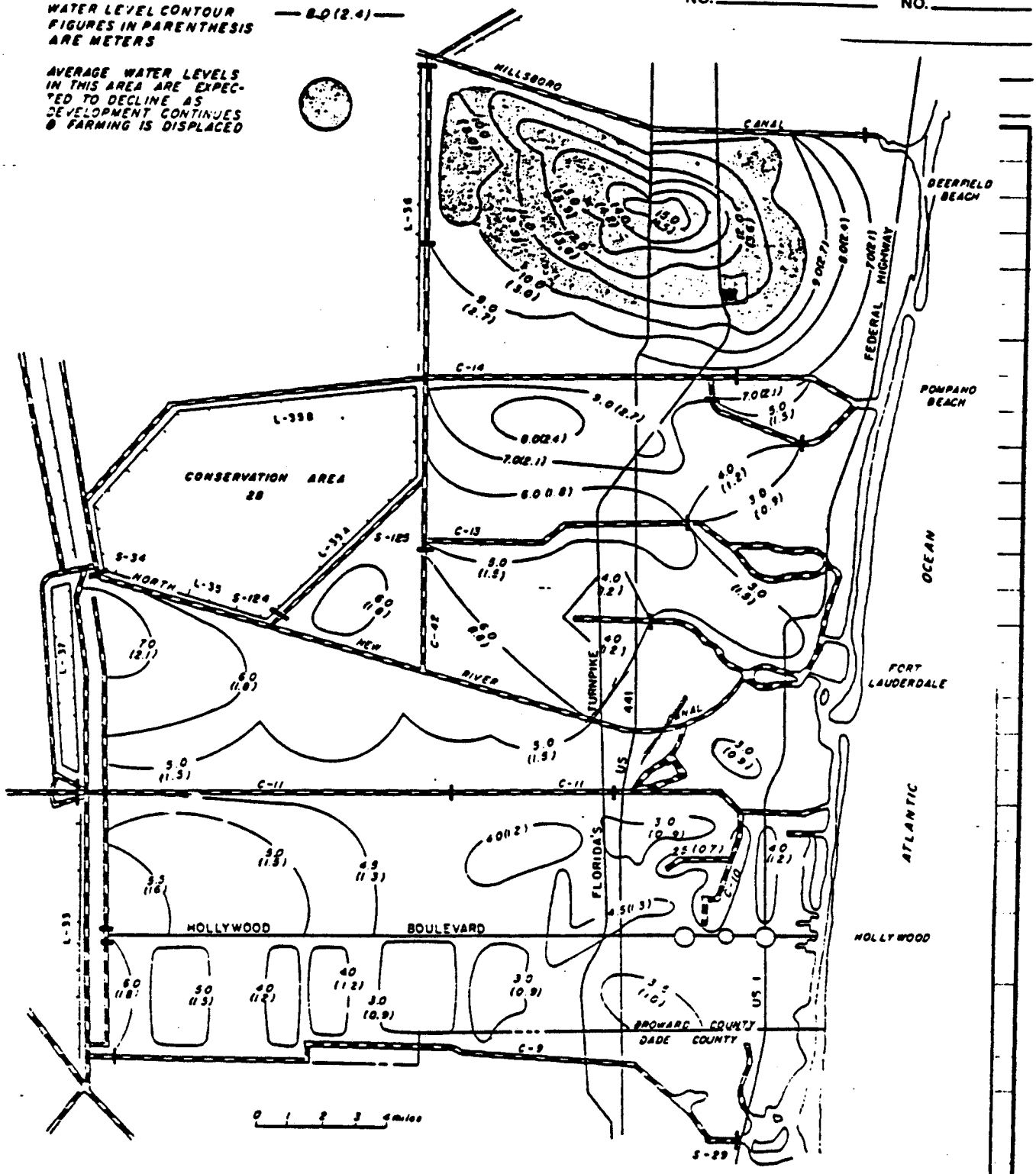
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Calc. 58

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JOB NO. _____ DEPT. NO. _____



BROWARD COUNTY TRANSPORTATION DEPARTMENT WATER MANAGEMENT DIVISION	APPROVED 7-19-77 REVISED	AVERAGE ANNUAL HIGH WATER TABLE	W. M. 2.1 1 OF 1 SHEETS

581 7-88

10.7-102

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SUBJECT Drainage Basin I

Storm		Precipitation	Runoff
3 day	25 year	14.95	11.73 inches
5 day	10 year	14.00	10.81 inches
5 day	100 year	20.24	16.89 inches

$$\frac{(14.95 - .632)^2}{14.95 + 2.528} = \frac{205.005}{17.478} = 11.73 \text{ inches}$$

$$\frac{(14 - .632)^2}{14 + 2.528} = 10.81 \text{ inches}$$

$$\frac{(20.24 - .632)^2}{20.24 + 2.528} = \frac{384.474}{22.768} = 16.89 \text{ inches}$$

Computerize into a BASIC Program

Unable to use SFWMD programs because:

1.) There is no documentation for them

2.) They were provided only in FORTRAN object deck form so there is no way to check them or even tell what they do

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PROJECT PFLR

SUBJECT Drainage Basin I

Basic Program to:

1. Provide correct precipitation - based on Table C-I-2 from SFWMD Manual

2. Calculate runoff from precip Use SCS method per page C-II-1 of Manual

$$Q = (P - 0.2S)^2 / (P + 0.8S)$$

3. Basin storage will be calculated as a linear interpolation between 1 foot contours.

e.g. for basin I, from p. 1

Elevation	Area	Incremental Storage *	Total Storage
3	0	0	0
4	.598 Ac	0.299 Ac-ft	.299
5	.947 Ac	.773	1.072
6.3	1.210 Ac	1.402	2.474

for area I, the parking lot area has storage, the intake canal area does not.

* Storage = $\frac{\text{Area at top} + \text{Area at Bottom}}{2} \times \text{height}$

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PROJECT PFLR

SUBJECT Drainage Basin I

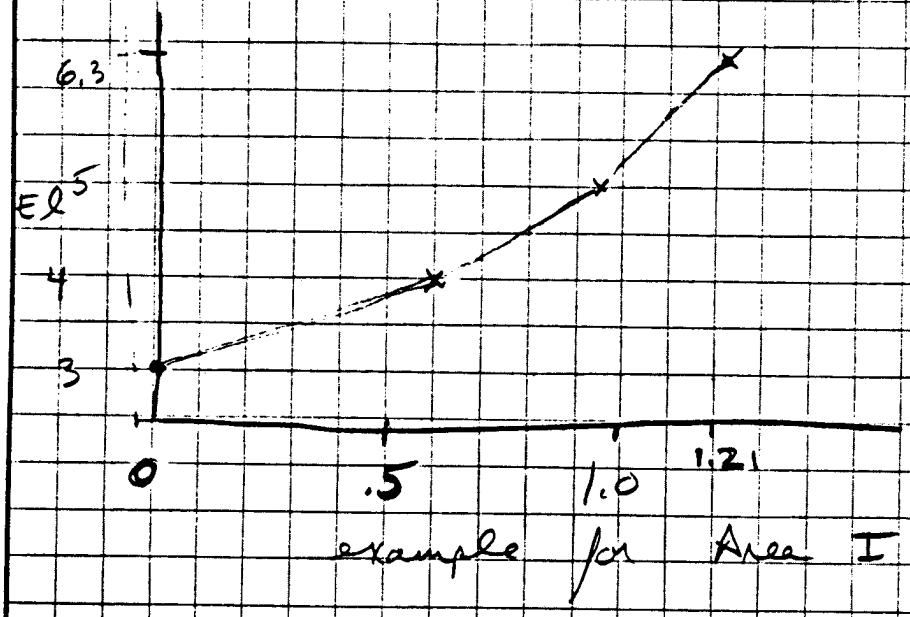
assume a time step I

start with B (I), incremental runoff for step I

inches acres

B (I) * Area = Inflow (I) in inch-acres

Stor (I) =



example for Area I

first step is .02

.02 * 1.21 = .0242

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PROJECT PFLR

SUBJECT Drainage Basin I

Discharge - flow vs elevation

from future parking area in sub-basin I, discharge is through a device like a broad-crested weir, for which

from Open Channel Flow by Henderson, p 211

$$q = \tfrac{2}{3} H \sqrt{\tfrac{2}{3} g H}$$

from page 4, width scales to about 80 feet

$$Q = 80 * \tfrac{2}{3} H * \sqrt{\tfrac{2}{3} g H}$$

where H = elevation above crest

g = 32.2

flood routing theory

1. Calculate incremental runoff per SCS method for both areas draining to storage and areas draining directly to discharge

2. Calculate storage volume = initial storage volume + incremental runoff - discharge based on water level during previous time step

a) discharge flow based on proper weir equation from storage area

3 Calculate total discharge = direct discharge + discharge from storage area

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SUBJECT Drainage Basin I

4. from storage, calculate water level

5. go to next time step.

for program listing (in Quick Basic version 4.5, from Microsoft)

see pages 12 & 13

for output from existing area I,

see pages

per page 18, peak discharge ≅ 78 cfs, water level max is at 3.36 ft

for Area I after Repowering

for Basin topography, see page 21

Changes are:

1. Fill in portion of stub canal to El + 3, put in weir at end of now-dry portion - adds 0.658 acres to total
2. Fill in old intake canal to El +3
3. New culvert from old intake canal to stub canal

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PROJECT PFLR

SUBJECT Drainage Basin I

```
REM! SAVE FLOOD1.BAS
REM! C=CUMULATIVE RAINFALL
REM! R=CUMULATIVE RUNOFF
REM! T=24 HOUR RAINFALL
REM! X=INCREMENTAL RUNOFF
REM! Z=TIME IN HOURS
REM! D=DISCHARGE
REM! A=INCREMENTAL RAINFALL
REM! B=INCREMENTAL RUNOFF
REM! E=INCREMENTAL STORAGE
REM! L=WATER LEVEL
      WIDTH "LPT1:", 132
      OPTION BASE 1
      DIM C(289), R(289), X(289), D(289), A(289), B(289), E(289), L(289), El(4), St(4), Sd(289)
REM!  U=NUMBER OF STORAGE ELEVATION/VOLUME POINTS
REM!  El and St = ARE ELEVATIONS AND CORRESPONDING VOLUMES WITHIN STORAGE
REM!  Rs=RUNOFF TO THE STORAGE AREA
REM!  Rd=RUNOFF TO DIRECT DISCHARGE
REM!  Rf=FLOOD-ROUTED RUNOFF
REM!  Ast= AREA RECEIVING RUNOFF WHICH GOES TO STORAGE
REM!  Cel=CONTROL ELEVATION OF STORAGE AREA
REM!  Ad= AREA RECEIVING RUNOFF WHICH GOES DIRECT TO DISCHARGE
REM!  Sr=1st GUESS AT STORAGE VALUE
REM!  Es=1st GUESS AT STORAGE WATER LEVEL
REM!  Sd= DISCHARGE FROM STORAGE AREA
      Cel = 3
      U = 4
      Ast = 1.21
      Ad = 4.569
      S = 3.16
      T = 11
      DATA .000,.002,.003,.005,.006,.008,.009,.011,.012,.014,.015,.017,.018,.020,.021,.023,.024
      DATA .026,.027,.029,.030,.032,.033,.035,.036,.038,.040,.041,.043,.044,.046,.047,.049,.050
      DATA .052,.053,.055,.056,.058,.059,.061,.062,.064,.065,.067,.068,.070,.071,.073,.075,.076
      DATA .078,.079,.081,.082,.084,.085,.087,.088,.090,.091,.093,.094,.096,.097,.099,.100,.102
      DATA .103,.105,.106,.108,.110,.111,.113,.114,.116,.117,.119,.120,.122,.123,.125,.126,.128
      DATA .129,.131,.132,.134,.135,.137,.138,.140,.141,.143,.144,.146,.148,.150,.153,.155,.157
      DATA .159,.162,.164,.166,.168,.170,.173,.175,.177,.179,.182,.184,.186,.188,.190,.193,.195
      DATA .197,.199,.201,.204,.206,.208,.210,.213,.215,.217,.219,.221,.224,.226,.228,.230,.233
      DATA .235,.237,.239,.241,.244,.246,.248,.250,.252,.255,.257,.259,.261,.264,.266,.268,.270
      DATA .272,.275,.277,.279,.281,.284,.286,.288,.290,.292,.295,.297,.299,.301,.304,.306,.308
      DATA .310,.312,.315,.317,.319,.321,.324,.326,.328,.330,.332,.335,.337,.339,.341,.343,.346
      DATA .348,.350,.352,.355,.357,.359,.362,.364,.367,.369,.372,.374,.377,.379,.382,.385,.388
      DATA .391,.394,.397,.400,.404,.408,.412,.417,.421,.426,.431,.437,.442,.448,.454,.461,.467
      DATA .474,.481,.488,.496,.504,.512,.521,.530,.540,.550,.561,.572,.584,.596,.612,.628,.653
      DATA .678,.847,1.015,1.052,1.088,1.107,1.126,1.140,1.154,1.166,1.177,1.186,1.194,1.202,1.209,1.217,1.224
      DATA 1.232,1.239,1.243,1.248,1.253,1.257,1.262,1.266,1.271,1.275,1.280,1.284,1.289,1.293,1.298,1.302,1.307
      DATA 1.311,1.314,1.317,1.320,1.323,1.326,1.329,1.332,1.335,1.338,1.341,1.344,1.347,1.350,1.353,1.356,1.359
      FOR I = 1 TO 289
      READ Q
      C(I) = Q * T
      NEXT I
      DATA 3,0,4,.299,.5,1.072,.6,3,2.474
      FOR K = 1 TO U
      READ El(K), St(K)
      NEXT K
      E(1) = 0
      L(1) = 3
      Z = 0
      LPRINT "    TIME        INCR          INCR          TOTAL          STORAGE        WATER          DISCHARGE"
      LPRINT "    HOURS       RAINFALL      RUNOFF        DISCHARGE      AC-FT          LEVEL          FROM"
      LPRINT "                INCHES        INCHES        CFS                           FT MSL         STORAGE-AC-FT"
      LPRINT " "
      FOR I = 2 TO 289
      T = T + 1 / 4
```

581/8-81

10.7-108

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CHKD. BY KM DATE 5/15/90

CLIENT FPL

PROJECT PFLR

SUBJECT Drainage Basin H

EBASCO SERVICES INCORPORATED

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Calc. 58

10.7-109

561/8-81

```
      FOR K = 1 TO U
      READ El(K), St(K)
      NEXT K
      E(1) = 0
      L(1) = 3
      Z = 0
      LPRINT "    TIME        INCR          INCR       TOTAL        STORAGE       WATER        DISCHARGE    "
      LPRINT "    HOURS      RAINFALL      RUNOFF    DISCHARGE       AC-FT        LEVEL          FROM"
      LPRINT "                 INCHES       INCHES       CFS                      FT MSL       STORAGE-AC-FT"
      LPRINT " "
      FOR I = 2 TO 289
      Z = Z + 1 / 4
      R(I) = (C(I) - .2 * S) * (C(I) - .2 * S) / (C(I) + .8 * S)
      IF R(I) > C(I) THEN R(I) = C(I)
      A(I) = C(I) - C(I - 1)
      B(I) = R(I) - R(I - 1)
      IF B(I) < 0 THEN B(I) = 0
      Rs = B(I) * Ast / 12
      Rd = B(I) * Ad / 12
      Sr = Rs + E(I - 1) - Sd(I - 1)
10    FOR J = 2 TO U
      IF Sr < St(J) THEN 20
      GOTO 10
      NEXT J
20    Es = El(J - 1) + ((Sr - St(J - 1)) / (St(J) - St(J - 1))) * (El(J) - El(J - 1))
      H = ((Es + L(I - 1)) / 2) - Cel
      IF H < 0 THEN H = 0
      Rf = 80 * 2 / 3 * H * ((2 / 3 * 32.17 * H)) ^ (.5)
      Sd(I) = Rf * 60 * 15 / 43560
      Rs = Rs - Sd(I)
      E(I) = Rs
      Sr = Rs + E(I - 1)
30    FOR J = 2 TO U
      IF Sr < St(J) THEN 40
      GOTO 30
      NEXT J
40    L(I) = H + Cel
50    D(I) = Rd * (43560 / (15 * 60)) + Rf
      ZZZ = ZZZ + 1
      IF ZZZ <> 53 THEN 70
      LPRINT
      LPRINT
      LPRINT
      LPRINT
      LPRINT
      LPRINT
      LPRINT
      LPRINT
      LPRINT
      LPRINT
      LPRINT "    TIME        INCR          INCR       TOTAL        STORAGE       WATER        DISCHARGE    "
      LPRINT "    HOURS      RAINFALL      RUNOFF    DISCHARGE       AC-FT        LEVEL          FROM"
      LPRINT "                 INCHES       INCHES       CFS                      FT MSL       STORAGE-AC-FT"
      LPRINT " "
      ZZZ = 1
70    LPRINT USING "   ###.##        ##.##          ##.##        ##.##       ##.##      ##.##          ##.##          ##.##"; Z, A(I), B(I), D
(I), E(I), L(I), Sd(I)
      NEXT I
      END
```

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DEPT.

TIME HOURS	INCR RAINFALL INCHES	INCR RUNOFF INCHES	TOTAL DISCHARGE CFS	STORAGE AC-FT	WATER LEVEL FT MSL
0.25	0.02	0.02	0.46	0.00	3.00
0.50	0.01	0.01	0.26	0.00	3.00
0.75	0.02	0.02	0.46	0.00	3.00
1.00	0.01	0.01	0.26	0.00	3.00
1.25	0.02	0.02	0.46	0.00	3.00
1.50	0.01	0.01	0.25	0.00	3.00
1.75	0.02	0.00	0.00	-0.00	3.00
2.00	0.01	0.00	0.00	-0.00	3.00
2.25	0.02	0.00	0.00	-0.00	3.00
2.50	0.01	0.00	0.00	-0.00	3.00
2.75	0.02	0.00	0.00	-0.00	3.00
3.00	0.01	0.00	0.00	-0.00	3.00
3.25	0.02	0.00	0.00	-0.00	3.00
3.50	0.01	0.00	0.00	0.00	3.00
3.75	0.02	0.00	0.00	0.00	3.00
4.00	0.01	0.00	0.00	0.00	3.00
4.25	0.02	0.00	0.00	0.00	3.00
4.50	0.01	0.00	0.00	0.00	3.00
4.75	0.02	0.00	0.00	0.00	3.00
5.00	0.01	0.00	0.00	0.00	3.00
5.25	0.02	0.00	0.00	0.00	3.00
5.50	0.01	0.00	0.00	0.00	3.00
5.75	0.02	0.00	0.00	0.00	3.00
6.00	0.01	0.00	0.00	0.00	3.00
6.25	0.02	0.00	0.00	0.00	3.00
6.50	0.02	0.00	0.00	0.00	3.00
6.75	0.01	0.00	0.00	0.00	3.00
7.00	0.02	0.00	0.00	0.00	3.00
7.25	0.01	0.00	0.00	0.00	3.00
7.50	0.02	0.00	0.00	0.00	3.00
7.75	0.01	0.00	0.00	0.00	3.00
8.00	0.02	0.00	0.00	0.00	3.00
8.25	0.01	0.00	0.00	0.00	3.00
8.50	0.02	0.00	0.00	0.00	3.00
8.75	0.01	0.00	0.00	0.00	3.00
9.00	0.02	0.00	0.00	0.00	3.00
9.25	0.01	0.00	0.00	0.00	3.00
9.50	0.02	0.00	0.00	0.00	3.00
9.75	0.01	0.00	0.00	0.00	3.00
10.00	0.02	0.00	0.01	0.00	3.00
10.25	0.01	0.00	0.01	0.00	3.00
10.50	0.02	0.00	0.02	0.00	3.00
10.75	0.01	0.00	0.01	0.00	3.00
11.00	0.02	0.00	0.02	0.00	3.00
11.25	0.01	0.00	0.02	0.00	3.00
11.50	0.02	0.00	0.03	0.00	3.00
11.75	0.01	0.00	0.02	0.00	3.00
12.00	0.02	0.00	0.04	0.00	3.00
12.25	0.02	0.00	0.05	0.00	3.00
12.50	0.01	0.00	0.03	0.00	3.00
12.75	0.02	0.00	0.05	0.00	3.00
13.00	0.01	0.00	0.03	0.00	3.00

Rev. 1

EBASCO SERVICES INCORPORATED

BY HAP KM DATE 5/13/90 5/15/90

TIME HOURS	INCR RAINFALL INCHES	INCR RUNOFF INCHES	TOTAL DISCHARGE CFS	STORAGE AC-FT	WATER LEVEL FT MSL
13.25	0.02	0.00	0.06	0.00	3.00
13.50	0.01	0.00	0.04	0.00	3.00
13.75	0.02	0.00	0.07	0.00	3.00
14.00	0.01	0.00	0.04	0.00	3.00
14.25	0.02	0.00	0.08	0.00	3.00
14.50	0.01	0.00	0.04	0.00	3.00
14.75	0.02	0.00	0.08	0.00	3.00
15.00	0.01	0.00	0.05	0.00	3.00
15.25	0.02	0.00	0.09	0.00	3.00
15.50	0.01	0.00	0.05	0.00	3.00
15.75	0.02	0.00	0.10	0.00	3.00
16.00	0.01	0.00	0.06	0.00	3.00
16.25	0.02	0.01	0.10	0.00	3.00
16.50	0.01	0.00	0.06	0.00	3.00
16.75	0.02	0.01	0.11	0.00	3.00
17.00	0.01	0.00	0.06	0.00	3.00
17.25	0.02	0.01	0.12	0.00	3.00
17.50	0.01	0.00	0.07	0.00	3.00
17.75	0.02	0.01	0.12	0.00	3.00
18.00	0.02	0.01	0.13	0.00	3.00
18.25	0.01	0.00	0.07	0.00	3.00
18.50	0.02	0.01	0.13	0.00	3.00
18.75	0.01	0.00	0.07	0.00	3.00
19.00	0.02	0.01	0.14	0.00	3.00
19.25	0.01	0.00	0.08	0.00	3.00
19.50	0.02	0.01	0.14	0.00	3.00
19.75	0.01	0.00	0.08	0.00	3.00
20.00	0.02	0.01	0.15	0.00	3.00
20.25	0.01	0.00	0.08	0.00	3.00
20.50	0.02	0.01	0.15	0.00	3.00
20.75	0.01	0.00	0.09	0.00	3.00
21.00	0.02	0.01	0.16	0.00	3.00
21.25	0.01	0.00	0.09	0.00	3.00
21.50	0.02	0.01	0.16	0.00	3.00
21.75	0.01	0.00	0.09	0.00	3.00
22.00	0.02	0.01	0.17	0.00	3.00
22.25	0.01	0.00	0.09	0.00	3.00
22.50	0.02	0.01	0.17	0.00	3.00
22.75	0.01	0.00	0.10	0.00	3.00
23.00	0.02	0.01	0.18	0.00	3.00
23.25	0.01	0.00	0.10	0.00	3.00
23.50	0.02	0.01	0.18	0.00	3.00
23.75	0.01	0.00	0.10	0.00	3.00
24.00	0.02	0.01	0.19	0.00	3.00
24.25	0.02	0.01	0.20	0.00	3.00
24.50	0.02	0.01	0.20	0.00	3.00
24.75	0.03	0.01	0.31	0.00	3.00
25.00	0.02	0.01	0.21	0.00	3.00
25.25	0.02	0.01	0.21	0.00	3.00
25.50	0.02	0.01	0.21	0.00	3.00
25.75	0.03	0.02	0.33	0.00	3.00
26.00	0.02	0.01	0.22	0.00	3.00

Rev. 1 NDR 5/13/90 KM 5/15/90

EBASCO SERVICES INCORPORATED

TIME HOURS	INCR RAINFALL INCHES	INCR RUNOFF INCHES	TOTAL DISCHARGE CFS	STORAGE AC-FT	WATER LEVEL FT MSL
26.25	0.02	0.01	0.22	0.00	3.00
26.50	0.02	0.01	0.23	0.00	3.00
26.75	0.02	0.01	0.23	0.00	3.00
27.00	0.03	0.02	0.35	0.00	3.00
27.25	0.02	0.01	0.23	0.00	3.00
27.50	0.02	0.01	0.24	0.00	3.00
27.75	0.02	0.01	0.24	0.00	3.00
28.00	0.03	0.02	0.36	0.00	3.00
28.25	0.02	0.01	0.25	0.00	3.00
28.50	0.02	0.01	0.25	0.00	3.00
28.75	0.02	0.01	0.25	0.00	3.00
29.00	0.02	0.01	0.25	0.00	3.00
29.25	0.03	0.02	0.38	0.00	3.00
29.50	0.02	0.01	0.26	0.00	3.00
29.75	0.02	0.01	0.26	0.00	3.00
30.00	0.02	0.01	0.26	0.00	3.00
30.25	0.02	0.01	0.26	0.00	3.00
30.50	0.03	0.02	0.40	0.00	3.00
30.75	0.02	0.01	0.27	0.00	3.00
31.00	0.02	0.01	0.27	0.00	3.00
31.25	0.02	0.01	0.27	0.00	3.00
31.50	0.03	0.02	0.41	0.00	3.00
31.75	0.02	0.01	0.28	0.00	3.00
32.00	0.02	0.01	0.28	0.00	3.00
32.25	0.02	0.01	0.28	0.00	3.00
32.50	0.02	0.01	0.28	0.00	3.00
32.75	0.03	0.02	0.43	0.00	3.00
33.00	0.02	0.01	0.29	0.00	3.00
33.25	0.02	0.01	0.29	0.00	3.00
33.50	0.02	0.01	0.29	0.00	3.00
33.75	0.03	0.02	0.44	0.00	3.00
34.00	0.02	0.01	0.29	0.00	3.00
34.25	0.02	0.01	0.30	0.00	3.00
34.50	0.02	0.01	0.29	0.00	3.00
34.75	0.02	0.01	0.30	0.00	3.00
35.00	0.03	0.02	0.45	0.00	3.00
35.25	0.02	0.01	0.30	0.00	3.00
35.50	0.02	0.01	0.30	0.00	3.00
35.75	0.02	0.01	0.30	0.00	3.00
36.00	0.02	0.01	0.31	0.00	3.00
36.25	0.03	0.02	0.47	0.00	3.00
36.50	0.02	0.01	0.31	0.00	3.00
36.75	0.02	0.01	0.31	0.00	3.00
37.00	0.02	0.01	0.31	0.00	3.00
37.25	0.03	0.02	0.48	0.00	3.00
37.50	0.02	0.01	0.31	0.00	3.00
37.75	0.02	0.01	0.32	0.00	3.00
38.00	0.02	0.01	0.31	0.00	3.00
38.25	0.02	0.01	0.32	0.00	3.00
38.50	0.03	0.02	0.48	0.00	3.00
38.75	0.02	0.01	0.33	0.00	3.00
39.00	0.02	0.01	0.32	0.00	3.00

Rev. 1

EBASCO SERVICES INCORPORATED

BY WDP KYA DATE 5/13/90 5/15/90

TIME HOURS	INCR RAINFALL INCHES	INCR RUNOFF INCHES	TOTAL DISCHARGE CFS	STORAGE AC-FT	WATER LEVEL FT MSL
39.25	0.02	0.02	0.33	0.00	3.00
39.50	0.03	0.02	0.49	0.00	3.00
39.75	0.02	0.02	0.33	0.00	3.00
40.00	0.02	0.02	0.33	0.00	3.00
40.25	0.02	0.02	0.33	0.00	3.00
40.50	0.02	0.02	0.33	0.00	3.00
40.75	0.03	0.02	0.51	0.00	3.00
41.00	0.02	0.02	0.33	0.00	3.00
41.25	0.02	0.02	0.34	0.00	3.00
41.50	0.02	0.02	0.33	0.00	3.00
41.75	0.03	0.02	0.52	0.00	3.00
42.00	0.02	0.02	0.33	0.00	3.00
42.25	0.02	0.02	0.35	0.00	3.00
42.50	0.02	0.02	0.33	0.00	3.00
42.75	0.02	0.02	0.35	0.00	3.00
43.00	0.03	0.02	0.51	0.00	3.00
43.25	0.02	0.02	0.35	0.00	3.00
43.50	0.02	0.02	0.34	0.00	3.00
43.75	0.02	0.02	0.35	0.00	3.00
44.00	0.03	0.02	0.52	0.00	3.00
44.25	0.02	0.02	0.35	0.00	3.00
44.50	0.02	0.02	0.35	0.00	3.00
44.75	0.02	0.02	0.36	0.00	3.00
45.00	0.02	0.02	0.35	0.00	3.00
45.25	0.03	0.02	0.54	0.00	3.01
45.50	0.02	0.02	0.34	0.00	3.00
45.75	0.02	0.02	0.37	0.00	3.00
46.00	0.02	0.02	0.34	0.00	3.00
46.25	0.02	0.02	0.37	0.00	3.00
46.50	0.03	0.02	0.53	0.00	3.00
46.75	0.02	0.02	0.37	0.00	3.00
47.00	0.02	0.02	0.35	0.00	3.00
47.25	0.02	0.02	0.38	0.00	3.00
47.50	0.03	0.02	0.53	0.00	3.00
47.75	0.02	0.02	0.38	0.00	3.00
48.00	0.02	0.02	0.35	0.00	3.00
48.25	0.03	0.03	0.57	0.00	3.01
48.50	0.02	0.02	0.34	0.00	3.00
48.75	0.03	0.03	0.59	0.00	3.01
49.00	0.02	0.02	0.33	0.00	3.00
49.25	0.03	0.03	0.61	-0.00	3.01
49.50	0.02	0.02	0.32	0.00	3.00
49.75	0.03	0.03	0.62	-0.00	3.01
50.00	0.02	0.02	0.32	0.00	3.00
50.25	0.03	0.03	0.63	-0.00	3.01
50.50	0.03	0.03	0.49	0.00	3.00
50.75	0.03	0.03	0.66	-0.00	3.01
51.00	0.03	0.03	0.48	0.00	3.00
51.25	0.03	0.03	0.68	-0.00	3.01
51.50	0.03	0.03	0.48	0.00	3.00
51.75	0.03	0.03	0.68	-0.00	3.01
52.00	0.04	0.03	0.65	0.00	3.00

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EBASCO SERVICES INCORPORATED

BY NRP DATE 5/13/90

CHKD. BY KCM DATE 5/15/90

SHEET 18 OF 36

OFS NO. 7918.017 DEPT. NO. 941

TIME HOURS	INCR RAINFALL INCHES	INCR RUNOFF INCHES	TOTAL DISCHARGE CFS	STORAGE AC-FT	WATER LEVEL FT MSL
52.25	0.04	0.04	0.96	-0.00	3.01
52.50	0.04	0.04	0.65	0.00	3.00
52.75	0.05	0.04	1.19	-0.00	3.01
53.00	0.04	0.04	0.65	0.00	3.00
53.25	0.05	0.04	1.20	-0.00	3.01
53.50	0.06	0.04	0.82	0.00	3.00
53.75	0.07	0.05	1.51	-0.01	3.02
54.00	0.05	0.04	0.83	0.00	3.00
54.25	0.07	0.05	1.53	-0.01	3.02
54.50	0.07	0.05	1.00	0.01	3.00
54.75	0.08	0.06	1.86	-0.01	3.02
55.00	0.07	0.05	1.01	0.01	3.00
55.25	0.08	0.06	1.88	-0.01	3.02
55.50	0.08	0.06	1.18	0.01	3.00
55.75	0.08	0.06	1.98	-0.01	3.02
56.00	0.09	0.07	1.36	0.01	3.00
56.25	0.09	0.07	2.35	-0.01	3.03
56.50	0.09	0.07	1.38	0.01	3.00
56.75	0.10	0.08	2.64	-0.01	3.03
57.00	0.10	0.08	1.56	0.01	3.00
57.25	0.11	0.09	3.04	-0.02	3.03
57.50	0.11	0.09	1.75	0.01	3.00
57.75	0.12	0.10	3.46	-0.02	3.03
58.00	0.12	0.11	1.94	0.01	3.00
58.25	0.13	0.12	3.90	-0.02	3.04
58.50	0.13	0.12	2.13	0.01	3.00
58.75	0.18	0.16	5.27	-0.03	3.05
59.00	0.18	0.16	2.87	0.02	3.00
59.25	0.28	0.25	8.86	-0.06	3.07
59.50	0.27	0.25	4.55	0.02	3.00
59.75	1.86	1.70	77.89	-0.79	3.33
60.00	1.85	1.73	31.96	0.17	3.00
60.25	0.41	0.39	59.91	-1.05	3.36
60.50	0.40	0.38	6.94	0.04	3.00
60.75	0.21	0.20	11.14	-0.13	3.10
61.00	0.21	0.20	3.68	0.02	3.00
61.25	0.15	0.15	6.20	-0.06	3.06
61.50	0.15	0.15	2.71	0.01	3.00
61.75	0.13	0.13	4.78	-0.04	3.05
62.00	0.12	0.12	2.14	0.01	3.00
62.25	0.10	0.09	3.40	-0.02	3.04
62.50	0.09	0.08	1.56	0.01	3.00
62.75	0.09	0.08	2.74	-0.02	3.03
63.00	0.08	0.07	1.36	0.01	3.00
63.25	0.09	0.08	2.64	-0.01	3.03
63.50	0.08	0.07	1.36	0.01	3.00
63.75	0.09	0.08	2.64	-0.01	3.03
64.00	0.08	0.07	1.36	0.01	3.00
64.25	0.04	0.04	1.46	-0.01	3.02
64.50	0.06	0.05	0.98	0.01	3.00
64.75	0.05	0.05	1.56	-0.01	3.02
65.00	0.04	0.04	0.78	0.00	3.00

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EBASCO SERVICES INCORPORATED

BY NDP DATE 5/13/90

CHKD. BY KM DATE 5/15/90

SHEET 19 OF 36

OFS NO. 7918.017 DEPT. NO. 941

CLIENT FPL

PROJECT PFLR

SUBJECT Drainage Basin I

TIME HOURS	INCR RAINFALL INCHES	INCR RUNOFF INCHES	TOTAL DISCHARGE CFS	STORAGE AC-FT	WATER LEVEL FT MSL
65.25	0.06	0.05	1.48	-0.01	3.02
65.50	0.04	0.04	0.78	0.00	3.00
65.75	0.05	0.05	1.48	-0.01	3.02
66.00	0.04	0.04	0.78	0.00	3.00
66.25	0.06	0.05	1.48	-0.01	3.02
66.50	0.04	0.04	0.78	0.00	3.00
66.75	0.06	0.05	1.48	-0.01	3.02
67.00	0.04	0.04	0.78	0.00	3.00
67.25	0.06	0.05	1.48	-0.01	3.02
67.50	0.04	0.04	0.78	0.00	3.00
67.75	0.06	0.05	1.48	-0.01	3.02
68.00	0.04	0.04	0.78	0.00	3.00
68.25	0.03	0.03	0.93	-0.00	3.01
68.50	0.03	0.03	0.59	0.00	3.00
68.75	0.03	0.03	0.86	-0.00	3.01
69.00	0.03	0.03	0.59	0.00	3.00
69.25	0.03	0.03	0.86	-0.00	3.01
69.50	0.03	0.03	0.59	0.00	3.00
69.75	0.03	0.03	0.86	-0.00	3.01
70.00	0.03	0.03	0.59	0.00	3.00
70.25	0.03	0.03	0.86	-0.00	3.01
70.50	0.03	0.03	0.59	0.00	3.00
70.75	0.03	0.03	0.86	-0.00	3.01
71.00	0.03	0.03	0.59	0.00	3.00
71.25	0.03	0.03	0.86	-0.00	3.01
71.50	0.03	0.03	0.59	0.00	3.00
71.75	0.03	0.03	0.86	-0.00	3.01
72.00	0.03	0.03	0.59	0.00	3.00

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EBASCO SERVICES INCORPORATED

BY HRF DATE 5/14/90

CHKD. BY KM DATE 5/15/90

SHEET 20 OF 36

OFS NO. 7918.017 DEPT. NO. 941

CLIENT FPL

PROJECT PFLR

SUBJECT Drainage Basin I

Resultant Changes

Perviousness

Pervious area = 3.313 (Old from p. 1) + 1.509 (filled intake canal) + 0.658 (partially filled stub canal) = 5.480 acres ⇒ 85%

Impervious = 0.957 acres (p. 1) ⇒ 15%

6.437 acres total

Retention / Detention Criteria

Wet Detention =

1" or 2.5" * .15 = .38", whichever is greater

= 1"

Dry detention = .75 * wet detention

= 0.75"

However, we are detaining entire storm. Will need to route the outflow from our device to stub canal outlet

Rev. 1

EBASCO SERVICES INCORPORATED

BY NAF DATE 5/13/90

CHKD. BY KM DATE 5/15/90

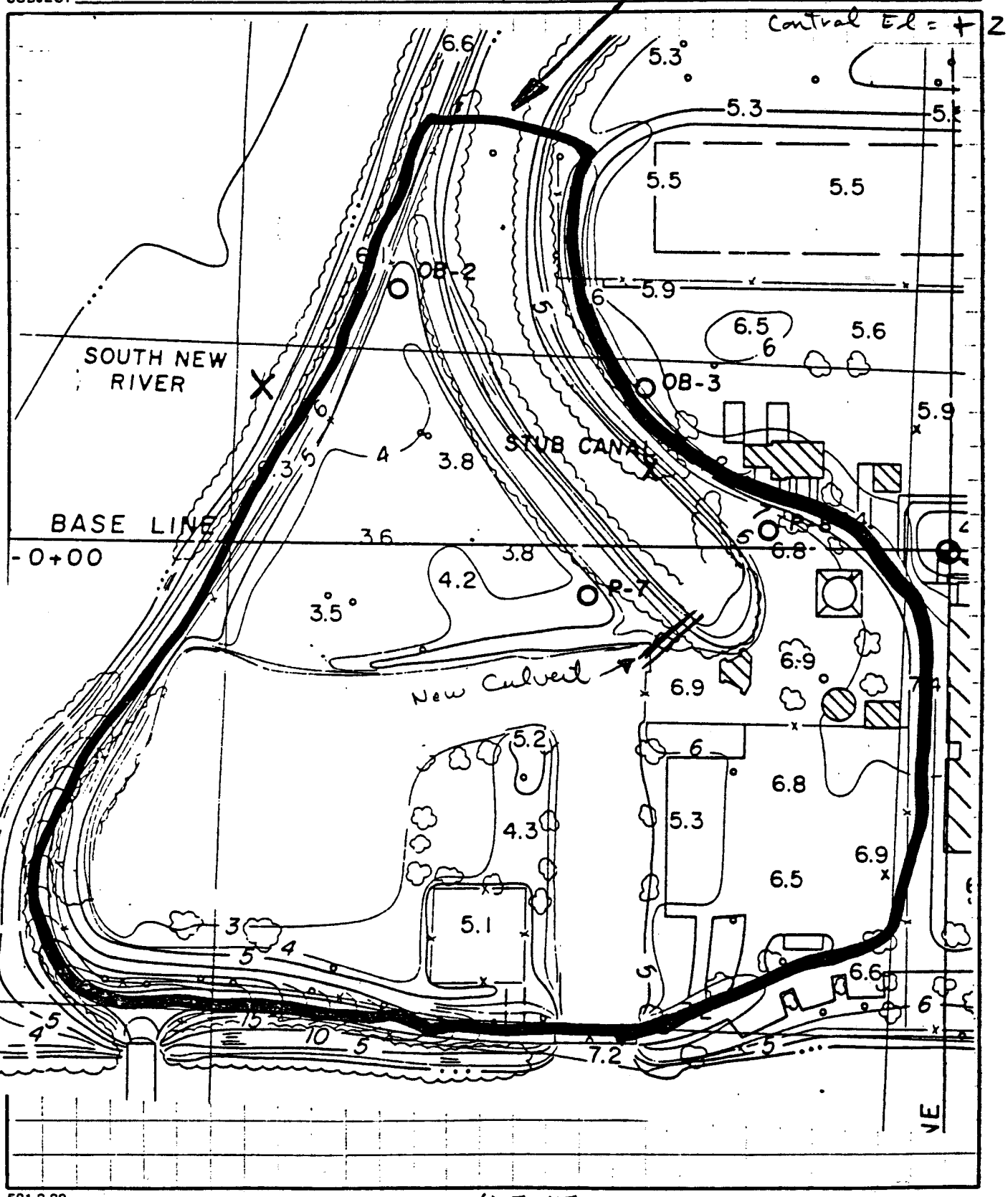
SHEET 21 OF 36

OFS NO. 7918.017 DEPT. NO. 941

CLIENT FPL

PROJECT PFLR Drainage Basin I

SUBJECT 1" = 100'



581 2-88

10.7-117

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EBASCO SERVICES INCORPORATED

BY HAP DATE 5/13/90 SHEET 22 OF 36

CHKD. BY KM DATE 5/15/90 OFS NO. 7918.017 DEPT. NO. 941

CLIENT FPL

PROJECT PFLR

SUBJECT Drainage Basin I

Based on pages 1, 5, 11 and 20, after repowering Area I stage / volume curve is as follows

(add .658 acres from p 11 to totals from page 1)

Stage	Area	Storage Volume
El +3	2.167	0
4	3.078	2.6225 Acft
5	3.687	3.3825
6.5	6.437	7.593

Discharge Curve

assume culvert is significantly larger than the weir, assume weir is triangular with central elevation at +2 ft MSL to make detention dry per Engineering Fluid Mechanics, Olson p 381 discharge curve then, for 90° V-notch is $Q = 2.5 H^{2.5}$

where H = 0 at el = 2

Thus, the following changes to ELOOD1.BAS (existing program for Basin 1) are required:

1. Control El = 2
2. Area contributing runoff to storage = 6.437 Ac
3. Area with direct discharge = 0
4. change stage curve per above
5. change discharge formula per above

Rev. 1

EBASCO SERVICES INCORPORATED

BY NAP DATE 5/13/90

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SHEET 23 OF 36

OFS NO. 7918.017 DEPT. NO. 941

CLIENT FPL

PROJECT PFLR

SUBJECT Drainage Basin I

Resultant Program called FLOOD1R.BAS
see pp 24 and 25 for listing

Results are shown on pages 26 - 31

Note: peak flow occurs at hour 60 at 6.01 cfs, down from 78 cfs for existing

Remainder of sub-basins will be done in separate calcs.

