CDM

Application for Power Plant Site Certification

Hillsborough County Resource Recovery Facility Expansion

Volume II

Hillsborough County
Florida

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November 18, 2005

Mr. Hamilton S. Oven, Jr., P.E.
Administrator, Office of Siting Coordination
Florida Department of Environmental Protection
2600 Blair Stone Road, MS 48
Tallahassee, Florida 32399

Subject: Hillsborough County Resource Recovery Facility Expansion
Application for Power Plant Site Certification

Dear Mr. Oven:

Enclosed, please find Hillsborough County's Application for Power Plant Site Certification (Application), which addresses the construction and operation of an additional municipal waste combustor at the County's existing Resource Recovery Facility (Facility). This application has been prepared to satisfy the requirements set forth in the Florida Electrical Power Plant Siting Act (PPSA) and the PPSA rules adopted by the Florida Department of Environmental Protection (FDEP) at Chapter 62-17, of the Florida Administrative Code.

The Hillsborough County Resource Recovery Facility is owned by Hillsborough County and operated by Covanta Hillsborough, Inc. The Facility has operated successfully since 1987, serving the waste disposal needs of unincorporated Hillsborough County. The Facility has operated at full capacity for several years, necessitating the diversion of municipal waste to the County's landfill. The expansion being applied for with this Application will allow the Facility to recover energy from an additional 600 tons of waste per day and will result in a beneficial environmental and economic impact on solid waste disposal in Hillsborough County.

As part of the Application process, the County has compiled the necessary information to allow the FDEP to evaluate the merits of expanding the Facility. Specifically:

- The air quality analysis demonstrates the expanded Facility's emissions will be indistinguishable from existing ambient conditions.
- The proposed emission limits, developed in accordance with a Best Available Control Technology (BACT) evaluation are more stringent than the USEPA's New Source Performance Standards for Municipal Waste Combustors.

- An assessment of human health and ecological risks associated with the expansion demonstrates that that the expanded Facility is not anticipated to have an adverse impact.
- The expansion of the Facility is consistent with the County's Comprehensive Growth Plan to reduce dependence on a landfill for solid waste disposal.

Enclosed herein is a check in the amount of $125,000 for payment of the application fee. We look forward to working with you and your staff to answer any questions you may have about the project. If you should have any questions concerning the Application submittal or require additional information, please do not hesitate to contact us at (813) 281-2900.

Very truly yours,

Daniel E. Strobridge, QEP
Vice President
Camp Dresser & McKee Inc.

Jason M. Gorrie, P. E.
Sr. Project Manager
Camp Dresser & McKee Inc.

Enclosure

c: Thomas G. Smith, HCSWMD

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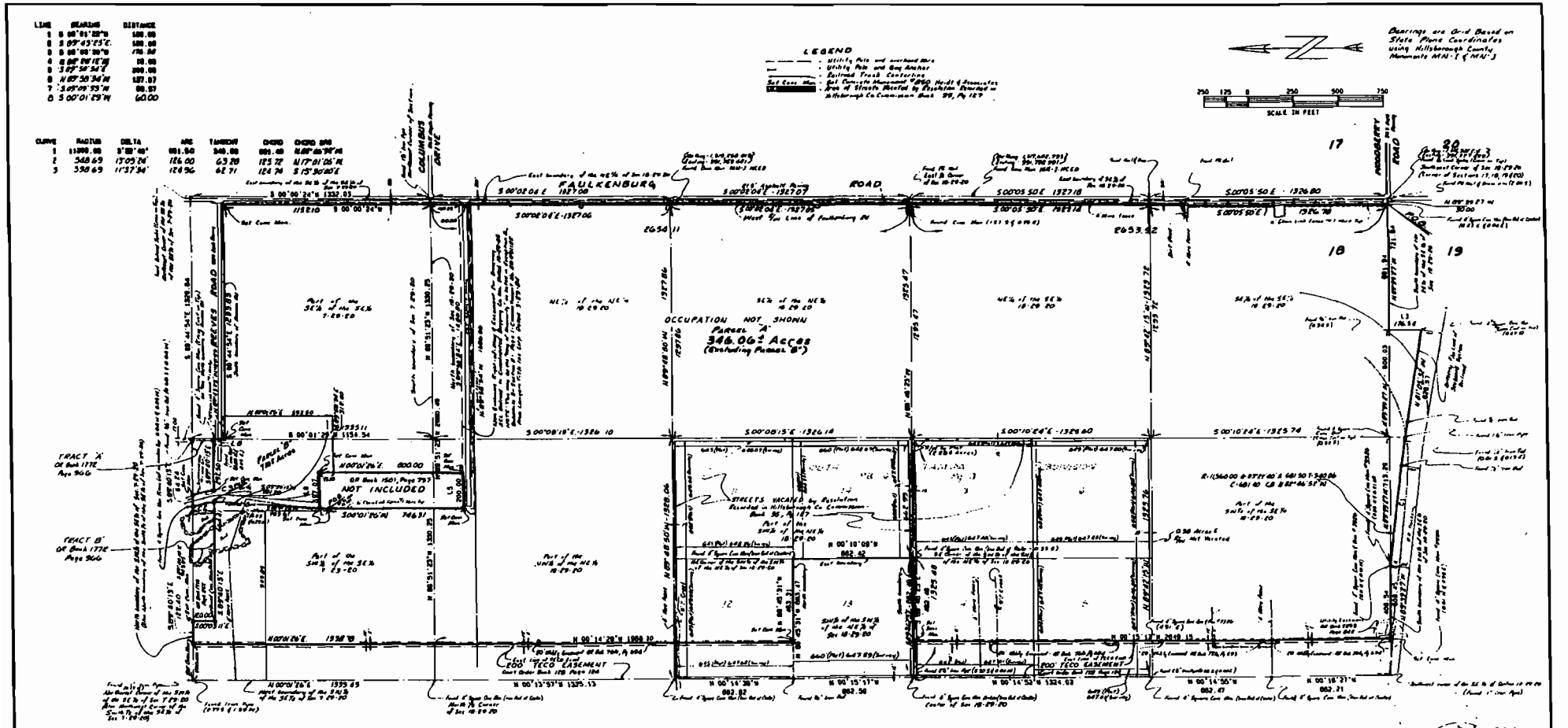


LEGAL DESCRIPTION:
PARCEL "A"
A parcel of land located in Hillsborough County, Florida, more particularly described as follows: From a point in the center line of Faulkenburg Road marking the section corner of Sections 17, 18, 19 & 20, Township 28 South, Range 20 East; run thence S.89°59'37"E., 30.00 feet along the South line of the Southwest 1/4 of the Southwest 1/4 of said Section 17 to a point on the East line of said Faulkenburg Road, said point being the Point of Beginning; continue thence S.89°59'37"E., 1351.96 feet along said South line of said Southwest 1/4 of the Southwest 1/4 of said Section 17 to a point; thence S.89°57'39"E., 1326.54 feet to a point in the Northerly right-of-way line of Seaboard System Main Track; thence N.01°02'32"E., 650.57 feet along said railroad right-of-way, which continues to be 100 feet from and at right angles to said railroad main track, to the point of curvature of a curve concave to the Southwest; thence continue 681.56 feet along said railroad right-of-way and the arc of said curve whose radius is 11,366.00 feet, with a central angle of 03°26'00" and whose chord bears N. 03°16'32"W., 681.46 feet to the point of tangency; thence continue N.04°59' 11"W., 10.06 feet along said railroad right-of-way to a point that is 100 feet from and at right angles to said railroad main track and that is on the South line of the Southwest 1/4 of the Southwest 1/4 of said Section 10; thence N.89°39'23"W., 686.36 feet along said railroad right-of-way and said South line of Section 10 to a point on the East line of a 100 foot easement, granted to Tampa Electric Company as recorded in Court Order Book 139, Page 184, of the Public Records of Hillsborough County, Florida; thence N.00°10'17"W., 2649.13 feet along said East line of said Tampa Electric Company easement to a point of intersection with the South boundary of the Southwest 1/4 of the Southwest 1/4 of the Northwest 1/4 of said Section 10; thence S.89°40'32"E., 663.46 feet along said South boundary of the Southwest 1/4 of the Southwest 1/4 of the Northwest 1/4 of said Section 10 to the Southeast corner thereof; thence N.00°19'05"E., 662.43 feet along the East boundary of said Southwest 1/4 of the Southwest 1/4 of the Northwest 1/4 to the Northeast corner thereof; thence N.89°49'37"E., 140.35 feet along the North boundary of said Southwest 1/4 of the Southeast 1/4 of the Northwest 1/4 to a point on the said East line of said Tampa Electric Company easement; thence N. 00°10'17"W., 1988.16 feet along the East line of said Tampa Electric Company easement to a point on the North line of said Section 10; thence N.89°51'19" E., 1330.78 feet along the East line of said Tampa Electric Company easement to a point on the North line of the Southeast 1/4 of the Southeast 1/4 of Section 7, Township 28 South, Range 20 East; thence S.89°49'17"E., 331.46 feet along said North line of the Southeast 1/4 of the Southeast 1/4 to a point marking the Northeast corner of a tract described in O.R. Book 1711 at Page 253; thence S.00°03'11"E., 1325.86 feet along the Westerly boundary of above said tract to a point; thence S.89°49'13"E., 664.41 feet along the South boundary of above said tract and Tract "B" as described in O.R. Book 1772 at Page 960 to a point on a curve and marking the Southeast corner of above said Tract "B"; thence Northeasterly 124.96 feet along the Easterly boundary of above said Tract "B" and the arc of a curve concave to the Southeast, whose radius is 540.00 feet with a central angle of 13°15'39" and whose chord bears N.17°01'26"E., 124.72 feet to a point on the North boundary of the Southeast 1/4 of the Southeast 1/4 of said Section 7, marking the Northeast corner of above said Tract "B"; thence S. 89°49'13"E., 54.24 feet along the North boundary of the Southeast 1/4 of the Southeast 1/4 of said Section 7, to a point on a curve marking the Northeast corner of Tract "A" as also described in O.R. Book 1772 at Page 960; thence Southerly 124.96 feet along the arc of a curve concave to the Southeast, whose radius is 540.00 feet, with a central angle of 13°15'39" and whose chord bears S.17°01'26"W., 124.72 feet to the Southeasterly corner of said Tract "A"; thence S.89°49'13"E., 332.46 feet along the Southerly boundary of said Tract "A" to the Southeast corner thereof, on the North boundary of Reeves Road; thence S.89°51'27"E., 66.00 feet to the South boundary of Reeves Road; thence S.89°51'59"E., 1290.05 feet to a point on the East line of Faulkenburg Road, said point being 30.00 feet Westerly of and at right angles to the East boundary of the Southwest 1/4 of the Southeast 1/4 of said Section 7; thence S.00°09'27"E., 1153.10 feet along the East line of Faulkenburg Road, said line being 30.00 feet Westerly of and parallel to the East boundary of the Southwest 1/4 of the Southeast 1/4 of said Section 7 to a point on the North boundary of Section 18, Township 28 South, Range 20 East; thence continuing S.00°09'27"E., 2594.11 feet along the East line of Faulkenburg Road, said line being 30.00 feet Westerly of and parallel to the East boundary of the Northwest 1/4 of said Section 19, Township 28 South, Range 20 East; thence continuing S.00°10'24"E., 1325.74 feet along the East line of Faulkenburg Road, said line being 30.00 feet Westerly of and parallel to the East boundary of the Southwest 1/4 of said Section 19, S.00°09'58"E., 2655.92 feet to the Point of Beginning;

LESS AND EXCEPT:
PARCEL "B"
A parcel of land known as "Parcel B" to the South 1/2 of the Southwest 1/4 of Section 7, Township 28 South, Range 20 East, more particularly described as follows:

From the Northwest corner of the South 1/2 of the Southwest 1/4 of Section 7, run S.89°49'13"E., 331.46 feet along the North boundary thereof to a point; run thence S.00°03'11"E., 1325.86 feet to the Point of Beginning of "Parcel B"; from said point of beginning as "Parcel B" run thence S.89°51'27"E., 331.30 feet to a point; thence S.00°56'25"E., 197.07 feet to a point; thence S.89°51'27"E., 75.00 feet to a point; thence S.00°56'25"E., 353.00 feet to a point; thence N.89°51'27"W., 503.30 feet to a point; thence N.00° 03'11"E., 553.00 feet to a point; thence N.89°51'27"W., 66.00 feet to a point; thence N.89°51'27"W., 252.96 feet to a point on a curve; thence Northerly 124.96 feet along the arc of said curve concave to the West, whose radius is 540.00 feet having a central angle of 13°15'39" and whose chord bears N.13°29'06"E., 124.72 feet to a point on the North boundary of said South 1/2 of the Southwest 1/4 of Section 7; thence N.89°49'13"E., 54.24 feet along said North boundary to a point on a curve; thence, Southerly 124.96 feet along the arc of said curve concave to the East whose radius is 540.00 feet, through a central angle of 13°15'39" and whose chord bears S. 17°01'26"E., 124.72 feet to the Point of Beginning.

"Parcel B" containing 2.68 Acres more or less.

NOTE:
The information shown on this map is based upon Commitment No. BO 001102 by Lawyers Title Insurance Company, dated March 23, 1984.

Heidt & Associates, Inc. makes no representations or guarantees pertaining to easements, rights-of-way, setback lines, reservations, agreements and other similar matters.

AND LESS AND EXCEPT:
OR Book 1161, Pg. 797
A parcel of land to the Southwest 1/4 of the Southeast 1/4 of Section 7, Township 28 South, Range 20 East, and in the Northwest 1/4 of the Northeast 1/4 of Section 18, Township 28 South, Range 20 East, Hillsborough County, Florida, described as follows:

From the Northeast corner of said Southwest 1/4 of the Southeast 1/4 of Section 7, run S.89°49'13"E., 261.05 feet along the North boundary thereof to a point; run thence S.00°03'11"E., 752.01 feet along a line that is 993.05 feet Easterly of and parallel to the East boundary of the Southwest 1/4 of the Southeast 1/4 of said Section 7, to the Point of Beginning; from said Point of Beginning, continue S.00°03'11"E., 166.81 feet to a point; thence S.89°56'49"E., 200.00 feet; thence N.00°01'20"E., 200.00 feet to a point; thence N.89°51'27"W., 177.61 feet to a point; thence S.03°09'13"W., 33.33 feet to the Point of Beginning.

"Parcel A" containing 346.06 acres more or less which includes 5.38 acres of platted right-of-way as shown on the Plat of South Tampa Subdivision in Plat Book 4 at Page 3, but excludes 7.68 acres in "PARCEL B".

BOUNDARY SURVEY
LAND AT FAULKENBURG ROAD

This Survey Prepared for: Hillsborough County

HEIDT & ASSOCIATES, INC.

BOUNDARY SURVEY OF 353-ACRE TRACT

Proj. 82-85-X

4JP0522841 21

THIS DEED, Made this 25th day of May, A.D., 1984, between SEABOARD SYSTEM RAILROAD, INC., a Virginia corporation, formerly Seaboard Coast Line Railroad Company, formerly Seaboard Air Line Railroad Company and as successor by merger to Atlantic Coast Line Railroad Company, hereinafter called "Grantor"; HILLSBOROUGH COUNTY, a political subdivision of the State of Florida, hereinafter called "Grantee"; and UNITED STATES TRUST COMPANY OF NEW YORK, Corporate Trustee under the First (formerly General) Mortgage dated March 1, 1950, made by the former Atlantic Coast Line Railroad Company, to which Seaboard System Railroad, Inc., is successor by merger, and CHEMICAL BANK, Corporate Trustee under the Consolidated Mortgage dated as of March 15, 1971, made by the former Seaboard Coast Line Railroad Company, to which Seaboard System Railroad, Inc., is successor by merger, hereinafter called "Trustees";

(Wherever used herein, the terms "Grantor" and "Grantee" shall be construed in the singular or plural as the context may require or admit and shall include the heirs, legal representatives and assigns of individuals and the successors and assigns of corporations.)

WITNESSETH: That Grantor, for and in consideration of the sum of TWO HUNDRED FIFTEEN THOUSAND TWO HUNDRED FIFTY AND 00/100 DOLLARS ($215,250.00), to it in hand paid by Grantee, the receipt of which is hereby acknowledged, has granted, bargained and sold, and by these presents does grant, bargain, sell and convey unto Grantee that certain tract or parcel of land situate, lying and being at Tampa, County of Hillsborough, State of Florida, and described as follows, to wit:

A parcel of land in the S½ of the SE¼ of Section 7, Township 29 South, Range 20 East, more particularly described as follows: From the northwest corner of the S½ of the SE¼ of Section 7, run S 89°40'13" E, 322.40 feet along the north boundary thereof to a point; run thence S 00°03'11" E, 120.00 feet to a point; run thence S 89°40'13" E, 664.41 feet to the point of beginning; from said point of beginning, run thence S 03°59'15" W, 581.28 feet to a point; thence S 89°58'34" E, 197.07 feet to a point; thence S 00°01'26" W, 75.00 feet to a point; thence S 89°58'34" E, 312.00 feet to a point; thence N 00°01'26" E, 592.50 feet to a point; thence N 89°43'25" W, 125.59 feet to a point; thence N 00°01'29" E, 60.00 feet to a point; thence N 89°40'13" W, 292.50 feet to a point on a curve; thence northerly 124.96 feet along the arc of said curve concave to the west, whose radius is 598.69 feet having a central angle of 11°57'34" and whose chord bears N 15°30'40" W, 124.74 feet to a point on the north boundary of said S½ of the SE¼ of Section 7; thence N 89°40'13" W, 54.24 feet along said north boundary to a point on a curve; thence southerly 126.00 feet along the arc of said curve concave to the west whose radius is 548.69 feet through a central angle of 13°09'24" and whose chord bears S 17°01'06" E, 125.72 feet to the point of beginning; containing 7.00 acres, more or less, as shown on print of survey dated March 23, 1984, last revised May 21, 1984, prepared by Heidt & Associates, Inc.

GRANTOR, its successors or assigns, reserve a 20-foot wide track right of way, i.e., 10 feet wide on each side of the center line of Grantor's tracks as located thereon.

TOGETHER with all and singular the rights, members, hereditaments and appurtenances to said premises belonging or in anywise incident or appertaining.

TO HAVE AND TO HOLD said premises unto Grantee in fee simple forever; SUBJECT, However, to reservations, conditions, restrictions and easements of record, or apparent from an inspection of the premises, including but not limited to that portion of Reeves Road as located thereon.

Except as to the matters referred to in the preceding paragraph, Grantor hereby binds itself that the premises are free from encumbrances, that it is seized of said premises in fee and that it will fully warrant and forever defend all and singular said premises unto Grantee against Grantor and all other persons lawfully claiming or to claim the same or any part thereof.

The recitals of fact made hereinabove are to be taken only as recitals made by Grantor and not by Trustees.

The property hereinabove conveyed is subject to the lien of the First (formerly General) Mortgage made by the former Atlantic Coast Line Railroad Company, dated as of March 1, 1950, as supplemented and modified, under which mortgage United States Trust Company of New York is Corporate Trustee, and Trustee joins herein for the purpose of releasing and does hereby release the property hereinabove conveyed from the lien of said mortgage pursuant to the provisions of Section 6.01 of Article Six thereof.

The property hereinabove conveyed is subject also to the lien of the Consolidated Mortgage made by the former Seaboard Coast Line Railroad Company, dated as of March 15, 1971, as supplemented, under which mortgage Chemical Bank, a New York corporation, is Corporate Trustee and L. F. Sadler of Jacksonville, Florida, is Individual Trustee, and Corporate Trustee joins herein for the purpose of releasing and does hereby release the property hereinabove conveyed from the lien of said mortgage pursuant to the provisions of Section 5.17 of Article Five thereof; Individual Trustee being relieved of any obligation to join in such release by Section 10.06 of Article Ten of said mortgage.

IN WITNESS WHEREOF Grantor and Trustees have caused these presents to be duly signed and sealed the day and year first above written.

Signed, sealed and delivered
in the presence of:

SEABOARD SYSTEM RAILROAD, INC.

By _____
Vice President

Attest _____
Corporate Secretary

Signed, sealed and delivered
in the presence of:

UNITED STATES TRUST COMPANY OF NEW YORK, as Corporate Trustee as aforesaid.

By _____
Asst. Vice President

Attest _____
Assistant Secretary

Signed, sealed and delivered
in the presence of:

CHEMICAL BANK, as Corporate Trustee
as aforesaid.

By _____
TRUST

Attest _____

Form 9519-B-Fla.

FLORIDA FORM

STATE OF NEW YORK }
COUNTY OF NEW YORK }

I hereby certify that on this day before me, an officer duly authorized to take acknowledgments in the State and County above set forth, personally appeared JAMES E. LOCAR and Thomas S. Moser respectively AsST. Vice President and Assistant Secretary of UNITED STATES TRUST COMPANY OF NEW YORK a corporation under the laws of the State of New York, to me known to be the persons described in and who executed the foregoing instrument, and they severally acknowledged before me the execution thereof as such officers, by virtue of due and proper corporate authority in them vested, and that the said instrument is the act and deed of said corporation.

And the said Thomas S. Moser Assistant Secretary as aforesaid, also acknowledged before me that he affixed to said instrument the corporate seal of said corporation, by like authority in him vested.

WITNESS my signature and official seal in the County and State above set forth, this 30TH day of MAY 1984

Notary Public

My commission Expires

JOHN M. GUILIANO
Notary Public, State of New York
No. 41-4633572
Qualified in Suffolk County
Commission Expires March 30, 1986

Form 5519-B-Fla.

FLORIDA FORM

STATE OF FLORIDA
COUNTY OF DUVAL

I hereby certify that on this day before me, an officer duly authorized to take acknowledgments in the State and County above set forth, personally appeared J. T. Rice and Robert A. Bernard respectively Vice President and Corporate Secretary of SEABOARD SYSTEM RAILROAD, INC., a corporation under the laws of the State of Virginia, to me known to be the persons described in and who executed the foregoing instrument, and they severally acknowledged before me the execution thereof as such officers, by virtue of due and proper corporate authority in them vested, and that the said instrument is the act and deed of said corporation.

And the said Robert A. Bernard, Corporate Secretary as aforesaid, also acknowledged before me that he affixed to said instrument the corporate seal of said corporation, by like authority in him vested.

WITNESS my signature and official seal in the County and State above set forth, this 25th day of May 19 84

Angelia C. Goodell
Notary Public.

My commission Expires NOTARY PUBLIC, STATE OF FLORIDA My commission expires Sept. 15, 1987 Bonded Thru Patterson-Becht Agency

5JP0522841 24

THIS DEED, Made this 1st day of June, A.D., 1984, between SEABOARD SYSTEM RAILROAD, INC., a Virginia corporation, formerly Seaboard Coast Line Railroad Company, formerly Seaboard Air Line Railroad Company and as successor by merger to Atlantic Coast Line Railroad Company, hereinafter called "Grantor"; HILLSBOROUGH COUNTY, a political subdivision of the State of Florida, hereinafter called "Grantee";

(Wherever used herein, the terms "Grantor" and "Grantee" shall be construed in the singular or plural as the context may require or admit and shall include the heirs, legal representatives and assigns of individuals and the successors and assigns of corporations.)

WITNESSETH: That Grantor, for and in consideration of the sum of TEN MILLION SIX HUNDRED FORTY-ONE THOUSAND THREE HUNDRED FORTY-FIVE DOLLARS ($10,641,345.00), to it in hand paid by Grantee, the receipt of which is hereby acknowledged, has granted, bargained and sold, and by these presents does grant, bargain, sell and convey unto Grantee that certain tract or parcel of land situate, lying and being at Tampa, County of Hillsborough, State of Florida, and described as follows, to wit:

A parcel of land located in Hillsborough County, Florida, more particularly described as follows: From a point in the center line of Faulkenburg Road marking the section corner of Section 17, 18, 19 and 20, Township 29 South, Range 20 East; run thence N 89°39'27" W, 30.00 feet along the south line of the SE¼ of the SE¼ of said Section 18 to a point in the west line of said Faulkenburg Road, said point being the point of beginning; continue thence N 89°39'27" W, 691.94 feet along said south line of said SE¼ of the SE¼ of said Section 18 to a point; thence S 00°03'30" W, 176.54 feet to a point in the northerly right of way line of Seaboard System Railroad, said point being 100 feet from and at right angles to said Seaboard System main track; thence N 81°05'32" W, 626.57 feet along said Railroad right of way, which continues to be 100 feet from and at right angles to said Railroad main track, to the point of curvature of a curve concave to the southwest; thence continue 681.50 feet along said Railroad right of way and the arc of said curve whose radius is 11,560.00 feet, with a central angle of 03°22'40" and whose chord bears N 82°46'52" W, 681.40 feet to the point of tangency; thence continue N 84°28'12" W, 18.08 feet along said Railroad right of way to a point that is 100 feet from and at right angles to said Railroad main track and that is on the south line of the SW¼ of the SE¼ of said Section 18; thence N 89°39'27" W, 408.54 feet along said Railroad right of way and said south line of Section 18 to a point on the east line of a 200-foot easement granted to Tampa Electric Company as recorded in Court Order Book 128, Page 104, of the Public Records of Hillsborough County, Florida; thence N 00°15'17" W, 2649.15 feet along said east line of said Tampa Electric Company easement to a point of intersection with the south boundary of the SW¼ of the SW¼ of the NE¼ of said Section 18; thence S 89°46'23" E, 462.48 feet along said south boundary of the SW¼ of the SW¼ of the NE¼ to the southeast corner thereof; thence N 00°10'09" W, 662.42 feet along the east boundary of said SW¼ of the SW¼ of the NE¼ to the northeast

corner thereof; thence N 89°45'31" W, 463.31 feet along the north boundary of said SW¼ of the SW¼ of the NE¼ to a point on the said east line of said Tampa Electric Company easement; thence N 00°14'28" W, 1988.10 feet along the east line of said Tampa Electric Company easement to a point on the north line of said Section 18; thence N 00°01'26" E, 1338.78 feet along the east line of said Tampa Electric Company easement to a point on the north line of the SW¼ of the SE¼ of Section 7, Township 29 South, Range 20 East; thence S 89°40'13" E, 122.40 feet along said north line of the SW¼ of the SE¼ to a point marking the northwest corner of a tract described in O.R. Book 1710 at Page 252; thence S 00°03'11" E, 120.00 feet along the westerly boundary of above said tract to a point; thence S 89°40'13" E, 664.41 feet along the south boundary of above said tract and Tract B as described in O.R. Book 1772 at Page 966 to a point on a curve and marking the southeast corner of above said Tract B; thence northwesterly 126.00 feet along the easterly boundary of above said Tract B and the arc of a curve concave to the southwest, whose radius is 548.69 feet with a central angle of 13°09'24" and whose chord bears N 17°01'06" W, 125.72 feet to a point on the north boundary of the SW¼ of the SE¼ of said Section 7, marking the northeast corner of above said Tract B; thence S 89°40'13" E, 54.24 feet along the north boundary of the SW¼ of the SE¼ of said Section 7, to a point on a curve marking the northwest corner of Tract A as also described in O.R. Book 1772 at Page 966; thence southerly 124.96 feet along the arc of a curve concave to the southwest, whose radius is 598.69 feet, with a central angle of 11°57'34" and whose chord bears S 15°30'40" E, 124.74 feet to the southwesterly corner of said Tract A; thence S 89°40'13" E, 292.50 feet along the southerly boundary of said Tract A to the southeast corner thereof, on the north boundary of Reeves Road; thence S 00°01'29" W, 60.00 feet to the south boundary of Reeves Road; thence S 89°44'54" E, 1299.89 feet to a point on the west line of Faulkenburg Road, said point being 30.00 feet westerly of and at right angles to the east boundary of the SE¼ of the SE¼ of said Section 7; thence S 00°00'24" W, 1152.10 feet along the west line of Faulkenburg Road, said line being 30.00 feet westerly of and parallel to the east boundary of the SE¼ of the SE¼ of said Section 7 to a point on the north boundary of Section 18, Township 29 South, Range 20 East; thence continuing S 00°02'04" E, 2654.11 feet along the west line of Faulkenburg Road, said line being 30.00 feet westerly of and parallel to the east boundary of the NE¼ of said Section 18; thence continuing along the west line of Faulkenburg Road, said line being 30.00 feet westerly of and parallel to the east boundary of the SE¼ of said Section 18, S 00°05'50" E, 2653.92 feet to the point of beginning.

LESS AND EXCEPT, a parcel of land in the SW¼ of the SE¼ of Section 7, Township 29 South, Range 20 East, and in the NW¼ of the NE¼ of Section 18, Township 29 South, Range 20 East, Hillsborough County, Florida, described as follows: From the

northwest corner of said SW¼ of the SE¼ of Section 7, run S 89°40'13" E, 943.85 feet along the north boundary thereof to a point; run thence S 00°01'26" W, 753.61 feet along a line that is 943.85 feet easterly of and parallel to the west boundary of the SW¼ of the SE¼ of said Section 7, to the point of beginning; from said point of beginning, continue S 00°01'26" W, 746.51 feet to a point; thence S 89°58'34" E, 200.00 feet; thence N 00°01'26" E, 800.00 feet to a point; thence N 89°58'34" W, 197.07 feet to a point; thence S 03°09'33" W, 53.57 feet to the point of beginning;

AND less and except seven acre parcel conveyed separately dated May 25, 1984 recorded in Official Record Book _____ on Page _____ of the Public Records of Hillsborough County, Florida.

Containing 346.06 acres, more or less, as shown on print of survey dated March 23, 1984, last revised May 21, 1984, prepared by Heidt & Associates, Inc.

TOGETHER with all and singular the rights, members, hereditaments and appurtenances to said premises belonging or in anywise incident or appertaining.

TO HAVE AND TO HOLD said premises unto Grantee in fee simple forever; SUBJECT, However, to reservations, conditions, restrictions and easements of record, or apparent from an inspection of the premises. SUBJECT ALSO to easement dated October 22, 1965, whereby the former Atlantic Coast Line Railroad Company granted Consolidated Bagging Company, Inc., a 60-foot wide right of way for ingress and egress from the west right of way line of Faulkenburg Road to the west line of Consolidated Bagging Company's property, a 20-foot utility easement as recorded in O.R. Book 766, Page 694, of Hillsborough County, Florida, a 20-foot utility easement as recorded in O.R. Book 726, Page 593, of Hillsborough County, Florida, a utility easement granted Tampa Electric Company dated April 17, 1974, as recorded in O.R. Book 2893, Page 842, Hillsborough County, Florida, and all fences, ponds, and roads as located thereon.

Except as to the matters referred to in the preceding paragraph, Grantor hereby binds itself that the premises are free from encumbrances, that it is seized of said premises in fee and that it will fully warrant and forever defend all and singular said premises unto Grantee against Grantor and all other persons lawfully claiming or to claim the same or any part thereof.

IN WITNESS WHEREOF Grantor has caused these presents to be duly signed and sealed the day and year first above written.

Signed, sealed and delivered in the presence of:

SEABOARD SYSTEM RAILROAD, INC.

By James L. Kiesler
James L. Kiesler,
Assistant Vice-President-Real Estat

Appendix 1-2
List of Adjacent Property

Faulkenburg Road Resource
Recovery Site
Project 82-95-U

OWNERSHIP WITHIN 150 FEET
OF PROPOSED SITE
(per 1982 Tax Rolls)

As to proerties abutting proposed site:

(1) Seaboard Coast Line Railroad Company
500 Water Street
Jacksonville, Florida 32202

Folio #'s
67477.0000
68001.0000
68017.0000
67973.0000

As to properties on East side of Faulkenburg Road:

Folio 67897.0002 (1) James A. & Beverly A. Taylor
2109 E. Lumsden Road
Valrico, Florida 33594

67877.2030 (2) Thomas L. & Elizabeth I. Fahringer
P. O. Box 1412
Brandon, Florida 33511

67895.0000 (3) Samuel E. and Aurea Leon
Rt. 3 Box 95
Tampa, Florida 33619

67896.0000 (4) McDonald - Logan Inc.
P. O. Box 5357
Tampa, Florida 33675

67774.0000 (5) J. L. and Mary Coker
Rt. 3 Box 97
Tampa, Florida 33619

(6) Ken Foster
128 N. Parsons Ave.
Brandon, Florida 33511

As to properteis South of Seaboard Coast Line Railroad

Folio #'s
68052.0516
68052.0518
68052.0520

(1) Interstate Park of Commerce Ltd.
519 E. Madison Street
Tampa, Florida 33602

68052.0514 (2) OKI Realty Corporation
2643 Crescent Springs Road
Erlanger, Kentucky 41018

Local Agent: John Swart
P. O. Box 23804
Tampa, Florida 33623

IDENTIFICATION OF SUBDIVISIONS
WITHIN 250 FEET
OF PROPOSED SITE:

1) South Tampa Subdivision, Plat Book 6, page 3.
2) Faulkenburg Industrial Park, Plat Book 47, page 58
3) Fisher's Farms, Plat Book 26, page 1.
4) Interstate Park Commerce, Plat Book 52, page 32.

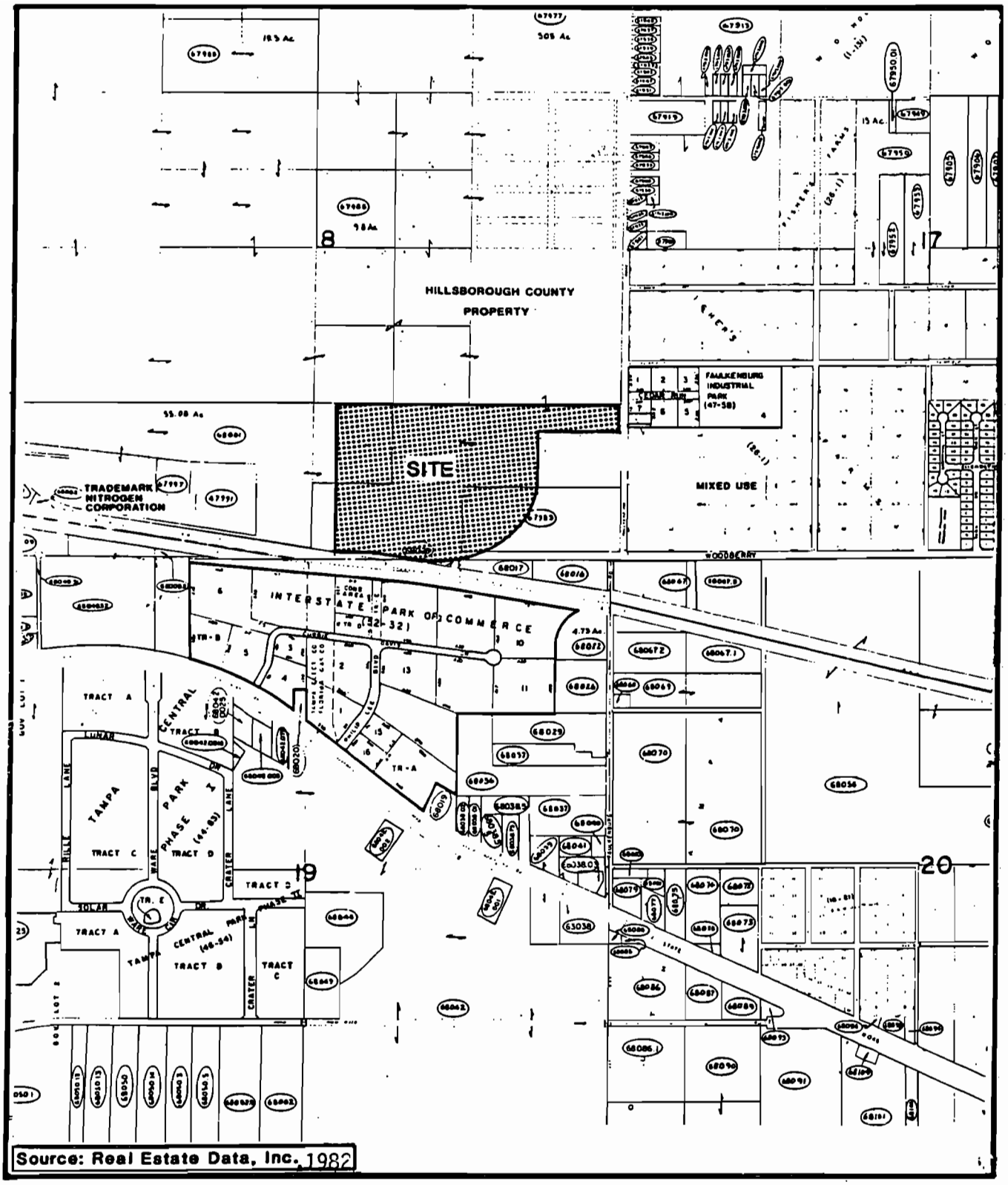
67977.0000	18-29-20 SEABOARD COAST LINE RR CO C/O TAX DEPT # 500 WATER ST JACKSONVILLE FL 32202 E 1/2 OF NE 1/4 LESS E 30 FT FOR R/W NW 1/4 OF NE 1/4 LESS N 160 62 FT OF E 200 FT OF W 1143 85 FT TRACTS 11 12 & 14 NE 1/4 TRACTS 9 10 15 & 16 IN NW 1/4 GOV LOT 1 N 1/2 OF GOV LOT 2 NE 1/4 OF SW 1/4 NE 1/4 OF SW 1/4 OF SE 1/4 NE 1/4 OF SE 1/4 LESS E 30 FT FOR R/W AND TRACTS 3 4 5 AND 6 IN SE 1/4 & ALL STS & RDS & S 1/2 OF SW 1/4 OF SE 1/4 AND SE 1/4 OF SE 1/4 LESS E 30 FT FOR FAULKENBURG RD R/W AND LESS TRACT BEG ON W R/W LINE OF FAULKENBURG RD 60 FT W AND 30 FT W OF SE COR OF SE 1/4 AND RUN W 1321 8 FT N 577 78 FT E 1322 43 FT TO RD AND S 578 31 FT ALONG RD TO BEG SHOWN ON PLAT OF SOUTH TAMPA PLAT 6 PG 5 ADJ OR CONTAINED IN TRACTS 1 TO 16 INCL V3 FLA/SB CARD 7 ACL	41200-TRANS-COMM-UTIL	505.07-AC	91-MISC		$44,944.15T $2,516.68SL UNIMPROVED
67983.0000	18-29-20 SEABOARD COAST LINE RR CO C/O TAX DEPT # 500 WATER ST JACKSONVILLE FL 32202 TRACT BEG ON WLY R/W LINE OF FAULKENBURG RD 60 FT N AND 30 FT W OF SE COR OF SE 1/4 AND RUN N 89 DEG 55 MIN 35 SEC W 1321 8 FT N 0 DEG 26 MIN 05 SEC W 577 78 FT S 89 DEG 55 MIN 45 SEC E 1322 43 FT AND S 0 DEG 21 MIN 45 SEC E 578 31 FT TO BEG V3 FLA/SB CARD 8 ACL	41200-TRANS-COMM-UTIL	17.55-AC	91-MISC		$9,047.87T $114.80OL $351.58OI
68001.0000	19-29-20 SEABOARD COAST LINE RR CO C/O TAX DEPT # 500 WATER ST JACKSONVILLE FL 32202 TRACT BEG AT NW COR OF S 1/2 OF SW 1/4 AND RUN S 116 81 FT SELY ALONG A CURVE RAD 503 34 FT AN ARC DIST OF 436 7 FT S 54 DEG 51 MIN E 1210 03 FT SELY ALONG A CURVE RAD 1955 08 FT AN ARC DIST OF 172 24 FT S 89 DEG 37 MIN E 381 77 FT S 741 71 FT N 84 DEG 31 MIN W P/L TO WLY R/W OF SAL RR 1240 8 FT NWLY ALONG A CURVE RAD 453 34 FT AN ARC DIST OF 244 1 FT N 53 DEG 40 MIN W 672 96 FT NWLY ALONG A CURVE RAD 453 34 FT AN ARC DIST OF 191 78 FT N 84 DEG 31 MIN W 15 6 FT TO W BDRY OF S 1/2 OF SW 1/4 S 109 66 FT MOL TO WLY R/W OF HOPEWELL RD S 53 DEG 40 MIN E ALONG RD TO INTER WITH WLY R/W OF SAL RR S 84 DEG 31 MIN E ALONG R/W TO E LINE OF S 1/2 OF SW 1/4 N TO NE COR & W TO BEG & NW 1/4 OF SW 1/4 OF SE 1/4 SUBJ TO T E EASEMENT V3 FLA/SB CARD 6 ACL	41200-TRANS-COMM-UTIL	55.80-AC	91-MISC		$12,178.28T $627.74OL UNIMPROVED
68017.0000	19-29-20 SEABOARD COAST LINE RR CO C/O TAX DEPT # 500 WATER FL JACKSONVILLE FL 32202 THAT PT OF NE 1/4 OF NE 1/4 N OF RR DESC AS BEG 722 21 FT W OF NE COR AND RUN W 600 FT S 86 08 FT S 81 DEG 21 MIN 45 SEC E 607 23 FT AND N 176 41 FT TO BEG——THAT PART OF NW 1/4 OF NE 1/4 N OF RR R/W V3 FLA/SB CARD 9 ACL	41200-TRANS-COMM-UTIL	2.60-AC	91-MISC		$304.20T $15.68OL UNIMPROVED

67897.2002	17-29-20 TAYLOR JAMES A AND BEVERLY A # 2109 E LLMSDEN VALRICO FL 33594 FAULKENBURG INDUSTRIAL PARK LOT 1	21000-UNDEVELOPED LND		00-VACANT RES	3720-0943	1980 $32,900	$426.80T $22.00OL UNIMPROVED
67897.2030	17-29-20 FANGINDER THOMAS J AND ELIZABETH T # P O BOX 3612 BRANDON FL 33511 FAULKENBURG INDUSTRIAL PARK LOT 7	91000-UNDEVELOPED LND		00-VACANT RES	3691-1751	1980 $22,000	$234.15T $12.06OL UNIMPROVED

67894.0000	17-29-20 COLEP J L AND MARY # RT 5 BOX 97 TAMPA FLA 33619 FISHER S FARMS S 1/2 OF LOT 44	81598-RESOURCE-AGRIC	5.97-AC 1926	68-AGRICULTURAL ER:N			$159.22T $24.01TL $9.19OI $134.01SA
67895.0000	17-29-20 LEON SAMUEL E AND AUREA # RT 5 BOX 95 TAMPA FLA 33619 FISHER S FARMS LOT BEG AT NW COR OF LOT 44 AND RUN E 200 FT S 83 FT W 200 FT AND N 83 FT TO BEG	11100-RESIDENTIAL		01-RESIDENTIAL ER:N	3876-0740	1981 $68,000	$4,620L $11,070I
67896.0000	17-29-20 MC DONALD-LOGAN INC # P O BOX 5357 TAMPA FLA 33675 FISHER S FARMS S 1/2 OF N 1/2 OF LOT 44	11100-RESIDENTIAL	1956	01-RESIDENTIAL	3781-1441	1981 $68,000	$1,096.89T $36.37OL $20,170I

68052.0514	19-29-20 [illegible] [illegible] INTERSTATE PARK OF COMMERCE LOT 7	91000-UNDEVELOPED LND		00-VACANT RES	3600-1912	1979	$3,995.47T $205.65OL UNIMPROVED
68052.0516	19-29-20 INTERSTATE PARK OF COMMERCE LTD # 510 E MADISON ST TAMPA FL 33602 INTERSTATE PARK OF COMMERCE LOT 8	91000-UNDEVELOPED LND		00-VACANT RES	3600-1912	1979	$4,423.85T $228.03OL UNIMPROVED
68052.0518	19-29-20 INTERSTATE PARK OF COMMERCE LTD # 510 E MADISON ST TAMPA FL 33602 INTERSTATE PARK OF COMMERCE LOT 9	91000-UNDEVELOPED LND		00-VACANT RES	3600-1912	1979	$4,259.60T $219.36OL UNIMPROVED
68052.0520	19-29-20 INTERSTATE PARK OF COMMERCE LTD # 510 E MADISON ST TAMPA FL 33602 INTERSTATE PARK OF COMMERCE LOT 10	91000-UNDEVELOPED LND		00-VACANT RES	3600-1912	1979	$4,295.59T $221.42OL UNIMPROVED

OKI Realty Corp.
2643 cresent Springs Rd.
Erlanger, Kentucky 41018



HILLSBOROUGH COUNTY
ENERGY RECOVERY PROJECT

Property Assessment Map

FEET
500 0 500 1000 1500

Appendix 2
Zoning and Land Use Plan

Appendix 2-1
Standard Zoning Districts

PART 2.01.00 STANDARD ZONING DISTRICTS

Sec. 2.01.01. Intent

The County is divided into districts of such number, shape, characteristics, area, common unity of purpose, adaptability, or use as will accomplish the objectives of the Comprehensive Plan and this Code.

Sec. 2.01.02. Establishment of Zoning Districts

A. Generally

The unincorporated portion of Hillsborough County shall be divided by this Code into Zoning Districts, the boundaries and designations of which shall be shown on a series of maps, covering in time the entire unincorporated area of Hillsborough County, and identified as the Official Zoning Atlas of Hillsborough County, hereafter Official Zoning Atlas.

B. List of Zoning Districts

AM Agricultural Mining

A Agriculture

AR Agricultural Rural

AS-0.4 Agricultural, Single-Family Estate

AS-1 Agricultural, Single-Family

ASC-1 Agricultural, Single-Family Conventional

AI Agricultural Industrial

RSC-2 Residential, Single-Family Conventional

RSC-3 Residential, Single-Family Conventional

RSC-4 Residential, Single-Family Conventional

RSC-6 Residential, Single-Family Conventional

RSC-9 Residential, Single-Family Conventional

MH Residential, Single-Family Mobile Home Overlay

RDC-6 Residential, Duplex Conventional

RDC-12 Residential, Duplex Conventional

RMC-6 Residential, Multi-Family Conventional

RMC-9 Residential, Multi-Family Conventional

RMC-12 Residential, Multi-Family Conventional

RMC-16 Residential, Multi-Family Conventional

RMC-20 Residential, Multi-Family Conventional

BPO Business, Professional Office

OR Office Residential

CN Commercial, Neighborhood

CG Commercial, General

CI Commercial, Intensive

M Manufacturing

SB Show Business Overlay

SPI-HC Historic and Cultural Conservation

SPI-RVR Recreational Vehicle and Private Pleasure Craft Residential Overlay

SPI-UC-1 Special Public Interest-University Community

SPI-UC-2 Special Public Interest-University Community

SPI-UC-3 Special Public Interest-University Community

SPI-AP-1 Special Public Interest - Airport

SPI-AP-2 Special Public Interest - Airport

SPI-AP-3 Special Public Interest - Airport

SPI-AP-4 Special Public Interest - Airport

SPI-AP-5 Special Public Interest - Airport

SPI-AP-V Special Public Interest - Airport

SPI-NMD Special Public Interest - North Dale Mabry Overlay

PD Planned Development

IPD-1 Interstate Planned Development

IPD-2 Interstate Planned Development

IPD-3 Interstate Planned Development

POD Pedestrian Oriented Development

TOD Transit Oriented Development

TND Traditional Neighborhood Development

BMS Brandon Main Street

CPV Citrus Park Village

R-BPO Restricted-Business Professional Office Overlay

(Ord. No. 02-13, § 2, 8-1-02; Ord. No. 03-36, § 2, 11-12-03)

Sec. 2.01.03. Official Zoning Atlas

A. The Official Zoning Atlas, together with all lawfully adopted explanatory material shown thereon or therewith, is hereby adopted by reference and declared to be part of this Code.

B. Where the scale generally applicable to the basic atlas sheets or supplemental

maps is inadequate for presentation of details in particular areas, such areas may be cross-referenced on the basic atlas sheets or supplemental maps to separate inset maps at the appropriate scale.

C. Other supplements, in the form of maps, indices, guides, illustrations, records, reports, interpretive material and standards, may be officially adopted, directly or by reference, to facilitate administration and public understanding of the Official Zoning Atlas or of regulations adopted for the zoning districts or other division established thereby.

Sec. 2.01.04. Zoning District Boundaries

A. For the special purposes set out below, where boundaries and designations are not shown directly on the basic atlas sheets, they shall be indicated by overlays to such sheets or as separate maps. Overlays or separate maps shall have the same force and effect as the basic atlas sheets.

B. A district symbol or name shown within district boundaries in the Official Zoning Atlas indicates that district regulations pertaining to the district extend throughout the whole area surrounded by the boundary line, except as otherwise specifically provided.

C. Where uncertainty exists as to boundaries of districts, or other areas delineated for regulatory purposes in the Official Zoning Atlas, the following rules shall apply:

1. Boundaries indicated as approximately following the centerlines of streets, alleys, rights-of-way, or easements shall be construed as following such centerlines as they exist on the ground (except where variation of actual location from mapped location would change the zoning status of a lot or parcel, in which case the boundary shall be so interpreted as to avoid such change). In the event of vacation, the boundary shall be construed as remaining in its location except where ownership of the vacated property is divided other than at the center, in which case the boundary shall be construed as moving with the ownership. However, existing right-of-way is not subject to zoning regulations unless vacated.

2. Boundaries indicated as approximately following boundaries of streets, alleys, other public or private property lines, rights-of-way, or easements shall be construed as following such boundaries, except where variation of actual location from mapped location would change the district status of a lot or parcel, in which case the boundary shall be so interpreted as to void such change.

3. Boundaries indicated as approximately following mean high waterlines or centerlines of river, canals, lakes, bays, or other bodies of water shall be construed as following such mean high waterlines, or centerlines. If said mean high waterline or centerlines changes, the boundary shall be construed as moving with the change, except where moving would change the district status of a lot or parcel, in which case the boundary shall be interpreted in such manner as to avoid such change.

4. Boundaries indicated as approximately parallel to or extensions of features described in Paragraphs 1, 2 and 3 above, shall be construed as being parallel to or extensions of such features.

5. Where distances are not specifically indicated on any map in the Official Zoning Atlas, they shall be determined by reference to the scale of the map.

6. Boundaries indicated as entering any body of water, but not continuing to intersect with other zoning boundaries or with the limits of the jurisdiction of the

County, shall be construed as extending, in the direction in which they enter the body of water, to intersect with other zoning boundaries or with the limits of County jurisdiction.

(Ord. No. 00-21, § 2, 5-18-00)

PART 2.02.00 USES ALLOWED WITHIN ZONING DISTRICTS

Sec. 2.02.01. Use Classifications and Definitions

The following sections describe the categories of uses which apply within Hillsborough County. Each category contains a description of the fundamental characteristics of the category and a list of representative uses. It is not possible to list each and every individual use which may be allowable within a category. The intent is to describe the category and provide a sufficient number of illustrative or representative uses to allow other uses to be assigned to a category as they are proposed in a zoning district.

A. Residential Uses

Residential uses are those which provide dwellings or structures intended for occupancy for housekeeping, and includes units which are single-family (attached or detached), accessory apartments, multi-family in a variety of housing styles, including but not limited to duplex, triplex, quadplex, garden apartments, villas and townhouses, mid-rise and high-rise apartment buildings, and garage apartments. Also included are manufactured homes, mobile homes, condominium ownership, cooperatives, and other ownership arrangements. Residential uses also include bed and breakfast, group homes, congregate care homes, assisted living facilities, life care treatment, foster homes, and may include special housing needs such fratemities and sororities, or farm worker housing. Certain uses are also allowable in the residential use category by development order, and are specified in 2.03.00. Residential units, while allowable, must meet the density limitations shown in the comprehensive plan. In addition, not all housing types are allowable in every zoning district. Refer to 2.02.03 which describes which housing types are allowable in each residential zoning district.

B. Agricultural Uses

1. Agricultural uses are those related to the production, keeping, or maintenance, whether for sale or personal use, of plants and animals for food, forage, fiber, or omamental purposes. Agricultural uses are characterized as predominantly outdoor activities, with structures covering a very small portion of the land. However, some specific production activities may require relatively large amounts of land coverage, such as poultry houses, greenhouses, and kennels. Trip generation is very low; the number of employees per acre is very small. Nuisance may occur due to dust, odor, or pests, depending upon the type of activity. The uses within this category may include both domestic and exotic species, except as specifically prohibited by other regulations.

2. Included uses are silviculture; horticulture; aquaculture; crop production; pasture lands; livestock; bees; orchards; plant farms; kennels; rural home industry; agricultural manufacturing; and structures and facilities necessary to agricultural production activities, including barns, sties, pens, corrals, stables, greenhouses, milking parlors and dairies, feedlots, silos, and other substantially similar facilities and structures whether for the primary use or accessory to agricultural activity. Also included is land application disposal. Agricultural uses may also include a bed and breakfast, farm worker housing, and residences for the farm owner, operator, or caretaker, where the residential use(s) is directly associated with the principal agricultural use of the land.

C. Cultural/Institutional Uses

1. Cultural/institutional uses provide a personal service in the form of education, culture, fine arts displays and exhibits, and similar activities. Uses in this category are predominantly day-time activities, are moderately intense as measured by degree of land coverage, level of traffic, but may be periodically intense due to special events which create large amounts of traffic within a short time period as well as increased demands for parking. Number of employees and users will vary widely due to the periodic nature of institutional uses. Institutional uses may be public or private.

2. Institutional uses include, but are not limited, to libraries, galleries, and museums; pre-kindergarten, kindergarten, primary, elementary, middle, and secondary schools; child care, day care, or child nurseries; community centers; churches and synagogues; parks and recreation facilities with or without lighted fields and courts. Specifically not included in this category are theaters and auditoriums or other similar places of assembly; colleges and universities are not included.

D. Neighborhood Business and Commercial

1. Land use activities in this category are those which serve the surrounding neighborhood or a small group of neighborhoods. Uses are small-scale, have low-to mid-range trip generation, typically require access to collectors, and operate primarily in daytime or early evening hours. Intensity as measured by impervious surface coverage and floor area ratio is relatively low, with a predominance of one-story and low-rise buildings outside of activity centers. This category does not include large-scale discount supercenters or big box retailers.

2. Typical uses in this category include commercial recreation, entertainment, retail, hospitality, adult uses, and general business, such as retail goods stores; financial institutions with or without drive-up facilities; funeral homes and mortuaries; shopping centers; agricultural stands; neighborhood convenience stores with or without gas pumps; car wash; grocery stores; specialty food stores; and supermarkets; bowling alleys; billiards and pool parlors, spas, gyms, and health clubs; commercial, vocational, business or trade schools; bed and breakfast establishments and guest lodges; hotels and motels; service businesses such as blueprint, printing, catering, travel agencies, mail and package services, repair shops, upholstery, and laundries; personal services such as beauty shops, barbers, employment services, or photography studios; adult care centers, child care centers, nursing homes; restaurants; general offices, professional offices, and governmental offices, schools for the performing or fine arts and for martial arts.

E. General Business and Commercial Uses

1. Land use activities in this category are those which serve the surrounding neighborhood, a small group of neighborhoods, or are community-serving. Uses are small- and medium-scale, have mid-range trip generation, typically require access to collectors and arterials, and operate primarily in daytime or early evening hours. Intensity as measured by impervious surface coverage and floor area ratio is relatively low, with a predominance of one-story and low-rise buildings outside of activity centers. Uses tend to be in individual structures or in community-scale shopping centers. This category does not include large-scale discount supercenters or big box retailers.

2. Typical uses in this category include commercial recreation, entertainment, retail, hospitality, adult uses, and general business, such as retail goods stores; financial institutions with or without drive-up facilities; funeral homes and mortuaries; farm and garden supply centers; agricultural stands; neighborhood

convenience stores with or without gas pumps; car wash; grocery stories, specialty food stores, and supermarkets; bowling alleys, billiards and pool parlors, spas, gyms, and health clubs; community hospitals; commercial, vocational, business or trade schools; bed and breakfast establishments and guest lodges; hotels and motels; mini-warehouses; service businesses such as blueprint, printing, catering, travel agencies, mail and package services, repair shops, upholstery, and laundries; personal services such as beauty shops, barbers, employment services, photography studios, adult care centers, child care centers, nursing homes; restaurants; general offices, professional offices, and government offices; domestic vehicle sales rental and minor service and repair, schools for the performing or fine arts and for martial arts.

F. High Intensity/Highway Commercial Uses

1. Business uses in the high intensity/highway commercial use category are those which typically have high or extremely high traffic associated with the use. Uses generally require access to a major or minor arterial or have close proximity to major intersections or interchanges with limited access facilities. These uses are characterized by outdoor activity and outdoor storage, a high demand for parking, a high level of impervious surface coverage, as well as high levels of trip generation. High intensity/highway commercial uses are those which are major employment centers, or which serve the traveling public and are oriented to vehicular travel; however, they are distinguished from regional uses by scale. These uses are intense as measured by the impacts to adjacent properties, but are typically not of an overall size or building mass as a regional activity center. These uses often have an actual or potential negative impact on surrounding properties due to late hours of operation, noise, and or light. Uses may be located in several buildings, as in shopping centers or business parks, or may be located in a single building, such as a discount supercenter, or big box retailer.

2. Examples of uses in this category include, but are not limited to the following: all types of vehicle sales, rental, service, repair, and storage, including truck stops, body shops, road services, car wash facilities, and the sales, rental, repair and service of new or used automobiles, boats, buses, farm and garden equipment, motorcycles, trucks, recreational vehicles, and mobile homes; gasoline sales and service, combination gasoline sale and food marts; large scale discount centers, supercenters, large scale building supply centers and do-it-yourself centers, big-box retailers; free-standing taverns, bars, lounges, night clubs, and dance halls; financial institutions with drive-up facilities; restaurants with drive-up facilities; agricultural stands, temporary or permanent; outdoor arenas, rodeo grounds, livestock auction facilities, race tracks (auto, dog, go-kart, horse, motorcycle), shooting and firing ranges; veterinary offices and animal hospital with outside kennels; minor industry; storage yards for equipment, machinery, and supplies for building and trades contractors, garbage haulers; flea markets or similar outdoor or indoor/outdoor sales complexes, whether temporary or permanent; hotels and motels; and other substantially similar facilities and uses.

G. Industrial, Manufacturing, Distribution Uses

1. The characteristics of uses in this category include large or extremely large lots, often with a single user or single employer, where manufacturing, processing, storing, or distribution of goods occurs. Buildings are typically one floor, but may cover large expanses of land. High levels of employment, two or three shifts per day, and potential negative impacts from truck traffic, rail, employee shift changes, noise, or industrial, chemical, heat producing, and manufacturing processes all are typical of uses in this category. These uses may

also have substantial and significant outdoor storage and/or outdoor activity. Uses are not typically open to the general public.

2. Typical uses in this category are manufacturing, processing, production, and assembly plants; warehousing, with or without distribution centers; lumberyards; dry cleaning plants; large-scale printing plants; slaughterhouse and animal processing plants; power plants; and substantially similar uses.

H. Mining and Extractive Activities

This category includes all uses where resources are removed from the ground, such as mines, land excavation, and the like.

I. Office and Professional Services

1. Office and professional service uses have only moderate impacts to surrounding properties due to primarily day-time operations, low to moderate trip generation, and the absence of significant impacts due to noise, light, or pollution. There is no outdoor storage or outdoor activity associated with these uses. Commercial uses are accessory only.

2. Typical uses in this category include service businesses such as blueprint, printing, catering, travel agencies, mail and package services, repair shops, upholstery, and laundries; personal services such as beauty shops, barbers, employment services, or photography studios; restaurants; general offices professional offices, and government offices; medical offices or clinics with scheduled or emergency services by physicians, dentists, chiropractors, psychiatrists, podiatrists, physical therapists, optometrists, and other medical practitioners, including ambulatory/day surgery centers. This category also includes diagnostic centers which provide radiology, and medical screening and testing services. Facilities to provide medical equipment, supplies, devices, eyeglasses, hearing aids, or other similar items for personal use upon advice of a health provider may be included in this category so long as they are functionally associated with the office or clinic and are not an isolated or freestanding use. This category does not include hospitals or other health care facilities which provide overnight lodging.

J. Outdoor/Passive Uses

1. Outdoor/passive uses are characterized by uses which have large and extremely large amounts of land, few and small structures, little coverage of the land with paved areas, little or no vehicular use, low trip generation rates, little outdoor lighting, and low numbers of employees or other users per acre of land. Activities tend to be low impact and are predominately or exclusively daytime activities.

2. Included are walking and hiking trails, bridle paths, greenways, game preserves, natural preserves, parks with picnic areas, camps, and similar low impact uses. Also allowable are country clubs, golf clubs, and golf driving ranges, cemeteries (either human or pet). Mausoleums, or crematoriums, may be permitted, provided they function accessory to and on the same site as related cemetery.

K. Neighborhood Public Service and Emergency Service Uses

1. This category represents those uses which, while they may be of moderate intensity, with a high degree of outdoor storage and outdoor activity, a high ratio of land coverage, and potential nuisance, are nevertheless necessary as support to surrounding uses. Any potential nuisance is mitigated by limitations on scale of development, consistent with neighborhood scale development.

2. The type of uses included in this category include, but are not limited to neighborhood-scale fire stations; components of water systems; components of wastewater systems; electricity substations; neighborhood support services; and substantially similar and related uses.

L. General Public Service and Emergency Service Uses

1. This category represents those uses which are relatively high intensity, often with 24-hour operations, a high degree of outdoor storage and outdoor activity, a high ratio of land coverage, a high level of nuisance due to noise, and high levels of truck or large vehicle traffic.

2. The types of uses included in this category include, but are not limited to general aviation airports and heliports (but not Tampa International Airport); railyards and terminals; ambulance services; fire stations; water plants and systems; wastewater plants and systems; maintenance, garage, and storage yards for school buses, highway construction equipment, telephone equipment, utility company trucks and equipment; microwave, radio, and television transmission towers; radiotelephone communication facilities, electricity substations; and substantially similar and related uses.

M. Regional Business and Commercial Uses

This category contains those business and commercial uses which serve several communities or an entire region. These uses require a high degree of access, typically locating near a limited access transportation facility or the intersection of major arterials. Uses are relatively high intensity as measured by trip generation and land coverage. Uses tend to be located in extremely large-scale complexes, such as a commercial shopping mall, commerce park, or similar facility. The distinguishing characteristics of this category are not the specific uses which may be included, but the scale of the development. All uses in the general commercial, high intensity commercial, office and professional services, medical office would be allowable and are classified as regional business and commercial due to scale and intensity of use. Tampa International Airport is included in this category. Uses in this category will be developments-of-regional-impact under chapter 380, Florida Statutes.

N. Regional Cultural and Entertainment Facilities

1. This category contains those cultural and entertainment uses which serve an entire region or the entire state. These uses require a high degree of access, large amounts of parking, and typically locate near a limited access transportation facility or the intersection of major arterials. Uses are relatively high intensity as measured by trip generation and land coverage. Uses are often enclosed with controlled access from the surrounding area. Uses are often under the control of a single entity, and are of a scale consistent with developments-of-regional-impact under chapter 380, Florida Statutes.

2. Uses in this category include colleges and universities, amusement and theme parks, performing arts centers, hospitals and medical centers, convention centers, and substantially similar facilities.

O. Solid Waste Facilities

This category is for uses such as landfills (classes I, II, and III), hazardous waste transfer facilities, recycling centers, composting and other yard waste facilities, and substantially similar facilities.

(Ord. No. 97-18, § 2, 12-18-97; Ord. No. 00-21, § 2, 5-18-00; Ord. No. 03-9, § 2, 6-5-03; Ord. No. 03-36, § 2, 11-12-03)

Sec. 2.02.02. Allowable Uses In Zoning Districts

1. The table below indicates the categories of uses which are allowable in each standard zoning district within Hillsborough County. The categories of uses are arranged in the vertical column on the left side of the table and the zoning districts are listed across the top. "P" indicates that the use is permitted, subject to the standards of this Code. "C" indicates the use is a Conditional Use that may be allowed in the identified district pursuant to conformance with the design standards contained in Article VI. No public hearing is required for Conditional Uses unless otherwise stated in the applicable standards in Article VI. "S" designates uses as Special Uses that may be established in the district, pursuant to a noticed public hearing as described in Part 10.02.00 and in conformance with the standards contained in Article VI. An "A" indicates the use is an Accessory Use that may be established in the district pursuant to the requirements of Article VI. Uses identified with an "N" are potentially permitted Conditional Uses in the identified district pursuant to the criteria contained in Section 6.11.65 (Non-Industrial Uses in Industrially Designated Areas). A blank space indicates that the use is prohibited. All uses are subject to the development standards of the zoning district in which it is to be located as well as all other rules and regulations of this Code and Hillsborough County.

2. All uses are potentially permitted in Planned Development (PD) districts, subject to the policies of the Comprehensive Plan, the requirements of Part 5.03.00 of this Code and all other rules regulations and ordinances of Hillsborough County. Land uses permitted in existing Planned Development districts are specified in the PD's conditions of approval. Requests for rezonings or modifications to Planned Developments are reviewed in accordance with Part 10.03.00 of this Code.

3. All uses permitted in Traditional Neighborhood Developments (TNDs), Pedestrian-Oriented Developments (PODs) and Transit-Oriented Developments (TODs) are identified in Part 5.08.00 of this Code.

TABLE INSET:

NOTE: TABLE IS TOO LARGE FOR PROPER DISPLAY

Endnotes:

1 Separate Alcohol Beverage Special Use Permit required.

2 Permitted only in HI (Heavy Industrial) Comprehensive Plan Category.

3 Reviewed and permitted in accordance with the design standards of Article VI at site development/building permit review, unless separation requirement is not met. In such cases, a noticed public hearing is required.

4 Permitted subject to review according to Public Facility Siting Policy.

5 Permitted subject to review procedures of Interlocal Agreement with School Board.

(Ord. No. 97-18, § 2, 12-18-97; Ord. No. 02-13, § 2, 8-1-02; Ord. No. 02-22, § 2, 11-13-02; Ord. No. 03-9, § 2, 6-5-03; Ord. No. 03-36, § 2, 11-12-03; Ord. No. 04-27, § 2, 6-10-04; Ord. No. 04-30, § 2, 6-10-04)

Sec. 2.02.03. Housing Types

The table below indicates the housing types allowed in each zoning district within Hillsborough County. The housing types are arranged across the top. "P" indicates that the use is allowable by right, subject to the standards of this Code. A blank space indicates that the use is prohibited.

TABLE INSET:

HOUSING TYPE				
ZONING DISTRICTS	Single-Family	Duplex	Multi-Family	Mobile Home
AM	P		P 1	P
A	P		P 1	P
AR	P		P 1	P
AS-0.4	P		P 1	P
AS-1	P		P 1	P
ASC-1	P		P 1	
RSC-2	P			
RSC-3	P			
RSC-4	P			
RSC-6	P			
RSC-9	P			
MH	P			P
RDC-6	P	P		

RDC-12	P	P		
RMC-6	P	P	P	
RMC-9	P	P	P	
RMC-12	P	P	P	
RMC-16	P	P	P	
RMC-20	P	P	P	
SB	P			P
OR	P	P	P	
SPI-UC-1	P	P	P	
SPI-UC-2				
SPI-UC-3	P	P	P	

1 Community Residential Homes and Professional Residential Facilities only.

(Ord. No. 01-30, § 2, 11-15-01)

Sec. 2.02.04. Accessory Uses

A. Generally

1. Accessory uses are uses that are on the same lot or in the same structure with, and of a nature and extent customarily incidental and subordinate to, the principal use of the lot or structure. The procedure for review of accessory uses shall be the same as is required for the principal use unless otherwise identified in Table 2.02.02. All required accessory uses for any principal use, including but not limited to off-street parking and loading areas, retention or drainage areas, and private sewer or water systems shall be located on the same parcel as the principal use and shall have the same or similar zoning district designation as the principal use, except in accordance with the Site Development Review Requirements in 5.02.03 of this Code and/or except as expressly permitted elsewhere in this Code. In no case shall the principal or accessory use be located in a zoning district where that use is not either a permitted use or a permissible Conditional or Special Use.

2. Each of the following uses is considered to be a customary accessory use, and as such, may be situated on the same lot with, but detached from, the principal use with which it is associated.

B. Agricultural Mining, Accessory Uses

1. The following uses shall be permitted as accessory uses in the Agricultural Mining District, accessory to an active phosphate mining facility:

a. Phosphate research activities; which must meet the performance standards in 6.09.00 as measured at the zoning lot line.

b. Classrooms.

c. Tank farms.

d. Warehouses.

e. Maintenance and storage facilities.

f. Similar uses.

2. Such uses shall be engaged only in phosphate connected activities for the phosphate mining activity on the same zoning lot.

C. Office, Commercial, Industrial, SPI, and PD Districts

1. Automated teller machines.

D. RMC-9, RMC-12, RMC-16, SPI-UC-1, SPI-UC-2, PD

1. Dormitories.

E. All Zoning Districts

1. Radio-TV antenna or dish.

2. Guard house, security mobile home or security residence.

3. Off-street parking.

(Ord. No. 02-13, § 2, 8-1-02; Ord. No. 03-9, § 2, 6-5-03)

Sec. 2.02.05. Temporary Uses

A. Allowable Temporary Uses: Non-Residential Zoning Districts

The following temporary uses may be allowable in non-residential zoning districts:

1. Neighborhood fairs and circuses.

2. Contractor's temporary office and/or equipment sheds incidental to construction project.

3. Security residences.

4. Temporary vendors.

5. Agricultural offices.

6. Recyclable goods trailers.

B. Allowable Temporary Uses: Residential Zoning Districts

1. Temporary manufactured homes due to medical hardship.

2. Temporary manufactured homes while constructing.

3. Neighborhood fairs.

4. Model dwelling units and pre-construction sales offices.

5. Garage, yard sales.

6. Temporary vendors (non-profit).

C. Standards

No more than two permits for temporary uses shall be issued for the same site within a one-year period unless otherwise specified in section 6.11.00.

D. Procedures

Temporary uses shall be issued in accordance with the procedures contained at 10.01.00 for the issuance of development permits.

(Ord. No. 00-38, § 2, 11-2-00)

Appendix 2-2
Land Use Element and Solid Waste Use Element

Land Use Element:

Growth Management Strategy:

"Goal: Ensure that character and location of land uses optimizes the combined potentials for economic benefit and the enjoyment and the protection of natural resources while minimizing the threat to health, safety and welfare posed by hazards, nuisances, incompatible land uses and environmental degradation."

Policy A 2.9:
"Prior to the placement of any new or expanded major public facility or public building or grounds, such as landfills, correctional facilities and wastewater treatment plants, the proposed site and possible impacts shall be evaluated in accordance with the criteria specified below:

General Criteria
a) The County shall provide opportunities at the time of planning and site selection for citizens and neighborhoods to express their viewpoints on major facility siting and design; and in order to ensure neighborhood preservation, the County shall take into consideration the viewpoints of citizens and neighborhoods in the final decision making process in major facility siting and design.

b) In the planning, siting, land acquisition and development of major public facilities the County shall consider alternatives, including not siting the facility. The alternatives evaluation shall include consideration of such factors as technical aspects of the facility, costs, design, impacts on the environment and availability of public facilities and services, including transportation impacts and future operation and maintenance costs of alternative sites as well as public safety and welfare factors.

c) Opportunities shall be provided for adjacent property owners and neighbor-hoods to choose to participate in the review process.

d) The siting process for these facilities shall also avoid any detrimental effects on existing and planned development in the study area as well as consider the ancillary impacts associated with the particular facility and ensure that those uses also will not negatively affect the community.

Policy A-2.10:
New development and redevelopment must mitigate the adverse noise, visual, odor and vibration impacts created by that development upon all adjacent land uses.

Policy B-7.1:
Economic development areas shall be any area with land use designation consistent with the potential impacts of desirable economic growth.

Policy B-7.2:
Economic development areas should be within designated transit corridors.

Policy B-7.3:
Economic development areas shall be within the County's Urban Growth Boundaries.

Electrical Power Generation Facilities
Because of the growth in all classifications experienced by Hillsborough County and projected increases as supported by this Plan, Hillsborough County is expected to require additional electric generation capacity to serve the needs of its citizens in all of their endeavors - industrial, commercial, agricultural and residential. In order to maximize a desirable development pattern and to minimize the potential for adverse impacts upon other types of land uses, it is necessary to provide the policy framework to analyze such facilities based upon various factors, such as the nature of the facility, the compatibility with surrounding uses, the need and obligation of Tampa Electric Company to provide reliable, low cost electric service and the County's obligations to require needed infrastructure for future growth. Development of an Electrical Power Generation Facility (EPGF) is subject to the Goals, Objectives and Policies of the Land Use Element, applicable development regulations and established locational criteria for specific land use.

Objective C-33: To locate future electric power generation facilities in geographical areas which are compatible with such use considering surrounding areas, accessibility to modes of transportation to support the facilities' fuel requirements, enhancement of employment and minimization of any potentially adverse impact to environmentally sensitive areas and residential areas, while balancing Tampa Electric Company's legal obligations to provide reliable, low cost electric service to all citizens in strict compliance with all Federal, State and local environmental laws, rules and regulations.

Policy C-33.1:
Placement of future electric power generating facilities shall be given consideration in areas adjacent to other industrial areas, and/or adjacent to rail and/or adjacent to rail and/or water borne transportation for fuel required to serve that type of use.

Policy C-33.3:
All land approved for an electrical power generation facility shall require a planned unit development rezoning.

Policy C-33.4:
Electric power generating facilities shall have an affirmative duty to protect any environmentally sensitive areas through buffering and/or other mitigating techniques. The environmentally sensitive areas shall be specifically detailed on the site plan submitted as part of the rezoning.

Policy C-33.5:
The location of all electric power generating facilities shall strictly comply with all federal, state, and local laws, rules, and regulations pertaining to the site, certification, permitting,

and environmental requirements pertaining to same. See tables in background report for a listing of the minimum local, state and federal requirements which apply.

Policy C-33.6:
The Board of County Commissioners shall not approve any rezoning for an electrical power generating facility that does not demonstrate adequate protection and reservation of natural resources, including air, water, plant and animal life, and adequate protection of human health, safety and welfare.

Policy C-33.7:
An application for rezoning for the purpose of utilizing land for an Electrical Power Generating Facility may only be filed after submission of an application to the State under the Power Plant Siting Act. Further said zoning application shall include all information required by the State Department of Environmental Protection for initial submission in accordance with the Power Plant Siting Act and any additional studies required by the County. For the purposes of rezoning review the standard time requirements for processing an application shall be waived or otherwise altered to allow appropriate consideration of all information. Any rezoning shall be conditioned upon the issuance of a written order approving in whole, or approving with conditions, the application for power plant siting by the Governor and Cabinet sitting as the Siting Board. If the Siting Board denies the siting, then the zoning shall revert to Agricultural or the zoning in existence at the time of rezoning application if other than Agricultural.

Solid Waste Element:

Goal 1:
Hillsborough County shall provide for an environmentally sound and efficient solid waste management system.

ISSUES: The impact of commercial, industrial and residential growth in Hillsborough County is readily apparent. As growth continues, responsibilities for collections, handling and disposal of the growing volumes of solid waste must be undertaken by the County for its residents. The County government must plan and operate its solid waste management system in an efficient and environmentally sensitive manner.

OBJECTIVE 1.2: The County shall provide for increases in disposal capacity of solid waste facilities to meet future needs.

Policy 1.2.1:
The County shall conduct an annual review of future facility needs and budget for those needs within the Capital Improvements Element.

OBJECTIVE 1.3: The County shall continue to operate solid waste facilities in compliance with minimum air, groundwater and surface water pollution standards established by federal, state and local laws, regulations and guidelines.

Policy 1.3.1:
The County shall conduct an annual review of facility operations and operating practices to evaluate compliance with federal and state requirements.

Policy 1.3.2:

The County shall conduct an annual review of technology and innovations available in solid waste management to exceed federal and state requirements.

Policy 1.3.3:

Based on annual reviews, county staff shall provide recommendations of measures to correct or enhance the existing solid waste management system.

Policy 1.3.4:

The level of service to be maintained by all facilities shall be as stated in the Capital Improvements Element.

OBJECTIVE 1.5: The County's solid waste management system shall take all practical measures to minimize the volume of the solid waste stream.

Policy 1.5.1:
The County shall continue recycling programs to separate the majority of newspaper, glass, plastic bottles, steel cans and aluminum cans reaching County disposal facilities.

Policy 1.5.2:
The County shall continue to review and implement recycling and waste reduction programs designed to reduce the per capita solid waste stream reaching County disposal facilities in compliance with state legislative guidelines.

The proposed County resource recovery facility, has been evaluated to determine whether it is consistent with the Comprehensive Plan. As presented in Section 2.2.2.1 of this chapter, the definition of Public/Quasi-Public refers to the Goals, Policies, and objectives of the 2015 Hillsborough Comprehensive Plan. In order to determine consistency, the development proposal has been considered within the context of the standards and criteria found within those Goals, Policies and Objectives.

Appendix 2-3
Siting Board's Final Order

State of Florida

Executive Director
DAVID L. SWAFFORD
(904) 488-7181

Public Service Commission

November 7, 1983

Received DER

NOV 9 1983

P.P.S

Mr. Hamilton S. Oven, Jr., P.E.
Administrator, Power Plant Siting
Department of Environmental Regulation
Twin Towers Office Building
2600 Blairstone Road
Tallahassee, Florida 32301

Dear Mr. Oven:

The attached orders constitute the Commission's final reports, as required by Section 403.507(1)(b) of the Power Plant Siting Act, on the applications of Pinellas and Hillsborough Counties for power plant certification.

As the orders indicate, the matter was handled in the form of a Proposed Agency Action. No person requested a hearing within the required time; therefore, the Commission's finding that a need exists for the proposed plants has become final.

Sincerely yours,

DAVID L. SWAFFORD
Executive Director

DLS/cd

CC: Commissioners
Electric & Gas Department
Legal Department
Department of Community Affairs
Hillsborough County
Pinellas County

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

In re: Petition by Hillsborough County for determination of need for a solid waste-fired cogeneration power plant.	) DOCKET 830419-EU) ORDER NO. 12610) ISSUED: 10-14-83)	

The following Commissioners participated in the disposition of this matter:

GERALD L. GUNTER, Chairman
JOSEPH P. CRESSE
JOHN R. MARKS, III
KATIE NICHOLS
SUSAN W. LEISNER

NOTICE OF PROPOSED AGENCY ACTION

ORDER

BY THE COMMISSION:

Under the Florida Electrical Power Plant Siting Act, Section 403.501, Florda Statutes, the Commission is charged with the responsibility of determining whether construction of a proposed electrical generation facility is necessary to meet the present or expected need for electricity in all or part of Florida. Under the Act, the Department of Environmental Regulation must determine whether the proposed plant will comply with all relevant environmental standards and whether the proposed site for the plant is suitable for that use. Weighing all of these determinations, the Governor and Cabinet, sitting as the Power Plant Siting Board, ultimately determine whether approval will be granted for construction of the proposed plant.

Certification under the Act must be obtained for the construction of any generating facility greater than 50 MW, and may be obtained for a smaller facility. Hillsborough County has elected to seek certification of its proposed 39 MW small power production facility, by a petition filed on August 30, 1983.

Hillsborough County proposes to construct and operate a solid waste-fired electrical generating facility using 1,200 tons of municipal solid waste per day as its primary fuel source. In anticipation of its expected needs, Hillsborough County seeks certification for an ultimate site electrical generating capacity of 39 megawatts (gross), using 1,600 tons per day of municipal solid waste fuel. This is a small power production facility within the meaning of PURPA and Rules 25-17.80 through 25-17.87, Fla. Admin. Code.

The proposed plant will utimately produce 39-megawatts of power which will be sold to Tampa Electric Company. The projected in-service date for the unit is July, 1987, with construction scheduled to begin in the summer of 1984. In its first year of production, the plant will make available for sale to Tampa Electric, about 13 MW on an annual average basis. Generation will continue to increase as the supply of fuel increases and the ultimate capacity available for sale to Tampa Electric will reach about 30 MW on an annual average basis in the late 1990's.

While the Power Plant Siting Act requires the Commission to determine whether a need exists for the proposed generating facility, the purpose of the Commission's need determination is to protect electric utility ratepayers from unnecessary expenditures. The statute lists four criteria the Commission must consider in determining need:

1) the need for electrical system reliability and integrity;

2) the need for adequate electricity at a reasonable cost;

3) whether the proposed plant is the most cost effective alternative available; and

4) conservation measures taken or reasonably available that might mitigate the need for new plant (Sec. 403.519, F.S.)

Congress and the Florida Legislature have determined that cogeneration and small power production should be encouraged on the premise that they constitute alternate sources of power that either displace production of fossil fuel electricity or use fossil fuels more efficiently. Moreover, the proliferation of cogeneration and small power production facilities may obviate the need for construction of additional generating facilities by electric utilities. Therefore, in the present context, we find that the County's proposed small power production facility will increase electrical system reliability and integrity and will maintain the supply of adequate electricity at a reasonable cost while reducing our dependence on fossil fuel. When viewed as an alternative to construction of additional generating facilities by electric utilities, and considering the permissible level of payments to small power producers outlined in Rules 25-17.80 through 25-17.87, Florida Adminstrative Code, the proposed facility is the most cost effective alternative available. Finally, construction of the plant is a conservation measure which we have encouraged precisely because it may mitigate the need for additional construction by electric utilities. Therefore, the relief sought in this petition, an affirmative determination of need, will be and the same is hereby granted. It is, therefore,

ORDERED by the Florida Public Service Commission that this Order constitute the final report required by Section 403.507(1)(b), Florida Statutes, the report concluding that a need exists, within the meaning of Chapter 403, Florida Statutes, for the construction of the 39 MW generating facility proposed by Hillsborough County, Florida. 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. It is further

ORDERED that any person adversely affected by the action proposed herein may file a petition for a formal proceeding, as provided in Rule 25-22.29, within 21 days of the date of this order, November 4, 1983, in the form provided by Rule 25-22.36(7)(a) and (f). It is further

ORDERED that in the absence of such a petition, this Order shall become effective and final as provided by Rule 25-22.29(6), as stated in a subsequent order.

By Order of the Florida Public Service Commisison, this 14th day of OCTOBER 1983.

(S E A L)

Steve Tribble

STEVE TRIBBLE
COMMISSION CLERK

BED

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

In re: Petition of Hillsborough County for determination of need for a solid waste-fired cogeneration power plant.	) DOCKET NO. 830419-EU) ORDER NO. 12678) ISSUED: 11-14-83	

CONSUMMATING ORDER

BY THE COMMISSION:

By Order No. 12610, this Commission proposed to take certain action, subject to a Petition for Formal Proceeding as provided in Rule 25-22.29, Florida Administrative Code. No response has been filed to the order and it has become effective. It is, therefore,

ORDERED by the Florida Public Service Commission that this Order constitute the final report required by Section 403.507(1)(b), Florida Statutes, the report concluding that a need exits, within the meaning of Section 403, Florida Statutes, for the construction of the 39 MW generating facility proposed by Hillsborough County, Florida. 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. It is further

ORDERED that Order No. 12610 be and the same is hereby determined to be effective and final on November 4, 1983, as provided in Rule 25-22.29(6), Florida Administrative Code. It is further

ORDERED that this docket be closed.

By ORDER of the Florida Public Service Commission, this day 14th of November, 1983.

Steve Tribble
COMMISSION CLERK

(S E A L)

BED

STATE OF FLORIDA
DIVISION OF ADMINISTRATIVE HEARINGS

IN RE: HILLSBOROUGH COUNTY RESOURCE RECOVERY PROJECT POWER PLANT SITING CERTIFICATION APPLICATION PA 84-19.	)))))	CASE NO. 84-2789 (LAND USE HEARING)

RECOMMENDED ORDER

Pursuant to notice, an administrative hearing was held before Diane D. Tremor, Hearing Officer with the Division of Administrative Hearings, on October 22, 1984, in Tampa, Florida. The sole issue for determination at the hearing, pursuant to Section 403.508(2), Florida Statutes, is whether the site selected for Hillsborough County's proposed resource recovery facility is consistent and in compliance with existing land use plans and zoning ordinances.

APPEARANCES

For Hillsborough County:	David S. Dee and Jacob D. Varn Carlton, Fields, Ward, Emmanuel, Smith & Cutler, P.A. P.O. Box 190 410 Lewis State Bank Tallahassee, Fl. 32301
For the Department of Environmental Regulation:	Charles G. Stephens and James L. Torres Twin Towers Office Building 2600 Blairstone Road Tallahassee, Fl. 32301
For the Department of Community Affairs:	C. Lawrence Keesev 2571 Executive Center Circle Tallahassee, Fl. 32301
For the Greater Brandon Citizens Alliance:	Thomas Cone Blain & Cone, P.A. 202 Madison Street Tampa, Fl. 33602

INTRODUCTION

Pursuant to the Florida Electrical Power Plant Siting Act, Sections 403.501 - 403.517, Florida Statutes, Hillsborough County filed, on August 2, 1984, an application for power plant site certification for a resource recovery facility. The statutory scheme calls for both a land use hearing and a certification hearing. This land use portion of the proceeding pertains to the

sole issue of whether or not the proposed site conforms with existing land use plans and zoning ordinances.

In support of its position of conformance, Hillsborough County adduced the testimony of seven witnesses and its Exhibits 1-7, 11, 14-17, 19, 20, 27A-G, 30, 31, 34, 36-38, 42, 44, 50, 51, 53, 54, and 56 were received into evidence. Testifying on Hillsborough County's behalf were: Robert Hauser, Jr., an engineer with Camp Dresser & McKee (CDM), who was accepted as an expert witness in the areas of solid waste management disposal, including resource recovery facilities; Dr. Marc Rogoff, the coordinator of the Hillsborough County resource recovery program; Donald F. Elias, the supervisor of the Atmospheric Sciences Division of CDM, who was accepted as an expert in the areas of air pollution, noise, odor, and resource recovery; William Oliver, an engineer who was accepted as an expert in the area of transportation analysis; Gary Engelhardt, Hillsborough County's Zoning Administrator, who was accepted as an expert in zoning and land use planning; James Stutzman, a senior planner at the Hillsborough County City-County Planning Commission, who was accepted as an expert in zoning and land use planning; and Richard Eric Gehring, the district director of the consulting firm of Post, Buckley, Shuh and Jernigan, who was accepted as an expert in zoning and land use planning. Hillsborough County also introduced the deposition testimony of three expert witnesses: Richard Klusza, a real estate appraiser; Paul Darst, a senior planner with the Department of Community Affairs; and David McDevitt, a planner with the Department of Community Affairs.

The Department of Community Affairs, the Department of Environmental Regulation and the Southwest Florida Water Management District are parties to this proceeding, pursuant to Section 403.508, Florida Statutes. They stipulated prior to the hearing that they do not dispute Hillsborough County's contention that the proposed project is consistent and compatible with the local land

use plan and zoning regulations. The Department of Environmental Regulation introduced one exhibit to establish proof of publication of notice for the land use hearing. The Department of Environmental Regulation and the Department of Community Affairs did not call any witnesses. The Southwest Florida Water Management District did not participate at the land use hearing.

Prior to the hearing, the Greater Brandon Citizens Alliance ("Alliance") filed notice of its intent to be a party. At the hearing, however, the Alliance's counsel presented an opening argument and then withdrew the Alliance's request to be a party. Counsel for the Alliance also explained that the Alliance had voluntarily dismissed with prejudice its lawsuit challenging the validity of the zoning and land use plan for the proposed Hillsborough County resource recovery facility.

One witness testified as a member of the general public. Barbara Stillie, a member of the Board of Directors of the Greater Brandon Chamber of Commerce, testified that the Chamber opposed the proposed facility on the grounds that it would negatively impact the residential and business atmosphere and the orderly and healthy growth of the area.

Subsequent to the hearing, Hillsborough County submitted proposed findings of facts and proposed conclusions of law. The other parties did not submit proposed orders. To the extent that Hillsborough County's proposed findings of fact are not included in this Recommended Order, they are rejected as being not supported by competent substantial evidence adduced at the hearing, irrelevant or immaterial to the issues in dispute or as constituting legal conclusions as opposed to factual findings.

FINDINGS OF FACT

Upon consideration of the oral and documentary evidence presented at the hearing as well as the parties' prehearing stipulations of fact, the following relevant facts are found:

The Site:

1. Hillsborough County desires to build a resource recovery facility and a wastewater treatment plant on an undeveloped 50 acre parcel of land ("the site") owned by the County and situated in an unincorporated area of Hillsborough County. The site is located approximately 5 miles east of downtown Tampa, 2.5 miles northwest of the unincorporated community of Brandon, 0.6 mile north of State Road 60 and 0.75 mile west of the Interstate 75 by-pass.

The site is an open, grassy pasture with a few trees, and is presently used for grazing. It is not an environmentally sensitive or pristine area. There are no viable wetlands on the site.

2. The proposed site is bounded by a railroad track on the south, a TECO 230 KV electric transmission line corridor on the west, Faulkenburg Road and a pipe fabrication facility on the east and approximately 300 acres of improved pastureland on the north. Hillsborough County owns the site, the pasture to the north and the land used by the pipe fabricating facility.

3. Nine square miles (5600 acres) of land around the site are designated in the local comprehensive plan for industrial development. Approximately 80% of the land within one mile of the site is zoned for light industrial use. There are many existing industrial facilities in the area, including a pipe fabrication facility, two cement batch plants, a foundry, a garbage collection company with a garbage truck storage area, an automobile battery manufacturer, a bagging company and an oil reprocessing plant which is on the Environmental Protection Agency national priority list of hazardous waste sites.

4. Although there are a few homes scattered along Faulkenburg Road, they constitute nonconforming land uses in this industrial district. The resource recovery facility will be built on the western portion of the 50-acre site and will be more than 1700 feet (560 yards) from the nearest home. The nearest residential subdivision, Woodbury Estates, is 4200 feet (.79 mile) away from the resource recovery building. This subdivision is located

on the far (east) side of the Interstate 75 by-pass. Since the interstate highway is elevated in this area, it forms a natural dividing line or buffer between the industrial and residential areas.

The Resource Recovery Facility and Wastewater Treatment Plant

5. The primary purpose of the proposed resource recovery facility is to receive solid waste and convert it into electrical power. This "waste to energy" facility will initially have 3 boilers, will dispose of 1200 tons of refuse each day and will produce 29 MW of electricity. A fourth combustion unit will be added in the future. With the fourth unit, the facility will use 1600 tons of refuse each day and produce 39 MW of electricity. Mass burn technology will be used and refuse will be the sole combustion fuel. It would take 280,000 barrels of oil each year to produce the same amount of electricity at a power plant. Over the 20-year life of the facility, Hillsborough County will recover the energy equivalent of 5.6 million barrels of oil. The electricity will be sold to TECO, thus reducing the cost of solid waste management.

6. The resource recovery facility and the .75 MGD (eventually to be increased to 3.0 MGD) wastewater treatment plant will be owned by Hillsborough County and operated by a private company under a 20-year contract. It is intended that the facility and the plant will work as an integrated system. The wastewater treatment plant will provide process and cooling water for the resource recovery plant. No groundwater will be used. The resource recovery plant will dispose of treated effluent from the wastewater treatment plant by evaporation. The wastewater treatment plant will treat the liquid wastes from the resource recovery plant. If approval for the on-site wastewater treatment plant cannot be obtained, effluent from another wastewater treatment facility would be brought to the site. Ash and residue will be taken from the resource recovery plant to the Southeast Hillsborough County Landfill for disposal.

7. The site development plans for the entire project contemplate that enclosed refuse trucks will enter the facility from Faulkenburg Road. The trucks will be weighed in the scale house area, proceed up a ramp into the enclosed refuse receiving-unloading building and then exit back onto Faulkenburg Road. The facility consists of the refuse receiving-unloading building, the refuse storage and crane area building, the boiler house portion of the building and the air pollution control system and residue processing portions of the building. There will be an administration building, an electrical switch yard and parking areas. The maximum building height is 140 feet (the boiler building) and the maximum elevation on the flue gas stack is 220 feet. Trees and shrubbery will be planted around the site to provide screening and buffering.

Local Comprehensive Plan

8. The Hillsborough County land use map is part of the local comprehensive plan, known as the Horizon 2000 Plan. Prior to February of 1984, the site was designated on the land use map as Light Industrial. The types of uses allowed in such areas are industrial activities that create a minimal degree of impact on the surrounding environment, particularly in terms of non-objectionable levels of noise, vibration, dust or odors. In February of 1984, the land use map was amended so as to change the designation of the proposed site for the resource recovery facility from Light Industrial to "Public/Semi-Public." The amendment to the land use map was formally reviewed and approved by four different groups in Hillsborough County. First, the amendment was reviewed and approved by the staff of the Hillsborough County City-County Planning Commission, which reviews all proposed amendments to the comprehensive plan. Second, the amendment was reviewed and approved by the staff of the Department of Development Coordination. The Department of Development Coordination submits comments to the Planning Commission concerning any amendment to the local comprehensive plan. Third, the change was approved by a

unanimous vote of the Planning Commission. Finally, it was approved by a unanimous vote of the Board of County Commissioners. The Board found that the proposed site for the resource recovery facility was compatible with the Light Industrial designation contained in the Horizon 2000 Plan, and that the redesignation to Public/Semi-Public was designed to provide notice on the land use map of the existence of a public facility.

9. The Public/Semi-Public land use designation is used to identify the location of existing or proposed public facilities that have unique significance to the community. For example, this designation is used to identify the location of the Tampa International Airport, the University of South Florida and the Hillsborough Heights Landfill. The proposed resource recovery facility and wastewater treatment plant are major public facilities that will provide unique benefits to the citizens of Hillsborough County.

Zoning

10. The proposed site was formerly zoned as Restricted Industry or "M-1A." In May of 1984, zoning on the site was changed to Community Unit District or "C-U." During the review and rezoning process, several public hearings were held and members of the public were provided an opportunity to express their views about the project. The rezoning was reviewed and approved by six different entities or individuals. Specifically, it was approved by the staff of the Planning Commission; the staff of the Department of Development Coordination; various agencies in Hillsborough County, including the Health Department, Traffic Department, and Hillsborough County Environmental Protection Commission; the Zoning Administrator for Hillsborough County; an independent zoning hearing master who conducted an evidentiary hearing; and a unanimous vote of the Board of County Commissioners.

11. According to the zoning regulations, the purpose of the "C-U" zone is to provide the maximum in development opportunities, subject to reasonable restrictions on height, area,

setback, etc. While the "C-U" zone is not limited as to the types of land uses that are permissible, facilities built in a "C-U" zone must be compatible with surrounding land uses. To determine whether the proposed facility will be compatible with other uses of the land surrounding the proposed site, it is necessary to examine the external impacts anticipated from construction or operation of the resource recovery facility.

External Impacts

12. The resource recovery facility and wastewater treatment plant will be one of the most attractive industrial developments in the area. The project has been designed to resemble an office building and the site will have extensive landscaping, including trees, shrubs and berms. The facility will be fully enclosed to minimize noise, odor, dust and other off-site impacts. The impacts associated with the facility will, in most instances, be less than the impacts associated with the existing industrial uses in the area.

13. The operation of the resource recovery facility will increase noise levels by less than 3 decibels at the nearest residence, which is 1700 feet away from the resource recovery building. An increase of 3 decibels is the limit of perceptibility for the normal person. The noise level at the nearest subdivision, located on the other side of I-75, would not be affected. It would be completely masked by existing noise levels.

14. The resource recovery facility will not produce any objectionable odors off-site. The refuse will be unloaded in an enclosed area inside the resource recovery building. The unloading ("tipping") area will be under negative air pressure. The air in the tipping area will be drawn into the furnace, and heat in the furnace will destroy any odiferous compounds in the air. No refuse, ash or other material will be stored outside of the building.

15. The proposed Hillsborough County resource recovery facility must comply with the Florida and national ambient air

quality standards. The Clean Air Act expressly states that those standards were established to protect the public health and welfare, with an adequate margin of safety.

The proposed facility is designed to minimize any potential air pollution. During normal operating conditions, there will be no smoke emissions from the facility. Less than one percent of the time, during severe wintertime conditions, a trace of a condensation plume at the top of the stack might appear, but it would evaporate quickly. At full operation, the proposed sulphur and sulphur dioxide emissions rate for this facility is 23.1 grams per second. As a comparison, the TECO Big Bend Units 1 through 3 emissions are approxmiately 8,000 grams per second.

16. Except during the construction phase, there will be no dust created by the facility itself under normal operating conditions. Entrance roads will be paved and maintained and the facility is enclosed and maintained under negative pressure.

17. The proposed facility will have very little effect on traffic in the area. Traffic from the resource recovery facility and wastewater treatment plant will comprise less than five percent (5%) of the capacity on Faulkenburg Road and less than one percent (1%) on State Road 60. The County uses a 5% threshhold to determine whether there will be a negative impact on traffic. Traffic from the resource recovery facility will have no effect on the peak or rush hour traffic conditions. The proposed facility will generate less traffic and will have less impact on peak hour conditions than a typical light industrial development that could otherwise be built on this site. A site this size associated with light industrial use could typically be expected to generate about 2,650 vehicle trips per day. When the proposed facility is operating at full capacity, approximately 650 vehicle trips per day are anticipated.

18. The proposed facility will not adversely affect the

value of either the existing nearby industrial properties or vacant land in the area. The site surrounding a similar and larger resource recovery facility in Pinellas County is experiencing a great deal of new residential, commercial and industrial development.

Additional Facts

19. The Hillsborough County zoning regulations and comprehensive plan do not expressly designate a particular zoning or land use category for resource recovery facilities. An electrical power plant is one of the uses designated for a "heavy" as opposed to a "light" industrial area. While the proposed facility will burn refuse and produce electricity, it should not be equated to either an incinerator or a power plant because of its technological superiority to a conventional incinerator and its smallness in size as compared to a typical power plant. It will not have the offensive off-site impacts in terms of dust, noise, odor and air pollution that normally occur at an incinerator or power plant.

20. The Department of Community Affairs (DCA), the Department of Environmental Regulation (DER), and the Southwest Florida Water Management District do not dispute Hillsborough County's contention that the project is consistent and compatible with local zoning regulations and the local comprehensive plan. The DCA has concluded that the project is consistent with the goals, objectives, and policies of the State Comprehensive Plan.

21. Notice of the land use hearing was published in the Tampa Tribune on September 7, 1984, and also in the Florida Administrative Weekly on September 7 and September 14, 1984.

CONCLUSIONS OF LAW

The sole issue for determination in this land use portion of the proceeding is whether the proposed Hillsborough County resource recovery facility site is consistent and in compliance with land use plans and zoning ordinances in effect as of the date of the application for power plant site certification.

Case No. 84-2789

Honorable Bob Graham
Governor
State of Florida
The Capitol
Tallahassee, Fl. 32301

Honorable Jim Smith
Attorney General
State of Florida
The Capitol
Tallahassee, Fl. 32301

Honorable Doyle Conner
Commissioner of Agriculture
The Capitol
Tallahassee, Fl. 32301

Honorable Ralph Turlington
Commissioner of Education
The Capitol
Tallahassee, Fl. 32301

Honorable George Firestone
Secretary of State
The Capitol
Tallahassee, Fl. 32301

Honorable Bill Gunter
State Treasurer and Insurance
Commissioner
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Honorable Gerald Lewis
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Public Service Commission
101 E. Gaines Street
Tallahassee, Fl. 32301

BEFORE THE GOVERNOR AND CABINET

OF THE STATE OF FLORIDA

IN RE: HILLSBOROUGH COUNTY RESOURCE RECOVERY PROJECT POWER PLANT SITING CERTIFICATION APPLICATION PA 83-19	)	DOAH CASE NO. 84-2789 (SITE CERTIFICATION HEARING)

FINAL ORDER OF CERTIFICATION

BY THE GOVERNOR AND CABINET:

The Governor and Cabinet, sitting as the Siting Board, having reviewed the Recommended Order which is attached hereto as Exhibit 1, and otherwise being fully advised herein, issue this Final Order and, therefore, it is

ORDERED:

1. The Recommended Order (dated November 9, 1984) prepared by the Hearing Officer in this case is approved and adopted.

2. The conditions of certification attached to the Recommended Order as Appendix "A" are approved and adopted.

3. The certification of the Hillsborough County resource recovery facility is specifically subject to the conditions of certification contained in Appendix "A."

4. Pursuant to Section 403.504(13), Florida Statutes, the Department of Environmental Regulation shall retain $5,000.00 from Hillsborough County's application fee to verify the emission rates from the facility in accordance with the conditions of certification.

DONE AND ORDERED this 20th day of December, 1984, in Tallahassee, Florida, pursuant to the vote of the Governor and Cabinet, sitting as the Siting Board, at a duly constituted Cabinet meeting on December 18, 1984.

FOR THE GOVERNOR AND CABINET,
SITTING AS THE SITING BOARD

Bob Graham

THE HONORABLE BOB GRAHAM
Governor

The action of the Siting Board is based on the following vote:

	For	Against	Absent
Honorable Bob Graham	✓		
Honorable George Firestone			✓
Honorable Bill Gunter	✓		
Honorable Gerald A. Lewis	✓		
Honorable Jim Smith	✓		
Honorable Ralph D. Turlington	✓		
Honorable Doyle Conner	✓		

FILING AND ACKNOWLEDGEMENT
Filed, on this date, pursuant to Section 120.52(10), Florida Statutes (1983), with the designated Department Clerk, receipt of which is hereby acknowledged.

Diane M. Nelson
Clerk

12/21/84
Date

Copies furnished to:
(See attached list)

COPIES FURNISHED TO:

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STATE OF FLORIDA
DIVISION OF ADMINISTRATIVE HEARINGS

IN RE: HILLSBOROUGH COUNTY RESOURCE RECOVERY PROJECT POWER PLANT SITING CERTIFICATION APPLICATION PA 84-19.	)))))	CASE NO. 84-2789 (SITE CERTIFICATION HEARING)

RECOMMENDED ORDER

Pursuant to notice, an administrative hearing was held before Diane D. Tremor, Hearing Officer with the Division of Administrative Hearings, on November 8, 1984, in Tampa, Florida. The issue for determination at the hearing was whether the application for Power Plant Site Certification filed by Hillsborough County, Florida, for the construction and operation of a resource recovery facility should be approved and site certification granted by the Governor and Cabinet, sitting as the Siting Board.

APPEARANCES

For Hillsborough County:	Jacob D. Varn and David S. Dee Carlton, Fields, Ward, Emmanuel, Smith & Cutler, P.A. P.O. Box 190 410 Lewis State Bank Tallahassee, Fl. 32301
For the Department of Environmental Regulation:	Charles G. Stephens Twin Towers Office Building 2600 Blairstone Road Tallahassee, Fl. 32301
For the Department of Community Affairs:	David Jordan 2571 Executive Center Circle Tallahassee, Fl. 32301

INTRODUCTION

Pursuant to the Florida Electrical Power Plant Siting Act, Sections 403.501 through 403.517, Florida Statutes, Hillsborough County filed, on August 2, 1984, an application for the construction and operation of a resource recovery facility. The statutory scheme calls for both a land use hearing and a certification hearing. The land use hearing was held on October 22, 1984, and, in a Recommended Order dated November 9, 1984, the undersigned concluded that the

EXHIBIT 1

proposed site is consistent and in compliance with existing land use plans and zoning ordinances.

At the certification hearing held on November 8, 1984, the parties stipulated that the transcript and exhibits from the prior land use hearing should be included and incorporated as a part of the evidentiary record. Accordingly, Hillsborough County's Exhibits 1-7, 11, 12, 14-17, 19, 20, 27A-G, 30, 31, 34, 36-38, 42, 44, 50, 51, 53, 54, 56, DER Exhibit 1, and the transcript of the testimony of seven witnesses were accepted into evidence as a portion of the record of this proceeding.

In support of its application for site certification, Hillsborough County adduced the testimony of six witnesses and its Exhibits 27H, 27I, 37, 47, 48, 58, 59 and 60 were received into evidence. Testifying on behalf of the applicant were Robert Hauser, Jr., who was accepted as an expert witness in the areas of solid waste management and disposal, including resource recovery facilities; Dr. Robert Powell, who was accepted as an expert witness in the areas of surface water and groundwater hydrology; Louis R. Tortora, Jr., who was accepted as an expert witness concerning wastewater disposal and treatment facilities; Donald F. Elias, who was accepted as an expert witness in the areas of air pollution, noise, odor, and resource recovery; Clair Fancy, the Deputy Bureau Chief in the DER Bureau of Air Quality Management, who was accepted as an expert in air pollution control and engineering; and Hamilton Oven, Jr., the Administrator of DER's program for power plant siting, who was accepted as an expert concerning power plant siting and the Department's requirements.

The Department of Community Affairs (DCA), the Department of Environmental Regulation (DER), the Public Service Commission (PSC), and the Southwest Florida Water Management District (SWFWMD) are parties to this proceeding, pursuant to Section 403.508, Florida Statutes. The DER and the DCA participated at the hearing, but did not call any witnesses. The DER's Exhibit 2 was received into evidence.

No individual, group or agency spoke in opposition to the project at the site certification hearing. No public witnesses testified at the hearing. No one asked to intervene as a party to the site certification hearing.

Subsequent to the hearing, Hillsborough County submitted proposed findings of fact and proposed conclusions of law. The other parties did not submit proposed orders. To the extent that Hillsborough County's proposed findings of fact are not included in this Recommended Order, they are rejected as being not supported by competent substantial evidence adduced at the hearing, irrelevant or immaterial to the issues in dispute or as constituting legal conclusions as opposed to factual findings.

The following findings of fact and conclusions of law should be considered in conjunction with the Recommended Order dated November 9, 1984, entered by the undersigned Hearing Officer for the land use portion of this proceeding.

FINDINGS OF FACT

Upon consideration of the oral and documentary evidence presented at the hearing, as well as the parties' prehearing stipulations of fact, the following relevant facts are found:

The Site

1. Hillsborough County desires to construct and operate a resource recovery facility and a wastewater treatment plant on an undeveloped 50 acre parcel of land located in an unincorporated area of Hillsborough County. The site is an open, improved pasture that is currently used for grazing. Nine square miles surrounding the proposed site are zoned for industrial development. The site is bounded by a railroad track, a TECO 230 KV electric transmission line corridor, a pipe fabrication facility, and improved pasture. There are numerous existing industrial facilities in the area near the site.

2. The proposed site is presently owned by Hillsborough County. It is not an environmentally sensitive or pristine area. There are no viable wetlands on the site, and it is not in the 100

year flood plain. No rare, threatened or endangered animal or plant species have been detected on the site. No significant archaeological or historical areas have been found on the site.

Construction Impacts

3. Construction of the proposed resource recovery facility is expected to take about 34 months. The subsurface conditions on site are typical of the area and the site is suitable for the planned construction. Access roads, enclosed refuse unloading areas, boilers, cooling towers, air pollution control equipment, and associated facilities will be built. An advanced secondary sewage treatment plant, with a capacity of 3 million gallons per day, will be built on the site after the appropriate permits are issued in a separate permitting proceeding.

4. Since the site and the surrounding industrial areas have already been disturbed by prior human activities, the construction of the resource recovery facility should not have any adverse impact on the environment or endangered species. There will be some short-term increases in noise and dust during construction, typical of any large construction project. The noise will not adversely affect the industrial neighborhood surrounding the site, and watering is planned for dust depression.

5. Some small increase in storm water run-off is expected as a result of the removal of vegetation in the construction areas. Several stormwater retention basins will be built to collect, detain and filter stormwater run-off during construction. The basins were designed to comply with all of the applicable DER and SWFWMD requirements. The basins will retain and filter the first $\frac{1}{2}$ inch of run-off over a 72-hour period. The basins also will regulate the volume and rate of flow of stormwater leaving the site.

6. Hillsborough County will dewater the area where the refuse bunker will be built. The dewatering activities will not last more than 6 months or adversely affect groundwater conditions. SWFWMD permits are not required for this type of site dewatering. Dewatering the site will not affect wells located off-site, since the maximum draw-down in the water table at the property boundary

would range from 1.5 to 3.5 feet.

7. If necessary, the water collected during the dewatering activities will be filtered through the stormwater basins before it is discharged. The water discharged from the basins will not have any significant impact on the quality or quantity of the water downstream. This discharge will be subject to the conditions of a National Pollutant Discharge Elimination System (NPDES) permit from the United States Environmental Protection Agency.

8. There will be no dredge and fill activity in connection with the proposed project, and no wells will be installed. There will be no construction on state sovereignty lands, and the County will not use or cross the property of any other local, state or federal agency. Hillsborough County will not need any variances to construct or operate the resource recovery facility, and it has certified that the project is consistent with the Florida Coastal Management Program.

9. Hillsborough County will not build any linear facilities or transmission lines in conjunction with this facility. The site is located adjacent to an existing TECO transmission line corridor, and TECO will connect the resource recovery facility to its transmission line network.

Plant Operations

10. When the resource recovery facility is built, enclosed refuse trucks will deliver municipal solid waste to the facility. The trucks will unload the refuse into the sealed refuse bunker inside the resource recovery facility. The refuse will be deposited by crane in a hopper that leads into the furnace. The refuse will be burned in the furnace to produce heat, which will be used to produce steam in the boiler, which will be used to produce electricity in a turbine generator.

Operational Impacts on Water Resources

11. Hillsborough County will not use any surface or groundwaters at the site to operate the resource recovery plant. The resource recovery facility will use treated effluent from a wastewater treatment plant for cooling and process water. Potable water will be obtained from an existing water main, and no water or injection

wells for this project will be required.

12. There will not be any discharge of liquid waste into any surface or ground waters. Liquid wastes (e.g., blow-down) from the resource recovery plant will be used to wet the ash before it is taken to the county landfill for disposal. Excess liquid waste will go to the wastewater treatment plant.

13. There is very little chance of any surface or ground-water pollution occurring at the resource recovery plant because the facility does not have any holding ponds, cooling ponds, coal piles, sludge piles, or other typical sources of water pollution. The refuse, ash and residue will be kept in sealed bunkers inside the fully enclosed resource recovery building.

14. When the resource recovery facility is operating, stormwater run-off at the site will be collected and filtered through stormwater basins. The water discharged from the stormwater basins will not materially affect the quality or quantity of the water downstream.

Air Quality

15. The resource recovery facility is designed to minimize any potential air pollution, and will utilize the best available control technology (BACT). It will not burn hazardous waste or sewage sludge, and will only use municipal solid waste as fuel.

16. Hillsborough County conducted a detailed study of the existing air quality at the site, which included five years of meteorological data. This data was used in a computer model approved by the Environmental Protection Agency to calculate the maximum ground-level pollutant concentrations that might occur as a result of the resource recovery facility. Hillsborough County's computer analysis utilized a very conservative approach which was designed to maximize the potential impacts of the proposed facility.

17. The potential emissions and impact of many pollutants were evaluated. The analyses show that the maximum predicted emissions from the proposed resource recovery facility are far below all of the applicable air quality standards. Other analyses demonstrated

that the emissions from the facility would not adversely affect sensitive receptors, such as the Class I Chassahowitzka National Wilderness Area, or other air quality related values, such as soils, vegetation and visibility.

18. State and federal law require Hillsborough County to utilize the best available control technology. In this case, a high efficiency electrostatic precipitator will be used to control particulate matter and certain metals. The design of the facility and good operating procedures will control the emissions of carbon monoxide and nitrogen oxides. Sulfur dioxide emissions will be limited by burning only municipal solid waste, a low sulfur content fuel.

Benefits of the Resource Recovery Facility

19. Hillsborough County's "waste to energy" facility will dispose of solid waste and produce electricity. Initially, it will dispose of 1200 tons of refuse each day and produce 29 megawatts (MW) of electricity. After it is expanded in the future, the resource recovery plant will dispose of 1600 tons of refuse each day and produce 39 MW of electricity.

20. By producing electricity from solid waste instead of fossil fuel, Hillsborough County will conserve non-renewable resources. Over a 20 year operational period, the energy equivalent of 5.6 million barrels of oil will be recovered, representing a savings of $156 million. When burning 1600 tons of refuse per day, the County will recover the energy equivalent of 150,000 tons of coal each year.

21. Burning the refuse reduces its volume by 90 percent. By reducing the volume of material to be landfilled, the resource recovery facility will eliminate the need for approximately 17.5 million cubic yards of space at landfills.

22. The proposed resource recovery facility will utilize "mass burn" technology, a technology proven to be a reliable form of resource recovery at a great number of facilities located throughout the world. Hillsborough County has conducted several

studies which show that the proposed mass burn resource recovery facility is the most reliable, cost effective method of long-term solid waste disposal for Hillsborough County.

Agency Recommendations

23. Pursuant to Section 403.519, Florida Statutes, the Florida Public Service Commission (PSC) made an affirmative determination that there is a need for the resource recovery facility. Noting that Congress and the Florida Legislature have encouraged such facilities because they constitute alternative sources of power which displace the production of electricity with non-renewable fossil fuels, the PSC found that the proposed resource recovery facility:

> "will increase electrical system reliability and integrity and will maintain the supply of adequate electricity at a reasonable cost while reducing our dependence on fossil fuel."

24. The Florida Department of Commerce reviewed the proposed project and concluded that:

> "In addition to its efficient use of solid waste, this project has the secondary benefit of improving the image of the Tampa Bay Area as a good location for high technology industry. When our Development Representatives are conducting plant site tours in Hillsborough County, this project will be a visible example of an efficient use of resources by local government.
>
> The Hillsborough County Resource Recovery Project is consistent with the goals and programs of the Florida Department of Commerce."

25. The Tampa Bay Regional Planning Council (TBRPC) found that the project is consistent with the TBRPC's adopted growth policy. The proposal also is consistent with the TBRPC policy of encouraging research, development and implementation of resource recovery.

26. The Florida Department of Community Affairs evaluated the proposed project and concluded that it is consistent with the goals, objectives and policies of the State Comprehensive Plan.

27. The Southwest Florida Water Management District determined that the project will comply with all of the applicable SWFWMD requirements, including the requirements for stormwater basins, site dewatering, and the consumptive use of water. Since SWFWMD encourages the reuse of water, SWFWMD also endorsed Hillsborough County's plan

to reuse water at the resource recovery facility.

28. The Department of Natural Resources (DNR) concluded that the project would not affect any state lands. The DNR and the Florida Game and Fresh Water Fish Commission had no comments concerning the project.

29. The Hillsborough County Environmental Protection Commission reviewed the plans for the proposed project and raised several potential issues. Those issues were considered by the Department of Environmental Regulation and addressed in the proposed conditions of site certification.

30. The Department of Environmental Regulation coordinated the agency review process for this facility. Based on its independent evaluation and the reports submitted to it by the various agencies that reviewed the proposed project, the DER concluded that Hillsborough County has given reasonable assurances that the resource recovery project will comply with all of the applicable environmental rules and regulations. For this reason, DER recommended in its report, and stipulated prior to the site certification hearing, that the project should be approved, subject to the conditions of site certification that are attached to this Recommended Order. DER also stipulated that the project is consistent with the Florida Resource Recovery and Management Act, Chapter 403, Part IV, Florida Statutes (1983).

31. Notice of the site certification hearing was published in the Tampa Tribune on October 6, 1984. Notice was also published in the Florida Administrative Weekly on October 5, 1984, in Volume 10, Number 40. A news release was given to the Florida Information Bureau in Tallahassee on October 8, 1984.

CONCLUSIONS OF LAW

Adequate and sufficient notice of the site certification hearing has been given to all parties and to the general public. Sections 403.501 through 403.517, Florida Statutes, known as the "Florida Electrical Power Plant Siting Act," governs this proceeding. In a statement of legislative intent, Section 403.502 provides:

> "It is the policy of this state that, while recognizing the pressing need for increased power generation facilities, the state shall ensure through available and reasonable methods that the location and operation of electrical power plants will produce minimal adverse effect on human health, the environment, the ecology of the land and its wildlife, and the ecology of state waters and their aquatic life. It is the intent to seek courses of action that will fully balance the increasing demands for electrical power plant location and operation with the broad interests of the public."

When performing this balancing test, recognition is to be given to the need for abundant, low cost electrical energy; assurances that the operational safeguards of the facility are technically sufficient to protect the citizens of Florida; and a reasonable balance between the need for the facility and the environmental impacts resulting from the construction and operation of the facility. Section 403.502, Florida Statutes.

In this proceeding, the applicant has demonstrated by competent, substantial evidence that its proposed resource recovery facility will provide abundant, low cost electrical energy and, at the same time, reduce the cost of solid waste management. The construction and operational safeguards have also been demonstrated to be technically sufficient for the welfare and protection of the citizens of Florida. The construction and operation of the facility, if performed in accordance with the terms of the application and the proposed conditions of certification, will not adversely affect the quality or quantity of surface water or ground water at or near the site, or otherwise contribute to a violation of water quality standards. Likewise, if the facility is built and constructed in accordance with the application and in compliance with the conditions of site certification, it will meet all state and federal ambient air quality standards. Hillsborough County has stipulated that it accepts and can and will comply with the proposed conditions of site certification. Thus, the balance between the need for the facility and the environmental impact from construction and operation of the facility has been achieved.

All of the reports, studies and comments required by Section

403.507, Florida Statutes, have been completed and presented to the Department of Environmental Regulation. All such reports and comments, including those from local and regional agencies, were favorable to the certification of the proposed resource recovery plant. The proposed project has been demonstrated to be in compliance with all applicable environmental rules and regulations and with other state laws. The Department of Environmental Regulation has recommended certification of the facility at its ultimate capacity of 39 MW, subject to the conditions of certification attached to this Recommended Order. In summary, it is concluded that the construction and operation of the resource recovery facility at the proposed site will comply with all applicable statutes, rules, regulations and criteria of the State of Florida and, therefore, is entitled to certification, with conditions, pursuant to Chapter 403, Florida Statutes.

RECOMMENDATION

Based upon the entire record in this proceeding and the findings of fact and conclusions of law contained in this Recommended Order, it is

RECOMMENDED that Hillsborough County be granted certification by the Governor and Cabinet, sitting as the Siting Board, for the location, construction and operation of the proposed resource recovery facility at its ultimate site capacity of 39 megawatts, subject to the conditions of site certification attached to this Recommended Order as Appendix "A".

Respectfully submitted and entered this 28th day of November, 1984, in Tallahassee, Florida.

Diane D. Tremor

DIANE D. TREMOR, Hearing Officer
Division of Administrative Hearings
The Oakland Building
2009 Apalachee Parkway
Tallahassee, Florida 32301
(904) 488-9675

Filed with the Clerk of the Division of Administrative Hearings this 28th day of November, 1984.

Copies furnished:

See attached page

Case No. 84-2789

Honorable Bob Graham
Governor
State of Florida
The Capitol
Tallahassee, Fl. 32301

Honorable Jim Smith
Attorney General
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Appendix 3
Final Draft Materials Separation Plan for Hillsborough County, Florida

Hearing Transcripts

HILLSBOROUGH COUNTY
FLORIDA

SOLID WASTE MANAGEMENT DEPARTMENT

PUBLIC MEETING

DATE: Monday, October 3, 2005

TIME: 7:00 p.m. - 7:08 p.m.

PLACE: Resource Recovery Facility
350 Faulkenburg Road
Tampa, Florida 33619

REPORTED BY: MS. CATHY J. JOHNSON MESSINA
NOTARY PUBLIC, RPR

APPEARANCES

NAME	AFFILIATION	PHONE NUMBER
THOMAS SMITH	Hillsborough County Solid Waste	813-276-2909
DANNIE BENNETT	Hillsborough County Solid Waste	813-992-1221
JOSEPH TRESHLER	Covanta Energy	727-856-2917
DAN STROBRIDGE	Camp, Dresser & McKee	813-281-2900
JASON GORRIE	Camp, Dresser & McKee	813-281-2900
GLENN HOAG	Covanta Hillsborough	813-684-5688
DAVID DEE, ESQ.	Landers & Parsons, P.A.	850-681-0311

(WHEREUPON, the following Public Meeting was held at 7:05 p.m.:)

MR. SMITH: My name is Thomas Smith. I'm with the Hillsborough County Solid Waste Management Department.

I'd like to officially open this public meeting to receive public comment on the Preliminary Draft Materials Separation Plan for Hillsborough County.

The plan was prepared in compliance with the requirement set forth in 40 CFR 60.57b. This is done and is part of the expansion of the Hillsborough County energy facility.

Do we have any documents that we want to enter into the record at this point?

MR. DEE: Yes. My name is David Dee. I'm an attorney with the law firm of Landers and Parsons in Tallahassee. I'm assisting the County with the efforts to obtain the environmental permits for the expansion of the facility.

For the record, I'd like to introduce the notice that was published in the Tampa Tribune on Monday, August 29th, 2005, announcing this meeting and identifying the agenda and the issues that were to be discussed tonight in compliance with the requirements of Federal law.

I'd also like to introduce as Exhibit Number 2 a copy of the Preliminary Draft Materials Separation Plan that's

been prepared for Hillsborough County. This is the plan that is the subject of tonight's meeting.

At this time, it would be appropriate to have the other people here in attendance identify themselves and identify their affiliation or their business organization.

MR. TRESHLER: Joseph Treshler, Covanta Energy.

MR. DEE: And Covanta is the operator of this facility, right?

MR. TRESHLER: We're the operator of the facility.

MR. HOAG: Glenn Hoag, Facility Manager, Covanta Hillsborough.

MR. GORRIE: Jason Gorrie, Camp, Dresser & McKee. We're the independent engineer for Hillsborough County Solid Waste.

MR. STROBRIDGE: I'm Dan Strobridge also with CDM.

MR. DEE: These gentlemen were brought to the hearing tonight so that they could receive comments about the plan, describe the plan to the public and respond to questions from the public.

At this time, however, there are no members of the public here to provide us with comments.

The opportunity for submitting written comments will continue until October 5th. And unless there are any other issues that need to be addressed, I would recommend that we adjourn the hearing at this time.

MR. SMITH: Second the motion.

MR. DEE: The meeting is adjourned.

(WHEREUPON, the Public Meeting adjourned at 7:08 p.m.)

STATE OF FLORIDA)

COUNTY OF HILLSBOROUGH)

I, CATHY J. JOHNSON MESSINA, Registered Merit Reporter and Notary Public in and for the State of Florida at large, hereby certify that the Public Hearing was recorded in Stenotypy by me and that the foregoing pages constitute a true and correct transcription of my recordings thereof.

I FURTHER CERTIFY that I am neither an attorney nor of counsel for the parties to this cause nor a relative or employee of any attorney or party connected with this litigation and that I have no interest in the outcome of this action.

WITNESS my hand and seal this 4th day of October, 2005, at Tampa, Hillsborough County, Florida.

Cathy J. Johnson Messina

Court Reporter
My Commission Expires:

TRANSCRIPT ORDERED: 10-03-05

CATHY J. JOHNSON MESSINA
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NOTICE OF PUBLIC MEETING CONCERNING HILLSBOROUGH COUNTY'S PRELIMINARY DRAFT MATERIALS SEPARATION PLAN FOR THE EXPANSION OF THE HILLSBOROUGH COUNTY RESOURCE RECOVERY FACILITY

The Board of County Commissioners and the Solid Waste Management Department of Hillsborough County, Florida, hereby give notice that a public meeting will be held at 7:00 p.m. on October 3, 2005, to present and review Hillsborough County's Preliminary Draft Materials Separation Plan (Plan). This Plan is being prepared in accordance with the requirements in 40 Code of Federal Regulations, section 60.57b, as part of the County's efforts to obtain the environmental permits and approvals for the expansion of the Hillsborough County Resource Recovery Facility. Hillsborough County will accept written and oral comments about the Plan during the public meeting, which will be held at the Hillsborough County Resource Recovery Facility, located at 350 N. Falkenburg Road, Tampa, Florida. County staff will be at the meeting to discuss the details and answer any questions residents may have. All meeting facilities are ADA compliant. Please contact the Solid Waste Management Department at (813) 276-2938, with 48-hour notice, if any additional ADA accommodations are needed.

Agenda for the Public Meeting

A. Introduction
B. The proposed expansion of Hillsborough County's Resource Recovery Facility
C. The size of the area served by Hillsborough County's Resource Recovery Facility
D. The amount of solid waste generated in Hillsborough County's service area
E. The types and estimated amounts of materials proposed for separation
F. The methods proposed for materials separation
G. The amount of residual waste for disposal
H. Alternate disposal methods for handling the residual waste
I. Public questions and comments.

In addition to submitting comments at the public meeting, the public may submit written comments about the Plan to the Solid Waste Management Department of Hillsborough County at Post Office Box 1110, Tampa, Florida 33601. Comments will be accepted from the date of this notice until October 5, 2005.

The Preliminary Draft Materials Separation Plan is available for inspection at the following locations:

Hillsborough County Solid Waste Management Department 601 E. Kennedy Blvd., 24th Floor Tampa, Florida 33602
Monday-Friday: 8:00 AM to 5:00 PM

Brandon Regional Library 619 Vonderburg Drive Brandon, Florida 33511
Monday-Thursday 9:00 AM to 9:00 PM
Friday 9:00 AM to 6:00 PM
Sunday 9:00 AM to 5:00 PM
Sunday 12:30 PM to 5:00 PM

John F. Germany Public Library
900 North Ashley Drive
Tampa, Florida 33602
Monday-Thursday 9:00 AM to 9:00 PM
Friday 9:00 AM to 6:00 PM
Saturday 9:00 AM to 5:00 PM
Sunday 10:00 AM to 6:00 PM

West Gate Regional Library
7606 Paula Drive
Tampa, Florida 33615
Monday-Thursday
9:00 AM to 9:00 PM
Friday 9:00 AM to 6:00 PM
Saturday 9:00 AM to 5:00 PM
Sunday 12:30 PM to 5:00 PM

If the County receives timely comments about the Plan, the County will prepare responses to those comments. The County also will prepare a Final Draft Materials Separation Plan. The County's responses to public comments, and the County's Final Draft Materials Separation Plan, will be available for inspection at the same locations that are listed above for the inspection of the Preliminary Draft Materials Separation Plan.

ANY PERSON WHO MIGHT WISH TO APPEAL ANY DECISION MADE BY THE HILLSBOROUGH COUNTY BOARD OF COUNTY COMMISSIONERS REGARDING ANY MATTER CONSIDERED AT THE FORTHCOMING PUBLIC HEARING OR MEETING IS HEREBY ADVISED THAT THEY WILL NEED A RECORD OF THE PROCEEDINGS, AND FOR SUCH PURPOSE THEY MAY NEED TO ENSURE THAT A VERBATIM RECORD OF THE PROCEEDINGS IS MADE WHICH WILL INCLUDE THE TESTIMONY AND EVIDENCE UPON WHICH SUCH APPEAL IS TO BE BASED.

1413 8/29/05

Public Notice

The Joint Commission on Accreditation of Healthcare Organizations will conduct an accreditation survey of HealthCare Connection of Tampa, Inc. on September 27 through 29, 2005.

The purpose of the survey will be to evaluate the organization's compliance with nationally established Joint Commission standards. The survey results will be used to determine whether, and the conditions under which, accreditation should be awarded the organization.

Joint Commission standards deal with organizational quality and safety-of-care issues, and the safety of the environment in which care, treatment, and services are provided. Anyone believing that he or she has pertinent and valid information about such matters may request a public information review with the Joint Commission's field representatives at the time of the survey. Information presented at the interview will be carefully evaluated for relevance to the accreditation process. Requests for a public information interview must be made in writing and should be sent to the Joint Commission no later than five working days before the survey begins. The request must also indicate the nature of the information to be provided at the interview. Such requests should be addressed to

**Division of Accreditation Operations
Office of Quality Monitoring
Joint Commission on Accreditation of Healthcare Organizations
One Renaissance Boulevard
Oakbrook Terrace, IL 60181**

Or

Faxed to 630/792-5636

Or

E-mailed to complaint@jcaho.org

The Joint Commission's Office of Quality Monitoring will acknowledge in writing or by telephone requests received 10 days before the survey begins. An Account Representative will contact the individual requesting the public information interview prior to the survey, indicating the location, date, and time of the interview, and the name of the surveyor who will conduct the interview.

This notice is posted in accordance with the Joint Commission's requirements and may not be removed before the survey is complete.

Date Posted: August 29, 2005

1414 9/29/05

HILLSBOROUGH COUNTY AVIATION AUTHORITY INVITATION TO BID

Sealed bids will be received by the Hillsborough County Aviation Authority for:

FEDERAL APD MODEL G-90 CD SERIES PARKING *BARRIER GATES* BID NO. 05-08-RF-B

Bids will be received for the Aviation Authority by the Purchasing Manager, Hillsborough County Aviation Authority, Tampa International Airport, P.O. Box 22287, Tampa, Florida 33622-2287 until 2:00 PM, Tuesday, September 6, 2005 at which time bids will be opened publicly and read aloud. All bid envelopes should be marked:

FEDERAL APD MODEL G-90 CD SERIES PARKING BARRIER GATES BID NO. 05-08-RF-B

Detailed specifications for these items are available upon request from the Purchasing Department, 870-8700, ext. 8554 or Tampa International Airport- Website: www.tampaairport.com.

The Hillsborough County Aviation Authority reserves the right to waive any informalities in or to reject any and all bids or avoid or refrain from awarding a contract for the work.

By: s/s Louis E. Miller
Louis E. Miller, Executive Director

1349 8/22,29/05

NOTICE OF INTENT TO SOLE SOURCE
FILE NUMBER:
P-0370-05(BM)
PURCHASE OF COMPLETE RADIO FREQUENCY IDENTIFICATION SYSTEMS FOR THE LIBRARY SERVICES DEPARTMENT.

Hillsborough County intends to recommend the award of a sole source purchase agreement for the purchase of Radio Frequency Identification Systems for Library Services Department.

Contractors who believe they can meet or exceed the above stated requirement must provide convincing technical data sufficient to support their position. The Hillsborough County Purchasing Department must receive replies to this notice not later than close of business on 09/06/2005. After this date, an award will be made. Responses to this notice will be used to determine whether bona fide competition exists.

Send written responses to the Hillsborough County Purchasing Department, 601 E. Kennedy Blvd., County Center, 18th Floor, Tampa, Florida, 33601. Attention: Belinda McKnight, or FAX to (813) 272-6290. For further information call (813) 301-7066.

1411 8/29/05

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Legals

HILLSBOROUGH COUNTY AVIATION AUTHORITY

REQUEST FOR PROPOSALS

ORACLE SOFTWARE CONSULTANT SERVICES

The Authority is seeking qualified firms or individuals desiring to be considered for this project. The RFP documents will be available on the Authority's website August 22, 2005, at www.tampaairport.com: Airport Business, RFP/RFQ. For questions regarding the RFP contact Connie Mundzak at 813-801-6040.

HILLSBOROUGH COUNTY AVIATION AUTHORITY

By: /s/ Louis E. Miller
Louis E. Miller, Executive Director

1350 8/22,29/05

Hillsborough County Board of County Commissioners Notice of Intent to *Designate Positions for* Inclusion in the Senior Management Service Class of the State of Florida Retirement System

In accordance with Florida Statute, Chapter 121.055 (2004), the Hillsborough County Board of County Commissioners gives Notice of Intent to designate the following positions for inclusion in the Senior Management Service Class of the State of Florida Retirement System: Managing Attorney (4 positions); *Chief Administrative* Manager/Legal Office Administrator (1 position).

1352 8/22,29/05

Practice Moving - The Physician practice of Martin Solorzano, MD, and Gerardo Dieguez, MD, located at 917 West Linebaugh Avenue in Tampa, will be moving to 3954 Premier North Drive in Tampa effective September 19, 2005. The new phone number will be (813) 969-4440.

1260 08/22, 29, 9/05, 9/12
08/24, 31, 9/07, 9/14

1-49 Announcements

1 Lost

American Bulldog red brindle, red eyes, 50 lbs old, female, 2 years old. Last seen in Arbor Oaks Aug. 21. Reward. 813-727-5847, 267-1982.

CAMERA Zephyrhills Pk Sun. Aug 21, EZ Shot Kodak. 813-685-7480 813-621-6200x5

Cat, male, declawed, gray & beige tiger stripes, approx. 4 yrs old. Seminole Heights, lost 7/16. 813-494-4025.

Chihuahua, disappeared June 3rd, small cream & white male, could be anywhere. REWARD. 813-633-3407, 863-712-8814.

Chinese Pug Male
Fawn. Wearing a collar. Reward. Riverview area. 813-672-9297

DOG: Border Collie, male, at Oakfield & Lakewood, Brandon. Brown/white. Answers to "Brutus". 813-685-1064

DOG-F German Shep, answers to "Seeka", floppy ears, skinny, poodle shaved tail, MacDill & Grace St. 813-966-9593

DOG-Lost female American Bulldog, white with brown spots, off of 38th Ave. N., in St. Petersburg 727-433-0524

DOG Lost in Zip Code 33604, Blood Hound, 4 month old Female, Black and Tan, Reward! 813-933-9469

DOG lost small brown male Papillion, Riverview area 813-741-1306

Dog, old Chihuahua-Pom mix, blonde female, last seen Bloomingdale E on Nature's Way. Please call anytime 662-0131

DOG-YORKIE lost in West Tampa (Abdella between Lincoln & Himes). Male, not neutered, black and gold. PLEASE return dog to an elderly lady who is very sad. Reward! 813-877-3344

CLASSIFIED IS CONVENIENT

1 Lost

DOGS, 2 Black Lab mixed males, 1 solid blk Med Build, 1 Sm Blk w/wht, Brandon Area 8/14. 813-654-2658

PARROT African Grey - South Tampa area near MacDill air force base. Grey with red tail. Call 813-839-2126

PASSPORT - SAUDI REWARD!
CALL 813-695-5710

PIT BULL-Lost 08/20. Female, grey/blue with white paws & chest, ears cropped, 45lbs, 1½yrs old. Lost near county line Rd./Dranefield area. Big $$$ reward! No questions asked! Please, please, please call 813-967-7079 or 813-967-4355

YELLOW LAB MIX Forest Oaks area, Spring Hill. F/13 Last seen 8/23/05. Call (352) 688-9045

YORKIE NEAR Waters and Twin Lakes in Lago Vista (813) 546-3683

2 Found

BIKE, chrome, found Tues eves Hillsb. & Memorial Call to ID 813-882-4494

CATS (2) Orange. Gray. Found 8/21 & Woods at Riverridge. 727 847-6770

DOG- Bassett Hound, male, 8/25, Zephyrhills. 813-779-9407

DOG Black neut. male, white paws, muzzle & eyebrows. 352-686-5438

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DOG, brown male, very small. Near W. Waters Ave. 813-884-0858

DOG, Fawn Pit Bull Female, Morgan Woods Elem. 8/26 813-494-4885

DOG, MALE, 8/23, RIDGE MANOR AREA, CALL ☎ 352-583-4666

DOG, Male, Terrier mix, blonde, The Eagles, Sat. 727-430-0697

Dog Red nosed pitbull, recently had puppies, [illegible] collar [illegible] 813-920-2[illegible]

DOG- Small dog in Carrollwood. Sat. 8/20. 968-4001 to identify

DOG-small in [illegible] Heights [illegible]

[illegible] Terrier Mix, m. found 6605 Waters/Armenia area. 813 888-6564

DOG, white, found, Hunter's Ridge on Little Rd. 727-869-4754

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DOG-Yellow Lab, F, area of ElPrado Blvd., Tampa. 813-805-2078, 340-9653

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MALE YORKIE Mix near 30th & Busch (813) 546-3683

RING 1 small ladies ring, at Bruce B. Downs Target. 813-991-5778

TERRIER-Male found Boyette & Rhoding area, Riverview. 813-651-3978

Yorkshire Terrier, female, found near Ola/Fletcher 8/19/05. 813-962-0827

5 Personals

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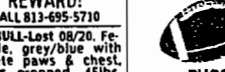

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(2) 30-yd line, Sect. 334 Row J, face value. 813-613-6739

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BUCS TICKETS-Club seats, section 239, row DD, seats 1 through 4, whole season, face value, $[illegible] 813-839-[illegible]

BUCS Season Tickets (2) East Club [illegible] sect. 217, row [illegible] + pkg pass, 8 games @ 25% discount. 888-605-0884

BUCS SEASON TICKETS Lower & Upper level [illegible] 813-[illegible]

BUCS [illegible] SEASON Section [illegible] Row F, 1 parking passes free less face value 813-832-3646

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BUCS SEASON SEATS 10 together, lower level, sec 125, best offer + 2 club seats, sec 207, best offer, 727-726-8047

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(4) BUCS TIX, Club 35 yrd line, sect 234, row B, seats 11-14, + lot 4 pkg pass incl. Call 727-698-7259 anytime

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tablished, non-franchised businesses such as convenience stores, gas stations, restaurants, etc. See class #51 Business Opportunities for network marketing, multi level marketing and distributorship type opportunities or class #52 Franchises.

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51 Business Opps

NOTICE: This classification is intended for network marketing, multi level marketing and distributorship type opportunities. See class #50 Businesses For Sale - established, non-franchised business opportunities and franchises. Business opportunities in the state of Florida, you should know about Chapter 559, Part VIII, Florida Statutes, the Sale of Business Opportunities Act. Florida law requires certain sellers of business opportunities to provide a prospective purchaser with a disclosure document including a copy of the purchase contract, with the Department of Agriculture and Consumer Services before soliciting in Florida. In part the law applies to business opportunities with a purchase price in excess of $500. For info on a seller of a business opportunity or to file a complaint, please contact the Department of Agriculture and Consumer Services at 1-800-HELP FLA (800-435-7352) in Florida or 904-488-2221.

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BP Gas/Store w/ Land $864K. Gas Stations USA. 1-800-933-0673

LIQUOR LICENSE Hillsborough Co. $65K firm. Call 813-963-2719

Monday 12 noon

CDM

Hillsborough County, Florida

Final Draft Materials Separation Plan for Hillsborough County, Florida

October 2005

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Section 1
Introduction

1.1 Purpose

This document is the final draft Materials Separation Plan for Hillsborough County (County). The County has prepared this document because the County plans to expand the combustion capacity of its solid waste resource recovery facility (SWRRF or Facility). This final draft Materials Separation Plan has been prepared in compliance with the requirements set forth in 40 CFR 60.57b.

1.2 Background and Overview

In 1984, Hillsborough County (County) was authorized to construct and operate its Facility pursuant to the Florida Electrical Power Plant Siting Act and other applicable laws. The Facility commenced commercial operations in 1987.

The Facility burns approximately 1,200 tons of municipal solid waste (MSW) each day. The heat from the combustion process is used to generate steam, which is used to generate approximately 29 megawatts (MW) of electricity. Since the Facility generates electricity by using MSW as fuel, instead of oil, the Facility reduces the need to use oil for the production of electricity. In this fashion, the Facility displaces the use of approximately 1,200 barrels of oil/day[1].

The County also operates a comprehensive recycling program, which meets the State of Florida's 30% recycling goal. The County's recycling program reduces the amount of material that must be processed at the Facility; however, there is no cost-effective method to recycle all of the MSW that is generated in the County. The County uses the Facility to recover energy, and reduce the volume of MSW that is not recycled.

The County currently generates more MSW than the Facility can process. Moreover, the amount of MSW generated in the County is increasing as a result of population growth. Given the ever-increasing quantities of MSW, the County proposes to expand the processing capacity of its Facility, rather than increase the amount of MSW sent to its landfill for disposal.

In 1999, the County developed a comprehensive plan for the unincorporated portions of the County. This plan includes a master plan for handling solid waste. The solid waste master plan describes the existing systems and the projected needs for solid waste management in Hillsborough County. The solid waste master plan is based on the following goals:

- To provide an environmentally sound and efficient solid waste management system; and

[1] Themelis, Nickolas J., Millrath, Karsten, "The Case for WTE as a Renewable Source of Energy," 12th North American Waste to Energy Conference (NAWTEC12).

- To handle all hazardous waste in a manner that minimizes risk to the citizens and the environment.

The master plan identifies specific objectives that shall be met to accomplish the County's goals. In summary, the major objectives are:

- Strict adherence to all federal and state regulations, including, but not limited to, the regulations concerning the protection of air quality, groundwater and surface water quality, and the management of hazardous waste;
- Continue the County's recycling program and strive to meet or exceed the State of Florida's recycling goal of 30 percent; and
- Maintain comprehensive hazardous waste management and emergency response programs.

The County continues to accomplish its solid waste goals and objectives with an integrated solid waste management system (System). The System has three major components:

- A Recycling Program, which reduces the amount of material that must be taken to the County's Facility or landfill for disposal;
- A Resource Recovery Facility, which reduces the volume of material that must be taken to the County's landfill; and
- A Landfill, which is used for the disposal of ash from the Facility and the disposal of materials that cannot be recycled or processed at the Facility.

The County's solid waste master plan also requires that the System must be financially and environmentally responsible.

Section 2 of this document describes the County's solid waste management system in more detail. Section 3 describes the components of the County's materials separation plan (Plan) and the anticipated additions to the Plan. Section 4 describes alternative disposal options.

Section 2
Solid Waste Management System

2.1 Service Area

Hillsborough County has provided residential and commercial solid waste collection and disposal services since 1955. The County provides solid waste collection service twice each week to all of the unincorporated residential areas in the County. Garbage collection is mandatory. The County's three franchise haulers provide the County's collection service to the County's residents. Businesses also must use one of the County's three franchise haulers for their collection needs. The County's service area also includes all of the areas that were annexed into the cities of Tampa and Temple Terrace after June 1983. **Figure 2-1** shows the general location of Hillsborough County. **Figure 2-2** shows the County and the city limits of the Cities of Tampa, Plant City and Temple Terrace.

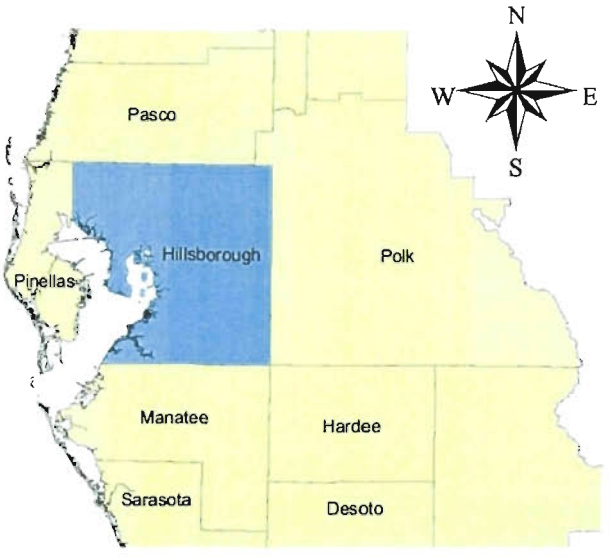


Figure 2-1
Hillsborough County and Neighboring Counties

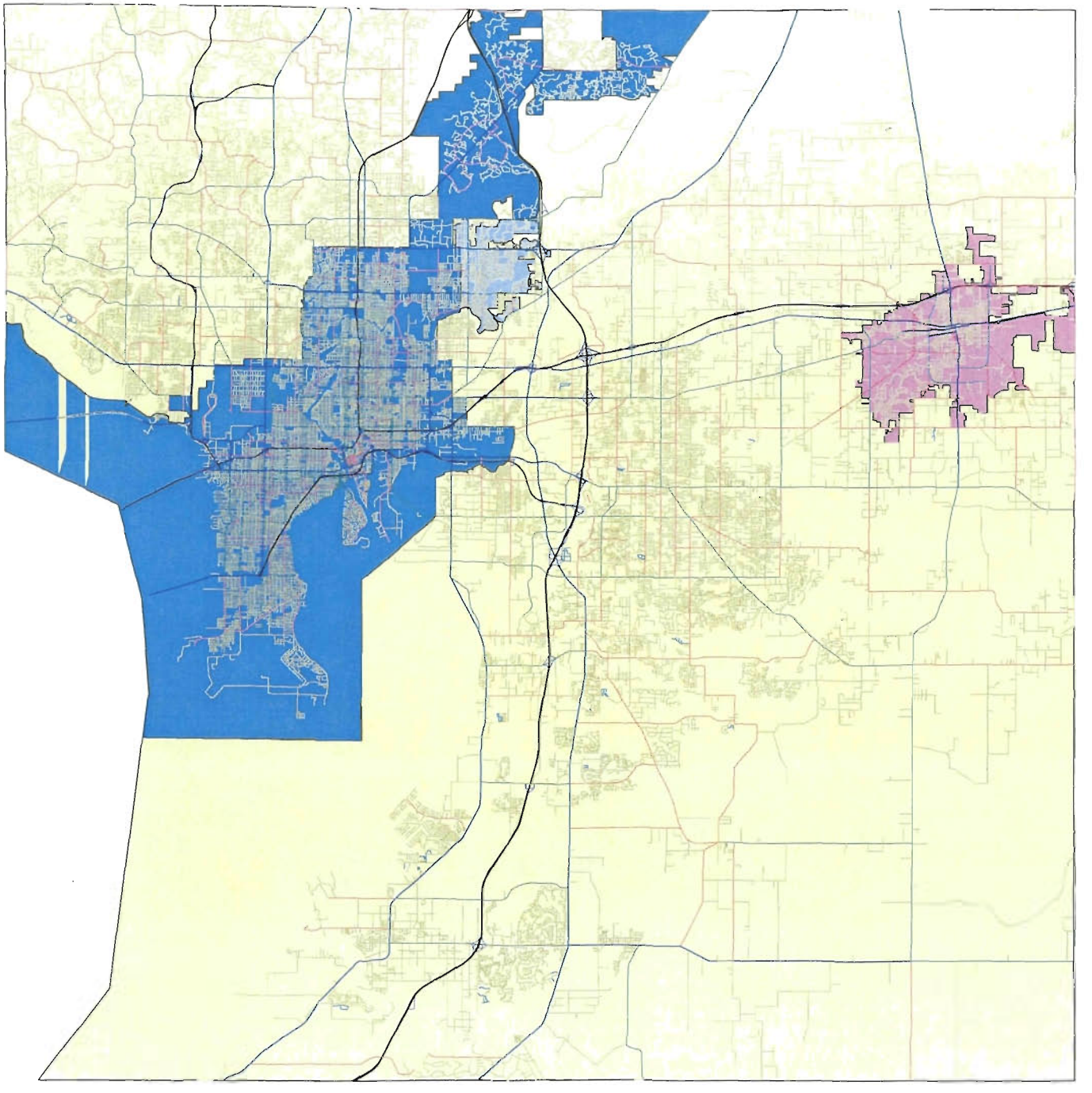
2.2 Facilities and Components

The County operates an integrated solid waste management system. The System includes the following:

- Southeast County Landfill, Tire Processing and Leachate Treatment Facility – This facility contains a Class I landfill and encompasses 175 acres. Ash from the Resource Recovery Facility, non-processible waste, and bypass waste are disposed in the landfill. The landfill also accepts solid waste from the Cities of Temple Terrance and Plant City, as well as ash and MSW from the City of Tampa.

- Hillsborough County Resource Recovery Facility – The Facility processes approximately 1,200 tons of MSW daily. The Facility is composed of three combustion units, and each unit has the capacity to process approximately 400 tons of MSW each day. The combustion units generate enough steam to produce approximately 29 MW of electricity in a steam turbine generator.

- Northwest Transfer Station, Community Collection Center and Yard Waste Processing Facility – This transfer station has the capacity to handle approximately 600 tons of MSW per day. MSW delivered to the transfer station is taken to the



Hillsborough County
City of Tampa
City of Plant City
Temple Terrace

N

CDM

Figure 2-2
County Unincorporated Areas

Resource Recovery Facility for processing. The transfer station also has collection bins for scrap metal, tires, motor oil, lead-acid batteries, and other recyclables.

- Hillsborough County Yard and Wood Waste Processing Facility – This 16-acre site produces wood chips, fuel, mulch, and compost from yard waste and wood waste. This site is permitted as a composting facility by the FDEP. It is adjacent to the Hillsborough County Resource Recovery Facility. The County also collects yard and wood waste at the South County and Northwest County Transfer Stations.

- Hillsborough Heights Community Collection Center – This is a community collection center where residents can drop-off MSW, scrap metal, tires, lead-acid batteries and recyclables.

- Alderman Ford Community Collection Center – This is a community collection center, which accepts MSW from County residents, as well as scrap metal, tires, lead-acid batteries and recyclables.

- Wimauma Community Collection Center - This community collection center also accepts MSW from County residents, as well as scrap metal, tires, lead-acid batteries and recyclables. One Saturday each month, this facility collects household hazardous waste, including cleaners, paint, pool chemicals, lawn and garden chemicals, and similar materials.

- Sheldon Road Household Chemical Collection Center – Household hazardous wastes are collected at this facility once per month. The facility collects cleaners, paint, pool chemicals, lawn and garden chemicals, and other similar household hazardous wastes.

- South County Transfer Station, Community Collection Center and Yard Waste Processing Facility – This facility collects MSW from commercial haulers, as well as yard waste and recyclables from County residents.

- Waste Tire Processing Facility – This facility receives waste tires from licensed waste tire haulers and the County's transfer stations. Tires are shredded into 2-inch chips for use as cover at the County's landfill.

2.3 Solid Waste Agreements

To provide economical, efficient, and environmentally responsible solid waste service, the County has entered into agreements with multiple organizations. These agreements include:

- Facility operating agreement – The County has entered into a 20-year agreement for the operation of the County's Resource Recovery Facility. This contract has been extended through 2027 subject to certain conditions. Under this contract, the

Facility currently is operated by Covanta (formerly Ogden Martin Systems of Hillsborough, Inc.).

- Electrical power purchase agreement – Power generated at the Facility is sold to Tampa Electric Company (TECO) pursuant to this agreement.

- Franchise hauler agreements – Franchised haulers collect MSW at the residential curbside twice each week pursuant to these franchise agreements. The haulers collect recyclable materials and yard waste once per week. The County currently holds agreements with three waste haulers: East Bay Sanitation, Kimmins Recycling and Waste Management of Tampa.

2.4 Waste Quantities and Projections

2.4.1 Population Projections

Hillsborough County is experiencing rapid growth, as is the majority of the State of Florida. **Figure 2-3** shows historical population estimates and population projections for Hillsborough County. Historical population estimates are taken from the data collected by the United States Bureau of Census. Future population estimates were obtained from the Bureau of Economic and Business Development Research (BEBR) at the University of Florida.

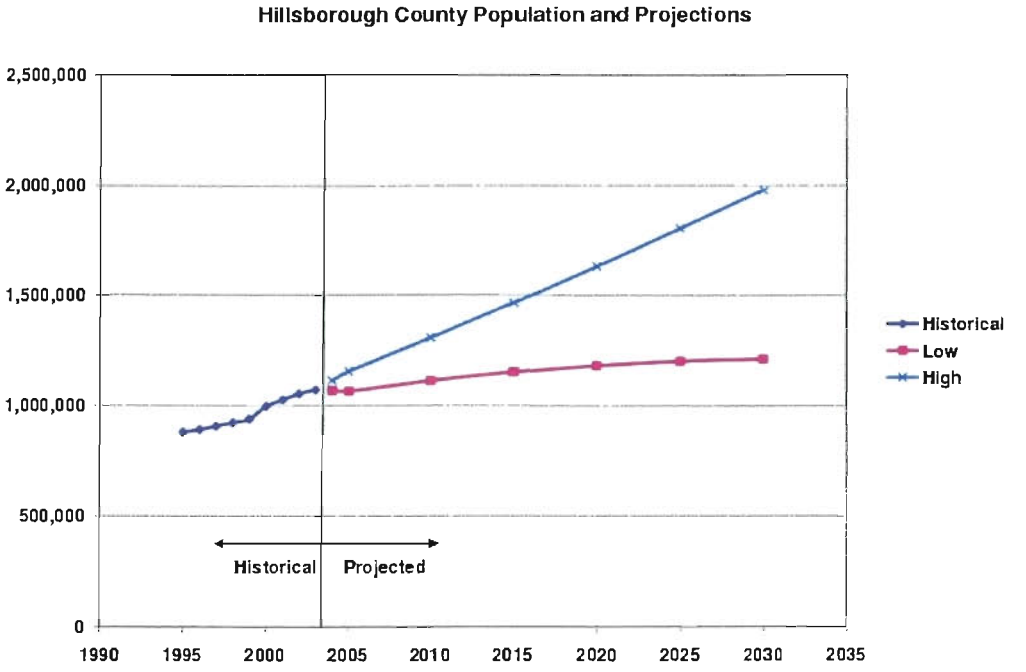


Figure 2-3
Hillsborough County Population Projections

2.4.2 Municipal Solid Waste

The County receives municipal solid waste at its transfer stations, resource recovery facility, and landfill. **Figure 2-4** shows historical tonnages and future projections. The projections in **Figure 2-3** assume that MSW production will increase at the same rate as the County's population[1]. These projections include the MSW generated in the entire county, including the Cities of Tampa, Temple Terrace, and Plant City. The County operates all of the solid waste processing facilities within the incorporated and unincorporated areas of Hillsborough County, except for those facilities operated by the City of Tampa, such as the McKay Bay Waste-to-Energy facility.

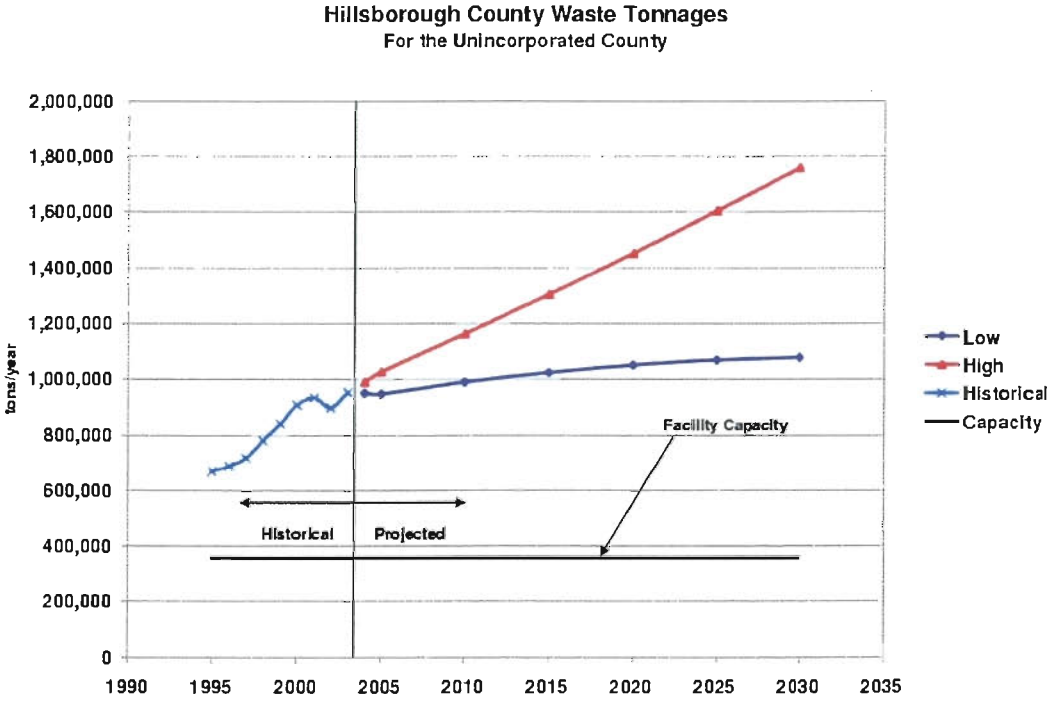


Figure 2-4
Hillsborough County Projected Solid Waste Tonnages

The Resource Recovery Facility processes approximately 360,000 tons of MSW each year. The unincorporated portion of the County generates approximately 1,000,000 tons of MSW each year. Currently, the amount of MSW generated in the County exceeds the Facility's capacity. Waste generation is expected to increase within the "high" and "low" projections as shown in **Figure 2-4**.

2.4.3 Recycling

Hillsborough County intends to continue meeting or exceeding the State of Florida's recycling goal of 30 percent. **Figure 2-5** shows historical recycled materials for the

[1] The observed "spike" in delivered tonnages in the late 1990's is the result of a change in solid waste accounting practices as relates to yard waste, which is not processed at the resource recovery facility.

unincorporated sections of the County. This shows that the County has consistently recycled 30 percent of its generated MSW.

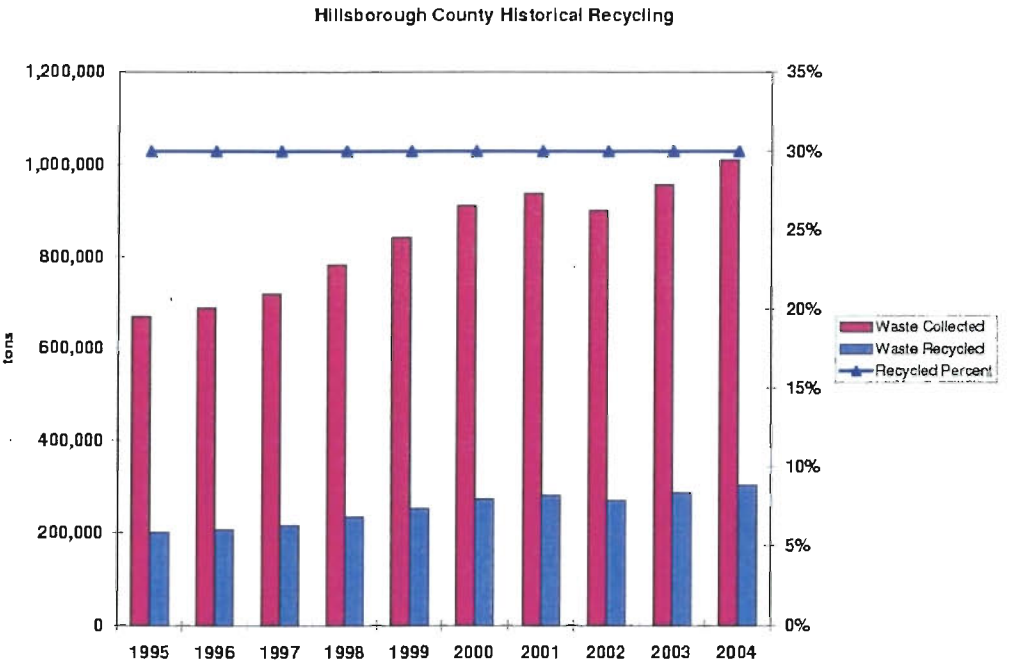


Figure 2-5
Hillsborough County Historical Recycling

As discussed above in Section 1, the amount of solid waste remaining after recycling and source reduction exceeds the current capacity of the Resource Recovery Facility. This excess tonnage is diverted to the County's Southeast Landfill for disposal.

Section 3
Materials Separation Plan

3.1 Objectives

Hillsborough County intends to meet or exceed the 30 percent recycling goal set by the State of Florida. The County has been successful in achieving this goal each year since the late 1990's. Recycling is a crucial component of the County's integrated waste management system. This section provides a summary of the County's recycling program, including improvements the County is planning to make to enhance its program.

3.2 Materials Separation Strategy

The County is committed to increasing waste recycling and waste reduction activities in the County. Part of the County's strategy involves providing public education and increasing public awareness of the County's recycling programs.

As indicated above, the County already has facilities to recycle the following materials:

- Yard Waste;
- White Goods;
- Waste Tires;
- Household Hazardous Waste;
- Electronic Waste;
- Ferrous Metals;
- Recyclable Materials from Commercial Property;
- Recyclable Materials from Residential Property;
- Recyclable Materials from County Offices.

The County's plan for recycling each of these materials is discussed in more detail below.

3.3 Materials Separation Program

The County achieves a considerable portion of its materials diversion and recycling success by providing for the collection of certain recyclable materials that have been separated by the resident or business. The County mandates the separation of yard waste from MSW. Franchise haulers collect recycled materials curbside in residential

areas of the unincorporated portion of the County. The County also maintains collection facilities where County residents and business can drop off many types of recyclable items, including glass, paper, plastic, cardboard, motor oil, white goods, household hazardous waste, and electronic waste.

3.3.1 Curbside Recycling

The County provides weekly, curbside pickup of recyclables to all residents in the unincorporated portion of the County through private franchise contractors. The County also provides recycling bins to residents for easy separation of paper, glass, metal and plastic. Two privately owned materials recovery facilities accept and process these materials. These two facilities will accept a variety of recyclable material, including aluminum cans, glass bottles and jars, multiple types of paper, wood waste, tin cans, cardboard, plastic bottles, Christmas trees, and some yard waste. The curbside recycling program collects approximately 30,000 to 40,000 tons of recyclables each year from the unincorporated areas in the County.

3.3.2 Yard Waste

In 1997, the County mandated that all yard waste must be separated from garbage and other types of MSW. Yard waste may be isolated in plastic bags or containers. Yard waste, other than grass clippings and leaves, may also be left curbside in bundles or boxes. Yard waste is collected weekly. Residents may also deliver yard waste directly to processing facilities. The yard waste is processed and sold as mulch, soil amendment and biomass fuel.

3.3.4 Household Hazardous Waste

Household hazardous waste includes a variety of items, such as chemical cleaners, paint, solvents, pool chemicals, lawn and garden chemicals, and similar materials. The County maintains three facilities to collect household hazardous waste. Each facility accepts waste on one Saturday per month, resulting in 36 collections per year. The County collects about 120,000 tons per year of household hazardous waste. Most of the collected materials are used by the County or recycled. Materials that are not used or recycled are taken to licensed disposal facilities.

3.3.5 Tires

The County receives about 22,000 tons of tires annually. Tires are transferred to the Waste Tire Processing Facility (WTPF) and shredded into 2-inch chips. These chips are then used for landfill cover or disposed of in the South County Landfill.

3.3.6 Commercial Recycling

Commercial recycling is voluntary in Hillsborough County. Currently, businesses are responsible for delivering their own recyclables to the appropriate facilities.

3.3.7 Electronics

The County currently collects electronic waste at the household hazardous waste collection sites, along with other household hazardous waste. The County plans to increase the frequency of collection in the near future. Collected items include computer monitors, cell phones, CD and tape players, televisions, etc.

3.3.8 Ferrous Materials Recovery

Unlike other recyclables, most ferrous material is recovered after being processed at the Resource Recovery Facility. Ferrous material is collected, post-combustion, from the ash. A large magnet separates ferrous material from the ash. The County recycled over 130,000 tons of ferrous material in 2002.

3.3.9 Public Education and Interaction

The County recognizes that recycling is a joint project between the County and its citizens. As a result, the County has multiple programs to educate its citizens about the County's recycling and waste reduction programs. Citizens have become involved in recycling programs and, in cooperation with the County, have formed a Recycling Task Force and Keep Hillsborough County Beautiful.

The Recycling Task Force is a volunteer organization made up of citizens representing each district in the County. This organization develops educational publications and organizes special events and media campaigns to promote recycling and waste reduction. In particular, the Task Force sponsors the "Art of Recycling" program in Hillsborough County schools.

The County also creates publications and education programs. The County releases a quarterly newsletter/report on solid waste management in the County called "The Recycling Planet". This report is readily available to the public on the County's website. The County also provides funding to the Hillsborough County Cooperative Extension Service so that they can hold composting workshops, "Enviroshopping" seminars, a compost and mulch demonstration site, and 4-H recycling education programs.

3.4 New Programs

Previously, e-waste was collected four times each year. Beginning in January 2005, the County started collecting e-waste at the household hazardous waste collection sites, when these sites were open to collect household hazardous waste. This increased e-waste collection to 36 times per year.

In order to increase the recycling efforts of small business, the County plans to provide pick-up service to small business. Hauling recyclables can be cost prohibitive for small businesses. The County will provide this service with the same haulers that provide residential collection services.

Section 4
Alternative Disposal Options

As previously noted herein, the County has a comprehensive and successful recycling and materials separation program. The County's program continues to grow and improve, but the County's program cannot handle all of the additional materials that are expected to be generated within the County's service area in the future. There also are no demonstrated, cost-effective technologies available to recycle all of the additional waste materials that are projected to be generated in the County in the future.

The County's Resource Recovery Facility can process some, but not all, of the non-recyclable materials that are currently generated in the County. The excess materials are taken to the County's landfill for disposal. At this time, there are only two practical and demonstrated options available for the future disposal of the materials that cannot be handled by the County's materials separation program: (1) expansion of the Resource Recovery Facility and/or (2) taking the material to a landfill.

The County has evaluated these options carefully and determined that expansion of the Facility is the County's preferred option. This choice is consistent with the County's decision in the 1980's to pursue the use of a resource recovery facility as one of the cornerstones of the County's solid waste management system. The County's decision to expand the Facility also is consistent with the Florida Legislature's declaration in Section 377.709(1), Florida Statutes, that "the combustion of refuse by solid waste facilities to supplement the electricity supply not only represents an effective conservation effort but also represents an environmentally preferred alternative to conventional solid waste disposal in this state."

Appendix 4
Requirements for New Waste to-Energy Facility Capacity

Appendix 4
Section 403.7061 Requirements for New Waste-to-Energy Facility Capacity

4.1 Purpose

Hillsborough County (County) proposes to expand its existing solid waste resource recovery facility (SWRRF). This document addresses the requirements set forth in Section 403.7061(3), Florida Statues.

4.2 Background

The County planned construction and applied for a permit for the SWRRF in 1984. Prior to then, the County relied entirely on landfills for solid waste disposal. The City of Tampa operated a refuse incinerator until 1980. The SWRRF was constructed with three boilers units. Each unit is capable of processing 400 tons per day of refuse. The construction plans included space to install a fourth unit anticipating that the County would require extra capacity in the future.

In 1999, the County, in conjunction with the Cities of Tampa, Plant City, and Temple Terrace, developed a comprehensive master plan. This comprehensive plan contained a solid waste element designed to plan for solid waste management in a growing county. The solid waste portion of the master plan called for an integrated waste management system.

In following this plan, the County maintains an integrated waste management system that includes recycling, waste-to-energy, and landfill. The County also collects household hazardous waste, construction and demolition debris, electronic waste and other types of waste to increase recycling and provide proper disposal for many different types of items that could be hazardous. One underlying goal in the master plan is to achieve a recycling rate of 30 percent. The County has consistently met this goal.

In the last 5 years, the County has grown 16 percent with respect to population. According to the Bureau of Economic and Business Research (BEBR), the County will experience 4 to 13 percent population growth in the next five years and between 8 and 27 percent growth in the next ten years. Due to these population projections, the County cannot depend on recycling and waste reduction efforts alone to handle the expected increase in solid waste production.

The facility currently operates at or above its guarantee capacity of 372,300 tons per year. The only waste-handling facility in the County that is not owned by the County is the City of Tampa's McKay Bay Refuse-to-Energy Facility. This facility processes 328,500 tons per year, assuming 90 percent availability. The total annual waste combustion capacity for the County is 700,800. This is well below the two million tons of waste collected in 2003. About 600,000 tons per year are recycled in the County (including recycling efforts in the Cities of Tampa, Temple Terrace, and Plant City).

This leaves approximately 700,000 tons per year that must be diverted to the South County Landfill (Landfill). The amount of waste diverted to the Landfill will grow as the population grows.

In addition, the average heating value of the municipal solid waste (MSW) in Hillsborough County has been slowly increasing over the last five years. As the refuse heating value rises above the design heating value, the capacity of the facility decreases. As the County is collecting more garbage, the capacity of the SWRRF may continue to decrease.

4.3 System Description

4.3.1 Service Area

Residents in the unincorporated portion of Hillsborough County pay an annual assessment along with their property tax for solid waste collection and disposal. This practice began in 1997 along with the mandate that all residents and businesses within the unincorporated sections of the County (including sections annexed into cities after June 1983) must make arrangements with the contract haulers to have their waste collected. Waste is collected twice per week. Separated recyclables are collected once per week.

4.3.2 Solid Waste Generation Projections

Hillsborough County, along with Florida in general, is experiencing rapid population growth. The County population is expected to increase between 8 and 27 percent. **Figure 4-1** shows historical and projected population estimates for the County. The historical estimates are based on data provided by the United States Bureau of Census. The population projections are from BEBR. **Figure 4-2** shows the corresponding waste generation assuming that it increases proportionally as population increases. The waste projections correspond to the low, medium, and high population projections from BEBR.

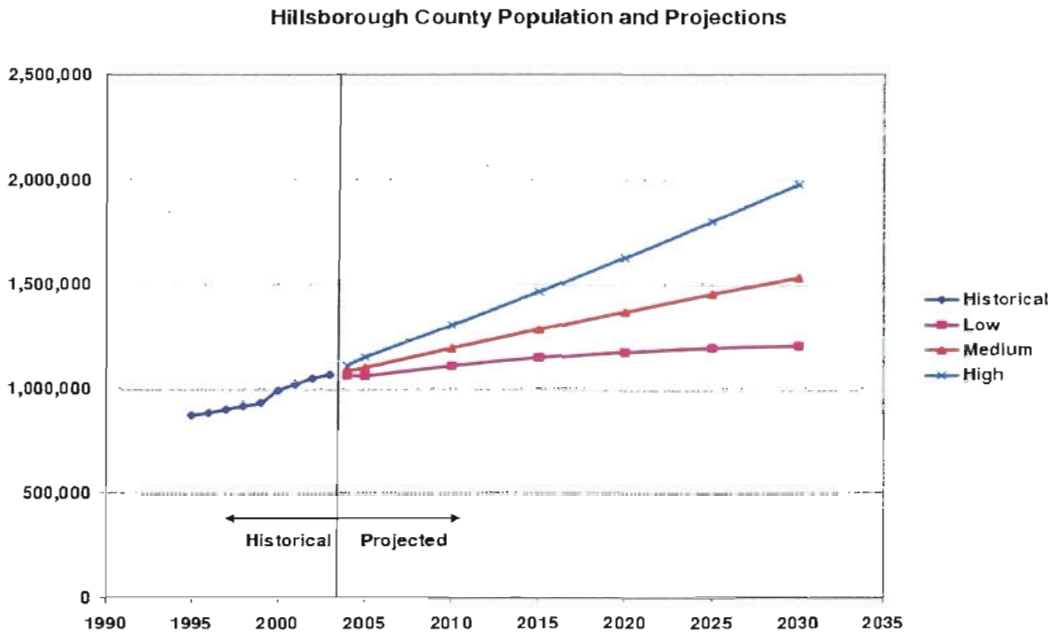


Figure 4-1
Hillsborough County Population Projections

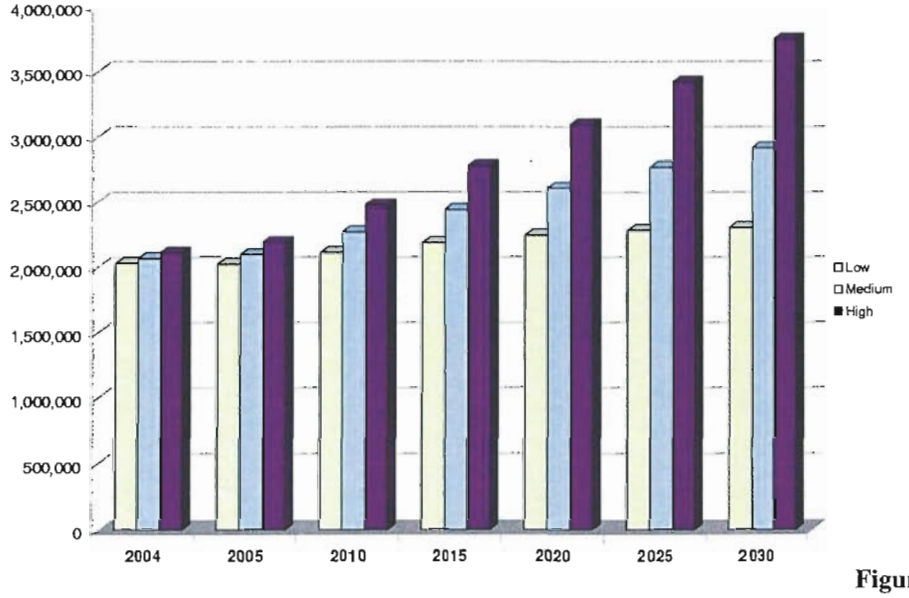


Figure 4-2
Hillsborough County Waste Tonnage Projections

4.3.3 Flow Control

Hillsborough County has consistently recycled 30 percent of its generated waste during the past years. In the future, it intends to continue meeting or exceeding the State of Florida's recycling goal of 30 percent.

As discussed in Section 4.2, the amount of solid waste remaining after recycling and source reduction exceeds the current capacity of the Resource Recovery Facility. This excess tonnage is diverted to the County's Southeast Landfill for disposal.

4.3.4 Agreements

To provide economical, efficient, and environmentally responsible solid waste service, the County has entered into agreements with multiple organizations. These agreements include:

- Covanta operating service agreement – This agreement, originally with Ogden Martin Systems of Hillsborough, Inc., is a 20-year agreement to operate the resource recovery facility. The contract is due to be renegotiated in 2005.

- Electrical power purchase agreement – Power generated at the resource recovery facility is sold to Tampa Electric Company (TECO)

- Franchise hauler agreements – Franchise haulers provide curbside waste collection twice a week. They collect recyclables and yard waste once per week. The County currently holds agreements with three waste haulers: East Bay Sanitation, Liberty Waste & Recycling and Waste Management.

4.3.5 System Components

The County operates an integrated solid waste management system. The system includes the:

- Southeast County Landfill, Tire Processing and Leachate Treatment Facility – This facility contains a Class I landfill and encompasses 175 acres. It stores ash from the resource recovery facility, non-processable waste and bypass waste. The facility also accepts waste from the Cities of Temple Terrance and Plant City as well as ash and bypass waste from the City of Tampa.

- Hillsborough County Resource Recovery Facility – The resource recovery facility processes approximately 1,200 tons of garbage daily. The facility is composed of three boilers, each with a 400 ton per day capacity. The combustion units generate enough steam to produce 29 megawatts through a turbine generator.

- Northwest Transfer Station, Community Collection Center and Yard Waste Processing Facility – This transfer station has a capacity of 600 tons per day. This waste is transferred to the resource recovery facility for processing. This facility also has collection bins for scrap metal, tires, motor oil, lead-acid batteries, and other recyclables.

- Hillsborough County Yard and Wood Waste Processing Facility – This 16-acre site produces fuel, mulch, and soil amendment materials from yard and wood waste. This site is also permitted as a composting facility by the FDEP.

- Hillsborough Heights Community Collection Center – This is a community drop-off center that collects general waste, scrap metal, tires, motor oil, lead-acid batteries and recyclables.

- Alderman Ford Community Collection Center – This facility accepts general waste from tax-paying citizens as well as scrap metal, tires, motor oil, lead-acid batteries and recyclables.

- Apollo Beach Household Chemical Collection Center – [Not sure if this is still in use. Confirm]

- Wimauma Community Collection Center - This facility accepts general waste from tax-paying citizens as well as scrap metal, tires, motor oil, lead-acid batteries and recyclables. One Saturday each month, this facility collects household hazardous waste including, cleaners, paint, pool chemicals, lawn and garden chemicals, etc.

- Sheldon Road Household Chemical Collection Center – Collections are held at this facility once per month. The facility collects cleaners, paint, pool chemicals, lawn and garden chemicals, etc.

4.4 Requirements in Section 403.7061(3), Florida Statutes

4.4.1 Requirements in 403.7061(3)(a)

Section 403.7061(3)(a), Florida Statutes (FS) states:

The facility is a necessary part of the local government's integrated solid waste management program in the jurisdiction where the facility is located and cannot be avoided through feasible and practical efforts to use recycling or waste reduction.

In 1999, the County and the Cities of Tampa, Temple Terrace, and Plant City (the Cities) put into effect a comprehensive master plan (Plan). The Plan included a solid waste element to plan for future industrial, commercial, and residential growth and solid waste services demand. The solid waste element of the Plan outlines an integrated system for waste management. The Plan includes recycling, the SWRRF, and landfill. The County has incorporated the following programs into the Plan:

- Construction and Demolition Debris Program

- Yard Waste Separation (Mandatory)

- County Offices Recycling Program

- White Goods Separation

- Waste Tire Separation and Landfill Cover Use
- Household Hazardous Waste Collection Program
- Electronic Waste Collection Program
- Ferrous Metals Recovery Program
- Commercial Recycling Program
- Residential Recycling Program

The County has consistently met the state mandated recycling goal of 30 percent. **Exhibit A** shows the most recent assessment of the County's recycling program as included in the Florida Department of Environmental Protection's (FDEP) 2001 Annual Report. The County is planning to provide curbside pickup of recyclables for small businesses and increase electronic waste collection to increase recycling.

Figure 4-2 shows projected waste tonnages based on BEBR population estimates. These projections show an increase of up to 27 percent over the next ten years. The County must plan for 27 percent growth as a conservative estimate. The SWRRF is already operating at its full capacity and rejecting some waste that must be sent to the South County Landfill. Any additional waste due to population growth will be above and beyond the capacity of the SWRRF. The County cannot reasonably rely on recycling and waste reduction efforts alone to handle increased waste tonnages.

The SWRRF has a guaranteed throughput of 85 percent of boiler plate rating. Historically, the facility has operated above this guarantee. **Table 4-1** shows the projected shortfall in waste-to-energy capacity based on high population projections.

Year	Expected Capacity	Projected Waste to be Processed or Landfilled	SWRRF Capacity Shortfall
2004	354,780	517,731	-162,951
2005	354,780	536,979	-182,199
2006	354,780	551,040	-196,260
2007	354,780	565,102	-210,322
2008	341,135	579,164	-238,030
2009	341,135	593,226	-252,091
2010	341,135	607,288	-266,153
2011	341,135	622,065	-280,930
2012	341,135	636,842	-295,707
2013	341,135	651,619	-310,484
2014	341,135	666,396	-325,261
2015	341,135	681,173	-340,038

These shortfall projections include the assumption that 30 percent of the waste collected in the County will be recycled. Thus, the excess waste must be landfilled.

Table 4-1 illustrates that expanded the facility is a necessary part of maintaining the County's integrated waste management system.

4.4.2 Requirements in 403.7061(3)(b)

Section 403.7061(3)(b), FS states:

The use of capacity at existing waste-to-energy facilities within reasonable transportation distance of the proposed facility must have been evaluated and found not to be economically feasible when compared to the use of the proposed facility for the expected life of the proposed facility.

Several other municipalities operate waste-to-energy facilities in western Florida. Pinellas and Pasco County each operate a mass burn facility. The City of Tampa operates the McKay Bay Refuse to Energy facility. Although these facilities are nearby, they do not have additional capacity to offer the County, as these facilities are fully utilized providing waste management to their respective municipalities.

The McKay Bay facility operates at or above full capacity while diverting waste to the County's South County Landfill. The Pinellas County Waste to Energy facility also operates at full capacity. The Pasco County facility operates above its rated capacity. Pasco County is considering expanding its facility in the next 5 years. As a result, Hillsborough County cannot reasonably rely on these facilities to ease its refuse processing burden.

4.2.3 Requirements in 403.7061(3)(c)

Section 403.7061(3)(c), FS states:

The County in which the facility is located will achieve the 30-percent waste reduction goal set forth in s. 403.706(4) by the time the facility begins operation.

The County has consistently met the state mandated wasted reduction goal of 30 percent. The County plans to meet or exceed this goal in the future, even after the fourth combustion unit is constructed.

Exhibit A shows the most recent assessment of the County's recycling program as included in the FDEP's 2001 Annual Report. **Exhibit B** contains historical documents from other FDEP annual reports. These report excerpts confirm that the County met the 30 percent recycling goal in the past. **Figure 4-3** shows historical recycling percentages for the County, as reported to the FDEP.

The County has multiple drop-off facilities for recyclables and provides curbside pickup to residents. In an effort to increase recycling participation, the County will soon be providing curbside pickup of recyclables for small business. The County also plans to increase its recycling of electronics.

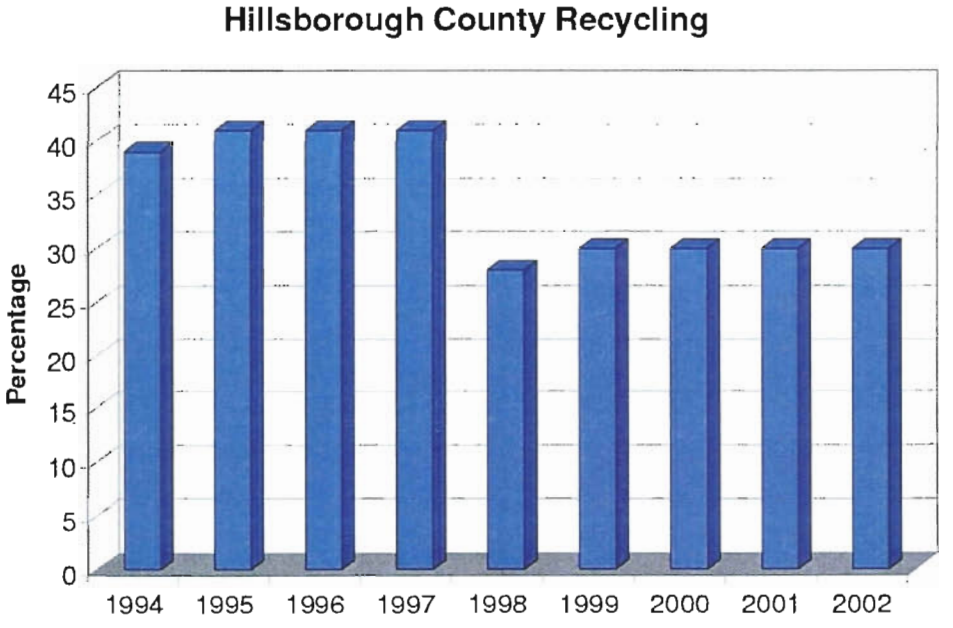


Figure 4-3
Hillsborough County Recycling Percentages

4.4.4 Requirements in 403.7061(3)(d)

Section 403.7061(3)(d), FS states:

The local government in which the facility is located has implemented a mulching, composting or other waste reduction program for yard waste.

In 1997, the County mandated that all yard waste must be separated. It may be isolated in plastic bags or containers. Yard waste other than grass clippings and leaves may also be left curbside in bundles or boxes. Yard waste is collected weekly. Residents may also deliver yard waste directly to processing facilities. Plant material is processed and sold as mulch, soil amendment and fuel. On average, the County collects about 80,000 tons of yard waste each year.

4.4.5 Requirements in 403.7061(3)(e)

Section 403.7061(3)(e), FS states:

The local government served by the facility will have implemented or participated in a separation program designed to removal small-quantity generator and household hazardous waste, mercury containing devices, and mercuric-oxide batteries from the waste stream prior to incineration, by the time the facility begins operation.

The County maintains three facilities to collect household hazardous waste. Collections are held on three Saturdays each month, alternating between two

facilities. These collections are for County residents, not commercial entities. Most of the collected materials are used by the County or recycled. The County collects about 120,000 tons per year of household hazardous waste. Household hazardous waste covers a variety of items including chemical cleaners, paint, solvents, pool chemicals, lawn and garden chemicals, etc. Materials that are not recycled are taken to licensed disposal facilities.

The County currently collects electronic waste (e-waste) four times per year at one of the community collection centers. The County plans to increase the frequency of collection in the near future. Collected items include computer monitors, cell phones, CD and tape players, televisions, etc.

The County also collects other household hazardous waste such as the lead acid batteries, paints, and other recyclables at the community collection centers. All the collected materials are sent to recycling.

The County also has a pollution prevention program that focuses on educating the public and other small quantity generators (businesses and institutions) about pollution prevention program that focuses on educating the citizens about pollution prevention and compliance issues, including recycling and disposal options for a variety of hazardous materials. Citizens have become involved in recycling programs and, in cooperation with the County, have formed a Recycling Task Force and Keep Hillsborough County Beautiful.

4.4.6 Requirements in 403.7061(3)(f)

Section 403.7061(3)(f), FS states:

The local government in which the facility is located has implemented a program to procure products or materials with recycled content, pursuant to s. 403.7065.

Hillsborough County has implemented a program to procure products and materials with recycled content, pursuant to s.403.7065, F.S. The County's policy states that 75% of the paper products purchased by the County's offices must contain recycled content, and janitorial paper products must have at least 50% recycled content. All printed materials are to indicate that they are printed on recycled paper. The County's policy requires the purchase of recycled content materials when available and requires that the County's bid specifications request recycled content materials. The County's policy also limits the purchase of non-recyclable paper products.

4.4.7 Requirements in 403.7061(3)(g)

Section 403.7061(3)(g), FS states:

A program will exist in the local government in which the facility is located for collecting and recycling recovered materials from the institutional, commercial, and industrial sectors by the time the facility begins operation.

The County currently has in place a commercial recycling program. This program is voluntary. Individual commercial entities may negotiate with any of the three franchise haulers available in the County for collection. All three have the exclusive right to compete for collection contracts anywhere within the service area. (The service area includes unincorporated sections of the County, and areas incorporated after June 1983.

Commercial entities that voluntarily participate in the program deliver their recyclables to County facilities or other privately operated recycling facilities. To increase recycling participation, the County plans to provide curbside pickup for small businesses, as it does for residents within the service area.

4.4.8 Requirements in 403.7061(3)(h)

Section 403.7061(3)(h), FS states:

The facility will be in compliance with applicable ordinances and with the approved state and local comprehensive plans required by Chapter 163.

In 1999, the County, in cooperation with the Cities of Tampa, Temple Terrace and Plant City, developed a comprehensive master plan. The plan, in compliance with Chapter 163, FS, contained a solid waste element. The solid waste element of the plan outlines an integrated solid waste management system including recycling, landfill, and resource recovery.

In addition, the SWRRF complies with all applicable local ordinances and state and local comprehensive plans. Applicable land use and zoning ordinances were addressed before the original facility was constructed. The facility complies with the requirements of the Florida Electrical Power Plant Siting Act and will continue to do so.

4.4.9 Requirements in 403.7061(3)(i)

Section 403.7061(3)(i), FS states:

The facility is in substantial compliance with its permit, conditions of certification, and any agreements or orders resulting from environmental enforcement actions by state agencies.

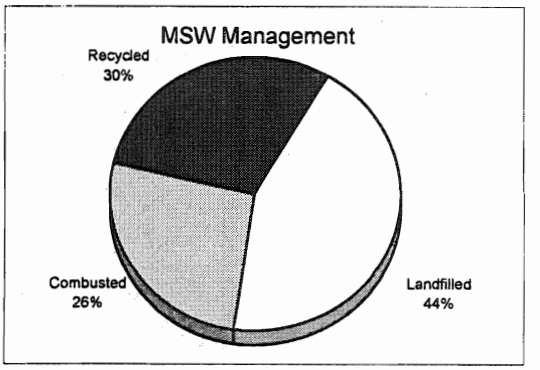
Hillsborough County Facility is in compliance with its permit conditions and conditions of certification. The Facility has not had any environmental enforcement actions by federal, state or local agencies. The County's Facility is equipped with extensive, state-of-the art air-pollution control equipment systems and considered one of the best operational waste-to-energy facilities in the United States.

Hillsborough County
(Jan. 1, 2001 - Dec. 31, 2001)

1. Population [1] 1,025,794

2. MSW Management (tons) [2]

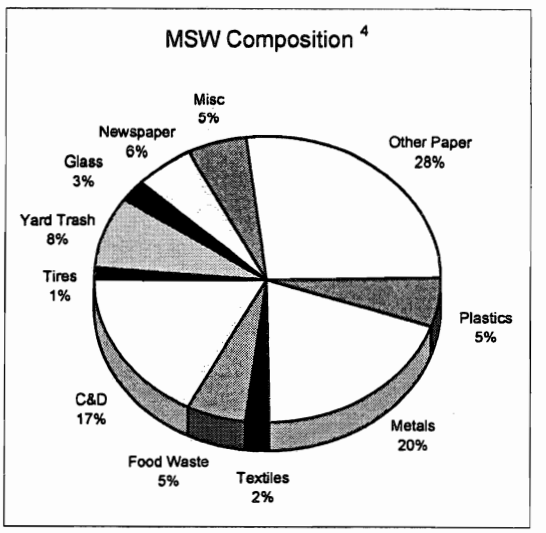
A. Landfilled	735,766
B. Combusted	440,544
C. Recycled	499,447
D. Total	1,675,757
E. Total Pounds per Capita Per Day [1]	8.95



3. MSW Collected & Recycled

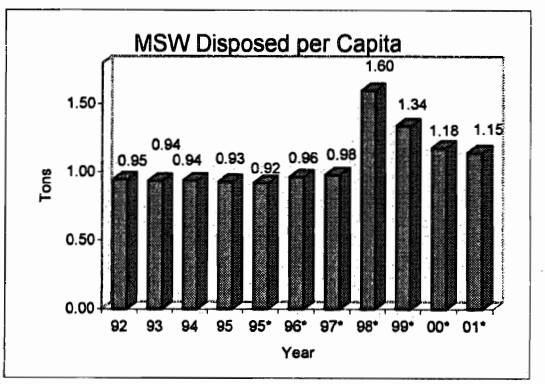
A. Minimum Five Wastes [3]	Collected (tons)	Recycled (%)
1. Newspaper	93,887	41
2. Glass	41,914	33
3. Aluminum Cans	5,030	29
4. Plastic Bottles	23,471	7
5. Steel Cans	16,766	36

B. Special Wastes [5]	Collected (tons)	Recycled (%)
1. C&D Debris	293,170	21
2. Yard Trash	135,166	54
3. White Goods	40,237	38
4. Tires	23,472	9
5. Process Fuel	52,908	100
C. Other Wastes	1,002,644	23
D. Total Recycling Rate (%)		30
E. Adjusted Recycling Rate (%) [5,6]		30



F. Waste Reduction Per Capita (%)
(A negative number indicates an increase in the MSW disposal rate per capita.)

1. Base Year: July 1988-June 1989	-2
2. Base Year: July 1989-June 1990	-8
3. Base Year: July 1990-June 1991	-18
4. Base Year: July 1991-June 1992	-22
5. Base Year: July 1992-June 1993	-23
6. Base Year: July 1993-June 1994	-23



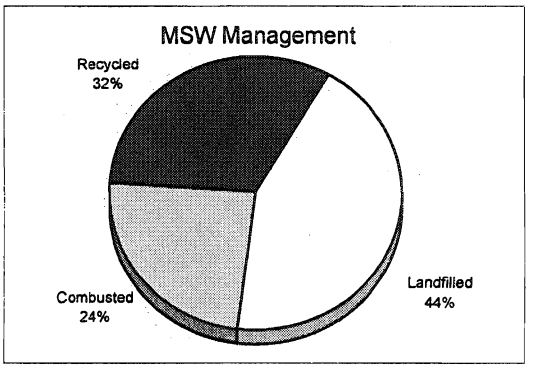
G. Participation in Recycling [7]	Units	Percent [8]
1. Single-family Curbside	309,629	70
2. Multi-family Curbside [9]	127,574	12
3. Commercial [10]	49,140	
a) Scheduled collection		15
b) On call collection		4

Hillsborough County
(Jan. 1, 2000 - Dec. 31, 2000)

1. Population [1] 998,948

2. MSW Management (tons) [2]

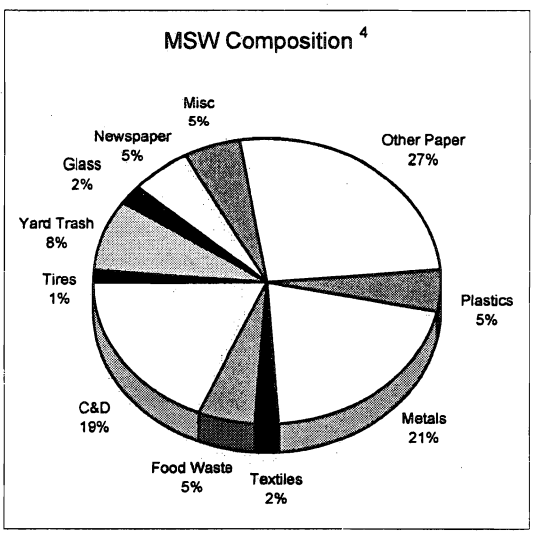
A. Landfilled	757,890
B. Combusted	418,015
C. Recycled	556,550
D. Total	1,732,455
E. Total Pounds per Capita Per Day [1]	9.50



3. MSW Collected & Recycled

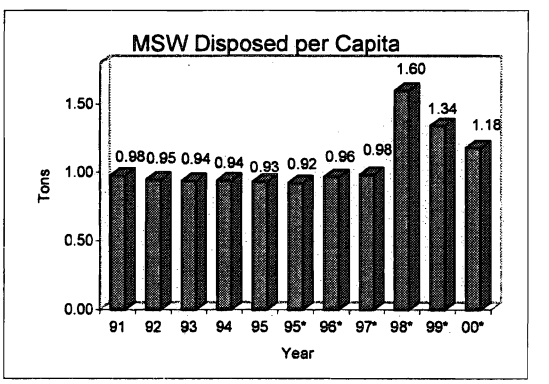
A. Minimum Five Wastes [3]	Collected (tons)	Recycled (%)
1. Newspaper	94,364	40
2. Glass	42,893	28
3. Aluminum Cans	5,147	36
4. Plastic Bottles	15,441	29
5. Steel Cans	17,157	52

B. Special Wastes [5]	Collected (tons)	Recycled (%)
1. C&D Debris	320,190	16
2. Yard Trash	137,256	37
3. White Goods	41,177	52
4. Tires	24,020	9
5. Process Fuel	67,015	100
C. Other Wastes	1,034,810	29
D. Total Recycling Rate (%)		32
E. Adjusted Recycling Rate (%) [5,6]		32



F. Waste Reduction Per Capita (%)
(A negative number indicates an increase in the MSW disposal rate per capita.)

1. Base Year: July 1988-June 1989	-3
2. Base Year: July 1989-June 1990	-10
3. Base Year: July 1990-June 1991	-21
4. Base Year: July 1991-June 1992	-24
5. Base Year: July 1992-June 1993	-26
6. Base Year: July 1993-June 1994	-25



G. Participation in Recycling [7]

	Units	Percent [8]
1. Single-family Curbside	304,980	290
2. Multi-family Curbside [9]	123,220	36
3. Commercial [10]	48,240	
a) Scheduled collection		138
b) On call collection		37

Appendix 5
State Permit Applications and Approvals

Appendix 5-1
Revised Stormwater Calculations

PRE-DEVELOPM. . CONDITIONS

The entire site is divided into 3 drainage areas: West, North-1, and North-2.

Pre-Development Conditions

Drainage area	Path	Slope, %	Length, ft	Runoff Coeff	Time of concentration (tc), min			
West	1A	3.9	570	0.30	22			
	2A		30		1			
	2B		81		1			
	2C	0.7	70	0.95	3			
	2D	1.4	50	0.95	2			
	2E	0.5	60	0.95	3			
	2F	3.1	290	0.30	17			
					25			
						Max tc	43	minutes
	3A	9.0	210	0.30	10		~45	minutes
	3B	0.7	420	0.30	33			
					43			
North -2	4A	8.5	200	0.30	10			
						Max tc	57	minutes
					10		~60	minutes
	6A	0.3	680	0.30	57			
					57			
	7A	0.6	495	0.85	11			
					11			
North -1	5A		10		0.4			
	5B		32		0.7			
	5C		45.5		0.8	Max tc	9	minutes
	5D	16.5	170	0.3	7		~10	minutes
					9.3			

Pre-L ɔlopment Peak Discharge

Storm	Drainage Area	Acreage	Time of Concentration, min	Rainfall Intensity, inches/hr	Runoff Coefficient	Peak Discharge, cfs
		'A'		'I'	'C'	Q=CIA
25 year	West	21.5	45	4.2	0.68	61.7
	North 1	7.8	10	8.0	0.73	45.8
	North 2	8.8	60	3.6	0.86	27.4
10 year	West	21.5	45	3.7	0.56	45.3
	North 1	7.8	10	7.0	0.61	33.4
	North 2	8.8	60	3.2	0.72	20.3

Runoff was computed for 3 drainage areas separately.

West Drainage Area

Time of Concentration 45 min
Percent impervious 41 %
Percent pervious 59 %
Initial abstraction for pervious area 0.29 inches
Soil Group D
Curve Number = (0.41x98+0.59x80) 87 Note: Good condition (grass cover >75%) 0.8
Impervious (directly connected) 0.98

Max storage of water $S' = \frac{1000}{CN} - 10 = 1.45$

Rainfall volume for 24 hr 25 year rainfall from SFWMD Atlas P = 8.5

Total volume of run-off $R = \frac{(P-0.2xS')^2}{(P+0.8xS')} =$ **6.98 INCHES**

North 1 Drainage Area

Time of Concentration 10 min
Percent impervious 47 %
Percent pervious 53 %
Initial abstraction for pervious area 0.26 inches
Soil Group D
Curve Number = (0.47x98+0.53x80) 88 Note: Good condition (grass cover >75%) 0.8
Impervious (directly connected) 0.98

Max storage of water S' $= \frac{1000}{CN}$ = 1.30

Rainfall volume for 24 hr 25 year rainfall from SFWMD Atlas P = 8.5

Total volume of run-off R = $\frac{(P-0.2xS')^2}{(P+0.8xS')}$ = **7.11 INCHES**

North 2 Drainage Area

Time of Concentration		60 min	
Percent impervious		64 %	
Percent pervious		36 %	
Initial abstraction for pervious area		0.18 inches	
Soil Group		D	
Curve = (0.64x98+0.36x80)		92 Note: Good condition (grass cover >75%)	0.8
Number		Impervious (directly connected)	0.98

Max storage of water S' $= \frac{1000}{CN}$ -10 = 0.92

Rainfall volume for 24 hr 25 year rainfall from SFWMD Atlas P = 8.5

Total volume of run-off R = $\frac{(P-0.2xS')^2}{(P+0.8xS')}$ = **7.49 INCHES**

POST-DEVELOPMEN CONDITIONS

The entire site is again divided into 3 drainage areas: West, North-1, and North-2.

Drainage area	Path	Slope, %	Length, ft	Runoff Coeff	Time of concentration (tc), min			
West	1A	3.9	570	0.30	22			
	2A		30		1			
	2B		81		1			
	2C	0.7	70	0.95	3			
	2D	1.4	50	0.95	2			
	2E	0.5	60	0.95	3			
	2F	3.1	290	0.30	17			
					25			
						Max tc	43	minutes
	3A	9.0	210	0.30	10		~45	minutes
	3B	0.7	420	0.30	33			
					43			
North -2	4A	8.5	200	0.30	10			
						Max tc	57	minutes
					10		~60	minutes
	6A	0.3	680	0.30	57			
					57			
	7A	0.6	495	0.85	11			
					11			
North -1	5A		10		0.4			
	5B		32		0.7			
	5C		45.5		0.8	Max tc	9	minutes
	5D	16.5	170	0.3	7		~10	minutes
					9.3			

Post- .elopment Peak Discharge

Storm	Drainage Area	Acreage	Time of Concentration, min	Rainfall Intensity, inches/hr	Runoff Coefficient	Peak Discharge, cfs
		'A'		'I'	'C'	Q=CIA
25 year	West	21.5	45	4.2	0.7	63.0
	North 1	7.8	10	8.0	0.73	45.9
	North 2	8.8	60	3.6	0.86	27.4
10 year	West	21.5	45	3.7	0.58	46.2
	North 1	7.8	10	7.0	0.61	33.5
	North 2	8.8	60	3.2	0.72	20.3

Runoff was computed for 3 drainage areas separately.

West Drainage Area

Time of Concentration 45 min
Percent impervious 43 %
Percent pervious 57 %
Initial abstraction for pervious area 0.28 inches
Soil Group D
Curve Number = (0.43x98+0.57x80) 88 Note: Good condition (grass cover >75%) 0.80
Impervious (directly connected) 0.98

Max storage of water $S' = \frac{1000}{CN} - 10 = 1.41$

Rainfall volume for 24 hr 25 year rainfall from SFWMD Atlas $P = 8.5$

Total volume of run-off $R = \frac{(P-0.2xS')^2}{(P+0.8xS')} =$ **7.02 INCHES**

North 1 Drainage Area

Time of Concentration 10 min
Percent impervious 47 %
Percent pervious 53 %
Initial abstraction for pervious area 0.26 inches

Soil Group		D			
Curve Number	= (0.47x98+0.53x80)	89	Note: Good condition (grass cover >75%)		0.80
			Impervious (directly connected)		0.98

Max storage of water $S' = \frac{1000}{CN} - 10 = 1.29$

Rainfall volume for 24 hr 25 year rainfall from SFWMD Atlas $P = 8.5$

Total volume of run-off $R = \frac{(P-0.2xS')^2}{(P+0.8xS')} =$ **7.12 INCHES**

North 2 Drainage Area

Time of Concentration		60	min		
Percent impervious		64	%		
Percent pervious		36	%		
Initial abstraction for pervious area		0.18	inches		
Soil Group		D			
Curve Number	= (0.64x98+0.36x80)	92	Note: Good condition (grass cover >75%)		0.80
			Impervious (directly connected)		0.98

Max storage of water $S' = \frac{1000}{CN} - 10 = 0.92$

Rainfall volume for 24 hr 25 year rainfall from SFWMD Atlas $P = 8.5$

Total volume of run-off $R = \frac{(P-0.2xS')^2}{(P+0.8xS')} =$ **7.49 INCHES**

STORAGE VOLUME CALCULATIONS

Basin	Discharge Location	Acreage Drained	Percent of Total Acreage Drained	Discharge Limit, cfs	Limiting Discharge, cfs
North 1	North Ditch	7.8	47	25	12
North 2	North Ditch	8.8	53	25	13
West	West Channel	21.5	60	35	21

A) Calculation of Storage Required for Retention

Basin	Discharge Location	Watershed Area, acres	Runoff depth, inches	Runoff Volume, cu.ft
North 1	North Ditch	7.8	0.5	14,157
North 2	North Ditch	8.8	0.5	15,899
West	West Channel	21.5	0.5	39,023

B) Calculation of Storage Required for Peak Attenuation

Basin	Discharge Location	Watershed Area, acres	Runoff depth, inches	Runoff Volume, cu.ft
				Vr'
North 1	North Ditch	7.8	7.12	201,596
North 2	North Ditch	8.8	7.49	238,173
West	West Channel	21.5	7.02	547,876

C) Using TR-55 (Technical Resource Manual) formulae

C0	0.682
C1	-1.43
C2	1.64
C3	-0.804

$$\frac{Vs}{Vr} = C0+C1\,(qo/qi)+C2(q0/qi)^2+C3(q0/qi)^3$$

Basin	Discharge Location	Limiting Discharge q0,cfs	qi	q0/qi	Vs/Vr'	Vr', ft^3	Vs, ft^3
North 1	North Ditch	12	45.9	0.3	0.4	201,596	81,259
North 2	North Ditch	13	27.4	0.5	0.3	238,173	69,059
West	West Channel	21	63.0	0.3	0.4	547,876	196,220

Details	Ret n Pond	Watershed Area, acres	Storage required for Peak Attemuation, cu.ft	S je reqd for retention, cu.ft	Total Storage Required, cu.ft	Total Storage Required, acre-ft	Total Storage Provided, cu.ft	Total age Provided, acre-ft
North 1	Retention Pond C	7.8	81,259	14,157	95,416	**2.19**	159,321	**3.66**
North 2	Retention Pond D	8.8	69,059	15,899	84,958	**1.95**	101,146	**2.32**
West	Retention Pond A and B	21.5	196,220	39,023	235,243	**5.40**	301,261	**6.92**

Appendix 5-2
Title V Air Operation Permit

NOTICE OF FINAL PERMIT

In the Matter of an
Application for Permit by:

Mr. Daryl Smith
Hillsborough County Solid Waste
Management Department
601 East Kennedy Boulevard
Tampa, Florida 33602

FINAL Permit No.: 0570261-005-AV
Hillsborough County Resource Recovery Facility

Enclosed is FINAL Permit Revision Number 0570261-005-AV for the operation of the Hillsborough County Resource Recovery Facility located at 350 Falkenburg Road, Tampa, Hillsborough County, issued pursuant to Chapter 403, Florida Statutes (F.S.).

Any party to this order (permit) has the right to seek judicial review of the permit pursuant to Section 120.68, F.S., by the filing of a Notice of Appeal pursuant to Rule 9.110, Florida Rules of Appellate Procedure, with the Clerk of the permitting authority in the Legal Office; 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 (thirty) days from the date this Notice is filed with the Clerk of the permitting authority.

Executed in Tallahassee, Florida.

Trina Vielhauer
Chief
Bureau of Air Regulation

CERTIFICATE OF SERVICE

The undersigned duly designated deputy agency clerk hereby certifies that this NOTICE OF FINAL PERMIT (including the FINAL permit) was sent by certified mail and copies were mailed by U.S. Mail before the close of business on 4/30/03 to the person(s) listed or as otherwise noted:

Daryl Smith, Director, Hillsborough County Solid Waste Management Department

Clerk Stamp

FILING AND ACKNOWLEDGMENT FILED, on this date, pursuant to Section 120.52(7), Florida Statutes, with the designated agency Clerk, receipt of which is hereby acknowledged.

Barbara J. Friday 4/30/03
(Clerk) (Date)

The undersigned duly designated deputy agency clerk hereby certifies that this NOTICE OF FINAL PERMIT was sent by U.S. Mail before the close of business on _____ to the person(s) listed or as otherwise noted:

Jason M. Gorrie, PE, Camp Dresser & McKee
Eric Peterson, PE, FDEP SWD
USEPA, Region 4 (INTERNET E-mail Memorandum)

Clerk Stamp

FILING AND ACKNOWLEDGMENT FILED, on this date, pursuant to Section 120.52(7), Florida Statutes, with the designated agency Clerk, receipt of which is hereby acknowledged.

Barbara J. Friday 4/30/03
(Clerk) (Date)

FINAL PERMIT DETERMINATION

FINAL Permit No.: 0570261-005-AV

I. Comment(s).

No comments were received on the PROPOSED Title V Permit.

II. Conclusion.

Since no comments were received, the PROPOSED Title V Air Operation Permit becomes the FINAL Title V Air Operation Permit.

STATEMENT OF BASIS

Hillsborough County
Hillsborough County Resource Recovery Facility
Facility ID No.: 0570261
Hillsborough County

Title V Air Operation Permit Revision
FINAL Permit Project No.: 0570261-005-AV
Revision to Title V Air Operation Permit No.: 0570261-001-AV

The initial Title V Air Operation Permit, No. 0570261-001-AV, was issued/effective on October 24, 2000. This Title V Air Operation Permit Revision is issued under the provisions of Chapter 403, Florida Statutes (F.S.), and Florida Administrative Code (F.A.C.) Chapters 62-4, 62-210 and 62-213. The above named permittee is hereby authorized to operate the facility shown on the application and approved drawing(s), plans, and other documents, attached hereto or on file with the permitting authority, in accordance with the terms and conditions of this permit.

This permit revision is being issued for the purpose of incorporating the terms and conditions of the air construction permit, No. 0570261-004-AC, for a Dolomitic Lime Storage Silo; incorporating the terms and conditions of administrative permit correction, No. 0570261-003-AV, correcting the rule language previously cited in Facility-wide Condition 10; deleting obsolete specific conditions which address plant operation prior to the implementation of 40 CFR 60, Subparts Cb and Eb; and, incorporating changes to 40 CFR 60, Subparts Cb and Eb allowing 15 hours of excess carbon monoxide emissions for specified malfunctions.

Several Specific Condition(s) established in Title V Air Operation Permit, No. 0570261-001-AV, are changed, as a result of this revision. The following Specific Conditions are changed as follows:

Facility-wide Conditions:

FROM: **10.** Statement of Compliance. The permittee shall submit a statement of compliance with all terms and conditions of the permit.
{See condition 51., APPENDIX TV-3, TITLE V CONDITIONS}
[Rule 62-213.440(3), F.A.C.]

TO: **10.** Statement of Compliance. The annual statement of compliance pursuant to Rule 62-213.440(3)(a)2., F.A.C., shall be submitted within 60 (sixty) days after the end of the calendar year using DEP Form number 62-213.900(7), F.A.C.
[Rule 62-213.440(3), F.A.C.]

DELETE: All Specific Conditions in **Section III, Subsection A.**

DELETE: All Specific Conditions in **Section III, Subsection B.**

Section III, Subsection C. Specific Condition **C.34.**:

FROM: **C.34.** Startup, Shutdown and Malfunction. The standards under 40 CFR 60, Subpart Cb apply at all times except during periods of startup, shutdown, or malfunction. Duration of startup or shutdown periods are limited to 3 hours per occurrence.
(i) The startup period commences when the affected facility begins the continuous burning of municipal solid waste and does not include any warm-up period when the affected facility is combusting fossil fuel or other nonmunicipal solid waste fuel, and no municipal solid waste is being fed to the combustor.
(ii) Continuous burning is the continuous, semicontinuous, or batch feeding of municipal solid waste for purposes of waste disposal, energy production, or providing heat to the combustion system in preparation for waste disposal or energy production. The use of municipal solid waste solely to provide thermal protection of the grate or hearth during the startup period when municipal solid waste is not being fed to the grate is not considered to be continuous burning.
[40 CFR 60.38b and 40 CFR 60.58b(a)]

TO: **C.34.a.** Startup, Shutdown and Malfunction. The standards under 40 CFR 60, Subpart Cb apply at all times except during periods of startup, shutdown, or malfunction. Duration of startup or shutdown periods are limited to 3 hours per occurrence.
(i) The startup period commences when the affected facility begins the continuous burning of municipal solid waste and does not include any warm-up period when the affected facility is combusting fossil fuel or other nonmunicipal solid waste fuel, and no municipal solid waste is being fed to the combustor.
(ii) Continuous burning is the continuous, semicontinuous, or batch feeding of municipal solid waste for purposes of waste disposal, energy production, or providing heat to the combustion system in preparation for waste disposal or energy production. The use of municipal solid waste solely to provide thermal protection of the grate or hearth during the startup period when municipal solid waste is not being fed to the grate is not considered to be continuous burning.
[40 CFR 60.38b and 40 CFR 60.58b(a)]

C.34.b. For the purpose of compliance with the carbon monoxide emission limits in 40 CFR 60.53b(a), if a loss of boiler water level control (e.g., loss of combustion air fan, induced draft fan, combustion grate bar failure) is determined to be a malfunction, the duration of the malfunction period is limited to 15 hours per occurrence.
[40 CFR 60.58b(a)(1)iii]

Section III, Subsection E. Specific Conditions **E.2.** and **E.3.**:

FROM: **E.2.** Particulate Matter. Particulate matter emissions shall not exceed 0.015 grains per dry standard cubic foot, front-half catch.
[PSD-FL-121(B)]

E.3. Visible Emissions. Visible emissions shall not exceed five (5) percent opacity.
[PSD-FL-121(B)]

TO: **E.2.** Particulate Matter. Particulate matter emissions shall not exceed:
Emissions unit -101: 0.015 grains per dry standard cubic foot, front-half catch.
Emissions unit -106: 6.32 pounds per hour and 0.39 tons per year.
[PSD-FL-121(B) and 0570261-004-AC]

E.3. Visible Emissions.
Emissions unit -101: Visible emissions shall not exceed five (5) percent opacity.
Emissions unit -106: Visible emissions shall not be equal to or greater than 20 percent opacity.
[PSD-FL-121(B); 0570261-004-AC; and, Rule 62-296.320(4)(b)1., F.A.C.]

CAM does not apply.

Also included in this permit are miscellaneous unregulated/insignificant emissions units and/or activities.

Based on the initial Title V permit application received June 17, 1996, this facility is a major source of hazardous air pollutants (HAPs).

Hillsborough County
Hillsborough County Resource Recovery Facility
Facility ID No.: 0570261
Hillsborough County

Title V Air Operation Permit Revision
Revision to Title V Air Operation Permit No.: 0570261-001-AV

FINAL Permit No.: 0570261-005-AV

Permitting Authority:
State of Florida
Department of Environmental Protection
Division of Air Resource Management
Bureau of Air Regulation
Title V Section

Mail Station #5505
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Telephone: 850/488-0114
Fax: 850/922-6979

Compliance Authority:
Department of Environmental Protection
Southwest District Office
3804 Coconut Palm Drive
Tampa, Florida 33619-8218
Telephone: 813/744-6100
Fax: 813/744-6084

Title V Air Operation Permit Revision

FINAL Permit No.: 0570261-005-AV
Revision to Title V Air Operation Permit No.: 0570261-001-AV

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Department of Environmental Protection

Jeb Bush
Governor

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

David B. Struhs
Secretary

Permittee:
Hillsborough County
601 East Kennedy Boulevard
Tampa, Florida 33602

FINAL Permit No.: 0570261-005-AV
Facility ID No.: 0570261
SIC Nos.: 4953
Project: Title V Air Operation Permit Revision

This permit revision is being issued for the purpose of incorporating the terms and conditions of the air construction permit, No. 0570261-004-AC, for a Dolomitic Lime Storage Silo; incorporating the terms and conditions of administrative permit correction, No. 0570261-003-AV, correcting the rule language previously cited in Facility-wide Condition 10; deleting obsolete specific conditions which address plant operation prior to the implementation of 40 CFR 60, Subparts Cb and Eb; and, incorporating changes to 40 CFR 60, Subparts Cb and Eb, allowing 15 hours of excess carbon monoxide emissions for specified malfunctions. The Hillsborough County Resource Recovery Facility is located at 350 Falkenburg Road, Tampa, Hillsborough County; UTM Coordinates: Zone 17, 368.2 km East and 3092.7 km North; Latitude: 27° 57' 14" North and Longitude: 82° 40' 22" West.

This Title V air operation permit revision is issued under the provisions of Chapter 403, Florida Statutes (F.S.), and Florida Administrative Code (F.A.C.) Chapters 62-4, 62-210, and 62-213. 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 permitting authority, in accordance with the terms and conditions of this permit.

Referenced attachments made a part of this permit:
Appendix U-1, List of Unregulated Emissions Units and/or Activities
Appendix I-1, List of Insignificant Emissions Units and/or Activities
APPENDIX TV-4, TITLE V CONDITIONS version dated 02/12/02
APPENDIX SS-1, STACK SAMPLING FACILITIES version dated 10/07/96
TABLE 297.310-1, CALIBRATION SCHEDULE version dated 10/07/96
FIGURE 1 - SUMMARY REPORT-GASEOUS AND OPACITY EXCESS EMISSION AND MONITORING SYSTEM PERFORMANCE REPORT version dated 07/96

Effective Date: October 24, 2000
Revision Effective Date: April 30, 2003
Renewal Application Due Date: April 29, 2005
Expiration Date: October 24, 2005

Howard L. Rhodes, Director
Division of Air Resource Management

HLR/sms/ejs

Section I. Facility Information.

Subsection A. Facility Description.

The facility consists of three municipal waste combustors (MWCs) having a nominal design rate capacity of 400 tons MSW per day, 150 MMBtu per hour (excluding 9.9 MMBtu/hr from the combustion air preheaters) and 94,270 pounds steam per hour with MSW having a heating value of 4,500 Btu per pound. The "operating window" of 115 percent (%) over the nominal design rate of 150 MMBtu heat input corresponds to 172.5 MMBtu/hr heat input and 102,000 lbs steam/hour per each boiler. By letter dated March 17, 1998, D.B Riley, Inc. (boilers' manufacturer) indicated that it performed an evaluation of each boiler's ability to operate at the proposed increase steam flow of 102,000 lbs steam/hr and concluded that each boiler can safely operate at an increased continuous steam generation rate of 103,700 lbs steam/hr. Short-term capacity is limited by limiting steam production (102,000 lbs/hr), which effectively limits heat input. The facility has a design net steam energy of 1158 Btu/lb. Natural gas fired auxiliary burners and combustion control systems, with continuous monitoring devices for combustion and process parameters and SO_2, NOx and CO, will be installed to improve combustion efficiency and control. The air pollution control equipment consists of a spray dryer absorber, a fabric filter, and activated carbon injection system. A selective non-catalytic reduction system (SNCR) and auxiliary gas burners are installed in the furnaces. The facility will also have an ash building and handling system; two lime storage silos; and, an activated carbon storage silo.

Also included in this permit are miscellaneous unregulated/insignificant emissions units and/or activities.

Based on the initial Title V permit application received June 17, 1996, this facility is a major source of hazardous air pollutants (HAPs).

Subsection B. Summary of Emissions Unit ID No(s). and Brief Description(s).

The facility consists of the following regulated emissions units:

E.U. ID No.	Brief Description
-001	150 MMBtu/hr (nominal) Municipal Waste Combustor & Auxiliary Burners - Unit 1
-002	150 MMBtu/hr (nominal) Municipal Waste Combustor & Auxiliary Burners - Unit 2
-003	150 MMBtu/hr (nominal) Municipal Waste Combustor & Auxiliary Burners - Unit 3
-100	Ash Building and Handling System
-101	Lime Storage Silo
-102	Activated Carbon Storage Silo
-106	Dolomitic Lime Storage Silo

Unregulated Emissions Units and/or Activities

-103	Cooling Tower
-104	Wastewater Treatment Facility
-105	NaOH Storage Tank

Please reference the Permit No., Facility ID No., and appropriate Emissions Unit(s) ID No(s). on all correspondence, test report submittals, applications, etc.

Subsection C. Relevant Documents.

The documents listed below are not a part of this permit; however, they are specifically related to this permitting action.

These documents are provided to the permittee for information purposes only:
Table 1-1, Summary of Air Pollutant Standards and Terms
Table 2-1, Summary of Compliance Requirements
Appendix A-1, Abbreviations, Acronyms, Citations, and Identification Numbers
Appendix H-1: Permit History
Statement of Basis
Appendix BW, Biomedical Waste Definitions

These documents are on file with the permitting authority:
Initial Title V Air Operation Permit issued October 24, 2000
Application for a Title V Air Operation Permit Revision received October 1, 2002

Section II. Facility-wide Conditions.

The following conditions apply facility-wide:

1. APPENDIX TV-4, TITLE V CONDITIONS, is a part of this permit.
{Permitting note: APPENDIX TV-4, TITLE V CONDITIONS, is distributed to the permittee only. Other persons requesting copies of these conditions shall be provided a copy when requested or otherwise appropriate.}

2. General Pollutant Emission Limiting Standards. Objectionable Odor Prohibited. No person shall cause, suffer, allow, or permit the discharge of air pollutants which cause or contribute to an objectionable odor. The truck access doors to the facility shall remain closed except during normal working shifts when MSW is being received at the storage pit area. To minimize odors at the facility, a negative pressure shall be maintained on the tipping floor and air from within the building will be used as combustion air.
[Rule 62-296.320(2), F.A.C.; and, PSD-FL-121(B)]

3. General Particulate Emission Limiting Standards. General Visible Emissions Standard.
Except for emissions units that are subject to a particulate matter or opacity limit set forth or established by rule and reflected by conditions in this permit, no person shall cause, let, permit, suffer or allow to be discharged into the atmosphere the emissions of air pollutants from any activity, the density of which is equal to or greater than that designated as Number 1 on the Ringelmann Chart (20 percent opacity). EPA Method 9 is the method of compliance pursuant to Chapter 62-297, F.A.C.
[Rules 62-296.320(4)(b)1. & 4., F.A.C.]

4. Prevention of Accidental Releases (Section 112(r) of CAA).
a. The permittee shall submit its Risk Management Plan (RMP) to the Chemical Emergency Preparedness and Prevention Office (CEPPO) RMP Reporting Center when, and if, such requirement becomes applicable. Any Risk Management Plans, original submittals, revisions or updates to submittals, should be sent to:

RMP Reporting Center
Post Office Box 3346
Merrifield, VA 22116-3346
Telephone: 703/816-4434

and,
b. The permittee shall submit to the permitting authority Title V certification forms or a compliance schedule in accordance with Rule 62-213.440(2), F.A.C.
[40 CFR 68]

5. Unregulated Emissions Units and/or Activities. Appendix U-1, List of Unregulated Emissions Units and/or Activities, is a part of this permit.
[Rule 62-213.440(1), F.A.C.]

6. Insignificant Emissions Units and/or Activities. Appendix I-1, List of Insignificant Emissions Units and/or Activities, is a part of this permit.
[Rules 62-213.440(1), 62-213.430(6) and 62-4.040(1)(b), F.A.C.]

7. General Pollutant Emission Limiting Standards. Volatile Organic Compounds Emissions or Organic Solvents Emissions. The permittee shall allow no person to store, pump, handle, process, load, unload or use in any process or installation, volatile organic compounds or organic solvents without applying known and existing vapor emission control devices or systems deemed necessary and ordered by the Department.
Nothing was deemed necessary and ordered at this time.
[Rule 62-296.320(1)(a), F.A.C.]

8. Emissions of Unconfined Particulate Matter. Pursuant to Rules 62-296.320(4)(c)1., 3. & 4., F.A.C., reasonable precautions to prevent emissions of unconfined particulate matter at this facility include the following requirements (see Condition 57. of APPENDIX TV-4, TITLE V CONDITIONS): All roads shall be adequately paved, and vacuum swept if appropriate, to minimize accumulations of ash and dust. The unpaved areas of the facility are maintained and either sodded or landscaped. Hoods, fans, filters, or similar equipment is used to contain, capture, and/or vent particulate matter. The conveyor systems of the facility are enclosed or covered. The ash is wetted before being stored in the ash handling building. Speed limit signs shall be posted. Unprocessed refuse storage areas which must be open for operational purposes (e.g., tipping floor or the refuse bunker while trucks are entering or leaving) shall be under negative air pressure.
[Rule 62-296.320(4)(c)2., F.A.C.; PSD-FL-121(B); and, proposed in initial Title V permit application]

9. When appropriate, any recording, monitoring, or reporting requirements that are time-specific shall be in accordance with the effective date of the permit, which defines day one.
[Rule 62-213.440, F.A.C.]

10. Statement of Compliance. The annual statement of compliance pursuant to Rule 62-213.440(3)(a)2., F.A.C., shall be submitted within 60 (sixty) days after the end of the calendar year using DEP Form number 62-213.900(7), F.A.C.
[Rule 62-213.440(3), F.A.C.]

11. The permittee shall submit all compliance related notifications and reports required of this permit to the Department's Southwest District office.

Department of Environmental Protection
Southwest District Office
3804 Coconut Palm Drive
Tampa, Florida 33619-8218
Telephone: 813/744-6100, Fax: 813/744-6084

12. Any reports; data, notifications; certifications; and, requests, required to be sent to the United States Environmental Protection Agency, Region 4, should be sent to:

United States Environmental Protection Agency
Region 4
Air, Pesticides & Toxics Management Division
Air and EPCRA Enforcement Branch
Air Enforcement Section
61 Forsyth Street
Atlanta, Georgia 30303-8960
Telephone: 404/562-9155; Fax: 404/562-9163

13. Certification by Responsible Official (RO). In addition to the professional engineering certification required for applications by Rule 62-4.050(3), F.A.C., any application form, report, compliance statement, compliance plan and compliance schedule submitted pursuant to Chapter 62-213, F.A.C., shall contain a certification signed by a responsible official that, based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete. Any responsible official who fails to submit any required information or who has submitted incorrect information shall, upon becoming aware of such failure or incorrect submittal, promptly submit such supplementary information or correct information.
[Rule 62-213.420(4), F.A.C.]

Section III. Emissions Unit(s) and Conditions.

Subsection A. This section addresses the following emissions unit(s).

(RESERVED)

Section III. Emissions Unit(s) and Conditions.

Subsection B. This section addresses the following emissions unit(s).

(RESERVED)

Section III. Emissions Unit(s) and Conditions.

Subsection C. This section addresses the following emissions unit(s).

E.U. ID No.	Brief Description
-001	150 MMBtu/hr (nominal) Municipal Waste Combustor & Auxiliary Burners - Unit 1
-002	150 MMBtu/hr (nominal) Municipal Waste Combustor & Auxiliary Burners - Unit 2
-003	150 MMBtu/hr (nominal) Municipal Waste Combustor & Auxiliary Burners - Unit 3

Each of the three municipal waste combustor (MWCs) shall have a nominal design rate capacity of 400 tons MSW per day, 150 MMBtu per hour (excluding 9.9 MMBtu/hr from the combustion air preheaters) and 94,270 pounds steam per hour with MSW having a heating value of 4,500 Btu per pound. The "operating window" of 115 percent (%) over the nominal design rate of 150 MMBtu heat input corresponds to 172.5 MMBtu/hr heat input and 102,000 lbs steam/hour per each boiler. By letter dated March 17, 1998, D.B Riley, Inc. (the boilers' manufacturer) indicated that it performed an evaluation of each boiler's ability to operate at the proposed increase steam flow of 102,000 lbs steam/hr and concluded that each boiler can safely operate at an increased continuous steam generation rate of 103,700 lbs steam/hr. Short-term capacity is limited by limiting steam production (102,000 lb/hr), which effectively limits heat input. The units have a designed net steam energy of 1,158 Btu/lb (1378.86 Btu/lb steam enthalpy – 220 Btu/lb feed water enthalpy). Natural gas fired auxiliary burners and combustion control systems, with continuous monitoring devices for combustion and process parameters and SO_2, NOx and CO, will be installed to improve combustion efficiency and control. The air pollution control equipment consists of a spray dryer absorber, a fabric filter, and activated carbon injection system. A selective non-catalytic reduction system (SNCR) and auxiliary gas burners are installed in the furnaces. Emissions exhaust through a 220 feet tall stack.

{Permitting note(s): These emissions units are regulated under NSPS - 40 CFR 60, Subpart Cb, Emissions Guidelines and Compliance Times for Large Municipal Waste Combustors That Are Constructed on or Before September 20, 1994, adopted and incorporated by reference, subject to provisions in Rule 62-204.800(8)(b), F.A.C.; NSPS - 40 CFR 60, Subpart E, Standards of Performance for Incinerators, adopted and incorporated by reference in Rule 62-204.800(7), F.A.C.; Rule 62-212.400(5), F.A.C., Prevention of Significant Deterioration (PSD); Rule 62-212.400(6), F.A.C., Best Available Control Technology (BACT); Rule 62-296.401(2), F.A.C., Incinerators; and, Rule 62-296.416, F.A.C., Waste-to-Energy Facilities. Note: This project is subject to the requirements of 40 CFR 60, Subpart Cb. This permit may refer to the requirements of 40 CFR 60, Subpart Eb, where these requirements are referenced by Subpart Cb.}

The following conditions apply to the emissions unit(s) listed above:

Essential Potential to Emit (PTE) Parameters

C.1. Capacity. The maximum individual MWC throughput shall not exceed 460 tons MSW per day (1380 tons per day entire facility), and, 102,000 pounds steam per hour (on a 4-hour block arithmetic average). The incinerators/boilers shall not be loaded in excess of their maximum operating capacity, equivalent to 1380 tons MSW per day total, but no more than 1200 tons MSW per day on an annual (52 week rolling average) average basis for the entire facility.
[Rules 62-4.160(2) and 62-210.200(PTE), F.A.C.; and, PSD-FL-121(C)]

C.2. Capacity. The procedures specified in paragraphs (1) and (2) shall be used for calculating municipal waste combustor unit capacity as defined under 40 CFR 60.51b.
(1) For municipal waste combustor units capable of combusting municipal solid waste continuously for a 24-hour period, municipal waste combustor unit capacity shall be calculated based on 24 hours of operation at the maximum charging rate. The maximum charging rate shall be determined as specified in paragraphs (i) and(ii) as applicable.

(i) For combustors that are designed based on heat capacity, the maximum charging rate shall be calculated based on the maximum design heat input capacity of the unit and a heating value of 12,800 kilojoules per kilogram for combustors firing refuse-derived fuel and a heating value of 10,500 kilojoules per kilogram for combustors firing municipal solid waste that is not refuse-derived fuel.

(ii) For combustors that are not designed based on heat capacity, the maximum charging rate shall be the maximum design charging rate.

[40 CFR 60.31b and 40 CFR 60.58b(j)]

C.3. Emissions Unit Operating Rate Limitation After Testing. See specific condition **C.51.**
[Rule 62-297.310(2), F.A.C.]

C.4. Maximum Demonstrated Municipal Waste Combustor Unit Load. Unit load means the steam load of the municipal waste combustor measured as specified in 40 CFR 60.58b(I)(6). Each unit shall not operate at a load level greater than 110 percent of the unit's "maximum demonstrated unit load." Maximum demonstrated municipal waste combustor unit load means the highest 4-hour arithmetic average municipal waste combustor unit load achieved during four consecutive hours during the most recent dioxin/furan performance test demonstrating compliance with the applicable limit for municipal waste combustor organics specified in specific condition **C.25.** Higher loads are allowed for testing purposes as specified in 40 CFR 60.53b(b).
[40 CFR 60.34b(b) and 40 CFR 60.51b; and, PSD-FL-121(C)]

C.5. Maximum Demonstrated Particulate Matter Control Device Temperature. Maximum demonstrated particulate matter control device temperature means the highest 4-hour arithmetic average flue gas temperature measured at the particulate matter control device inlet during four consecutive hours during the most recent dioxin/furan performance test demonstrating compliance with the applicable limit for municipal waste combustor organics specified in specific condition **C.25.**
[40 CFR 60.34b(b) and 40 CFR 60.51b]

C.6.0. Methods of Operation - Fuels. The primary fuel for the facility is municipal solid waste (MSW), including the items and materials that fit within the definition of MSW contained in either 40 CFR 60.51b or Section 403.706(5), Florida Statutes (1995).

C.6.1. Subject to the limitations contained in this permit, the authorized fuels for the facility also include the other solid wastes that are not MSW which are described below. However, the facility shall not knowingly burn:
(a) those materials that are prohibited by state or federal law;
(b) those materials that are prohibited by this permit;
(c) lead acid batteries;
(d) hazardous waste;
(e) nuclear waste;
(f) radioactive waste;
(g) sewage sludge;
(h) explosives;
(i) beryllium-containing waste as defined in 40 CFR 61.31(g);
(j) untreated biomedical waste from biomedical waste generators regulated pursuant to Chapter 64E-16, F.A.C., and from other similar generators (or sources);
(k) segregated loads of biological waste.

C.6.2. The fuel may be received either as a mixture or as a single-item stream (segregated load) of discarded materials. If the facility intends to use an authorized fuel that is segregated non-MSW material, the fuel shall be either:
(a) well mixed with MSW in the refuse pit; or
(b) alternately charged with MSW in the hopper.

C.6.3. The facility operator shall prepare and maintain records concerning the description and quantities of all segregated loads of non-MSW material which are received and used as fuel at the facility, and subject to a percentage weight limitation, below (**C.6.6.** and **C.6.7.**). For the purposes of this permit, a segregated load is defined to mean a container or truck that is almost completely or exclusively filled with a single item or homogeneous composition of waste material, as determined by visual observation.

C.6.4. To ensure that the facility's fuel does not adversely affect the facility's combustion process or emissions, the facility operator shall:
(a) comply with good combustion operating practices in accordance with 40 CFR 60.53b;
(b) install, operate and maintain continuous emissions monitors (CEMS) for oxygen, carbon monoxide, sulfur dioxide, oxides of nitrogen and temperature in accordance with 40 CFR 60.58b; and
(c) record and maintain the CEMS data in accordance with 40 CFR 60.59b.

These steps shall be used to ensure and verify continuous compliance with the emissions limitations in this permit.

Natural gas may be used as fuel during warm-up, startup, shutdown, and malfunction periods, and at other times when necessary and consistent with good combustion practices.

C.6.5. Subject to the conditions and limitations contained in this permit, the following other solid waste may be used as fuel at the facility:
(a) Confidential, proprietary or special documents (including but not limited to business records, lottery tickets, event tickets, coupons and microfilm);
(b) Contraband which is being destroyed at the request of appropriately authorized local, state or federal governmental agencies, provided that such material is not an explosive, a propellant, a hazardous waste, or otherwise prohibited at the facility. For the purposes of this section, contraband includes but is not limited to drugs, narcotics, fruits, vegetables, plants, counterfeit money, and counterfeit consumer goods;
(c) Wood pallets, clean wood, and land clearing debris;
(d) Packaging materials and containers;
(e) Clothing, natural and synthetic fibers, fabric remnants, and similar debris, including but not limited to aprons and gloves; or
(f) Rugs, carpets, and floor coverings, but not asbestos-containing materials or polyethylene or polyurethane vinyl floor coverings.

C.6.6. Subject to the conditions and limitations contained in this permit, waste tires may be used as fuel at the facility. The total quantity of waste tires received as segregated loads and burned at the facility shall not exceed 3%, by weight, of the facility's total fuel. Compliance with this limitation shall be determined on a calendar month basis in accordance with specific condition **C.86.** below.

C.6.7. Subject to the conditions and limitations contained in this permit, the following other solid waste materials may be used as fuel at the facility (i.e. the following are authorized fuels that are non-MSW material). The total quantity of the following non-MSW material received as segregated loads and burned at the facility shall not exceed 5%, by weight, of the facility's total fuel. Compliance with this limitation shall be determined on a calendar month basis in accordance with specific condition **C.86.** below.
(a) Construction and demolition debris.
(b) Oil spill debris from aquatic, coastal, estuarine or river environments. Such items or materials include but are not limited to rags, wipes, and absorbents.

(c) Items suitable for human, plant or domesticated animal use, consumption or application where the item's shelf-life has expired or the generator wishes to remove the items from the market. Such items or materials include but are not limited to off-specification or expired consumer products, pharmaceuticals, medications, health and personal care products, cosmetics, foodstuffs, nutritional supplements, returned goods, and controlled substances.
(d) Consumer-packaged products intended for human or domesticated animal use or application but not consumption. Such items or materials include but are not limited to carpet cleaners, household or bathroom cleaners, polishes, waxes and detergents.
(e) Waste materials that:
(i) are generated in the manufacture of items in categories (c) or (d), above and are functionally or commercially useless (expired, rejected or spent); or
(ii) are not yet formed or packaged for commercial distribution. Such items or materials must be substantially similar to other items or materials routinely found in MSW.
(f) Waste materials that contain oil from:
(i) the routine cleanup of industrial or commercial establishments and machinery; or
(ii) spills of virgin or used petroleum products. Such items or materials include but are not limited to rags, wipes, and absorbents.
(g) Used oil and used oil filters. Used oil containing a PCB concentration equal or greater than 50 ppm shall not be burned, pursuant to the limitations of 40 CFR 761.20(e).

{Permitting note: Waste materials specifically authorized above do not require Department approval.}

(h) Waste materials generated by manufacturing, industrial or agricultural activities, provided that these items or materials are substantially similar to items or materials that are found routinely in MSW, subject to prior approval of the Department.

C.6.8. Auxiliary Burners:
(a) Auxiliary burners for each unit shall be fired only by natural gas. The annual capacity factor for natural gas shall be 10 percent or less. Monthly records shall be maintained of the amount of natural gas used by the auxiliary burners in each unit; and, the equivalent gross heat input. On an annual basis (no later than 60 days after the end of the calendar year), a demonstration must be performed based on the monthly records showing that the capacity factor for natural gas in each unit was 10 percent or less. The annual capacity factor for natural gas is the ratio between the heat input to the unit from natural gas and the potential heat input to the unit had it been operated for 8760 hours during a calendar year at the maximum steady state design heat input capacity.
(b) During boiler startup, the auxiliary burners shall be operating at their maximum capacity prior to the introduction of municipal solid waste to the boilers, and shall remain in operation until the lime spray dryer and particulate control device are fully operational.
[Rules 62-4.160(2) and 62-213.440(1), F.A.C.; and, PSD-FL-121(C)]

C.7. Hours of Operation. This emissions unit is allowed to operate continuously, i.e., 8,760 hours/year.
[Rule 62-210.200(PTE), F.A.C.]

Operating Practices and Requirements

C.8. No owner or operator of an affected facility shall cause such facility to operate at a load level greater than 110 percent of the maximum demonstrated municipal waste combustor unit load as defined in specific condition **C.4.**, except as specified below. The averaging time is specified in specific condition **C.10.**
(1) During the annual dioxin/furan performance test and the two weeks preceding the annual dioxin/furan performance test, no municipal waste combustor unit load limit is applicable.
(2) The municipal waste combustor unit load limit may be waived in accordance with permission granted by the Administrator or delegated State regulatory authority for the purpose of evaluating system performance, testing new technology or control technologies, diagnostic testing, or related activities for the purpose of improving facility performance or advancing the state-of-the-art for controlling facility emissions.
[40 CFR 60.34b(b) and 40 CFR 60.53b(b)]

C.9. No owner or operator of an affected facility shall cause such facility to operate at a temperature, measured at the particulate matter control device inlet, exceeding 17□C above the maximum demonstrated particulate matter control device temperature as defined in specific condition **C.5.**, except as specified below. The averaging time is specified in specific condition **C.10.** These requirements apply to each particulate matter control device utilized at the affected facility.
(1) During the annual dioxin/furan performance test and the two weeks preceding the annual dioxin/furan performance test, no particulate matter control device temperature limitations are applicable.
(2) The particulate matter control device temperature limits may be waived in accordance with permission granted by the Administrator or delegated State regulatory authority for the purpose of evaluating system performance, testing new technology or control technologies, diagnostic testing, or related activities for the purpose of improving facility performance or advancing the state-of-the-art for controlling facility emissions.
[40 CFR 60.34b(b) and 40 CFR 60.53b(c)]

C.10. Operating Requirements. The procedures specified in paragraphs (1) through (12) shall be used for determining compliance with the operating requirements under 40 CFR 60.53b.
(1) Compliance with the carbon monoxide emission limits in 40 CFR 60.53b(a) shall be determined using a 4-hour block arithmetic average for all types of affected facilities except mass burn rotary waterwall municipal waste combustors and refuse-derived fuel stokers.

(2) For affected mass burn rotary waterwall municipal waste combustors and refuse-derived fuel stokers, compliance with the carbon monoxide emission limits in 40 CFR 60.53b(a) shall be determined using a 24-hour daily arithmetic average.
(3) The owner or operator of an affected facility shall install, calibrate, maintain, and operate a continuous emission monitoring system for measuring carbon monoxide at the combustor outlet and record the output of the system and shall follow the procedures and methods specified in paragraphs(i) through(iii).

(i) The continuous emission monitoring system shall be operated according to Performance Specification 4A in appendix B of 40 CFR 60.

(ii) During each relative accuracy test run of the continuous emission monitoring system required by Performance Specification 4A in appendix B of 40 CFR 60, carbon monoxide and oxygen (or carbon dioxide) data shall be collected concurrently (or within a 30- to 60-minute period) by both the continuous emission monitors and the test methods specified in paragraphs (A) and (B).

(A) For carbon monoxide, EPA Reference Method 10, 10A, or 10B shall be used.

(B) For oxygen (or carbon dioxide), EPA Reference Method 3, 3A, or 3B, as applicable shall be used.

(iii) The span value of the continuous emission monitoring system shall be 125 percent of the maximum estimated hourly potential carbon monoxide emissions of the municipal waste combustor unit.

(4) The 4-hour block and 24-hour daily arithmetic averages specified in paragraphs (1) and (2) shall be calculated from 1-hour arithmetic averages expressed in parts per million by volume corrected to 7 percent oxygen (dry basis). The 1-hour arithmetic averages shall be calculated using the data points generated by the continuous emission monitoring system. At least two data points shall be used to calculate each 1-hour arithmetic average.
(5) The owner or operator of an affected facility may request that compliance with the carbon monoxide emission limit be determined using carbon dioxide measurements corrected to an equivalent of 7 percent oxygen. The relationship between oxygen and carbon dioxide levels for the affected facility shall be established as specified in 40 CFR 60.58b(b)(6).
(6) The procedures specified in paragraphs (i) through (v) shall be used to determine compliance with load level requirements under 40 CFR 60.53b(b).

(i) The owner or operator of an affected facility with steam generation capability shall install, calibrate, maintain, and operate a steam flow meter or a feed water flow meter; measure steam (or feed water) flow in kilograms per hour (or pounds per hour) on a continuous basis; and record the output of the monitor. Steam (or feed water) flow shall be calculated in 4-hour block arithmetic averages.

(ii) The method included in the ``American Society of Mechanical Engineers Power Test Codes: Test Code for Steam Generating Units, Power Test Code 4.1-1964 (R1991)" section 4 (incorporated by reference, see 40 CFR 60.17) shall be used for calculating the steam (or feed water) flow required under paragraph (6)(i). The recommendations in ``American Society of Mechanical Engineers Interim Supplement 19.5 on Instruments and Apparatus: Application, Part II of Fluid Meters, 6th edition (1971)," chapter 4 (incorporated by

reference-see 40 CFR 60.17) shall be followed for design, construction, installation, calibration, and use of nozzles and orifices except as specified in (iii).

(iii) Measurement devices such as flow nozzles and orifices are not required to be recalibrated after they are installed.

(iv) All signal conversion elements associated with steam (or feed water flow) measurements must be calibrated according to the manufacturer's instructions before each dioxin/furan performance test, and at least once per year.

(7) To determine compliance with the maximum particulate matter control device temperature requirements under 40 CFR 60.53b(c), the owner or operator of an affected facility shall install, calibrate, maintain, and operate a device for measuring on a continuous basis the temperature of the flue gas stream at the inlet to each particulate matter control device utilized by the affected facility. Temperature shall be calculated in 4-hour block arithmetic averages.

(8) The maximum demonstrated municipal waste combustor unit load shall be determined during the initial performance test for dioxins/furans and each subsequent performance test during which compliance with the dioxin/furan emission limit specified in 40 CFR 60.52b(c) is achieved. The maximum demonstrated municipal waste combustor unit load shall be the highest 4-hour arithmetic average load achieved during four consecutive hours during the most recent test during which compliance with the dioxin/furan emission limit was achieved.

(9) For each particulate matter control device employed at the affected facility, the maximum demonstrated particulate matter control device temperature shall be determined during the initial performance test for dioxins/furans and each subsequent performance test during which compliance with the dioxin/furan emission limit specified in 40 CFR 60.52b(c) is achieved. The maximum demonstrated particulate matter control device temperature shall be the highest 4-hour arithmetic average temperature achieved at the particulate matter control device inlet during four consecutive hours during the most recent test during which compliance with the dioxin/furan limit was achieved.

(10) At a minimum, valid continuous emission monitoring system hourly averages shall be obtained as specified in paragraphs(i) and(ii) for 75 percent of the operating hours per day for 90 percent of the operating days per calendar quarter that the affected facility is combusting municipal solid waste.

(i) At least two data points per hour shall be used to calculate each 1-hour arithmetic average.

(ii) At a minimum, each carbon monoxide 1-hour arithmetic average shall be corrected to 7 percent oxygen on an hourly basis using the 1-hour arithmetic average of the oxygen (or carbon dioxide) continuous emission monitoring system data.

(11) All valid continuous emission monitoring system data must be used in calculating the parameters specified under 40 CFR 60.58b(i) even if the minimum data requirements of paragraph (10) are not met. When carbon monoxide continuous emission data are not obtained because of continuous emission monitoring system breakdowns, repairs, calibration checks, and zero and span adjustments, emissions data shall be obtained using other monitoring systems as approved by the Administrator or EPA Reference Method 10 to provide, as necessary, the minimum valid emission data.

(12) Quarterly accuracy determinations and daily calibration drift tests for the carbon monoxide continuous emission monitoring system shall be performed in accordance with procedure 1 in appendix F of 40 CFR 60.
[40 CFR 60.38b and 40 CFR 60.58b(i)]

Operator Training and Certification

C.11. Standards for municipal waste combustor operator training and certification.
(a) No later than the date 6 months after the date of startup of an affected facility or 12 months after State plan approval [40 CFR 60.39b(c)(4)(ii)], whichever is later, each chief facility operator and shift supervisor shall obtain and maintain a current provisional operator certification from either the American Society of Mechanical Engineers [QRO-1-1994 (incorporated by reference - see 40 CFR 60.17 of Subpart A)] or a State certification program.
(b) No later than the date 6 months after the date of startup of an affected facility or 12 months after State plan approval [40 CFR 60.39b(c)(4)(ii)], whichever is later, each chief facility operator and shift supervisor shall have completed full certification or shall have scheduled a full certification exam with either the American Society of Mechanical Engineers [QRO-1-1994 (incorporated by reference - see 40 CFR 60.17 of Subpart A)] or a State certification program.
(c) No owner or operator of an affected facility shall allow the facility to be operated at any time unless one of the following persons is on duty and at the affected facility: A fully certified chief facility operator, a provisionally certified chief facility operator who is scheduled to take the full certification exam according to the schedule specified in paragraph (b), a fully certified shift supervisor, a provisionally certified shift supervisor who is scheduled to take the full certification exam according to the schedule specified in paragraph (b).

(1) The requirement specified in paragraph (c) shall take effect 6 months after the date of startup of the affected facility or 12 months after State plan approval [40 CFR 60.39b(c)(4)(ii)], whichever is later.

(2) If one of the persons listed in paragraph (c) must leave the affected facility during their operating shift, a provisionally certified control room operator who is onsite at the affected facility may fulfill the requirement in paragraph (c).

(d) All chief facility operators, shift supervisors, and control room operators at affected facilities must complete the EPA or State municipal waste combustor operator training course no later than the date 6 months after the date of startup of the affected facility, or by 12 months after State plan approval [40 CFR 60.39b(c)(4)(iii)], whichever is later.
(e) The owner or operator of an affected facility shall develop and update on a yearly basis a site-specific operating manual that shall, at a minimum, address the elements of municipal waste combustor unit operation specified in paragraphs (e)(1) through (e)(11).

(1) A summary of the applicable standards;

(2) A description of basic combustion theory applicable to a municipal waste combustor unit;

(3) Procedures for receiving, handling, and feeding municipal solid waste;

(4) Municipal waste combustor unit startup, shutdown, and malfunction procedures;

(5) Procedures for maintaining proper combustion air supply levels;

(6) Procedures for operating the municipal waste combustor unit within the standards established;
(7) Procedures for responding to periodic upset or off-specification conditions;
(8) Procedures for minimizing particulate matter carryover;
(9) Procedures for handling ash;
(10) Procedures for monitoring municipal waste combustor unit emissions; and
(11) Reporting and recordkeeping procedures.

(f) The owner or operator of an affected facility shall establish a training program to review the operating manual according to the schedule specified in paragraphs (f)(1) and (f)(2) with each person who has responsibilities affecting the operation of an affected facility including, but not limited to, chief facility operators, shift supervisors, control room operators, ash handlers, maintenance personnel, and crane/load handlers.

(1) Each person specified in paragraph (f) shall undergo initial training no later than the date specified in paragraph (f)(1)(i), (f)(1)(ii), or (f)(1)(iii), whichever is later.
(i) The date 6 months after the date of startup of the affected facility;
(ii) The date prior to the day the person assumes responsibilities affecting municipal waste combustor unit operation; or
(iii) 12 months after State plan approval [40 CFR 60.39b(c)(4)(iii)].

(2) Annually, following the initial review required by paragraph (f)(1).

(g) The operating manual required by paragraph (e) shall be kept in a readily accessible location for all persons required to undergo training under paragraph (f). The operating manual and records of training shall be available for inspection by the EPA or its delegated enforcement agency upon request.
[40 CFR 60.35b, 40 CFR 60.39b(c)(4)(ii) & (iii), and 40 CFR 60.54b]

C.12. The requirement specified in 40 CFR 60.54b(d) does not apply to chief operators, shift supervisors, and control room operators who have obtained full certification from the American Society of Mechanical Engineers on or before the date of State plan approval.
[40 CFR 60.39b(c)(4)(iii)(A)]

C.13. The owner or operator of a designated facility may request that the EPA Administrator waive the requirement specified in 40 CFR 60.54b(d) for chief operators, shift supervisors, and control room operators who have obtained provisional certification from the American Society of Mechanical Engineers on or before the date of State plan approval.
[40 CFR 60.39b(c)(4)(iii)(B)]

C.14. The initial training requirements specified in 40 CFR 60.54b(f)(1) shall be completed no later than the date specified in (1), (2), or (3), whichever is later.
(1) The date six (6) months after the date of startup of the affected facility;
(2) Twelve (12) months after State plan approval; or
(3) The date prior to the day when the person assumes responsibilities affecting municipal waste combustor unit operation.
[40 CFR 60.39b(c)(4)(iii)(C)]

Emission Limitations and Standards

{Permitting note: Table 1-1, Summary of Air Pollutant Standards and Terms, summarizes information for convenience purposes only. This table does not supersede any of the terms or conditions of this permit.}

{Permitting Note: Unless otherwise specified, the averaging times for Specific Conditions **C.15.** - **C.18.** and **C.22.** - **C.31.** are based on the specified averaging time of the applicable test method.}

{Permitting note: Equivalent emissions (pound per hour and pound per million Btu), where they appear, are listed for the purposes of providing information and to indicate the potential to emit and are not emission compliance standards.}

Particulate Matter

C.15. The emission limit for particulate matter contained in the gases discharged to the atmosphere from each MWC unit is 27 milligrams per dry standard cubic meter or 0.012 grain per dry standard cubic foot, corrected to 7 percent oxygen (equivalent to 0.024 lb/MMBtu, heat input and 4.1 lbs/hr) and 17.96 tons/yr.
[40 CFR 60.33b(a)(1)(i) and PSD-FL-121(C)]

Visible Emissions

C.16. The emission limit for opacity exhibited by the gases discharged to the atmosphere from each MWC unit is 10 percent (6-minute block average).
[40 CFR 60.33b(a)(1)(iii) and PSD-FL-121(C)]

Cadmium

C.17. The emission limit for cadmium contained in the gases discharged to the atmosphere from each MWC unit is 0.040 milligrams per dry standard cubic meter, corrected to 7 percent oxygen (equivalent to 3.47E-05 lb/MMBtu, heat input and 6.00E-03 lb/hr) and 0.026 ton/yr.
[40 CFR 60.33b(a)(2)(i) and PSD-FL-121(C)]

Mercury

C.18. The emission limit for mercury contained in the gases discharged to the atmosphere from each MWC unit is 0.070 milligrams per dry standard cubic meter or 15 percent of the potential mercury emission concentration (85-percent reduction by weight), corrected to 7 percent oxygen, whichever is less stringent (equivalent to 1.17E-04 lb/MMBtu, heat input or 15 percent of the potential mercury emission concentration (85-percent reduction by weight), corrected to 7 percent oxygen, whichever is less stringent and 0.020 lb/hr or 15 percent of the potential mercury emission concentration (85-percent reduction by weight), corrected to 7 percent oxygen, whichever is less stringent) and 0.087 ton/yr.
[40 CFR 60.33b(a)(3); Rule 62-296.416(3)(a)1., F.A.C.; and, PSD-FL-121(C)]

C.19. Facilities subject to the mercury emissions limiting standard of Rule 62-296.416(3)(a)1., F.A.C., shall demonstrate individual emissions unit compliance by the compliance date specified in Rule 62-296.416(3)(a)2., F.A.C., and annually thereafter.
[Rule 62-296.416(3)(a)3., F.A.C.]

C.20. [reserved]

C.21. [reserved]

Lead

C.22. The emission limit for lead contained in the gases discharged to the atmosphere from each MWC unit is 0.44 milligrams per dry standard cubic meter, corrected to 7 percent oxygen (equivalent to 3.81E-04 lb/MMBtu, heat input and 0.065 lb/hr) and 0.288 ton/yr.
[40 CFR 60.33b(a)(4) and PSD-FL-121(C)]

Sulfur Dioxide

C.23. The emission limit for sulfur dioxide contained in the gases discharged to the atmosphere from each MWC unit is 29 parts per million by volume or 25 percent of the potential sulfur dioxide emission concentration (75-percent reduction by weight or volume), corrected to 7 percent oxygen (dry basis), whichever is less stringent (equivalent to 0.190 lb/MMBtu, heat input or 25 percent of the potential sulfur dioxide emission concentration (75-percent reduction by weight or volume), corrected to 7 percent oxygen (dry basis), whichever is less stringent and 32.86 lbs/hr or 25 percent of the potential sulfur dioxide emission concentration (75-percent reduction by weight or volume), corrected to 7 percent oxygen (dry basis), whichever is less stringent) and 143.9 tons/yr. Compliance with this emission limit is based on a 24-hour daily geometric mean.
[40 CFR 60.33b(b)(3)(i) and PSD-FL-121(C)]

Hydrogen Chloride

C.24. The emission limit for hydrogen chloride contained in the gases discharged to the atmosphere from each MWC unit is 29 parts per million by volume or 5 percent of the potential hydrogen chloride emission concentration (95-percent reduction by weight or volume), corrected to 7 percent oxygen (dry basis), whichever is less stringent (0.099 lb/MMBtu, heat input or 5 percent of the potential hydrogen chloride emission concentration (95-percent reduction by
weight or volume), corrected to 7 percent oxygen (dry basis), whichever is less stringent and 17.00 lbs/hr or 5 percent of the potential hydrogen chloride emission concentration (95-percent reduction by weight or volume), corrected to 7 percent oxygen (dry basis), whichever is less stringent) and 74.43 tons/yr.
[40 CFR 60.33b(b)(3)(ii) and PSD-FL-121(C)]

Dioxins/Furans

C.25. The emission limit for dioxins/furans contained in the gases discharged to the atmosphere from each MWC unit that do not employ an electrostatic precipitator-based emission control system is 30 nanograms per dry standard cubic meter (total mass), corrected to 7 percent oxygen (equivalent to 2.60E-08 lb/MMBtu, heat input and 4.5E-06 lb/hr) and 1.96E-05 ton/yr.
[40 CFR 60.33b(c)(1)(ii) and PSD-FL-121(C)]

Nitrogen Oxides

C.26. The emission limit for nitrogen oxides contained in the gases discharged to the atmosphere from each MWC unit is 205 parts per million by volume, corrected to 7 percent oxygen, dry basis (equivalent to 0.34 lb/MMBtu, heat input and 58.63 lbs/hr) and 256 tons/yr. Compliance with this emission limit is based on a 24-hour daily arithmetic mean.

Nitrogen oxide emissions from the auxiliary burners are approximately 3.45 lbs/hr and 15.1 tons/yr per unit. These emissions are part of, and not in addition to, combustor emissions. Allowable emissions for MSW combustors include auxiliary burners. This facility is limited to a 10 percent (0.10) or less, total annual gross heat input for natural gas consumption. Auxiliary burners for each MWC unit shall be fired only by natural gas, and consumption of natural gas shall not exceed 104,937,500 cubic feet per MWC unit in any calendar year (i.e., annual capacity factor for natural gas of 10% or less as determined by 40 CFR 60.44b(d)).
[40 CFR 60.33b(d) and PSD-FL-121(C)]

Carbon Monoxide

C.27. The emission limit for carbon monoxide contained in the gases discharged to the atmosphere from each MWC unit is 100 parts per million by volume, measured at the combustor outlet in conjunction with a measurement of oxygen concentration, corrected to 7 percent oxygen, dry basis (equivalent to 0.101 lb/MMBtu, heat input and 17.4 lbs/hr) and 76.26 tons/yr. Calculated as an arithmetic average. Averaging time is a 4-hour block average.
[40 CFR 60.34b(a); Rules 62-212.400(2)(g) and 62-212.400(5), F.A.C.; and, PSD-FL-121(C)]

Fluoride

C.28. The emission limit for fluoride contained in the gases discharged to the atmosphere from each MWC unit is 6.74 milligrams per dry standard cubic meter, corrected to 7 percent oxygen (equivalent to 0.0059 lb/MMBtu, heat input and 1.00 lbs/hr) and 4.43 tons/yr.
[PSD-FL-121(C)]

Beryllium

C.29. The emission limit for beryllium contained in the gases discharged to the atmosphere from each MWC unit is 1.48 micrograms per dry standard cubic meter, corrected to 7 percent oxygen (equivalent to 1.27E-06 lb/MMBtu, heat input and 2.18E-04 lbs/hr) and 9.6E-04 ton/yr.
[Rules 62-212.400(2)(g) and 62-212.400(5), F.A.C.; and, PSD-FL-121(C)]

Volatile Organic Compounds

C.30. The emission limit for volatile organic compounds contained in the gases discharged to the atmosphere from each MWC unit shall not exceed 0.01 grain per dry standard cubic foot, corrected to 12 percent carbon dioxide or 0.2 lb/ton, whichever is more restrictive, to be demonstrated during the initial compliance test, only.
[PSD-FL-104 and PSD-FL-121(C)]

Sulfuric Acid Mist

C.31. The emission limit for sulfuric acid mist contained in the gases discharged to the atmosphere from each MWC unit shall not exceed 0.072 grain per dry standard cubic foot, corrected to 12 percent carbon dioxide, to be demonstrated during the initial compliance test, only.
[PSD-FL-121(C)]

Excess Emissions

{Permitting note: The Excess Emissions Rule at Rule 62-210.700, F.A.C., cannot vary any requirement of an NSPS, NESHAP, or Acid Rain program provision.}

C.32. The opacity standards set forth in 40 CFR 60 shall apply at all times except during periods of startup, shutdown, malfunction, and as otherwise provided in the applicable standard.
[40 CFR 60.11(c)]

C.33. At all times, including periods of startup, shutdown, and malfunction, owners and operators shall, to the extent practicable, maintain and operate any affected facility including associated air pollution control equipment in a manner consistent with good air pollution control practice for minimizing emissions. Determination of whether acceptable operating and maintenance procedures are being used will be based on information available to the Administrator which may include, but is not limited to, monitoring results, opacity observations, review of operating and maintenance procedures, and inspection of the source.
[40 CFR 60.11(d)]

C.34.a. Startup, Shutdown and Malfunction. The standards under 40 CFR 60, Subpart Cb apply at all times except during periods of startup, shutdown, or malfunction. Duration of startup or shutdown periods are limited to 3 hours per occurrence.
(i) The startup period commences when the affected facility begins the continuous burning of municipal solid waste and does not include any warm-up period when the affected facility is combusting fossil fuel or other nonmunicipal solid waste fuel, and no municipal solid waste is being fed to the combustor.
(ii) Continuous burning is the continuous, semicontinuous, or batch feeding of municipal solid waste for purposes of waste disposal, energy production, or providing heat to the combustion system in preparation for waste disposal or energy production. The use of municipal solid waste solely to provide thermal protection of the grate or hearth during the startup period when municipal solid waste is not being fed to the grate is not considered to be continuous burning.
[40 CFR 60.38b and 40 CFR 60.58b(a)]

C.34.b. For the purpose of compliance with the carbon monoxide emission limits in 40 CFR 60.53b(a), if a loss of boiler water level control (e.g., loss of combustion air fan, induced draft fan, combustion grate bar failure) is determined to be a malfunction, the duration of the malfunction period is limited to 15 hours per occurrence.
[40 CFR 60.58b(a)(1)iii]

C.35. Excess emissions resulting from malfunction shall be permitted provided that best operational practices to minimize emissions are adhered to and the duration of excess emissions shall be minimized but in no case exceed three hours per occurrence. A malfunction means any sudden and unavoidable failure of air pollution control equipment or process equipment to operate in a normal or usual manner.
[Rule 62-210.700(1), F.A.C.; and, PSD-FL-121(C)]

C.36. Excess emissions which are caused entirely or in part by poor maintenance, poor operation, or any other equipment or process failure which may reasonably be prevented during malfunction shall be prohibited.
[Rule 62-210.700(4), F.A.C.]

Test Methods and Procedures

{Permitting note: Table 2-1, Summary of Compliance Requirements, summarizes information for convenience purposes only. This table does not supersede any of the terms or conditions of this permit.}

C.37. Performance tests shall be conducted under such conditions as the Administrator shall specify to the plant operator based on representative performance of the affected facility. The owner or operator shall make available to the Administrator such records as may be necessary to determine the conditions of the performance tests. Operations during periods of startup, shutdown, and malfunction shall not constitute representative conditions for the purpose of a performance test nor shall emissions in excess of the level of the applicable emission limit during periods of startup, shutdown, and malfunction be considered a violation of the applicable emission limit unless otherwise specified in the applicable standard.
[40 CFR 60.8(c)]

Particulate Matter and Opacity

C.38. The procedures and test methods specified in paragraphs (1) through (11) shall be used to determine compliance with the emission limits for particulate matter and opacity.
(1) The EPA Reference Method 1 shall be used to select sampling site and number of traverse points.
(2) The EPA Reference Method 3, 3A, or 3B, as applicable shall be used for gas analysis.
(3) The EPA Reference Method 5 shall be used for determining compliance with the particulate matter emission limit. The minimum sample volume shall be 1.7 cubic meters. The probe and filter holder heating systems in the sample train shall be set to provide a gas temperature no greater than 160 $\pm$14 □C. An oxygen or carbon dioxide measurement shall be obtained simultaneously with each Method 5 run.
(4) The owner or operator of an affected facility may request that compliance with the particulate matter emission limit be determined using carbon dioxide measurements corrected to an equivalent of 7 percent oxygen. The relationship between oxygen and carbon dioxide levels for the affected facility shall be established as specified in paragraph (6).
(5) As specified under 40 CFR 60.8, all performance tests shall consist of three test runs. The average of the particulate matter emission concentrations from the three test runs is used to determine compliance.
(6) In accordance with paragraphs (7) and (11), EPA Reference Method 9 shall be used for determining compliance with the opacity limit except as provided under 40 CFR 60.11(e)

(7) The owner or operator of an affected facility shall conduct an initial performance test for particulate matter emissions and opacity as required under 40 CFR 60.8.
(8) The owner or operator of an affected facility shall install, calibrate, maintain, and operate a continuous opacity monitoring system for measuring opacity and shall follow the methods and procedures specified in paragraphs (8)(i) through (8)(iv).

(i) The output of the continuous opacity monitoring system shall be recorded on a 6-minute average basis.

(ii) The continuous opacity monitoring system shall be installed, evaluated, and operated in accordance with 40 CFR 60.13.

(iii) The continuous opacity monitoring system shall conform to Performance Specification 1 in appendix B of 40 CFR 60.

(iv) The initial performance evaluation shall be completed no later than 180 days after the date of the initial startup of the municipal waste combustor unit, as specified under 40 CFR 60.8.

(9) Following the date that the initial performance test for particulate matter is completed or is required to be completed under 40 CFR 60.8 for an affected facility, the owner or operator shall conduct a performance test for particulate matter on an annual basis (no more than 12 calendar months following the previous performance test).
(10) [reserved]
(11) Following the date that the initial performance test for opacity is completed or is required to be completed under 40 CFR 60.8 for an affected facility, the owner or operator shall conduct a performance test for opacity on an annual basis (no more than 12 calendar months following the previous performance test) using the test method specified in paragraph (6).
[40 CFR 60.38b and 40 CFR 60.58b(c)]

Cadmium, Lead and Mercury

C.39. The procedures and test methods specified in paragraphs (1) and (2) shall be used to determine compliance with the emission limits for cadmium, lead, and mercury.
(1) The procedures and test methods specified in paragraphs (1)(i) through (1)(ix) shall be used to determine compliance with the emission limits for cadmium and lead.

(i) The EPA Reference Method 1 shall be used for determining the location and number of sampling points.

(ii) The EPA Reference Method 3, 3A, or 3B, as applicable, shall be used for flue gas analysis.

(iii) The EPA Reference Method 29 shall be used for determining compliance with the cadmium and lead emission limits.

(iv) An oxygen or carbon dioxide measurement shall be obtained simultaneously with each Method 29 test run for cadmium and lead required under paragraph (1)(iii).

(v) The owner or operator of an affected facility may request that compliance with the cadmium or lead emission limit be determined using carbon dioxide measurements corrected to an equivalent of 7 percent oxygen. The relationship between oxygen and carbon dioxide levels for the affected facility shall be established as specified in paragraph 40 CFR 60.58b(b)(6).

(vi) All performance tests shall consist of a minimum of three test runs conducted under representative full load operating conditions. The average of the cadmium or lead emission concentrations from three test runs or more shall be used to determine compliance.
(vii) Following the date of the initial performance test or the date on which the initial performance test is required to be completed under 40 CFR 60.8, the owner or operator of an affected facility shall conduct a performance test for compliance with the emission limits for cadmium and lead on an annual basis (no more than 12 calendar months following the previous performance test).
(viii) [reserved]
(ix) [reserved]

(2) The procedures and test methods specified in paragraphs (2)(i) through (2)(xi) shall be used to determine compliance with the mercury emission limit.
(i) The EPA Reference Method 1 shall be used for determining the location and number of sampling points.
(ii) The EPA Reference Method 3, 3A, or 3B, as applicable, shall be used for flue gas analysis.
(iii) The EPA Reference Method 29 shall be used to determine the mercury emission concentration. The minimum sample volume when using Method 29 for mercury shall be 1.7 cubic meters.
(iv) An oxygen (or carbon dioxide) measurement shall be obtained simultaneously with each Method 29 test run for mercury required under paragraph (2)(iii).
(v) The percent reduction in the potential mercury emissions (%PHg) is computed using equation 1:

$$[\%P_{HG}] = \left[\frac{E_i - E_o}{E_i}\right] X\ 100 \qquad \text{(equation 1)}$$

where:

%PHG = percent reduction of the potential mercury emissions achieved.

E_i = potential mercury emission concentration measured at the control device inlet, corrected to 7 percent oxygen (dry basis).

E_o = controlled mercury emission concentration measured at the mercury control device outlet, corrected to 7 percent oxygen (dry basis).

(vi) All performance tests shall consist of a minimum of three test runs conducted under representative full load operating conditions. The average of the mercury emission concentrations or percent reductions from three test runs or more is used to determine compliance.
(vii) The owner or operator of an affected facility may request that compliance with the mercury emission limit be determined using carbon dioxide measurements corrected to an

equivalent of 7 percent oxygen. The relationship between oxygen and carbon dioxide levels for the affected facility shall be established as specified in paragraph 40 CFR 60.58b(b)(6).
(viii) The owner or operator of an affected facility shall conduct an initial performance test for mercury emissions as required under 40 CFR 60.8.
(ix) Following the date that the initial performance test for mercury is completed or is required to be completed under 40 CFR 60.8, the owner or operator of an affected facility shall conduct a performance test for mercury emissions on a annual basis (no more than 12 calendar months from the previous performance test).
(x) [reserved]
(xi) The owner or operator of an affected facility where activated carbon injection is used to comply with the mercury emission limit shall follow the procedures specified in 40 CFR 60.58b(m) for measuring and calculating carbon usage. See specific condition **C.81.**
[40 CFR 60.38b and 40 CFR 60.58b(d)]

C.40. Mercury Emissions Test Method and Procedures. All mercury emissions tests performed pursuant to the requirements of this rule shall comply with the following provisions.
1. The test method for mercury shall be EPA Method 29 adopted in Chapter 62-297, F.A.C.
2. Test procedures shall meet all applicable requirements of Chapter 62-297, F.A.C.
(4) Flue Gas Temperature Standard. Waste-to-energy facilities choosing to control mercury emissions through the use of post-combustion control equipment designed to remove mercury from flue gases shall comply with the flue gas temperature standard of Rule 62-296.416(4)(a), F.A.C.
(a) Temperature Standard. The flue gas temperature standard set forth in 40 CFR 60.53b(c), incorporated by reference in Rule 62-04.800, F.A.C., shall apply.
(b) Temperature Monitoring. The temperature monitoring requirements set forth in 40 CFR 60.58b(i), incorporated by reference in Rule 62-204.800, F.A.C., shall apply.
(5) Carbon Usage Rate. The carbon injection rate operating standard and monitoring requirements set forth in 40 CFR 60.58b(m), incorporated by reference in Rule 62-204.800, F.A.C., shall apply. See specific condition **C.81.**
[Rule 62-296.416(3)(d), F.A.C.]

Sulfur Dioxide

C.41. The procedures and test methods specified in paragraphs (1) through (14) shall be used for determining compliance with the sulfur dioxide emission.
(1) The EPA Reference Method 19, section 4.3, shall be used to calculate the daily geometric average sulfur dioxide emission concentration.
(2) The EPA Reference Method 19, section 5.4, shall be used to determine the daily geometric average percent reduction in the potential sulfur dioxide emission concentration.
(3) The owner or operator of an affected facility may request that compliance with the sulfur dioxide emission limit be determined using carbon dioxide measurements corrected to an equivalent of 7 percent oxygen. The relationship between oxygen and carbon dioxide levels for the affected facility shall be established as specified in 40 CFR 60.58b(b)(6).

(4) The owner or operator of an affected facility shall conduct an initial performance test for sulfur dioxide emissions as required under 40 CFR 60.8. Compliance with the sulfur dioxide emission limit (concentration or percent reduction) shall be determined by using the continuous emission monitoring system specified in paragraph (5) to measure sulfur dioxide and calculating a 24-hour daily geometric average emission concentration or a 24-hour daily geometric average percent reduction using EPA Reference Method 19, sections 4.3 and 5.4, as applicable.
(5) The owner or operator of an affected facility shall install, calibrate, maintain, and operate a continuous emission monitoring system for measuring sulfur dioxide emissions discharged to the atmosphere and record the output of the system.
(6) Following the date that the initial performance test for sulfur dioxide is completed or is required to be completed under 40 CFR 60.8, compliance with the sulfur dioxide emission limit shall be determined based on the 24-hour daily geometric average of the hourly arithmetic average emission concentrations using continuous emission monitoring system outlet data if compliance is based on an emission concentration, or continuous emission monitoring system inlet and outlet data if compliance is based on a percent reduction.
(7) At a minimum, valid continuous monitoring system hourly averages shall be obtained as specified in paragraphs (7)(i) and (7)(ii) for 75 percent of the operating hours per day for 90 percent of the operating days per calendar quarter that the affected facility is combusting municipal solid waste.

(i) At least two data points per hour shall be used to calculate each 1-hour arithmetic average.

(ii) Each sulfur dioxide 1-hour arithmetic average shall be corrected to 7 percent oxygen on an hourly basis using the 1-hour arithmetic average of the oxygen (or carbon dioxide) continuous emission monitoring system data.

(8) The 1-hour arithmetic averages required under paragraph (6) shall be expressed in parts per million corrected to 7 percent oxygen (dry basis) and used to calculate the 24-hour daily geometric average emission concentrations and daily geometric average emission percent reductions. The 1-hour arithmetic averages shall be calculated using the data points required under 40 CFR 60.13(e)(2).
(9) All valid continuous emission monitoring system data shall be used in calculating average emission concentrations and percent reductions even if the minimum continuous emission monitoring system data requirements of paragraph (7) are not met.
(10) The procedures under 40 CFR 60.13 shall be followed for installation, evaluation, and operation of the continuous emission monitoring system.
(11) The initial performance evaluation shall be completed no later than 180 days after the date of initial startup of the municipal waste combustor as specified under 40 CFR 60.8.
(12) The continuous emission monitoring system shall be operated according to Performance Specification 2 in 40 CFR 60 appendix B.

(i) During each relative accuracy test run of the continuous emission monitoring system required by Performance Specification 2 in 40 CFR 60 appendix B, sulfur dioxide and oxygen (or carbon dioxide) data shall be collected concurrently (or within a 30- to 60-minute period) by both the continuous emission monitors and the test methods specified in paragraphs (A) and (B).

(A) For sulfur dioxide, EPA Reference Method 6, 6A, or 6C shall be used.

(B) For oxygen (or carbon dioxide), EPA Reference Method 3, 3A, or 3B, as applicable shall be used.

(ii) The span value of the continuous emissions monitoring system at the inlet to the sulfur dioxide control device shall be 125 percent of the maximum estimated hourly potential sulfur dioxide emissions of the municipal waste combustor unit. The span value of the continuous emission monitoring system at the outlet of the sulfur dioxide control device shall be 50 percent of the maximum estimated hourly potential sulfur dioxide emissions of the municipal waste combustor unit.

(13) Quarterly accuracy determinations and daily calibration drift tests shall be performed in accordance with procedure 1 in appendix F of 40 CFR 60.

(14) When sulfur dioxide emissions data are not obtained because of continuous emission monitoring system breakdowns, repairs, calibration checks, and zero and span adjustments, emissions data shall be obtained by using other monitoring systems as approved by the Administrator or EPA Reference Method 19 to provide, as necessary, valid emissions data for a minimum of 75 percent of the hours per day that the affected facility is operated and combusting municipal solid waste for 90 percent of the days per calendar quarter that the affected facility is operated and combusting municipal solid waste.

[40 CFR 60.38b and 40 CFR 60.58b(e)]

Hydrogen Chloride

C.42. The procedures and test methods specified in paragraphs (1) through (8) shall be used for determining compliance with the hydrogen chloride emission limit.

(1) The EPA Reference Method 26 or 26A, as applicable, shall be used to determine the hydrogen chloride emission concentration. The minimum sampling time for Method 26 shall be 1 hour.

(2) An oxygen (or carbon dioxide) measurement shall be obtained simultaneously with each Method 26 test run for hydrogen chloride required by paragraph (1).

(3) The percent reduction in potential hydrogen chloride emissions (% PHCl) is computed using equation 2:

$$[\%P_{HCl}] = \left[\frac{E_i - E_o}{E_i}\right] X\ 100 \qquad \text{(equation 2)}$$

where:

%PHCl = *percent reduction of the potential hydrogen chloride emissions achieved.*

EI = potential hydrogen chloride emission concentration measured at the control device inlet, corrected to 7 percent oxygen (dry basis).

E_o = controlled hydrogen chloride emission concentration measured at the control device outlet, corrected to 7 percent oxygen (dry basis).

(4) The owner or operator of an affected facility may request that compliance with the hydrogen chloride emission limit be determined using carbon dioxide measurements corrected to an equivalent of 7 percent oxygen. The relationship between oxygen and carbon dioxide levels for the affected facility shall be established as specified in 40 CFR 60.58b(b)(6).
(5) As specified under 40 CFR 60.8, all performance tests shall consist of three test runs. The average of the hydrogen chloride emission concentrations or percent reductions from the three test runs is used to determine compliance.
(6) The owner or operator of an affected facility shall conduct an initial performance test for hydrogen chloride as required under 40 CFR 60.8.
(7) Following the date that the initial performance test for hydrogen chloride is completed or is required to be completed under 40 CFR 60.8, the owner or operator of an affected facility shall conduct a performance test for hydrogen chloride emissions on an annual basis (no more than 12 calendar months following the previous performance test).
(8) [reserved]
[40 CFR 60.38b and 40 CFR 60.58b(f)]

Dioxin/Furan

C.43. The procedures and test methods specified in paragraphs (1) through (9) shall be used to determine compliance with the limits for dioxin/furan emissions.
(1) The EPA Reference Method 1 shall be used for determining the location and number of sampling points.
(2) The EPA Reference Method 3, 3A, or 3B, as applicable, shall be used for flue gas analysis.
(3) The EPA Reference Method 23 shall be used for determining the dioxin/furan emission concentration.
(i) The minimum sample time shall be 4 hours per test run.
(ii) An oxygen (or carbon dioxide) measurement shall be obtained simultaneously with each Method 23 test run for dioxins/furans.
(4) The owner or operator of an affected facility shall conduct an initial performance test for dioxin/furan emissions in accordance with paragraph (3), as required under 40 CFR 60.8.
(5) Following the date that the initial performance test for dioxins/furans is completed or is required to be completed under 40 CFR 60.8, the owner or operator of an affected facility shall conduct performance tests for dioxin/furan emissions in accordance with paragraph (3), according to one of the schedules specified in paragraphs (i) through (iii).
(i) For affected facilities, performance tests shall be conducted on an annual basis (no more than 12 calendar months following the previous performance test.)
(ii) [reserved]

(iii) Where all performance tests over a 2-year period indicate that dioxin/furan emissions are less than or equal to 15 nanograms per dry standard cubic meter (total mass) for all affected facilities located within a municipal waste combustor plant, the owner or operator of the municipal waste combustor plant may elect to conduct annual performance tests for one affected facility (i.e., unit) per year at the municipal waste combustor plant. At a minimum, a performance test for dioxin/furan emissions shall be conducted annually (no more than 12 months following the previous performance test) for one affected facility at the municipal waste combustor plant. Each year a different affected facility at the municipal waste combustor plant shall be tested, and the affected facilities at the plant shall be tested in sequence (e.g., unit 1, unit 2, unit 3, unit 4, as applicable). If each annual performance test continues to indicate a dioxin/furan emission level less than or equal to 15 nanograms per dry standard cubic meter (total mass), the owner or operator may continue conducting a performance test on only one affected facility per year. If any annual performance test indicates a dioxin/furan emission level greater than 15 nanograms per dry standard cubic meter (total mass), performance tests thereafter shall be conducted annually on all affected facilities at the plant until and unless all annual performance tests for all affected facilities at the plant over a 2-year period indicate a dioxin/furan emission level less than or equal to 15 nanograms per dry standard cubic meter (total mass).

(6) The owner or operator of an affected facility that selects to follow the performance testing schedule specified in paragraph (5)(iii) shall follow the procedures specified in 40 CFR 60 60.59b(g)(4) for reporting the selection of this schedule.

(7) The owner or operator of an affected facility where activated carbon is used to comply with the dioxin/furan emission limits specified in 40 CFR 60.52b(c) or the dioxin/furan emission level specified in paragraph (5)(iii) shall follow the procedures specified in 40 CFR 60.58b(m) for measuring and calculating the carbon usage rate.

(8) The owner or operator of an affected facility may request that compliance with the dioxin/furan emission limit be determined using carbon dioxide measurements corrected to an equivalent of 7 percent oxygen. The relationship between oxygen and carbon dioxide levels for the affected facility shall be established as specified in 40 CFR 60.58b(b)(6).

(9) As specified under 40 CFR 60.8, all performance tests shall consist of three test runs. The average of the dioxin/furan emission concentrations from the three test runs is used to determine compliance. [40 CFR 60.38b and 40 CFR 60.58b(g)]

Nitrogen Oxides

C.44. The procedures and test methods specified in paragraphs (1) through (12) shall be used to determine compliance with the nitrogen oxides emission limit for affected facilities under Sec. 60.52b(d).

(1) The EPA Reference Method 19, section 4.1, shall be used for determining the daily arithmetic average nitrogen oxides emission concentration.

(2) The owner or operator of an affected facility may request that compliance with the nitrogen oxides emission limit be determined using carbon dioxide measurements corrected to an

equivalent of 7 percent oxygen. The relationship between oxygen and carbon dioxide levels for the affected facility shall be established as specified in 40 CFR 60.58b(b)(6).
(3) The owner or operator of an affected facility subject to the nitrogen oxides limit shall conduct an initial performance test for nitrogen oxides as required under 40 CFR 60.8. Compliance with the nitrogen oxides emission limit shall be determined by using the continuous emission monitoring system specified in paragraph (4) for measuring nitrogen oxides and calculating a 24-hour daily arithmetic average emission concentration using EPA Reference Method 19, section 4.1.
(4) The owner or operator of an affected facility subject to the nitrogen oxides emission shall install, calibrate, maintain, and operate a continuous emission monitoring system for measuring nitrogen oxides discharged to the atmosphere, and record the output of the system.
(5) Following the date that the initial performance test for nitrogen oxides is completed or is required to be completed under 40 CFR 60.8, compliance with the emission limit for nitrogen oxides shall be determined based on the 24-hour daily arithmetic average of the hourly emission concentrations using continuous emission monitoring system outlet data.
(6) At a minimum, valid continuous emission monitoring system hourly averages shall be obtained as specified in paragraphs (i) and (ii) for 75 percent of the operating hours per day for 90 percent of the operating days per calendar quarter that the affected facility is combusting municipal solid waste.

(i) At least 2 data points per hour shall be used to calculate each 1-hour arithmetic average.

(ii) Each nitrogen oxides 1-hour arithmetic average shall be corrected to 7 percent oxygen on an hourly basis using the 1-hour arithmetic average of the oxygen (or carbon dioxide) continuous emission monitoring system data.

(7) The 1-hour arithmetic averages required by paragraph (5) shall be expressed in parts per million by volume (dry basis) and used to calculate the 24-hour daily arithmetic average concentrations. The 1-hour arithmetic averages shall be calculated using the data points required under 40 CFR 60.13(e)(2).
(8) All valid continuous emission monitoring system data must be used in calculating emission averages even if the minimum continuous emission monitoring system data requirements of paragraph (6) are not met.
(9) The procedures under 40 CFR 60.13 shall be followed for installation, evaluation, and operation of the continuous emission monitoring system. The initial performance evaluation shall be completed no later than 180 days after the date of initial startup of the municipal waste combustor unit, as specified under 40 CFR 60.8.
(10) The owner or operator of an affected facility shall operate the continuous emission monitoring system according to Performance Specification 2 in appendix B of 40 CFR 60 and shall follow the procedures and methods specified in paragraphs(i) and (ii).

(i) During each relative accuracy test run of the continuous emission monitoring system required by Performance Specification 2 of appendix B of 40 CFR 60, nitrogen oxides and oxygen (or carbon dioxide) data shall be collected concurrently (or within a 30- to 60-minute period) by both the continuous emission monitors and the test methods specified in paragraphs (A) and (B).

(A) For nitrogen oxides, EPA Reference Method 7, 7A, 7C, 7D, or 7E shall be used.

(B) For oxygen (or carbon dioxide), EPA Reference Method 3, 3A, or 3B, as applicable shall be used.

(ii) The span value of the continuous emission monitoring system shall be 125 percent of the maximum estimated hourly potential nitrogen oxide emissions of the municipal waste combustor unit.

(11) Quarterly accuracy determinations and daily calibration drift tests shall be performed in accordance with procedure 1 in appendix F of 40 CFR 60.

(12) When nitrogen oxides continuous emissions data are not obtained because of continuous emission monitoring system breakdowns, repairs, calibration checks, and zero and span adjustments, emissions data shall be obtained using other monitoring systems as approved by the Administrator or EPA Reference Method 19 to provide, as necessary, valid emissions data for a minimum of 75 percent of the hours per day for 90 percent of the days per calendar quarter the unit is operated and combusting municipal solid waste.

[40 CFR 60.38b and 40 CFR 60.58b(h)]

Fluoride

C.45. Compliance with the fluoride limits shall be demonstrated using EPA Method 13A or 13B during the initial compliance test and annually thereafter.

[PSD-FL-121(B)]

Beryllium

C.46. Compliance with the beryllium limits shall be demonstrated using EPA Method 29 during the initial compliance test and annually thereafter.

[PSD-FL-121(B)]

Carbon Monoxide

C.47. See Specific Condition **C.10.**

Volatile Organic Compounds

C.48. Compliance with the volatile organic compounds limits shall be demonstrated using EPA Method 18, 25 or 25A. This is an initial compliance test requirement and once satisfied, no further tests are required.

[PSD-FL-121(B)]

Sulfuric Acid Mist

C.49. Compliance with the sulfuric acid mist limits shall be demonstrated using EPA Method 8. This is an initial compliance test requirement and once satisfied, no further tests are required.