Same flood-routing program will be used except adjusted for varying sub-basin characteristics

Summary Basin I

Existing	After Repowering	
78	6.01	Peak flow cfs
3.36	3.42	Peak water elevation ft-MSL

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EBASCO SERVICES INCORPORATED

BY NAP DATE 5/13/90 SHEET 24 OF 36

CHKD. BY EM DATE 5/15/90 OFS NO. 7918.017 DEPT. NO. 941

CLIENT FPL

PROJECT PFLR

SUBJECT Drainage Basin I

```
REM! SAVE FLOOD1R.BAS
REM! C=CUMULATIVE RAINFALL
REM! R=CUMULATIVE RUNOFF
REM! T=24 HOUR RAINFALL
REM! X=INCREMENTAL RUNOFF
REM! Z=TIME IN HOURS
REM! D=DISCHARGE
REM! A=INCREMENTAL RAINFALL
REM! B=INCREMENTAL RUNOFF
REM! E=INCREMENTAL STORAGE
REM! L=WATER LEVEL
      WIDTH "LPT1:", 132
      OPTION BASE 1
      DIM C(289), R(289), X(289), D(289), A(289), B(289), E(289), L(289), El(4), St(4), Sd(289)
REM!  U=NUMBER OF STORAGE ELEVATION/VOLUME POINTS
REM!  El and St = ARE ELEVATIONS AND CORRESPONDING VOLUMES WITHIN STORAGE
REM!  Rs=RUNOFF TO THE STORAGE AREA
REM!  Rd=RUNOFF TO DIRECT DISCHARGE
REM!  Rf=FLOOD-ROUTED RUNOFF
REM!  Ast= AREA RECEIVING RUNOFF WHICH GOES TO STORAGE
REM!  Cel=CONTROL ELEVATION OF STORAGE AREA
REM!  Ad= AREA RECEIVING RUNOFF WHICH GOES DIRECT TO DISCHARGE
REM!  Sr=1st GUESS AT STORAGE VALUE
REM!  Es=1st GUESS AT STORAGE WATER LEVEL
REM!  Sd= DISCHARGE FROM STORAGE AREA
      Cel = 2
      U = 4
      Ast = 6.437
      Ad = 0
      S = 3.16
      T = 11
      DATA .000,.002,.003,.005,.006,.008,.009,.011,.012,.014,.015,.017,.018,.020,.021,.023,.024
      DATA .026,.027,.029,.030,.032,.033,.035,.036,.038,.040,.041,.043,.044,.046,.047,.049,.050
      DATA .052,.053,.055,.056,.058,.059,.061,.062,.064,.065,.067,.068,.070,.071,.073,.075,.076
      DATA .078,.079,.081,.082,.084,.085,.087,.088,.090,.091,.093,.094,.096,.097,.099,.100,.102
      DATA .103,.105,.106,.108,.110,.111,.113,.114,.116,.117,.119,.120,.122,.123,.125,.126,.128
      DATA .129,.131,.132,.134,.135,.137,.138,.140,.141,.143,.144,.146,.148,.150,.153,.155,.157
      DATA .159,.162,.164,.166,.168,.170,.173,.175,.177,.179,.182,.184,.186,.188,.190,.193,.195
      DATA .197,.199,.201,.204,.206,.208,.210,.213,.215,.217,.219,.221,.224,.226,.228,.230,.233
      DATA .235,.237,.239,.241,.244,.246,.248,.250,.252,.255,.257,.259,.261,.264,.266,.268,.270
      DATA .272,.275,.277,.279,.281,.284,.286,.288,.290,.292,.295,.297,.299,.301,.304,.306,.308
      DATA .310,.312,.315,.317,.319,.321,.324,.326,.328,.330,.332,.335,.337,.339,.341,.343,.346
      DATA .348,.350,.352,.355,.357,.359,.362,.364,.367,.369,.372,.374,.377,.379,.382,.385,.388
      DATA .391,.394,.397,.400,.404,.408,.412,.417,.421,.426,.431,.437,.442,.448,.454,.461,.467
      DATA .474,.481,.488,.496,.504,.512,.521,.530,.540,.550,.561,.572,.584,.596,.612,.628,.653
      DATA .678,.847,1.015,1.052,1.088,1.107,1.126,1.140,1.154,1.166,1.177,1.186,1.194,1.202,1.209,1.217,1.224
      DATA 1.232,1.239,1.243,1.248,1.253,1.257,1.262,1.266,1.271,1.275,1.280,1.284,1.289,1.293,1.298,1.302,1.307
      DATA 1.311,1.314,1.317,1.320,1.323,1.326,1.329,1.332,1.335,1.338,1.341,1.344,1.347,1.350,1.353,1.356,1.359
      FOR I = 1 TO 289
      READ Q
      C(I) = Q * T
      NEXT I
      DATA 3,0,4,2.6225,5,3.3825,6.5,7.593
      FOR K = 1 TO U
      READ El(K), St(K)
      NEXT K
      E(1) = 0
      L(1) = 3
      Z = 0
      LPRINT "    TIME        INCR          INCR          TOTAL        STORAGE       WATER          DISCHARGE"
      LPRINT "    HOURS       RAINFALL      RUNOFF        DISCHARGE    AC-FT         LEVEL          FROM"
      LPRINT "                INCHES        INCHES        CFS                        FT MSL         STORAGE-AC-FT"
      LPRINT "
      FOR I = 2 TO 289
      Z = Z + 1 / 4
      R(I) = (C(I) - .2 * S) * (C(I) - .2 * S) / (C(I) + .8 * S)
```

Rev. 1

EBASCO SERVICES INCORPORATED

BY DOF DATE 5/13/90
CHKD. BY FM DATE 5/15/90
CLIENT FPL
PROJECT PFLR
SUBJECT Drainage Basin H
OFS NO. 7918.017 DEPT. NO. 941
SHEET 25 OF 36

Calc. 58

581/8-81

10.7-121

```
        FOR K = 1 TO U
        READ El(K), St(K)
        NEXT K
        E(1) = 0
        L(1) = 3
        Z = 0
        LPRINT "    TIME        INCR          INCR        TOTAL        STORAGE      WATER        DISCHARGE      "
        LPRINT "    HOURS       RAINFALL      RUNOFF      DISCHARGE    AC-FT        LEVEL        FROM"
        LPRINT "                INCHES        INCHES      CFS                       FT MSL       STORAGE-AC-FT"
        LPRINT " "
        FOR I = 2 TO 289
        Z = Z + 1 / 4
        R(I) = (C(I) - .2 * S) * (C(I) - .2 * S) / (C(I) + .8 * S)
        IF R(I) > C(I) THEN R(I) = C(I)
        A(I) = C(I) - C(I - 1)
        B(I) = R(I) - R(I - 1)
        IF B(I) < 0 THEN B(I) = 0
        Rs = B(I) * Ast / 12
        Rd = B(I) * Ad / 12
        Sr = Rs + E(I - 1) - Sd(I - 1)
10      FOR J = 2 TO U
        IF Sr < St(J) THEN 20
        GOTO 10
        NEXT J
20      Es = El(J - 1) + ((Sr - St(J - 1)) / (St(J) - St(J - 1))) * (El(J) - El(J - 1))
        H = ((Es + L(I - 1)) / 2) - Cel
        IF H < 0 THEN H = 0
        Rf = 2.5 * (H ^ 2.5)
        Sd(I) = Rf * 60 * 15 / 43560
        Rs = Rs - Sd(I)
        E(I) = Rs
        Sr = Rs + E(I - 1)
30      FOR J = 2 TO U
        IF Sr < St(J) THEN 40
        GOTO 30
        NEXT J
40      L(I) = H + Cel
50      D(I) = Rd * (43560 / (15 * 60)) + Rf
        ZZZ = ZZZ + 1
        IF ZZZ <> 53 THEN 70
        LPRINT
        LPRINT
        LPRINT
        LPRINT
        LPRINT
        LPRINT
        LPRINT
        LPRINT
        LPRINT
        LPRINT
        LPRINT "    TIME        INCR          INCR        TOTAL        STORAGE      WATER        DISCHARGE      "
        LPRINT "    HOURS       RAINFALL      RUNOFF      DISCHARGE    AC-FT        LEVEL        FROM"
        LPRINT "                INCHES        INCHES      CFS                       FT MSL       STORAGE-AC-FT"
        LPRINT " "
        ZZZ = 1
70      LPRINT USING "   ###.##        ##.##         ##.##        ##.##        ##.##        ##.##         ##.##         ##.##"; Z, A(I),
(I), E(I), L(I), Sd(I)
        NEXT I
        END
```

Rev. 1

EBASCO SERVICES INCORPORATED

BY NRP DATE 5/13/90

CHKD BY KM DATE 5/15/90

OFS NO. 7918.017 DEPT. NO. 941

TIME HOURS	INCR RAINFALL INCHES	INCR RUNOFF INCHES	TOTAL DISCHARGE CFS	STORAGE AC-FT	WATER LEVEL FT MSL
0.25	0.02	0.02	2.51	-0.04	3.00
0.50	0.01	0.01	2.41	-0.04	2.98
0.75	0.02	0.02	2.36	-0.04	2.98
1.00	0.01	0.01	2.34	-0.04	2.97
1.25	0.02	0.02	2.33	-0.04	2.97
1.50	0.01	0.01	2.32	-0.04	2.97
1.75	0.02	0.00	2.31	-0.05	2.97
2.00	0.01	0.00	2.29	-0.05	2.97
2.25	0.02	0.00	2.29	-0.05	2.96
2.50	0.01	0.00	2.28	-0.05	2.96
2.75	0.02	0.00	2.28	-0.05	2.96
3.00	0.01	0.00	2.28	-0.05	2.96
3.25	0.02	0.00	2.28	-0.05	2.96
3.50	0.01	0.00	2.28	-0.05	2.96
3.75	0.02	0.00	2.28	-0.05	2.96
4.00	0.01	0.00	2.28	-0.05	2.96
4.25	0.02	0.00	2.28	-0.05	2.96
4.50	0.01	0.00	2.28	-0.05	2.96
4.75	0.02	0.00	2.28	-0.05	2.96
5.00	0.01	0.00	2.28	-0.05	2.96
5.25	0.02	0.00	2.28	-0.05	2.96
5.50	0.01	0.00	2.28	-0.05	2.96
5.75	0.02	0.00	2.28	-0.05	2.96
6.00	0.01	0.00	2.28	-0.05	2.96
6.25	0.02	0.00	2.28	-0.05	2.96
6.50	0.02	0.00	2.28	-0.05	2.96
6.75	0.01	0.00	2.28	-0.05	2.96
7.00	0.02	0.00	2.28	-0.05	2.96
7.25	0.01	0.00	2.28	-0.05	2.96
7.50	0.02	0.00	2.28	-0.05	2.96
7.75	0.01	0.00	2.28	-0.05	2.96
8.00	0.02	0.00	2.28	-0.05	2.96
8.25	0.01	0.00	2.28	-0.05	2.96
8.50	0.02	0.00	2.28	-0.05	2.96
8.75	0.01	0.00	2.28	-0.05	2.96
9.00	0.02	0.00	2.28	-0.05	2.96
9.25	0.01	0.00	2.28	-0.05	2.96
9.50	0.02	0.00	2.28	-0.05	2.96
9.75	0.01	0.00	2.28	-0.05	2.96
10.00	0.02	0.00	2.28	-0.05	2.96
10.25	0.01	0.00	2.28	-0.05	2.96
10.50	0.02	0.00	2.28	-0.05	2.96
10.75	0.01	0.00	2.28	-0.05	2.96
11.00	0.02	0.00	2.28	-0.05	2.96
11.25	0.01	0.00	2.28	-0.05	2.96
11.50	0.02	0.00	2.28	-0.05	2.96
11.75	0.01	0.00	2.28	-0.05	2.96
12.00	0.02	0.00	2.28	-0.05	2.96
12.25	0.02	0.00	2.29	-0.05	2.96
12.50	0.01	0.00	2.29	-0.05	2.96
12.75	0.02	0.00	2.29	-0.05	2.96
13.00	0.01	0.00	2.29	-0.05	2.96

Rev. 1

EBASCO SERVICES INCORPORATED

BY HAP DATE 5/13/90

CHKD BY KM DATE 5/15/90

JOB NO

SHEET 27 OF 36

DEPT. NO

TIME HOURS	INCR RAINFALL INCHES	INCR RUNOFF INCHES	TOTAL DISCHARGE CFS	STORAGE AC-FT	WATER LEVEL FT MSL
13.25	0.02	0.00	2.29	-0.05	2.96
13.50	0.01	0.00	2.29	-0.05	2.96
13.75	0.02	0.00	2.29	-0.05	2.96
14.00	0.01	0.00	2.29	-0.05	2.97
14.25	0.02	0.00	2.29	-0.05	2.97
14.50	0.01	0.00	2.29	-0.05	2.97
14.75	0.02	0.00	2.29	-0.05	2.97
15.00	0.01	0.00	2.29	-0.05	2.97
15.25	0.02	0.00	2.29	-0.04	2.97
15.50	0.01	0.00	2.29	-0.05	2.97
15.75	0.02	0.00	2.29	-0.04	2.97
16.00	0.01	0.00	2.29	-0.05	2.97
16.25	0.02	0.01	2.29	-0.04	2.97
16.50	0.01	0.00	2.29	-0.05	2.97
16.75	0.02	0.01	2.29	-0.04	2.97
17.00	0.01	0.00	2.29	-0.05	2.97
17.25	0.02	0.01	2.29	-0.04	2.97
17.50	0.01	0.00	2.29	-0.05	2.97
17.75	0.02	0.01	2.29	-0.04	2.97
18.00	0.02	0.01	2.29	-0.04	2.97
18.25	0.01	0.00	2.29	-0.05	2.97
18.50	0.02	0.01	2.29	-0.04	2.97
18.75	0.01	0.00	2.29	-0.05	2.97
19.00	0.02	0.01	2.29	-0.04	2.97
19.25	0.01	0.00	2.29	-0.05	2.97
19.50	0.02	0.01	2.29	-0.04	2.97
19.75	0.01	0.00	2.29	-0.05	2.97
20.00	0.02	0.01	2.29	-0.04	2.97
20.25	0.01	0.00	2.29	-0.05	2.97
20.50	0.02	0.01	2.29	-0.04	2.97
20.75	0.01	0.00	2.29	-0.05	2.97
21.00	0.02	0.01	2.29	-0.04	2.97
21.25	0.01	0.00	2.29	-0.05	2.97
21.50	0.02	0.01	2.29	-0.04	2.97
21.75	0.01	0.00	2.29	-0.05	2.97
22.00	0.02	0.01	2.29	-0.04	2.97
22.25	0.01	0.00	2.29	-0.05	2.97
22.50	0.02	0.01	2.30	-0.04	2.97
22.75	0.01	0.00	2.30	-0.05	2.97
23.00	0.02	0.01	2.30	-0.04	2.97
23.25	0.01	0.00	2.30	-0.05	2.97
23.50	0.02	0.01	2.30	-0.04	2.97
23.75	0.01	0.00	2.30	-0.05	2.97
24.00	0.02	0.01	2.30	-0.04	2.97
24.25	0.02	0.01	2.30	-0.04	2.97
24.50	0.02	0.01	2.30	-0.04	2.97
24.75	0.03	0.01	2.30	-0.04	2.97
25.00	0.02	0.01	2.31	-0.04	2.97
25.25	0.02	0.01	2.30	-0.04	2.97
25.50	0.02	0.01	2.30	-0.04	2.97
25.75	0.03	0.02	2.31	-0.04	2.97
26.00	0.02	0.01	2.31	-0.04	2.97

Rev. 1

EBASCO SERVICES INCORPORATED

BY HAP KM DATE 5/13/90 5/15/90

SHEET 28 DEPT OF 36

TIME HOURS	INCR RAINFALL INCHES	INCR RUNOFF INCHES	TOTAL DISCHARGE CFS	STORAGE AC-FT	WATER LEVEL FT MSL
26.25	0.02	0.01	2.31	-0.04	2.97
26.50	0.02	0.01	2.31	-0.04	2.97
26.75	0.02	0.01	2.30	-0.04	2.97
27.00	0.03	0.02	2.31	-0.04	2.97
27.25	0.02	0.01	2.31	-0.04	2.97
27.50	0.02	0.01	2.31	-0.04	2.97
27.75	0.02	0.01	2.31	-0.04	2.97
28.00	0.03	0.02	2.31	-0.04	2.97
28.25	0.02	0.01	2.31	-0.04	2.97
28.50	0.02	0.01	2.31	-0.04	2.97
28.75	0.02	0.01	2.31	-0.04	2.97
29.00	0.02	0.01	2.31	-0.04	2.97
29.25	0.03	0.02	2.31	-0.04	2.97
29.50	0.02	0.01	2.31	-0.04	2.97
29.75	0.02	0.01	2.31	-0.04	2.97
30.00	0.02	0.01	2.31	-0.04	2.97
30.25	0.02	0.01	2.31	-0.04	2.97
30.50	0.03	0.02	2.31	-0.04	2.97
30.75	0.02	0.01	2.31	-0.04	2.97
31.00	0.02	0.01	2.31	-0.04	2.97
31.25	0.02	0.01	2.31	-0.04	2.97
31.50	0.03	0.02	2.31	-0.04	2.97
31.75	0.02	0.01	2.32	-0.04	2.97
32.00	0.02	0.01	2.31	-0.04	2.97
32.25	0.02	0.01	2.31	-0.04	2.97
32.50	0.02	0.01	2.31	-0.04	2.97
32.75	0.03	0.02	2.31	-0.04	2.97
33.00	0.02	0.01	2.32	-0.04	2.97
33.25	0.02	0.01	2.31	-0.04	2.97
33.50	0.02	0.01	2.31	-0.04	2.97
33.75	0.03	0.02	2.32	-0.04	2.97
34.00	0.02	0.01	2.32	-0.04	2.97
34.25	0.02	0.01	2.31	-0.04	2.97
34.50	0.02	0.01	2.31	-0.04	2.97
34.75	0.02	0.01	2.31	-0.04	2.97
35.00	0.03	0.02	2.32	-0.04	2.97
35.25	0.02	0.01	2.32	-0.04	2.97
35.50	0.02	0.01	2.32	-0.04	2.97
35.75	0.02	0.01	2.31	-0.04	2.97
36.00	0.02	0.01	2.31	-0.04	2.97
36.25	0.03	0.02	2.32	-0.04	2.97
36.50	0.02	0.01	2.32	-0.04	2.97
36.75	0.02	0.01	2.32	-0.04	2.97
37.00	0.02	0.01	2.31	-0.04	2.97
37.25	0.03	0.02	2.32	-0.04	2.97
37.50	0.02	0.01	2.32	-0.04	2.97
37.75	0.02	0.01	2.32	-0.04	2.97
38.00	0.02	0.01	2.32	-0.04	2.97
38.25	0.02	0.01	2.31	-0.04	2.97
38.50	0.03	0.02	2.32	-0.04	2.97
38.75	0.02	0.01	2.32	-0.04	2.97
39.00	0.02	0.01	2.32	-0.04	2.97

Rev. 1

EBASCO SERVICES INCORPORATED

BY HAP KM DATE 5/13/90 5/15/90

TIME HOURS	INCR RAINFALL INCHES	INCR RUNOFF INCHES	TOTAL DISCHARGE CFS	STORAGE AC-FT	WATER LEVEL FT MSL
39.25	0.02	0.02	2.32	-0.04	2.97
39.50	0.03	0.02	2.32	-0.04	2.97
39.75	0.02	0.02	2.32	-0.04	2.97
40.00	0.02	0.02	2.32	-0.04	2.97
40.25	0.02	0.02	2.32	-0.04	2.97
40.50	0.02	0.02	2.32	-0.04	2.97
40.75	0.03	0.02	2.32	-0.04	2.97
41.00	0.02	0.02	2.32	-0.04	2.97
41.25	0.02	0.02	2.32	-0.04	2.97
41.50	0.02	0.02	2.32	-0.04	2.97
41.75	0.03	0.02	2.32	-0.04	2.97
42.00	0.02	0.02	2.32	-0.04	2.97
42.25	0.02	0.02	2.32	-0.04	2.97
42.50	0.02	0.02	2.32	-0.04	2.97
42.75	0.02	0.02	2.32	-0.04	2.97
43.00	0.03	0.02	2.32	-0.04	2.97
43.25	0.02	0.02	2.32	-0.04	2.97
43.50	0.02	0.02	2.32	-0.04	2.97
43.75	0.02	0.02	2.32	-0.04	2.97
44.00	0.03	0.02	2.32	-0.04	2.97
44.25	0.02	0.02	2.32	-0.04	2.97
44.50	0.02	0.02	2.32	-0.04	2.97
44.75	0.02	0.02	2.32	-0.04	2.97
45.00	0.02	0.02	2.32	-0.04	2.97
45.25	0.03	0.02	2.32	-0.03	2.97
45.50	0.02	0.02	2.32	-0.04	2.97
45.75	0.02	0.02	2.32	-0.04	2.97
46.00	0.02	0.02	2.32	-0.04	2.97
46.25	0.02	0.02	2.32	-0.04	2.97
46.50	0.03	0.02	2.32	-0.03	2.97
46.75	0.02	0.02	2.33	-0.04	2.97
47.00	0.02	0.02	2.32	-0.04	2.97
47.25	0.02	0.02	2.32	-0.04	2.97
47.50	0.03	0.02	2.32	-0.03	2.97
47.75	0.02	0.02	2.33	-0.04	2.97
48.00	0.02	0.02	2.32	-0.04	2.97
48.25	0.03	0.03	2.33	-0.03	2.97
48.50	0.02	0.02	2.33	-0.04	2.97
48.75	0.03	0.03	2.33	-0.03	2.97
49.00	0.02	0.02	2.33	-0.04	2.97
49.25	0.03	0.03	2.33	-0.03	2.97
49.50	0.02	0.02	2.33	-0.04	2.97
49.75	0.03	0.03	2.33	-0.03	2.97
50.00	0.02	0.02	2.33	-0.04	2.97
50.25	0.03	0.03	2.33	-0.03	2.97
50.50	0.03	0.03	2.33	-0.03	2.97
50.75	0.03	0.03	2.34	-0.03	2.97
51.00	0.03	0.03	2.34	-0.03	2.97
51.25	0.03	0.03	2.34	-0.03	2.97
51.50	0.03	0.03	2.34	-0.03	2.97
51.75	0.03	0.03	2.34	-0.03	2.97
52.00	0.04	0.03	2.34	-0.03	2.97

Rev. 1

EBASCO SERVICES INCORPORATED

BY NAP DATE 5/13/90

CHKD BY KM DATE 5/15/90

TIME HOURS	INCR RAINFALL INCHES	INCR RUNOFF INCHES	TOTAL DISCHARGE CFS	STORAGE AC-FT	WATER LEVEL FT MSL
52.25	0.04	0.04	2.35	-0.03	2.98
52.50	0.04	0.04	2.36	-0.03	2.98
52.75	0.05	0.04	2.36	-0.03	2.98
53.00	0.04	0.04	2.37	-0.03	2.98
53.25	0.05	0.04	2.37	-0.03	2.98
53.50	0.06	0.04	2.38	-0.03	2.98
53.75	0.07	0.05	2.38	-0.02	2.98
54.00	0.05	0.04	2.39	-0.03	2.98
54.25	0.07	0.05	2.39	-0.02	2.98
54.50	0.07	0.05	2.40	-0.02	2.98
54.75	0.08	0.06	2.41	-0.02	2.98
55.00	0.07	0.05	2.41	-0.02	2.99
55.25	0.08	0.06	2.41	-0.02	2.99
55.50	0.08	0.06	2.42	-0.02	2.99
55.75	0.08	0.06	2.42	-0.02	2.99
56.00	0.09	0.07	2.43	-0.01	2.99
56.25	0.09	0.07	2.44	-0.01	2.99
56.50	0.09	0.07	2.45	-0.01	2.99
56.75	0.10	0.08	2.45	-0.01	2.99
57.00	0.10	0.08	2.46	-0.01	2.99
57.25	0.11	0.09	2.48	-0.00	3.00
57.50	0.11	0.09	2.49	-0.00	3.00
57.75	0.12	0.10	2.50	0.00	3.00
58.00	0.12	0.11	2.51	0.00	3.00
58.25	0.13	0.12	2.52	0.01	3.00
58.50	0.13	0.12	2.53	0.01	3.01
58.75	0.18	0.16	2.57	0.03	3.01
59.00	0.18	0.16	2.61	0.03	3.02
59.25	0.28	0.25	2.68	0.08	3.03
59.50	0.27	0.25	2.78	0.07	3.04
59.75	1.86	1.70	3.94	0.83	3.20
60.00	1.85	1.73	6.01	0.81	3.42
60.25	0.41	0.39	5.59	0.09	3.38
60.50	0.40	0.38	4.14	0.12	3.22
60.75	0.21	0.20	3.45	0.04	3.14
61.00	0.21	0.20	3.05	0.04	3.08
61.25	0.15	0.15	2.84	0.02	3.05
61.50	0.15	0.15	2.72	0.02	3.03
61.75	0.13	0.13	2.65	0.01	3.02
62.00	0.12	0.12	2.60	0.01	3.02
62.25	0.10	0.09	2.56	-0.00	3.01
62.50	0.09	0.08	2.52	-0.01	3.00
62.75	0.09	0.08	2.49	-0.01	3.00
63.00	0.08	0.07	2.47	-0.01	3.00
63.25	0.09	0.08	2.47	-0.01	2.99
63.50	0.08	0.07	2.46	-0.01	2.99
63.75	0.09	0.08	2.46	-0.01	2.99
64.00	0.08	0.07	2.46	-0.01	2.99
64.25	0.04	0.04	2.43	-0.03	2.99
64.50	0.06	0.05	2.41	-0.02	2.99
64.75	0.05	0.05	2.40	-0.02	2.98
65.00	0.04	0.04	2.40	-0.03	2.98

EBASCO SERVICES INCORPORATED

Rev. 1

BY HAP DATE 5/13/90

CHKD. BY KM DATE 5/15/90

SHEET 31 OF 36

OFS NO. 7918.017 DEPT. NO. 941

CLIENT FPL

PROJECT PFLR

SUBJECT Drainage Basin I

TIME HOURS	INCR RAINFALL INCHES	INCR RUNOFF INCHES	TOTAL DISCHARGE CFS	STORAGE AC-FT	WATER LEVEL FT MSL
65.25	0.06	0.05	2.39	-0.02	2.98
65.50	0.04	0.04	2.39	-0.03	2.98
65.75	0.05	0.05	2.39	-0.02	2.98
66.00	0.04	0.04	2.39	-0.03	2.98
66.25	0.06	0.05	2.39	-0.02	2.98
66.50	0.04	0.04	2.39	-0.03	2.98
66.75	0.06	0.05	2.39	-0.02	2.98
67.00	0.04	0.04	2.39	-0.03	2.98
67.25	0.06	0.05	2.39	-0.02	2.98
67.50	0.04	0.04	2.39	-0.03	2.98
67.75	0.06	0.05	2.39	-0.02	2.98
68.00	0.04	0.04	2.39	-0.03	2.98
68.25	0.03	0.03	2.38	-0.03	2.98
68.50	0.03	0.03	2.36	-0.03	2.98
68.75	0.03	0.03	2.36	-0.03	2.98
69.00	0.03	0.03	2.35	-0.03	2.98
69.25	0.03	0.03	2.35	-0.03	2.98
69.50	0.03	0.03	2.35	-0.03	2.98
69.75	0.03	0.03	2.35	-0.03	2.98
70.00	0.03	0.03	2.35	-0.03	2.98
70.25	0.03	0.03	2.35	-0.03	2.98
70.50	0.03	0.03	2.35	-0.03	2.98
70.75	0.03	0.03	2.35	-0.03	2.98
71.00	0.03	0.03	2.35	-0.03	2.98
71.25	0.03	0.03	2.35	-0.03	2.98
71.50	0.03	0.03	2.35	-0.03	2.98
71.75	0.03	0.03	2.35	-0.03	2.98
72.00	0.03	0.03	2.35	-0.03	2.98

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EBASCO SERVICES INCORPORATED

BY HAP DATE 5/14/90 SHEET 32 OF 36

CHKD. BY KM DATE 5/15/90 OFS NO. 7918.017 DEPT. NO. 941

CLIENT FPL

PROJECT PFLR

SUBJECT Drainage Basin I

Above flood routing works if

1) culvert from old intake canal area carries the 6.01 cfs at El 3.42, and

2) Remaining wet portion of stub canal handles the flow.

for 1 use CMP, pipe Culvert flowing full per Chart 11, page C-IV-20 of Manual (see p. 33)

start with 6 cfs & 0.42 feet of head (assume old intake area can back up to 3.84 and be OK)

from nomogram - for Q = 6 and

H = 0.4, and Length = 50 feet we get about 20 in diameter (for K_e = 0.25)

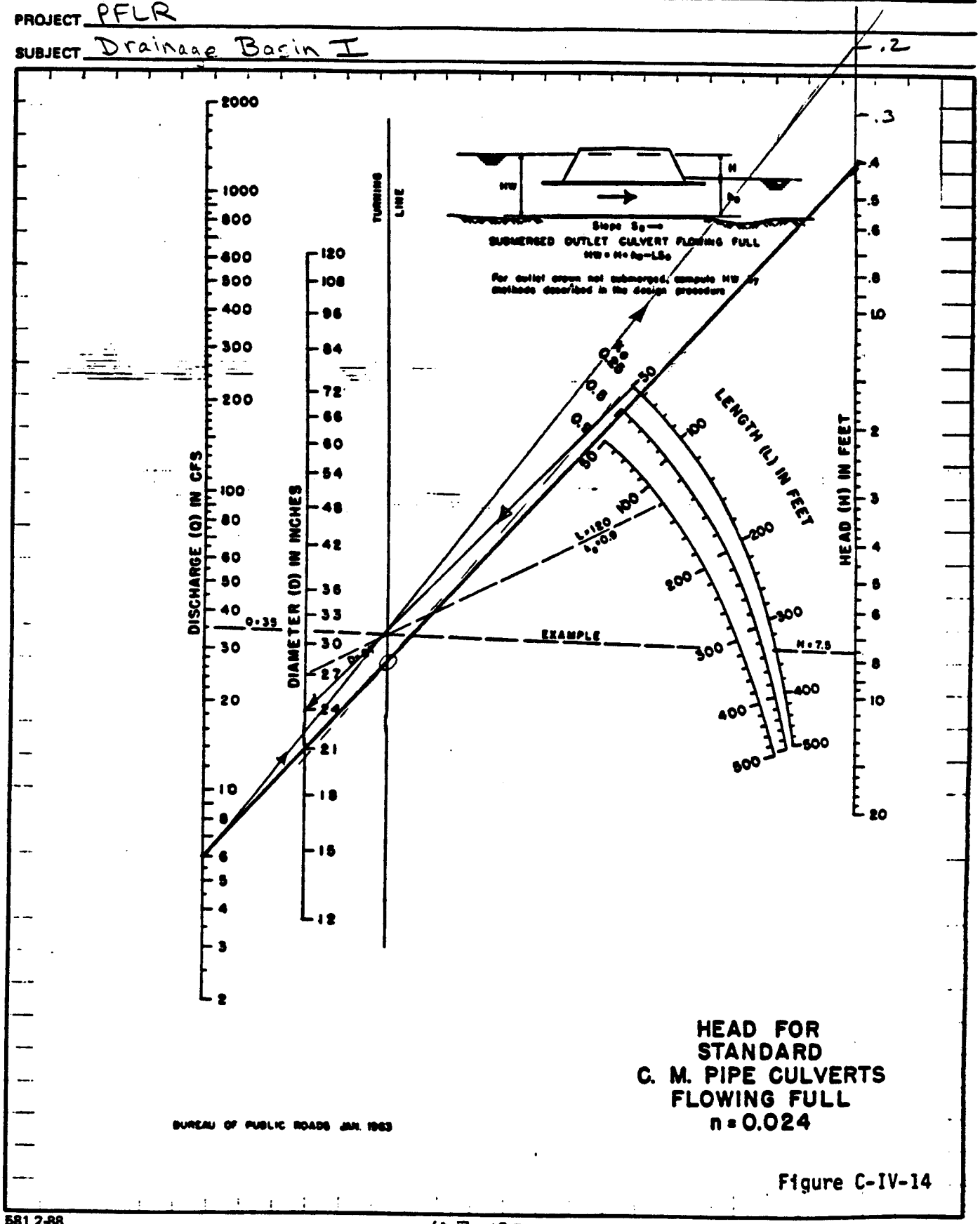
set diameter to 2 feet & set invert on each end to EL + 1

Assume a 24" ø, K_e = .25 & L = 50

Get H = 0.2 feet

OK

for Typical culvert details, see page 34



HEAD FOR STANDARD C. M. PIPE CULVERTS FLOWING FULL n = 0.024

Figure C-IV-14

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BY HAP DATE 5/14/90 SHEET 34 OF 36

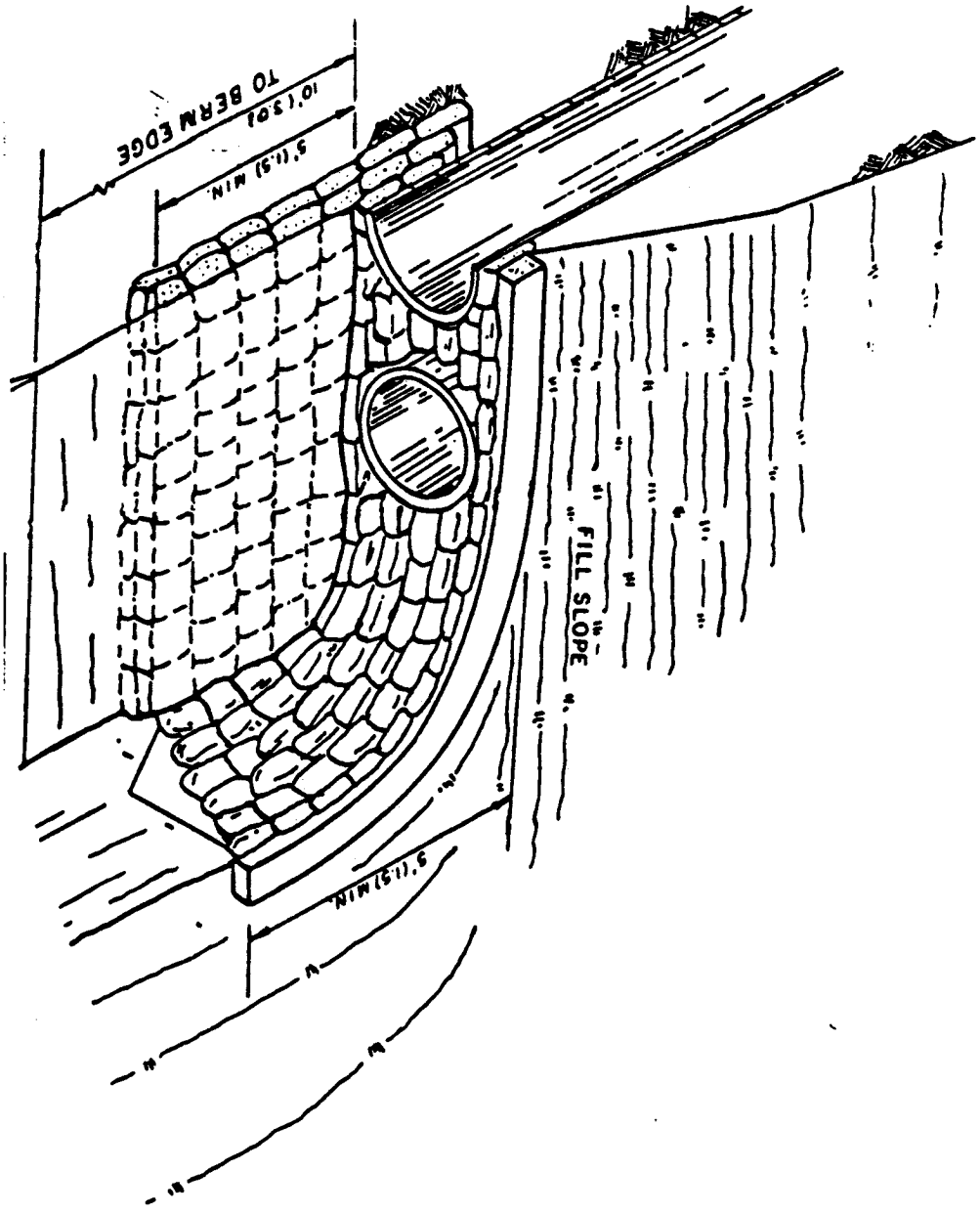
CHKD. BY KM DATE 5/15/90 OPS NO. 7918.017 DEPT. NO. 941

CLIENT FPL

PROJECT PFLR Typical Detail - Culvert Inlet

SUBJECT Based on Broward County Standards

ISOMETRIC



NOTE:
FIGURES IN PARENTHESIS ARE METERS.

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SHEET 35 OF 36

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CLIENT FPL

PROJECT PFLR

SUBJECT Drainage Basin I

for 2, need outlet of remaining stub canal to handle flow

is a 12" ϕ pipe at length = 29 feet

per nomograph page 36, use Ke = 0.5

cfs	head
6	3.7 feet

Since water level at downstream end is tidal, it will average 0 ft MSL giving a max water surface in stub canal of + 3.7. This would temporarily back everything up another 3.7 feet. However, we have ignored both storage in wet portion of stub canal, and its infiltration.

Even so, 3.7 + 0.2 + 1.42 = 5.32

at El 5.32, there would still be no outflow from the basin.

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BY NAP DATE 5/14/90

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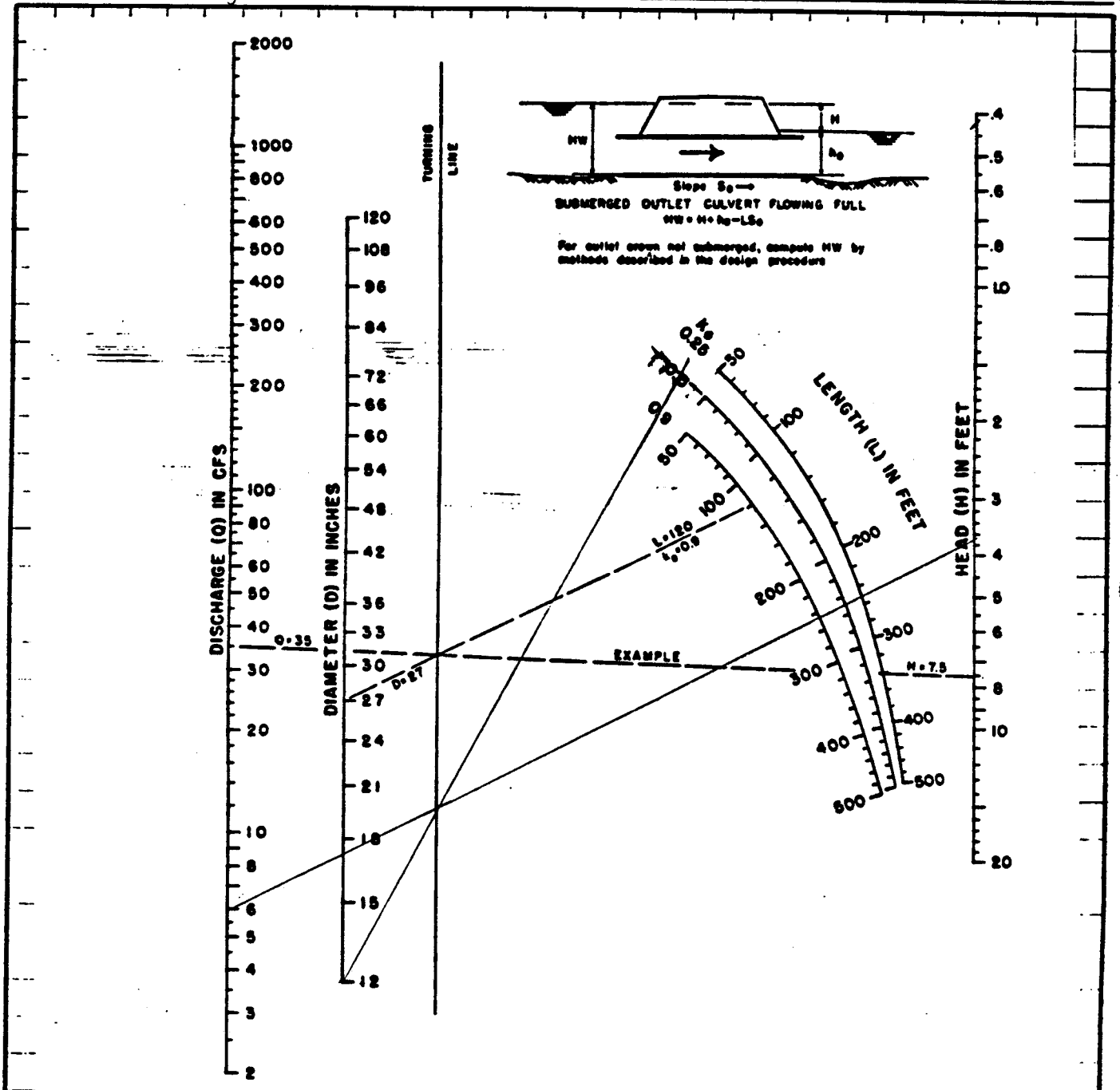
SHEET 36 OF 36

OFS NO. 7918.017 DEPT. NO. 941

CLIENT FPL

PROJECT FFLR

SUBJECT Drainage Basin I



HEAD FOR STANDARD C. M. PIPE CULVERTS FLOWING FULL n = 0.024

Figure C-IV-14

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Calc. 59

EBASCO SERVICES INCORPORATED

BY HAF DATE 5/15/90

CHKD. BY KM DATE 5/16/90

SHEET 1 OF 1

OFS NO. FL07918.017 DEPT. NO. 941

CLIENT FPL / PFLR

PROJECT Summary Sheet - Drainage Basin 2

SUBJECT

1. Existing Discharge - peak of 0 at water level of 5.18 feet

2. Post-Project

peak of 0 at water level of 5.24 feet

New Structures

None

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EBASCO SERVICES INCORPORATED

BY HAP DATE 5/15/90 SHEET 1 OF 23

CHKD. BY KM DATE 5/16/90 OFS NO. FLO 7918.017 DEPT. NO. 944

CLIENT FPL

PROJECT PFLR

SUBJECT Sub-basin 2 drainage - existing

Sub-basin 2, after Repowering, (see calc 57) covers the same area as existing sub-basin II (see calc 58), and is designated as the Water Treatment Area

for topography, see page 2
(for El 4 and 3, see page 3)

From Calc 58, High Water Table ± +3

El	Acres
+7	4.44
6	3.37
5	0.40
4	0.04
3	0.00056

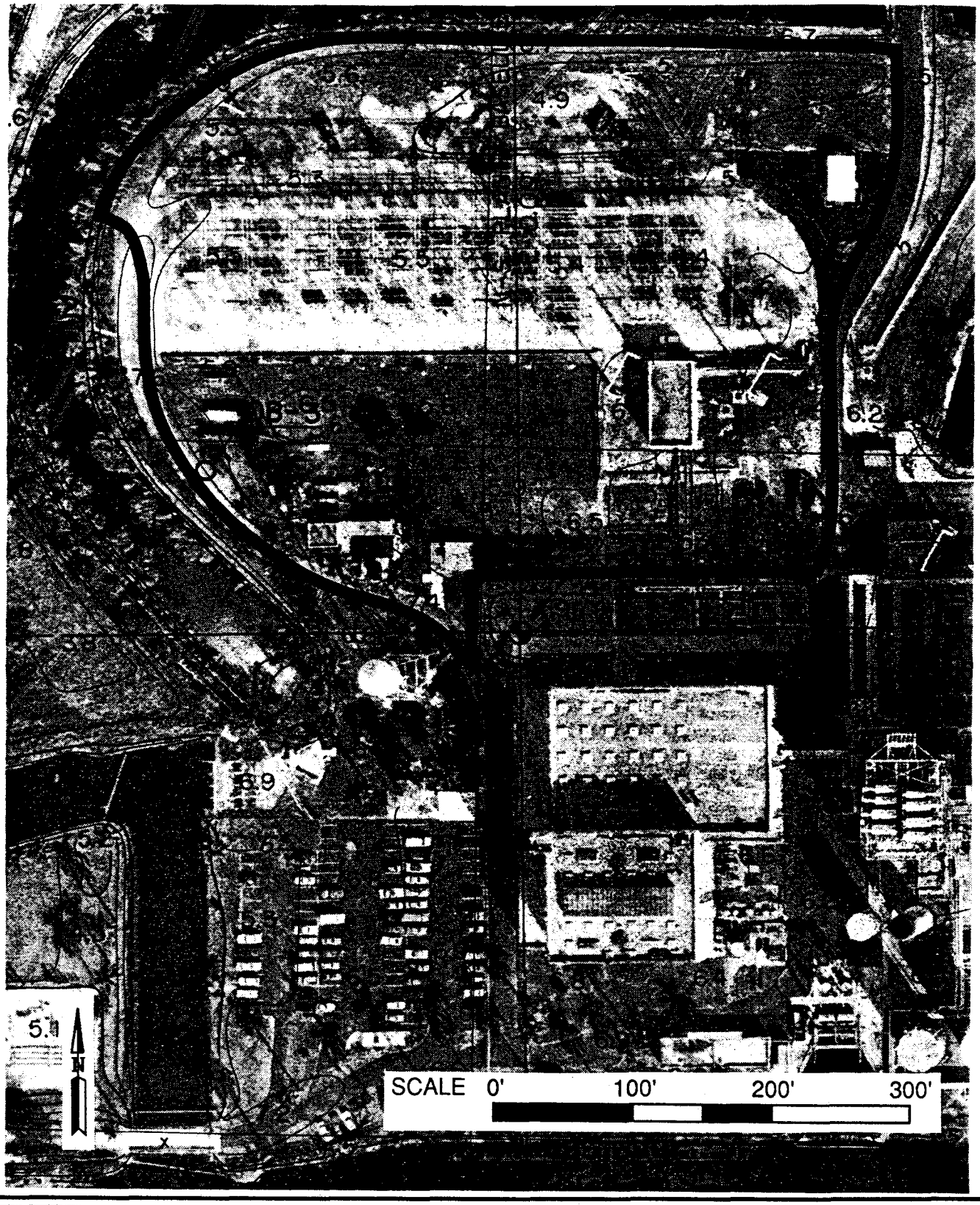
Impervious Areas

Buildings

Haz Material	=	90 x 50 =	4500
Paint Storage	=	20 x 20 =	400
Elect Control Bldg	=	30 x 60 =	1800
Gardeners Bldg	=	60 x 25 =	1500
			8200

$\frac{8200\ ft^2}{43560} = 0.19\ ac$

Rev. 1



SUB-BASIN II

FPL

Lauderdale
Repowering
Project

10.7-135

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EBASCO SERVICES INCORPORATED

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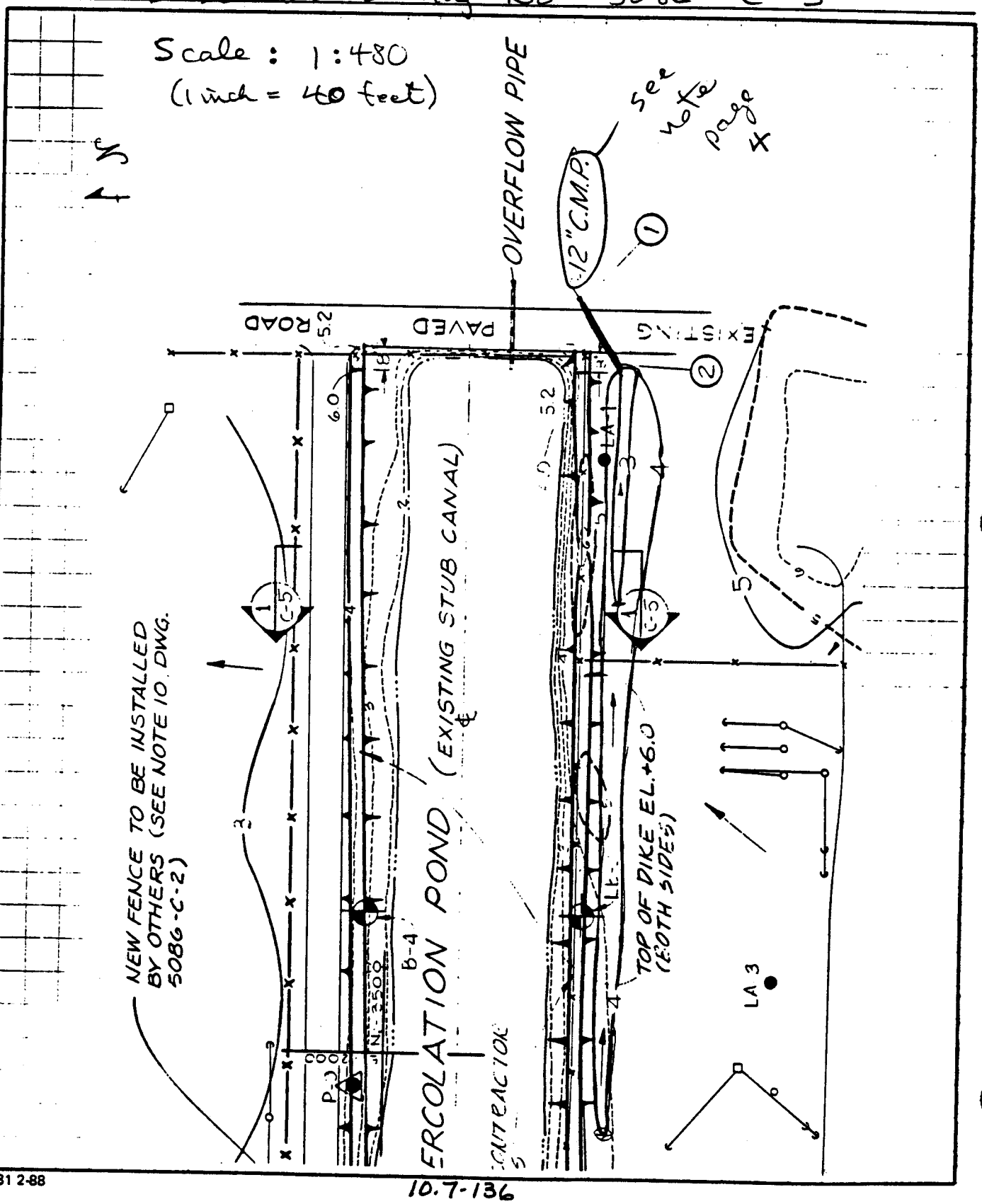
SHEET 3 OF 23

OFS NO. FLO 7918.017 DEPT. NO. 941

CLIENT FPL

PROJECT PFLR

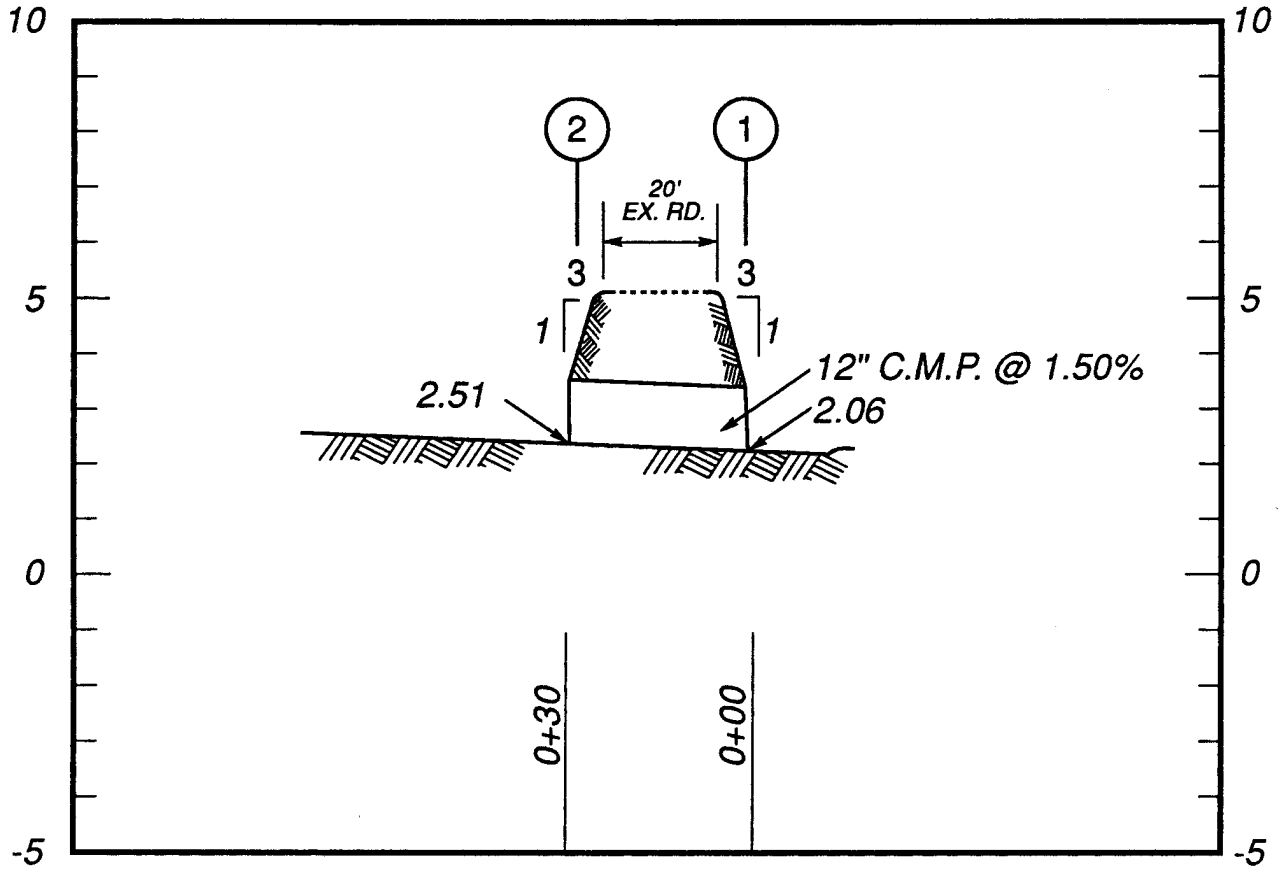
SUBJECT Based on Drawing No 5086-C-3



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10.7-136

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PROFILE

CALC 59 SHEET 4

Lauderdale
Repowering
Project

FPL

10.7-137

EBASCO SERVICES INCORPORATED

BY HAP DATE 5/15/90

CHKD. BY KM DATE 5/16/90

SHEET 5 OF 23

OFS NO. FLO 7918.017 DEPT. NO. 941

CLIENT FPL

PROJECT PTLR

SUBJECT Sub-Basin 2 Drainage

Impervious = 0.19 acres — 4%

pervious = (4.44 - 0.19) 4.25 — 96%

Calculate storage for high water at 3 ft MSL and use method on page C-III-1 of Manual

El	Acres	Net* Acres	Storage-ft	Storage - Ac-ft
3	0	0	0	0
4	0.04	.04	0.6/12	0.002
5	0.40	.36	2.5/12	0.075
6	3.37	2.97	6.6/12	1.634
7	4.44	1.07	10.9/12	0.972
				2.683

* because area is a depression, only the differential areas between elevations have storage

$\frac{2.683 \text{ Ac-ft}}{4.44 \text{ Ac}} = 0.604 \text{ feet} = 7.25 \text{ in}$

at 96% pervious, S = 0.96 * 7.25 = 6.96"

EBASCO SERVICES INCORPORATED

BY HAF DATE 5/15/90

CHKD. BY KM DATE 5/16/90

SHEET 6 OF 23

OFS NO. FLO-7918.017 DEPT. NO. 941

CLIENT FPL

PROJECT PFLR

SUBJECT Sub-Basin 2 Drainage

for direct runoff, per SCS equation page C-II-1

$$Q = \frac{(P - 0.2S)^2}{(P + 0.8S)}$$

Storm	Precipitation	Runoff
3 day 25 year	14.95	8.96"
5 day 10 year	14.00	8.12"
5 day 100 year	20.24	13.765"

$$\frac{(14.95 - .2 * 6.96)^2}{14.95 + .8 * 6.96} = \frac{(14.95 - 1.392)^2}{14.95 + 5.568} = \frac{13.558^2}{20.52}$$

$$= 8.96 \text{ inches}$$

$$\frac{(14 - 1.392)^2}{14 + 5.568} = 8.12"$$

$$\frac{(20.24 - 1.392)^2}{20.24 + 5.568} = \frac{355.247}{25.808} = 13.765 \text{ inches}$$

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EBASCO SERVICES INCORPORATED

BY NAP DATE 5/15/90

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SHEET 7 OF 23

OFS NO. FLO 7918.017 DEPT. NO. 941

CLIENT FPL

PROJECT PFLR

SUBJECT Sub-Basin 2 Drainage

Basin Storage

El	Acres	Incremental Storage	Total Storage (Ac-Ft)
3	0	0	0
4	.04	.02	0.02
5	.40	.22	0.24
6	3.37	1.885	2.125
7	4.44	3.905	6.030

Discharge

Because culvert was removed when Hazardous material storage building was installed, there is no discharge from storage unless road is over-topped

See pages 8-9 for flood-routing program (FLOOD2.BAS, see Calc 58 for derivation of FLOOD1.BAS)

Results of flood-routing are on pages 10 through 15

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BY NAP DATE 5/15/90

CHKD. BY KM DATE 5/16/90

CLIENT FPL

PROJECT FPLR

SUBJECT Sub-Basin 2 Drainage

EBASCO SERVICES INCORPORATED

OFS NO. FLOOD2.017 SHEET 8 OF 23 DEPT. NO. 941

Calc. 59

581 2-88

10.7-141

```
REM! SAVE FLOOD2.BAS
REM! C=CUMULATIVE RAINFALL
REM! S=STORAGE CAPACITY OF SOIL
REM! R=CUMULATIVE RUNOFF
REM! T=24 HOUR RAINFALL
REM! X=INCREMENTAL RUNOFF
REM! Z=TIME IN HOURS
REM! D=DISCHARGE
REM! A=INCREMENTAL RAINFALL
REM! B=INCREMENTAL RUNOFF
REM! E=INCREMENTAL STORAGE
REM! L=WATER LEVEL
      WIDTH "LPT1:", 132
      OPTION BASE 1
      DIM C(289), R(289), X(289), D(289), A(289), B(289), E(289), L(289), El(5), St(5), Sd(289)
REM!  U=NUMBER OF STORAGE ELEVATION/VOLUME POINTS
REM!  El and St = ARE ELEVATIONS AND CORRESPONDING VOLUMES WITHIN STORAGE
REM!  Rs=RUNOFF TO THE STORAGE AREA
REM!  Rd=RUNOFF TO DIRECT DISCHARGE
REM!  Rf=FLOOD-ROUTED RUNOFF
REM!  Ast= AREA RECEIVING RUNOFF WHICH GOES TO STORAGE
REM!  Cel=CONTROL ELEVATION OF STORAGE AREA
REM!  Ad= AREA RECEIVING RUNOFF WHICH GOES DIRECT TO DISCHARGE
REM!  Sr=1st GUESS AT STORAGE VALUE
REM!  Es=1st GUESS AT STORAGE WATER LEVEL
REM!  Sd= DISCHARGE FROM STORAGE AREA
      Cel = 3
      U = 5
      Ast = 4.44
      Ad = 0
      S = 6.96
      T = 11
DATA .000,.002,.003,.005,.006,.008,.009,.011,.012,.014,.015,.017,.018,.020,.021,.023,.024
DATA .026,.027,.029,.030,.032,.033,.035,.036,.038,.040,.041,.043,.044,.046,.047,.049,.050
DATA .052,.053,.055,.056,.058,.059,.061,.062,.064,.065,.067,.068,.070,.071,.073,.075,.076
DATA .078,.079,.081,.082,.084,.085,.087,.088,.090,.091,.093,.094,.096,.097,.099,.100,.102
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DATA .197,.199,.201,.204,.206,.208,.210,.213,.215,.217,.219,.221,.224,.226,.228,.230,.233
DATA .235,.237,.239,.241,.244,.246,.248,.250,.252,.255,.257,.259,.261,.264,.266,.268,.270
DATA .272,.275,.277,.279,.281,.284,.286,.288,.290,.292,.295,.297,.299,.301,.304,.306,.308
DATA .310,.312,.315,.317,.319,.321,.324,.326,.328,.330,.332,.335,.337,.339,.341,.343,.346
DATA .348,.350,.352,.355,.357,.359,.362,.364,.367,.369,.372,.374,.377,.379,.382,.385,.388
DATA .391,.394,.397,.400,.404,.408,.412,.417,.421,.426,.431,.437,.442,.448,.454,.461,.467
DATA .474,.481,.488,.496,.504,.512,.521,.530,.540,.550,.561,.572,.584,.596,.612,.628,.653
DATA .678,.847,1.015,1.052,1.088,1.107,1.126,1.140,1.154,1.166,1.177,1.186,1.194,1.202,1.209,1.217,1.224
DATA 1.232,1.239,1.243,1.248,1.253,1.257,1.262,1.266,1.271,1.275,1.280,1.284,1.289,1.293,1.298,1.302,1.307
DATA 1.311,1.314,1.317,1.320,1.323,1.326,1.329,1.332,1.335,1.338,1.341,1.344,1.347,1.350,1.353,1.356,1.359
      FOR I = 1 TO 289
      READ Q
      C(I) = Q * T
      NEXT I
```

changes from FLOOD1.BAS

```
      C(I) = Q * T
      NEXT I
      DATA 3,0,4,.02,5,0.240,6,2.125,7,6.03
      FOR K = 1 TO U
      READ El(K), St(K)
      NEXT K
      E(1) = 0
      L(1) = 3
      Z = 0
      LPRINT "    TIME        INCR          INCR        TOTAL        STORAGE      WATER        DISCHARGE    "
      LPRINT "    HOURS       RAINFALL      RUNOFF      DISCHARGE    AC-FT        LEVEL          FROM"
      LPRINT "                INCHES        INCHES      CFS                       FT MSL       STORAGE-AC-FT"
      LPRINT " "
      FOR I = 2 TO 289
      Z = Z + 1 / 4
      R(I) = (C(I) - .2 * S) * (C(I) - .2 * S) / (C(I) + .8 * S)
      IF R(I) ) C(I) THEN R(I) = C(I)
      A(I) = C(I) - C(I - 1)
      B(I) = R(I) - R(I - 1)
      IF B(I) < 0 THEN B(I) = 0
      Rs = B(I) * Ast / 12
      Rd = B(I) * Ad / 12
      Sr = Rs + E(I - 1) - Sd(I - 1)
10    FOR J = 2 TO U
      IF Sr < St(J) THEN 20
      NEXT J
20    Es = El(J - 1) + ((Sr - St(J - 1)) / (St(J) - St(J - 1))) * (El(J) - El(J - 1))
      H = ((Es + L(I - 1)) / 2) - Cel
      IF H < 0 THEN H = 0
      Rf = 0
      Sd(I) = Rf * 60 * 15 / 43560
      Rs = Rs - Sd(I)
      E(I) = Rs
      Sr = Rs + E(I - 1)
30    FOR J = 2 TO U
      IF Sr < St(J) THEN 40
      NEXT J
40    L(I) = H + Cel
50    D(I) = Rd * (43560 / (15 * 60)) + Rf
      ZZZ = ZZZ + 1
      IF ZZZ <> 53 THEN 70
      LPRINT
      LPRINT
      LPRINT
      LPRINT
      LPRINT
      LPRINT
      LPRINT
      LPRINT
      LPRINT
      LPRINT
      LPRINT "    TIME        INCR          INCR        TOTAL        STORAGE      WATER        DISCHARGE    "
      LPRINT "    HOURS       RAINFALL      RUNOFF      DISCHARGE    AC-FT        LEVEL          FROM"
      LPRINT "                INCHES        INCHES      CFS                       FT MSL       STORAGE-AC-FT"
      LPRINT " "
      ZZZ = 1
70    LPRINT USING "   ###.##        ##.##          ##.##        ##.##        ##.##      ##.##          ##.##          ##.##"; Z, A(I), B(I), D
(I), E(I), L(I), Sd(I)
      NEXT I
      END
```

changes from FLOOD 1.BAS

zero discharge

10-7-92

Rev. 1

BY NCP DATE 5/15/90

CHKD. BY KM DATE 5/16/90

CLIENT FPL

PROJECT PFLR

SUBJECT Sub-Basin 2 Drainage

OFS NO.

EBASCO SERVICES INCORPORATED

9/23

Calc. 59

EBASCO SERVICES INCORPORATED

Rev. 1 BY NAP DATE 5/15/90
CHKD. BY KM DATE 5/16/90
CLIENT FPL

SHEET 10 OF 23
OFS NO. FL07918.017 DEPT. NO. 941

TIME HOURS	INCR RAINFALL INCHES	INCR RUNOFF INCHES	TOTAL DISCHARGE CFS	STORAGE AC-FT	WATER LEVEL FT MSL
0.25	0.02	0.02	0.00	0.01	3.20
0.50	0.01	0.01	0.00	0.00	3.41
0.75	0.02	0.02	0.00	0.01	3.51
1.00	0.01	0.01	0.00	0.00	3.56
1.25	0.02	0.02	0.00	0.01	3.59
1.50	0.01	0.01	0.00	0.00	3.60
1.75	0.02	0.02	0.00	0.01	3.60
2.00	0.01	0.01	0.00	0.00	3.61
2.25	0.02	0.02	0.00	0.01	3.61
2.50	0.01	0.01	0.00	0.00	3.61
2.75	0.02	0.02	0.00	0.01	3.61
3.00	0.01	0.01	0.00	0.00	3.61
3.25	0.02	0.02	0.00	0.01	3.61
3.50	0.01	0.01	0.00	0.00	3.61
3.75	0.02	0.00	0.00	0.00	3.41
4.00	0.01	0.00	0.00	0.00	3.20
4.25	0.02	0.00	0.00	0.00	3.10
4.50	0.01	0.00	0.00	0.00	3.05
4.75	0.02	0.00	0.00	0.00	3.03
5.00	0.01	0.00	0.00	0.00	3.01
5.25	0.02	0.00	0.00	0.00	3.01
5.50	0.01	0.00	0.00	0.00	3.00
5.75	0.02	0.00	0.00	0.00	3.00
6.00	0.01	0.00	0.00	0.00	3.00
6.25	0.02	0.00	0.00	0.00	3.00
6.50	0.02	0.00	0.00	0.00	3.00
6.75	0.01	0.00	0.00	0.00	3.00
7.00	0.02	0.00	0.00	0.00	3.00
7.25	0.01	0.00	0.00	0.00	3.00
7.50	0.02	0.00	0.00	0.00	3.00
7.75	0.01	0.00	0.00	0.00	3.00
8.00	0.02	0.00	0.00	0.00	3.00
8.25	0.01	0.00	0.00	0.00	3.00
8.50	0.02	0.00	0.00	0.00	3.00
8.75	0.01	0.00	0.00	0.00	3.00
9.00	0.02	0.00	0.00	0.00	3.00
9.25	0.01	0.00	0.00	0.00	3.00
9.50	0.02	0.00	0.00	0.00	3.00
9.75	0.01	0.00	0.00	0.00	3.00
10.00	0.02	0.00	0.00	0.00	3.00
10.25	0.01	0.00	0.00	0.00	3.00
10.50	0.02	0.00	0.00	0.00	3.00
10.75	0.01	0.00	0.00	0.00	3.00
11.00	0.02	0.00	0.00	0.00	3.00
11.25	0.01	0.00	0.00	0.00	3.00
11.50	0.02	0.00	0.00	0.00	3.00
11.75	0.01	0.00	0.00	0.00	3.00
12.00	0.02	0.00	0.00	0.00	3.00
12.25	0.02	0.00	0.00	0.00	3.00
12.50	0.01	0.00	0.00	0.00	3.00
12.75	0.02	0.00	0.00	0.00	3.00
13.00	0.01	0.00	0.00	0.00	3.00

TIME HOURS	INCR RAINFALL INCHES	INCR RUNOFF INCHES	TOTAL DISCHARGE CFS	STORAGE AC-FT	WATER LEVEL FT MSL
13.25	0.02	0.00	0.00	0.00	3.00
13.50	0.01	0.00	0.00	0.00	3.00
13.75	0.02	0.00	0.00	0.00	3.00
14.00	0.01	0.00	0.00	0.00	3.00
14.25	0.02	0.00	0.00	0.00	3.00
14.50	0.01	0.00	0.00	0.00	3.00
14.75	0.02	0.00	0.00	0.00	3.00
15.00	0.01	0.00	0.00	0.00	3.00
15.25	0.02	0.00	0.00	0.00	3.00
15.50	0.01	0.00	0.00	0.00	3.00
15.75	0.02	0.00	0.00	0.00	3.00
16.00	0.01	0.00	0.00	0.00	3.00
16.25	0.02	0.00	0.00	0.00	3.00
16.50	0.01	0.00	0.00	0.00	3.00
16.75	0.02	0.00	0.00	0.00	3.00
17.00	0.01	0.00	0.00	0.00	3.00
17.25	0.02	0.00	0.00	0.00	3.00
17.50	0.01	0.00	0.00	0.00	3.00
17.75	0.02	0.00	0.00	0.00	3.00
18.00	0.02	0.00	0.00	0.00	3.00
18.25	0.01	0.00	0.00	0.00	3.00
18.50	0.02	0.00	0.00	0.00	3.00
18.75	0.01	0.00	0.00	0.00	3.00
19.00	0.02	0.00	0.00	0.00	3.00
19.25	0.01	0.00	0.00	0.00	3.00
19.50	0.02	0.00	0.00	0.00	3.00
19.75	0.01	0.00	0.00	0.00	3.00
20.00	0.02	0.00	0.00	0.00	3.00
20.25	0.01	0.00	0.00	0.00	3.00
20.50	0.02	0.00	0.00	0.00	3.00
20.75	0.01	0.00	0.00	0.00	3.00
21.00	0.02	0.00	0.00	0.00	3.00
21.25	0.01	0.00	0.00	0.00	3.00
21.50	0.02	0.00	0.00	0.00	3.00
21.75	0.01	0.00	0.00	0.00	3.01
22.00	0.02	0.00	0.00	0.00	3.01
22.25	0.01	0.00	0.00	0.00	3.01
22.50	0.02	0.00	0.00	0.00	3.01
22.75	0.01	0.00	0.00	0.00	3.02
23.00	0.02	0.00	0.00	0.00	3.02
23.25	0.01	0.00	0.00	0.00	3.02
23.50	0.02	0.00	0.00	0.00	3.02
23.75	0.01	0.00	0.00	0.00	3.03
24.00	0.02	0.00	0.00	0.00	3.03
24.25	0.02	0.00	0.00	0.00	3.04
24.50	0.02	0.00	0.00	0.00	3.05
24.75	0.03	0.00	0.00	0.00	3.06
25.00	0.02	0.00	0.00	0.00	3.07
25.25	0.02	0.00	0.00	0.00	3.07
25.50	0.02	0.00	0.00	0.00	3.07
25.75	0.03	0.00	0.00	0.00	3.08
26.00	0.02	0.00	0.00	0.00	3.09

Rev-1

EBASCO SERVICES INCORPORATED

BY INCF DATE 5/15/90

CHKD. BY KM DATE 5/16/90

SHEET 12 OF 23

OFS NO. FL07918.017 DEPT. NO. 941

TIME HOURS	INCR RAINFALL INCHES	INCR RUNOFF INCHES	TOTAL DISCHARGE CFS	STORAGE AC-FT	WATER LEVEL FT MSL
26.25	0.02	0.00	0.00	0.00	3.09
26.50	0.02	0.00	0.00	0.00	3.09
26.75	0.02	0.00	0.00	0.00	3.09
27.00	0.03	0.00	0.00	0.00	3.11
27.25	0.02	0.00	0.00	0.00	3.12
27.50	0.02	0.00	0.00	0.00	3.12
27.75	0.02	0.00	0.00	0.00	3.12
28.00	0.03	0.00	0.00	0.00	3.13
28.25	0.02	0.00	0.00	0.00	3.14
28.50	0.02	0.00	0.00	0.00	3.14
28.75	0.02	0.00	0.00	0.00	3.14
29.00	0.02	0.00	0.00	0.00	3.14
29.25	0.03	0.01	0.00	0.00	3.16
29.50	0.02	0.00	0.00	0.00	3.17
29.75	0.02	0.00	0.00	0.00	3.16
30.00	0.02	0.00	0.00	0.00	3.16
30.25	0.02	0.00	0.00	0.00	3.16
30.50	0.03	0.01	0.00	0.00	3.18
30.75	0.02	0.00	0.00	0.00	3.19
31.00	0.02	0.00	0.00	0.00	3.18
31.25	0.02	0.00	0.00	0.00	3.18
31.50	0.03	0.01	0.00	0.00	3.20
31.75	0.02	0.01	0.00	0.00	3.22
32.00	0.02	0.01	0.00	0.00	3.20
32.25	0.02	0.01	0.00	0.00	3.20
32.50	0.02	0.01	0.00	0.00	3.20
32.75	0.03	0.01	0.00	0.00	3.22
33.00	0.02	0.01	0.00	0.00	3.24
33.25	0.02	0.01	0.00	0.00	3.22
33.50	0.02	0.01	0.00	0.00	3.22
33.75	0.03	0.01	0.00	0.00	3.24
34.00	0.02	0.01	0.00	0.00	3.26
34.25	0.02	0.01	0.00	0.00	3.24
34.50	0.02	0.01	0.00	0.00	3.23
34.75	0.02	0.01	0.00	0.00	3.23
35.00	0.03	0.01	0.00	0.00	3.26
35.25	0.02	0.01	0.00	0.00	3.28
35.50	0.02	0.01	0.00	0.00	3.26
35.75	0.02	0.01	0.00	0.00	3.25
36.00	0.02	0.01	0.00	0.00	3.25
36.25	0.03	0.01	0.00	0.00	3.28
36.50	0.02	0.01	0.00	0.00	3.30
36.75	0.02	0.01	0.00	0.00	3.28
37.00	0.02	0.01	0.00	0.00	3.27
37.25	0.03	0.01	0.00	0.00	3.30
37.50	0.02	0.01	0.00	0.00	3.31
37.75	0.02	0.01	0.00	0.00	3.29
38.00	0.02	0.01	0.00	0.00	3.28
38.25	0.02	0.01	0.00	0.00	3.28
38.50	0.03	0.01	0.00	0.00	3.31
38.75	0.02	0.01	0.00	0.00	3.33
39.00	0.02	0.01	0.00	0.00	3.31

10.7-145

TIME HOURS	INCR RAINFALL INCHES	INCR RUNOFF INCHES	TOTAL DISCHARGE CFS	STORAGE AC-FT	WATER LEVEL FT MSL
39.25	0.02	0.01	0.00	0.00	3.30
39.50	0.03	0.01	0.00	0.00	3.33
39.75	0.02	0.01	0.00	0.00	3.35
40.00	0.02	0.01	0.00	0.00	3.32
40.25	0.02	0.01	0.00	0.00	3.31
40.50	0.02	0.01	0.00	0.00	3.30
40.75	0.03	0.01	0.00	0.00	3.34
41.00	0.02	0.01	0.00	0.00	3.36
41.25	0.02	0.01	0.00	0.00	3.34
41.50	0.02	0.01	0.00	0.00	3.32
41.75	0.03	0.01	0.00	0.00	3.36
42.00	0.02	0.01	0.00	0.00	3.38
42.25	0.02	0.01	0.00	0.00	3.35
42.50	0.02	0.01	0.00	0.00	3.34
42.75	0.02	0.01	0.00	0.00	3.33
43.00	0.03	0.01	0.00	0.00	3.37
43.25	0.02	0.01	0.00	0.00	3.39
43.50	0.02	0.01	0.00	0.00	3.36
43.75	0.02	0.01	0.00	0.00	3.35
44.00	0.03	0.01	0.00	0.01	3.39
44.25	0.02	0.01	0.00	0.00	3.41
44.50	0.02	0.01	0.00	0.00	3.37
44.75	0.02	0.01	0.00	0.00	3.36
45.00	0.02	0.01	0.00	0.00	3.35
45.25	0.03	0.01	0.00	0.01	3.40
45.50	0.02	0.01	0.00	0.00	3.42
45.75	0.02	0.01	0.00	0.00	3.39
46.00	0.02	0.01	0.00	0.00	3.37
46.25	0.02	0.01	0.00	0.00	3.37
46.50	0.03	0.01	0.00	0.01	3.41
46.75	0.02	0.01	0.00	0.00	3.43
47.00	0.02	0.01	0.00	0.00	3.40
47.25	0.02	0.01	0.00	0.00	3.38
47.50	0.03	0.02	0.00	0.01	3.42
47.75	0.02	0.01	0.00	0.00	3.45
48.00	0.02	0.01	0.00	0.00	3.41
48.25	0.03	0.02	0.00	0.01	3.44
48.50	0.02	0.01	0.00	0.00	3.46
48.75	0.03	0.02	0.00	0.01	3.47
49.00	0.02	0.01	0.00	0.00	3.48
49.25	0.03	0.02	0.00	0.01	3.48
49.50	0.02	0.01	0.00	0.00	3.48
49.75	0.03	0.02	0.00	0.01	3.49
50.00	0.02	0.01	0.00	0.00	3.49
50.25	0.03	0.02	0.00	0.01	3.49
50.50	0.03	0.02	0.00	0.01	3.55
50.75	0.03	0.02	0.00	0.01	3.58
51.00	0.03	0.02	0.00	0.01	3.59
51.25	0.03	0.02	0.00	0.01	3.60
51.50	0.03	0.02	0.00	0.01	3.61
51.75	0.03	0.02	0.00	0.01	3.62
52.00	0.04	0.02 10.7-146	0.00	0.01	3.67

TIME HOURS	INCR RAINFALL INCHES	INCR RUNOFF INCHES	TOTAL DISCHARGE CFS	STORAGE AC-FT	WATER LEVEL FT MSL
52.25	0.04	0.02	0.00	0.01	3.76
52.50	0.04	0.02	0.00	0.01	3.80
52.75	0.05	0.03	0.00	0.01	3.88
53.00	0.04	0.02	0.00	0.01	3.93
53.25	0.05	0.03	0.00	0.01	3.95
53.50	0.06	0.03	0.00	0.01	3.98
53.75	0.07	0.04	0.00	0.01	4.00
54.00	0.05	0.03	0.00	0.01	4.01
54.25	0.07	0.04	0.00	0.01	4.02
54.50	0.07	0.04	0.00	0.01	4.02
54.75	0.08	0.04	0.00	0.02	4.04
55.00	0.07	0.04	0.00	0.01	4.04
55.25	0.08	0.04	0.00	0.02	4.04
55.50	0.08	0.05	0.00	0.02	4.05
55.75	0.08	0.05	0.00	0.02	4.06
56.00	0.09	0.05	0.00	0.02	4.07
56.25	0.09	0.05	0.00	0.02	4.08
56.50	0.09	0.05	0.00	0.02	4.08
56.75	0.10	0.06	0.00	0.02	4.09
57.00	0.10	0.06	0.00	0.02	4.10
57.25	0.11	0.07	0.00	0.03	4.12
57.50	0.11	0.07	0.00	0.03	4.13
57.75	0.12	0.08	0.00	0.03	4.14
58.00	0.12	0.08	0.00	0.03	4.16
58.25	0.13	0.09	0.00	0.03	4.17
58.50	0.13	0.09	0.00	0.03	4.19
58.75	0.18	0.12	0.00	0.04	4.22
59.00	0.18	0.12	0.00	0.04	4.27
59.25	0.28	0.19	0.00	0.07	4.35
59.50	0.27	0.19	0.00	0.07	4.45
59.75	1.86	1.39	0.00	0.52	4.82
60.00	1.85	1.49	0.00	0.55	5.13
60.25	0.41	0.34	0.00	0.13	5.18
60.50	0.40	0.33	0.00	0.12	5.09
60.75	0.21	0.18	0.00	0.07	4.93
61.00	0.21	0.18	0.00	0.07	4.72
61.25	0.15	0.13	0.00	0.05	4.57
61.50	0.15	0.13	0.00	0.05	4.46
61.75	0.13	0.11	0.00	0.04	4.39
62.00	0.12	0.10	0.00	0.04	4.33
62.25	0.10	0.09	0.00	0.03	4.28
62.50	0.09	0.08	0.00	0.03	4.23
62.75	0.09	0.08	0.00	0.03	4.20
63.00	0.08	0.07	0.00	0.02	4.17
63.25	0.09	0.08	0.00	0.03	4.16
63.50	0.08	0.07	0.00	0.02	4.15
63.75	0.09	0.08	0.00	0.03	4.15
64.00	0.08	0.07	0.00	0.02	4.15
64.25	0.04	0.04	0.00	0.01	4.12
64.50	0.06	0.05	0.00	0.02	4.09
64.75	0.05	0.05	0.00	0.02	4.08
65.00	0.04	0.04	0.00	0.01	4.07

EBASCO SERVICES INCORPORATED

BY NAF DATE 5/15/90

CHKD. BY KM DATE 5/16/90

SHEET 15 OF 23

OFS NO. FL07918.017 DEPT. NO. 941

CLIENT FPL

PROJECT PFLR

SUBJECT Sub-Basin 2 Drainage

TIME HOURS	INCR RAINFALL INCHES	INCR RUNOFF INCHES	TOTAL DISCHARGE CFS	STORAGE AC-FT	WATER LEVEL FT MSL
65.25	0.06	0.05	0.00	0.02	4.06
65.50	0.04	0.04	0.00	0.01	4.06
65.75	0.05	0.05	0.00	0.02	4.06
66.00	0.04	0.04	0.00	0.01	4.06
66.25	0.06	0.05	0.00	0.02	4.05
66.50	0.04	0.04	0.00	0.01	4.05
66.75	0.06	0.05	0.00	0.02	4.05
67.00	0.04	0.04	0.00	0.01	4.05
67.25	0.06	0.05	0.00	0.02	4.05
67.50	0.04	0.04	0.00	0.01	4.06
67.75	0.06	0.05	0.00	0.02	4.06
68.00	0.04	0.04	0.00	0.01	4.06
68.25	0.03	0.03	0.00	0.01	4.04
68.50	0.03	0.03	0.00	0.01	4.02
68.75	0.03	0.03	0.00	0.01	4.01
69.00	0.03	0.03	0.00	0.01	4.01
69.25	0.03	0.03	0.00	0.01	4.01
69.50	0.03	0.03	0.00	0.01	4.01
69.75	0.03	0.03	0.00	0.01	4.01
70.00	0.03	0.03	0.00	0.01	4.01
70.25	0.03	0.03	0.00	0.01	4.01
70.50	0.03	0.03	0.00	0.01	4.01
70.75	0.03	0.03	0.00	0.01	4.01
71.00	0.03	0.03	0.00	0.01	4.01
71.25	0.03	0.03	0.00	0.01	4.01
71.50	0.03	0.03	0.00	0.01	4.01
71.75	0.03	0.03	0.00	0.01	4.01
72.00	0.03	0.03	0.00	0.01	4.01

Rev. 1

EBASCO SERVICES INCORPORATED

Calc. 59

BY NP DATE 5/15/90

CHKD. BY KM DATE 5/16/90

SHEET 16 OF 23

OFS NO. FLO 7918.017 DEPT. NO. 941

CLIENT FPL

PROJECT PFLR

SUBJECT Sub-Basin 2 Drainage

Summary of Results - Existing Conditions

Peak discharge flow = 0

Peak water surface Elevation = 5.18 ft at 60.25 hours

Note

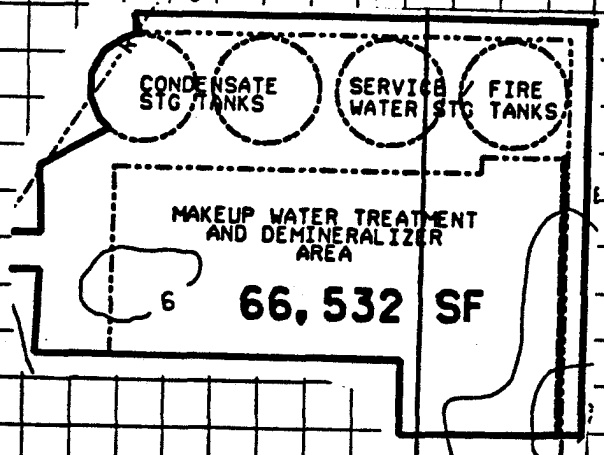
Percolation removes

5.18 - 4.01 feet over 12 hours

or 1.17 feet in 12 hours

After Repowering

Only change is the addition of Impervious Area by the construction of the water Treatment system



$\frac{66532}{43560} = 1.53$ Acres

from page 5

pervious = 4.25 - 1.53 = 2.72

impervious = .19 + 1.53 = 1.72

pervious = 61 %

impervious = 39 %

Rev. 1

EBASCO SERVICES INCORPORATED

BY NAP DATE 5/15/90

CHKD. BY KM DATE 5/16/90

SHEET 17 OF 23

OFS NO. FL07918.017 DEPT. NO. 941

CLIENT FPL

PROJECT PFLR

SUBJECT Sub-Basin 2 Drainage

New value of S = 7.25 * .61 = 4.42 inches

Change S to 4.42 instead of 6.96

to make program FLOOD2R.BAS

results are on pp 18 - 23

in summary

max flow out = 0

max water elevation = 5.24'

at hour 60.25

EBASCO SERVICES INCORPORATED

BY NAP DATE 5/15/90

CHKD. BY KM DATE 5/16/90

CLIENT FPL

PRO

SUB

TIME HOURS	INCR RAINFALL INCHES	INCR RUNOFF INCHES	TOTAL DISCHARGE CFS	STORAGE AC-FT	WATER LEVEL FT MSL
0.25	0.02	0.02	0.00	0.01	3.20
0.50	0.01	0.01	0.00	0.00	3.41
0.75	0.02	0.02	0.00	0.01	3.51
1.00	0.01	0.01	0.00	0.00	3.56
1.25	0.02	0.02	0.00	0.01	3.59
1.50	0.01	0.01	0.00	0.00	3.60
1.75	0.02	0.02	0.00	0.01	3.60
2.00	0.01	0.01	0.00	0.00	3.61
2.25	0.02	0.01	0.00	0.00	3.52
2.50	0.01	0.00	0.00	0.00	3.37
2.75	0.02	0.00	0.00	0.00	3.19
3.00	0.01	0.00	0.00	0.00	3.09
3.25	0.02	0.00	0.00	0.00	3.05
3.50	0.01	0.00	0.00	0.00	3.02
3.75	0.02	0.00	0.00	0.00	3.01
4.00	0.01	0.00	0.00	0.00	3.01
4.25	0.02	0.00	0.00	0.00	3.00
4.50	0.01	0.00	0.00	0.00	3.00
4.75	0.02	0.00	0.00	0.00	3.00
5.00	0.01	0.00	0.00	0.00	3.00
5.25	0.02	0.00	0.00	0.00	3.00
5.50	0.01	0.00	0.00	0.00	3.00
5.75	0.02	0.00	0.00	0.00	3.00
6.00	0.01	0.00	0.00	0.00	3.00
6.25	0.02	0.00	0.00	0.00	3.00
6.50	0.02	0.00	0.00	0.00	3.00
6.75	0.01	0.00	0.00	0.00	3.00
7.00	0.02	0.00	0.00	0.00	3.00
7.25	0.01	0.00	0.00	0.00	3.00
7.50	0.02	0.00	0.00	0.00	3.00
7.75	0.01	0.00	0.00	0.00	3.00
8.00	0.02	0.00	0.00	0.00	3.00
8.25	0.01	0.00	0.00	0.00	3.00
8.50	0.02	0.00	0.00	0.00	3.00
8.75	0.01	0.00	0.00	0.00	3.00
9.00	0.02	0.00	0.00	0.00	3.00
9.25	0.01	0.00	0.00	0.00	3.00
9.50	0.02	0.00	0.00	0.00	3.00
9.75	0.01	0.00	0.00	0.00	3.00
10.00	0.02	0.00	0.00	0.00	3.00
10.25	0.01	0.00	0.00	0.00	3.00
10.50	0.02	0.00	0.00	0.00	3.00
10.75	0.01	0.00	0.00	0.00	3.00
11.00	0.02	0.00	0.00	0.00	3.00
11.25	0.01	0.00	0.00	0.00	3.00
11.50	0.02	0.00	0.00	0.00	3.00
11.75	0.01	0.00	0.00	0.00	3.00
12.00	0.02	0.00	0.00	0.00	3.00
12.25	0.02	0.00	0.00	0.00	3.00
12.50	0.01	0.00	0.00	0.00	3.00
12.75	0.02	0.00	0.00	0.00	3.00
13.00	0.01	0.00	10.7-151	0.00	0.00	3.00

EBASCO SERVICES INCORPORATED

BY HAP DATE 5/15/90

CHKD. BY KM DATE 5/16/90

SHEET 19 OF 23

OFS NO. FL07918.017 DEPT. NO. 941

CLIENT FPL

PF

ST

TIME HOURS	INCR RAINFALL INCHES	INCR RUNOFF INCHES	TOTAL DISCHARGE CFS	STORAGE AC-FT	WATER LEVEL FT MSL
13.25	0.02	0.00	0.00	0.00	3.00
13.50	0.01	0.00	0.00	0.00	3.00
13.75	0.02	0.00	0.00	0.00	3.00
14.00	0.01	0.00	0.00	0.00	3.01
14.25	0.02	0.00	0.00	0.00	3.01
14.50	0.01	0.00	0.00	0.00	3.01
14.75	0.02	0.00	0.00	0.00	3.02
15.00	0.01	0.00	0.00	0.00	3.02
15.25	0.02	0.00	0.00	0.00	3.03
15.50	0.01	0.00	0.00	0.00	3.03
15.75	0.02	0.00	0.00	0.00	3.04
16.00	0.01	0.00	0.00	0.00	3.04
16.25	0.02	0.00	0.00	0.00	3.04
16.50	0.01	0.00	0.00	0.00	3.05
16.75	0.02	0.00	0.00	0.00	3.05
17.00	0.01	0.00	0.00	0.00	3.06
17.25	0.02	0.00	0.00	0.00	3.06
17.50	0.01	0.00	0.00	0.00	3.06
17.75	0.02	0.00	0.00	0.00	3.07
18.00	0.02	0.00	0.00	0.00	3.08
18.25	0.01	0.00	0.00	0.00	3.08
18.50	0.02	0.00	0.00	0.00	3.08
18.75	0.01	0.00	0.00	0.00	3.09
19.00	0.02	0.00	0.00	0.00	3.09
19.25	0.01	0.00	0.00	0.00	3.09
19.50	0.02	0.00	0.00	0.00	3.10
19.75	0.01	0.00	0.00	0.00	3.10
20.00	0.02	0.00	0.00	0.00	3.10
20.25	0.01	0.00	0.00	0.00	3.11
20.50	0.02	0.00	0.00	0.00	3.11
20.75	0.01	0.00	0.00	0.00	3.11
21.00	0.02	0.00	0.00	0.00	3.12
21.25	0.01	0.00	0.00	0.00	3.12
21.50	0.02	0.00	0.00	0.00	3.12
21.75	0.01	0.00	0.00	0.00	3.13
22.00	0.02	0.00	0.00	0.00	3.13
22.25	0.01	0.00	0.00	0.00	3.13
22.50	0.02	0.01	0.00	0.00	3.13
22.75	0.01	0.00	0.00	0.00	3.14
23.00	0.02	0.01	0.00	0.00	3.14
23.25	0.01	0.00	0.00	0.00	3.14
23.50	0.02	0.01	0.00	0.00	3.15
23.75	0.01	0.00	0.00	0.00	3.15
24.00	0.02	0.01	0.00	0.00	3.15
24.25	0.02	0.01	0.00	0.00	3.18
24.50	0.02	0.01	0.00	0.00	3.20
24.75	0.03	0.01	0.00	0.00	3.24
25.00	0.02	0.01	0.00	0.00	3.26
25.25	0.02	0.01	0.00	0.00	3.25
25.50	0.02	0.01	0.00	0.00	3.24
25.75	0.03	0.01	0.00	0.00	3.28
26.00	0.02	0.01	0.00	0.00	3.29

10.7-152

Rev. 1

EBASCO SERVICES INCORPORATED

BY NAP DATE 5/15/90

CHKD. BY KM DATE 5/16/90

CLIENT FPL

SHEET 20 OF 23

OFS NO. FL07918.017 DEPT. NO. 941

PF

SL

TIME HOURS	INCR RAINFALL INCHES	INCR RUNOFF INCHES	TOTAL DISCHARGE CFS	STORAGE AC-FT	WATER LEVEL FT MSL
26.25	0.02	0.01	0.00	0.00	3.28
26.50	0.02	0.01	0.00	0.00	3.27
26.75	0.02	0.01	0.00	0.00	3.27
27.00	0.03	0.01	0.00	0.00	3.30
27.25	0.02	0.01	0.00	0.00	3.32
27.50	0.02	0.01	0.00	0.00	3.30
27.75	0.02	0.01	0.00	0.00	3.29
28.00	0.03	0.01	0.00	0.00	3.33
28.25	0.02	0.01	0.00	0.00	3.35
28.50	0.02	0.01	0.00	0.00	3.32
28.75	0.02	0.01	0.00	0.00	3.31
29.00	0.02	0.01	0.00	0.00	3.31
29.25	0.03	0.01	0.00	0.00	3.35
29.50	0.02	0.01	0.00	0.00	3.37
29.75	0.02	0.01	0.00	0.00	3.35
30.00	0.02	0.01	0.00	0.00	3.34
30.25	0.02	0.01	0.00	0.00	3.33
30.50	0.03	0.01	0.00	0.01	3.37
30.75	0.02	0.01	0.00	0.00	3.40
31.00	0.02	0.01	0.00	0.00	3.37
31.25	0.02	0.01	0.00	0.00	3.36
31.50	0.03	0.01	0.00	0.01	3.40
31.75	0.02	0.01	0.00	0.00	3.42
32.00	0.02	0.01	0.00	0.00	3.39
32.25	0.02	0.01	0.00	0.00	3.37
32.50	0.02	0.01	0.00	0.00	3.37
32.75	0.03	0.01	0.00	0.01	3.41
33.00	0.02	0.01	0.00	0.00	3.44
33.25	0.02	0.01	0.00	0.00	3.41
33.50	0.02	0.01	0.00	0.00	3.39
33.75	0.03	0.02	0.00	0.01	3.44
34.00	0.02	0.01	0.00	0.00	3.46
34.25	0.02	0.01	0.00	0.00	3.42
34.50	0.02	0.01	0.00	0.00	3.41
34.75	0.02	0.01	0.00	0.00	3.40
35.00	0.03	0.02	0.00	0.01	3.45
35.25	0.02	0.01	0.00	0.00	3.48
35.50	0.02	0.01	0.00	0.00	3.44
35.75	0.02	0.01	0.00	0.00	3.42
36.00	0.02	0.01	0.00	0.00	3.42
36.25	0.03	0.02	0.00	0.01	3.47
36.50	0.02	0.01	0.00	0.00	3.50
36.75	0.02	0.01	0.00	0.00	3.46
37.00	0.02	0.01	0.00	0.00	3.44
37.25	0.03	0.02	0.00	0.01	3.49
37.50	0.02	0.01	0.00	0.00	3.51
37.75	0.02	0.01	0.00	0.00	3.47
38.00	0.02	0.01	0.00	0.00	3.45
38.25	0.02	0.01	0.00	0.00	3.45
38.50	0.03	0.02	0.00	0.01	3.50
38.75	0.02	0.01	0.00	0.00	3.53
39.00	0.02	0.01	0.00	0.00	3.49