[PSD-FL-121(B)]

C.50. Required Number of Test Runs. For mass emission limitations, a compliance test shall consist of three complete and separate determinations of the total air pollutant emission rate through the test section of the stack or duct and three complete and separate determinations of any applicable process variables corresponding to the three distinct time periods during which the stack emission rate was measured provided, however, that three complete and separate determinations shall not be required if the process variables are not subject to variation during a compliance test, or if three determinations are not necessary in order to calculate the unit's emission rate. The three required test runs shall be completed within one consecutive five day period. In the event that a sample is lost or one of the three runs must be discontinued because of circumstances beyond the control of the owner or operator, and a valid third run cannot be obtained within the five day period allowed for the test, the Secretary or his or her designee may accept the results of the two complete runs as proof of compliance, provided that the arithmetic mean of the results of the two complete runs is at least 20 percent below the allowable emission limiting standards.
[Rule 62-297.310(1), F.A.C.]

C.51. Operating Rate During Testing. Testing of emissions shall be conducted with the emissions unit operation at permitted capacity, which is defined as 90 to 100 percent of the maximum operation rate allowed by the permit. If it is impracticable to test at permitted capacity, an emissions unit may be tested at less than the minimum permitted capacity; in this case, subsequent emissions unit operation is limited to 110 percent of the test load until a new test is conducted. Once the emissions unit is so limited, operation at higher capacities is allowed for no more than 15 consecutive days for the purpose of additional compliance testing to regain the authority to operate at the permitted capacity. Higher loads are allowed for testing purposes as specified at 40 CFR 60.53b(b).
[Rules 62-297.310(2) & (2)(b), F.A.C.; and, PSD-FL-121(B)]

C.52. Calculation of Emission Rate. The indicated emission rate or concentration shall be the arithmetic average of the emission rate or concentration determined by each of the three separate test runs unless otherwise specified in a particular test method or applicable rule.
[Rule 62-297.310(3), F.A.C.]

C.53. Applicable Test Procedures.
(a) Required Sampling Time.
1. Unless otherwise specified in the applicable rule, the required sampling time for each test run shall be no less than one hour and no greater than four hours, and the sampling time at each sampling point shall be of equal intervals of at least two minutes.
2. Opacity Compliance Tests. When either EPA Method 9 or DEP Method 9 is specified as the applicable opacity test method, the required minimum period of observation for a compliance test shall be sixty (60) minutes for emissions units which emit or have the potential to emit 100 tons per year or more of particulate matter, and thirty (30) minutes for emissions units which have potential emissions less than 100 tons per year of particulate matter and are not subject to a multiple-valued opacity standard. The opacity test

observation period shall include the period during which the highest opacity emissions can reasonably be expected to occur. Exceptions to these requirements are as follows:

a. For batch, cyclical processes, or other operations which are normally completed within less than the minimum observation period and do not recur within that time, the period of observation shall be equal to the duration of the batch cycle or operation completion time.

b. The observation period for special opacity tests that are conducted to provide data to establish a surrogate standard pursuant to Rule 62-297.310(5)(k), F.A.C., Waiver of Compliance Test Requirements, shall be established as necessary to properly establish the relationship between a proposed surrogate standard and an existing mass emission limiting standard.

c. The minimum observation period for opacity tests conducted by employees or agents of the Department to verify the day-to-day continuing compliance of a unit or activity with an applicable opacity standard shall be twelve minutes.

(b) Minimum Sample Volume. Unless otherwise specified in the applicable rule, the minimum sample volume per run shall be 25 dry standard cubic feet.

(c) Required Flow Rate Range. For EPA Method 5 particulate sampling, acid mist/sulfur dioxide, and fluoride sampling which uses Greenburg Smith type impingers, the sampling nozzle and sampling time shall be selected such that the average sampling rate will be between 0.5 and 1.0 actual cubic feet per minute, and the required minimum sampling volume will be obtained.

(d) Calibration of Sampling Equipment. Calibration of the sampling train equipment shall be conducted in accordance with the schedule shown in Table 297.310-1, attached as part of this permit.

(e) Allowed Modification to EPA Method 5. When EPA Method 5 is required, the following modification is allowed: the heated filter may be separated from the impingers by a flexible tube.

[Rule 62-297.310(4), F.A.C.]

C.54. Required Stack Sampling Facilities. When a mass emissions stack test is required, the permittee shall comply with the requirements contained in Appendix SS-1, Stack Sampling Facilities, attached to this permit.

[Rule 62-297.310(6), F.A.C.]

C.55. Frequency of Compliance Tests. The following provisions apply only to those emissions units that are subject to an emissions limiting standard for which compliance testing is required.

(a) General Compliance Testing.

3. The owner or operator of an emissions unit that is subject to any emission limiting standard shall conduct a compliance test that demonstrates compliance with the applicable emission limiting standard prior to obtaining a renewed operation permit. Emissions units

that are required to conduct an annual compliance test may submit the most recent annual compliance test to satisfy the requirements of this provision. In renewing an air operation permit pursuant to Rule 62-210.300(2)(a)3.b., c., or d., F.A.C., the Department shall not require submission of emission compliance test results for any emissions unit that, during the year prior to renewal:

a Did not operate; or

b. In the case of a fuel burning emissions unit, burned liquid and/or solid fuel for a total of no more than 400 hours.

4. During each federal fiscal year (October 1 - September 30), unless otherwise specified by rule, order, or permit, the owner or operator of each emissions unit shall have a formal compliance test conducted for:

a. Visible emissions, if there is an applicable standard;

b. Each of the following pollutants, if there is an applicable standard, and if the emissions unit emits or has the potential to emit: 5 tons per year or more of lead or lead compounds measured as elemental lead; 30 tons per year or more of acrylonitrile; or 100 tons per year or more of any other regulated air pollutant; and

c. Each NESHAP pollutant, if there is an applicable emission standard.

5. An annual compliance test for particulate matter emissions shall not be required for any fuel burning emissions unit that, in a federal fiscal year, does not burn liquid and/or solid fuel, other than during startup, for a total of more than 400 hours.

9. The owner or operator shall notify the Department, at least 15 days prior to the date on which each formal compliance test is to begin, of the date, time, and place of each such test, and the test contact person who will be responsible for coordinating and having such test conducted for the owner or operator.

(b) Special Compliance Tests. When the Department, after investigation, has good reason (such as complaints, increased visible emissions or questionable maintenance of control equipment) to believe that any applicable emission standard contained in a Department rule or in a permit issued pursuant to those rules is being violated, it may require the owner or operator of the emissions unit to conduct compliance tests which identify the nature and quantity of pollutant emissions from the emissions unit and to provide a report on the results of said tests to the Department.

(c) Waiver of Compliance Test Requirements. If the owner or operator of an emissions unit that is subject to a compliance test requirement demonstrates to the Department, pursuant to the procedure established in Rule 62-297.620, F.A.C., that the compliance of the emissions unit with an applicable weight emission limiting standard can be adequately determined by means other than the designated test procedure, such as specifying a surrogate standard of no visible emissions for particulate matter sources equipped with a bag house or specifying a fuel analysis for sulfur dioxide emissions, the Department shall waive the compliance test requirements for such emissions units and order that the alternate means of determining compliance be used, provided, however, the provisions of Rule 62-297.310(7)(b), F.A.C., shall apply.

[Rule 62-297.310(7), F.A.C.; and, SIP approved]

Compliance With Standards and Maintenance Requirements

C.56. Compliance with standards in 40 CFR 60, other than opacity standards, shall be determined by performance tests established by 40 CFR 60.8, unless otherwise specified in the applicable standard. [40 CFR 60.11(a)]

C.57. Compliance with opacity standards in 40 CFR 60 shall be determined by conducting observations in accordance with Reference Method 9 in Appendix A of 40 CFR 60, any alternative method that is approved by the Administrator, or as provided in 40 CFR 60.11(e)(5).
[40 CFR 60.11(b)]

C.58. The owner or operator of an affected facility subject to an opacity standard may submit, for compliance purposes, continuous opacity monitoring system (COMS) data results produced during any performance test required under 40 CFR 60.8 in lieu of EPA Method 9 observation data. If an owner or operator elects to submit COMS data for compliance with the opacity standard, he or she shall notify the Administrator of that decision, in writing, at least 30 days before any performance test required under 40 CFR 60.8 is conducted. Once the owner or operator of an affected facility has notified the Administrator to that effect, the COMS data results will be used to determine opacity compliance during subsequent tests required under 40 CFR 60.8 until the owner or operator notifies the Administrator, in writing, to the contrary. For the purpose of determining compliance with the opacity standard during a performance test required under 40 CFR 60.8 using COMS data, the minimum total time of COMS data collection shall be averages of all 6-minute continuous periods within the duration of the mass emission performance test. Results of the COMS opacity determinations shall be submitted along with the results of the performance test required under 60.8. The owner or operator of an affected facility using a COMS for compliance purposes is responsible for demonstrating that the COMS meets the requirements specified in 40 CFR 60.13(c), that the COMS has been properly maintained and operated, and that the resulting data have not been altered in any way. If COMS data results are submitted for compliance with the opacity standard for a period of time during which EPA Method 9 data indicates noncompliance, the EPA Method 9 data will be used to determine opacity compliance.
[40 CFR 60.11(e)(5)]

Monitoring Requirements

C.59. For the purposes of 40 CFR 60.13, all continuous monitoring systems (CMS) required under applicable subparts shall be subject to the provisions of 40 CFR 60.13 upon promulgation of performance specifications for continuous monitoring systems under Appendix B of 40 CFR 60 and, if the continuous monitoring system is used to demonstrate compliance with emission limits on a continuous basis, Appendix F of 40 CFR 60, unless otherwise specified in an applicable subpart or by the Administrator. Appendix F is applicable December 4, 1987.
[40 CFR 60.13(a)]

C.60. If the owner or operator of an affected facility elects to submit continuous opacity monitoring system (COMS) data for compliance with the opacity standard as provided under 40 CFR 60.11(e)(5), he shall conduct a performance evaluation of the COMS as specified in Performance Specification 1, Appendix B, of 40 CFR 60 before the performance test required under 40 CFR 60.8 is conducted. Otherwise, the owner or operator of an affected facility shall conduct a performance evaluation of the COMS or continuous emission monitoring system (CEMS) during any performance test required under 40 CFR 60.8 or within 30 days thereafter in accordance with the applicable performance specification in Appendix B of 40 CFR 60. The owner or operator of an affected facility shall conduct COMS or CEMS performance evaluations at such other times as may be required by the Administrator under section 114 of the Act.
(1) The owner or operator of an affected facility using a COMS to determine opacity compliance during any performance test required under 60.8 and as described in 40 CFR 60.11(e)(5) shall furnish the Administrator two or, upon request, more copies of a written report of the results of the COMS performance evaluation described in 40 CFR 60.13(c) at least 10 days before the performance test required under 60.8 is conducted.
[40 CFR 60.13(c)(1)]

C.61. (1) Owners and operators of all continuous emission monitoring systems (CEMS) installed in accordance with the provisions of this part shall check the zero (or low-level value between 0 and 20 percent of span value) and span (50 to 100 percent of span value) calibration drifts at least once daily in accordance with a written procedure. The zero and span shall, as a minimum, be adjusted whenever the 24-hour zero drift or 24-hour span drift exceeds two times the limits of the applicable performance specifications in Appendix B. The system must allow the amount of excess zero and span drift measured at the 24-hour interval checks to be recorded and quantified, whenever specified. For continuous monitoring systems measuring opacity of emissions, the optical surfaces exposed to the effluent gases shall be cleaned prior to performing the zero and span drift adjustments except that for systems using automatic zero adjustments. The optical surfaces shall be cleaned when the cumulative automatic zero compensation exceeds 4 percent opacity.

(2) Unless otherwise approved by the Administrator, the following procedures shall be followed for continuous monitoring systems measuring opacity of emissions. Minimum procedures shall include a method for producing a simulated zero opacity condition and an upscale (span) opacity condition using a certified neutral density filter or other related technique to produce a known obscuration of the light beam. Such procedures shall provide a system check of the analyzer internal optical surfaces and all electronic circuitry including the lamp and photo detector assembly.
[40 CFR 60.13(d)(1) and (2)]

C.62. Except for system breakdowns, repairs, calibration checks, and zero and span adjustments required under 40 CFR 60.13(d), all continuous monitoring systems (CMS) shall be in continuous operation and shall meet minimum frequency of operation requirements as follows:
(1) All continuous monitoring systems referenced by 40 CFR 60.13(c) for measuring opacity of emissions shall complete a minimum of one cycle of sampling and analyzing for each successive 10-second period and one cycle of data recording for each successive 6-minute period.
(2) All continuous monitoring systems referenced by 40 CFR 60.13(c) for measuring emissions, except opacity, shall complete a minimum of one cycle of operation (sampling, analyzing, and data recording) for each successive 15-minute period.
[40 CFR 60.13(e)(1) and (2)]

C.63. All continuous monitoring systems (CMS) or monitoring devices shall be installed such that representative measurements of emissions or process parameters from the affected facility are obtained. Additional procedures for location of continuous monitoring systems contained in the applicable Performance Specifications of Appendix B of 40 CFR 60 shall be used.
[40 CFR 60.13(f)]

C.64. [reserved]

C.65. Owners or operators of all continuous monitoring systems for measurement of opacity shall reduce all data to 6-minute averages and for continuous monitoring systems other than opacity to 1-hour averages for time periods as defined in 40 CFR 60.2. Six-minute opacity averages shall be calculated from 36 or more data points equally spaced over each 6-minute

period. For continuous monitoring systems other than opacity, 1-hour averages shall be computed from four or more data points equally spaced over each 1-hour period. Data recorded during periods of continuous monitoring system breakdowns, repairs, calibration checks, and zero and span adjustments shall not be included in the data averages computed under this paragraph. An arithmetic or integrated average of all data may be used. The data may be recorded in reduced or nonreduced form (e.g., ppm pollutant and percent O2 or ng/J of pollutant). All excess emissions shall be converted into units of the standard using the applicable conversion procedures specified in subparts. After conversion into units of the standard, the data may be rounded to the same number of significant digits as used in the applicable subparts to specify the emission limit (e.g., rounded to the nearest 1 percent opacity).
[40 CFR 60.13(h)]

C.66. Determination of Process Variables.
(a) Required Equipment. The owner or operator of an emissions unit for which compliance tests are required shall install, operate, and maintain equipment or instruments necessary to determine process variables, such as process weight input or heat input, when such data are needed in conjunction with emissions data to determine the compliance of the emissions unit with applicable emission limiting standards.
(b) Accuracy of Equipment. Equipment or instruments used to directly or indirectly determine process variables, including devices such as belt scales, weight hoppers, flow meters, and tank scales, shall be calibrated and adjusted to indicate the true value of the parameter being measured with sufficient accuracy to allow the applicable process variable to be determined within 10% of its true value.
[Rule 62-297.310(5), F.A.C.]

CEMS for Oxygen or Carbon Dioxide

C.67. The owner or operator of an affected facility shall install, calibrate, maintain, and operate a continuous emission monitoring system and record the output of the system for measuring the oxygen or carbon dioxide content of the flue gas at each location where carbon monoxide, sulfur dioxide, or nitrogen oxides emissions are monitored and shall comply with the test procedures and test methods specified in paragraphs (1) through (7).
(1) The span value of the oxygen (or carbon dioxide) monitor shall be 25 percent oxygen (or carbon dioxide).
(2) The monitor shall be installed, evaluated, and operated in accordance with 40 CFR 60.13.
(3) The initial performance evaluation shall be completed no later than 180 days after the date of initial startup of the affected facility, as specified under 40 CFR 60.8.
(4) The monitor shall conform to Performance Specification 3 in appendix B of 40 CFR 60 except for section 2.3 (relative accuracy requirement).
(5) The quality assurance procedures of appendix F of 40 CFR 60 except for section 5.1.1 (relative accuracy test audit) shall apply to the monitor.

(6) If carbon dioxide is selected for use in diluent corrections, the relationship between oxygen and carbon dioxide levels shall be established during the initial performance test according to the procedures and methods specified in paragraphs (i) through (iv). This relationship may be reestablished during performance compliance tests.

(i) The fuel factor equation in Method 3B shall be used to determine the relationship between oxygen and carbon dioxide at a sampling location. Method 3, 3A, or 3B, as applicable, shall be used to determine the oxygen concentration at the same location as the carbon dioxide monitor.

(ii) Samples shall be taken for at least 30 minutes in each hour.

(iii) Each sample shall represent a 1-hour average.

(iv) A minimum of three runs shall be performed.

(7) The relationship between carbon dioxide and oxygen concentrations that is established in accordance with paragraph (6) shall be submitted to the EPA Administrator as part of the initial performance test report and, if applicable, as part of the annual test report if the relationship is reestablished during the annual performance test.

[40 CFR 60.38b and 40 CFR 60.58b(b)]

Recordkeeping and Reporting Requirements

C.68. The owner or operator subject to the provisions of 40 CFR 60 shall furnish the Administrator written notification as follows:

(4) A notification of any physical or operational change to an existing facility which may increase the emission rate of any air pollutant to which a standard applies, unless that change is specifically exempted under an applicable subpart or in 40 CFR 60.14(e). This notice shall be postmarked 60 days or as soon as practicable before the change is commenced and shall include information describing the precise nature of the change, present and proposed emission control systems, productive capacity of the facility before and after the change, and the expected completion date of the change. The Administrator may request additional relevant information subsequent to this notice.

[40 CFR 60.7(a)(4)]

C.69. The owner or operator subject to the provisions of 40 CFR 60 shall maintain records of the occurrence and duration of any startup, shutdown, or malfunction in the operation of an affected facility; any malfunction of the air pollution control equipment; or, any periods during which a continuous monitoring system or monitoring device is inoperative.

[40 CFR 60.7(b)]

C.70. Each owner or operator required to install a continuous monitoring system (CMS) or monitoring device shall submit an excess emissions and monitoring systems performance report (excess emissions are defined in applicable subparts) and/or a summary report form [see 40 CFR 60.7(d)] to the Administrator semiannually, except when: more frequent reporting is specifically required by an applicable subpart; or, the CMS data are to be used directly for compliance

determination, in which case quarterly reports shall be submitted; or, the Administrator, on a case-by-case basis, determines that more frequent reporting is necessary to accurately assess the compliance status of the source. All reports shall be postmarked by the 30th day following the end of each calendar half (or quarter, as appropriate). Written reports of excess emissions shall include the following information:
(1) The magnitude of excess emissions computed in accordance with 40 CFR 60.13(h), any conversion factor(s) used, and the date and time of commencement and completion of each time period of excess emissions. The process operating time during the reporting period.
(2) Specific identification of each period of excess emissions that occurs during startups, shutdowns, and malfunctions of the affected facility. The nature and cause of any malfunction (if known), the corrective action taken or preventative measures adopted.
(3) The date and time identifying each period during which the continuous monitoring system was inoperative except for zero and span checks and the nature of the system repairs or adjustments.
(4) When no excess emissions have occurred or the continuous monitoring system(s) have not been inoperative, repaired, or adjusted, such information shall be stated in the report.
[40 CFR 60.7(c)(1), (2), (3), and (4)]

C.71. The summary report form shall contain the information and be in the format shown in Figure 1 (attached) unless otherwise specified by the Administrator. One summary report form shall be submitted for each pollutant monitored at each affected facility.
(1) If the total duration of excess emissions for the reporting period is less than 1 percent of the total operating time for the reporting period and CMS downtime for the reporting period is less than 5 percent of the total operating time for the reporting period, only the summary report form shall be submitted and the excess emission report described in 40 CFR 60.7(c) need not be submitted unless requested by the Administrator.
(2) If the total duration of excess emissions for the reporting period is 1 percent or greater of the total operating time for the reporting period or the total CMS downtime for the reporting period is 5 percent or greater of the total operating time for the reporting period, the summary report form and the excess emission report described in 40 CFR 60.7(c) shall both be submitted.
[40 CFR 60.7(d)(1) and (2)]

{See attached Figure 1: Summary Report-Gaseous and Opacity Excess Emission and Monitoring System Performance}

C.72. (1) Notwithstanding the frequency of reporting requirements specified in 40 CFR 60.7(c), an owner or operator who is required by an applicable subpart to submit excess emissions and monitoring systems performance reports (and summary reports) on a quarterly (or more frequent) basis may reduce the frequency of reporting for that standard to semiannual if the following conditions are met:

(i) For 1 full year (e.g., 4 quarterly or 12 monthly reporting periods) the affected facility's excess emissions and monitoring systems reports submitted to comply with a standard under this part continually demonstrate that the facility is in compliance with the applicable standard;

(ii) The owner or operator continues to comply with all recordkeeping and monitoring requirements specified in 40 CFR 60, Subpart A, and the applicable standard; and
(iii) The Administrator does not object to a reduced frequency of reporting for the affected facility, as provided in 40 CFR 60.7(e)(2).

(2) The frequency of reporting of excess emissions and monitoring systems performance (and summary) reports may be reduced only after the owner or operator notifies the Administrator in writing of his or her intention to make such a change and the Administrator does not object to the intended change. In deciding whether to approve a reduced frequency of reporting, the Administrator may review information concerning the source's entire previous performance history during the required recordkeeping period prior to the intended change, including performance test results, monitoring data, and evaluations of an owner or operator's conformance with operation and maintenance requirements. Such information may be used by the Administrator to make a judgment about the source's potential for noncompliance in the future. If the Administrator disapproves the owner or operator's request to reduce the frequency of reporting, the Administrator will notify the owner or operator in writing within 45 days after receiving notice of the owner or operator's intention. The notification from the Administrator to the owner or operator will specify the grounds on which the disapproval is based. In the absence of a notice of disapproval within 45 days, approval is automatically granted.
(3) As soon as monitoring data indicate that the affected facility is not in compliance with any emission limitation or operating parameter specified in the applicable standard, the frequency of reporting shall revert to the frequency specified in the applicable standard, and the owner or operator shall submit an excess emissions and monitoring systems performance report (and summary report, if required) at the next appropriate reporting period following the noncomplying event. After demonstrating compliance with the applicable standard for another full year, the owner or operator may again request approval from the Administrator to reduce the frequency of reporting for that standard as provided for in 40 CFR 60.7(e)(1) and (e)(2).
[40 CFR 60.7(e)(1)]

C.73. Any owner or operator subject to the provisions of 40 CFR 60 shall maintain a file of all measurements, including continuous monitoring system, monitoring device, and performance testing measurements; all continuous monitoring system performance evaluations; all continuous monitoring system or monitoring device calibration checks; adjustments and maintenance performed on these systems or devices; and, all other information required by 40 CFR 60 recorded in a permanent form suitable for inspection. The file shall be retained for at least **five (5)** years following the date of such measurements, maintenance, reports, and records.
[40 CFR 60.7(f) and Rule 62-213.440(1)(b)2.b., F.A.C.]

C.74. Notification of Construction or Reconstruction. The owner or operator of an affected facility with a capacity to combust greater than 250 tons per day shall submit a notification of construction, which includes the information specified in paragraphs (1) through (4).
(1) Intent to construct.

(2) Planned initial startup date.
(3) The types of fuels that the owner or operator plans to combust in the affected facility.
(4) The municipal waste combustor unit capacity and supporting capacity calculations prepared in accordance with 40 CFR 60.58b(j).
[40 CFR 60.39b and 40 CFR 60.59b(b)]

C.75. The owner or operator of an affected facility subject to the standards under 40 CFR. 60.53b, 60.54b, and 60.55b shall maintain records of the information specified in paragraphs (1) through (15), as applicable, for each affected facility for a period of at least 5 years.
(1) The calendar date of each record.
(2) The emission concentrations and parameters measured using continuous monitoring systems as specified under paragraphs (i) and (ii).

(i) The measurements specified in paragraphs (A) through (D) shall be recorded and be available for submittal to the Administrator or review onsite by an inspector.

(A) All 6-minute average opacity levels as specified under 40 CFR 60.58b(c).

(B) All 1-hour average sulfur dioxide emission concentrations as specified under 40 CFR 60.58b(e).

(C) All 1-hour average nitrogen oxides emission concentrations as specified under 40 CFR 60.58b(h).

(D) All 1-hour average carbon monoxide emission concentrations, municipal waste combustor unit load measurements, and particulate matter control device inlet temperatures as specified under 40 CFR 60.58b(i).

(ii) The average concentrations and percent reductions, as applicable, specified in paragraphs (2)(ii)(A) through (2)(ii)(D) shall be computed and recorded, and shall be available for submittal to the Administrator or review on-site by an inspector.

(A) All 24-hour daily geometric average sulfur dioxide emission concentrations and all 24-hour daily geometric average percent reductions in sulfur dioxide emissions as specified under 40 CFR 60.58b(e).

(B) All 24-hour daily arithmetic average nitrogen oxides emission concentrations as specified under 40 CFR 60.58b(h).

(C) All 4-hour block or 24-hour daily arithmetic average carbon monoxide emission concentrations, as applicable, as specified under 40 CFR 60.58b(i).

(3) Identification of the calendar dates when any of the average emission concentrations, percent reductions, or operating parameters recorded under paragraphs (2)(ii)(A) through (2)(ii)(D), or the opacity levels recorded under paragraph (2)(i)(A) are above the applicable limits, with reasons for such exceedances and a description of corrective actions taken.
(4) For affected facilities that apply activated carbon for mercury or dioxin/furan control, the records specified in paragraphs (i) through (v).

(i) The average carbon mass feed rate (in kilograms per hour or pounds per hour) estimated as required under 40 CFR 60.58b(m)(1)(i) during the initial mercury performance test and all subsequent annual performance tests, with supporting calculations.

(ii) The average carbon mass feed rate (in kilograms per hour or pounds per hour) estimated as required under 40 CFR 60.58b(m)(1)(ii) during the initial dioxin/furan performance test and all subsequent annual performance tests, with supporting calculations.

(iii) The average carbon mass feed rate (in kilograms per hour or pounds per hour) estimated for each hour of operation as required under 40 CFR 60.58b(m)(3)(ii), with supporting calculations.

(iv) The total carbon usage for each calendar quarter estimated as specified by 40 CFR 60.58b(m)(3), with supporting calculations.

(v) Carbon injection system operating parameter data for the parameter(s) that are the primary indicator(s) of carbon feed rate (e.g., screw feeder speed).

(5) [reserved]

(6) Identification of the calendar dates for which the minimum number of hours of any of the data specified in paragraphs (i) through (v) have not been obtained including reasons for not obtaining sufficient data and a description of corrective actions taken.

(i) Sulfur dioxide emissions data;

(ii) Nitrogen oxides emissions data;

(iii) Carbon monoxide emissions data;

(iv) Municipal waste combustor unit load data; and

(v) Particulate matter control device temperature data.

(7) Identification of each occurrence that sulfur dioxide emissions data, nitrogen oxides emissions data (large municipal waste combustors only), or operational data (i.e., carbon monoxide emissions, unit load, and particulate matter control device temperature) have been excluded from the calculation of average emission concentrations or parameters, and the reasons for excluding the data.

(8) The results of daily drift tests and quarterly accuracy determinations for sulfur dioxide, nitrogen oxides, and carbon monoxide continuous emission monitoring systems, as required under appendix F of this part, procedure 1.

(9) The test reports documenting the results of the initial performance test and all annual performance tests listed in paragraphs (i) and (ii) shall be recorded along with supporting calculations.

(i) The results of the initial performance test and all annual performance tests conducted to determine compliance with the particulate matter, opacity, cadmium, lead, mercury, dioxins/furans, hydrogen chloride, and fugitive ash emission limits.

(ii) For the initial dioxin/furan performance test and all subsequent dioxin/furan performance tests recorded under paragraph (9)(i), the maximum demonstrated municipal waste combustor unit load and maximum demonstrated particulate matter control device temperature (for each particulate matter control device).

(10) [reserved]

(12) The records specified in paragraphs (i) through (iii).

(i) Records showing the names of the municipal waste combustor chief facility operator, shift supervisors, and control room operators who have been provisionally certified by the American Society of Mechanical Engineers or an equivalent State-approved certification

program as required by 40 CFR 60.54b(a) including the dates of initial and renewal certifications and documentation of current certification.

(ii) Records showing the names of the municipal waste combustor chief facility operator, shift supervisors, and control room operators who have been fully certified by the American Society of Mechanical Engineers or an equivalent State-approved certification program as required by 40 CFR 60.54b(b) including the dates of initial and renewal certifications and documentation of current certification.

(iii) Records showing the names of the municipal waste combustor chief facility operator, shift supervisors, and control room operators who have completed the EPA municipal waste combustor operator training course or a State-approved equivalent course as required by 40 CFR 60.54b(d) including documentation of training completion.

(13) Records showing the names of persons who have completed a review of the operating manual as required by 40 CFR 60.54b(f) including the date of the initial review and subsequent annual reviews.

(14) For affected facilities that apply activated carbon for mercury or dioxin/furan control, identification of the calendar dates when the average carbon mass feed rates recorded under (4)(iii) were less than either of the hourly carbon feed rates estimated during performance tests for mercury or dioxin/furan emissions and recorded under paragraphs (4)(i) and (4)(ii), respectively, with reasons for such feed rates and a description of corrective actions taken.

(15) For affected facilities that apply activated carbon for mercury or dioxin/furan control, identification of the calendar dates when the carbon injection system operating parameter(s) that are the primary indicator(s) of carbon mass feed rate (e.g., screw feeder speed) recorded under paragraph (4)(v) are below the level(s) estimated during the performance tests as specified in 40 CFR 60.58b(m)(1)(i) and 40 CFR 60.58b(m)(1)(ii), with reasons for such occurrences and a description of corrective actions taken. [40 CFR 60.39b and 40 CFR 60.59b(d)]

C.76. The owner or operator of an affected facility shall submit the information specified in paragraphs (1) through (6) in the initial performance test report.

(1) The initial performance test data as recorded under 40 CFR 60.59b(d)(2)(ii)(A) through (d)(2)(ii)(D) for the initial performance test for sulfur dioxide, nitrogen oxides, carbon monoxide, municipal waste combustor unit load level, and particulate matter control device inlet temperature.

(2) The test report documenting the initial performance test recorded under 40 CFR 60.59b(d)(9) for particulate matter, opacity, cadmium, lead, mercury, dioxins/furans, hydrogen chloride, and fugitive ash emissions.

(3) The performance evaluation of the continuous emission monitoring system using the applicable performance specifications in appendix B of this part.

(4) The maximum demonstrated municipal waste combustor unit load and maximum demonstrated particulate matter control device inlet temperature(s) established during the initial dioxin/furan performance test as recorded under 40 CFR 60.59b(d)(9).

(5) For affected facilities that apply activated carbon injection for mercury control, the owner or operator shall submit the average carbon mass feed rate recorded under 40 CFR 60.59b(d)(4)(i).

(6) For those affected facilities that apply activated carbon injection for dioxin/furan control, the owner or operator shall submit the average carbon mass feed rate recorded under 40 CFR 60.59b(d)(4)(ii).
[40 CFR 60.39b and 40 CFR 60.59b(f)]

C.77. Following the first year of municipal combustor operation, the owner or operator of an affected facility shall submit an annual report including the information specified in paragraphs (1) through (4), as applicable, no later than February 1 of each year following the calendar year in which the data were collected (once the unit is subject to permitting requirements under Title V of the Act, the owner or operator of an affected facility must submit these reports semiannually).
(1) A summary of data collected for all pollutants and parameters regulated under this subpart, which includes the information specified in paragraphs (i) through (v).

(i) A list of the particulate matter, opacity, cadmium, lead, mercury, dioxins/furans, hydrogen chloride, and fugitive ash emission levels achieved during the performance tests recorded under 40 CFR 60.59b (d)(9).

(ii) A list of the highest emission level recorded for sulfur dioxide, nitrogen oxides, carbon monoxide, municipal waste combustor unit load level, and particulate matter control device inlet temperature based on the data recorded under 40 CFR 60.59b(d)(2)(ii)(A) through (d)(2)(ii)(D).

(iii) List the highest opacity level measured, based on the data recorded under 40 CFR 60.59b(d)(2)(i)(A).

(iv) The total number of days that the minimum number of hours of data for sulfur dioxide, nitrogen oxides, carbon monoxide, municipal waste combustor unit load, and particulate matter control device temperature data were not obtained based on the data recorded under 40 CFR 60.59b(d)(6).

(v) The total number of hours that data for sulfur dioxide, nitrogen oxides, carbon monoxide, municipal waste combustor unit load, and particulate matter control device temperature were excluded from the calculation of average emission concentrations or parameters based on the data recorded under 40 CFR 60.59b(d)(7).

(2) The summary of data reported under paragraph (1) shall also provide the types of data specified in paragraphs (1)(i) through (1)(vi) for the calendar year preceding the year being reported, in order to provide the Administrator with a summary of the performance of the affected facility over a 2-year period.
(3) The summary of data including the information specified in paragraphs (1) and (2) shall highlight any emission or parameter levels that did not achieve the emission or parameter limits specified under this subpart.
(4) A notification of intent to begin the reduced dioxin/furan performance testing schedule specified in 40 CFR 60.58b(g)(5)(iii) during the following calendar year.
[40 CFR 60.39b and 40 CFR 60.59b(g)]

C.78. The owner or operator of an affected facility shall submit a semiannual report that includes the information specified in paragraphs (1) through (5) for any recorded pollutant or parameter that does not comply with the pollutant or parameter limit specified under this subpart, according to the schedule specified under paragraph (6).
(1) The semiannual report shall include information recorded under 40 CFR 60.59b(d)(3) for sulfur dioxide, nitrogen oxides, carbon monoxide, municipal waste combustor unit load level, particulate matter control device inlet temperature, and opacity.
(2) For each date recorded as required by 40 CFR 60.59b(d)(3) and reported as required by paragraph (1), the semiannual report shall include the sulfur dioxide, nitrogen oxides, carbon monoxide, municipal waste combustor unit load level, particulate matter control device inlet temperature, or opacity data, as applicable, recorded under 40 CFR 60.59b(d)(2)(ii)(A) through (d)(2)(ii)(D) and (d)(2)(i)(A), as applicable.
(3) If the test reports recorded under 40 CFR 56.59b(d)(9) document any particulate matter, opacity, cadmium, lead, mercury, dioxins/furans, hydrogen chloride, and fugitive ash emission levels that were above the applicable pollutant limits, the semiannual report shall include a copy of the test report documenting the emission levels and the corrective actions taken.
(4) The semiannual report shall include the information recorded under 40 CFR 60.59b(d)(15) for the carbon injection system operating parameter(s) that are the primary indicator(s) of carbon mass feed rate.
(5) For each operating date reported as required by paragraph (4), the semiannual report shall include the carbon feed rate data recorded under 40 CFR 60.59b(d)(4)(iii).
(6) Semiannual reports required by this condition shall be submitted according to the schedule specified in paragraphs (i) and (ii).

(i) If the data reported in accordance with paragraphs (1) through (5) were collected during the first calendar half, then the report shall be submitted by August 1 following the first calendar half.
(ii) If the data reported in accordance with paragraphs (1) through (5) were collected during the second calendar half, then the report shall be submitted by February 1 following the second calendar half.

[40 CFR 60.39b and 40 CFR 60.59b(h)]

C.79. All reports specified under 40 CFR 60.59b(a), (b), (c), (f), (g), (h), and (i) shall be submitted as a paper copy, postmarked on or before the submittal dates specified under these paragraphs, and maintained onsite as a paper copy for a period of 5 years.
[40 CFR 60.39b and 40 CFR 60.59b(j)]

C.80. All records specified under 40 CFR 60.59b(d) and (e) shall be maintained onsite in either paper copy or computer-readable format, unless an alternative format is approved by the Administrator.
[40 CFR 60.39b and 40 CFR 60.59b(k)]

C.81. The Permittee shall maintain a central file containing all measurements, records, and other data that are required to be collected pursuant to the various specific conditions of this permit. This file shall include but not be limited to:
(a) Data collected from monitoring instruments, including CEM/COM systems, steam or feed water flow measurements and PM control device temperatures;
(b) Continuous steam flow or feed water flow records on 4-hour block average basis;
(c) Records on daily solid waste charging rates and hours of operation derived from monthly truck scale data, refuse pit inventory, and operational records.
(d) Amount of natural gas burned for each unit each month; the equivalent heat input from natural gas for each unit each month, calculated using the heat value for natural gas provided by the natural gas supplier; and the annual records of the natural gas capacity factor for each unit;
(e) Results of all source tests or performance tests; and records of the maximum demonstrated unit load specified by this permit.
(f) Amounts of activated carbon used for mercury control;
(g) Calibration logs for all instruments subject to this permit;
(h) Maintenance/repair logs for any work performed which is subject to this permit;
(i) Records showing the names of facility personnel who have been provisionally or fully certified, and who have completed the MWC operator training course, and who have completed reviews of the operating manual, including the dates and documentation of certification/review.
(j) Records demonstrating compliance with the percentage limitations on segregated solid wastes required by this permit.
[PSD-FL-121(B)]

C.82. If the owner or operator of an affected facility would prefer a different annual or semiannual date for submitting the periodic reports required by 40 CFR 60.59b(g), (h) and (i), then the dates may be changed by mutual agreement between the owner or operator and the Administrator according to the procedures specified in 40 CFR 60.19(c) of subpart A of this part.
[40 CFR 60.39b and 40 CFR 60.59b(l)]

C.83. In the case of excess emissions resulting from malfunctions, each owner or operator shall notify the Department in accordance with Rule 62-4.130, F.A.C. A full written report on the malfunctions shall be submitted in a quarterly report, if requested by the Department.
[Rule 62-210.700(6), F.A.C.]

C.84. Submit to the Department a written report of emissions in excess of emission limiting for each calendar quarter. The nature and cause of the excess emissions shall be explained. This report does not relieve the owner or operator of the legal liability for violations. All recorded data shall be maintained on file by the Source for a period of five years.
[Rule 62-213.440, F.A.C.]

C.85. Test Reports.
(a) The owner or operator of an emissions unit for which a compliance test is required shall file a report with the Department on the results of each such test.
(b) The required test report shall be filed with the Department as soon as practical but no later than 45 days after the last sampling run of each test is completed.
(c) The test report shall provide sufficient detail on the emissions unit tested and the test procedures used to allow the Department to determine if the test was properly conducted and the test results properly computed. As a minimum, the test report, other than for an EPA or DEP Method 9 test, shall provide the following information:

1. The type, location, and designation of the emissions unit tested.
2. The facility at which the emissions unit is located.
3. The owner or operator of the emissions unit.
4. The normal type and amount of fuels used and materials processed, and the types and amounts of fuels used and material processed during each test run.
5. The means, raw data and computations used to determine the amount of fuels used and materials processed, if necessary to determine compliance with an applicable emission limiting standard.
6. The type of air pollution control devices installed on the emissions unit, their general condition, their normal operating parameters (pressure drops, total operating current and GPM scrubber water), and their operating parameters during each test run.
7. A sketch of the duct within 8 stack diameters upstream and 2 stack diameters downstream of the sampling ports, including the distance to any upstream and downstream bends or other flow disturbances.
8. The date, starting time and duration of each sampling run.
9. The test procedures used, including any alternative procedures authorized pursuant to Rule 62-297.620, F.A.C. Where optional procedures are authorized in this chapter, indicate which option was used.
10. The number of points sampled and configuration and location of the sampling plane.
11. For each sampling point for each run, the dry gas meter reading, velocity head, pressure drop across the stack, temperatures, average meter temperatures and sample time per point.
12. The type, manufacturer and configuration of the sampling equipment used.
13. Data related to the required calibration of the test equipment.
14. Data on the identification, processing and weights of all filters used.
15. Data on the types and amounts of any chemical solutions used.
16. Data on the amount of pollutant collected from each sampling probe, the filters, and the impingers, are reported separately for the compliance test.
17. The names of individuals who furnished the process variable data, conducted the test, analyzed the samples and prepared the report.
18. All measured and calculated data required to be determined by each applicable test procedure for each run.

19. The detailed calculations for one run that relate the collected data to the calculated emission rate.
20. The applicable emission standard, and the resulting maximum allowable emission rate for the emissions unit, plus the test result in the same form and unit of measure.
21. A certification that, to the knowledge of the owner or his authorized agent, all data submitted are true and correct. When a compliance test is conducted for the Department or its agent, the person who conducts the test shall provide the certification with respect to the test procedures used. The owner or his authorized agent shall certify that all data required and provided to the person conducting the test are true and correct to his knowledge.

[Rule 62-297.310(8), F.A.C.]

C.86. Segregated Solid Waste Record Keeping: The following records shall be made and kept to demonstrate compliance with the segregated non-MSW percentage limitations of specific conditions **C.6.6.** and **C.6.7.**:

Each segregated load of non-MSW materials, that is subject to the percentage weight limitations of specific conditions **C.6.6.** and **C.6.7.**, which is received for processing shall be documented as to waste description and weight. The weight of all waste materials received for processing shall be measured using the facility truck scale and recorded.

Each day the total weight of segregated tires received shall be computed, and the daily total shall be added to the sum of the daily totals from the previous days in the current calendar month. At the end of each calendar month, the resultant monthly total weight of tires shall be divided by the total weight of all waste materials received in the same calendar month, and the resultant number shall be multiplied by 100 to express the ratio in percentage terms. The percentage computed shall be compared to the 3% limitation.

Each day the total weight of segregated non-MSW materials received that are subject to the 5% restriction shall be computed, and the daily total shall be added to the sum of the daily totals from the previous days in the current calendar month. At the end of each calendar month, the resultant monthly total weight of segregated non-MSW materials subject to the 5% restriction shall be divided by the total weight of all waste materials received in the same calendar month, and the resultant number shall be multiplied by 100 to express the ratio in percentage terms. The percentage computed shall be compared to the 5% limitation.

[PSD-FL-121(C)]

C.87. Charging Rate Monitoring: The average daily solid waste charging rate shall be determined on a monthly basis and recorded for each MWC unit. The daily charging rate shall be determined each month on an average daily basis for each MWC unit using the Facility's truck scale weight data, refuse pit inventory data and MWC operating data for the preceding calendar month. Monthly truck scale weight records of the weight of solid waste received and processed at the Facility, and refuse pit inventory data, shall be used to determine the amount of solid waste charged during the preceding calendar month on an average daily basis. The MWC load level measurements or other operating data shall be used to determined the number of operating hours per MWC unit for each day during the preceding calendar month.
[Rules 62-204.800(8) and 62-4.070(3), F.A.C.; 40 CFR 60.53(a); and, PSD-FL-121(B)]

Miscellaneous Requirements.

C.88. Definitions. For the purposes of Rules 62-204.800(7), (8), and (9), F.A.C., the definitions contained in the various provisions of 40 CFR Parts 60 and 61, adopted herein shall apply except that the term "Administrator" when used in 40 CFR Parts 60 and 61, shall mean the Secretary or the Secretary's designee except as noted in 40 CFR 61.157.
[40 CFR 60.2; and, Rules 62-204.800(7)(a), (8)(a)2. and (9)(a), F.A.C.]

C.89. Circumvention. No owner or operator subject to the provisions of 40 CFR 60 shall build, erect, install, or use any article, machine, equipment or process, the use of which conceals an emission which would otherwise constitute a violation of an applicable standard. Such concealment includes, but is not limited to, the use of gaseous diluents to achieve compliance with an opacity standard or with a standard which is based on the concentration of a pollutant in the gases discharged to the atmosphere.
[40 CFR 60.12]

C.90. Activated Carbon Injection The owner or operator of an affected facility where activated carbon injection is used to comply with the mercury emission limit, or the dioxin/furan emission limits , or the dioxin/furan emission level specified in 40 CFR 60.58b(g)(5)(iii) shall follow the procedures specified in paragraphs (1) through (3).
(1) During the performance tests for dioxins/furans and mercury, as applicable, the owner or operator shall estimate an average carbon mass feed rate based on carbon injection system operating parameters such as the screw feeder speed, hopper volume, hopper refill frequency, or other parameters appropriate to the feed system being employed, as specified in paragraphs (i) and (ii).

(i) An average carbon mass feed rate in kilograms per hour or pounds per hour shall be estimated during the initial performance test for mercury emissions and each subsequent performance test for mercury emissions.

(ii) An average carbon mass feed rate in kilograms per hour or pounds per hour shall be estimated during the initial performance test for dioxin/furan emissions and each subsequent performance test for dioxin/furan emissions.

(2) During operation of the affected facility, the carbon injection system operating parameter(s) that are the primary indicator(s) of the carbon mass feed rate (e.g., screw feeder setting) must equal or exceed the level(s) documented during the performance tests specified under paragraphs (1)(i) and (1)(ii).
(3) The owner or operator of an affected facility shall estimate the total carbon usage of the plant (kilograms or pounds) for each calendar quarter by two independent methods, according to the procedures in paragraphs (i) and (ii).

(i) The weight of carbon delivered to the plant.

(ii) Estimate the average carbon mass feed rate in kilograms per hour or pounds per hour for each hour of operation for each affected facility based on the parameters specified under paragraph (1), and sum the results for all affected facilities at the plant for the total number of hours of operation during the calendar quarter.

[40 CFR 60.38b and 40 CFR 60.58b(m)]

C.91. General Applicability and Definitions. The Standards of Performance for New Stationary Sources adopted by reference in Rule 62-204.800(7), F.A.C., the Emission Guidelines for Existing Sources adopted by reference in Rule 62-204.800(8), F.A.C., and the National Emissions Standards for Hazardous Air Pollutants adopted by reference in Rule 62-204.800(9), F.A.C., shall be controlling over other standards in the air pollution rules of the Department except that any emissions limiting standard contained in or determined pursuant to the air pollution rules of the Department which is more stringent than one contained in a Standard of Performance, an Emission Guideline, or a National Emission Standard, or which regulates emissions of pollutants or emissions units not regulated by an applicable Standard of Performance, Emission Guideline, or National Emission Standard, shall apply.
[Rules 62-204.800(7)(c), (8)(a)1., and (9)(c), F.A.C.]

C.92. The combustor boilers shall have a metal name plate affixed in a conspicuous place on the shell showing manufacturer, model number, type waste, and rated capacity.
[PSD-FL-121(B)]

C.93. Continuous Load Monitoring: The owner or operator shall install, calibrate, maintain, and operate a steam flow meter or a feed water flow meter, measure steam (or feed water) flow in kilograms (or pounds) per hour on a continuous basis, and record the output of the monitor (in accordance with the ASME method described in 40 CFR 60.58b(i)(6)). Steam (or feed water) flow shall be calculated in 4-hour block arithmetic averages. Higher loads are allowed for testing purposes pursuant to 40 CFR 60.53b(b).
[Rule 62-204.800(8), F.A.C.; 40 CFR 60.31b, 60.38b, 60.51b, 60.53b(b), and 60.58b(i)(6); and, PSD-FL-121(B)]

C.94. Acid Rain Part Application. For any unit which was a solid waste incinerator, burning less than 20 percent fossil fuel as described in 40 CFR 72.6(b)(7), adopted and incorporated by reference at Rule 62-204.800, F.A.C. the designated representative of the source containing the unit shall submit a complete Acid Rain Part application governing such unit to the Department before the later of January 1, 1998, or March 1 of the year following the three calendar year period in which the incinerator consumed 20 percent or more fossil fuel on a British thermal unit (BTU) basis.
[Rule 62-214.320(1)(h), F.A.C.]

C.95. Continuous Emission Monitoring System (CEMS). CEMS with recorders shall be installed, calibrated, maintained and operated for each unit, subject to review by FDEP, for the following pollutants and operational parameters:
Carbon Monoxide
Nitrogen Oxides
Opacity
Sulfur Dioxide (monitors shall be located both upstream and downstream of the baghouse for percent removal efficiency calculations)
Oxygen
Total Steam Production (lbs/hr, pressure, and temperature) or Feed water Flow Rate (lbs/hr)
Flue Gas Temperature (at the fabric filter inlet)
Carbon Injection System Operating Parameters
Power Generation (in MW)
Unless required in 40 CFR 60, Subpart Cb, operational data monitoring systems (steam production, baghouse inlet temperature, carbon injection system parameters and power generation) shall be calibrated annually and operated in accordance with good engineering practice.
[PSD-FL-121(C)]

C.96. The monitoring devices shall meet the requirements of Rule 62-297.520, F.A.C., 40 CFR 60.45 and 40 CFR60.13, including certification of each device in accordance with 40 CFR 60, Appendix B, Performance Specifications and 40 CFR 60.7(a)(5). Quality assurance procedures must conform to all applicable sections of 40 CFR 60, Appendix F. Data on CEM/COM equipment specifications, manufacturer, type, calibration and maintenance needs, and its location after the economizer or in the air pollution control equipment outlet duct shall be provided to the Department's Southwest District office and the Hillsborough County Environmental Protection Commission for review at least 90 days prior to installation. Initial performance evaluations must be completed within 180 days after initial startup of each retrofitted unit.
[PSD-FL-121(C)]

Section III. Emissions Unit(s) and Conditions.

Subsection D. This section addresses the following emissions unit(s).

E.U. ID No.	Brief Description
-100	Ash Building and Handling System

Flyash and bottom ash is collected and conveyed to the ash handling building. The ash handling system is completely enclosed or covered to decrease the potential for fugitive emissions. The ash is quenched and wetted before being temporarily stored in the ash handling facility and loaded onto a truck. A baghouse is located on the ash handling building as an added precaution for fugitive emissions.

{Permitting note(s): This emissions unit is regulated under NSPS - 40 CFR 60, Subpart Cb, Emissions Guidelines and Compliance Times for Large Municipal Waste Combustors That Are Constructed on or Before September 20, 1994, adopted and incorporated by reference, subject to provisions, in Rule 62-204.800(8)(b), F.A.C.; Rule 62-212.400(5), F.A.C., Prevention of Significant Deterioration (PSD); and, Rule 62-212.400(6), F.A.C., Best Available Control Technology (BACT). Note: This project is subject to the requirements of 40 CFR 60, Subpart Cb. This permit may refer to the requirements of 40 CFR 60, Subpart Eb, where these requirements are referenced by Subpart Cb.}

The following specific conditions apply to the emissions unit(s) listed above:

Essential Potential to Emit (PTE) Parameters

D.1. Hours of Operation. This emissions unit is allowed to operate continuously, i.e., 8,760 hours/year. [Rule 62-210.200(PTE), F.A.C.; and, PSD-FL-121(B)]

Emission Limitations and Standards

{Permitting note: Table 1-1, Summary of Air Pollutant Standards and Terms, summarizes information for convenience purposes only. This table does not supersede any of the terms or conditions of this permit.}

{Permitting Note: Unless otherwise specified, the averaging times for Specific Conditions **D.2.**, **D.4.** and **D.5.** are based on the specified averaging time of the applicable test method.}

Fugitive Ash Emissions

D.2. Fugitive Ash Emissions
(a) On and after the date on which the initial performance test is completed or is required to be completed under 40 CFR 60.8 of Subpart A, no owner or operator of an affected facility shall cause to be discharged to the atmosphere visible emissions of combustion ash from an ash conveying system (including conveyor transfer points) in excess of 5 percent of the observation period (i.e., 9 minutes per 3-hour period), as determined by EPA Reference Method 22 observations as specified in 40 CFR 60.58b(k), except as provided in paragraphs (b) and (c). See specific condition **D.7.**
(b) The emission limit specified in paragraph (a) does not cover visible emissions discharged inside buildings or enclosures of ash conveying systems; however, the emission limit specified in paragraph (a) does cover visible emissions discharged to the atmosphere from buildings or enclosures of ash conveying systems.
(c) The provisions of paragraph (a) do not apply during maintenance and repair of ash conveying systems.
[40 CFR 60.36b and 40 CFR 60.55b]

D.3. The potential for dust generation by ash handling activities will be mitigated by quenching the ash prior to loading in ash transport trucks. The ash handling facilities shall be enclosed. Unprocessed refuse storage areas which must be open for operational purposes (e.g., tipping floor of the refuse bunker while trucks are entering and leaving) will be under negative air pressure. Residue from the grates, grate siftings, and ash from the combustor/boiler and fabric filter hoppers during normal operations shall be discharged into the ash quenching system, or otherwise handled in a manner to minimize visible dust. The ash/residue in the ash handling building shall remain sufficiently moist to prevent dust during storage and handling operations.
[PSD-FL-121(B)]

D.4. PM emissions from the ash handling facility baghouse shall not exceed 1.63 pounds per hour.
[PSD-FL-121(B)]

D.5. Visible emissions from the ash handling facility baghouse shall not exceed 5 percent opacity.
[PSD-FL-121(B)]

Excess Emissions

{Permitting note: The Excess Emissions Rule at Rule 62-210.700, F.A.C., cannot vary any requirement of a NSPS, NESHAP, or Acid Rain program provision.}

D.6. At all times, including periods of startup, shutdown, and malfunction, owners and operators shall, to the extent practicable, maintain and operate any affected facility including associated air pollution control equipment in a manner consistent with good air pollution control practice for minimizing emissions. Determination of whether acceptable operating and maintenance procedures are being used will be based on information available to the Administrator which may include, but is not limited to, monitoring results, opacity observations, review of operating and maintenance procedures, and inspection of the source.
[40 CFR 60.11(d)]

D.7. Excess emissions from these emissions units resulting from startup, shutdown or malfunction shall be permitted provided that best operational practices to minimize emissions are adhered to and 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.
[Rule 62-210.700(1), F.A.C.]

D.8. Excess emissions which are caused entirely or in part by poor maintenance, poor operation, or any other equipment or process failure which may reasonably be prevented during startup, shutdown or malfunction shall be prohibited.
[Rule 62-210.700(4), F.A.C.]

Test Methods and Procedures

{Permitting note: Table 2-1, Summary of Compliance Requirements, summarizes information for convenience purposes only. This table does not supersede any of the terms or conditions of this permit.}

Fugitive Ash

D.9. The procedures specified in paragraphs (1) through (4) shall be used for determining compliance with the fugitive ash emission limit under 40 CFR 60.55b.
(1) The EPA Reference Method 22 shall be used for determining compliance with the fugitive ash emission limit under 40 CFR 60.55b. The minimum observation time shall be a series of three 1-hour observations. The observation period shall include times when the facility is transferring ash from the municipal waste combustor unit to the area where ash is stored or loaded into containers or trucks.
(2) The average duration of visible emissions per hour shall be calculated from the three 1-hour observations. The average shall be used to determine compliance with 40 CFR 60.55b.
(3) The owner or operator of an affected facility shall conduct an initial performance test for fugitive ash emissions as required under 40 CFR 60.8.

(4) Following the date that the initial performance test for fugitive ash emissions is completed or is required to be completed under Sec. 60.8 for an affected facility, the owner or operator shall conduct a performance test for fugitive ash emissions on an annual basis (no more than 12 calendar months following the previous performance test).
[40 CFR 60.38b and 40 CFR 60.58b(k)]

D.10. Performance tests shall be conducted under such conditions as the Administrator shall specify to the plant operator based on representative performance of the affected facility. The owner or operator shall make available to the Administrator such records as may be necessary to determine the conditions of the performance tests. Operations during periods of startup, shutdown, and malfunction shall not constitute representative conditions for the purpose of a performance test nor shall emissions in excess of the level of the applicable emission limit during periods of startup, shutdown, and malfunction be considered a violation of the applicable emission limit unless otherwise specified in the applicable standard.
[40 CFR 60.8(c)]

D.11. Particulate Matter. The test methods for particulate emissions shall be EPA Method 5 incorporated by reference in Chapter 62-297, F.A.C. **The permittee has elected to accept an alternate standard of five (5) percent opacity to waive the particulate matter compliance test requirement.** See specific condition **D.5.**
[Rules 62-213.440 and 62-297.620(4), F.A.C.]

D.12. Visible Emissions. EPA Method 9 shall be used to determine opacity compliance pursuant to Chapter 62-297, F.A.C.
[Rule 62-297.401, F.A.C.]

D.13. In the case of an emissions unit which has the potential to emit less than 100 tons per year of particulate matter and is equipped with a baghouse, the Secretary or the appropriate Director of District Management may waive any particulate matter compliance test requirements for such emissions unit specified in any otherwise applicable rule, and specify an alternative standard of 5% opacity. The waiver of compliance test requirements for a particulate emissions unit equipped with a baghouse, and the substitution of the visible emissions standard, shall be specified in the permit issued to the emissions unit.

If the Department has reason to believe that the particulate weight emission standard applicable to such an emissions unit is not being met, it shall require that compliance be demonstrated by the test method specified in the applicable rule.
[Rule 62-297.620(4), F.A.C.]

D.14. Operating Rate During Testing. Testing of emissions shall be conducted with the emissions unit operation at permitted capacity, which is defined as 90 to 100 percent of the maximum operation rate allowed by the permit. If it is impracticable to test at permitted capacity, an emissions unit may be tested at less than the minimum permitted capacity; in this case, subsequent emissions unit operation is limited to 110 percent of the test load until a new test is conducted. Once the emissions unit is so limited,

operation at higher capacities is allowed for no more than 15 consecutive days for the purpose of additional compliance testing to regain the authority to operate at the permitted capacity.
[Rules 62-297.310(2) & (2)(b), F.A.C.]

D.15. Applicable Test Procedures.
(a) Required Sampling Time.

1. Unless otherwise specified in the applicable rule, the required sampling time for each test run shall be no less than one hour and no greater than four hours, and the sampling time at each sampling point shall be of equal intervals of at least two minutes.
2. Opacity Compliance Tests. When either EPA Method 9 or DEP Method 9 is specified as the applicable opacity test method, the required minimum period of observation for a compliance test shall be sixty (60) minutes for emissions units which emit or have the potential to emit 100 tons per year or more of particulate matter, and thirty (30) minutes for emissions units which have potential emissions less than 100 tons per year of particulate matter and are not subject to a multiple-valued opacity standard. The opacity test observation period shall include the period during which the highest opacity emissions can reasonably be expected to occur. Exceptions to these requirements are as follows:
   a. For batch, cyclical processes, or other operations which are normally completed within less than the minimum observation period and do not recur within that time, the period of observation shall be equal to the duration of the batch cycle or operation completion time.
   b. The observation period for special opacity tests that are conducted to provide data to establish a surrogate standard pursuant to Rule 62-297.310(5)(k), F.A.C., Waiver of Compliance Test Requirements, shall be established as necessary to properly establish the relationship between a proposed surrogate standard and an existing mass emission limiting standard.
   c. The minimum observation period for opacity tests conducted by employees or agents of the Department to verify the day-to-day continuing compliance of a unit or activity with an applicable opacity standard shall be twelve minutes.

[Rule 62-297.310(4), F.A.C.]

D.16. Frequency of Compliance Tests. The following provisions apply only to those emissions units that are subject to an emissions limiting standard for which compliance testing is required.
(a) General Compliance Testing.

3. The owner or operator of an emissions unit that is subject to any emission limiting standard shall conduct a compliance test that demonstrates compliance with the applicable emission limiting standard prior to obtaining a renewed operation permit. Emissions units that are required to conduct an annual compliance test may submit the most recent annual compliance test to satisfy the requirements of this provision. In renewing an air operation permit pursuant to Rule 62-210.300(2)(a)3.b., c., or d., F.A.C., the Department shall not require submission of emission compliance test results for any emissions unit that, during the year prior to renewal:

a Did not operate; or

4. During each federal fiscal year (October 1 - September 30), unless otherwise specified by rule, order, or permit, the owner or operator of each emissions unit shall have a formal compliance test conducted for:

a. Visible emissions, if there is an applicable standard;

b. Each of the following pollutants, if there is an applicable standard, and if the emissions unit emits or has the potential to emit: 5 tons per year or more of lead or lead compounds measured as elemental lead; 30 tons per year or more of acrylonitrile; or 100 tons per year or more of any other regulated air pollutant; and

c. Each NESHAP pollutant, if there is an applicable emission standard.

9. The owner or operator shall notify the Department, at least 15 days prior to the date on which each formal compliance test is to begin, of the date, time, and place of each such test, and the test contact person who will be responsible for coordinating and having such test conducted for the owner or operator.

(b) Special Compliance Tests. When the Department, after investigation, has good reason (such as complaints, increased visible emissions or questionable maintenance of control equipment) to believe that any applicable emission standard contained in a Department rule or in a permit issued pursuant to those rules is being violated, it may require the owner or operator of the emissions unit to conduct compliance tests which identify the nature and quantity of pollutant emissions from the emissions unit and to provide a report on the results of said tests to the Department.

(c) Waiver of Compliance Test Requirements. If the owner or operator of an emissions unit that is subject to a compliance test requirement demonstrates to the Department, pursuant to the procedure established in Rule 62-297.620, F.A.C., that the compliance of the emissions unit with an applicable weight emission limiting standard can be adequately determined by means other than the designated test procedure, such as specifying a surrogate standard of no visible emissions for particulate matter sources equipped with a bag house or specifying a fuel analysis for sulfur dioxide emissions, the Department shall waive the compliance test requirements for such emissions units and order that the alternate means of determining compliance be used, provided, however, the provisions of Rule 62-297.310(7)(b), F.A.C., shall apply.

[Rule 62-297.310(7), F.A.C.; and, SIP approved]

D.17. Compliance with standards in 40 CFR 60, other than opacity standards, shall be determined by performance tests established by 40 CFR 60.8, unless otherwise specified in the applicable standard.
[40 CFR 60.11(a)]

Monitoring of Operations

D.18. Determination of Process Variables.
(a) Required Equipment. The owner or operator of an emissions unit for which compliance tests are required shall install, operate, and maintain equipment or instruments necessary to determine process variables, such as process weight input or heat input, when such data are needed in conjunction with emissions data to determine the compliance of the emissions unit with applicable emission limiting standards.
(b) Accuracy of Equipment. Equipment or instruments used to directly or indirectly determine process variables, including devices such as belt scales, weight hoppers, flow meters, and tank scales, shall be calibrated and adjusted to indicate the true value of the parameter being measured with sufficient accuracy to allow the applicable process variable to be determined within 10% of its true value.
[Rule 62-297.310(5), F.A.C.]

Recordkeeping and Reporting Requirements

D.19. The owner or operator subject to the provisions of 40 CFR 60 shall furnish the Administrator written notification as follows:
(4) A notification of any physical or operational change to an existing facility which may increase the emission rate of any air pollutant to which a standard applies, unless that change is specifically exempted under an applicable subpart or in 40 CFR 60.14(e). This notice shall be postmarked 60 days or as soon as practicable before the change is commenced and shall include information describing the precise nature of the change, present and proposed emission control systems, productive capacity of the facility before and after the change, and the expected completion date of the change. The Administrator may request additional relevant information subsequent to this notice.
[40 CFR 60.7(a)(4)]

D.20. *The owner or operator subject to the provisions of 40 CFR 60 shall maintain records of the* occurrence and duration of any startup, shutdown, or malfunction in the operation of an affected facility; any malfunction of the air pollution control equipment; or, any periods during which a continuous monitoring system or monitoring device is inoperative.
[40 CFR 60.7(b)]

D.21. (1) Notwithstanding the frequency of reporting requirements specified in 40 CFR 60.7(c), an owner or operator who is required by an applicable subpart to submit excess emissions and monitoring systems performance reports (and summary reports) on a quarterly (or more frequent) basis may reduce the frequency of reporting for that standard to semiannual if the following conditions are met:

(i) For 1 full year (e.g., 4 quarterly or 12 monthly reporting periods) the affected facility's excess emissions and monitoring systems reports submitted to comply with a standard under this part continually demonstrate that the facility is in compliance with the applicable standard;
(ii) The owner or operator continues to comply with all recordkeeping and monitoring requirements specified in 40 CFR 60, Subpart A, and the applicable standard; and
(iii) The Administrator does not object to a reduced frequency of reporting for the affected facility, as provided in 40 CFR 60.7(e)(2).

(2) The frequency of reporting of excess emissions and monitoring systems performance (and summary) reports may be reduced only after the owner or operator notifies the Administrator in writing of his or her intention to make such a change and the Administrator does not object to the intended change. In deciding whether to approve a reduced frequency of reporting, the Administrator may review information concerning the source's entire previous performance history during the required recordkeeping period prior to the intended change, including performance test results, monitoring data, and evaluations of an owner or operator's conformance with operation and maintenance requirements. Such information may be used by the Administrator to make a judgment about the source's potential for noncompliance in the future. If the Administrator disapproves the owner or operator's request to reduce the frequency of reporting, the Administrator will notify the owner or operator in writing within 45 days after receiving notice of the owner or operator's intention. The notification from the Administrator to the owner or operator will specify the grounds on which the disapproval is based. In the absence of a notice of disapproval within 45 days, approval is automatically granted.
(3) As soon as monitoring data indicate that the affected facility is not in compliance with any emission limitation or operating parameter specified in the applicable standard, the frequency of reporting shall revert to the frequency specified in the applicable standard, and the owner or operator shall submit an excess emissions and monitoring systems performance report (and summary report, if required) at the next appropriate reporting period following the noncomplying event. After demonstrating compliance with the applicable standard for another full year, the owner or operator may again request approval from the Administrator to reduce the frequency of reporting for that standard as provided for in 40 CFR 60.7(e)(1) and (e)(2).
[40 CFR 60.7(e)(1)]

{See attached Figure 1: Summary Report-Gaseous and Opacity Excess Emission and Monitoring System Performance}

D.22. Any owner or operator subject to the provisions of 40 CFR 60 shall maintain a file of all measurements, including continuous monitoring system, monitoring device, and performance testing measurements; all continuous monitoring system performance evaluations; all continuous monitoring system or monitoring device calibration checks; adjustments and maintenance performed on these systems or devices; and, all other information required by 40 CFR 60 recorded in a permanent form suitable for inspection. The file shall be retained for at least **5 (five)** years following the date of such measurements, maintenance, reports, and records.
[40 CFR 60.7(f); and, Rule 62-213.440(1)(b)2.b., F.A.C.]

D.23. Test Reports.
(a) The owner or operator of an emissions unit for which a compliance test is required shall file a report with the Department on the results of each such test.
(b) The required test report shall be filed with the Department as soon as practical but no later than 45 days after the last sampling run of each test is completed.
(c) The test report shall provide sufficient detail on the emissions unit tested and the test procedures used to allow the Department to determine if the test was properly conducted and the test results properly computed. As a minimum, the test report, other than for an EPA or DEP Method 9 test, shall provide the following information:

1. The type, location, and designation of the emissions unit tested.
2. The facility at which the emissions unit is located.
3. The owner or operator of the emissions unit.
4. The normal type and amount of fuels used and materials processed, and the types and amounts of fuels used and material processed during each test run.
5. The means, raw data and computations used to determine the amount of fuels used and materials processed, if necessary to determine compliance with an applicable emission limiting standard.
6. The type of air pollution control devices installed on the emissions unit, their general condition, their normal operating parameters (pressure drops, total operating current and GPM scrubber water), and their operating parameters during each test run.
7. A sketch of the duct within 8 stack diameters upstream and 2 stack diameters downstream of the sampling ports, including the distance to any upstream and downstream bends or other flow disturbances.
8. The date, starting time and duration of each sampling run.
9. The test procedures used, including any alternative procedures authorized pursuant to Rule 62-297.620, F.A.C. Where optional procedures are authorized in this chapter, indicate which option was used.
10. The number of points sampled and configuration and location of the sampling plane.
11. For each sampling point for each run, the dry gas meter reading, velocity head, pressure drop across the stack, temperatures, average meter temperatures and sample time per point.
12. The type, manufacturer and configuration of the sampling equipment used.
13. Data related to the required calibration of the test equipment.
14. Data on the identification, processing and weights of all filters used.
15. Data on the types and amounts of any chemical solutions used.
16. Data on the amount of pollutant collected from each sampling probe, the filters, and the impingers, are reported separately for the compliance test.
17. The names of individuals who furnished the process variable data, conducted the test, analyzed the samples and prepared the report.
18. All measured and calculated data required to be determined by each applicable test procedure for each run.
19. The detailed calculations for one run that relate the collected data to the calculated emission rate.

20. The applicable emission standard, and the resulting maximum allowable emission rate for the emissions unit, plus the test result in the same form and unit of measure.
21. A certification that, to the knowledge of the owner or his authorized agent, all data submitted are true and correct. When a compliance test is conducted for the Department or its agent, the person who conducts the test shall provide the certification with respect to the test procedures used. The owner or his authorized agent shall certify that all data required and provided to the person conducting the test are true and correct to his knowledge.
[Rules 62-213.440 and 62-297.310(8), F.A.C.]

D.24. Malfunction Reporting. In the case of excess emissions resulting from malfunctions, each owner or operator shall notify the Department in accordance with Rule 62-4.130, F.A.C. A full written report on the malfunctions shall be submitted in a quarterly report, if requested by the Department.
[Rule 62-210.700(6), F.A.C.]

Miscellaneous Requirements

D.25. Definitions. For the purposes of Rules 62-204.800(7), (8), and (9), F.A.C., the definitions contained in the various provisions of 40 CFR Parts 60 and 61, adopted herein shall apply except that the term "Administrator" when used in 40 CFR Parts 60 and 61, shall mean the Secretary or the Secretary's designee except as noted in 40 CFR 61.157.
[40 CFR 60.2; and, Rules 62-204.800(7)(a), (8)(a)2., and, (9)(a), F.A.C.]

D.26. Circumvention. No owner or operator subject to the provisions of 40 CFR 60 shall build, erect, install, or use any article, machine, equipment or process, the use of which conceals an emission which would otherwise constitute a violation of an applicable standard. Such concealment includes, but is not limited to, the use of gaseous diluents to achieve compliance with an opacity standard or with a standard which is based on the concentration of a pollutant in the gases discharged to the atmosphere.
[40 CFR 60.12]

D.27. General Applicability and Definitions. The Standards of Performance for New Stationary Sources adopted by reference in Rule 62-204.800(7), F.A.C., the Emission Guidelines for Existing Sources adopted by reference in Rule 62-204.800(8), F.A.C., and the National Emissions Standards for Hazardous Air Pollutants adopted by reference in Rule 62-204.800(9), F.A.C., shall be controlling over other standards in the air pollution rules of the Department except that any emissions limiting standard contained in or determined pursuant to the air pollution rules of the Department which is more stringent than one contained in a Standard of Performance, an Emission Guideline, or a National Emission Standard, or which regulates emissions of pollutants or emissions units not regulated by an applicable Standard of Performance, Emission Guideline, or National Emission Standard, shall apply.
[Rules 62-204.800(7)(c), (8)(a)1., and (9)(c), F.A.C.]

Section III. Emissions Unit(s) and Conditions.

Subsection E. This section addresses the following emissions unit(s).

E.U. ID No.	Brief Description
-101	Lime Storage Silo
-106	Dolomitic Lime Storage Silo

Lime used in the spray dryer absorbers for each municipal waste combustor is stored in silos. Emissions from each silo are controlled by bag house filters.

{Permitting note(s): Emissions unit -101 is regulated under Rule 62-212.400(5), F.A.C., Prevention of Significant Deterioration (PSD); and, Rule 62-212.400(6), F.A.C., Best Available Control Technology (BACT). Emissions unit -104 is regulated under Rule 62-296.320(4)(b), F.A.C., General Visible Emissions Standard.}

The following specific conditions apply to the emissions unit(s) listed above:

Essential Potential to Emit (PTE) Parameters

E.1. Hours of Operation. This emissions unit is allowed to operate continuously, i.e., 8,760 hours/year. [Rule 62-210.200(PTE), F.A.C.]

Emission Limitations and Standards

{Permitting note: Table 1-1, Summary of Air Pollutant Standards and Terms, summarizes information for convenience purposes only. This table does not supersede any of the terms or conditions of this permit.}

{Permitting Note: Unless otherwise specified, the averaging times for Specific Conditions **E.2.** and **E.3.** are based on the specified averaging time of the applicable test method.}

E.2. Particulate Matter. Particulate matter emissions shall not exceed:
Emissions unit -101: 0.015 grains per dry standard cubic foot, front-half catch.
Emissions unit -106: 6.32 pounds per hour and 0.39 tons per year.
[PSD-FL-121(B) and 0570261-004-AC]

E.3. Visible Emissions.
Emissions unit -101: Visible emissions shall not exceed five (5) percent opacity.
Emissions unit -106: Visible emissions shall not be equal to or greater than 20 percent opacity.
[PSD-FL-121(B); 0570261-004-AC; and, Rule 62-296.320(4)(b)1., F.A.C.]

Excess Emissions

E.4. Excess emissions from these emissions units resulting from startup, shutdown or malfunction shall be permitted provided that best operational practices to minimize emissions are adhered to and 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.
[Rule 62-210.700(1), F.A.C.]

E.5. Excess emissions which are caused entirely or in part by poor maintenance, poor operation, or any other equipment or process failure which may reasonably be prevented during startup, shutdown or malfunction shall be prohibited.
[Rule 62-210.700(4), F.A.C.]

Test Methods and Procedures

{Permitting note: Table 2-1, Summary of Compliance Requirements, summarizes information for convenience purposes only. This table does not supersede any of the terms or conditions of this permit.}

E.6. Particulate Matter. The test methods for particulate emissions shall be EPA Method 5 incorporated by reference in Chapter 62-297, F.A.C. **The permittee has elected to accept an alternate standard of five (5) percent opacity to waive the particulate matter compliance test requirement.** See specific condition **E.3.**
[Rules 62-213.440 and 62-297.620(4), F.A.C.]

E.7. Visible Emissions. EPA Method 9 shall be used to determine opacity compliance pursuant to Chapter 62-297, F.A.C.
[Rule 62-297.401, F.A.C.]

E.8. In the case of an emissions unit which has the potential to emit less than 100 tons per year of particulate matter and is equipped with a baghouse, the Secretary or the appropriate Director of District Management may waive any particulate matter compliance test requirements for such emissions unit specified in any otherwise applicable rule, and specify an alternative standard of 5% opacity. The waiver of compliance test requirements for a particulate emissions unit equipped with a baghouse, and the substitution of the visible emissions standard, shall be specified in the permit issued to the emissions unit.

If the Department has reason to believe that the particulate weight emission standard applicable to such an emissions unit is not being met, it shall require that compliance be demonstrated by the test method specified in the applicable rule.
[Rule 62-297.620(4), F.A.C.]

E.9. Operating Rate During Testing. Testing of emissions shall be conducted with the emissions unit operation at permitted capacity, which is defined as 90 to 100 percent of the maximum operation rate allowed by the permit. If it is impracticable to test at permitted capacity, an emissions unit may be tested at less than the minimum permitted capacity; in this case,
subsequent emissions unit operation is limited to 110 percent of the test load until a new test is conducted. Once the emissions unit is so limited, operation at higher capacities is allowed for no more than 15 consecutive days for the purpose of additional compliance testing to regain the authority to operate at the permitted capacity.
[Rules 62-297.310(2) & (2)(b), F.A.C.]

E.10. Applicable Test Procedures.
(a) Required Sampling Time.

1. Unless otherwise specified in the applicable rule, the required sampling time for each test run shall be no less than one hour and no greater than four hours, and the sampling time at each sampling point shall be of equal intervals of at least two minutes.
2. Opacity Compliance Tests. When either EPA Method 9 or DEP Method 9 is specified as the applicable opacity test method, the required minimum period of observation for a compliance test shall be sixty (60) minutes for emissions units which emit or have the potential to emit 100 tons per year or more of particulate matter, and thirty (30) minutes for emissions units which have potential emissions less than 100 tons per year of particulate matter and are not subject to a multiple-valued opacity standard. The opacity test observation period shall include the period during which the highest opacity emissions can reasonably be expected to occur. Exceptions to these requirements are as follows:

a. For batch, cyclical processes, or other operations which are normally completed within less than the minimum observation period and do not recur within that time, the period of observation shall be equal to the duration of the batch cycle or operation completion time.
b. The observation period for special opacity tests that are conducted to provide data to establish a surrogate standard pursuant to Rule 62-297.310(5)(k), F.A.C., Waiver of Compliance Test Requirements, shall be established as necessary to properly establish the relationship between a proposed surrogate standard and an existing mass emission limiting standard.

c. The minimum observation period for opacity tests conducted by employees or agents of the Department to verify the day-to-day continuing compliance of a unit or activity with an applicable opacity standard shall be twelve minutes.

[Rule 62-297.310(4), F.A.C.]

E.11. Frequency of Compliance Tests. The following provisions apply only to those emissions units that are subject to an emissions limiting standard for which compliance testing is required.

(a) General Compliance Testing.

3. The owner or operator of an emissions unit that is subject to any emission limiting standard shall conduct a compliance test that demonstrates compliance with the applicable emission limiting standard prior to obtaining a renewed operation permit. Emissions units that are required to conduct an annual compliance test may submit the most recent annual compliance test to satisfy the requirements of this provision. In renewing an air operation permit pursuant to Rule 62-210.300(2)(a)3.b., c., or d., F.A.C., the Department shall not require submission of emission compliance test results for any emissions unit that, during the year prior to renewal:

a Did not operate;

4. During each federal fiscal year (October 1 - September 30), unless otherwise specified by rule, order, or permit, the owner or operator of each emissions unit shall have a formal compliance test conducted for:

a. Visible emissions, if there is an applicable standard;

b. Each of the following pollutants, if there is an applicable standard, and if the emissions unit emits or has the potential to emit: 5 tons per year or more of lead or lead compounds measured as elemental lead; 30 tons per year or more of acrylonitrile; or 100 tons per year or more of any other regulated air pollutant; and

c. Each NESHAP pollutant, if there is an applicable emission standard.

9. The owner or operator shall notify the Department, at least 15 days prior to the date on which each formal compliance test is to begin, of the date, time, and place of each such test, and the test contact person who will be responsible for coordinating and having such test conducted for the owner or operator.

(b) Special Compliance Tests. When the Department, after investigation, has good reason (such as complaints, increased visible emissions or questionable maintenance of control equipment) to believe that any applicable emission standard contained in a Department rule or in a permit issued pursuant to those rules is being violated, it may require the owner or operator of the emissions unit to conduct compliance tests which identify the nature and quantity of pollutant emissions from the emissions unit and to provide a report on the results of said tests to the Department.

(c) Waiver of Compliance Test Requirements. If the owner or operator of an emissions unit that is subject to a compliance test requirement demonstrates to the Department, pursuant to the procedure established in Rule 62-297.620, F.A.C., that the compliance of the emissions unit with an applicable weight emission limiting standard can be adequately determined by means other than the designated test procedure, such as specifying a surrogate standard of no visible emissions for particulate matter sources equipped with a bag house or specifying a fuel analysis for sulfur dioxide emissions, the Department shall waive the compliance test requirements for such emissions units and order that the alternate means of determining compliance be used, provided, however, the provisions of Rule 62-297.310(7)(b), F.A.C., shall apply.
[Rule 62-297.310(7), F.A.C.; and, SIP approved]

Monitoring of Operations

E.12. Determination of Process Variables.
(a) Required Equipment. The owner or operator of an emissions unit for which compliance tests are required shall install, operate, and maintain equipment or instruments necessary to determine process variables, such as process weight input or heat input, when such data are needed in conjunction with emissions data to determine the compliance of the emissions unit with applicable emission limiting standards.
(b) Accuracy of Equipment. Equipment or instruments used to directly or indirectly determine process variables, including devices such as belt scales, weight hoppers, flow meters, and tank scales, shall be calibrated and adjusted to indicate the true value of the parameter being measured with sufficient accuracy to allow the applicable process variable to be determined within 10% of its true value.
[Rule 62-297.310(5), F.A.C.]

Recordkeeping and Reporting Requirements

E.13. Any measurements, maintenance, reports, and records shall be retained for at least **5 (five)** years following the date of such measurements, maintenance, reports, and records.
[Rule 62-213.440(1)(b)2.b., F.A.C.]

E.14. Test Reports.
(a) The owner or operator of an emissions unit for which a compliance test is required shall file a report with the Department on the results of each such test.
(b) The required test report shall be filed with the Department as soon as practical but no later than 45 days after the last sampling run of each test is completed.
(c) The test report shall provide sufficient detail on the emissions unit tested and the test procedures used to allow the Department to determine if the test was properly conducted and the test results properly computed. As a minimum, the test report, other than for an EPA or DEP Method 9 test, shall provide the following information:

1. The type, location, and designation of the emissions unit tested.

2. The facility at which the emissions unit is located.
3. The owner or operator of the emissions unit.
4. The normal type and amount of fuels used and materials processed, and the types and amounts of fuels used and material processed during each test run.
5. The means, raw data and computations used to determine the amount of fuels used and materials processed, if necessary to determine compliance with an applicable emission limiting standard.
6. The type of air pollution control devices installed on the emissions unit, their general condition, their normal operating parameters (pressure drops, total operating current and GPM scrubber water), and their operating parameters during each test run.
7. A sketch of the duct within 8 stack diameters upstream and 2 stack diameters downstream of the sampling ports, including the distance to any upstream and downstream bends or other flow disturbances.
8. The date, starting time and duration of each sampling run.
9. The test procedures used, including any alternative procedures authorized pursuant to Rule 62-297.620, F.A.C. Where optional procedures are authorized in this chapter, indicate which option was used.
10. The number of points sampled and configuration and location of the sampling plane.
11. For each sampling point for each run, the dry gas meter reading, velocity head, pressure drop across the stack, temperatures, average meter temperatures and sample time per point.
12. The type, manufacturer and configuration of the sampling equipment used.
13. Data related to the required calibration of the test equipment.
14. Data on the identification, processing and weights of all filters used.
15. Data on the types and amounts of any chemical solutions used.
16. Data on the amount of pollutant collected from each sampling probe, the filters, and the impingers, are reported separately for the compliance test.
17. The names of individuals who furnished the process variable data, conducted the test, analyzed the samples and prepared the report.
18. All measured and calculated data required to be determined by each applicable test procedure for each run.
19. The detailed calculations for one run that relate the collected data to the calculated emission rate.
20. The applicable emission standard, and the resulting maximum allowable emission rate for the emissions unit, plus the test result in the same form and unit of measure.
21. A certification that, to the knowledge of the owner or his authorized agent, all data submitted are true and correct. When a compliance test is conducted for the Department or its agent, the person who conducts the test shall provide the certification with respect to the test procedures used. The owner or his authorized agent shall certify that all data required and provided to the person conducting the test are true and correct to his knowledge.

[Rules 62-213.440 and 62-297.310(8), F.A.C.]

Section III. Emissions Unit(s) and Conditions.

Subsection F. This section addresses the following emissions unit(s).

E.U. ID No.	Brief Description
-102	Activated Carbon Storage Silo

Activated carbon used in the carbon injection system for each municipal waste combustor is stored in a silo. The activated carbon will be utilized for the control of mercury and dioxin/furans. Emissions from the silo are controlled by a baghouse.

{Permitting note(s): This emissions unit is regulated under Rule 62-212.400(5), F.A.C., Prevention of Significant Deterioration (PSD); and, Rule 62-212.400(6), F.A.C., Best Available Control Technology (BACT)}

The following specific conditions apply to the emissions unit(s) listed above:

Essential Potential to Emit (PTE) Parameters

F.1. Hours of Operation. This emissions unit is allowed to operate continuously, i.e., 8,760 hours/year. [Rule 62-210.200(PTE), F.A.C.]

Emission Limitations and Standards

{Permitting note: Table 1-1, Summary of Air Pollutant Standards and Terms, summarizes information for convenience purposes only. This table does not supersede any of the terms or conditions of this permit.}

{Permitting Note: Unless otherwise specified, the averaging times for Specific Conditions **F.2.** and **F.3.** are based on the specified averaging time of the applicable test method.}

F.2. Particulate Matter. Particulate matter emissions shall not exceed 0.015 grains per dry standard cubic foot, front-half catch.
[PSD-FL-121(B)]

F.3. Visible Emissions. Visible emissions shall not exceed five (5) percent opacity.
[PSD-FL-121(B)]

Excess Emissions

F.4. Excess emissions from these emissions units resulting from startup, shutdown or malfunction shall be permitted provided that best operational practices to minimize emissions are adhered to and 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.
[Rule 62-210.700(1), F.A.C.]

F.5. Excess emissions which are caused entirely or in part by poor maintenance, poor operation, or any other equipment or process failure which may reasonably be prevented during startup, shutdown or malfunction shall be prohibited.
[Rule 62-210.700(4), F.A.C.]

Test Methods and Procedures

{Permitting note: Table 2-1, Summary of Compliance Requirements, summarizes information for convenience purposes only. This table does not supersede any of the terms or conditions of this permit.}

F.6. Particulate Matter. The test methods for particulate emissions shall be EPA Method 5 incorporated by reference in Chapter 62-297, F.A.C. **The permittee has elected to accept an alternate standard of five (5) percent opacity to waive the particulate matter compliance test requirement.** See specific condition **F.3.**
[Rules 62-213.440 and 62-297.620(4), F.A.C.]

F.7. Visible Emissions. EPA Method 9 shall be used to determine opacity compliance pursuant to Chapter 62-297, F.A.C.
[Rule 62-297.401, F.A.C.]

F.8. In the case of an emissions unit which has the potential to emit less than 100 tons per year of particulate matter and is equipped with a baghouse, the Secretary or the appropriate Director of District Management may waive any particulate matter compliance test requirements for such emissions unit specified in any otherwise applicable rule, and specify an alternative standard of 5% opacity. The waiver of compliance test requirements for a particulate emissions unit equipped with a baghouse, and the substitution of the visible emissions standard, shall be specified in the permit issued to the emissions unit.

If the Department has reason to believe that the particulate weight emission standard applicable to such an emissions unit is not being met, it shall require that compliance be demonstrated by the test method specified in the applicable rule.
[Rule 62-297.620(4), F.A.C.]

F.9. Operating Rate During Testing. Testing of emissions shall be conducted with the emissions unit operation at permitted capacity, which is defined as 90 to 100 percent of the maximum operation rate allowed by the permit. If it is impracticable to test at permitted capacity, an emissions unit may be tested at less than the minimum permitted capacity; in this case,
subsequent emissions unit operation is limited to 110 percent of the test load until a new test is conducted. Once the emissions unit is so limited, operation at higher capacities is allowed for no more than 15 consecutive days for the purpose of additional compliance testing to regain the authority to operate at the permitted capacity.
[Rules 62-297.310(2) & (2)(b), F.A.C.]

F.10. Applicable Test Procedures.
(a) Required Sampling Time.

1. Unless otherwise specified in the applicable rule, the required sampling time for each test run shall be no less than one hour and no greater than four hours, and the sampling time at each sampling point shall be of equal intervals of at least two minutes.
2. Opacity Compliance Tests. When either EPA Method 9 or DEP Method 9 is specified as the applicable opacity test method, the required minimum period of observation for a compliance test shall be sixty (60) minutes for emissions units which emit or have the potential to emit 100 tons per year or more of particulate matter, and thirty (30) minutes for emissions units which have potential emissions less than 100 tons per year of particulate matter and are not subject to a multiple-valued opacity standard. The opacity test observation period shall include the period during which the highest opacity emissions can reasonably be expected to occur. Exceptions to these requirements are as follows:
    a. For batch, cyclical processes, or other operations which are normally completed within less than the minimum observation period and do not recur within that time, the period of observation shall be equal to the duration of the batch cycle or operation completion time.
    b. The observation period for special opacity tests that are conducted to provide data to establish a surrogate standard pursuant to Rule 62-297.310(5)(k), F.A.C., Waiver of Compliance Test Requirements, shall be established as necessary to properly establish the relationship between a proposed surrogate standard and an existing mass emission limiting standard.
    c. The minimum observation period for opacity tests conducted by employees or agents of the Department to verify the day-to-day continuing compliance of a unit or activity with an applicable opacity standard shall be twelve minutes.

[Rule 62-297.310(4), F.A.C.]

F.11. Frequency of Compliance Tests. The following provisions apply only to those emissions units that are subject to an emissions limiting standard for which compliance testing is required.
(a) General Compliance Testing.

3. The owner or operator of an emissions unit that is subject to any emission limiting standard shall conduct a compliance test that demonstrates compliance with the applicable emission limiting standard prior to obtaining a renewed operation permit. Emissions units that are required to conduct an annual compliance test may submit the most recent annual compliance test to satisfy the requirements of this provision. In renewing an air operation permit pursuant to Rule 62-210.300(2)(a)3.b., c., or d., F.A.C., the Department shall not require submission of emission compliance test results for any emissions unit that, during the year prior to renewal:

a. Did not operate;

4. During each federal fiscal year (October 1 - September 30), unless otherwise specified by rule, *order, or permit, the owner or operator of each emissions unit shall have a formal compliance test* conducted for:

a. Visible emissions, if there is an applicable standard;

b. Each of the following pollutants, if there is an applicable standard, and if the emissions unit emits or has the potential to emit: 5 tons per year or more of lead or lead compounds measured as elemental lead; 30 tons per year or more of acrylonitrile; or 100 tons per year or more of any other regulated air pollutant; and

c. Each NESHAP pollutant, if there is an applicable emission standard.

9. The owner or operator shall notify the Department, at least 15 days prior to the date on which each formal compliance test is to begin, of the date, time, and place of each such test, and the test contact person who will be responsible for coordinating and having such test conducted for the owner or operator.

(b) Special Compliance Tests. When the Department, after investigation, has good reason (such as complaints, increased visible emissions or questionable maintenance of control equipment) to believe that any applicable emission standard contained in a Department rule or in a permit issued pursuant to those rules is being violated, it may require the owner or operator of the emissions unit to conduct compliance tests which identify the nature and quantity of pollutant emissions from the emissions unit and to provide a report on the results of said tests to the Department.

(c) Waiver of Compliance Test Requirements. If the owner or operator of an emissions unit that is subject to a compliance test requirement demonstrates to the Department, pursuant to the procedure established in Rule 62-297.620, F.A.C., that the compliance of the emissions unit with an applicable weight emission limiting standard can be adequately determined by means other than the designated test procedure, such as specifying a surrogate standard of no visible emissions for particulate matter sources equipped with a bag house or specifying a fuel analysis for sulfur dioxide emissions, the Department shall waive the compliance test requirements for such emissions units and order that the alternate means of determining compliance be used, provided, however, the provisions of Rule 62-297.310(7)(b), F.A.C., shall apply.

[Rule 62-297.310(7), F.A.C.; and, SIP approved]

Monitoring of Operations

F.12. Determination of Process Variables.
(a) Required Equipment. The owner or operator of an emissions unit for which compliance tests are required shall install, operate, and maintain equipment or instruments necessary to determine process variables, such as process weight input or heat input, when such data are needed in conjunction with emissions data to determine the compliance of the emissions unit with applicable emission limiting standards.
(b) Accuracy of Equipment. Equipment or instruments used to directly or indirectly determine process variables, including devices such as belt scales, weight hoppers, flow meters, and tank scales, shall be calibrated and adjusted to indicate the true value of the parameter being measured with sufficient accuracy to allow the applicable process variable to be determined within 10% of its true value.
[Rule 62-297.310(5), F.A.C.]

Recordkeeping and Reporting Requirements

F.13. Any measurements, maintenance, reports, and records shall be retained for at least **5 (five)** years following the date of such measurements, maintenance, reports, and records.
[Rule 62-213.440(1)(b)2.b., F.A.C.]

F.14. Test Reports.
(a) The owner or operator of an emissions unit for which a compliance test is required shall file a report with the Department on the results of each such test.
(b) The required test report shall be filed with the Department as soon as practical but no later than 45 days after the last sampling run of each test is completed.
(c) The test report shall provide sufficient detail on the emissions unit tested and the test procedures used to allow the Department to determine if the test was properly conducted and the test results properly computed. As a minimum, the test report, other than for an EPA or DEP Method 9 test, shall provide the following information:

1. The type, location, and designation of the emissions unit tested.
2. The facility at which the emissions unit is located.
3. The owner or operator of the emissions unit.
4. The normal type and amount of fuels used and materials processed, and the types and amounts of fuels used and material processed during each test run.
5. The means, raw data and computations used to determine the amount of fuels used and materials processed, if necessary to determine compliance with an applicable emission limiting standard.
6. The type of air pollution control devices installed on the emissions unit, their general condition, their normal operating parameters (pressure drops, total operating current and GPM scrubber water), and their operating parameters during each test run.

7. A sketch of the duct within 8 stack diameters upstream and 2 stack diameters downstream of the sampling ports, including the distance to any upstream and downstream bends or other flow disturbances.
8. The date, starting time and duration of each sampling run.
9. The test procedures used, including any alternative procedures authorized pursuant to Rule 62-297.620, F.A.C. Where optional procedures are authorized in this chapter, indicate which option was used.
10. The number of points sampled and configuration and location of the sampling plane.
11. For each sampling point for each run, the dry gas meter reading, velocity head, pressure drop across the stack, temperatures, average meter temperatures and sample time per point.
12. The type, manufacturer and configuration of the sampling equipment used.
13. Data related to the required calibration of the test equipment.
14. Data on the identification, processing and weights of all filters used.
15. Data on the types and amounts of any chemical solutions used.
16. Data on the amount of pollutant collected from each sampling probe, the filters, and the impingers, are reported separately for the compliance test.
17. The names of individuals who furnished the process variable data, conducted the test, analyzed the samples and prepared the report.
18. All measured and calculated data required to be determined by each applicable test procedure for each run.
19. The detailed calculations for one run that relate the collected data to the calculated emission rate.
20. The applicable emission standard, and the resulting maximum allowable emission rate for the emissions unit, plus the test result in the same form and unit of measure.
21. A certification that, to the knowledge of the owner or his authorized agent, all data submitted are true and correct. When a compliance test is conducted for the Department or its agent, the person who conducts the test shall provide the certification with respect to the test procedures used. The owner or his authorized agent shall certify that all data required and provided to the person conducting the test are true and correct to his knowledge.

[Rules 62-213.440 and 62-297.310(8), F.A.C.]

Appendix U-1, List of Unregulated Emissions Units and/or Activities.

Hillsborough County
Hillsborough County Resource Recovery Facility

FINAL Permit No.: 0570261-005-AV
Facility ID No.: 0570261

Unregulated Emissions Units and/or Activities. An emissions unit which emits no "emissions-limited pollutant" and which is subject to no unit-specific work practice standard, though it may be subject to regulations applied on a facility-wide basis (e.g., unconfined emissions, odor, general opacity) or to regulations that require only that it be able to prove exemption from unit-specific emissions or work practice standards.

The below listed emissions units and/or activities are neither 'regulated emissions units' nor 'insignificant emissions units'.

E.U. ID No.	Brief Description of Emissions Units and/or Activity
-103	Cooling Tower
-104	Waste Water Treatment Plant
-105	NaOH Storage Tank

[electronic file name: 0570261u.doc]

Appendix I-1, List of Insignificant Emissions Units and/or Activities.

Hillsborough County
Hillsborough County Resource Recovery Facility

FINAL Permit No.: 0570261-005-AV
Facility ID No.: 0570261

The facilities, emissions units, or pollutant-emitting activities listed in Rule 62-210.300(3)(a), F.A.C., Categorical Exemptions, are exempt from the permitting requirements of Chapters 62-210 and 62-4, F.A.C.; provided, however, that exempt emissions units shall be subject to any applicable emission limiting standards and the emissions from exempt emissions units or activities shall be considered in determining the potential emissions of the facility containing such emissions units. Emissions units and pollutant-emitting activities exempt from permitting under Rule 62-210.300(3)(a), F.A.C., shall not be exempt from the permitting requirements of Chapter 62-213, F.A.C., if they are contained within a Title V source; however, such emissions units and activities shall be considered insignificant for Title V purposes provided they also meet the criteria of Rule 62-213.430(6)(b), F.A.C. No emissions unit shall be entitled to an exemption from permitting under Rule 62.210.300(3)(a), F.A.C., if its emissions, in combination with the emissions of other units and activities at the facility, would cause the facility to emit or have the potential to emit any pollutant in such amount as to make the facility a Title V source.

The below listed emissions units and/or activities are considered insignificant pursuant to Rule 62-213.430(6), F.A.C.

Brief Description of Emissions Units and/or Activities

1. Fire and safety equipment
2. Paint usage of less than 6 gallons per day
3. Emergency generator
4. Mineral spirits drums
5. Bulk drum of cooling water treatment
6. Flanges and valves
7. 55 gallon oil storage drums
8. 300 and 449 gallon fuel storage tanks
9. Laboratory vent
10. Yard waste mulching operation
11. Emergency generator at Falkenburg Wastewater Treatment Plant
12. Sulfuric acid tank
13. Chlorine cylinders
14. Aqueous Ammonia (19%) Storage Tank

[electronic file name: 0570261g.doc]

Appendix H-1: Permit History

Hillsborough County
Hillsborough County Resource Recovery Facility

FINAL Permit No.: 0570261-005-AV
Facility ID No.: 0570261

E.U. ID No.	Description	Permit No.	Effective Date	Expiration Date	Project Type [1]
All	Facility	0570261-001-AV	10/24/2000	10/24/2005	Initial
-001	Unit #1	0570261-002-AC	07/20/2000	12/19/2000	Construction (mod.)
-002	Unit #2				
-003	Unit #3				
-100	Ash Handling				
All	Facility	0570261-003-AV	04/23/2001	10/24/2005	Admin. Correction
-106	Dolomitic Lime Storage Silo	0570261-004-AC	03/27/2002	12/31/2002	Construction (new)
All	Facility	0570261-005-AV	04/30/2003	10/24/2005	Revision

[1] Project Type (select one): Title V: Initial, Revision, Renewal, or Admin. Correction; Construction (new or mod.); or, Extension (AC only).
[2] Change to an actual date, which is day 55 from the date of posting the PROPOSED Permit for EPA review (see confirmation e-mail from Tallahassee) or the date that EPA confirms resolvement of any objections.

RETENTION POND A

RETENTION POND B

RETENTION POND C

RETENTION POND D

PROPOSED STRUCTURE

STACK TOP EL 359.0

PRECIPITATOR ENCLOSURE FF EL 399' (ROOF EL 150.0')

BOILER HOUSE FF EL 399' (ROOF EL 150.0')

TIPPING FLOOR FF EL 62.5' (ROOF EL 108.0')

TURBINE/GENERATOR FF EL 399' (ROOF EL 107.0')

ADMINISTRATION FF EL 36.0' (ROOF EL 86.0')

EXISTING PLANTED AREA

ASH HANDLING B-01 FF EL 80.0' (ROOF EL 80.0')

ENCLOSED BELT CONVEYOR

CONC. TROUGH SEE SECT AC-AC (DWG C-109) SHT 1

APPROX LOCATION OF SPILLWAY

HEADWALL

SEE DETAIL 3 DWG. C-109

SEE DETAIL DWG. C-109

SEE DETAIL 2 DWG. C-109

SEE DETAIL DWG. C-109

SEE DETAIL DWG. C-109

SECTION C-C

VICINITY PLAN

SCALE 1"=1000'

ABUTTING AND ADJACENT PROPERTIES

SCALE 1"=200'

GRAPHIC SCALE

0 25 50 100 150

1"=50'-0"

NOTE:

ALL WORK INDICATED THUS [ ] IS INCLUDED IN THIS CONTRACT FOR EROSION PROTECTION

DWG. REVISED 4-12-83

OGDEN MARTIN SYSTEMS OF HILLSBOROUGH, INC.
HILLSBOROUGH COUNTY - FLORIDA
SOLID WASTE ENERGY RECOVERY FACILITY

REMEDIAL SITE WORK - SH 1

BURNS AND ROE INDUSTRIAL SERVICES CORP.

Work Order 4230-01 | Drawing No. C-107 | Rev. A

Appendix 5-1
Pre-Development Site Conditions

Appendix 6
Correspondence Related to Governmental Jurisdictions

BURCAW
& Associates, Inc.

Civil Engineering
Surveying, Planning
Environmental Services
Construction Administration
Transportation Engineers

September 30, 2004

Florida Fish and Wildlife Conservation Commission
620 South Meridian Street
Tallahassee, Florida 32399-1600

RE: Hillsborough County Solid Waste Energy Recovery Facility
350 North Falkenburg Road, Tampa, Florida

Dear Sir/Madam:

Burcaw & Associates has been contracted to prepare a new certification for Hillsborough County Solid Waste Energy Recovery Facility located at 350 North Falkenburg Road in Tampa. The original project study and certification was prepared in 1984.

We need your assistance in identifying properties under the jurisdiction of Florida Fish and Wildlife Conservation Commission which are within a five mile radius of the facility listed above.

Enclosed are two maps: 1) Governmental Jurisdictions used in the 1984 study which identifies affected properties within a five mile radius of the project. 2) a current map which includes updated information and local roads for 2004.

Please review both maps and make any changes and/or additions necessary to identify properties under your jurisdiction that are located within the five mile radius shown. Please mark up the enclosed maps with all updates/changes and add additional information as necessary and return to our office. ***Specific information required from Florida Fish and Wildlife Conservation Commission includes: Game Management Areas.***

If the information provided on the enclosed maps is accurate, please sign the bottom of this letter and return to our office in the enclosed, self addressed envelope by Wednesday, October 6, 2004. Please do not hesitate to contact me at the number below with any questions.

Sincerely,

Jerry Keith

Jerry W. Keith
Engineering Intern

The information on the enclosed maps is accurate and correct. The Florida Fish and Wildlife Conservation Commission has no additional properties within a five mile radius of this site.

_____ _____

Name, Title, Agency Date

6402 W. Linebaugh Ave.
Suite A.
Tampa, FL 33625

Phone: 1.813.882.4815
Fax: 1.813.882.3808
Web site: www.Burcawinc.com

BURCAW
& Associates, Inc.

Civil Engineering
Surveying, Planning
Environmental Services
Construction Administration
Transportation Engineers

September 30, 2004

Mr. Mike Bullock, Director
Florida Department of Environmental Protection
Division of Recreation and Parks
3900 Commonwealth Boulevard, MS 500
Tallahassee, Florida 32399

RE: Hillsborough County Solid Waste Energy Recovery Facility
350 North Falkenburg Road, Tampa, Florida

Dear Mr. Bullock:

Burcaw & Associates has been contracted to prepare a new certification for Hillsborough County Solid Waste Energy Recovery Facility located at 350 North Falkenburg Road in Tampa. The original project study and certification was prepared in 1984.

We need your assistance in identifying properties under the jurisdiction of Florida Department of Environmental Protection, Division of Recreation and Parks which are within a five mile radius of the facility listed above.

Enclosed are two maps: 1) Governmental Jurisdictions used in the 1984 study which identifies affected properties within a five mile radius of the project. 2) a current map which includes updated information and local roads for 2004.

Please review both maps and make any changes and/or additions necessary to identify properties under your jurisdiction that are located within the five mile radius shown. Please mark up the enclosed maps with all updates/changes and add additional information as necessary and return to our office. ***Specific information required from the Division of Recreation and Parks include: Monuments, Memorials and State Parks.***

If the information provided on the enclosed maps is accurate, please sign the bottom of this letter and return to our office in the enclosed, self addressed envelope by Wednesday, October 6, 2004. Please do not hesitate to contact me at the number below with any questions.

Sincerely,

Jerry W. Keith
Engineering Intern

The information on the enclosed maps is accurate and correct. The Florida Department of Environmental Protection, Division of Recreation and Parks has no additional properties within a five mile radius of this site.

_____ _____

Name, Title, Agency Date

6402 W. Linebaugh Ave.
Suite A.
Tampa, FL 33625

Phone: 1.813.882.4815
Fax: 1.813.882.3808
Web site: www.Burcawinc.com

BURCAW
& Associates, Inc.

Civil Engineering
Surveying, Planning
Environmental Services
Construction Administration
Transportation Engineers

September 30, 2004

Mr. Michael Barnett, Director
Florida Department of Environmental Protection
Division of Beaches & Coastal Systems
3900 Commonwealth Boulevard, MS 300
Tallahassee, Florida 32399

RE: Hillsborough County Solid Waste Energy Recovery Facility
350 North Falkenburg Road, Tampa, Florida

Dear Mr. Barnett:

Burcaw & Associates has been contracted to prepare a new certification for Hillsborough County Solid Waste Energy Recovery Facility located at 350 North Falkenburg Road in Tampa. The original project study and certification was prepared in 1984.

We need your assistance in identifying properties under the jurisdiction of Florida Department of Environmental Protection, Beaches & Coastal Systems which are within a five mile radius of the facility listed above.

Enclosed are two maps: 1) Governmental Jurisdictions used in the 1984 study which identifies affected properties within a five mile radius of the project. 2) a current map which includes updated information and local roads for 2004.

Please review both maps and make any changes and/or additions necessary to identify properties under your jurisdiction that are located within the five mile radius shown. Please mark up the enclosed maps with all updates/changes and add additional information as necessary and return to our office. ***Specific information required from the Division of Beaches & Coastal Systems include: State Parks, State Forests, Game Management Areas, Areas of Critical State Concern, Conservation & Recreation Areas, Aquatic Preserves, Outstanding Florida Waters, Scenic and Wild Rivers, Military Lands.***

If the information provided on the enclosed maps is accurate, please sign the bottom of this letter and return to our office in the enclosed, self addressed envelope by Wednesday, October 6, 2004. Please do not hesitate to contact me at the number below with any questions.

Sincerely,

Jerry Keith

Jerry W. Keith
Engineering Intern

The information on the enclosed maps is accurate and correct. The Florida Department of Environmental Protection, Division of Beaches & Coastal Systems has no additional properties within a five mile radius of this site.

_____ _____

Name, Title, Agency Date

6402 W. Linebaugh Ave.
Suite A.
Tampa, FL 33625

Phone: 1.813.882.4815
Fax: 1.813.882.3808
Web site: www.Burcawinc.com

BURCAW
& Associates, Inc.

Civil Engineering
Surveying, Planning
Environmental Services
Construction Administration
Transportation Engineers

September 30, 2004

Ms. Eva Armstrong, Director
Florida Department of Environmental Protection
Division of State Lands
3900 Commonwealth Boulevard, MS 100
Tallahassee, Florida 32399

RE: Hillsborough County Solid Waste Energy Recovery Facility
350 North Falkenburg Road, Tampa, Florida

Dear Ms. Armstrong:

Burcaw & Associates has been contracted to prepare a new certification for Hillsborough County Solid Waste Energy Recovery Facility located at 350 North Falkenburg Road in Tampa. The original project study and certification was prepared in 1984.

We need your assistance in identifying properties under the jurisdiction of Florida Department of Environmental Protection, Division of State Lands which are within a five mile radius of the facility listed above.

Enclosed are two maps: 1) Governmental Jurisdictions used in the 1984 study which identifies affected properties within a five mile radius of the project. 2) a current map which includes updated information and local roads for 2004.

Please review both maps and make any changes and/or additions necessary to identify properties under your jurisdiction that are located within the five mile radius shown. Please mark up the enclosed maps with all updates/changes and add additional information as necessary and return to our office. ***Specific information required from the Division of State Lands includes: State Forests.***

If the information provided on the enclosed maps is accurate, please sign the bottom of this letter and return to our office in the enclosed, self addressed envelope by Wednesday, October 6, 2004. Please do not hesitate to contact me at the number below with any questions.

Sincerely,

Jerry Keith

Jerry W. Keith
Engineering Intern

The information on the enclosed maps is accurate and correct. The Florida Department of Environmental Protection, Division of State Lands has no additional properties within a five mile radius of this site.

_____ _____

Name, Title, Agency Date

6402 W. Linebaugh Ave.
Suite A.
Tampa, FL 33625

Phone: 1.813.882.4815
Fax: 1.813.882.3808
Web site: www.Burcawinc.com

BURCAW
& Associates, Inc.

Civil Engineering
Surveying, Planning
Environmental Services
Construction Administration
Transportation Engineers

September 30, 2004

Mr. Michael C. Long, Director
Florida Department of Agriculture
Division of Forestry
3125 Connor Boulevard
Tallahassee, Florida 32399

RE: Hillsborough County Solid Waste Energy Recovery Facility
350 North Falkenburg Road, Tampa, Florida

Dear Mr. Long:

Burcaw & Associates has been contracted to prepare a new certification for Hillsborough County Solid Waste Energy Recovery Facility located at 350 North Falkenburg Road in Tampa. The original project study and certification was prepared in 1984.

We need your assistance in identifying properties under the jurisdiction of Florida Department Agriculture, Division of Forestry which are within a five mile radius of the facility listed above.

Enclosed are two maps: 1) Governmental Jurisdictions used in the 1984 study which identifies affected properties within a five mile radius of the project. 2) a current map which includes updated information and local roads for 2004.

Please review both maps and make any changes and/or additions necessary to identify properties under your jurisdiction that are located within the five mile radius shown. Please mark up the enclosed maps with all updates/changes and add additional information as necessary and return to our office. ***Specific information required from the Florida Department of Agriculture, Division of Forestry includes: State Forests.***

If the information provided on the enclosed maps is accurate, please sign the bottom of this letter and return to our office in the enclosed, self addressed envelope by Wednesday, October 6, 2004. Please do not hesitate to contact me at the number below with any questions.

Sincerely,

Jerry Keith

Jerry W. Keith
Engineering Intern

The information on the enclosed maps is accurate and correct. The Florida Department of Agriculture, Division of Forestry has no additional properties within a five mile radius of this site.

_____ _____

Name, Title, Agency Date

6402 W. Linebaugh Ave.
Suite A.
Tampa, FL 33625

Phone: 1.813.882.4815
Fax: 1.813.882.3808
Web site: www.Burcawinc.com

BURCAW
& Associates, Inc.

Civil Engineering
Surveying, Planning
Environmental Services
Construction Administration
Transportation Engineers

September 30, 2004

Ms. Katherine Andrews, Director
Florida Department of Environmental Protection
Office of Coastal and Aquatic Managed Areas
3900 Commonwealth Boulevard, MS 235
Tallahassee, Florida 32399

RE: Hillsborough County Solid Waste Energy Recovery Facility
350 North Falkenburg Road, Tampa, Florida

Dear Ms. Andrews:

Burcaw & Associates has been contracted to prepare a new certification for Hillsborough County Solid Waste Energy Recovery Facility located at 350 North Falkenburg Road in Tampa. The original project study and certification was prepared in 1984.

We need your assistance in identifying properties under the jurisdiction of Florida Department of Environmental Protection, Office of Coastal and Aquatic Managed Areas which are within a five mile radius of the facility listed above.

Enclosed are two maps: 1) Governmental Jurisdictions used in the 1984 study which identifies affected properties within a five mile radius of the project. 2) a current map which includes updated information and local roads for 2004.

Please review both maps and make any changes and/or additions necessary to identify properties under your jurisdiction that are located within the five mile radius shown. Please mark up the enclosed maps with all updates/changes and add additional information as necessary and return to our office. ***Specific information required from the Office of Coastal and Aquatic Managed Areas includes: Conservation and Recreation Lands, Scenic and Wild Rivers, Save Our Rivers Lands, Aquatic Preserves.***

If the information provided on the enclosed maps is accurate, please sign the bottom of this letter and return to our office in the enclosed, self addressed envelope by Wednesday, October 6, 2004. Please do not hesitate to contact me at the number below with any questions.

Sincerely,

Jerry W. Keith
Engineering Intern

The information on the enclosed maps is accurate and correct. The Florida Department of Environmental Protection, Office of Coastal and Aquatic Managed Areas has no additional properties within a five mile radius of this site.

Name, Title, Agency

Date

6402 W. Linebaugh Ave.
Suite A.
Tampa, FL 33625

Phone: 1.813.882.4815
Fax: 1.813.882.3808
Web site: www.Burcawinc.com

BURCAW
& Associates, Inc.

Civil Engineering
Surveying, Planning
Environmental Services
Construction Administration
Transportation Engineers

September 30, 2004

Mr. Ryan Wheeler, Chief
Office of the Bureau Chief
Florida Department of State
Office of Cultural and Historical Resources
500 South Bronough Street
Tallahassee, Florida 32399

RE: Hillsborough County Solid Waste Energy Recovery Facility
350 North Falkenburg Road, Tampa, Florida

Dear Chief Wheeler:

Burcaw & Associates has been contracted to prepare a new certification for Hillsborough County Solid Waste Energy Recovery Facility located at 350 North Falkenburg Road in Tampa. The original project study and certification was prepared in 1984.

We need your assistance in identifying properties under the jurisdiction of Florida Department of State, Office of Cultural and Historical Resources which are within a five mile radius of the facility listed above.

Enclosed are two maps: 1) Governmental Jurisdictions used in the 1984 study which identifies affected properties within a five mile radius of the project. 2) a current map which includes updated information and local roads for 2004.

Please review both maps and make any changes and/or additions necessary to identify properties under your jurisdiction that are located within the five mile radius shown. Please mark up the enclosed maps with all updates/changes and add additional information as necessary and return to our office. ***Specific information required from the Office of Cultural and Historical Resources include: State Archaeological Lands or Landmark Zones.***

If the information provided on the enclosed maps is accurate, please sign the bottom of this letter and return to our office in the enclosed, self addressed envelope by Wednesday, October 6, 2004. Please do not hesitate to contact me at the number below with any questions.

Sincerely,

Jerry Keith

Jerry W. Keith
Engineering Intern

The information on the enclosed maps is accurate and correct. The Florida Department of State Office of Cultural and Historical Resources has no additional properties within a five mile radius of this site.

_____ _____

Name, Title, Agency Date

6402 W. Linebaugh Ave.
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Tampa, FL 33625

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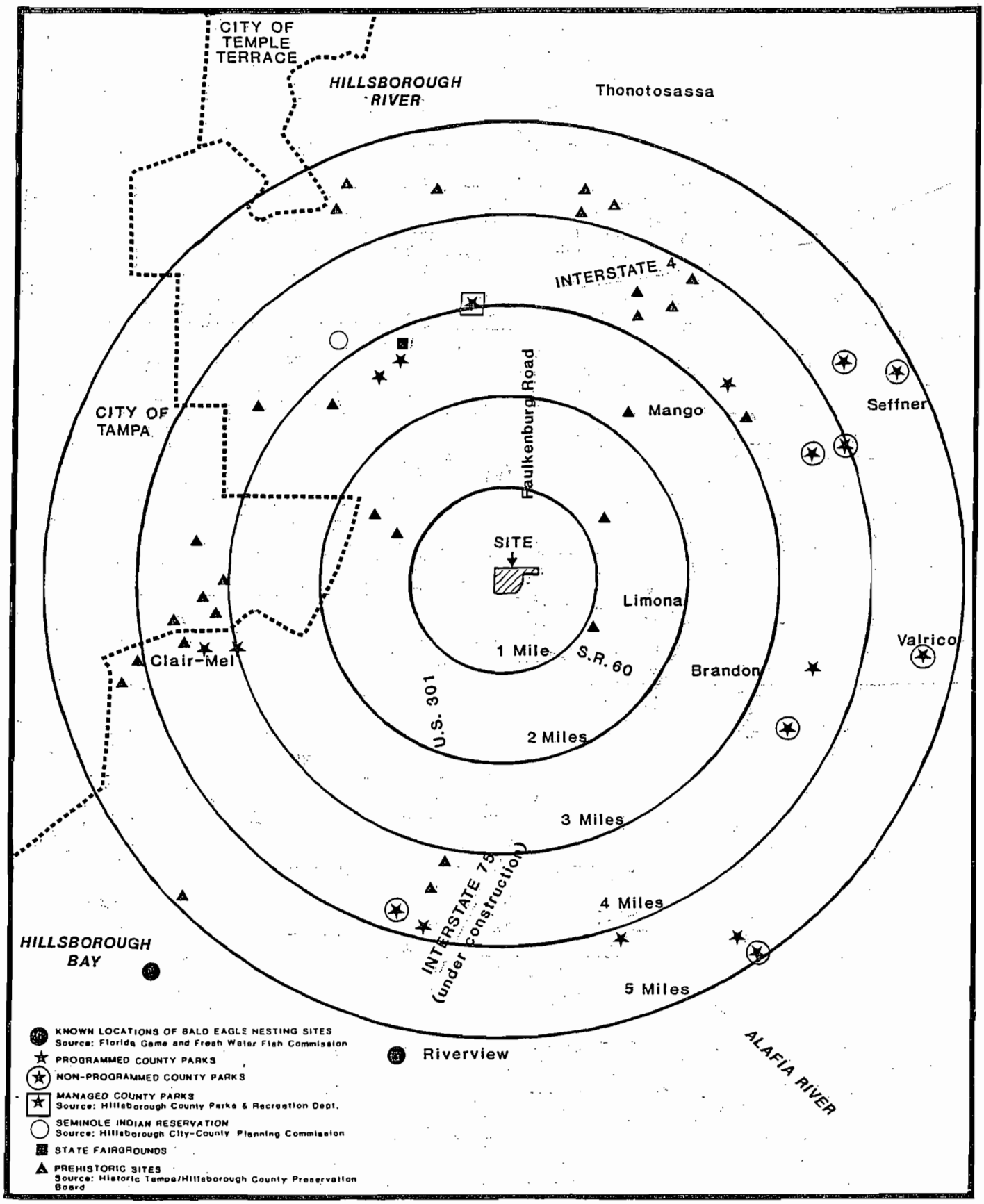

HILLSBOROUGH COUNTY
ENERGY RECOVERY PROJECT

1984

FIGURE 2.7
GOVERNMENTAL JURISDICTIONS MAP

1 0 1 2 MILES

City of Tampa
City of Temple Terrace
Site
1 Mile
2 Miles
3 Miles
4 Miles
5 Miles
FOWLER AV E
HARNEY RD
301 HW N
LINEBAUGH AV E
BUSH BLV BUSH BLVD
WATERS AVE
22ND ST
RAILROAD
56TH ST N
LAKE AVE HARNEY RD
US 41 HWY
DR KING BL E
WOODBERRY RD
ADAMO DR E
FALKENBURG RD N
LAKEWOOD DR
CROSSTOWN EW E
CAUSEWAY BL
78TH ST S
50TH ST S
PROGRESS BL
PROVIDENCE RD
BLOOMINGDALE
BLOOMINGDALE AV
LUMSDEN RD
BRYAN RD
BELL SHOALS RD
VALRICO RD N
VALRICO RD S
PARSONS AV N
KINGSWAY RD N
KINGSWAY RD S
TAYLOR RD N
TAYLOR RD S
579 HW
92 HW E
92 HW W
THONOTOSASSA RD
MCINTOSH RD
FORT KIN
CSX R
Hillsborough County Parks
State Fairgrounds
Known Locations of Bald Eagle Nesting Sites (approximate)
2004
N
Scale
0
1.5 miles

Appendix 7
Groundwater Well Inventory

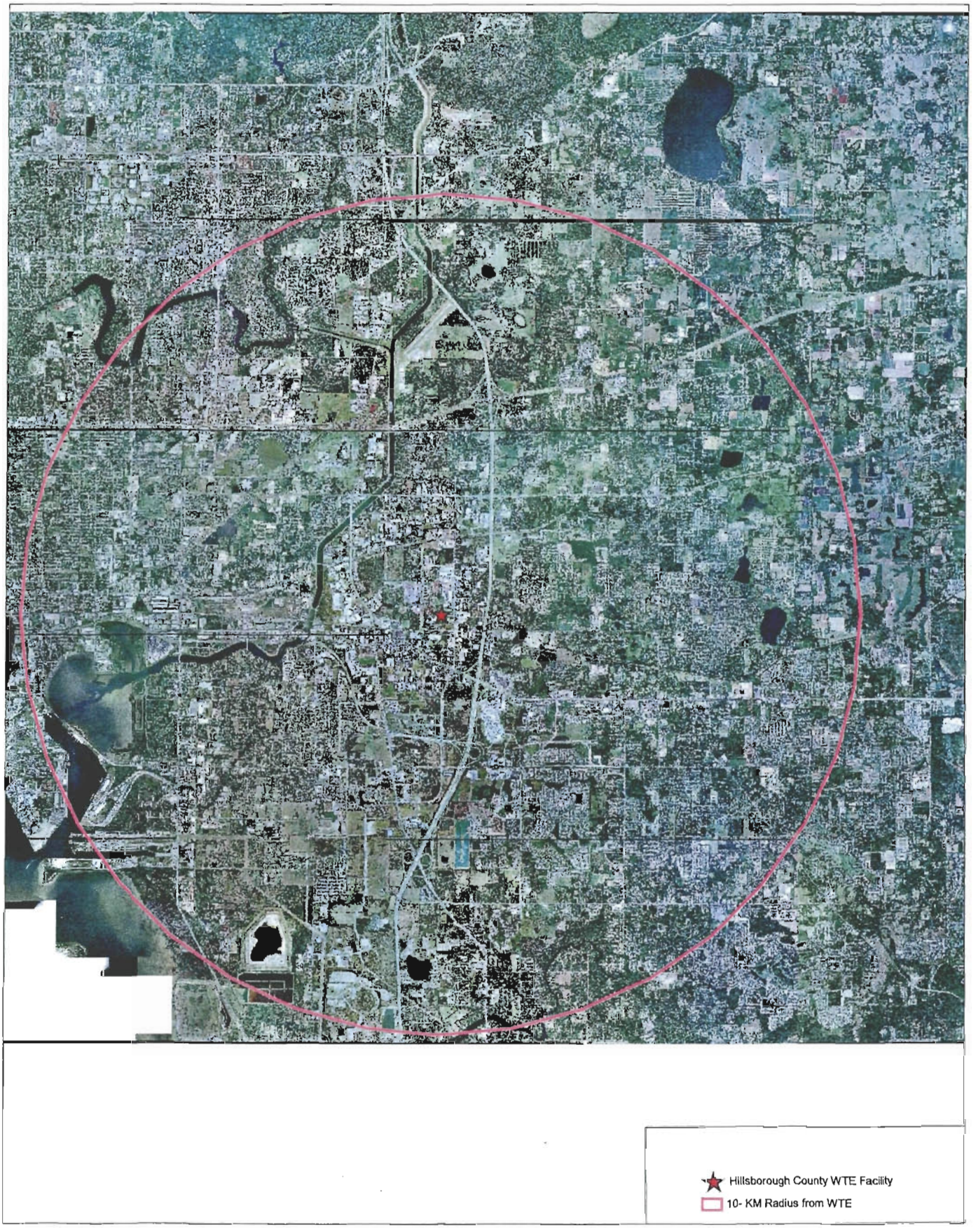

Figure 7-1. Aerial Photograph

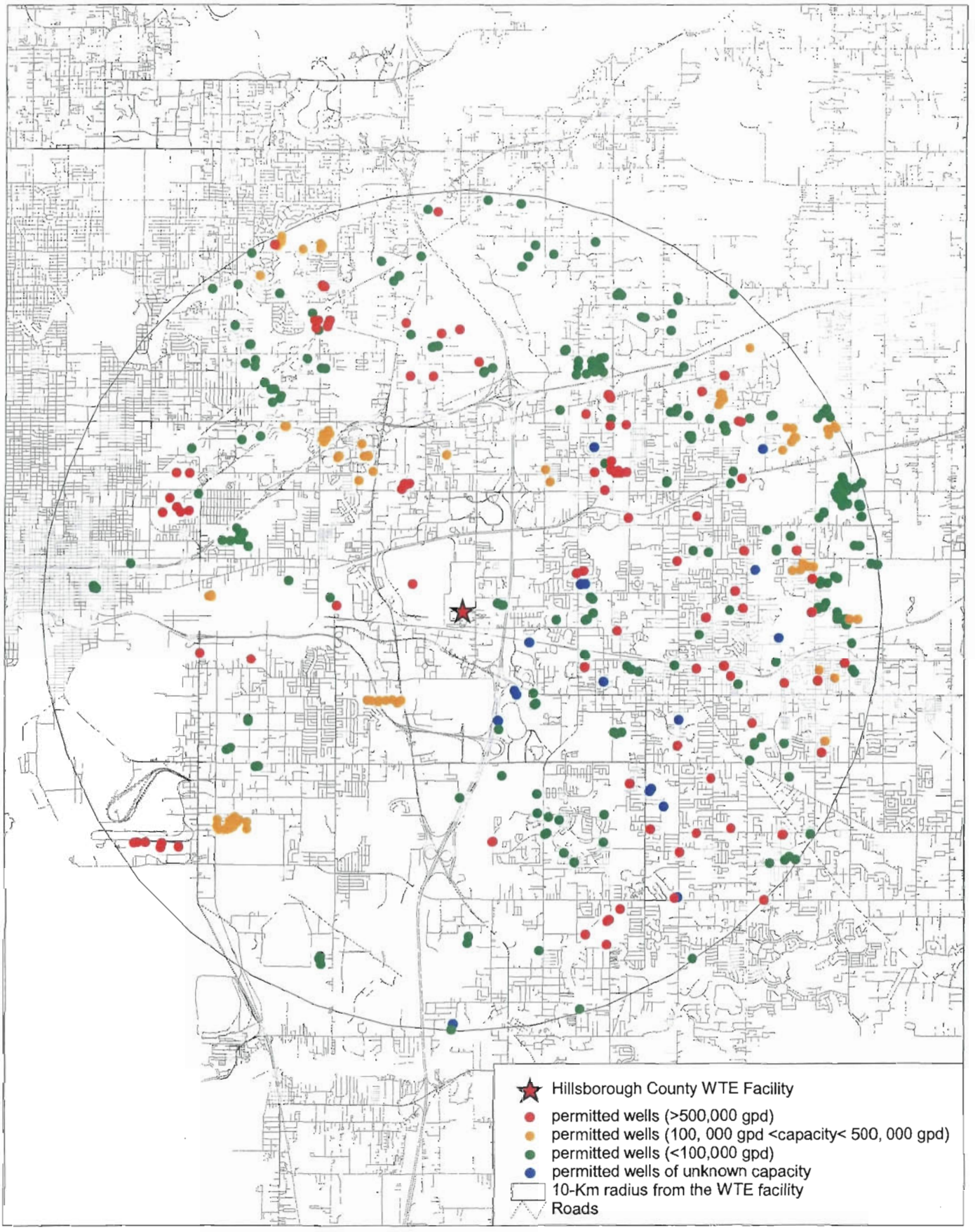

Figure 7-2. SWFWMD Permitted Wells

PWS ID	Mailing Name	Mailing Street	City	Zip	PWS Type	Status	Pop	Capacity(GPD)
6290017	A&A MHP	11010 CLAY PIT ROAD	TAMPA	33610	C	A	69	10,000
6290047	PARKVIEW MHP	10801 MAIN STREET	THONOTOSASSA	33592	C	A	48	19,000
6290072	ANNA MARY MHP	11014 HWY 301 N	THONOTOSASSA	33592	C	A	38	19,000
6290075	HCPRD/ANTIOCH CTY PK	FRANKLIN RD E/O CRUM ROAD	THONOTOSASSA	33592	N	A	50	19,000
6290157	HARMONY OAKS MHP	10321 MAIN ST.	THONOTOSASSA	33592	C	A	528	81,000
6290160	CLUB 92/MOULIN ROUGE	10101 U.S. 92 E.	TAMPA	33610	N	A	50	38,000
6290186	BRANDON TP	113 SOUTH MT. CARMEL ROAD	BRANDON	33511	C	A	422	110,000
6290227	CAMELOT MHP	11611 SIR LAWRENCE COURT	THONOTOSASSA	33592	C	A	240	230,000
6290256	CAROUSEL VILLAGE MHP	5410 FAULKENBERG RD	TAMPA	33610	C	A	82	15,000
6290266	CAST CRETE CORP	6324 C.R. 579	DOVER	33584	P	A	180	230,000
6290277	CHAPPARAL MHP	4409 FOXWORTH RD.	RIVERVIEW	33569	C	A	80	12,500
6290279	CHARLIES MHP	10813 E MAIN ST	THONOTOSASSA	33592	C	A	218	50,000
6290309	CITRUS KNOLL MHP	12960 MORRIS BRIDGE RD	THONOTOSASSA	33592	C	A	52	15,000
6290327	CITY OF TAMPA-WATER DEPARTMENT	7125 N. 30TH STREET	TAMPA	33610	C	A	540000	140,000,000
6290333	HCWD/SEABOARD	8612 1/2 FISHLAKE RD	TAMPA	33619	C	A	10023	400,000
6290392	COUNTRYSIDE MHP	10107 MAIN ST	THONOTOSASSA	33592	C	A	48	38,000
6290430	DAVPAM MHP	102 MAGNOLIA LANE	TAMPA	33610	C	A	768	100,000
6290474	TRIPLE T MHP	10602 TAYLOR ROAD	THONOTOSASSA	33592	C	A	75	19,000
6290497	EASTLAKE UTILITIES	6608 WALTON WAY	TAMPA	33610	C	A	2282	510,000
6290505	FAMILY RENTALS OF SEFFNER(PREVATT'S MHP)	11416 US 92 E	SEFFNER	33584	C	A	62	57,000
6290534	HCPRD/EUREKA SPRINGS	6400 EUREKA SPRINGS RD	TAMPA	33610	N	A	50	96,000
6290722	HAPPY ACRES MHP	10509 SYMMES RD	RIVERVIEW	33569	C	A	40	19,000
6290728	HAPPY TRAVELER'S RVP	9401 E FOWLER AVE	THONOTOSASSA	33592	P	A	190	159,000
6290740	HAVEN MHP	10606 MAGNOLIA DR.	THONOTOSASSA	33592	C	A	30	19,000
6290786	DEPARTMENT OF	6612 STARK RD.	SEFFNER	33584	N	A	25	518,000
6290793	HILLSBOROUGH RIVER	15402 U.S.301 NORTH	THONOTOSASSA	33592	N	A	1001	120,000
6290800	HILLTOP MHP	9915 U.S. 92	TAMPA	33610	C	A	44	19,000
6290937	KING RICHARDS' CT	10306 BIG BEND ROAD	RIVERVIEW	33569	C	A	210	43,000
6291135	MANGO TP	CURRY ROAD	MANGO	33584	N	A	65	6,500
6291153	MARY HELP OF CHRISTIAN	6400 CHELSEA ST.	TAMPA	33610	P	A	150	232,000
6291213	EASY LIVING MHP	4943 E HILLSBOROUGH AVE	TAMPA	33610	C	A	150	50,000
6291219	MOSS HAVEN MHP	3610 N HWY 301	TAMPA	33619	C	A	89	7,000
6291250	HCS/NATURES'	MORRIS BRIDGE ROAD	THONOTOSASSA	33592	P	A	32	15,000

PWS ID	Mailing Name	Mailing Street	City	Zip	PWS Type	Status	Pop	Capacity(GPD)
6291276	MGM MOBILE HOME	10632 S.R 579	THONOTOSASSA	33592	C	A	74	34,000
6291280	OAK HILL VILLAGE MHP	2620 E HWY 60 LOT 110	VALRICO	33594	C	A	555	35,000
6291341	PARADISE VILLAGE	9304 PARADISE DRIVE	TAMPA	33610	C	A	1228	200,000
6291445	BLACKDAIRY ROAD TP	6421/6427 BLACK DAIRY RD.	SEFFNER	33584	C	A	50	81,225
6291481	RANCH OAKS MHP	11940 U.S 301 NORTH	THONOTOSASSA	33592	C	A	164	50,000
6291529	GUTHRIES SUNSHINE PK	11930 HAZEN AVENUE LOT #15	THONOTOSASSA	33592	C	A	40	28,000
6291541	FEATHEROCK MHP	2200 HWY 60 E E/O VALRICO	VALRICO	33594	C	A	1044	500,000
6291605	SELF MOBILE HOME SITES	4260 CASTLEWOOD DR	SEFFNER	33584	C	A	42	28,000
6291610	SHADY GROVE	12966 MORRIS BRIDGE ROAD	THONOTOSASSA	33592	C	A	42	7,500
6291684	SPANISH MAIN RESORT	12110 SPANISH MAIN RESORT	THONOTOSASSA	33592	C	A	662	384,000
6291776	MCCARTHY'S MHP	8207 BOWLES ROAD	TAMPA	33610	C	A	53	7,500
6291778	SINGH 301 INC.	6503 US 301	TAMPA	33610	N	A	300	19,000
6291781	TAMPA MHP &	5319 GARDEN LANE ROAD	TAMPA	33610	P	A	32	10,000
6291840	TOWN & COUNTRY MHP	1221 N VALRICO RD	VALRICO	33594	C	A	136	20,000
6291870	TWIN PALMS COURT	11520 US 92 EAST	SEFFNER	33584	C	A	70	8,000
6291891	VALRICO HILLS UTILITY	712 FALKIRK AVE	VALRICO	33594	C	A	1239	576,000
6291988	WINDWARD KNOLL MHP	12415 THONOTOSASSA ROAD	THONOTOSASSA	33592	C	A	248	50,000
6292074	CHELSEA DUPLEXES	5624 CHELSEA RD.	TAMPA	33610	C	A	80	12,000
6292128	NEW HOPE CHILDREN'S	110 HUNTER RD	VALRICO	33594	P	A	95	62,100
6292152	FIRST BAPTIST CHURCH	11619 SR 574	MANGO	33584	N	A	100	1,000
6292159	LITTLE KIDS ACADEMY	11103 E US 92	SEFFNER	33584	P	A	49	1,600
6292161	PRECIOUS JEWELS DAY	5016 GARDEN LANE	TAMPA	33610	P	A	30	2,000
6292453	OAKWOOD ACRES APTS	10600 DAVIS ROAD	TAMPA	33637	C	A	80	10,000
6292477	CHINA PALACE	1807 HWY 60 E	VALRICO	33594	N	A	180	2,500
6292478	WILLIES RESTAURANT	1912 FRONT STREET	VALRICO	33594	N	A	455	15,000
6292549	HACIENDA	4109 E HILLSBOROUGH AVE	TAMPA	33610	N	A	170	5,000
6292554	KASH & KARRY	6422 HARNEY RD	TAMPA	33610	P	A	150	50,000
6292561	MOTEL 301	3411 N HWY 301	TAMPA	33619	N	A	28	2,500
6292566	DENTAL HEALTH GROUP	1620 HWY 60	VALRICO	33594	N	A	30	3,000
6292568	SUNBELT SALES &	6429 HARNEY RD	TAMPA	33610	N	A	55	5,000
6292571	SMOKING DOG	6501 US HWY 301 S	RIVERVIEW	33569	N	A	40	1,500
6292577	VALRICO MEDICAL CTR	1810 E BRANDON BLVD	VALRICO	33594	N	A	75	3,000
6292578	VILLAGE RESTAURANT	512 S.R.574	SEFFNER	33584	N	A	100	2,500
6292645	RIVERBREEZE MHP	4804 CLEWIS AVE	TAMPA	33610	C	A	38	5,000
6292647	YAK'S MHP	5507 BAPTIST CHURCH ROAD	TAMPA	33610	C	A	32	8,000

PWS ID	Mailing Name	Mailing Street	City	Zip	PWS Type	Status	Pop	Capacity(GPD)
6292660	HCPRD/STERLING	11706 WILLIAMS ROAD	THONOTOSASSA	33592	P	A	50	5,000
6292788	TERRACE ACRES APTS	10402 WILLIAMS RD.	THONOTOSASSA	33592	N	A	32	5,000
6292831	CIRCLE K #7074	SR 579 & MAIN ST	THONOTOSASSA	33592	N	A	100	2,500
6292833	JAY'S MINIMART	11606 WILLIAMS ROAD	THONOTOSASSA	33592	N	A	100	1,500
6292834	CIRCLE K #7108	10401 MCINTOSH ROAD	THONOTOSASSA	33592	N	A	100	2,500
6292835	CIRCLE K #7112	MORRIS BRIDGE AT ELOIAN	THONOTOSASSA	33592	N	A	100	2,500
6292836	PRESCO FOOD STORE #66	11931 HWY. 301 NORTH	THONOTOSASSA	33592	N	A	100	2,500
6292842	CITGO	11305 US 92 E.	SEFFNER	33584	N	A	100	5,000
6292846	CAMP DOROTHY THOMAS	16119 BOYETTE RD	RIVERVIEW	33569	N	A	190	45,000
6292847	ROTARY'S CAMP FLORIDA	1915 CAMP FLA RD	BRANDON	33510	N	A	120	10,000
6292851	AUNT FRANNIES	1708 SR 574	SEFFNER	33584	P	A	40	5,000
6292855	GIT N GO #4	5320 N. FAULKENBURG ROAD	TAMPA	33610	N	A	100	1,750
6292859	CAUSEWAY GRILL & FOOD	6110 CAUSEWAY BLVD	TAMPA	33619	N	A	100	1,500
6292861	MARY'S MIRACLE	10203 E. HWY 92	TAMPA	33610	N	A	75	5,000
6293003	SPUR	13025 U.S 301 N/O BIG BEND	RIVERVIEW	33569	N	A	100	1,500
6293036	FANTASY MENS CLUB	4948 N 56 TH ST	TAMPA	33610	N	A	50	2,500
6293037	DALLAS BULL	8222 HWY 301 NORTH	TAMPA	33637	N	A	250	5,000
6293041	POT BELLIES COUNTRY	11711 M.L.KING BLVD	MANGO	33584	N	A	100	5,000
6293068	301 HOUSE	8601 BOWLES RD	TAMPA	33637	N	A	25	5,000
6294000	GIT N GO MARKETS	6912 CAUSEWAY BLVD.	TAMPA	33619	N	A	100	1,750
6294172	GREEN OAKS MHP	12001 US 301 N	THONOTOSASSA	33592	C	A	70	6,000
6294333	GOLDEN OAKS APTS	9317 GOLDENROD ROAD	THONOTOSASSA	33592	C	A	40	15,000
6294339	GRACELAND MHP	6010 WILLIAMS RD	SEFFNER	33584	N	A	56	5,000
6294342	RUSTY ANCHOR PUB	7201 N 40TH ST	TAMPA	33604	N	A	75	1,500
6294409	HIGHLAND APARTMENTS	E/O HERSHEY S/O EASTFIELD	THONOTOSASSA	33592	C	A	60	10,000
6294591	MAIN STREET PLAZA	10804 MAIN STREET	THONOTOSASSA	33592	N	A	75	2,500
6294596	MIRROR LAKE PLAZA	11803 DR.M.L.KING BLVD	TAMPA	33584	N	A	25	10,410
6294597	MCCORMICK SKI SCHOOL	6120 MUCK POND RD	SEFFNER	33584	N	A	50	10,620
6294612	CAMP LEMORA	14910 DEAD RIVER RD	THONOTOSASSA	33592	N	A	447	30,000
6294792	SOUTHERN AIRE RVP	10511 FLORENCE RD	THONOTOSASSA	33592	P	A	258	50,000
6294846	GRACE COMMUNITY	1300 VALRICO ROAD	BRANDON	33594	P	A	450	32,400
6294856	EASTFIELD SLOPES	9529 FIELDVIEW CR.	THONOTOSASSA	33592	C	A	300	50,000
6294867	ATLANTIC FOOD MART	8407 N US HWY 301	TAMPA	33637	N	A	100	5,000
6294879	301 GRILL/WAGON WHEEL	12464 US 301 N	THONOTOSASSA	33592	N	A	75	5,500
6294891	EASTBAY RACEWAY PARK	6311 BURTS RD	TAMPA	33619	N	A	1000	1,000

PWS ID	Mailing Name	Mailing Street	City	Zip	PWS Type	Status	Pop	Capacity(GPD)
6294893	FOE/BRANDON AERIE	1810 FRONT ST	TAMPA	33594	N	A	25	2,500
6294913	THONOTOSASSA CHURCH OF GOD DC	11702 TAYLOR RD	THONOTOSASSA	33592	P	A	85	20,000
6294921	GULF COAST THERMO	7802 HWY 301 N	TAMPA	33637	P	A	30	2,500
6294940	ALL AREA ROOFING	1820 N 57TH STREET	TAMPA	33619	N	A	37	1
6294946	ANTIOCH FEED & FARM	12650 N. MCINTOSH RD.	THONOTOSASSA	33592	N	A	25	1,500
6294949	COUNTRY AIRE MHP	10914 CLAYPIT RD	SEFFNER	33584	C	A	122	30,000
6294954	ELEVEN MILE TAVERN	1118 SR 574 WEST	SEFFNER	33584	N	A	80	2,500
6294995	GENTLE SLOPE MHP	5019 WILLIAMS RD.	TAMPA	33610	N	A	24	12,000
6295002	CIRCLE K #7443	10039 E. BROADWAY	TAMPA	33619	N	A	100	5,000
6295018	YELLOW FREIGHT	8950 MAISLIN DRIVE	TAMPA	33637	N	A	30	3,200
6295028	BEVERAGE CASTLE 301	9202 US HWY 301 NORTH	TAMPA	33637	N	A	100	1,500
6295031	CALVARY TABERNACLE	10930 NORTH US HWY 301	THONOTOSASSA	33592	N	A	150	7,500
6295047	ERNIE'S METAL	8919 MAISLIN DRIVE	TAMPA	33637	P	A	70	2,500
6295073	HCPRD/DEAD RIVER	DEAD RIVER RD	THONOTOSASSA	33592	N	A	100	5,000
6295074	HCPRD/JOHN B SARGEANT SR PARK	US HWY 301	THONOTOSASSA	33592	N	A	100	2,500
6295075	HCPRD/MORRIS BRIDGE	13330 MORRIS BRIDGE ROAD	THONOTOSASSA	33592	N	A	100	5,000
6295087	COUNTRY COVE	807 DR. M.L.KING BLVD	SEFFNER	33584	N	A	50	2,500
6295089	PEOPLE FOR CHRIST MINISTRIES INC.	10511 MAIN ST	THONOTOSASSA	33592	N	A	150	1,500
6295112	OAKWOOD CT APTS	5313 OAKWOOD CT	TAMPA	33610	C	A	52	17,000
6295129	TRANSPORTATION SAFTEY CONTRACT	7750 PROFESSIONAL PLACE	TAMPA	33637	N	A	25	1,500
6295179	BARLOWORLD HANDLING	3915 HWY 301 N	TAMPA	33619	P	A	35	5,000
6295183	BAY HILLS VILLAGE	10504 BAY HILLS CIRCLE	THONOTOSASSA	33592	C	A	218	75,000
6295196	ASHLEY COVE MLC	420 N. ST. CLOUD	VALRICO	33594	N	A	100	2,600
6295214	RIVERVIEW SEVENTH DAY ADVENTISTS	10405 HOLLAND RD.	RIVERVIEW	33569	N	A	100	1,500
6295215	GOODSON FARMS	14215 BALM RIVERVIEW ROAD	BALM	33569	N	A	100	7,000
6295240	COUNTRY HOME PK	8401 BOWLES ROAD	TAMPA	33637	C	A	60	8,000
6295245	BRANDON KIDDIE CARE	202 PAULS DRIVE	BRANDON	33511	P	A	50	4,000
6295251	KELLY'S HIDEAWAY	1425 US 92 EAST	SEFFNER	33584	N	A	100	13,577
6295264	CROFTON & SONS	10250 WOODBERRY RD	TAMPA	33619	P	A	25	12,000

PWS ID	Mailing Name	Mailing Street	City	Zip	PWS Type	Status	Pop	Capacity(GPD)
6295291	HOLY INNOCENTS EPISCOPAL CHURC	604 N. VALRICO RD.	VALRIC0	33594	N	A	150	12,344
6295321	TAMPA AMALGAMATED STEEL CORP.	5215 ST. PAUL STREET	TAMPA	33619	P	A	45	5,000
6295325	CAUSEWAY MEDICAL	7108 CAUSEWAY BOULEVARD	TAMPA	33619	N	A	35	1,500
6295340	CIRCLE K #7109	11721 BALM RIVERVIEW ROAD	RIVERVIEW	33569	N	A	100	1,500
6295360	VALRICO PLACE	3120 E. HWY. 60	VALRICO	33594	N	A	75	7,500
6295369	ACTS(ALCOHOL COMM	11309 TOM FOLSOM RD	THONOTOSASSA	33592	P	A	40	10,000
6295385	SCOREBOARD LOUNGE	11018 U.S. 92 E	SEFFNER	33584	N	A	75	14,400
6295388	HCPRD/FLATWOOD SITE	14302 MORRIS BRIDGE ROAD	THONOTOSASSA	33592	N	A	100	2,500
6295398	SUNLAND MHP	802 ROLLINWOOD OAK LANE	SEFFNER	33584	C	A	50	15,000
6295399	FALKENBURG CTR	501 FALKENBURG ROAD	TAMPA	33619	P	A	75	2,800
6295404	YOUNGER YEARS	1905 S. LENNA AVE	SEFFNER	33584	P	A	54	1,500
6295408	LIVING FAITH CHURCH	5500 EAST SLIGH AVENUE	TAMPA	33610	N	A	80	1,000
6295409	BAY AREA CHURCH OF	3905 ORANGE ST	MANGO	33584	N	A	100	2,500
6295420	CIRCLE K #8532	7220 E. HILLSBOROUGH AVE.	TAMPA	33619	N	A	25	2,750
6295427	ST CECELIAS' EPISCOPAL	1920 MAY DELL DRIVE	TAMPA	33619	N	A	75	2,500
6295466	HCPRD/TROUT CREEK	MORRIS BRIDGE ROAD	THONOTOSASSA	33592	N	A	100	10,000
6295471	ASHLEY OAKS MOBILE	6401 CLEWIS AVENUE	TAMPA	33610	C	A	60	12,700
6295474	FIRST THONO BAPT	10650 MCINTOSH ROAD	THONOTOSASSA	33592	N	A	75	1,500
6295477	THONOTOSASSA BRANCH	10715 MAIN STREET [P.O. 1529)	THONOTOSASA	33592	N	A	30	2,500
6295492	HCRD/ROAD	13173 N. US HWY 301	THONOTOSASSA	33592	P	A	75	57,000
6295507	HUTTO'S MHP	11920 HAZEN AVENUE LOT #1	THONOTOSASSA	33592	C	A	60	10,000
6295510	AMERICAN LEGION #111	6918 NORTH FLORIDA AVENUE	TAMPA	33604	N	A	60	7,500
6295513	SOUTHEASTERN FREIGHT	12315 COUNTY ROAD 579	THONOTOSASSA	33592	P	A	150	1,000
6295541	THONOTOSASSA METHODIST CHURCH	11905 FORT KING RD	THONOTOSASSA	33592	N	A	150	1,000
6295551	JOE'S SUBURBAN CLUB	11601 DOWNS LOOP SOUTH	RIVERVIEW	33569	N	A	25	375
6295569	HILLSBOROUGH MHP	1610 S.R. 60	VALRICO	33594	C	A	60	7,500
6295577	NATURE'S TRAIL MHP	12880 MORRIS BRIDGE ROAD	THONOTOSASSA	33592	C	A	40	50,000
6295591	EMMANUEL BAPTIST	9812 HARNEY ROAD	THONOTOSASSA	33592	N	A	90	1,500
6295613	CYPRESS MOBILE HOME	25 SPRUCE LANE	VALRICO	33594	C	A	50	15,000
6295614	RAINBOW FOREST M.H.P.	9102 N. WILLIAMS ROAD	SEFFNER	33584	C	A	35	18,000
6295621	SHEARWOOD M.H.P.	9917 E. ELLICOTT STREET	TAMPA	33610	C	A	55	7,500
6295674	RANGE DAY CARE CENTER	10235 HARNEY ROAD	THONOTOSASSA	33592	P	A	43	2,500

PWS ID	Mailing Name	Mailing Street	City	Zip	PWS Type	Status	Pop	Capacity(GPD)
6295679	MERITA BAKERY	12221 HWY 301 NORTH	THONOTOSASSA	33592	N	A	25	1,000
6295685	DURANT CHEVRON	1005 LITHIA-PINCREST ROAD	BRANDON	33594	N	A	75	1,500
6295690	EAST TAMPA CHRISTIAN	7824 24TH AVE SO	TAMPA	33619	N	A	30	1,500
6295969	ALRO-METALS SERVICE	10223 WOODBERRY ROAD	TAMPA	33619	P	A	50	1,750
6295970	IRIS COURT APARTMENTS--	GREYROCK & HERSHEY	THONOTOSASSA	33592	N	A	25	24,999
6295972	FERNHILL TRAILER PARK	10704 FERNHILL	RIVERVIEW	33569	C	A	61	8,000
6295984	IRIS COURT APARTMENTS--	GREYROCK & HERSHEY	THONOTOSASSA	33592	N	A	25	24,999
6295991	THONOTOSASSA SDA	9525 JOE EBERT ROAD	THONOTOSASSA	33592	N	A	200	36,000
6295996	FRATERNAL ORDER OF	9001 NORTH TAYLOR ROAD	SEFFNER	33584	N	A	25	15,000
6295999	J.D. MILLER AND SONS	10441 NORTH HARNEY ROAD	THONOTOSASSA	33592	N	A	40	5,000
6296004	M&B OF TAMPA INC	8601 HARNEY RD	TAMPA	33637	P	A	70	200,000
6296005	ST. FRANCIS FOUNDATION	13133 ST FRANCIS LANE	THONOTOSASSA	33592	C	A	50	15,000
6296009	MACEDONIA M.B.C.	9750 ROCKHILL RD	THONOTOSASSA	33592	N	A	75	1,500
6296039	EAST POINT ASSEMBLY OF	5337 GARDEN LANE	TAMPA	33610	C	A	100	5,000
6296043	E.THONOTOSASSA BAPTIST CHURCH	12725 KNIGHTS GRIFFIN RD	THONOTOSASSA	33592	N	A	150	2,500
6296048	INDOOR SHOOTING CO	9402 EAST FOWLER AVE	THONOTOSASSA	33592	N	A	25	1,000
6296050	SEFFNER FOOD STORE	340 E. MARTIN LUTHER KING	SEFFNER	33584	N	A	100	1,000
6296057	UNITED SIKH FOUNDATION	15302 MORRIS BRIDGE ROAD	THONOTOSASSA	33592	N	A	50	5,000
6296064	SOUTHERN PALMS MHP	10615 OHIO AVE	THONOTOSASSA	33592	C	A	38	24,999
6296066	CONIGLIO LAND FILL	11981 NORTH WILLIAMS ROAD	THONOTOSASSA	33592	N	A	25	15,000
6296067	REESES FISH CAMP	11502 THONOTOSASSA RD.	THONOTOSASSA	33592	N	A	25	1,000
6296076	WEST CENTRAL SIGNS	7720 U. S. 301 NORTH	TAMPA	33637	P	A	30	2,000
6296084	SOUTHERN WINDING	5302 ST PAUL ST	TAMPA	33619	P	A	34	1,000
6296093	HUGHES SUPPLIES-TAMPA/ FIFE FL. ELECTRIC	10301 FISHER AVE	TAMPA	33619	P	A	30	1,200
6296096	RMC EWELL INC.	311 FAULKENBURG	BRANDON	33619	N	A	26	27,465
6296097	LITTLE SICILY	1724 8TH AVE EAST	TAMPA	33605	N	A	100	1,500
6296104	HOBBS STREET	501 HOBBS STREET	TAMPA	33619	P	A	175	7,000
6296106	SEAFOOD PALACE	6207 CAUSEWAY BLD	TAMPA	33619	N	A	75	1,500
6296120	SUNRISE LANDSCAPE	10000 HINES RD	TAMPA	33610	N	A	25	2,000
6296122	AUGUST GROUP	9501 E. HILLSBOROUGH AVE.	TAMPA	33610	N	A	25	2,000
6296123	FL. DIST. PENTECOSTAL CHURCH OF GOD	10320 MAIN STREET	THONTOSASSA	33592	N	A	150	2,000
6296124	STATE HIGHWAY BAPTIST	5502 BAPTIST CHURCH ROAD	TAMPA	33610	N	A	100	2,000

PWS ID	Mailing Name	Mailing Street	City	Zip	PWS Type	Status	Pop	Capacity(GPD)
6296125	NEW TESTAMENT MISSIONARY B. CHURCH	11530 WALKER ROAD	THONOTOSASSA	33592	N	A	100	2,000
6296126	BRADCO SUPPLY CO.	7820 PROFESSIONAL PLACE	TAMPA	33637	N	A	50	2,000
6296129	ST. MATTHEWS CHURCH	10701 BLOOMINGDALE AVE	RIVERVIEW	33569	N	A	100	86
6296130	COLLINS PRODUCE	101 N ST. CLOUD ST	VALRICO	33594	N	A	100	3,000
6296132	LITHIA PINECREST	725 LITHIA PINECREST RD	LITHIA	33511	P	A	50	1,080
6296133	SIMMONS LOOP BAPTIST	6610 SIMMONS LOOP	RIVERVIEW	33569	N	A	100	1,500
6296138	VANDENBERG AIRPORT	9334 VANDENBERG AIRPORT	TAMPA	33610	P	A	85	4,800
6296145	FAIRVIEW MHP	7100 MLK JR BLVD	TAMPA	33610	C	A	98	25,000
6296147	POLICE/FIRE	2920 E. HENRY AVENUE	TAMPA	33610	N	A	40	13,300
6296149	FELLOWSHIP BAPTIST CHURCH OF VALRICO	106 ROLLING HILLS	VALRICO	33594	N	A	50	1,500
6296151	DISCOUNT AUTO PARTS	12114 US HIGHWAY 301	THONOTOSASSA	33592	N	A	200	5,000
6296155	JOHN W. YORE	10350 FISHER AVE	TAMPA	33510	N	A	25	1,000
6296157	HORTICULTURE VOCATIONAL TRAINING	520 FALKENBERG RD.	TAMPA	33601	P	A	25	1,688
6296158	SAFETY-KLEEN CORP	5309 24TH AVE S	TAMPA	33619	N	A	48	5,000
6296164	MILLENNIUM CENTER	1206 MILLENNIUM PARKWAY	BRANDON	33511	P	A	80	1,000
6296165	ALL AMERICAN DINER	4406 FAULKENBURG ROAD	TAMPA	33610	N	A	75	2,500
6296181	VANDENBERG SOUTH HANGAR-US AIR FORCE	VANDENBERG HANGAR ROAD	TAMPA	33610	N	A	25	2,500
6296182	VANDENBERG RELIABLE AVIATION HANGAR	6044 VANDENBERG HANGAR LANE	TAMPA	33610	N	A	25	5,000
6296183	FELLOWSHIP BAPTIST	13515 N. US HWY 301	THONOTOSASSA	33592	N	A	300	3,480
6296188	IGLESIA DE ROCA ESPERANZA CHURCH	5903 NORTH 47TH STREET	TAMPA	33610	N	A	250	1,500
6296221	NEW LIFE FELLOWSHIP	125 CHURCH ST	VALRICO	33594	P	A	40	5,000
6296225	STACI'S LEARNING	10611 CONE GROVE ROAD	RIVERVIEW	33569	P	A	90	5,760
6296230	KRESTVIEW ACADEMY	11425 BALM-RIVERVIEW ROAD	RIVERVIEW	33569	P	A	40	8,000
6296234	SKINNER NURSERIES	9740 HARNEY ROAD	THONOTOSASSA	33592	N	A	25	7,872
6296247	MAIN STREET GRILL	10609 MAIN STREET	THONOTOSASSA	33592	N	A	100	1,000

Appendix 8
Historic and Archeological Report

Appendix 8-1
Correspondence with Florida Department of State Division of Archives, History, and Records Management

Memorandum FLORIDA DEPARTMENT of STATE

TO: Ms. Jane W. Wheeler
Camp, Dresser & McKee, Inc.
FROM: Frederick Gaske, Historic Sites Specialist
Division of Archives, History & Records Management
DATE: May 11, 1984

SUBJECT: Your Letter of April 26, 1984
Cultural Resource Assessment Request
Faulkenburg Road Resource Recovery Facility, Hillsborough County, Florida

Dear Ms. Wheeler:

As discussed in our telephone communication of this date, the subject tract was surveyed for archaeological and historic sites in 1983. The results of this investigation were reviewed by this office in our letter of June 21, 1983, a copy of which is enclosed for your reference. Please note that it was the opinion of this agency that no significant cultural resources would be affected by the proposed project.