581

10.7-153

TIME HOURS	INCR RAINFALL INCHES	INCR RUNOFF INCHES	TOTAL DISCHARGE CFS	STORAGE AC-FT	WATER LEVEL FT MSL
39.25	0.02	0.01	0.00	0.00	3.47
39.50	0.03	0.02	0.00	0.01	3.52
39.75	0.02	0.01	0.00	0.00	3.54
40.00	0.02	0.01	0.00	0.00	3.50
40.25	0.02	0.01	0.00	0.00	3.48
40.50	0.02	0.01	0.00	0.00	3.47
40.75	0.03	0.02	0.00	0.01	3.53
41.00	0.02	0.01	0.00	0.00	3.56
41.25	0.02	0.01	0.00	0.00	3.51
41.50	0.02	0.01	0.00	0.00	3.49
41.75	0.03	0.02	0.00	0.01	3.54
42.00	0.02	0.01	0.00	0.00	3.57
42.25	0.02	0.01	0.00	0.00	3.53
42.50	0.02	0.01	0.00	0.00	3.50
42.75	0.02	0.01	0.00	0.00	3.49
43.00	0.03	0.02	0.00	0.01	3.55
43.25	0.02	0.01	0.00	0.00	3.58
43.50	0.02	0.01	0.00	0.00	3.54
43.75	0.02	0.01	0.00	0.00	3.52
44.00	0.03	0.02	0.00	0.01	3.57
44.25	0.02	0.01	0.00	0.00	3.60
44.50	0.02	0.01	0.00	0.01	3.55
44.75	0.02	0.01	0.00	0.01	3.53
45.00	0.02	0.01	0.00	0.01	3.51
45.25	0.03	0.02	0.00	0.01	3.57
45.50	0.02	0.01	0.00	0.01	3.60
45.75	0.02	0.01	0.00	0.01	3.56
46.00	0.02	0.01	0.00	0.01	3.54
46.25	0.02	0.01	0.00	0.01	3.52
46.50	0.03	0.02	0.00	0.01	3.59
46.75	0.02	0.01	0.00	0.01	3.62
47.00	0.02	0.01	0.00	0.01	3.57
47.25	0.02	0.01	0.00	0.01	3.55
47.50	0.03	0.02	0.00	0.01	3.60
47.75	0.02	0.01	0.00	0.01	3.63
48.00	0.02	0.01	0.00	0.01	3.58
48.25	0.03	0.02	0.00	0.01	3.62
48.50	0.02	0.01	0.00	0.01	3.64
48.75	0.03	0.02	0.00	0.01	3.66
49.00	0.02	0.01	0.00	0.01	3.66
49.25	0.03	0.02	0.00	0.01	3.67
49.50	0.02	0.01	0.00	0.01	3.67
49.75	0.03	0.02	0.00	0.01	3.68
50.00	0.02	0.01	0.00	0.01	3.68
50.25	0.03	0.02	0.00	0.01	3.75
50.50	0.03	0.02	0.00	0.01	3.79
50.75	0.03	0.02	0.00	0.01	3.81
51.00	0.03	0.02	0.00	0.01	3.82
51.25	0.03	0.02	0.00	0.01	3.83
51.50	0.03	0.02	0.00	0.01	3.83
51.75	0.03	0.02	0.00	0.01	3.91
52.00	0.04	0.03	0.00	0.01	

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EBASCO SERVICES INCORPORATED

BY NCP DATE 5/15/90

CHKD. BY KM DATE 5/16/90

CLIENT FPL

TIME HOURS	INCR RAINFALL INCHES	INCR RUNOFF INCHES	TOTAL DISCHARGE CFS	STORAGE AC-FT	WATER LEVEL FT MSL
52.25	0.04	0.03	0.00	0.01	3.96
52.50	0.04	0.03	0.00	0.01	3.99
52.75	0.05	0.04	0.00	0.01	4.01
53.00	0.04	0.03	0.00	0.01	4.02
53.25	0.05	0.04	0.00	0.01	4.02
53.50	0.06	0.04	0.00	0.01	4.03
53.75	0.07	0.05	0.00	0.02	4.04
54.00	0.05	0.04	0.00	0.01	4.05
54.25	0.07	0.05	0.00	0.02	4.05
54.50	0.07	0.05	0.00	0.02	4.06
54.75	0.08	0.06	0.00	0.02	4.07
55.00	0.07	0.05	0.00	0.02	4.08
55.25	0.08	0.06	0.00	0.02	4.08
55.50	0.08	0.06	0.00	0.02	4.09
55.75	0.08	0.06	0.00	0.02	4.10
56.00	0.09	0.07	0.00	0.02	4.11
56.25	0.09	0.07	0.00	0.02	4.12
56.50	0.09	0.07	0.00	0.02	4.13
56.75	0.10	0.08	0.00	0.03	4.14
57.00	0.10	0.08	0.00	0.03	4.15
57.25	0.11	0.09	0.00	0.03	4.17
57.50	0.11	0.09	0.00	0.03	4.18
57.75	0.12	0.10	0.00	0.04	4.20
58.00	0.12	0.10	0.00	0.04	4.22
58.25	0.13	0.11	0.00	0.04	4.23
58.50	0.13	0.11	0.00	0.04	4.25
58.75	0.18	0.14	0.00	0.05	4.29
59.00	0.18	0.14	0.00	0.05	4.34
59.25	0.28	0.23	0.00	0.08	4.44
59.50	0.27	0.23	0.00	0.08	4.56
59.75	1.86	1.60	0.00	0.59	4.89
60.00	1.85	1.66	0.00	0.61	5.20
60.25	0.41	0.37	0.00	0.14	5.24
60.50	0.40	0.36	0.00	0.13	5.13
60.75	0.21	0.19	0.00	0.07	4.98
61.00	0.21	0.19	0.00	0.07	4.77
61.25	0.15	0.14	0.00	0.05	4.62
61.50	0.15	0.14	0.00	0.05	4.50
61.75	0.13	0.12	0.00	0.05	4.43
62.00	0.12	0.11	0.00	0.04	4.37
62.25	0.10	0.09	0.00	0.03	4.31
62.50	0.09	0.08	0.00	0.03	4.26
62.75	0.09	0.08	0.00	0.03	4.22
63.00	0.08	0.07	0.00	0.03	4.19
63.25	0.09	0.08	0.00	0.03	4.18
63.50	0.08	0.07	0.00	0.03	4.17
63.75	0.09	0.08	0.00	0.03	4.17
64.00	0.08	0.07	0.00	0.03	4.17
64.25	0.04	0.04	0.00	0.02	4.13
64.50	0.06	0.05	0.00	0.02	4.10
64.75	0.05	0.05	0.00	0.02	4.09
65.00	0.04	0.04	0.00	0.02	4.08

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Rev. 1 BY NAP DATE 5/15/90

CHKD. BY KM DATE 5/16/90

SHEET 23 OF 23

OFS NO. FL07918.017 DEPT. NO. 941

CLIENT FPL

PROJECT PFLR

SUBJECT Sub-Basin 2 Drainage

TIME HOURS	INCR RAINFALL INCHES	INCR RUNOFF INCHES	TOTAL DISCHARGE CFS	STORAGE AC-FT	WATER LEVEL FT MSL
65.25	0.06	0.05	0.00	0.02	4.07
65.50	0.04	0.04	0.00	0.02	4.07
65.75	0.05	0.05	0.00	0.02	4.07
66.00	0.04	0.04	0.00	0.02	4.07
66.25	0.06	0.05	0.00	0.02	4.07
66.50	0.04	0.04	0.00	0.02	4.07
66.75	0.06	0.05	0.00	0.02	4.07
67.00	0.04	0.04	0.00	0.02	4.07
67.25	0.06	0.05	0.00	0.02	4.07
67.50	0.04	0.04	0.00	0.02	4.07
67.75	0.06	0.05	0.00	0.02	4.07
68.00	0.04	0.04	0.00	0.02	4.07
68.25	0.03	0.03	0.00	0.01	4.05
68.50	0.03	0.03	0.00	0.01	4.03
68.75	0.03	0.03	0.00	0.01	4.02
69.00	0.03	0.03	0.00	0.01	4.02
69.25	0.03	0.03	0.00	0.01	4.02
69.50	0.03	0.03	0.00	0.01	4.01
69.75	0.03	0.03	0.00	0.01	4.01
70.00	0.03	0.03	0.00	0.01	4.01
70.25	0.03	0.03	0.00	0.01	4.01
70.50	0.03	0.03	0.00	0.01	4.01
70.75	0.03	0.03	0.00	0.01	4.01
71.00	0.03	0.03	0.00	0.01	4.01
71.25	0.03	0.03	0.00	0.01	4.01
71.50	0.03	0.03	0.00	0.01	4.01
71.75	0.03	0.03	0.00	0.01	4.01
72.00	0.03	0.03	0.00	0.01	4.01

Calc 60

EBASCO SERVICES INCORPORATED

Rev. 1

BY HAF DATE 5/17/90 SHEET 1 OF 20

CHKD. BY KM DATE 6/4/90 OFS NO. FL07912.017 DEPT. NO. 941

CLIENT FPL

PROJECT PFLR

SUBJECT Drainage - Sub-Basin 3 / Existing

Sub-Basin 3, after Repowering (see Calc 57, p 6), will cover the same area as the following existing Sub-basins:

III	VIII	XIV
IV	IX	IX
V	X	XX
VI	XI	
VII	XII (partial)	XIII

The following calculation will composite the above into one sub-basin which is the existing version of the proposed sub-basin 3

III for layout, see page 2

Elevation	Area - Acres	ΔA
5	.306	.306
6	.510	.204
7	.793	.283

of this 6 & below is pervious

.510 = pervious => 64%

.283 = impervious => 36%

.793

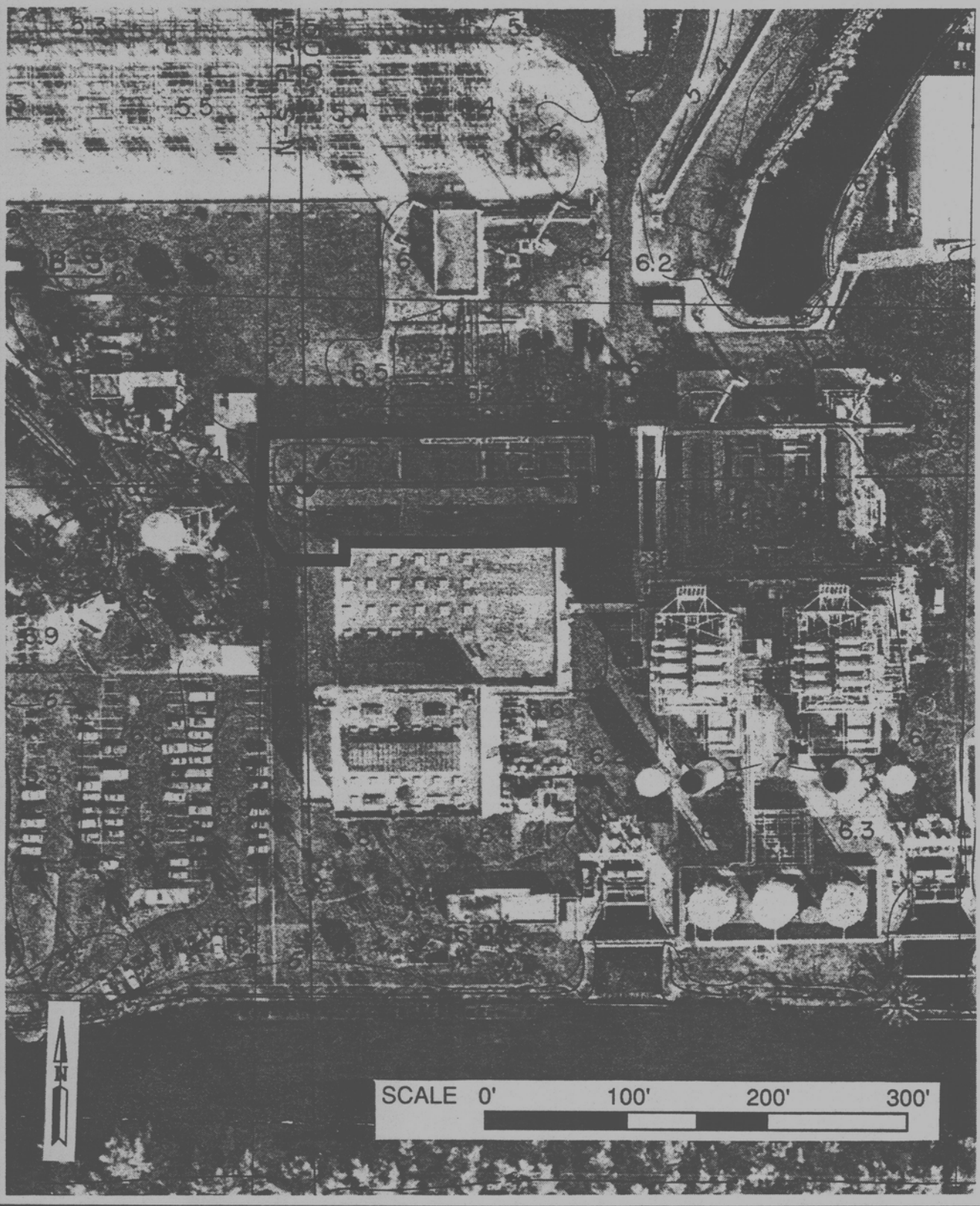
Water management area = storage = 0.510 acres

Note: when runoff begins, pumps from S-10 will remove at 570 gpm = 1.27 cfs

ref D.N. 5096-ME-1

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Rev. 1



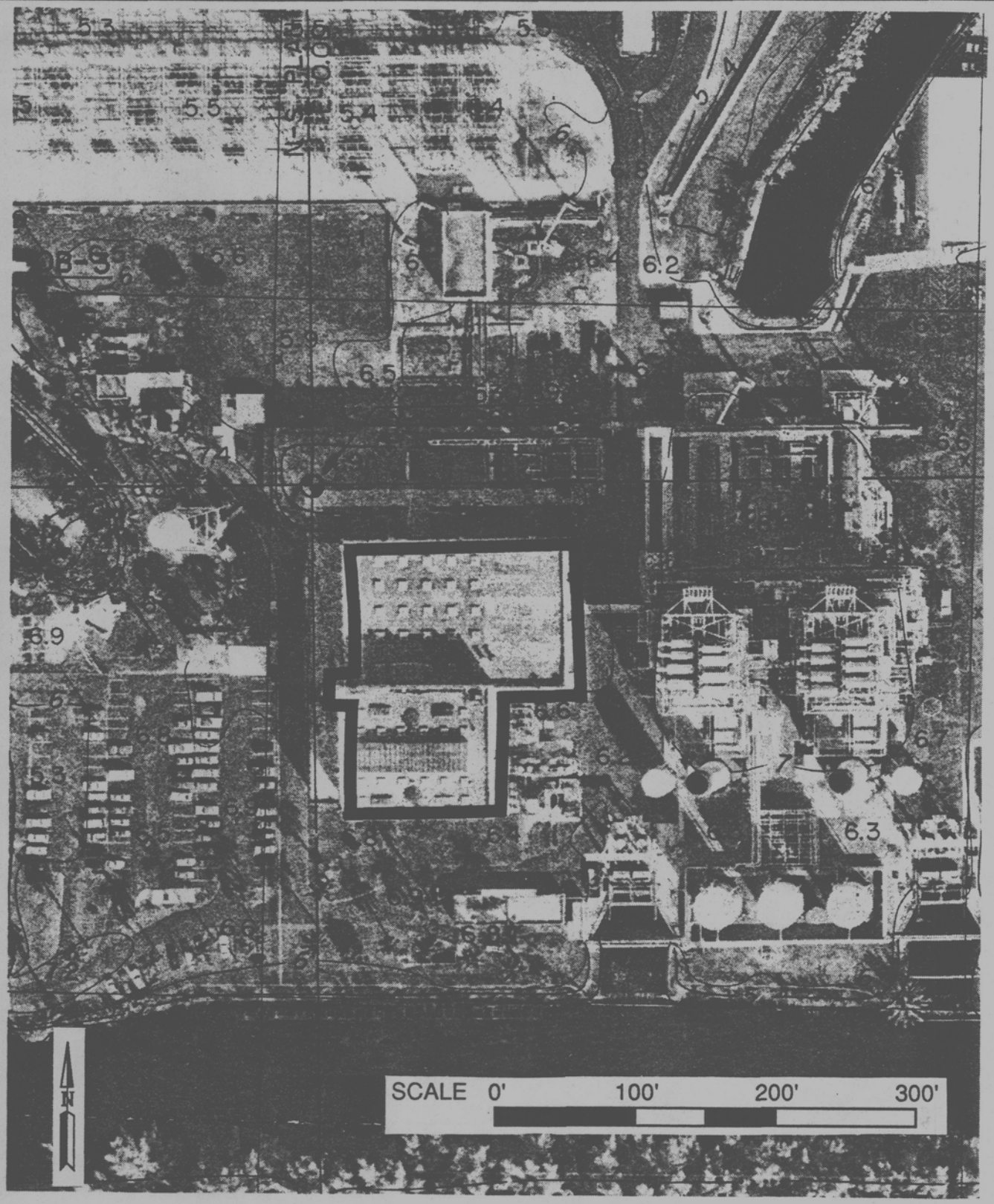
SUB-BASIN III

Lauderdale
Repowering
Project

FPL

10-7-158

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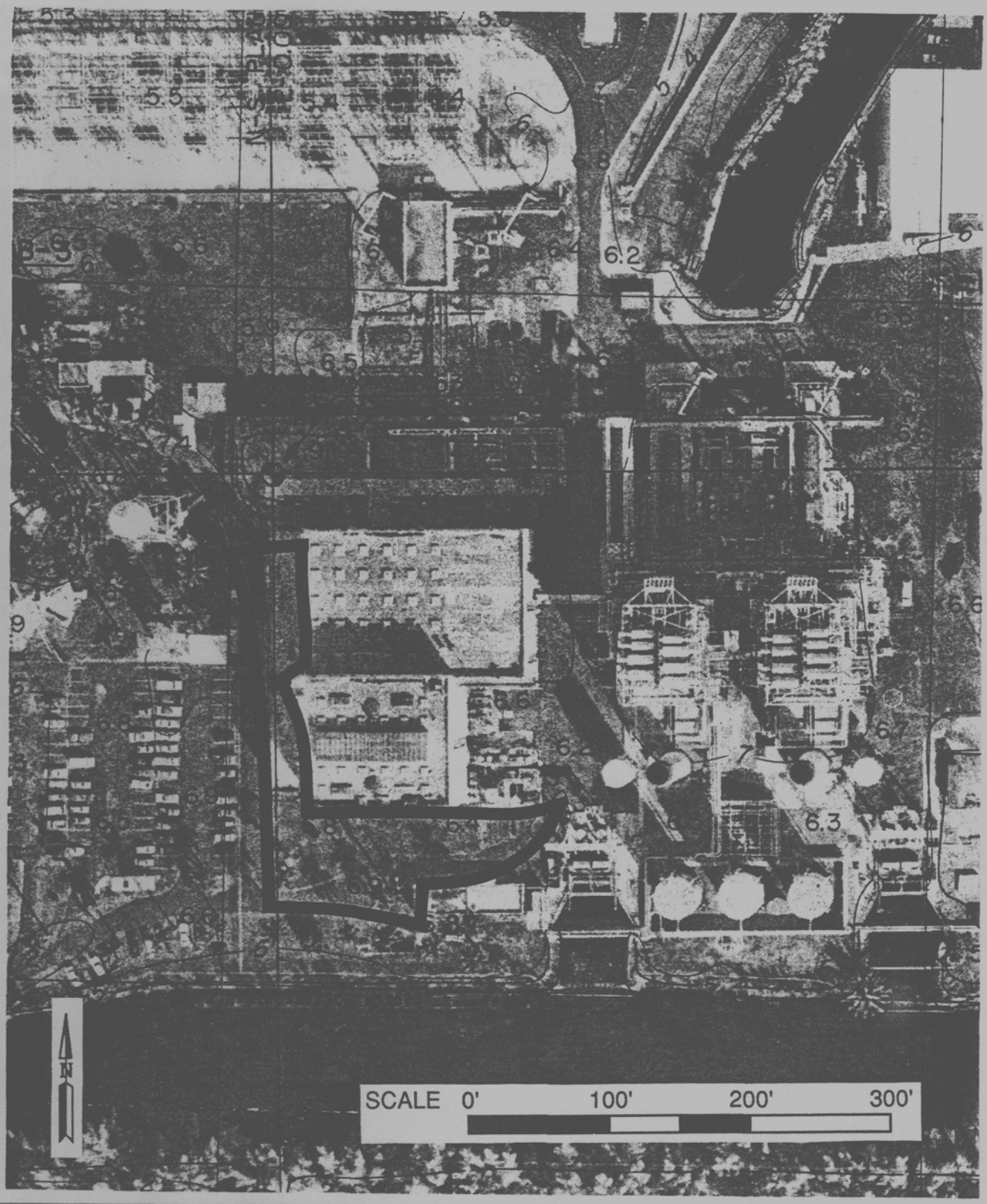
SUB-BASIN IV

Lauderdale
Repowering
Project

FPL

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Rev. 1



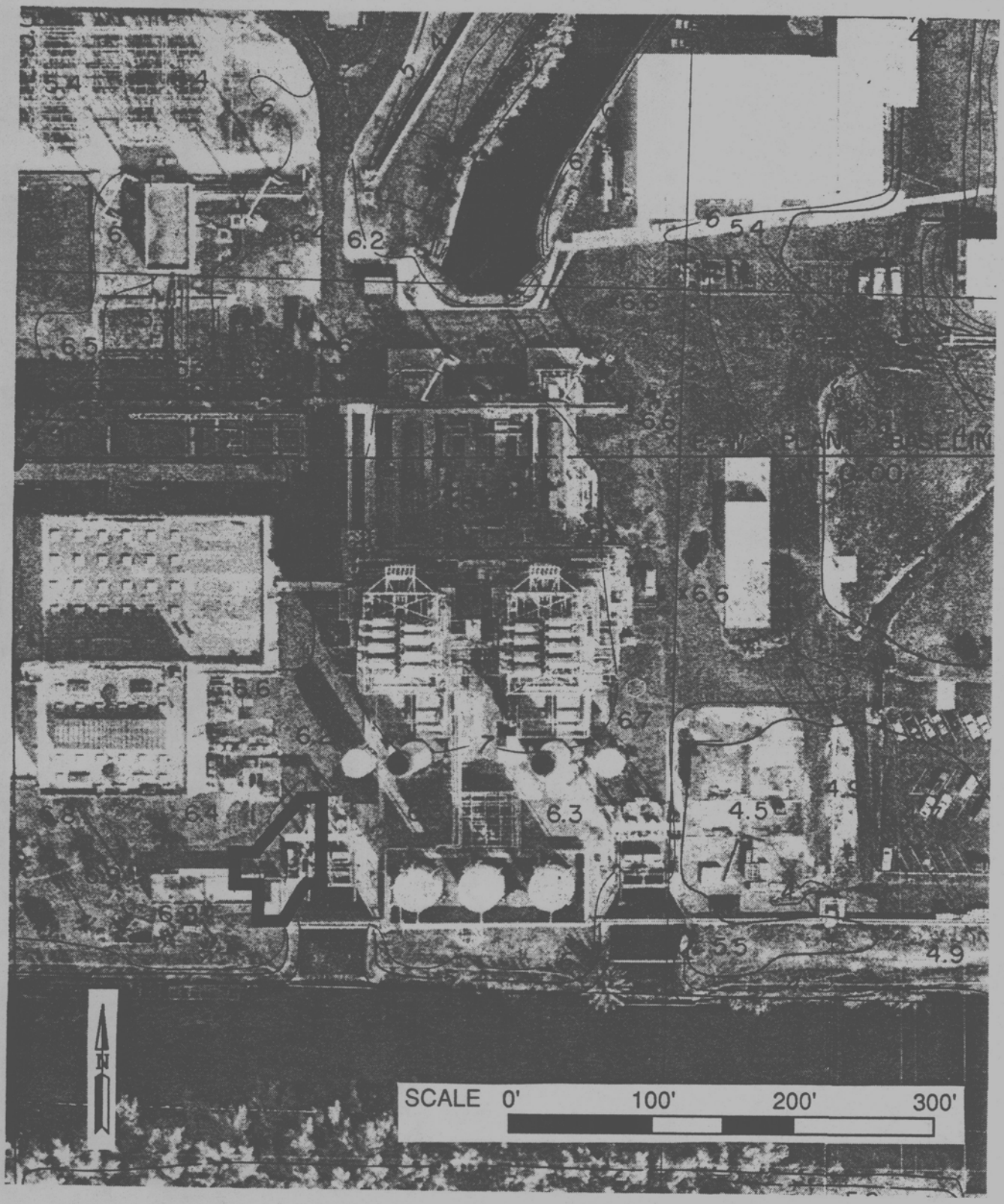
SUB-BASIN V

Lauderdale
Repowering
Project

FPL

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Rev. 1

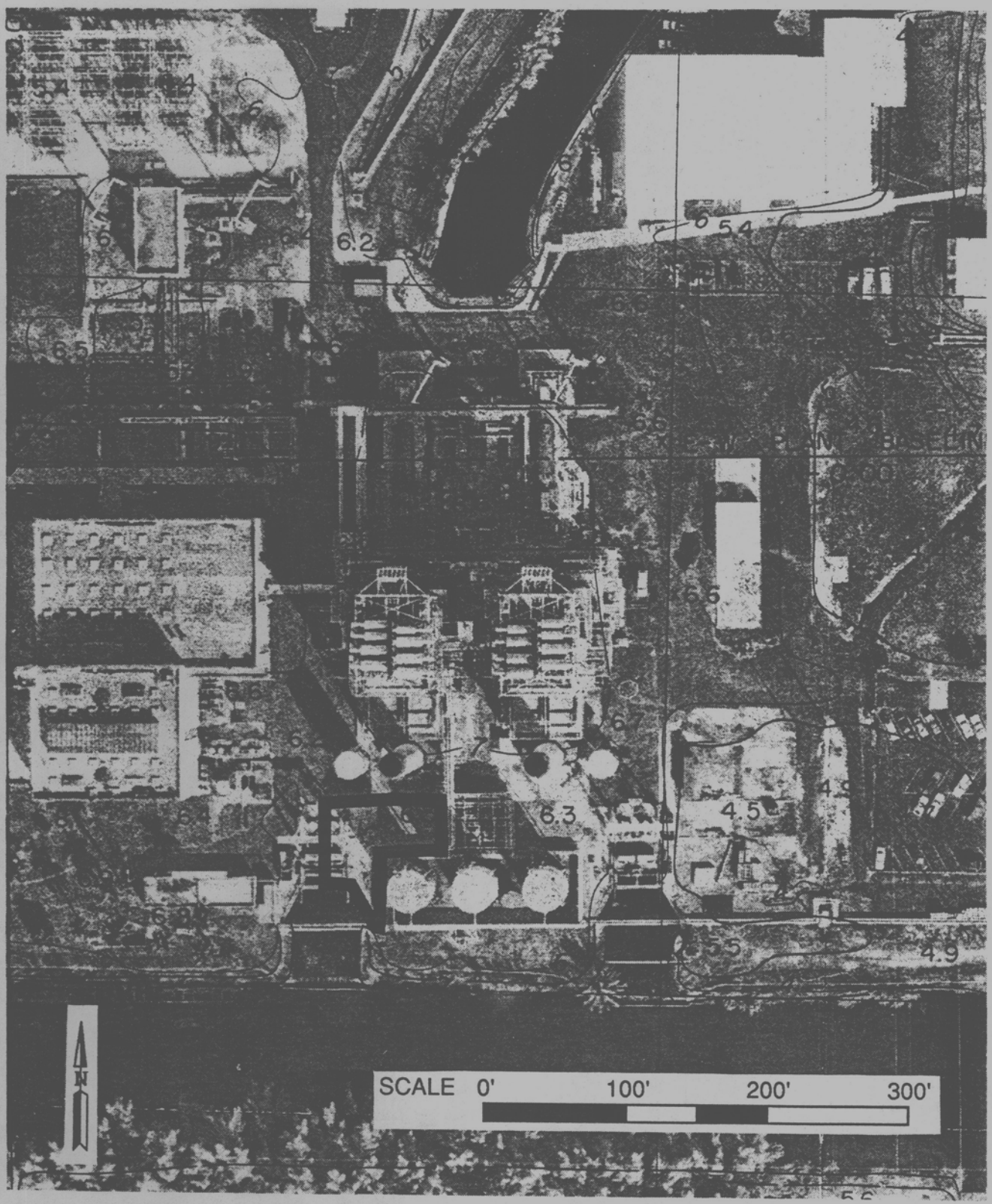


SUB-BASIN VI

Lauderdale
Repowering
Project

FPL

Rev.1



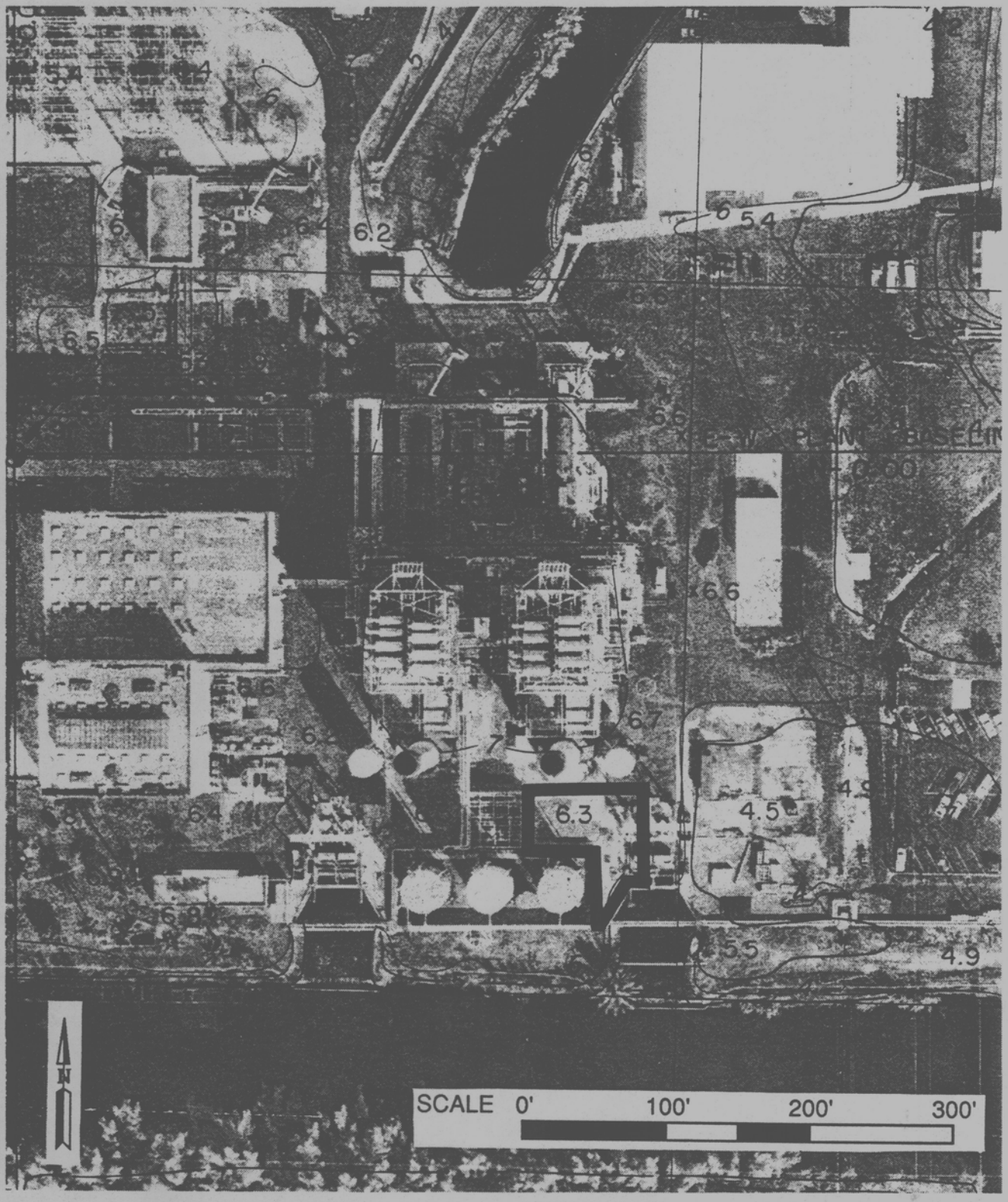
SUB-BASIN VII

Lauderdale
Repowering
Project

FPL

10.7-162

Rev. 1



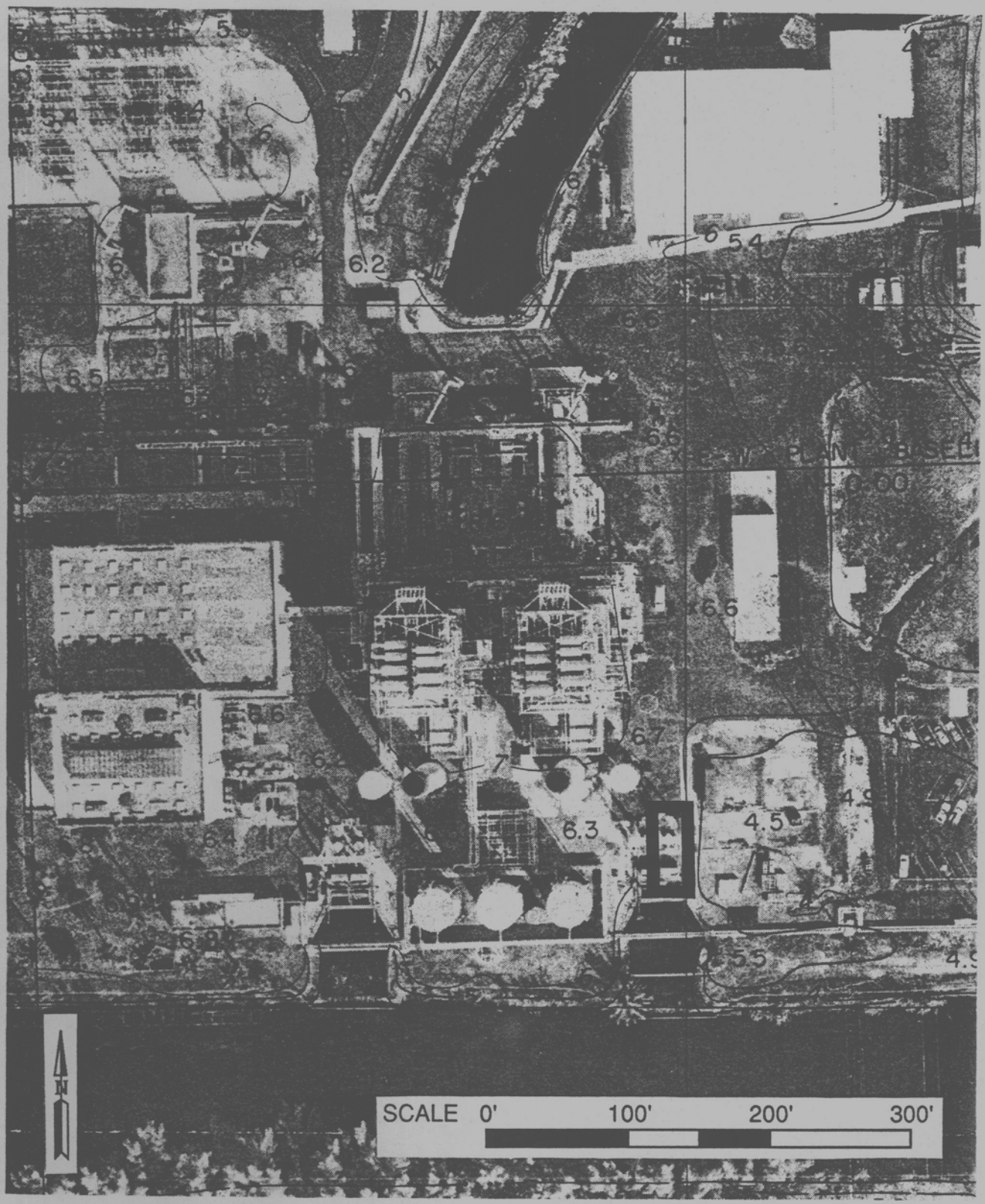
SUB-BASIN IX

Lauderdale
Repowering
Project

FPL

10.7-163

Rev. 1



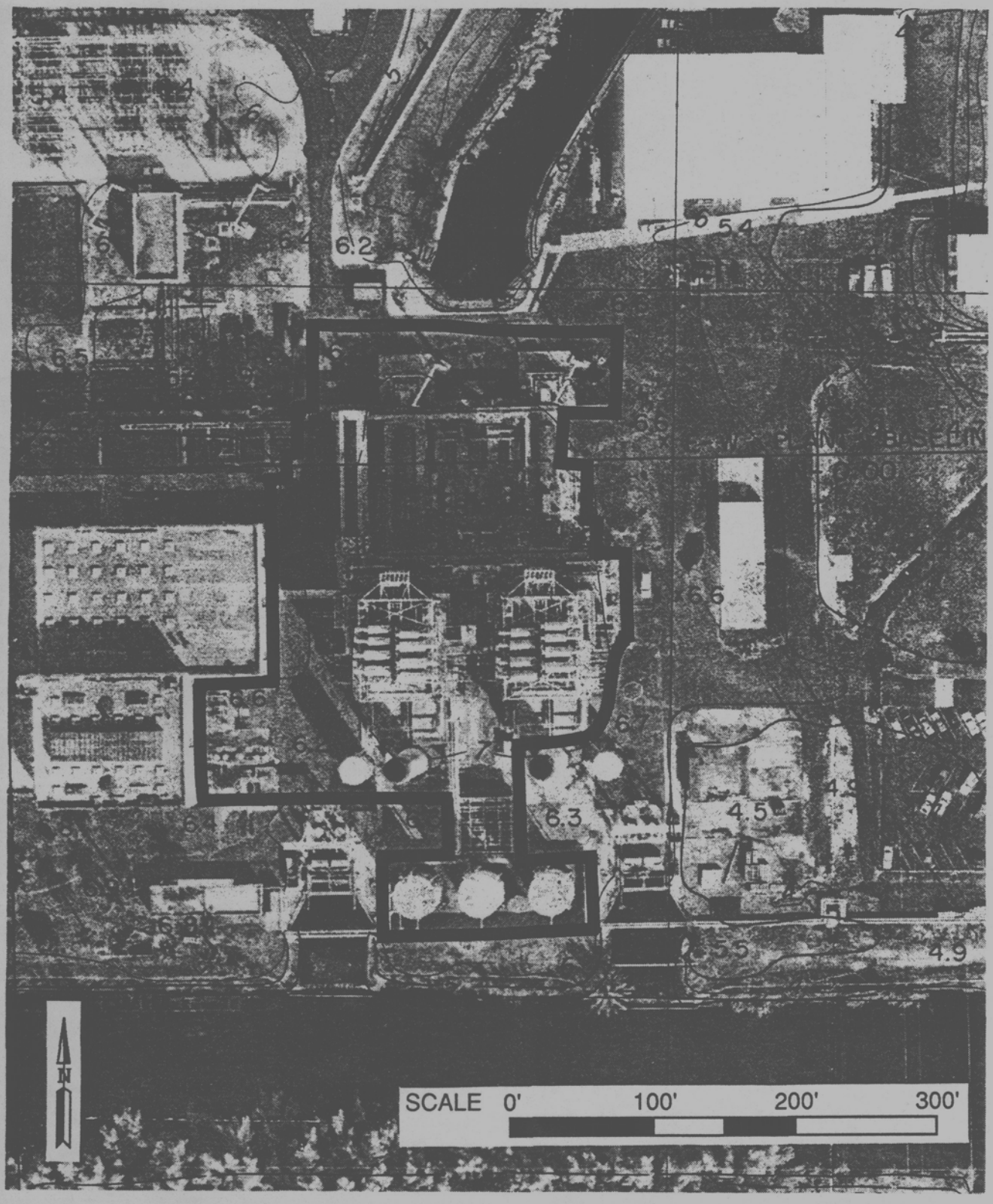
SUB-BASIN X

Lauderdale
Repowering
Project

FPL

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Rev. 1



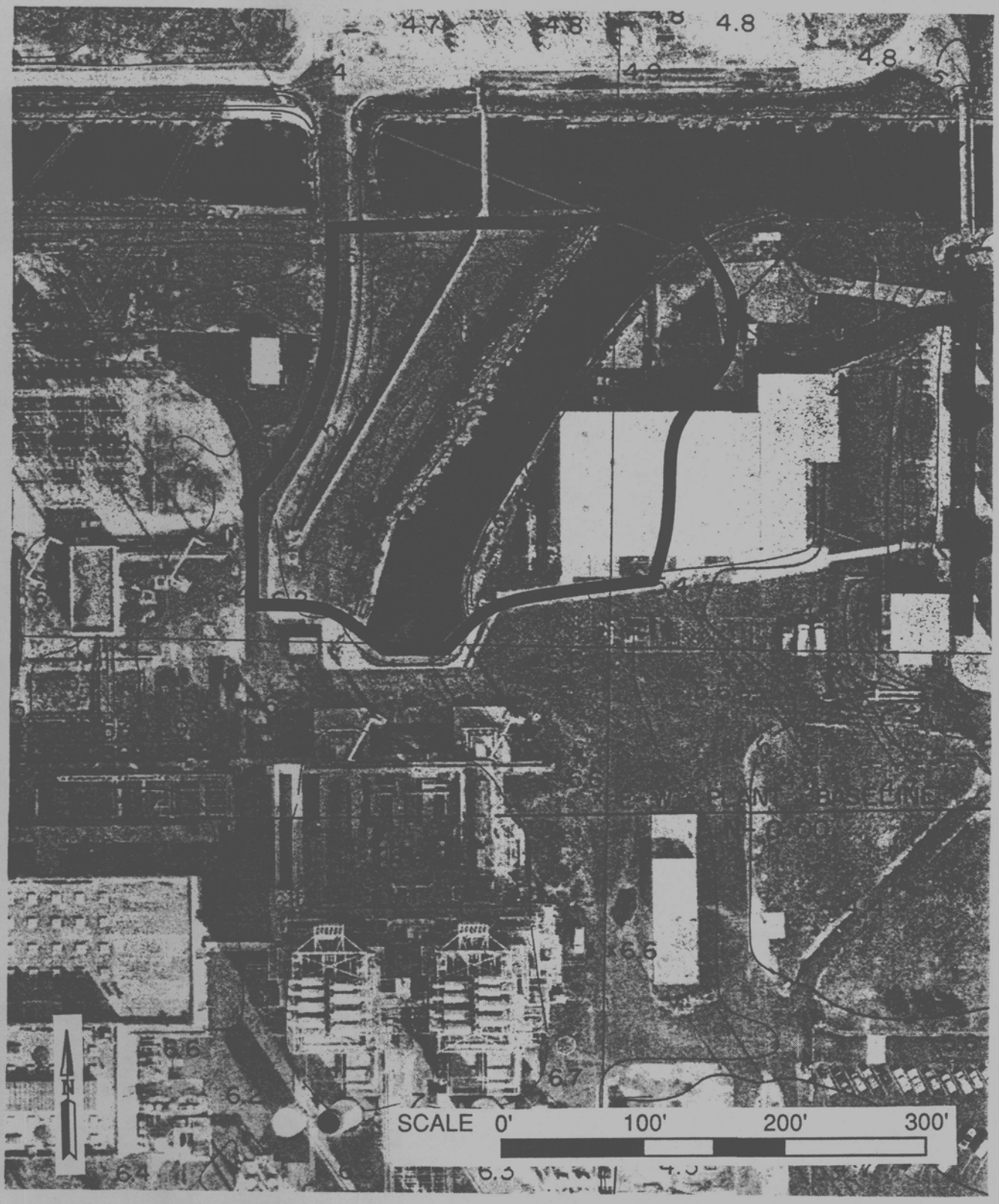
SUB-BASIN VIII

Lauderdale
Repowering
Project

FPL

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Rev. 1



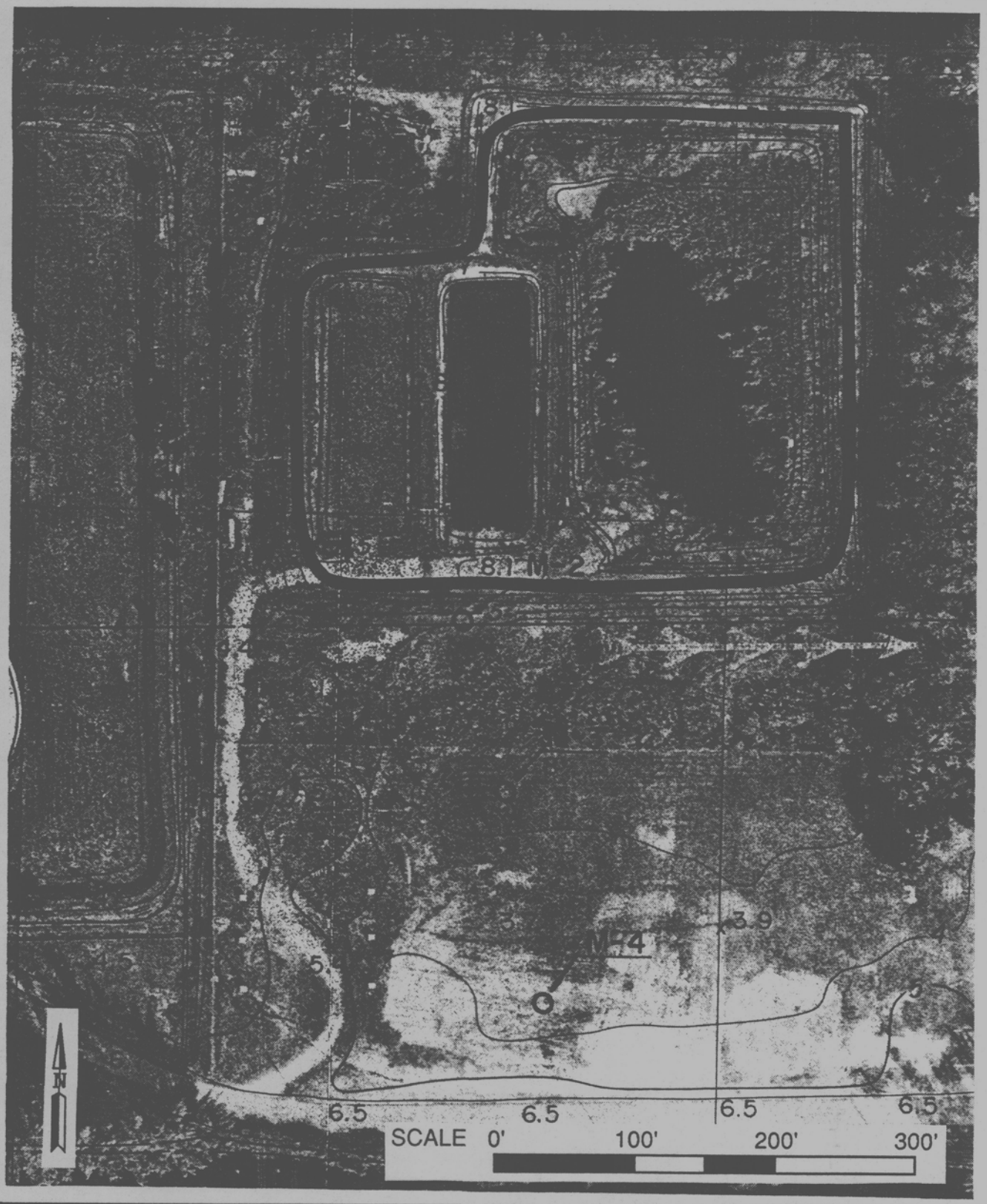
SUB-BASIN XI

Lauderdale
Repowering
Project

FPL

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Rev. 1



SUB-BASIN XX

Lauderdale
Repowering
Project

FPL

10.7-167

Rev. 1

EBASCO SERVICES INCORPORATED

Calc 60

BY NCF DATE 5/17/90

CHKD. BY KM DATE 6/4/90

SHEET 7 OF 20

OFS NO. FLO7918.017 DEPT. NO. 941

CLIENT FPL

PROJECT PFLR

SUBJECT Drainage - Sub Basin 3 / Existing

From page C-III + 1 | high ground water table
x +3 per p. 5
Calc 58

EQ	Area		(compacted)	Ac-Inches storage
5	.306	*	1.88 =	.575
6	.204	*	4.95 =	1,010
7	.283	*	8.18 =	2,315
				3,900

$\frac{3.90 \text{ Ac-inches}}{.793 \text{ Acres}} = 4.92$ inches

4.92 inches * .64 = 3.15 inches pervious

Do Flood Routing Program (see Calc 59)

first - without pumping out of sump

shows no runoff, can ignore this area (program FLOOD3.BAS)

III Layout shown on page 3

This is the roof of the Admin Bldg it drains to a sump in the building basements which is then pumped out to the stub canal

Area = 0.78 acres

100% impervious => $\frac{15}{12}$" * .78 = 0.98 Ac-ft

of 317,683 gallons

per DV 5086-1 ME-1, sump pumps run at 1200 gpm

$\frac{317683}{1200} = 265$ minutes or 4.4 hours

1200 gpm = 2.7 cfs

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EBASCO SERVICES INCORPORATED

Rev. 1 BY NDR DATE 5/17/90

CHKD. BY KM DATE 6/4/90

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OFS NO. FLO 7918.017 DEPT. NO. 941

CLIENT FPL

PROJECT PFLR

SUBJECT Drainage - Sub Basin 3 / Existing

Area V

small area west and South of Area IV - part has storage

El	Area	ΔA	
5	.075	.075	previous
6	(.183)	.108	previous
6½	.278	(.095)	impervious

Area not contributing to Storage = 0.205 Acres for 5

El			
5	.075 * 1.88 =	.141	
6	.108 * 4.95 =	.535	
		.676	

$\frac{.676}{.278}$ $\frac{\text{in-acres}}{\text{acres}}$ = 2.43 inches

Per flood routing program (FLOOD5.BAS)

Peak runoff = 1.5 cfs - overland flow

Peak Stage in Storage = 5 ft MSL

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EBASCO SERVICES INCORPORATED

Calc 60

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CLIENT FPL

PROJECT PFLR

SUBJECT Drainage - SubBasin 3 / Existing

VI, VII, IX and X

for layout, see page 4

These are the 4 minute reach around the circulating water Intake Structure

Each has a bottom El of 6.2 (DN 2291-C-24G) and can store up to El 7

Each is drained by an 8" ϕ x 9' pipe

Pipe Capacity per C-IV of manual

for N = 0.8 ft

$H_v = (1)\, v^2/2g$

$H_f = \left(\frac{29\, n^2 L}{R^{4/3}}\right) \frac{v^2}{2g}$

$H_e = 0.5$

for $H = k\,\frac{v^2}{2g}$

$k = 1 + 0.5 + \frac{29(.012^2 \times 9')}{(1/3)^{4/3}} = 1.66$

(assume n = .012)

@ H = 0.8

$.8 = \frac{1.66\ v^2}{32.2 \times 2}$

$v^2 = 32.2 \Rightarrow v = 5.68$ ft/sec

$Q = vA = 5.68 * \pi * (1/3)^2 = 1.98$ cfs

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EBASCO SERVICES INCORPORATED

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CLIENT FPL

PROJECT PFLR

SUBJECT Drainage - SubBasin 3

Area for each Basin

Basin	Area + Ac	Peak Flow	Peak El
VI	.131	.03 cfs	6.22 ft
VII	.201	.04	6.23
IX	.126	.02	6.22
X	.059	.02	6.21
		Total = .11	

Flood routing each basin (FLOOD 6, 7, 9, 10 .BAS)

@ S = 0

$Rf = A * \sqrt{2 * 32.2 * H / 1.66} = \sqrt{38.8H} * .035$

CEL = 6.2

AD 6.2 = A @ 7.0

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CLIENT FPL

PROJECT PFLR

SUBJECT Drainage - SubBasin 3/Existing

VIII This area is the existing Units 4 & 5 boiler and steam turbine - generation area

It is all flat at EL between 7 and 8 and is all impervious and all drained by sump pumps

Area = 1.314 Acres

Sump pump rate (using S-2 to the soil) is 570 gpm from S-10 & 250 gpm from S-11 (see DW 5586-ME-1)

or 820 gpm = 1.83 cfs

Per flood routing of Basins VI, VII, IX and X, peak intensity on a completely impervious area is 1.86 inches in 15 min

$$\frac{1.86'' \times 1.314 \text{ Acres}}{15 \text{ min}} = .163 \text{ in-acres/min}$$

$$.163 \text{ in acres} \times \frac{43560}{12} \times \frac{1}{60} = 9.9 \text{ cfs}$$

Need to perform flood-route

Set discharge = 1.83 cfs or less, depending on inflow

Results - peak discharge is 8 cfs for 30 minutes (see F4008.865)

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CLIENT FPL

PROJECT PFLR

SUBJECT Drainage - SubBasin 3 / Existing

Sub-Basin XT

Area around west end of discharge Canal has some storage - see page 6 for layout

El	Total Volume	As	Ad	Total Acres	Incr Volume
3	0	.030	—	0.030	0
4	0.141	.252	—	0.252	0.141
5	0.862	.632	.558	1.190	0.721
6	2.233	—	1.551	1.551	1.371
7	3.892	—	1.766	1.766	1.659

of El 7, impervious =

GT Repair Shop — .163

pavement — .249

.412

impervious = .412 => 23%

pervious = 1.354 => 77%

surface water management = 0.632 acres

to calculate S

El	Area	Incr. Area		Storage factor	acre-inches/storage
3	.03	.03	*	0	0
4	.252	.222	*	.45	0.100
5	1.190	.938	*	1.88	1.763
6	1.551	.361	*	4.95	1.787
7	1.766	.215	*	8.18	1.759
					5.409

$\frac{5.409 \text{ in-acres}}{1.766 \text{ acres}} = 3.063 \text{ in}$

3.063 in * .77 = 2.36" pervious

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CLIENT FPL

PROJECT FPLR

SUBJECT Drainage - SubBasin 3 / Existing

for flood-routing, see FLOOD11.BAS

Peak flow = 9.5 cfs, storage basin is full to EL 4.03

for purposes of simplification, summarize

Sub Basin	Peak Discharge to Dams	Peak Discharge to Cooling Pond
III	—	—
IV	—	2.7
V	1.5	—
VI	.03	—
VII	.04	—
VIII	—	8
IX	.07	—
X	.02	—
XI	—	9.5
I	78	—
II	—	—
Total	79.61	

↑ pre-existing

for simplicity, let us disregard sub-basins that do not contribute to the cooling pond

This leaves IV, VIII, XI and XII, XIV, IX

IV can be ignored as a roof-only drain, need to re-route directly to the pond

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10.7-174

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CLIENT FPL

PROJECT PFLR

SUBJECT Drainage - SubBasin 3 / Existing

Note: XX will add pervious & have no discharge

Let us assume Basin 3 includes:

XIII, VIII, X, XII, XIV and XIX

Redo as one basin; see layout on page 15

Stage vs Storage

El &	Area drains to storage	Area drains to discharge	Δ Storage	Δ drainage
4	0	1.587 (P)		
5	1.309 (P) + .661 (Imp) (1.970)	2.804 (P)	1.970	1.217
6	3.640	4.416 (P)	1.670	1.612
7	5.295	6.479 (P)	1.655	2.063
8 & above (is only GT 1-12 area)	0	9.611	0	3.132

Total 5.295 + 9.611 = 14.906

	Storage	Drainage Duct	Total
Pervious	1.309	6.479	7.788
Impervious	3.986	3.132	7.118
	5.295 - 1.309 =		14.906

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BY NDF 5/19

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CLIENT

PROJECT

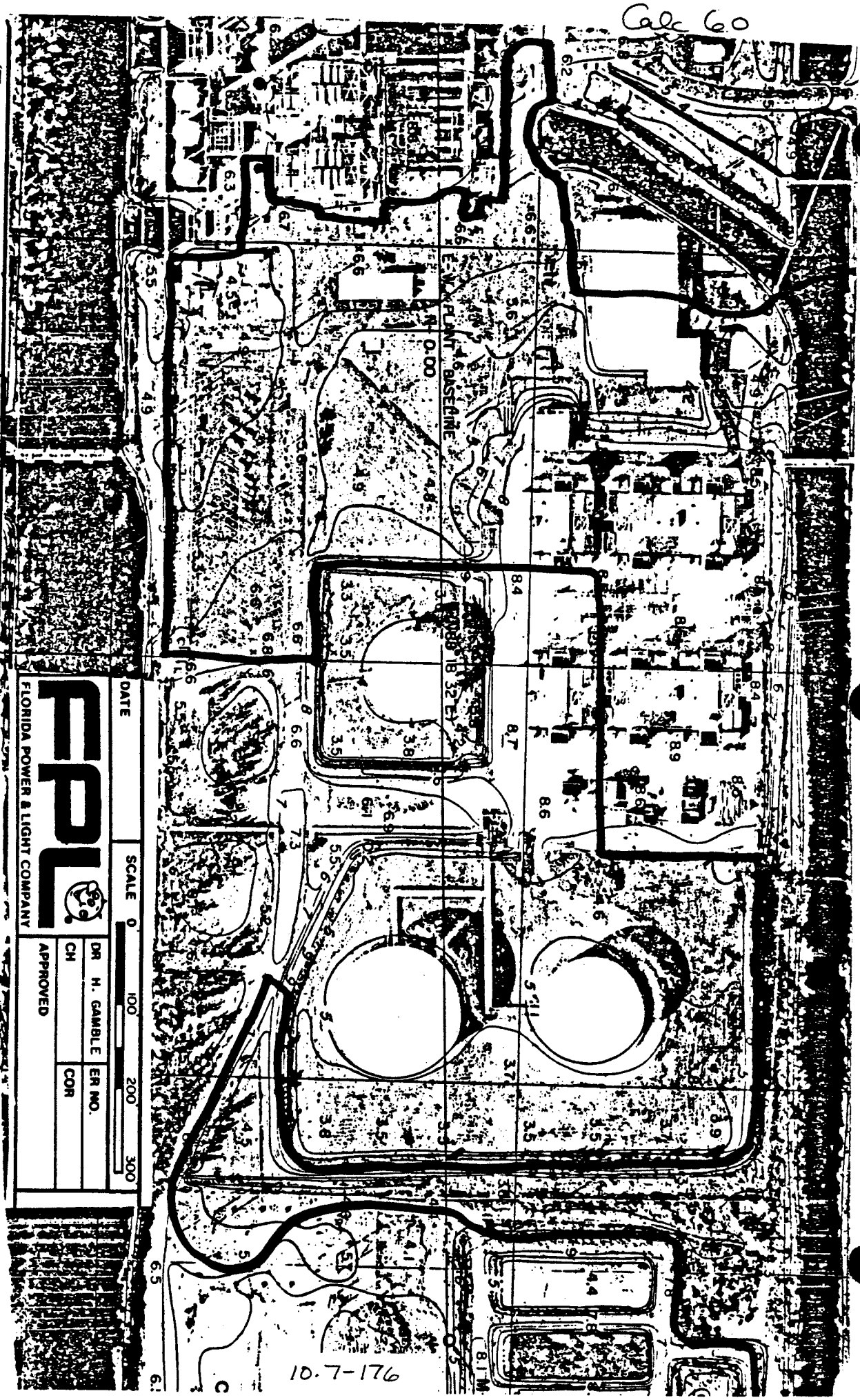
SUBJECT

page 15 of 20

N

New Basin for 3

Calc 60



10.7-176

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thus, for this basin

$\frac{7.788}{14.906} = .522$ or 52% pervious

thus 48% impervious

To calculate Storage S

EQ	Incremental Area	*	Storage Factor	Storage in acres
4	1.587	*	0.45	.714
5	3.187	*	1.88	5.992
6	3.282	*	4.95	16.246
7	3.718	*	8.18	30.413
8	3.132	*	8.18	25.620
				78.985

$\frac{78.985 \text{ inch-acres}}{14.906 \text{ acres}} = 5.299 \text{ inches}$

$5.299 * 0.52 = 2.755 = S$ (pervious)

Perform flood routing using program

FLOOD3RA.BAS

Storage in Water Management Area
(end-average area method)

El	Area	Incr. Volume	Cum Volume
4	0	0	0
5	1.970	.985	0.985
6	3.640	2.805	3.790
7	5.295	4.468	8.258
8	0	0	

Discharge from Storage Area

Per Ebasco Drawing No. 7918-C-M-378

is via a 12" ϕ 20 feet long steel pipe ; assume is horizontal with invert at EL 4.2 (per un-numbered FPL drawing)

for flood routing, assume control elevation = 4.2 + 1 and ignore discharge unless culvert flows full under inlet control

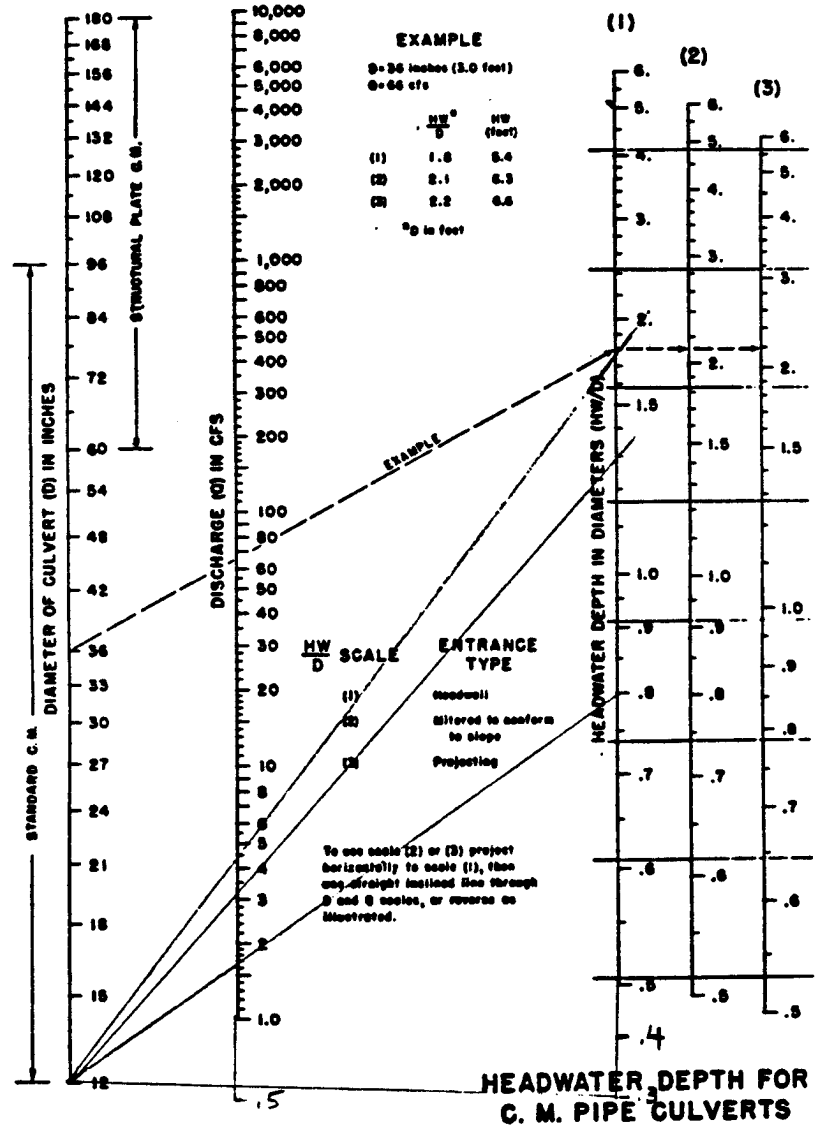
per page C-IV-6 for round pipe, develop Q vs H table (see p 18 for chart)

(See p 19 for H vs Q)

Based on p 19, use linear approximation at, Q = 4.5 when H = 1.8

Q = K H , K = 4.5/1.8 = 2.5

CHART 5



HEADWATER DEPTH FOR C. M. PIPE CULVERTS WITH INLET CONTROL

Figure C-IV-6

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Calc 60

EBASCO SERVICES INCORPORATED

BY NDP DATE 5/19/90

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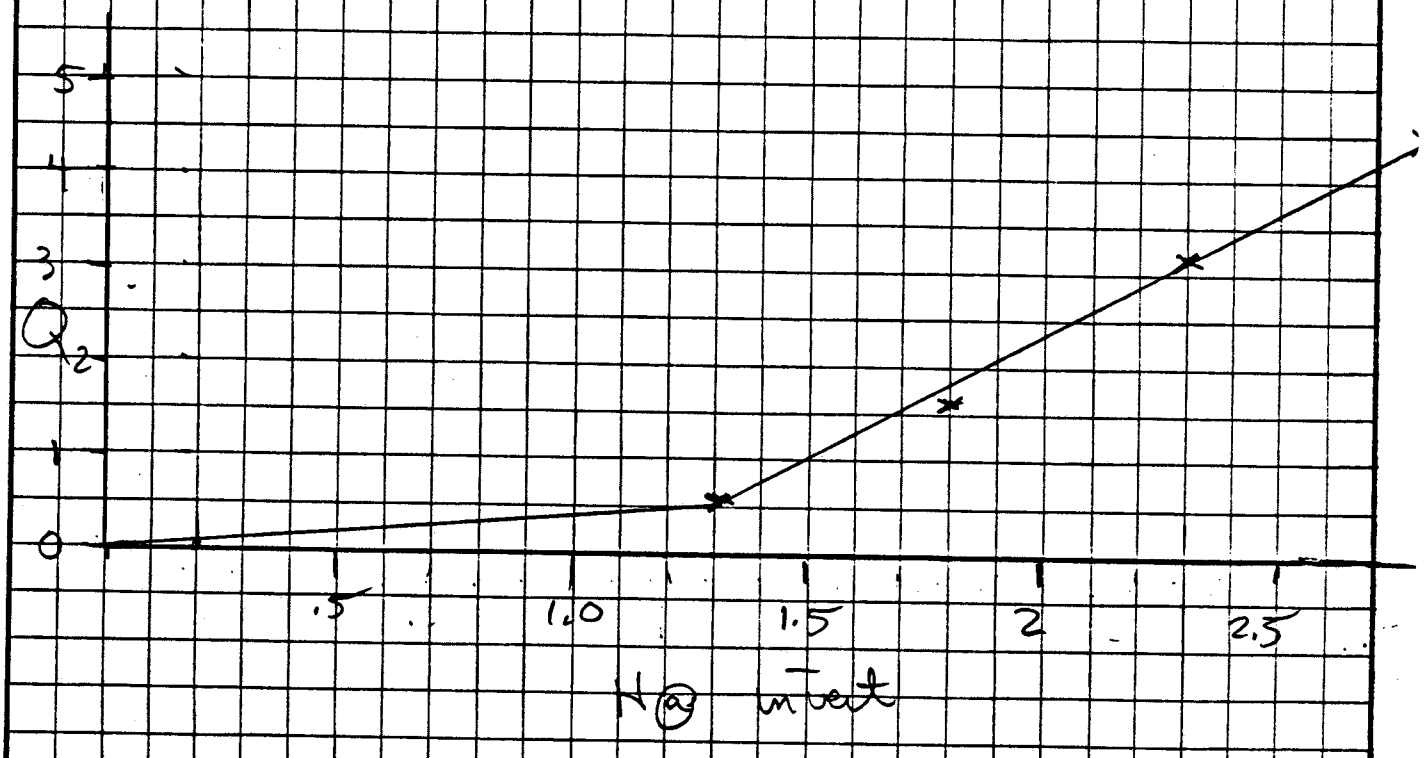
PROJECT PFLR

SUBJECT Drainage - Sub Basin 3 / Existing

per Chart page 18

El	H for inlet control	Q cfs	H for invert
4	-1.2	0	-.2
5	-0.2	0	+.8
5 1/2	0.3	0.55	1.3
6	0.8	1.6	1.8
6 1/2	1.3	3.2	2.3
7	1.8	4.5	2.8

Plot Q vs H for invert



let us use a 2-stage linear curve-fit depending whether H is about 1.3 or not

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EBASCO SERVICES INCORPORATED

Calc 60

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PROJECT PFLR

SUBJECT Drainage - Sub Basin 3 / Existing

Summary of Flood-Routing

Max flow = 684 cfs

Max water level in Stage = 4.91 ft MSL

Total Runoff = 12.09 inches

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EBASCO SERVICES INCORPORATED

Calc 68

BY HAP DATE 5/19/90

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SHEET 1 OF 4

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CLIENT FPL

PROJECT PFLR

SUBJECT Existing Drainage - Sub-Basin 4

This area will be the Power Block
At this time, it includes a portion
of Basin XII which which was included
in Calc 60, all of Basin XIII which
was also included in Calc 60, and
Basin XVI, which is shown on page 2

Basin XVI is the area of the proposed
percolation pond; its existing runoff is
overland to the Dania Cutoff Canal

Because this area is small (about 2.5 acres)
and highly pervious (about 2.3 acres or 92%),
soil storage is high - nearly the entire area
is at El +6

$$\text{Soil Storage} = 2.5 * .92 \times 4.95 = 11.39 \text{ inches}$$

$$\text{Total Runoff} = \frac{(14.95 - 11.39 * .2)^2}{(14.95 + .8 * 11.39)} = 6.67 \text{ inches}$$

$$6.67 \text{ inches} \times \frac{2.5 \text{ acres}}{12} = 1.39 \text{ acre-ft}$$

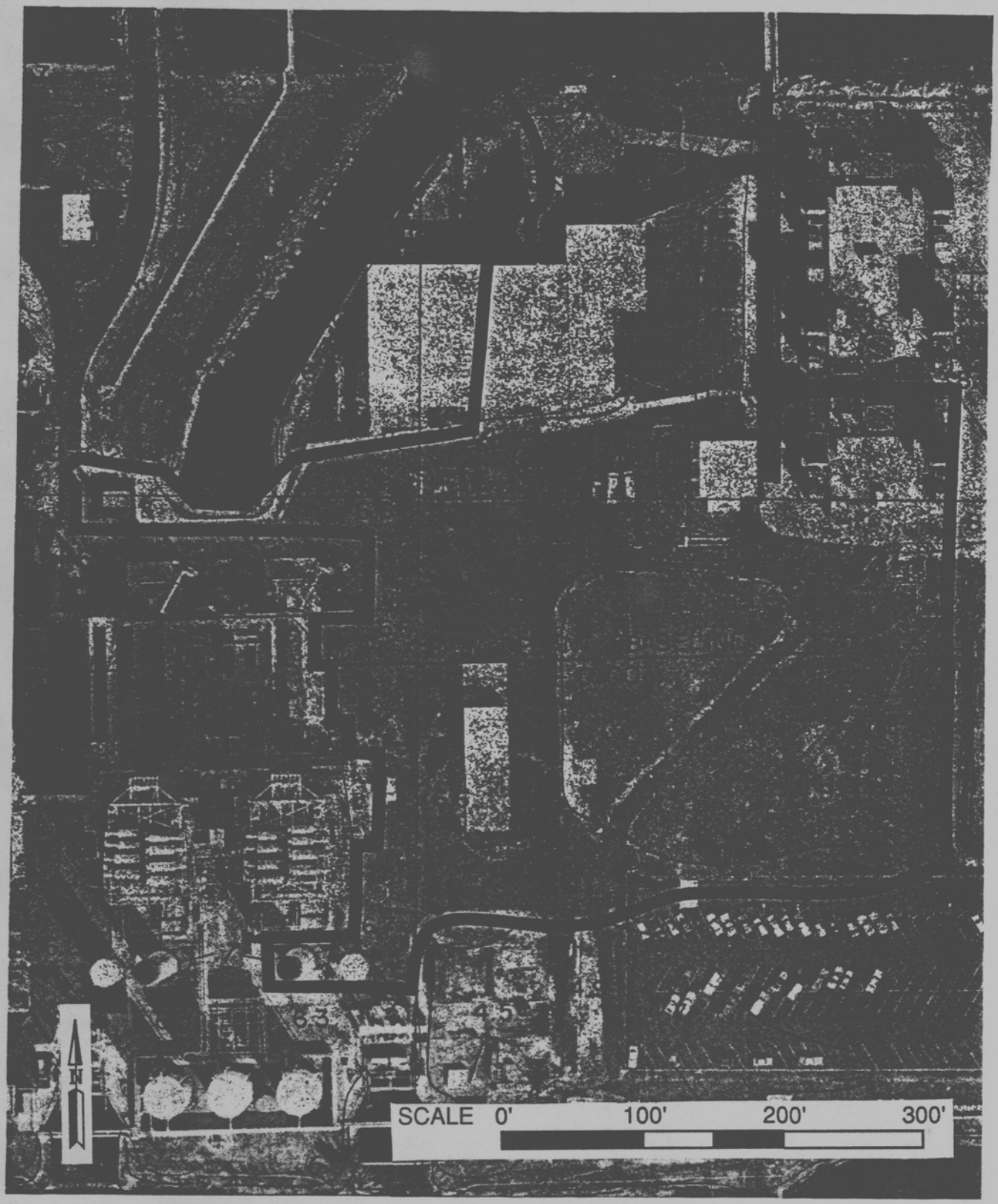
flood-route per program FLOOD 16.BAS

from flood-routing, peak discharge = 12.2 cfs

see pages 3 & 4 for tabulation

Image Quality
As you review the next group of images, Please note that the original documents
were of poor quality.

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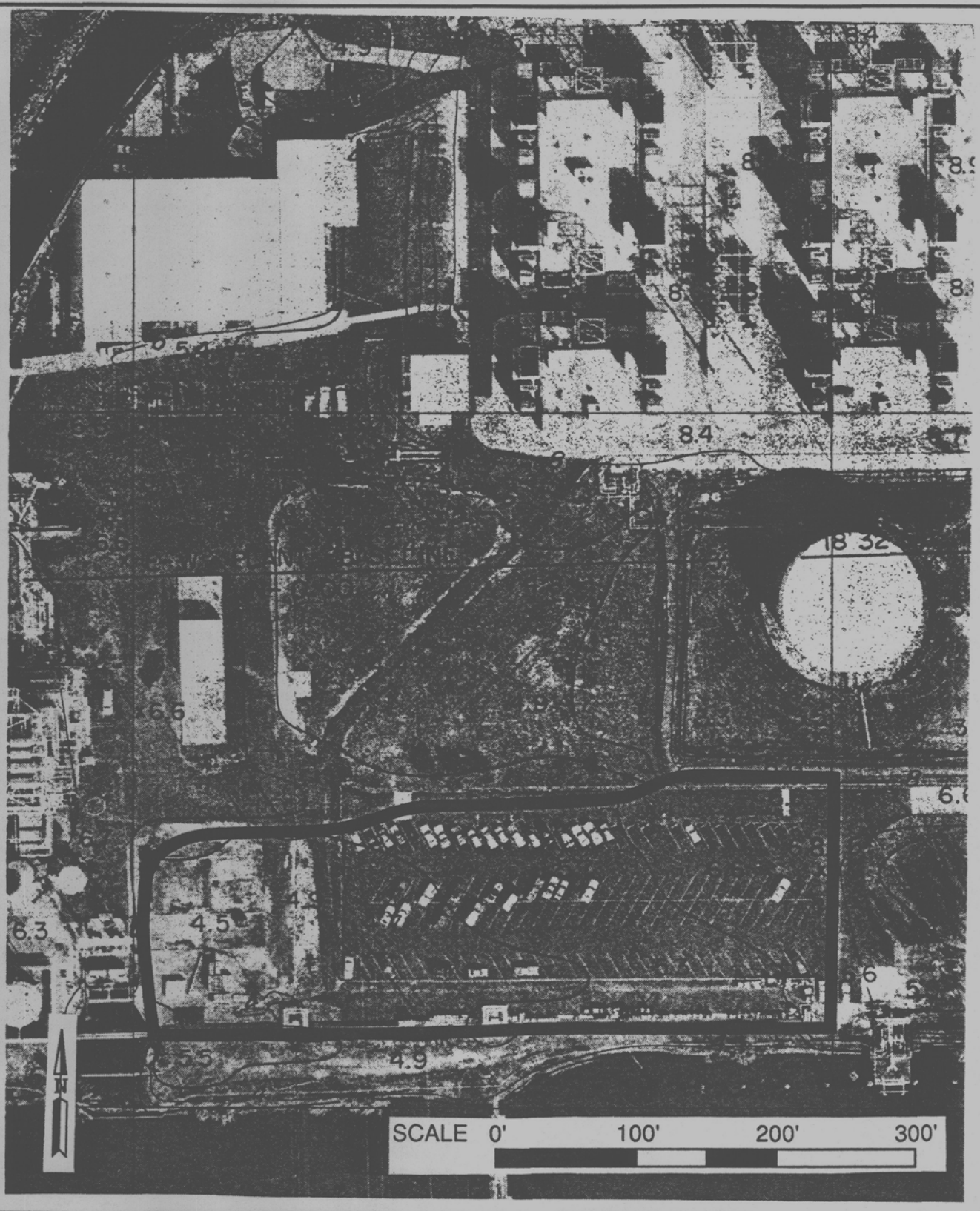
SUB-BASIN XII

Lauderdale
Repowering
Project

FPL

10.7-183

Rev. 1



SUB-BASIN XIII

Lauderdale
Repowering
Project

FPL

10.7-184

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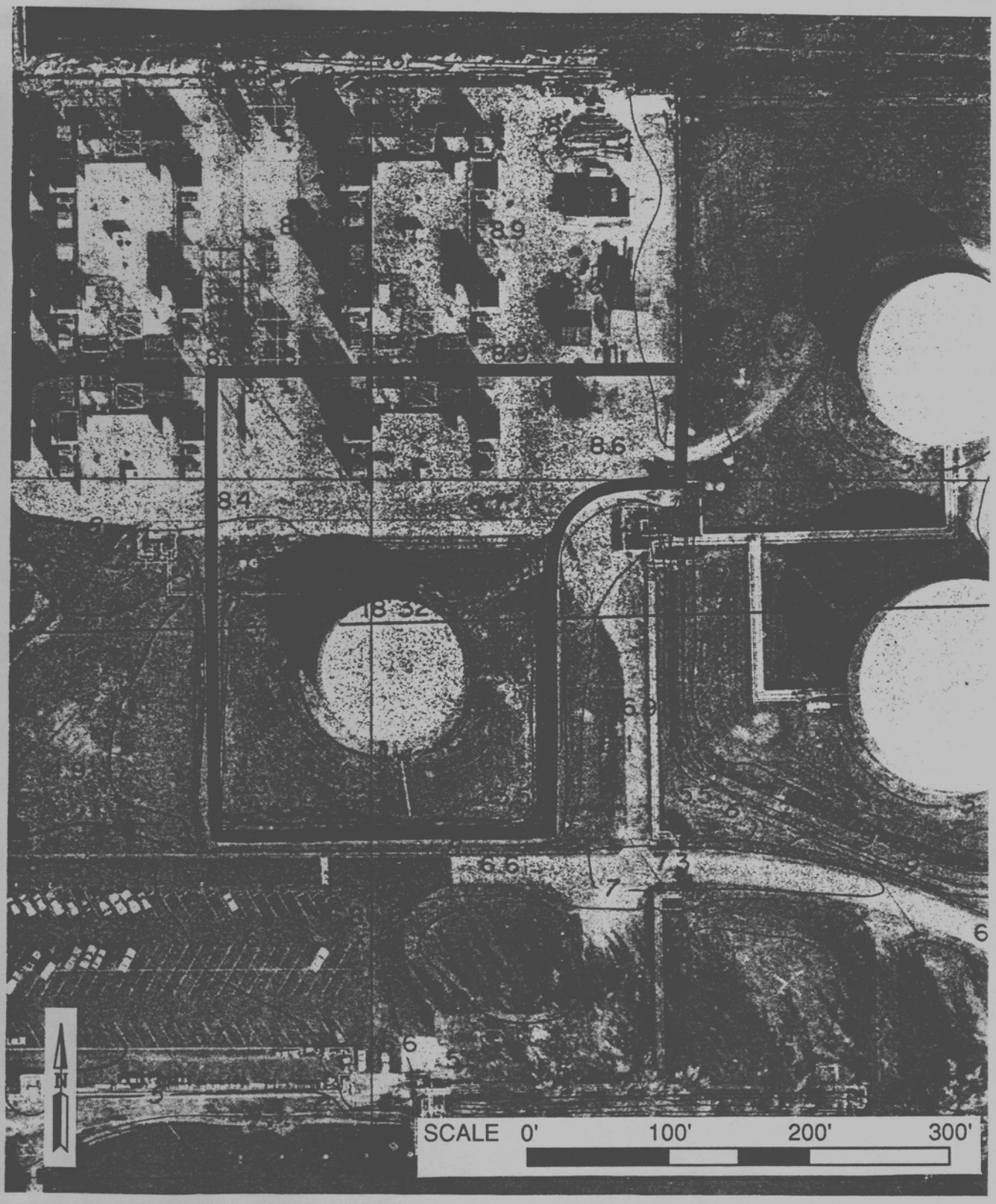
SUB-BASIN XVI

Lauderdale
Repowering
Project

FPL

10.7-185

Rev. 1



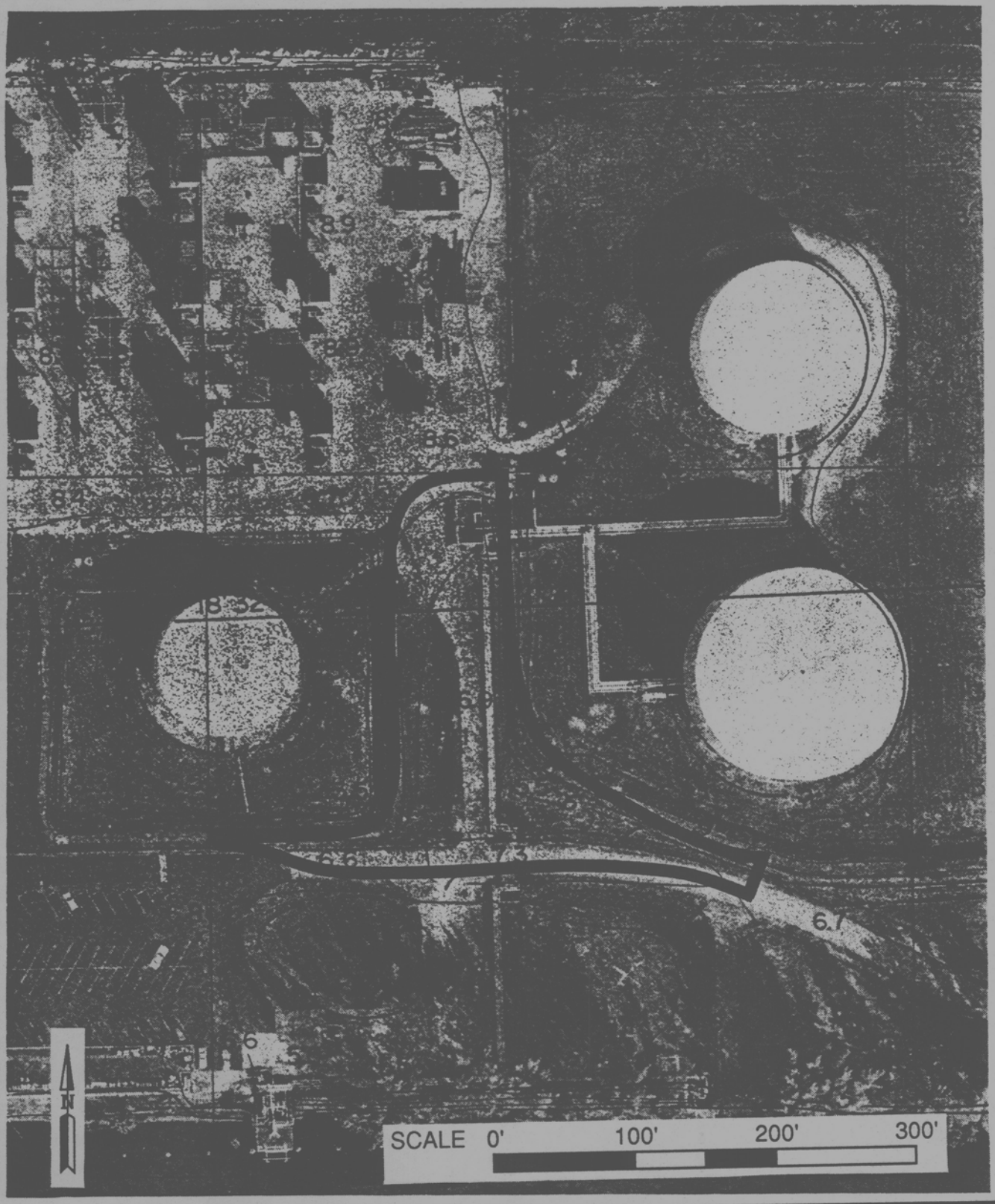
SUB-BASIN XV

Lauderdale
Repowering
Project

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SUB-BASIN XVII

Lauderdale
Repowering
Project

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EBASCO SERVICES INCORPORATED

Calc 68

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SHEET 3 OF 4

OFS NO. FL07918.017 DEPT. NO. 941

CLIENT FPL

PROJECT PFLR

SUBJECT Existing Drainage - Sub Basin 4

TIME HOURS	CUM RAINFALL INCHES	CUM RUNOFF INCHES	INCR RAINFALL INCHES	INCR RUNOFF INCHES	TOTAL DISCHARGE CFS	STORAGE AC-FT	WATER LEVEL FT MSL	DISCHARGE FROM STORAGE-AC-FT
52.25	4.49	0.36	0.04	0.01	0.13	0.00	6.00	0.00
52.50	4.53	0.37	0.04	0.01	0.13	0.00	6.00	0.00
52.75	4.59	0.39	0.05	0.02	0.17	0.00	6.00	0.00
53.00	4.63	0.40	0.04	0.01	0.14	0.00	6.00	0.00
53.25	4.69	0.42	0.05	0.02	0.18	0.00	6.00	0.00
53.50	4.74	0.44	0.06	0.02	0.18	0.00	6.00	0.00
53.75	4.81	0.46	0.07	0.02	0.22	0.00	6.00	0.00
54.00	4.86	0.48	0.05	0.02	0.18	0.00	6.00	0.00
54.25	4.93	0.50	0.07	0.02	0.23	0.00	6.00	0.00
54.50	4.99	0.52	0.07	0.02	0.23	0.00	6.00	0.00
54.75	5.07	0.55	0.08	0.03	0.27	0.00	6.00	0.00
55.00	5.14	0.57	0.07	0.02	0.24	0.00	6.00	0.00
55.25	5.21	0.60	0.08	0.03	0.28	0.00	6.00	0.00
55.50	5.29	0.63	0.08	0.03	0.29	0.00	6.00	0.00
55.75	5.37	0.66	0.08	0.03	0.29	0.00	6.00	0.00
56.00	5.46	0.69	0.09	0.03	0.34	0.00	6.00	0.00
56.25	5.54	0.73	0.09	0.03	0.35	0.00	6.00	0.00
56.50	5.63	0.76	0.09	0.04	0.35	0.00	6.00	0.00
56.75	5.73	0.80	0.10	0.04	0.41	0.00	6.00	0.00
57.00	5.83	0.84	0.10	0.04	0.41	0.00	6.00	0.00
57.25	5.94	0.89	0.11	0.05	0.47	0.00	6.00	0.00
57.50	6.05	0.94	0.11	0.05	0.48	0.00	6.00	0.00
57.75	6.17	0.99	0.12	0.05	0.54	0.00	6.00	0.00
58.00	6.29	1.05	0.12	0.05	0.55	0.00	6.00	0.00
58.25	6.42	1.11	0.13	0.06	0.61	0.00	6.00	0.00
58.50	6.56	1.17	0.13	0.06	0.62	0.00	6.00	0.00
58.75	6.73	1.25	0.18	0.08	0.85	0.00	6.00	0.00
59.00	6.91	1.34	0.18	0.09	0.87	0.00	6.00	0.00
59.25	7.18	1.48	0.28	0.14	1.39	0.00	6.00	0.00
59.50	7.46	1.62	0.27	0.14	1.44	0.00	6.00	0.00
59.75	9.32	2.69	1.86	1.07	10.78	0.00	6.00	0.00
60.00	11.16	3.89	1.85	1.21	12.16	0.00	6.00	0.00
60.25	11.57	4.18	0.41	0.28	2.83	0.00	6.00	0.00
60.50	11.97	4.45	0.40	0.28	2.80	0.00	6.00	0.00
60.75	12.18	4.60	0.21	0.15	1.50	0.00	6.00	0.00
61.00	12.39	4.75	0.21	0.15	1.51	0.00	6.00	0.00
61.25	12.54	4.86	0.15	0.11	1.12	0.00	6.00	0.00
61.50	12.69	4.98	0.15	0.11	1.13	0.00	6.00	0.00
61.75	12.83	5.07	0.13	0.10	0.97	0.00	6.00	0.00
62.00	12.95	5.16	0.12	0.09	0.89	0.00	6.00	0.00
62.25	13.05	5.23	0.10	0.07	0.73	0.00	6.00	0.00
62.50	13.13	5.30	0.09	0.06	0.65	0.00	6.00	0.00
62.75	13.22	5.36	0.09	0.07	0.66	0.00	6.00	0.00
63.00	13.30	5.42	0.08	0.06	0.58	0.00	6.00	0.00
63.25	13.39	5.49	0.09	0.07	0.66	0.00	6.00	0.00
63.50	13.46	5.54	0.08	0.06	0.58	0.00	6.00	0.00
63.75	13.55	5.61	0.09	0.07	0.66	0.00	6.00	0.00
64.00	13.63	5.67	0.08	0.06	0.58	0.00	6.00	0.00
64.25	13.67	5.70	0.04	0.03	0.33	0.00	6.00	0.00
64.50	13.73	5.74	0.06	0.04	0.42	0.00	6.00	0.00
64.75	13.78	5.78	0.05	0.04	0.42	0.00	6.00	0.00
65.00	13.83	5.81	0.04	0.03	0.33	0.00	6.00	0.00