If I can be of any further assistance, please do not hesitate to contact me.

Sincerely,

Frederick Gaske

FLORIDA DEPARTMENT OF STATE
George Firestone
Secretary of State
DIVISION OF ARCHIVES,
HISTORY AND RECORDS MANAGEMENT
The Capitol, Tallahassee, Florida 32301
(904) 488-1480

June 21, 1983

In Reply Refer to:

Frederick P. Gaske
Historic Sites Specialist
(904) 487-2333

Ms. Patricia A. Vogel
Environment Engineer
Resource Recovery Project
Hillsborough County Department
of Solid Waste
P.O. Box 1110
Tampa, Florida 33601

Re: Your Letter and Attachment of May 26, 1983
Cultural Resource Assessment Review Request
"An Archaeological and Historic Survey of the
Faulkenburg Road Resource Recovery Facility Tract,
Hillsborough County, Florida" by Dr. J. Raymond Williams,
Christine Newman, Richard Estabrook and William Johnson.

Dear Ms. Vogel:

As per the provisions of Chapter 17-17, Florida Administrative Code ("Rules of the State of Florida Department of Environmental Regulation, Electrical Power Plant Siting"), we have reviewed the above cited report prepared under the direction of Dr. J. Raymond Williams of the University of South Florida.

On the basis of the information contained in their report, we concur with the authors in concluding that the identified isolated prehistoric artifact finds located during the archaeological and historic site location survey do not constitute a significant archaeological site.

It is, therefore, the opinion of this office that the proposed project is unlikely to affect any significant archaeological or historic resources, and may proceed without further involvement with this agency.

If you have any questions concerning our comments, please feel free to contact us.

Your interest and cooperation in helping to protect Florida's archaeological and historical resources are appreciated.

Sincerely,

George W. Percy, Chief
Bureau of Historic Preservation

GWP:Gcm

cc: Patrick Lewis
William Ockunzzi
Hamilton S. Oven, Jr.
Paul J. Stoller
Dr. J. Raymond Williams

Appendix 8-2
National Register Entries from Hillsborough County

REC'D JUNE 11, 1984

NATIONAL REGISTER ENTRIES FROM HILLSBOROUGH COUNTY

The official name of the entry is listed first followed by the date of construction, type of entry, and address.

Union Railroad Station, 1912, building, 601 North Nebraska Avenue, Tampa

Tampa City Hall, 1915, building, 315 East J. F. Kennedy Boulevard, Tampa

Old School House, 1858, building, University of Tampa Campus, Tampa

U. S. Post Office, 1905, building, 601 North Florida Avenue, Tampa

Tampa Bay Hotel, 1891, building, 401 West J. F. Kennedy Boulevard, Tampa

Ward-Taliaferro House, 1890, building, 305 South Hyde Park Avenue, Tampa

Leiman House, 1915, building, 716 South Newport Avenue, Tampa

Stovall House, 1909, building, 4621 Bayshore Boulevard, Tampa

Chapin-Logan House, c. 1890, building, 4607 Bayshore Boulevard, Tampa

Johnson-Wolfe House, 1885, building, 6823 South De Soto Street, Port Tampa

Centro Asturiano, 1914, building, 1913 North Nebraska Avenue, Tampa

Centro Espanol de West Tampa, 1912, building, 2306 North Howard Avenue, Tampa

First National Bank Facade, 1894, object, 1415 North Franklin Street, Tampa

Ybor Cigar Factory, 1886, building, 1910 Avenida Republica de Cuba, Ybor City

El Pasaje, 1886, building, 1318 East 9th Avenue, Ybor City

Cuban Club, 1907, building, 2010 Avenida Republica de Cuba, Ybor City

Ruskin Women's Club, 1914, building, 508 Tamiami Trail, Ruskin

Plant City Railroad Station, 1908, building, Plant City (downtown)

Fort Foster, 1836, archaeological site, NE Hillsborough County

Cockroach Key, 700-1500 A. D., archaeological site, SW Hillsborough County

Ybor City Historic District, late 19th century, Ybor City, Tampa

OLD PLANT CITY HIGH SCHOOL, 1914, N. Collins St., Plant City

ANDERSON-FRANK HOUSE, Building, 1901, 341 Plant Avenue, Tampa

KRESS BUILDING, building, 811 N. Franklin Street, Tampa

WEST TAMPA HISTORIC DISTRICT

Appendix 8-3
Archaeological and Historical Survey of the Site by J. Raymond Williams, Et Al

AN ARCHAEOLOGICAL AND HISTORICAL SURVEY OF THE FAULKENBURG ROAD RESOURCE RECOVERY FACILITY TRACT, HILLSBOROUGH COUNTY, FLORIDA

conducted for

The Department of Solid Waste
Hillsborough County, Florida

by

J. Raymond Williams
Christine Newman
Richard Estabrook
William Johnson

May 1983

ABSTRACT

This report details an archaeolcgical and historical survey of a 50 acre tract in central Hillsborough County, Florida, conducted for the Solid Waste Department of Hillsborough County. The Florida Master Site File listed no historic or prehistoric sites known to be present within the tract boundaries. However, 34 sub-surface test pits were excavated to determine if any sites could be located. Testing was done since surveys in nearby, similar areas indicate that there may be sites present even though there is no surface indication of them.

Two chert flakes were recovered in a random testing design. More intensive testing near the location of these cultural materials was then undertaken, but no other material was found and no archaeological site is present. An historic assessment indicated that no significant historic sites have existed on the property. Furthermore, no significant historic events have occurred on the property.

Thus, the project will have no impact on any cultural resources, prehistoric or historic.

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INTRODUCTION

This report details the archaeological and historical survey of the 50 acre Faulkenburg Road Resource Recovery Facility Site tract in Sections 18 and 19, Township 29 South, Range 20 East, in Hillsborough County, Florida (see Figures 1 and 2).

The Florida Master Site File indicated no known sites on the property. However, since sites are known to exist in similar geographical and environmental areas nearby, a survey was recommended by the State Historic Preservation Officer (SHPO), State Division of Archives, History and Records Management. Because ground cover is usually heavy in Florida, there are few surface exposures. Also, buried sites do not always have surface expression. As a result of these factors, it was decided, in addition to a walk-over reconnaissance survey, that subsurface testing was needed to locate any cultural resources.

Testing began by the authors on April 2, 1983, but ended at noon because of rain. A second half-day of field work took place on April 15, 1983 which concluded the field work portion of the project. A total of 32 person hours was spent in the field portion of the project digging 34 test pits and checking any exposed surface areas within the boundarys of the tract.

The only cultural materials found were two chert flakes. These were recovered in two different test pits. Intensive testing near these pits resulted in no other cultural materials and no site.

Most of the land has been cleared and consists of improved pastureland. Thus, some surface disturbance has occurred in the past.

The tract has one standing structure of recent construction. This structure in associated with the agricultural activities on-going at the property and is not considered significant. Some farm machinery is still stored near this structure.

The planned use of the project area by the Solid Waste Department of Hillsborough County will, then, have no impact on any prehistoric or historic cultural resources.

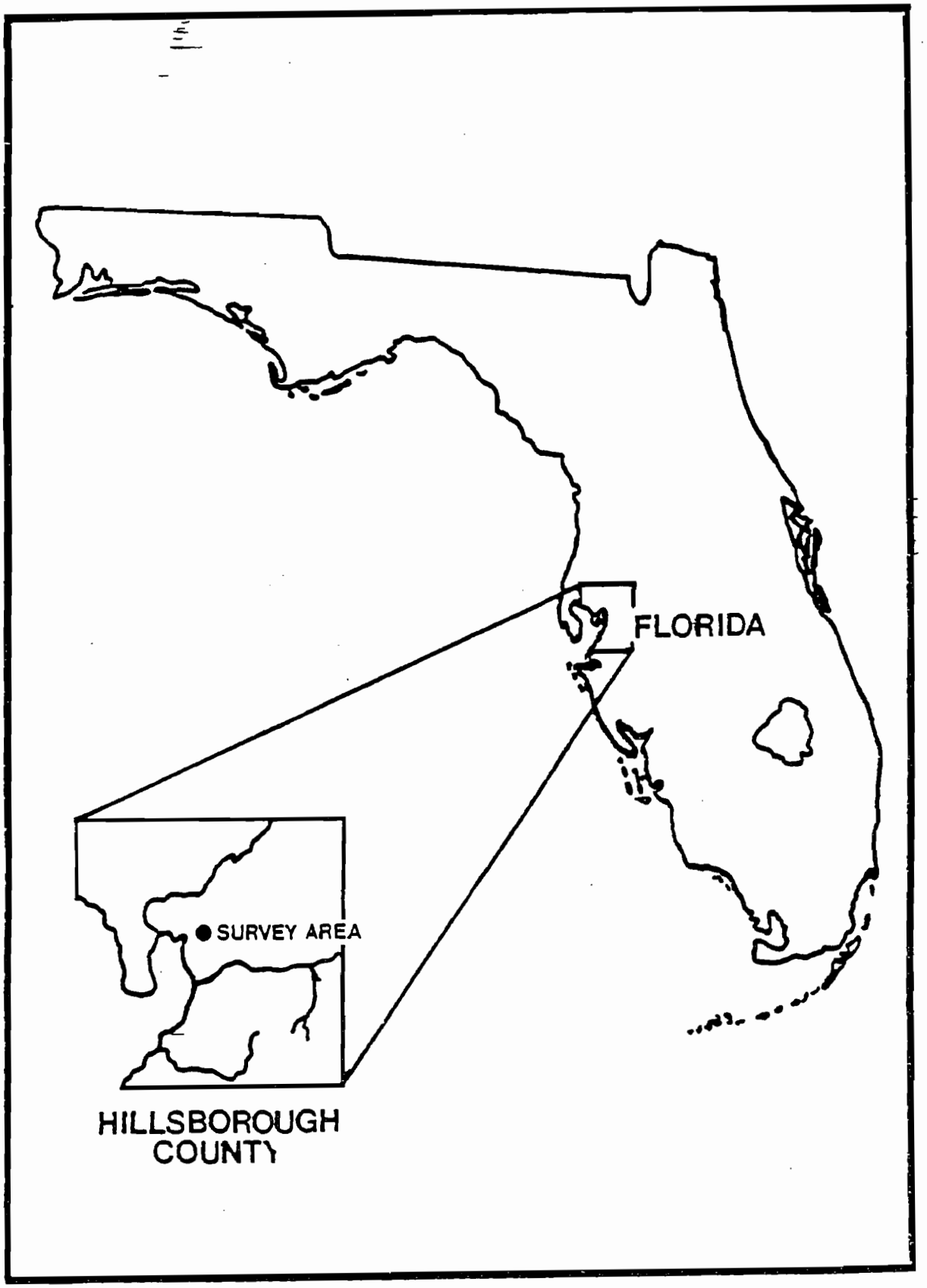

Figure 1. General Area of the Survey Tract.

SUMMARY OF PREVIOUS ARCHAEOLOGICAL WORK IN THE GULF COAST REGION

The major piece of literature that describes the history of archaeological research in the Central Peninsula Gulf Coast Region is Willey (1949). The sources in this short summary of work in these areas of Florida are to a great extent taken from Willey's volume.

Among the earliest published sources that relate to the area are those of Allen (1846) and Conrad (1846). Both Allen and Conrad discussed shell mounds and concluded that they were of natural origin. In fact, little of value was published about the archaeology of the area until the last quarter of the 1800s with two of the writings of S.T. Walker (1880a, 1880b). Walker not only excavated, but noted changes in stratigraphy and ceramic types by level. The last major figure of the Nineteenth Century was F.H. Cushing who excavated several sites including Key Marco far to the south of the Tampa Bay region. Cushing's report (1897) is shy of detail and he had a rather active imagination.

Although there are numerous references to specific sites in the Central Peninsula Gulf Coast Region in the late 1880s, most are accounts of dillettantes and are not worth referencing here. It was the work of Clarence Moore which laid "the groundwork for any synthesis of Florida Prehistory" (Willey 1949:21). Moore's first sojourn to the Gulf Coast was in 1900. Heading south from Clearwater Harbor in the north, he excavated numerous sites (mainly sand mounds) in the Central Peninsula Gulf Coast Region (Moore 1900). He returned to this area of Florida in 1903 and explored the lower reaches of several southern Central Peninsula Gulf Coast Rivers (Moore 1903).

Although Walker and Moore were as scientifically oriented as any other archaeologists of the day, their work leaves much to be desired by modern standards. Moore's greatest contribution is the volume of his work. He did, however, note intersite and regional differences, but his work can be characterized as conservative, if not almost devoid of ideas. Perhaps this was best after the rampant speculations of earlier investigators.

Although W.W. Holmes is associated with ceramic typology for the Eastern United States (Holmes 1903), Florida archaeologists were indebted to him for the order he gave to Moore's great collections (Holmes 1894a). His classifications do not relate specifically to the Central Peninsula Gulf Coast Region, however, he recognized the unique Weeden Island types and discussed their possible West Indies and Yucatan origins (Holmes 1894b).

Two famous archaeological sites were investigated in the Tampa Bay Region in the 1920s, both associated with M.W. Stirling. A burial mound at the famous Weeden Island site in Tampa Bay was excavated in 1923-1924 by J.W. Fewkes and Stirling (Fewkes 1924). Later, Stirling, who by this time was Chief of the Bureau of American Ethnology, returned to dig at the Safety Harbor site, also in the southern

Central Peninsula Gulf Coast archaeological region. Stirling headed the Smithsonian Federal Relief project excavations. Sites such as Perico Island and Englewood, other type sites for cultural periods, were excavated between 1933 and 1936 (Stirling 1935; Willey 1949).

The federally financed excavations were continued by the old Florida State Board of Conservation under the direction of J.C. Simpson (Willey 1949:31). Simpson excavated several sand mounds in Hillsborough County (Bullen 1952) between 1935 and 1938.

Although several other important sites were excavated or re-excavated in the 1930s, such as Griffin's work at Safety Harbor (Griffin and Bullen 1950), it was Gordon Willey whose major synthesis, Archaeology of the Florida Gulf Coast (Willey 1949), laid the foundation for all recent work. Although Willey obtained a considerable amount of data himself, others such as John Goggin, Charles Fairbanks, Ripley Bullen, Hale Smith, John Griffin, M.W. Stirling, R.B. Woodbury, Preston Holder, J. Clarence Simpson and Marshall T. Newman contributed significantly in terms of excavation data and knowledge of Florida archaeology. Willey's book and sites reported through the 1950s and 1960s may be referred to as "old archaeology," but they are the bases for our understanding of the temporal and spatial aspects of the Central Peninsula Gulf Coast Region of Florida. The most recent systhesis of Florida archaeology is that of Milanich and Fairbanks (1980). This book updates what is known throughout the state, but is aimed at overview rather than detail.

The major impetus to increasing archaeological work in the vicinity of the survey tract during the 1970s has been the state and federal requirements for cultural resource investigations in relation to Development of Regional Impact or Environmental Impact studies. The results of these investigations are discussed in detail in another section of this report.

Early research problems in the Florida Gulf Coast area were concentrated on the development of a regional chronological framework (Willey 1949) and its extension into the interior areas more removed from the coast. As discussed above, these cultural historical problems have not been completely solved and many questions remain.

Now, archaeologists have begun to turn their attention to more contemporary problems. Hypotheses testing, site prediction models and explanatory issues are examples of goals of research in more recent survey projects, particularly those covering large numbers of acres. This level of research is discussed more throughly in another section of this report.

OTHER SURVEYS NEAR THE PROJECT AREA AND THE USE OF SITE LOCATION MODELS

The 50 acre Faulkenberg Road Resource Recovery Facility tract is, when viewed within a large geographical context, in an area which has been subjected to several archaeological surveys within the past 10 years as a result of both state and federal historic preservation legislation.

To the east is the 868 acre Hopewell Land Corporation property (Piper, Piper and Fryman 1980). To the south is the Brandon Town Center tract of approximately 300 acres (Piper, Hardin and Piper 1982), the Big Bend tract which consisted of 1900 acres (Deming and Almy 1981), the 300 acre Hillsborough County South 201 Facilities tract (Deming 1981) and the Alderman's Ford Park tract of approximately 640 acres (Grange and Williams 1977). To the northwest, two large parcels have been surveyed, specifically, the seven recreation resource sites in the Lower Hillsborough River Flood Detention Area (Daniel, Wisenbaker and Fryman 1979) and the Deltona Corporation's Tampa Palms property (Grange, Fryman and Williams 1979; Rom 1979). These latter two projects total nearly 6000 acres. The I-75 corridor running through western Hillsborough County was also surveyed (Jones 1979). Though narrow, one of the interesting facts about this survey was that it crossed through several varied environmental zones and allows analysis of these zones in terms of site presence or absence. Somewhat more distant in eastern and southeastern Hillsborough County, Western Polk County and in Manatee and Hardee Counties, there have been numerous surveys, both large and small, associated with phosphate mining. These will not be mentioned here, although many are used in other parts of this section and in this report.

These surveys provide a substantial data base for planning survey work on new tracts of land within the region. They indicate that site density is low and many sites are referred to as "fragile patterns" and yield only sparse surface materials. Some sites have been substantial enough to warrent salvage excavations, however. Data from these and other surveys in the Central Gulf Coast Region are all useful in developing a preliminary prediction model of potential site locations prior to the actual field survey phase of a project.

The use of predictive models in archaeological survey has been growing since 1969, but most published examples post date 1975 (King 1978:122-124). Predictive surveys have been successful in west Florida in Hillsborough, Manatee and Polk counties (Grange and Williams 1977, 1978a, 1978b, 1978c, 1979a, 1979b; Grange, Williams and Almy 1977; Almy and Williams 1978; Williams and Grange 1980). The predictive models have been developed in conjunction with both specific surveys and on the basis of more general, county-wide studies (Almy 1976, 1978; Deming 1976, 1980; Grange 1978).

One factor which has been used effectively in site location prediction is soil type. The non-random association of archaeological sites with specific soil types was demonstrated by Almy in Sarasota County (Almy 1976, 1978). Soil itself is probably not the significant factor involved, but soils reflect drainage patterns and may be useful indicators of better drained areas suitable for habitation. Grange (1978) and Deming (1980)

showed, in a county-wide evaluation of site data for Hillsborough County, that a similar non-random association of prehistoric sites with soils was present. The soil type data have been employed in predictive surveys by Almy and Reed (1978), Almy and Williams (1978), and Grange and Williams (1977). Soils also reflect elevation, vegetation and the species of fauna which would be associated with specific vegetation communities. All of these played an important role in prehistoric site location.

A fairly direct association of prehistoric sites with permanent or semi-permanent water sources is also a well known settlement factor (Deming 1975, 1976). In her survey of the Beker mine tract, Deming developed some specific site location prediction models for hunting camps and village sites. Specifically, she indicated that hunting camps would be between 1 meter and 926 meters from a semi-permanent water source, and less than 1200 meters from a hardwood hammock. They would be in the floodplain or bottom slope, not on upland terrain, and on relatively flat, moderately to poorly drained soil. Village sites would be expected, in her model, to be between 100 and 1200 meters from semi-permanent water, on moderately well-drained soils in an upland location (Deming 1976:37; 94-95).

These are not new predictive factors. A number of archaeologists have noted the consistent association of sites with valley slopes close to water (Hemmings 1975:48; Batcho and Milanich 1978:6; Padgett 1976:45; Wood 1976:75). Miller (1976) found a similar pattern of site location in Hookers Prairie where sites were at the margin of the prairie water source. Deming's contribtuion was an effort to express the association in quantitative terms for predictive purposes. In a review of Hillsborough County data, Grange (1978) found that two-thirds of the sites were within 742 meters of a permanent water source, skewed closer to the source since 90 percent of the sites are within 579 meters of a water source (Grange 1978:38). This distance factor proved to be very useful during the re-examination of the Duette tract (Grange and Williams 1978c). Willis (1979:114) has shown that 14 aboriginal sites found in the AMAX Pine Level survey are all within 700 meters of water, and 12 of the 14 are within 300 meters which is virtually identical with Deming's mean distance of 299 $\pm$ 314 meter distance prediction, and 927 meter maximum limit for 95 percent of all sites (Deming 1975:91).

In the survey of the Hookers Prairie tract, Miller found six sites. Five of them were at the edge of the prairie water source and one was 150 meters distant from the water.

Deming estimated that sites would also be within 1200 meters of a hardwood hammock. It is presumed that such environments contain a significant resource base attractive to prehistoric hunters and gathers (Batcho and Milanich 1978:4). In a recent examination of a Hillsborough County location adjacent to the Hillsborough River (Daniel et al. 1979:79), it was found that the ecotonal break between uplands and river valley forest habitats, i.e., the margins of hardwood hammocks, was a primary site location. Another sample on the Hillsborough River showed the average

distance to a hardwood locus to be 1065 feet within a range of 300 to 3000 feet (Grange, Fryman and Williams 1979:28). In the Little Payne survey, the attraction of wooded area resources for prehistoric people was noted (Batcho and Milanich 1978:4).

Willis also showed a high correlation between sites and mesic hardwood locations in the AMAX survey (Willis 1979:114). Miller discussed the importance of live oak hammock strands as site locations and the potential for hydric hammock resources in the Hookers Prairie tract (Miller 1976: 20, 22).

Surveys of the two tracts of land that include the South Prong of the Alafia River--the Lonesome Mine (Hemmings 1975) and the Borden Big Four (Martin 1976)--clearly show that sites are located "in predictable locations along the valley slope-floodplain ecotone" (Hemmings 1975:48). Both Martin's and Hemmings' surveys were exclusively pedestrian, and involved no subsurface testing for buried sites that have no surface expression. Had they included this form of survey methodology, results could have been different and another perspective might have been added to site location prediction models.

PREHISTORY

The survey tract lies within what has been defined as the Central Peninsula Gulf Coast archaeological region (Milanich and Fairbanks 1980) which serves as both a geographical and cultural region. Geographically, the Central Peninsula Gulf Coast Region runs from Pasco County south to Charlotte Harbor and includes southern Pasco County, all of Pinellas, Hillsborough, Manatee and Sarasota Counties, the southwestern portion of Polk County, and the western portions of Hardee, DeSoto and Charlotte Counties. Two factors should be noted, however, first, these boundaries are "somewhat arbitrary" (Milanich and Fairbanks 1980:16), and second, although used as a cultural region, there is little cultural disparity between this and Florida's other cultural regions prior to 1000 B.C.

Prehistoric sites from all periods of the cultural sequence are found in this region. The cultural sequence begins with the Paleo-Indian Period, dating from the time that humans entered Florida (circa 14,000 years ago) to about 6500 B.C. There are few properly excavated sites dating from the Paleo-Indian Period in the Central Peninsula Gulf Coast Region, and site distribution is known primarily from scattered finds of cultural materials that date from this period.

One recently excavated site which has not yet been officially reported (Daniel and Wisenbaker n.d.) is the Harney Flats Site (8-Hi-507) in north central Hillsborough County, approximately two miles east of Temple Terrace. This site is located on a scarp overlooking Harney Flats, a low, swampy area. Although a later Middle Archaic Period component exists at the site, the Paleo-Indian component of the site is of primary interest because it contains more than a two meter deposit within a homogeneous sand matrix. Preliminary analysis, based on tool types and use wear, indicates that Harney Flats was a habitation site, or base camp. Furthermore, it is the only Paleo-Indian Period site with an extensive, controlled excavation by professional archaeologists in Florida. When analysis is complete and the report is published, it will contribute extensively to knowledge of this early period of human occupation in Florida.

Examples of possible Paleo-Indian artifacts are found at the Kellogg Fill (Warren 1970), Apollo Beach (Warren 1968b), Caladesi Causeway (Warren 1968a), Bear Creek (Warren 1967), an unnamed site near State Road 584, the Boot Ranch site near Oldsmar (Warren 1966), and the Fish Creek site in Tampa (Karklins 1970). It might be noted that most of these are isolated finds, or artifacts from dredged sites and dated relatively late within the Paleo-Indian Period.

It has long been suspected that prehistoric sites along bays, estuaries, rivers and coastal areas were inundated by the rising sea level at the end of the Wisconsin glaciation. Warren (1963, 1964,1970) reported finding Archaic and Paleo-Indian cultural

material in fill that had been dredged along old, now underwater river channels in Tampa Bay, and in Boca Ciega Bay. The modern dredged channels in Tampa Bay follow the routes of the natural channels, and the natural channels were old river bottoms. There is reason to believe, then, that the rivers which now flow into Tampa Bay once flowed over a land surface when the sea level was lower, and that prehistoric people lived on the banks of these rivers. Unfortunately, little of this early cultural material was discovered in situ.

More recent finds, dating to 10,000 B.C. have been excavated underwater with excellent provenience control of artifacts, human skeletal material and associated faunal and floral remains. These discoveries at Warm Mineral Springs (Cockrell 1973:3: Clausen et al. 1975) and at little Salt Springs (Clausen 1972:1-3,. Clausen et al. 1979) are among the earliest documented finds in Eastern North America. The human skeletal material indicates that the individuals were buried, above water, when the water was 60 - 90 feet below present sea level.

The Paleo-Indian Period is followed by what is called the Archaic Period which dates from approximately 6500 to 1200 BC. This period is usually divided into Early, Middle and Late stages. Early Archaic dates from 6500 to 5000 B.C., Middle Archaic from 5000 to 3000 B.C., and Late Archaic from 3000 to 1200 B.C. (Milanich and Fairbanks 1980). Environmental and cultural changes, which are of course related, mark the introduction of this period. The land became less arid and pine-palmetto forests replaced the hardwood forests (Milanich and Fairbanks 1980). Whereas Paleo-Indian peoples had hunted the large Pleistocene mammals (though they hunted the smaller ones too) which died out at the end of that period, Archaic peoples hunted deer and smaller animals and learned to efficiently exploit their environment for food. Population increased, as did the number of sites.

Again, there are few reported sites properly excavated with reliable provenience data. This situation has improved with data from several Archaic sites recently excavated in Hillsborough County by the State Division of Archives. These sites include the Deerstand Site (8-Hi-483), which Daniel (1982:161) considered to be a "short-term extraction station" occupied throughout the Archaic Period. Further, he stated (1982:161) that "it appears that the area was utilized as a biface workshop where quarried material from nearby sources was finished into tools." Other sites recently excavated within this program include 8-Hi-450D, an Early and Middle Archaic Period site (Daniel and Wisenbaker:1981), and Wetherington Island (8-Hi-473), a quarry site, which was utilized by aboriginal populations for lithic procurement during the Middle and Late Archaic Periods (Chance 1982:9).

Archaic sites are known from both coastal and hinterland areas although they differ considerably. Whereas Paleo-Indian Period sites probably represent remains of nomadic peoples, Archaic sites, at least those along the coast, represent a more sedentary or semi-sedentary way of life based on the acquisition of a relatively reliable year-around food resource--shellfish and other marine foods.

Examples of Early Archaic sites are the Apollo Beach site (Warren 1968b), the Bear Creek site (Warren 1967)(these are multi-component sites with both Paleo-Indian and Archaic occupations), the Palmer site (Bullen and Bullen 1976) and the Crystal Beach site (Wolf 1975). Late Archaic is primarily distinguished from the Early Archaic by distinct forms of projectile points (Bullen 1975). Late Archaic sites are represented by components at the Pinellas Point site (Goodyear 1968), Culbreath Bayou (Warren et al. 1967), and the Maximo Park Beach site (Williams 1979). These are coastal midden sites in or near Tampa Bay. Archaic sites can be divided into various functional categories, however. For example, in addition to coastal midden (habitation) sites, there are quarries, large central-base villages, special use camps, etc. The latter tend to be found inland from the present coast. Undoubtedly, the same people occupied many of the different functional categories of sites at different times of the year as a result of seasonal exploitation of food and other resources such as stone. One recently excavated Late Archaic site in interior Hillsborough County is the Mizelle Creek One Site (8-Hi-374) (Swindell 1977). Swindell's analysis of cultural materials from this site enabled us to understand the function of interior or hinterland sites to a much greater degree. Recently two sites on Amax Phosphate, Inc. in southeast Hillsborough County were excavated by Welch (1983). One site (8-Hi-425) was, to a great extent, previously destroyed as a result of road borrowing activities. The other (8-Hi-418), had surface areas damaged as a result of borrowing and clearing, but extensive testing at the site has given us further insight into interior sites. Basically, 8-Hi-418, the South Prong I site, appears to have been utilized over a long chronological time period, but by short-term occupants. The same is true for 8-Hi-425, the Cates Site. Both appear to be hunting camps used by seasonal people or migrating bands since the lithic materials resulted primarily from secondary reduction activities (Welch 1983).

The first ceramics appear at the end of the Archaic Period and mark the beginning of the third cultural period--the Orange. In west-central Florida, this period dates from approximately 2000 to 1000-500 B.C. (Milanich and Fairbanks 1980:23). As the overlapping dates indicate, it is difficult to define the end of the Archaic and the beginning of the Orange Period. The Orange Period is sometimes considered a continuation of the Archaic lifestyle with the addition of ceramics. However, the presence of pottery does signify an increasingly sedentary pattern of living as well as food storage. Orange Period ceramics are tempered with vegetable fibers and frequently decorated. The presence of these ceramics at sites enables us to cross-date the strata since thay can be used as a horizon marker. Orange Period ceramics have been found at the Kellogg Fill (Warren 1970), Maximo Point (Bushnell 1962; Sears 1958), the Palmer site (Bullen and Bullen 1976), Perico Island (Bullen 1950), and at the Yellow Bluffs-Whittaker Mound (Milanich 1972). All of these sites are in the Tampa Bay area south to Sarasota.

Following the Orange Period, a greater extent of cultural heterogeneity develops in Florida, and people's technologies more efficiently adapt to their local or microenvironmental settings. In the Tampa Bay area, the next period is the Deptford, dating from approximately

500 B.C. to A.D. 100-200 (Milanich and Fairbanks 1980). A great deal of research has been concluded on this period, and our understanding of it in relation to earlier periods is much more complete. However, this knowledge applies mainly to north Florida and Georgia, while little is known of its manifestation in the Tampa Bay area. Although the Deptford culture extends to Charlotte Harbor, little evidence of it is found in the Central Peninsula Gulf Coast region. Sites which produced Deptford cultural materials in the Tampa Bay area were the Bay Pines site in Pinellas County (Braley 1978) and the Culbreath Bayou site (Warren et al. 1967). The Deptford Period is characterized by distinct types of check-stamped pottery. The period also marks the beginning of burial mound construction in Florida and increasingly complex social and ceremonial activities associated with the burial of people in prepared earthen structures.

Following Deptford is the Weeden Island Period, dating from approximately A.D. 200-1300 (Milanich and Fairbanks 1980). Weeden Island is divided into several regional variations and the Tampa Bay Area lies within the Central Coast Peninsula (Manasota) culture. Weeden Island is also distinguished by distinctive types of ceramics, usually sand tempered, although some limestone tempered wares similar to those further north do occur. The Weeden Island culture has a wide geographical range including Florida, Georgia and Alabama. The site type is the famous Weeden Island prehistoric complex in Tampa Bay (Fewkes 1924; Willey 1949; Sears 1971). Other sites in the Tampa Bay area include the Thomas Mound (Bullen 1952), Cockroach Key (Walker 1880a; Moore 1900; Bullen 1952), Terra Ceia (Bullen 1951), Bay Pines (Gagel 1976; Braley 1978), and the Manatee Springs site (Bullen 1953). Inland sites also exist and may include the Stanley Mound in eastern Manatee County (Deming 1975) and the Cypress Creek site (8-Hi-471) which Almy (1982:179) believed was "utilized for short intervals as a special extractive task camp rather than a village or base camp." This site extends, Almy thought (1982:174-178), from the Deptford through Weeden Island Periods.

A sedentary village life is indicated and village sites are found both along the coast and inland. Villages frequently have associated mounds, but mounds may not be in the village area. Food resources seem to remain a result of hunting, gathering, and the utilization of marine life. No horticultural remains have been found, at least in sites in the Tampa Bay area, but they have been further north, and it is assumed that domesticated plants were becoming increasingly more important as a food resource and are linked to the increase in population, complex ceremonialism, and the growth in the political, social and economic substructures of the culture.

The last prehistoric manifestation in the Tampa Bay area is the Safety Harbor Period. This represents a continuation of Weeden Island traits with the infusion of Mississippian ideas from the north. Safety Harbor sites are more numerous than those of the Weeden Island Period and range from large coastal ceremonial sites to small inland sites. The type site is the Safety Harbor site at Phillipe Park (Griffin and Bullen 1950; Willey 1949), but other large coastal sites exist. Examples are Maximo Point (Bushnell 1962; Sears 1958),

Narvez (Bushnell 1966), the Tierra Verde Mound (Sears 1967), the Palm River Midden (Karklins 1968) and the sites on Rocky Point (Neill 1968). Inland sites include Buck Island (Bullen 1952) just north of the University of South Florida. Again, the coastal sites are most easily identified, but the inland areas of the state were undoubtedly utilized as an area of food procurement. Early archaeological research was not aimed at locating or excavating these sites.

According to Bullen (1978), a chiefdom level of sociopolitical organization developed during the Safety Harbor Period as reflected in the complexity of the sites. Burials were frequently in cemetaries as well as mounds, the construction of large pyramidal (ceremonial and residence) mounds occurred, and the use and variety of cultigens must have increased. Population must have expanded as more food resources were efficiently exploited.

Again, as with several of the earlier periods, ceramics provide the means of identification of Safety Harbor Period sites. In addition, however, these sites are also distinctive in other ways. These distinctions include new varieties of projectile points, village physical layout and artifically constructed mounds of sand and shell.

The prehistoric era was brought to an end by the Narvez expedition of 1528. Evidence of Spanish contact or influence with Safety Harbor peoples is indicated by the presence of historic period artifacts in Safety Harbor site contexts. However, the introduction of new diseases and the disruption of their cultural systems led to an end of the Safety Harbor culture as defined archaeologically. The vacuum created by the decline of aboriginal Florida populations, in conjunction with European and American political pressure in Georgia, caused Muskogean speaking peoples (Creeks, later called Seminoles) to migrate into Florida in the early 1700s. This era, however, is better understood from historical rather than archaeological studies.

A review of the prehistory of the area, then, indicates that prehistoric sites from any cultural period from 12,000 B.C. to A.D. 1500 might be found on the survey tract.

HISTORICAL ASSESSMENT

The purpose of this historical assessment is to ascertain whether the survey tract in parts of Section 18 and Section 19 of Township 29 South, Range 20 East, Hillsborough County, Florida contains any significant historic sites or remains that may be eligible for inclusion in the National Register of Historic Places. A study was conducted of pertinent state documents, local records, maps and other primary and secondary sources that pertained to the study area. This research indicates that the area contains no significant historic sites or remains.

While contact between the western world and Florida's west coast occurred as early as the first half of the Sixteenth century, Narvaez in 1528 and DeSoto in 1539, little knowledge was gained from these early expeditions. It was not until the 1800s that the first white settlers came to the Hillsborough County area. Before this time a few sporadic settlements had sprung up in this area but, due to the continued conflicts between the Seminoles and the settlers, only a few settlements resulted.

In 1821, Florida became a territory of the United States. Three years later Catonment (later Fort) Brooke was established on the south side of the mouth of the Hillsborough River where Robert J. Hackley had started a plantation (Guthrie 1974:10). Catonment Brooke was to become the "most important fort in Florida, often the headquarters of the Army in Florida and focal point of Indian removal" (Chamberlain 1968:63).

Along with the establishment of the fort, settlements began to emerge catering to the fort and in defiance of the Camp Moultrie Agreement of 1823. This agreement gave the Indians the right to settle the lands below a line just south of Ocala known as the Gadsen Boundary (Guthrie 1974:10). Scrimmages between Indians and settlers resulted and proved to be major factor in retarding development in the Hillsborough County area (Historic Tampa/Hillsborough County Preservation Board n.d.:1).

In 1830 the U.S. War Department established a military reservation around Fort Brooke of "16 miles square" (Chamberlin 1968:42). The survey property is included within these reservation lands since this boundary extended to the east of the survey tract (Florida Department of Natural Resources 1852). Apparently no effort was made by the military to remove any of the civilians that had homesteaded in any of the lands included within the reservation (Chamberlin 1968:43).

In 1836 an act requiring the entire Seminole Tribe to be reestablished in Arkansas resulted in the Second Seminole War, a war that was to last for seven years. During the first part of this period Hillsborough County saw little growth. At the end of the Second Seminole War the Fort Brooke reservation was reduced to "four miles square." In 1848, a further reduction to the limits of the military quarters took effect (Chamberlin 1968:111).

As the Second Seminole War was coming to an end, central Florida lands became available for settlement. The Armed Occupation Act of 1843 brought additional settlers to Central Florida. Arms, ammunition and acreage were supplied to people willing to occupy, defend and build upon lands for at least five years (Guthrie 1974:13). While many loci in Hillsborough County were occupied during this time, U.S. Government surveys conducted by Randolph (1843) and later by Hopkins (1853) make no mention of settlements in either Section 18 or Section 19. The lands within these sections consisted of "third rate pine" and swamp land (Randolph 1843).

While not within the specific survey tract, two roads did cross close to the property. To the north, the "Road to Thonotasassa" was illustrated on the Plat Map. It was later to become the Fort Mellon Road leading to present day Sanford, Florida (Chamberlin 1968:25). To the south, the "trail to Fort Alafia" is shown on an 1852 Plat Map of Township 29 South, Range 20 East (Florida Department of Natural Resources 1852).

No settlements are recorded in the areas outlying Tampa from 1868 to 1870 (Robinson 1928:51-52). In 1872, and again in 1884, a large portion of Section 18, including the survey property, was deeded to the Plant Investment Corporation (Florida Department of Natural Resources 1845) The Plant Investment Corporation was formed by several wealthy individuals: H.B. Plant, Henry M. Flagler, Morris Ketchem Jesup and William Thompson Walter. They controlled railroad lines, steamship lines, telegraph lines, hotels and real estate in Florida (Johnson 1965:144).

Another railroad company, the Jacksonville, Tampa and Key West Railroad, was to construct a line between Jacksonville and Tampa. This line, now owned by Seaboard Coastline, runs just south of the survey tract. They had been unable to secure the capital for construction of one section of the railroad track. In 1883 the Plant Investment Corporation bought this section of the route and the line was completed seven months later. This line played a major role in the development of the region. The line was extended to Port Tampa where, within the coming years, phosphate and tobacco were to become important export products (Johnson 1965:150-152). In 1902 much of the Plant Investment Corporation was sold to the Atlantic Coastline Railroad (Johnson 1965:182).

The remaining land in the survey tract was deeded in 1880 to the Florida Central and Peninsular Railroad. While completing a line that was to run from Tampa to Plant City, just south of the survey tract, problems arose with settlers on the edge of the old military reservation boundary. The railroad crew was forced to work between Saturday and midnight Sunday in order to avoid a court injunction. When the courts opened on Monday, the lands had already been crossed. The line was completed in 1890 with no further problems (Johnson 1965:97).

The Florida Central and Peninsular Railroad, incorporated from all properties of the Florida Railway and Navigation Company in addition to several other small railways, later merged with Florida Northern Railroad Company and in 1893 became Florida Central and Peninsular

railroad (Johnson 1965:98-100). As the Florida Central and Peninsular railroad, it linked lines from Florida to South Carolina. In 1903 it was taken over by the Seaboard Air Line Railroad Company (Bowman n.d.: 45; Johnson 1965:101).

During the 1880s in Florida, large grants of land were deeded to railroads for their investment in money, labor and equipment (Covington 1957). The railroads developed increased access to areas, thus stimulating growth and providing lines to other parts of the United States. At this time, citrus, cattle, lumber and phosphate became the major economic growth industries in the area.

Today the survey tract is still relatively undisturbed, improved pastureland. The two railroad lines running to Plant City, the Atlantic Coastline to the north of the survey tract and the Seaboard Air Lines to the south, merged in 1960 into the Seaboard Coast Line Railroad (Saunders 1978:202). The Seaboard Coast Line presently owns the survey property.

A comparison of the 1956 and the 1981 photorevised U.S.G.S. Brandon Quadrangle Maps indicates that additional construction to the south of the survey tract has occurred since 1956. This includes small railroad lines extending from the main track which do not appear on the 1981 Quadrangle Map.

In conclusion, a study of historic documents pertaining to the survey tract indicates there have been no significant events which have occurred and there are no significant historic sites or remains within this area that may be considered eligible for inclusion in the National Register of Historic Places.

ENVIRONMENTAL BACKGROUND

Geology, topography, soil association, relative elevation and nearby water resources are important factors to be considered in archaeological site locations. These factors have been determined to be useful as indicators of prehistoric land use and settlement patterning.

The survey tract is positioned on the Hawthorne Formation, a middle Miocene impermeable layer of phosphoritic sands, clays, marls and sandy limestones formed by the erosion of limestone strata which had accumulated during the Tertiary Period of the Cenozoic Era. Subsequent fluctuations in average global temperatures caused alternate periods of glaciation and melting, resulting in an advancing and receding shoreline. This action formed five terraces above the Hawthorne Formation. These terraces are divided by escarpments where the ancient shorelines existed (see Almy 1982). Weathering of these terraces by the action of streams and rivers gave rise to the present day topography of the Tampa Bay region.

Between approximately 14,000 and 7000 years ago, a relatively rapid rise in sea level affected the Paleo-environment of the Tampa Bay region. During this time, a cooler and dryer environment prevailed. According to Daniel and Wisenbaker (1981), much of Florida must have resembled the great Serengetti Plains of East Africa, with large herds of browsing and grazing herbivores being pursued by the many carnivores that also existed at that time.

Later, a warming trend developed and the vegetation slowly evolved into long-leaf pine forests, hammocks, marshes and cypress swamps which are typical of peninsular Florida today. Accompanied with these changes in vegetation came changes in the faunal community, reflected in undisturbed portions of present day central Florida.

The present topography of the area surrounding the survey tract is that of gently rolling land. The lower areas border creeks and swamps and rise to higher, sloping regions containing oak and pine. Extending further away are the pine flatwoods.

The soils on the survey tract are Leon fine sand, Leon fine sand, light-colored surface phase and Rutlege fine sand. The Leon fine sand and the Leon fine sand, light-colored surface phase are somewhat poorly drained soils with a slow surface runoff. The latter occupies slightly higher, better drained positions than the former and both are strongly acidic. The Rutlege fine sand occurs on level or nearly level relief or in slight depressions in the wet areas throughout the flatwoods. It is a strongly acidic and poorly drained to very poorly drained soil. Part of the year, areas of Rutlege fine sand are covered by several inches of water (Leighty et al. 1958).

The survey tract ranges in elevation from 25 to 40 feet above sea level, with only a small portion (5 acres) at the 40 foot level. During the archaeological survey, this small portion was noted as being the only

relatively dry area after heavy rains.

Water resources include small ponds around the survey tract as well as seasonal ponds on the survey tract (occurring on the Rutlege fine sand). Also, Sixmile Creek is located approximately 1.75 miles west of the property and serves as the major drainage for the area.

The natural vegetation occurring on the survey tract includes wiregrass, saw-palmetto, pine, scrub live-oaks, short grasses and shrubs (Leighty et al 1958). According to Daniel (1982), some of the well known mammals that inhabit eastern Hillsborough County (a similar physiographic region to the survey tract) include: bobcat, black bear, cottontail rabbit, gray fox and white-tailed deer (as well as others). The white-tailed deer is considered to be the most important of the above to the prehistoric peoples of this area. Also listed are some of the birds, amphibians, reptiles and fishes that may have been utilized by prehistoric people.

Historically, the original 19th century survey of this Section lists the area as "third rate pine" and suggests that the land might be utilized for grazing (Randolph 1843, Hopkins 1853). According to the soil survey map (Leighty et al 1958), the land was still in its natural state in 1958, therefore, clearing activities were relatively recent. Presently the survey tract is in improved pasture with a few pine trees in the western edge. Approximately 10% of the survey tract was noted as being under several inches of water, presumably reflecting the areas of Rutlege sand.

In summary, the survey tract offers minimal resources for prehistoric exploitation. The historic land use appears to have had a minimal impact on any site that might be situated on the property.

RESEARCH DESIGN: RESEARCH STRATEGIES AND GOALS

A research design is a plan to coordinate archaeological investigative activities from the inception to the completion of a project. This plan should minimally account for three considerations. It should make explicit the goals and intentions of the research. It should logically define the sequence of events to be undertaken in pursuit of the research goals. The research design should also provide a basis for evaluating the findings and conclusions drawn from the investigation. The assessment survey discussed in the Request for Services does not require a multi-stage research design, yet a statement of research goals and a discussion of research strategies is in order.

The goal of this archaeological and historic site assessment survey is to locate and document the existence of any evidence of potentially important historic or prehistoric behavior within the survey tract. The survey is the traditional and most cost-effective means of locating evidence of historic and prehistoric human behaviors within spatially defined boundaries (Schiffer et al. 1978). These behaviors usually manifest as archaeological or historic sites, historic structures, or non-site loci. Reconnaissance surveys attempt to locate all evidence of human behaviors that are archaeologically discernable with current investigative techniques. Survey techniques need to be exhaustive. These techniques must be able to document any material manifestation characteristic of any cultural period, yet be cost effective, as not to expose the contracting party to excessive expense. Toward this end, the investigation of the survey property employed a non-exclusive survey with systematic and judgementally placed sub-surface testing (King 1978:36) within a four part research strategy.

The research strategy is composed of four interrelated and roughly sequential components: the background investigation, the historic documents search, the formulation of an aboriginal site location predictive model, and the field survey. The background investigation involved several inquiries. A perusal of the relevant archaeological literature produced a summary of previous archaeological work in the Gulf Coast region and a discussion of previous survey work undertaken near the project area. The Florida Master Site File was checked for any previously recorded sites within the tract and to provide an indication of the prehistoric settlement and land-use patterns for the area. All current soil surveys, vegetation maps, and relevant literature were consulted to provide a description of the physiographic and geological region of which the survey tract is part.

The historic documents search involved research of the original township plat map, tract book entries and surveyor's field notes, and all relevant secondary historical sources for any information pertaining to the existence of historic structures, site of historic events, and historically occupied or noted aboriginal settlements within the survey tract area. An aboriginal site location predictive model for the survey tract was formulated based on the variables of soil drainage characteristics,

distance to permanent sources of potable water, and distance to a hardwood hammock. The field survey involved an on-site investigation consisting of a pedestrian transect survey and sub-surface investigation. The first two components the background investigations and the historic documents search, are discussed in separate sections of this report. The last two components , the aboriginal site location predictive model and the field survey, will define the present discussion topics.

Cultural resources surveys in the Central Gulf Coast region of Florida have successfully employed site location prediction models to assist in the location of archaeological resources (Grange, Fryman and Williams 1979; Grange and Williams 1983; Kammerer 1980). These models have been based on a variety of physiographic and hydrolic variables, three of the most salient being the relative location of potable (fresh) water, the distance from a hardwood hammock, and soil drainage characteristics.

The survey tract is characterized by three soil types: Rutlege fine sand (Rc), Leon fine sand (Lh), and Leon fine sand, light-colored surface phase (Lk). All three soil types are discribed as poorly to very poorly drained (Leighty et al. 1958). Almy (1976, 1978), and others, have established that prehistoric sites tend to co-occur with well-drained soils. Conversly, recent studies of site location and soil drainage characteristics for the combined known sites in Hernando, Citrus, Sumter, and Marion Counties produced an association between aboriginal site location and the poorly drained soil associations (Withlacoochee Regional Planning Council 1982). Deming and Almy (1983:18) interpret this apparent conflict in the data by noting that a large portion of the sites in the WRPC site sample are coastal sites, and could be biasing the study results.

Hardwood hammocks do not presently exist in the survey tract or in the surrounding area, nor does the area contain soils which would support such vegetation (Leighty et al. 1958). The potable water variable is of little use in microstratifying the survey tract as the entire survey area is within 1200 meters (Deming 1980) of some permanent or intermittent source of freshwater.

Site location prediction models, such as the one discribed here, are usually able to microstratify the survey tract into three zones, based on the relative co-occurrance of soil drainage characteristics, vegetation, and the location of sources of potable water. High probability areas for site location suggest areas with well-drained soils, hardwood hammocks, and adjacent freshwater sources, with which archaeolgical sites, historical sites, and non-site loci frequently co-occur. Medium probability areas for site location, are areas with fair to poorly drained soils, and either an adjacent water supply or a nearby hammock, with which cultural resources sometimes co-occur. Low probability areas for site location are associated with poorly drained to flooded soils and have neither an adjacent water source nor a nearby hammock.

Based on the presence or absence of these physiographic variables, and the suggested co-occurrence rates between these variables and prehistoric and

historic site locations, the survey tract can not be microstratified, but categorized as a single unit, medium probability zone for cultural resource location. This determination, and the relative size of the survey tract, suggest the use of a single survey sampling methodology and a moderately intensive regimen of sub-surface testing.

A non-exclusive survey with sub-surface investigation was chosen as the basis for the field survey strategy. A non-exclusive survey, as defined by King (1978:35) implies that survey coverage is complete, and no part of the project area is excluded from inspection. This is not to suggest that all parts of the survey tract will be covered, as total coverage will not be undertaken. Whenever survey coverage is not total, some form of sampling the area must be employed.

Transects were chosen as sample units and were preplotted on aerial photographs prior to the field investigation. Transects were placed at 100 meter intervals, running east west across the survey tract. The initial transect line was 25 meters south of the northwest property boundary. Each subsequent transect was then set in relation to the first at intervals of 100 meters. Five transects, including the initial transect, were established across the tract. The southernmost transect had to be moved north to include the southernmost extension of the property. The transect interval was shortened to 65 meters for this transect (see Figure 2).

The systematic sub-surface tests were placed along the transects at 100 meter intervals. Sub-surface test locations were preplotted on aerial photographs prior to the field investigation. Twenty-six systematic sub-surface tests were anticipated. The initial sub-surface test location was preestablished along the northernmost transect 50 meters from the west side of Faulkenberg Road. The sub-surface sample grid was established from this point. All sub-surface test locations were established along the transects, and within the sample grid, at 100 meter intervals (see Figure 2).

The location of four sub-surface tests were not predetermined, but were left to the discretion of the field archaeologists. This allowed for some flexibility in the field methodology so that unforseen events could be accomodated, and any areas that intuitively "looked promising" could be investigated.

In sum, the field survey strategy called for five pedestrian transects, one every 100 meters, and 26 systematic and 4 judgementally placed sub-surface tests.

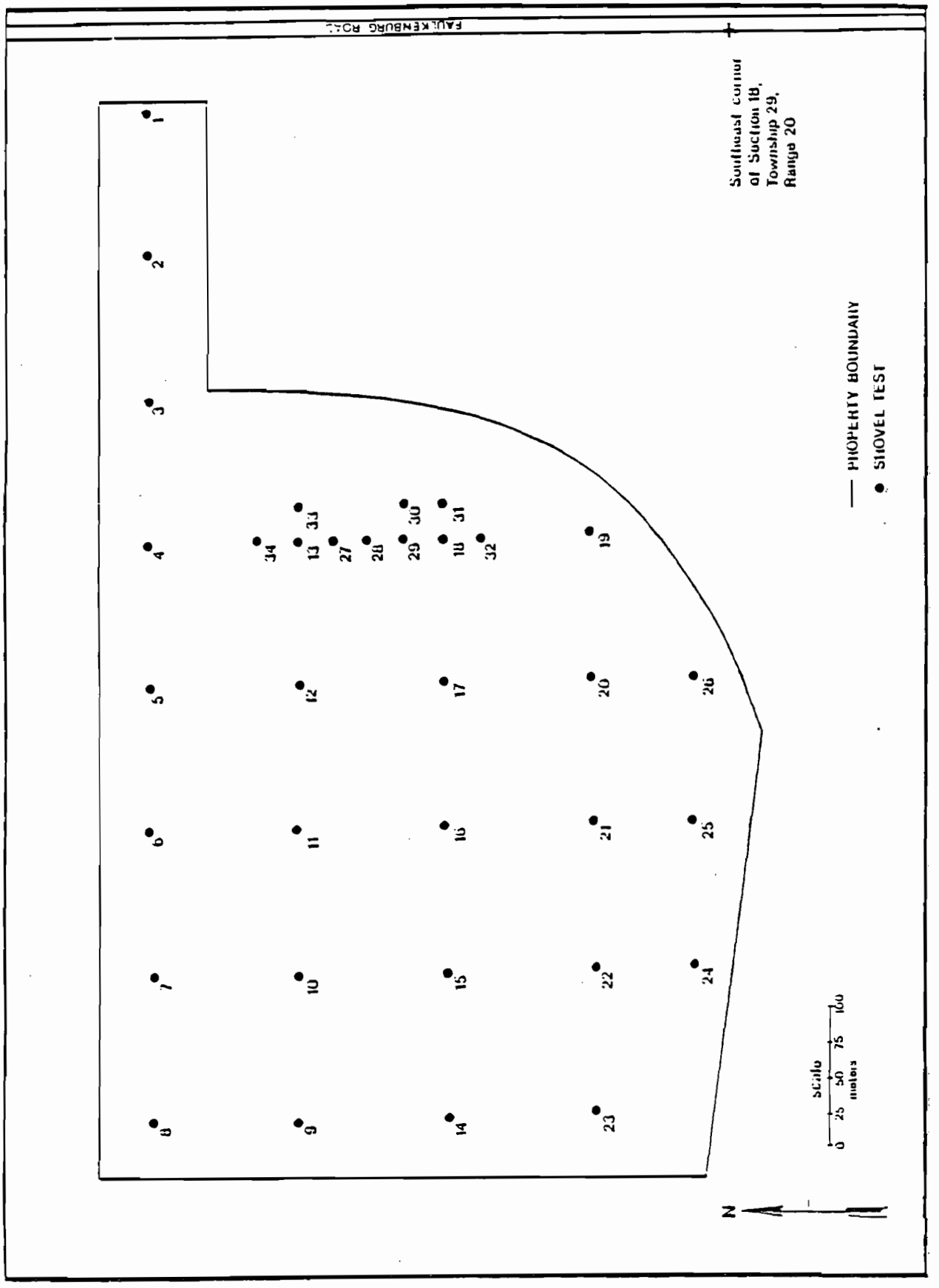

Figure 2. Location of the Test Pits within the Survey Tract.

FIELD METHODOLOGY

The field methodology formally operationalized the field survey strategy. A four person field crew was employed and divided in half to form two crews of two persons each. The field work was initiated on April 2, 1983, but rain forced postponment. The field work was continued on April 15, 1983 and the survey was completed. All transect locations were determined from the base points indicated on the aerial photographs and were oriented by compass sightings. One crew was responsible for the two northernmost transect and sub-surface tests. The second crew was assigned to the remaining three transects and sub-surface investigation. The field survey was completed by the four person crew in 32 person-hours.

The surface investigation involved each of the two person teams walking transects and inspecting the ground surface. One person was responsible for compass readings and pacing off the distance between tests. The second person was responsible for visually inspecting all ground surfaces, animal burrows, and exposed areas. As the survey tract is entirely improved pasture with planted grass ground cover, visibility was considered very good. No problems were encountered during the surface investigation, and all transects and test pit locations were identified. A check of all transect locations indicated that all transects and sub-surface test locations are accurate to within five meters. No aboriginal or historic material culture was located during the surface investigation.

All systematic sub-surface tests were 30 to 40 centimeter round soundings, performed every 100 meters along the transects as predetermined on the aerial photographs. All soil removed from the tests was screened through one-quarter inch hardwire mesh cloth. Observations regarding soil stratigraphy, soil condition, and the provenience of all cultural materials were recorded in the field. Test pits ranged from 60 to 110 centimeters in depth, with an average pit depth of 84 centimeters. Water was always encountered between 70 and 90 centimeters below ground surface. Testing continued until removing the soil from the test was no longer possible. All sub-surface tests were backfilled as completed. One flake was found in test pit 13, at approximately 25 centimeters below the ground surface. A second flake was discovered in test pit 18, at a depth of approximately 70 centimeters. Since these two test pits were within 100 meters of each other, the judgemental sub-surface testing focused in this area (see Figure 2).

Nine sub-surface tests were judgementally placed at 25 meter intervals in the vicinity of test pits 13 and 18. These tests were executed in the same manner as the systematic tests described above, except they were placed at the discretion of the Principal Investigator. Three tests, numbers 27, 28, and 29 were placed at 25 meter intervals on a north-south axis between the flake bearing test pits. Three tests, numbers 30, 31 and 32, were undertaken in the area around test pit 18. Two final tests, numbers 33 and 34, were undertaken 25 meters east and 25 meters north of test pit 13 respectively. No material remains were recovered from any of the judgemental sub-surface tests.

In sum, five pedestrian transects were traversed as part of the surface investigation, with negative results. Twenty-six systematically placed sub-surface tests were executed with positive results in two tests, numbers 13 and 18. Nine sub-surface investigations were undertaken in the areas between, and adjacent to, test pits 13 and 18. These tests failed to recover any historic or prehistoric remains.

ARTIFACT ANALYSIS AND LABORATORY PROCEDURES

All material remains recovered during the field investigation were returned to the University of South Florida Archaeology Laboratory for cleaning, labeling, and analysis. The material remains consisted of two chert flakes recovered from testpit numbers 13 and 18. No diagnostic artifacts were recovered. The recovered material was washed, dryed, and labeled with the number of the testpit from which it was recovered. Each flake was then measured, weighed, and subjected to microscopic investigation. Each flake was examined under a Bausch and Lomb binocular microscope, (7x to 30x power), for evidence of usewear, modification, and determination of the stage of lithic reduction (the stage at which each flake was removed).

The chert flake from testpit 13 was recovered at a depth of 25 centimeters below surface. This non-thermally altered chert flake is 1.50 centimeters long, 1.46 centimeters wide, 0.23 centimeters thick, and weighs 0.5 grams. The striking platform is laterally faceted and crushed, and the ventral face exhibits a difuse bulb of force. When the flake was originally removed, it terminated in a step fracture. This flake is classified as a non-decordication thinning flake, usually considered the result of late stage, or tertiary reduction.

The second flake was recovered from testpit 18 at a depth of 70 centimeters below surface. This non-thermally altered chert flake is 1.08 centimeters long, 1.13 centimeters wide, 0.16 centimeters thick, and weighs 0.15 grams. The striking platform is not prepared or modified, and the ventral face exhibits a difuse bulb of force. The flake terminated in a step fracture when originally removed, and shows evidence of damage in the right lateral margin. This flake is classified as a non-decordication thinning flake, usually considered the result of late stage, or tertiary reduction.

Both flakes can be classified as non-decortication thinning flakes. It is possible that both are associated with the tertiary, or late stage of the lithic reduction continuum, or associated with the maintenance or resharpening of stone implements sometime during the 14,000 years of human occupation in this area. As the specimens were encountered 100 meters apart, it is assumed that they were the result of discrete maintenance or reduction episodes.

RESULTS, CONCLUSIONS AND RECOMMENDATIONS

A non-exclusive pedestrian survey and sub-surface testing scheme was conducted on the 50 acre tract. This survey was designed on the basis of previous archaeological and historical surveys in nearby areas. The results of these surveys have provided a basis for a prediction model used in prehistoric site location. No surficial cultural materials were found during the pedestrian survey. Two chert flakes were recovered from the sub-surface testing phase of the field investigation. These were found in test pits 13 and 18, located 100 meters apart. These two flakes resulted from prehistoric activity on the tract, this activity being associated with a late stage in the manufacture or rejuvenation of stone tools. The excavation of 8 other test pits near these activity loci did not produce any other cultural materials. Thus, no evidence of habitation or even a short-term camp site exists. Isolated finds such as these have been referred to as "non-site loci" (Batcho and Milanich 1978). They provide evidence of prehistoric activity on the survey tract, but are not considered to be what is normally termed a prehistoric "site"; neither are the activity loci considered significant in terms of National Register of Historic Places criteria. Further data recovery (excavation) would yield very little, if any, cultural materials. The significance of the information lies in the fact that archaeologists are now aware of this prehistoric activity at these particular loci. This information is now recorded. No further archaeological investigation is recommended.

The historical documents research provided insight into the historic period use of the tract and its immediate environs. This research concluded that the survey tract has no significant historic period cultural resources; a fact that was confirmed by the field investigations. Only one modern farm related building is located on the tract and it is not a significant architectural structure. No further historical research is recommended.

Based on the research and investigations undertaken during the study, it is concluded that the projected use of the property will not impact any historic or prehistoric cultural resources.

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BRIEF RESUME OF SENIOR AUTHOR

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1958	B.S.	Missouri State University (history)
1962	M.A.	University of Missouri (anthropology)
1971	Ph.D.	University of Missouri (anthropology)

Research interests: Southeastern U.S. Prehistory; Cultural Resource Management

Experience:
University of Missouri: 1966-1969--Research Associate
University of South Florida: 1969-present--Professor

Publications:
5 monographs
8 refereed articles
55 technical reports

Certification: Society of Professional Archaeologists

Professional Activities:
Past President; Florida Anthropological Society
President; Anthropological Sciences Section, Florida Academy of Sciences
Editor; SOPANEWS, The Newsletter of the Society of Professional Archaeologists

REQUEST FOR ARCHAEOLOGICAL AND HISTORIC SITE ASSESSMENT SERVICES FAULKENBURG ROAD RESOURCE RECOVERY FACILITY SITE HILLSBOROUGH COUNTY, FLORIDA

I. PURPOSE:

Hillsborough County is proposing to build a Solid Waste Energy Recovery Facility. As part of the State of Florida's permitting process for the facility, an archaeological and historic site assessment survey must be undertaken. The Florida Department of State (Division of Archives, History and Records Management) has determined that there is a moderate to high likelihood of currently unknown significant archaeological or historic sites occurring within the parcel (described below) which has been previously unsurveyed for such sites.

Hillsborough County is therefore desirous of procuring the services of a professional archaeological consultant who has performed such site assessment surveys in Florida.

II. DELINEATION OF STUDY AREA:

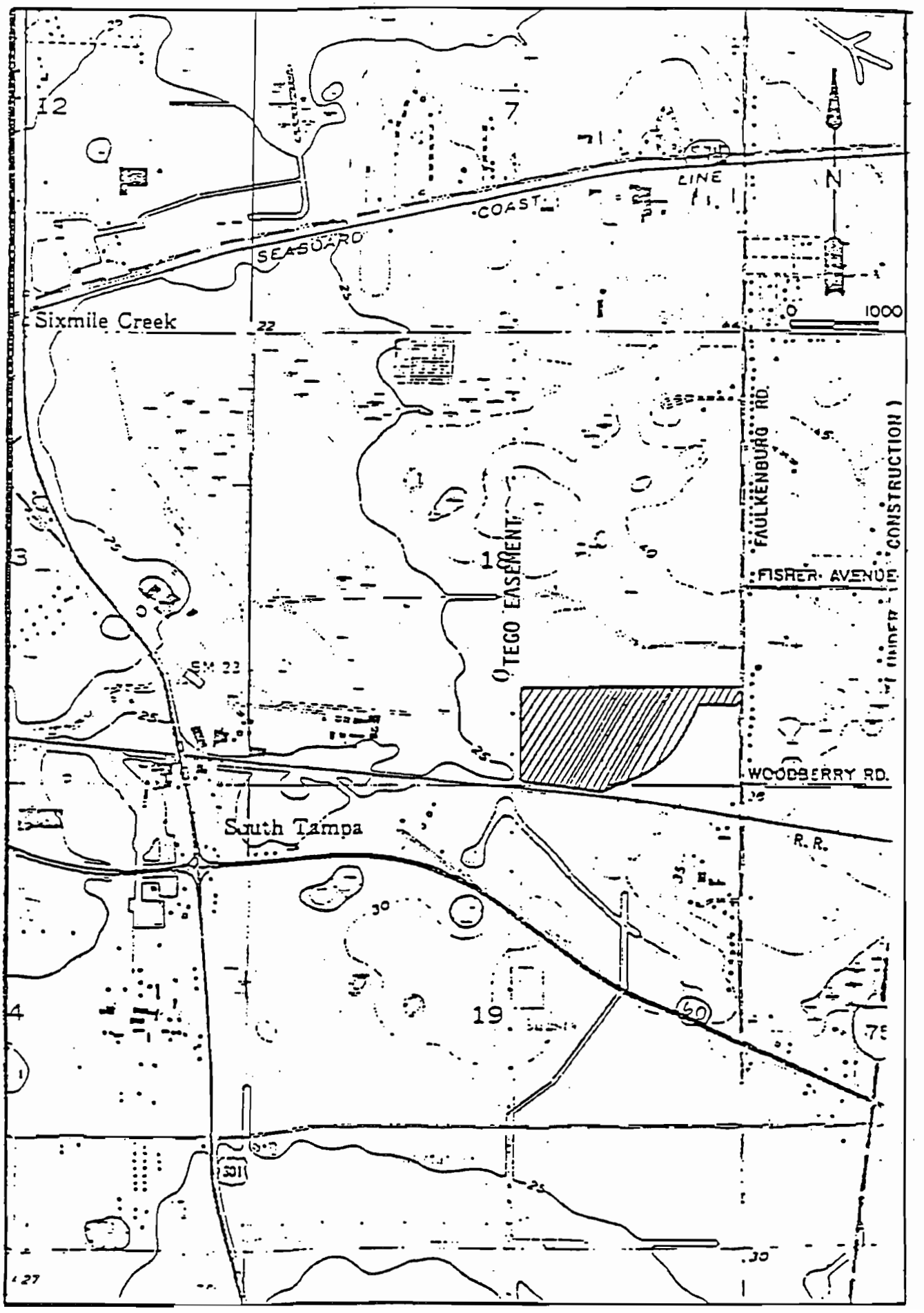
Figure 1 shows the location of the site. State Road 60 is located to the south of the site, County Road 574 to the north, and U. S. Route 301 is located to the west. The site area is bordered by Faulkenburg Road to the east, the Seaboard Coast Line Railroad (SCL) to the south, and the Tampa Electric Company powerline right-of-way to the west. The site is 50 acres M.O.L. and lies in Sections 18 and 19, Township 29 South, Range 20 East, Hillsborough County, Florida.

This property is now owned by SCL. Negotiations are underway with SCL to acquire the property for the Hillsborough County Resource Recovery Project. SCL has granted the County and its contractors permission to enter this property to complete engineering studies.

III. SCOPE OF SERVICES:

The contractor shall provide a high standard of professional archaeological service and will exert its best efforts with the time and funds available for this work program. The results of this study will be presented to the County in a written report following the guidelines which have been prepared by the Florida Archaeological Council and the Florida Department of State for the completion of such assessment studies (Attachment A). The contractor shall be responsible for coordination of all work to complete this site assessment survey and the provision of all labor, equipment and materials to perform the work. Hillsborough County shall assist consultant by placing at his disposal all available pertinent information including previous reports and any other data relative to the consultant's scope of services.

FIGURE 1 - RESOURCE RECOVERY SITE LOCATION



IV. SCHEDULE:

Due to the timing of other work activities in the Resource Recovery Program, the site assessment survey report must be completed expeditiously. The consultant shall provide the County with a draft report within 30 days after the start date. After review and comment by the County, the final report shall be submitted no later than 60 days after the original start date.

ATTACHMENT A

SITE ASSESSMENT SURVEY REPORTS

Site assessment survey reports may vary in format from a long letter style report to a detailed lengthy formal report, depending upon the particular project. In all instances such reports should identify for whom, by whom and why the work was performed, as well as the location of the area surveyed (including a project location map), field methodology and reasons for same, survey findings and conclusions. When in doubt, individuals or agencies preparing to conduct or have conducted such work are urged to contact the Division's project review staff to discuss the particular minimum needs of a specific project. This suggested consultation may be particularly helpful in determining the amount of background research necessary for a project.

I. TITLE PAGE (Formal Reports)

A. Report Title
B. Sponsoring Agency or Organization
C. Research Organization
D. Author(s)
Note: The research organization may be the author in some instances
E. Date of Report

II. ABSTRACT (Optional)

A. Presents report title, type of project, regulatory authorities (federal, state, local), sponsoring agency and research organization
B. Concise summary of report content including project location, field methodology, conclusions and any new information.
C. Summary of management recommendations

III. TABLE OF CONTENTS (Formal Reports)

IV. INTRODUCTION (Formal Presentation in Formal Reports and Informal Presentation in Letter Reports)

A. A statement of when, why and for whom the work was performed
B. Mention of the project location, including a general project location map
C. A general description of the nature and extent of the project
D. Other information deemed appropriate by the author

V. LITERATURE REVIEW (Formal Presentation in Formal Reports; Optional Brief Presentation in Letter Reports)

Note: This review should list previous studies in and around the project area. Its purpose is not to review the historical development of archaeological and historic studies in Florida; although, the author is not prohibited from making such a presentation. Its purpose is to demonstrate an awareness of the location, field methodology, and findings of previous researchers, including the information contained in the Florida Master Site File, in order to facilitate development of an adequate field methodology/research design. In areas containing historic structures or locales of historic activities, its purpose is also to identify associated research data and conclusions.

VI. BACKGROUND RESEARCH: DISCUSSION OF PREHISTORY/HISTORY (Formal Presentation in Formal Reports; Optional Brief Presentation in Letter Reports)

Note: This section summarizes the information derived from the Literature Review, and can be divided into two parts: Archaeological Review and Historical Review. The amount of detail devoted to each depends on the project's location as well as the type of project. For example, a pipeline or powerline right-of-way project through a historically undeveloped, poorly drained rural area with no extant or previously extant structures or roads over 40-50 years old will not require detailed historic background research; although, a general historic background presentation should be included in the report to document the rationale for the omission of a more detailed presentation. When in doubt, please call the Division's project review staff.

A. Archaeological Review

1. Presents a summary of the area's history and prehistory based on the archaeological record.
2. Its purpose is to provide a regional framework for the development of a site location predictive model, permit the analysis of recovered artifacts and evaluation of site significance, and to develop testable hypotheses.

B. Historical Review

1. Presents a summary of the area's history based on documentary records, biographies, etc.
2. Its purpose is to outline the major course of historical development in the area as it particularly relates to the project tract. Particular attention should be given to land use history for the subject tract and information relating to potentially significant historic structures or their remains and associated features.

VII: ENVIRONMENTAL BACKGROUND: DESCRIPTION OF PROJECT AREA AND VICINITY

A. Description of Project Location and Area (Included in both formal and letter reports)

This should describe the project's location in terms of township, range, section and parts of sections and/or U.T.M. coordinates. And include a project location map. The dimensions of the project tract in terms of acres or hectares should be noted.

B. Description of Geologic and Phisiographic Province in which Project Tract Occurs.
(Optional in letter reports, except for a very brief overview to indicate survey conditions; also optional in formal reports, except for brief overview, IF a source in which this subject is adequately presented is cited. For instance, project EIS's frequently have this as a special chapter or appendix, and, thus, the survey report would appear as a companion chapter or supporting documentation. Furthermore, the geologic development of an area prior to 50,000 B.P. should be omitted unless its particular relevance to a project can be demonstrated.)

1. For upland and wetland tracts, information of relevance would include topographic features, drainage, ground slope, soils, water sources, clay or hard mineral outcrops or near surface (aboriginally) exploitable features, the effects of sea level changes within the last 50,000 years, evidence of erosion, etc.;
2. For inundated locales, information of relevance would include depth below surface, topographic features, types of sediments and rock outcrops, current or wave surge conditions, stream flow, salinity, oxygen content, temperature regime, the effects of seal level changes within the last 50,000 years, erosion, etc.

C. Environment and Paleo-Environment
(Optional in letter reports except for a brief presentation of the present environment to indicate survey conditions. Also, beyond a brief overview, optional in formal reports IF a source in which the subject is adequately presented is cited. A noted exception is when a task of the survey is to investigate Paleo-Indian to Archaic site distribution in which case a discussion of the paleo-environment is required. However, a special report by a specialist may be attached as an appendix to the main survey report.)

1. The purpose of this section is to note the environmental conditions in which sites occur. Caution is urged for altered environments.

D. Historic Land Use Patterns
(Optional in letter reports, except for brief presentation to indicate survey conditions and potential site alteration. Formal presentation in formal reports; although, the amount of detail need not extend beyond a general overview except where it relates to site integrity and significance issues.)

1. The purpose of this section is to note known environmental changes and factors influencing site integriry. It is recognized that this information will not always be available to the researcher, in which case its unavailability should be noted.

VIII. FIELD METHODOLOGY/RESEARCH DESIGN
(Required for Both Formal and Letter Reports; Although, A Brief Presentation will be Appropriate in the Latter)

Note: Many factors influence survey methodology, including the size of the study area, its location (rural/urban; uplands/wetlands/coastal/submerged/etc.), vegetative cover, and present (and recent past) land use.

A. Survey Techniques, Including Subsurface Survey Strategy: This should contain an explicit discussion of the rationale for the survey methodology employed to locate and assess archaeological sites and historic structures. Particular attention should be paid to the selection of subsurface testing methodology.
B. Hypotheses to be Tested: (Generally Optional)
This would include a discussion of the analytical techniques required to test the hypotheses.
C. Map of Survey Area: This should show the location of the survey transects or area of survey coverage; and areas not surveyed. Ideally this map should also include the approximate location of subsurface tests with some code to distinguish between the various kinds of subsurface testing techniques employed. The location of identified archaeological sites and historic structures and associated features should also be shown. However, it is recognized that the verbal description of survey methodology is often of sufficient detail to preclude the need of mapping the test hole locations, and the location of identified sites may be omitted if included in the survey results section.
D. Constraints on Investigations: This would include limitations on access, poor ground visibility or other environmental limitations such as flooding, snowstorms, hurricanes, water currents, wave surge, wild hunters and attack dogs, etc.
E. Description of Data Collection Techniques: It is particularly important to describe the manner in which the horizontal and vertical limits, internal integrity, and other necessary site assessment data was obtained for identified archaeological sites. A description of method for locating and evaluating historic buildings, structures and other sites should also be included when applicable.
F. Listing and Justification For Any In-Field Modification of the Proposed Research Strategy
G. Personnel and Work Organization Technique (If not presented elsewhere)

IX. LABORATORY METHODS AND ANALYSIS
(Formal Presentation in Formal Reports or Brief Informal Presentation In Letter Reports if Sites Found. Optional in Letter and Formal Report if no Sites Found, or if Only a Few Non-Significant Sites are Found.)

A. Method For Artifact Processing and Accessioning: brief statement
B. Method For Chronological Determination: brief statement (e.g., based on artifact types, carbon dating, stratigraphy, etc.

C. Other Special Analytical Methods and Techniques: (Optional)

1. Paleo-ecological studies including soils, pollen, faunal and ethnobotanical analyses. (Note: A specialist is generally required for this type of work.)
2. Photographs and/or line drawings of all or a representative example of diagnostic artifact types or classes, and excavation unit profiles.
3. Artifact distribution tables and occurrence lists, etc.

D. Discussion of Changes in Proposed Laboratory Methods and Analysis

E. Discussion of Results

X. SURVEY RESULTS

(Formal in Both Formal or Letter Reports; although, the Presentation May be Brief if No Sites are Found. Site Forms Must Accompany All Reports When Sites are Located, Except for Isolated Find Sites.)

Note: Essentially this section should be an assessment inventory of the archaeological and historic sites, located within a survey area. For some projects where visual and other indirect impacts must be considered, it would also include the identification of nearby significant sites, particularly historic structures. It is important to remember that this will probably represent the only information which will ever be recorded for sites determined not significant. Also, information on the kinds of locations in which sites are <u>not</u> located is equally as important as locations with sites.

A. Site Forms: Florida Master Site File site forms should be completed for all newly located sites and updated for previously identified sites. No site forms need to be completed for isolated artifact find sites, or for non-historical structures.

B. Site-By-Site Description: Each site should be briefly described; although, artifact type and find location are sufficient for isolated artifact find sites. It is recommended that the location and approximate boundaries of each site be depicted on appropriate portions of U.S.G.S. Quadrangle maps. These descriptions need not repeat the detailed information contained in the accompanying site forms. They should, however, contain information on the location size, cultural/temporal affiliation, artifact sample size, function (if apparent), and such other information needed to assess site significance. An opinion of site significance, the need for further work before a final determination of significance can be made and the need for mitigative excavation should be offered.

C. Comparative Site Information: (Optional) The site distribution, chronological position and other related comparative information should be presented in tabular form and an effort made to generate or refine known site distribution models for the area in which the project occurs.

NOTE: It is recommended that an architectural historian or historic architect be consulted for describing and assessing the significance of historic structures. Furthermore, Sections IX and X are often combined as a single section in many projects.

XI. CONCLUSIONS AND RECOMMENDATIONS: (Formal in Formal Reports, Brief Invormal in Letter Reports)

A. Summary of Survey Results, Including Number of Significant and Potentially Significant Sites Identified: This would include a discussion of why each site so identified is deemed significant or potentially significant.
B. Site-By-Site Discussion of Potential Project Impacts to Significant and Potentially Significant Sites.
C. Specific Recommendations for Additional Survey Work (if any); Test Excavations or Additional Documentation at Potentially Significant Sites to Make a Final Determination of Significance; or, Mitigative Data Recovery at Significant Archaeological or Historic Sites.

Note: Such recommended additional work would only be necessary IF project activities will disturb and/or destroy the identified sensitive areas, rather than protect them through inclusion in passive recreation parks or preservation areas.

D. Other Cultural Resource Management Recommendations Such As:

1. Restoration, rehabilitation or retrofitting historic structures using "The Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings";
2. Preservation of significant archaeological resources by inclusion in "green space" sensitive environment preservation areas.
3. Preservation of significant archaeological sites, or a representative sample of a larger site, by use as passive recreation parks.
4. Site preservation monitoring program for significant and potentially significant sites set aside for preservation.
5. Preparation of brochures describing the cultural resources represented in the project area, the significance of those resources, and directions to visit identified significant resources for which protective measures from vandalism and sites looting can be enforced.

XII. REFERENCES
(Optional in Letter Reports)
A. Use American Antiquity's Style Guide (44:193-205)

XIII. APPENDICES
(Optional, Except For Florida Master Site File Site Forms.)

A. Florida Master Site File Site Forms: (Required)
These should be completed for all previously unidentified sites, except for isolated artifact find sites and (with a few exceptions) post-1940's structures. Also, current data supplemental site form pages should be completed for previously recorded sites; and, a listing and location map of isolated find sites is suggested, as their distributional pattern may be culturally significant.
B. Ancillary Studies: (e.g., paleo-environment, palynological, experimental lithic studies, hydrological, etc. reports)
C. Supporting Data: (e.g., computer printouts)
D. Peer Reviews
E. Scope of Work
F. Abbreviated Vita of Principal Investigator and Field Supervisor
G. Location of Artifacts Fieldnotes, etc.

Note: The above information could be incorporated into the text of the main report.

Appendix 9
Surface and Groundwater Related Information

Appendix 9-1
Well Construction Inventory

SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT

2379 BROAD STREET, BROOKSVILLE, FLORIDA 33512-9712
PHONE (904) 796-7211 · SUNCOM 684-1011

August 9, 1983

Mr. Tom Tetreavli
Comp, Dressler & McKee
1 Center Plaza
Boston, MA 02108

Re: Well Construction Permit Listing

Dear Mr. Tetreavli:

Enclosed you will find copies of the above referenced listing for Sections 17,18,19 & 20 in Township 29S, Range 20E. Also enclosed is a code sheet deciphering codes found under certain categories.

If I can be of any further assistance, feel free to contact this office.

Sincerely,

SANDY SEMEGEN
Permits Coordinator
Well Construction Permitting & Enforcement

SS:cm
Enclosure: as stated

WELL CONSTRUCTION LIST

DP USE	- FIRST THREE CHARACTERS
PERMIT	- WELL PERMIT NUMBER
DRILL	- DRILLER'S NUMBER
USE	- USE CODE
BASIN	- BASIN NUMBER
CNTY	- COUNTY CODE
LOCINT	- (SEC/TWP/RGE)
DIAM	- DIAMETER
D CASE	- DEPTH OF CASING
D WELL	- DEPTH OF WELL
GROUT	- GROUTING
BAGS	- BAGS
DRILLM	- DRILLING METHOD
ELEV	- ELEVATION
SWLLSD	- STATIC WATER LEVEL
SP CAP	- SPECIFIC CAPACITY
CL	- CLORIDES
FE	- IRON
SO	- SULPHATE
SEDSZE	- SEDIMENT SIZE
SEDCLR	- SEDIMENT COLOR
DP1CLA	- DEPTH TO 1ST CLAY
CL1CLA	- COLOR OF 1ST CLAY
TH1CLA	- THICKNESS OF 1ST CLAY
DP2CLA	- DEPTH TO 2ND CLAY
CL2CLA	- COLOR OF 2ND CLAY
TH2CLA	- THICKNESS OF 2ND CLAY
1 CARB	- 1ST SHOWING CARBONATE ROCK
CL1CRB	- COLOR OF 1ST CARBONATE ROCK
DP RCK	- DEPTH TO BEDROCK
CL RCK	- COLOR OF BEDROCK
UN FEA	- UNUSUAL FEATURES
OWNER	- OWNER

USE CODE

D - DOMESTIC
E - ESSENTIAL SERVICES
I - INDUSTRIAL
A - IRRIGATION
L - LIVESTOCK
M - MINING
P - POWER
R - RECREATIONAL
A - SPRINKLING SAME AS IRRIGATION
B - PUBLIC SUPPLY
J - INJECTION WELL
G - RECHARGE WELL
T - TEST WELL
O - OBSERVATION/MONITOR
F - FOUNDATION TEST
Z - OTHER
H - REPAIR OR DEEPEN
C - DEWATERING
N - RETURN A/HEAT
K - CONNECTOR WELL
Q - DRAINAGE WELL
V - INVENTORY
Y - PLUGGED/ABANDONED
Z - SEALING WELL
PIEZOMETERS-T/WELL
SATELLITE-RECHARGE
W - AIR CONDITIONING
SUPPLIES-OTHER RETURN

COUNTY CODE

08 - CHARLOTTE
09 - CITRUS
14 - DESOTO
21 - GILCHRIST
25 - HARDEE
27 - HERNANDO
28 - HIGHLANDS
29 - HILLSBOROUGH
35 - LAKE
38 - LEVY
41 - MANATEE
42 - MARION
48 - ORANGE
51 - PASCO
52 - PINELLAS
53 - POLK
58 - SARASOTA
60 - SUMTER

Field #	CC	
32	80-81	Color of Bedrock -- Recording is the same as for Sediment Color.
33	82-84	Unusual Features -- These are obtained from the completion report and are reported by using the following codes: Features are recorded in block 82.

J - Boulders

C - Cavities

B - Chert (flint)

D - Dolomite

F - Fossil shell fragments

E - Lignite (carbonaceous deposits)

L - Limonite (iron oxide)

G - Loss of water

M - Muck

O - Oolitic deposits

P - Pebbles

A - Phosphate

K - Pisolithic deposits

Q - Quicksand

S - Sinkhole developed

I - Water gained

X - More than two unusual features.

The depth (block 83) and the thickness (block 84) are recorded using the following codes:

9 Aug 83 S. Semyan letter

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WELL CONSTRUCTION LIST DATE 6/02/83

DP	PER	DR	BA	C	LOC	D	DC	DE	GR	B	DI	E	SWL	SP	SE	SD	SC	DP	C	TH	DP	C	TH	1C	LC	DP	C	UN	OW	
USE	MIL	LEN	SIT	NTY	SETNRGE	M	ES	LE	LT	S	M	V	D	PLE	OE	R	A	A	A	A	A	A		BB	RC	RK	CE	FA	ER	
WPE315726	0064	D	13	29	162920	4	82	115					51											50		50				CROSSON
WPE319188	0067	D	13	29	162920	4	69	150			C		35											54		54				H HICKMAN
WPE326394	1099	D	13	29	162920	3	63	104			C		34		MS											45				R GRECULA
WPE330925	1160	D	13	29	162920	4	115	252			C		54		MS	MY	20	MA	20	40	WH	71		30	MA	111	WH			R HOGAN
WPE329669	1233	A	13	29	162920	6	64	250			C		56		MS		18	MY	19					58	WH	58	WH	CDA		J W WALLACE
WPE333017	1358	D	13	29	NWSW162920	4	94	175			C		47		FS	MA	35	PK	25					45	CR	80	WH			G R WEIHE
WPE334256	1271	D	13	29	162920	4	86	147			C		44		MS		35	ME	20					75		86	MA			CAUM W
WPE337119	1043	D	13	29	162920	4	138	210			C		48		MS	LA	44	MR	29	77	LA	14		73	TA	136	WH			LOSCALZO,V
WPH342205	1358	A	13	29	162920	6	76	280			C		60																	BROOKS,D E
WPE309754	0072	D	13	29	172920	4	51	150			C		27											51						
WPE308628	0056	D	13	29	172920	5	106	150			C		55											40						
WPE308791	0198	D	13	29	SENE172920	3	45	65			C		31											43		43				C L SMITH
WPC348388	1043	D	13	29	172920	4	95	161			C		39																	CAMPO, MARY
WPC346927	1094	D	13	29	NE172920	2	130	182			R		28																	JOHNSON, WI
WPC348034	1043	D	13	29	172920	4	92	100			C		16																	MASON, JOHN
WPC350291	1094	D	13	29	172920	2	147	252			R		33																	POUND, LARR
WPC351913	1232	D	13	29	172920	4	95	200			R		47																	ODIORNE, GE
WPC351718	1043	D	13	29	172920	4	52	106			C		15																	SCOFIELD, C
WPC351305	1043	D	13	29	172920	4	53	90			C		15																	MURROW, FRE
WPC356359	1043	D	11	29	00D0D172920	4	86	165			T		50																	SHIVER, Y.
WPN356561	1104	D	11	29	172920	8	***	CANCELLED			***																			
WPC356431	1056	D	13	29	NWNW172920	4	57	195			C		35																	GIBSON, EHA
WPC358326	1183	D	13	29	NWSE172920	4	60	90			C		35																	D'BERRY, MR
WPC357735	1204	D	13	29	172920	4	42	215			C																			FAULKNER, L
WPC357179	1204	D	11	29	172920	4	42	196			C																			DAMON, RALP
WPC364072	1094	D	11	29	172920	2	147	310			R		30																	HARRISON, D
WPC364848	1043	D	13	29	172920	4	105	195			T		34																	KEARNEY, BA
WPC366845	2184	Y	11	29	NESW172920	3		68			R																			D O T
WPC366622	1160	D	11	29	172920	4	46	140			C		33																	MILLER, MR.
WPN366513	1094	D	13	29	172920	2	***	CANCELLED			***																			
WPC366846	2184	Y	11	29	SWSW172920	3		195			R																			D O T
WPC366847	2184	Y	11	29	SWSW172920	2		17			R																			D O T
WPC366884	1204	D	13	29	172920	4	42	217			C			D																WOOD, B. J.
WPE304833	0056	D	13	29	172920	4	113	145			C		35											85						
WPE304807	0119	L	13	29	NWNW172920	4	42	228			C		33											38						
WPE304948	0006	D	13	29	SWSW172920	3	87	220			R		29											42		58				A DAVIS
WPC367725	1160	D	11	29	172920	4	63	140			C		47																	VIERS, RAYM
WPE369134	1392	D	13	29	LT28172920	4																								DUKES, JOHN
WPC372159	1252	A	13	29	00000172920	4	180	260			R		20																	COLESTOCK,
WPC371540	1043	B	13	29	172920	4	67	165		12	R		24																	DEWRELL, L.
WPC373939	1817	I	13	29	172920	6	214	520			C																			DAVIS, ALVI

WELL CONSTRUCTION LIST

DATE 6/02/93

DUP USE	PERMIT NO	DIST	BASIN	SEC	TWN	RNG	MAP	DEPTH CASED	DEPTH WELL	GRAUT	BALLS	LOG	SWL	SCREEN DIA	SCREEN LEN	SCREEN TYPE	CASE1 DIA	CASE1 LEN	CASE1 TYPE	CASE2 DIA	CASE2 LEN	CASE2 TYPE	CLASS	CASE DIA	CASE LEN	CASE TYPE	USE	OWNER
	WPE382144	1043	D	13	29		172920	3																				MOTLEY, W.
	WPI382674	2250	D	13	29		172920	2																				POUND, LARR
	WPE306183	0016	D	13	29	SWSE	172920	3	72	92		C	50	38									70				
	WPE305519	0012	D	13	29		172920	4	95	130		C											70	999			M & GREENE
	WPE312360	0067	D	13	29		172920	4	64	160		C		50									45	45			W K JEFFREY
	WPE314122	0144	D	13	29		172920	4	91	175		C		45									47	75			ROY WILLIAM
	WPE322673	1043	D	13	29		172920	4	53	105		C											37	37			R DICKEY
	WPE322671	1244	D	13	29		172920	4	87	169		C		25									60	105			W OYKES
	WPE324497	1589	D	13	29		172920	4	70	190		C		30			MS		40		23		40	63			TRI CITY CO
	WPH326206	1056	B	13	29		172920	4	56	125		C		13			MS		10		16	26 MA 24	50 WH	50 WH			C E SMITH
	WPH332417	1232	B	11	29		172920	4	75	198	2	C		23			MS		15 MG	20	111 WH	10	15 WH	35 WH			MORGAN CONS
	WPH332479	1010	B	13	29		172920	6	73	300	3	R		24			MS MA		18 ME	20	80 ME	55	38 WH	38 WH			M CASSELS
	WPE331884	1160	D	13	29		172920	3	58	172		C		18			MS BK		20 DA	30	90 WH	50	50 LB	50 LB			J KEARREY
	WPH334099	1232	B	13	29		172920	4	90	280	20	R		20			MS		16 OR	14	30 MG	15	45 WH	70 TA			MORGAN CONS
	WPE334179	1094	D	13	29		172920	4	135	233		R		37			MS		12 ME	24	36 MA	19	55	127 WH			EDGAR D
	WPE336394	1233	D	13	29		172920	4	48	200		C		20			MS DB		6 MB	17	45 MY	2	35 WH	35 WH			P HANNIFIN
	WPE337206	1056	D	13	29		172920	4		142		C					MS						95	142			TUTT,R
	WPH339766	1855	B	13	29		172920	4	76	100		C		64			MS		17 MG	4	21	9	58	68 WH			MOORE,C L
	WPH342594	1598	D	13	29		172920	4	84	130		C															ZWAK,J
	WPE343293	1056	D	13	29		172920	4	65	151		C		20			MS		42 BK	3	45 MG	5	50	65			DUPREE,J
	WPH345146	1232	D	13	29		172920	4	63	137		C		26			MS		17 MG	13	30 WH	20	50 WH	65			SHARP,S
	WPH309198	0086	D	13	29		182920	3	50	84		C											16	16			BEORGE C. A
	WPC361444	1855	D	13	29		182920	4	52	130		C		28													CARTO, MR.
	WPC366166	1232	B	13	29		182920	4	97	220	20	R		17													P&N CONCRET
	WPE303142	0000	I	13	29		182920	8	25	300			H														
	WPC369077	2168	D	13	29		182920	2		72		C															FALLON, JOH
	WPC367856	1855	B	13	29		182920	4	84	230	5	C		21													DIXIE INDUS
	WPE312326	0332	D	13	29	NENW	182920	3	46	100		C		70									10	46			M HUPP
	WPC323186	1252	D	13	29		182920	4	84	163		C		21									25	100			W RAYBURN
	WPH326863	1232	B	13	29		182920	4	93	238		R		27			MS BK		10 WH	8	80 WH	6	28 WH	38 WH COC			B B FOSTER
	WPE334981	1160	D	13	29		182920	4	164	289		C		35			MS		42 MA	10	52 MB	11	63 WH	104 WH			SE GAL CORP
	WPE309314	0067	D	13	29		192920	4	43	150		C		6									18	44			ENGINEERED
	WPC371869	1126	A	11	29		192920	2	42	68		C	1	8													RUSSO, NICK
	WPC376256	1598	A	13	29		192920	4	28	70		C		4													BEST IRRIGA
	WPC379929	1232	A	13	29		192920	4	124	225		R		10													CENTRAL FLO
	WPE382204	2088	D	13	29		192920	4																			GREESON, FR
	WPE305490	0086	D	13	29	NWNE	192920	4	63	440		R		12									18	50			MORGAN CONS
	WPH307782	0003	D	13	29	NWSW	192920	3	63	100		C		20									40	40			CARL SMITH
	WPE316141	0253	D	13	29		192920	4	31	125		C		9									31	60			ADMO CL STR
	WPE320797	1233	M	13	29		192920	6	79	400		C											30	70			GADD CONC I
	WPE329352	1686	D	13	29		192920	4	42	203		C		35			MS		29 WH	6			35 WH	35 WH CUC			SALABARRIA

WELL CONSTRUCTION LIST DATE 6/02/83

DPE USE	PER MIT	DIS TRI CT	BAS IN	SEC TN	LOC RNG	DIA METR	DEPTH CASE	DEPTH WELL	GAL PER MIN	DRILL METH	DEPTH LEVL	SWL DATE	SWL PSI	SWL FLOW	SWL SIZE	SWL CLOSE	TEST PUMP	TEST HOUR	TEST DRAW	DES CAP	DES PUMP	DES HOUR	CUR CAP	CUR PUMP	CUR HOUR	USE CLASS	OWNER
WPE330028	1043	D	13	29	192920	4	69	120		R	18		MS	MA	18	MA	42			60	MA	60	MA	CLB	ATLANTIC CO
WPH334992	1024	B	13	29	192920	4	73	140	2	C	22		MS		30	WH	10	50	OR	10	70		70		BEJ	JERGINS C N
WPH334690	1233	B	13	29	192920	6	60	120		C	18		MS		12	MF	10				22	WH	58	WH		C WD CONST
WPC345975	1855	D	13	29	192920	4	66	120		C	72															RICHBURG
WPE310136	0165	D	13	29	202920	4	84	210		C											65		65			W HEATH
WPC348356	1056	B	13	29	202920	4	55	260	7	C	25															FL PRE FAB
WPC366422	1233	1	13	29	202920	4	63	125		C	24	F														HILLSBOROUG
WPH311502	0119	B	13	29SESE	202920	4	84	227		C	37										48					C COOPER
WPE310248	0264	T	13	29	202920	6	89	189		C	18										65					CUSTM STRUC
WPC371502	1160	D	13	29SWSE	202920	4	66	215		C	34	1														KINNEY, JAC
WPC375478	2258	L	13	29	202920	4	67	142		C	21															CAREY CATTL
WPC375548	1160	B	11	29	202920	4	41	205	6	C	21															ZANOTTI CON
WPN376680	2245	Y	11	29SWNW	202920		***	CANCELLED		***																
WPE312323	0198	D	13	29NWNW	202920	3	72	166		C	27										25		68			H D WILDIBI
WPE318931	0165	A	13	29	202920	4	70	195		C	23										26		26			PRIDE SLS
WPE318932	0165	A	13	29	202920	4	72	165		C	26										64		120			PRIDE SLS
WPE317786	0119	D	13	29	202920	4	100	205		C	29										47		89			C COOPER
WPE322712	1388	D	13	29	202920	3	51	100		C	21										51		75			SELF
WPE323859	1043	D	13	29	202920	4	74	199		C	45										65		72			P ZIMMERMAN
WPE322452	1185	D	11	27	202920	4	63	210		C	38										55		77			H CHURCHWEL
WPE325125	1160	D	13	29	202920	4	62	191		C													60			J LOWE
WPE331113	1183	D	11	29	202920	3	42	73		C	36		MS		8	MY	30				38	WH	38	WH		E HILL
WPE334203	1043	A	13	29	202920	4	83	147		C	30		MS		7	MB	7	14	MA	21	61		79			PRIDE G
WPE333591	1358	D	13	29	202920	4	92	205		C	50		MS		20	DA	10	30	MA	20	50	MA	90	WH	CUE	WALLACE C
WPE335688	1043	D	11	29	202920	4	115	155		C	80		MS		45	LA	26	71	MA	34	105	WH	112	WH		LANIER E A
WPE337419	1056	D	13	29	202920	4	90	155		C	35		MS	MB	14	MR	35	72	WH	16	49	WH	88	WH		CHANNELL,V
WPE337604	1056	D	13	29	202920	4	62	220		C	38		MS	MB	22	MA	38				60	WH	60	WH		GIRARD L BL
WPE308949	0067	D	11	29	212920	4	71	130		C	26										48		48			M CARRIER
WPC350121	1043	D	11	29	212920	4	63	216		T	45															BYRNES, C M
WPC350646	1043	D	13	29	212920	4	63	195		T	40															SMITH, HARR
WPC352678	1160	D	13	29	212920	4		225		C	39															BENSON, EDW
WPC355083	1809	D	13	29	212920	4	50	110		C	30															PHILLIPS, D
WPC354849	1958	Y	13	29NWSE	212920	6	60	60		C																HILLSBOROUG
WPC358330	1043	D	13	29	212920	4	105	225		T	30															SIVERLING,
WPC359637	1160	D	13	29	212920	4	84	212		C	44															MURRAY, MAR
WPC365196	1160	D	13	29	212920	4	78	176		C	34															ALVAREZ, AN
WPC365569	1043	D	13	29	212920	4	84	135		T	32															SMITH, E. W
WPC366361	1056	A	13	29NWNW	212920	4	85	240		C	40															DICK JOYCE
WPC366075	2147	D	13	29NESW	212920	4	63	170		C	28															MCDONALD, R
WPE311765	0003	D	13	29	212920	3	62	160			38										70		70			PUNGEMACH
WPE310980	0139	D	13	29	212920	4	99	136		C											94					E M WARD

Appendix 9-2
Consumptive Use Permits Inventory

SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT

2379 BROAD STREET, BROOKSVILLE, FLORIDA 33512-9712
PHONE (904) 796-7211 SUNCOM 684-1011

BRUCE A. SAMSON, Chairman, Tampa
Wm. O. STUBBS, JR., Vice Chairman, Dade City
JIM KIMBROUGH, Secretary, Brooksville
RONALD B. LAMBERT, Treasurer, Wauchula
DON CRANE, Assistant Secretary, St. Petersburg
ARCH UPDIKE, JR., Assistant Treasurer, Lake Wales

WALTER H. HARKALA, Plant City
MARY A. KUMPE, Sarasota
MICHAEL ZAGORAC, JR., Belleair

GARY W. KUHL, Executive Director

August 25, 1983

Camp, Dresser, and McKee, Inc.
Attn: Mr. Tetreault
4100 W. Kennedy Blvd.
Suite 109
Tampa, FL 33609

Re: Computer Print-Out

Dear Mr. Tetreault:

Enclosed is a print-out listing the consumptive use permits within the latitude/longitude boundaries delineated (27 59 45, 27 55 00, 82 22 30, 82 18 45) as an area of concern in your attempt to help Hillsborough County complete its application.

Please feel free to contact me at Extension 1322 if you have any questions or require additional assistance.

Sincerely,

Susan E Ames

SUSAN E. AMES
Supervisor
Processing & Records

SEA:aa
Enclosure: as stated

cc: L.M. Blain
J.E. Curren

REPORT NUMBER 41-099 DATE 83/08/24

PERMIT NUM	STAT	NAME	ADDRESS	CITY	ST	ZIP
0134C OC	P	CAMPOAMOR MODERN DAIRY INC.	501 US HWY 301 SOUTH	TAMPA	FL	33619

BASIN	COUNTY
HILLSBOROUGH	HILLSBOROUGH

PERMITTED AVG	PERMITTED MAX	NUM USES	NUM GWD PTS	NUM SWD PTS	TOT-ACRES	SEC/TWNSHP/RGE	EXPIRE DATE
143,400	205,100	2	6	0	180.0	OC CO CO	83/02/01

	WD TYPE	W/LAT	W/LONG	SOURCE NAME	DIAMETER	WD PER AVG	WD PER MAX	W/D DESCRIPTION
WD#001	G	275648	822134		0	140,000	200,000	MISSING USE CODE
WD#002	G	275654	822135		0	0	0	MISSING USE CODE
WD#003	G	275646	822130		0	0	0	MISSING USE CODE
WD#004	G	275638	822138		0	3,400	5,100	MISSING USE CODE
WD#005	G	275654	822132		0	0	0	MISSING USE CODE
WD#006	G	275656	822133		0	0	0	MISSING USE CODE

	USE CODE	USE DESCRIPTION	USE PUMPAGE	USE ACRES
USE#01	532	DAIRY FARMING	140,532	180.0
USE#02	010	DOMESTIC	2,868	0.0

WELL NUM	STIP CODE	FREQ CODE	DUE DATE	NEXT DUE	DESCRIPTION
COC	071	06	77/05	00/00	NO RUNOFF

REPORT NUMBER 41-099 DATE 83/08/24

PERMIT NUM	STAT	NAME	ADDRESS	CITY	ST	ZIP
01416 00	P	BROWNLEE, J. C.	716 S EVERS ST	PLANT CITY	FL	33566

BASIN	COUNTY
HILLSBOROUGH	HILLSBOROUGH

PERMITTED AVG	PERMITTED MAX	NUM USES	NUM GWD PTS	NUM SWD PTS	TOT-ACRES	SEC/TWNSHP/RGE	EXPIRE DATE
17,100	480,000	1	1	0	17.0	05 29 20	83/02/01

	WC TYPE	W/LAT	W/LONG	SOURCE NAME	DIAMETER	WD PER AVG	WD PER MAX	W/D DESCRIPTION
WD#001	G	275924	821925		0	17,100	480,000	MISSING USE CODE

	USE CODE	USE DESCRIPTION	USE PUMPAGE	USE ACRES
USE#01	125	CITRUS	17,100	17.0

WELL NUM	STIP CODE	FREQ CODE	DUE DATE	NEXT DUE	DESCRIPTION
000	071	06	77/05	00/00	NO RUNOFF

REPORT NUMBER 41-099 DATE 83/08/24

PERMIT NUM	STAT	NAME	ADDRESS	CITY	ST	ZIP
02024 OC	P	C.C.C. CC	PO BOX 1118	PLANT CITY	FL	33566

BASIN	COUNTY
HILLSBOROUGH	HILLSBOROUGH

PERMITTED AVG	PERMITTED MAX	NUM USES	NUM GWD PTS	NUM SWD PTS	TOT-ACRES	SEC/TWNSHP/RGE	EXPIRE DATE
23,671	288,000	1	1	0	85.0	05 29 20	83/04/06

	WD TYPE	W/LAT	W/LONG	SOURCE NAME	DIAMETER	WD PER AVG	WD PER MAX	W/D DESCRIPTION
WD#001	G	275909	821933	GROUNDWATER	0	23,671	288,000	MISSING USE CODE

	USE CODE	USE DESCRIPTION	USE PUMPAGE	USE ACRES
USE#01	125	CITRUS	23,671	40.8

WELL NUM	STIP CODE	FREQ CODE	DUE DATE	NEXT DUE	DESCRIPTION
COC	071	06	77/05	00/00	NO RUNOFF

REPORT NUMBER 41-099 DATE 83/08/24

PERMIT NUM	STAT	NAME	ADDRESS	CITY	ST	ZIP
02285 01	P	SPRINGER, CHARLES E.	7001 INTERBAY BLVD	TAMPA	FL	33616

BASIN	COUNTY
HILLSBOROUGH	HILLSBOROUGH

PERMITTED AVG	PERMITTED MAX	NUM USES	NUM GWD PTS	NUM SWD PTS	TOT-ACRES	SEC/TWNSHP/RGE	EXPIRE DATE
127,000	254,000	1	2	0	71.2	04 29 20	89/03/02

	WC TYPE	W/LAT	W/LONG	SOURCE NAME	DIAMETER	WD PER AVG	WD PER MAX	W/D DESCRIPTION
WD#001	G	275907	821907		6	63,500	127,000	PUBLIC SUPPLY
WD#002	G	275856	821904		12	63,500	127,000	PUBLIC SUPPLY

	USE CODE	USE DESCRIPTION	USE PUMPAGE	USE ACRES
USE#01	*026*	*ON-SITE PERCOLATION & PONDING*	*127,000*	*100.0*

WELL NUM	STIP CODE	FREQ CODE	DUE DATE	NEXT DUE	DESCRIPTION
000	073	06	83/05	00/00	DISTRICT RESERVES RIGHT TO COLLECT SAMPLES
000	082	72	89/05	00/00	MINIMUM AQUIFER LEVEL MAY BE SET
000	095	06	83/05	00/00	DISTRICT RESERVES RIGHT TO REQUIRE PUMPAGE RECORDS
000	097	06	83/05	00/00	WATER CONSERVATION METHODS

REPORT NUMBER 41-099 DATE 83/08/24

PERMIT NUM	STAT	NAME	ADDRESS	CITY	ST	ZIP
02285 01	P	SPRINGER, CHARLES E.	7001 INTERBAY BLVD	TAMPA	FL	33616

BASIN	COUNTY
HILLSBOROUGH	HILLSBOROUGH

PERMITTED AVG	PERMITTED MAX	NUM USES	NUM GWD PTS	NUM SWD PTS	TOT-ACRES	SEC/TWNSHP/RGE	EXPIRE DATE
127,000	254,000	1	2	0	71.2	04 29 20	89/03/02

	WC TYPE	W/LAT	W/LONG	SOURCE NAME	DIAMETER	WD PER AVG	WD PER MAX	W/D DESCRIPTION
WD#001	G	275907	821907		6	63,500	127,000	PUBLIC SUPPLY
WD#002	G	275856	821904		12	63,500	127,000	PUBLIC SUPPLY

	USE CODE	USE DESCRIPTION	USE PUMPAGE	USE ACRES
USE#01	026	ON-SITE PERCOLATION & PONDING	127,000	100.0

WELL NUM	STIP CODE	FREQ CODE	DUE DATE	NEXT DUE	DESCRIPTION
000	073	06	83/05	00/00	DISTRICT RESERVES RIGHT TO COLLECT SAMPLES
000	082	72	89/05	00/00	MINIMUM AQUIFER LEVEL MAY BE SET
000	095	06	83/05	00/00	DISTRICT RESERVES RIGHT TO REQUIRE PUMPAGE RECORDS
000	097	06	83/05	00/00	WATER CONSERVATION METHODS

REPORT NUMBER 41-099 DATE 83/08/24

PERMIT NUM	STAT	NAME	ADDRESS	CITY	ST	ZIP
02840.01	P	SEABORD UTILITIES CORP	3250 SW 3RD AVE	MIAMI	FL	33129

BASIN	COUNTY
HILLSBOROUGH	HILLSBOROUGH

PERMITTED AVG	PERMITTED MAX	NUM USES	NUM GWD PTS	NUM SWD PTS	TOT-ACRES	SEC/TWNSHP/RGE	EXPIRE DATE
720,000	2,260,000	1	9	0	1,895.4	25 29 19	83/12/07

	WD TYPE	W/LAT	W/LONG	SOURCE NAME	DIAMETER	WD PER AVG	WD PER MAX	W/D DESCRIPTION
WD#001	G	27561C	822138		4	68,000	172,000	PUBLIC SUPPLY
WD#002	G	27561C	822133		8	68,000	172,000	PUBLIC SUPPLY
WD#003	G	27561C	822127		8	0	0	PUBLIC SUPPLY
WD#004	G	27561C	822122		8	172,000	605,000	PUBLIC SUPPLY
WD#005	G	27561C	822113		6	63,000	156,000	PUBLIC SUPPLY
WD#006	G	27561C	822117		6	63,000	156,000	PUBLIC SUPPLY
WD#007	G	27560B	822116		6	0	0	PUBLIC SUPPLY
WD#008	G	27561D	822146		8	143,000	500,000	PUBLIC SUPPLY
WD#009	G	275613	822133		8	143,000	500,000	PUBLIC SUPPLY

	USE CODE	USE DESCRIPTION	USE PUMPAGE	USE ACRES
USE#01	034	ON-SITE SPRAY IRRIGATION	720,000	0.0

WELL NUM	STIP CODE	FREQ CODE	DUE DATE	NEXT DUE	DESCRIPTION
C0C	073	06	81/05	00/00	DISTRICT RESERVES RIGHT TO COLLECT SAMPLES
000	082	72	84/05	00/00	MINIMUM AQUIFER LEVEL MAY BE SET
C0C	112	72	82/12	88/12	REPORT ANALYSIS OF EFFECTS UPON HYDROLOGIC SYSTEM
C01	005	01	81/02	83/10	METER PUMPAGE-READ AND SUBMIT MONTHLY
C01	038	01	81/02	83/10	CHLORIDE ANALYSIS MONTHLY, SUBMIT MONTHLY
C02	005	01	81/02	83/10	METER PUMPAGE-READ AND SUBMIT MONTHLY
002	038	01	81/02	83/10	CHLORIDE ANALYSIS MONTHLY, SUBMIT MONTHLY
C04	005	01	81/02	83/10	METER PUMPAGE-READ AND SUBMIT MONTHLY
C04	038	01	81/02	83/10	CHLORIDE ANALYSIS MONTHLY, SUBMIT MONTHLY
005	005	01	81/02	83/10	METER PUMPAGE-READ AND SUBMIT MONTHLY
C05	038	01	81/02	83/10	CHLORIDE ANALYSIS MONTHLY, SUBMIT MONTHLY
006	005	01	81/02	83/10	METER PUMPAGE-READ AND SUBMIT MONTHLY
006	038	01	81/02	83/10	CHLORIDE ANALYSIS MONTHLY, SUBMIT MONTHLY
C08	005	01	81/06	83/10	METER PUMPAGE-READ AND SUBMIT MONTHLY
C08	038	01	81/06	83/10	CHLORIDE ANALYSIS MONTHLY, SUBMIT MONTHLY
C09	005	01	82/01	83/10	METER PUMPAGE-READ AND SUBMIT MONTHLY
C09	038	01	82/01	83/10	CHLORIDE ANALYSIS MONTHLY, SUBMIT MONTHLY

REPORT NUMBER 41-099 DATE 83/08/24

PERMIT NUM	STAT	NAME	ADDRESS	CITY	ST	ZIP
02916 00	P	FEATHERCOCK MOBILE HOME PARK	2200 HWY 60 E	VALRICO	FL	33594

BASIN	COUNTY
HILLSBOROUGH	HILLSBOROUGH

PERMITTED AVG	PERMITTED MAX	NUM USES	NUM GWD PTS	NUM SWD PTS	TOT-ACRES	SEC/TWNSHP/RGE	EXPIRE DATE
45,000	432,000	1	1	0	73.0	29 29 20	83/06/01

	WD TYPE	W/LAT	W/LONG	SOURCE NAME	DIAMETER	WD PER AVG	WD PER MAX	W/D DESCRIPTION
WD#001	G	275619	822035		0	45,000	432,000	MISSING USE CODE

	USE CODE	USE DESCRIPTION	USE PUMPAGE	USE ACRES
USE#01	034	ON-SITE SPRAY IRRIGATION	45,000	0.0

REPORT NUMBER 41-099 DATE 83/08/24

PERMIT NUM	STAT	NAME	ADDRESS	CITY	ST	ZIP
02969 OC	P	L.C. CASSIDY & SONS OF FLA., INC	1990 STANKEY RD.	LARGO	FL	33541

BASIN	COUNTY
HILLSBOROUGH	HILLSBOROUGH

PERMITTED AVG	PERMITTED MAX	NUM USES	NUM GWD PTS	NUM SWD PTS	TOT-ACRES	SEC/TWNSHP/RGE	EXPIRE DATE
1,000	2,300	1	1	0	1.0	17 29 20	83/05/04

	WD TYPE	W/LAT	W/LONG	SOURCE NAME	DIAMETER	WD PER AVG	WD PER MAX	W/D DESCRIPTION
WD#001	G	275725	822005		0	1,000	2,300	MISSING USE CODE

	USE CODE	USE DESCRIPTION	USE PUMPAGE	USE ACRES
USE#01	009	INDIVIDUAL SEPTIC TANKS	1,000	0.0

REPORT NUMBER 41-099 DATE 83/08/24

PERMIT NUM	STAT	NAME	ADDRESS	CITY	ST	ZIP
03281 00	P	ROZIER MACHINERY CO, JOSEPH L.	1219 HWY 301 N	TAMPA	FL	33609

BASIN	COUNTY
HILLSBOROUGH	HILLSBOROUGH

PERMITTED AVG	PERMITTED MAX	NUM USES	NUM GWD PTS	NUM SWD PTS	TOT-ACRES	SEC/TWNSHP/RGE	EXPIRE DATE
55,200	360,000	1	1	0	21.3	00 00 00	83/05/04

	WD TYPE	W/LAT	W/LONG	SOURCE NAME	DIAMETER	WD PER AVG	WD PER MAX	W/D DESCRIPTION
WD#001	G	275724	822117		0	55,200	360,000	MISSING USE CODE

	USE CODE	USE DESCRIPTION	USE PUMPAGE	USE ACRES
USE#01	900	MISCELLANEOUS (100% CONSUMPTIVE)	55,200	0.0

REPORT NUMBER 41-099 DATE 83/08/24

PERMIT NUM	STAT	NAME	ADDRESS	CITY	ST	ZIP
03406 00	P	FLA STATE FAIR AUTHORITY	PO BOX 11766	TAMPA	FL	33680

BASIN	COUNTY
HILLSBOROUGH	HILLSBOROUGH

PERMITTED AVG	PERMITTED MAX	NUM USES	NUM GWD PTS	NUM SWD PTS	TOT-ACRES	SEC/TWNSHP/RGE	EXPIRE DATE
235,000	604,000	2	2	0	278.6	00 00 00	83/08/03

	WD TYPE	W/LAT	W/LONG	SOURCE NAME	DIAMETER	WD PER AVG	WD PER MAX	W/D DESCRIPTION
WD#001	G	275928	822149		0	168,000	504,000	MISSING USE CODE
WD#002	G	275912	822216		0	67,000	100,000	MISSING USE CODE

	USE CODE	USE DESCRIPTION	USE PUMPAGE	USE ACRES
USE#01	102	LAWNS/SHRUBS FOR RECREATION/ATTRACTIONS	150,400	222.9
USE#02	082	LAKE AUGMENTATION	84,600	2.8

WELL NUM	STIP CODE	FREQ CODE	DUE DATE	NEXT DUE	DESCRIPTION
C00	C71	06	77/11	00/00	NO RUNOFF
C01	C03	03	78/04	83/10	METER PUMPAGE-READ MONTHLY, SUBMIT QUARTERLY
C02	C03	03	78/04	83/10	METER PUMPAGE-READ MONTHLY, SUBMIT QUARTERLY

REPORT NUMBER 41-099 DATE 83/08/24

PERMIT NUM	STAT	NAME	ADDRESS	CITY	ST	ZIP
04352	OC	P HILLSBOROUGH CO UTILITIES DEPT	PO DRAWER 3292	TAMPA	FL	33601

BASIN	COUNTY
ALAFIA	HILLSBOROUGH

PERMITTED AVG	PERMITTED MAX	NUM USES	NUM GWD PTS	NUM SWD PTS	TOT-ACRES	SEC/TWNSHP/RGE	EXPIRE DATE
13,078,000	27,440,000	5	55	0	1.1	0C CO CO	83/08/03

	WC	TYPE	W/LAT	W/LONG	SOURCE NAME	DIAMETER	WD PER AVG	WD PER MAX	W/D DESCRIPTION
WD#001		G	274252	822317		0	300,000	600,000	MISSING USE CODE
WD#002		G	274252	822324		0	300,000	600,000	MISSING USE CODE
WD#003		G	274318	822028		0	300,000	600,000	MISSING USE CODE
WD#004		G	274318	822030		0	300,000	600,000	MISSING USE CODE
WD#005		G	2743C9	822033		0	350,000	500,000	MISSING USE CODE
WD#006		G	2743C1	822035		0	250,000	500,000	MISSING USE CODE
WD#007		G	274322	822026		0	350,000	600,000	MISSING USE CODE
WD#008		G	274315	822017		0	370,000	600,000	MISSING USE CODE
WD#009		G	274256	822016		0	0	0	MISSING USE CODE
WD#010		G	2743C3	822009		0	250,000	500,000	MISSING USE CODE
WD#011		G	274443	822009		0	250,000	500,000	MISSING USE CODE
WD#012		G	2749C7	821953		0	550,000	800,000	MISSING USE CODE
WD#013		G	2749C3	821953		0	300,000	500,000	MISSING USE CODE
WD#014		G	274857	821953		0	0	0	MISSING USE CODE
WD#015		G	274857	821947		0	250,000	300,000	MISSING USE CODE
WD#016		G	2749C1	821941		0	550,000	700,000	MISSING USE CODE
WD#017		G	2749C4	821947		0	300,000	400,000	MISSING USE CODE
WD#018		G	2749C9	821947		0	400,000	400,000	MISSING USE CODE
WD#019		G	274914	821947		0	250,000	400,000	MISSING USE CODE
WD#020		G	275323	821608		0	500,000	1,000,000	MISSING USE CODE
WD#021		G	275337	821713		0	500,000	1,000,000	MISSING USE CODE
WD#022		G	275414	821707		0	100,000	500,000	MISSING USE CODE
WD#023		G	275427	821534		0	850,000	2,000,000	MISSING USE CODE
WD#024		G	275428	821750		0	50,000	150,000	MISSING USE CODE
WD#025		G	275429	821732		0	100,000	150,000	MISSING USE CODE
WD#026		G	2755C7	821754		0	150,000	350,000	MISSING USE CODE
WD#027		G	2755C8	821644		0	150,000	500,000	MISSING USE CODE
WD#028		G	275530	821712		0	150,000	340,000	MISSING USE CODE
WD#029		G	275556	821611		0	350,000	750,000	MISSING USE CODE
WD#030		G	275623	821519		0	750,000	1,750,000	MISSING USE CODE
WD#031		G	275634	821838		0	0	0	MISSING USE CODE
WD#032		G	275634	821839		0	0	0	MISSING USE CODE
WD#033		G	275639	821634		0	850,000	2,000,000	MISSING USE CODE
WD#034		G	275638	821631		0	0	0	MISSING USE CODE
WD#035		G	2757C7	821807		0	250,000	450,000	MISSING USE CODE
WD#036		G	275718	821649		0	200,000	900,000	MISSING USE CODE
WD#037		G	275722	821612		0	450,000	550,000	MISSING USE CODE
WD#038		G	275747	821839		0	200,000	350,000	MISSING USE CODE

WD#039	G	275759	821711		0	50,000	400,000 MISSING USE CODE

REPORT NUMBER 41-099 DATE 83/08/24

WD#040	G	275833	821655	0	100,000	200,000	MISSING USE CODE
WD#041	G	275854	822008	0	58,000	100,000	MISSING USE CODE
WD#042	G	275953	821833	0	150,000	550,000	MISSING USE CODE
WD#043	G	280009	821651	0	100,000	150,000	MISSING USE CODE
WD#044	G	280007	821811	0	500,000	1,750,000	MISSING USE CODE
WD#045	G	280017	821636	0	100,000	450,000	MISSING USE CODE
WD#046	G	275529	821506	0	400,000	1,000,000	MISSING USE CODE
WD#047	G	275446	821428	0	400,000	1,000,000	MISSING USE CODE
WD#048	G	274256	822016	10	0	0	OBSERVATION/MONITER
WD#049	G	274318	822028	4	0	0	OBSERVATION/MONITER
WD#050	G	274318	822028	6	0	0	OBSERVATION/MONITER
WD#051	G	274857	821953	10	0	0	OBSERVATION/MONITER
WD#052	G	274857	821954	4	0	0	OBSERVATION/MONITER
WD#053	G	274857	821954	6	0	0	OBSERVATION/MONITER
WD#054	G	275432	821613	12	0	0	OBSERVATION/MONITER
WD#057	G	275751	821614	12	0	0	OBSERVATION/MONITER

	USE CODE	USE DESCRIPTION	USE PUMPAGE	USE ACRES
USE#01	009	INDIVIDUAL SEPTIC TANKS	5,492,760	1.1
USE#02	026	ON-SITE PERCOLATION & PONDING	2,354,040	0.0
USE#03	690	BOILER MAKE-UP WATER	1,830,920	0.0
USE#04	665	PERISHABLE FOOD PROCESSING	784,680	0.0
USE#05	900	MISCELLANEOUS (100% CONSUMPTIVE)	2,615,600	0.0

WELL NUM	STIP CODE	FREQ CODE	DUE DATE	NEXT DUE	DESCRIPTION
000	107	01	78/04	81/06	SUBMIT CONTIOUS RAINFALL RECORDS
C01	003	03	79/01	83/10	METER PUMPAGE-READ MONTHLY, SUBMIT QUARTERLY
C01	042	03	79/01	83/10	CHLORIDE ANALYSIS MONTHLY, SUBMIT QUARTERLY
C01	280	03	79/01	83/10	SOLIDS (DISOLVED) - MONTHLY, SUBMIT QUARTERLY
C01	293	03	79/01	83/10	SULFATE ANALYSIS MONTHLY, SUBMIT QUARTERLY
C02	003	03	79/01	83/10	METER PUMPAGE-READ MONTHLY, SUBMIT QUARTERLY
002	042	03	79/01	83/10	CHLORIDE ANALYSIS MONTHLY, SUBMIT QUARTERLY
002	280	03	79/01	83/10	SOLIDS (DISOLVED) - MONTHLY, SUBMIT QUARTERLY
002	293	03	79/01	83/10	SULFATE ANALYSIS MONTHLY, SUBMIT QUARTERLY
C03	003	03	79/01	83/10	METER PUMPAGE-READ MONTHLY, SUBMIT QUARTERLY
C03	042	03	79/01	83/10	CHLORIDE ANALYSIS MONTHLY, SUBMIT QUARTERLY
C03	280	03	79/01	83/10	SOLIDS (DISOLVED) - MONTHLY, SUBMIT QUARTERLY
C03	293	03	79/01	83/10	SULFATE ANALYSIS MONTHLY, SUBMIT QUARTERLY
C04	003	03	79/01	83/10	METER PUMPAGE-READ MONTHLY, SUBMIT QUARTERLY
004	042	03	79/01	83/10	CHLORIDE ANALYSIS MONTHLY, SUBMIT QUARTERLY
C04	280	03	79/01	83/10	SOLIDS (DISOLVED) - MONTHLY, SUBMIT QUARTERLY
004	293	03	79/01	83/10	SULFATE ANALYSIS MONTHLY, SUBMIT QUARTERLY
C05	003	03	79/01	83/10	METER PUMPAGE-READ MONTHLY, SUBMIT QUARTERLY
C05	042	03	79/01	83/10	CHLORIDE ANALYSIS MONTHLY, SUBMIT QUARTERLY
005	280	03	79/01	83/10	SOLIDS (DISOLVED) - MONTHLY, SUBMIT QUARTERLY
C05	293	03	79/01	83/10	SULFATE ANALYSIS MONTHLY, SUBMIT QUARTERLY
C06	003	03	79/01	83/10	METER PUMPAGE-READ MONTHLY, SUBMIT QUARTERLY
C06	042	03	79/01	83/10	CHLORIDE ANALYSIS MONTHLY, SUBMIT QUARTERLY
C06	280	03	79/01	83/10	SOLIDS (DISOLVED) - MONTHLY, SUBMIT QUARTERLY
C06	293	03	79/01	83/10	SULFATE ANALYSIS MONTHLY, SUBMIT QUARTERLY
C07	003	03	79/01	83/10	METER PUMPAGE-READ MONTHLY, SUBMIT QUARTERLY

007	042	03	79/01	83/10	CHLORIDE ANALYSIS MONTHLY, SUBMIT QUARTERLY

C07	280	03	79/01	83/10	SOLIDS (DISOLVED) - MONTHLY, SUBMIT QUARTERLY
C07	293	03	79/01	83/10	SULFATE ANALYSIS MONTHLY, SUBMIT QUARTERLY
C08	003	03	79/01	83/10	METER PUMPAGE-READ MONTHLY, SUBMIT QUARTERLY
C08	042	03	79/01	83/10	CHLORIDE ANALYSIS MONTHLY, SUBMIT QUARTERLY
C08	280	03	79/01	83/10	SOLIDS (DISOLVED) - MONTHLY, SUBMIT QUARTERLY
C08	293	03	79/01	83/10	SULFATE ANALYSIS MONTHLY, SUBMIT QUARTERLY
C10	003	03	79/01	83/10	METER PUMPAGE-READ MONTHLY, SUBMIT QUARTERLY
C10	042	03	79/01	83/10	CHLORIDE ANALYSIS MONTHLY, SUBMIT QUARTERLY
C10	280	03	79/01	83/10	SOLIDS (DISOLVED) - MONTHLY, SUBMIT QUARTERLY
C10	293	03	79/01	83/10	SULFATE ANALYSIS MONTHLY, SUBMIT QUARTERLY
C11	003	03	79/01	83/10	METER PUMPAGE-READ MONTHLY, SUBMIT QUARTERLY
C11	042	03	80/07	83/10	CHLORIDE ANALYSIS MONTHLY, SUBMIT QUARTERLY
C11	280	03	79/01	83/10	SOLIDS (DISOLVED) - MONTHLY, SUBMIT QUARTERLY
C11	293	03	79/01	83/10	SULFATE ANALYSIS MONTHLY, SUBMIT QUARTERLY
C12	003	03	79/01	83/10	METER PUMPAGE-READ MONTHLY, SUBMIT QUARTERLY
C12	042	03	80/07	83/10	CHLORIDE ANALYSIS MONTHLY, SUBMIT QUARTERLY
C12	280	03	79/01	83/10	SOLIDS (DISOLVED) - MONTHLY, SUBMIT QUARTERLY
C12	293	03	79/01	83/10	SULFATE ANALYSIS MONTHLY, SUBMIT QUARTERLY
C13	003	03	79/01	83/10	METER PUMPAGE-READ MONTHLY, SUBMIT QUARTERLY
C13	042	03	79/01	83/10	CHLORIDE ANALYSIS MONTHLY, SUBMIT QUARTERLY
C13	280	03	79/01	83/10	SOLIDS (DISOLVED) - MONTHLY, SUBMIT QUARTERLY
C13	293	03	79/01	83/10	SULFATE ANALYSIS MONTHLY, SUBMIT QUARTERLY
C15	003	03	79/01	83/10	METER PUMPAGE-READ MONTHLY, SUBMIT QUARTERLY
C15	042	03	79/01	83/10	CHLORIDE ANALYSIS MONTHLY, SUBMIT QUARTERLY
C15	280	03	79/01	83/10	SOLIDS (DISOLVED) - MONTHLY, SUBMIT QUARTERLY
C15	293	03	79/01	83/10	SULFATE ANALYSIS MONTHLY, SUBMIT QUARTERLY
C16	003	03	79/01	83/10	METER PUMPAGE-READ MONTHLY, SUBMIT QUARTERLY
C16	042	03	79/01	83/10	CHLORIDE ANALYSIS MONTHLY, SUBMIT QUARTERLY
C16	280	03	79/01	83/10	SOLIDS (DISOLVED) - MONTHLY, SUBMIT QUARTERLY
C16	293	03	79/01	83/10	SULFATE ANALYSIS MONTHLY, SUBMIT QUARTERLY
C17	003	03	79/01	83/10	METER PUMPAGE-READ MONTHLY, SUBMIT QUARTERLY
C17	042	03	79/01	83/10	CHLORIDE ANALYSIS MONTHLY, SUBMIT QUARTERLY
C17	280	03	79/01	83/10	SOLIDS (DISOLVED) - MONTHLY, SUBMIT QUARTERLY
C17	293	03	79/01	83/10	SULFATE ANALYSIS MONTHLY, SUBMIT QUARTERLY
C18	003	03	79/01	83/10	METER PUMPAGE-READ MONTHLY, SUBMIT QUARTERLY
C18	042	03	79/01	83/10	CHLORIDE ANALYSIS MONTHLY, SUBMIT QUARTERLY
C18	280	03	79/01	83/10	SOLIDS (DISOLVED) - MONTHLY, SUBMIT QUARTERLY
C18	293	03	79/01	83/10	SULFATE ANALYSIS MONTHLY, SUBMIT QUARTERLY
C19	003	03	79/01	83/10	METER PUMPAGE-READ MONTHLY, SUBMIT QUARTERLY
C19	042	03	79/01	83/10	CHLORIDE ANALYSIS MONTHLY, SUBMIT QUARTERLY
C19	280	03	79/01	83/10	SOLIDS (DISOLVED) - MONTHLY, SUBMIT QUARTERLY
C19	293	03	79/01	83/10	SULFATE ANALYSIS MONTHLY, SUBMIT QUARTERLY
C20	003	03	79/01	83/10	METER PUMPAGE-READ MONTHLY, SUBMIT QUARTERLY
C20	042	03	79/01	83/10	CHLORIDE ANALYSIS MONTHLY, SUBMIT QUARTERLY
C20	280	03	79/01	83/10	SOLIDS (DISOLVED) - MONTHLY, SUBMIT QUARTERLY
C20	293	03	79/01	83/10	SULFATE ANALYSIS MONTHLY, SUBMIT QUARTERLY
C21	003	03	79/01	83/10	METER PUMPAGE-READ MONTHLY, SUBMIT QUARTERLY
C21	042	03	79/01	83/10	CHLORIDE ANALYSIS MONTHLY, SUBMIT QUARTERLY
C21	280	03	79/01	83/10	SOLIDS (DISOLVED) - MONTHLY, SUBMIT QUARTERLY
C21	293	03	79/01	83/10	SULFATE ANALYSIS MONTHLY, SUBMIT QUARTERLY
C22	003	03	79/01	83/10	METER PUMPAGE-READ MONTHLY, SUBMIT QUARTERLY
C22	042	03	79/01	83/10	CHLORIDE ANALYSIS MONTHLY, SUBMIT QUARTERLY