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EBASCO SERVICES INCORPORATED

Calc 68

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SHEET 4 OF 4

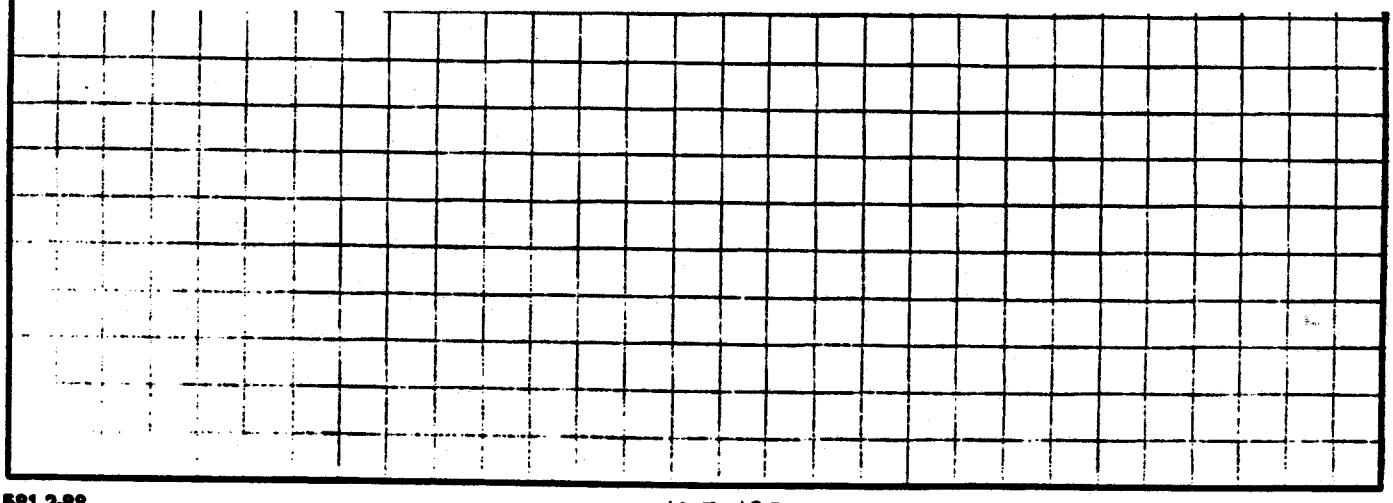
OFS NO. _____ DEPT. NO. 941

CLIENT FPL

PROJECT PFLR

SUBJECT Existing Drainage - Sub Basin 4

TIME HOURS	CUM RAINFALL INCHES	CUM RUNOFF INCHES	INCR RAINFALL INCHES	INCR RUNOFF INCHES	TOTAL DISCHARGE CFS	STORAGE AC-FT	WATER LEVEL FT MSL	DISCHARGE FROM STORAGE-AC-FT
65.25	13.88	5.86	0.06	0.04	0.42	0.00	6.00	0.00
65.50	13.93	5.89	0.04	0.03	0.34	0.00	6.00	0.00
65.75	13.98	5.93	0.05	0.04	0.42	0.00	6.00	0.00
66.00	14.02	5.96	0.04	0.03	0.34	0.00	6.00	0.00
66.25	14.08	6.01	0.06	0.04	0.42	0.00	6.00	0.00
66.50	14.12	6.04	0.04	0.03	0.34	0.00	6.00	0.00
66.75	14.18	6.08	0.06	0.04	0.42	0.00	6.00	0.00
67.00	14.22	6.11	0.04	0.03	0.34	0.00	6.00	0.00
67.25	14.28	6.16	0.06	0.04	0.42	0.00	6.00	0.00
67.50	14.32	6.19	0.04	0.03	0.34	0.00	6.00	0.00
67.75	14.38	6.23	0.06	0.04	0.42	0.00	6.00	0.00
68.00	14.42	6.27	0.04	0.03	0.34	0.00	6.00	0.00
68.25	14.45	6.29	0.03	0.03	0.25	0.00	6.00	0.00
68.50	14.49	6.32	0.03	0.03	0.26	0.00	6.00	0.00
68.75	14.52	6.34	0.03	0.03	0.26	0.00	6.00	0.00
69.00	14.55	6.37	0.03	0.03	0.26	0.00	6.00	0.00
69.25	14.59	6.39	0.03	0.03	0.26	0.00	6.00	0.00
69.50	14.62	6.42	0.03	0.03	0.26	0.00	6.00	0.00
69.75	14.65	6.44	0.03	0.03	0.26	0.00	6.00	0.00
70.00	14.69	6.47	0.03	0.03	0.26	0.00	6.00	0.00
70.25	14.72	6.49	0.03	0.03	0.26	0.00	6.00	0.00
70.50	14.75	6.52	0.03	0.03	0.26	0.00	6.00	0.00
70.75	14.78	6.55	0.03	0.03	0.26	0.00	6.00	0.00
71.00	14.82	6.57	0.03	0.03	0.26	0.00	6.00	0.00
71.25	14.85	6.60	0.03	0.03	0.26	0.00	6.00	0.00
71.50	14.88	6.62	0.03	0.03	0.26	0.00	6.00	0.00
71.75	14.92	6.65	0.03	0.03	0.26	0.00	6.00	0.00
72.00	14.95	6.67	0.03	0.03	0.26	0.00	6.00	0.00



Rev. 1

Calc 69

EBASCO SERVICES INCORPORATED

BY HAR DATE 5/19/90

CHKD. BY KM DATE 6/4/90

SHEET 1 OF 2

OFS NO. FLO 7918.017 DEPT. NO. 941

CLIENT FPL

PROJECT PFLR

SUBJECT Existing Drainage - Sub. Basin 5

As existing this sub-basin includes only the oil tank containment area (see page 2) labelled existing sub-basin XVIII

Minimum top of dike = +8

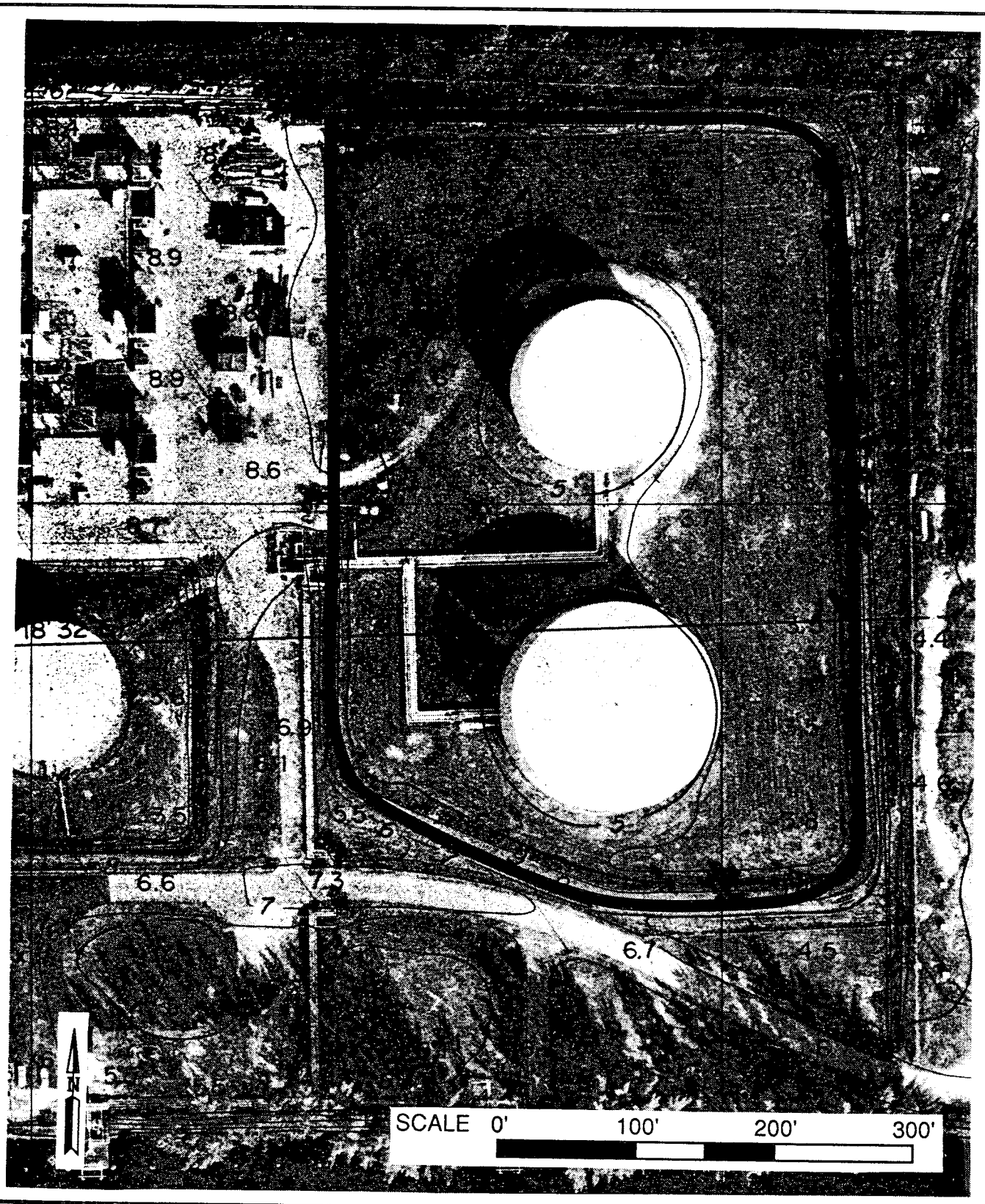
Maximum low spot inside dike = +5

Minimum Storage = 3 ft

Storage for exceeds rainfall, This area will never discharge

Area = 4.697 acres

Rev. 1



SUB-BASIN XVIII

Lauderdale Repowering Project

FPL

10.7-191

Lake 10

Rev. 1

EBASCO SERVICES INCORPORATED

BY NAP DATE 5/19/90 SHEET 1 OF 3

CHKD. BY KM DATE 6/4/90 OFS NO. FLO 7918.017 DEPT. NO. 941

CLIENT FPL

PROJECT PFLR

SUBJECT Existing Sub-Basin 6 Drainage

This area presently is not used and appears to have no drainage

Stage / area / volume follows - see page 2 for layout

El	Acres-Area	Increm. Area	Inc. Ac-Ft Storage	Total Storage
2.5	1,640	1.64	0	0
3.0	4.444	2.80	1.52	1.52
4.0	6.191	1.75	5.32	6.84
5.0	7.586	1.40	6.89	13.73
6.0	8,675	1.09	8.13	21.86

(assume edge of basin is at 6.0)

Note: Isolated wetland = 1.865 acres

LC	Soil Storage Inc. Area	* Storage Factor	In-Acres Storage
4	1.75	0.45	0.79
5	1.40	1.88	2.63
6	1.09	6.565	7.16
			10.58

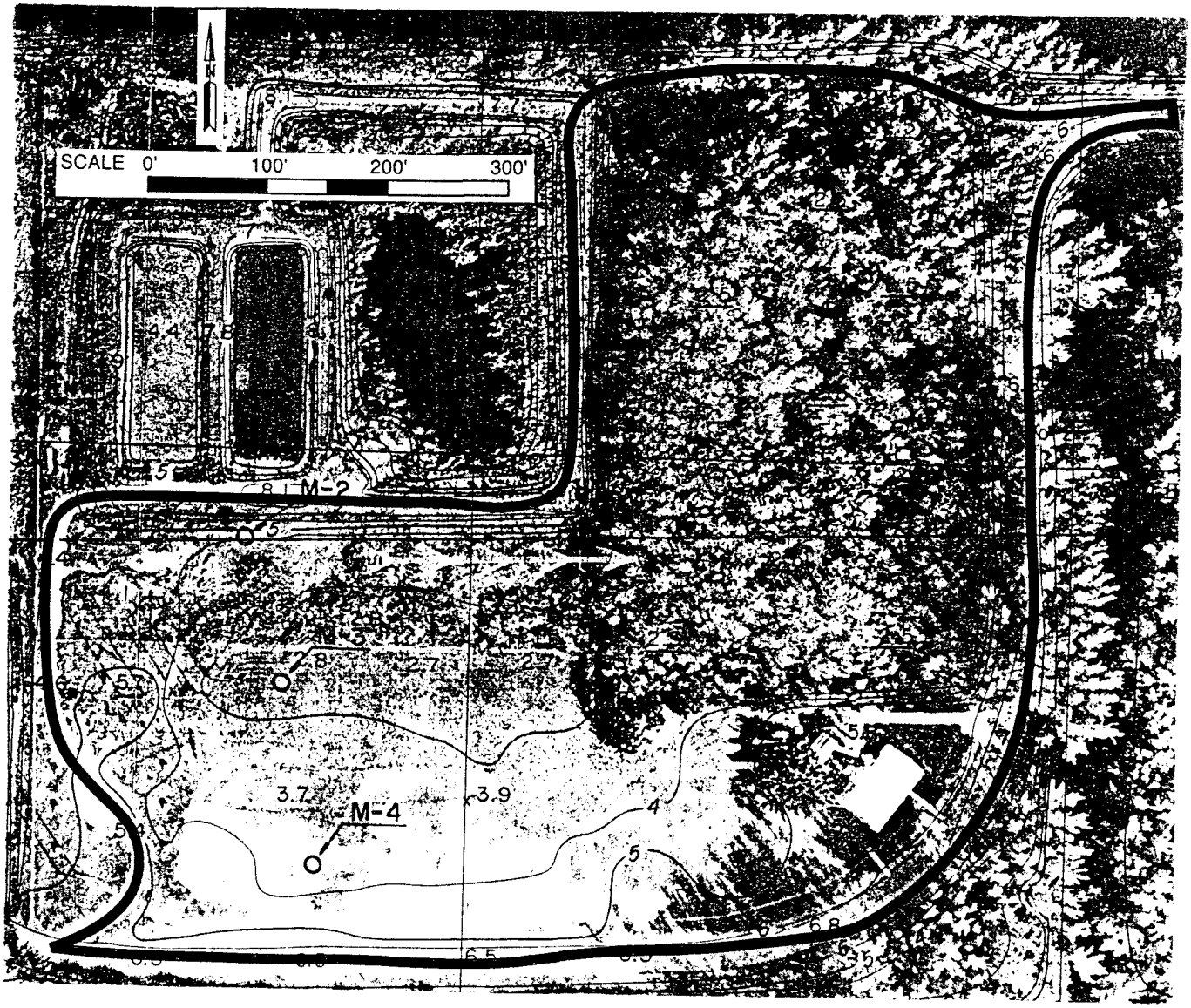
$\frac{10.58 \text{ in-acres}}{8,675 \text{ acres}} = 1.22 \text{ inches} = 5$ (assume 100% perviews)

$Runoff = \frac{(14.65 - .2(1.22))^2}{(14.65 + .8(1.22))}$

$= 13.28$ inches

$Volume = 13.28 \text{ in} * \frac{8,675 \text{ Ac}}{12} = 9.60$ Acre-ft

Rev. 1



SUB-BASIN XXI

Lauderdale
Repowering
Project

FPL

10.7-193

Detention of entire storm will fill to about El

$$\frac{9.6 - 6.84}{13.73 - 6.84} + 4 = 4.40$$

Need to flood route - see program FLOOD21.BAS

Assume a broad-crested weir at EL 8.9 for discharge, thus

$$Q = 250 * \frac{2}{3} H * \left(\frac{2}{3} g H\right)^{1/2}$$

Flood-routing results

Max Water Surface El = 3.21

Max discharge = 0

Total Runoff = 13.58

ok, no discharge

Rev. 1

Calc 11

EBASCO SERVICES INCORPORATED

BY NAP DATE 5/19/90

CHKD. BY KM DATE 6/4/90

SHEET 1 OF 10

OFS NO. FL07918.012 DEPT. NO. 941

CLIENT FPL

PROJECT PFLR

SUBJECT Backup to Calc 64

based on sub-basin 3 existing drainage Calc 60

Acreage

Total from existing = 14.906

remove Power Block planimeter from page 2 = 3.147

11.759

removed pervious area from p3 = 1.084 acres

new pervious = 7.788 − 1.084 = 6.704

impervious = 11.759 − 6.704 = 5.055

But are adding more impervious with new storage bldg (see p 4)

pervious = 6.704 − .33 = 6.374

impervious = 5.385

assume 1/2 bldg & 1/2 roads

Detention Area

was 5.295 acres

now, = 5.295 − 3.147 = 2.148

Floor elevation, min = 8.0 in new warehouse, see page 5

Rev. 1

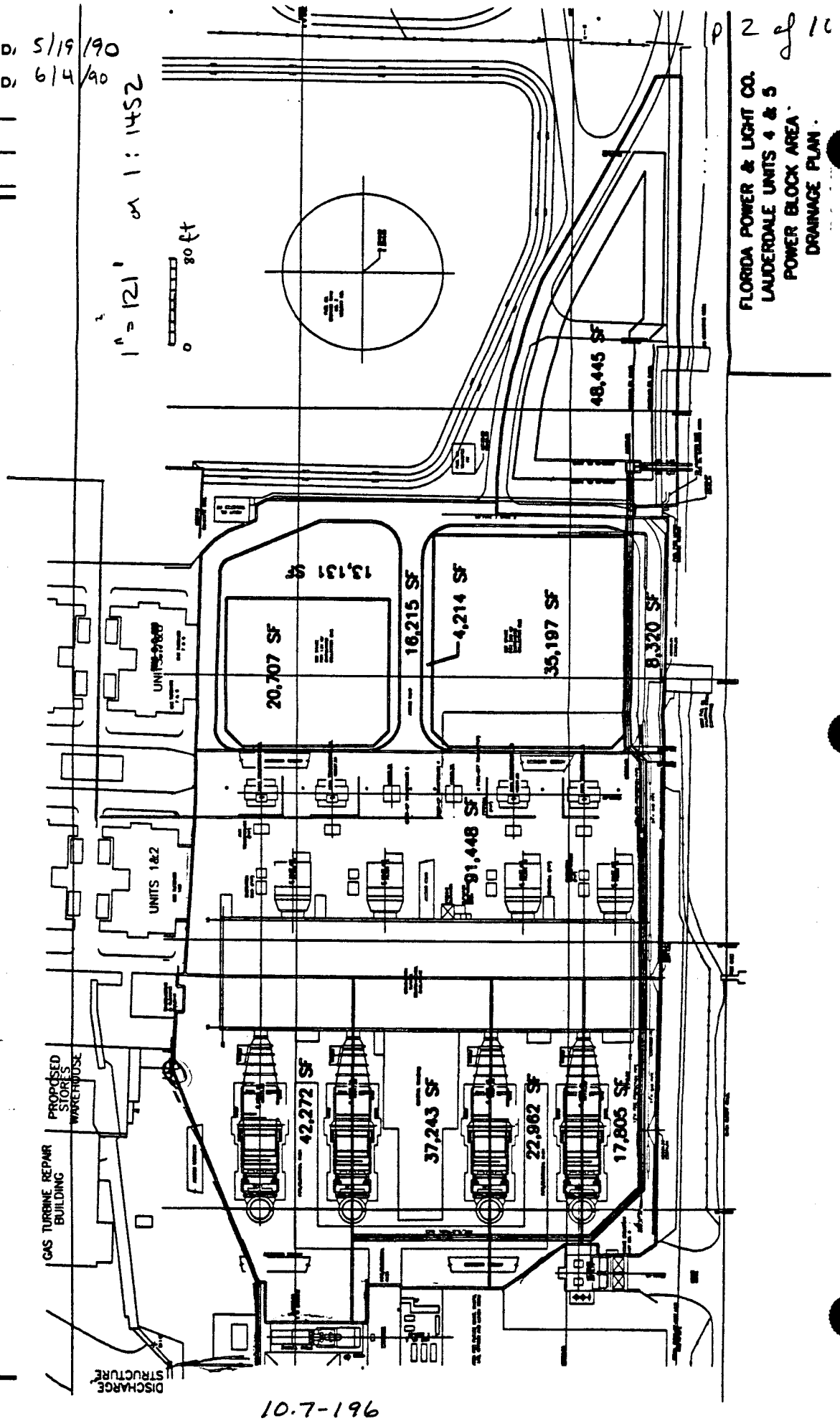
BY HAP D/ 5/19/90

CHKD. BY KM D/ 6/4/90

CLIENT

PROJECT

SUBJECT



581 2-88

10.7-196

Rev. 1

EBASCO SERVICES INCORPORATED

BY WEP DATE 5/19/90

CHKD. BY KM DATE 6/4/90

SHEET 3 OF 10

OFS NO. FLO 7918.017 DEPT. NO. 941

CLIENT FPL

PROJECT PFLR

SUBJECT Back up To Calc. 64

DATE | SCALE 0 100 200 300

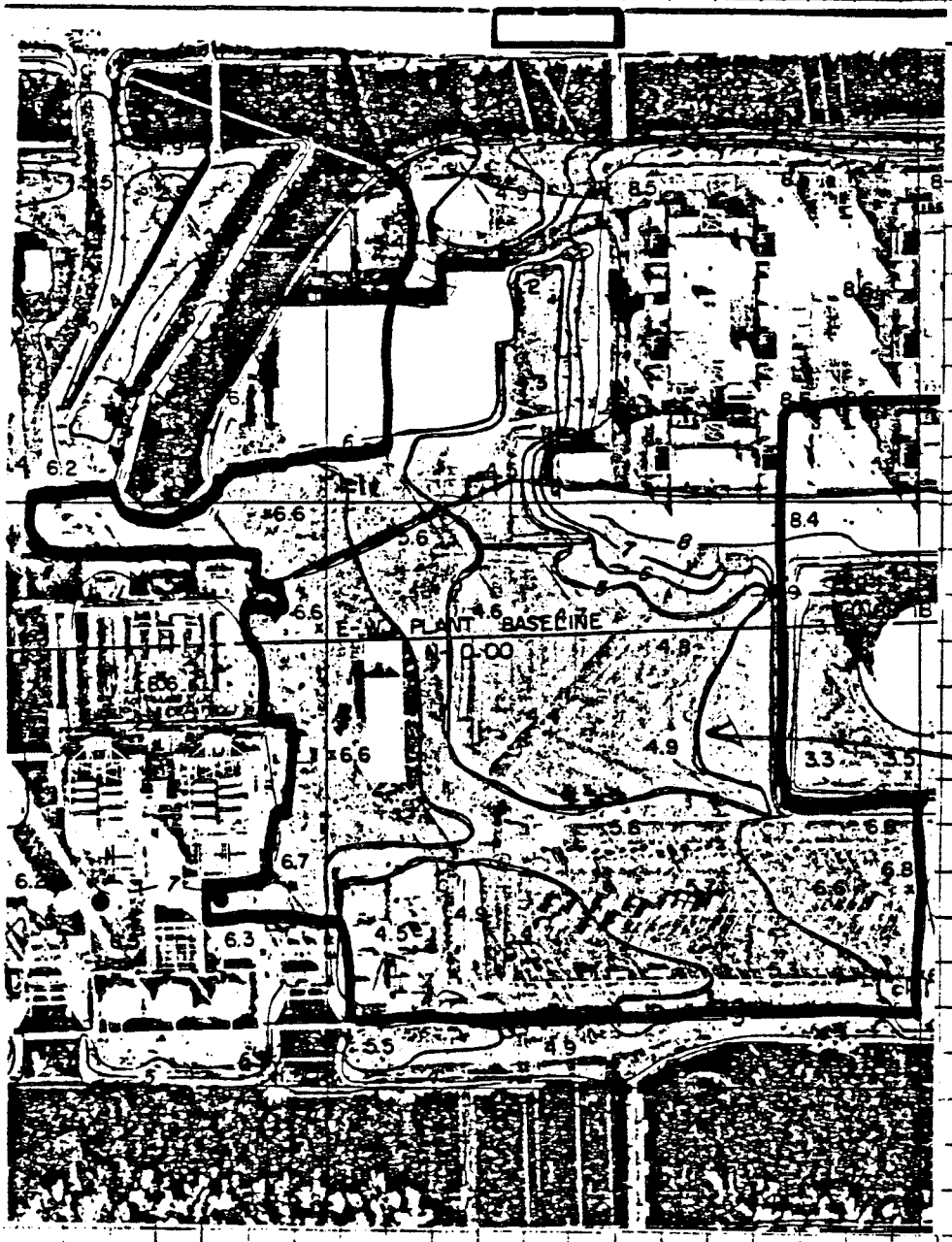
FPL FLORIDA POWER & LIGHT COMPANY

DR H. GAMBLE | ER NO.

CH | COR

APPROVED

Scale 1" = 200'



Power Block

Refueling area removed

Rev. 1 BY HAP DATE 5/19/90

CHKD. BY KM DATE 6/4/90

SHEET 4 OF 10

OFS NO. FLO 7918.017 DEPT. NO. 941

CLIENT FPL

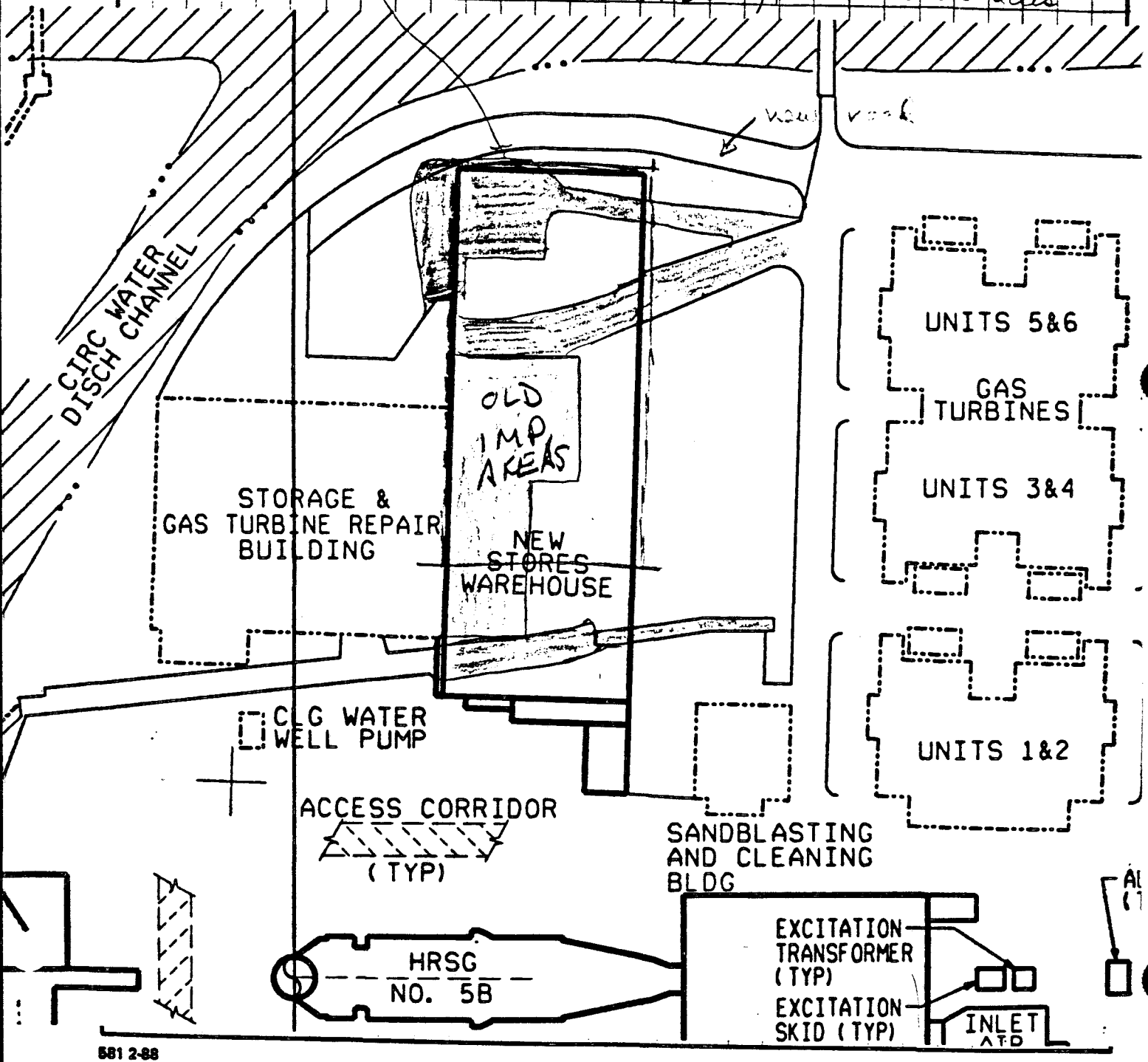
PROJECT PFLR

SUBJECT Back up To Calc 64

Estimate added impervious area = 180 * 79

Scale 1 : 720

114220 ft² = .33 acres



581 2-88

Rev. 1

Calc 11

EBASCO SERVICES INCORPORATED

BY NAP DATE 5/19/96

CHKD. BY KM DATE 6/4/90

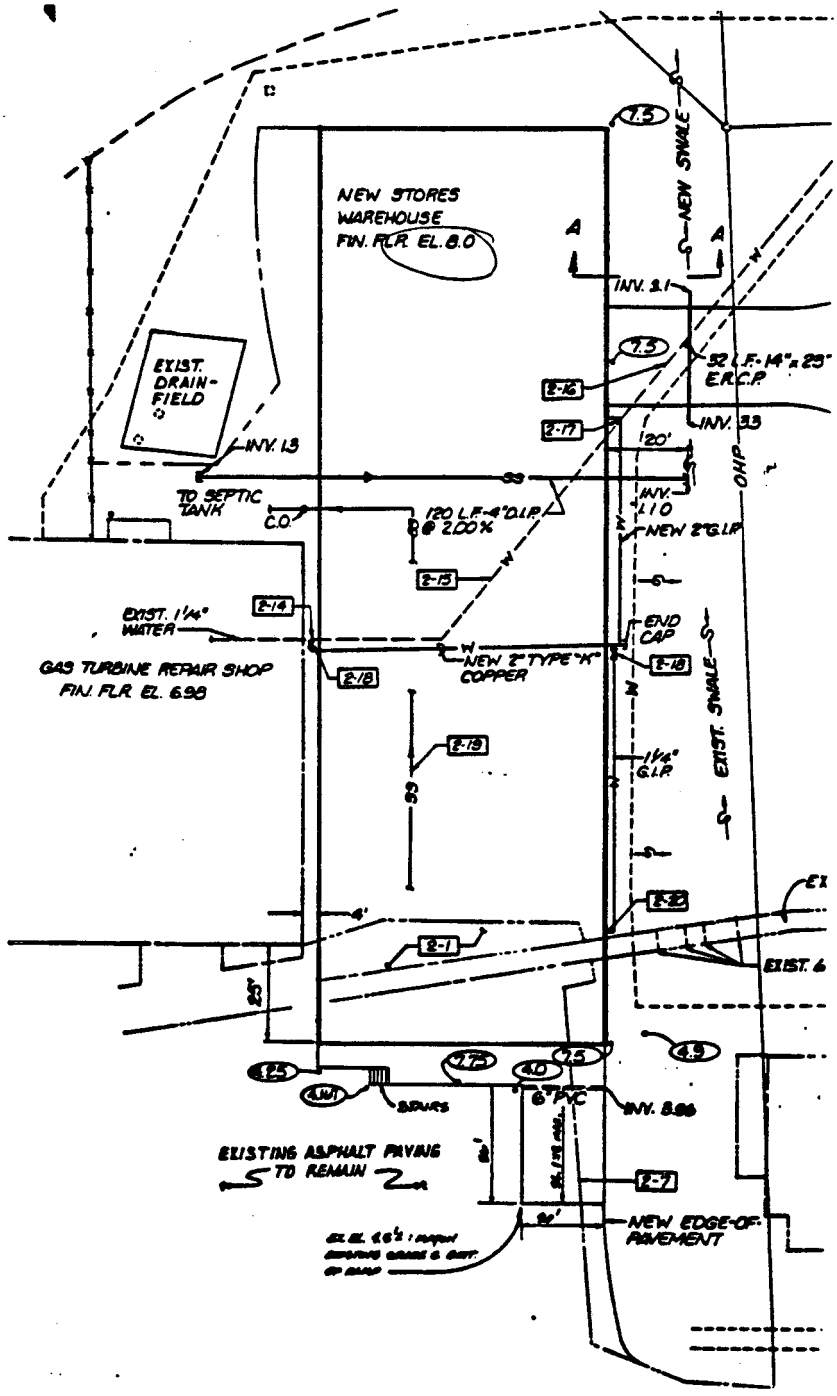
SHEET 5 OF 10

OFS NO. FL0 7918.017 DEPT. NO. 941

CLIENT FPL

PROJECT PFLR

SUBJECT Backup To Calc. 64



581 2-88

10.7-199

Soil Storage

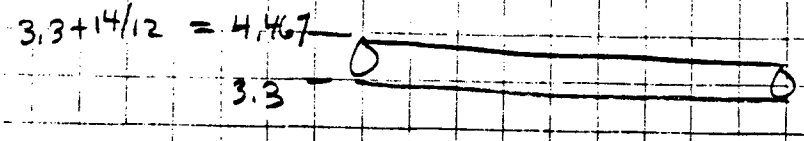
Incremental Storage, see p 14 Calc 60

El				
7	2.063	+ 1.655	− 1.084 (see p1)	= 2.634
6	1.612	+ 1.670	− 1.084	= 2.198
5	1.970	+ 1.217	− 1.084	= 2.103

Control Structure per pages 5 & 7 have an oval concrete pipe 14 x 23

upstream invert = 3.3

downstream invert = 3.1



Minimum full flow per page 8

1.2 cfs at HW/D = 0.4

NW = 0.4 * 14/12 = .467

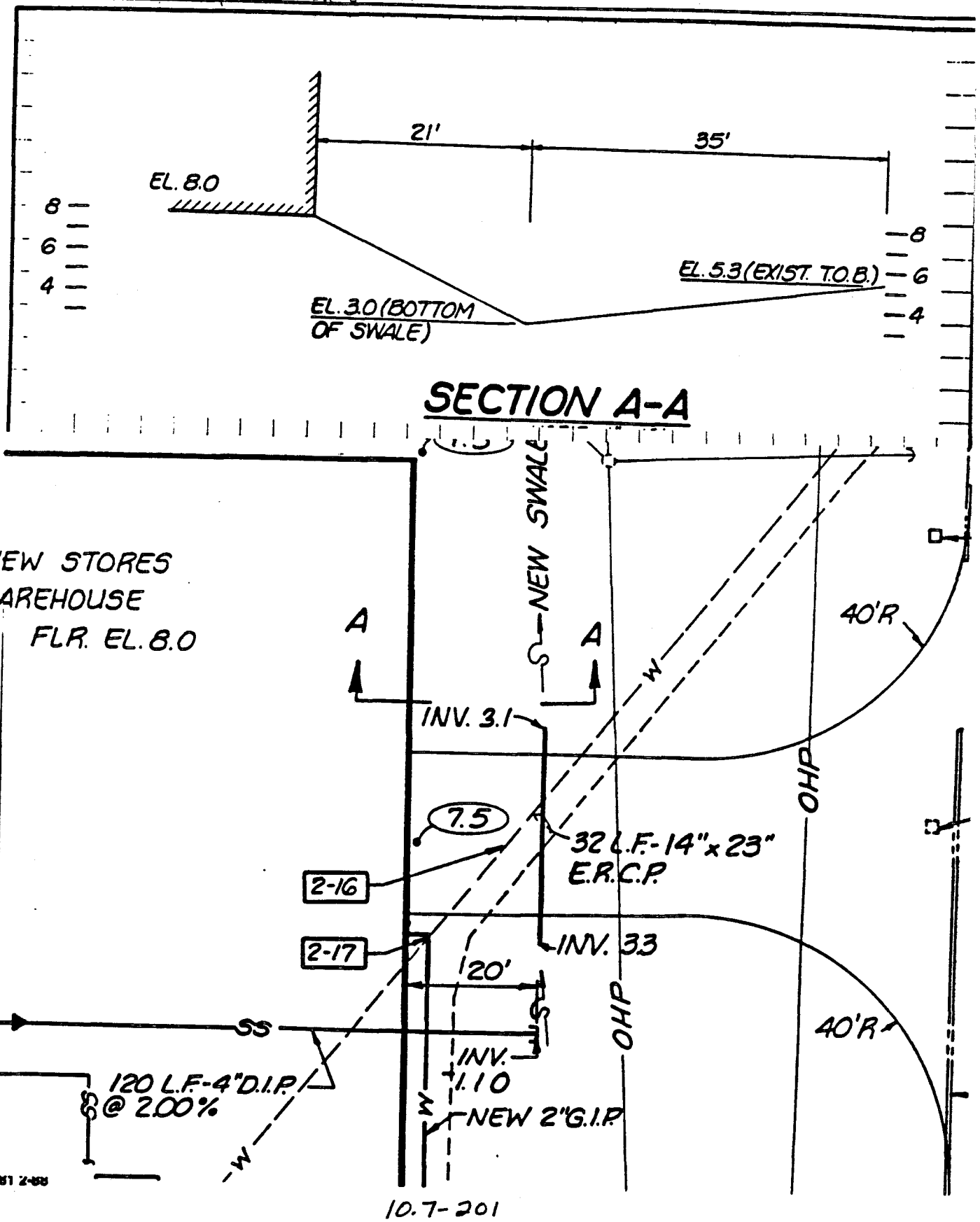
w water at 3.767

do a table:

El	NW	NW/D	Q
3.8	.467	0.4	1.2
4.0	.6	0.51	1.9
4.5	1.01	0.943	4.5
5.0	1.6	1.37	7.3

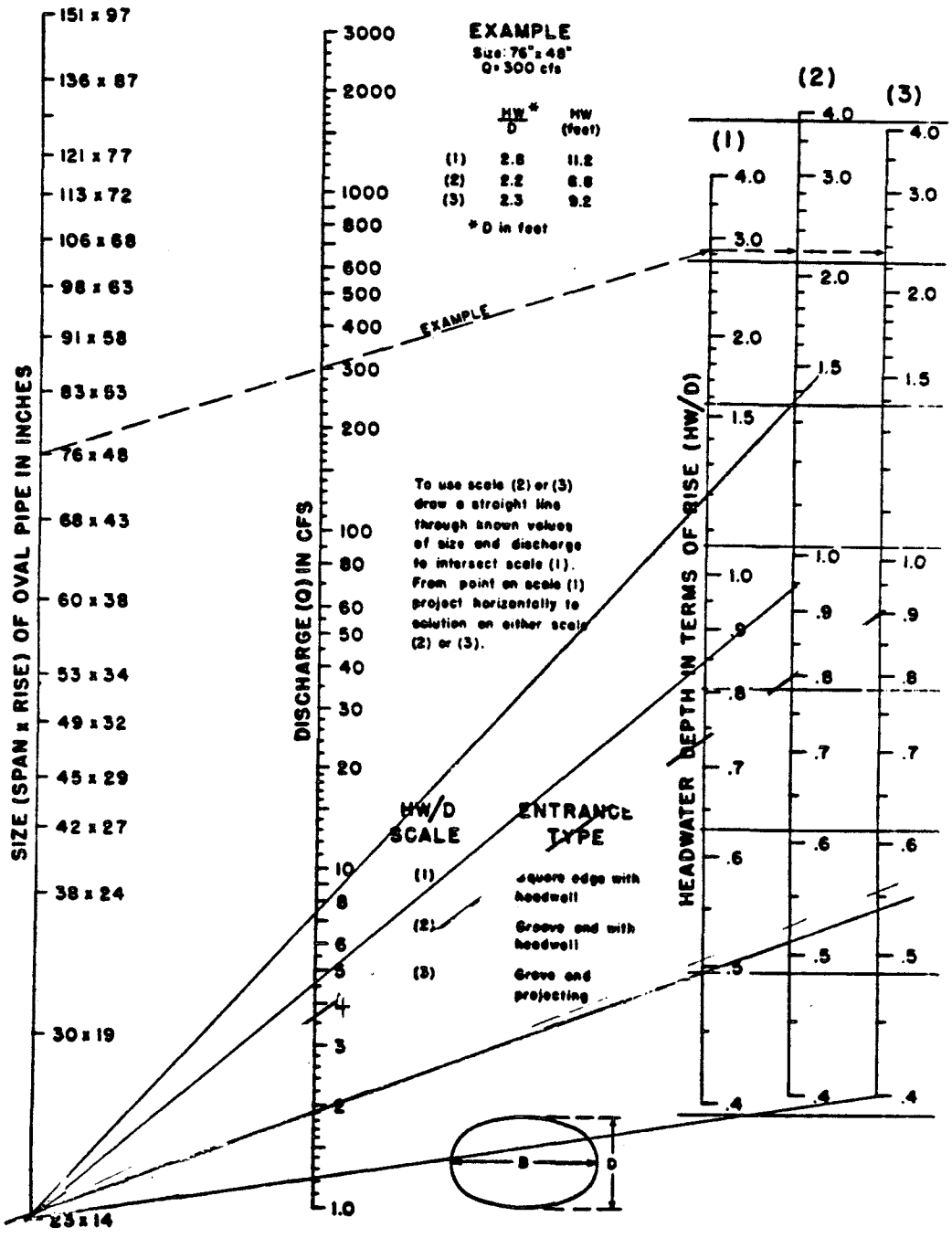
Rev. 1 BY HAP DATE 5/19/90
CHKD. BY KM DATE 6/4/90
CLIENT FPL
PROJECT PFLR
SUBJECT Back up To Calc. 64

SHEET 7 OF 10
OFS NO. FLO 7912.017 DEPT. NO. 941



10.7-201

CHART 3



HEADWATER DEPTH FOR OVAL CONCRETE PIPE CULVERTS LONG AXIS HORIZONTAL WITH INLET CONTROL

BUREAU OF PUBLIC ROADS JAN. 1963

Figure C-IV-4

Rev. 1

EBASCO SERVICES INCORPORATED

Calc 71

BY NAP DATE 5/19/90

CHKD. BY KM DATE 6/4/90

SHEET 9 OF 10

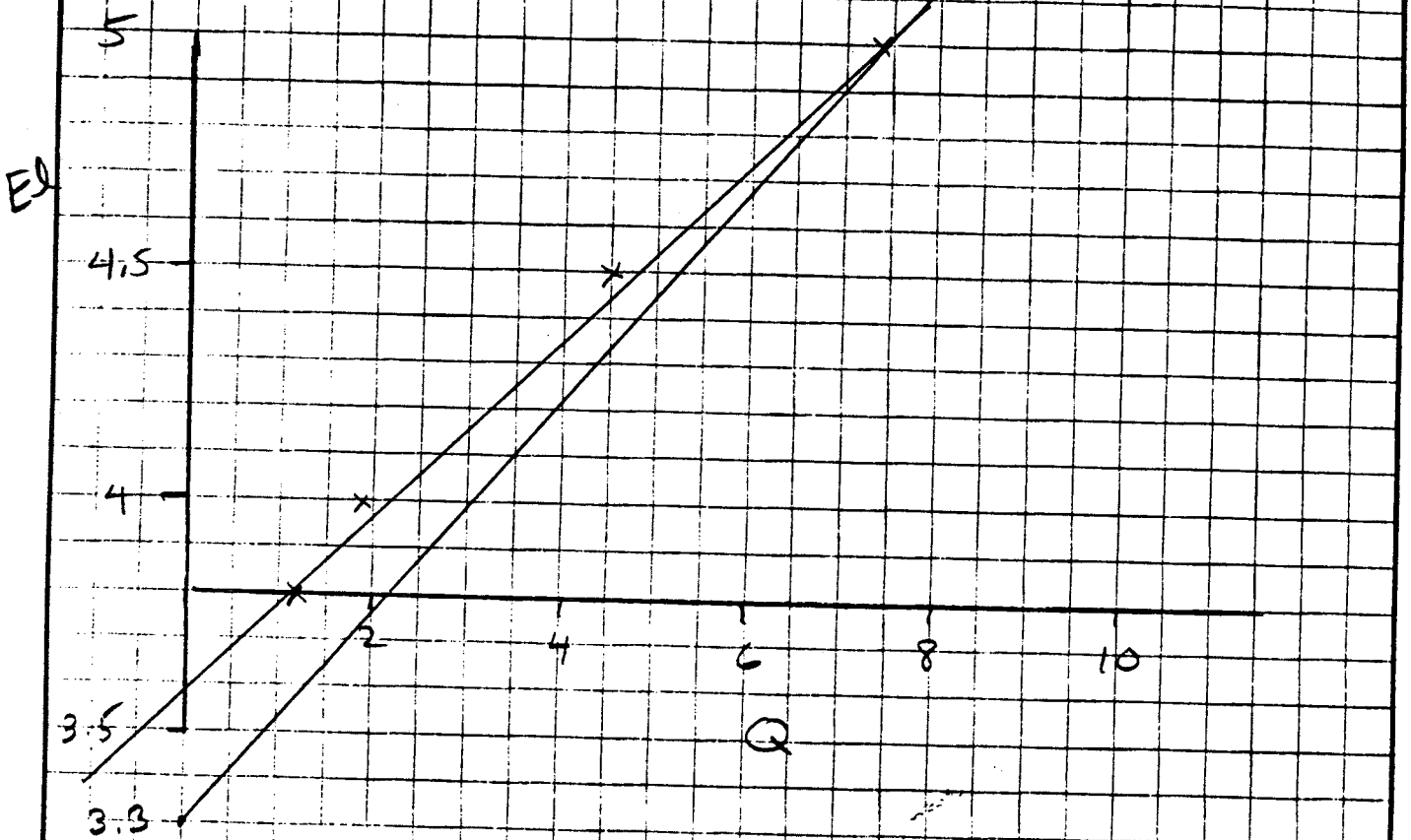
OFS NO. FL07918.017 DEPT. NO. 941

CLIENT FPL

PROJECT PFLR

SUBJECT Backup To Calc. 64

plot Q vs El



use green curve as estimate

Q = 7.3 at N = 1.7

N = El − 3.3

Q = 4.3 N

EBASCO SERVICES INCORPORATED

Rev. 1

BY NAF DATE 5/19/90

CHKD. BY KM DATE 6/4/90

SHEET 10 OF 10

OFS NO. FLO 7918.017 DEPT. NO. 941

CLIENT FPL

PROJECT PFLR

SUBJECT Back up To Calc. 64

Surface Storage - lose 3.147 acres from highest (page 1), lose 1.084 from El 5

(from p 14 Calc 60)

El	New Area	Δ Storage	Total Storage
4	0	0	0
5	.886	.443	.443
6	1.524	1.205	1.648
7	2.148	1.836	3.484

interpolate loss at 6' = average of loss at 5 & 7 = $\frac{3.147 + 1.084}{2} = 2.116$

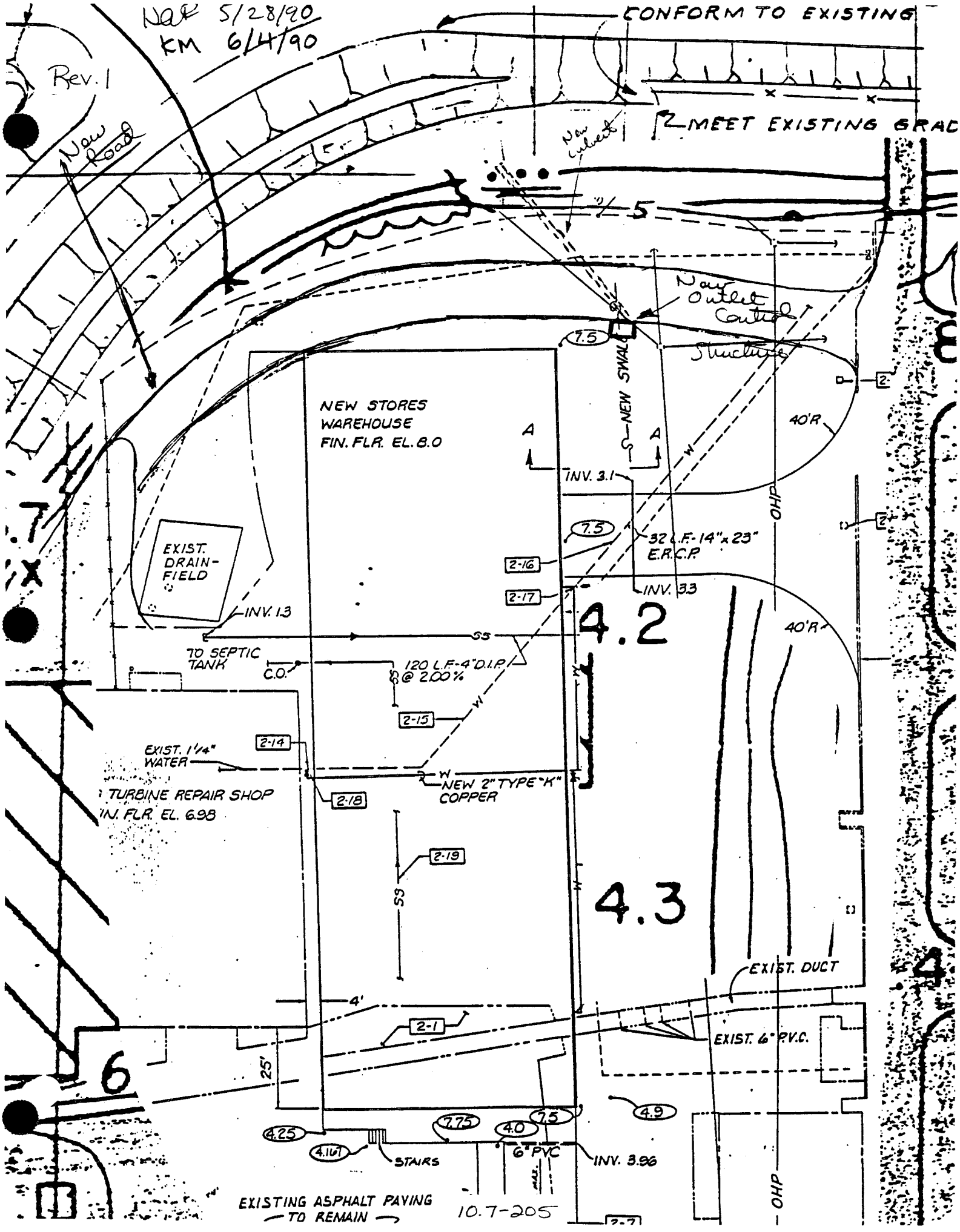
Add a 3rd area per conversation with Orlando Rubio on 5/24/90, north of new warehouse and downstream of new culverts.