022	280	03	79/01	83/10	SOLIDS (DISOLVED) - MONTHLY, SUBMIT QUARTERLY

022	293	03	79/01	83/10	SULFATE ANALYSIS MONTHLY, SUBMIT QUARTERLY
C23	C03	03	79/01	83/10	METER PUMPAGE-READ MONTHLY, SUBMIT QUARTERLY
C23	042	03	79/01	83/10	CHLORIDE ANALYSIS MONTHLY, SUBMIT QUARTERLY
023	280	03	79/01	83/10	SOLIDS (DISOLVED) - MONTHLY, SUBMIT QUARTERLY
C23	293	03	79/01	83/10	SULFATE ANALYSIS MONTHLY, SUBMIT QUARTERLY
024	003	03	79/01	83/10	METER PUMPAGE-READ MONTHLY, SUBMIT QUARTERLY
C24	042	03	79/01	83/10	CHLORIDE ANALYSIS MONTHLY, SUBMIT QUARTERLY
C24	280	03	79/01	83/10	SOLIDS (DISOLVED) - MONTHLY, SUBMIT QUARTERLY
C24	293	03	79/01	83/10	SULFATE ANALYSIS MONTHLY, SUBMIT QUARTERLY
C25	C03	03	79/01	83/10	METER PUMPAGE-READ MONTHLY, SUBMIT QUARTERLY
025	042	03	79/01	83/10	CHLORIDE ANALYSIS MONTHLY, SUBMIT QUARTERLY
025	280	03	79/01	83/10	SOLIDS (DISOLVED) - MONTHLY, SUBMIT QUARTERLY
025	293	03	79/01	83/10	SULFATE ANALYSIS MONTHLY, SUBMIT QUARTERLY
C26	003	03	79/01	83/10	METER PUMPAGE-READ MONTHLY, SUBMIT QUARTERLY
026	042	03	79/01	83/10	CHLORIDE ANALYSIS MONTHLY, SUBMIT QUARTERLY
C26	280	03	79/01	83/10	SOLIDS (DISOLVED) - MONTHLY, SUBMIT QUARTERLY
C26	293	03	79/01	83/10	SULFATE ANALYSIS MONTHLY, SUBMIT QUARTERLY
027	003	03	79/01	83/10	METER PUMPAGE-READ MONTHLY, SUBMIT QUARTERLY
C27	C42	03	79/01	83/10	CHLORIDE ANALYSIS MONTHLY, SUBMIT QUARTERLY
C27	280	03	79/01	83/10	SOLIDS (DISOLVED) - MONTHLY, SUBMIT QUARTERLY
C27	293	03	79/01	83/10	SULFATE ANALYSIS MONTHLY, SUBMIT QUARTERLY
C28	003	03	79/01	83/10	METER PUMPAGE-READ MONTHLY, SUBMIT QUARTERLY
028	042	03	79/01	83/10	CHLORIDE ANALYSIS MONTHLY, SUBMIT QUARTERLY
C28	280	03	79/01	83/10	SOLIDS (DISOLVED) - MONTHLY, SUBMIT QUARTERLY
028	293	03	79/01	83/10	SULFATE ANALYSIS MONTHLY, SUBMIT QUARTERLY
029	003	03	79/01	83/10	METER PUMPAGE-READ MONTHLY, SUBMIT QUARTERLY
029	042	03	79/01	83/10	CHLORIDE ANALYSIS MONTHLY, SUBMIT QUARTERLY
C29	280	03	79/01	83/10	SOLIDS (DISOLVED) - MONTHLY, SUBMIT QUARTERLY
029	293	03	79/01	83/10	SULFATE ANALYSIS MONTHLY, SUBMIT QUARTERLY
C30	003	03	79/01	83/10	METER PUMPAGE-READ MONTHLY, SUBMIT QUARTERLY
030	042	03	79/01	83/10	CHLORIDE ANALYSIS MONTHLY, SUBMIT QUARTERLY
C30	280	03	79/01	83/10	SOLIDS (DISOLVED) - MONTHLY, SUBMIT QUARTERLY
C30	293	03	79/01	83/10	SULFATE ANALYSIS MONTHLY, SUBMIT QUARTERLY
031	003	03	79/01	83/10	METER PUMPAGE-READ MONTHLY, SUBMIT QUARTERLY
031	042	03	79/01	83/10	CHLORIDE ANALYSIS MONTHLY, SUBMIT QUARTERLY
031	280	03	79/01	83/10	SOLIDS (DISOLVED) - MONTHLY, SUBMIT QUARTERLY
031	293	03	79/01	83/10	SULFATE ANALYSIS MONTHLY, SUBMIT QUARTERLY
C32	003	03	79/01	83/10	METER PUMPAGE-READ MONTHLY, SUBMIT QUARTERLY
032	042	03	79/01	83/10	CHLORIDE ANALYSIS MONTHLY, SUBMIT QUARTERLY
032	280	03	79/01	83/10	SOLIDS (DISOLVED) - MONTHLY, SUBMIT QUARTERLY
032	293	03	79/01	83/10	SULFATE ANALYSIS MONTHLY, SUBMIT QUARTERLY
C33	003	03	79/01	83/10	METER PUMPAGE-READ MONTHLY, SUBMIT QUARTERLY
033	042	03	79/01	83/10	CHLORIDE ANALYSIS MONTHLY, SUBMIT QUARTERLY
033	280	03	79/01	83/10	SOLIDS (DISOLVED) - MONTHLY, SUBMIT QUARTERLY
033	293	03	79/01	83/10	SULFATE ANALYSIS MONTHLY, SUBMIT QUARTERLY
C34	003	03	79/01	83/10	METER PUMPAGE-READ MONTHLY, SUBMIT QUARTERLY
034	042	03	79/01	83/10	CHLORIDE ANALYSIS MONTHLY, SUBMIT QUARTERLY
034	280	03	79/01	83/10	SOLIDS (DISOLVED) - MONTHLY, SUBMIT QUARTERLY
034	293	03	79/01	83/10	SULFATE ANALYSIS MONTHLY, SUBMIT QUARTERLY
C35	003	03	79/01	83/10	METER PUMPAGE-READ MONTHLY, SUBMIT QUARTERLY
035	042	03	79/01	83/10	CHLORIDE ANALYSIS MONTHLY, SUBMIT QUARTERLY
035	280	03	79/01	83/10	SOLIDS (DISOLVED) - MONTHLY, SUBMIT QUARTERLY

035	293	03	79/01	83/10	SULFATE ANALYSIS MONTHLY, SUBMIT QUARTERLY

C36	C03	03	79/C1	83/10	METER PUMPAGE-READ MONTHLY, SUBMIT QUARTERLY
036	042	03	79/01	83/10	CHLORIDE ANALYSIS MONTHLY, SUBMIT QUARTERLY
036	280	03	79/01	83/10	SOLIDS (DISOLVED) - MONTHLY, SUBMIT QUARTERLY
C36	293	03	79/01	83/10	SULFATE ANALYSIS MONTHLY, SUBMIT QUARTERLY
037	003	03	79/C1	83/10	METER PUMPAGE-READ MONTHLY, SUBMIT QUARTERLY
037	042	03	79/01	83/10	CHLORIDE ANALYSIS MONTHLY, SUBMIT QUARTERLY
C37	280	03	79/01	83/10	SOLIDS (DISOLVED) - MONTHLY, SUBMIT QUARTERLY
037	293	03	79/01	83/10	SULFATE ANALYSIS MONTHLY, SUBMIT QUARTERLY
C38	003	03	79/01	83/10	METER PUMPAGE-READ MONTHLY, SUBMIT QUARTERLY
C38	C42	03	79/C1	83/10	CHLORIDE ANALYSIS MONTHLY, SUBMIT QUARTERLY
038	280	03	79/01	83/10	SOLIDS (DISOLVED) - MONTHLY, SUBMIT QUARTERLY
C38	293	03	79/01	83/10	SULFATE ANALYSIS MONTHLY, SUBMIT QUARTERLY
039	003	03	79/01	83/10	METER PUMPAGE-READ MONTHLY, SUBMIT QUARTERLY
039	C42	03	79/01	83/10	CHLORIDE ANALYSIS MONTHLY, SUBMIT QUARTERLY
C39	280	03	79/C1	83/10	SOLIDS (DISOLVED) - MONTHLY, SUBMIT QUARTERLY
C39	293	03	79/01	83/10	SULFATE ANALYSIS MONTHLY, SUBMIT QUARTERLY
040	003	03	79/01	83/10	METER PUMPAGE-READ MONTHLY, SUBMIT QUARTERLY
C4C	042	03	79/01	83/10	CHLORIDE ANALYSIS MONTHLY, SUBMIT QUARTERLY
C4C	280	03	79/01	83/10	SOLIDS (DISOLVED) - MONTHLY, SUBMIT QUARTERLY
040	293	03	79/01	83/10	SULFATE ANALYSIS MONTHLY, SUBMIT QUARTERLY
C41	C03	03	79/C1	83/10	METER PUMPAGE-READ MONTHLY, SUBMIT QUARTERLY
C41	042	03	79/01	83/10	CHLORIDE ANALYSIS MONTHLY, SUBMIT QUARTERLY
041	280	03	79/01	83/10	SOLIDS (DISOLVED) - MONTHLY, SUBMIT QUARTERLY
C41	293	03	79/01	83/10	SULFATE ANALYSIS MONTHLY, SUBMIT QUARTERLY
042	003	03	79/01	83/10	METER PUMPAGE-READ MONTHLY, SUBMIT QUARTERLY
C42	C42	03	79/01	83/1C	CHLORIDE ANALYSIS MONTHLY, SUBMIT QUARTERLY
042	280	03	79/01	83/10	SOLIDS (DISOLVED) - MONTHLY, SUBMIT QUARTERLY
042	293	03	79/01	83/1C	SULFATE ANALYSIS MONTHLY, SUBMIT QUARTERLY
043	C03	03	79/01	83/10	METER PUMPAGE-READ MONTHLY, SUBMIT QUARTERLY
043	042	03	79/01	83/10	CHLORIDE ANALYSIS MONTHLY, SUBMIT QUARTERLY
C43	280	03	79/01	83/10	SOLIDS (DISOLVED) - MONTHLY, SUBMIT QUARTERLY
043	293	03	79/01	83/10	SULFATE ANALYSIS MONTHLY, SUBMIT QUARTERLY
044	003	03	79/01	83/10	METER PUMPAGE-READ MONTHLY, SUBMIT QUARTERLY
044	C42	03	79/01	83/10	CHLORIDE ANALYSIS MONTHLY, SUBMIT QUARTERLY
C44	280	03	79/C1	83/10	SOLIDS (DISOLVED) - MONTHLY, SUBMIT QUARTERLY
044	293	03	79/01	83/10	SULFATE ANALYSIS MONTHLY, SUBMIT QUARTERLY
C45	003	03	79/01	83/10	METER PUMPAGE-READ MONTHLY, SUBMIT QUARTERLY
045	042	03	79/01	83/10	CHLORIDE ANALYSIS MONTHLY, SUBMIT QUARTERLY
C45	280	03	79/01	83/10	SOLIDS (DISOLVED) - MONTHLY, SUBMIT QUARTERLY
C45	293	03	79/C1	83/10	SULFATE ANALYSIS MONTHLY, SUBMIT QUARTERLY
046	003	03	79/01	83/10	METER PUMPAGE-READ MONTHLY, SUBMIT QUARTERLY
046	C42	03	79/01	83/10	CHLORIDE ANALYSIS MONTHLY, SUBMIT QUARTERLY
046	112	72	78/06	84/06	REPORT ANALYSIS OF EFFECTS UPON HYDROLOGIC SYSTEM
046	280	03	79/01	83/10	SOLIDS (DISOLVED) - MONTHLY, SUBMIT QUARTERLY
C46	293	03	79/C1	83/10	SULFATE ANALYSIS MONTHLY, SUBMIT QUARTERLY
C47	C03	03	79/01	83/10	METER PUMPAGE-READ MONTHLY, SUBMIT QUARTERLY
047	042	03	79/01	83/10	CHLORIDE ANALYSIS MONTHLY, SUBMIT QUARTERLY
C47	C89	72	78/05	00/00	NOTIFY DISTRICT UPON CHANGE OF OPERATION
047	112	72	78/06	84/C6	REPORT ANALYSIS OF EFFECTS UPON HYDROLOGIC SYSTEM
047	124	72	78/05	84/05	PUMP FACILITIES AT MAX RATE FOR TESTING
047	280	03	79/C1	83/10	SOLIDS (DISOLVED) - MONTHLY, SUBMIT QUARTERLY
047	293	03	79/01	83/10	SULFATE ANALYSIS MONTHLY, SUBMIT QUARTERLY

048	063	03	78/07	87/10	MEASURE WATER LEVEL DAILY, SUBMIT QUARTERLY

048	139	03	79/01	83/10	SUBMIT HYDROGRAPHS FROM MONITOR WELL(S)
049	063	03	78/07	83/10	MEASURE WATER LEVEL DAILY, SUBMIT QUARTERLY
049	139	03	79/01	83/10	SUBMIT HYDROGRAPHS FROM MONITOR WELL(S)
050	063	03	78/07	83/10	MEASURE WATER LEVEL DAILY, SUBMIT QUARTERLY
050	139	03	79/01	83/10	SUBMIT HYDROGRAPHS FROM MONITOR WELL(S)
051	063	03	78/07	83/10	MEASURE WATER LEVEL DAILY, SUBMIT QUARTERLY
051	139	03	79/01	83/10	SUBMIT HYDROGRAPHS FROM MONITOR WELL(S)
052	063	03	78/07	83/10	MEASURE WATER LEVEL DAILY, SUBMIT QUARTERLY
052	139	03	79/01	83/10	SUBMIT HYDROGRAPHS FROM MONITOR WELL(S)
053	063	03	78/07	83/10	MEASURE WATER LEVEL DAILY, SUBMIT QUARTERLY
053	139	03	79/01	83/10	SUBMIT HYDROGRAPHS FROM MONITOR WELL(S)
054	063	03	78/07	83/10	MEASURE WATER LEVEL DAILY, SUBMIT QUARTERLY
054	139	03	79/01	83/10	SUBMIT HYDROGRAPHS FROM MONITOR WELL(S)
055	300	72	78/08	84/08	CONSTRUCT 1 MONITOR WELL
056	300	72	78/08	84/08	CONSTRUCT 1 MONITOR WELL
057	063	03	78/07	83/10	MEASURE WATER LEVEL DAILY, SUBMIT QUARTERLY
057	139	03	78/07	83/10	SUBMIT HYDROGRAPHS FROM MONITOR WELL(S)

C48	139	03	79/01	83/10	SUBMIT HYDROGRAPHS FROM MONITOR WELL(S)
C49	063	03	78/07	83/10	MEASURE WATER LEVEL DAILY, SUBMIT QUARTERLY
C49	139	03	79/01	83/10	SUBMIT HYDROGRAPHS FROM MONITOR WELL(S)
C50	063	03	78/07	83/10	MEASURE WATER LEVEL DAILY, SUBMIT QUARTERLY
C50	139	03	79/01	83/10	SUBMIT HYDROGRAPHS FROM MONITOR WELL(S)
C51	063	03	78/07	83/10	MEASURE WATER LEVEL DAILY, SUBMIT QUARTERLY
C51	139	03	79/01	83/10	SUBMIT HYDROGRAPHS FROM MONITOR WELL(S)
C52	063	03	78/07	83/10	MEASURE WATER LEVEL DAILY, SUBMIT QUARTERLY
C52	139	03	79/01	83/10	SUBMIT HYDROGRAPHS FROM MONITOR WELL(S)
C53	063	03	78/07	83/10	MEASURE WATER LEVEL DAILY, SUBMIT QUARTERLY
C53	139	03	79/01	83/10	SUBMIT HYDROGRAPHS FROM MONITOR WELL(S)
C54	063	03	78/07	83/10	MEASURE WATER LEVEL DAILY, SUBMIT QUARTERLY
C54	139	03	79/01	83/10	SUBMIT HYDROGRAPHS FROM MONITOR WELL(S)
C55	300	72	78/06	84/08	CONSTRUCT 1 MONITOR WELL
C56	300	72	78/08	84/08	CONSTRUCT 1 MONITOR WELL
C57	063	03	78/07	83/10	MEASURE WATER LEVEL DAILY, SUBMIT QUARTERLY
C57	139	03	78/07	83/10	SUBMIT HYDROGRAPHS FROM MONITOR WELL(S)

REPORT NUMBER 41-099 DATE 83/08/24

PERMIT NUM	STAT	NAME	ADDRESS	CITY	ST	ZIP
05244 00	P	WOODBERY ESTATES, ELIZABETH	124 KNIGHTS AVE	BRANDON	FL	33511

BASIN	COUNTY
HILLSBOROUGH	HILLSBOROUGH

PERMITTED AVG	PERMITTED MAX	NUM USES	NUM GWD PTS	NUM SWD PTS	TOT-ACRES	SEC/TWNSHP/RGE	EXPIRE DATE
14,500	240,000	2	1	0	220.0	20 29 20	85/07/10

	WD TYPE	W/LAT	W/LONG	SOURCE NAME	DIAMETER	WD PER AVG	WD PER MAX	W/D DESCRIPTION
WD#001	G	275702	821902		6	14,500	240,000	MISSING USE CODE

	USE CODE	USE DESCRIPTION	USE PUMPAGE	USE ACRES
USE#01	250	VEGETABLES	13,775	15.0
USE#02	115	PASTURE-HAY	725	10.0

WELL NUM	STIP CODE	FREQ CODE	DUE DATE	NEXT DUE	DESCRIPTION
000	071	06	79/11	00/00	NO RUNOFF
000	073	06	79/11	00/00	DISTRICT RESERVES RIGHT TO COLLECT SAMPLES
000	082	72	85/07	00/00	MINIMUM AQUIFER LEVEL MAY BE SET
000	086	06	79/11	80/11	NOTIFY IF PERMANENT TERMINATION OF WITHDRAWAL

REPORT NUMBER 41-099 DATE 83/08/24

PERMIT NUM	STAT	NAME	ADDRESS	CITY	ST	ZIP
06396 CC	P	PULIDO INC., R. M.	3601 PROVIDENCE RD	RIVERVIEW	FL	33569

BASIN	COUNTY
ALAFIA	HILLSBOROUGH

PERMITTED AVG	PERMITTED MAX	NUM USES	NUM GWD PTS	NUM SWD PTS	TOT-ACRES	SEC/TWNSHP/RGE	EXPIRE DATE
242,000	1,440,000	3	1	0	240.0	32 29 20	87/07/01

	WD TYPE	W/LAT	W/LONG	SOURCE NAME	DIAMETER	WD PER AVG	WD PER MAX	W/D DESCRIPTION
WD#001	G	275508	821933		12	242,000	1,440,000	IRRIGATION

	USE CODE	USE DESCRIPTION	USE PUMPAGE	USE ACRES
USE#01	355	SMALL GRAINS	77,924	34.8
USE#02	250	VEGETABLES	46,948	34.8
USE#03	250	VEGETABLES	117,128	34.8

WELL NUM	STIP CODE	FREQ CODE	DUE DATE	NEXT DUE	DESCRIPTION
COC	C71	06	81/11	00/00	NO RUNOFF
COC	C73	06	81/11	00/00	DISTRICT RESERVES RIGHT TO COLLECT SAMPLES
COC	C82	72	87/11	00/00	MINIMUM AQUIFER LEVEL MAY BE SET

REPORT NUMBER 41-099 DATE 83/08/24

PERMIT NUM	STAT	NAME	ADDRESS	CITY	ST	ZIP
06713 00	P	TAMPA WATER DEPT, CITY OF	1 CITY HALL PLAZA, 5TH FLOOR	TAMPA	FL	33602

BASIN	COUNTY
HILLSBOROUGH	HILLSBOROUGH

PERMITTED AVG	PERMITTED MAX	NUM USES	NUM GWD PTS	NUM SWD PTS	TOT-ACRES	SEC/TWNSHP/RGE	EXPIRE DATE
58,000	100,000	1	1	0	48.0	06 29 20	83/05/05

	WC TYPE	W/LAT	W/LONG	SOURCE NAME	DIAMETER	WD PER AVG	WD PER MAX	W/C DESCRIPTION
WD#001	G	275854	822008		6	58,000	100,000	PUBLIC SUPPLY

	USE CODE	USE DESCRIPTION	USE PUMPAGE	USE ACRES
USE#01	009	INDIVIDUAL SEPTIC TANKS	58,000	0.0

WELL NUM	STIP CODE	FREQ CODE	DUE DATE	NEXT DUE	DESCRIPTION
COC	C70	06	82/11	00/00	METER CONNECTIONS; DATA AVAILABLE ON REQUEST
COC	D73	06	82/11	00/00	DISTRICT RESERVES RIGHT TO COLLECT SAMPLES
000	082	06	83/05	00/00	MINIMUM AQUIFER LEVEL MAY BE SET
COO	095	06	82/11	00/00	DISTRICT RESERVES RIGHT TO REQUIRE PUMPAGE RECORDS
COC	C97	06	82/11	00/00	WATER CONSERVATION METHODS

REPORT NUMBER 41-099 DATE 83/08/24

PERMIT NUM	STAT	NAME	ADDRESS	CITY	ST	ZIP
06783 OC	P	DAVIS, ALVIN	63 RANCHETTE RD	ZEPHYRHILLS	FL	33599

BASIN	COUNTY
HILLSBOROUGH	HILLSBOROUGH

PERMITTED AVG	PERMITTED MAX	NUM USES	NUM GWD PTS	NUM SWD PTS	TOT-ACRES	SEC/TWNSHP/RGE	EXPIRE DATE
14,400	32,000	1	1	0	6.2	17 29 20	82/11/30

	WD TYPE	W/LAT	W/LONG	SOURCE NAME	DIAMETER	WD PER AVG	WD PER MAX	W/D DESCRIPTION
WD#001	G	275732	821940		6	14,400	32,000	INDUSTRIAL

	USE CODE	USE DESCRIPTION	USE PUMPAGE	USE ACRES
USE#01	890	MISCELLANEOUS (90% CONSUMPTIVE)	14,400	0.0

WELL NUM	STIP CODE	FREQ CODE	DUE DATE	NEXT DUE	DESCRIPTION
000	073	06	82/11	00/00	DISTRICT RESERVES RIGHT TO COLLECT SAMPLES
000	082	06	82/11	00/00	MINIMUM AQUIFER LEVEL MAY BE SET
000	097	06	82/11	00/00	WATER CONSERVATION METHODS

REPORT NUMBER 41-099 DATE 83/08/24

TOTAL SURFACE WITHDRAWALS	0
TOTAL GROUND WITHDRAWALS	83
NUMBER OF USES	23
TOTAL USE ACRES	694.0
TOTAL USE PUMPAGE	14,774,271
TOTAL PERMIT ACRES	3,137.8
PERMITTED AVERAGE PUMPAGE	14,774,271
PERMITTED MAXIMUM PUMPAGE	34,137,400
TOTAL CONSUMPTIVE USE	8,903,897

Appendix 9-3
Surface Water Quality Sampling
Lab Analysis
(Sampling Locations are presented in Section 2.3.4 of the Application)

Orlando Laboratories, Inc.
P. O. Box 19127 • Orlando, Florida 32814 • 305/896-6645

REPORT OF ANALYSIS

Camp Dresser & McKee
Attn: Dana Pedersen
1 Center Plaza
Boston, MA 02108

Report #: 30494 (2732)
Sampled by: OLI-G. Bircher
Date sampled: 10-31-83
Date received: 10-31-83
Date reported: 11-17-83

IDENTIFICATION: Station #1 @ 0940 hrs, Weather conditions: Sunny/no clouds, Water condition: Turbid/grey-white suspended. Water temperature: 24°C, pH: 7.35, Open area, grass field with errosion on culvert.

RESULTS OF ANALYSIS

DETERMINATION	SAMPLE
Turbidity, NTU	196
Total Alkalinity, $CaCO_3$	29
Ammonia Nitrogen, N (NH_3-N)	0.08
Total Kjeldahl Nitrogen, TKN	1.1
Nitrate Nitrogen, N (NO_3-N)	0.10
Nitrite Nitrogen, N (NO_2-N)	<0.01
Total Phosphate, P (T-PO_4-P)	0.58
Total Suspended Solids, TSS	27
Dissolved Oxygen, DO (Field-Fixed)	10.1
Total Hardness, $CaCO_3$	111

SIEVE SIZING

Percentages expressed as dry weight basis. Sample sediments dried at 105°C for 24 hours. Percentage of sample sediment retained at given sieve sizes:

Sieve Size:	Percentage retained:
#20	0.364
#40	9.09
#70	62.3
#140	26.0
#200	1.93
Percent passed through #200 sieve	0.176

Results expressed in mg/l unless otherwise designated. < = Less Than
Our Florida Department of Health & Rehabilitative Service Identification Number is 83141.

Respectfully submitted,
ORLANDO LABORATORIES, INC.

Chemist/Biologist Chemist/Biologist Chemist/Biologist

REPORT OF ANALYSIS

Camp Dresser & McKee
Attn: Dana Pedersen
1 Center Plaza
Boston, MA 02108

Report #: 30494 (2732)
Sampled by: OLI-G. Bircher
Date sampled: 10-31-83
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Date reported: 11-17-83

IDENTIFICATION: Station #1 @ 0940 hrs, Weather conditions: Sunny/no clouds, Water condition: Turbid/grey-white suspended. Water temperature: 24°C, pH: 7.35, Open area, grass field with errosion on culvert.

RESULTS OF ANALYSIS

Benthic counts based on a single grab (6" X 6") per sampling site.

ORGANISM	# INDIVIDUALS	SHANNON SPECIES DIVERSITY INDEX
Chironomus	8	
Hyallela azteca	2	
Lumbriculus inconstans	5	
Tubifex	2	
		0.528

Results expressed in mg/l unless otherwise designated. < = Less Than
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Chemist/Biologist Chemist/Biologist Chemist/Biologist

EPORT OF ANALYSIS

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1 Center Plaza
Boston, MA 02108

Report #: 30494 (2732)
Sampled by: OLI-G. Bircher
Date sampled: 10-31-83
Date received: 10-31-83
Date reported: 11-17-83

IDENTIFICATION: Station #2 @ 1040 hrs, Weather conditions: Sunny/no clouds, Water condition: Clear. Wooded area. Water temperature: 22.5°C, pH: 6.90.

RESULTS OF ANALYSIS

DETERMINATION	SAMPLE
Turbidity, NTU	4.9
Total Alkalinity, $CaCO_3$	151
Ammonia Nitrogen, N (NH_3-N)	0.31
Total Kjeldahl Nitrogen, TKN	0.77
Nitrate Nitrogen, N (NO_3-N)	0.03
Nitrite Nitrogen, N (NO_2-N)	<0.01
Total Phosphate, P (T-PO_4-P)	0.15
Total Suspended Solids, TSS	9.0
Dissolved Oxygen, DO (Field-Fixed)	2.60
Total Hardness, $CaCO_3$	238

SIEVE SIZING

Percentages expressed as dry weight basis. Sample sediments dried at 105°C for 24 hours. Percentage of sample sediment retained at given sieve sizes:

Sieve Size:	Percentage retained:
#20	0.866
#40	12.9
#70	57.5
#140	26.6
#200	1.90
Percent passed through #200 sieve	0.186

Results expressed in mg/l unless otherwise designated. < = Less Than
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ORLANDO LABORATORIES, INC.

Chemist/Biologist / Chemist/Biologist / Chemist/Biologist

REPORT OF ANALYSIS

Camp Dresser & McKee
Attn: Dana Pedersen
1 Center Plaza
Boston, MA 02108

Report #: 30494 (2732)
Sampled by: OLI-G. Bircher
Date sampled: 10-31-83
Date received: 10-31-83
Date reported: 11-17-83

IDENTIFICATION: Station #2 @ 1040 hrs, Weather conditions: Sunny/no clouds, Water condition: Clear. Wooded area. Water temperature: 22.5°C, pH: 6.90.

RESULTS OF ANALYSIS

Benthic counts based on a single grab (6" X 6") per sampling site.

ORGANISM	# INDIVIDUALS	SHANNON SPECIES DIVERSITY INDEX
Chironomus	2	
Pentaneura monilis	2	
Stenelmis	10	
Caenis diminuta	9	
Lumbriculus inconstans	9	
(Bivalve) too immature to identify	2	
		0.762

3 Gambusia affinis also collected in sample.

Results expressed in mg/l unless otherwise designated. < = Less Than
Our Florida Department of Health & Rehabilitative Service Identification Number is 83141.

Respectfully submitted,
ORLANDO LABORATORIES, INC.

Chemist/Biologist Chemist/Biologist Chemist/Biologist

REPORT OF ANALYSIS

Camp Dresser & McKee
Attn: Dana Pedersen
1 Center Plaza
Boston, MA 02108

Report #: 30494 (2732)
Sampled by: OLI-G. Bircher
Date sampled: 10-31-83
Date received: 10-31-83
Date reported: 11-17-83

IDENTIFICATION: Station #3 @ 1240 hrs, Weather conditions: Sunny/no clouds, Water Temperature: 22°C, pH: 7.2, Cow pasture ditches, soft ground, black muck ditch, turbid water, large amount of leaf matter (detritus), Laural oaks predominant, scrub forest fauna, cattle feces present.

RESULTS OF ANALYSIS

DETERMINATION	SAMPLE
Turbidity, NTU	31
Total Alkalinity, $CaCO_3$	92
Ammonia Nitrogen, N (NH_3-N)	0.29
Total Kjeldahl Nitrogen, TKN	1.2
Nitrate Nitrogen, N (NO_3-N)	0.28
Nitrite Nitrogen, N (NO_2-N)	<0.01
Total Phosphate, P (T-PO_4-P)	2.0
Total Suspended Solids, TSS	60
Dissolved Oxygen, DO (Field-Fixed)	4.80
Total Hardness, $CaCO_3$	182

Benthic counts based on a single grab (6" X 6") per sampling site.

ORGANISM	# INDIVIDUALS	SHANNON SPECIES DIVERSITY INDEX
Perithemis domitia	1	
Lumbriculus inconstans	16	
Actinolaimus	23	
Pentaneura monilis	1	
		0.378

Results expressed in mg/l unless otherwise designated. < = Less Than
Our Florida Department of Health & Rehabilitative Service Identification Number is 83141.

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ORLANDO LABORATORIES, INC.

Chemist/Biologist Chemist/Biologist Chemist/Biologist

REPORT OF ANALYSIS

Camp Dresser & McKee
Attn: Dana Pedersen
1 Center Plaza
Boston, MA 02108

Report #: 30494 (2732)
Sampled by: OLI-G. Bircher
Date sampled: 10-31-83
Date received: 10-31-83
Date reported: 11-17-83

IDENTIFICATION: Station #4 @ 1300 hrs, Weather conditions: Sunny/no clouds, Water Temperature: 22°C, pH: 7.9, Cow pasture ditches, soft ground, black muck ditch, white-grey turbid water, large amount of leaf matter (detritus), Laural oaks predominant, scrub forest fauna, cattle feces present, second feed in ditch.

RESULTS OF ANALYSIS

DETERMINATION	SAMPLE
Turbidity, NTU	126
Total Alkalinity, $CaCO_3$	33
Ammonia Nitrogen, N (NH_3-N)	0.43
Total Kjeldahl Nitrogen, TKN	1.4
Nitrate Nitrogen, N (NO_3-N)	0.07
Nitrite Nitrogen, N (NO_2-N)	<0.01
Total Phosphate, P (T-PO_4-P)	0.38
Total Suspended Solids, TSS	61
Dissolved Oxygen, DO (Field-Fixed)	6.40
Total Hardness, $CaCO_3$	85.6

Benthic counts based on a single grab (6" X 6") per sampling site.

ORGANISM	# INDIVIDUALS	SHANNON SPECIES DIVERSITY INDEX
Tupifex	2	
Lumbriculus inconstans	6	
		0.244

Results expressed in mg/l unless otherwise designated. < = Less Than
Our Florida Department of Health & Rehabilitative Service Identification Number is 83141.

Respectfully submitted,
ORLANDO LABORATORIES, INC.

Chemist/Biologist / Chemist/Biologist / Chemist/Biologist

REPORT OF ANALYSIS

Camp Dresser & McKee
Attn: Dana Pedersen
1 Center Plaza
Boston, MA 02108

Report #: 30494 (2732)
Sampled by: OLI-G. Bircher
Date sampled: 10-31-83
Date received: 10-31-83
Date reported: 11-17-83

IDENTIFICATION: Station #5 @ 1430 hrs, Weather conditions: Sunny/no clouds, Water Temperature: 24°C, pH: 7.4, culvert near Tampa By-pass canal, hard bottom, possible lime or clay substrate, sampled with Kemmerer for water sample from roadway, Ekman grab sample taken from side of ditch, white-grey clay sediment, very hard, small amount of sample taken.

RESULTS OF ANALYSIS

DETERMINATION	SAMPLE
Turbidity, NTU	39
Total Alkalinity, $CaCO_3$	129
Ammonia Nitrogen, N (NH_3-N)	0.16
Total Kjeldahl Nitrogen, TKN	1.2
Nitrate Nitrogen, N (NO_3-N)	2.2
Nitrite Nitrogen, N (NO_2-N)	0.04
Total Phosphate, P (T-PO_4-P)	0.50
Total Suspended Solids, TSS	26
Dissolved Oxygen, DO (Field-Fixed)	8.35
Total Hardness, $CaCO_3$	227

Benthic counts based on a single grab (6" X 6") per sampling site.

ORGANISM	# INDIVIDUALS	SHANNON SPECIES DIVERSITY INDEX
No macroinvertebrates found.		0

Results expressed in mg/l unless otherwise designated. < = Less Than
Our Florida Department of Health & Rehabilitative Service Identification Number is 83141.

Respectfully submitted,
ORLANDO LABORATORIES, INC.

Chemist/Biologist / Chemist/Biologist / Chemist/Biologist

Appendix 10
Soils and Related Geotechnical Information

Appendix 10-1
Summary of Important Soil Characteristics

SUMMARY OF IMPORTANT CHARACTERISTICS

Map symbol	Soil	Relief or percent slopes	Drainage		Reaction	Surface soil	Lower layers	Principal uses	Principal native vegetation	Capability unit
			Surface runoff	Internal						
Aa	Adamsville fine sand	0-2	Slow	Rapid when freed of the high water table.	Slightly acid to neutral or alkaline.	Dark-gray to gray fine sand, 3 to 8 inches thick.	Light-gray to brownish-yellow fine sand.	Vegetables, truck crops, pasture, and forest.	Pines; saw-palmettos; cabbage palmettos; wiregrass.	IVs-2.
Ab	Alachua loamy fine sand	0-2	Medium	Medium	Medium acid	Very dark grayish-brown to grayish-brown loamy fine sand, 6 to 8 inches thick. Contains a few small pebbles.	Dark-brown or pale-brown to yellowish-brown, brown, or strong-brown loamy fine sand. Contains a few small pebbles.	General crops, a few acres of vegetables, and pasture.	Hardwoods; a few shrubs and grasses.	IIw-1.
Ac	Alluvial land	Nearly level	Very slow	Very slow	Strongly acid to neutral or alkaline.	Variable	Variable	Forest, pasture, and refuges for wildlife.	Hammock vegetation of hardwoods; shrubs; vines; cypress; a few pines.	Vw-1.
Ad	Arredondo fine sand: Level phase	0-2	Medium	Rapid	Medium to slightly acid.	Very dark grayish-brown to grayish-brown fine sand, 6 to 8 inches thick. Contains a few small pebbles.	Dark yellowish-brown to yellowish-brown or brownish-yellow fine sand. Contains a few phosphatic pebbles.	Citrus fruits, general crops, pasture, and forest.	Pines; live and blue-jack oaks; hickory; various grasses.	IIIs-1.
Ae	Gently undulating phase.	2-8	Medium to rapid.	Rapid	Same	Same	Same	Citrus fruits, general crops, vegetables, pasture, and forest.	Same	IIIs-1.
Ba	Blanton fine sand: Level phase	0-2	Slow	Rapid	Medium acid	Dark-gray or gray fine sand, 4 to 8 inches thick.	Grayish-brown or light brownish-gray to very pale brown or light-gray fine sand, lower part splotched with pale yellow or yellow.	Citrus fruits, general crops, vegetables, pasture, and forest.	Oaks; pines; a few saw-palmettos; grasses.	IIIs-1.
Bb	Gently undulating phase.	2-5	Medium to rapid.	Rapid	Medium acid	Same	Same	Same	Same	IIIs-1.
Bc	Undulating phase	5-12	Rapid	Rapid	Medium acid	Same	Same	Forest, pasture, citrus fruits, and general crops.	Same	IIIs-1.
Bd	Brown-layer phase	0-2	Slow	Medium.	Medium acid	Same	Gray or light brownish-gray fine sand over dark grayish-brown, organic stained layer; grayish-brown or pale-brown to very pale brown or light-gray fine sand, splotched with yellow at depths between 22 and 42 inches.	Pasture, general crops, and forest.	Oaks; a few pines and saw-palmettos; grasses.	IIIs-1.
Be	Blichton fine sand	0-8	Slow to medium.	Slow to medium.	Medium acid to strongly acid.	Dark-gray fine sand, 6 to 9 inches thick.	Grayish-brown or gray fine sand, containing a few pebbles and rounded stones, to mottled light yellowish-brown and yellow fine sandy clay or fine sandy clay loam con-	General crops, citrus fruits, pasture, and forest.	Hardwoods; pines; a few cabbage palmettos and saw-palmettos; grasses.	IIc-1.

Map symbol	Soil	Relief or percent slopes	Drainage		Reaction	Surface soil	Lower layers	Principal uses	Principal native vegetation	Capability unit
			Surface runoff	Internal						
							taining many pebbles and rounded stones.			
Bf	Bradenton fine sand	0–2	Same	Same	Sand layers strongly acid to medium acid; clayey materials slightly acid to neutral.	Dark-gray fine sand, 4 to 9 inches thick.	Light grayish-brown or light-gray to pale-brown or grayish-brown fine sand over grayish-brown fine sandy clay; light-gray marl at depths between 32 and 42 inches.	Vegetables, truck crops, pasture, and forest.	Live oak; cabbage palmettos and saw-palmettos; pines; vines; shrubs; a few grasses.	IIIs–2.
Bg	Thin surface phase	0–2	Same	Slow	Same	Same	Light grayish-brown or light-gray to pale-brown or grayish-brown fine sand over grayish-brown fine sandy clay at depths within 18 inches of the surface; gray marl at depths between 20 and 30 inches.	Pasture and forest.	Live oak, gum, elm, hickory, magnolia, and cabbage palmettoes; rank growth of saw-palmettos, shrubs, and vines; a few grasses.	IIIs–2.
Bh	Brighton peat	Nearly level or slightly depressed.	Very slow or ponded.	Slow	Strongly to very strongly acid.	Very dark brown fibrous peat.	Dark grayish-brown or brown fibrous peat, underlain by dark-gray or gray fine sand at depths between 20 and 48 inches.	Pasture and truck crops; used as organic fertilizer or as filler in mixed fertilizer.	Water plants and grasses.	IIIs–4.
Bk	Brighton mucky peat	Same	Same	Slow	Same	Black nonfibrous mucky peat.	Dark-brown or grayish-brown fibrous felty peat underlain at depths between 15 and 40 inches by gray or light-gray fine sand.	Same	Same	IIIs–4.
Bl	Broward fine sand	0–2	Slow	Medium to rapid if freed of high water table.	Sand layers slightly acid to alkaline.	Dark-gray or gray fine sand, 3 to 8 inches thick.	Light-gray to yellowish-brown fine sand. Limestone at 12 to 36 inches.	Pasture and forest.	Second-growth pine; cabbage palmettos, saw-palmettos, and runner oaks; gallberry and other shrubs; wiregrass.	IVs–2.
Ca	Charlotte fine sand	Level or slightly depressed.	Very slow or ponded.	Rapid when freed of high water table.	Same	Grayish-brown fine sand, 3 to 8 inches thick.	Yellowish-brown to brownish-yellow fine sand at depths of 12 to 24 inches over light-gray or white fine sand, underlain by limestone or marl.	Pasture and a few acres of vegetables.	Grasses; a few pines; cabbage palmettos.	IVs–3.
Da	Delray fine sand	Same	Same	Same	Same	Black fine sand, 7 to 20 inches thick.	Very dark gray or dark-gray to light-gray or gray fine sand, lower part streaked with pale yellow and brown.	Same	Grasses; gallberry and myrtle bushes; a few cabbage palmettes; pines; hardwoods.	IIIs–3.
Db	Shallow phase	Same	Same	Same	Same	Same	Dark-gray to gray or light-gray fine sand underlain, at depths between 30 and 42 inches, by gray to light-gray fine sandy clay loam or fine sandy clay, mottled with pale	Pasture and a few acres of vegetables and truck crops.	Same	IIIs–3.

SUMMARY OF IMPORTANT CHARACTERISTICS—*Continued*

Map symbol	Soil	Relief or percent slopes	Drainage		Reaction	Surface soil	Lower layers	Principal uses	Principal native vegetation	Capability unit
			Surface runoff	Internal						
							yellow and grayish brown.			
Ea	Eustis fine sand: Level phase	0-2	Slow to medium.	Rapid	Strongly acid	Dark grayish-brown or grayish-brown fine sand, 2 to 6 inches thick.	Strong-brown to reddish-yellow, or yellowish-red loose fine sand.	Citrus fruits, pasture, and a few acres of watermelons and general crops.	Oaks; sand pines; a few saw-palmettos; rosemary; grasses.	IIIs-1.
Eb	Gently undulating phase.	2-8	Medium to rapid.	Rapid	Strongly acid	Same	Same	Same	Same	IIIs-1.
Fa	Felda fine sand	Level or slightly depressed.	Very slow or ponded.	Medium when freed of high water table.	Sand layers slightly acid; clayey materials slightly acid to alkaline.	Very dark gray or dark-gray fine sand, 3 to 9 inches thick.	Grayish-brown to light-gray fine sand over slightly mottled light brownish-gray or light-gray fine sandy clay loam; mottled light-gray, brownish-yellow, and yellow fine sandy clay loam containing a few lime and iron concretions at depths between 30 and 48 inches.	Pasture, vegetables, truck crops, and forest.	Grasses; a few pines; saw-palmettos, cabbage palmettos; gallberry bushes, myrtle bushes, and other shrubs.	IIIs-3.
Fb	Fellowship loamy fine sand.	0-8	Medium	Slow	Strongly acid	Very dark gray loamy fine sand containing a few pebbles; 4 to 8 inches thick.	Dark-gray loamy fine sand containing many pebbles to mottled gray, yellowish-brown, and yellow fine sandy clay, containing many pebbles and stones.	Pasture, general crops, forest.	Live oaks; pines; shrubs; grasses.	IIc-1.
Fc	Fort Meade loamy fine sand: Level phase	0-2	Slow to medium.	Medium to rapid.	Medium acid	Black loamy fine sand containing a few phosphatic pebbles; 10 to 20 inches thick.	Dark grayish-brown to grayish-brown or brown loamy fine sand containing many pebbles and small rounded stones in lower part.	Citrus fruits, vegetables, general crops, improved pasture, forest.	Oaks; hickory and other hardwoods; pines; grasses.	IIs-2.
Fd	Undulating phase	2-12	Medium to rapid.	Medium to rapid.	Medium acid	Same	Same	Same	Same	IIs-2.
Fe	Fresh water swamp (unclassified soils).	Level or depressions.	Soil covered by water during much of year.	Medium to rapid if freed of high water table.	Variable	Variable	Variable	Forest, refuges for wildlife.	Hardwoods; cypress; vines; shrubs; grasses.	Unclassified.
Ga	Gainesville loamy fine sand: Level phase	0-2	Slow to medium.	Medium to rapid.	Medium acid	Very dark grayish-brown loamy fine sand containing a few small phosphatic pebbles; 6 to 9 inches thick.	Dark-brown to strong-brown loamy fine sand containing a few pebbles and small stones.	Citrus fruits, general crops, improved pasture, forest.	Oaks; hickory; magnolia; pines; shrubs; grasses.	IIs-2.
Gb	Gently undulating phase.	2-5	Rapid	Medium to rapid.	Medium acid	Same	Same	Same	Same	IIs-2.

SUMMARY OF IMPORTANT CHARACTERISTICS—*Continued*

Map symbol	Soil	Relief or percent slopes	Drainage		Reaction	Surface soil	Lower layers	Principal uses	Principal native vegetation	Capability unit
			Surface runoff	Internal						
Ia	Immokalee fine sand	0–2	Slow	Medium to rapid when freed of high water table.	Strongly to very strongly acid.	Dark-gray fine sand, 3 to 8 inches thick.	Gray to light-gray fine sand, between depths of 30 and 42 inches, overlying a very dark brown fine sand, weakly cemented layer grading to lighter color with depth.	Pasture, forest, and a few acres of vegetables.	Second-growth pine; saw-palmettos; runner oak; gallberry bushes; grasses.	IVs-2.
Ib	Alkaline variant	0–2	Slow	Same	Upper part of profile strongly to very strongly acid; lower part, immediately below the hardpan, neutral to alkaline.	Same	Same	Pasture and forest.	Pines; saw-palmettos; shrubs; grasses.	IVs-2.
Ic	Istokpoga peat	Level or slightly depressed.	Very slow or ponded.	Slow	Strongly to very strongly acid.	Black or very dark brown woody peat, 8 to 15 inches thick.	Dark reddish-brown to dark-brown woody peat underlain by gray or light-gray fine sand at depths of 30 to 60 inches.	Pasture, forest, and wildlife.	White and red bays; cypress; maple and other hardwoods; myrtle bushes; briers; vines; ferns; grasses.	IVs-4.
Id	Istokpoga mucky peat	Same	Same	Slow	Same	Black mucky peat, 6 to 10 inches thick.	Dark grayish-brown or reddish-brown woody peat over gray or light-gray fine sand.	Same	Same	IVs-4.
Ka	Kanapaha fine sand	0–2	Slow to medium.	Slow to medium.	Strongly acid	Dark-gray fine sand, 3 to 6 inches thick.	Light-gray or light yellowish-brown to very pale brown fine sand containing a few pebbles. Streaked in lower part with yellowish brown and brownish yellow.	Vegetables, citrus fruits, pasture, and forest.	Gums; hickory; magnolia; oak; cabbage palmettos; saw-palmettos; pines; grasses.	IIIs-1.
Kb	Keri fine sand	0–2	Slow	Medium	Fine sand layers strongly acid to slightly acid. Marl layer strongly alkaline and overlies neutral to mildly alkaline fine sand.	Dark-gray or gray fine sand, 3 to 8 inches thick.	Light-gray or light brownish-gray fine sand over light-gray marl, streaked in places with yellow. Underlying layer mottled light-gray, brownish-yellow, and yellow fine sand.	Pasture, forest, and a few acres of vegetables.	Pines; runner oak; gallberry bushes; saw-palmettos; a few cabbage palmettos; grasses.	IVs-2.
Lb	Lakeland fine sand: Level phase	0–2	Slow to medium.	Rapid	Strongly to very strongly acid.	Dark-gray fine sand, 3 to 8 inches thick.	Yellowish-brown or brownish-yellow to light yellowish-brown loose fine sand.	Citrus fruits, watermelons, general crops, pasture, and forest.	Pines; a few shrubs and grasses; and bluejack oaks.	IIIs-1.
Ld	Gently undulating phase.	2–5	Medium to rapid.	Rapid	Same	Same	Same	Same	Same	IIIs-1.
Le	Undulating phase	5–8	Rapid	Rapid	Same	Same	Same	Same	Oaks; a few pines; shrubs; grasses.	IIIs-1.

SUMMARY OF IMPORTANT CHARACTERISTICS—*Continued*

Map symbol	Soil	Relief or percent slopes	Drainage		Reaction	Surface soil	Lower layers	Principal uses	Principal native vegetation	Capability unit
			Surface runoff	Internal						
Lo	Shallow phase	0–5	Slow to medium.	Rapid through sandy layer; medium to slow through clayey materials.	Same	Same	Yellowish-brown to brownish-yellow fine sand underlain at depths of 30 to 42 inches by fine sandy clay loam or sandy clay.	Citrus fruits, general crops, and pasture.	Same	IIIs–1.
Lc	Level deep phase	0–5	Slow to rapid.	Rapid	Same	Gray or light-gray fine sand, 4 to 8 inches thick.	Yellowish-brown to pale-yellow fine sand; finer textured materials at depths greater than 72 inches.	Pasture	Scrub live oaks; a few turkey oaks; sand pines; rosemary; grasses.	IIIs–1.
Lf	Undulating deep phase	Undulating	Same	Rapid	Same	Same	Same	Pasture	Scrub live oaks; sand pines; rosemary; saw-palmettos; a few grasses.	IIIs–1.
Lg	Lakewood fine sand	0–2	Very slow because of rapid infiltration.	Medium to rapid.	Strongly acid throughout.	Light-gray or gray fine sand, 2 to 4 inches thick.	White fine sand to depths of 12 to 24 inches over yellow or brownish-yellow fine sand that grades to light gray and white with increasing depth.	Pasture, forest, and building sites.	Sand pine; scrub oak; undergrowth of saw-palmettos, rosemary, runner oak, pricklypear cactus, and wiregrass; few turkey and bluejack oaks.	IVs–1.
Lh	Leon fine sand	0–2	Slow	Medium to rapid if freed of high water table.	Very strongly acid.	Dark-gray fine sand, 3 to 8 inches thick.	Light-gray fine sand over the very dark grayish-brown or black pan that begins at depths of 14 to 30 inches; dark-brown to yellowish-brown fine sand below the organic pan.	Pasture, forest, vegetables, and strawberries.	Second-growth pine; saw-palmettos; a few gallberry bushes and runner oaks; wiregrass.	IVs–2.
Ll	Heavy substratum phase.	0–2	Slow	Same	Strongly acid; lower part of clayey material strongly acid to neutral or alkaline.	Same	Light-gray fine sand over very dark grayish-brown organic pan that begins at depths of 24 to 32 inches; light-gray to yellowish-brown sandy clay loam or sandy clay below organic pan.	Pasture and forest.	Pine; runner oaks, gallberry bushes, a few myrtle bushes; grasses.	IVs–2.
Lk	Light-colored surface phase.	0–2	Slow to medium.	Same	Very strongly acid.	Light-gray or gray fine sand, 1 to 3 inches thick.	Light-gray fine sand over the very dark grayish-brown or black organic pan; dark-brown to yellowish-brown fine sand below the pan.	Pasture and forest.	Pines; saw-palmettos; a few gallberry bushes and runner oaks; wiregrass.	Vs–1.
Ma	Made land	Variable	Variable	Variable	Variable	Variable	Variable	Roadbuilding material, building sites, pasture, and forest.	Pines; grasses	Unclassified.

Map symbol	Soil	Relief or percent slopes	Drainage		Reaction	Surface soil	Lower layers	Principal uses	Principal native vegetation	Capability unit
			Surface runoff	Internal						
Mc	Manatee fine sandy loam	Level or slightly depressed.	Very slow or ponded.	Medium to slow when freed of high water table.	Upper layers slightly acid to neutral; lower layers neutral to alkaline.	Black fine sandy loam, 6 to 15 inches thick.	Black or very dark gray to mottled dark-gray or gray fine sandy clay underlain at depths within 42 inches by light-gray marl, streaked with pale yellow and gray.	Vegetables, pasture, and forest.	Hardwoods; cypress; a few cabbage palmettos; vines; shrubs; grasses; aquatic plants.	IIIs-3.
Md	Manatee loamy fine sand	Same	Same	Same	Same	Black loamy fine sand, 9 to 20 inches thick.	Dark-gray or very dark gray fine sandy clay loam to mottled gray or light-gray fine sandy clay, in places underlain by marl that begins at depths of 30 to 36 inches.	Pasture, vegetables, and forest.	Hammock vegetation of oaks; cabbage palmettos; saw-palmettos; a few pines and cypress trees; aquatic plants.	IIIs-3.
Mb	Manatee fine sandy clay, heavy variant.	Same	Very slow	Very slow	Upper layers slightly acid to neutral; lower layer alkaline.	Very dark gray or dark-gray fine sandy clay, 8 to 14 inches thick.	Gray or grayish-brown fine sandy clay, or streaked or mottled gray or grayish-brown fine sandy clay.	Pasture and forest.	Grasses; shrubs; a few pines and hardwoods.	IIIs-3.
Me	Mines, pits, and dumps	Variable	Variable	Variable	Variable	Variable	Variable	Variable	Pines; saw-palmettos; shrubs; grasses	Unclassified.
Mf	Mixed alluvium, high bottom phase.	0-2	Slow	Slow to medium.	Upper layers slightly acid; lower layers strongly acid to neutral or mildly alkaline.	Dark-gray fine sand, 3 to 8 inches thick.	Grayish-brown to light-gray or very pale brown fine sand overlying mottled gray, light-gray, and yellowish-brown fine sandy clay loam; light brownish-gray fine sand at depths between 20 and 38 inches.	Pasture and forest.	Oaks; pines; saw-palmettos; shrubs; grasses.	IVs-2.
Oa	Ona fine sand	0-2	Slow	Rapid if freed of high water table.	Strongly acid	Dark gray to black fine sand, 6 to 12 inches thick.	Dark-brown fine sand, color grading to light yellowish brown, and light gray with increasing depth.	Vegetables, strawberries, pasture, forest, and citrus fruits.	Pines; saw-palmettos; gallberry and myrtle bushes; grasses.	IIs-1.
Ob	Light-colored surface phase.	0-2	Slow	Same	Strongly acid	Light-gray to gray fine sand, 4 to 10 inches thick.	Same	Pasture, vegetables, strawberries, citrus fruits, and forest.	Pines; oaks; saw-palmettos; grasses.	IIIs-2.
Oc	Orlando fine sand	0-2	Slow	Rapid	Strongly acid	Very dark gray fine sand, 9 to 15 inches thick.	Dark grayish-brown to yellowish-brown or light yellowish-brown fine sand.	Citrus fruits, vegetables, general crops, pasture, and forest.	Oaks; pines; grasses	IIIs-1.
Pa	Pamlico muck	Level or depressed.	Very slow or ponded. Covered by water much of the time.	Medium when freed of the high water table.	Strongly acid	Black muck, 6 to 15 inches thick.	Black muck or mucky fine sand over dark-gray or gray fine sand, color grading to light gray with increasing depth.	Pasture, wildlife	Aquatic plants	IIIs-4.

SUMMARY OF IMPORTANT CHARACTERISTICS—*Continued*

Map symbol	Soil	Relief or percent slopes	Drainage		Reaction	Surface soil	Lower layers	Principal uses	Principal native vegetation	Capability unit
			Surface runoff	Internal						
Pb	Parkwood fine sand	0–2	Slow	Medium to slow.	Sand layers slightly acid to mildly alkaline; marl slightly alkaline.	Dark-gray or grayish-brown fine sand, 4 to 8 inches thick.	Gray to light brownish-gray fine sand over light-gray marl.	Vegetables, pasture, and forest.	Cabbage palmettos; oaks and other hardwoods; pines; vines; bamboo briers; a few saw-palmettos.	IIIs–2.
Pc	Peace River soils	0–2	Slow	Slow	Loamy fine sand layers slightly acid to neutral; clayey materials neutral to alkaline.	Black loamy fine sand, 8 to 14 inches thick.	Very dark gray or very dark grayish-brown loamy fine sand over dark-gray fine sandy clay streaked in a few places with yellowish brown; mottled gray, light-gray, and yellowish-brown fine sandy clay at depths between 26 and 40 inches.	Pasture, forest, wildlife.	Hardwoods; cypress; cabbage palmettos; vines; shrubs; grasses.	Unclassified.
Pd	Plummer fine sand	Nearly level or slightly depressed.	Very slow or ponded; sometimes under water.	Rapid when freed of high water table.	Strongly acid	Dark-gray or gray fine sand, 4 to 8 inches thick.	Light brownish-gray to light-gray or very pale brown fine sand.	Pasture and forest.	Grasses; a few saw-palmettos; shrubs; and pines.	IVs–3.
Pe	Shallow phase	Same	Same	Same	Strongly acid	Same	Same	Pasture and forest.	Same	IVs–3.
Pf	Pomello fine sand	0–2	Slow to medium.	Rapid	Strongly acid	Gray or dark-gray fine sand, 3 to 6 inches thick.	Light-gray through white fine sand to depths of 42 inches.	Pasture, gladioli, and building sites.	Saw-palmettos; oaks; grasses.	Vs–1.
Pg	Pompano fine sand	Level or nearly level.	Slow or ponded; sometimes covered by water.	Rapid when freed of high water table.	Upper part slightly acid to neutral; lower part neutral to alkaline.	Dark-gray or dark grayish-brown fine sand, 4 to 8 inches thick.	Grayish-brown to light brownish-gray or light-gray fine sand.	Pasture, vegetables, truck crops.	Grasses; pines; cabbage palmettos; saw-palmettos.	IVs–3.
Ph	Shallow phase	Level areas or slightly depressed.	Same	Rapid to medium when freed of high water table.	Same	Same	Grayish-brown to light brownish-gray or light-gray fine sand underlain, at depths between 30 and 42 inches, by grayish-brown to light-gray fine sandy clay loam or fine sandy clay, mottled yellowish brown and yellow.	Pasture and vegetables.	Same	IVs–3.
Pk	Portsmouth fine sand	Level or slightly depressed.	Very slow or ponded.	Medium to slow when freed of high water table.	Strongly acid	Black to very dark gray fine sand, 10 to 15 inches thick.	Gray to light-gray fine sand over mottled light-gray, yellowish-brown, and yellow fine sandy clay loam.	Pasture, forest, and vegetables.	Grasses; shrubs; pines; a few cypress and hardwood trees.	IVs–3
Pl	Portsmouth mucky fine sand.	Same	Same	Same	Strongly acid	Black to very dark gray mucky fine sand, 8 to 15 inches thick.	Very dark gray or black fine sand, underlain by gray and yellowish-brown fine sandy clay or fine sandy clay loam.	Same	Grasses; shrubs; hardwoods; vines.	IVs–3.

SUMMARY OF IMPORTANT CHARACTERISTICS—*Continued*

Map symbol	Soil	Relief or percent slopes	Drainage		Reaction	Surface soil	Lower layers	Principal uses	Principal native vegetation	Capability unit
			Surface runoff	Internal						
Ra	Rains fine sand	Same	Very slow	Medium when freed of high water table.	Strongly acid	Dark-gray or gray fine sand, 4 to 8 inches thick.	Light-gray or light brownish-gray fine sand over gray or grayish-brown fine sandy clay, streaked with strong brown and yellow; mottled light brownish-gray fine sandy clay at depths between 28 and 48 inches.	Same	Grasses; shrubs; a few pines.	IVs-3.
Rb	Ruskin fine sand	Level or nearly level.	Slow	Same	Medium acid in upper part to slightly acid or neutral in lower part.	Dark-gray fine sand, 4 to 9 inches thick.	Light-gray fine sand, over mottled brownish-yellow or yellowish-brown fine sandy clay loam; white and pale-yellow shell marl at depths between 24 and 42 inches.	Vegetables, truck crops, pasture, and forests.	Pines; saw-palmettos; runner oaks; grasses.	IIIs-2.
Rc	Rutlege fine sand	Nearly level or slightly depressed.	Very slow to ponded.	Rapid when freed of high water table.	Strongly acid	Black fine sand, 9 to 15 inches thick.	Very dark gray to dark-gray fine sand over mottled light-gray, pale-yellow, and brownish-yellow fine sand.	Pasture, vegetables, and strawberries.	Grasses; shrubs; pines; hardwoods; cypress trees.	IIIs-3.
Rd	Shallow phase	Same	Same	Moderate when freed of high water table.	Strongly acid	Same	Very dark gray to light gray or light brownish-gray fine sand over mottled grayish-brown, light olive-brown, and yellowish-brown fine sandy clay at depths between 30 and 42 inches.	Same	Same	IIIs-3.
Re	Rutlege mucky fine sand.	Same	Same	Rapid when freed of high water table.	Strongly acid	Black mucky fine sand, 6 to 15 inches thick.	Black or very dark gray fine sand, grading to lighter colors with increasing depth.	Same	Grasses; shrubs; cypress and hardwood trees.	IIIs-3.
Sd	St. Lucie fine sand	Nearly level	Very slow because of rapid infiltration.	Rapid	Strongly acid	Light-gray or gray fine sand, 2 to 4 inches thick.	Light-gray to white fine sand.	Pasture and refuges for wildlife.	Live oaks; sand pines; rosemary; saw-palmettos; prickly-pear cactus; grasses.	VIIs-1.
Sa	Sandy local alluvium	Small depressions on bases of slopes.	Medium to slow.	Rapid	Strongly acid	Very dark gray fine sand, 6 to 12 inches thick.	Gray to mottled very pale brown fine sand.	General crops, pasture.	Oaks; pines; shrubs; grasses.	IIw-1.
Ib	Scranton fine sand	0-2	Slow	Medium if freed of high water table.	Strongly acid	Black fine sand, 9 to 15 inches thick.	Dark grayish-brown to pale-yellow, very pale brown, and brownish-yellow fine sand mottled in lower part.	Vegetables, strawberries, citrus fruits, pasture, forest.	Pine; saw-palmettos; shrubs; grasses.	IIs-1.
Sc	Shallow ponds with grass.	Depressions	Covered by water during much of year.	Covered by water during much of year.	Surface layer strongly acid; lower part strongly acid to alkaline.	Variable	Light-gray or gray fine sand.	Refuges for wildlife, pasture.	Water-tolerant plants.	Unclassified.

SUMMARY OF IMPORTANT CHARACTERISTICS—*Continued*

Map symbol	Soil	Relief or percent slopes	Drainage		Reaction	Surface soil	Lower layers	Principal uses	Principal native vegetation	Capability unit
			Surface runoff	Internal						
Se	Sunniland fine sand: Moderately shallow over marl.	Level or nearly level.	Slow	Medium to slow through the sandy clay loam layer.	Upper part strongly acid; lower part neutral to alkaline.	Dark-gray fine sand, 3 to 8 inches thick.	Light-gray fine sand over mottled yellowish-brown, strong-brown, and light-gray fine sandy clay or fine sandy clay loam; white marl at depths between 40 and 48 inches.	Pasture, forest, vegetables.	Pines; cabbage palmettos; saw-palmettos; oaks; waxmyrtle bushes; grasses.	IIIs-2.
Sf	Shallow over marl	Same	Slow	Medium to slow.	Same	Same	Light-gray fine sand over brown, stained layer; brownish-yellow and yellowish-brown fine sandy clay at depths between 14 and 22 inches, underlain by white marl, streaked with yellow.	Pasture, forest, and vegetables.	Pines; oaks; cabbage palmettos; saw-palmettos; shrubs; grasses.	IIIs-2.
To	Terra Ceia peaty muck	Level or slightly depressed.	Very slow or ponded.	Rapid when freed of high water table. Covered by water for long periods.	Slightly acid to neutral in upper part; neutral or mildly alkaline in lower part.	Black peaty muck, 10 to 15 inches thick.	Black or very dark brown muck over dark gray or very dark gray fine sandy clay loam; light gray fine sandy clay at depths between 20 and 36 inches.	Pasture and vegetables.	Water-tolerant plants	IIIs-4.
Tb	Tidal marsh (unclassified soils).	Level or nearly level.	Covered by high tides.	Covered by high tides.	Variable	Nearly black mucky fine sand to dark-gray fine sand, 3 to 8 inches thick.	Light-gray or gray fine sand, mixed with shells.	Refuges for wildlife.	Salt-tolerant grasses.	Unclassified.
Tc	Tidal swamp (unclassified soils).	Same	Same	Same	Variable	Variable	Light-gray or gray fine sand or sandy clay loam.	Same	Salt-tolerant grasses.	Unclassified.

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Appendix 10-2
Estimated Soil Properties for Engineering

ESTIMATED SOIL PROPE[illegible] FOR ENGINEERING

HILLSBOROUGH COUNTY, FLORIDA

TABLE [illegible]
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Map Symbol	Soil Name	Flood Hazard 1/ (Frequency/ Duration)	Water Table 2/ Seasonally High (Depth and Duration)	Percolation Rate (Min./ In.)	Layer Depth (In.)	Permeability Rate (In./Hr.)	Available Water Holding Capacity (In./In.)
Aa	Adamsville fine sand	Infrequent Brief	Shallow Brief	45	0-42+	6.3	.05
Ab	Alachua loamy fine sand	Frequent Brief	Mod. deep Long	45	0-42+	6.3	.05-.10
Ac	Alluvial land	Frequent Brief	Variable	Variable	0-60	Variable	Variable
Ad	Arredondo fine sand, level	None	Mod. deep Long	45	0-42+	6.3	.05-.10
Ae	Arredondo fine sand, gently undulating	None	Mod. deep Long	45	0-42+	6.3	.05-.10
Ba	Blanton fine sand, level	None	Shallow V. brief	45	0-42+	6.3	.05
Bb	Blanton fine sand, gently undulating	None	Shallow V. brief	45	0-42+	6.3	.05
Bc	Blanton fine sand, undulating	None	Shallow V. brief	45	0-42+	6.3	.05
Bd	Blanton fine sand, brown layer	None	Shallow	45	0-42+	6.3	.05
Be	Blichton fine sand	Infrequent Brief	Shallow V. brief	75	0-8 8-25 25-42+	6.3 2.0-6.3 .06-.20	.05-.10 .05-.10 .15-.20
Bf	Bradenton fine sand	Infrequent Brief	Shallow Brief	45-75	0-22 22-32 32-42+	6.3 .63-2.0 .20-.63	.05-.10 .10-.15 .10-.15

ESTIMATED SOIL PROPERTIES FOR ENGINEERING

HILLSBOROUGH COUNTY, FLORIDA

Map Symbol	Soil Name	Layer Depth (In.)	CLASSIFICATION			Shrink-Swell Potential	Hydrologic Soils Group
			USDA Texture	Unified	AASHO		
Aa	Adamsville fine sand	0-42+	fs	SP-SM	A-3	Low	C
Ab	Alachua loamy fine sand	0-42+	lfs	SM	A-2-3	Low	
Ac	Alluvial land	0-60	Variable	Variable	Variable	Variable	
Ad	Arredondo fine sand, level	0-42+	fs	SP-SM, SM	A-2-4, A-3	Low	A
Ae	Arredondo fine sand, gently undulating						
Ba	Blanton fine sand, level	0-42+	fs	SP, SP-SM	A-3	Low	A
Bb	Blanton fine sand, gently undulating						
Bc	Blanton fine sand, undulating						
Bd	Blanton fine sand, brown layer						
Be	Blichton fine sand	0-8	fs, lfs	SM	A-2-4	Low	D
		8-25	lfs	SM, SC-SM	A-2-4	Low	
		25-42+	fscl-fsc	SC	A-6	Moderate	
Bf	Bradenton fine sand	0-22	fs	SP-SM	A-2	Low	B/D
		22-32	fscl	SM-SC, SC	A-2, A-6	Moderate	
		32-42+	fscl-fsc	SC	A-6	Moderate	
Bg	Bradenton fine sand, thin surface	0-12	fs	SP-SM	A-2	Low	B/D
		12-28	fscl	SM-SC, SC	A-2, A-6	Moderate	
		28-42+	scl	SC	A-6	Moderate	
Bh	Brighton peat	0-40	pt	pt	Organic	High	A/D
Bk	Brighton mucky peat	40-60	fs	SP	A-3	Low	

ESTIMATED SOIL PROPE[illegible] FOR ENGINEERING

HILLSBOROUGH COUNTY, FLORIDA

TABLE [illegible]

Map Symbol	Soil Name	Flood Hazard 1/ (Frequency/ Duration)	Water Table 2/ Seasonally High (Depth and Duration)	Percolation Rate (Min./ In.)	Layer Depth (In.)	Permeability Rate (In./Hr.)	Available Water Holding Capacity (In./In.)
Bg	Bradenton fine sand, thin surface	Infrequent Brief	Shallow Brief	45-75	0-12 12-28 28-42+	6.3 .63-2.0 .20-.63	.05-.10 .10-.15 .10-.15
Bh	Brighton peat	V. frequent V. long	V. shallow Continuous	45	0-40 40-60	6.3 6.3	.20 .05
Bk	Brighton mucky peat	V. frequent V. long	V. shallow Continuous	45	0-40 40-60	6.3 6.3	.20 .05
Bl	Broward fine sand	Infrequent Brief	V. shallow Brief	45	0-28 28+	6.3	.05
Ca	Charlotte fine sand	V. frequent Long	V. shallow V. long	45	0-48+	6.3	.05
Da	Delray fine sand	V. frequent V. long	V. shallow V. long	45	0-12 12-48+	6.3 6.3	.20 .05-.10
Db	Delray fine sand, shallow	V. frequent V. long	V. shallow V. long	45	0-12 12-36 36-48+	6.3 6.3 .63-2.0	.20 .05-.10 .10-.15
Ea	Eustis fine sand, level level	None	Deep Continuous	45	0-48+	6.3	.05
Eb	Eustis fine sand, gently undulating	None	Deep	45	0-48+	6.3	.05
Fa	Felda fine sand	V. frequent Long	V. shallow Long	45-75	0-22 22-48+	6.3 .63-2.0	.05-.10 .10-.15

Map Symbol	Soil Name	Layer Depth (In.)	CLASSIFICATION			Shrink-Swell Potential	Hydrologic Soils Group
			USDA Texture	Unified	AASHO		
Ca	Charlotte fine sand	0-48+	fs	SP	A-3	Low	A/D
Da	Delray fine sand	0-12	fs	SP-SM	A-2	Low	A/D
		12-48+	fs	SP	A-3	Low	
Db	Delray fine sand, shallow	0-12	fs	SP-SM	A-3	Low	A/D
		12-36	fs	SP	A-3	Low	
		36-48+	fscl, fsc	SM-SC, SC	A-2, A-6	Moderate	
Ea Eb	Eustis fine sand, level Eustis fine sand, gently undulating	0-48+	fs	SP	A-3	Low	A
Fa	Felda fine sand	0-22	fs	SP	A-3	Low	B/D
		22-48+	fscl	SM SC	A-2-4	Mod-Low	
Fb	Fellowship loamy fine sand	0-12	lfs	SM-SC	A-2	Low	D
		12-42+	sc, c	SC, CL, CH	A-7	High	
Fc Fd	Ft. Meade loamy fine sand, level Ft. Meade loamy fine sand, undulating	0-42+	lfs	SM, SM-SC	A-2	Low	A
Fe	Fresh water swamp	---	---	-----	----	----	--
Ga Gb	Gainesville loamy fine sand level Gainesville loamy fine sand, gently undulating	0-42+	lfs	SM	A-2	Low	A

ESTIMATED SOIL PROPER. FOR ENGINEERING

HILLSBOROUGH COUNTY, FLORIDA

Map Symbol	Soil Name	Flood Hazard 1/ (Frequency/ Duration)	Water Table 2/ Seasonally High (Depth and Duration)	Percolation Rate (Min./ In.)	Layer Depth (In.)	Permeability Rate (In./Hr.)	Available Water Holding Capacity (In./In.)
Fb	Fellowship loamy fine sand	None	V. shallow Brief	75	0-12 12-42+	2.0-6.3 .06	.15-.20 .15-.20
Fc	Ft. Meade loamy fine sand, level	None	Mod. deep Long	45	0-42+	6.3	.05-.10
Fd	Ft. Meade loamy fine sand, undulating	None	Mod. deep Long	45	0-42+	6.3	.05-.10
Fe	Fresh water swamp	--	--	--	--	--	---
Ga	Gainesville loamy fine sand, level	None	Mod. deep Long	45	0-42+	6.3	.05-.10
Gb	Gainesville loamy fine sand, gently undulating	None	Mod. deep Long	45	0-42+	6.3	.05-.10
Ia	Immokalee fine sand	Infrequent Brief	V. shallow Brief	45	0-32 32-38 38-42+	6.3 .63-2.0 6.3	.05 .05-.10 .05
Ib	Immokalee fine sand, alkaline variant	Infrequent Brief	V. shallow Brief	45	0-32 32-38 38-42+	6.3 .63-2.0 6.3	.05 .05-.10 .05
Ic	Istokpoga peat	V. frequent V. long	V. shallow Continuous	45	0-40 40-60+	6.3 6.3	.20 .05
Id	Istokpoga mucky peat	V. frequent V. long	V. Shallow Continuous	45	0-40 40-60+	6.3 6.3	.20 .05
Ka	Kanapaha fine sand	None	Shallow V. brief	45	0-42+	6.3	.05

Map Symbol	Soil Name	Layer Depth (In.)	CLASSIFICATION			Shrink-Swell Potential	Hydrologic Soils Group
			USDA Texture	Unified	AASHO		
Ja	Immokalee fine sand	0-32	fs	SP	A-3	Low	B/D
Ib	Immokalee fine sand, alkaline variant	32-38	fs	SP-SM	A-3, A-2	Low	
		38-42+	fs	SP	A-3	Low	
Ic	Istokpoga peat	0-40	P	Pt	Organic	High	A/D
Id	Istokpoga mucky peat	40-60+	fs	PS	A-3	Low	
Ka	Kanapaha fine sand	0-42+	fs	SP, SP-SM	A-3, A-2	Low	A/D
Kb	Keri fine sand	0-22	fs	SP, SP-SM	A-3	Low	A/D
		22-30	fsl, fscl	SC	A-2-6	Low	
		30-42+	fs	SP	A-3	Low	
La	Lakeland fine sand, shallow	0-60	fs	SP, SP-SM	A-3, A-2	Low	A
Lb	Lakeland fine sand, level	60+	fscl	SC	A-4, A-6	Low	
Ld	Lakelanf fine sand, gently undulating						
Le	Lakeland fine sand, undulating						
Lc	Lakeland fine sand, level, deep	0-72+	fs	SP	A-3	Low	A
Lf	Lakeland fine sand, undulating deep						
Lg	Lakewood fine sand	0-48+	fs	SP	A-3	Low	
Lh	Leon fine sand	0-20	fs	SP	A-3	Low	A/D
Lk	Leon fine sand, light colored surface	20-26	fs	SP-SM	A-3, A-2	Low	
		26-42+	fs	SP	A-3	Low	

ESTIMATED SOIL PROPER FOR ENGINEERING

HILLSBOROUGH COUNTY, FLORIDA

TABLE 2.

Map Symbol	Soil Name	Flood Hazard 1/ (Frequency/ Duration)	Water Table 2/ Seasonally High (Depth and Duration)	Percolation Rate (Min./ In.)	Layer Depth (In.)	Permeability Rate (In./Hr.)	Available Water Holding Capacity (In./In.)
Kb	Keri fine sand	Infrequent Brief	V. shallow Brief	45	0-22 22-30 30-42+	6.3 .20-.63 6.3	.05 .10-.15 .05
La	Lakeland fine sand, shallow						
Lb	Lakeland fine sand, level	None	Deep	45	0-60	6.3	.05
Ld	Lakeland fine sand, gently undulating		Continuous		60+	.20-.63	.10-.15
Le	Lakeland fine sand, undulating						
Lc	Lakeland fine sand, level, deep	None	Deep	45	0-72+	6.3	.05
Lf	Lakeland fine sand, undulating deep		Continuous				
Lg	Lakewood fine sand	None	Deep Continuous	45	0-48+	6.3	.05
Lh	Leon fine sand	Infrequent	V. shallow	45	0-20	6.3	.05
Lk	Leon fine sand, light colored surface	Brief	Brief		20-26 26-42+	.63-2.0 6.3	.05-.10 .05
Ll	Leon fine sand heavy subsstratum	Infrequent Brief	V. shallow Brief	45-75	0-20 20-26 26-42+	6.3 .63-2.0 .63-2.0	.05 .05-.10 .10-.15
Ma	Made land	Variable	Variable	Variable	0-60	Variable	Variable
Me	Mines, pits and dumps						
Mb	Manatee fine sandy clay, heavy variant	V. frequent V. long	V. shallow V. long	75 8-42+	0-8 .06-.20	.63-2.0 .15-.20	.20

ESTIMATED SOIL PROPERTIES FOR ENGINEERING

HILLSBOROUGH COUNTY, FLORIDA

Map Symbol	Soil Name	Layer Depth (In.)	CLASSIFICATION			Shrink-Swell Potential	Hydrologic Soils Group
			USDA Texture	Unified	AASHO		
L1	Leon fine sand, heavy substratum	0-20	fs	SP	A-3	Low	A/D
		20-26	fs	SP-SM	A-3, A-2	Low	
		26-42+	scl	SC	A-2, A-6	Moderate	
Ma	Made land	0-60	Variable	Variable	Variable	Variable	Variable
Me	Mines, pits and dumps						
Mb	Manatee fine sandy clay, heavy variant	0-8	l, sc	ML, CL	A-2, A-4	High	B/D
		8-42+	c	CH	A-6, A-7	High	
Mc	Manatee fine sandy loam	0-10	lfs, fsl	SM, SP-SM	A-2	Low	B/D
Md	Manatee loamy fine sand	10-24	scl	SC	A-2, A-6	Moderate	
		24-42+	scl	SC	A-2, A-4	Moderate	
Me	Mixed alluvium, high bottom	0-60	Variable	Variable	Variable	Variable	Variable
Oa	Ona fine sand	0-14	fs	SM, SP-SM	A-2	Low	A/D
Ob	Ona fine sand, light colored surface	14-42+	fs	SP, SP-SM	A-3	Low	
Oc	Orlando fine sand	0-15	fs	SM, SP-SM	A-2	Low	A
		15-42+	fs	SP, SP-SM	A-3	Low	
Pa	Pamlico muck	0-36	muck	OL	Organic	High	D
		36-48+	fs	SP, SP-SM	A-3, A-2	Low	
Pb	Parkwood fine sand	0-18	fs	SP, SP-SM	A-3, A-2	Low	A/D
		18-42+	marl	---	---	-	
Pc	Peace River soils	0-60	Variable	Variable	Variable	Variable	Variable

ESTIMATED SOIL PROPER[illegible] FOR ENGINEERING

HILLSBOROUGH COUNTY, FLORIDA

TABLE 2.
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Map Symbol	Soil Name	Flood Hazard 1/ (Frequency/ Duration)	Water Table 2/ Seasonally High (Depth and Duration)	Percolation Rate (Min./ In.)	Layer Depth (In.)	Permeability Rate (In./Hr.)	Available Water Holding Capacity (In./In.)
Mc	Manatee fine sandy loam	V. frequent	V. shallow	45-75	0-10	2.0-6.3	.20
Md	Manatee loamy fine sand	V. long	V. long		10-24	.20-.63	.10-.15
					24-42+	.20-.63	.10-.15
Me	Mixed alluvium, high	Frequent Brief	Variable	Variable	0-60	Variable	Variable
Oa	Ona fine sand	Frequent	V. shallow	45	0-14	6.3	.10-.15
Ob	Ona fine sand, light colored surface	Brief	Brief		14-42+	6.3	.05-.10
Oc	Orlando fine sand	None	Deep Continuous	45	0-15	6.3	.10-.15
					14-42+	6.3	.05-.10
Pa	Pamlico muck	V. frequent	V. shallow	45	0-36	6.3	.20
		V. long	V. long		36-48+	6.3	.05-.10
Pb	Parkwood fine sand	Infrequent	V. shallow	45	0-18	6.3	.05-.10
		Brief	Brief		18-42+	-	-
Pc	Peace River soils	V. frequent Brief	Variable	Variable	0-60	Variable	Variable
Pd	Plummer fine sand	V. frequent Long	V. shallow Long	45	0-48+	6.3	.05
Pe	Plummer fine sand, shallow	V. frequent Long	V. shallow Long	45	0-36	6.3	.05
					36-48+	.63-2.0	.10-.15
Pf	Pomello fine sand	None	Mod. shallow	45	0-38	6.3	.05
			Brief		38-60+	6.3	.05-.10

Map Symbol	Soil Name	Layer Depth (In.)	CLASSIFICATION			Shrink-Swell Potential	Hydrologic Soils Group
			USDA Texture	Unified	AASHO		
Pd	Plummer fine sand	0-48+	fs	SP, SP-SM	A-3	Low	B/D
Pe	Plummer fine sand, shallow	0-36	fs	SP, SP-SM	A-3	Low	B/D
		36-48+	fscl	SC	A-2, A-6	Low-Mod.	
Pf	Pomello fine sand	0-38	fs	SP	A-3	Low	C
		38-60+	fs	SP-SM	A-3, A-2	Low	
Pg	Pompano fine sand	0-42+	fs	SP, SP-SM	A-3	Low	A/D
Ph	Pompano fine sand, shallow	0-33	fs	SP, SP-SM	A-3, A-2	Low	A/D
		33-48+	fscl	SC	A-2, A-6	Moderate	
Pk	Portsmouth fine sand	0-24	fs, mfs	SP-SM, SM	A-2	Low	D
Pl	Portsmouth mucky fine sand	24-42+	scl	SC-SM, SC	A-2, A-4	Moderate	
Ra	Rains fine sand	0-18	fs	SP, SP-SM	A-3, A-2	Low	B/D
		18-48+	fscl	SC, SM-SC	A-2, A-4	Moderate	
Rb	Ruskin fine sand	0-24	fs	Sm, SM-SP	A-2	Low	A/D
		24-36	fscl	SC	A-2, A-4	Moderate	
		36-42	marl	marl	--	---	---
Rc	Rutledge fine sand	0-20	fs, mfs	SP-SM, SM	A-2	Low	A/D
Re	Rutledge mucky fine sand	20-42+	fs	SP, SP-SM	A-3	Low	
Rd	Rutledge fine sand, shallow	0-14	fs	SP-SM	A-2	Low	A/D
		14-36	fs	SP	A-3	Low	
		36-42+	scl	SM-SC, SC	a-6	Moderate	
Sd	St. Lucie fine sand	0-42+	fs	SP	A-3	Low	A

ap ymbol	Soil Name	Flood Hazard 1/ (Frequency/ Duration)	Water Table 2/ Seasonally High (Depth and Duration)	Percolation Rate (Min./ In.)	Layer Depth (In.)	Permeability Rate (In./Hr.)	Available Water Holding Capacity (In./In.)
Pg	Pompano fine sand	V. frequent Long	V. shallow Long	45	0-42+	6.3	.05
Ph	Pompano fine sand,	V. frequent Long	V. shallow Long	45	0-33 33-48+	6.3 .20-.63	.05 .10-.15
Pk	Portsmouth fine sand	V. frequent	V. shallow	45-75	0-24	6.3	.15-.20
Pl	Portsmouth mucky fine sand	V. long	V. long		24-42+	.20-.63	.10-.15
Ra	Rains fine sand	V. frequent V. long	V. shallow V. long	45-75	0-18 18-48+	6.3 .20-.63	.05-.10 .10-.15
Rb	Ruskin fine sand	Infrequent Brief	V. shallow Brief	45	0-24 24-36 36-42	6.3 2.0-6.3 -	.05 .10-.15 -
Rc	Rutledge fine sand	V. frequent	V. shallow	45	0-20	6.3	.15-.20
Re	Rutledge mucky fine sand	V. long	V. long		2-=42+	6.3	.05
Rd	Rutledge fine sand, shallow	V. frequent	V. shallow	45	0-14 14-36 36-42+	6.3 6.3 .63-2.0	.15-.20 .05 .10-.15
Sd	St. Lucie fine sand	None	Deep Continuous	45	0-42+	6.3	.05
Sa	Sandy local alluvium	Infrequent Brief	Mod shallow Brief	45	0-42+	6.3	.05
Sb	Scranton fine sand	Frequent Brief	V. shallow Long	45	0-14 14-42+	6.3 6.3	.10-.15 .05-.10

Map Symbol	Soil Name	Layer Depth (In.)	CLASSIFICATION			Shrink-Swell Potential	Hydrologic Soils Group
			USDA Texture	Unified	AASHO		
Sa	Sandy local aaluvium	0-42+	fs	SP	A-3	Low	
Sb	Scranton fine sand	0-14	fs	SP-SM	A-2	Low	D
		14-42+	fs	SP	A-3	Low	
Sc	Shallow ponds with grass	0-60	Variable	Variable	Variable	Variable	Variable
Se	Sunniland fine sand, mod. shallow over marl	0-20	fs	SP	A-3	Low	
		20-30	fscl	SC	A-2-6	Moderate	
		30-40+	marl	--	--	--	
Ta	Terra Ceia peaty muck	0-20	muck	Pt, OL	Organic	High	A/D
		20-48+	fscl	SC	A-2-6	Moderate	
Tb	Tidal marsh (Unclassified soils)	0-60	Variable	Variable	Variable	Variable	Variable
Tc	Tidal swamp (Unclassified soils)						

Abbreviations:

- c - clay
- fs - fine sand
- fsc - fine sandy clay
- fscl - fine sandy clay loam
- fsl - fine sandy loam
- lfs - loamy fine sand
- mfs - mucky fine sand
- V. - Very
- Mod. - Moderately

ESTIMATED SOIL PROPER FOR ENGINEERING

HILLSBOROUGH COUNTY, FLORIDA

Map Symbol	Soil Name	Flood Hazard 1/ (Frequency/ Duration)	Water Table 2/ Seasonally High (Depth and Duration)	Percolation Rate (Min./ In.)	Layer Depth (In.)	Permeability Rate (In./Hr.)	Available Water Holding Capacity (In./In.)
Sc	Shallow ponds with grass	V. frequent V. long	V. shallow V. long	Variable	0-60	Variable	Variable
Se	Sunniland fine sand, mod. shallow over marl	Infrequent Brief	V. shallow Brief	45	0-20 20-30 30-40+	6.3 2.0-6.3 -	.05 .10-.15 -
Ta	Terra Ceia peaty muck	V. frequent V. long	V. shallow V. long	45	0-20 20-48+	6.3 2.0-6.3	.20 .10-.15
Tb	Tidal Marsh (Unclassified soils)	V. frequent V. long	V. shallow V. long	Variable	0-60	Variable	Variable
Tc	Tidal Swamp (Unclassified soils)						

1/ Flood Hazard: Water from stream overflow, runoff, or seepage, standing or flowing above the soil surface.

FREQUENCY		DURATION	
None	Less often than once in 50 years	Extremely brief	Shorter than 2 days
Very infrequent	Once in 20 to 50 years	Very brief	2 to 7 days
Infrequent	Once in 5 to 20 years	Brief	7 days to 1 month
Frequent	Once in 1 to 5 years	Long	1 month to 6 months
Very frequent	More often than once every year	Very long	Longer than 6 months

2/ Water Table: The upper surface of free water in a soil or underlying material. In some places an upper or perched water table is separated from a lower one by a dry zone. If water is above the surface, it is called flooding.

DEPTH		DURATION	
Deep	Deeper than 120 inches	Very brief	Shorter than 1 month per year
Moderately deep	Deeper than 60 to 120 inches	Brief	1 to 2 months per year
Moderately shallow	Deeper than 30 to 60 inches	Long	2 to 6 months per year
Shallow	Deeper than 15 to 30 inches	Very long	6 to 12 months per year
Very shallow	Deeper than 0 to 15 inches	Continuous	More than 12 months

Appendix 10-3
Test Lab, Inc. Report

Report

of

PRELIMINARY GEOTECHNICAL STUDY
RESOURCE RECOVERY FACILITY
FAULKENBURG ROAD SITE
HILLSBOROUGH COUNTY, FLORIDA

for

Hillsborough County - Department of Solid Waste

TEST LAB INC.

MATERIALS ENGINEERING, TESTING AND INSPECTION
TEST LAB INC.

April 20, 1984

Hillsborough County
Department of Solid Waste
P.O. Box 1110
Tampa, Florida 33601

Attention: Mr. Marc J. Rogoff
Resource Recovery Program Administrator

Subject: Preliminary Geotechnical Study
Resource Recovery Facility
Falkenburg Road Site
Hillsborough County, Florida
Project No. 84-1479

Gentlemen:

The purpose of this preliminary geotechnical study was to determine the general nature of the subsurface conditions at the plant site and generally ascertain the types of foundation systems which might be used to support the facilities. An earlier study had been made, but the facility was relocated to the northern portion of the tract. Although it was thought that similar subsurface conditions would exist at the new plant site, a field exploration program was necessary to verify this. Ultimately, this proved to be the case. The following report briefly describes the field and laboratory procedures used in this study and presents a general engineering evaluation of the subsurface and foundation conditions.

4619 WEST CURTIS STREET • P. O. BOX 15732 • TAMPA, FLORIDA 33614 • PHONE (813) 872-7821

FIELD PROCEDURES

Twelve exploratory borings were made at the site at the locations shown on the accompanying plan. These borings were made at locations we recommended, but which were staked in the field by county personnel who also determined the ground surface elevation.

The exploratory borings were made with a truck-mounted CME-55 drilling rig. Conventional rotary drilling procedures were utilized along with a bentonite drilling fluid to stabilize the bore holes. Standard penetration tests were made and split-barrel soil samples obtained at 2.5 foot intervals to a depth of 10 feet and 5 foot intervals thereafter. The following is a brief description of this field test procedure.

> The exploratory borings were made in accordance with ASTM's method of standard field penetration tests (D 1586). Standard penetration tests are made with a 2 inch O.D. split-barrel sampler. After drilling to the required depth and cleaning the bore hole, the sampler is driven 18 inches into the undisturbed soil by a 140 pound drop-hammer falling 30 inches. The number of blows required to affect the last foot of penetration is recorded as the penetration resistance (N). The numerals in parenthesis below the 'N' values are the blow count for each of the 6 inch increments which the split-barrel sampler was driven. The soil samples thus obtained were visually classified, and some used for qualitative laboratory tests. Upon completion of the drilling, the bore holes were sealed and grouted in accordance with Southwest Florida Water Management District regulations.

The subsurface data obtained from the field exploration program are presented on the accompanying logs. Also attached is a legend explaining the classification terms and symbols used on these logs.

LABORATORY PROCEDURES

A laboratory test program, limited to determining soil index properties, was undertaken to better ascertain the physical characteristics of the various soil strata found at the site. Grain-size analyses and atterberg limit determinations were conducted on selected disturbed soil samples. The following are brief descriptions of these test procedures.

Grain Size Analyses

Particle size analyses were made in accordance with ASTM procedure 422. The distribution of particle sizes larger than a No. 200 sieve is determined by mechanical sieving; whereas, the distribution of particle sizes smaller than a No. 200 sieve is determined by a sedimentation process. Either or both procedures may be used to more fully evaluate the physical characteristics of the soil. In this study, only the former procedure was used, but the soil samples were mechanically washed over a No. 200 sieve (ASTM D 1140) to more accurately determine the percentage of silt and clay sized particles.

Plasticity Tests (Atterberg Limits)

The liquid limit (LL) and plastic limit (PL) of the soils were determined in accordance with ASTM procedures D 423 and D 424, respectively. The soil plasticity index (PI) is the numerical difference between the liquid limit and plastic limit. The atterberg limits of a soil are particularly useful when identifying and classifying cohesive soils; and also as indexes to other significant properties such as compressibility, plasticity, permeability, and swell-shrink potential.

The data obtained from the laboratory tests are presented on the accompanying grain size distribution sheets.

SUBSURFACE CONDITIONS

The field exploration program revealed generally similar subsurface conditions existing in the various areas investigated. These conditions were similar to those found in

the southern portion of the tract by the earlier Williams study. Basically, four relatively distinct soil/rock strata were revealed by the borings. The following is a generalized description of these strata in the sequence encountered.

Stratum No. 1

This is a moderately thick cohesionless surface stratum which consists of very loose to loose gray and brown medium fine sand and slightly clayey sand containing numerous dark brownish black slightly clayey organic stained zones. This surface stratum varies from 5' to 22' in thickness, but is typically 10' thick.

Stratum No. 2

This a moderately thin semi-cohesive stratum which consists of generally firm brown, grayish brown and light tannish gray clayey medium-fine sand with some slightly clayey lenses. This stratum varies in thickness from 0 to 15 feet, but is typically 5' thick; and extends to depths ranging from 12 to 27 feet.

Stratum No. 3

This is a thick complex stratum of interbedded semi-cohesive and cohesive soils. Typically the upper part of this stratum is a firm light green clay which transgresses with depth to more granular semi-cohesive soils - that is, greenish gray and tan fine sandy clay and clayey fine sand which contain some zones with cemented sand fragments. This stratum is typically about 20' thick, although occasionally much thinner, and extends to depths varying from 24' to 47' .

Stratum No. 4

This stratum, which is the Tampa Formation, is the limestone bedrock. The nature of this stratum is quite variable, typically being more like soil than rock - that is, a hard light tannish white calcareous sandy clay containing rock fragments, hard limestone lenses, some softer weathered zones and occasional green and gray sandy clay lenses. Generally, the upper part of this stratum is poorly indurated and softer, probably the result of weathering; whereas below this, this stratum tends to be somewhat harder and more competent, but frequently contains softer zones. This stratum was encountered at depths of 24 to 47 feet.

Although the stratigraphy in the areas investigated is quite similar, the depth and thickness of the various strata are quite varied. Therefore, the attached soil test boring logs should be reviewed for a detailed description of the materials and conditions encountered at each boring location. The depth to ground water table measured in the borings at the time of the study is shown on the logs. However it should be noted that after heavy rains during the study, standing water existed throughout much of the site.

PRELIMINARY EVALUATION

The object of this preliminary study was to determine the general nature of the subsurface conditions and to generally evaluate these conditions from a foundation standpoint with respect to supporting the type facilities proposed. While this general data and information is to be provided to prospective bidders so that they will be more knowledgeable of the site, subsurface and foundation conditions; it should be noted that this preliminary data is not sufficient to develop final foundation recommendations and design criteria. A more comprehensive final geotechnical study must be undertaken for such purposes.

At the present time, only conceptual plans have been developed, and thus specific structural data and foundation loads are not available. However the proposed facilities will generally be of the size, configuration and located at shown on the accompanying plan. The main building will be a very large heavy steel-frame structure which will house the refuse pit, refuse storage bins, furnace and furnace charging equipment, boilers, air pollution control equipment, and administrative offices. Although the refuse pit will extend approximately 10' below grade, the ground floor level

elsewhere will be at approximately existing grade. Adjacent to the main building will be a 250' high stack. Other more lightly loaded associated facilities are the cooling towers, electric switchyard, and scales & scale houses. An extensive roadway system and associated parking areas are planned. Most of the roadways and parking areas will be constructed at approximately the existing grade. However, high earthern ramps approximately 25' in height will be required for truck access and unloading into the refuse pit. Some large shallow retention ponds are also proposed to store storm water drainage.

The preliminary evaluation of the foundation conditions is based upon analyzing the soil/rock characteristics obtained from this study by comparison with previously made correlations of such data and foundation stabilities that have been developed for subsurface conditions similar to those found at this site. In addition, the data derived from the earlier Williams study, specifically the laboratory consolidation test data, were also used to evaluate the foundation conditions. The general engineering evaluation of the foundation conditions is based upon a site development plan and facilities of the type previously discussed.

The subsurface conditions at the site are considered typical of those generally found in this area. These conditions were quite similar to those revealed by the earlier Williams study. No unusual or significantly different conditions were found. Basically the same potentially poor subsurface conditions exist at the new plant site, that is:

1. The generally loose consistency of the cohesionless surface soils (stratum no. 1).

2. The weak and potentially compressible nature of the soft & loose zones within the deeper underlying semi-cohesive and cohesive soils (stratum no. 3).

3. The less competent, weak, poorly indurated, or highly weathered zones within the limestone bedrock (stratum no. 4).

4. The very shallow ground water table.

The first potentially poor condition poses a foundation problem because loose cohesionless soils may not provide adequate support for even lightly loaded shallow foundations. Shallow foundations supported on loose sands may settle as a result of consolidation due to imposed foundation loads, changes in loading conditions or vibrations. Thus, special site preparation will be necessary to densify the shallow loose sands, thereby providing adequate support for shallow foundations and minimizing potential settlement from this source. Although inexpensive routine proof-rolling techniques may adequately densify the shallow loose sands to a sufficient depth to provide satisfactory foundation support for very light structures, such as the scale facilities; this method may not be adequate for other moderately light structures because of the slightly clayey nature and depth of the loose sands and high ground water table. Therefore, other special in situ densification methods may be required.

The second potentially poor condition is of more serious concern. These potentially compressible cohesive soils cannot be readily improved, except by means of surcharging which does not appear practical. Heavy foundation and embankment loads will induce subsurface stresses of sufficient magnitude to cause appreciable consolidation compression of the weaker zones within this stratum. Thus significant total and differential settlement would occur which could detrimentally affect the structures. Therefore the main building and other associated heavily loaded structures should be supported on deep foundation systems which extend through the compressible soils to adequate bearing on or within the more competent

underlying weathered limestone stratum. Although obviously deep foundations must be used to support the heavy structures, it might also be more practical to similarly support even moderately light structures in view of the relatively shallow depth at which deep foundations will bear and the difficulty and cost of adequately densifying the loose cohesionless soils. Another potential effect caused by the consolidation of this stratum is that of negative friction or pile drag-down. This must be considered in the design of deep foundations in areas where they may be affected - such as adjacent to the roadway embankments.

The third potentially poor condition is only of significance in that the less competent weak weathered zones will limit the capacity of deep foundations. Furthermore, significant variations in the depth at which deep foundations will achieve adequate bearing are anticipated because of the somewhat erratic nature of the limestone bedrock.

The fourth potentially poor condition, i.e. very high ground water table, will necessitate proper dewatering for below grade construction, such as the refuse pit and scales. The dead weight of buried structures must also be sufficient to resist the uplift pressure caused by the ground water. Special consideration must also be given to the high ground water table in the design of pavements, as proper subgrade drainage is essential to achieve satisfactory pavement performance. It would appear that pavements should either be raised to avoid this problem or underdrains installed to alleviate the problem. Also a type of pavement or base should be used which is resistant to deterioration if wetted. The high ground water table will also severely limit the storage capacity of retention basins. This may necessitate raising of the general plant site to facilitate drainage and provide adequate storage capacity, or lowering outfalls may suffice.

It should be noted that during heavy rains and shortly thereafter, and possibly throughout the rainy season, standing water may exist in many portions of the site which can severly hamper construction operations. Thus, site drainage improvements should be one of the first construction activities.

This preliminary study indicates that after proper site preparation and densification of the shallow loose sands light structures may be supported on conventional shallow foundation systems, whereas moderate to heavy structures must be supported on deep foundation systems. Driven piles or drilled piers appear to be the most economical and practical types of deep foundation systems to use; whereas, auger-cast piles do not appear appropriate for the subsurface conditions. The preliminary subsurface data indicate that adequate bearing for deep foundations can be achieved at reasonably shallow depths. Driven piles will typically reach bearing at 35' to 45', although significant variations (30' to 60') are anticipated due to the variable nature of the weathered limestone bedrock. Drilled piers may have to penetrate at somewhat greater depths, depending upon their capacity.

The following page presents some very general deep foundation design parameters which may be used for preliminary planning and cost estimating purposes. However, a more comprehensive geotechnical study should be undertaken to finally select the most appropriate and economical types of deep foundation systems to use for the various structures.

Although various types of piling commonly used in the area have been shown, there are advantages to using certain types. Displacement type piling (timber, concrete, closed-end pipe, or shell) usually derive their support primarily from end-bearing on the underlying weathered limestone bedrock;

DRIVEN PILES

Timber Piling, conforming to ASTM specification D-25.

8 inch	20 tons
10 inch	30 tons

Prestress Concrete Piling, conforming to FDOT specifications (not commercial grade).

10 inch	35 tons
12 inch	50 tons
14 inch	70 tons

Closed-End Steel Pipe Piling (concrete filled), with minimum wall thickness of 0.25 inches, conforming to ASTM specification 252A grade 2.

10 inch	50 tons
12 inch	60 tons

Mandrel-Driven-Shell Piling, with adequate shell guage to withstand both driving stresses and earth pressures without damage or collapse, minimum 14 guage is suggested.

10 inch	50 tons
12 inch	60 tons

Open-End Steel Pipe Piling, conforming to ASTM A 252, with a minimum wall thickness of 3/8 inch (soil or concrete filled).

9 inch	60 tons
11 inch	75 tons

Steel H-Piling, conforming to ASTM specification A-36.

HP 8 x 36	40 tons
HP 10 x 42 or 12 x 53	50 tons
HP 10 x 57	70 tons

DRILLED PIERS

Should be installed by the wet-hole method or slurry displacement technique. Capacity is dependent upon diameter and length of rock socket. Load carrying capacity should be based solely upon rock socket side friction at 5 to 6 KSF in competent limestone.

whereas non-displacement type piling (open-end pipe, or H-piles) usually drive their support by a combination of friction and end-bearing in the underlying limestone bedrock. Consequently displacement piling usually takeup and reach adequate bearing at somewhat shallower depths than non-displacement piling which tend to penetrate somewhat deeper into the weathered limestone bedrock. A disadvantage of fixed-length type piling (timber or concrete) is the difficulty of predetermining the length to purchase where the depth to bearing is quite variable as at this site. Furthermore, these piles are usually difficult and costly to splice, particularly to sustain uplift loads. Thus, it is usually advisable to purchase sufficiently long piles to eliminate this problem, as it is frequently less costly to waste cutoffs than to splice. To avoid these difficulties, it is usually advantageous to use other types of piling which are more readily adaptable to significant variations in required length - such as pipe, shell, or H-piling which can be more easily cut off and spliced. These various factors and structural loadings and pile cap design requirements must be considered in the selection of the foundation system.

A more comprehensive final foundation study should be undertaken to obtain the additional data needed to establish specific site preparation procedures and foundation design criteria for the various facilities. These additional data are also needed to permit the detailed cost estimates necessary to select the most appropriate and economical types of deep foundation systems to use. Furthermore, additional data are required to establish specific design and construction recommendations for dewatering and foundation installation procedures, load testing, construction monitoring, etc.

LIMITATIONS

This preliminary study was undertaken for planning purposes only. Generally accepted soil mechanics and foundation engineering practices were utilized in the preparation of this report; and no other warranty, either expressed or implied, is made as to the professional advice provided. This report has been prepared solely for the use of our client and may not contain sufficient information for other uses or for the purposes of other parties. We are not responsible for any conclusions or recommendations based upon this data which are made by others, unless we have been given an opportunity to review and concur with them. The following are other applicable limitations.

The lines on the logs designating the interface between the various strata may only be approximate boundaries when the transition is gradational or could not be detected by the drilling operations.

The depth to the ground water table measured in the borings during the investigation is only indicative of the water level at that time. The ground water table may fluctuate significantly due to seasonal changes, variations in rainfall, and other factors not evident at the time of the investigation.

The general engineering evaluation of the subsurface conditions and the preliminary opinions and conclusions presented in this report are based solely upon the data obtained from the exploratory borings made at the locations indicated on the attached plan; and are only valid so long as the site and subsurface conditions remain unchanged. This report does not reflect any variations which may occur between these borings, except as may be discussed in the report.

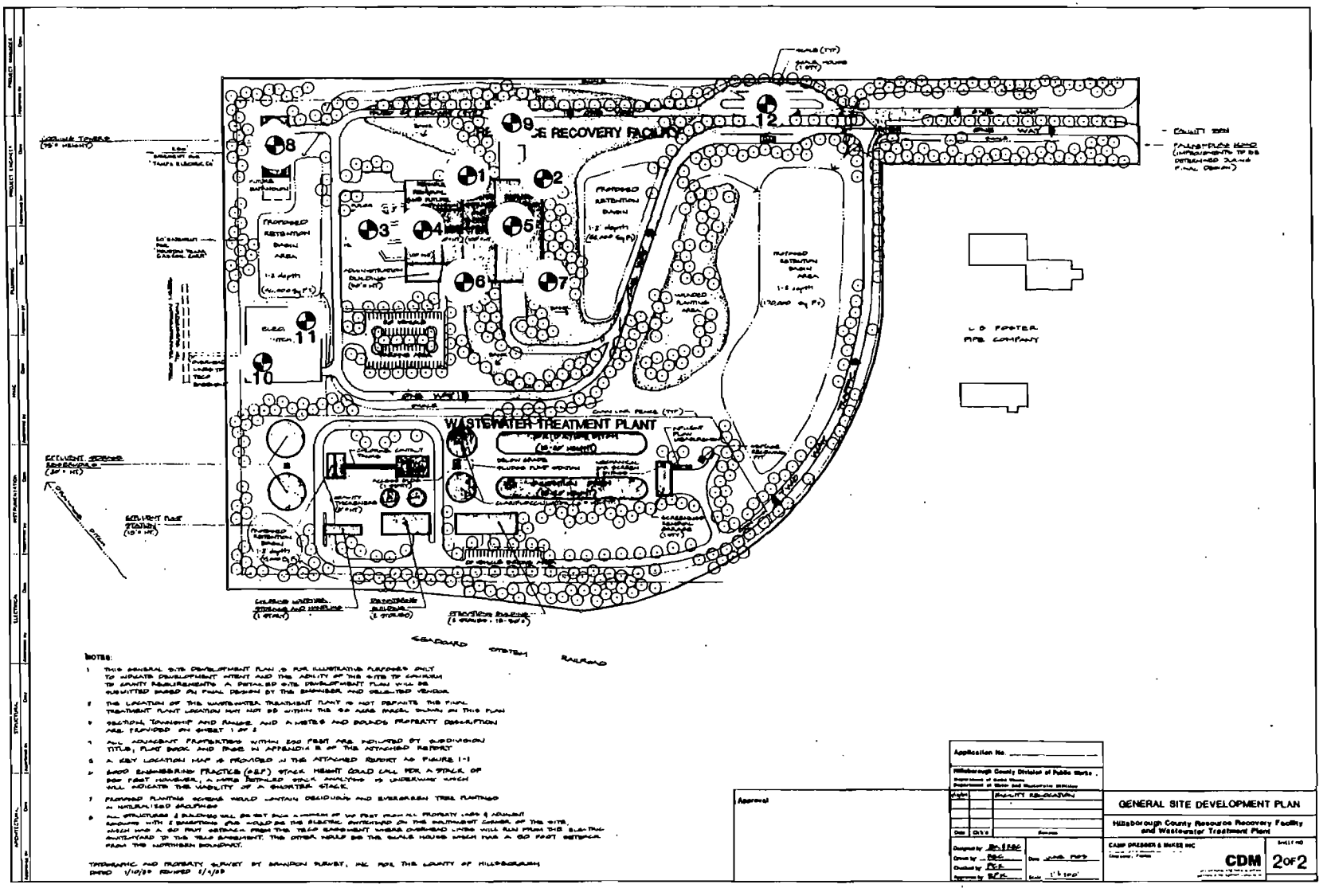
Because of the preliminary nature and limited scope of this study, this report is by necessity rather brief and quite general. However, we would be pleased to answer any specific questions you may have or evaluate these preliminary findings with respect to any other specific development concept you

might consider. It should be noted that the exploratory borings were very widely spaced, thus significantly different or more varied conditions are possible at other locations. When the final planning of this facility is complete and more definitive data regarding foundation loads available, a more comprehensive study should be undertaken to establish specific site preparation and foundation criteria for the planned facilities.

If you have any questions concerning this study, or if we may be of further assistance, please do not hesitate to call.

Respectfully submitted,

James F. Orofino, PE
President



HILLSBOROUGH COUNTY
ENERGY RECOVERY PROJECT

SOIL BORING LOCATIONS

FEET

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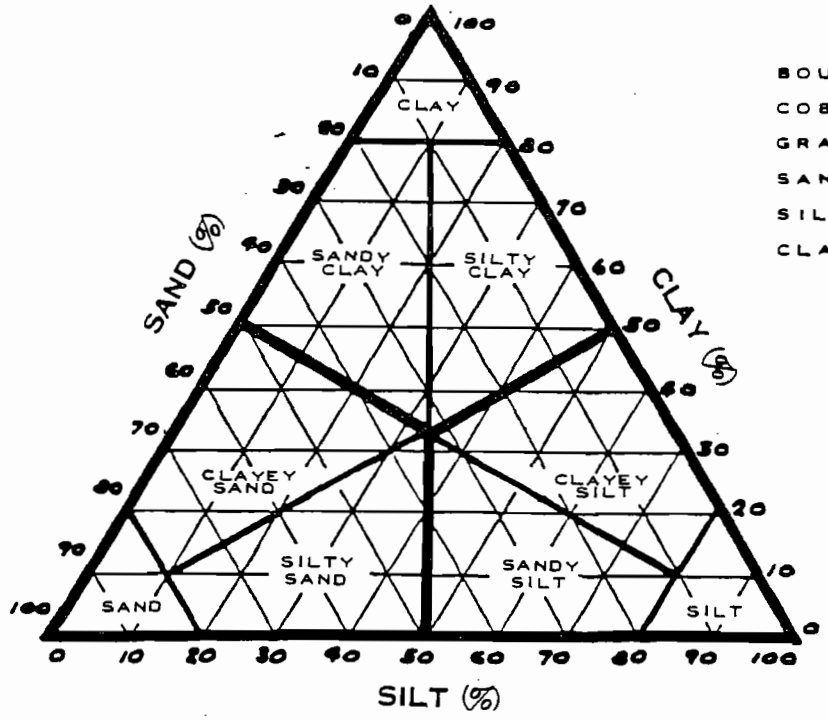
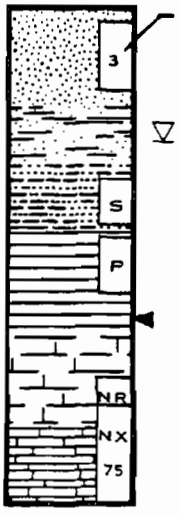


BOULDERS	LARGER THAN 6 INCHES
COBBLES	2 TO 6 INCHES
GRAVEL	2 MM TO 2 INCHES
SAND	0.074 TO 2 MM
SILT	0.002 TO 0.074 MM
CLAY	SMALLER THAN 0.002 MM

SOIL CLASSIFICATION CHART

SOIL SYMBOLS

- SAND
- CLAYEY SAND, SILTY SAND
- SANDY CLAY, SANDY SILT
- CLAY, SILT, SILTY CLAY, CLAYEY SILT
- VOID/CAVITY
- WEATHERED LIMESTONE
- LIMESTONE
- PEAT, MUCK, ORGANIC SOILS
- GRAVEL, COBBLES, BOULDERS
- MISCELLANEOUS FILL, TOPSOIL, ETC.



- SAMPLE NUMBER
- STANDARD PENETRATION TEST
- GROUND WATER
- SHELBY SAMPLE
- PISTON SAMPLE
- LOSS OF DRILLING FLUID (PERCENT)
- NO RECOVERY
- CORE SIZE
- CORE RECOVERY (PERCENT)

CONSISTENCY

Cohesionless Soil

VERY LOOSE	0 – 4 BLOWS/FT.
LOOSE	4 – 10 BLOWS/FT.
FIRM	10 – 30 BLOWS/FT.
DENSE	30 – 50 BLOWS/FT.
VERY DENSE	50 – UP BLOWS/FT.

Cohesive Soil

VERY SOFT	0 – 2 BLOWS/FT.
SOFT	2 – 4 BLOWS/FT.
FIRM	4 – 8 BLOWS/FT.
STIFF	8 – 15 BLOWS/FT.
VERY STIFF	15 – 30 BLOWS/FT.
HARD	30 – UP BLOWS/FT.

LEGEND

MATERIALS ENGINEERING, TESTING AND INSPECTION
TEST LAB

SOIL TEST BORING LOG

Project: Resource Recovery Facility **Job No.:** 84-1479

Depth	Soil Description	Soil Log	Sampler Blows/Ft.
	dark grayish brown medium-fine SAND (topsoil)		
	loose light grayish tan medium-fine SAND	1	4 ▽ (2,2,2)
5	loose dark brown medium-fine SAND (slightly organic stained)	2	7 (3,4,3)
	loose light brown medium-fine SAND	3	5 (2,2,3)
10		4	8 (2,3,5)
	loose dark brown medium-fine SAND (slightly organic stained)		
15	dense dark brown slightly clayey medium-fine SAND	5	52 (17,24,28)
20	dense light brown CLAYEY medium-fine SAND w/sand lenses	6	42 (10,16,26)
25	firm grayish brown CLAYEY medium-fine SAND	7	29 (14,14,15)
30	loose light greenish gray CLAYEY fine SAND w/cemented sand fragments	8	4 (3,2,2)
35	very stiff tan calcareous sandy clay w/some rock fragments & greenish zones (WEATHERED LIMESTONE)	9	16 (4,6,10)

Remarks: ground surface elevation 36.5 feet
complete loss of drilling fluid at 37 feet
bore hole cased (BX) to depth of 40 feet
bore hole grouted - ¼ hour and ½ bag cement

BORING: B-1

Page 1 of 3

TEST LAB

SOIL TEST BORING LOG

Project: Resource Recovery Facility **Job No.:** 84-1479

Depth	Soil Description	Soil Log	Sampler Blows/Ft.
40	hard light tannish white calcareous sandy clay w/some rock fragments & softer zones (WEATHERED LIMESTONE)	10	63 (12,30,33)
45		11	50 = 5"
50	firm grayish tan calcareous clayey sand (WEATHERED LIMESTONE)	12	24 (13,11,13)
55	hard light tannish white calcareous sandy clay w/rock fragments (WEATHERED LIMESTONE)	13	34 (11,12,22)
60	dense tan calcareous clayey sand (WEATHERED LIMESTONE)	14	75 = 10" (15,25,50/4)
65	hard gray & green fine SANDY CLAY w/rock fragments & weathered limestone lenses	15	100 = 10" (17,50,50/4)
70	hard tan calcareous sandy clay w/rock fragments & limestone lenses (WEATHERED LIMESTONE)	NR	50 = 1"

Remarks:

BORING: B-1

TEST LAB

SOIL TEST BORING LOG

Project: Resource Recovery Facility **Job No.:** 84-1479

Depth	Soil Description	Soil Log	Sampler Blows/Ft.
75	hard tan calcareous sandy clay w/rock fragments & greenish gray & brown sandy clay lenses (WEATHERED LIMESTONE)	16	53 (16,20,33)
	boring terminated		

Remarks:

BORING: B-1

Page 3 of 3

TEST LAB

SOIL TEST BORING LOG

Project: Resource Recovery Facility **Job No.:** 84-1479

Depth	Soil Description	Soil Log	Sampler Blows/Ft
	*		
	light brown medium-fine SAND	1	6 ▽ (2,3,3)
	loose dark brown slightly clayey medium-fine SAND		
5	loose brown slightly clayey medium-fine SAND	2	4 (1,2,2)
		3	12 (4,6,6)
10	firm light grayish brown CLAYEY medium-fine SAND	4	18 (7,9,9)
15	firm light green CLAY w/some harder zones	5	23 (1,3,20)
20	stiff light tan fine very SANDY CLAY	6	9 (3,4,5)
25	soft light greenish tan fine SANDY CLAY	7	3 (1,1,2)
30	very stiff light tannish white calcareous sandy clay w/some rock fragments & occasional limestone lenses (WEATHERED LIMESTONE)	8	27 (31,13,14)
35		9	31 (17,14,17)

Remarks: * dark brown & gray medium-fine SAND

ground surface elevation 38.0 feet
partial loss of drilling fluid at 27 & 45 feet
bore hole cased (BX) to depth of 30 feet
bore hole grouted - ¼ hour and ½ bag cement

BORING: B-2

Page 1 of 2

TEST LAB

SOIL TEST BORING LOG

Project: Resource Recovery Facility **Job No.:** 84-1479

Depth	Soil Description	Soil Log	Sampler Blows/Ft.
	very stiff light tannish white calcareous sandy clay w/some rock fragments & occasional limestone lenses (WEATHERED LIMESTONE)	10	50 = 1½" (17,50/1½)
40			
45	hard light tannish white calcareous sandy clay w/rock fragments, limestone lenses, some greenish zones & occasional softer zones (WEATHERED LIMESTONE)	11	85 (36,40,45)
50		NR	50 = 2"
	hard light tannish white calcareous sandy clay w/rock fragments, limestone lenses & occasional softer zones (WEATHERED LIMESTONE)	NR	50 = 1½"
55	boring terminated		

Remarks:

BORING: B-2

Page 2 of 2

TEST LAB

SOIL TEST BORING LOG

Project: Resource Recovery Facility **Job No.:** 84-1479

Depth	Soil Description	Soil Log	Sampler Blows/Ft
	*		
	very loose dark brownish black slightly clayey medium-fine SAND (organic stained)	1 ▽	3 (1,1,2)
	very loose brown medium-fine SAND	2 3	3 (2,1,2)
5	very loose dark brownish black slightly clayey medium-fine SAND (organic stained)	4	2 (1,1,1)
10	firm light tannish gray CLAYEY medium-fine SAND	5	15 (4,5,10)
15	firm light green CLAY	6	4 (1,2,2)
20	firm light greenish gray fine SANDY CLAY w/some cemented sand fragments	7	6 (7,3,3)
25	very loose green CLAYEY fine SAND	8	1 = 18"
30	very soft light tannish white calcareous sandy clay w/rock fragments (WEATHERED LIMESTONE)	9	2 (1,1,1)
35	hard light tan calcareous sandy clay w/rock fragments, limestone lenses & some softer zones (WEATHERED LIMESTONE)	10	50 = 5"

Remarks: * dark grayish peaty medium-fine SAND (topsoil)

ground surface elevation 33.8 feet
partial loss of drilling fluid at 22 feet
complete loss of drilling fluid at 27 feet
bore hole cased (BX) to depth of 35 feet
bore hole grouted - ¼ hour and ½ bag cement

BORING: B-3

Page 1 of 2

TEST LAB

SOIL TEST BORING LOG

Project: Resource Recovery Facility **Job No.:** 84-1479

Depth	Soil Description	Soil Log	Sampler Blows/Ft.
40	hard light tan calareous sandy clay w/rock fragments, limestone lenses & some softer zones (WEATHERED LIMESTONE)	11	50 = 4" (17,50/4)
45		NR	50 = 3"
50		12	73 (32,36,37)
	boring terminated		

Remarks:

BORING: B-3

TEST LAB

SOIL TEST BORING LOG

Project: Resource Recovery Facility **Job No.:** 84-1479

Depth	Soil Description	Soil Log	Sampler Blows/Ft.
	*	1	▽ 2 (1,1,1)
	**		
5	very loose to firm dark brownish black slightly clayey medium-fine SAND (organic stained)	2	13 (3,7,6)
		3	6 (2,2,4)
10		4	5 (2,2,3)
15	firm light green CLAY	5	7 (2,3,4)
20	firm bluish green CLAY	6	7 (2,2,5)
25	stiff light bluish green fine very SANDY CLAY w/trace of small gravel	7	9 (2,4,5)
30	very loose greenish gray, gray & light brown CLAYEY fine SAND w/some slightly clayey zones	8 9	2 (2,1,1)
35	very soft tan calcareous sandy clay w/rock fragments (WEATHERED LIMESTONE)	10	2 (1,1,1)

Remarks:

* dark grayish brown medium-fine SAND (topsoil)
** light brownish bray medium-fine SAND
ground surface elevation 35.1 feet
partial loss of drilling fluid at 35 feet
bore hole grouted - ¼ hour and ½ bag cement

BORING: B-4

TEST LAB

SOIL TEST BORING LOG

Project: Resource Recovery Facility **Job No.:** 84-1479

Depth	Soil Description	Soil Log	Sampler Blows/Ft.
40	hard tan calcareous sandy clay w/rock fragments, limestone lenses & occasional softer zones (WEATHERED LIMESTONE)	11	50 = 4" (32,50/4)
45		12	42 (29,20,22)
	firm green CLAYEY fine SAND	13	50 = 4" (13,30,50/4)
50	hard tan calcareous sandy clay w/rock fragments, limestone lenses & some softer zones (WEATHERED LIMESTONE)		
55		14	50 = 4" (46,50,50/4)
60	firm dark greenish gray fine SANDY CLAY w/tan calcareous lenses	15	8 (7,4,4)
65	very stiff tannish gray calcareous sandy clay w/rock fragments & some greenish zones (WEATHERED LIMESTONE)	16	18 (2,5,13)
70	hard tan calcareous sandy clay w/rock fragments & limestone lenses (WEATHERED LIMESTONE	17	50 = 4" (16,46,50/4)

Remarks:

BORING: B-4

TEST LAB

SOIL TEST BORING LOG

Project: Resource Recovery Facility **Job No.:** 84-1479

Depth	Soil Description	Soil Log	Sampler Blows/Ft.
75	hard tan calcareous sandy clay w/rock fragments & limestone lenses (WEATHERED LIMESTONE)	NR	50 = 3"
		18	50 = 4" (22,46,50/4)
80	boring terminated		

Remarks:

BORING: B-4

Page 3 of 3

TEST LAB

SOIL TEST BORING LOG

Project: Resource Recovery Facility **Job No.:** 84-1479

Depth	Soil Description	Soil Log	Sampler Blows/Ft.
	*		
	loose light grayish tan medium-fine SAND	1	8 ▽ (3,3,5)
5		2	16 (4,6,10)
	firm dark brownish black slightly clayey medium-fine SAND (organic stained)	3	12 (7,6,6)
10	loose grown medium-fine SAND	4	8 (2,3,5)
	loose brown CLAYEY medium-fine SAND w/some slightly clayey zones & dark brownish black organic stained zones	5 6	9 (2,3,6)
20	firm light green CLAY	7	4 (2,2,2)
25	very loose light brownish gray, tan & greenish gray CLAYEY fine SAND w/cemented sand fragments, limestone fragments, & some sandy clay lenses	8	2 (2,1,1)
30		9	3 (2,2,1)
	very loose yellowish tan & gray CLAYEY fine SAND	10	3 (1,1,2)
35			

Remarks: * gray medium-fine SAND

ground surface elevation 37.8 feet
bore hole grouted - ¼ hour and ½ bag cement

BORING: B-5

Page 1 of 2

TEST LAB

SOIL TEST BORING LOG

Project: Resource Recovery Facility **Job No.:** 84-1479

Depth	Soil Description	Soil Log	Sampler Blows / Ft.
40	hard light tannish white calcareous sandy clay w/rock fragments, limestone lenses, some softer zones & occasional greenish zones (WEATHERED LIMESTONE)	11	50 = 5½"
45		12	50 = 4"
50		13	50 = 2½"
55	boring terminated	14	50 = 3½" (38,50/3)

Remarks:

BORING: B-5

Page 2 of 2

TEST LAB

SOIL TEST BORING LOG

Project: Resource Recovery Facility **Job No.:** 84-1479

Depth	Soil Description	Soil Log	Sampler Blows/Ft.
	*		
	loose light grayish tan medium-fine SAND	1 ▽	7 (2,3,4)
5	loose brown slightly clayey medium-fine SAND	2	6 (2,2,4)
	very loose dark brownish black slight clayey medium-fine SAND (organic stained)	3	2 (2,1,1)
10	loose light grayish brown CLAYEY medium-fine SAND	4	9 (3,4,5)
15	firm light green CLAY	5	4 (2,2,2)
20		6	5 (1,2,3)
25	firm greenish gray fine very SANDY CLAY w/cemented sand lenses & fragments	7	10 (2,4,6)
30	stiff light tannish white calcareous sandy clay w/rock fragments & greenish zones (WEATHERED LIMESTONE)	8	29 (3,7,22)
35	hard light tannish white calcareous sandy clay w/rock fragments & limestone lenses (WEATHERED LIMESTONE)	9	50 = 3"

Remarks: * gray medium-fine SAND

ground surface elevation 36.8 feet
bore hole grouted - ¼ hour and ½ bag cement

BORING: B-6

Page 1 of 2

TEST LAB

SOIL TEST BORING LOG

Project: Resource Recovery Facility **Job No.:** B4-1479

Depth	Soil Description	Soil Log	Sampler Blows / Ft.
40	hard light tannish white calcareous sandy clay w/rock fragments, limestone lenses, some softer zones & occasional greenish gray zones (WEATHERED LIMESTONE)	10	50 = 4" (25,47,50/4)
45		11	50 = 3"
50		12	63 (16,27,36)
	boring terminated		

Remarks:

BORING: B-6

Page 2 of 2

TEST LAB

SOIL TEST BORING LOG

Project: Resource Recovery Facility **Job No.:** 84-1479

Depth	Soil Description	Soil Log	Sampler Blows/Ft.
	*		
	loose light gray medium-fine SAND	1	7 (2,3,4)
5	loose to firm dark brownish black very slightly clayey medium-fine SAND (organic stained)	2	9 (2,3,6)
		3	15 (4,6,9)
10	loose brown medium-fine SAND	4	8 (3,4,4)
15	firm dark brownish black very slightly clayey medium-fine SAND (organic stained)	5	19 (7,10,9)
20		6	13 (5,6,7)
25	firm light brown CLAYEY medium-fine SAND	7	15 (5,6,9)
30	firm dark greenish brown CLAY	8	6 (2,3,3)
35	very loose light brown CLAYEY fine SAND w/cemented sand & shell fragments	9	2 (3,1,1)

Remarks: * gray medium-fine SAND

ground surface elevation 38.4 feet
partial loss of drilling fluid at 60 feet
bore hole grouted - ½ hour and ½ bag cement

BORING: B-7

TEST LAB

SOIL TEST BORING LOG

Project: Resource Recovery Facility **Job No.:** 84-1479

Depth	Soil Description	Soil Log	Sampler Blows / Ft.
40	very loose greenish gray CLAYEY fine SAND	10	1 = 18"
45		11	1 = 18"
50	hard light tan calcareous sandy clay w/some rock fragments, occasional limestone lenses, greenish zones & softer zones (WEATHERED LIMESTONE)	12	50 = 2" (38,50/2)
55		13	71 = 10" (11,21,50/4)
60	hard light grayish tan calcareous sandy clay w/rock fragments, limestone lenses & some softer zones (WEATHERED LIMESTONE)	14	50 = 3" (32,50/3)
65	boring terminated	15	88 (40,40,48)

Remarks:

BORING: B-7

Page 2 of 2

TEST LAB

SOIL TEST BORING LOG

Project: Resource Recovery Facility **Job No.:** 84-1479

Depth	Soil Description	Soil Log	Sampler Blows/Ft.
	loose brown medium-fine SAND	1	▽ 6 (2,3,3)
5	loose dark brownish black slightly clayey medium-fine SAND (organic stained)	2	4 (3,2,2)
	firm green CLAY w/brown clayey sand & sandy clay lenses	3	6 (2,3,3)
10		4	5 (2,2,3)
15	stiff light green fine SANDY CLAY	5	9 (3,4,5)
20	soft light greenish gray & tan fine SANDY CLAY	6	3 (2,1,2)
25	firm light tannish white calcareous sandy clay w/rock fragments (WEATHERED LIMESTONE)	7	7 (2,3,4)
30	very stiff to hard light tannish white calcareous sandy clay w/occasional rock fragments & greenish zones (WEATHERED LIMESTONE)	8	33 (10,20,13)
35		9	22 (6,7,15)

Remarks: * dark grayish brown slightly peaty medium-fine SAND (topsoil)

ground surface elevation 30.4 feet
bore hole grouted - ¼ hour and ½ bag cement

BORING: B-8

Page 1 of 2

TEST LAB

SOIL TEST BORING LOG

Project: Resource Recovery Facility **Job No.:** 84-1479

Depth	Soil Description	Soil Log	Sampler Blows / Ft.
40	hard green fine very SANDY CLAY	10	31 (8,13,18)
45	hard light tannish white calcareous sandy clay w/some rock fragments, limestone lenses, greenish zones & occasional softer zones (WEATHERED LIMESTONE)	11	50 = 4" (30,50/4)
50		12	80 (14,30,50)
55	hard light tan calcareous sandy clay w/rock fragments (WEATHERED LIMESTONE)	13	40 (9,20,20)
60	hard grayish tan calcareous sandy clay w/rock fragments, limestone lenses, occasional greenish zones & softer zones (WEATHERED LIMESTONE)	14	83 = 4" (25,33,50/4)
65		15	50 = 5"
70	boring terminated	NR	50 = 2"

Remarks:

BORING: B-8

Page 2 of 2

TEST LAB

SOIL TEST BORING LOG

Project: Resource Recovery Facility **Job No.:** 84-1479

Depth	Soil Description	Soil Log	Sampler Blows/Ft.
	*		
	loose light gray medium-fine SAND	1	8 ▽ (2,3,5)
5	loose brown medium-fine SAND	2	6 (2,2,4)
	very loose dark brownish black very slightly clayey medium-fine SAND (organic stained)	3	3 (1,2,1)
10		4 5	14 (3,6,8)
	firm light grayish tan CLAYEY medium-fine SAND		
15		6	18 (5,9,9)
20	soft light green CLAY	7	3 (2,1,2)
25	loose light greenish tan CLAYEY fine SAND	8	8 (2,3,5)
30	very soft light greenish gray fine very SANDY CLAY w/clayey sand lenses, tan calcareous clay lenses & rock fragments	9	2 (1,1,1)
35	very soft light tannish white calcareous sandy clay w/green sandy clay lenses (WEATHERED LIMESTONE)	10 11	1 - 18"

Remarks: * grayish brown medium-fine SAND (topsoil)

ground surface elevation 37.2 feet
partial loss of drilling fluid at 35 feet
bore hole cased (BX) to depth of 40 feet
bore hole grouted - ¼ hour and ½ bag cement

BORING: B-9

Page 1 of 2

TEST LAB

SOIL TEST BORING LOG

Project: Resource Recovery Facility **Job No.:** 84-1479

Depth	Soil Description	Soil Log	Sampler Blows/Ft.
40	stiff light tan & white calcareous sandy clay w/rock fragments (WEATHERED LIMESTONE)	12	12 (2,7,5)
45	hard light tannish white calcareous sandy clay w/rock fragments, limestone lenses & some softer zones (WEATHERED LIMESTONE)	13	50 = 3" (50,50/3)
50	boring terminated	14	50 = 3"

Remarks:

BORING: B-9

TEST LAB

SOIL TEST BORING LOG

Project: Resource Recovery Facility **Job No.:** 84-1479

Depth	Soil Description	Soil Log	Sampler Blows/Ft.
	dark grayish brown medium-fine SAND (topsoil)		
	loose light grayish tan medium-fine SAND	1 ▽	6 (2,2,4)
5	firm brown medium-fine SAND	2	17 (4,7,10)
	firm dark brownish black very slightly clayey medium-fine SAND (organic stained)	3	15 (4,8,7)
10		4	6 (2,2,4)
	loose to firm gray & brown medium-fine SAND		
15		5	28 (5,11,17)
20	firm gray CLAY	6	4 (3,2,2)
25	firm light grayish tan very CLAYEY fine SAND	7	11 (3,4,7)
	boring terminated		

Remarks: ground surface elevation 32.2 feet

BORING: B-10

TEST LAB

SOIL TEST BORING LOG

Project: Resource Recovery Facility **Job No.:** 84-1479

Depth	Soil Description	Soil Log	Sampler Blows / Ft.
	*		
	loose light gray & tan medium-fine SAND	1	▽ 7 (2,3,4)
5	loose dark brown medium-fine SAND	2	8 (2,3,5)
	firm dark brownish black medium-fine SAND (organic stained)	3	13 (4,5,8)
		4	19 (5,8,11)
10	firm to dense brown & gray medium-fine SAND		
		5	36 (9,14,22)
15			
	stiff gray fine very SANDY CLAY w/some tan sand lenses	6	11 (2,4,7)
20			
	stiff light bluish gray fine SANDY CLAY w/some tan sand lenses	7	14 (3,6,8)
25	boring terminated		

Remarks: * grayish brown medium-fine SAND (topsoil)

ground surface elevation 32.8 feet

BORING: B-11

TEST LAB

SOIL TEST BORING LOG

Project: Resource Recovery Facility **Job No.:** 84-1479

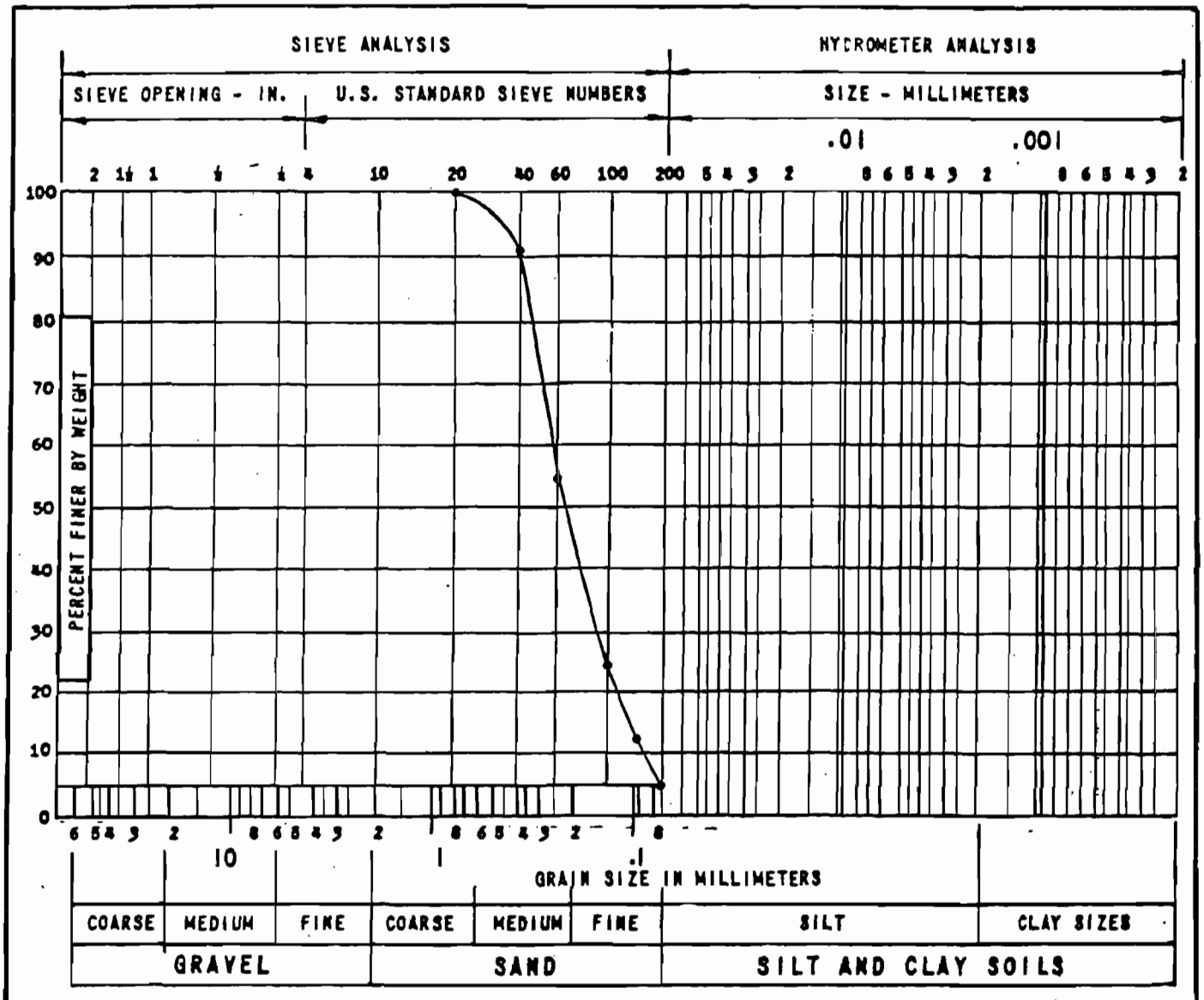
Depth	Soil Description	Soil Log	Sampler Blows/Ft.
	*		▽
	very loose dark brownish black slightly clayey medium-fine SAND (organic stained)	1	2 (1,1,1)
5		2	3 (1,1,2)
	loose brown slightly clayey medium-fine SAND	3	9 (5,5,4)
		4	3 (1,2,1)
10	very loose to loose dark brown medium-fine SAND w/some dark brownish black organic stained zones		
		5	5 (1,2,3)
15			
	firm light gray CLAYEY fine SAND	6	14 (10,8,6)
20		7	
	stiff light green CLAY		
		8	8 (3,3,5)
25	boring terminated		

Remarks: * dark brownish black slightly peaty medium-fine SAND (topsoil)

ground surface elevation 33.0 feet

BORING: B-12

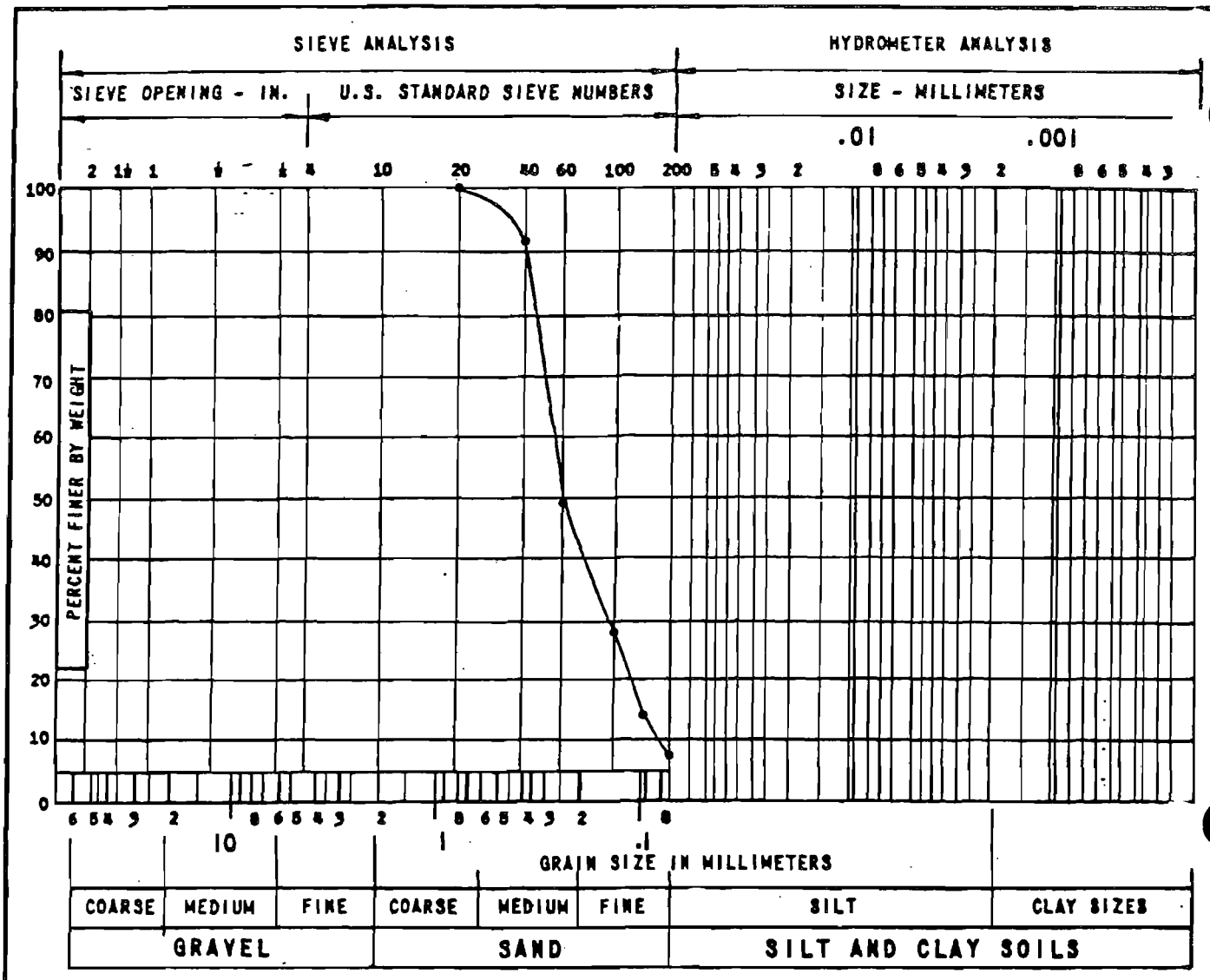
TEST LAB



CURVE NO.	SYM.	SAMPLE NUMBER	DEPTH	ELEV.	L.L.	P.I.	DESCRIPTION
		B-1 Sample No. 1	1' to 2½'				light grayish tan medium-fine sand

GRAIN SIZE DISTRIBUTION

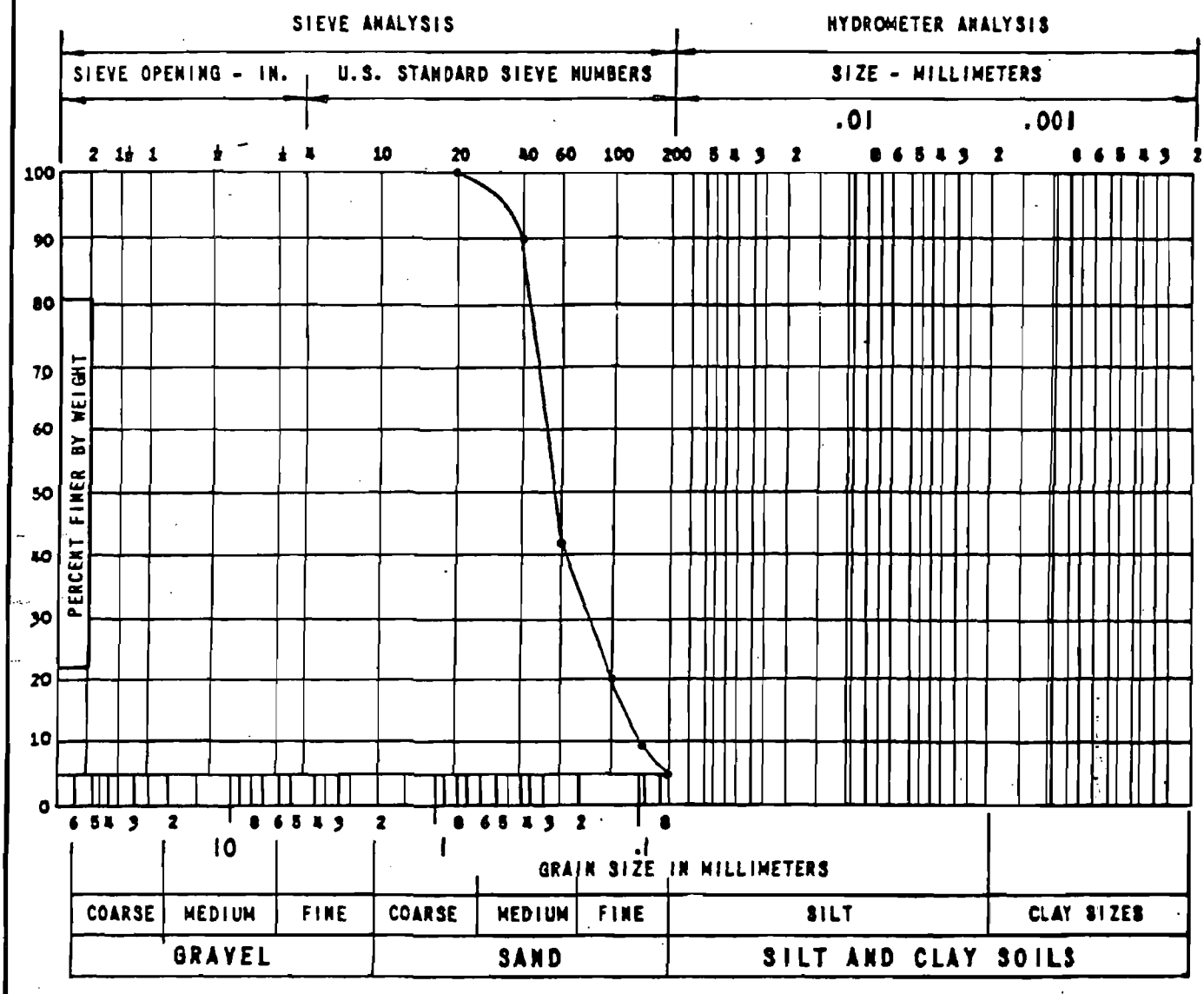
MATERIALS ENGINEERING, TESTING AND INSPECTION
TEST LAB



CURVE NO.	SYM.	SAMPLE NUMBER	DEPTH	ELEV.	L.L.	P.I.	DESCRIPTION
		B-1 Sample No. 2	3½' to 5'				loose dark brown medium-fine sand (slightly organic stained)

GRAIN SIZE DISTRIBUTION

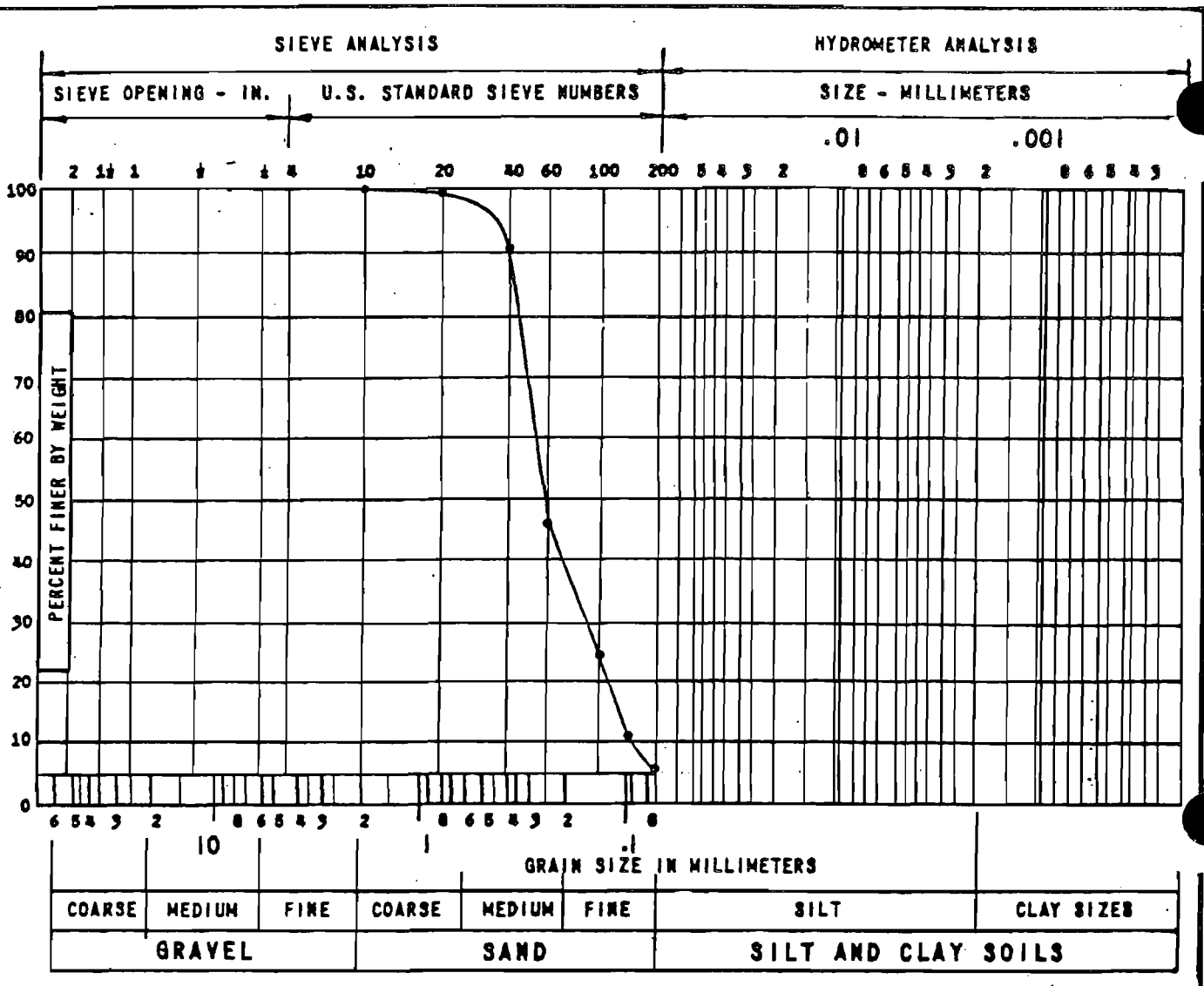
MATERIALS ENGINEERING, TESTING AND INSPECTION
TEST LAB



CURVE NO.	SYM.	SAMPLE NUMBER	DEPTH	ELEV.	L.L.	P.I.	DESCRIPTION
		B-1 Sample No. 3	6' to 7½'				light brown medium-fine sand

GRAIN SIZE DISTRIBUTION

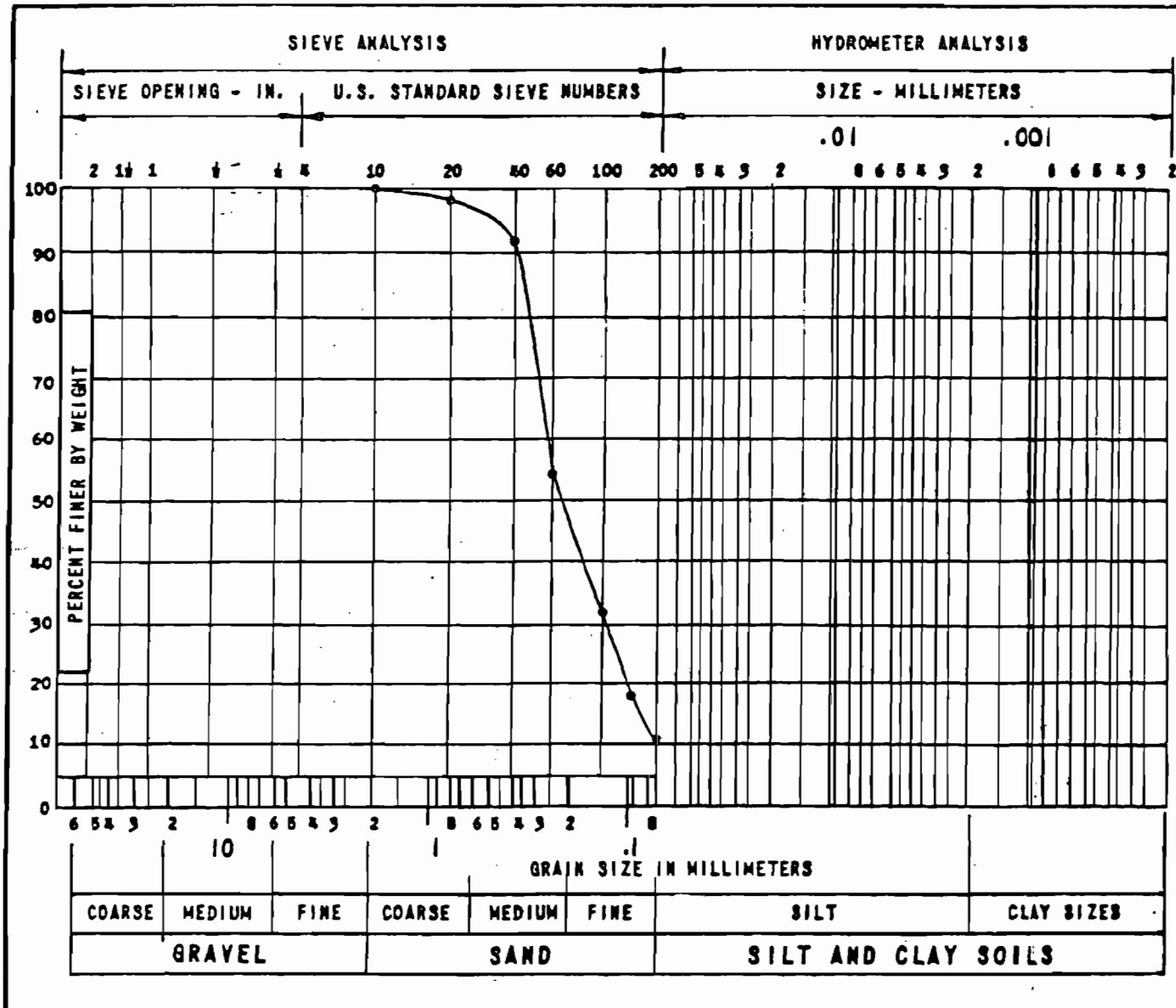
MATERIALS ENGINEERING, TESTING AND INSPECTION
TEST LAB



CURVE NO.	SYM.	SAMPLE NUMBER	DEPTH	ELEV.	L.L.	P.I.	DESCRIPTION
		B-1 Sample No. 4	8½' to 10'				dark brown medium-fine sand (slightly organic stained)

GRAIN SIZE DISTRIBUTION

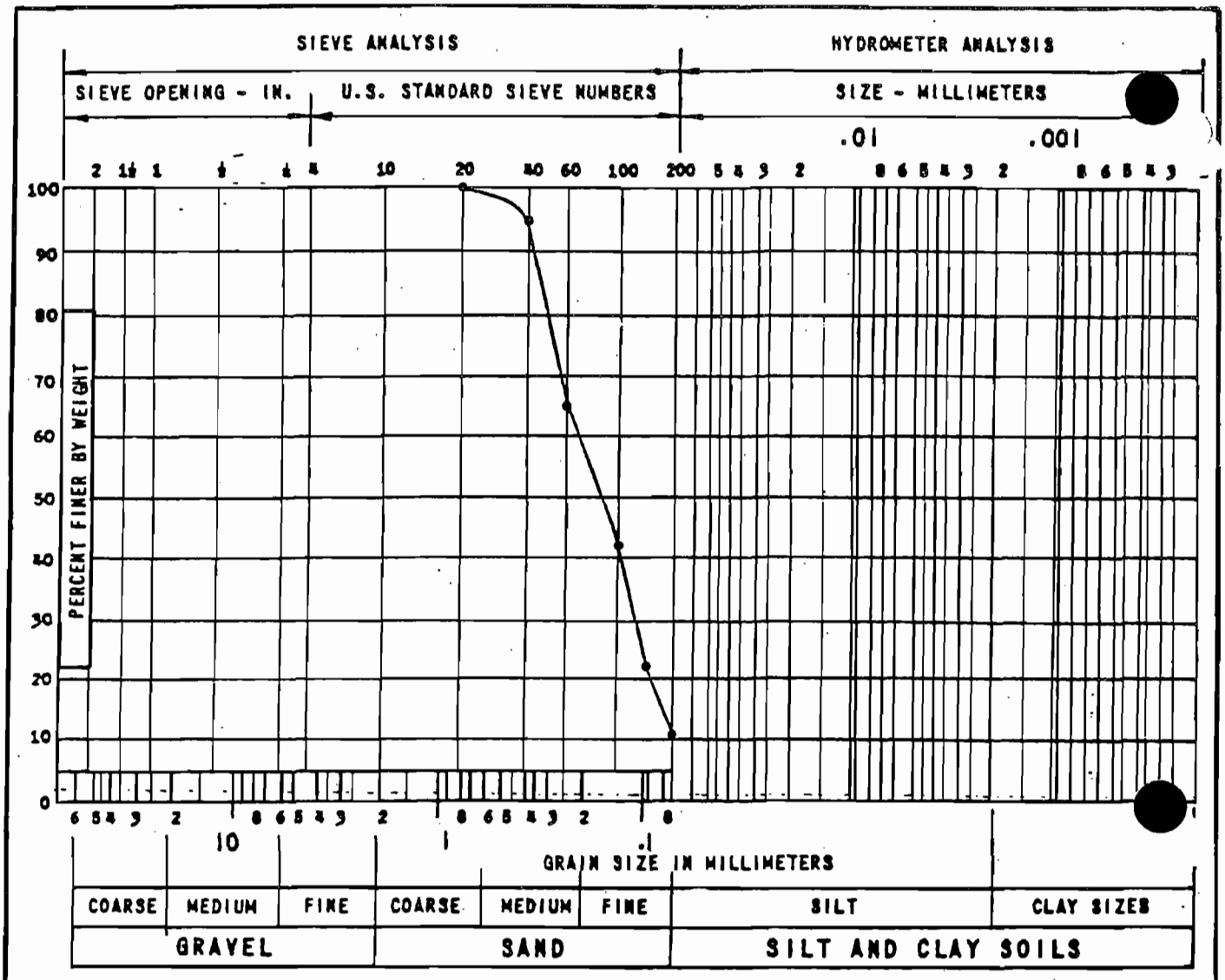
MATERIALS ENGINEERING, TESTING AND INSPECTION
TEST LAB



CURVE NO.	SYM.	SAMPLE NUMBER	DEPTH	ELEV.	L.L.	P.I.	DESCRIPTION
		B-1 Sample No. 5	13½' to 15'				dark brown slightly clayey medium-Fine sand

GRAIN SIZE DISTRIBUTION

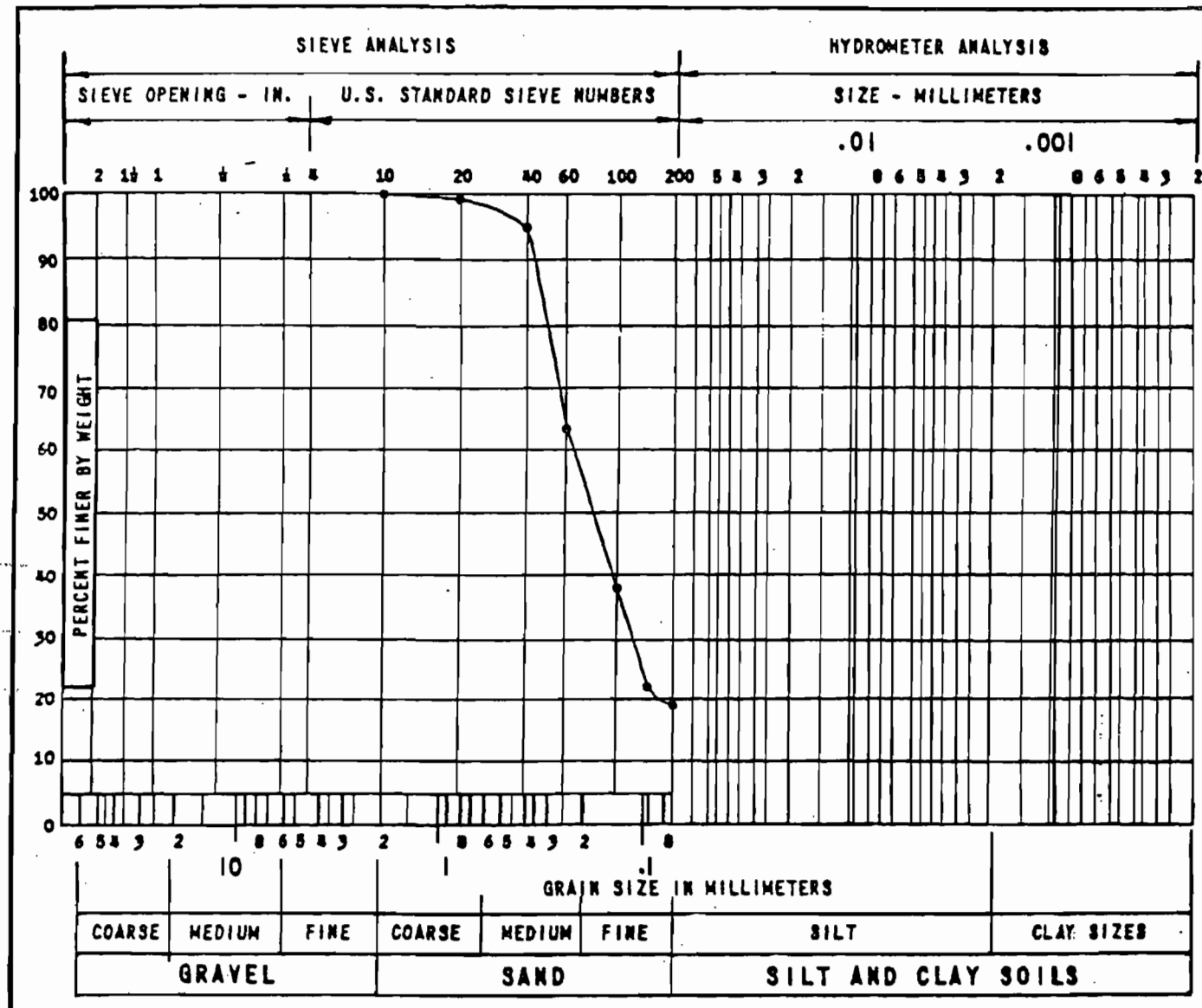
MATERIALS ENGINEERING, TESTING AND INSPECTION
TEST LAB



CURVE NO.	SYM.	SAMPLE NUMBER	DEPTH	ELEV.	L.L.	P.I.	DESCRIPTION
		B-1 Sample No. 6	18½' to 20'				light brown clayey medium-fine sand w/sand lenses

GRAIN SIZE DISTRIBUTION

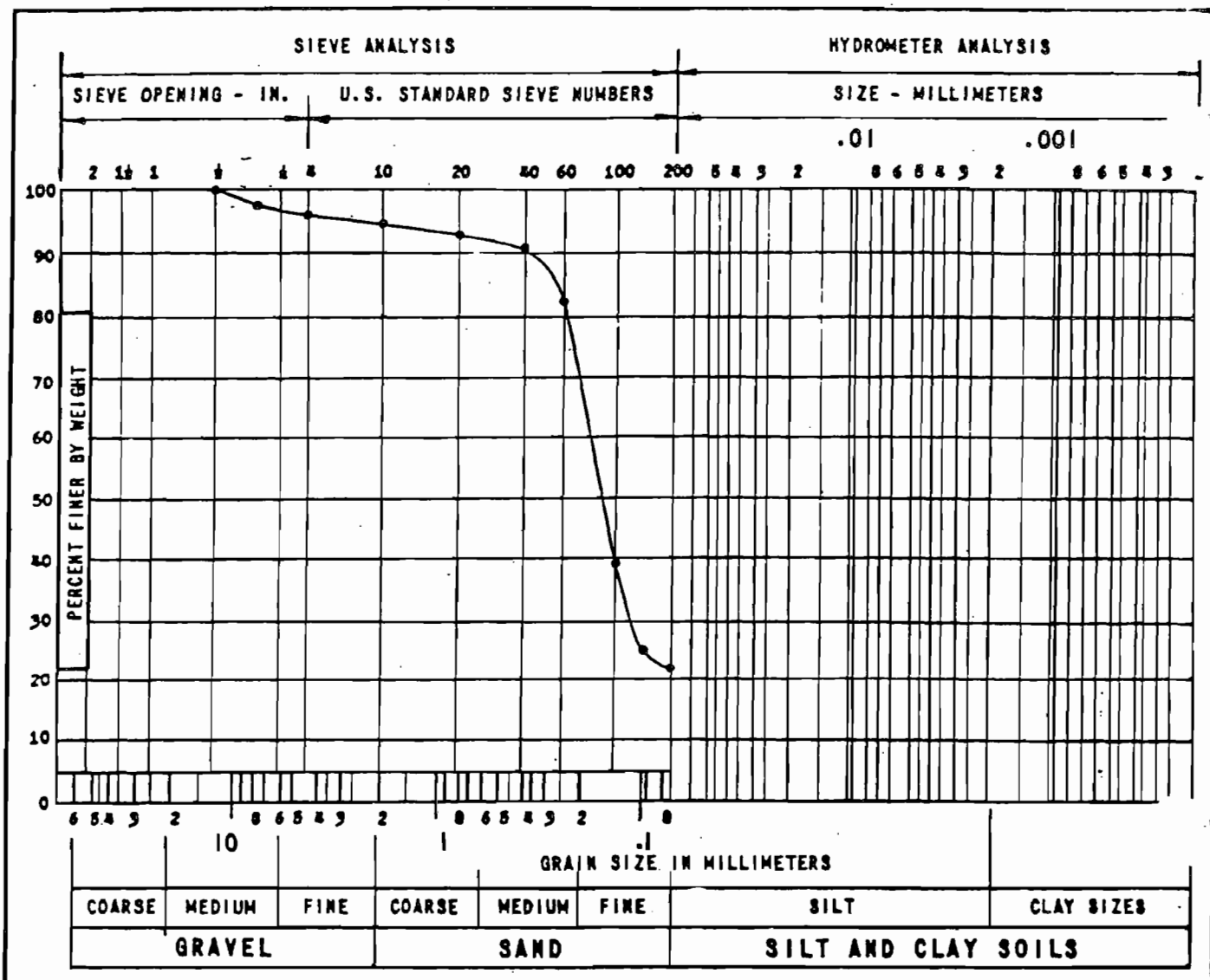
MATERIALS ENGINEERING, TESTING AND INSPECTION
TEST LAB



CURVE NO.	SYM.	SAMPLE NUMBER	DEPTH	ELEV.	L.L.	P.I.	DESCRIPTION
		B-1 Sample No. 7	23½' to 25'		20	7	grayish brown clayey medium-fine sand

GRAIN SIZE DISTRIBUTION

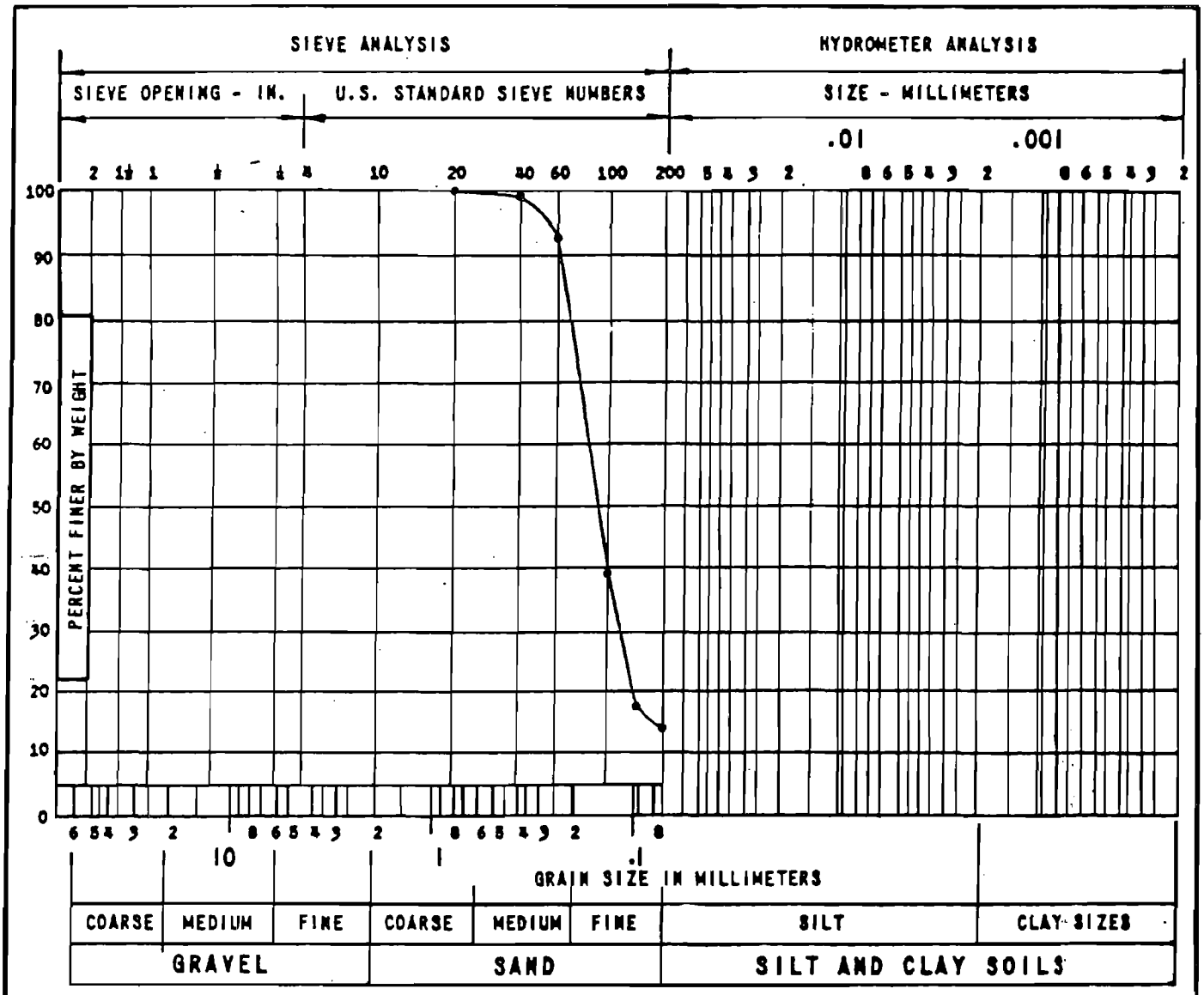
MATERIALS ENGINEERING, TESTING AND INSPECTION
TEST LAB



CURVE NO.	SYM.	SAMPLE NUMBER	DEPTH	ELEV.	L.L.	P.I.	DESCRIPTION
		B-1 Sample No. 8	28½' to 30'		28	13	light greenish gray clayey fine sand w/cemented sand fragments

GRAIN SIZE DISTRIBUTION

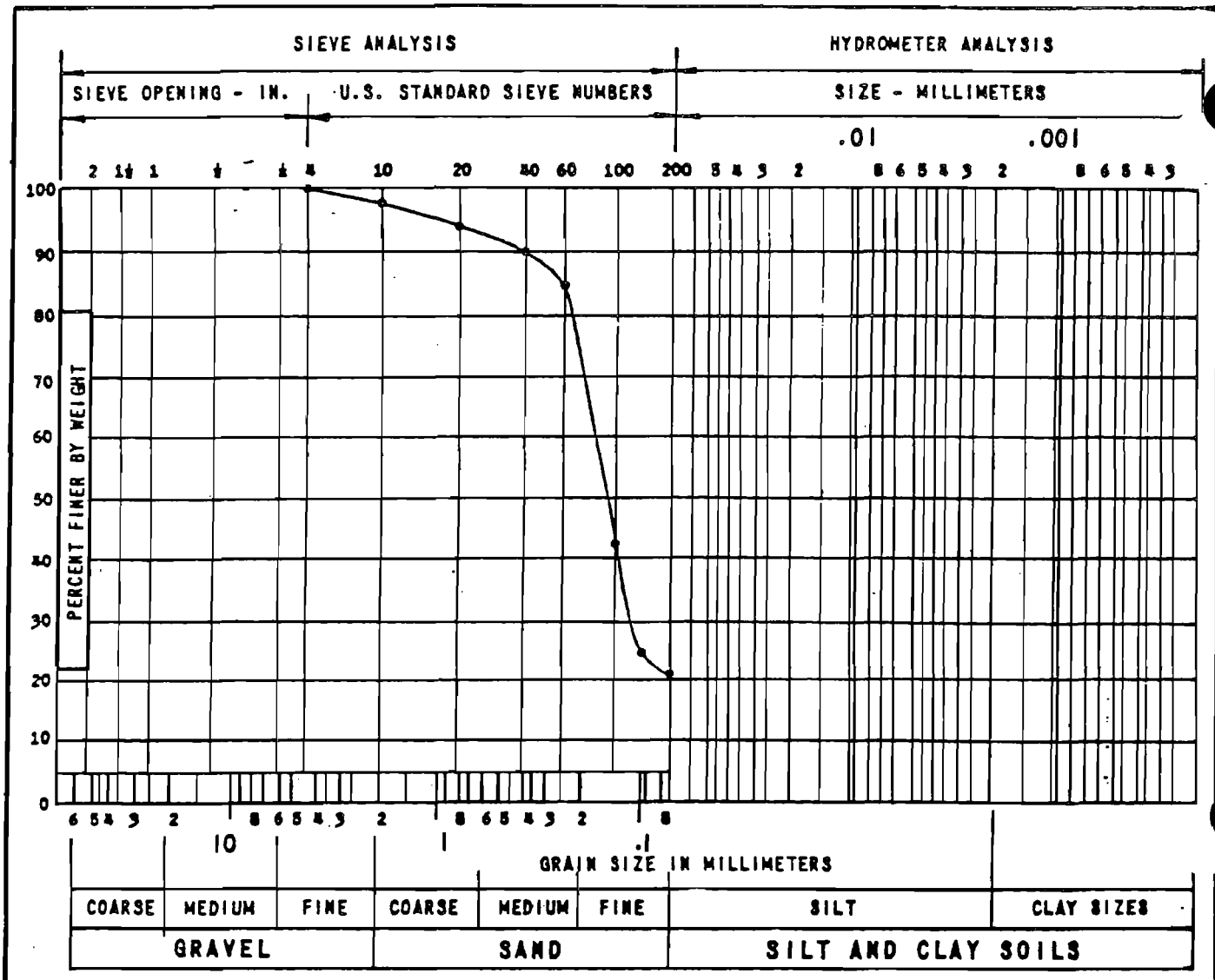
MATERIALS ENGINEERING, TESTING AND INSPECTION
TEST LAB



CURVE NO.	SYM.	SAMPLE NUMBER	DEPTH	ELEV.	L.L.	P.I.	DESCRIPTION
		B-3 Sample No. 8	23½' to 25'		22	NP	green clayey fine sand

GRAIN SIZE DISTRIBUTION

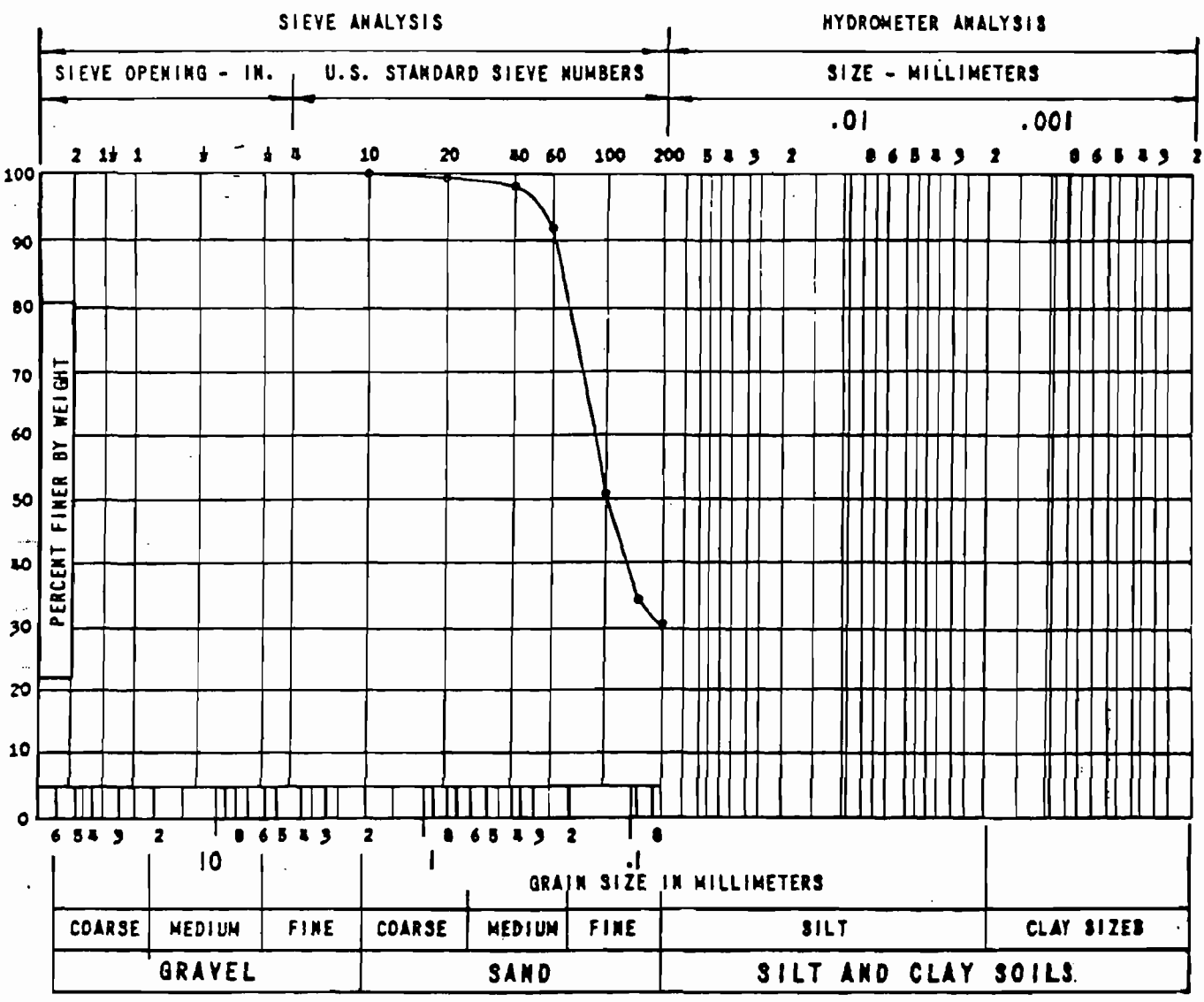
MATERIALS ENGINEERING, TESTING AND INSPECTION
TEST LAB



CURVE NO.	SYM.	SAMPLE NUMBER	DEPTH	ELEV.	L.L.	P.I.	DESCRIPTION
		B-5 Sample No. 8	23½' to 25'		35	10	light brownish gray clayey fine sand w/some cemented fragments

GRAIN SIZE DISTRIBUTION

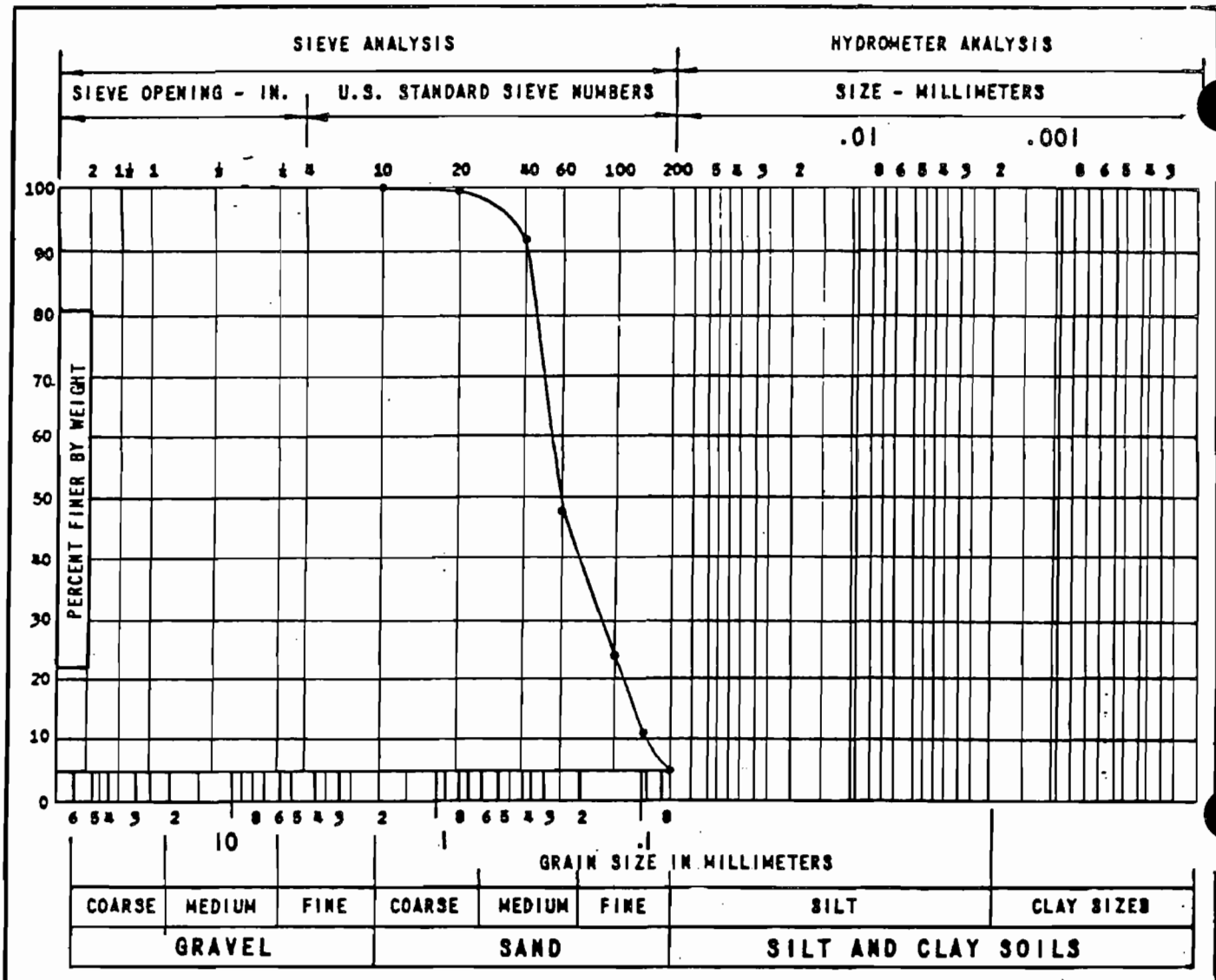
MATERIALS ENGINEERING, TESTING AND INSPECTION
TEST LAB



CURVE NO.	SYM.	SAMPLE NUMBER	DEPTH	ELEV.	L.L.	P.I.	DESCRIPTION
		B-5 Sample No. 10	33½' to 35'		61	22	yellowish tan & gray clayey fine sand

GRAIN SIZE DISTRIBUTION

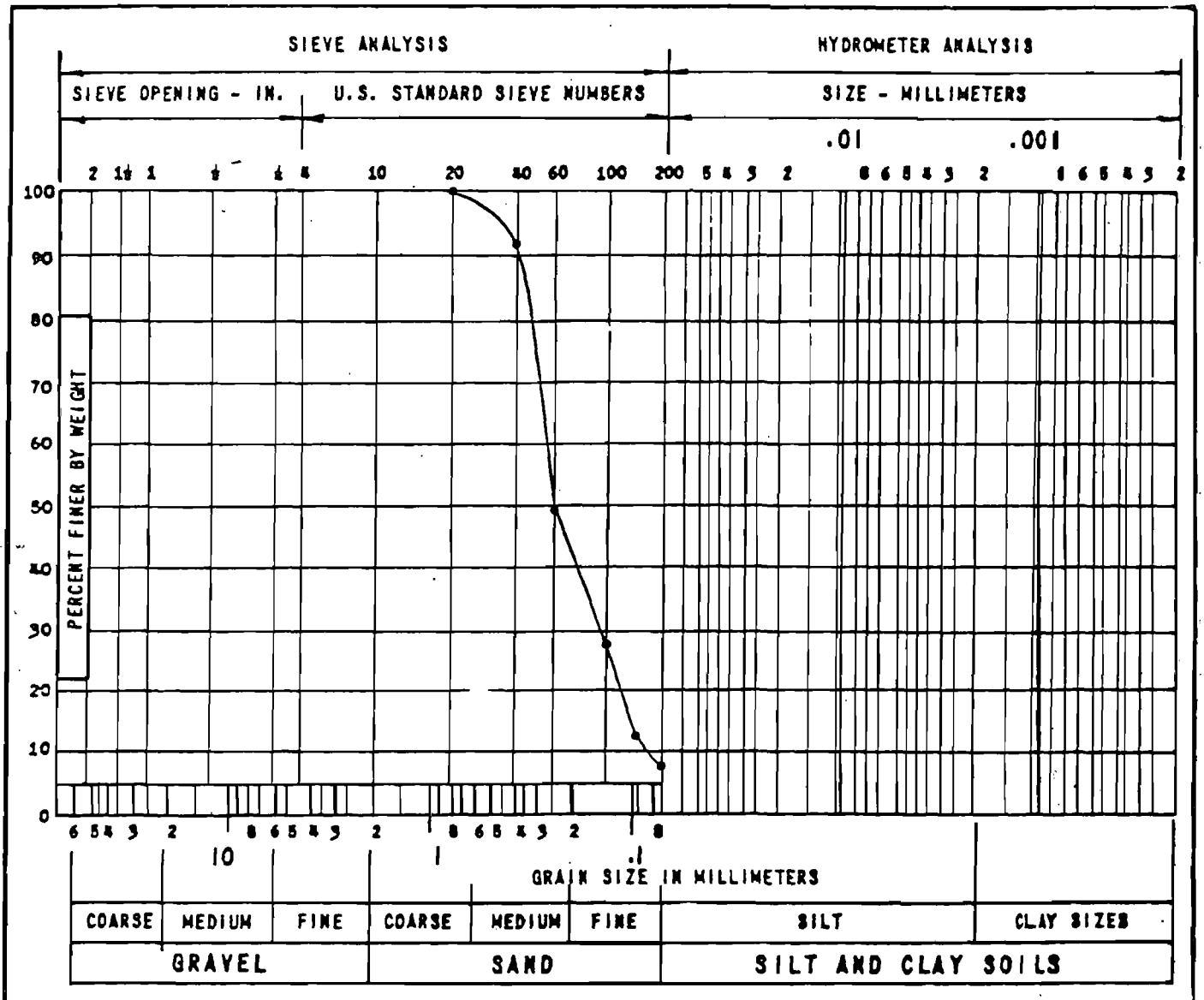
MATERIALS ENGINEERING, TESTING AND INSPECTION
TEST LAB



CURVE NO.	SYM.	SAMPLE NUMBER	DEPTH	ELEV.	L.L.	P.I.	DESCRIPTION
		B-7 Sample No. 1	1' to 2½'				light gray medium-fine sand

GRAIN SIZE DISTRIBUTION

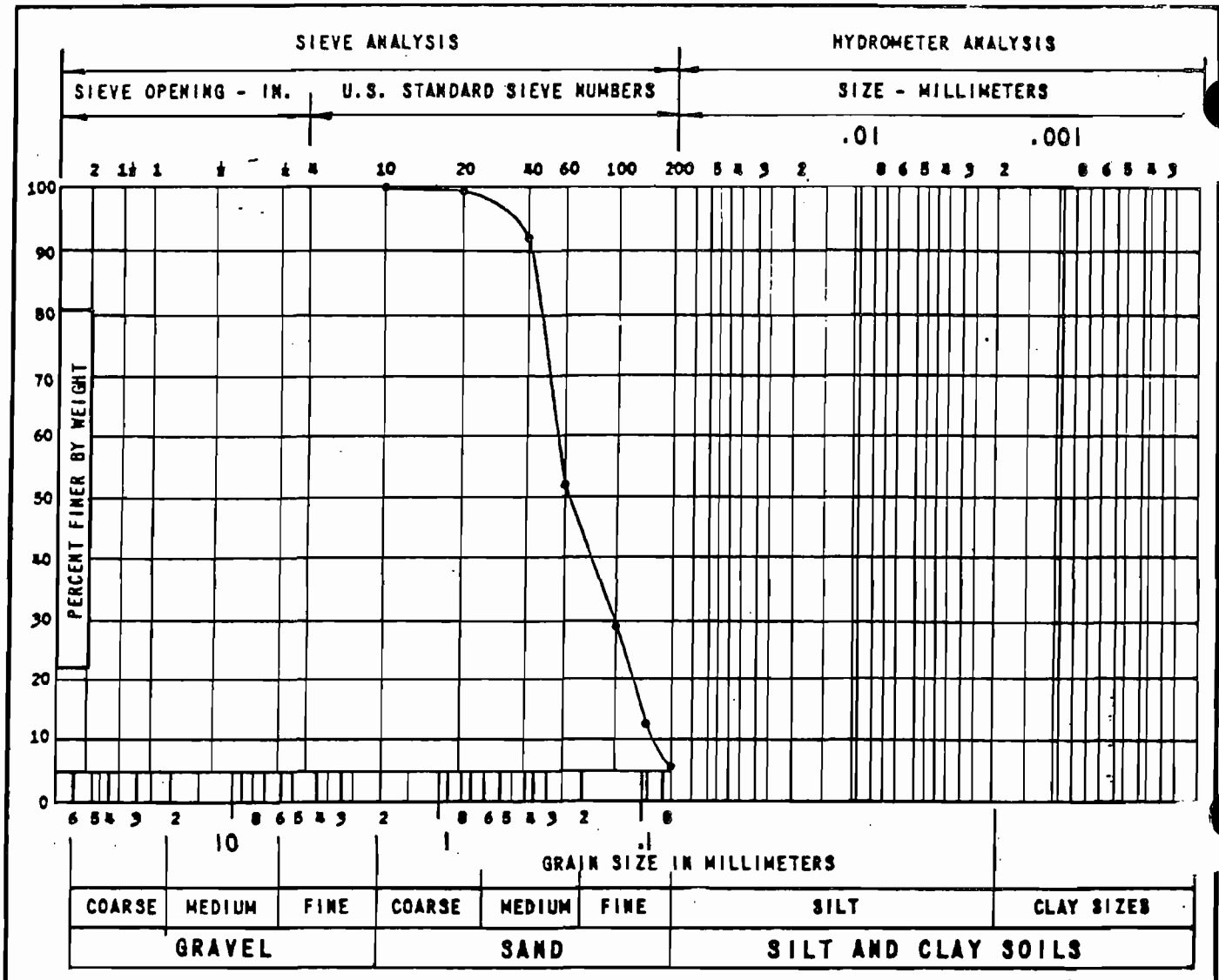
MATERIALS ENGINEERING, TESTING AND INSPECTION
TEST LAB



CURVE NO.	SYM.	SAMPLE NUMBER	DEPTH	ELEV.	L.L.	P.I.	DESCRIPTION
	*	B-7 Sample No. 2	3½' to 5'				dark brownish black very slightly clayey medium-fine sand (organic stained)

GRAIN SIZE DISTRIBUTION

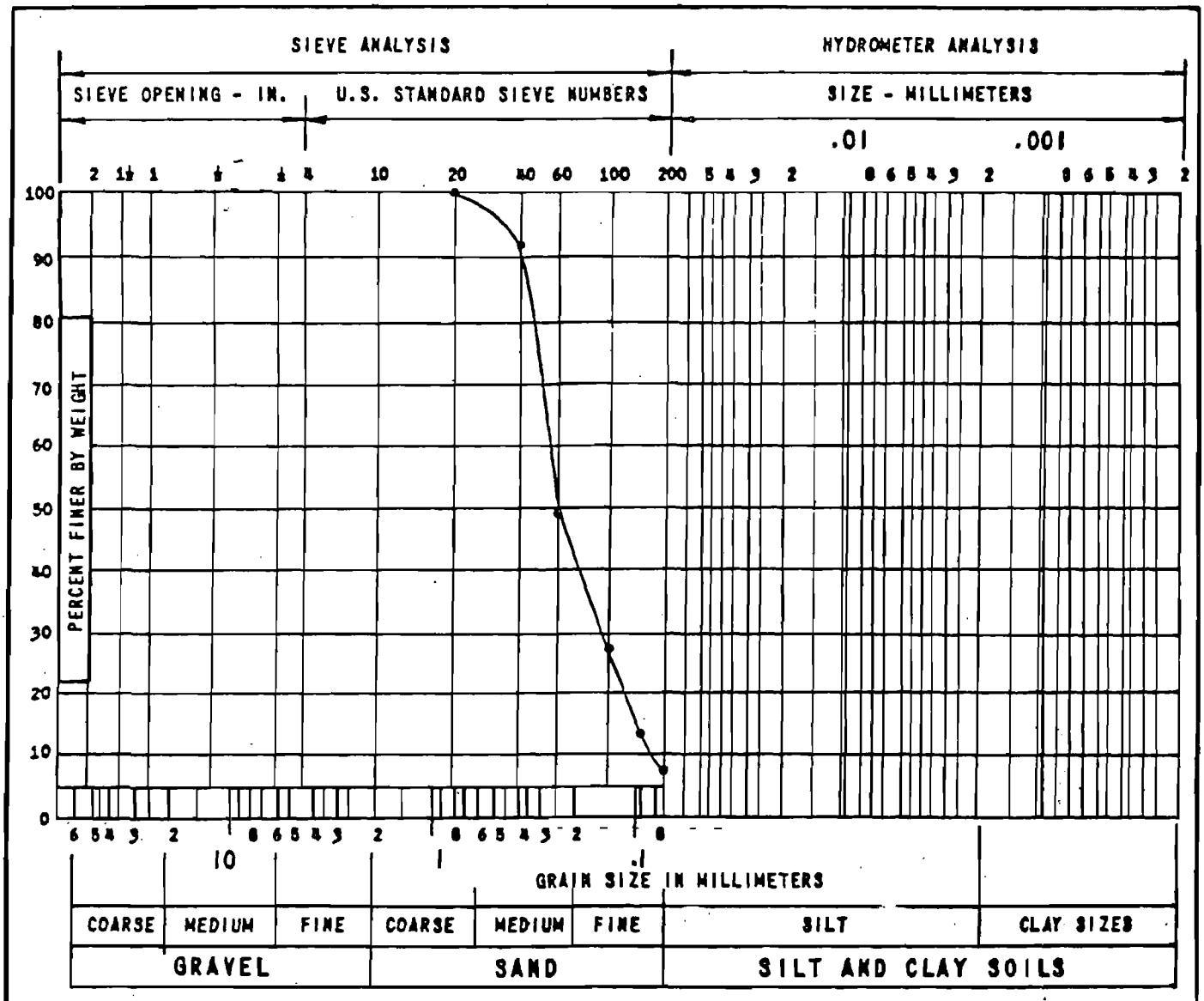
MATERIALS ENGINEERING TESTING AND INSPECTION
TEST LAB



CURVE NO.	SYM.	SAMPLE NUMBER	DEPTH	ELEV.	L.L.	P.I.	DESCRIPTION
		B-7 Sample No. 4	8½' to 10'				brown medium-fine sand

GRAIN SIZE DISTRIBUTION

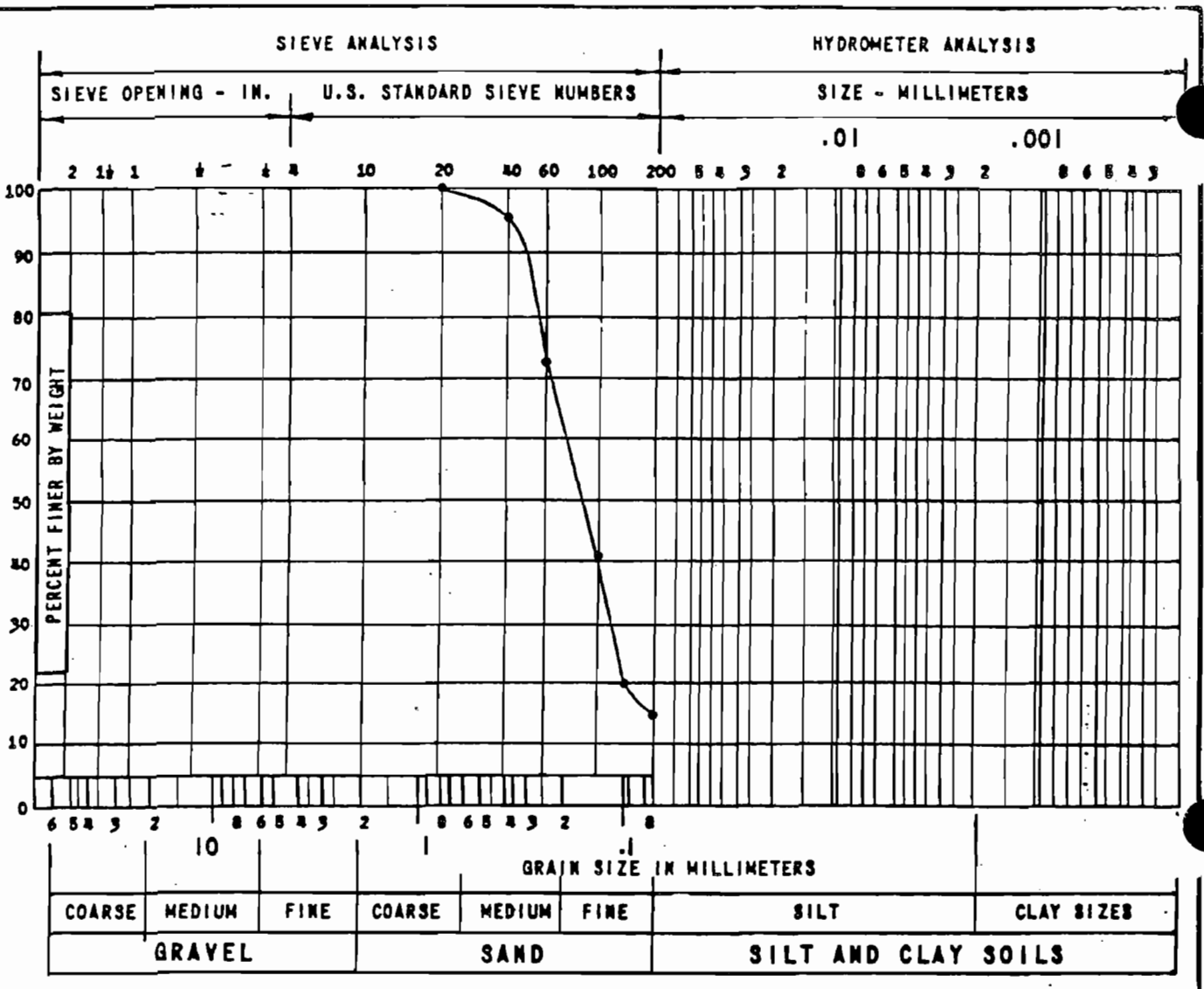
MATERIALS ENGINEERING, TESTING AND INSPECTION
TEST LAB



CURVE NO.	SYM.	SAMPLE NUMBER	DEPTH	ELEV.	L.L.	P.I.	DESCRIPTION
	-	B-7 Sample No. 5	13½' to 15'				dark brownish black very slightly clayey medium-fine sand (organic stained)

GRAIN SIZE DISTRIBUTION

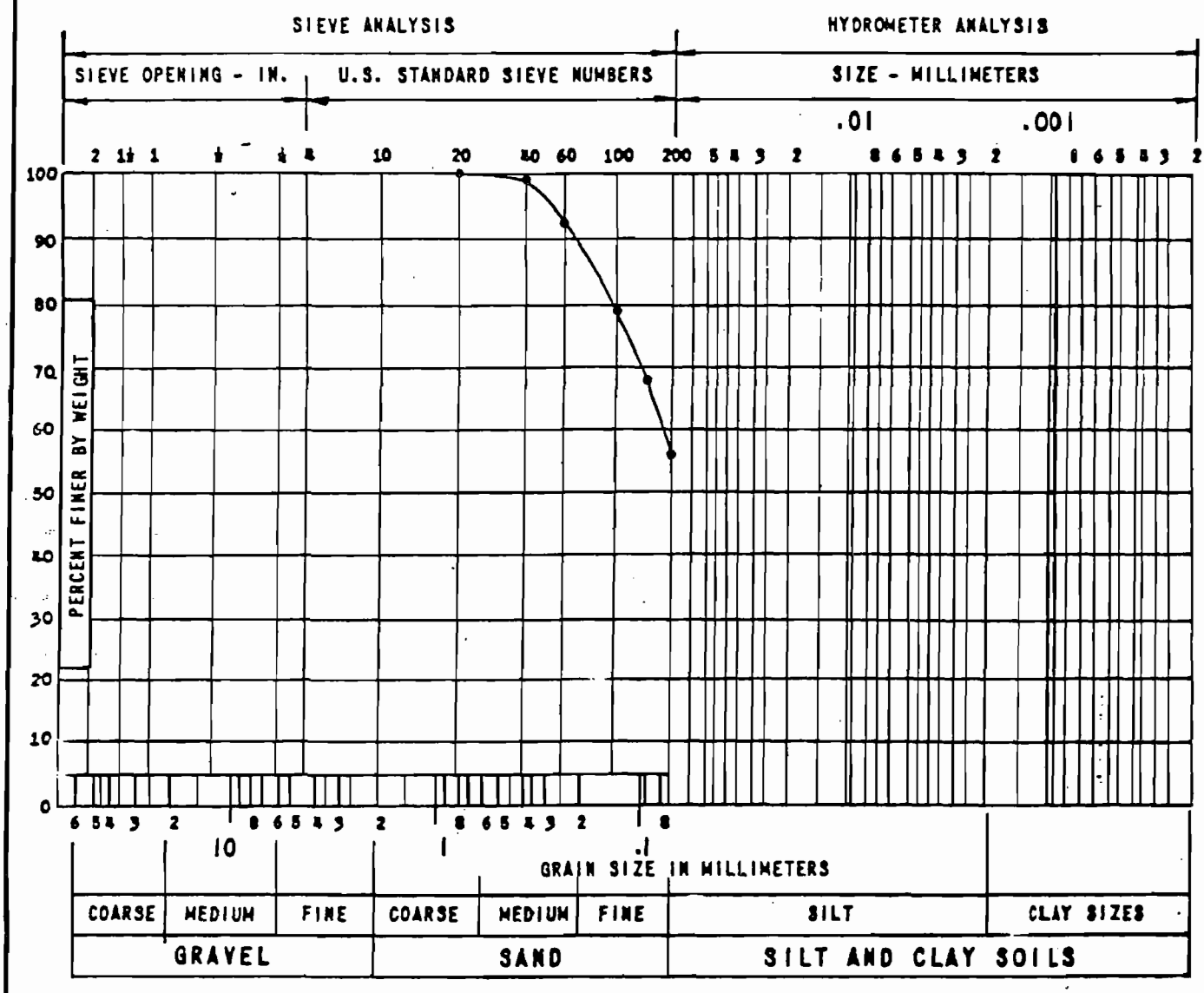
MATERIALS ENGINEERING, TESTING AND INSPECTION
TEST LAB



CURVE NO.	SYM.	SAMPLE NUMBER	DEPTH	ELEV.	L.L.	P.I.	DESCRIPTION
		B-7 Sample No. 7	23½' to 25'		20	NP	light brown clayey medium-fine sand

GRAIN SIZE DISTRIBUTION

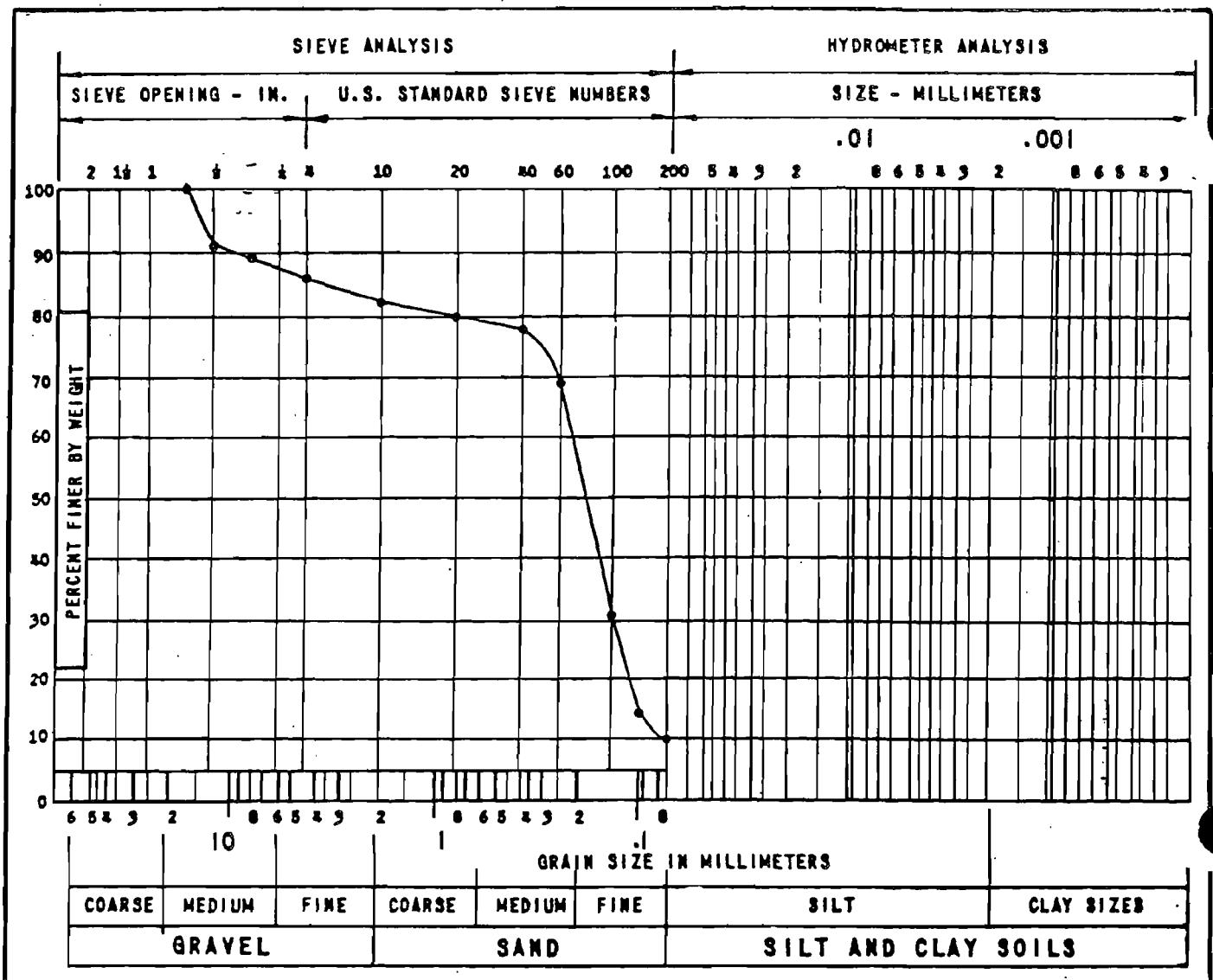
MATERIALS ENGINEERING, TESTING AND INSPECTION
TEST LAB



CURVE NO.	SYM.	SAMPLE NUMBER	DEPTH	ELEV.	L.L.	P.I.	DESCRIPTION
		B-7 Sample No. 8	28½' to 30'		55	20	dark greenish brown fine sandy clay

GRAIN SIZE DISTRIBUTION

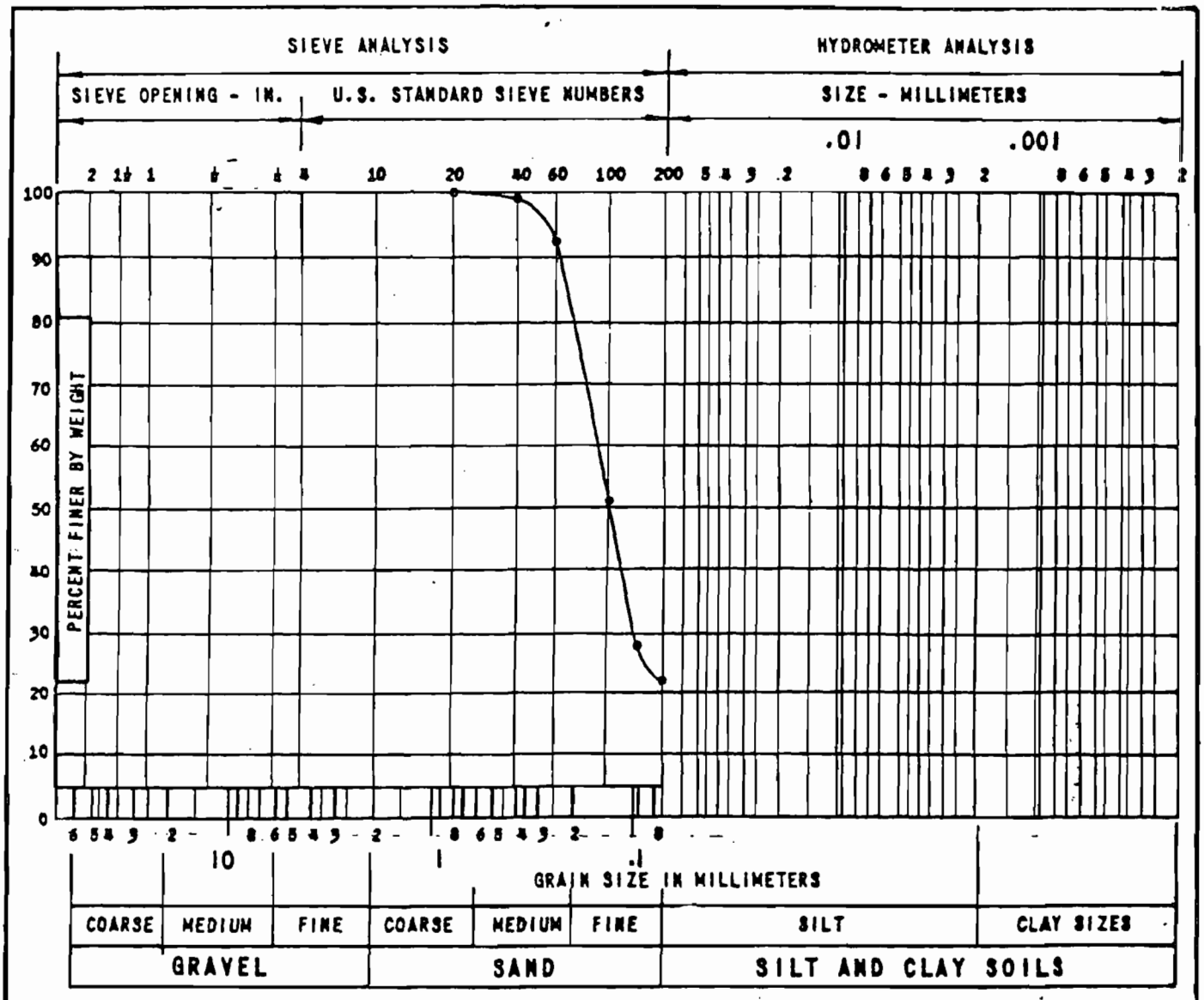
MATERIALS ENGINEERING, TESTING AND INSPECTION
TEST LAB



CURVE NO.	SYM.	SAMPLE NUMBER	DEPTH	ELEV.	L.L.	P.I.	DESCRIPTION
		B-7 Sample No. 9	33½' to 35'		24	NP	light brown clayey fine sand w/cemented sand & shall fragments

GRAIN SIZE DISTRIBUTION

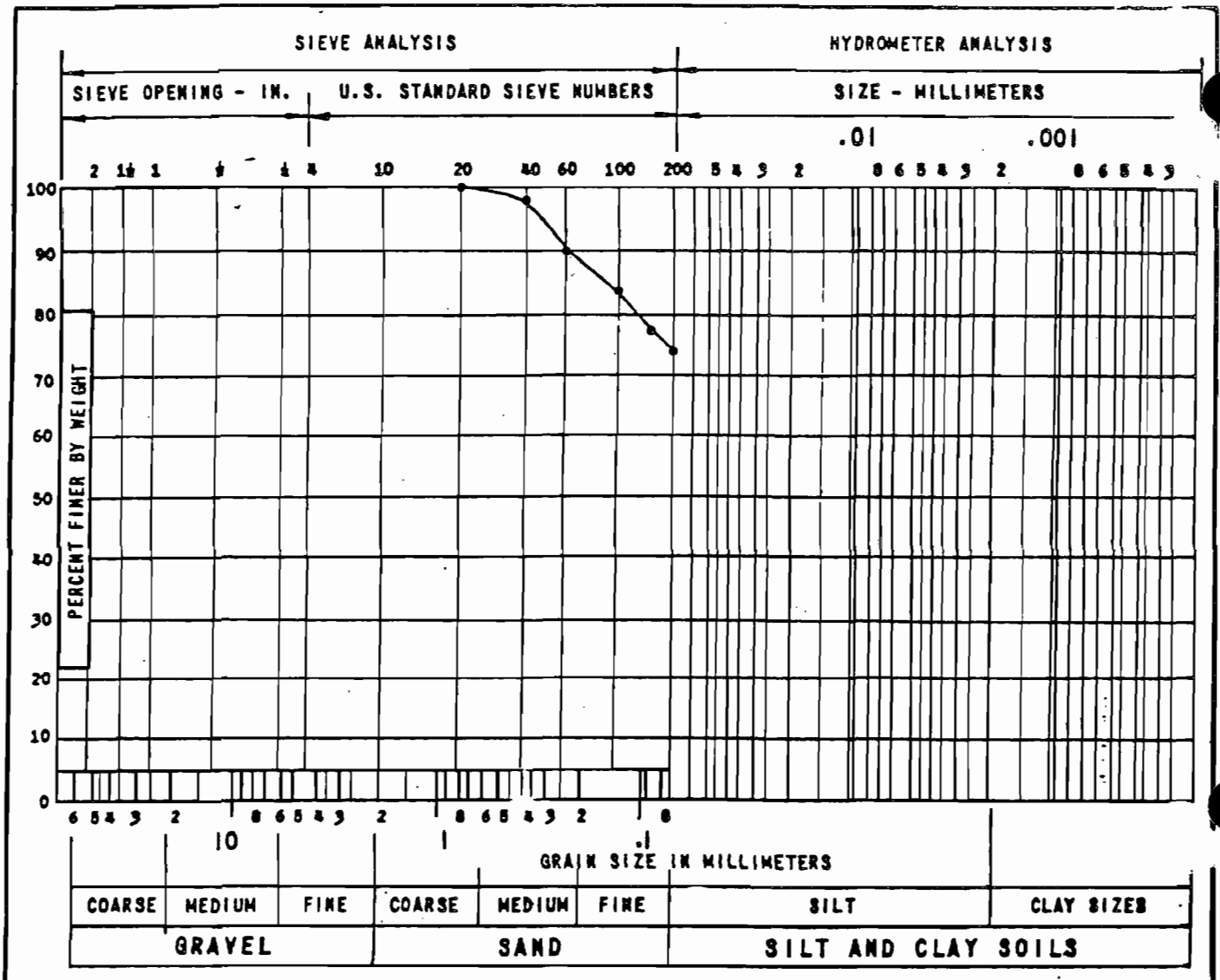
MATERIALS ENGINEERING, TESTING AND INSPECTION
TEST LAB



CURVE NO.	SYM.	SAMPLE NUMBER	DEPTH	ELEV.	L.L.	P.I.	DESCRIPTION
		B-7 Sample No. 10	38½' to 40'		43	22	greenish gray clayey fine sand

GRAIN SIZE DISTRIBUTION

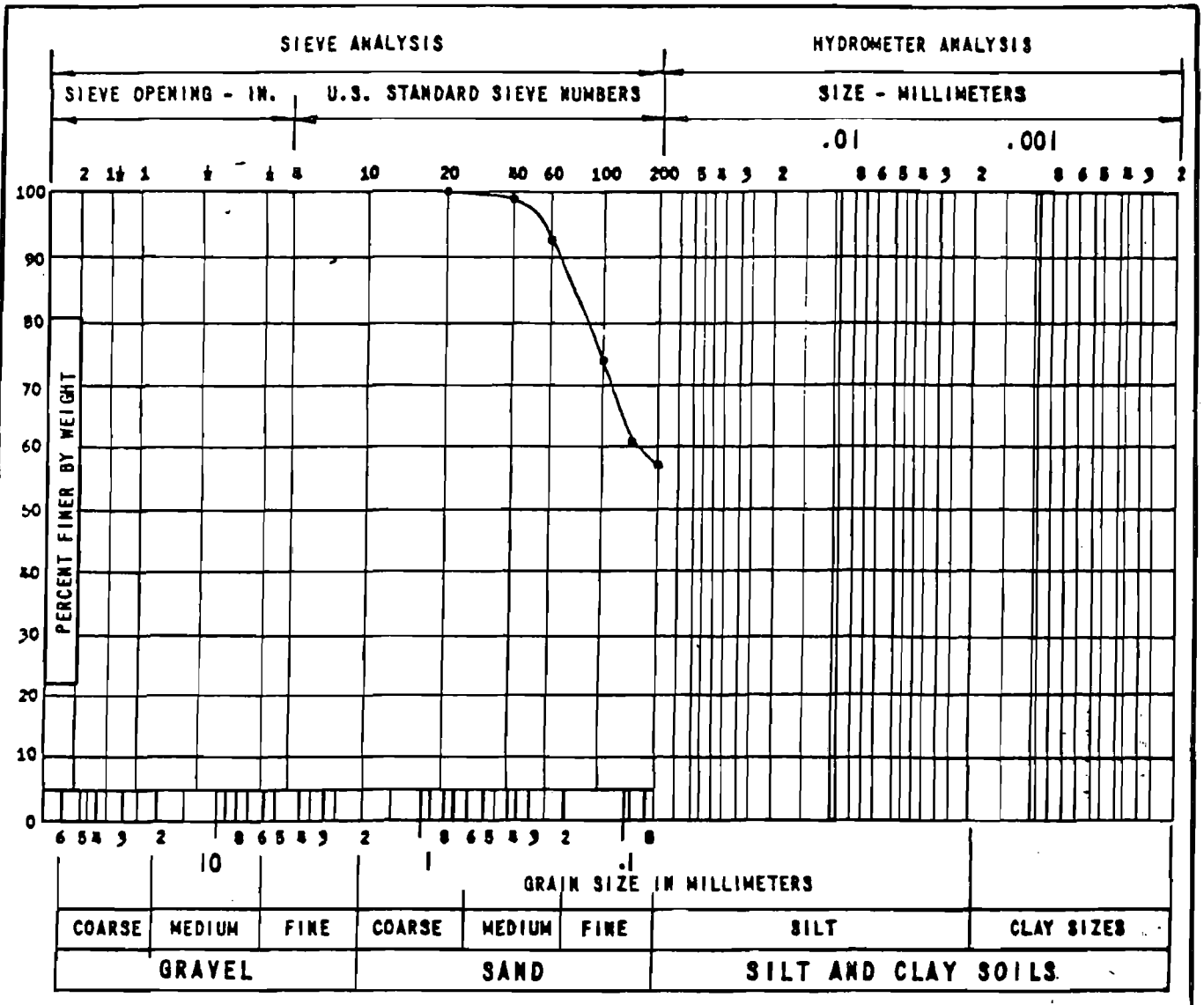
MATERIALS ENGINEERING, TESTING AND INSPECTION
TEST LAB



CURVE NO.	SYM.	SAMPLE NUMBER	DEPTH	ELEV.	L.L.	P.I.	DESCRIPTION
		B-8 Sample No. 3	6' to 7½'		93	64	firm green clay w/brown clayey fine sand & fine sandy clay lenses

GRAIN SIZE DISTRIBUTION

MATERIALS ENGINEERING, TESTING AND INSPECTION
TEST LAB



CURVE NO.	SYM.	SAMPLE NUMBER	DEPTH	ELEV.	L.L.	P.I.	DESCRIPTION
		8-8 Sample No. 6	18½' to 20'		86	62	light greenish gray & tan fine sandy clay

GRAIN SIZE DISTRIBUTION

MATERIALS ENGINEERING, TESTING AND INSPECTION
TEST LAB

Appendix 10-4
Williams and Associates Inc., Report

WILLIAMS & ASSOCIATES, INC.
GEOTECHNICAL ENGINEERING & MATERIALS TESTING
12290 US HIGHWAY 19 SOUTH, CLEARWATER, FLORIDA 33516
TELEPHONE: CLEARWATER (813) 536-4789 TAMPA (813) 228-7020

29 March 1983

County of Hillsborough
Department of Solid Waste
Post Office Box 1110
Tampa, FL 33601

Attention: Mr. Warren N. Smith

Subject: Report of a Preliminary Subsurface Exploration
Proposed Solid Waste Energy Recovery Facility
Faulkenburg Road Site, Hillsborough County, Florida
Our File Number D820117P

Gentlemen:

Williams & Associates, Inc., has performed a subsurface exploration for the subject project. The intent of this study was to develop preliminary or conceptual soil-related criteria for foundation design. It is our understanding that these recommendations are to be utilized in the development of preliminary cost estimates. Previous investigative work we have performed at this and other potential recovery facility sites was reported to you on 1 November 1982.

Our engineering and testing services were authorized by your acceptance of our proposal dated 24 January 1983. The scope of data collection indicated in that proposal was altered due to difficult access caused by the high groundwater levels. One change was to perform additional soil test borings rather than electric cone penetrometer soundings. Also, no data could be obtained from several test locations due to the high water. Because of the relatively uniform conditions encountered, it is not anticipated that additional borings will be performed for this preliminary study.

Williams & Associates, Inc., appreciates the opportunity to provide these engineering and testing services. If you have any questions, please contact our office.

Very truly yours,

WILLIAMS & ASSOCIATES, INC.

Stephan L. Sonnenfeld, P.E.
Senior Geotechnical Engineer
Florida Registration Number 19398

SLS/cb/460/H
SUBMITTALS: Addressee (1)
Camp, Dresser & McKee, Inc. (3)

Revised 12 December 1983

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APPENDIX:

Drawings:

No. 820117P-1	Site Location
No. 820117P-2	Test Locations
No. 820117P-3	Soil Profiles
No. 820117P-4	Soil Profiles

Field Testing

Laboratory Testing

I. INVESTIGATIVE PROCEDURES

A. FIELD TESTING

1. Soil Test Borings

On a supplied site plan, we selected the locations for ten soil test borings. These borings were located in the field by our engineering technician using a 100-foot tape and estimated right angles. The approximate boring locations are shown on our Drawing 820117P-2, which we prepared from the furnished site plan.

Soil test borings provide soil samples and Standard Penetration Resistance Values from selected depth intervals. Based on previously developed empirical correlations, various engineering properties of the soils can be inferred from these data. Records of the test borings are attached.

2. Undisturbed Samples

Soft cohesive soils which could adversely affect foundation support were encountered in the test borings. To better quantify these soils' engineering properties, relatively undisturbed samples were obtained for quantitative laboratory testing. These samples were obtained in conjunction with the soil test borings and are shown on the appropriate boring record.

3. NX Coring

NX-size corings were performed in general accordance with ASTM D 2113. The borings were advanced using a double-tube core barrel. Water was pumped through the core barrel to the tip to aid in cutting and flushing the bore hole. Once the desired length of core had been cut, the barrel was returned to the surface and the sample removed.

Coring provides a continuous sample of the more competent material encountered. These samples aid in better stratification of the subsurface conditions and provide samples for laboratory testing. This type procedure is not applicable in the softer material. A record of all coring is presented on the soil test boring logs.

B. LABORATORY TESTING

1. Classification Tests

Grain-size and Atterberg limit tests were performed on selected samples to assist in soils classification and to provide a general indication of the soils' engineering properties. The grain-size tests were performed in general accordance with ASTM D 442-63.

The soils' liquid limit was determined in general accordance with ASTM 423-67. The plastic limit and plasticity index were determined in general accordance with ASTM D 424-59. The test results are shown in the Summary of Laboratory Test Data.

2. Determination of Unit Weight and Moisture Content

In-place unit weights and moisture contents are necessary in evaluating the soils' settlement potential. The test data are presented in the Summary of Laboratory Test Data.

3. Consolidation Tests

In order to determine the soils' settlement characteristics, consolidation tests were performed on selected undisturbed samples. Consolidation tests provide quantitative data for estimating the soils' settlement potential under planned loading conditions. The tests were performed in general accordance with the procedures outlined in ASTM D 2435-78. The test results are presented as plots of void ratio versus the log of the applied vertical pressure.

II. SITE AND SUBSURFACE CONDITIONS

The location of the proposed Faulkenburg Road solid waste treatment facility is shown on our Drawing 820117P-1. At the present time, the site is being utilized for pasture land. Due to heavy rains which have occurred recently, standing water has been observed over portions of the site. This very wet condition has made access to the site extremely difficult for truck-mounted equipment.

The soil test borings drilled during this study indicated overburden soils consisting primarily of fine sands to sandy clays (see Drawings 820117P-3 and 4). The clean, fine sands were typically encountered from the ground surface to depths of 5 to 13 feet. The consistency of this upper layer of sands ranged from very loose to medium dense, as indicated by Standard Penetration Resistance Values ranging from 3 to 19 blows per foot. An exception to this occurred at Boring 105, where dense conditions in the upper sands were indicated by Standard Penetration Resistance Values as high as 60 blows per foot.

Underlying the fine sands, clayey fine sands to sandy clays were encountered. Borings 108 and 109 were terminated in this cohesive stratum at a depth of 21.5 feet. The consistency of these clays varied markedly, as indicated by Standard Penetration Resistance Values ranging from 2 to 20 blows per foot. This wide range in penetration resistance values of the cohesive stratum indicates a significant variation in its settlement potential. This potential was further defined by laboratory consolidation tests.

The soils overlying the limestone formation were encountered to depths ranging from approximately 27 to 38 feet below existing ground surface. The test borings penetrated through these soils into the calcareous clays and silts of the limestone formation. Standard Penetration Resistance Values in the upper portion of the formation varied significantly from 8 to in excess of 100 blows per foot. However, the penetration resistance values within the

formation typically increased in depth, ranging from approximately 26 to in excess of 100 blows per foot. The borings were terminated in the formation at a maximum depth of 60 feet.

The relatively porous nature of the limestone formation was indicated by the loss of drilling fluid. However, no voids or near-void conditions were observed.

Relatively stabilized groundwater was observed in hand auger borings drilled adjacent to the test borings. At the time of our study, groundwater was encountered at ground surface to depths of approximately 1 foot. However, it is known the groundwater levels will fluctuate with rainfall and seasonal conditions.

III. SUPPLIED INFORMATION

At the present time, we have not been provided with specific structural information pertaining to the proposed solid waste facility. The following structural concepts are based on our experience with similar type facilities. We have assumed that the most critical components will be the refuse pit, boilers, steam generators, smoke stack, and heavy steel-frame structures.

The refuse pit will likely have an area load of approximately 3000 pounds per square foot. For traffic to access this pit, a ramp, a minimum of 20 to 30 feet in height, will likely be required. Both the fill and the proposed pit will cover large lateral areas.

Other heavier loading conditions will exist in the boiler, steam generator, and smoke stack areas. We have estimated that column loads could range from as high as 1000 to 1500 kips. At the present time, we have not considered the affects of equipment vibrations on the proposed foundations.

Typically a development of this nature will have a series of relatively small on-site improvements. These improvements could consist of office space, cooling towers and electrical substations, for example. For our preliminary purposes, we have defined lightly loaded structures as those which would have column loads less than 200 kips.

IV. EVALUATIONS

The following evaluations and recommendations are based on the subsurface data collected at this site and the preliminary structural conditions discussed herein. While in our opinion sufficient data have been obtained to evaluate the site in a preliminary fashion, additional subsurface data will be necessary in order to develop final recommendations. Also, it is cautioned that these evaluations are based on assumed structural conditions which could vary markedly. If there are significant variations from these structural conditions, we should be informed so as to review these evaluations for possible changes to our recommendations.

The subsurface data collected at this site indicate two limiting conditions for using conventional shallow foundations under the planned heavy loads. These are the very loose surficial sands and the potential for consolidation-type settlement in the underlying clayey stratum. The upper sands could be improved so as to significantly reduce the potential for post-construction settlement. However, the potential for consolidation-type settlement in the underlying clays would be somewhat more difficult to reduce. One procedure would be to surcharge the area. However, from a preliminary or conceptual point of view, this approach does not appear to be favored due to the required fill and possible construction delays.

For the relatively light loads, column loads less than 200 kips, post-construction settlement due to consolidation will likely be less than 1 inch. Therefore, shallow foundation support for lightly loaded components is quite feasible. It is cautioned that care would have to be taken between shallow-supported and pile-supported elements so as to reduce the potential for detrimental affects of differential types of settlement.

The proposed structures could be supported on a driven pile foundation. Additional information pertaining to the compressive strength of the limestone formation was obtained from both soil test borings and NX core samples. Based on this additional data, it is our opinion that pile compressive capa-

cities at this site should be limited to 60 tons. We estimate typical pile tip depths will range from 30 to 40 feet below existing ground surface for the 12-x 12-inch precast, prestressed concrete pile; or a pipe pile with a minimum diameter of 10 inches, driven to the 60-ton compressive capacity. However, based on a literal interpretation of the boring data, pile tip depths as great as 55 feet could occur at this site. Therefore, cutting and splicing of piles will likely be required. If the concrete section were selected rather than the steel section, then some means of splicing should be agreed upon prior to beginning production pile installation.

Another deep foundation support system would be to utilize a drilled shaft. Due to the relatively high groundwater levels, the drilled shaft would likely be installed using the "wet-hole" technique. Therefore, we recommend for preliminary planning that you consider drilled shafts developing their load-carrying capacity solely by side friction in the limestone formation. The top of the limestone formation was encountered at the test locations varying from approximately 27 to 40 feet below existing ground surface. Based on the additional data obtained during this study, we still recommend a design allowable friction capacity of 6 kips per square foot.

The relatively high groundwater level was observed throughout the entire site. Lowering of the groundwater level will likely be required during foundation construction. Also, depending on final site grading, high groundwater levels could be a factor in the design of pavement sections. We strongly recommend that for proposed paved areas, which will exist near or below existing ground surface, you consider a base course which is resistant to early deterioration due to water intrusion. Such base courses as soil-cement and cement-treated limerock would appear to be appropriate.

Aerial photographs of this site indicate numerous circular depressions in this general area. One of the test borings drilled during our previous study was located in a depression. The porous nature of the formation was indicated by the loss of drilling fluid in some of the test borings. However, this is not considered to be a unique condition. No evidence of advanced solution activity

such as voids and near-void conditions, was observed within either the overburden or limestone formation. Therefore, it is our opinion that this site does not appear to have a higher potential for solution and sink development than that which exists in this general locale.

V. PRELIMINARY RECOMMENDATIONS

We recommend that for your conceptual planning you consider supporting the heavily loaded components by means of a deep foundation system. Preliminary criteria for alternate deep foundation systems are discussed below. For the more lightly loaded components, less than 200-kip column loads, shallow foundation support would seem to be feasible. Preliminary recommendations for these footings are also recommended. However, it is again cautioned that care should be taken to reduce the potential of detrimental affects between the shallow and deep supported elements.

A. Heavily-Loaded Components

1. Driven Piles

Individual pile compressive capacities of up to 60 tons are available for preliminary design. The recommended minimum pile sections are a 12- x 12-inch precast, prestressed concrete pile and a closed-end, concrete-filled pipe pile with a minimum diameter of 10 inches. These piles should be installed with a driving hammer which has a rated energy of at least 19,500 foot-pounds. Estimates of pile lengths are presented in the Evaluation section. It is cautioned that the boring data does not fully bracket the variations in tip depths that production piles might encounter. Also, some cutting and splicing of these piles are likely. Therefore, if the concrete section is selected, appropriate splicing techniques should be agreed upon prior to beginning pile installation. After the final subsurface exploration is performed, criteria for test pile driving and load testing should be developed.

2. Drilled Shafts

We recommend that you consider drilled shafts for support of the heavier-loaded components. The drilled shafts should develop their load-carrying capacity solely by side friction in the underlying limestone formation. Side friction values up to 8 kips per square foot can be used for design.

Estimates of the top of the limestone formation were presented in the Evaluations section. Again, additional field and laboratory test data should be obtained prior to developing specific criteria for testing and observation of production drilled shafts.

B. Lightly-Loaded Components

1. Design Criteria

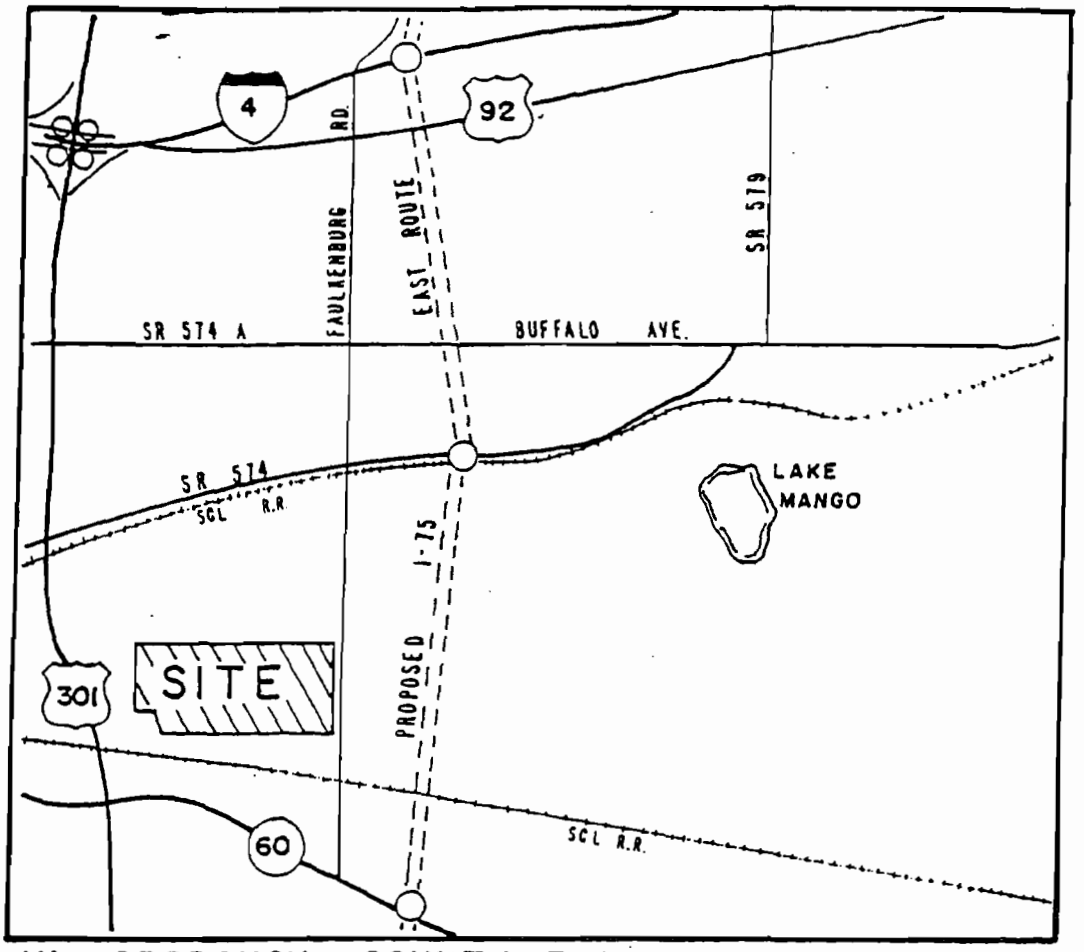
Soil bearing pressures of up to 3000 pounds per square foot (total load) are available for design of the more lightly-loaded components. Minimum footing widths of not less than 18 inches for continuous footings and 24 inches for isolated column footings should be specified even though maximum allowable bearing pressures may not be developed. The minimum dimensions are considered necessary to provide confinement which cohesionless bearing soils require to develop adequate shear strength. All footings should bear a minimum of 18 inches below final adjacent grade.

Specific criteria for installation of these footings should be based on data obtained during a final subsurface exploration and specific structural information. Also, lowering of the groundwater levels during footing construction will likely be required. A system of perimeter ditches may be effective. Pumping directly from footing excavations should be strictly prohibited.

2. Roadways and Parking Areas

The development of specific design criteria for a wearing surface, base, or sub-base is considered beyond the scope of this preliminary study. Due to the relatively high groundwater levels, the need for underdrains, and/or cement-treated base courses may be necessary. The determination of whether to use one or both of these should be based on actual site grading and the anticipated high groundwater conditions.

* * *



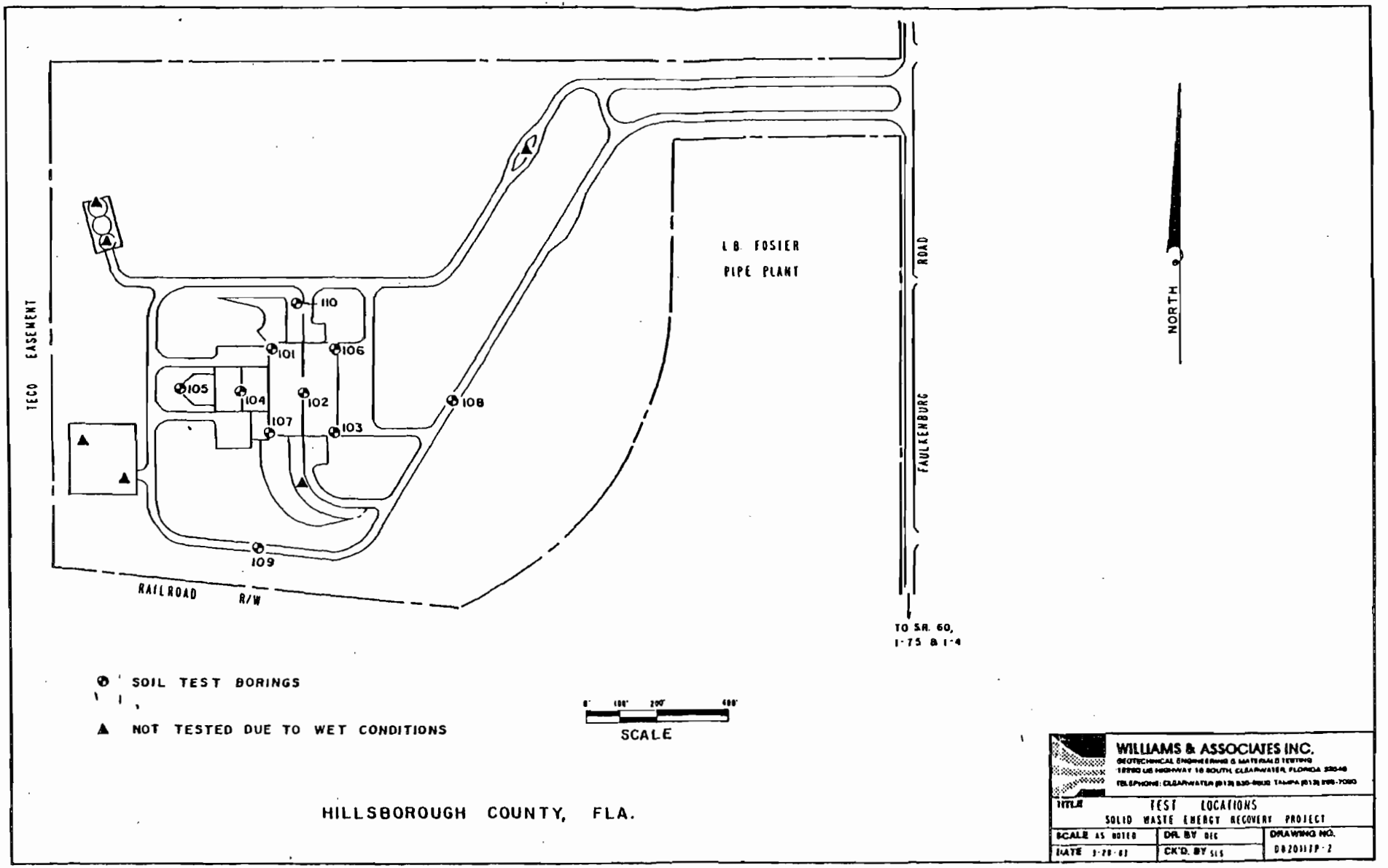
HILLSBOROUGH COUNTY, FLA.

NORTH

1 MILE
SCALE

WILLIAMS & ASSOCIATES INC.
GEOTECHNICAL ENGINEERING & MATERIALS TESTING
18260 US HIGHWAY 19 SOUTH, CLEARWATER, FLORIDA 33546
TELEPHONE: CLEARWATER (813) 535-5502 TAMPA (813) 885-7080

TITLE	SITE LOCATION SOLID WASTE ENERGY RECOVERY PROJECT	
SCALE AS NOTED	DR. BY DEG	DRAWING NO. 0820111P-1
DATE 3-29-83	CK'D. BY SLS	



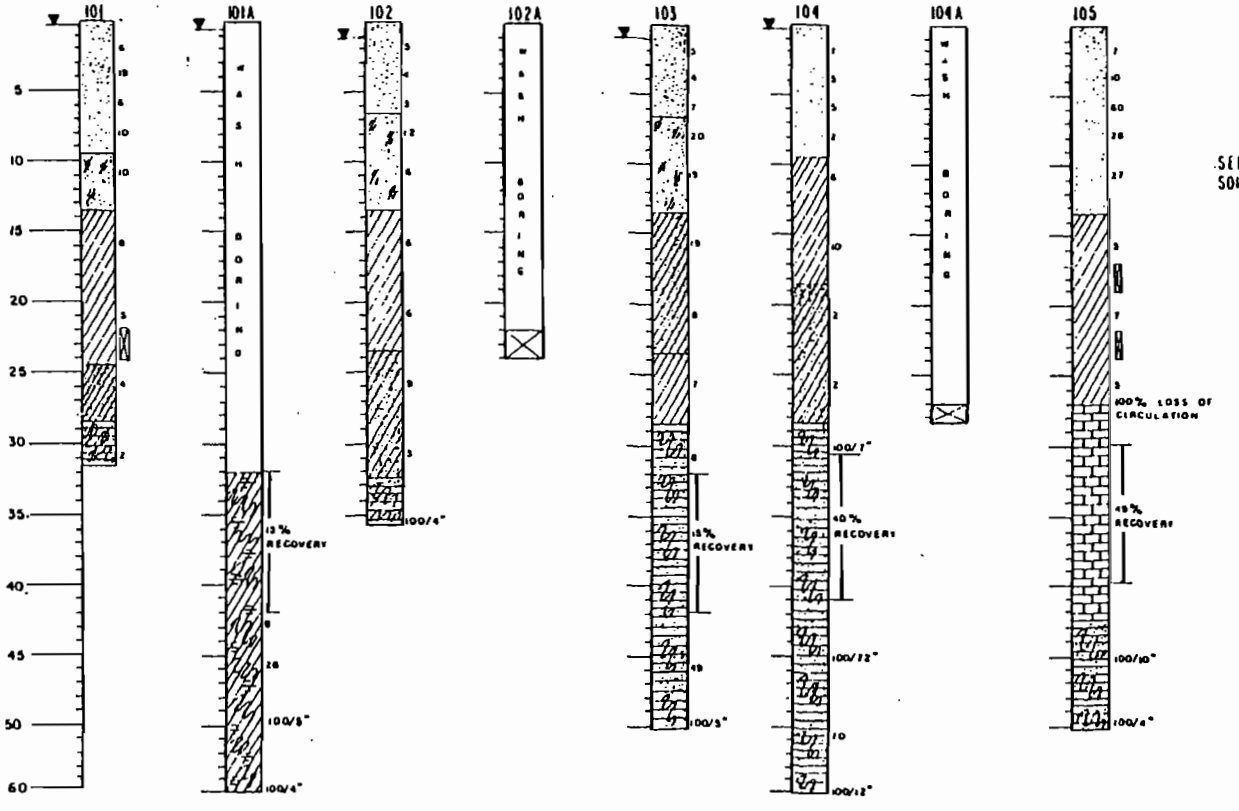
HILLSBOROUGH COUNTY, FLA.

WILLIAMS & ASSOCIATES INC.
GEOTECHNICAL ENGINEERING & MATERIALS TESTING
12220 US HIGHWAY 19 SOUTH, CLEARWATER, FLORIDA 33546
TELEPHONE: CLEARWATER (813) 530-9900 TAMPA (813) 988-7080

TITLE: TEST LOCATIONS SOLID WASTE ENERGY RECOVERY PROJECT		
SCALE AS NOTED	DR. BY DLC	DRAWING NO.
DATE 1-28-83	CK'D. BY SLS	D8203TP-2

Revised 12 December 1983

101



SEE DRAWING NO. DB20111P-4 FOR SOIL CLASSIFICATION LEGEND

WILLIAMS & ASSOCIATES INC.

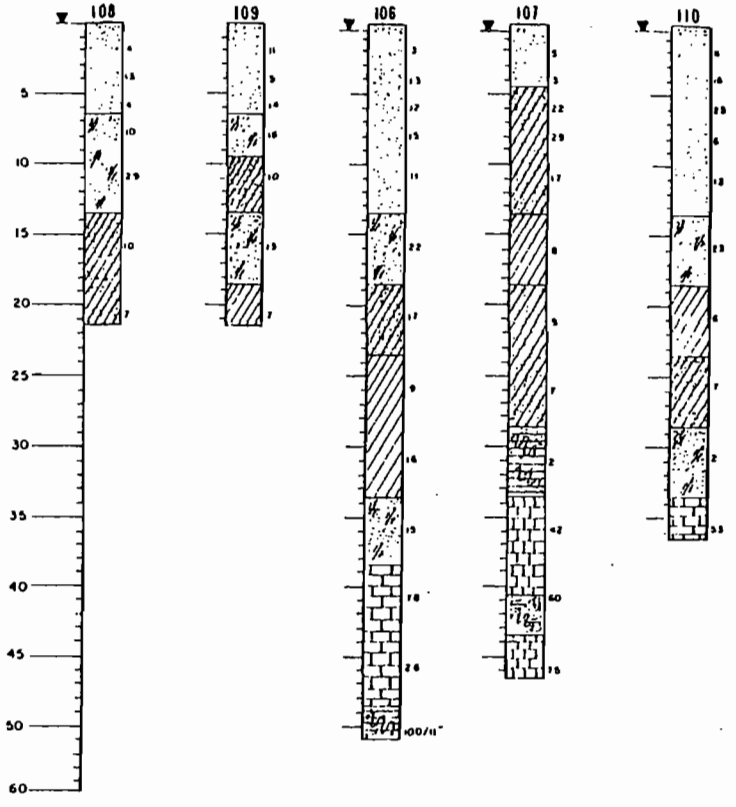
GEOTECHNICAL ENGINEERING & MATERIALS TESTING

TELEPHONE CLEARWATER [813] 536-0505 TAMPA [813] 886-7080

TITLE: SOIL PROFILES SOLID WASTE ENERGY RECOVERY PROJECT		
SCALE: AS NOTED	DR. BY: DLC	DRAWING NO.
DATE: 5-23-83	CK'D. BY: SLS	DB20111P-5

102

Revised 12 December 1983



LEGEND

- SAND
- CLAYEY SAND
- SILTY SAND
- CLAY
- SANDY CLAY
- SILTY CLAY
- SANDY SILT
- CLAYEY SANDY SILT
- LIMESTONE
- CALCAREOUS CEMENTED SOILS (LIMESTONE FORMATION)
- UNDISTURBED SAMPLE

▼ WATER TABLE

NUMBERS TO THE RIGHT OF COLUMNS REFER TO BLOWCOUNTS

WILLIAMS & ASSOCIATES INC.
GEOTECHNICAL ENGINEERING & MATERIALS TESTING
TERRA LAB HIGHWAY 19 SOUTH, CLEARWATER, FLORIDA 33540
TELEPHONE: CLEARWATER (813) 536-0500 TAMPA (813) 839-7060

TITLE	SOIL PROFILES SOLID WASTE ENERGY RECOVERY PROJECT	
SCALE AS NOTED	DR. BY DEG	DRAWING NO.
DATE 3-28-83	CK'D. BY SLS	D820117P-4

Revised 12 December 1983

TEST BORINGS

A) Soil Test Borings

Drilling and Standard Penetration Testing were performed in accordance with ASTM D1586-67, and as modified by the job specifications. These test borings were advanced to the desired testing depths by a rotary drilling process. This process utilizes a viscous drilling fluid to flush cuttings and stabilize the bore hole. To drill these nominal 4-inch diameter holes, an upward baffled side discharge drill bit was utilized. The drill bit was then withdrawn and a penetration test performed with a standard 1.4-inch I.D., 2-inch O.D., split-barrel sampler.

In penetration testing, the sample was driven with a 140-pound hammer falling 30 inches until either:

1) 18 inches of penetration was achieved, or
2) 50 blows were applied with less than 6 inches of penetration.

The number of hammer blows required to drive this hammer each 6 inches was recorded. The first 6-inch increment was considered to be the seating drive. The number of blows required to drive the sampler the final foot is designated "penetration resistance". Where the sampler was advanced less than 12 inches for 50 blows, the number of hammer blows applied and the penetrations achieved were recorded. The actual energy being transmitted from the hammer to the sampler was calibrated by Dr. John H. Schmertmann. A copy of his report is included.

Soil test borings provide soil samples and standard penetration resistance from selected depth intervals. Based on previously developed empirical correlations, various engineering properties of the soils can be inferred from these data. A record of the test borings is attached.

EXPLORATION LOGS

BORING LOG

NO. 101 Sheet 1 of 1

Project Solid Waste Energy Recovery Project
Hillsborough County, Florida Job Number D820117P
Client Hillsborough County Engineering Dept.
Boring Date 2/28/83 Casing 20.0' Drill # 250
Location See Drawing 820117P-2
Ground Water 0.0 Date 2/28 Ground Elevation unknown

FEET	SAMPLE	METERS	CLASSIFICATION	STANDARD PENETRATION TEST Blows per foot on 2" O.D. Sampler with 140 lb. hammer falling 30" (10 30 50 70 90)	BLOWS ON SAMPLER per 6"
			LOOSE TO MEDIUM DENSE gray fine SAND		2/2/4
					4/6/13
5		2	LOOSE dark brown fine SAND with minor finely divided organic matter		2/3/3
					3/4/6
10		3	LOOSE brown very clayey fine SAND		3/5/5
		4			
15		5	FIRM green plastic CLAY with minor indurated zones		3/3/5
		6			
20					4/3/2
		7	Shelby Tube sample: light gray sandy CLAY with random horizontal seams of clay		
25		8	SOFT green sandy CLAY		2/2/2
		9	VERY SOFT tan calcareous slightly sandy clayey SILT (Limestone formation)		1/1/1
30		10	Bottom of Boring Grouted borehole		
35		11			
		12			
40		13			

Revised
12 December 1983

BORING LOG

NO. 101A Sheet 1 of 2

Project Solid Waste Energy Recovery Project
Hillsborough County, Florida Job Number D820117P
Client Hillsborough County Engineering Dept.
Boring Date 3/2/83 Casing none Drill # 250
Location See Drawing 820117P-2
Ground Water 0.5' Date 3/2 Ground Elevation unknown

FEET	SAMPLE	METERS	CLASSIFICATION	STANDARD PENETRATION TEST Blows per foot on 2" O.D Sampler with 140 lb. hammer falling 30" (10 / 30 / 50 / 70 / 90)	BLOWS ON SAMPLER per 6"
			Wash Boring from 0.0' to 32.0'		
			NX Core: gray calcareous partially-indurated sandy very silty CLAY (Limestone formation) Interval 32.0'-42.0' Recovery 1.5' % Recovery 15		
			FIRM gray calcareous partially-indurated sandy very silty CLAY (Limestone formation)		

BORING LOG

NO. 101A Sheet 2 of 2

Project Solid Waste Energy Recovery Project
Hillsborough County, Florida Job Number D820117P

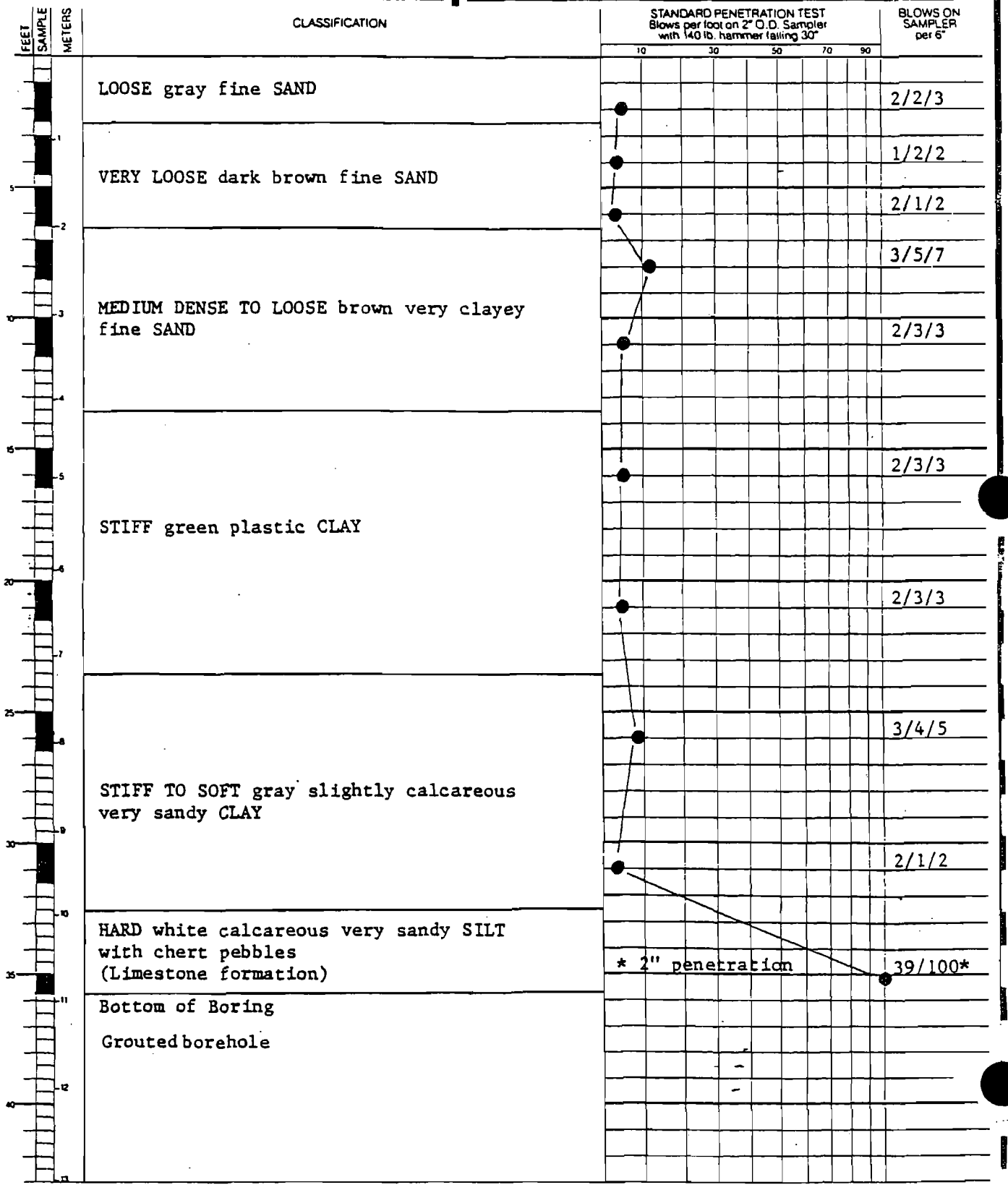
FEET	SAMPLE	METERS	CLASSIFICATION	STANDARD PENETRATION TEST Blows per foot on 2" O.D. Sampler with 140 lb. hammer falling 30" (10 30 50 70 90)	BLOWS ON SAMPLER per 6"
45		14	FIRM gray calcareous partially-indurated sandy very silty CLAY (Limestone formation)		6/5/3
					6/10/18
50		15	LIMESTONE	* 5" penetration	100*
		16			
55		17		* 4" penetration	100*
			Bottom of Boring		
60		18			
		19			
65		20			
		21			
70		22			
75		23			
		24			
80		25			

Revised
12 December 1983

BORING LOG

NO. 102 Sheet 1 of 1

Project Solid Waste Energy Recovery Project
Hillsborough County, Florida Job Number D820117P
Client Hillsborough County Engineering Dept.
Boring Date 2/22/83 Casing 35.0' Drill # 250
Location See Drawing 820117P-2
Ground Water 1.1' Date 2/22 Ground Elevation unknown



BORING LOG

NO. 102A Sheet 1 of 1

Project Solid Waste Energy Recovery Project
Hillsborough County, Florida Job Number D820117P
Client Hillsborough County Engineering Dept.
Boring Date 2/23/83 Casing none Drill # 250
Location See Drawing 820117P-2
Ground Water Date Ground Elevation unknown

FEET	SAMPLE	METERS	CLASSIFICATION	STANDARD PENETRATION TEST Blows per foot on 2" O.D. Sampler with 140 lb. hammer falling 30" (10 / 30 / 50 / 70 / 90)	BLOWS ON SAMPLER per 6"
			Wash Boring from 0.0' to 22.0'		
20		6	Shelby Tube Sample: light gray sandy CLAY		
25		8	Bottom of Boring		
30		9			
35		10			
40		11			
		12			

BORING LOG

NO. 103 Sheet 1 of 2

Project Solid Waste Energy Recovery Project
Hillsborough County, Florida Job Number D820117P
Client Hillsborough County Engineering Dept.
Boring Date 2/22/83 Casing 32.0' Drill # 1500
Location See Drawing 820117P-2
Ground Water 1.0' Date 2/22 Ground Elevation unknown

FEET	SAMPLE	METERS	CLASSIFICATION	BLOWS ON SAMPLER per 6"
			LOOSE dark brown fine SAND with minor roots	2/2/3
5		1	VERY LOOSE TO LOOSE brown fine SAND	2/2/2
		2		4/3/4
10		3	MEDIUM DENSE brown very clayey fine SAND	9/10/10
		4		7/9/10
15		5	VERY STIFF green very sandy CLAY	8/9/10
20		6	interpocketed FIRM green very sandy CLAY and FIRM white sandy CLAY	2/4/4
		7		
25		8	FIRM green plastic CLAY	2/3/4
		9	FIRM white calcareous partially-cemented very sandy SILT (Limestone formation	3/1/7
30		10	NX Core: white calcareous partially-cemented very sandy SILT (Limestone formation)	
35		11	Interval 32.0'-42.0' Recovery 1.5' % Recovery 15	
		12		
40			HARD white calcareous partially-cemented very sandy SILT (Limestone formation)	

STANDARD PENETRATION TEST
Blows per foot on 2" O.D. Sampler with 140 lb. hammer falling 30"
10 30 50 70 90

BORING LOG

Project Solid Waste Energy Recovery Project
Hillsborough County, Florida Job Number D820117P

NO. 103 Sheet 2 of 2

FEET	SAMPLE	METERS	CLASSIFICATION	STANDARD PENETRATION TEST Blows per foot on 2" O.D. Sampler with 140 lb. hammer falling 30" (10 30 50 70 90)	BLOWS ON SAMPLER per 6"
45		14	HARD white calcareous partially-cemented very sandy SILT (Limestone formation)		23/23/26
50		15	* 5" penetration		100*
			Bottom of Boring		
55		17			
60		18			
		19			
65		20			
		21			
70		22			
75		23			
		24			
80		25			

BORING LOG

NO. 104 Sheet 1 of 2

Project Solid Waste Energy Recovery Project
Hillsborough County, Florida Job Number D820117P
Client Hillsborough County Engineering Dept.
Boring Date 2/23/83 Casing 30.0' Drill # 250
Location See Drawing 820117P-2
Ground Water 0.3' Date 2/23 Ground Elevation unknown

FEET	SAMPLE	METERS	CLASSIFICATION	BLOWS ON SAMPLER per 6"
			LOOSE dark brown fine SAND with roots	3/4/3
5		1	LOOSE brown fine SAND	1/2/3
		2		2/2/3
			VERY LOOSE dark brown fine SAND with minor finely divided organic matter	2/1/1
10		3		1/2/4
		4	FIRM TO STIFF green plastic CLAY	
15		5		2/4/6
20		6		2/1/1
		7	VERY SOFT gray slightly sandy plastic CLAY	
25		8		1/1/1
			HARD tan calcareous partially-cemented sandy SILT (Limestone formation)	* 8" penetration 100*
30		9		
		10	NX Core: tan calcareous partially-cemented sandy SILT (Limestone formation)	
35		11	Interval 30.6'-41.0' Recovery 4.0' % Recovery 38	
		12		
40		13	HARD tan calcareous partially-cemented sandy SILT (Limestone formation)	

STANDARD PENETRATION TEST
Blows per foot on 2" O.D. Sampler with 140 lb. hammer falling 30"
10 30 50 70 90

BORING LOG

NO. 104 Sheet 2 of 2

Project Solid Waste Energy Recovery Project
Hillsborough County, Florida Job Number D820117P

FEET	SAMPLE	METERS	CLASSIFICATION	STANDARD PENETRATION TEST Blows per foot on 2" O.D. Sampler with 140 lb. hammer falling 30" (10 30 50 70 90)	BLOWS ON SAMPLER per 6"
45		14	HARD tan calcareous partially-cemented sandy SILT (Limestone formation)	* 12" penetration	100*
50		15			36/25/45
55		17		* 12" penetration	100*
60		18	Bottom of Boring		
65		19			
70		20			
75		21			
80		22			
		23			
		24			
		25			

BORING LOG

NO. 104A Sheet 1 of 1

Project Solid Waste Energy Recovery Project
Hillsborough County, Florida Job Number D820117P
Client Hillsborough County Engineering Dept.
Boring Date 2/24/83 Casing none Drill # 250
Location See Drawing 820117P-2
Ground Water Date Ground Elevation unknown

FEET	SAMPLE	METERS	CLASSIFICATION	STANDARD PENETRATION TEST Blows per foot on 2" O.D. Sampler with 140 lb. hammer falling 30" (10 30 50 70 90)	BLOWS ON SAMPLER per 6"
			Wash Boring from 0.0' to 27.0'		
			Shelby Tube sample: light gray sandy CLAY		
			Bottom of Boring		

BORING LOG

NO. 105 Sheet 1 of 2

Project Solid Waste Energy Recovery Project
Hillsborough County, Florida Job Number D820117P
Client Hillsborough County Engineering Dept.
Boring Date 2/24/83 Casing 30.0' Drill # 250
Location See Drawing 820117P-2
Ground Water Date Ground Elevation unknown

FEET	SAMPLE	METERS	CLASSIFICATION	STANDARD PENETRATION TEST Blows per foot on 2" O.D. Sampler with 140 lb. hammer falling 30" (10 / 30 / 50 / 70 / 90)	BLOWS ON SAMPLER per 6"
			LOOSE gray fine SAND with minor roots		3/4/3
			LOOSE dark brown fine SAND with minor finely divided organic matter		2/4/6
5		2	VERY DENSE dark brown fine SAND with minor finely divided organic matter		17/24/36
					10/13/15
10		3	MEDIUM DENSE dark brown fine SAND with minor finely divided organic matter		12/12/15
		4			
15		5	FIRM green plastic CLAY		2/2/3
			Shelby Tube sample: no recovery		
20		6	SOFT green plastic CLAY		3/3/4
		7	Shelby Tube sample: no recovery		
25		8	SOFT green plastic CLAY (100% loss of circulation at 27.0')		1/1/2
30		9	NX Core: tan sandy LIMESTONE		
		10	Interval: 30.0'-40.0' Recovery: 4.9' % Recovery: 49		
35		11			
40		12	HARD tan calcareous partially cemented sandy SILT (Limestone formation)		
		13			

BORING LOG

Project Solid Waste Energy Recovery Project
Hillsborough County, Florida Job Number D82011

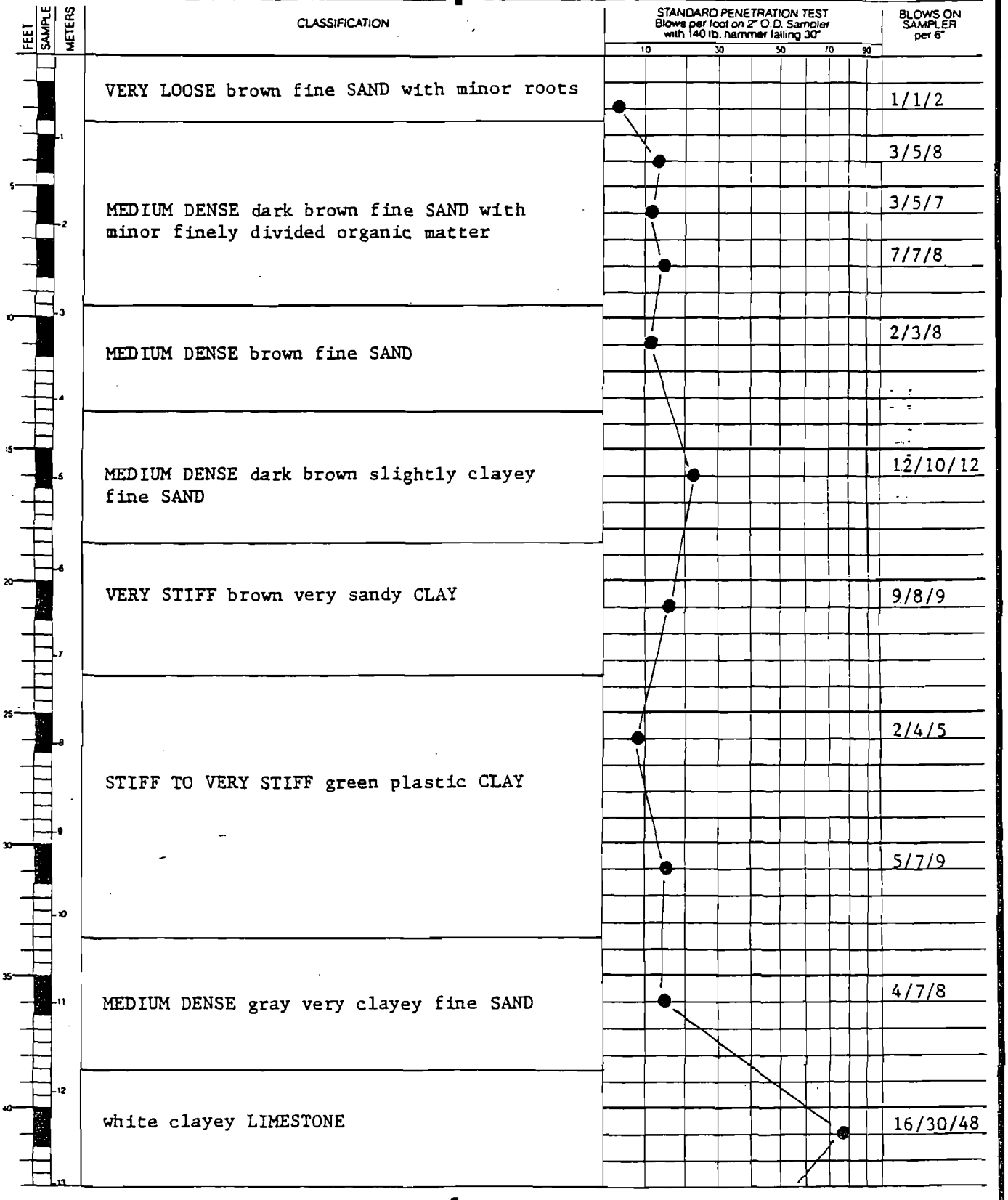
NO. 105 Sheet 2 of 2

FEET	SAMPLE	METERS	CLASSIFICATION	STANDARD PENETRATION TEST Blows per foot on 2" O.D Sampler with 140 lb. hammer falling 30" (10 30 50 70 90)	BLOWS ON SAMPLER per 6"
45		14	HARD tan calcareous partially-cemented sandy SILT (Limestone formation)	* 12" penetration	100*
50		15		* 4" penetration	100*
			Bottom of Boring		
55		17			
60		18			
		19			
65		20			
70		21			
		22			
75		23			
		24			
80		25			

BORING LOG

NO. 106 Sheet 1 of 2

Project Solid Waste Energy Recovery Project
Hillsborough County, Florida Job Number D820117P
Client Hillsborough County Engineering Dept.
Boring Date 3/1/83 Casing 20.0' Drill # 250
Location See Drawing 820117P-2
Ground Water 0.3' Date 3/1 Ground Elevation unknown



BORING LOG

Project Solid Waste Energy Recovery Project
Hillsborough County, FLorida Job Number D820117P

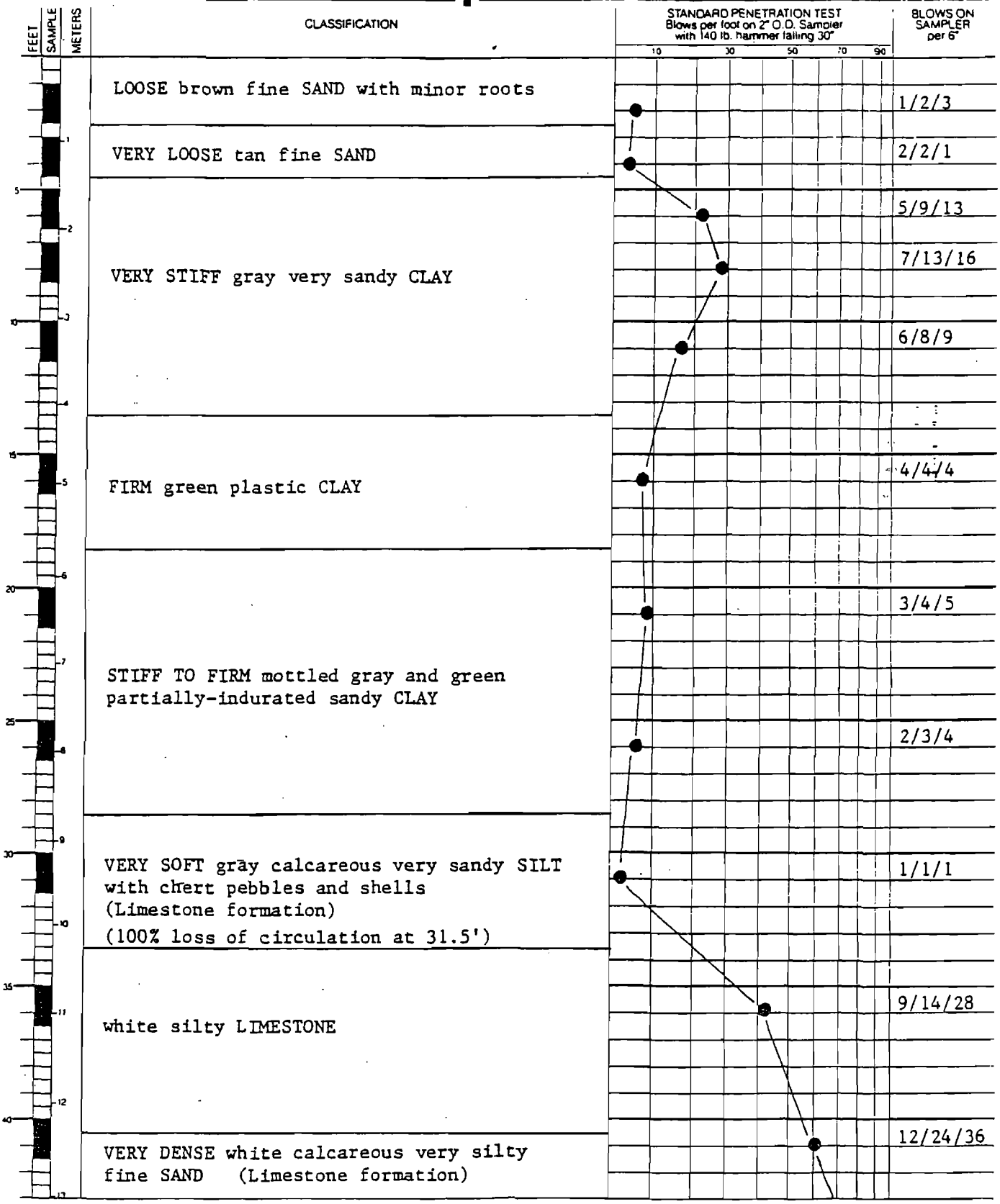
NO. 106 Sheet 2 of 2

FEET	SAMPLE	METERS	CLASSIFICATION	STANDARD PENETRATION TEST Blows per foot on 2" O.D. Sampler with 140 lb. hammer falling 30" (10 30 50 70 90)	BLOWS ON SAMPLER per 6"
45		14	white clayey LIMESTONE		8/12/14
50		15	HARD tan calcareous partially-cemented sandy SILT (Limestone formation)	* 11" penetration	100*
			Bottom of Boring		
55		17			
60		18			
		19			
65		20			
70		21			
		22			
75		23			
		24			
80		25			

BORING LOG

NO. 107 Sheet 1 of 2

Project Solid Waste Energy Recovery Project
Hillsborough County, Florida Job Number D820117P
Client Hillsborough County Engineering Dept.
Boring Date 3/1/83 Casing 30.0' Drill # 250
Location See Drawing 820117P-2
Ground Water 0.3' Date 3/1 Ground Elevation unknown



BORING LOG

NO. 108 Sheet 1 of 1

Project Solid Waste Energy Recovery Project
Hillsborough County, Florida Job Number D820117P
Client Hillsborough County Engineering Dept.
Boring Date 2/28/83 Casing none Drill # 250
Location See Drawing 820117P-2
Ground Water 0.0' Date 2/28 Ground Elevation unknown

FEET	SAMPLE	METERS	CLASSIFICATION	BLOWS ON SAMPLER per 6"
			VERY LOOSE gray fine SAND with minor roots	3/2/2
5		2	MEDIUM DENSE dark brown fine SAND with minor finely divided organic matter	3/7/6
			VERY LOOSE dark brown fine SAND	2/2/2
10		3	LOOSE TO MEDIUM DENSE brown very clayey fine SAND	3/4/6
		4		7/13/16
15		5	STIFF TO FIRM green slightly sandy plastic CLAY	5/5/5
20		6		2/3/4
		7	Bottom of Boring	
25		8		
30		9		
		10		
35		11		
		12		
40		13		

STANDARD PENETRATION TEST
Blows per foot on 2" O.D. Sampler with 140 lb. hammer falling 30"
10 30 50 70 90

BORING LOG

NO. 109 Sheet 1 of 1

Project Solid Waste Energy Recovery Project
Hillsborough County, Florida Job Number D820117P
Client Hillsborough County Engineering Dept.
Boring Date 2/25/83 Casing none Drill #250
Location See Drawing 820117P-2
Ground Water Date Ground Elevation unknown

FEET	SAMPLE	METERS	CLASSIFICATION	BLOWS ON SAMPLER per 6"
			MEDIUM DENSE dark brown fine SAND with minor finely divided organic matter	2/4/7
5		2	LOOSE brown fine SAND	2/2/3
			MEDIUM DENSE dark brown fine SAND	2/3/11
10		3	MEDIUM DENSE brown slightly clayey fine SAND	8/9/7
		4	STIFF green sandy CLAY with minor decaying roots	4/4/6
15		5	MEDIUM DENSE gray clayey fine SAND	3/6/7
20		6	FIRM green plastic CLAY	2/4/3
		7	Bottom of Boring	
25		8		
30		9		
		10		
35		11		
		12		
40		13		

STANDARD PENETRATION TEST
Blows per foot on 2" O.D. Sampler with 140 lb. hammer falling 30"
10 30 50 70 90

BORING LOG

NO. 110 Sheet 1 of 1

Project Solid Waste Energy Recovery Project
Hillsborough County, Florida Job Number D820117P
Client Hillsborough County Engineering Dept.
Boring Date 3/2/83 Casing none Drill # 250
Location See Drawing 820117P-2
Ground Water 0.3' Date 3/2 Ground Elevation unknown

FEET	SAMPLE	METERS	CLASSIFICATION	BLOWS ON SAMPLER per 6"
			LOOSE gray fine SAND	2/3/5
5		2	LOOSE TO MEDIUM DENSE dark brown fine SAND	2/7/9
				7/13/12
10		3		1/2/4
		4		4/6/6
15		5	MEDIUM DENSE brown slightly clayey fine SAND	9/15/8
20		6	FIRM green plastic CLAY	2/3/3
		7		
25		8	FIRM green sandy CLAY	2/2/5
30		9	VERY LOOSE gray very clayey fine SAND	1/1/1
		10		
35		11	gray clayey LIMESTONE	10/21/32
			Bottom of Boring	
40		12		
		13		

STANDARD PENETRATION TEST
Blows per foot on 2" O.D. Sampler with 140 lb. hammer falling 30"
10 30 50 70 90

SECONDARY LABORATORY TESTING

WILLIAMS & ASSOCIATES INC.
GEOTECHNICAL ENGINEERING & MATERIALS TESTING
12290 US HIGHWAY 19 SOUTH, CLEARWATER, FLORIDA 33516
TELEPHONE: CLEARWATER (813) 536-4789 TAMPA (813) 228-7020

CLIENT Hillsborough County, Department of Solid Waste JOB NO. D820117P

PROJECT Solid Waste Energy Recovery Project

Boring No. and/or Sample No.	Depth-Ft.	Soil Description	Natural Water Content %	Dry Unit Weight pcf	Sieve Analysis % Finer By Weight								Organic Content %	Atterberg Limits	
					#4	#10	#40	#60	#80	#100	#200	#270		LL	PI
B-101 S-7A	22.0-24.0	light gray snady clay with seams of clay	28.5	93.6	99.2	98.4	96.4	94.6	96.7	48.3	30.2			36	15
B-102A S-1	22.0-24.0	light gray sandy clay	53.1	69.8	99.0	98.4	97.5	96.6	71.8	40.0	21.1			48	27
B-104A S-1	27.0-28.3	light gray sandy clay	33.3	87.4	100	99.8	99.5	97.4	83.9	51.1	30.3			39	21

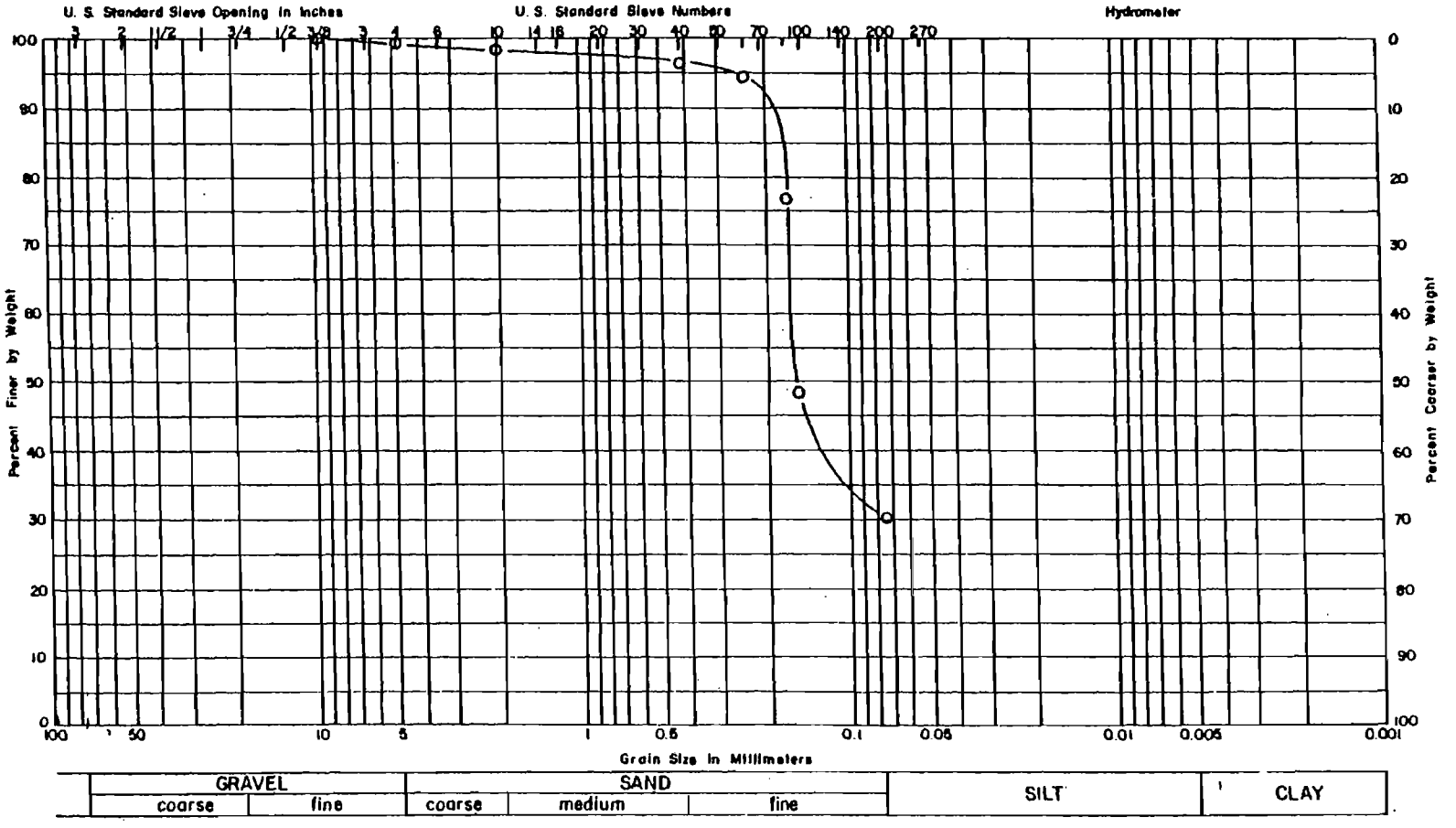
SOIL CLASSIFICATION
AASHT[illegible] UNIFIED

Revised 12 December 1983

125

ummary of laboratory test re[illegible]lts

WILLIAMS & ASSOCIATES, INC.
MATERIALS TESTING ENGINEERS
12290 US HIGHWAY 19 SOUTH, CLEARWATER, FLORIDA 33546
TELEPHONE: CLEARWATER (813) 535-9802 TAMPA (813) 228-7020



PROJECT: Solid Waste Energy Recovery Project
D820117P

CLIENT: Hillsborough County Engineering Dept.