Add an outlet structure (see Att 1) similar to new structure at east end of stub canal (see Att 2) at downstream end of new swale, outlet pipe to go under new road.

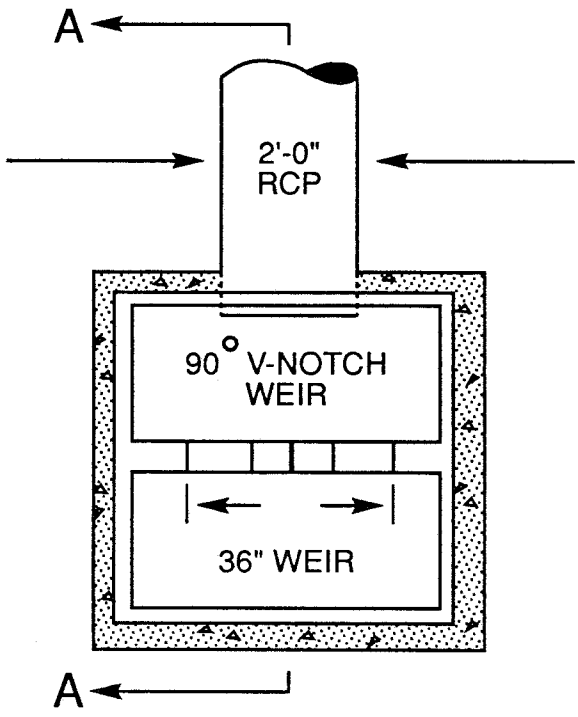
New area added is negligible, use flood routing in Calc 64 based on storage above

Because we are so close to the discharge canal, high water table will not be more than EL +2 (see aquifer pump test reports). Thus weir control at 3.1 is OK for dry detention

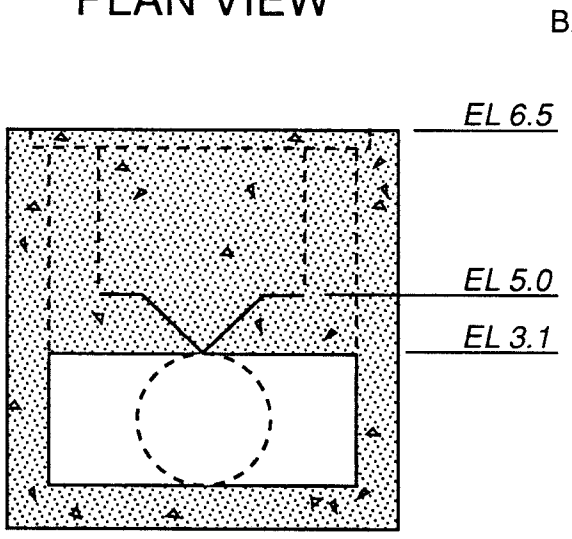
See Att 2 for control structure


NAR 5/28/90
KM 6/4/90
Rev. 1
New Road
CONFORM TO EXISTING
MEET EXISTING GRAD
New culvert
New Outlet Control Structure
NEW STORES WAREHOUSE FIN. FLR. EL. 8.0
NEW SWALE
INV. 3.1
INV. 3.3
32 L.F.-14"x23" E.R.C.P.
OHP
40'R
EXIST. DRAIN-FIELD
INV. 1.3
TO SEPTIC TANK
C.O.
120 L.F.-4" D.I.P. @ 2.00%
SS
W
EXIST. 1 1/4" WATER
NEW 2" TYPE "K" COPPER
TURBINE REPAIR SHOP
FIN. FLR. EL. 6.98
4.2
4.3
EXIST. DUCT
EXIST. 6" P.V.C.
4'
25'
STAIRS
6" PVC
INV. 3.96
EXISTING ASPHALT PAVING — TO REMAIN —
10.7-205

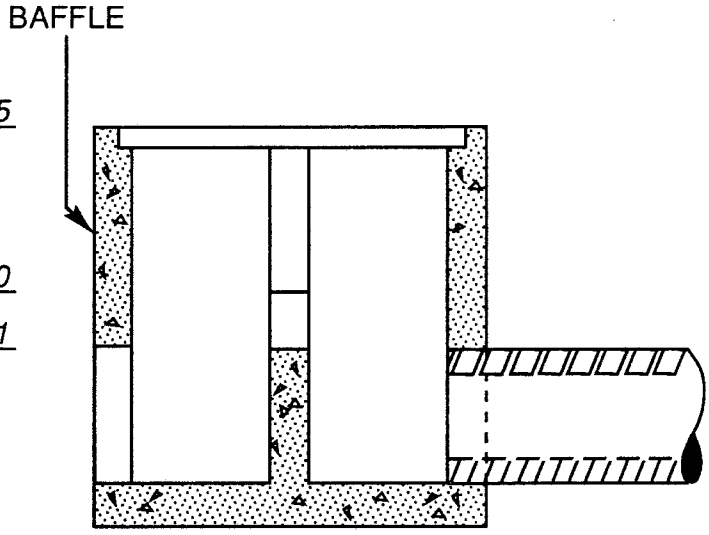
Rev. 1



PLAN VIEW



FRONT VIEW



SECTION A-A

CALC 71 ATTACHMENT 2

Lauderdale
Repowering
Project

FPL

10.7-206

Rev. 1

EBASCO SERVICES INCORPORATED

Calc 72

BY HAP DATE 5/20/90

CHKD. BY KM DATE 6/4/90

SHEET 1 OF 3

OFS NO. 7918.017 DEPT. NO. 941

CLIENT FPL

PROJECT PFLR

SUBJECT drainage - backup to calc 71

Need to add more detention to existing sub-basin XIX (see p 2)

New Storage Basin

El	Area	Incr Sto	Total Storage
3	0	0	0
4	0.55	.275	.28
5	1.42	.985	~~1.13~~ 1.265
ele. ≈ 6	2.160	1.79	~~2.42~~ 3.055

Change Storage Curve from 2.148 to

2.148 + 2.16 = 4.31

(p1 calc 71)

Revise project surface storage text from p 10 Calc 71 & add from above - see p 5 calc 64 for results ✓

Pretreatment

Existing GT area has pretreatment, all precip to area within structure is collected, treated & discharged to ground water

Area (see p. 3) = $\frac{2 * 140 * 80}{43560}$ = 0.51 acres

total pretreatment

= 0.51 acres * $\frac{14.95 \text{ inches}}{12}$

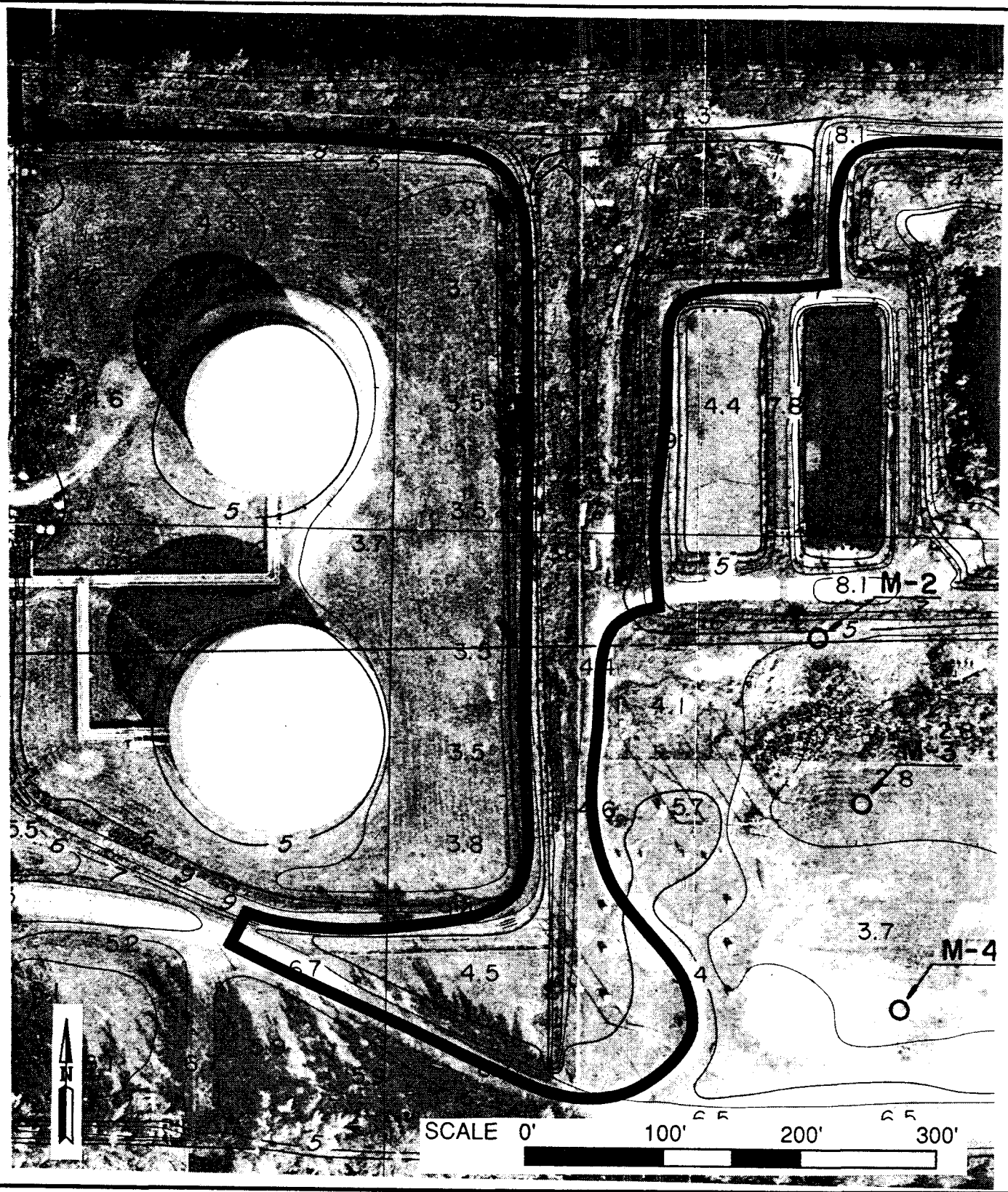
= 0.64 acre-feet

on sub-basin basis = $\frac{0.64 \text{ ac-ft}}{11.759 \text{ acres}}$ =

0.54 feet or 0.65"

581 2-88

Rev. 1



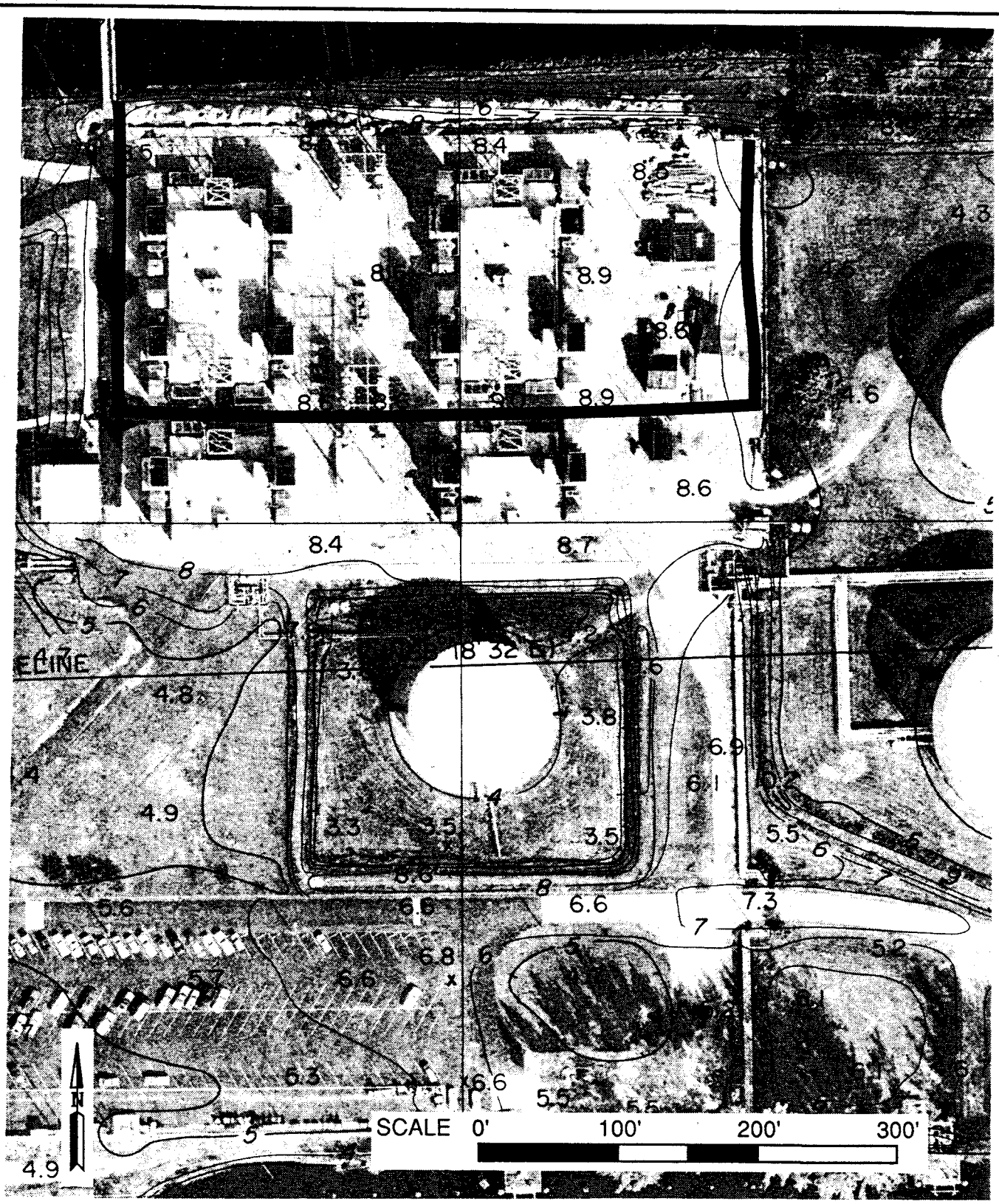
SUB-BASIN XIX

Lauderdale Repowering Project

FPL

10.7-208

Rev-1



SUB-BASIN XIV

Lauderdale
Repowering
Project

FPL

10.7-209

Rev. 1

EBASCO SERVICES INCORPORATED

Calc 73

BY NAF DATE 5/20/90

CHKD. BY KM DATE 6/4/90

SHEET 1 OF 2

OFS NO. FLO 7918.017 DEPT. NO. 941

CLIENT FPL

PROJECT PFLR

SUBJECT Backup to Calc 65

Pond Area

EL	Area - Acres	Acres Incr Area	Acre-Feet Incr Vol	Acre-Feet Total Storage
3	.216	216	0	0
5	.384	.168	.600	.600
6.7	.608	.224	.843	1.443

(6.7 is el which can not be exceeded without overtopping

from p1 Calc 65 Total Area = 8.38 acres

Impervious = 8.38 - .608 = 7.77

Pretreatment - from Calc 74, pick out areas in Power Block whose runoff is pumped to the oily wastewater basin for treatment (see p 9 calc 74)

Sump	Area - ft²
SW 1	665
SW 4	1617
Station Service Transformers	2028
CT Main Transformers	6400
CT Aux Transformers	1306
Startup transformers	563
	13079

$\frac{13079 \text{ ft}^2}{43560} = 0.3$ acres

$0.3 \text{ acres} * \frac{14.95''}{12}$

$= 0.37$ acre-feet

581 2-88

Rev. 1

EBASCO SERVICES INCORPORATED

Calc "1"

BY NAF DATE 5/20/90

CHKD. BY KM DATE 6/4/90

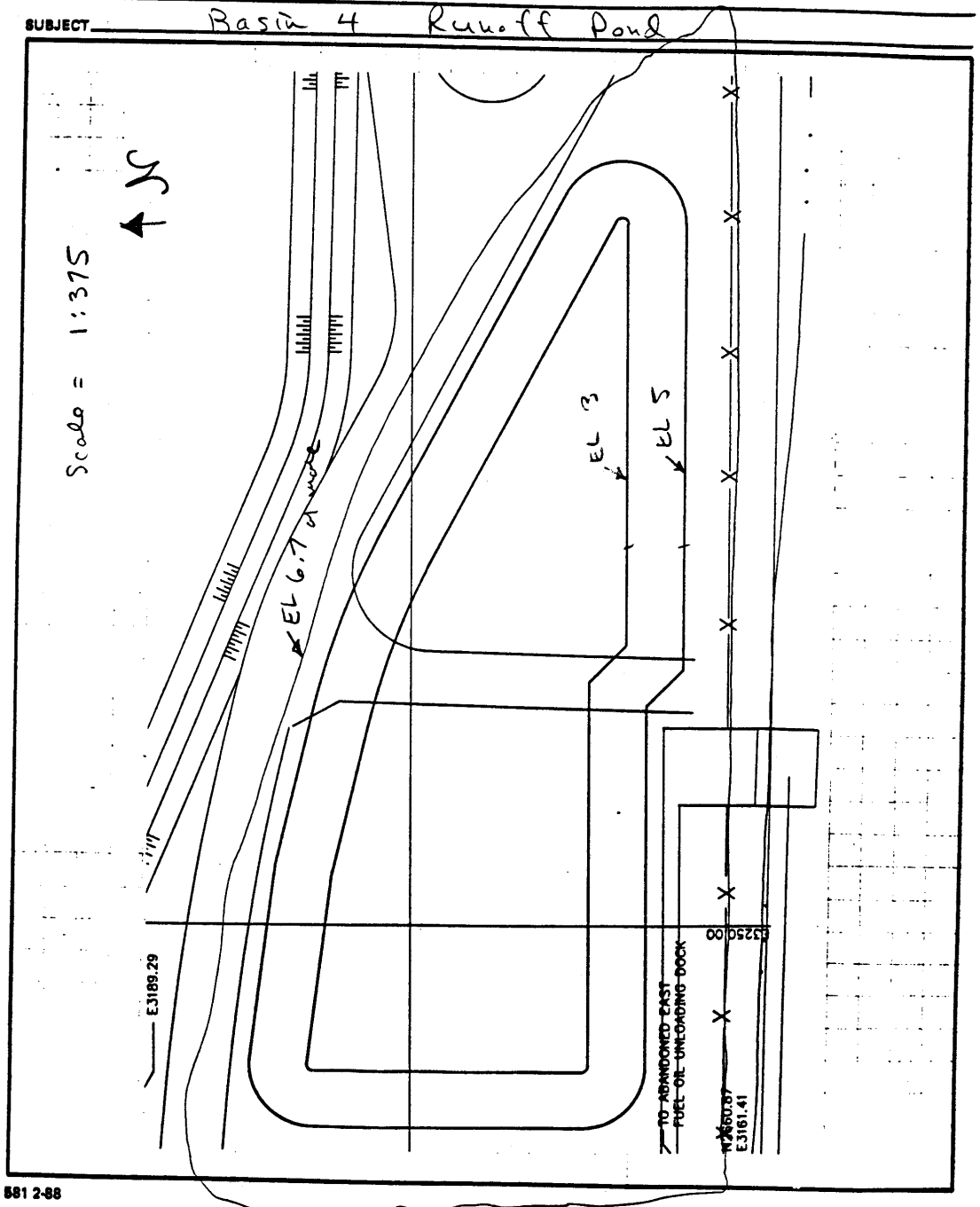
SHEET 2 OF 2

OFS NO. FL07918.017 DEPT. NO. 941

CLIENT FPL

PROJECT PFLR

SUBJECT Basin 4 Runoff Pond



581 2-88

10.7-211

Calc 74

EBASCO SERVICES INCORPORATED

CALCULATION COVER SHEET

Sheet 1 of 23

CLIENT FPL OFS. NO. _____

PROJECT Lauderdale Repowering DEPT. NO. 705

SUBJECT Wastewater Treatment Flow and Basin Sizing

CALCULATION NO. _____ NO. OF SHEETS 22

PROBLEMS: Calculate Design Flow Rates and Basin Sizes.

CONCLUSIONS: ① Oily Wastewater Subsystem flowrate is 250 spm

② Oily Wastewater Surge Basin volume is 600,000 gallons

③ Wastewater Treatment System flowrate is 550 spm

④ Wastewater Equalization Basin Volume is 900,000 gallons

Rev. No.	Sht. Nos.	Name Calculation By	Date	Name Checked By	Date	Name Reviewed or Approved By	Date

PRELIMINARY ____ PREFINAL ____ FINAL ____ SUPERSEDES CAL. NO. —

10.7-212

BY J. Whalen DATE _____ SHEET 1 OF 22

CHKD. BY K Masters DATE 5/4/90 OFS NO. _____ DEPT. NO. _____

CLIENT FPL

PROJECT Lauderdale Repowering

SUBJECT Size Wastewater Treatment System & Basins

Problem: Size wastewater basins and set design flowrates for oily and non-oily subsystems. Since many of the components of the plant that are serviced by the wastewater system are not yet finalized, inaccuracies are unavoidable in this calculation. Basin sizes and system flowrates will therefore be rounded up for conservancy.

Inputs: Per the South Florida Water Management District, rainfall runoff must be based on the 25 year - 72 hour storm. For the Lauderdale site, the 25 year - 24 hr storm consists of an 11-inch rainfall. The 25 year - 72 hour storm is based on multiples of this quantity, as defined in SFWMD Table 2-I-2 (attached).

All flows into the basins during the 25-year - 72 hour storm (including continuous process flows) must be pumped out within 5 days to be ready for another 25-year - 72 hour storm.

This calculation basically quantifies flows into the basins based on flows from the wastewater sumps, to arrive at system flowrates and basin volumes.

Basin / Sump flow configurations are shown on Dwg 7918-C-M-227, Sheets 1 and 2.

OW-1 • Lube Oil Collection Tank Area

This is a walled enclosure to contain oil in case of a tank rupture. Wastewater from this sump consists only of (the design 25 year / 72 hour) rainfall that falls within the enclosure

From Dwg 7918-C-P-005 Sheet 1, Rev 0 "General Arrangement, Power Block Area" this sump is scaled to be:

$$19 \text{ ft} \times 35 \text{ ft} = 665 \text{ ft}^2$$

$$665 \text{ ft}^2 \times 15'' \text{ rain} \times \frac{1 \text{ ft}}{12} = = 831.25 \text{ ft}^3 \times 7.48$$

$$= \underline{6218 \text{ gallons}}$$

OW-2 • Unit 4 Combustion Turbine Environmental Enclosure

From Water Balance, Dwg 7918-C-M-174, the average pump seal flow is 8 gpm for 2 units, or 4 gpm per unit. As a continuous flow, this value is integrated over the entire five days during which the basins are pumped

$$4 \text{ gpm} \times 1440 \text{ min/day} \times 5 \text{ days} = \underline{28,800 \text{ gal}}$$

• Assume washdowns are not in progress during the 25-year storm.

OW-3 • Unit 5 Combustion Turbine Environmental Encl.

Same as OW-2 Pump seal water:

4 gpm × 1440 min/day × 5 days = 28,800 gal

OW-4 • No 5 Steam T/G Main Transformer

Scaled from Dwg 7918-C-P-001, Sheet 2, Rev 0, the (existing) transformer enclosure measures:

42' × 38.5' = 1617 ft²

$1617\ ft^2 \times \frac{15''\ rain}{12''/ft} \times 7.48\ gal/ft^3 =$

= 15,119 gallons

• Steam Turbine Drains

These are equipment drains only, assume not in use during storm. All pump seal flows have already been accounted for in OW-2 and OW-3.

0 gallons

• Station Service Transformers

From Dwg 7918-C-P-005, this area is scaled at 2028 ft²

$2028\ ft^2 \times \frac{15''\ rain}{12''/ft} \times 7.48\ gal/ft^3$

= 18,962 gallons

OW-5 Combustion Turbine Area Transformers

Transformer dikes to contain potential oil spills have not yet been designed, since the transformers have not been purchased and oil quantities are not known in detail.

To set a reasonable approximation of the areas required from Dwg 7518-C-P-001, Sheet 1, Rev 0, the sizes shown for typical equipment were doubled to yield the following for enclosure areas:

Main Transformers 40' x 40'

Auxilary Transformers 21.25' x 21.25'

Start-Up Transformers 13.25' x 21.25'

There are ~~four~~ Main Transformers:

$(40')^2 \times 4 = 6400\ ft^2 \times \frac{15"\ rain}{12"/ft} \times 7.48\ gal/ft^3$

$= 59,840\ gal$

There are four Auxilary Transformers

$(21.25')^2 \times 4 = 1806\ ft^2 \times \frac{15"\ rain}{12"/ft} \times 7.48\ gal/ft^3$

$= 16,888\ gal$

There are two start-up transformers

$(13.25) * (21.25) * (2) = 563\ ft^2 \times \frac{15"\ rain}{12"/ft} \times 7.48 \frac{gal}{ft^3}$

$= \underline{5265\ gal}$

OW-6 Fuel Oil Storage Tank Area(s)

To minimize storage basin volumes, and thereby minimize impacts on the isolated wetlands on the eastern part of the site (where the wastewater basins were originally located) the impounded areas around existing oil storage tanks will be subdivided. Low berms will separate those areas which contain piping, valves, or other equipment from the majority of the containment areas. This will allow pumping rainfall only from the areas most prone to spills with the balance of rainfall within the existing dikes left to evaporate or percolate into the ground.

- For Fuel Oil Storage Tanks No 2 and 3, the area to be pumped is 70,938 ft²

(See attached copy of a portion of Dwg 7918-C-P-001 Sheet 1, Rev. 0 for markup of proposed berm locations and scaled/calculated areas.)

$70,938\ ft^2 \times \frac{15\ in\ rain}{12\ in/ft} \times 7.48\ gal/ft^3 = \underline{663,270\ gal}$

- For Fuel Oil Storage Tank No. 5:

As above, the existing diked area will be subdivided.

From Dwg 5086, Rev 9 (copy of portion attached) the subdivided area to be pumped is 38,750 ft²

$$38{,}750\ ft^2 \times \frac{15\ in\ rain}{12\ in/ft} \times 7.48\ gal/ft^3 =$$

362,312 gal

- Existing Gas Turbine Site No. 1

This area, as well as site No. 2, are not yet within Ebasco's scope of work, however the wastewater basins and treatment system are sized to include the resultant flows, since the project will not be licenseable otherwise.

From Dwg 5086, Rev 9, the area is 108,750 ft².

Rainfall runoff from the existing gas turbine sites is designed to catch only the initial portion of the storm, with the balance running off to the environment. Although the discharge points will be updated, this philosophy will be retained per H. Frediani; we design for 2½ inches of rainfall from these structures, not 15".

$108,750\ ft^2 \times \frac{2.5\ in\ rain}{12\ in/ft} \times 7.48\ gal/ft^3$

$= 169,469\ gallons$

- Existing Gas Turbine Sit No 2

The same considerations apply as for Site 1. The area, scaled from the same drawings, is

$142,500\ ft^2 \times \frac{2.5"\ rain}{12"/ft} \times 7.48\ gal/ft^3$

$= 222,062\ gallons$

- Fuel Oil Transfer Pit

This is a concrete enclosure, and the 15" rainfall criteria apply. From Dwg 7918-SK-M-080, Rev C, Sheet 2 this pit is scaled at 28' x 28'

$(28')^2 = 784\ ft^2 \times \frac{15"\ rain}{12"/ft} \times 7.48\ gal/ft^3$

$= 7330\ gallons$

- Heavy Oil Transfer Pit

This is also a concrete enclosure. From Dwg 7918-SK-M-080, Rev C, Sheet 3 this pit is scaled at 23' x 32' = 736 ft^2

$736\ ft^2 \times \frac{15"\ rain}{12"/ft} \times 7.48\ gal/ft^3 = 6882\ gallons$

Note: Pumps and piping to convey waters from Fuel Oil Storage Tank No 5 the existing GT Sites No 1 and No 2, the Fuel Oil Transfer Pit and the Heavy Oil Transfer Pit are not currently scoped / designed. For the purpose of this calculation only these flows are lumped with sump OW-6, although the exact routing to the oily Wastewater Surge Basin may change.

OW-7 : No 4 Steam T/G Main Transformer

This flow is identical to the No 5 Steam T/G set main transformer runoff entered in to OW-4: 1617 ft².

15,119 gal

As for OW-4 steam turbine drains are assumed to be zero flow.

OW-8 : No 4 Steam Turbine Area

From Dwg 7918-C-P-001, Sheet 2, Rev 0, the area drained by this sump is 114 ft²

$$114\ ft^2 \times \frac{15"\ rain}{12"/ft} \times 7.48\ gal/ft^3 = 1066\ gal$$

OW-9 No 5 Steam Turbine Area

Same as OW-8. 114 ft² 1066 gal

Rev. 1

EBASCO SERVICES INCORPORATED

Calc '14

BY _____ DATE _____

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CHKD. BY K Masters DATE 5/4/90

OFS NO. _____ DEPT. NO. _____

CLIENT FPL

PROJECT Lauderdale Repowering

SUBJECT TABLE 1

SOURCE	DESCRIPTION	AREA (ft^2)	GPM	GALLONS	INCHES OF RAIN
OW-1	Lube Oil Collection Tank Area	665	–	6,218	15
OW-2	Pump Seals	–	4	28,800	–
OW-3	Pump Seals	–	4	28,800	–
OW-4	#5 Steam T/G Main Transformer	1,617	–	15,119	15
"	#5 Steam Turbine Drains	–	0	0	–
"	Station Service Transformers	2,028	–	18,962	15
OW-5	New Main Transformers	6,400	–	59,840	15
"	New Auxilary Transformers	1,806	–	16,888	15
"	New Start-up Transformers	563	–	5,265	15
OW-6	Nos. 2 & 3 Fuel Oil Storage Tanks	70,938	–	663,270	15
	No 5 Fuel Oil Storage Tank Area	38,750	–	362,312	15
	Existing GT Site No. 1	108,750	–	169,469	2.5
	Existing GT Site No. 2	142,500	–	222,062	2.5
	Fuel Oil Transfer Pit	784	–	7,330	15
	Heavy Oil Transfer Pit	736	–	6,882	15
OW-7	No. 4 Steam T/G Main Transformer	1,617	–	15,119	15
"	No. 4 Steam Turbine Drains		0	0	–
OW-8	No 4 Steam Turbine Area	114	–	1066	15
OW-9	No 5 Steam Turbine Area	114	–	1066	15
	TOTALS	337,382	8	1,628,468	

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Total flow into Oily Wastewater Surge Basin during 5-day pumpout period (includes 25 year - 72 hr storm) is 1,628,468 gallons. By permit, we must treat and discharge this quantity within 5 days.

1,628,468 gal / 5 days / 1440 min per day

= 226 gpm.

To be conservative, size system for 250 gallons per minute

Oily Wastewater Surge Basin:

From South Florida Water Management District Table C-I-2 (copy attached) the rainfall rate for the first 24 hours is 0.006 x the design 24 hour, 25-year storm. Also from South Florida Water Management District, the 25 year, 24 hour storm is 11 inches.

11 inches rain x 0.006 = 0.066 inches/hr

For the area drained by the oily wastewater subsystem (337,382 ft², Table 1) this corresponds to:

$$\frac{0.066 \text{ inches/hr}}{12 \text{ in/ft}} \times \frac{24 \text{ hrs}}{1 \text{ day}} \times \frac{1 \text{ day}}{1440 \text{ min}} \times 337{,}382 \text{ ft}^2 \times 7.48 \frac{\text{gal}}{\text{ft}^3}$$

= 231 gallons/minute entering basin

In addition, 8 gpm of process flows enter basin continuously. Total flowrate, for first 24 hrs, is 239 gpm

$239 \text{ gal/min} \times 1440 \text{ min} = 344{,}160 \text{ gal}$ pumped out 1st day

Again from the SFWMD table C-I-2 the rainfall rate for the second day is:

0.359 (48 hr cumulative)
−0.146 (24 hr cumulative)

$0.213 \times 11'' / 24 \text{ hr} = 0.097625 \text{ in/hr}$

For Second Day:

$$\frac{0.097625 \text{ in/hr}}{12 \text{ in/ft}} \times \frac{24 \text{ hr}}{1440 \text{ min/day}} \times 337{,}382 \text{ ft}^2 \times 7.48 \frac{\text{gal}}{\text{ft}^3} = 342 \text{ gpm}$$

Since this inflow is greater than 250 gpm system will operate at 250 gpm design flowrate for days 2 & 3

$250 \text{ gal/min} \times 1440 \text{ min/day} \times 2 \text{ days}$

$= 720{,}000$ gal pumped out

Total gallonage pumped out during 3 days of 25 year storm:

Day 1	344,160 gal
Days 2&3	720,000 gal
	1,064,160 gal

Flow into Basin over 5 days: 1,628,468 gallons

Pumpout, first 3 days: 1,064,160 gallons

Surge Capacity Required: 564,308 gallons

Required Basin volume, neglecting rain fall onto basin itself, is 564,308 gal.

Say 600,000 gallons required

for Oily Wastewater Surge Basin

Assume useable basin depth is 9 ft 0 in. 15 inches is reserved for rainfall. 7 ft 9" depth for surge

600,000 gal ÷ 7.48 = 80,213.9 ft³ reqd

80,213.9 ÷ 7.75 ft depth = 10,350 ft²

For this area, for the first 24 hrs

$0.066 \text{ in/hr} \times \frac{\text{ft}}{12 \text{ in}} \times \frac{\text{hr}}{60 \text{ min}} \times 10,350 \text{ ft}^2 \times 7.48 \text{ gal/ft}^3$

= 7.09 gpm rainfall directly onto basin

Keep basin size, but increase pumpout rate to 239 + 7 = 246 gpm for the first day

Non-Oily Waste Streams

WT-1 Chemical Laboratory Drains

From the water Balance, Dwg 7918-C-M-176, Rev 0, the Chem Lab drains flow at an average of 5 gpm

5 gpm × 1440 min/day × 5 days = 36,000 gal

WT-2 • No 5 HRSG Drains

Assume flow = 0, since major cleaning operations would be suspended during a 25-year storm

0 gal

• HRSG No 5 Blowdown

Use 1% of steam flow, and quench with service water to 150°F, per C Khalaf, 4/25/90

Flows are 25 gpm blowdown + 4 gpm quench

29 gpm × 1440 min/day × 5 days = 208,800 gal

• No 5 Chemical Feed Skids

Ammonia (NH_3) and Hydrazine (N_2H_4) Skids each measure 7' x 9' as scaled from the preliminary HRSG Area Layout Drawing (Dwg Number not yet assigned)

There are 3 NH_3 skids and 3 N_2H_4 skids

7 ft x 9 ft x 6 skids = 378 ft^2

From the same drawing, phosphate skids are expected to measure 14 ft x 7 ft
There is one phosphate skid per unit

14 ft x 7 ft = 98 ft^2

Total Area, #5 Chem Feed Skids: 378 ft^2
98 ft^2

476 ft^2

$$476\ ft^2 \times \frac{15\ in\ rain}{12\ in/ft} \times 7.48\ gal/ft^3$$

$$= 4451\ gal$$

- No 5 Stack Drains

There are two stacks per unit. For worst case use 15 inch rainfall criteria.

From Dwg 7918-C-P-001, Sheet 1 Rev 0, Stack ID is scaled at 20 ft.

$$\frac{\pi (20)^2}{4} = 314\ ft^2 \times 2\ stacks = 628\ ft^2$$

$$628\ ft^2 \times \frac{15\ in\ rain}{12\ in/ft} \times 7.48\ gal/ft^3 = 5874\ gal$$

WT-3 Flows are the same as WT-2, except for the addition of the battery room washdown. Washdown is assumed to be for a period of 20 minutes per day at the single-hose rate of 15 gpm

15 gpm x 20 min/day x 5 days = 1500 gal

WT-4 Steam Turbine Sample Drains (Units 4&5)

From the Water Balance Dwg 7918-C-M-176 Rev 0 the acreage of all samples is 2gpm. Assume all plant samples enter this sump.

2 gpm x 1440 min/day x 5 days = 14,400 gal

Reverse Osmosis Rejects

The R/O rejects were previously assumed to be routed to the Wastewater Treatment System when their pH was out of limits for direct discharge. This resulted in more than doubling the size of the wastewater treatment system and adding more than 5 million gallons to the inventory of the equalization basin. In order to preserve the isolated wetlands on the east side of the plant, this basin volume must be reduced. Therefore separate pH adjustment will be provided for the R/O wastes. 0 gallons

Demineralizer Regeneration Wastes

This stream is normally discharged directly to the canal after neutralization in the "Totally Enclosed Treatment Facility"

From the Water Balance, Dwg 7918-C-M-176 Rev 0 the demineralizer product flow is normally 769 gpm. For mixed bed demineralizers, the regeneration wastes are assumed to be 9% of product flowrate.

769 gpm × 0.09 = 69 gpm

69 gpm × 1440 min/day × 5 days = 496,800 gal

Carbon Filter Backwash & Rinse

From the Water Balance Dwg 7918-C-M-176 Rev 0, this flow is 4 3/4 % of the product, or 57 gpm

57 gpm × 1440 min/day × 5 days = 410,400 gal

Wastewater ("Continuous Backwash") Filter Backwash

From the Water Balance, Dwg 7918-C-M-176, Rev 0, this flow is 20 gpm.

20 gpm × 1440 min/day × 5 days = 144,000 gal

Sludge Transfer Pumps

This flow is assumed to occur for 40 minutes per day at the rate of 25 gpm

25 gpm × 40 minutes/day × 5 days = 5000 gal

Centrifuge Reclaimed Water

This flow is assumed to occur for 60 minutes per day at the rate of 30 gpm

30 gpm × 60 min/day × 5 days = 9000 gal

Makeup Watertreatment Area Runoff

This area is scaled from Dwg 7918-C-P-009, Rev C, to be 140' × 240', less a rectangle measuring 40' × 155'. Net Area is 27,400 ft²

$$27{,}400\ ft^2 \times \frac{15\ in\ rain}{12\ in/ft} \times 7.48\ gal/ft^3$$

$$= 256{,}190\ gal$$

Combustion Turbine Evaporative Coolers

From Westinghouse letter CTW-ESI-132-89-0039, dated Dec 19, 1989, the makeup flow to the coolers is given as 236 gpm. Since makeup water is R/O product (service water), the

quality should easily support 10 cycles of concentration. To be conservative, assume 5 cycles. Blowdown is therefore 20% of makeup, or 236 l/s = 47 gpm

47 gpm x 1440 min/day x 5 days

= 338,400 gal.

From Table 2, flows into the equalization basin will accumulate 2,149,940 gallons. The pumpout rate for this system will also have to reprocess the contents of the oily wastewater Surge Basin

Equalization Basin (gross) 2,149,940
Oily Wastewater Surge Basin 1,628,468

Total Basins' volume = 3,778,408

This volume must be processed within 5 days.

3,778,408 gal / 5 days / 1440 min per day

= 525 gpm

To be conservative, size system for

550 gpm

Source	Description	Area (ft^2)	GPM	Gallons	Inches Rain
WT-1	Chemical Laboratory Drains	-	5	36,000	-
WT-2	#5 HRSG Drains	-	0	0	-
	#5 HRSG Blowdown	-	29	208,800	-
	#5 Chemical Feed Skids	476	-	4,451	15
	#5 Stack Drains	628	-	5,874	15
WT-3	#4 HRSG Drains	-	0	0	-
	#4 HRSG Blowdown	-	29	208800	-
	#4 Chemical Feed Skids	476	-	4,451	15
	#4 Stack Drains	628	-	5,874	15
	Battery Room	-	0.2	1,500	-
WT-4	#4 & #5 Sample Drains	-	2	14,400	-
TETF	Demineralizer Regeneration	-	69	496,800	-
	Carbon Filter Backwash	-	57	410,400	-
Direct	Wastewater Filter Backwash	-	20	144,000	-
Direct	Sludge Transfer	-	0.7	5,000	-
Direct	Centrifuge Reclaimed Water		1.25	9,000	
	Water Treatment Area Runoff	27,400	-	256,190	15
	C.T. Evaporative Coolers	-	47	338,400	-
	TOTALS	29,608	260	2,149,940	

Equalization Basin Sizing.