SAMPLE LOCATION: Boring 101
22.0' - 24.0'

SAMPLE DESCRIPTION: light gray sandy clay with random horizontal seams of clay

LL = 36 PI = 15

grain size analyis

Revised 12 December 1983

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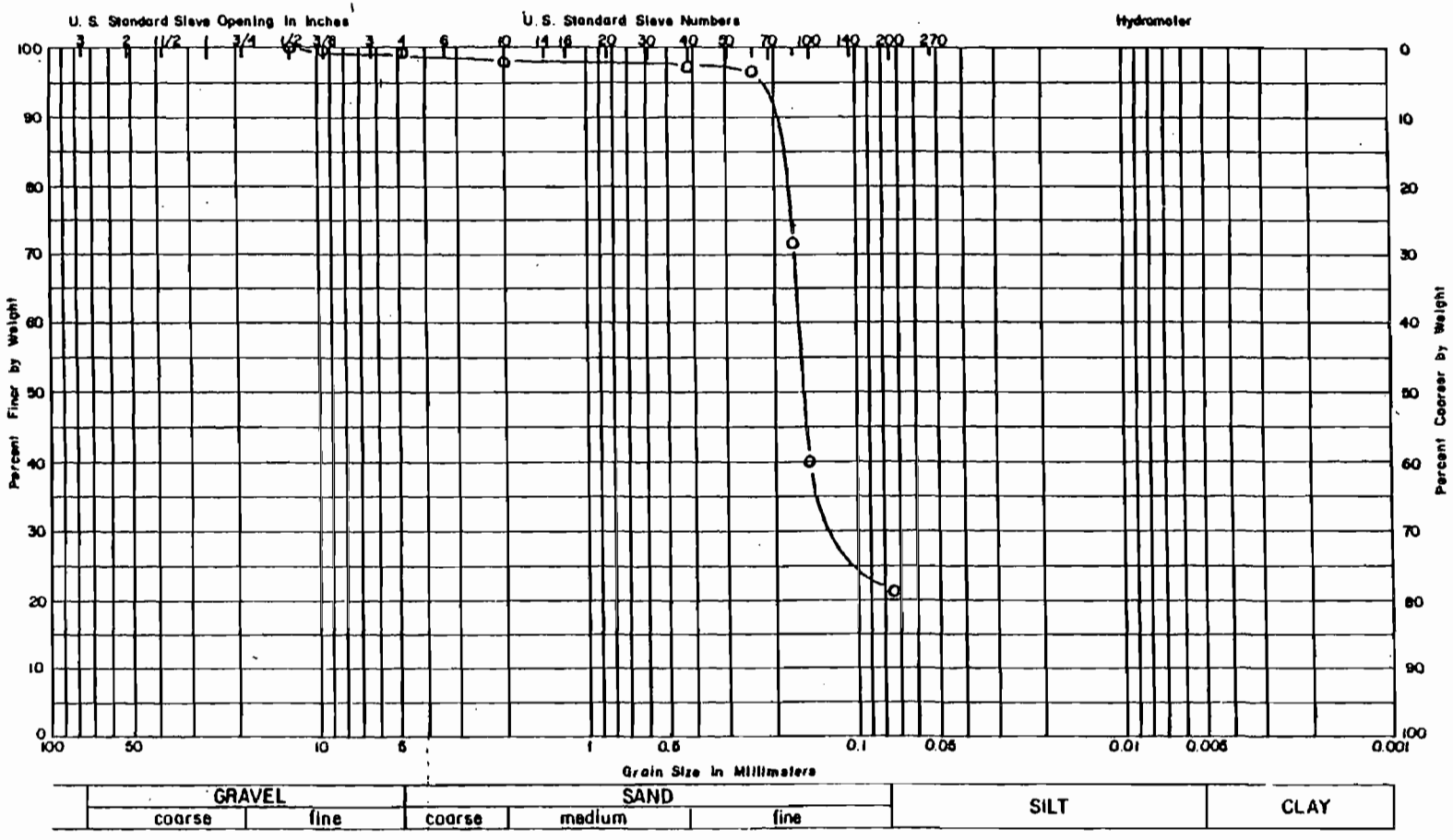

PROJECT: Solid Waste Energy Recovery Project
D820117P

CLIENT: Hillsborough County Engineering Dept.

SAMPLE LOCATION: Boring 102A
22.0' - 24.0'

SAMPLE DESCRIPTION; light gray sandy clay

LL = 48 PI = 27

grain size analysis

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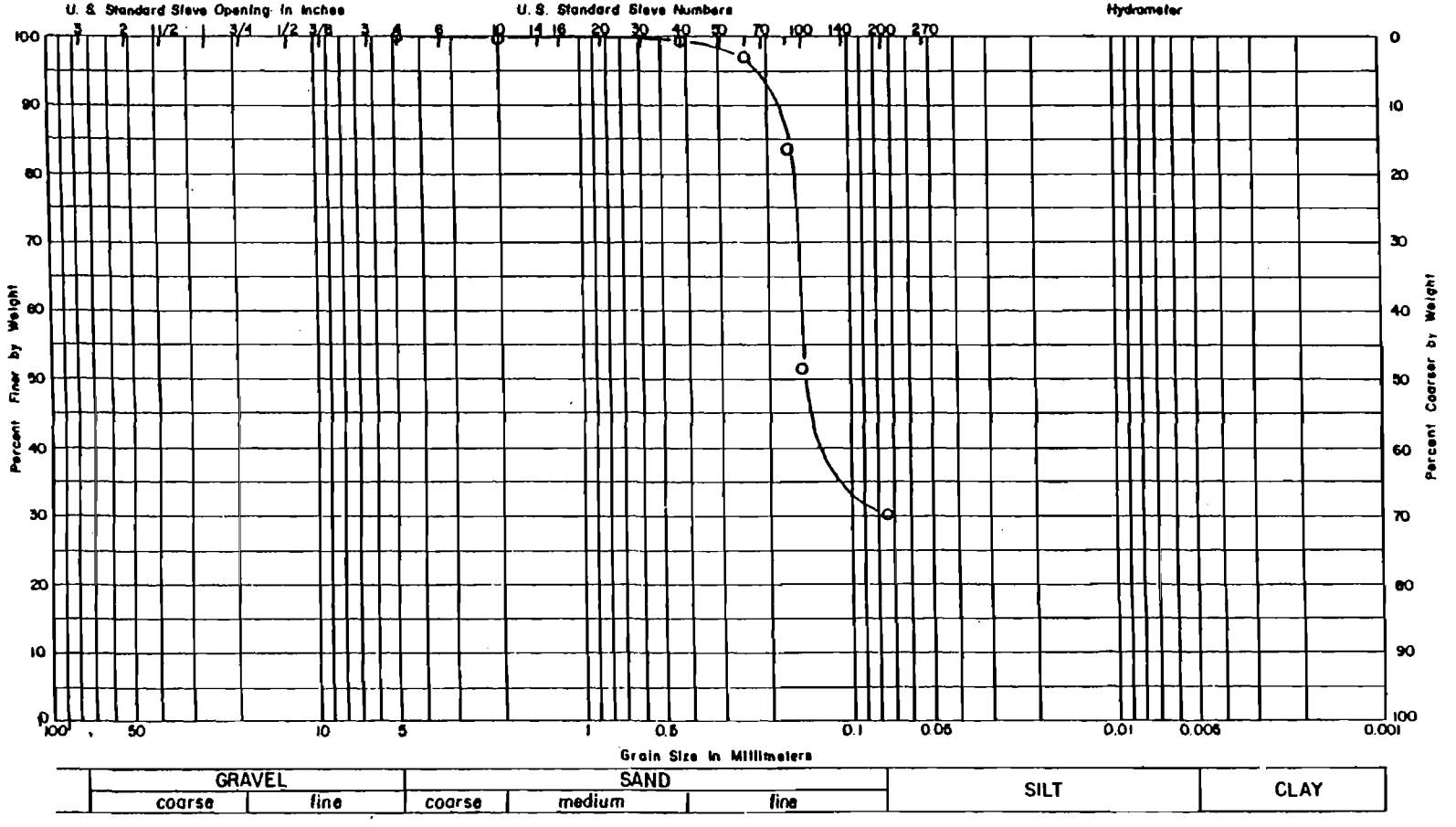


PROJECT: Solid Waste Energy Recovery Project
D820117P

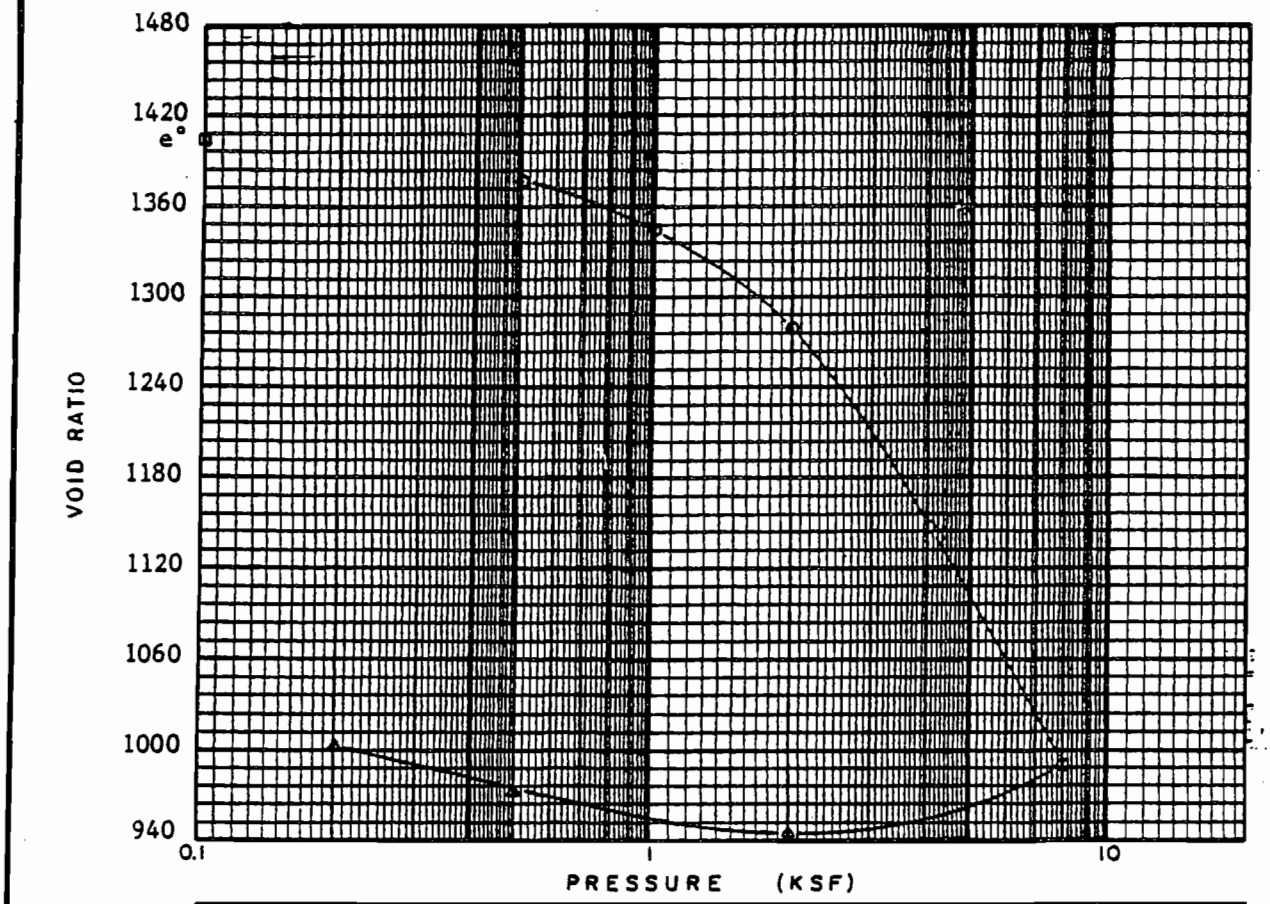
CLIENT: Hillsborough County Engineering Dept.

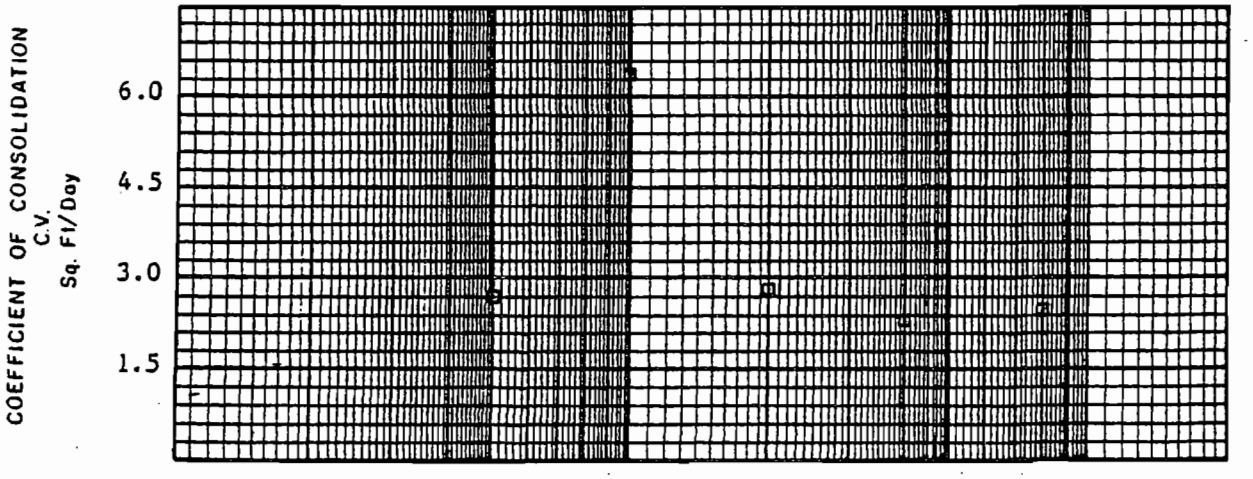
SAMPLE LOCATION: Boring 104A
27.0' - 28.3'

SAMPLE DESCRIPTION: light gray sandy clay

LL = 39 PI - 21

grain size analyis





CONSOLIDATION TEST

CLIENT: Hillsborough County Engineering Dept.

PROJECT: Solid Waste Energy Recovery Project
D820117P

SAMPLE LOCATION: Boring 102A
22.0' - 24.0'

SOIL DESCRIPTION: Light gray sandy clay

LL = 48 PI = 21

G_s = 2.650

INITIAL: s = 100%
γ_d = 69.8

FINAL: s = 100%
γ_d = 81.5

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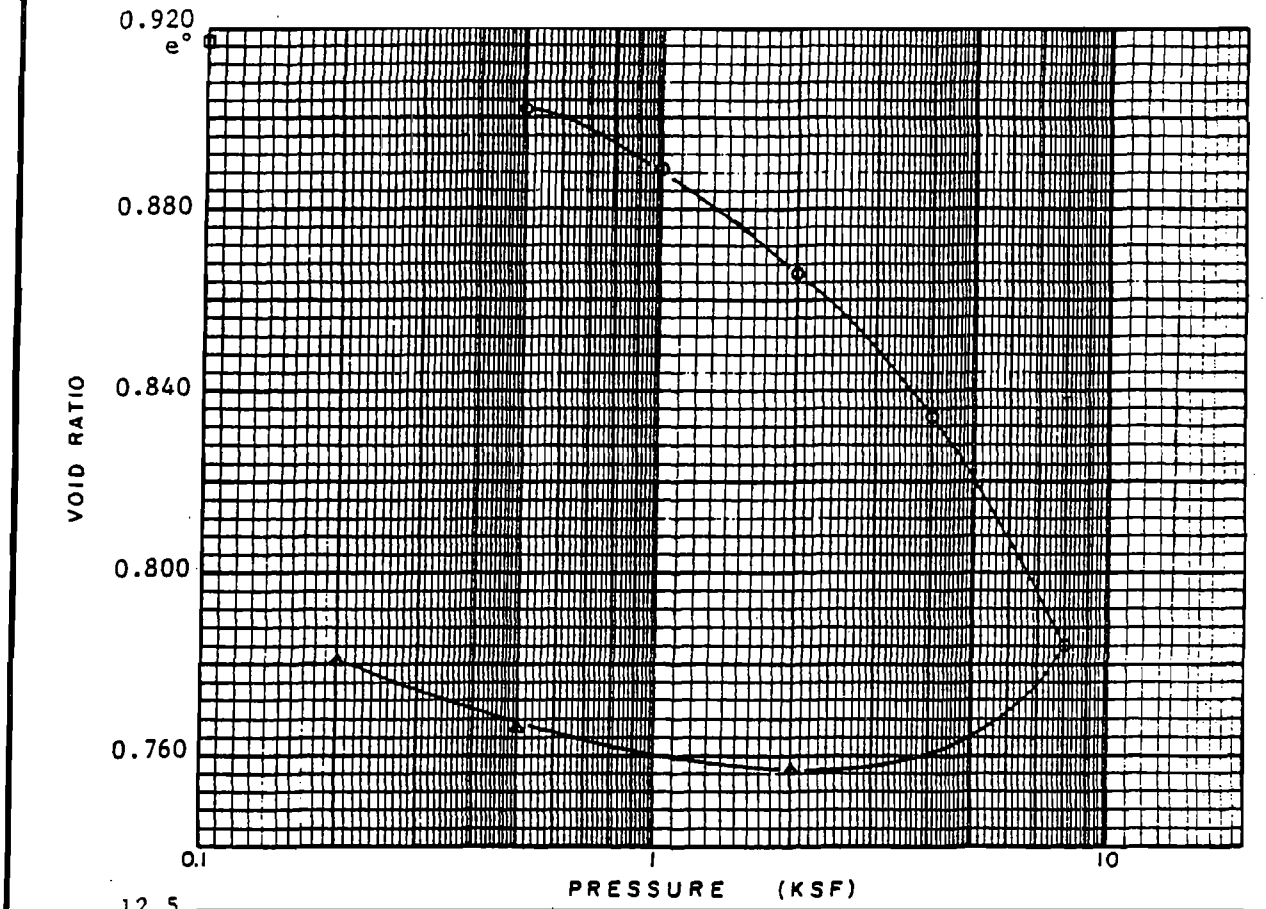
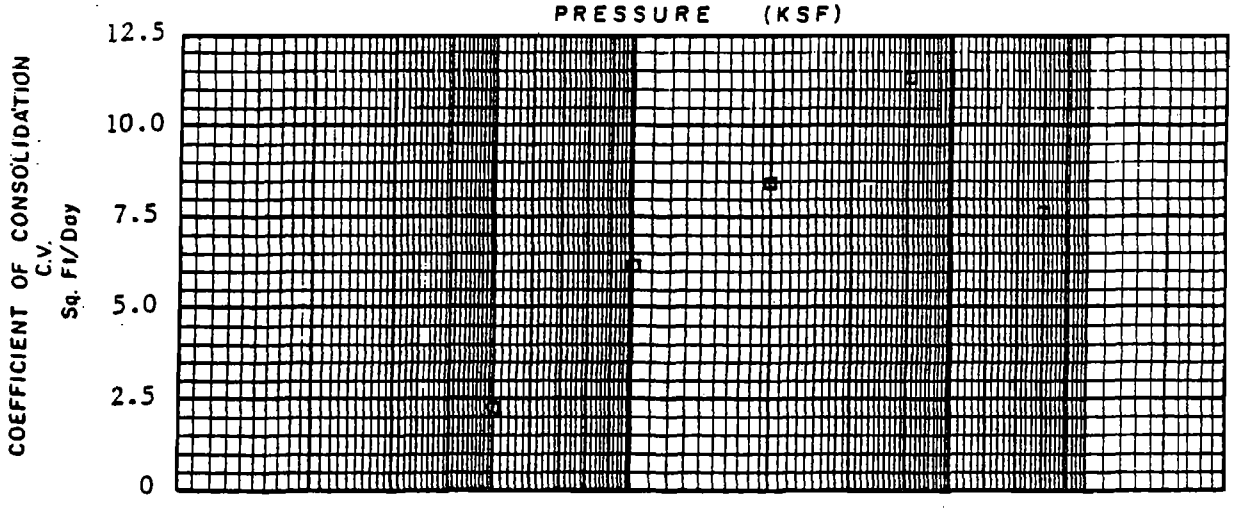
GEOTECHNICAL ENGINEERS





CONSOLIDATION TEST

CLIENT: Hillsborough County Engineering Dept.

PROJECT: Solid Waste Energy Recovery Project
D820117P

SAMPLE LOCATION: Boring 104A
27.0' - 28.3'

SOIL DESCRIPTION: Light gray sandy clay

LL = 39 PI = 18

G_s = 2.645

INITIAL: s = 96.1%
γ_d = 87.4

FINAL: s = 100%
γ_d = 94.1

Revised 12 December 1983

WILLIAMS & ASSOCIATES, INC.
GEOTECHNICAL ENGINEERS

IMPORTANT INFORMATION
ABOUT YOUR
GEOTECHNICAL ENGINEERING REPORT

More construction problems are caused by site subsurface conditions than any other factor. As troublesome as subsurface problems can be, their frequency and extent have been lessened considerably in recent years, thanks to the Association of Soil and Foundation Engineers (ASFE).

When ASFE was founded in 1969, subsurface problems were frequently being resolved through lawsuits. In fact, the situation had grown to such alarming proportions that consulting geotechnical engineers had the worst professional liability record of all design professionals. *By 1980, ASFE-member consulting soil and foundation engineers had the best professional liability record.* This dramatic turn-about can be attributed directly to client acceptance of problem-solving programs and materials developed by ASFE for its members' application. *This acceptance was gained because clients perceived the ASFE approach to be in their own best interests.* Disputes benefit only those who earn their living from others' disagreements.

The following suggestions and observations are offered to help you reduce the geotechnical-related delays, cost-overruns and other costly headaches that can occur during a construction project.

A GEOTECHNICAL ENGINEERING REPORT IS BASED ON A UNIQUE SET OF PROJECT-SPECIFIC FACTORS

A geotechnical engineering report is based on a subsurface exploration plan designed to incorporate a unique set of project-specific factors. These typically include: the general nature of the structure involved, its size and configuration; the location of the structure on the site and its orientation; physical concomitants such as access roads, parking lots, and underground utilities, and the level of additional risk which the client assumed by virtue of limitations imposed upon the exploratory program. To help avoid costly problems, consult the geotechnical engineer to determine how any factors which change subsequent to the date of his report may affect his recommendations.

Unless your consulting geotechnical engineer indicates otherwise, *your geotechnical engineering report should not be used:*

- When the nature of the proposed structure is changed, for example, if an office building will be erected instead of a parking garage, or if a refrigerated warehouse will be built instead of an unrefrigerated one;
- when the size or configuration of the proposed structure is altered;
- when the location or orientation of the proposed structure is modified;
- when there is a change of ownership, or
- for application to an adjacent site.

A geotechnical engineer cannot accept responsibility for problems which may develop if he is not consulted after factors considered in his report's development have changed.

MOST GEOTECHNICAL "FINDINGS" ARE PROFESSIONAL ESTIMATES

Site exploration identifies actual subsurface conditions only at those points where samples are taken, when they are taken. Data derived through sampling and subsequent laboratory testing are extrapolated by the geotechnical engineer who then renders an opinion about overall subsurface conditions, their likely reaction to proposed construction activity, and appropriate foundation design. Even under optimal circumstances actual conditions may differ from those opined to exist, because no geotechnical engineer, no matter how qualified, and no subsurface exploration program, no matter how comprehensive, can reveal what is hidden by earth, rock and time. For example, the actual interface between materials may be far more gradual or abrupt than the report indicates, and actual conditions in areas not sampled may differ from predictions. *Nothing can be done to prevent the unanticipated, but steps can be taken to help minimize their impact.* For this reason, *most experienced owners retain their geotechnical consultant through the construction stage,* to identify variances, conduct additional tests which may be needed, and to recommend solutions to problems encountered on site.

SUBSURFACE CONDITIONS CAN CHANGE

Subsurface conditions may be modified by constantly-changing natural forces. Because a geotechnical engineering report is based on conditions which existed at the time of subsurface exploration, *construction decisions should not be based on a geotechnical engineering report whose adequacy may have been affected by time.* Speak with the geotechnical consultant to learn if additional tests are advisable before construction starts.

Construction operations at or adjacent to the site and natural events such as floods, earthquakes or groundwater fluctuations may also affect subsurface conditions and, thus, the continuing adequacy of a geotechnical report. The geotechnical engineer should be kept apprised of any such events, and should be consulted to determine if additional tests are necessary.

A GEOTECHNICAL ENGINEERING REPORT IS SUBJECT TO MISINTERPRETATION

Costly problems can occur when other design professionals develop their plans based on misinterpretations of a geotechnical engineering report. To help avoid these problems, the geotechnical engineer should be retained to work with other appropriate design professionals to explain relevant geotechnical findings and to review the adequacy

of their plans and specifications relative to geotechnical issues.

BORING LOGS SHOULD NOT BE SEPARATED FROM THE ENGINEERING REPORT

Final boring logs are developed by the geotechnical engineer based upon his interpretation of field logs (assembled by site personnel) and laboratory evaluation of field samples. Only final boring logs customarily are included in geotechnical engineering reports. *These logs should not under any circumstances be redrawn* for inclusion in architectural or other design drawings, because drafters may commit errors or omissions in the transfer process. Although photographic reproduction eliminates this problem, it does nothing to minimize the possibility of contractors misinterpretating the logs during bid preparation. When this occurs, delays, disputes and unanticipated costs are the all-too-frequent result.

To minimize the likelihood of boring log misinterpretation, *give contractors ready access to the complete geotechnical engineering report*. Those who do not provide such access may proceed under the *mistaken* impression that simply disclaiming responsibility for the accuracy of subsurface information always insulates them from attendant liability. Providing the best available information to contractors helps prevent costly construction problems and the adversarial attitudes which aggravate them to disproportionate scale.

READ RESPONSIBILITY CLAUSES CLOSELY

Because geotechnical engineering is based extensively on judgement and opinion, it is far less exact than other design disciplines. This situation has resulted in wholly unwarranted claims being lodged against geotechnical consultants. To help prevent this problem, geotechnical engineers have developed model clauses for use in written transmittals. These are *not* exculpatory clauses designed to foist the geotechnical engineer's liabilities onto someone else. Rather, they are definitive clauses which identify where the geotechnical engineer's responsibilities begin and end. Their use helps all parties involved recognize their individual responsibilities and take appropriate action. Some of these definitive clauses are likely to appear in your geotechnical engineering report, and you are encouraged to read them closely. Your geotechnical engineer will be pleased to give full and frank answers to your questions.

OTHER STEPS YOU CAN TAKE TO REDUCE RISK

Your consulting geotechnical engineer will be pleased to discuss other techniques which can be employed to mitigate risk. In addition, the Association of Soil and Foundation Engineers has developed a variety of materials which may be beneficial. Contact ASFE for a complimentary copy of its publications directory.

Published by

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ASSOCIATION OF SOIL AND FOUNDATION ENGINEERS

8811 Colesville Road/Suite 225
Silver Spring, Maryland 20910
301/565-2733

Appendix 11
Miscellaneous Reports

Appendix 11-1
Noise Technical Analysis

APPENDIX 10.12

NOISE TECHNICAL ANALYSIS

Existing Noise Environment

This section provides the background information necessary to evaluate, quantify, and locate potential increases of noise levels (above baseline or existing ambient noise levels) due to the proposed construction and operation of the Hillsborough County Resource Recovery Facility.

Noise is most often, and most simply defined as unwanted sound. The magnitude of air pressure fluctuations produced by sound is the sound level, and is measured in decibels (annotated as the abbreviation dB) (Kryter, 1970). Whereas the sound pressure disturbance that humans are capable of hearing is very small in relation to atmospheric pressure, the ranges of pressures within this range from the faintest to the loudest sound happen to be extensive. The decibel scale compresses this large range of pressures using a logarithmic function into a meaningful scale from 0 dB, representing the faintest possible audible sound, to in excess of 140 dB, which in turn produces pain in humans. Human hearing sensitivity, being frequency dependant, is represented by the "A-weighting" filter. This filter when applied to the decibel scale, simulates the frequency range upon which humans are dependent, and is used in measuring and reporting environmental noise levels. When applied to the decibel scale, the "A-weighting" filter is annotated dBA.

Since the decibel scale represents a compressed view of actual sound pressure variations, we find the relationship between the decibel scale and pressure variations to be somewhat complicated. For example, a 26 percent change in sound pressure would reflect on the decibel level as a miniscule "one dB". The most sensitive human ear would not detect this change, except in the ideal conditions of an acoustical laboratory. A doubling of the sound pressure would result, again in a very small capacity, as 3 dB - therefore, barely perceptible to the human ear whilst in a natural environment. A tripling of the sound level would however result in a clearly noticeable change of 5 dB. And, a change of ten time the sound pressure, represented as a10 dB increase or decrease, would be perceived by the human ear as a doubling or halving of the apparent loudness respectively.

The noise descriptors used in this analysis are equivalent sound level, annotated by L_{eq} and the exceedence levels L_{10}, L_{50}, and L_{90}. The equivalent sound level is a single value of sound level for any desired duration, subsequently including all of the time-varying sound energy within that measurement duration. The equivalent noise level correlates reasonably with the effects of noise upon humans for wide variations in environmental sound levels and time patterns, and is easily measured by available equipment. The exceedence levels represent those noise levels which are exceeded in a given percentage of a predetermined time period (the actual percentage is denoted by the subscript number following "L"). For example, L_{10} is the noise level exceeded 10 percent of the measured time, and is regarded as a measure of the more intrusive noise levels, whereas L_{90} is the noise level exceeded 90 percent of the allotted time measurement and is considered the ambient noise level (Peterson 1980).

The County of Hillsborough has set criteria for ambient noise levels using the L_{eq}. Table 1 (shown below) presents these criteria as categorized by land use at appropriate time periods of the day.

Table 1	**HILLSBOROUGH COUNTY NOISE CRITERIA (Sound Levels by Receiving Land Use)**	
Receiving Land Use Category	**Time**	**Sound Level Limit dBA (L_{eq})**
Residential and Public Space	7am thru 10pm 10pm thru 7am	60 55
Commercial Areas	7am thru 10pm 10pm thru 7am	65 60
Industrial Areas	At All Times	75

Source: Hillsborough County Environmental Protection Commission, 1976 (http://www.epchc.org/Noise.htm)

Since the operation of the facility (having been designed with noise control equipment) should not result in significantly increasing noise levels, the major noise sources would be the truck traffic approaching and departing. Because the terrain grade does not vary greatly, the noise

levels associated with the acceleration of these trucks from a stop should not be greater than those noise levels associated with normal roadway speeds. To aid in accessing potential increases over the current noise levels, a baseline noise monitoring program was implemented. This program was designed to represent the current traffic induced noise levels and facility operation levels in the area. Gross ambient sound level measurements were obtained in the vicinity of the site by Burcaw & Associates (B&A).

The baseline sound level survey was designed to provide a gross survey of ambient noise conditions during day and nighttime periods. The survey determined representative ambient noise levels at locations on and adjacent to the facility site. The locations for this noise inventory are the circled numbers 1 through 7 as shown via Figure 1 and the basis for their selection is described in Table 2.

Table 2	INFORMATION ON SELECTED NOISE MONITORING LOCATIONS
Monitoring Site Number	**Rationale for Selection**
1	This location was selected to collect existing ambient noise levels at the boundary of that portion of the site where development would occur (between the existing facility and the nearest sensitive receptors). This location is within zoning designated as PD-I.
2	This location was selected due to it being the closest residence to the proposed addition site and access road whilst remaining on site property. This area borders (to the North) the property currently abandoned by the light-industrial L.B. Foster Pipe Company, and the Hillsborough County Animal Services facility (to the South). This location is within zoning designated as PD-I.
3	This location was selected due to it being in the vicinity of the closest main residential area to the site and Falkenburg Road. This location is within zoning designated as ASC-1.
4	This location was selected due to it being the closest commercial manufacturing facility to the PI of the access road and Falkenburg Road. Note that this site directly borders the public right-of-way designated as Falkenburg Road. This location is within zoning designated as M.
5 - 7	These locations were selected to determine the impact, if any, on the southern bordering distribution (warehousing/light industrial) facilities located just South of the existing railway. These locations are within zoning designated as M.

Source: Burcaw & Associates Incorporated, Public Sector Department, 2004

Noise measurements were made using a hand–held meter, which measures dBA sound pressure levels. The meter is identified as a Brüel & Kjær, Precision Sound Level Meter, Type 2232, serial no. 865 786.

Spot noise measurements were made at each of the above indicated locations in order to determine a representative sound pressure level for the 2 daytime peak hour periods (8:00am-9:30am and 6:00pm-7:30pm) and a representative sound pressure level for the nighttime period (10:00pm-11:30pm). Measurements at each location were conducted every five seconds for sixty seconds total, with a full 360° sweep so that so that omni directional noise sources did not overly influence the ambient noise estimates for a particular location. The one-minute equivalent sound levels (L_{eq}) for two representative daytime peak hours and one nighttime hour are presented in Table 3.1. Measurements were taken by B&A at seven monitoring locations (1 through 7) during the approximate time periods noted below:

Date	Daytime	Nighttime
September 17, 2004	8:00am - 9:30am 6:00pm - 7:30pm	10:00pm - 11:30pm
October 1, 2004	8:00am - 9:30am 6:00pm - 7:30pm	10:00pm - 11:30pm

During each measurement, the monitoring station and description, noise level in dBA, time, temperature and weather conditions, and wind direction were recorded. Detailed charts encompassing all results and factors as listed above are provided, and are designated as: Table 3.2, Table 3.3, and Table 3.4.

Due to the higher noise levels emitted by heavy duty trucks as compared to light trucks and cars, the percentage of each category for each road segment was identified for the resultant noise environment modeling discussed later. A traffic count of the main roadways surrounding the facility site was conducted to determine the current traffic mix. In the past, the county has directed the specific routes to be utilized by the transfer trailers and packer trucks to the facility. Since the northern portion of Falkenburg Road is more utilized by residential traffic, the county has directed facility traffic to be distributed in an estimated 90 percent southern and 10 percent northern split.

Table 3.1	NOISE BASELINE DATA SUMMARY SEPTEMBER 17, 2004 OCTOBER 1, 2004

Site	Time	L_{eq} (dBA)
1 (B&A)[b]	8:00am 6:00pm 10:00pm	64.1 63.3 50.7
2 (B&A)[c]	8:00am 6:00pm 10:00pm	68.7 66.7 61.0
3 (B&A)[c]	8:00am 6:00pm 10:00pm	74.8[a] 75.0[a] 65.1[a]
4 (B&A)[c]	8:00am 6:00pm 10:00pm	73.6 73.2 67.1
5 (B&A)[c]	8:00am 6:00pm 10:00pm	64.8 64.5 52.8
6 (B&A)[c]	8:00am 6:00pm 10:00pm	58.2 60.7 50.6
7 (B&A)[c]	8:00am 6:00pm 10:00pm	52.1 50.6 45.4

Source: Burcaw & Associates Incorporated, Public Sector Department, 2004

a - Level currently exceeds limits as set by Hillsborough County Environmental Protection Commission

b - Recorded on September 17, 2004

c - Recorded on October 1, 2004

Resultant Noise Environment

Construction Impacts. There are two basic areas of concern associated with potential noise related impacts. The first being the short-term noise impacts from the construction of the proposed expansion and the second being the longer-term impacts from the expanded facilities operation. While construction noise impacts are important, their short-term nature and the availability of effective mitigative measures minimizes their significance in what is essentially a noise analysis for long-term land use impacts.

Noise at a given construction site will depend on the phase of construction, the type of equipment being utilized, and the time of day. Also, the noise produced will depend upon the source of power used to operate the equipment, and the material properties and operational characteristics of the equipment itself. A characterization, based upon the dominant noise sources of commonly used construction equipment is as follows:

- Earth Moving equipment - including, but not limited to, such machinery as bulldozers, shovel-type excavators, front-end loaders, graders, and trucks.

- Erecting and Demolition equipment - such as cranes, concrete mixers, pile drivers, and pavers.

- Supporting equipment - including, but not limited to, pumps, generators, compressors, and light towers.

Table 4 represents typical construction equipment noise ranges.

Aforementioned construction noise impacts will be of short duration due to vegetative shielding coupled with the industrialized nature of the areas surrounding the facility and should result in only slightly adverse impacts.

Table 4	CONSTRUCTION EQUIPMENT SOUND LEVELS

Equipment	Sound Level at 50 ft. (dBA)
Earth Moving	
Bulldozer (250 to 700 horsepower)[a]	72 – 85
Front-end loader (6 to 15 cubic yards)[a]	72 – 85
Grader (13- to 16-foot blade)[a]	80 – 94
Shovel (2 to 5 cubic yards)[a]	72 – 93
Tractor (3/4 to 2 cubic yards)[a]	76 – 93
Compactors/rollers[b]	72 - 75
Material Handling	
Truck (200 to 400 horsepower)[a]	83 - 95
Mobile crane (11 to 20 tons)[a]	76 - 87
Concrete pumps (30 to 150 cubic yards)[a]	82 - 85
Concrete mixers[b]	75 – 88
Impact Equipment	
Pneumatic wrenches[b]	82 – 89
Jack hammers & rock drills[b]	81 – 98
Miscellaneous	
Portable generators (50 to 200 kilowatts)[a]	71 – 83
Compressors[b]	75 – 87
Pumps[b]	69 - 71

Source: a - Barnes et al., 1976, 1977

b - US EPA, January 1971

Operational Impacts. The operation of the facility involves many noise generating activities through equipment, machinery, and activities relevant to said operation. Noise levels have been found to exceed 90 dBA in the tipping area of this mass-burning plant when refuse trucks dump within an enclosed building housing both tipping bays and charging floor. The primary sources of noise at all locations were the packer-ejection mechanism during truck dumping, truck traffic, and release of the air brakes on the packers and transfer vans. All noise levels, with the exception of truck traffic, are significantly attenuated or reduced outside the building and with increasing distance from the buildings.

Cinder block walls and heavy doors cause decibel loss during transmission through the material, ranging from 25 to 40 dBA. Thus, when a 100 dBA noise source is in operation within the facility structure, only about a 75 dBA level would be noted directly outside.

The facility has been identified as an omni directional noise source; therefore, noise levels are radiated equally in all directions from their source. Decibel loss over distance from this point was calculated using a normal atmospheric attenuation factor of 6dB loss with a doubling of distance. For the original noise analysis, it was found that the reference noise level and distance were measured to be at 75dBA when at a distance of 50 feet from the facility.

For the noise analysis, a sensitive receptor is defined as a residential area, school, hospital, or other type of community institution. There are two existing groups of receptors potentially affected by noise impacts. The closest sensitive receptor to the facility is the Hillsborough County Animal Services. Although not considered a "sensitive receptor", another receptor potentially affected by noise is S&S Electric Co. (a commercial manufacturing area) about 1600 feet east of the facility (represented by Monitoring Site 4 on Figure 1).

The sound pressure reduction over the 1,600 feet to the commercial manufacturing use area would be about 30 dBA (75 minus 30) resulting in a perceived sound pressure level of 45 dBA from the proposed facility. This being well below the current observed daytime ambient level, and coupled with the adjacent roadway noise levels, results in the absence of any increases in the ambient noise levels at this location. All other potential sensitive receptors are beyond this distance and, therefore, are not impacted by noise levels resultant from facility operations

From this analysis it can be seen that daytime operations of the facility would not result in any perceived noise impacts at the closest sensitive receptors. Nighttime ambient noise monitoring at the closest residence indicate nighttime noise levels of 50.7 dBA. With facility noise levels at the location of this sensitive receptor to be in the vicinity of 44 to 46 dBA, no impact is anticipated.

Efforts will be made during the design phases of this project to include appropriate mitigative measures for reducing these expected noise levels.

Such measures include, but are not limited to:

- Locating major noise producing components of the expanded facility, such as draft fans, conveyors, and screw type compressors.

- Completing all required building siding and structural modifications to new Grizzly Building and Main Process/Boiler Enclosure.

- Use of structural noise screens and if necessary, planting of vegetative buffers.

It should be noted that while an additional effort will be made to minimize noise levels, the resultant sound levels at the receiving receptors will be well below Hillsborough County EPC noise criteria. The rules of the Hillsborough County Environmental Protection Commission (Rule 1-10) allow a dBA sound level limit of 75 for a manufacturing/industrial land use category at all times. The predicted noise levels of the proposed facility expansion will be well below these limits.

Noise levels from the facility at other areas in the vicinity of the site will be well below existing day and nighttime ambient levels, save that of location 3. However, let it be noted that any exceeding levels in this location are due in their entirety to roadway traffic and not facility operations.

The operation of the expanded facility will increase daytime truck traffic levels along roadways in the vicinity of the site. Truck traffic is restricted to daytime hours, more specifically 8 a.m. to 5 p.m. As a result of the truck traffic, noise levels can be expected to increase minimally in the

vicinity of the site's access road, Falkenberg Road, and State Road 60. Table 5, as presented below, represents the increase in truck traffic.

Table 5	**TRUCK TRAFFIC ANALYSIS**	
Sources of Truck Traffic	**Increased Volume Daily (8 ton/20 ton trailer[a])**	**Increased Volume Hour (8 ton/20 ton trailer[a])**
Refuse/Ash Hauling	82 (75/7)	8 (7/1)[b]
Repair/Delivery	13	4
Total	95	12

Source: Covanta Energy (Covanta Hillsborough, Inc.) at the Resource Recovery Facility

Note: a - Where applicable, volumes are listed as Daily (8 ton/20 ton trailer) which accounts for differential truck/trailer loads.

b - The peak hour volume is disproportionately less than values which would be obtained from using ***Institute of Transportation Engineer's (ITE) Trip Generation Manual, 7th Edition.*** According to representatives at the Facility, truck traffic is always minimized during peak hours, therefore a factor of ten-percent is applied.

The noise that would be generated by traffic related to the proposed facility was determined by using the Traffic Impact Analysis as detailed in Appendix 10.1.3. The results compared the existing modeled sound levels with and without the proposed expansion to the resource recovery facility. The existing modeled noise levels, which are presented in Table 6 and 7, compare will with the 1 minute L_{eq}s monitored by B&A. Table 6 presents the predicted 1-hour equivalent sound levels for two daytime peak traffic hours and one nighttime traffic hour for each of the seven receptors with and without the addition to facility traffic and facility noise sources. Table 7 presents the peak traffic noise with and without the facility expansion at the given intervals of distance from the roadway. The hour which has the highest traffic volume for each road segment was used to determine the composite "peak" traffic hour in Table 7. These hours are typically associated with the afternoon rush hour.

Table 6	NOISE IMPACT ASSESSMENT SUMMARY FOR HILLSBOROUGH COUNTY RESOURCE RECOVERY FACILITY						
Case	Receptor Site Locations						
	1	2	3	4	5	6	7
L_{eq} Noise Level without Facility Expansion 8:00am Peak Day Traffic	62.3	65.8	74.5	74.6	66.4	59.1	51.4
L_{eq} Noise Level with Facility Expansion 8:00am Peak Day Traffic	64.1[a]	69.2[a]	74.5	74.6	66.4	59.1	51.4
L_{eq} Noise Level without Facility Expansion 6:00pm Peak Day Traffic	61.3	68.7	74.7	74.0	64.6	61.6	50.6
L_{eq} Noise Level with Facility Expansion 6:00pm Peak Day Traffic	63.6[a]	70.5[a]	74.7	74.0	64.6	61.6	50.6
L_{eq} Noise Level without Facility Expansion 10:00pm Night Traffic	51.2	56.9	65.3	67.2	56.6	53.2	46.7
L_{eq} Noise Level with Facility Expansion 10:00pm Night Traffic	52.9[a]	57.3[a]	65.3	67.2	56.6	53.2	46.7

Source: Burcaw & Associates Incorporated, Public Sector Department, 2004

a - Increase due to facility expansion

NOTE: All values are 1-hour equivalent sound levels. See Figure 1 for location of receptors.

Table 7	PEAK HOUR NOISE LEVEL ATTENUATION FROM ROADWAYS

		Predicted Noise Levels							
Roadway Section	Distance	L_{eq} [a]	Without Expansion			L_{eq} [a]	With Expansion		
			L10	L50	L90		L10	L50	L90
1. Falkenburg SR-60 to SR-574	50	74.3	80.5	73.6	71.2	75.0	80.8	74.1	72.6
	100	69.6	75.9	69.1	66.5	70.3	76.1	69.4	67.9
	150	66.8	73.2	66.2	63.6	67.5	73.3	66.6	65.1
	200	64.7	71.1	64.3	61.4	65.4	71.2	64.5	63.0
	300	61.6	68.1	61.4	58.2	62.3	68.1	61.4	59.9
	500	57.6	64.2	57.3	54.1	58.3	64.1	57.4	55.9
	1,000	51.9	58.4	51.6	48.2	52.6	58.4	51.7	50.2
2. SR-60 US-301 to Falkenburg	50	76.7	81.4	75.0	72.8	76.7	81.4	75.0	72.8
	100	72.0	76.8	70.5	68.1	72.0	76.8	70.5	68.1
	150	69.2	74.1	67.6	65.2	69.2	74.1	67.6	65.2
	200	67.1	72.0	65.7	63.0	67.1	72.0	65.7	63.0
	300	64.0	69.0	62.8	59.8	64.0	69.0	62.8	59.8
	500	60.0	65.1	58.7	55.7	60.0	65.1	58.7	55.7
	1,000	54.3	59.3	53.0	49.8	54.3	59.3	53.0	49.8
3. SR-60 Falkenburg To Lakewood	50	76.1	82.6	75.3	73.3	76.1	82.6	75.3	73.3
	100	71.4	78.0	70.8	68.6	71.4	78.0	70.8	68.6
	150	68.6	75.3	67.9	65.7	68.6	75.3	67.9	65.7
	200	66.5	73.2	66.0	63.5	66.5	73.2	66.0	63.5
	300	63.4	70.2	63.1	60.3	63.4	70.2	63.1	60.3
	500	59.4	66.3	59.0	56.2	59.4	66.3	59.0	56.2
	1,000	53.7	60.5	53.3	50.3	53.7	60.5	53.3	50.3
4. SR-574 US-301 To Falkenburg	50	72.9	79.7	71.5	69.9	72.9	79.7	71.5	69.9
	100	68.2	75.1	67.0	65.2	68.2	75.1	67.0	65.2
	150	65.4	72.4	64.1	62.3	65.4	72.4	64.1	62.3
	200	63.3	70.3	62.2	60.1	63.3	70.3	62.2	60.1
	300	60.2	67.3	59.3	56.9	60.2	67.3	59.3	56.9
	500	56.2	63.4	55.2	52.8	56.2	63.4	55.2	52.8
	1,000	50.5	57.6	49.5	46.9	50.5	57.6	49.5	46.9
5. SR-574 Falkenburg To Williams	50	72.2	78.5	71.4	69.1	72.2	78.5	71.4	69.1
	100	67.5	73.9	66.9	64.4	67.5	73.9	66.9	64.4
	150	64.7	71.2	64.0	61.5	64.7	71.2	64.0	61.5
	200	62.6	69.1	62.1	59.3	62.6	69.1	62.1	59.3
	300	59.5	66.1	59.2	56.1	59.5	66.1	59.2	56.1
	500	55.5	62.2	55.1	52.0	55.5	62.2	55.1	52.0
	1,000	49.8	56.4	49.4	46.1	49.8	56.4	49.4	46.1

Source: Burcaw & Associates Incorporated, Public Sector Department, 2004

a - Hourly L_{eq}

The noise level at a point away from the roadway is a function of:

- The distance from the roadway
- The relative elevations of roadway and receiver
- Traffic volume on the roadway
- The percentage of light-duty (two axles and four tires), medium duty (two axles and six tires), and heavy-duty (more than three axles) vehicles
- Vehicle speed
- Roadway grade
- Topographic features such as trees, shrubbery, and buildings
- The noise source height of the vehicles

Trucks traveling along Falkenberg Road maintain a relatively steady speed of 45 mph. At the railroad tracks and at the access road to the site these trucks will slow down to about 20 mph or stop.

Nevertheless, the model treated the velocity as a constant higher velocity to maintain the conservatism of the analysis. Trucks hauling along State Road 60 will maintain a speed of 50 mph. Falkenberg Road and the facility access road do not have grades that significantly increase truck generated noise levels.

Currently, hourly truck volume from the facility is 4 to 5 vehicle trips. The maximum hourly truck volume expected to be added to Falkenberg Road from the proposed facility expansion is 8 vehicle trips. At this volume, the median sound level recorded from the trucks along with the current existing trucks traveling along Falkenberg at 50 feet from the roadway is averaged to 73.6 dBA with or without the expansion. Additional truck traffic could be expected to slightly increase ambient noise levels by 0.5 to 1 dBA during this maximum truck volume period along Falkenberg Road. As stated earlier, an increase of 3dB is barely perceptible in the natural environment. The Hillsborough County EPC noise criteria allows a sound level limit of 75 dBA at manufacturing or industrial receiving land uses, a level of 65 dBA at commercial or business receiving land uses, and a sound level limit of 60 dBA at residential land uses between the hours of 7 a.m. and 10 p.m. The peak hourly traffic with the additional facility traffic is not expected to exceed the County criteria at any of the receptors except at Site 3. Noise levels at this location have been known to be in excess since prior to 1984, and the construction of the original Waste Treatment Facility.

Modeling of the existing traffic levels at all of the monitoring sites, as shown on Table 6 at the indicated peak and nighttime hours along with the steady noise source of 75 dBA at 50 ft from the facility, again predicts an insignificant increase of only 0.5 to 1.0 dBA above existing monitored and modeled data.

Figure 2 presents the contour analysis data from the modeling runs. Contours are shown as light green lines and are in 5dBA increments ranging from 75 to 60 dBA. These contours represent the worst case (maximum noise levels) for each receptor from peak traffic for the hour with the highest existing traffic volume as detailed in Appendix 13.1 and the peak hourly traffic associated with the facility operations. Care must be exercised when interpreting these results because the contour lines were generated using rush hour traffic values which occur only two hours a day and thus are not representative of a 24-hour period. This map indicates no substantial increase of noise levels (between 0 -1 dBA) due to this facility and its expansion.

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Appendix 11-2
Traffic Impact Analysis

TRAFFIC IMPACT ANALYSIS

FOR

HILLSBOROUGH COUNTY

RESOURCE RECOVERY FACILITY

PREPARED FOR:

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October 5, 2004

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INTRODUCTION

The Hillsborough County Resource Recovery Facility (RRF) is a proposed expansion to an existing energy recovery operation located on the west side of Falkenburg Road, north of SR-60 Adamo Drive. As indicated by this report, the Facility will have no adverse impact on the surrounding roadway network.

SCOPE OF PROJECT

The Hillsborough County Resource Recovery Facility is a proposed expansion to the existing energy recovery facility. The Facility incinerates processable solid waste (solid waste that can be incinerated), produces steam, and converts the steam to electricity which is sold to the Tampa Electric Company. The initial phase was completed in 1987 at a cost of approximately $80,000,000 by Ogden Martin Systems of Hillsborough, Inc. and was designed to operate at a capacity of 1,200 tons per day (TPD).

The proposed expansion project will increase the capacity by 600 tons per day. This Traffic Impact Analysis evaluates the potential traffic-related impacts to the surrounding roadway network caused by the current and proposed trips generated by the operation and maintenance of the facility. Traffic associated with construction of this project is not evaluated in this report but is addressed in Section 4.6.3 Traffic Associated with Construction.

LOCATION MAP

The Facility is located on Falkenburg Road north of SR-60 Adamo Drive (between SR-60 Adamo Drive and SR-574 MLK Blvd.). The Facility is on the west side of Falkenburg Road, and is accessed by a driveway located approximately 1 mile north of SR-60. The project location is shown in ***Figure 1***.

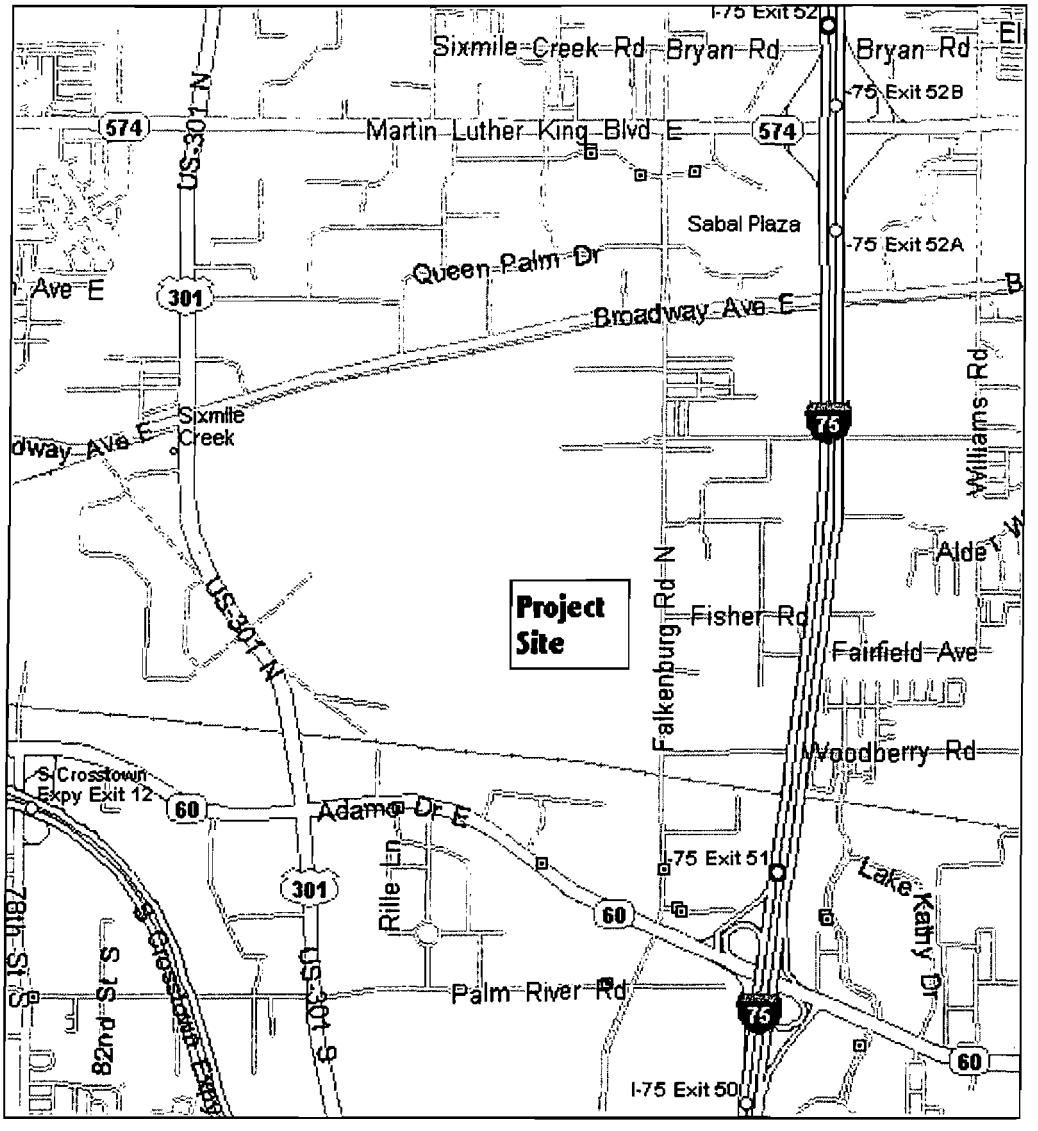


FIGURE 1 – PROJECT LOCATION

EXISTING ROADWAY NETWORK

The surrounding roadway networks which are evaluated in this analysis are those roads which could be impacted by traffic generated by the Facility. Existing traffic volumes and distribution patterns are used to determine traffic flow and proposed trip distributions.

The roadways which are evaluated for this traffic impact analysis are delineated and established by proposed conditions and the format and limits of existing traffic data. The roadways which are evaluated include:

Falkenburg Road

(I) From SR-60 (Adamo Drive) to SR-574 (MLK Boulevard)

SR-60 (Adamo Drive/Brandon Boulevard)

(II) From US-301 to Falkenburg Road

(III) From Falkenburg Road to Lakewood Drive

SR-574 (MLK Boulevard)

(IV) From US-301 to Falkenburg Road

(V) From Falkenburg Road to Williams Road

These roadways are shown in the roadway network map in ***Figure 2***.

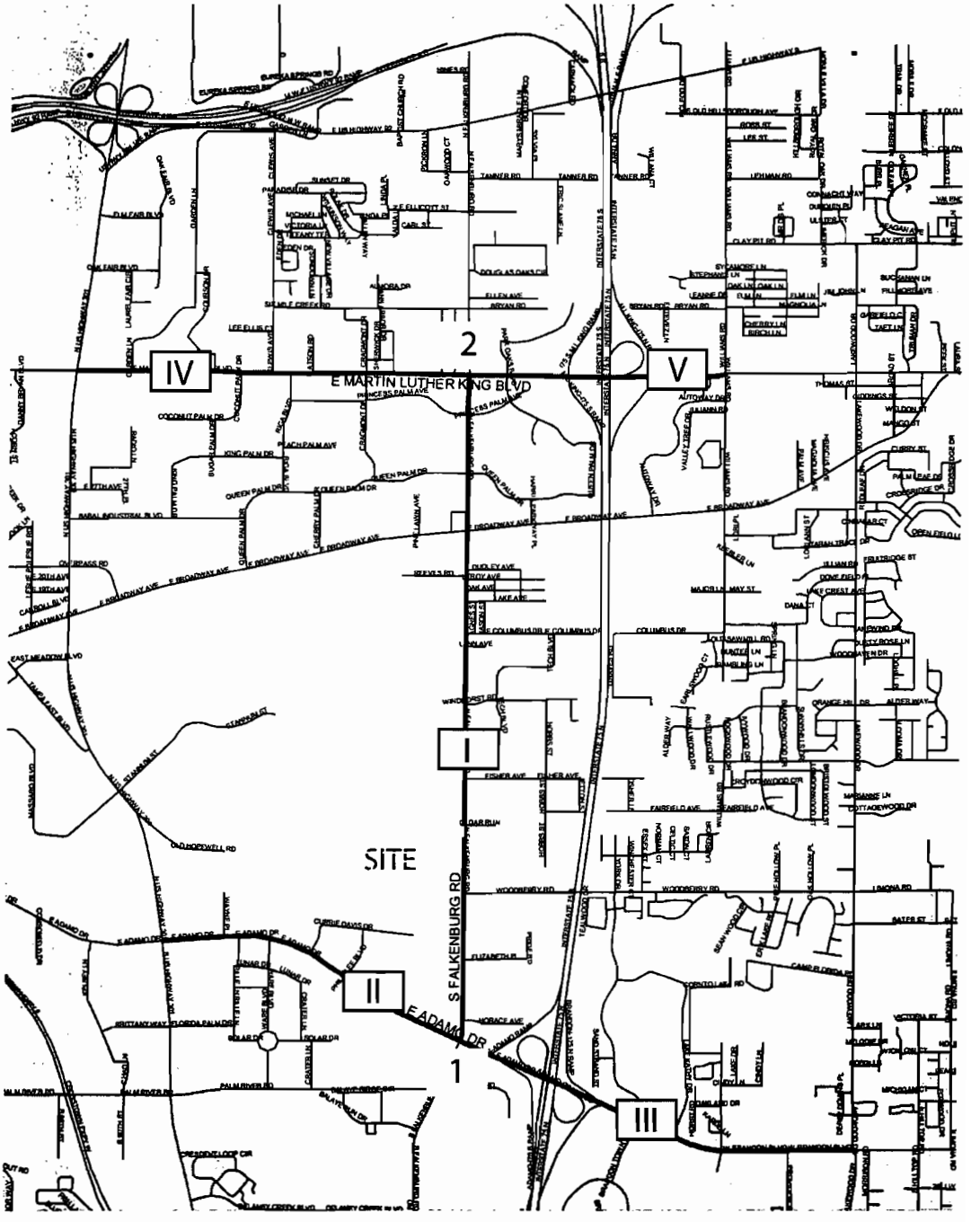


FIGURE 2 – ROADWAY NETWORK

The existing traffic volumes and level of service (LOS) for these roadways were obtained from the ***Hillsborough County – Board of County Commissioners – 2004 Roadway Level of Service Report*** prepared by ***Planning & Growth Management - Transportation Division.*** The results for the roadways which are evaluated in this analysis are summarized in ***Table 1***.

TABLE 1 – ROADWAY LEVEL OF SERVICE REPORT

	Roadway (From/To)	FC	Road Type	Speed Limit	LOS Std.	AADT	Daily Cap	PM Pk Hr Dir Vol	PM Pk Hr Dir Cap	LOS
I	Falkenburg (SR-60 to SR-574)	MA	4D	45	E	29000	29700	1250	1410	C
II	SR-60 (US-301 to Falkenburg)	PA	4D	50	E	45700	43600	2600	2450	F
III	SR-60 (Falkenburg to Lakewood)	PA	8D	50	E	75500	78700	4000	4200	D
IV	SR-574 (US-301 to Falkenburg)	PA	6D	50	D	33000	53500	1800	2790	B
V	SR-574 (Falkenburg to Williams)	PA	4D	50	D	35600	35700	1900	1860	F

*See Appendix A and Appendix B foe descriptions

TRIP GENERATION

Vehicular traffic associated with the Facility is anticipated to be generated primarily by delivery of refuse to the facility and the removal of ash for disposal. A much smaller volume of traffic will be generated from the commuting employees and from support vehicles performing delivery of supplies and facility repairs and maintenance.

EMPLOYEE VEHICULAR TRIP GENERATION

There are approximately 42 current employees at the facility. The current capacity of the facility is 1200 tons per day (TPD) which will be increased by 600 TPD with the expansion. According to Covanta Energy representatives, the expansion project will result in seven new employees operating the Facility, including four operators and 3 maintenance. Therefore, the projected number of employees will be 49, with the additional 7 employees.

The facility operates on a three-shift cycle with the day shift accounting for approximately 60 percent of the staff while the other two shifts each require another 20 percent of the work force. Most employees will commute via use of single rider automobiles. Although trips generated from commuting employees is anticipated to be distributed during any 24-hour period divided into shifts according to these ratios, the analysis for this study will be based on total employees with out reference to their shift. This will allow use of current trip generation data and account for the overlapping of trips during shift changes.

The additional 7 employees required to operate the facility will generate 38 additional trips per day (TPD) or 5 addition trips (TPD) during the entering PM Maximum Peak Hour traffic.

The results of trips generated from commuting employees are shown in ***Table 2***.

TABLE 2 - COMMUTING EMPLOYEE TRIP GENERATION

Land Use	Condition	ITE Code	Units	Number Of Units	Daily		AM Peak				PM Peak			
					Rate[1]	Trips	Rate	Trips	Entering	Exiting	Rate	Trips	Entering	Exiting
Utility	Current	170	Empl.	42	1.80	76	0.76	32	(90%) 29	(10%) 3	0.76	32	(15%) 5	(85%) 27
Utility	Projected Increase	170	Empl.	7	1.80	12	0.76	5	(90%) ~5	(10%) ~1	0.76	6	(15%) ~1	(85%) ~5
Utility	Total	170	Empl.	49	1.80	88	0.76	38	(90%) 34	(10%) 4	0.76	38	(15%) 6	(85%) 32

1. Source derived from previous study
2. Rates and factors applied are derived from the ***Institute of Transportation Engineer's (ITE) Trip Generation Manual, 7th Edition.***

Based on current population densities and proximity of major population centers to the planned project, it is anticipated that distribution of the traffic generated by commuting employees will be fairly evenly divided between population centers to the east and to the west (mainly Tampa and Brandon). It is further anticipated that based on the project location and existing traffic patterns that approximately 60 percent of the commuting employer trips generated will enter and exit the roadway network using SR-60 Adamo Drive while the remaining 40 percent will use SR-574 MLK Boulevard.

TRUCK TRAFFIC TRIP GENERATION

The major contributor to truck traffic for the facility is associated with the delivery of refuse to the facility to be incinerated, and the removal of ash residue to the land fill. A small amount of truck traffic will be generated from the delivery of supplies and from maintenance vehicles which will be discussed separately in the following section. Hillsborough County Solid Waste Management divides the county into tree major collection zones as shown in ***Figure 3.***

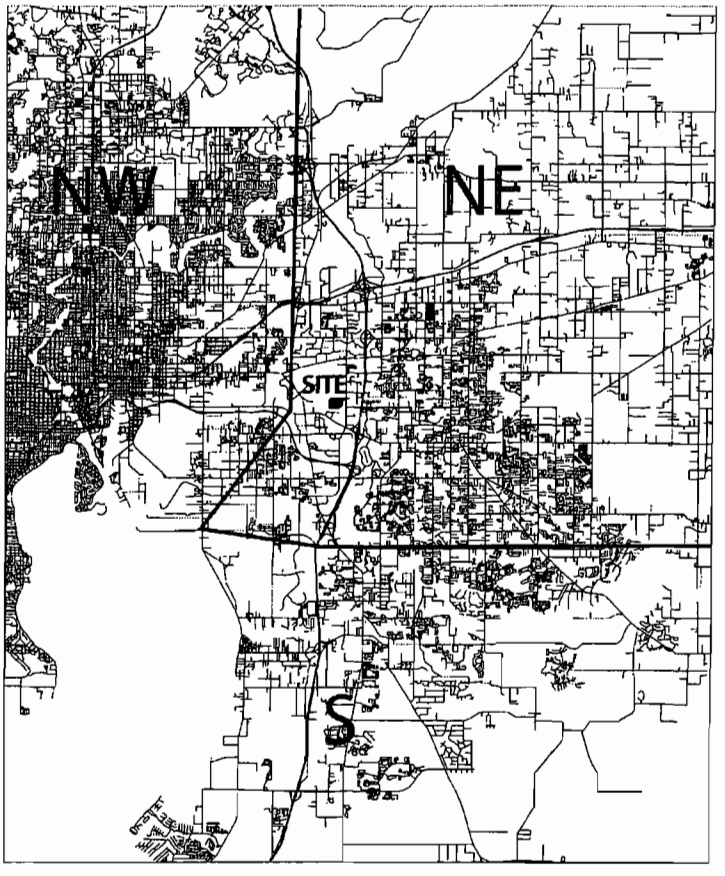


FIGURE 3 – COLLECTION ZONES

In order to provide more convenient disposition alternatives for processable solid waste the system utilizes two (2) transfer stations which are located in and service zones NW

and S and are designated as the Northwest County Solid Waste Transfer Station (NWTS) and the South County Solid Waste Transfer Station (SCTS). Most of the refuse from these zones is taken to the transfer stations by the hauler's roll-off or rear-end load trucks and then is transferred into county owned 40 foot trailers. The Facility can only accommodate approximately 15 transfer trailer loads each day of operation (Monday – Saturday) all originating from the NWTS Facility. The remainder of the transfer trailer loads are diverted to the landfill in southern Hillsborough County. At the current time all transfer trailer loads originating from the SCTS Facility are directed straight to the landfill.

Information derived from a field inspection and visit indicates that the facility currently receives approximately 200-250 trucks a day delivering refuse to incinerate. Of these 15 are county trailers (20 cubic yard) from the Northwest County Refuse Station. The balance of the daily truck traffic is composed of refuse trucks, roll-off or rear-end loaders (~8 cubic yard).

Trips generated from truck traffic (refuse and ash hauling) as shown in Table 3.

TABLE 3 - TRUCK TRAFFIC TRIP GENERATION

Condition	Truck Volume					
	Daily			Peak Hour		
	Total	Light	Trailer	Total	Light	Trailer
Current	250	235	15	25	24	1
Proposed Increase	125	118	8	12	11	1
Total	375	353	23	37	35	2

TABLE 4 - VISITOR / MAINTAINENCE TRIP GENERATION

Condition	Volume	
	Daily	Peak Hour
	Total	Total
Current	30	10
Proposed Increase	6	2
Total	36	12

Combining the different sources of trip generations and appropriating the volumes as current, proposed increase and total the results are shown in Table 5 (Daily Volume) and Table 6 (PM Peak Hour).

TABLE 5 - FACILITY RELATED TRIPS GENERATED (DAILY)

Source of Trips Generated	Existing Volume[1] (trips/day)	Proposed Volume (trips/day)	Increase Volume (trips/day)
Commuting Employees	76	88	12
Refuse/Ash Hauling	250(235/15)	375 (353/23)	125(118/8)
Repair/Delivery/Visitors	30	36	6
TOTAL	356	499	143

TABLE 6 - FACILITY TRIPS GENERATED (PM PEAK HOUR)

Source of Trips Generated	Existing Volume (trips/peak hour)	Proposed Volume (trips/peak hour)	Increase Volume (trips/peak hour)
Commuting Employees	32	38	5
Refuse/Ash Hauling	25 (24/1)	37(35/2)	12 (11/1)
Repair/Delivery/Visitors	10	12	2
TOTAL	67	87	19

The data obtained indicates that the facility will produce an additional 143 trips a day, with an additional 19 trips during peak hour. These trips are applied to the local roadway network to evaluate the impact on these roadways. Table 7 list the roadway capacity and level of service (LOS) for the impacted roadways. Using the peak hour volume of 19 trips generated, these trips are applied to the roadway network by two methods. No roadway segment will have a significant change in its level of service (LOS) as a result of additional traffic generated by this project.

TABLE 7 - ROADWAY CAPACITY AND LEVEL OF SERVICE

Roadway	Segment	Standard LOS[1] / Capacity[2]	Existing LOS / Volume[3]	Anticipated Volume Increase[4]	
				Method 1	Method 2
Falkenburg Road	SR-60 to SR-574	E / 1410	C / 1250	19	17
SR-60/Adamo Dr	US-301 to Falkenburg	E / 2450	F / 2600	10	4
SR-60/Adamo Dr/ Brandon Blvd	Falkenburg to Lakewood	E / 4200	D / 4000	9	6
SR-574/MLK Blvd	US-301 to Falkenburg	D / 2790	B / 1800	0	3
SR-574/MLK Blvd	Falkenburg to Williams	D / 1860	F / 1900	0	3

Source: Hillsborough County 2004 Roadway Level of Service Report
Notes:

1. LOS is level of service
2. Using PM Peak Hour Direction Capacity
3. Using PM Peak Hour Direction Volume
4. *Volume Increase Based on anticipated traffic from one of two methods:*
   a. Method 1 – Assuming all traffic approaches and departs south of the facility and then equally east or west on US-60.
   b. Method 2 – Assuming traffic approaches and departs based on established traffic distribution patterns on major surrounding roadway network.

CONCLUSIONS

As depicted in Table 2-22, the anticipated volume increase does not add significantly to the existing volume as to affect the level of service (LOS) at any of the surrounding roadway segments. The trips generated from this project will not significantly impact the surrounding roadway network.

Appendix 11-3
Ash Management Plan

COVANTA
ENERGY

INTEROFFICE CORRESPONDENCE

To: Glenn Hoag, Facility Manager

From: Rebecca Macionski, Environmental Engineer

Date: May 26, 2004 5/28/04

Subject: Ash Management Plan Revisions

Attached please find the latest version to the Hillsborough County Resource Recovery Facility's Ash Management Plan in accordance with 62-702.400 F. A. C. Please keep all memorandums notifying you of these periodic updates within Attachment 3 of the enclosed document.

If you have any further comments upon the Ash Management Plan, please feel free to contact me.

Cc: S. Haas
Shift Supervisor(s)
File

HILLSBOROUGH COUNTY

SOLID WASTE ENERGY RECOVERY FACILITY

ASH RESIDUE MANAGEMENT PLAN

HILLSBOROUGH COUNTY SOLID WASTE ENERGY RECOVERY FACILITY

ASH RESIDUE MANAGEMENT PLAN

The Hillsborough County Solid Waste Energy Recovery Facility is located on a 40-acre site in Tampa, Florida. The facility receives, stores, and combusts municipal solid waste and other solid wastes items. The technology used by the facility is a process generally known as "mass-burning" in which solid waste is burned (90% volume reduction) with little or no pre-combustion processing. Fly ash (from the boiler and air pollution control devices) and bottom ash are combined within the fully enclosed Martin residue handling system.

The facility, consists of three (3) MWC combustion trains, at full load generates approximately 300 TPD (100,000 tons-per-year) of residue, which is disposed of in the Southeast County Sanitary Landfill in Picnic, Florida. Approximately 7% of the ash residue is recovered ferrous metals which are removed prior to disposal.

The residue handling methods, equipment, ash disposal site, analytical QA/QC for ash characterization, potential for ash recycling, and conditions of assuring that hazardous wastes are not received or incinerated at the facility are all discussed within this ash residue management plan, per the requirements of Rule 62-702.400, F.A.C.

1. Residue Handling Equipment

The residues of combustion consist of non-combustible by-products, fly ash, reacted lime products, excess lime, and bottom ash siftings. The resultant ash residue is approximately 25 to 30 percent (by weight) of the incoming MSW. It is not possible to accurately estimate the fly ash component generated from the total ash residue produced. Most facilities currently in operation in the United States combine fly ash and bottom ash in the ash quench system. Thus, there is little information for calculating the precise amounts of fly versus bottom ash.

The fly ash system collects and handles material discharged from the superheater, economizer, spray dry gas absorber, and particulate removal systems. The air pollution control (APC) systems and boiler ash hoppers discharge to screw conveyors through dump valves. These provide a barrier between the air pressure in the conveyors and the various pressure levels at different points in the combustion train. The collected stream is combined with the bottom ash for quenching and removal in the ash discharger.

Each stoker is furnished with one proprietary Martin GmbH residue discharger that receives, combines, wets and quenches burned out waste residues, grate siftings and fly ash. The ash discharger is totally enclosed, thus preventing siftings from becoming airborne prior to quenching. Once the ash is quenched, the excess water from the residual materials drains back into the ash discharger quench tank. The ash is then transported to the main conveyor; the ash will retain approximately 10 to 25 percent moisture content. The mechanical nature of the ash handling and disposal operations, in combination with enclosed systems whenever possible will minimize the potential for inhalation, ingestion or body contact with the material.

From the quench chamber, a hydraulically driven ram pushes the residue up an inclined draining/drying chute. In the chute, excess water from the residue drains back into the quench bath. Residue, containing enough moisture to prevent dusting (10 to 25 percent by weight), then falls on to the main vibrating residue conveyor.

The main conveyor carries discharged residue from the boilers to a grizzly scalper. The grizzly scalper extracts large residue pieces from the main residue stream. Oversized pieces are transported to the residue storage building via front-end loader. Undersized pieces are fed to an inclined belt conveyor for transport to the residue storage building. Just prior to the incline belt conveyor, dolomitic lime is spread over the undersized ash pieces at a fixed rate using a rotary feeder. Two fine water sprays are utilized to aid in controlling dust issues associated with the dolomitic lime feed onto the incline belt conveyor. The ash transport conveyors that are exterior to the buildings are covered to limit fugitive emission during transport.

The residue storage building contains two separate storage bunkers, one for ash residue and another for recovered ferrous metals. An iron-aggregate shake-on concrete surface hardener is applied to the entire floor of the building. Joints are sealed to prevent water from seeping out at walls and construction joints in the floor. Each storage compartment is sized to allow a naturally forming residue pile in order to minimize the amount of residue recast required. Each residue pile consists of a cone with its lower portion constrained by the compartment walls. Sufficient storage volume will be provided for approximately three days of material (38,000 ft^3 cubic feet). Processed residue is then removed from storage and loaded into trucks by a front-end loader for

ultimate disposal in the designated landfill. The moisture content of the ash (10 to 25 percent by weight) minimizes any potential fugitive dust emissions and possible human exposure through inhalation during the handling, conveying, and transport activities. The consistency and appearance of the ash residue is comparable to wet aggregate. This moisture condition continues to be maintained during transport to the landfill. The facility uses mulch from the adjacent Hillsborough County yard waste processing facility to aid in absorbing moisture in the truck access ways on the ash management building floor. The addition of the mulch aids in limiting the amount of ash being tracked outside the ash management building by the exiting truck tires.

Separation and recovery of ferrous metals is also done in the residue building. When the residue first enters the building, it passes under a magnet which is designed to remove at least 80 % of the ferrous metals in residue containing at least 8 % by weight of magnetic ferrous metals greater than 1" in size. The separated metals pass through a rotating drum trommel that conditions the ferrous by removing adhering ash particles. The recovered ferrous is directed to the second bay of the building. The separated ash then falls in the ash bunker directly beneath the trommel.

Please note the addendum to the Ash Management Plan addressed to the Hillsborough County Environmental Protection Commission dated March 16, 1994. *See Attachment 2.*

The trucks used to transport the residue material to the landfill are typically leak-resistant containerized vehicles that have the capability of conveying up to 25 tons of material per load. The vehicle is covered with a canvas tarp during transport to the landfill to help prevent any potential spillage or fugitive dust. The vehicle makes approximately five or six round trips per day, operating six days per week.

The ash materials will be managed in compliance with Chapter 62-702, F.A.C. and in a manner (i.e., moist) such that an extremely low potential for inhalation ingestion or direct dermal contact will exist. HC-RRF has developed a detailed and specific employee safety-training program. The program provides effective personal respiratory protection equipment as necessary to promote a high degree of protection to facility personnel who may have excessive contact with the ash material. This program will be continuously updated as new information and equipment is developed to assure compliance with all OSHA standards and FDEP requirements.

2. Ash Disposal Site

The current ash residue disposal site is located in a portion of the Southeast County Sanitary Landfill at Picnic, FL which is approximately 20 miles from the HC-RRF facility. It is a co-disposal landfill with a composite lining and leachate collection and removal system that complies with the requirements of Rule 62-701.050, F.A.C. The landfill started receiving ash from the HC-RRF facility January 1987.

3. Analytical Quality Assurance/Quality Control Plan

Sampling and analysis analytical procedures used for characterization of the ash residue will be in accordance with the following EPA documents:

1. Test Methods for Evaluating Solid Waste - Physical/Chemical Methods (SW-846), September 1986, 2nd Edition

2. FDEP - Quality Assurance Standard Operating Procedure Manual for Sampling of Ash Residue from Solid Waste Combustors issued in December 1993.

A representative sample combined from the monthly ash samples will be obtained on a quarterly basis using procedures outlined in the ASTM "Belt Sampling Protocol" (ASTM D2234-86) and Rule 62-702.570, F.A.C. The sample will be sent to an independent laboratory and analyzed using appropriate methods and techniques. Analysis will include total metals analysis for the thirteen priority pollutant metals using EPA method 3050 (Acid Digestion of Sediments, Sludges, and Soils). The priority pollutant metals include: silver, arsenic, beryllium, cadmium, chromium, copper, mercury, nickel, lead, antimony, selenium, thallium, and zinc.

The laboratory will adhere to a strict quality control program and adhering to the requirements contained within SW-846. The State of Florida also has an extremely stringent certification process.

The destination landfill is also required to collect and analyze the leachate for the priority pollutant metals on a quarterly basis. The results of the ash and leachate analyses will be submitted in separate reports annually to the FDEP.

4. Recycling of Ash Residue

As part of the total ash management program, the County will be alert to potential uses of ash. Currently, various pilot projects are underway in Florida and other states to study the possibility of reusing the ash. For example, several communities are studying the effects of incorporating ash materials into asphalt and concrete aggregate materials used in roadway pavements. This work is still in the development and research stages however, and will require additional study regarding mixing ratios, leachability, and encapsulation techniques for the material. If these programs are successful, the County may pursue ash reuse programs of its own.

5. Non-Processible Wastes

Per contractual obligations, as specified by the Consolidated Operation and Management Agreement (Amendment No.10) between Hillsborough County and Ogden Martin Systems of Hillsborough, Inc. (May 20, 1998), the facility may neither receive nor burn non-processible waste (Section 7.3.3). The definition of a "non-processible waste" as defined by the Operation and Management Agreement, is:

> "...ashes, foundry sand, cesspool and other human waste, human remains and animal carcasses, tree trunk sections, branches and stumps longer than 5 feet or more than 8 inches in diameter, matter or material longer than 5 feet, motor vehicles (including major parts such as transmissions, rear ends, springs, and fenders), agriculture machinery and

equipment, marine vessels and their major parts, any other large machinery or equipment, liquid waste, any matter or material the combustion of which in the Project is prohibited by any law, ordinance, rule, or regulation of any government or public agency having jurisdiction over the Project and its operations, noncombustible construction material or demolition debris, and hazardous waste, such as but not limited to, explosives, hazardous chemicals, radioactive materials, cleaning fluids, crank case oils, cutting oils, paints, acids, caustics, poisons or drugs."

Per Section 7.3.3 of the Operation and Management Agreement, the County is responsible for removing any non-processible waste (including hazardous waste) delivered to the facility. To prevent hazardous waste delivery to the facility, the County has adopted an ordinance prohibiting the deliveries of such wastes and will conduct periodic random inspection of vehicles delivering waste to the facility.

In addition to these contractual obligations, HC-RRF has an Unacceptable Waste Screening Protocol (see Attachment 1) which is included as part of the facility's Operation and Maintenance Manual. This protocol establishes methods for screening the incoming waste stream for unacceptable and hazardous wastes.

The Hillsborough County Department of Solid Waste also employs a full-time tipping floor attendant to assist in screening efforts.

Attachment 1

UNACCEPTABLE WASTE SCREENING PROCEDURE

Unacceptable waste screening will be conducted on a random basis as necessary to ensure compliance with the Unacceptable Waste Program.

Prerequisites

1. Safety equipment including appropriate personnel protective gear (i.e., Scott Air Packs, respirators, protective clothing, gloves, boots, first aid kit, etc.), emergency fire fighting equipment, and clean up equipment will be stored near the tipping floor and be readily available. Appropriate materials (e.g., rope, pylons, etc.) needed to isolate any potentially dangerous waste will also be stored near by and be readily available.

2. The Facility Superintendent will assign a "trained" employee to serve as Inspector. He will conduct the screening and complete the necessary reports.

3. A front-end loader and operator will be standing by to help with the screening.

Types of Screening

I. On-Board Screening (only done on open type vehicles)

1. The Inspector shall select a vehicle for screening and upon entering the tipping floor inform the driver of this fact.

2. The driver will be asked to fold back the screens or tarpaulin covering his load.

3. The Inspector shall then position himself such as to obtain the maximum possible view of the load.

4. If the load is observed to contain unacceptable materials, the Inspector will immediately notify the Facility Superintendent or other designated management representative who will inspect the load and determine if the hauler is to be turned away.

5. If the load is acceptable, the driver will be told to discharge into the pit.

6. If unsure, the Inspector will direct the driver to a designated area of the tipping floor where floor screening will be conducted, as described below.

7. The Inspector will complete the Waste Screening Report that will be submitted to the Facility Superintendent for appropriate disposition. The driver will be asked to sign the report before leaving the facility.

II. Pit Screening

1. The Inspector shall select a vehicle for screening and inform the driver of this fact.

2. The Inspector shall position himself so as to obtain maximum view of the load as it is discharged into the pit.

3. If unacceptable waste is observed, the crane operator will be directed to remove it for proper disposal.

4. In cases where potentially dangerous materials are found and are considered to present a possible immediate threat (such as explosives or large quantities of infectious materials), no attempt will be made by facility personnel to move these materials. The material will be left in place and that portion of the tipping floor or tipping bay roped off. Personnel and traffic will be prevented from operating in that section of the plant. Danger signs and warnings will be posted. No attempt will be made to open suspect waste containers. OMSH will notify appropriate government agencies, including the local Fire and Rescue Department and/or Police Department, for dispatch to the facility.

5. The Inspector will complete the Waste Screening Report that will be submitted to the Facility Superintendent for appropriate disposition. The driver will be asked to sign the report before leaving the facility.

III. Floor Screening

1. The Inspector shall select a vehicle for screening and inform the driver of this fact.

2. The driver shall be directed to a designated area of the tipping floor where he will dump and spread his load, ensuring that the complete load is discharged. The front-end loader shall be utilized as necessary to spread the load uniformly to a minimal depth.

3. The driver will park his vehicle ensuring that he does not interfere with the existing traffic pattern or impede other haulers.

4. The Inspector will watch the unloading process and, if possible, stop the process if he observes unacceptable or potentially dangerous material.

5. If unacceptable waste is found, the Facility Superintendent or designated management representative is to be notified and the hauler may be required to remove it from the facility. A screening report and notice of infraction will be issued as appropriate.

6. The Inspector will complete the Waste Screening Report, which will be submitted to the Facility Superintendent for appropriate disposition. The driver will be asked to sign the report before leaving the facility.

7. After conclusion of screening, acceptable waste will be charged to the pit by the front-end loader and the hauler will leave the facility.

8. In cases where potentially dangerous materials are found and considered to present a possible immediate threat (such as explosives or large quantities of infectious materials), no attempt will be made by facility personnel to move these materials. The material will be left in place and that portion of the tipping floor or tipping bay roped off. Personnel and traffic will be prevented from operating in that section of the plant. Danger signs and warnings will be posted. No attempt will be made to open suspect waste containers. OMSH will notify appropriate government agencies, including the local Fire and Rescue Department and/or Police Department, for dispatch to the facility.

Attachment 2

HILLSBOROUGH COUNTY

Florida

March 16, 1994

Mr. Carl J. Heintz, Hydrogeologist
Enviromental Protection Commission
Waste Management Division
1900 - 9th Avenue
Tampa, Florida 33605

RE: Ash Residue Management - Hillsborough County Waste-to-Energy Facility
EPC Complaint # 35868

Dear Mr. Heintz:

The Department of Solid Waste (DSW) is in receipt of your March 8, 1994 letter (received by DSW 3/10/94) requesting a plan addendum to the December 31, 1993 DSW proposal for additional ash residue management. First, the DSW is disappointed that the Environmental Protection Commission (EPC) did not deem it necessary to respond to the DSW's February 9, 1994 request for clarification and/or additional information relative to the ash residue issue (letter attached).

Below, each of the EPC comments contained in your January 27, 1994 letter are restated in bold and are followed by the DSW response.

1. **The EPC requests the immediate removal of visible ash residue that has been tracked into the environment. This includes, but is not limited to, ash residue that has been deposited along the edges of the roadway. The EPC agrees with Ogden Martin Systems of Hillsborough, Inc.'s proposal to install curbing on both sides of the ash residue storage building's exit roadway.**

   The visible ash residue along the edges of the roadway outside of the ash residue storage building has been removed. Installation of curbing on both sides of the ash residue storage building's exit roadway will commence as soon as the plan is approved by EPC.

2. **Please specifically address how your agency intends "to improve ash truck loading procedures to reduce spillage on the Ash Building floor."**

The residue ash is placed in transport vehicles by a front-end loader. The loader operator has been advised of the problems associated with the spillage and has been instructed to be more prudent and observant in his loading techniques.

3. **Please provide the approximate hour of the day when the "daily cleaning of the Ash Building" will be performed. What specific procedures will the daily cleaning of the ash residue storage building entail? What procedures will be taken during the daily cleaning ritual to keep <u>any</u> ash residue from being emitted to the environment?**

Daily cleaning of the ash residue storage building will entail the removal of ash from that portion of the building traversed by ash transport vehicles. At a minimum, the cleaning will be performed at the end of each working day by a vacuum-type mechanical sweeper or by the front-end loader bucket blade. Any ash residue that may escape from the building during the daily cleaning process will be vacuumed and redeposited into the ash residue storage building.

4. Your agency proposes to "increase general housekeeping activities (street sweeping, etc.) in the area of the Ash Building from three (3) days to six (6) days per week." The EPC requests that the general housekeeping activities be performed during every day of the facility's out loading operations. Please provide the approximate hour of the day that the daily "general housekeeping activities" will be performed. Street sweeping might exacerbate ash residue dispersal to the environment. What specific measures will be taken to control further ash residue dispersal to the environment during the daily street sweeping activities?

The proposed increase in general housekeeping activities from three (3) days to six (6) days per week will cover all days when ash residue is transported from the facility. This daily activity will occur during the later part of the day after ash residue transport activities have ceased. That is not to say, however, that this activity will not occur on a more frequent or as-needed basis. With regard to the potential exacerbation of ash residue dispersal to the environment by the street sweeping, the street sweeper utilized is a vacuum-type which collects the ash residue into a self-contained bin. In addition, the curbing proposed in Item 1 should prevent the ash residue from leaving the roadway. For aesthetic reasons, the white rock in the road shoulder of the Ash Residue Building exit road is routinely removed and disposed of at the County's landfill as part of normal facility clean-up procedures. This activity will continue on an as-needed basis and will address any ash residue that may leave the roadway. Based upon all correspondence and discussions to date, it is our understanding that the environment, as it relates to this issue, is the roadway and the roadway edges.

Please advise should you have any questions concerning the responses or wish to discuss this matter further. You may contact me at 276-2900 or Thomas Smith at 276-2909.

Sincerely,

Daryl H. Smith, Director
Department of Solid Waste

DHS/tgs

Attachment

xc:

Thomas G. Smith, DSW
Susan Allan, County Attorney's Office
John Burbridge, OMSH
Allison Amram, FDEP Southwest District
Hooshang Boostani, EPC
Paul Schipfer, EPC
Ron Cope, EPC

Attachment 3

COVANTA
ENERGY

INTEROFFICE CORRESPONDENCE

To: Glenn Hoag, Facility Manager

From: Rebecca Macionski, Environmental Engineer

Date: December 18, 2002

Subject: Ash Management Plan Revisions

Attached please find the latest version to the Hillsborough County Resource Recovery Facility's Ash Management Plan in accordance with 62-702.400 F. A. C. Please keep all memorandum notifying you of these periodic updates within Attachment 3 of the enclosed document.

If you have any further comments upon the Ash Management Plan, please feel free to contact me.

Cc: J. Howard
Shift Supervisor(s)
File

COVANTA
ENERGY

INTEROFFICE CORRESPONDENCE

To: Glenn Hoag, Facility Manager

From: Rebecca Macionski, Environmental Engineer

Date: March 14, 2001

Subject: Ash Management Plan Revisions

Attached please find the latest version to the Hillsborough County Resource Recovery Facility's Ash Management Plan in accordance with 62-702.400 F. A. C. Please keep all memorandum notifying you of these periodic updates within Attachment 3 of the enclosed document.

If you have any further comments upon the Ash Management Plan, please feel free to contact me.

Cc: J. Howard
Shift Supervisor(s)
File

OGDEN

INTEROFFICE CORRESPONDENCE

To: John Burbridge

From: Becky Bigan

Date: September 1, 1998

Subject: Revision to the facility's Ash Management Plan

The Hillsborough County Resource Recovery Facility's ash management plan is reviewed and updated in accordance with 62-702.400 F.A.C. The facility's combustion ash is properly disposed of at the Southeast County - Class I Landfill which operates in accordance with permit number S029-256427.

Include the enclosed copy of the Southeast County Landfill's operating permit as Attachment 4 to the HC-RRF ash management plan. Please keep all memorandum notifying you of these periodic updates within Attachment 3 of the ash management plan.

If you have any further question or comments, please feel free to contact me.

cc: R. Kilgore
Shift Supervisor(s)
File

OGDEN

INTEROFFICE
CORRESPONDENCE

To: John Burbridge

From: Becky Bigari

Date: July 24, 1998

Subject: Revision to the facility's Ash Management Plan

Attached is the latest revision to Hillsborough County Resource Recovery Facility's Ash Management Plan in accordance with 62-702.400 F.A.C. Please keep all memorandum notifying you of these periodic updates within Attachment 3 of the enclosed document.

If you have any comments upon the Ash Management Plan, please feel free to contact me.

cc: R. Kilgore
Shift Supervisor(s)
File

OGDEN

Ogden Martin Systems of Hillsborough, Inc.
350 N. Falkenburg Road
Tampa, FL 33619
Tel: 813 684 5688
Fax: 813 684 7964

August 11, 1997

Ms. Allison Amram
Solid Waste Section
Florida Department of Environmental Protection
3804 Coconut Palm Drive
Tampa, Florida 33619

SUBJECT: **Hillsborough County Resource Recovery Facility**
Ash Residue Management Plan

Dear Ms. Amram,

The Hillsborough County Resource Recovery Facility is attaching a copy of the latest version of the facility's ash residue management plan per the requirements of Chapter 62-702 F.A.C. which regulates ash management practices.

If you have any further questions regarding this matter, please contact me at 684-5688.

Sincerely,

John P. Burbridge

John Burbridge
Facility Manager

cc: T. Smith (HC-SWMD)
S. Woodard (HC-EPC)
B. Bigari (OMSH)
File

ashplan ltr

OGDEN

Ogden Martin Systems of Hillsborough, Inc.
350 N. Falkenberg Road
Tampa, FL 33619
Tel: 813 684 5688
Fax: 813 684 7964

August 11, 1997

Ms. Allison Amram
Solid Waste Section
Florida Department of Environmental Protection
3804 Coconut Palm Drive
Tampa, Florida 33619

SUBJECT: Hillsborough County Resource Recovery Facility
Ash Residue Management Plan

Dear Ms. Amram,

The Hillsborough County Resource Recovery Facility is attaching a copy of the latest version of the facility's ash residue management plan per the requirements of Chapter 62-702 F.A.C. which regulates ash management practices.

If you have any further questions regarding this matter, please contact me at 684-5688.

Sincerely,

John P. Burbridge

John Burbridge
Facility Manager

cc: T. Smith (HC-SWMD)
S. Woodard (HC-EPC)
B. Bigari (OMSH)
File

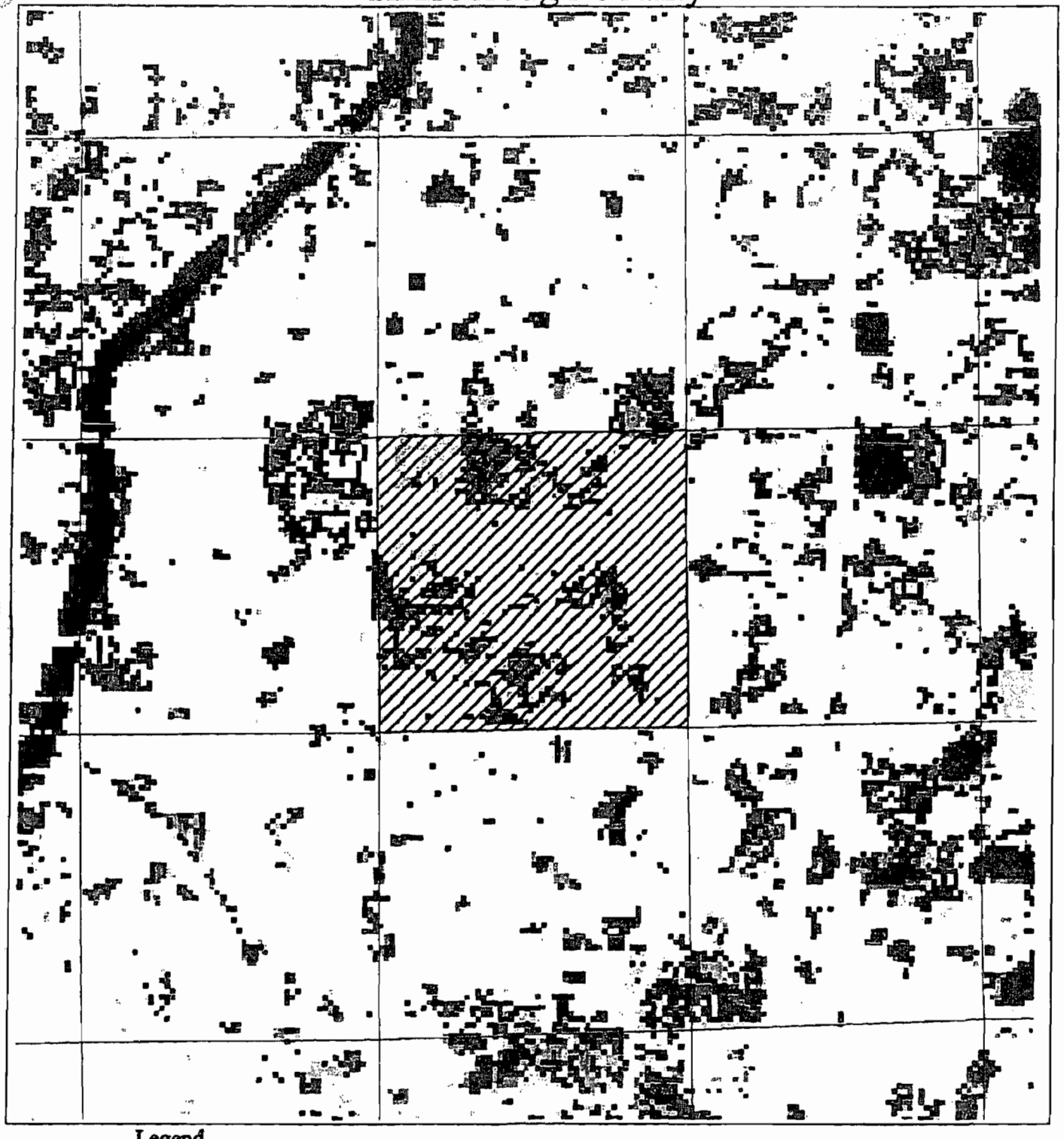
ashplan.ltr

Appendix 12
Other Supplemental Information

Appendix 12-1
Ecology

29s20e18
Hillsborough County

Land Cover



Legend

- Coastal Strand
- Sand/Beach
- Xeric Oak Scrub
- Sand Pine Scrub
- Sandhill
- Dry Prairie
- Mixed Hardwood-Pine Forest
- Hardwood Hammocks and Forests
- Pinelands
- Cabbage Palm-Live Oak Hammock
- Tropical Hardwood Hammock
- Freshwater Marsh and Wet Prairie
- Sawgrass Marsh
- Cattail Marsh
- Shrub Swamp
- Bay Swamp
- Cypress Swamp
- Cypress/Pine/Cabbage Palm
- Mixed Wetland Forest
- Hardwood Swamp
- Hydric Hammock
- Bottomland Hardwood Forest
- Salt Marsh
- Mangrove Swamp
- Scrub Mangrove
- Tidal Flats
- Open Water
- Shrub and Brushland
- Bare Soil/Clearcut
- Improved Pasture
- Unimproved Pasture
- Citrus
- Agriculture/ Grassland
- Exotic Plants
- Urban
- Extractive

0.5 0 0.5 1 Miles

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September 29, 2004

FLORIDA
Natural Areas
INVENTORY

1018 Thomasville Road
Suite 200-C
Tallahassee, FL 32303
850-224-8207
fax 850-681-9364
www.fnai.org

October 1, 2004

Brad Rosenblatt
Burcaw and Associates, Inc.
6402 W. Linebaugh Avenue, Suite A
Tampa, FL 33625

Dear Mr. Rosenblatt:

Thank you for your request for information from the Florida Natural Areas Inventory (FNAI). We have compiled the following information for your project area.

Project:	Hillsborough County Waste Recovery Facility
Date Received:	September 28, 2004
Location:	Township 29 S, Range 20 E, Section 18 Hillsborough County

Element Occurrences

A search of our maps and database indicates that currently we have several Element Occurrences mapped within the vicinity of the study area (see enclosed map and table). Please be advised that a lack of element occurrences in the FNAI database is not a sufficient indication of the absence of rare or endangered species on a site.

The Element Occurrences data layer includes occurrences of rare species and natural communities. The map legend indicates the precision of the element occurrence location, defined as second (within about 300 feet of the point), minute (within about one mile), or general (within about 5 miles). For animals and plants, Element Occurrences generally refer to more than a casual sighting; they usually indicate a viable population of the species. Note that some element occurrences represent historically documented observations that may no longer be extant.

Potential Natural Areas

Portions of the site appear to be located on or near Potential Natural Areas (PNA). These PNA are priority 5 and may include the following community types: scrub, xeric hammock, scrubby flatwoods, mesic flatwoods or depression swamp.

Potential Natural Areas are lands that appear to be relatively intact areas of natural vegetation based on aerial photography, as determined by FNAI scientists. Please see the enclosed explanation sheet for more information. PNAs are not a regulatory designation; they are intended for conservation planning purposes. The maps show a revised version of the PNAs, based on 1995 land use land cover data from the water management districts.

Florida Resources
and Environmental
Analysis Center

Institute of Science
and Public Affairs

The Florida State University

Potential Habitat for Rare Species

Portions of the site appear to be located on or near Potential Habitat for Rare Species. This potential habitat is associated with a known occurrence in the vicinity of: wood stork (*Mycteria americana*), Florida sandhill crane (*Grus canadensis pratensis*), manatee (*Trichechus manatus*), bald eagle (*Haliaeetus leucocephalus*) and eastern indigo snake (*Drymarchon couperi*).

FNAI Potential Habitat for Rare Species indicates areas, which based on landcover type, offer suitable habitat for one or more rare species that is known to occur in the vicinity. Potential habitat layers have been developed for approximately 250 of the most rare species tracked by the Inventory, including all federally listed species.

Potential Habitat is not a regulatory designation, and should not be confused with "critical habitat", which is an official designation made by the U.S. Fish and Wildlife Service. Information on critical habitats can be found in the Code of Federal Regulations, 50 CFR 17.95, which lists all critical habitats that have been designated. The Code of Federal Regulations can be accessed through the following website: "www.access.gpo.gov/nara/cfr/cfr-table-search.html".

The Inventory always recommends that a site-specific survey be conducted to determine the current presence or absence of rare, threatened, or endangered species. Surveys should be conducted by persons familiar with Florida's flora and fauna. For your convenience, a summary of the elements documented or reported for Hillsborough County is enclosed. For more information about the rare plants and animals that may be found in the region around your project site, please visit our searchable tracking list at: www.fnai.org/data.cfm

The database maintained by the Florida Natural Areas Inventory is the single most comprehensive source of information available on the locations of rare species and other significant ecological resources. However, the data are not always based on comprehensive or site-specific field surveys. Therefore, this information should not be regarded as a final statement on the biological resources of the site being considered, nor should it be substituted for on-site surveys. Inventory data are designed for the purposes of conservation planning and scientific research, and are not intended for use as the primary criteria for regulatory decisions.

Information provided by this database may not be published without prior written notification to the Florida Natural Areas Inventory, and the Inventory must be credited as an information source in these publications. FNAI data may not be resold for profit.

Thank you for your use of FNAI services. An invoice will be mailed to your accounts payable department. If I can be of further assistance, please give me a call at (850) 224-8207.

Sincerely,

Edwin A. Abbey

Edwin A. Abbey
Environmental Reviewer

encl

Township 29 S, Range 20 E, Section 18

Hillsborough County

1018 Thomasville Road
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Tallahassee, FL 32303
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www.fnai.org

FLORIDA Natural Areas INVENTORY

Element Occurrences

Precision: second minute general

- Animals
- Plants
- Communities
- Other

U.S. Fish & Wildlife Service Scrub Jay Survey 1992-96

FL Fish & Wildlife Cons. Comm. Breeding Bird Atlas Project 1986-91 center point of 10 sq mi survey block

Conservation Lands

- Federal
- State
- Local
- Private
- State Aquatic Preserves

Land Acquisition Projects

- Florida Forever Board of Trustees Projects

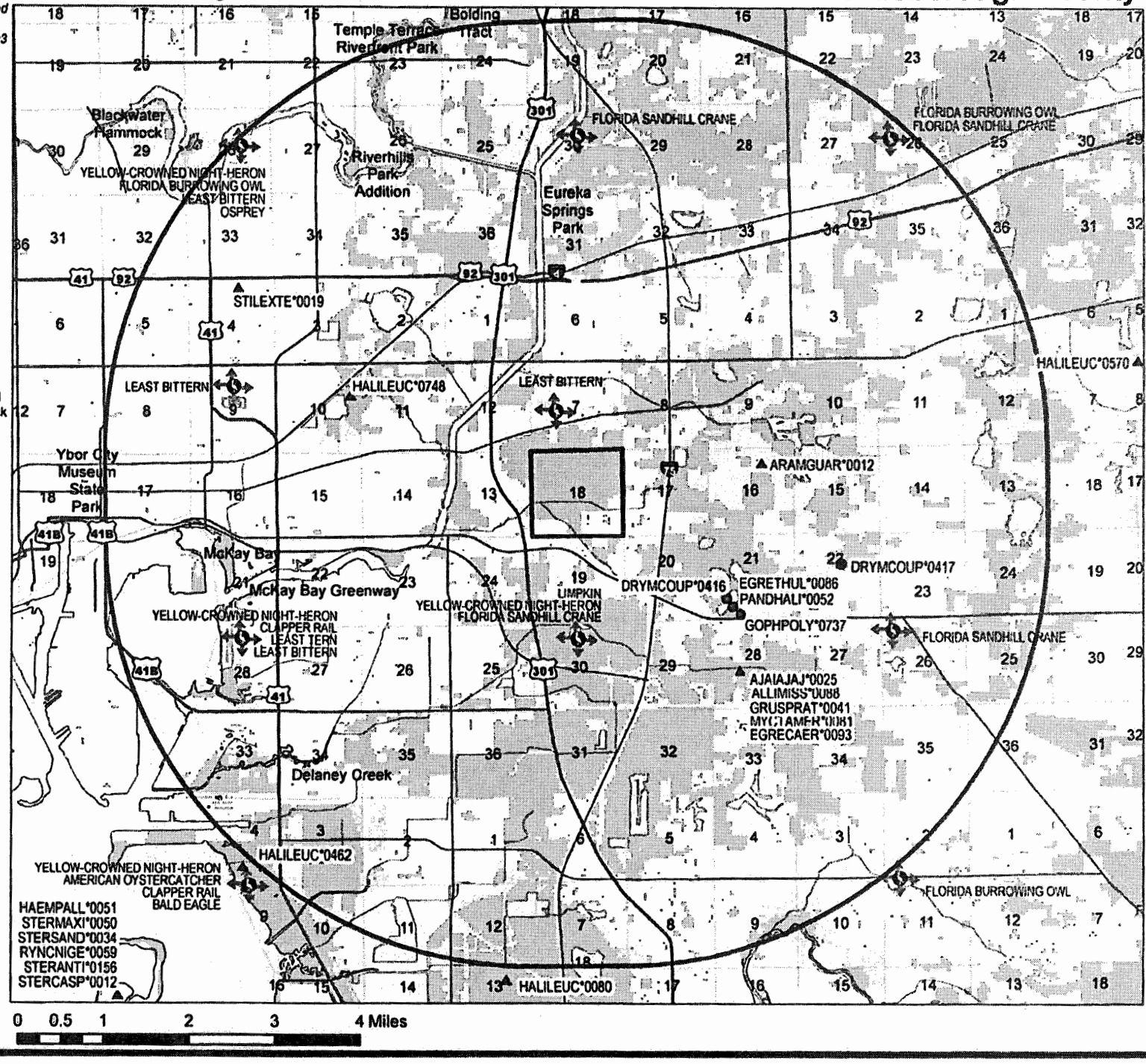
Non-Managed Natural Areas

- FNAI Potential Habitat for Rare Species
- FNAI Potential Natural Areas

- County Boundary
- Interstate
- Turnpike
- Major Highway
- Local Road
- Water

Map produced by EAA
Data Source: 06/2004

NOTE
Map should not be interpreted without accompanying documents.



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Florida Natural Areas Inventory

ELEMENT OCCURRENCES MAPPED WITHIN 5 MILES OF PROJECT SITE

Map Label	Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Listing	Observation Date	Description	EO Comments
DRYMCOUP*0416	Drymarchon couperi	Eastern Indigo Snake	G3	S3	N	LT	1987	No general description given	1 INDIVIDUAL OBSERVED. NEST AT FOOT OF HALF FALLEN LIVE OAK NEAR LAKE SHORE.
DRYMCOUP*0417	Drymarchon couperi	Eastern Indigo Snake	G3	S3	N	LT	1991	SHALLOW LAKE AND WETLAND AREA.	1 SNAKE OBSERVED.
GRUSPRAT*0041	Grus canadensis pratensis	Florida Sandhill Crane	G5T2T3	S2S3	N	LT	1991-06	No general description given	ADULTS AND YOUNG OBSERVED. INDIVIDUALS HAVE BEEN KILLED ON SR-60.
EGRECAER*0093	Egretta caerulea	Little Blue Heron	G5	S4	N	LS	1991-06	No general description given	+/- 90 ANIMALS FORAGING OVER 3 LAKES.
ARAMGUAR*0012	Aramus guarauna	Limpkin	G5	S3	N	LS	1990-07	AREA OF KARST DEPRESSIONS.	3 INDIVIDUALS (2 ADULTS, 1 CHICK) OBSERVED FEEDING.
EGRETHUL*0086	Egretta thula	Snowy Egret	G5	S3	N	LS	1991-07	WETLAND LAKE SHORE.	4 TO 22+ BIRDS ROOST IN WILLOWS AT EDGE OF POND IN WINTER MONTHS (8 MONTHS +/-).
HALILEUC*0748	Haliaeetus leucocephalus	Bald Eagle	G4	S3	LT	LT	1991	No general description given	NEST; 1991: PRODUCED 2 YOUNG; 1990; PRODUCTIVITY UNKNOWN.
GOPHPOLY*0737	Gopherus polyphemus	Gopher Tortoise	G3	S3	N	LS	1991-08	SCRUBBY OAK COMMUNITY GRADING TO MESIC FLATWOODS.	+/- 6 BURROWS OBSERVED, EST. 2-10 INDIVIDUALS. FEEDING AND NESTING OBSERVED. OBSERVED ON SITE SINCE THE 1940'S.
AJAIAJAJ*0025	Ajaia ajaja	Roseate Spoonbill	G5	S2	N	LS	1991	No general description given	1-6 INDIVIDUALS OBSERVED, VARYING WITH YEAR.
STILEXTE*0019	Stilosoma extenuatum	Short-tailed Snake	G3	S3	N	LT	1971-11-07	No general description given	SPECIMEN COLLECTED CA 1500 HR, 1971-11-07.
PANDHALI*0052	Pandion haliaetus	Osprey	G5	S3S4	N	LS*	1991-07	LAKE AND MESIC HAMMOCK.	2 BIRDS OBSERVED FEEDING IN AREA FROM 1989-1991.
ALLIMISS*0088	Alligator mississippiensis	American Alligator	G5	S4	T(S/A)	LS	1991-06	No general description given	ADULTS AND YOUNG OBSERVED.
MYCTAMER*0081	Mycteria americana	Wood Stork	G4	S2	LE	LE	1991-06	No general description given	1-50+ INDIVIDUALS DEPENDING ON THE YEAR.

Florida Natural Areas Inventory
Potential Natural Areas (PNA) Data Layer

POTENTIAL NATURAL AREAS (PNA)

The Potential Natural Areas data layer indicates, throughout the State of Florida, lands that are in private ownership and are not managed or listed for conservation purposes that are possible examples of good quality natural communities. These areas were determined from FNAI's scientific staff vegetative interpretation of 1988-1993 FDOT aerial photographs and from input received during Regional Ecological Workshops held for each regional planning council. These workshops were attended by experts familiar with natural areas in the region. Element occurrences in the FNAI database may or may not be present on these sites. In order to be classified as a Potential Natural Area (with the exception of internal rank PNA-5) the natural communities identified through aerial photographs must meet the following criteria:

1. Must be a minimum of *500 acres*. *Exceptions*: sandhill, min. 320 acres; scrub, min. 80 acres; pine rockland, min. 20 acres; dry prairie, min. 320 acres; *or* any example of coastal rock barren, upland glade, coastal dune lake, spring-run stream or terrestrial cave.

2. Must contain at least one of the following:
   a. One or more high quality examples of FNAI state ranked S3 or above natural communities.
   b. An outstanding example of any FNAI tracked natural community.

Potential Natural Areas have been assigned ranks of PNA-1 through PNA-4 mostly based on size and perceived quality and type of natural community present. The areas included in internal rank PNA-5 (former ACI Category C) are exceptions to the above criteria. These areas were identified through the same process of aerial photographic interpretation and regional workshops as the PNA 1 through 4 ranked sites, but do not meet the standard criteria. These PNA 5 areas are considered lower priority for conservation than areas ranked PNA 1- 4, but nonetheless are believed to be ecologically viable tracts of land representative of Florida's natural ecosystems.

FLORIDA Natural Areas INVENTORY
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Florida Resources and Environmental Analysis Center
Institute of Science and Public Affairs
The Florida State University

Tracking Florida's Biodiversity

FLORIDA NATURAL AREAS INVENTORY

Florida Scrub-Jay Survey and Breeding Bird Atlas Data Layers

In addition to our element occurrence database of rare species and natural community locations, the Inventory has additional data layers that have been provided by state and federal agencies.

Florida Scrub-Jay Survey - U.S. Fish and Wildlife Service

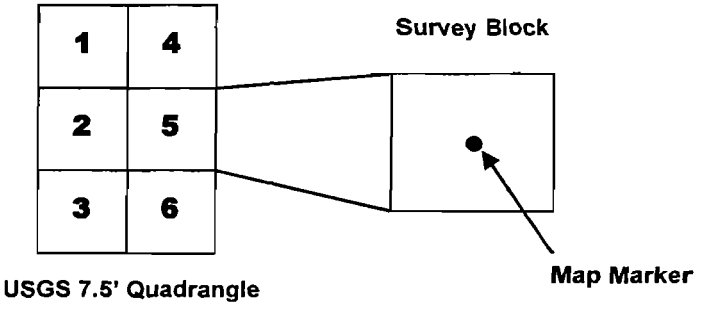
This survey was conducted by staff and associates of the Archbold Biological Station from 1992 to 1996. An attempt was made to record all scrub-jay (*Aphelocoma coerulescens*) groups, although most federal lands were not officially surveyed.

Each map point represents one or more groups.

Florida Breeding Bird Atlas Project - Florida Game and Fresh Water Fish Commission (now Florida Fish and Wildlife Conservation Commission)

This study was conducted from 1986 to 1991, (final report, *An Atlas of Florida's Breeding Birds* by Kale, Pranty, Stith, and Biggs, Nongame Wildlife Program, Florida Game and Fresh Water Fish Commission). The study divided the state into "blocks", with each block representing one-sixth of a U.S. Geological Survey 7.5 minute topographic quadrangle map. Several categories of breeding activity were recorded by observers.

Each map point is located at the center of a block, and represents species listed as Possible or Probable Breeders within the surrounding block (approximately 10 square miles in area).



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FLORIDA Natural Areas INVENTORY

Florida Resources and Environmental Analysis Center
Institute of Science and Public Affairs
The Florida State University

Tracking Florida's Biodiversity

FLORIDA NATURAL AREAS INVENTORY
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Tallahassee, FL 32303
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October 2004

Hillsborough County Summary

Rare Species and Natural Communities Documented or Reported

Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Status
FISH					
Microphis brachyurus	Opossum Pipefish	G4G5	S2	PS:C	N
AMPHIBIANS					
Rana capito	Gopher Frog	G3	S3	N	LS
REPTILES					
Alligator mississippiensis	American Alligator	G5	S4		LS
Caretta caretta	Loggerhead	G3	S3	LT	LT
Chelonia mydas	Green Turtle	G3	S2	LE, LT	LE
Crocodylus acutus	American Crocodile	G2	S1	LE	LE
Crotalus adamanteus	Eastern Diamondback Rattlesnake	G4	S3	N	N
Dermochelys coriacea	Leatherback	G2	S2	LE	LE
Drymarchon couperi	Eastern Indigo Snake	G3	S3	LT	LT
Gopherus polyphemus	Gopher Tortoise	G3	S3	N	LS
Heterodon simus	Southern Hognose Snake	G2	S2	N	N
Lepidochelys kempii	Kemp's Ridley	G1	S1	LE	LE
Pituophis melanoleucus mugitus	Florida Pine Snake	G4T3?	S3	N	LS
Pseudemys concinna suwanniensis	Suwannee Cooter	G5T3	S3	N	LS
Stilosoma extenuatum	Short-tailed Snake	G3	S3	N	LT
BIRDS					
Accipiter cooperii	Cooper's Hawk	G5	S3	N	N
Aimophila aestivalis	Bachman's Sparrow	G3	S3	N	N
Ajaia ajaja	Roseate Spoonbill	G5	S2	N	LS
Aphelocoma coerulescens	Florida Scrub-jay	G3	S2	LT	LT
Aramus guarauna	Limpkin	G5	S3	N	LS
Ardea alba	Great Egret	G5	S4	N	N
Athene cunicularia floridana	Florida Burrowing Owl	G4T3	S3	N	LS
Buteo brachyurus	Short-tailed Hawk	G4G5	S1	N	N
Charadrius alexandrinus	Snowy Plover	G4	S1	N	LT
Charadrius melodus	Piping Plover	G3	S2	LE, LT	LT
Dendroica discolor paludicola	Florida Prairie Warbler	G5T3	S3	N	N
Egretta caerulea	Little Blue Heron	G5	S4	N	LS
Egretta rufescens	Reddish Egret	G4	S2	N	LS
Egretta thula	Snowy Egret	G5	S3	N	LS
Egretta tricolor	Tricolored Heron	G5	S4	N	LS
Elanoides forficatus	Swallow-tailed Kite	G5	S2	N	N
Eudocimus albus	White Ibis	G5	S4	N	LS
Falco columbarius	Merlin	G5	S2	N	N
Falco peregrinus	Peregrine Falcon	G4	S2	N	LE
Falco sparverius paulus	Southeastern American Kestrel	G5T4	S3	N	LT
Fregata magnificens	Magnificent Frigatebird	G5	S1	N	N
Grus canadensis pratensis	Florida Sandhill Crane	G5T2T3	S2S3	N	LT
Haematopus palliatus	American Oystercatcher	G5	S2	N	LS
Haliaeetus leucocephalus	Bald Eagle	G4	S3	N	LT
Ixobrychus exilis	Least Bittern	G5	S4	N	N
Laterallus jamaicensis	Black Rail	G4	S2	N	N
Mycteria americana	Wood Stork	G4	S2	N	LE
Nyctanassa violacea	Yellow-crowned Night-heron	G5	S3	N	N
Nycticorax nycticorax	Black-crowned Night-heron	G5	S3	N	N
Pandion haliaetus	Osprey	G5	S3S4	N	LS*
Pelecanus occidentalis	Brown Pelican	G4	S3	N	LS

Hillsborough County Summary

Rare Species and Natural Communities Documented or Reported

Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Status
BIRDS					
Picoides villosus	Hairy Woodpecker	G5	S3	N	N
Plegadis falcinellus	Glossy Ibis	G5	S3	N	N
Rallus longirostris scottii	Florida Clapper Rail	G5T3?	S3?	N	N
Recurvirostra americana	American Avocet	G5	S2	N	N
Rynchops niger	Black Skimmer	G5	S3	N	LS
Sterna antillarum	Least Tern	G4	S3	N	LT
Sterna caspia	Caspian Tern	G5	S2	N	N
Sterna maxima	Royal Tern	G5	S3	N	N
Sterna sandvicensis	Sandwich Tern	G5	S2	N	N
Vireo altiloquus	Black-whiskered Vireo	G5	S3	N	N
MAMMALS					
Corynorhinus rafinesquii	Rafinesque's Big-eared Bat	G3G4	S2	N	N
Eptesicus fuscus	Big Brown Bat	G5	S3	N	N
Mustela frenata peninsulae	Florida Long-tailed Weasel	G5T3	S3	N	N
Neofiber alleni	Round-tailed Muskrat	G3	S3	N	N
Podomys floridanus	Florida Mouse	G3	S3	N	LS
Sciurus niger shermani	Sherman's Fox Squirrel	G5T3	S3	N	LS
Trichechus manatus	Manatee	G2	S2	LE	LE
INVERTEBRATES					
Utterbackia peninsularis	Peninsular Floater	G3	S2	N	N
PLANTS					
Andropogon arctatus	Pine-woods Bluestem	G3	S3	N	LT
Asplenium erosum	Auricled Spleenwort	G5	S2	N	LE
Bonamia grandiflora	Florida Bonamia	G3	S3	LT	LE
Carex chapmanii	Chapman's Sedge	G3	S3	N	LE
Centrosema arenicola	Sand Butterfly Pea	G2Q	S2	N	LE
Chrysopsis floridana	Florida Golden Aster	G1	S1	LE	LE
Glandularia tampensis	Tampa Vervain	G2	S2	N	LE
Gymnopogon chapmanianus	Chapman's Skeletongrass	G3	S3	N	N
Helianthus debilis ssp. vestitus	Hairy Beach Sunflower	G5T2	S2	N	N
Lechea cernua	Nodding Pinweed	G3	S3	N	LT
Ophioglossum palmatum	Hand Fern	G4	S2	N	LE
Pteroglossaspis ecristata	Giant Orchid	G2	S2	N	LT
Rhynchospora harveyi var. culixa	Georgia Beakrush	G1Q	SH	N	N
Thelypteris serrata	Toothed Maiden Fern	G5	S1	N	LE
Triphora amazonica	Broad-leaved Nodding-caps	G1?Q	S1	N	LE
NATURAL COMMUNITIES					
Beach dune		G3	S2	N	N
Coastal grassland		G3	S2	N	N
Estuarine composite substrate		G3	S3	N	N
Estuarine consolidated substrate		G3	S3	N	N
Estuarine tidal marsh		G5	S4	N	N
Estuarine tidal swamp		G5	S4	N	N
Estuarine unconsolidated substrate		G5	S5	N	N
Hydric hammock		G4	S4	N	N
Marine grass bed		G3	S2	N	N
Marine mollusk reef		G3	S3	N	N
Marine tidal swamp		G5	S4	N	N
Maritime hammock		G3	S2	N	N
Sandhill		G3	S2	N	N
Scrub		G2	S2	N	N
OTHER ELEMENTS					
Bird rookery		GNR	SNR	N	N
Geological feature		GNR	SNR	N	N
Manatee aggregation site		GNR	SNR	N	N

Hillsborough County Summary

Rare Species and Natural Communities Documented or Reported

Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Status

Total count:

Number of tracked elements: 96
Number of distinct occurrences: 318

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GLOBAL AND STATE RANKS

Florida Natural Areas Inventory (FNAI) defines an **element** as any rare or exemplary component of the natural environment, such as a species, natural community, bird rookery, spring, sinkhole, cave, or other ecological feature. FNAI assigns two ranks to each element found in Florida: the **global rank**, which is based on an element's worldwide status, and the **state rank**, which is based on the status of the element within Florida. Element ranks are based on many factors, including estimated number of occurrences, estimated abundance (for species and populations) or area (for natural communities), estimated number of adequately protected occurrences, range, threats, and ecological fragility.

GLOBAL RANK DEFINITIONS

G1	Critically imperiled globally because of extreme rarity (5 or fewer occurrences or less than 1000 individuals) or because of extreme vulnerability to extinction due to some natural or human factor.
G2	Imperiled globally because of rarity (6 to 20 occurrences or less than 3000 individuals) or because of vulnerability to extinction due to some natural or human factor.
G3	Either very rare and local throughout its range (21-100 occurrences or less than 10,000 individuals), or found locally in a restricted range, or vulnerable to extinction from other factors.
G4	Apparently secure globally (may be rare in parts of range).
G5	Demonstrably secure globally.
GH	Occurred historically throughout its range, but has not been observed for many years.
GX	Believed to be extinct throughout range.
GXC	Extirpated from the wild but still known from captivity or cultivation.
G#?	Rank uncertain (e.g., G2?).
G#G#	Range of rank; insufficient data to assign specific global rank (e.g., G2G3)
G#T#	Rank of a taxonomic subgroup such as a subspecies or variety; the G portion of the rank refers to the entire species, and the T portion refers to the subgroup; T# has same definition as G#.
G#Q	Ranked as species but there is some question as to whether it is a valid species.
G#T#Q	Same as above, but validity as subspecies or variety is questioned.
GU	Global rank unknown; due to lack of information, no rank or range can be assigned.
G?	Temporarily not ranked.

STATE RANK DEFINITIONS

State ranks (S#) follow the same system and have the same definitions as global ranks, except they apply only to Florida, with the following additions:

SA	Accidental in Florida and not part of the established biota.
SE	Exotic species established in Florida (may be native elsewhere in North America).
SX	Believed to be extirpated from state.

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FEDERAL AND STATE LEGAL STATUSES

Provided by FNAI for information only.
For official definitions and lists of protected species, consult the relevant state or federal agency.

FEDERAL LEGAL STATUS

Definitions derived from U.S. Endangered Species Act of 1973, Sec. 3. Note that the federal status given by FNAI refers only to Florida populations and that federal status may differ elsewhere.

LE	Endangered: species in danger of extinction throughout all or a significant portion of its range.
LT	Threatened: species likely to become Endangered within the foreseeable future throughout all or a significant portion of its range.
E(S/A)	Endangered due to similarity of appearance to a species which is federally listed such that enforcement personnel have difficulty in attempting to differentiate between the listed and unlisted species.
T(S/A)	Threatened due to similarity of appearance (see above).
PE	Proposed for listing as Endangered species.
PT	Proposed for listing as Threatened species.
C	Candidate species for which federal listing agencies have sufficient information on biological vulnerability and threats to support proposing to list the species as Endangered or Threatened.
XN	Non-essential experimental population.
MC	Not currently listed, but of management concern to USFWS.
N	Not currently listed, nor currently being considered for listing as Endangered or Threatened.

FLORIDA LEGAL STATUSES

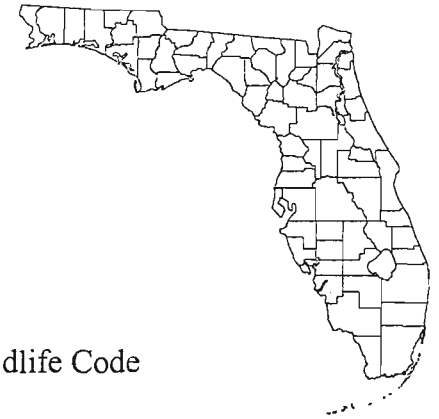
Animals: Definitions derived from "Florida's Endangered Species and Species of Special Concern, Official Lists" published by Florida Fish and Wildlife Conservation Commission, 1 August 1997, and subsequent updates.

LE	Endangered: species, subspecies, or isolated population so few or depleted in number or so restricted in range that it is in imminent danger of extinction.
LT	Threatened: species, subspecies, or isolated population facing a very high risk of extinction in the future.
LS	Species of Special Concern is a species, subspecies, or isolated population which is facing a moderate risk of extinction in the future.
PE	Proposed for listing as Endangered.
PT	Proposed for listing as Threatened.
PS	Proposed for listing as Species of Special Concern.
N	Not currently listed, nor currently being considered for listing.

Plants: Definitions derived from Sections 581.011 and 581.185(2), Florida Statutes, and the Preservation of Native Flora of Florida Act, 5B-40.001. FNAI does not track all state-regulated plant species; for a complete list of state-regulated plant species, call Florida Division of Plant Industry, 352-372-3505.

LE	Endangered: species of plants native to Florida that are in imminent danger of extinction within the state, the survival of which is unlikely if the causes of a decline in the number of plants continue; includes all species determined to be endangered or threatened pursuant to the U.S. Endangered Species Act.
LT	Threatened: species native to the state that are in rapid decline in the number of plants within the state, but which have not so decreased in number as to cause them to be Endangered.
PE	Proposed for listing as Endangered.
PT	Proposed for listing as Threatened.
N	Not currently listed, nor currently being considered for listing.

WOOD STORK
Mycteria americana



Order: Ciconiiformes
Family: Ciconiidae
FNAI Ranks: G4/S2
U.S. Status: Endangered
FL Status: Endangered
U.S. Migratory Bird Treaty Act and state Wildlife Code prohibit take of birds, nests, or eggs.

immatures © Barry Mansell

© Barry Mansell

Description: Very large, white wader with black in wings and a short black tail. Soars with neck and legs extended, displaying its long, broad wings; black flight feathers contrast with white along length of wings. Legs are dark and feet are beige. Adults have bare, scaly, dark-gray heads and necks and long, heavy, decurved bills. Head and neck of immature storks have grayish brown feathering, and their bills are yellowish.

Similar Species: American white pelicans (*Pelecanus erythrorynchos*) have a similar wing pattern and also soar but have short legs, white tail, and do not fly with necks extended. White ibis (*Eudocimus albus;* see species account) is much smaller and only has black on wing tips. Great egret (*Ardea alba*) lacks black on wings.

Habitat: Nests colonially in a variety of inundated forested wetlands, including cypress strands and domes, mixed hardwood swamps, sloughs,

and mangroves. Increasingly nesting in artificial habitats (e.g., impoundments and dredged areas with native or exotic vegetation) in north and central Florida. Forages mainly in shallow water in freshwater marshes, swamps, lagoons, ponds, tidal creeks, flooded pastures and ditches, where they are attracted to falling water levels that concentrate food sources (mainly fish).

Seasonal Occurrence: Post-breeding dispersal carries large numbers from more southern locales to more northern parts of range; in winter, northern birds move south. Annual and long-term use of nesting sites is very dependent on feeding conditions, which may be affected dramatically by altered hydrologic patterns. Colonies may form late November - early March in south Florida and February - March in central and northern Florida.

Florida Distribution: Locally rare to abundant in the peninsula and Big Bend, but generally rare or lacking in panhandle and the Florida Keys. Uncommon to rare in winter in north.

Range-wide Distribution: In U.S., breeds locally in South Carolina, Georgia, and Florida (formerly west to Texas). South, locally in lowlands from Mexico and northern Central America to South America (to western Ecuador, eastern Peru, Bolivia, northern Argentina), and rarely in Cuba and the Dominican Republic. Winters throughout breeding range except in South Carolina and Georgia.

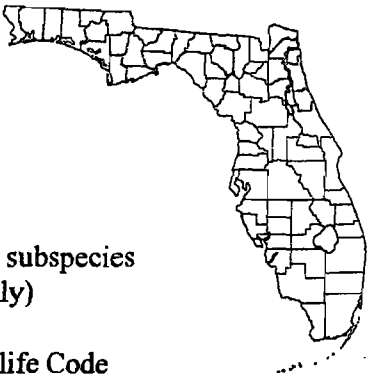
Conservation Status: Many known breeding sites occur within public and private conservation lands. Dramatic decline in the large colonies (>500 individuals) formerly found in south Florida, and trend toward fewer birds distributed among smaller, more numerous colonies in central and northern Florida. Very sensitive to manipulation of water regimes and loss of wetland habitat, which affect both nesting sites and feeding areas.

Protection and Management: Survey colony sites and important feeding areas regularly. Essential to protect wetland areas, closely monitor water quality, and manage hydrologic patterns that consider the needs of the wood stork.

Selected References: Poole and Gill (eds.) 1999, Robertson and Woolfenden 1992, Rodgers et al. (eds.) 1996, Runde et al. 1991, Stevenson and Anderson 1994.

FLORIDA SANDHILL CRANE

Grus canadensis pratensis



Order: Gruiformes
Family: Gruidae
FNAI Ranks: G5T2T3/S2S3
U.S. Status: Endangered (nonmigratory subspecies in Cuba and Mississippi only)
FL Status: Threatened

U.S. Migratory Bird Treaty Act and state Wildlife Code prohibit take of birds, nests, or eggs.

© Karla Brandt

Description: A tall, long-necked, long-legged bird with a clump of feathers that droops over the rump. Adult is gray overall, with a whitish chin, cheek, and upper throat, and dull red skin on the crown and lores (lacking in immatures); feathers may have brownish-red staining resulting from preening with muddy bill. Immature has pale to tawny feathers on head and neck and a gray body with brownish-red mottling. Flies with neck extended. Their distinctive rolling call can be heard from far away.

Similar Species: Indistinguishable from greater sandhill crane (*Grus canadensis tabida*), which winters in Florida. Greater sandhill crane generally arrives in Florida in October and leaves in March, so the date observed or definite evidence of reproduction may be used to differentiate the two. Great blue heron (*Ardea herodias*) is sometimes mistakenly

identified as a crane. This heron lacks the bald, red crown of the sandhill and flies with its neck tucked in, typical of herons and egrets. Whooping crane (*G. americana*) is white.

Habitat: Prairies, freshwater marshes, and pasture lands. Avoids forests and deep marshes but uses transition zones and edges between these and prairies or pasture lands. Will frequent agricultural areas like feed lots and crop fields, and also golf courses and other open lawns, especially in winter and early spring. Nest is a mound of herbaceous plant material in shallow water or on the ground in marshy areas. Favors wetlands dominated by pickerelweed and maidencane.

Seasonal Occurrence: Nonmigratory. Very sedentary, although may forage widely. Large influx of northern migratory subspecies in winter (October - March).

Florida Distribution: Most of peninsular Florida within appropriate habitat, though not as common south of Lake Okeechobee. Rarely reported west of Taylor County.

Range-wide Distribution: Florida range plus extreme southeastern Georgia (Okefenokee Swamp).

Conservation Status: Population estimate in 1975 of approximately 4,000 birds (25 percent are nonbreeding subadults) is still considered accurate. Habitat availability will become more and more of concern as Florida continues to lose open rangeland and native prairie to development and more intensive agricultural uses (e.g., citrus, row crops). Nesting success in human-altered areas is well below that of native areas. Shallow wetlands used by cranes are easily affected by drainage of adjacent uplands even if they are not directly disturbed. Florida sandhill cranes are found on federal and state lands and on local government lands (e.g., wellfields).

Protection and Management: Because of large home-range requirements, public lands do not protect large populations of cranes. Aquire land, through fee-simple acquisition and conservation easements on suitable ranchlands, in areas that bolster existing protected populations. Periodic fire important to retard invasion of woody vegetation in crane habitat. Filling drainage ditches to restore natural hydrological conditions important in some areas.

Selected References: Poole and Gill (eds.) 1992, Robertson and Woolfenden 1992, Rodgers et al. (eds.) 1996, Stevenson and Anderson 1994, Toland 1999a.

MANATEE
Trichechus manatus

Order: Sirenia
Family: Trichechidae
FNAI Ranks: G2/S2
U.S. Status: Endangered
FL Status: Endangered

© Brad Stith

Description: A large (182 - 400 lbs. = 400 - 900 kg), gray, nearly hairless, walrus-like aquatic mammal. Tail is broad, rounded, and flattened. Front limbs are flipper-like, with three nails; hind limbs are absent. Head is broad and undifferentiated from body. Upper lip deeply cleft and bearing stiff bristles. Eyes are small. No external ears.

Similar Species: Dolphins (Delphinidae) have dorsal fins and long, cylindrical snouts. Mermaids have long, flowing hair.

Habitat: Coastal waters, bays, rivers, and (occasionally) lakes. Requires warm-water refugia such as springs or cooling effluent during cold weather. Sheltered coves are important for feeding, resting, and calving.

Seasonal Occurrence: Wide-ranging during warm months; restricted to springs and other warm-water areas during the winter.

Florida Distribution: May be found in any coastal or estuarine waters, but most common in peninsular Florida.

Range-wide Distribution: During warm-water periods, coastal waters from Texas to North Carolina, but restricted to Florida during the winter.

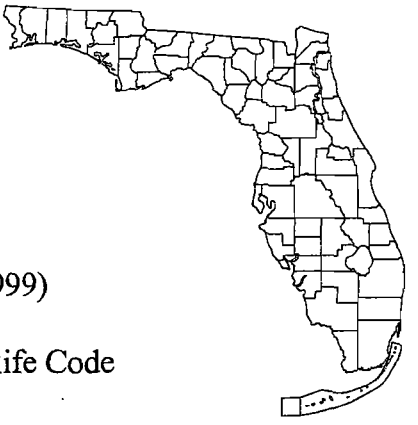
MANATEE *Trichechus manatus*

Conservation Status: There are no reliable population estimates because of the difficulty in censussing. Recent winter counts at aggregation areas have been in the vicinity of 2,000 individuals. Overall population may be stable, but is threatened by increased boat traffic and other accidents associated with expanding development in Florida. Sanctuaries have been established to protect some wintering and calving areas.

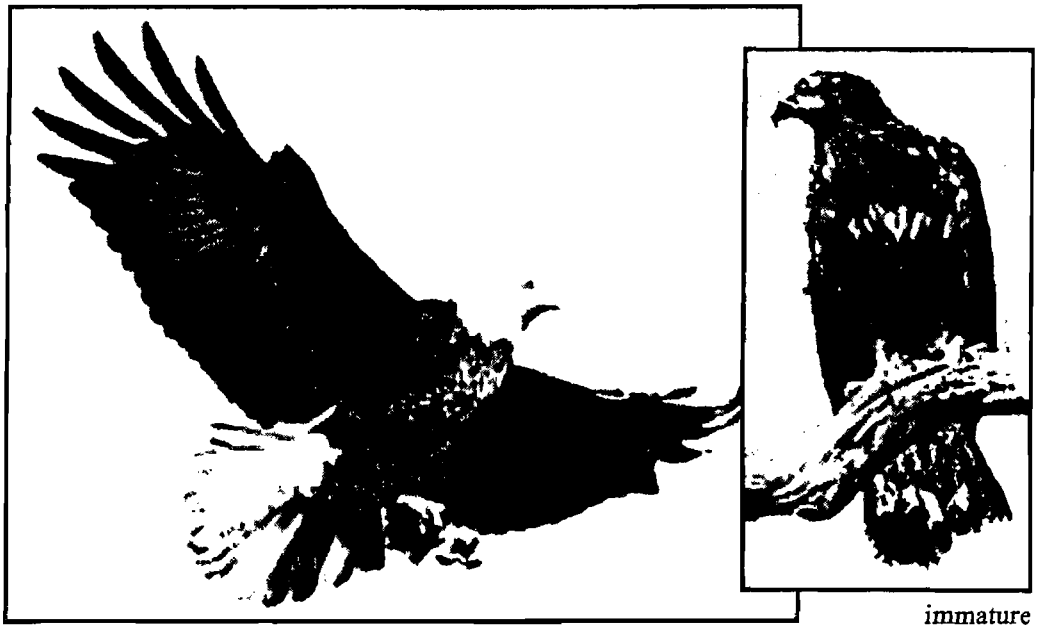
Protection and Management: Reduce boat traffic in waters that manatees use regularly. Provide sanctuaries to prevent accidental collisions and harassment. Implement the manatee protection plan developed by the USGS Caribbean Science Center's Sirenia Project.

Selected References: Brown 1997, Hall 1981, Humphrey (ed.) 1992, Whitaker 1996.

BALD EAGLE
Haliaeetus leucocephalus



Order: Falconiformes
Family: Accipitridae
FNAI Ranks: G4/S3
U.S. Status: Threatened
(proposed for delisting in 1999)
FL Status: Threatened
U.S. Migratory Bird Treaty Act and state Wildlife Code prohibit take of birds, nests, or eggs.



© Tom Vezo

immature
© Barry Mansell

Description: Adult has white head, white tail,and large, bright yellow bill; other plumage is dark. Immatures dark with variable amounts of light splotching on body, wings, and tail; head and bill are dark. In flight wings are broad and wide and held horizontally, presenting a flat profile when soaring and gliding. Flies with slow, powerful wing-beats.

Similar Species: At a distance, in flight, eagle's size and lack of white in wings should help differentiate it from the crested caracara (*Caracara cheriway*; see species account), which also has a white head. Flattened aspect of the eagle's wings is unlike the teetering, V-shaped flight of the turkey vulture (*Cathartes aura*).

Habitat: Most commonly includes areas close to coastal areas, bays, rivers, lakes, or other bodies of water that provide concentrations of food sources, including fish, waterfowl, and wading birds. Usually nests in tall trees (mostly live pines) that provide clear views of surrounding area. In Florida Bay, where there are few predators and few tall emergent trees, eagles nest in crowns of mangroves and even on the ground.

BALD EAGLE *Haliaeetus leucocephalus*

Seasonal Occurrence: In extreme southern Florida, most adults are resident, but most birds in northern and central Florida migrate north out of state after breeding season (late May - July). Juveniles and younger birds mostly migrate north in summer and may range as far as Canada. Also, in winter, some birds from northern populations migrate to northern Florida.

Florida Distribution: Florida has largest breeding population of any state outside Alaska. Breeds throughout most of peninsular Florida and Keys, mainly along coast in eastern panhandle, and is rare in western panhandle. Greatest concentrations of nesting eagles occur around Lake Kissimmee in Polk and Osceola counties, around Lake George in Putnam, Volusia, and Lake counties, lakes Jessup, Monroe, and Harney in Seminole and Volusia counties, along Gulf coast north of Tampa, and Florida Bay and southwest peninsula area.

Range-wide Distribution: North America. Breeding range extends from Alaska, across Canada, south to Baja California, the Gulf coast and Florida Keys, although very local in the Great Basin and prairie and plains regions in interior U.S., where range has expanded to include Nebraska and Kansas. Non-breeding range is generally throughout breeding range except in far north, most commonly from southern Alaska and southern Canada southward.

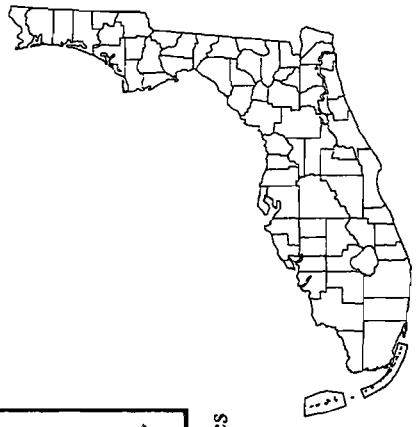
Conservation Status: Original population in Florida could be found throughout state and likely numbered well over 1,000 pairs. Population declined sharply after late 1940s, reaching a low of 120 active nests in 1973, and by 1978 was considered rare as a breeder. Use of pesticide DDT and related compounds and development of coastal habitat are probably chief causes of decline. Numbers have steadily increased, especially since 1989. In 1993, 667 active territories were reported, and in 1999, 996 active nests were recorded. Major threats include habitat loss because of development and commercial timber harvest; pollutants and decreasing food supply are also of concern.