The equalization basin volume can be decreased by the quantity of water pumped out of the basin during the 25 year - 72 hour storm. The design pumpout rate (550 gpm) can be used only if supported by equal or greater flows into the basin. Lowest rainfall rates, and therefore the lowest influent rates, occur during the first 24 hours.

The following are significant flows into the Equalization Basin:

Oily Wastewater treatment effluent
Process flows directly to Equalization Basin
Rainfall runoff collected by Equal. Basin
Rainfall directly into Basin

From Page 12 of this calculation the oily wastewater process flow for the first 24 hours is 246 gpm

Process flows entering the Equal. Basin total 260 gpm (Table 2)

The area drained into the equal basin is 29,668 ft^2 (from Table 2). From page 10 of this calculation the initial rainfall rate is 0.066 inch rain per hour

$$\frac{0.06\ in/hr \times 29,608\ ft^2 \times 7.48\ gal/ft^3}{(12\ in/ft)(60\ min/hr)} = 20\ gpm$$

To calculate the rainfall rate on the Equalization basin, the basin size must be known. Since the sizing is the object of this exercise, a rate will be assumed as an input to the basin sizing and then verified, with adjustments as appropriate.

Since 7 gpm fell on the Oily Wastewater Surge basin during the first 24 hours (Page 12 of this calculation), and the Equalization basin should be larger than the Oily Wastewater basin, estimate rainfall onto the Equalization basin to be at the rate of 10 gpm.

Flows entering Equalization Basin during the first 24 hours are:

Oily Wastewater Product	246 gpm
Process flows	260 "
Rainfall drainage	20 "
Rainfall onto basin	10 "
	536 gpm.

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Calc 74

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CHKD. BY K Masters DATE 5/4/90

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CLIENT FPL

PROJECT Lauderdale Repowering

SUBJECT Size Wastewater Treatment System & Basins

Using pumpout rate of 536 gpm, a deduction must be made for the 246 gpm from the city wastewater system (this flow empties the city Wastewater surge basin, and is only a pass through for Equalization basin hydraulics)

Adjusted pumpout rate = 536 - 246 = 290 gpm

290 gpm x 1440 min/day x 3 days

pumpout = 1,252,800 gallons

Influent (Table 2) 2,149,940 gallons

− 1,252,800 "

897,140 gallons

Say 900,000 gallon Equalization Basin Volume

Verify rainfall assumption into basin:

900,000 gal / (7.48 gal/ft³) / 7.75 ft basin depth (w/o rain)

= 15,525 ft²

$0.066 \text{ in/hr} \times \frac{\text{ft}}{12 \text{ in}} \times \frac{\text{hr}}{60 \text{ min}} \times 15{,}525 \text{ ft}^2 \times 7.48 \text{ gal/ft}^3$

= 10.64 gpm into basin first day

Assumption is valid. Using 300 gpm 2nd & 3rd Day is justified; more conservative

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TABLE C-I-2

DESIGN RAINFALL DISTRIBUTION

72-HOUR EVENT — 15-MINUTE INCREMENTS

TIME (HOURS)	RAINFALL RATIO (TOTAL/24-HR)	TIME (HOURS)	RAINFALL RATIO (TOTAL/24-HR)	TIME (HOURS)	RAINFALL RATIO (TOTAL/24-HR)
.00	.000	12.25	.075	24.25	.148
.25	.002	12.50	.076	24.50	.150
.50	.003	12.75	.078	24.75	.153
.75	.005	13.00	.079	25.00	.155
1.00	.006	13.25	.081	25.25	.157
1.25	.008	13.50	.082	25.50	.159
1.50	.009	13.75	.084	25.75	.162
1.75	.011	14.00	.085	26.00	.164
2.00	.012	14.25	.087	26.25	.166
2.25	.014	14.50	.088	26.50	.168
2.50	.015	14.75	.090	26.75	.170
2.75	.017	15.00	.091	27.00	.173
3.00	.018	15.25	.093	27.25	.175
3.25	.020	15.50	.094	27.50	.177
3.50	.021	15.75	.096	27.75	.179
3.75	.023	16.00	.097	28.00	.182
4.00	.024	16.25	.099	28.25	.184
4.25	.026	16.50	.100	28.50	.186
4.50	.027	16.75	.102	28.75	.188
4.75	.029	17.00	.103	29.00	.190
5.00	.030	17.25	.105	29.25	.193
5.25	.032	17.50	.106	29.50	.195
5.50	.033	17.75	.108	29.75	.197
5.75	.035	18.00	.110	30.00	.199
6.00	.036	18.25	.111	30.25	.201
6.25	.038	18.50	.113	30.50	.204
6.50	.040	18.75	.114	30.75	.206
6.75	.041	19.00	.116	31.00	.208
7.00	.043	19.25	.117	31.25	.210
7.25	.044	19.50	.119	31.50	.213
7.50	.046	19.75	.120	31.75	.215
7.75	.047	20.00	.122	32.00	.217
8.00	.049	20.25	.123	32.25	.219
8.25	.050	20.50	.125	32.50	.221
8.50	.052	20.75	.126	32.75	.224
8.75	.053	21.00	.128	33.00	.226
9.00	.055	21.25	.129	33.25	.228
9.25	.056	21.50	.131	33.50	.230
9.50	.058	21.75	.132	33.75	.233
9.75	.059	22.00	.134	34.00	.235
10.00	.061	22.25	.135	34.25	.237
10.25	.062	22.50	.137	34.50	.239
10.50	.064	22.75	.138	34.75	.241
10.75	.065	23.00	.140	35.00	.244
11.00	.067	23.25	.141	35.25	.246
11.25	.068	23.50	.143	35.50	.248
11.50	.070	23.75	.144	35.75	.250
11.75	.071	24.00	.146	36.00	.252
12.00	.073				

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TABLE C-I-2 (continued)

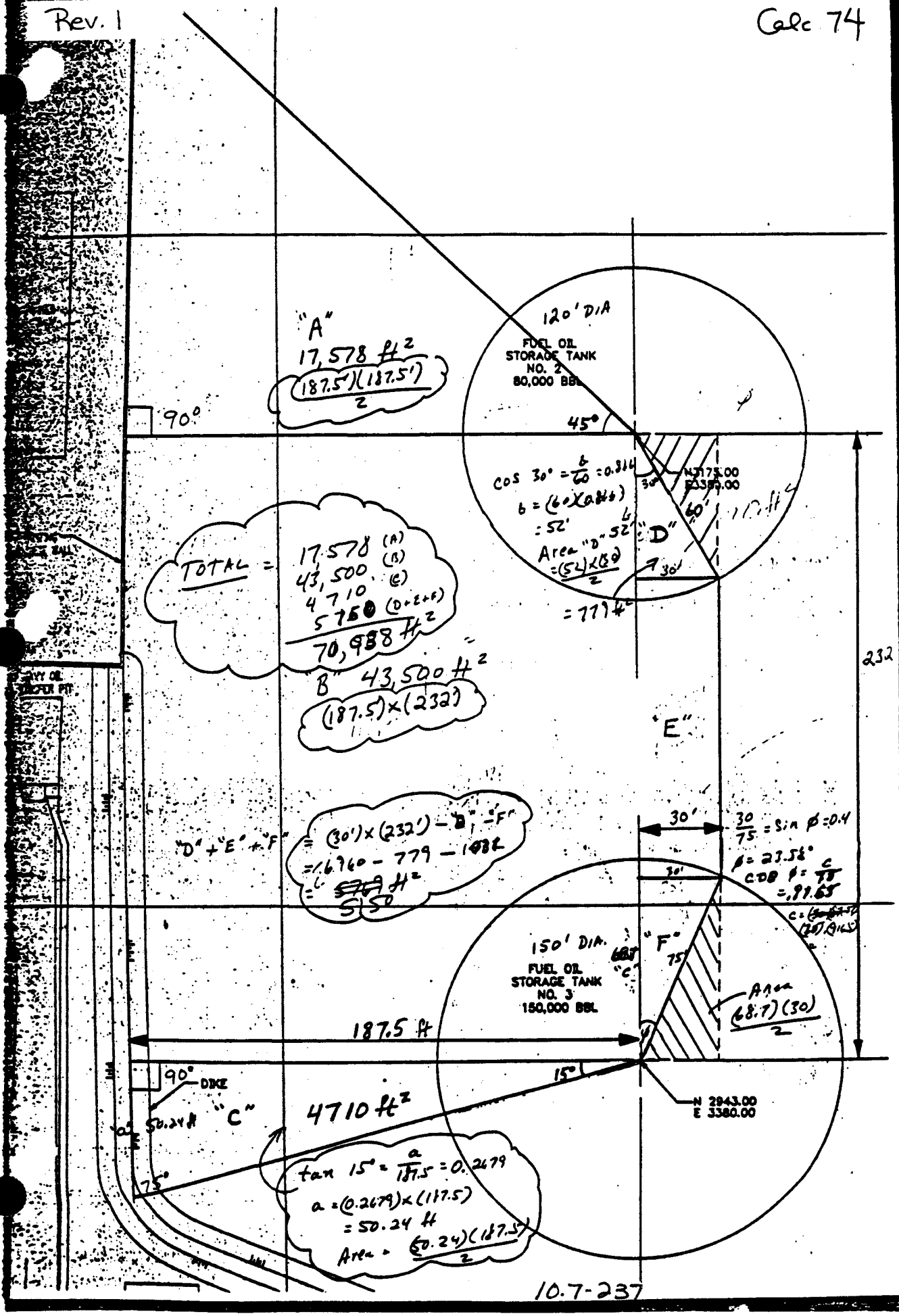
DESIGN RAINFALL DISTRIBUTION

72-HOUR EVENT — 15-MINUTE INCREMENTS

TIME (HOURS)	RAINFALL RATIO (TOTAL/24-HOUR)		TIME (HOURS)	RAINFALL RATIO (TOTAL/24-HR)		TIME (HOURS)	RAINFALL RATIO (TOTAL/24-HR)	
36.25	.255	3	48.25	.362	3	60.25	1.052	37
36.50	.257	2	48.50	.364	2	60.50	1.088	36
36.75	.259	2	48.75	.367	3	60.75	1.107	19
37.00	.261	3	49.00	.369	2	61.00	1.126	19
37.25	.264	2	49.25	.372	3	61.25	1.140	14
37.50	.266	2	49.50	.374	2	61.50	1.154	14
37.75	.268	2	49.75	.377	3	61.75	1.166	12
38.00	.270	2	50.00	.379	2	62.00	1.177	11
38.25	.272	3	50.25	.382	3	62.25	1.186	9
38.50	.275	2	50.50	.385	3	62.50	1.194	8
38.75	.277	2	50.75	.388	3	62.75	1.202	8
39.00	.279	2	51.00	.391	3	63.00	1.209	7
39.25	.281	3	51.25	.394	3	63.25	1.217	8
39.50	.284	2	51.50	.397	3	63.50	1.224	7
39.75	.286	2	51.75	.400	4	63.75	1.232	8
40.00	.288	2	52.00	.404	4	64.00	1.239	7
40.25	.290	2	52.25	.408	4	64.25	1.243	4
40.50	.292	3	52.50	.412	5	64.50	1.248	5
40.75	.295	2	52.75	.417	4	64.75	1.253	5
1.00	.297	2	53.00	.421	5	65.00	1.257	4
41.25	.299	2	53.25	.426	5	65.25	1.262	5
41.50	.301	3	53.50	.431	6	65.50	1.266	4
41.75	.304	2	53.75	.437	5	65.75	1.271	5
42.00	.306	2	54.00	.442	6	66.00	1.275	4
42.25	.308	2	54.25	.448	6	66.25	1.280	5
42.50	.310	2	54.50	.454	7	66.50	1.284	4
42.75	.312	3	54.75	.461	6	66.75	1.289	5
43.00	.315	2	55.00	.467	7	67.00	1.293	4
43.25	.317	2	55.25	.474	7	67.25	1.298	5
43.50	.319	2	55.50	.481	7	67.50	1.302	4
43.75	.321	3	55.75	.488	8	67.75	1.307	5
44.00	.324	2	56.00	.496	8	68.00	1.311	4
44.25	.326	2	56.25	.504	8	68.25	1.314	3
44.50	.328	2	56.50	.512	9	68.50	1.317	3
44.75	.330	2	56.75	.521	9	68.75	1.320	3
45.00	.332	2	57.00	.530	10	69.00	1.323	3
45.25	.335	2	57.25	.540	10	69.25	1.326	3
45.50	.337	2	57.50	.550	11	69.50	1.329	3
45.75	.339	2	57.75	.561	11	69.75	1.332	3
46.00	.341	2	58.00	.572	12	70.00	1.335	3
46.25	.343	3	58.25	.584	12	70.25	1.338	3
46.50	.346	2	58.50	.596	16	70.50	1.341	3
46.75	.348	2	58.75	.612	16	70.75	1.344	3
47.00	.350	2	59.00	.628	25	71.00	1.347	3
47.25	.352	3	59.25	.653	25	71.25	1.350	3
47.50	.355	2	59.50	.678	169	71.50	1.353	3
47.75	.357	2	59.75	.847	168	71.75	1.356	3
48.00	.359		60.00	1.015		72.00	1.359	

Rev. 1

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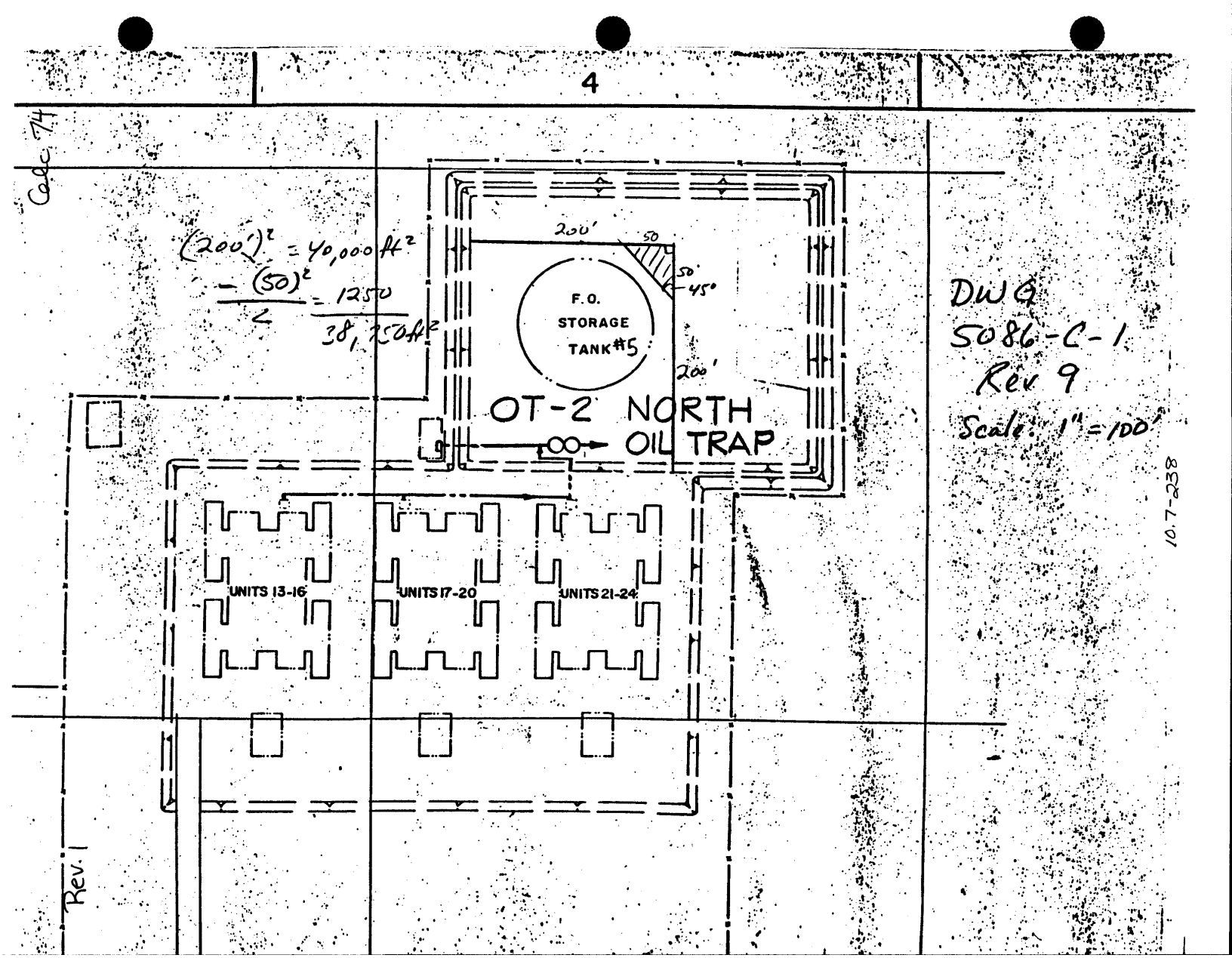
10.7-237

Code 74

$(200')^2 = 40{,}000\ ft^2$

$-\ (50)^2 = 1250$

$\frac{}{4}\ \frac{}{38{,}750 ft^2}$



DWG
5086-C-1
Rev 9
Scale: 1" = 100'

10.7-238

Rev. 1

Rev. 1

EBASCO SERVICES INCORPORATED

BY HAP DATE 3/25/90

CHKD. BY KM DATE 3/26/90

SHEET 1 OF 13

OFS NO. 7918.017 DEPT. NO. 941

CLIENT FPL

PROJECT PFLR

SUBJECT Existing and Proposed Stormwater Runoff Acreage Breakdown

Page 2 is based on SCA Figure 2.3-2

east-west division based on Figure 2.1-6

East half = 202.2 acres (Figure 2.1-6)
West half = 189.7 acres " "

391.9 ≈ 392 acres

From east half, have 7 land areas (see p. 2) numbered I through VII

by planimeter of areas on p 2

Area	Square Inches	Acres
I	.2325004	3.46
II	.2635005	3.92
III	.6975013	10.39
IV	.1085002	1.62
V	.2480004	3.69
VI	.0930001	1.38
VII	.0775001	1.15
East half	13.578027	202.2 *

* known

Total I thru VII 25.61

202.2
− 25.6
176.6 acres lake

rest is

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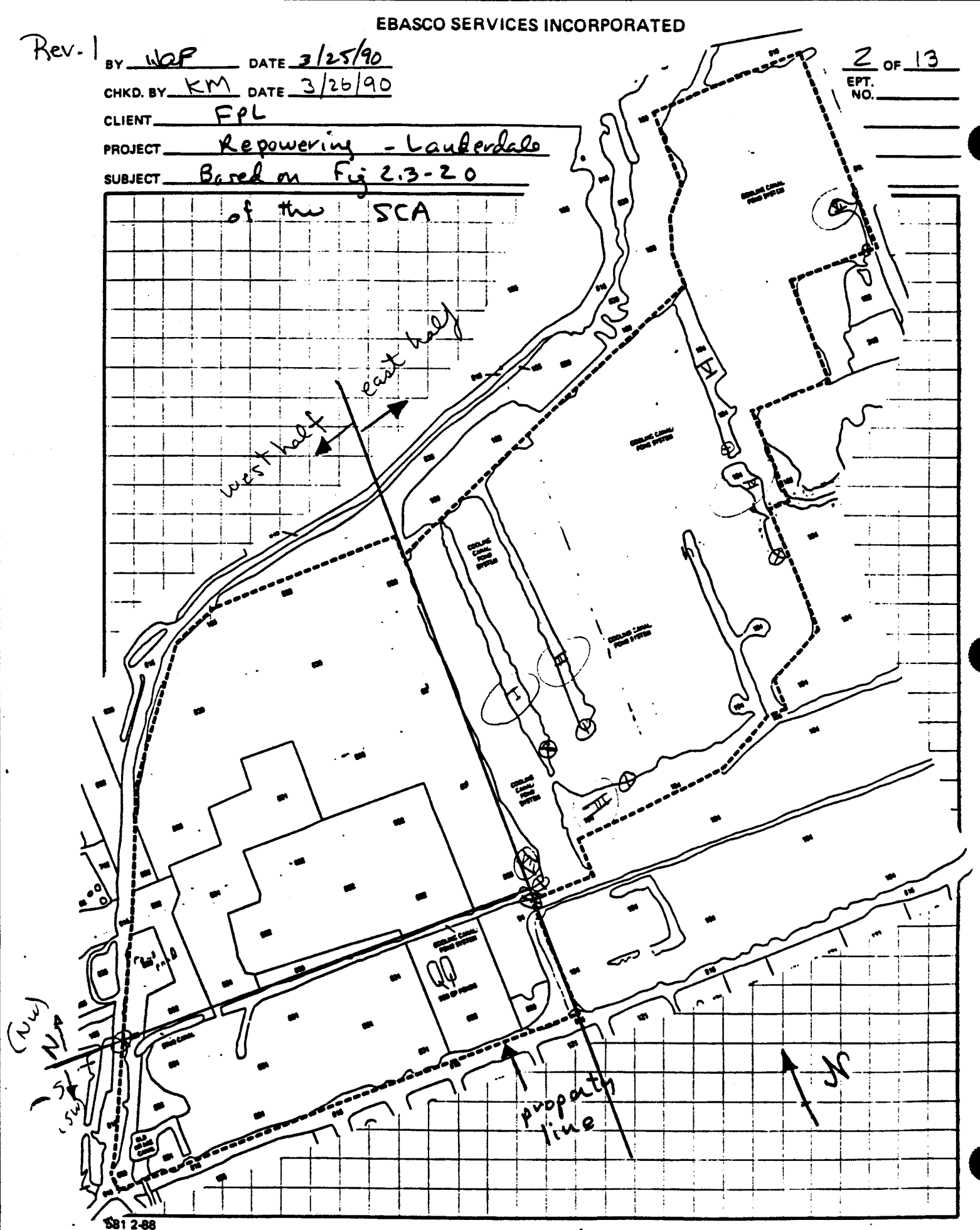
CLIENT FPL

PROJECT Repowering - Lauderdale

SUBJECT Based on Fig 2.3-20 of the SCA

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10.7-240

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CLIENT FPL

PROJECT PFLR

SUBJECT Existing + Proposed Stormwater Runoff Acreage Breakdown

SFWMD sufficiency question 20 only gives four types of areas:

pervious areas
water management areas
building (rooted) areas
other impervious areas

So, for east half of site

176.6 acres of water management area
25.6 acres of pervious area

for the west half of the site, divide into 2 sections; north-west & south-west

Northwest is north of existing discharge canal southwest is south of existing discharge canal (& including canal)

see p. 4

of the Northwest Portion, only the GT area (3 banks of 4, each - see p. 5 for enlarged view) and the oil tank are impervious and they are not buildings, so are "other" impervious area

from page 5

impervious → $206 * 469 + 120^2 * \pi/4$

$= 96,614 + 11,310 = 107924 ft^2$

$= 2.5$ acres

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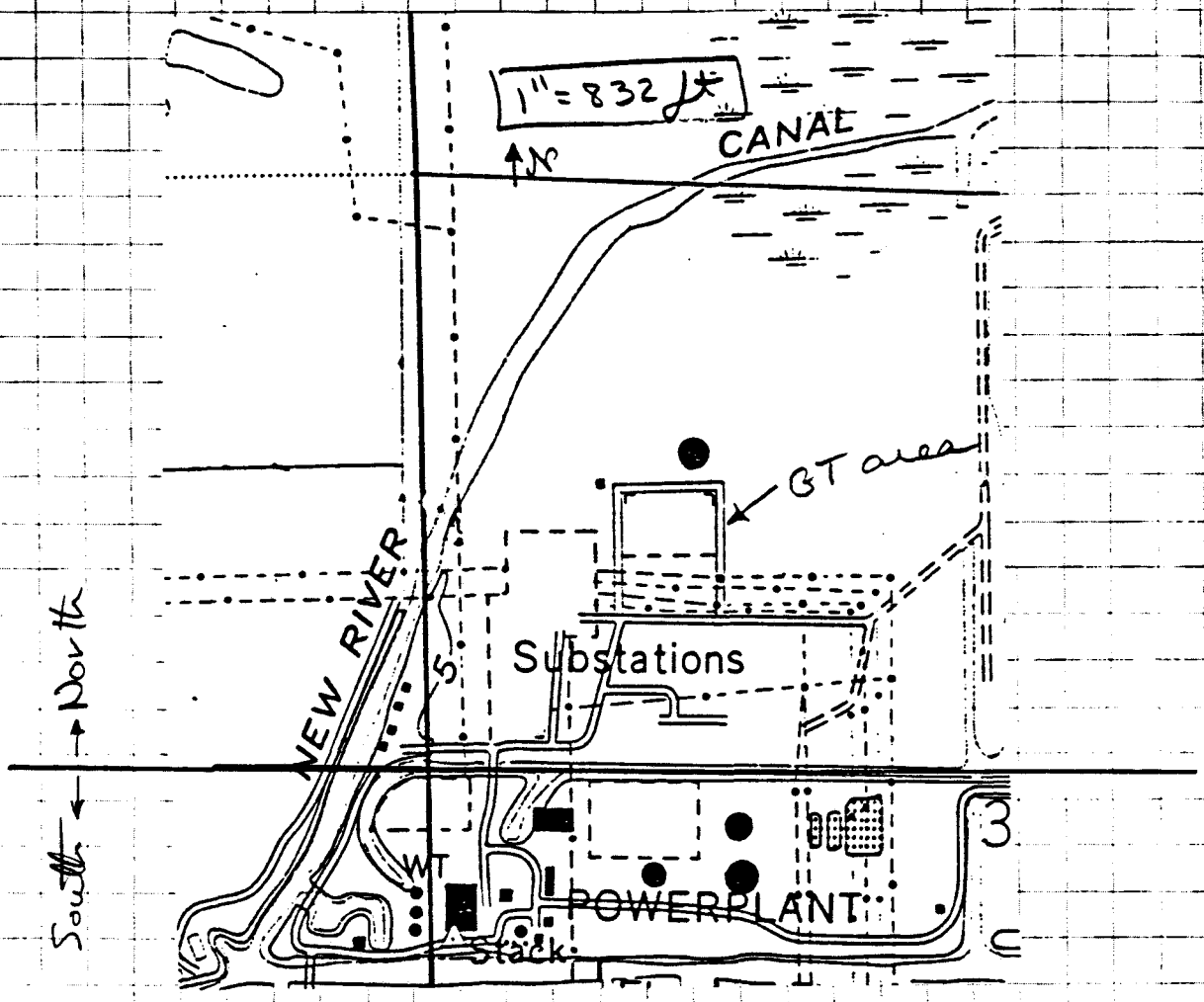
BY NOP DATE 3/25/90 SHEET 4 OF 13

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PROJECT PFLR

SUBJECT Acreage Breakdown on site



Based on USGS 7½' Quad Sheet
Lauderdale S. multiplied 2.4 times

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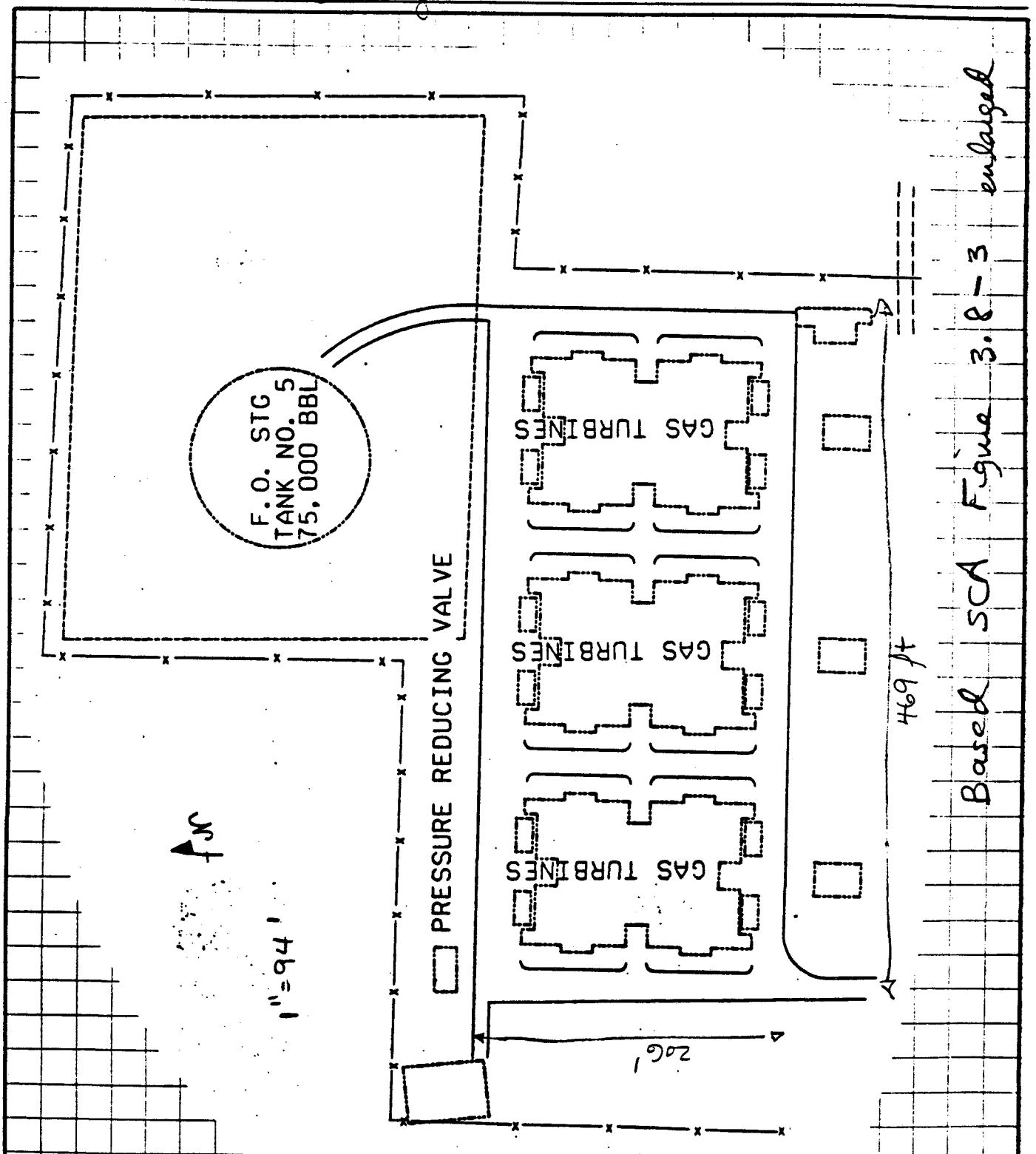
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PROJECT PFLR

SUBJECT Site Drainage



Based SCA Figure 3.8-3 enlarged

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10.7-243

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CLIENT FPL

PROJECT PFLR

SUBJECT Site Drainage

Planimeter from p 2, the Northwest area

= 9.501519 in^2 = 141.5 acres

of this, 2.5 is other impervious

thus 141.5 - 2.5 = 139.0 acres is pervious

Southwest portion is all that left

West half = 189.7 acres

Northwest part = 141.5

48.2 = remainder of south-west

Summary thus far:

	east half	north-west	Total
pervious areas	25.6	139	164.6
water man. areas	176.6		176.6
building areas			
other imp. areas		2.5	2.5
			343.7

these values are unchanged between existing and proposed

---

all the differences between proposed and existing will occur in the "southwest" portion

(go to page 9)

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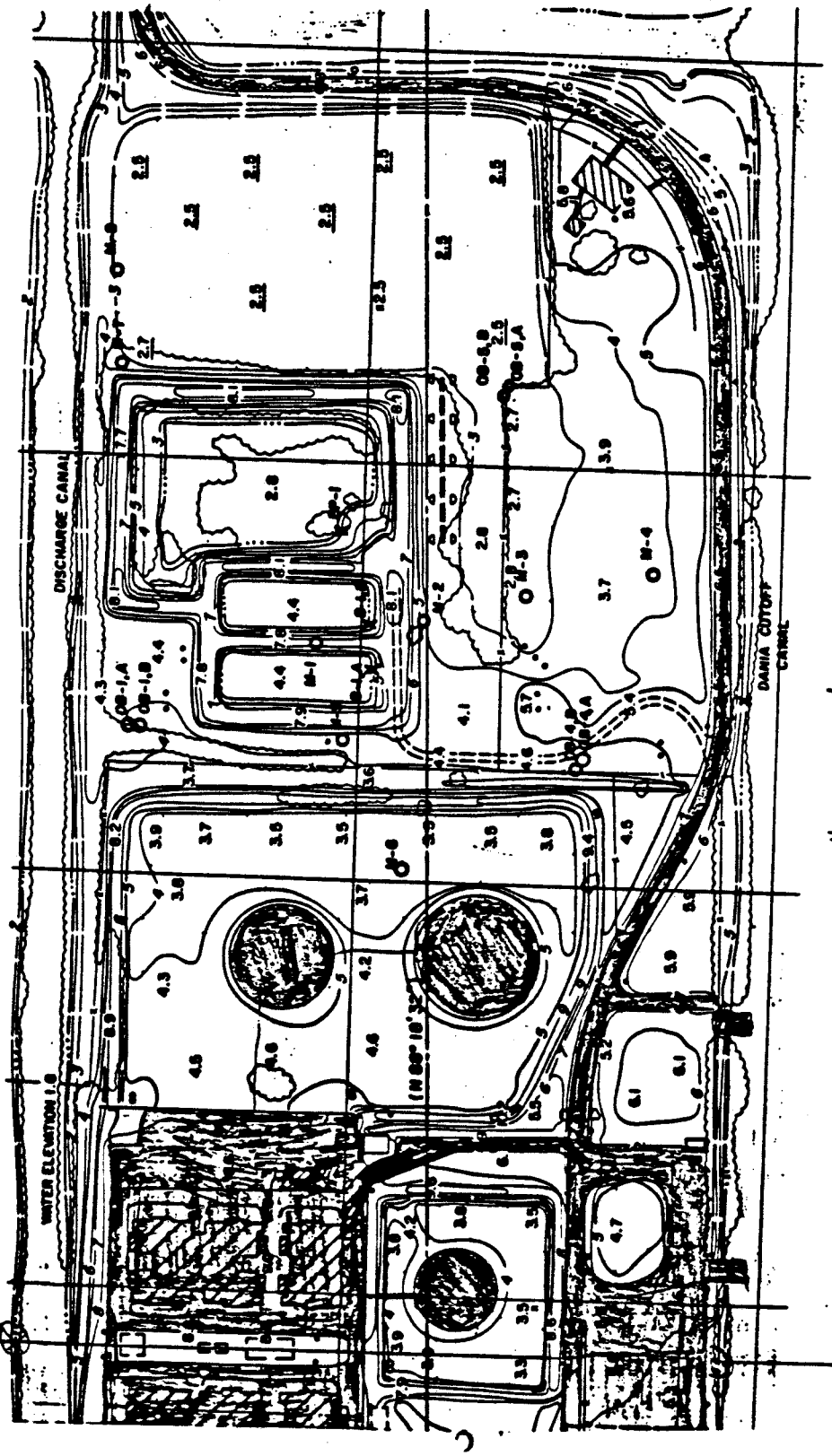
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CLIENT FPL

PROJECT PFLR

SUBJECT Existing & Proposed Stormwater Runoff Acreage Breakdown



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10.7-245

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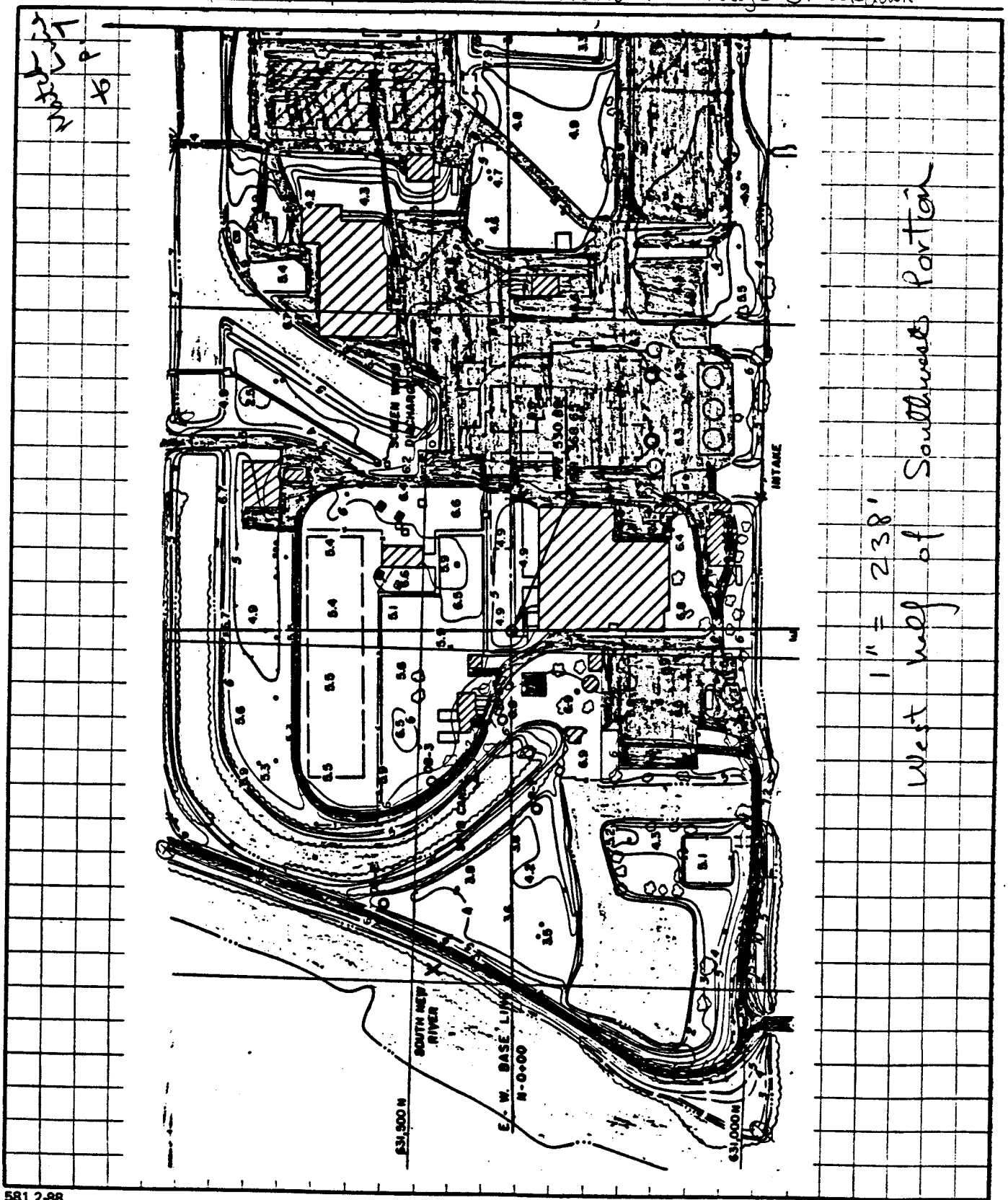
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PROJECT PFLR

SUBJECT Existing and Proposed Stormwater Runoff Acreage Breakdown



1" = 238'

West half of Southwest Portion

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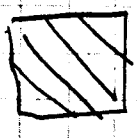
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PROJECT PFLR

SUBJECT Site Drainage

Pages 7 & 8 depict southwest Portion of site with areas designated as follows:

shaded – other impervious

 – buildings

blank – pervious

inside — water management areas

by planimeter, per sheet

	P8 in²	P7 in²	Total in²	Acres
other impervious	10.05952	4.96 00099	15.02	11.4
building	1.5810031	0.1550003	1.74	1.3
water management (old intake) (stub) (ditch, channel)	1.3020026 1.5500031 1.4260028 4.2780085	2.1390042	6.42	4.9
pervious (calc. by subtract from totals)			40.25	30.6
total	30.876061	32.550065	63.43	48.2 (from p. 6)

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Calc. 56

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PROJECT PFLR

SUBJECT Site Drainage

Summary – Existing Acreage

	East & Northwest Portions	Southwest Portion	Total Existing
Pervious Areas	164.6	30.6	195.2
Water Management Areas	176.6	4.9	181.5
Building Areas	–	1.3	1.3
Other Impervious Areas	2.5	11.4	13.9

Total = 391.9 Acres

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CLIENT FPL
PROJECT PFLR
SUBJECT Site Drainage - Acres

Acreage Breakdown for Proposed Site Usage is the same except for the Southwest Portion - from Section 3.8.2 of SCA & New Areas

Water Management Areas

Eq Basin - 3 Acres
Runoff Pond 0.7

Existing

pervious - 3
pervious 0.7
3.7

Buildings

CT Enclosure
390 x 105 = .9 acres
(sect 3.2.2)
43560

rest of Power Block 8.4
other Impervious

New Warehouse 0.4 acres
1.3

4.6 pervious
4.7 other imp.
(by inspection of p. 12)
other → 0.4

Other Impervious

Wat Treatment Area 1.1 — 1.1 perv
Wastewater Trt Area 1.5 — 1.5 perv
8.4
Triangular Parking Lot on West End 0.8 — 0.8 perv
11.8

Pervious

New area of old intake canal 1.0 — 1.0 wat man. area

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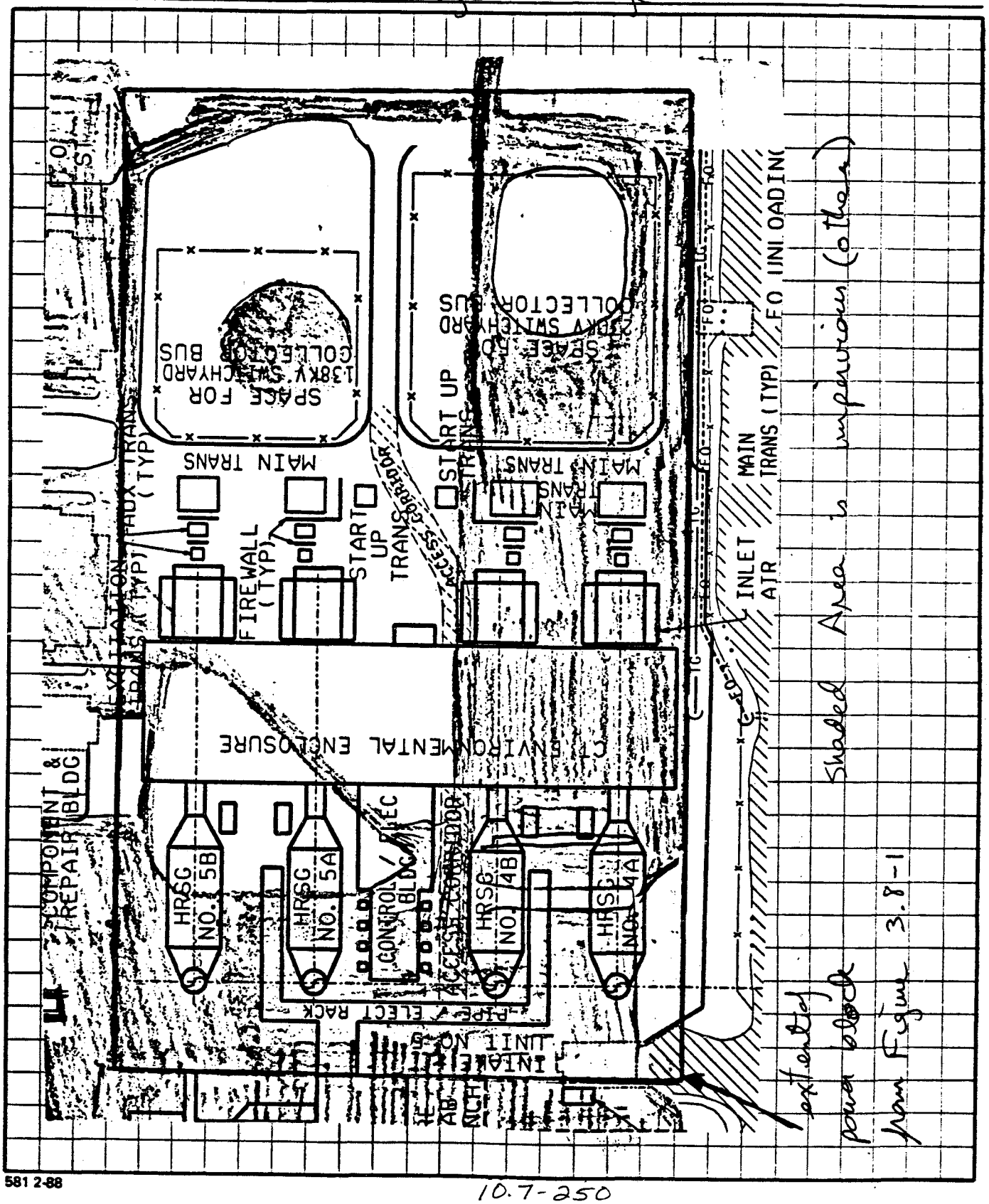
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CLIENT FPL

PROJECT PFLR

SUBJECT site drainage - acreage



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10.7-250

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CLIENT FPL

PROJECT PFLR

SUBJECT Existing and Proposed Stormwater Runoff Acreage Breakdown

Summary of Changes

	Existing (p. 10)	Add (p 11) with Proposed Use	Delete ⊛ with Proposed Use	Under Proposed Use
Pervious Areas	195.2	1.0	11.7	184.5
Water Management Areas	181.5	3.7	1.0	184.2
Building Areas	1.3	1.3	0	2.6
Other Impervious Areas	13.9	11.8	5.1	20.6
total	391.9	17.8	17.8	391.9

⊛ from p 11

delete per p. 11

pervious		other
3.0	9.1	4.7
0.7	1.1	0.4
4.6	1.5	
0.8	11.7	5.1
9.1		

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