Protection and Management: Monitored annually by Fish and Wildlife Conservation Commission (FFWCC). Continue acquisition of breeding territories and protection of foraging and roosting sites. Incorporate information known about buffer zones around nesting areas into state and local development regulations to help mitigate losses as Florida's human population continues to expand. Monitor pesticides and other environmental contaminants that affect reproduction and food supply.

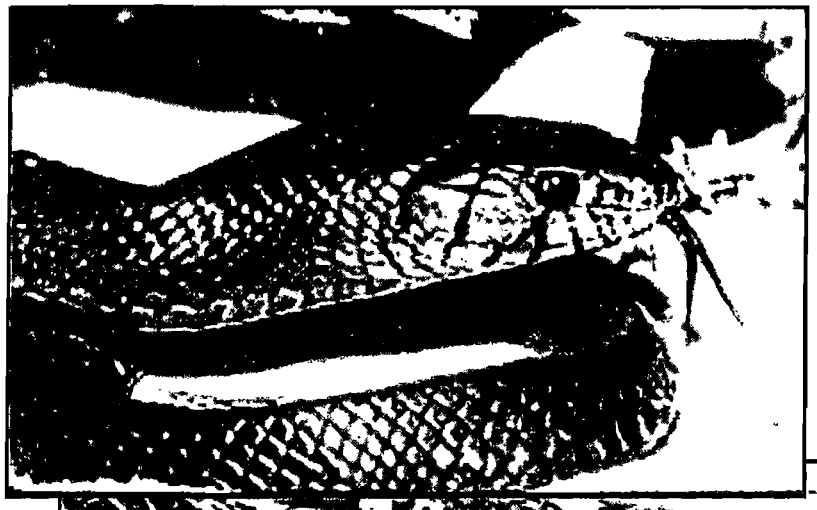
Selected References: FFWCC 2001, Kale (ed.) 1978, Poole and Gill (eds.) 2000, Robertson and Woolfenden 1992, Rodgers et. al. (eds.) 1996, Stevenson and Anderson 1994.

EASTERN INDIGO SNAKE

Drymarchon corais couperi



Order: Squamata
Family: Colubridae
FNAI Ranks: G4T3/S3
U.S. Status: Threatened
FL Status: Threatened



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Description: A very large, stout-bodied, shiny black snake reaching lengths as great as 8 ft. (244 cm). Black ventrally, but chin, throat, and sides of head may be reddish or (rarely) white. Scales typically smooth (no ridges), though adult males have keel on front half of some scales along back; anal scale undivided. Young similar to adults though often more reddish anteriorly, 17 - 24 in. (430 - 610 mm) at hatching. When encountered, often hisses, flattens neck vertically (from side to side), and vibrates tail, but rarely bites.

EASTERN INDIGO SNAKE *Drymarchon corais couperi*

Similar Species: Black racer (*Coluber constrictor*), which rarely exceeds 5 ft. (152 cm), is more slender, a duller sooty black usually with a white chin and throat, and has a divided anal scale. The mostly aquatic mud snake (*Farancia abacura*) is glossy black above and can grow to 6 ft. (183 cm), but has a reddish, rarely white, belly, with the coloration encroaching the sides, and a sharp-pointed tail tip.

Habitat: Broad range of habitats, from scrub and sandhill to wet prairies and mangrove swamps. In northern part of range, often winters in gopher tortoise burrows in sandy uplands but forages in more hydric habitats. Requires very large tracts to survive.

Seasonal Occurrence: Active nearly year-round in southern Florida but winters underground farther north. Lays eggs in May and June.

Florida Distribution: Statewide, including Upper and Lower Keys, but rare in panhandle.

Range-wide Distribution: Florida and southern Georgia; formerly extended from southern South Carolina to southeastern Mississippi.

Conservation Status: Rare in most areas, though species has been recorded from many public lands statewide; however, whether most of these support viable populations is uncertain. Major threats are habitat loss, degradation, and fragmentation, with associated highway mortality. Other threats include gassing of tortoise burrows for rattlesnakes, collection for pets, and deliberate persecution, all of which are illegal.

Protection and Management: Protect very large tracts (> 5000 acres = 2025 ha) of appropriate natural habitat unfragmented by roads; use prescribed fire as needed. Maintain gopher tortoise populations and dead stumps to provide natural subterranean refugia. Enforce bans on tortoise burrow gassing and on collection or molestation of snake. Avoid construction of roads through unfragmented habitat. Educate public to avoid wanton destruction of large snakes.

Selected References: Ashton and Ashton 1988b, Conant and Collins 1991, Ernst and Barbour 1989, Georgia DNR 1999, Lazell 1989, Moler (ed.) 1992, Mount 1975, Tenant 1997.

Common Plant Communities in Southwest Florida

and their respective vegetation stratum:

Depression marsh, south Florida - are often rounded, often inundated for a portion of their hydroperiod and are dominated by herbaceous perennial plant species. They are typically found in landscapes with sandy soils, very little relief, especially in pine flatwoods and hammocks. The groundcover usually forms concentric rings from the landward edge to the frequently flooded center. A common pattern is a ring of hummocked grasses and sedges, a zone of St. Johns wort, maidencane, pickeralweed, buttonbush, coastal plain willow, fire flag or scattered swamp tupelo in the center. Fluctuating water levels may make it difficult for plants to colonize the ecotone between the upland and marsh, this may appear as a band of white sand around concentric bands of vegetation. Look for adventitious roots on woody vegetation, especially the St. John's wort and buttonbush. The ecotone between the pine flatwoods and depression marsh is often demarcated by a ring of saw palmetto, sometimes the saw palmetto will form a short "trunk" in the ecotone. The vegetation of depression marshes is related to that of savannas, the Everglades, freshwater lakes and ponds. Often you will see similar species composition in depression marshes, ditches, swales, freshwater lakes and ponds. The following is a list of the major plants associated with depression marshes in south Florida.

Canopy		
Botanical Latin	Common Name	Wetland Status
Nyssa sylvatica var. biflora	swamp tupelo	OBL
Salix caroliniana	coastal plain willow	OBL
Groundcover:		
Botanical Latin	Common Name	Wetland Status
Aristida affinis	long-leaf three-awn grass	OBL
Aristida spiciformis	three-awn bottlebrush	FAC
Aristida stricta	wiregrass; pineland three-awn grass	FAC
Cephalanthus occidentalis	buttonbush	OBL

Cladium jamaicense	sawgrass	OBL
Dichromena latifolia	sandswamp whitetop	OBL
Eleocharis sp.	spikerush	OBL
Hypericum fasciculatum	marsh St. John's-wort	OBL
Myrica cerifera	southern bayberry	FAC
Panicum hemitomon	maidencane	OBL
Panicum rigidulum	red-top panicum	FACW
Panicum virgatum	switchgrass	FACW
Pontederia cordata	pickerelweed	OBL
Rhynchospora inundata	horned beakrush	OBL
Rhynchospora microcarpa	southern beakrush	OBL
Rhynchospora tracyi	Tracy's beakrush	OBL
Sagittaria lancifolia	bulltongue arrowhead	OBL
Stillingia aquatica	corkwood	OBL
Thalia geniculata	thalia; fire flag	OBL
Woodwardia virginica	chainfern	FACW

Cypress domes are forested wetlands (swamps) that are dominated by bald cypress and/or pond cypress. Generally these are depression wetlands with a domed canopy and mucky, organic soils. Often this plant community is associated with a seepage bog or savanna and is related to the bayhead community. Most of the characteristics of cypress dome swamps overlap with a bayhead. Pond cypress usually dominate these dome swamps in pine flatwoods, a variation on this type of community occurs along karst rivers (Aucilla river), here the dominant is bald cypress. Swamp gum, red maple, sweetbay (magnolia), dahoon holly, swamp bay and slash pine may be found in the canopy. Tropical species such as pond apple may be found in cypress domes in south Florida. Groundcover plants may be sparse due to prolonged inundation of these landscapes. Typical hydrologic indicators include: algal mats, aquatic mosses and liverworts, aquatic plants, elevated lichen lines, evidence of aquatic fauna, morphological plant adaptations, vegetated hummocks and tussocks, and water marks.

Canopy		
Botanical name	Common name	DEP status
Acer rubrum	red maple	FACW
Gordonia lasianthus	loblolly bay	FACW
Magnolia virginiana var. *australis*	sweetbay magnolia	OBL
Nyssa sylvatica var. *biflora*	swamp tupelo	OBL
Persea palustris	swamp bay	OBL
Pinus ellottii	slash pine	UPLAND
Taxodium ascendens	pond cypress	OBL
Taxodium distichum	bald cypress	OBL
Subcanopy and groundcover		
Botanical name	Common name	DEP status
Annona glabra	pond apple	OBL
Ilex cassine	dahoon holly	OBL
Itea virginica	Virginia willow	OBL
Lyonia lucida	fetter-bush	FACW
Viburnum nudum	possum-haw viburnum	FACW
Groundcover		
Botanical name	Common name	DEP status
Blechnum serrulatum	swamp fern	FACW
Osmunda cinnamomea	cinnamon fern	FACW
Osmunda regalis	royal fern	OBL
Woodwardia areolata	chainfern	OBL
Woodwardia virginica	chainfern	FACW

Hydric Hammocks are forested wetlands (swamps) that are dominated by a mixture of primarily hardwood tree species with sabal palms. Hydric hammocks are typically found in areas where limestone is close to the soil surface. Soils are variable; often a clay layer or limestone layer helps keep the soil saturated for long periods. Look for stripped matrix in the upper six inches of the soil column. Typical hydrologic indicators include buttressing, loop roots, elevated lichen lines and crayfish chimneys.

Canopy		
Botanical name	Common name	DEP status
Acer rubrum	red maple	FACW
Celtis laevigata	sugar-berry; hackberry	FACW
Diospyros virginiana	common persimmon	FAC
Fraxinus americana	white ash	UPLAND
Fraxinus profunda	pumpkin ash	OBL
Gleditsia aquatica	water-locust	OBL
Gleditsia triacanthos	honey-locust	FACW
Ilex cassine	dahoon holly	OBL
Ilex opaca	American holly	FAC
Juniperus virginiana	eastern red cedar	UPLAND
Liquidambar styraciflua	sweetgum	FACW
Liriodendron tulipifera	tulip tree	FACW
Magnolia grandiflora	southern magnolia	UPLAND
Magnolia virginiana var. *australis*	sweetbay magnolia	OBL
Morus rubra	red mulberry	FAC
Nyssa sylvatica var. *biflora*	swamp tupelo	OBL
Persea palustris	swamp bay	OBL

Pinus ellottii	slash pine	UPLAND
Pinus teada	loblolly pine	UPLAND
Quercus laurifolia	laurel oak	FACW
Quercus michauxii	swamp chestnut oak	FACW
Quercus nigra	water oak	FACW
Quercus virginiana	live oak	UPLAND
Sabal palmetto	cabbage palm	FAC
Tilia americana	American basswood	FACW
Ulmus americana var. *floridana*	American elm	FACW
Subcanopy and groundcover		
Botanical name	Common name	DEP status
Aesculus pavia	red buckeye	UPLAND
Arisaema spp.	jack-in-the-pulpit; green-dragon	FACW
Berchemia scandens	rattan vine	VINE
Carpinus caroliniana	American hornbeam	FACW
Chasmanthium latifolium	spangle grass	FAC
Chasmanthium sessiliflorum	longleaf chasmanthium	FAC
Chasmanthium spp.	spanglegrass	FACW
Crataegus marshallii	parsley haw	FACW
Crataegus viridis	green haw	FACW
Decumaria barbara	climbing hydrangea	VINE
Elephantopus nudatus	purple elephant's foot	UPLAND
Elytraria caroliniensis	Carolina scaly-stem	FAC

Itea virginica	Virginia willow	OBL
Lyonia lucida	fetter-bush	FACW
Mitchella repens	partridge berry	UPLAND
Osmunda cinnamomea	cinnamon fern	FACW
Rhapidophyllum hystrix	needle palm	FACW
Rhynchospora spp.	beakrush	FACW
Sabal minor	dwarf palmetto	FACW
Viburnum dentatum	arrow-wood	FACW
Viburnum obovatum	Walter viburnum	FACW
Woodwardia areolata	chainfern	OBL
Woodwardia virginica	chainfern	FACW

Hydric Pine Flatwoods are forests with a canopy of slash pine (*Pinus elliottii*) or pond pine (*Pinus serotina*) on flat, poorly drained land. Where fires are frequent, the subcanopy is sparse or absent and the groundcover is a diverse mix of grasses and herbs—a wet prairie with pines. Common groundcover plants include wiregrass (*Aristida stricta*), yellow-eyed grass (*Xyris* spp.), meadow-beauty (*Rhexia* spp.), bog-buttons (Eriocaulaceae), and carnivores like pitcher plants (*Sarracenia* spp.), sundews (*Drosera* spp.), and butterworts (*Pinguicula* spp.). Saw palmetto (*Serenoa repens*) is patchy or absent. Where fire has been suppressed, shrubs and trees like titi (*Cyrilla racemiflora* and *Cliftonia monophylla*), gallberry (*Ilex glabra*), big gallberry (*Ilex coriacea*), myrtle-leaved holly (*Ilex myrtifolia*), sweet bay (*Magnolia virginiana*), black gum (*Nyssa sylvatica* var. *biflora*) and swamp bay (*Persea palustris*) become dense and the groundcover disappears. Dense tangles of laurel-leaved greenbriar (*Smilax laurifolia*) often drape these shrubs. The longer fire is excluded, the more these flatwoods approach bay swamps. Hydric pine flatwoods are common throughout the lower parts of the panhandle, especially near the coast, and are absent in the higher clayey land toward the Georgia and Alabama lines.

Canopy		
Botanical Latin	Common Name	Wetland Status
Pinus elliottii	slash pine	UPL
Pinus serotina	pond pine	FACW

Cliftonia monophylla	buckwheat-tree	FACW
Cyrilla racemiflora	swamp cyrilla	FAC
Magnolia virginiana	sweetbay	OBL
Nyssa sylv. var. *biflora*	swamp tupelo	OBL
Persea palustris	swamp bay	OBL
Ilex myrtifolia	myrtle holly	OBL
Subcanopy		
Botanical Latin	Common Name	Wetland Status
Ilex glabra	gallberry	UPL
Ilex coriacea	bay-gall holly	FACW
Myrica cerifera	southern bayberry	FAC
Myrica heterophylla	evergreen bayberry	FACW
Serenoa repens	saw palmetto	UPL
Groundcover and vines		
Botanical Latin	Common Name	Wetland Status
Aristida stricta	wiregrass	FAC
Calamovilfa curtissii	Curtiss' reed grass	FACW
Smilax laurifolia	laurel greenbrier	vine
Rhynchospora sp.	beakrush	
Rhexia sp.	meadow-beauty	
Eriocaulon sp.	pipewort	OBL
Lachnocaulon sp.	lachnocaulon	

Sarracenia sp.	pitcher-plant	OBL
Xyris sp.	yellow-eyed grass	OBL
Scleria sp.	nutrush	FACW
Drosera sp.	sundew	OBL
Pinguicula sp.	butterwort	OBL
Lilium catesbaei	southern red lily	FAC
Liatris spicata	spiked gayfeather	FAC
Sabatia sp.	rose-gentian	FACW
Anthaenantia rufa	purple silky-scale	FACW

Bayheads are forested wetlands (swamps) that include a variety of dominant tree species. Generally these are depression wetlands with a canopy and mucky, organic soils. Often this plant community is associated with a seepage bog and may represent a fire suppressed version of a typically open seepage bog in some areas. Bayheads are related to dome swamps. Typically bayheads are dominated by evergreen tree and shrub species. In north Florida deciduous taxa such as pond cypress and swamp gum are often co-dominants and share the canopy with sweetbay (magnolia), loblolly bay, white cedar and slash pine. The understory is typically dominated by holly species and fetter-bush. Bayheads in central and south Florida tend to have more sweetbay and loblolly bay with subtropical species such as myrsine and tropical fern species in the groundcover. With the widespread fire suppression in Florida, bayheads are often difficult to delineate using the unified wetland delineation methodology (in rule 62-340, F.A.C.) as the ecotone between the bayhead and pine dominated flatwoods is often obscured.

Canopy		
Botanical name	Common name	DEP status
Acer rubrum	red maple	FACW
Chamaecyparis thyoides	Atlantic white cedar	OBL
Gordonia lasianthus	loblolly bay	FACW
Magnolia virginiana var. *australis*	sweetbay magnolia	OBL
Nyssa sylvatica var. *biflora*	swamp tupelo	OBL
Persea palustris	swamp bay	OBL

Pinus ellottii	slash pine	UPLAND
Quercus laurifolia	laurel oak	FACW
Quercus nigra	water oak	FACW
Taxodium ascendens	pond cypress	OBL
Subcanopy and groundcover		
Botanical name	Common name	DEP status
Ilex cassine	dahoon holly	OBL
Ilex coriacea	bay-gall holly	FACW
Itea virginica	Virginia willow	OBL
Lyonia lucida	fetter-bush	FACW
Myrica cerifera	southern bayberry	FAC
Myrsine guianensis	Guiana myrsine	FAC
Viburnum nudum	possum-haw viburnum	FACW
Groundcover		
Botanical name	Common name	DEP status
Blechnum serrulatum	swamp fern	FACW
Osmunda cinnamomea	cinnamon fern	FACW
Osmunda regalis	royal fern	OBL
Woodwardia areolata	chainfern	OBL
Woodwardia virginica	chainfern	FACW

Floodplain Swamps are associated with rivers and streams. These are natural features influenced by overflow and inundation from a flood event. The most diverse assemblage of floodplain trees are found on the larger rivers of northwest Florida. While in subtropical Florida, rare ferns and orchids might be discovered in the floodplains of south Florida. Although there are few rivers that have not been severely hydrologically altered in south Florida, the St. Lucie and Loxahatchee River have remnant examples of floodplain forest (salt water intrusion is slowly converting freshwater floodplain into mangrove swamp). Floodplains are both wetlands and surface waters and are typically

flooded for a portion of the growing season. Look for hydrologic indicators during dry periods such as rafted debris, elevated lichen lines, buttressed trees, river wash and sediment deposition and stain lines. Often the *ordinary high water line* can be determined by observing the elevation of hydrologic indicators. When gauge data is available the *mean annual flood* can be calculated. As their name would indicate floodplains are important landscapes that help alleviate the disastrous effects of flooding and provide important habitat for many of Florida's most imperiled plants and animals. The following is a list of the major plants associated with floodplains swamps in south Florida.

Canopy		
Botanical name	Common name	DEP status
Acer rubrum	red maple	FACW
Annona glabra	pond apple	OBL
Carya aquatica	water hickory	OBL
Ficus aurea	strangler fig	FAC
Fraxinus caroliniana	popash	OBL
Ilex cassine	dahoon holly	OBL
Magnolia virginiana var. *australis*	sweetbay magnolia	OBL
Nyssa sylvatica var. *biflora*	swamp tupelo	OBL
Persea palustris	swamp bay	OBL
Quercus laurifolia	swamp laurel oak	FACW
Quercus virginiana	live oak	UPLAND
Sabal palmetto	cabbage palm	FAC
Taxodium ascendens	pond cypress	OBL
Taxodium distichum	bald cypress	OBL
Subcanopy and Groundcover		
Acrostichum danaeifolium	leather fern	OBL
Aster carolinianus	climbing aster	OBL
Blechnum serrulatum	swamp fern	FACW

Cornus foemina	swamp dogwood	OBL
Crinum americanum	swamp lily	OBL
Itea virginica	Virginia willow	OBL
Osmunda cinnamomea	cinnamon fern	FACW
Osmunda regalis	royal fern	OBL
Thalia geniculata	fire flag	OBL
Viburnum obovatum	Walter's viburnum	FACW
Woodwardia virginica	chainfern	FACW

Floodplain marshes are typically associated with floodplain swamps along rivers and streams. These are natural features influenced by overflow and inundation from a flood event. Floodplain marshes are both wetlands and surface waters and are typically flooded for a portion of the growing season. Look for hydrologic indicators during dry periods such as rafted debris, elevated lichen lines, adventitious rooting, river wash, sediment deposition and stain lines. Often the ordinary high water line (OHWL) can be determined by observing the elevation of hydrologic indicators. When gauge data is available the *mean annual flood* can be calculated and used as an approximation of the OHWL. As their name would indicate floodplain marshes are important landscapes that help alleviate the disastrous effects of flooding and provide important habitat for many wetland dependent species. The following is a list of the common plants associated with floodplain marshes in south Florida.

Groundcover		
Botanical name	Common name	DEP status
Acrostichum danaeifolium	leather fern	OBL
Aeschynomene sp.	jointvetch	FACW, OBL
Amaranthus australis	southern amaranth	OBL
Aster carolinianus	climbing aster	OBL
Blechnum serrulatum	swamp fern	FACW
Brachiaria mutica	para grass	FACW
Canna flaccida	bandanna of the	OBL

	Everglades	
Carex gigantea	large sedge	OBL
Crinum americanum	swamp lily	OBL
Cynodon dactylon	bermudagrass	UPL
Cyperus sp.	flatsedge	OBL, FACW
Echinochloa crus-galli	barnyardgrass	FACW
Echinochloa walteri	coast cockspur	FACW
Eleocharis baldwinii	Baldwin's spikerush	OBL
Hibiscus grandiflorus	swamp rosemallow	OBL
Hydrochloa caroliniensis	watergrass	OBL
Hydrocotyle ranunculoides	floating penny-wort	OBL
Hymenachne amplexicaulis	trompetilla	OBL
Hymenocallis crassifolia	spider lily	OBL
Juncus repens	lesser creeping rush	OBL
Justicia angusta	pineland waterwillow	OBL
Limnobium spongia	frogbit	OBL
Ludwigia leptocarpa	anglestem primrosewillow	OBL
Ludwigia palustris	marsh seedbox	OBL
Ludwigia peruviana	Peruvian primrosewillow	OBL
Ludwigia repens	creeping primrosewillow	OBL
Panicum dichotomiflorum	fall panicum	FACW
Panicum hemitomon	maidencane	OBL

Panicum rigidulum	red-top panicum	FACW
Paspalum repens	water paspalum	OBL
Polygonum sp.	smartweed	OBL
Proserpinaca palustris	marsh mermaidweed	OBL
Rumex verticillatus	swamp dock	FACW
Sagittaria lancifolia	bulltongue arrowhead	OBL
Scirpus cubensis	Cuban bulrush	OBL
Sesbania emerus	danglepod	FAC
Thalia geniculata	fire flag	OBL
Typha sp.	cattail	OBL
Woodwardia virginica	chainfern	FACW

Mangrove Swamps are wetlands dominated by red, black and/or white mangroves. The large, arching prop roots are characteristic of red mangrove, while the upright roots called, "pneumatophores" are characteristic of black and white mangroves. Mangroves are distributed in coastal landscape by their ecological tolerance, i.e. there is zonation associated with a mangrove swamp. Look carefully and you may notice that black mangrove is the most salt tolerant mangrove species, often growing where the soils are hypersaline. The following is a list of the major plants associated with mangrove swamps.

Canopy		
Botanical Latin	Common Name	Wetland Status
Avicennia germinans	black mangrove	OBL
Conocarpus erectus	buttonwood	FACW
Laguncularia racemosa	white mangrove	OBL
Rhizophora mangle	red mangrove	OBL
Groundcover		
Botanical Latin	Common Name	Wetland Status

Batis maritima	saltwort	OBL
Borrichia spp.	seaside tansy	OBL
Lycium carolinianum	Christmas berry	OBL
Monanthochloe littoralis	keygrass	OBL
Salicornia sp.	glasswort	OBL
Spartina alterniflora	saltmarsh cordgrass	OBL
Suaeda sp.	sea-blight	OBL

Other wetland communities which may occur throughout Hillsborough County include:

- **Savanna, wet prairie** – locally common, associated with pine flatwoods.
- **Lakeshore marsh/swamp** – Associated with large lakes, throughout.
- **Spring-run** – includes floodplains/marsh in part – found wherever there are springs.
- **Salt marsh** – only in coastal areas, tends to be replaced by mangroves as one moves south from Tampa Bay. Extensive salt marsh is found in the big bend of Florida, north of the Tampa Bay area. Good examples of salt marsh are found in Upper Tampa Bay (county) Park (Hillsborough County).

Appendix 12-2
Growth Management Strategy Information

Land Use Element:

Growth Management Strategy:

"Goal: Ensure that character and location of land uses optimizes the combined potentials for economic benefit and the enjoyment and the protection of natural resources while minimizing the threat to health, safety and welfare posed by hazards, nuisances, incompatible land uses and environmental degradation."

Policy A 2.9:
"Prior to the placement of any new or expanded major public facility or public building or grounds, such as landfills, correctional facilities and wastewater treatment plants, the proposed site and possible impacts shall be evaluated in accordance with the criteria specified below:

General Criteria
a) The County shall provide opportunities at the time of planning and site selection for citizens and neighborhoods to express their viewpoints on major facility siting and design; and in order to ensure neighborhood preservation, the County shall take into consideration the viewpoints of citizens and neighborhoods in the final decision making process in major facility siting and design.

b) In the planning, siting, land acquisition and development of major public facilities the County shall consider alternatives, including not siting the facility. The alternatives evaluation shall include consideration of such factors as technical aspects of the facility, costs, design, impacts on the environment and availability of public facilities and services, including transportation impacts and future operation and maintenance costs of alternative sites as well as public safety and welfare factors.

c) Opportunities shall be provided for adjacent property owners and neighbor-hoods to choose to participate in the review process.

d) The siting process for these facilities shall also avoid any detrimental effects on existing and planned development in the study area as well as consider the ancillary impacts associated with the particular facility and ensure that those uses also will not negatively affect the community.

Policy A-2.10:
New development and redevelopment must mitigate the adverse noise, visual, odor and vibration impacts created by that development upon all adjacent land uses.

Policy B-7.1:
Economic development areas shall be any area with land use designation consistent with the potential impacts of desirable economic growth.

Policy B-7.2:
Economic development areas should be within designated transit corridors.

Policy B-7.3:
Economic development areas shall be within the County's Urban Growth Boundaries.

Electrical Power Generation Facilities
Because of the growth in all classifications experienced by Hillsborough County and projected increases as supported by this Plan, Hillsborough County is expected to require additional electric generation capacity to serve the needs of its citizens in all of their endeavors - industrial, commercial, agricultural and residential. In order to maximize a desirable development pattern and to minimize the potential for adverse impacts upon other types of land uses, it is necessary to provide the policy framework to analyze such facilities based upon various factors, such as the nature of the facility, the compatibility with surrounding uses, the need and obligation of Tampa Electric Company to provide reliable, low cost electric service and the County's obligations to require needed infrastructure for future growth. Development of an Electrical Power Generation Facility (EPGF) is subject to the Goals, Objectives and Policies of the Land Use Element, applicable development regulations and established locational criteria for specific land use.

Objective C-33: To locate future electric power generation facilities in geographical areas which are compatible with such use considering surrounding areas, accessibility to modes of transportation to support the facilities' fuel requirements, enhancement of employment and minimization of any potentially adverse impact to environmentally sensitive areas and residential areas, while balancing Tampa Electric Company's legal obligations to provide reliable, low cost electric service to all citizens in strict compliance with all Federal, State and local environmental laws, rules and regulations.

Policy C-33.1:
Placement of future electric power generating facilities shall be given consideration in areas adjacent to other industrial areas, and/or adjacent to rail and/or adjacent to rail and/or water borne transportation for fuel required to serve that type of use.

Policy C-33.3:
All land approved for an electrical power generation facility shall require a planned unit development rezoning.

Policy C-33.4:
Electric power generating facilities shall have an affirmative duty to protect any environmentally sensitive areas through buffering and/or other mitigating techniques. The environmentally sensitive areas shall be specifically detailed on the site plan submitted as part of the rezoning.

Policy C-33.5:
The location of all electric power generating facilities shall strictly comply with all federal, state, and local laws, rules, and regulations pertaining to the site, certification, permitting,

and environmental requirements pertaining to same. See tables in background report for a listing of the minimum local, state and federal requirements which apply.

Policy C-33.6:
The Board of County Commissioners shall not approve any rezoning for an electrical power generating facility that does not demonstrate adequate protection and reservation of natural resources, including air, water, plant and animal life, and adequate protection of human health, safety and welfare.

Policy C-33.7:
An application for rezoning for the purpose of utilizing land for an Electrical Power Generating Facility may only be filed after submission of an application to the State under the Power Plant Siting Act. Further said zoning application shall include all information required by the State Department of Environmental Protection for initial submission in accordance with the Power Plant Siting Act and any additional studies required by the County. For the purposes of rezoning review the standard time requirements for processing an application shall be waived or otherwise altered to allow appropriate consideration of all information. Any rezoning shall be conditioned upon the issuance of a written order approving in whole, or approving with conditions, the application for power plant siting by the Governor and Cabinet sitting as the Siting Board. If the Siting Board denies the siting, then the zoning shall revert to Agricultural or the zoning in existence at the time of rezoning application if other than Agricultural.

Solid Waste Element:

Goal 1:
Hillsborough County shall provide for an environmentally sound and efficient solid waste management system.

ISSUES: The impact of commercial, industrial and residential growth in Hillsborough County is readily apparent. As growth continues, responsibilities for collections, handling and disposal of the growing volumes of solid waste must be undertaken by the County for its residents. The County government must plan and operate its solid waste management system in an efficient and environmentally sensitive manner.

OBJECTIVE 1.2: The County shall provide for increases in disposal capacity of solid waste facilities to meet future needs.

Policy 1.2.1:
The County shall conduct an annual review of future facility needs and budget for those needs within the Capital Improvements Element.

OBJECTIVE 1.3: The County shall continue to operate solid waste facilities in compliance with minimum air, groundwater and surface water pollution standards established by federal, state and local laws, regulations and guidelines.

Policy 1.3.1:
The County shall conduct an annual review of facility operations and operating practices to evaluate compliance with federal and state requirements.

Policy 1.3.2:

The County shall conduct an annual review of technology and innovations available in solid waste management to exceed federal and state requirements.

Policy 1.3.3:

Based on annual reviews, county staff shall provide recommendations of measures to correct or enhance the existing solid waste management system.

Policy 1.3.4:

The level of service to be maintained by all facilities shall be as stated in the Capital Improvements Element.

OBJECTIVE 1.5: The County's solid waste management system shall take all practical measures to minimize the volume of the solid waste stream.

Policy 1.5.1:
The County shall continue recycling programs to separate the majority of newspaper, glass, plastic bottles, steel cans and aluminum cans reaching County disposal facilities.

Policy 1.5.2:
The County shall continue to review and implement recycling and waste reduction programs designed to reduce the per capita solid waste stream reaching County disposal facilities in compliance with state legislative guidelines.

The proposed County resource recovery facility, has been evaluated to determine whether it is consistent with the Comprehensive Plan. As presented in Section 2.2.2.1 of this chapter, the definition of Public/Quasi-Public refers to the Goals, Policies, and objectives of the 2015 Hillsborough Comprehensive Plan. In order to determine consistency, the development proposal has been considered within the context of the standards and criteria found within those Goals, Policies and Objectives.

Appendix 12-3
Nitrogen Deposition to Tampa Bay

Section 1
Introduction

The combustion of municipal solid waste results in the formation of oxides of nitrogen (NO_x). Complex chemical processes transform the nitrogen in the atmosphere and the nitrogen is eventually deposited on land and in water bodies through wet and/or dry deposition mechanisms. Concern has been expressed in recent years about excessive amounts of atmospheric-based nitrogen ending up in Tampa Bay - a sensitive estuary prone to eutrophication problems. To address these concerns, CDM has estimated the total amount of nitrogen that could be deposited in Tampa Bay from the expansion project. Our estimates show that the annual amount of nitrogen deposition from the project is *de minimus* compared to the total amount of nitrogen being deposited from all other sources.

To estimate the amount of nitrogen deposited, CDM first estimated the total amount of NO_x to be emitted from a fourth unit at the facility. CDM estimated these emissions as explained in detail throughout Volume III of the Power Plant Siting Application. Next, CDM utilized accepted air dispersion modeling techniques to predict deposition values at various "receptors" (or locations) throughout Tampa Bay. **Section 2** of this report presents the complete modeling methodology.

Finally, CDM compared the predicted deposition impact from the proposed fourth unit to existing deposition values. Numerous studies have been undertaken in recent years to quantify the amount of atmospheric nitrogen deposited in Tampa Bay annually. A 2002 study commissioned by the Tampa Bay Estuary Program concluded that total atmospheric deposition of nitrogen to Tampa Bay was approximately 880 tons.[1] In contrast, our modeling results show that total wet and dry deposition of nitrogen from the proposed fourth unit to Tampa Bay will be approximately 0.5 tons per year.

[1] Poor, N.D., "*Atmospheric Deposition of Nitrogen and Air Toxins to the Tampa Bay Estuary*", Tampa Bay Estuary Program, 2002.

Section 2
Modeling Methodology

2.1 Model Selection

Steady-state Gaussian plume models are valid for distances to 50 kilometers. This assumes that the transport time is less than or equal to the averaging time, since the plume is instantaneously assumed to travel any distance downwind.

The preferred model for near source impact assessments, such as this, is the Industrial Source Complex – Short Term (ISCST3) dispersion model. The ISCST3 model is a steady-state Gaussian plume model used to assess pollutant impacts from a variety of sources. This model can account for the following: Settling and dry deposition of particles; downwash; area, line and volume sources; plume rise as a function of downwind distance; separation of point sources; and limited terrain adjustment. ISCST3 operates in both long-term and short-term modes.

Currently, Version 02035 of ISCST3 is used. The graphical user interface, ISC-AERMOD View, created by Lakes Environmental was used to facilitate model setup and post processing. ISCST3 was used in "refined" mode, with full receptor grids and five years of meteorological data.

2.2 Modeling Options

ISCST3 was run to produce values of concentration and total, wet and dry deposition. Dry and wet depletion of the plume were selected. Modeling options included the following: Rural dispersion coefficients; Final Plume Rise; Stack-tip Downwash; Buoyancy-induced Dispersion; Calms Processing Routine; Missing Data Processing Routine; Default Wind Profile Exponents; Default Vertical Potential Temperature Gradients; and HE>ZI - Adjusts Vertical Term for cases when HE > ZI, which may occur for receptors below source base elevation.

Modeled averaging times included 1-hour, 24-hour and annual periods.

2.3 Source Characteristics

Only the proposed fourth unit was included in the NO_x deposition analysis of greater Tampa Bay. Since the stack height is not considered Good Engineering Practice, the effects of building downwash were included in the modeling. The stack parameters associated with the fourth unit are presented in **Table 2-1**.

Table 2-1
Bay Deposition Modeling Stack Parameters

Stack Parameter	Value
Stack base elevation (meters)	12
Stack height (meters)	67
Stack diameter (meters)	2.26
Gas exit temperature (degrees-Kelvin)	405.4
Gas exit velocity (meters per second)	17.06
NO_X emission rate (grams per second)	7.37

2.4 Receptors

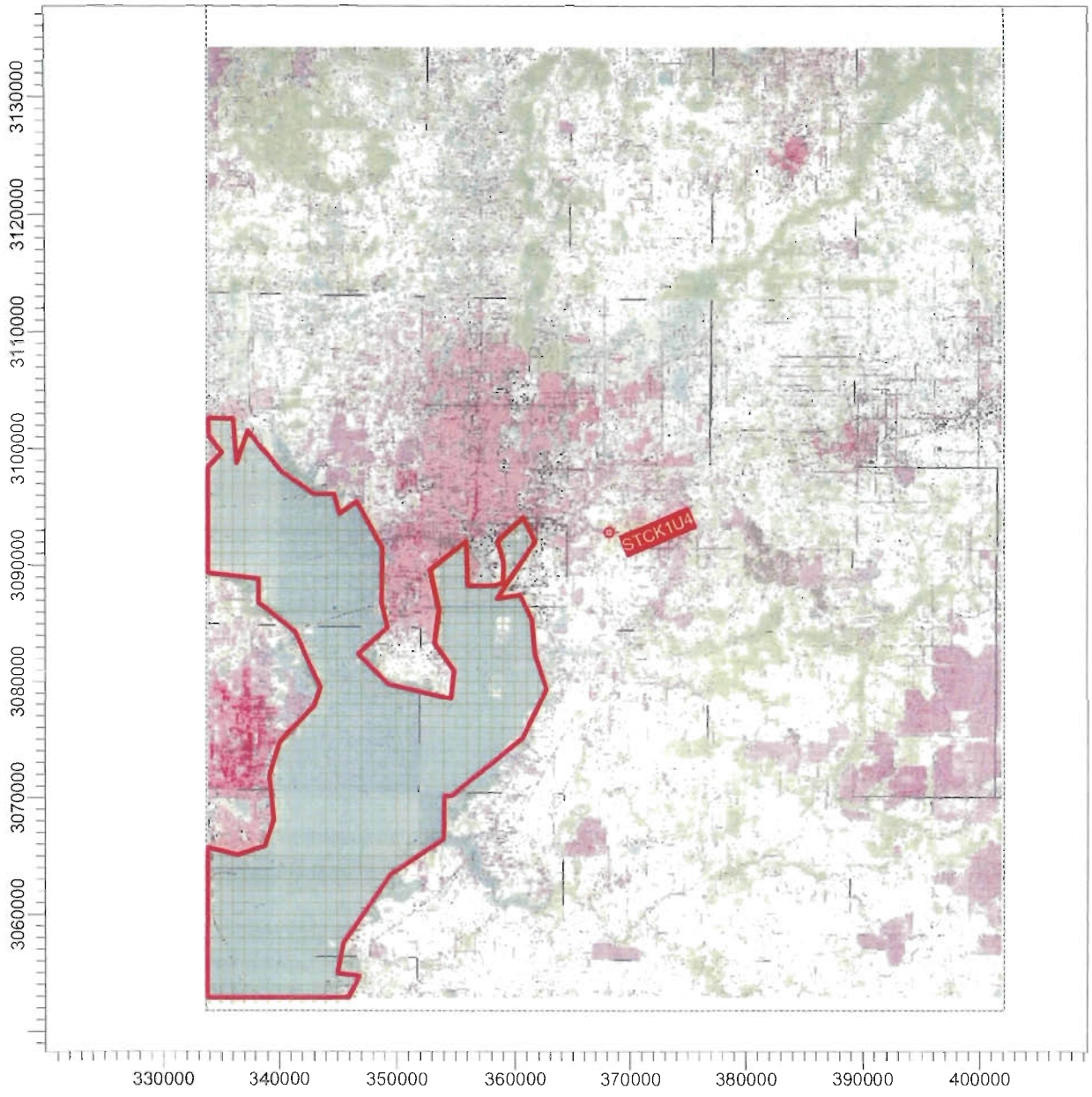
A total of 729 receptors were modeled. All receptors were within the area encompassed by McKay Bay, East Bay, Hillsborough Bay, Tampa Bay, and Old Tampa Bay. They were spaced one kilometer apart, aligned in a Cartesian (rectangular) grid, and given elevations at or just above sea level. The modeled area is shown in **Figure 2-1**.

2.5 Meteorology

Meteorological data from Tampa International Airport for 1986 through 1990 was used in the deposition modeling analyses for the Bay areas. Tampa International Airport is the National Weather Service Station (WBAN Station No. 12842) closest to the site. It is approximately 6.7 miles (10.8 km) to the west of the Hillsborough County Facility and observed meteorological data is most representative of the site vicinity. Meteorological data available from this station, include hourly readings of temperature, wind speed, wind direction, and total opaque cloud cover (atmospheric stability), as well as twice-daily measurements of upper air data used to calculate mixing heights. In addition, micrometeorological data (friction velocity, Monin-Obukhov length, surface roughness length) and precipitation data (type and rate) are required for dry and wet deposition calculations. All of this information was used to run the ISCST3 model.

PROJECT TITLE:

Hillsborough County Resource Recovery Facility Expansion Project
Unit 4 - Nitrogen Deposition to Tampa Bay



COMMENTS: Nitrogen Deposition To Greater Tampa Bay Modeling Domain Receptors	SOURCES : 1	COMPANY NAME: CDM	
	RECEPTORS : 729	MODELER: Vincent R. Tino, CCM	CDM
		0 — 20 km	
		DATE: 5/24/2005	PROJECT NO.: 6033-40441-PartII.Permit.PSD

ISC-AERMOD View - Lakes Environmental Software

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Section 3
Modeling Results

3.1 Summary of Results

Table 3-1 presents the ISCST modeling results for Unit 4 over the years where meteorological data was available. The model calculated total nitrogen dioxide deposition, and total nitrogen deposition is calculated based the molecular weight ratio of nitrogen to nitrogen dioxide. For these years, the total annual nitrogen deposition to the receptor area is estimated to range from 0.3 to 0.5 tons/year.

Table 3-1
Annual Average Nitrogen Dioxide and Total Nitrogen Deposition
ISCST Modeling Results – Unit 4 Only

	Year				
Model Result	**1986**	**1987**	**1988**	**1989**	**1990**
Max. Annual NO_2 Concentration ($\mu g/m^3$)	0.02638	0.02628	0.02885	0.02342	0.02598
Avg. Annual NO_2 Concentration ($\mu g/m^3$)	0.08929	0.09543	0.08397	0.06465	0.10809
Max. Annual Dry NO_2 Deposition ($\mu g/m^2$)	0.00094	0.00106	0.00120	0.00082	0.00103
Avg. Annual Dry NO_2 Deposition ($\mu g/m^2$)	0.00348	0.00452	0.00413	0.00252	0.00523
Max. Annual Wet NO_2 Deposition ($\mu g/m^2$)	0.00068	0.00095	0.00065	0.00056	0.00044
Avg. Annual Wet NO_2 Deposition ($\mu g/m^2$)	0.00733	0.00933	0.00393	0.00465	0.00583
Max. Annual Total NO_2 Deposition ($\mu g/m^2$)	0.00163	0.00201	0.00186	0.00138	0.00148
Avg. Annual Total NO_2 Deposition ($\mu g/m^2$)	0.01081	0.01337	0.00773	0.00701	0.01036

Table 3-1
Annual Average Nitrogen Dioxide and Total Nitrogen Deposition
ISCST Modeling Results – Unit 4 Only

	Year				
Model Result	**1986**	**1987**	**1988**	**1989**	**1990**
Sum of all Annual Total NO_2 Deposition (g/m^2)	1.18576	1.46830	1.35373	1.00806	1.07545
Spacing of each receptor (m)	1,000	1,000	1,000	1,000	1,000
Area each receptor "encompasses" (m^2)	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000
Total Annual NO_2 Deposition estimate to entire Bay (g)	1185760	1468300	1353730	1008060	1075450
Total Annual N Deposition estimate to entire Bay (g)[1]	*360883.5*	*446873.9*	*412004.8*	*306800.9*	*327310.9*
Total Annual N Deposition estimate to entire Bay (lb)[1]	795.6	985.2	908.3	676.4	721.6
Total Annual N Deposition estimate to entire Bay (tons)[1]	**0.4**	**0.5**	**0.5**	**0.3**	**0.4**

[1]Total N estimated using ratio of molecular weight of N (14) to molecular weight of NO_2 (46).

3.2 Deposition Contours

Figures 3-1 through **3-5** present contours of the annual average total deposition of nitrogen oxide (NO_2) throughout the receptor area. The results show that the deposition decreases as the distance from the stack increases, with a vast majority of the receptor area receiving depositions in the range of 0.000 to 0.002 g/m^2 of NO_2. This area represents a majority of Tampa Bay. Areas closest to the stack are calculated to receive depositions in the range of 0.006 to 0.010 g/m^2 of NO_2. This area encompasses McKay Bay, East Bay, Hillsborough Bay and a portion of Tampa Bay.

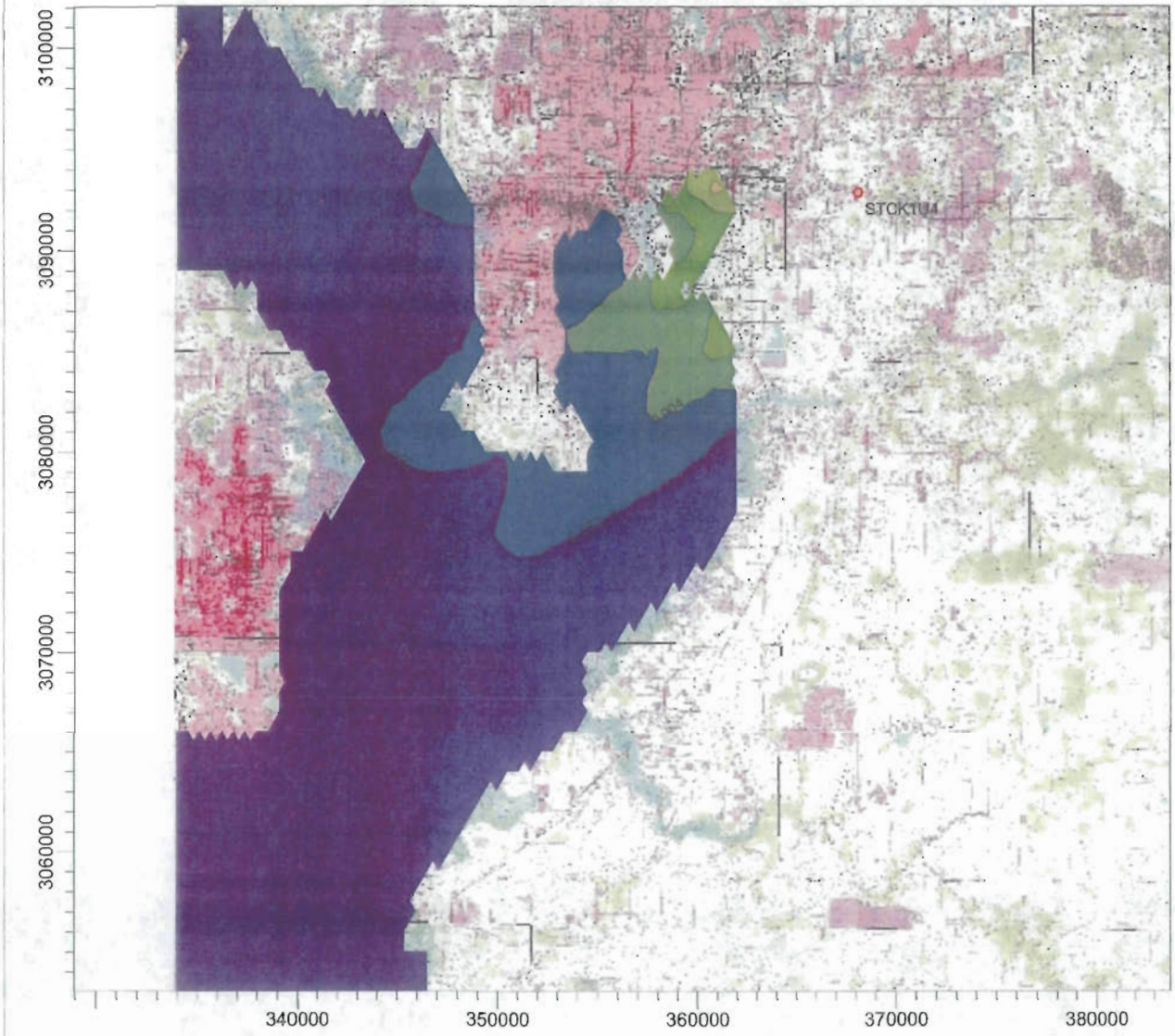
3.3 Conclusions

The modeling data show that the proposed fourth unit contributes a total annual average nitrogen deposition of 0.5 tons to the Bay. This is less than one-half of one percent of the total annual atmospheric deposition of nitrogen into the Bay, which was estimated at 880 tons by a 2002 study commissioned by the Tampa Bay Estuary

Program. In the aggregate, CDM's estimate shows that the impact of nitrogen deposition to the Bay is *de minimus*.

PROJECT TITLE:

HILLSBOROUGH COUNTY RESOURCE RECOVERY FACILITY EXPANSION PROJECT
PLOT FILE OF ANNUAL VALUES FOR SOURCE GROUP: SRCGP1



Contours g/m²

0.000 0.002 0.004 0.006 0.008 0.010 0.012 0.014

COMMENTS: 1986 Annual Average Total Deposition Bay Areas Only	MODELING OPTIONS: CONC, DEPOS, DDEP, WDEP, RURAL, ELEV, MSGPRO, DRYDPL, WETDPL, HE>ZI	COMPANY NAME: CDM	
		MODELER: Vincent Tino, CCM	CDM
	OUTPUT TYPE: DEPOS / RECEPTORS: 729	0 10 km	
	MAX: 0.01081 / UNITS: g/m³	DATE: 7/18/2005	PROJECT NO.: 033-44077-PARTII.PERMIT.PSD

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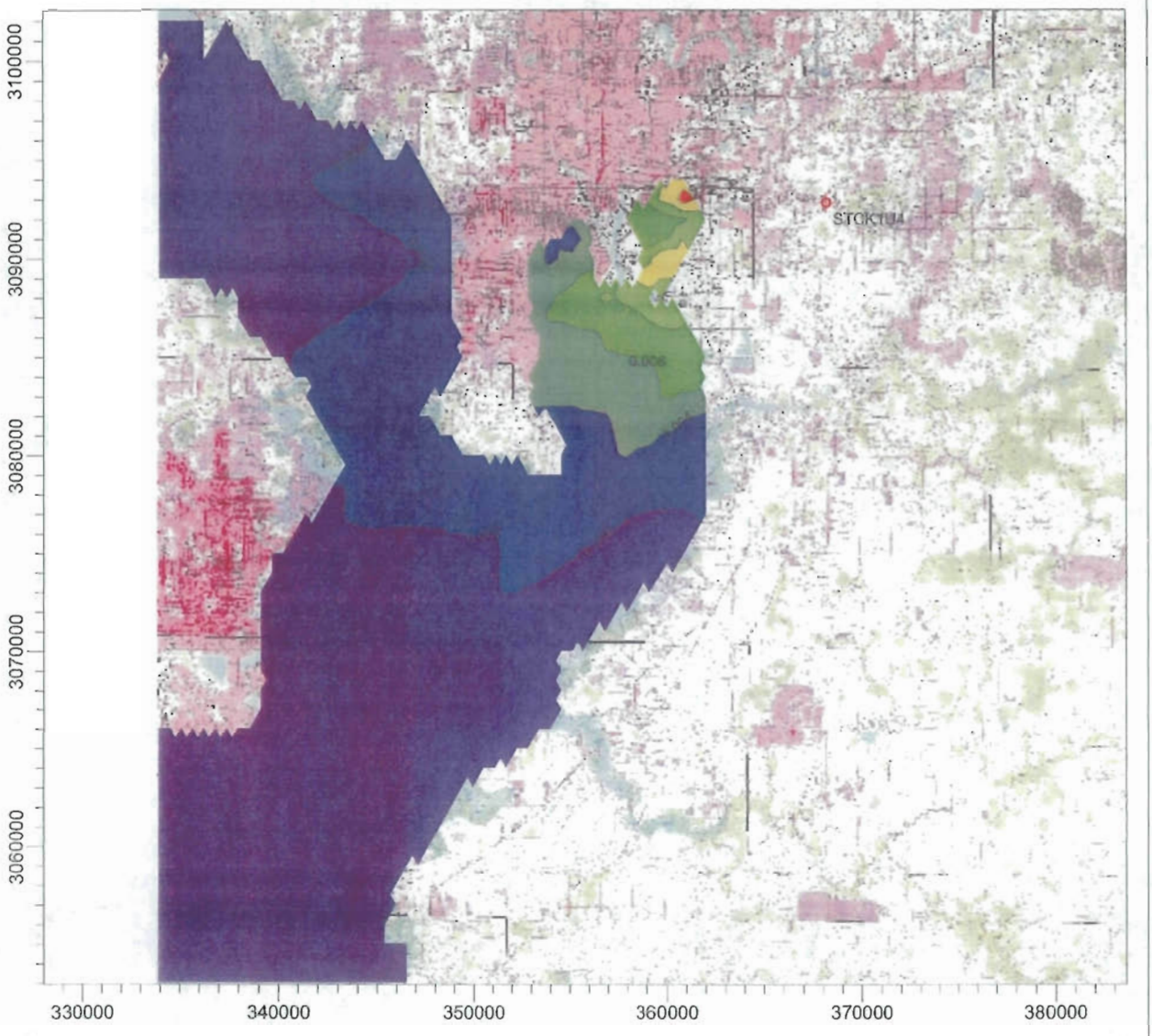
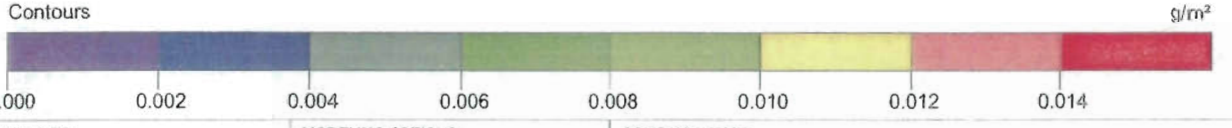
PROJECT TITLE:

HILLSBOROUGH COUNTY RESOURCE RECOVERY FACILITY EXPANSION PROJECT
PLOT FILE OF ANNUAL VALUES FOR SOURCE GROUP: SRCGP1





COMMENTS:

1987 Annual Average Total Deposition

Bay Areas Only

MODELING OPTIONS:

CONC, DEPOS, DDEP, WDEP, RURAL, ELEV, MSGPRO, DRYDPL, WETDPL, HE>ZI

COMPANY NAME:

CDM

MODELER:

Vincent Tino, CCM

OUTPUT TYPE:	RECEPTORS:
DEPOS	729

0 10 km

MAX:	UNITS:
0.01337	g/m²

DATE:

7/18/2005

PROJECT NO.:

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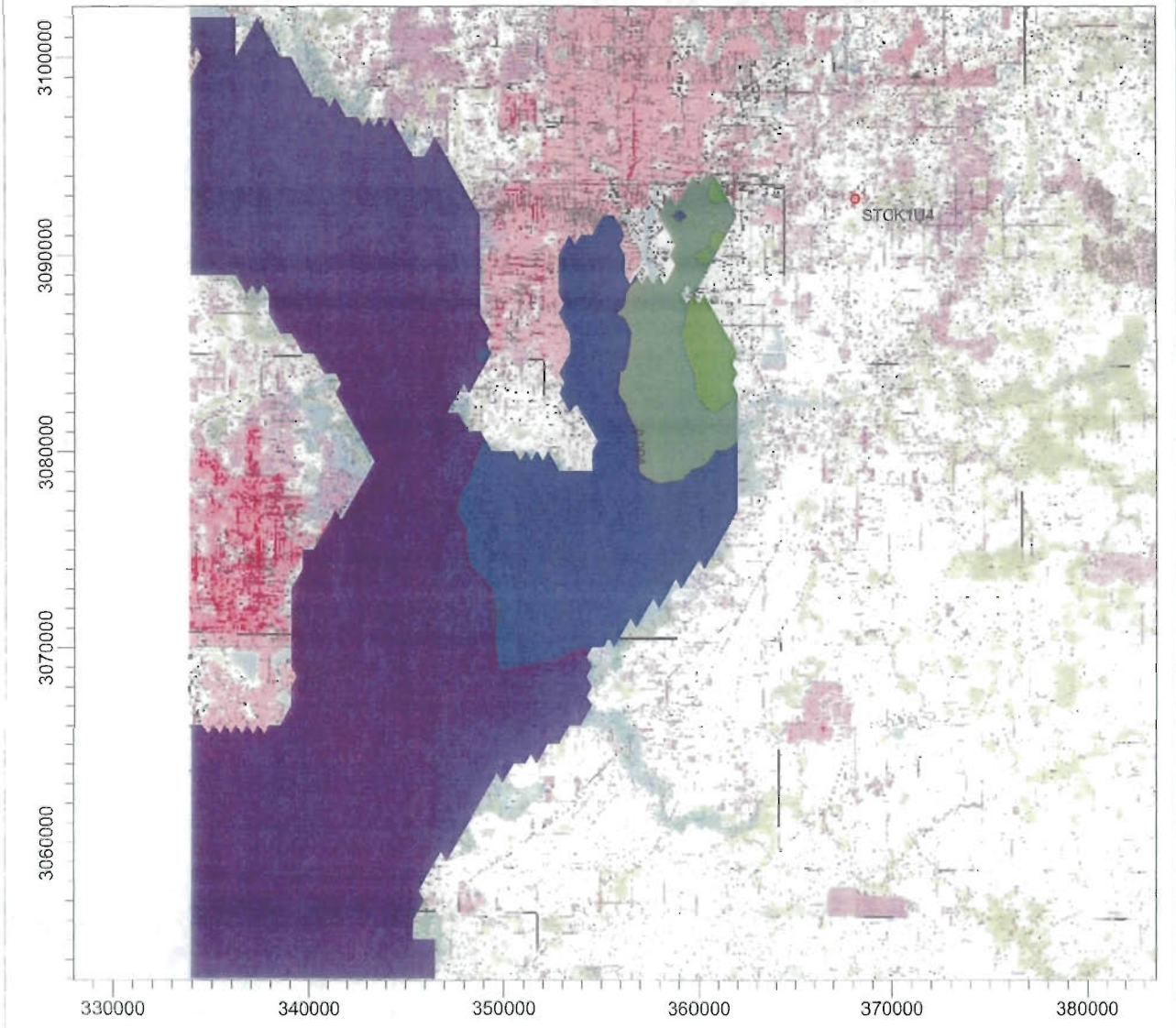

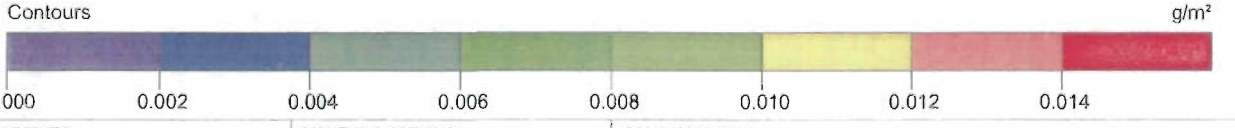

COMMENTS:

1988 Annual Average Total Deposition

Bay Areas Only

MODELING OPTIONS:

CONC, DEPOS, DDEP, WDEP, RURAL, ELEV, MSGPRO, DRYDPL, WETDPL, HE>ZI

OUTPUT TYPE:	RECEPTORS:
DEPOS	729
MAX:	UNITS:
0.00773	g/m²

COMPANY NAME:

CDM

MODELER:

Vincent Tino, CCM

0 10 km

DATE:

7/18/2005

PROJECT NO.:

033-44077-PARTII.PERMIT.PSI

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PROJECT TITLE:

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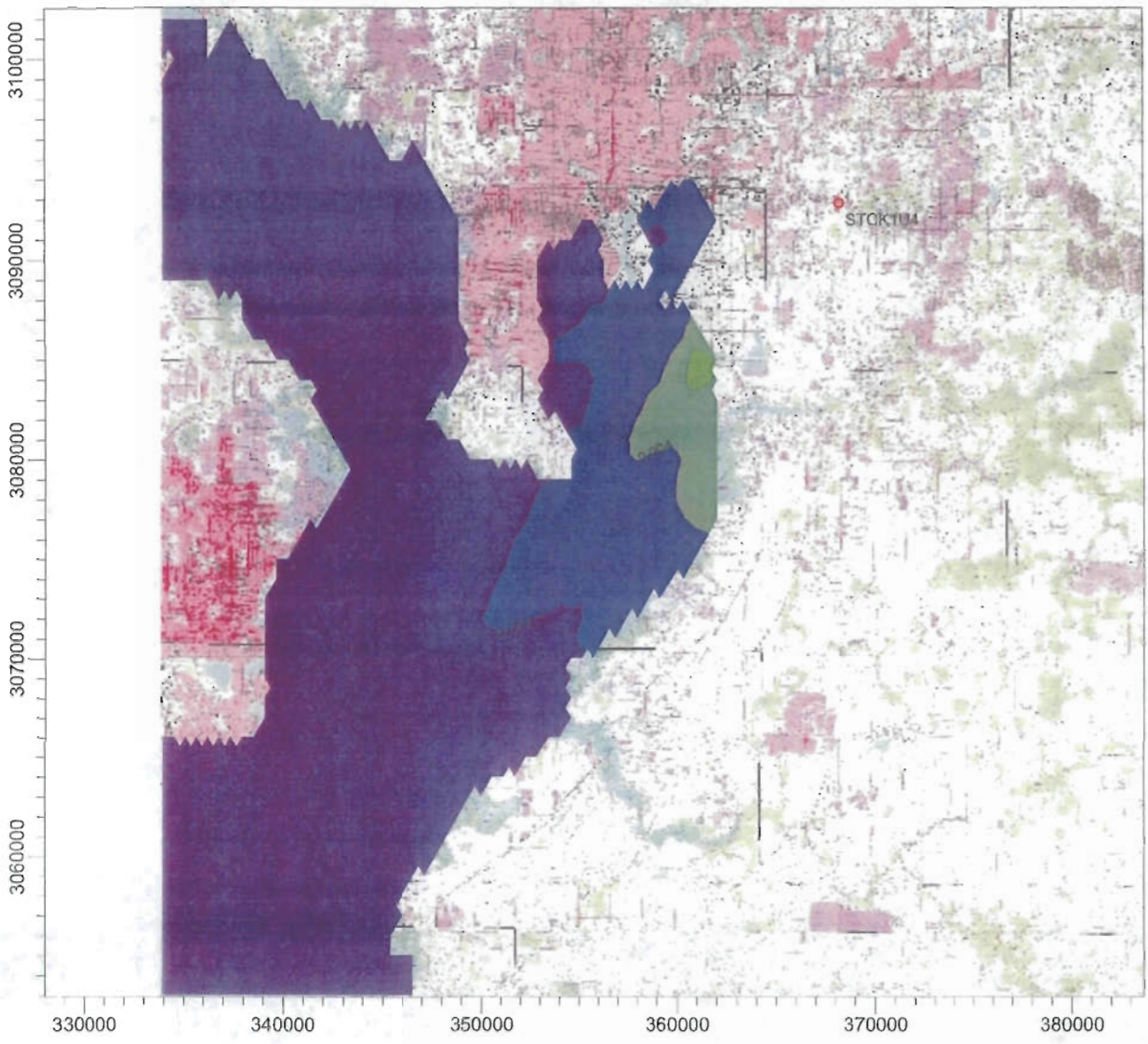

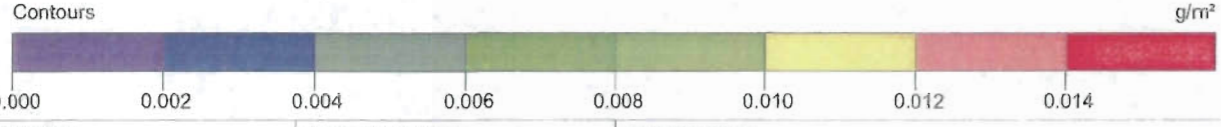

COMMENTS:

1989 Annual Average Total Deposition

Bay Areas Only

MODELING OPTIONS:

CONC, DEPOS, DDEP, WDEP, RURAL, ELEV, MSGPRO, DRYDPL, WETDPL, HE>ZI

COMPANY NAME:

CDM

MODELER:

Vincent Tino, CCM

OUTPUT TYPE:	RECEPTORS:
DEPOS	729

0 10 km

MAX:	UNITS:
0.00701	g/m²

DATE:

7/18/2005

PROJECT NO.:

033-44077-PARTII.PERMIT.PSD

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PROJECT TITLE:

HILLSBOROUGH COUNTY RESOURCE RECOVERY FACILITY EXPANSION PROJECT
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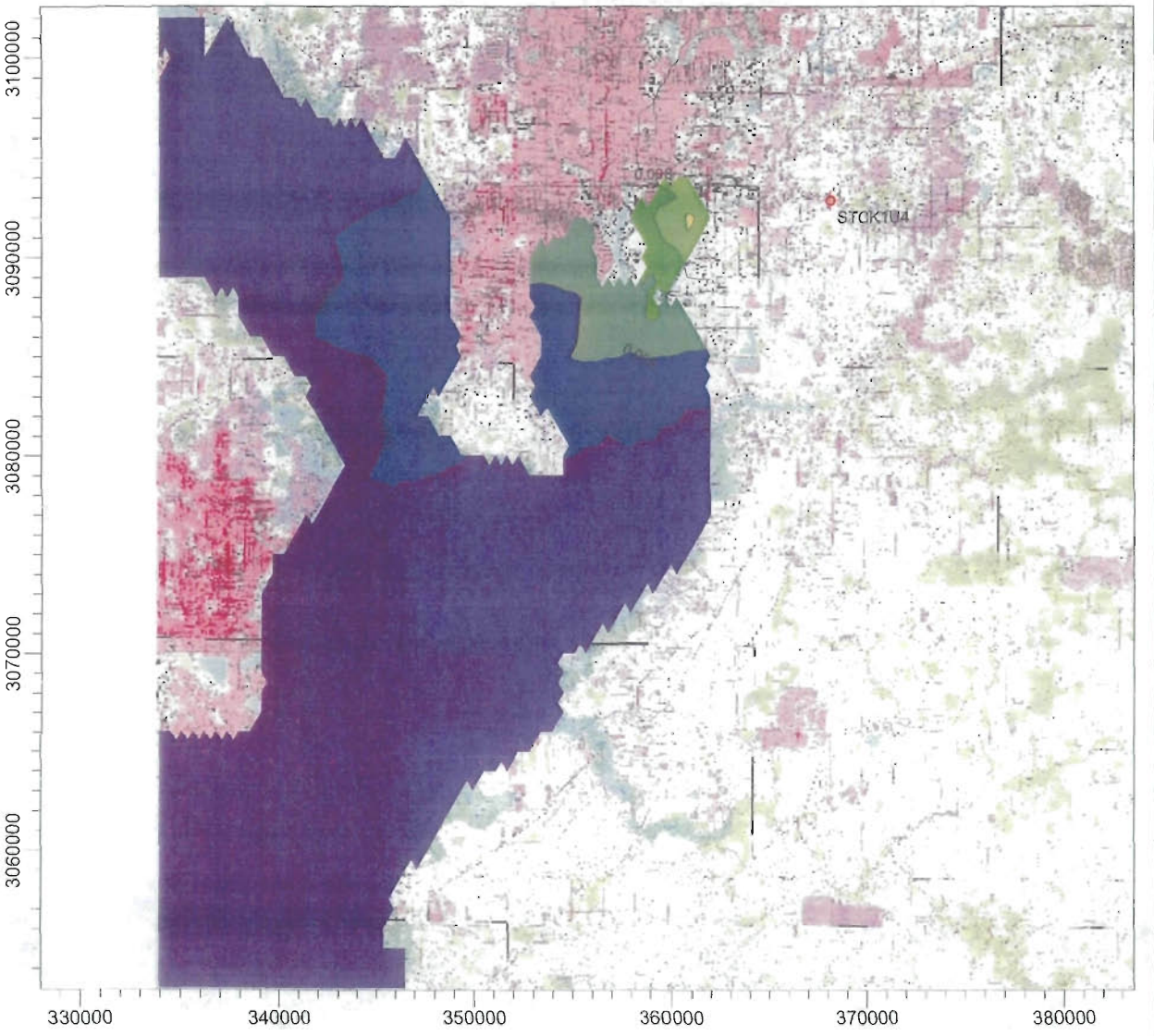

Contours g/m²

0.000 0.002 0.004 0.006 0.008 0.010 0.012 0.014

COMMENTS:

1990 Annual Average Total Deposition

Bay Areas Only

MODELING OPTIONS:

CONC, DEPOS, DDEP, WDEP, RURAL, ELEV, MSGPRO, DRYDPL, WETDPL, HE>ZI

COMPANY NAME:

CDM

MODELER:

Vincent Tino, CCM

OUTPUT TYPE:	RECEPTORS:
DEPOS	729

0 10 km

MAX:	UNITS:
0.01036	g/m²

DATE:

7/18/2005

PROJECT NO.:

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Appendix 13
APC Technical Specifications
(Attachments 1-5)

ATTACHMENT 1

PROJECT SPECIFIC REQUIREMENTS

1. Number of Trains/Train MSW Capacity (TPD) — One (1) / 600

2. ID Fans by Seller (yes/no) — Yes

3. The following economic factors shall be used in evaluating the vendors proposals:

   A. Lime ($/LB/HR of 90% Ca0): — N.A.

   B. Power Consumption ($/KW): — $2300/kW

   C. Pressure Drop ($/In. w.g./train): — Based on $2300/kW

5. Seller to provide test ports and instrument connections for Purchaser's opacity and CEMS instruments located on the ID fan inlet duct (Ref. Section 2.6.1 and Attachment 18) plus associated access platforms (Ref. Section 2.6,4) (Yes/No/Option) — Yes

6. Design (outdoor) summer/winter ambient temperature (°F) — 110 / 35

7. Structural Design Criteria:

   Florida Building Code and
   Governing Code ASCE –7-98 Year 2001
   Wind Speed 120 MPH C Exposure Tw = 1.0
   Earthquake Seismic Coefficients Av Very Low – N. A.
   Aa Very Low – N.A.
   Ground Snow Load (Minimum) 0 psf

8. Boiler auxiliary fuel (fuel oil, natural gas, propane) — Natural Gas

9. APC area to be enclosed (Yes/No) — Yes (See Dwg. SKS001)

10. The balance of the plant control system is:

    [ ] Single Loop Control System
    [X] Distributed Control System;
    Manuf./Model — Bailey or Equal

11. Seller to provide the Control System interface in accordance with page:

    [X] A10-1
    [ ] A10-2

12. Boiler will have urea injection and flue gas recirculation (FGR) for reduction of NO_x (Yes/No) Yes

13. Additional economizer outlet particulate loading (Above those shown in Attachment 2 due to Purchaser's furnace dry lime injection system, gr/scf dry (Expected Continuous/Design) N.A. / N.A.

14. Cooling Water Pressure at interface point, psig

    A. Supply available *Later*
    B. Return required *Later*

15. The Purchaser's CEMS system shall provide the following SO_2 and HCl control signals

A. SO_2

1.	Inlet to scrubber (yes/no)	Yes
2.	Outlet to stack (yes/no)	Yes
3.	"Sample and Hold"/Dedicated	Dedicated
4.	Continuous Signal time (minutes)	Updated every ten (10) seconds
5.	"Hold"/Calibration time (minutes)	15-once every 24 hrs.

B. HCl

1.	Inlet to scrubber (yes/no)	No
2.	Outlet to stack (yes/no)	No
3.	"Sample and Hold"/Dedicated	N.A.
4.	Continuous Signal time (minutes)	N.A.
5.	"Hold"/Calibration time (minutes)	N.A.

16. Mercury reduction system required by the Facility (Yes/No) Yes

    To be provided by Seller (Yes/No)
    (If yes, per Specification SM-155) No

17. Proposals shall be provided for the following system configurations:

Electrostatic Precipitator Only	____	Yes	X	No
Scrubber/Electrostatic Precipitator	____	Yes	X	No
Scrubber/Baghouse	X	Yes	____	No

Refer to General Arrangement Drawings (See Attachment 8)

18. *Economizer Outlet Connection (Ref. Section 2.1.7)

Centerline Height above grade	**
Height/Width (ft.)	** /
Distance inside Boiler Building Column Line (ft.) ***	N.A.
Stoker Width (ft.)	29' – 5 9/16" (approx.)

19. *Stack Interface ****

	See Zurn Drawing
Maximum Breeching Width/Height (ft.)	GA-1 and GA-2
Stack Shell Outside Dimensions (ft.)	See Zurn Dwg. GA-2
Stack Foundation Dimensions (ft.)	63' x 63'

* These dimensions are preliminary.

** See Boiler Sketch – Martin GMBH Drawing 2A459Q03

*** Economizer outlet is located beneath the superheater.

**** The existing chimney has a spare flue that was designed for a 400 TPD expansion (and not the 600 TPD planned. The flue will be modified or replaced by others to provide a velocity of ~ 65 ft./sec. @ 270 ^{0}F at the outlet.

20. The attached Project Specific Requirements, if any, are clarifications additions, deletions, and/or revisions to the preceding Specification requirements and shall be considered as part of this Specification.

General Overview: The existing and operating Hillsborough County WTE facility consists of three (3) stoker/boiler units rated each at 400 TPD fired by 4,500 Btu/lb municipal solid waste or refuse. Steam produced in these boilers drives a nominal 29 MW condensing steam turbine generator. The expansion will consist of a new independent combustion unit (stoker/boiler/APC train) rated at 600 TPD fired by 5,000 Btu/lb refuse, and a new steam turbine. The specific requirements for the new APC system are per this Specification and as follows.

20.1 Page 1, Section 1.0, General: The APC system described herein is for a 4th boiler train. As such, Seller's supply shall be a complete and independent system for this boiler unit (scrubber, baghouse, ID Fan, etc.) except as amended below.

20.2 Page 1, Section 1.0, General: Seller shall be responsible for field verification of all dimensions for their design and erection. Seller shall note that the drawings included with this specification (ref Attachment 8) may not reflect all the as-built conditions. It is imperative that the Seller make as many field visits as necessary to completely familiarize himself with any and all potential interferences/impacts to his design/erection whether identified on the attached drawings or not.

20.3 Page 1, Section 1.0, General: Seller's design/erection shall minimize impacts to the facility. The design/erection of the new APC train shall not require shut down of the existing equipment. **Any impact shall be noted in the Seller's bid.**

20.4 Page 3, Section 1.2.5, Structural: The APC equipment will be enclosed in an area 121 feet long and 74.5 feet in width. The clear height above the scrubber will be 108 feet and the clear height above the baghouse will be 82.25 feet (See Roof Framing Plan and Steel drawings SK –S-015 and SK-S-016). **Seller to confirm in his proposal that the space provided is adequate. The Seller shall also identify if a smaller space is possible.**

20.5 Page 12, Section 2.2.1, Scrubber Vessel, 1st paragraph, 2nd sentence: The material for the roof, walls, and hopper shall be carbon steel (ASTM A36), except that the scrubber hopper (including hopper outlet flange) and the lower 8 feet of the scrubber cylindrical section shall be all stainless steel 316L hoppers ¼" thick. **This change shall be priced as an option.**

20.6 Page 14, Section 2.2.2, Scrubber Vessel Atomizer/Nozzle Enclosure, Platforms, and Stairways: A weather tight enclosure (penthouse) is not required since the APC system will be enclosed in a building.

20.7 Page 25, Section 2.2.4.9, Slurry Flushing/Chemical Cleaning System: The system shall not employ automatic supply and drain valves. Instead, manual valves shall be employed to flush all portions of the piping in the system.

20.8 Page 27, Section 2.3.1, Baghouse Structure, 1st paragraph, 6th sentence: The casing and roof shall be constructed of minimum ¼ carbon steel (ASTM A36) plate, except that the lower 6 feet of the casing (module walls) shall be ¼ inch stainless steel ASTM 316L. **This change shall be priced as an option.**

20.9 Page 30, Section 2.3.2, Bags/Cages: Seller shall provide pricing and design for the following options.

a. 20 oz. fiberglass bags in lieu of 16 oz.
b. Ryton (PPS) bags in lieu of fiberglass bags. The bags shall be 17 oz/yd2 and shall be scrim-less (self-supporting). The Ryton bag design option shall be offered using 12 wire cages in lieu of 20 wire cages. The Ryton bags shall be offered in accordance with Attachment 21, PPS Bag/Cage Purchase Guidelines. Where conflicts exist between Attachment 21 and requirements in Sections 2.3.2.1, Pulse Jet Filter Bag Specification and 2.3.2.3, Pulse Jet Cage Specification, these requirements in Attachment 21 shall supercede requirements in those Sections.

20.10 Page 43, Section 2.5, Hoppers, 1st paragraph, 4th sentence: The hopper walls shall be constructed of minimum 1/4" stainless steel (ASTM 316L). **This change shall be priced as an option.**

20.11 Page 94, Section 4.2, Proposal Data and Drawings: The Hillsborough Expansion Project design will be based on 3-D PDS model. Contractor shall provide to Covanta an accurate 3-D

PDS model of the APC equipment and structure. The PDS model provided by the Contractor will be integrated with the rest of the plant model, and it will be utilized for layout of Covanta's piping and electrical work. The PDS model shall include scaled and accurate depiction of the equipment, support structure steel, all platforms, handrails, stairs, ladders, ductwork, and piping. Contractor shall periodically update and resubmit the model incorporating the changes.

ATTACHMENT 2

ECONOMIZER OUTLET OPERATING CONDITIONS (1)

		Expected Continuous(2)	Design(3)
Gas Quantity (wet)	lb/hr	476,891	546,893
Gas Quantity (dry)	lb/hr	421,245	483,079
Gas Volume (wet)	SCFM (@68°F)	109,000	125,000
Gas Temperature	°F	430 - 505	430 - 505
Gas Pressure	IWC	approx.-1.5	approx. –3
Gas Composition (Wet)			
CO_2	vol. %	10.286	10.286
0_2	"	6.237	6.237
N_2 + Ar	"	65.215	65.215
H_20	"	18.199	18.199
SO_2	"	0.013	0.0491
HC1	"	0.050	0.0818
HF	"	-	0.0041
Total		100	100
Gas Composition (Dry)			
CO_2	vol. %	12.574	12.574
0_2	"	7.624	7.624
N_2 + Ar	"	79.725	79.725
SO_2	"	0.016	0.0600
HC1	"	0.061	0.1000
HF	"	-	0.0050
Total		100	100

		Expected Continuous (2)	Design(3)
Mercury ug/NDM^3 @ 7%02		< 0.00115	< 0.00115
Acid Gases (Dry Gas)			
SO_2	Lbs/hr	141	612
SO_2	PPMDV	160	600
HCl	Lbs/hr	309	581
HCl	PPMDV	610	1000
HF	Lbs/hr -	-	16
HF	PPMDV	-	50
H_2SO_4	PPMDV at 7% O_2(4)	14	45
Particulates (Wet Gas) (5,6)			
gr/scf (68°F)		2.2	2.5
lbs/hr		2,055	2,679

NOTES

1. All data are for one (1) unit and are based on combustion calculations and not the "pitot tube" conditions. The Seller shall provide allowance for in-leakage (3% minimum); this shall be included in Seller's mass balances (assume in-leakage occurs at the economizer outlet connection). In addition, the boiler may be fired on Auxiliary fuel (see Attachment 1), refuse, or a combination of both.

2. Minimum operation will be at 70% of flow based on Expected Continuous operation. During initial start-up of the boiler, economizer outlet flue gas temperatures will be about 330°F. As the boiler fouls, the outlet temperature will increase to the temperature shown. This initial operation will last approximately 4 to 6 weeks. Similar, less severe, conditions may also occur after major boiler overhauls. The scrubber vessel and auxiliaries shall be designed such that acid gas scrubbing can begin at 330°F and 70% of "Expected Continuous" gas flow and flue gas can be passed through the

baghouse modules. Lime consumption and acid gas removal efficiency guarantees are not required for this operation. The Seller shall state the estimated acid gas removal efficiency at this operating point. The Seller shall also list any other system start-up limitations that would affect operation under the above conditions.

3. Seller shall provide mass balance for the Design Condition at the normal operating, high O_2 and high H_2O points shown in figure 1 of attachment 3. For the high O_2 and H_2O cases, the lbs/hr of flue gas and acid gases are the same as shown above. The gas compositions for the High 0_2 and High H_2O cases are shown below. Seller shall also provide Mass Balance for the Design Condition based on the highest scrubber outlet temperature shown in note 2 of attachment 3 using the most stringent combination of O_2/H_20 (Ref. figure 1 of Attachment 3) with respect to consumption of lime.

Gas Composition (Vol. % Wet)

	High 0_2 Case	High H_20 Case
CO_2	8.892	10.102
O_2	8.237	6.125
N_2 & Ar	67.083	64.050
H_2O	15.733	19.661

4. H_2SO_4 concentrations are shown at an O_2 concentration of 7%. The APC system shall be designed to accommodate the range of O_2 concentrations shown in figure 1 of Attachment 3.

5. Minimum particulate loading is 0.25 gr/dscf.

6. Seller's design shall also include the additional particulate loading shown in Attachment 1.

ATTACHMENT 3

REQUIRED GUARANTEES

3.1 Emission Guarantees (1)

Particulates: 0.00874 gr/dscf corrected to 7% O_2.

PM-10 0.00874 gr/dscf corrected to 7% O_2.

Sulfur Dioxide: 80 % min. removal rate or 26 ppmv (dry)(max) corrected to 7% O_2, whichever is less stringent.

Hydrogen Chlorides: 95 % min. removal rate or 25 ppmv (dry)(max)corrected to 7% O_2, whichever is less stringent.

Hydrogen Fluoride: - % min. removal rate or 3.5 ppmv (dry) (max) corrected to 7% O_2, whichever is less stringent.

Sulfuric Acid: - % min. removal rate or 15 ppmv (dry) (max) corrected to 7% O_2, whichever is less stringent.

Opacity: less than 10 % under all operating conditions and based on a 6-minute rolling average

Mercury (Required/Optional Price):

28 ug/dscfm corrected to 7% O_2

or 85 % minimum removal rate, whichever is less stringent, based on a minimum inlet value of 1.15 mg/dscfm.

_____ lb/hr.

N0x: 110 ppmdv corrected to 7% O_2

NH_3: 10 ppmdv corrected to 7% O_2

Averaging Time: The above guarantees shall be verified by the test methods in Section 3.2.1.1 Acid gases that are monitored with CEMS analyzers and subject to averaging times will be monitored for a 72 hour period to confirm that system response time is sufficient to maintain compliance. Averaging times are as follows:

3.2 Overall System Static Pressure Drop (1)

Seller shall provide overall maximum and average APC system static pressure drop guarantees based on the flows and temperatures at the Economizer outlet. The Maximum pressure drop shall be with one baghouse compartment isolated at the start of a cleaning cycle. The Average pressure drop shall be the average between the baghouse cleaning and non-cleaning modes. Correction curves shall be provided as

specified in Section 3.1.1. These guarantees shall be provided for the following operating conditions:

a. Expected Continuous Operation - Maximum and Average

b. Design Condition - Maximum and Average

c. 0.91 x flow at the Design Condition - Maximum only (for use in I.D. fan Test Block Pressure determination)

3.3 Total System Power Consumption

a. Vendor to supply this data for Expected Continuous Operation and Design Conditions. Guarantee values shall be 24 hour average values and shall include all equipment (except the I.D. fan) supplied by Seller.

b. Guaranteed maximum power demand.

3.4 Total System Water usage

Seller to supply this data for Expected Continuous Operation and Design Conditions.

3.5 Instrument/Pulse-Jet Air Consumption

3.6 a. Total Reagent Consumption (as 90% CaO) (1)

Vendor to supply this data for Expected Continuous Operation and Design Conditions and correction curves as specified in Section 3.1.1.

b. Total Activated Carbon Consumption and maximum turn-down.

3.7 Bag Life - 2/3 years (minimum) for Pulse-Jet/Reverse Air Bags

3.8 In addition to the above, Seller shall guarantee that the APC system being furnished will meet all sections of the regulations of applicable regulatory agencies and permits that apply to acid gas removal and particulate removal requirements including test methods, reporting criteria, etc. Copies of which are attached hereto and form an integral part of this Specification (Attachment 9).

3.9 Gas Temperatures for Above Guarantees

a. Scrubber Exit (2): 285 °F
b. Stack Inlet: maximum 10°F drop from Scrubber outlet

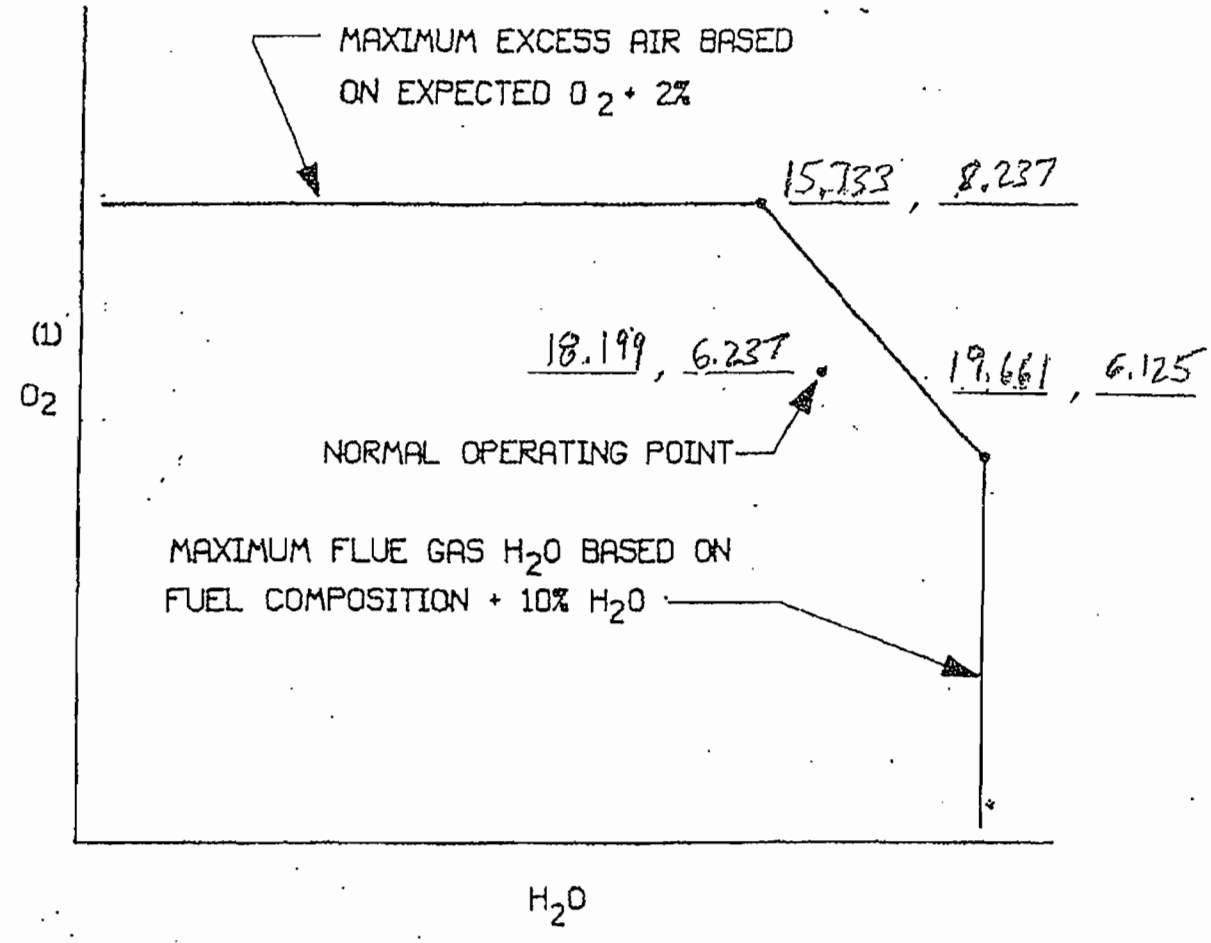
3.10 Scrubber Outlet Temperature Distribution

Seller shall demonstrate that the +/- 5 degrees F flue gas temperature distribution is met using the five (5) test port (4-inch) grid at 6-inch spacing increments.

NOTES:

1. These guarantees shall be met for each individual combustion train. The methods of Section 3.2.1.1 and compliance with averaging times as verified with facility CEMS equipment shall be used.

2. Emission guarantees shall also be met for scrubber outlet temperatures ranging from 270 °F to 325 °F.



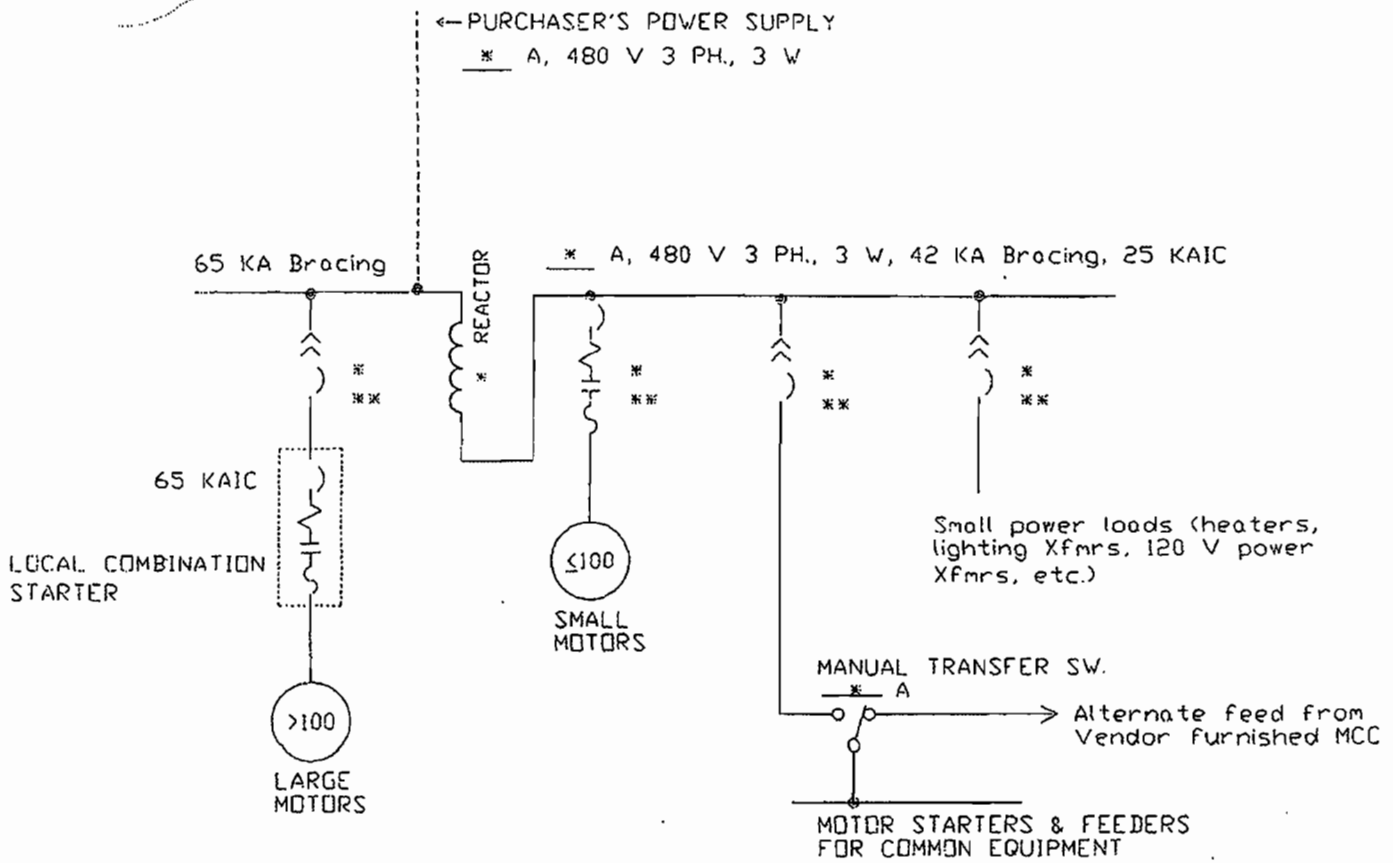
(1) O_2 IS BASED ON HIGH EXCESS AIR OPERATION. ADDITIONAL AIR FLOW SHALL BE CONSIDERED.

	FIGURE 1 EMISSIONS GUARANTEE CURVE	APPROVED:	DATE
		DWG. No. SM-105	REV.

ATTACHMENT 4

TYPICAL APC SYSTEM ONE LINE DIAGRAM

SM - 105 ATTACHMENT - 4
TYPICAL FLUE GAS CLEANING SYSTEM ONE LINE



* RATINGS TO BE DETERMINED BY VENDOR.
** QUANTITY TO BE DETERMINED BY VENDOR.

ATTACHMENT 5

SERVICE WATER ANALYSIS

Milligrams Per Liter
(Except Where Units Are Indicated)

	Slaking Water	Scrubber/ Dilution Water
Alkalinity ($CaCO_3$)	107	187
Phenol Alkalinity ($CaCO_3$)		
Noncarbonate Hardness ($CaCO_3$)		
Total Hardness ($CaC0_3$)	188	241
Calcium (Ca)	168	170
Magnesium (Mg)	20	71
Sodium (Na)	31	127
Chloride (C1)	26	154
Fluoride (F)		
Nitrate ($N0_3$)	0.6	2.5
Total Phosphate ($P0_4$)	< 0.5	< 0.5
Sulfate (SO_4)	108	160
Total Cations (meq/1)		
Total Anions (meq/1)		
Total Dissolved Solids	335	743
Turbidity (NTU)		
Silica (Si0)	7.2	26
Color (Pt-Co Color Units)		
Conductivity (umhos/cm)	493	1093
pH Value (pH Units)	5.9	6.2
Total THM's (ug/1)		
Free Chlorine		
Gpm available	As Required	As Required
Pressure/Temperature (psig/°F) (at supply point)	As Required / 60	As Required / 60

*Potable water is available at the supply point at ____ / / ____ GPM/psig/°F.

* Same as Slaking Water

ATTACHMENT 5 (Cont'd.)

TYPICAL SCRUBBER/DILUTION WATER ANALYSIS

Component	Range in ppm as $CaCO_3$	
Ca	100-1000	ppm as $CaCO_3$
Mg	50-400	ppm as $CaCO_3$
Na	1000-4000	ppm as $CaCO_3$
SO_4	2000	ppm as $CaCO_3$
Cl	2500	ppm as $CaCO_3$
NO_3	25-100	ppm as $CaCO_3$
HCO_3	300	ppm as $CaCO_3$
S_iO_2	200	mg/l
pH	6.5-8.5	
TDS	4000	
TSS	< 200	
Temperature	45-120	°F
Gpm available	_____	gpm
Pressure Available	_____	psig

Note: The above are based on using cooling tower blowdown from a zero discharge facility.

Appendix 14
Human Health and Ecological Impact Analysis of the Hillsborough County Resource Recovery Facility Expansion

CHROSTOWSKI, PEARSALL & FOSTER

October 25, 2005

Jason Gorrie
Camp Dresser & McKee
1715 North Westshore Blvd., Suite 875
Tampa, FL 33607

Re: Human Health and Ecological Impact Analysis of the Hillsborough County Resource Recovery Facility Expansion (Project No. 6033-44077)

Dear Jason:

Please find enclosed a copy of the above-mentioned report for your records.

It has been our pleasure working with you on this project and we look forward to a successful application process.

Should you have any questions, or need additional information, please feel free to contact us.

Very Truly Yours,

Sarah Foster

Sarah Foster, Principal
CPF Associates, Inc.

Attachment

HUMAN HEALTH AND ECOLOGICAL IMPACT ANALYSIS OF THE HILLSBOROUGH COUNTY RESOURCE RECOVERY FACILITY EXPANSION

Prepared by
CPF Associates, Inc.
7708 Takoma Avenue
Takoma Park, Maryland

Prepared for
Hillsborough County, Florida
Solid Waste Management Department
601 E. Kennedy Blvd.
Tampa, Florida 33602

October 2005

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ATTACHMENT A: *Biographies of CPF Associates, Inc. Scientists*

ACRONYMS

ACI	activated carbon injection
APC	air pollution control
BACT	best available control technology
CAA	Clean Air Act
DEP	Florida Department of Environmental Protection
EPA	U.S. Environmental Protection Agency
FF	fabric filter
FIFRA	Federal Insecticide Fungicide and Rodenticide Act
LCA	life cycle analysis
MACT	Maximum Achievable Control Technology
MW	megawatts
MSW	municipal solid waste
MWC	municipal waste combustor
NOx	nitrogen oxides
PCBs	polychlorinated biphenyls
PCDD/PCDFs	polychlorinated dibenzo-p-dioxins and dibenzofurans
PPSA	Florida Electrical Power Plant Siting Act
PSD	Prevention of Significant Deterioration
RCRA	Resource Recovery and Conservation Act
RRF	resource recovery facility
RTF	Recycling Task Force
SDA	spray dryer absorber
SIP	State Implementation Plan
SNCR	selective non-catalytic reduction
SWMD	Hillsborough County Solid Waste Management Department
TECO	Tampa Electric Company
TEQs	2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) toxic equivalents
TPD	tons per day
TSCA	Toxic Substance Control Act
USCOM	U.S. Conference of Mayors
WERT	Waste to Energy Research Council
W-T-E	waste to energy

HUMAN HEALTH AND ECOLOGICAL IMPACT ANALYSIS OF THE HILLSBOROUGH COUNTY RESOURCE RECOVERY FACILITY EXPANSION

EXECUTIVE SUMMARY

Hillsborough County is proposing to expand the solid waste processing capacity of its existing Resource Recovery Facility from 1,200 to 1,800 tons per day. Hillsborough County requested CPF Associates, Inc., an independent scientific research and consulting organization, to evaluate the potential for negative human health or ecological impacts associated with the expansion. CPF's evaluation was conducted by: (a) researching the scientific and regulatory literature regarding waste-to-energy facilities, (b) analyzing site-specific information concerning the proposed expansion project, including the information presented in the County's Power Plant Siting Act permit application, and (c) performing standardized risk assessment calculations and analyses. The results of CPF's analysis show that the proposed expansion project is unlikely to have a negative impact on human health or the environment if constructed and operated as stated in the County's permit application.

1.0 INTRODUCTION

1.1 The Proposed Expansion

Hillsborough County owns a 1,200 ton per day (TPD) resource recovery facility (RRF), which is operated as part of the County's Integrated Solid Waste Management System. The RRF, comprised of three 400 TPD combustion units, incinerates municipal solid waste (MSW), produces steam, and converts the steam to electricity, which is sold to the Tampa Electric Company. Due to residential and commercial growth in the County since the RRF became operational in 1987, the 1,200 ton per day capacity of the existing plant has become inadequate. The County Commission has concluded that it should increase the RRF's capacity to 1,800 tons per day. The proposed RRF expansion project would involve the addition of a new 600 ton per day boiler and certain ancillary equipment.

1.2 Objectives Of This Analysis

The permit process for the proposed fourth unit at the RRF will require the submittal of a number of application documents. These include a Site Certification Application to comply with the Florida Electrical Power Plant Siting Act (PPSA), and an application for a permit under the Prevention of Significant Deterioration (PSD) program to comply with the Clean Air Act. PPSA approval to construct the fourth unit will be determined by the State of Florida's Siting Board (i.e., Governor and Cabinet). The PSD permit will be issued by the Florida Department of Environmental Protection (DEP).

The Human Health and Ecological Impact Analysis presented in this document was performed to address questions related to human and environmental health that may arise during the course of the permit processes. This analysis is not a formal requirement of the permit processes for the County's expansion project, but was conducted to ensure that issues of potential concern related to the proposed RRF expansion were evaluated.

This Human Health and Ecological Impact Analysis was performed by CPF Associates, Inc., a Washington, D.C.-based scientific and regulatory consulting firm. Appendix A provides biographies of the CPF scientists who participated in this effort.

1.3 Methods Of This Analysis

This analysis consists of several parts. First, information regarding the operation of Hillsborough County's Solid Waste Management System, including the existing RRF and the proposed RRF expansion, was obtained and reviewed. Second, information about the regulatory context of waste-to-energy facilities is

evaluated and the implications investigated for the proposed Hillsborough expansion. Following these activities, a scientific literature search and review was conducted to obtain information relevant to the analysis, including general information about analogous facilities and specific information about the west Florida environment. Hillsborough County's engineer, CDM, was requested to perform survey work to obtain site-specific information that was pertinent to the analysis. CDM also conducted air dispersion and deposition modeling to address the behavior of the RRF's stack emissions in the environment. The results of the modeling were used as inputs to a health risk assessment.

Risk assessment is an important tool that can be used to evaluate the probability of adverse effects from various types of activities or situations. This well-recognized method of analysis can assist in identifying the probability of adverse health effects occurring as a result of exposure to chemicals. It is also often used in a regulatory context, in which risk assessment results are compared to regulatory target risk levels. The U.S. Environmental Protection Agency (EPA), and numerous other regulatory and research organizations, including the National Academy of Sciences, have developed guidelines for the performance of risk assessments. These guidelines were followed in the assessment of the proposed expansion of the Hillsborough County RRF.

2.0 THE GENERAL CONTEXT OF WASTE-TO-ENERGY

In 2003, Americans generated 236.2 million tons of municipal solid waste (MSW) for a generation rate of 4.45 pounds per person per day (EPA 2005). Approximately 23.5% of this material was recycled and 7.1% was composted. The remaining 69.4% required disposal. The majority of the waste slated for disposal was landfilled (55.4%) and another 14% was combusted for energy recovery. This latter option is known as waste-to-energy, trash-to-energy, or resource recovery.

All methods of waste management involve some potential human health or environmental risks. In the United States, regulatory programs have been implemented to minimize the risks from MSW management activities. This section explores the use of waste-to-energy and places it in context at the federal, state, and county levels, with an emphasis on those regulatory factors relevant to the protection of human health and the environment.

2.1 Federal Regulations and Policies

At the national level, there are currently 89 waste-to-energy plants operating in 27 states (Norris 2005). They generate about 2,700 megawatts of electricity from the processing of 95,000 tons of MSW each day. The electricity generated meets the energy needs of about 2.3 million homes and may be viewed as a replacement for about 48 million barrels of oil each year.

At the federal level, the primary regulatory agency is the Environmental Protection Agency (EPA), which regulates both the management of MSW and the air emissions from waste-to-energy plants. The primary vehicles for regulation are the Resource Recovery and Conservation Act (RCRA) and the Clean Air Act (CAA).

RCRA defines solid and hazardous wastes and sets up an overall management strategy. Among other things, RCRA forbids the disposal of hazardous and medical wastes at MSW disposal sites. This ensures that hazardous and medical wastes will not be combusted at the Hillsborough RRF. RCRA also delegates specific regulatory programs for the management of MSW to the states. The federal role in this context is to establish minimum criteria that describe the best practicable environmental controls and monitoring requirements for solid waste disposal facilities. Other specific federal regulations that impact waste disposal in waste-to-energy plants include the Toxic Substance Control Act (TSCA), which bans the disposal of polychlorinated biphenyls (PCBs) with MSW, and the Federal Insecticide Fungicide and Rodenticide Act (FIFRA), which regulates the disposal of pesticides and pesticide containers. RCRA

regulates the ash that is generated during the MSW combustion process at a resource recovery facility.

The CAA is the other primary vehicle for the regulation of waste-to-energy plants at the federal level. There are several provisions of the CAA that apply to the Hillsborough RRF, such as those regulating the prevention of significant deterioration (PSD) of air quality. In this case, the provisions of the CAA that are most relevant to the protection of human health and the environment are the New Source Performance Standards (NSPS) for new large MSW combustors, such as the Hillsborough RRF, which are contained in Subpart Eb of 40 CFR Part 60 ("Standards of Performance" for Large Municipal Waste Combustors for which Construction is commenced after September 20, 1994) (EPA 1995).

The overall objective of the NSPS in Subpart Eb is to ensure that emissions from waste-to-energy plants do not occur at levels that could pose a public health threat. The NSPS requires the implementation of Maximum Achievable Control Technology (MACT) to limit the amount and number of pollutants that may be emitted from a large MSW combustor. In the CAA, MACT is defined as the maximum degree of reduction in emissions of designated air pollutants, taking into consideration various factors. In the case of MSW combustors, the designated pollutants subject to MACT include dioxins and furans, cadmium, lead, mercury, particulate matter, hydrogen chloride, sulfur dioxide, nitrogen oxides, and fugitive ash emissions. In addition to the MACT controls on these specific pollutants, the NSPS require the use of good combustion practices (combustion efficiency) and imposes requirements for facility siting, operator training and certification, compliance and performance testing, and reporting and recordkeeping. Under the CAA, the State of Florida has a federally-approved State Implementation Plan (SIP) and the State has been delegated the authority to issue a permit under the NSPS Subpart Eb.

EPA (2002) examined the reductions in pollutant emissions from large waste-to-energy facilities as a result of the implementation of the NSPS. The following table compares emissions in the year 2000 to the year 1990 (Table 2-1).

Table 2-1
Reduction in Emissions Associated with NSPS

Pollutant	Reduction in %
Dioxins/furans	99.7
Mercury	95.1
Cadmium	93.0
Lead	90.9
Hydrochloric acid	94.3
Sulfur dioxide	86.7
Particulate matter	89.8

Based on these data, EPA (2002) concluded that the "performance of the MACT retrofits has been outstanding." The Agency also noted that "since 1990 (pre-MACT conditions), dioxin/furan emissions have been reduced by more than 99 percent, and mercury emissions have been reduced by more than 95 percent." Since the potential for public health impacts usually is proportional to the amount of emissions, these significant reductions in WTE emissions should provide a positive impact on public health.

In 2003, EPA concluded that the use of MACT at WTE facilities allows municipal solid waste to be used "as a clean, reliable, renewable source of energy." Further, EPA noted that WTE plants in the U.S. "produce 2800 megawatts of electricity with less environmental impact than almost any other source of electricity." (EPA 2003).

2.2 State Regulations and Policies

Increases in Florida's population have resulted in large increases in MSW generation. In 2000, for example, a total of 25.7 million tons of MSW were collected in Florida (DEP 2002). This represents a substantial increase (32%) from 1991, when the corresponding amount was 19.5 million tons. The per capita generation rates have also increased 6%, from 8.3 pounds per person per day in 1991 to 8.8 pounds per person per day in 2000. Hillsborough County ranks fourth in the state in waste generation rates. The largest component of Florida's MSW stream is paper (newspapers, corrugated paper, other paper) at 24.8%, followed by construction and demolition debris (23.2%) and yard trash (14%). In 2000, 5.56 million tons of MSW were processed by incineration, 7.05 million tons by recycling, and 14.87 million tons by landfilling.

Waste to energy capacity in Florida has grown from one plant in 1982 to 13 operating plants in 2002 (DEP 2002) with a total capacity of 19,176 tons per day. These plants generate about 534 megawatts of electricity daily. The waste-to-energy capacity in Florida is greater than any other state in the US. The primary reasons for the success of waste-to-energy in Florida are the vulnerability of groundwater resources to potential leachate emissions from landfills and the lack of suitable landfill space. In addition, the energy crisis of the mid-1970s led to increased reliance on alternative energy technologies. Current shortages and high costs of fossil fuels underscore the desirability of waste-to-energy compared with oil or natural gas. The largest operating waste-to-energy plant in the state is the Pinellas County Resource Recovery Facility (3,150 tons per day), followed by the Miami-Dade County Resources Recovery Facility, and Broward County's two resource recovery facilities.

The State of Florida regulates waste-to-energy plants under Chapter 403 of the Florida Statutes and Florida Administrative Code Chapter 62, which provides for the implementation of the NSPS (Subpart Eb 40 CFR 60). Under Florida law, a WTE facility must seek approval under the PPSA if the Facility will generate 75

MW or more electricity. A WTE facility that generates less than 75 MW may seek approval under the PPSA or seek individual permits. In either case, a WTE facility is subject to comprehensive and detailed review procedures to determine whether the facility will comply with all applicable local, state, and federal environmental regulations.

2.3 Non-governmental Organization Activity

Several non-governmental organizations have addressed questions regarding the utility of waste-to-energy facilities. In 2005, the U.S. Conference of Mayors (USCOM) adopted a resolution that supported the use of waste-to-energy as a component of a comprehensive solid waste disposal management strategy. The USCOM cited waste-to-energy as safe, environmentally sound, and efficient and noted significant benefits with respect to energy diversity and security in addition to the environmental benefits.

The Waste to Energy Research Council[1] (WERT) has sponsored a significant amount of research regarding the environmental, energy, and policy implications of waste-to-energy. WERT-sponsored research (published by Themelis & Millrath (2004)) reviewed the available information and concluded that waste-to-energy should be considered as a component of a renewable energy portfolio. The benefits of waste-to-energy cited by these researchers include low emissions, diversion of waste from landfilling, no impact on recycling rates, and energy generation.

2.4 Hillsborough County

Hillsborough County is located on the central west coast of Florida. The 2004 population was 1,115,960. About 2/3 of the population lives in unincorporated areas and the remainder in the incorporated cities of Tampa, Temple Terrace, and Plant City. The Hillsborough County Solid Waste Management Department (SWMD) is responsible for the operation of an Integrated Solid Waste Management System that provides for the collection, transportation, and disposition of solid waste within the County[2]. The SWMD service area consists of the unincorporated area of the County, but various services also are provided to Tampa and Temple Terrace. Facilities under the SWMD include (a) the current 1,200 ton per day waste-to-energy plant, (b) a Class I landfill, (c) two solid waste transfer stations, (d) solid waste collection, yard waste processing and community collection centers, (e) a household hazardous waste collection program, and (f) a waste tire processing program. In addition, the County operates several recycling programs, including drop-off recycling centers and programs for used oil recycling, scrap metal recycling, lead acid battery recycling, and waste reduction.

[1] www.columbia.edu/cu/wtert
[2] www.hillsboroughcounty.org/solidwaste/disposition/home.cfm

The current waste-to-energy plant, known as the Hillsborough County Resource Recovery Facility (RRF), has been in operation since October 1987. The facility has 39 MW of electrical generating capacity and has a daily power output of about 29 MW (equivalent to the amount of electricity generated with 1,200 barrels of oil). Air pollution control equipment currently used at the plant consists of (a) a spray dryer absorber (SDA) to remove large particles, sulfur dioxide and acid gases, (b) a fabric filter (FF) to remove small particles, (c) an activated carbon injection (ACI) system to remove mercury, and a selective non-catalytic reduction (SNCR) system to reduce nitrogen oxide (NOx) emissions. Continuous monitors installed at the outlet of the boilers and inlet to the FFs are used to ensure proper combustion conditions and operation of emission controls.

The proposed RRF expansion project will increase the MSW processing capacity to 1,800 tons per day and the electrical generation capacity to 47 MW. Air pollution control equipment for the proposed fourth MWC unit will be similar to that used in the existing 3 MWC units: SDA, FF, ACI, and SNCR, in conjunction with continuous emission monitors. One notable exception is that the proposed fourth unit will use an "enhanced" SNCR system that will be capable of controlling NOx to lower levels than the existing three units. Section 3 of the PPSA application and the County's PSD application discuss these devices in greater detail and demonstrate that these systems reflect best available control technologies (BACT). Section 6 of the PPSA application demonstrates that the new MWC unit, as well as the proposed four-unit facility, will comply with the emissions requirements of the NSPS. Given these facts, it is anticipated that the facility will be able to meet EPA's environmental and public health goals with respect to pollutant emissions.

3.0 HUMAN HEALTH AND ENVIRONMENTAL IMPACTS OF WASTE-TO-ENERGY

A number of health studies and risk assessments have been conducted for waste combustion facilities. Arguably, the most important of these studies was the National Academy of Sciences/National Research Council's report on waste incineration and public health (NAS/NRC 2000) which reviewed all of the information then available on potential associations between incinerator emissions and public health[3]. Other studies, including numerous human health and environmental risk assessments have been conducted on specific facilities. These studies indicate that stack emissions from a modern MSW waste-to-energy plant regulated under the NSPS will not cause adverse health effects if it is designed and operated in accordance with current state and federal regulations. This section presents information from the scientific literature regarding potential environmental and health impacts associated with waste-to-energy plants and other waste combustion facilities.

3.1 Environmental Studies at Waste-to-Energy Plants

Monitoring studies have been conducted around numerous waste-to-energy plants and these have shown that emissions from a modern facility do not produce measurable changes in environmental chemical concentrations or the levels of chemicals in animal tissues. Samples have been collected from ambient air, soil, cow's milk, vegetation, and human blood and milk.

The EPA conducted an intensive study of ambient air quality in the area of a 240 ton per day waste-to-energy plant in Rutland, Vermont (EPA 1991). Ambient air monitoring locations for dioxins and particulate matter were selected based on wind patterns in the facility area and air dispersion modeling. The EPA concluded from the monitoring results that the facility was not the primary source of dioxins in ambient air in the vicinity of the facility. The study also found no correlation between the amount of waste combusted and ambient air particle concentrations.

Soil sampling for dioxins was conducted by scientists from the Ontario Ministry of Environment in the vicinity of a municipal solid-waste combustor in Hamilton, Ontario (McLaughlin et al. 1989). The soil sampling, conducted after 10 years of facility operation, was initiated due to airborne dioxin emissions in excess of Provincial guidelines. The 14 soil samples included 3 control sites and the predicted point of maximum impact. The authors concluded that there was no measurable change in surface soils in the plant vicinity as a result of stack emissions.

[3] This report dealt with hazardous waste and medical waste incineration in addition to MSW combustion.

Scientists from Cornell University and the Horticultural Research Institute of Ontario analyzed vegetation around a municipal solid waste combustor for metals and PCBs (Bache et al. 1991). The incinerator had been in operation for approximately 7 years prior to sample collection. Statistical analyses of the sampling results indicated that PCBs and 5 of the 6 metals evaluated, including mercury, were not significantly higher than background concentrations.

The Connecticut Agricultural Experiment Station analyzed cow's milk samples for chlorinated dibenzodioxins and furans near a new waste-to-energy plant before and 1 year after the facility went into operation (Eitzer 1995). The data showed no statistically significant differences between pre-operational and post-operational concentrations.

The State of Massachusetts conducted a study of metal concentrations in soil around the SEAMASS waste-to-energy plant in Rochester after the facility had been operating for several years (MDEP 1996). The combustor's emissions had no detectable effect on mercury concentrations in either air or soil around the facility.

Scientists from the Institute of Toxicology in Germany collected samples of blood and human milk from persons living 8 or more years in the vicinity of a municipal solid waste combustor that had been in operation for 13 years (Deml et al. 1996). The authors concluded that living in the vicinity of the incinerator did not result in a higher body burden for dioxins and furans.

The topic of global climate change has emerged as an important environmental issue of the 21st Century. In essence, scientists believe that increased emissions of greenhouse gases associated with human activity may result in changes in the earth's climate. The most discussed consequence of this is the phenomenon of global warming – i.e., the temperature of the atmosphere will increase to the extent that there could be impacts to both the human and natural environments. Human impacts could range from a rise in coastal waters to a shift in the ability of various regions to produce crops. The potential impact of waste to energy on greenhouse gas emissions relative to other waste management activities such as landfilling has been evaluated by several scientists (Batchelor et al. 2002, Eschenroeder 2001, Thorneloe et al 2002). These studies show that waste-to-energy is associated with a reduced environmental impact compared to landfilling when potential effects on the global climate are concerned. There are several reasons for this result, however, the most significant reasons are the fact that waste-to-energy plants emit carbon dioxide, which has less of an impact on global climate than the methane emitted from landfills, and that waste-to-energy displaces the need to generate electricity from fossil fuels.

An alternative mode of evaluating health and environmental impacts is through life cycle analysis (LCA). LCA looks at the entire life cycle of a product or

process. For example, it could be used to compare recycling, waste-to-energy, and landfilling for the management of different components of MSW such as paper, various plastics and other materials. Although full scale LCAs have not been performed for MSW, the available data (Dewuld & van Langenhove 2002) suggest that waste-to-energy is similar to recycling with respect to the energy impacts of the life cycle of combustible materials.

3.2 Epidemiologic Studies

Researchers at the University of North Carolina studied whether living near waste combustion plants increases the occurrence of respiratory health effects (Shy et al. 1995). The study focused on people living near a biomedical waste incinerator, a waste-to-energy plant, and an industrial furnace fueled by liquid waste. The authors concluded that there was no difference in acute or chronic respiratory symptoms or lung function between the communities living near the waste combustors and the comparison communities. The also concluded that particle and acid gas emissions from the three waste combustors contributed trivial amounts to air concentrations in adjacent neighborhoods. In a follow-up study (Hu et al. 2001), the authors again found no significant associations between exposures for any of the waste combustion facilities and lung function tests. One result for the waste-to-energy facility did show a statistically significant relationship for lung function but this result was only observed for one of the three years of the study and when using only one of the four different types of exposure estimation methods.

The National Academy of Sciences (NAS/NRC 2000) evaluated available epidemiological data regarding waste incineration and health effects in surrounding communities and concluded that waste combustion facilities that are in compliance with EPA's Maximum Achievable Control Technology (MACT) requirements pose minimal or negligible risks to surrounding communities. NAS also noted that for modern, well-controlled waste combustors, risk assessments show that potential cancer effects even for the most highly exposed persons in the surrounding areas are generally small to negligible.

Two recent health studies have been published in Europe. Although European standards for waste-to-energy plants are similar to those in the United States, there are differences with respect to the implementation dates, methods of calculating the emissions, and the emission levels themselves. Thus, the European studies should be used only in a supporting or confirmatory sense to the U.S. studies. Rabl and Spadaro (2002) reviewed the potential for human health and environmental impact assuming all MSW was incinerated under the new European regulations that were promulgated in December 2000. These authors looked at several different indicators of environmental performance including:

- Increase in chemical concentration compared to background,

- Increase in chemical concentration compared to health guidelines,
- Health risks of various pollutants compared to each other,
- Increased damage cost (monetary value of health impacts) compared to the cost of incineration itself,
- Difference in emissions compared to other emission sources, and
- Difference in years of life lost due to MWCs compared to other risks of everyday life.

They concluded that the health impacts of MSW incinerators were insignificant using any of these comparisons as long as the European standards were met.

Enviros/University of Birmingham (2004) undertook a systematic review of epidemiological studies of the public health effects of waste incinerators. Specifically, these investigators looked at evidence for ill-health in people who might possibly be affected by emissions from MSW processes. They concluded that health effects in people living near waste management facilities were either generally not apparent or the evidence was not consistent or convincing.

3.3 Recent Environmental Monitoring Studies

Detailed environmental monitoring studies have been undertaken at two Covanta waste-to-energy facilities – the Montgomery County facility in Dickerson, Maryland, and the Union County facility in Rahway, New Jersey. Since Covanta operates the Hillsborough County RRF, the information gained from these studies can yield useful insights about Covanta's operations and the Hillsborough County facility.

The Montgomery Country facility consists of three 600 TPD combustion units. The air pollution control equipment and electrical generating capacity of the Montgomery County facility are similar to those at the Hillsborough County facility. Each unit has a separate flue and is equipped with a dry scrubber and fabric filter baghouse, direct lime injection into the furnace, ammonia injection at the top of the furnace, and activated carbon injection at the scrubber inlet (Rao et al. 2003). The Montgomery County facility has been operating since 1995. Although the population of Montgomery County is approximately 800,000 people, the land use around this facility is semi-rural, and includes residential units, agricultural (including dairy) operations, and fishery resources. Roy F. Weston, Inc. was contracted by Montgomery County to conduct an ambient air monitoring study (Weston 1998) and a non-air monitoring study (Weston 2000).

Weston (1998) evaluated both air toxics and meteorologic data before the facility went into operation (pre-operation) and after the facility had been operating for approximately two years (post-operational). Air toxics monitoring included dioxins/furans, polycyclic aromatic hydrocarbons, polychlorinated biphenyls, formaldehyde, arsenic, cadmium, chromium, lead, mercury, and nickel. Particulate matter was also monitored. Numerous long-term and short-term

measurements were obtained. The number of post-operational measurements ranged from 20 for PCBs to 79 for dioxins and furans. The primary monitoring site was situated near the maximum point of annual ground-level air and dry deposition concentrations, as predicted by air dispersion/deposition modeling. Weston concluded that no major differences in air quality were observed at any operating sites when pre-operational and post-operational measurements were compared. Additionally, Weston concluded that the facility did not have a significant impact on air quality in the surrounding region.

The non-air media report (Weston 2000) evaluated chemical concentrations in soil, earthworms, cow's milk, forage/hay, vegetables, surface water and sediment, and fish tissue. The monitoring locations were selected based on local meteorology, air modeling, and the results of a human health risk assessment. Pre-operational sampling was conducted in 1994 and post-operational sampling was conducted in 1996 and 1998. The samples were analyzed for dioxins/furans, PAHs, PCBs, arsenic, beryllium, cadmium, chromium, lead, mercury, and nickel. The results showed that there were no statistically significant or consistent patterns detected between the pre-operational and post-operational phases of the study. Many of the environmental media sampled during the post-operational phase had concentrations approximately equivalent to or less than the pre-operational conditions. In some media, the concentrations increased; however, the investigators felt that this change was a reflection of scientific uncertainty rather than an actual impact. The study concluded that the operation of the facility had not caused unacceptable increases in target compound concentrations.

The Union County, New Jersey facility is a 1,440 TPD resource recovery facility that has been operating since 1994 in Rahway. The land use around the facility is highly industrial, dominated by heavy industry and transportation uses. The Union County Utilities Authority contracted with Paulus, Sokolowski and Sartor, Inc. (PSS) and HDR Environmental Engineering, Inc. (HDR) to conduct on-going monitoring studies in the air and other media around this facility (PSS 1993, PSS 1997, HDR 1998). As with the Montgomery County facility, these studies consisted of both pre- and post-operational monitoring. The chemicals of potential concern included PCBs, dioxin (2,3,7,8-TCDD), arsenic, beryllium, cadmium, chromium, lead, mercury, and nickel. In addition to ambient air, soil, sediment, surface water, food crops (lettuce, radishes, tomatoes) and fish have been evaluated periodically, both pre- and post-operationally. The post-operational data show that the chemicals of potential concern are present at levels consistent with those anticipated for an urban industrial environment. Additionally, the reports suggest that the post-operational samples are consistent with the pre-operational samples. This program is continuing.

The results of these two recent studies, based on operating Covanta facilities similar to the Hillsborough County RRF, show that the RRF facilities do not cause any discernable impact on the local environment with respect to the chemicals

that are considered to be the most significant trace components of waste-to-energy emissions. These results are consistent with the results that are reported elsewhere in the literature. They suggest that similar results would likely be obtained in Hillsborough County.

3.4 Risk Assessments

Risk assessments are formal scientific evaluations of information regarding the potentially hazardous effects of exposure to chemicals in the environment. Risk assessments of waste-to-energy facilities are often used to determine if these facilities are capable of meeting regulatory or statutory goals with respect to protection of human health and the environment. Although risk assessments of waste-to-energy plants have been performed for several decades, they have become standardized since the early 1990s (Hattemer-Frey & Travis 1991, CARB 1990). This standardization allows risks associated with different regulatory schemes and air pollution control technologies to be extrapolated from plant to plant. Most recently, risk assessors have further standardized the process by relying on EPA guidelines for performing hazardous waste incinerator risk assessments (EPA 1998a). These assessments are based on a highly standardized approach that allows regulators to readily use their results to make environmental health decisions.

The results of recent comprehensive risk assessments conducted for the waste-to-energy facilities in Montgomery County, Maryland, the City of Spokane, Washington, and Lee County, Florida, also provide insight into the potential risks associated with the Hillsborough County facility (Rao et al. 2003, Pioneer 2001, Clement 1992, CPF 2002). These risk assessments are pertinent because these facilities are state-of-the-art plants operated in accordance with the NSPS, as is the Hillsborough County facility.

3.4.1 Montgomery County, Maryland

The Montgomery County facility risk assessment relied on measured stack emission rates since 1995 and on-site meteorological data to calculate potential risks through multiple exposure pathways for 19 selected chemicals of potential concern, including PCDD/PCDFs and mercury. As noted above, this facility is operated by Covanta and it has similar electrical generating capacity and equipment as the Hillsborough facility. Risks for the Montgomery County facility were calculated for a typical resident at two maximum impact locations, as well for a subsistence farmer, a subsistence fisherman, and a pond fishing scenario. The excess lifetime cancer risks were calculated to range from 14 to more than 400 times less than the one in 100,000 (1E-5) target cancer risk level. The predominant compounds contributing to the cancer risks were PCDDs/PCDFs. The non-cancer hazard index values were calculated to be equivalent to or below a target hazard index value of 1, with mercury accounting for the majority of the risk results. Based on the risk assessment, it was concluded that no adverse

non-cancer health effects are expected, and that cancer risks are lower than 1 in one million, as a result of exposure to facility-related emissions (Rao et al. 2003).

3.4.2 Spokane, Washington

The Spokane, Washington facility is comprised of two MWC units, each capable of managing roughly 800 TPD of municipal solid waste. The air pollution controls on each unit consist of lime slurry spray dryer absorbers followed by fabric filter baghouses. A carbon injection system also is used. An anhydrous ammonia, thermal DeNox, selective non-catalytic system is also used for nitrogen oxides control.

The risk assessment utilized 10 years of measured emissions data to calculate potential risks through multiple exposure pathways at a maximum off-site impact point. Risks were evaluated at this point for a typical resident, a subsistence farmer, a subsistence fisher and infants. The results were determined to be below Washington state target risk levels (i.e., a non-cancer hazard index below 1 and an excess lifetime cancer risk below one in one hundred thousand). The predominant chemicals contributing to the non-cancer risk results were hydrogen chloride via inhalation and methyl mercury via ingestion of fish. The predominant compounds contributing to the cancer risks were PCDDs/PCDFs due to ingestion of animal products.

3.4.3 Lee County, Florida

The risk assessment performed for the Lee County Solid Waste Energy Recovery Facility (ERF) is particularly relevant to the proposed Hillsborough RRF expansion for a number of reasons. There are similarities between these two facilities in waste stream composition, emission controls, land use, climate, and state regulatory programs. In addition, the Lee ERF project involved a 600 TPD expansion of an existing facility, unlike the Montgomery County or Spokane projects, which were newly constructed. In addition, the Lee County and Hillsborough County combustion facilities are both operated by Covanta. These similarities mean that the Lee County risk assessment, which will be presented in the remainder of this section, is uniquely applicable to the Hillsborough County project and can indicate the likelihood of potential risks associated with the Hillsborough County proposal.

Municipal solid waste from Lee County and Hendry County is processed at the Lee County Solid Waste Energy Recovery Facility, which began operation in 1994. Lee County proposed to add a third combustion unit to the ERF to accommodate excess municipal solid waste that is being generated. A series of studies over more than a 10 year period were used in the Lee County ERF risk assessment process.

Two studies conducted in 1992 evaluated the potential human health and

ecological impacts of the currently operating Lee County ERF. These studies concluded that construction and operation of the facility would not adversely affect humans or threatened or endangered species. Lee County also initiated a biological monitoring program in 1993 to determine if operation of the facility was correlated with mercury levels in aquatic life. The program results suggest that mercury concentrations in aquatic life in the area are generally similar to the levels typical of South Florida and not associated with operation of the ERF.

The risk assessment for the expanded facility relied on air dispersion and particle deposition modeling conducted to calculate air concentrations and deposition rates associated with the proposed ERF (i.e., operation of the two existing units plus the proposed third unit). This information was then used in EPA environmental fate and transport models to calculate chemical concentrations in soil, produce, surface water, beef and fish. Air concentrations were calculated for all of the chemicals regulated under the facility's air permit. Mercury and polychlorinated dibenzodioxin and dibenzofuran (PCDD/PCDF) concentrations were calculated for the other environmental media. The model inputs included a substantial amount of local site-specific data. Overall, the models and input assumptions are expected to provide conservative (i.e., health protective) calculations of potential environmental concentrations.

The calculated environmental concentrations associated with stack emissions from the proposed three-unit Lee County ERF were compared with typical environmental levels. These comparisons showed that the environmental concentrations associated with the proposed three-unit ERF are consistent with or below typical environmental concentrations, thus the proposed expansion will not measurably increase the typical concentrations of chemicals in the environment.

The human health risk assessment was conducted following current EPA guidance and is summarized below:

- Potential human health risks were evaluated in two types of risk assessments. An inhalation risk assessment was performed for all chemicals currently regulated under the facility's air permit using permit limit-based emission rates. A more refined multiple pathway risk assessment was also performed for mercury and PCDDs/PCDFs using emission rates based on long-term stack gas measurements.

- In the inhalation risk assessment, inhalation exposures were calculated for two hypothetical groups of people, an adult resident and a child resident. In the multiple pathway risk assessment, exposures were calculated for 12 different hypothetical groups of people, including adults, children and infants. The exposure pathways considered in the multiple pathway assessment were inhalation, soil ingestion, ingestion of produce, beef and fish, and ingestion of breast-milk.

- A variety of evaluations were performed in the human health risk assessment. Chronic long-term excess lifetime cancer risks were found to be at least 10 times lower than EPA's combustion risk assessment target risk level of $1x10^{-5}$ (one in 100,000) and did not exceed Florida's common target risk level of $1x10^{-6}$ (one in 1,000,000). Chronic long-term noncancer effects were predicted not to occur, with a large margin of safety (i.e., calculated exposures were at least 10 times lower than the common regulatory noncancer target exposure levels). An analysis of short-term acute inhalation adverse effects showed that these effects will not occur with a large margin of safety (i.e., calculated short-term air concentrations were at least 100 times lower than health-based reference air concentrations).

An ecological risk assessment was also conducted in accordance with EPA guidelines and is summarized below.

- The ecological assessment focused on mercury and PCDDs/PCDFs which, among the compounds present in MSW combustion facility emissions, are expected to be of greatest potential concern to aquatic and terrestrial wildlife of the area.

- The ecological risk assessment evaluated potential impacts to wildlife species that were considered to be at greatest risk based on habitat use, exposure potential and population status. The species selected for evaluation consisted of aquatic life, the wood stork, the snail kite, the white pelican, and the river otter.

- Adverse impacts to aquatic and terrestrial wildlife were predicted not to occur, with a large margin of safety (i.e., exposures to ecological receptors were at least 10 times lower than comparison toxicity reference values).

In conclusion, the risk assessment showed that potential risks from stack emissions from the expansion of the Lee County ERF, in its proposed configuration with three combustion units, were below regulatory and other target risk levels for both human health and ecological receptors. Additionally, the environmental concentrations in air, soil, surface water, beef and fish associated with emissions from the proposed three-unit ERF facility were calculated to be consistent with or below typical environmental levels and would not measurably increase the typical concentrations of chemicals in the environment.

3.4.4 Lessons Drawn from Risk Assessments

Although there are site-specific differences among these three facilities, there are many common threads both from risk assessment and regulatory points of view. First and foremost, all three of these facilities were designed to comply with the

NSPS. All contain state-of-the art emission controls that are designed to fit the criteria for maximum achievable control technology. Since EPA's overall objective in promulgating the NSPS was protection of human health and the environment, it should be anticipated that facilities compliant with the NSPS would have a negligible environmental health impact. Second, the risk assessments show that the risks associated with operating these facilities are below risks of concern to regulatory and public health agencies. Third, the results of the risk assessments show that, although the risks are low, they are dominated by exposure to dioxins and furans as potential human carcinogens and mercury as a neurotoxin. Last, the risk assessments also show that indirect exposure pathways, such as the consumption of fish, are the most significant sources of exposure, regardless of the absolute value of the risks.

4.0 SIGNIFICANT CHARACTERISTICS OF THE PROPOSED EXPANSION

4.1 *Waste Composition*

Hillsborough County has a very aggressive recycling program and solid waste management program that reduces the introduction of unwanted materials in the solid waste at the RRF, thereby helping to reduce unwanted emissions.

The waste composition is controlled in part through programs designed to prevent unwanted materials from reaching the RRF. For example, the RRF does not accept for combustion a wide variety of wastes, including: lead acid batteries, hazardous waste, nuclear waste, radioactive waste, sewage sludge, explosives, beryllium-containing wastes, untreated biomedical waste, segregated loads of biological waste, mercury containing devices, and materials prohibited by state or federal law. The County's successful lead acid battery recycling program promotes drop-off of batteries at community collection centers in the area, and has resulted in the recycling of roughly 5,000 batteries per year. The household chemical collection program also encourages delivery of household chemicals (paints, fertilizers, etc.) at household community collection centers. Items received at the household chemical collection sites are either managed as a hazardous waste or recycled. Virtually all of the tires received in the County's waste disposal system are shredded in a waste tire processing facility and do not enter the RRF. The County's used oil recycling program consists of seven drop-off locations for use by residents, and recycles approximately 26,000 gallons of used oil per year. Roughly 1,849 tons of scrap metal are recycled per year in the County. Moreover, the County sponsors a waste reduction program through the Hillsborough County Cooperative Extension Service. The County's solid waste profile program further ensures that unacceptable waste will not enter the RRF by requiring potential customers to submit information on waste to be delivered.

At the RRF facility, waste deliveries are monitored in several ways. Access at the scale house is controlled through initial screening of solid waste deliveries, including notation of the customer and type of waste. On the tipping floor of the RRF, a County employee (spotter) inspects waste loads as they are dumped to ensure that no unacceptable items are present.

Hillsborough County manages an extensive program that collects and recycles a variety of materials, including newspaper, glass, aluminum cans, plastic bottles, steel cans, yard trash, tires, and white goods (e.g., refrigerators, dishwashers). Annually, the County recycles over 500,000 tons of solid waste. The County achieved a 32% recycling rate in 2002. The County also provides support to the not-for-profit Recycling Task Force (RTF), which coordinates county-wide recycling activities. The RTF includes representatives from the County, the cities of Tampa, Plant City and Temple Terrace, the School Board, the Cooperative Extension Service, local commercial recyclers and haulers, local businesses, environmental and civic groups, and interested citizens. Recycling not only

reduces the amount of waste requiring disposal, but also can increase the heating value of waste fed into the RRF by removing low-Btu materials from the waste stream (e.g., glass and metal).

4.2 Environmental Controls

The environmental controls in use at the Hillsborough RRF, and proposed for the County's fourth unit, are essentially identical to those in place at the Lee County RRF. These controls consist of a combination of air pollution control equipment and operating practices that reflect best available control technologies and minimize potential emissions of concern. The pollution controls at the Hillsborough and Lee County facilities include the following: spray dryer absorbers with fabric filters to remove particles, sulfur dioxide and acid gases; activated carbon injection to remove mercury; and selective non-catalytic reduction to reduce NOx emissions. The APC combination of spray dryer absorber, fabric filter and activated carbon injection have also been shown to reduce emissions of dioxins and furans.

4.3 Emissions

Emission limits have been proposed for the expanded Hillsborough RRF, as described in the County's PSD and PPSA permit applications, based on consideration of the air pollution control equipment to be used (as determined through a Best Available Control Technology (BACT) evaluation), the NSPS, experience with the existing Hillsborough combustion units, and emission limits that have been most recently specified for new municipal waste combustor units in the U.S. The MSW combustion units most recently permitted in the U.S. consist of the Camden County, New Jersey RRF (a 350 TPD unit), the Harrisonburg, Virginia RRF (a 100 TPD unit) and the Lee County, Florida RRF (a 600 TPD unit). Among these three, the new unit recently permitted at the Lee County RRF is most similar to the unit being proposed for Hillsborough and, in fact, is essentially identical with respect to operation, equipment, and general location in the U.S.

The protectiveness of the emission limits proposed for the Hillsborough facility can best be evaluated by comparison with the NSPS and the Lee County facility, which is most similar to the Hillsborough unit and the most recently permitted MSW combustion unit in the U.S. Table 4-1 presents the existing and proposed emission limits for the Lee County RRF and the Hillsborough County RRF, along with the NSPS for new MWC combustion units. As can be seen from this table, the emission limits proposed for the new MWC unit at Hillsborough are equivalent to or

Table 4-1
Comparison of Emissions Limits

Facility Name:	Lee County Waste-to-Energy Facility, FL		Hillsborough County Resource Recovery Facility, FL		NSPS Subpart Eb (40 CFR 60)	NSPS Subpart Cb (40 CFR 60.33)
Combustion Unit Type:	New 3rd Unit (291.5 MMBtu/hr)	Existing two units (275 MMBtu/hr)	New 4th Unit (250 MMBtu/hr)	Existing three units (150 MMBtu/hr)		
MSW Throughput:	600 TPD	600 TPD	600 TPD	400 TPD		
Compound	Emission Limit (c)	Emission Limit Per Unit (d)	Emission Limit (a)	Emission Limit Per Unit (b)	Emission Limit (a)	Emission Limit (e)
Particulate Matter	20.6 mg/dscm[1] (for both PM and PM10)	24 mg/dscm (0.01 gr/dscf) (for both PM and PM10)[1]	20.6 mg/dscm (0.009 gr/dscf) (for both PM and PM10)[1]	27 mg/dscm (0.012 gr/dscf)[1]	24 mg/dscm (0.01 gr/dscf)[1]	27 mg/dscm (0.011 gr/dscf)[1]
Nitrogen Oxides	110 ppmdv (12-mo rolling average)[1]; 150 ppmdv (24-hr average)[1]	180 ppmdv (24-hr average)[1]	110 ppmdv subsequent years 150 ppmdv (24-hour average)[1]	205 ppmdv[1]	180 ppmdv 1st year; 150 ppmdv subsequent years[1]	
Sulfur Dioxide	26 ppmdv or 80% control[1]	30 ppmdv (24-hr average) or 80% control[1]	20 ppmdv or 80% control[1]	29 ppmdv or 75% control[1]	30 ppmdv or 80% control[1]	31 ppmdv or 75% control[1]
Carbon Monoxide	80 ppmdv (30-day rolling avg.); 100 ppmdv (4-hr avg.)[1]	100 ppmdv (4-hr average)[1]	80 ppmdv (12-mo rolling average) 100 ppmdv (4-hr average)[1]	100 ppmdv[1]	100 ppmdv (4-hr average)[1]	
Cadmium	--		0.02 mg/dscm	0.04 mg/dscm[1]	0.02 mg/dscm[1]	0.04 mg/dscm[1]
Mercury	0.028 mg/dscm or 85% control[1]	0.07 mg/dscm or 85% control[1]; 0.0379 lb/hr	0.028 mg/dscm or 85% control[1]	0.07 mg/dscm or 85% control[1]	0.08 mg/dscm or 85% control[1] Florida limit 0.07 mg/dscm	0.08 mg/dscm or 85% control1
Lead	0.2 mg/dscm[1]	0.165 lb/hr (0.66 tons/yr)	0.2 mg/dscm[1] (0.243 tons/yr)	0.44 mg/dscm[1]	0.2 mg/dscm[1]	0.44 mg/dscm[1]
Arsenic	--	0.0025 lb/hr (0.01 tons/yr)				
Beryllium	--	3.7E-5 lb/hr (1.47E-4 tons/yr)	1.73E-4 tons/yr			
Hydrogen Chloride	25 ppmdv[1] or 95% control	25 ppmdv or 95% control[1]	25 ppmdv or 95% control[1]	29 ppmdv or 95% control[1]	25 ppmdv or 95% control[1]	
H_2SO_4	15 ppmdv[1]	9.85 lb/hr (39.3 tons/yr)	15 ppmdv[2] (74.4 tons/yr)	0.072 gr/dscf[2] or 0.2 lb/ton	--	
Hydrogen Fluoride	3.5 ppmdv[1]	5 ppmdv[1]	3.5 ppmdv[1]	6.74 ppmdv[1]	--	
PCDD/PCDF	13 ng/dscm (total)[1]	30 ng/dscm (total)[1]	13 ng/dscm (total)[1]	30 ng/dscm (total)[1]	13 ng/dscm (total)[1]	30 ng/dscm (total)[1]
Volatile Organic Compounds		37 ppmdv[1] (5.8 lb/hr, 23 tons/yr)	0.1 lb/ton, 12 tons/yr	0.2 lb/ton (or 0.01 gr/dscf[2])		
Visible Emissions						
Fugitive PM (ash)						
Metals	20.6 mg/dscm[1]					
Ammonia	50 ppmdv[1]	50 ppmdv[1]	50 ppmdv[1]	--	--	

(a) Data in this column obtained from Table 2-2, Table 2-3 and Table 3-3 of Air Permit Volume III in Hillsborough County Expansion Permit Application
(b) Data in this column obtained from Table 3-3 of Air Permit Volume III in Hillsborough County Expansion Permit Application
(c) Data in this column obtained from Table 3-1 of Air Permit Volume III in Hillsborough County Expansion Permit Application and Lee County Solid Waste Energy Recovery Facility permit (dated 10/8/2003)
(d) Data in this column obtained from Lee County Solid Waste Energy Recovery Facility permit (dated 10/8/2003)
(e) The NSPS in Subpart Cb apply to large MWC units that were constructed before December 19, 1995.

[1] Limits shown are corrected to 7% oxygen.
[2] Limits shown are corrected to 12% CO2.

-- = no limit.

more stringent than both the NSPS and permit limits in place for the additional Lee County unit. All of the proposed emission limits for the fourth unit at Hillsborough are more stringent than the comparable limits for the existing three units at the facility.

Stack test measurements collected over recent years at the existing Hillsborough facility demonstrate that emissions of the two classes of compounds of most concern to human health and the environment, dioxins/furans (PCDD/PCDFs) and mercury, are and will continue to be maintained below the facility's proposed permit limits. [4]

[4] After the retrofit of the facility in 1999, all of the stack tests for dioxin demonstrated compliance with the MACT standard. After the retrofit, the MACT emission limit for mercury was exceeded once (July 21, 1999) in Unit 3, but this event appears to be an anomaly. All of the subsequent stack tests for mercury emissions from Unit 3, including tests conducted on July 29-30, 1999, demonstrated compliance with the MACT standard. All of the stack tests for mercury emissions from the facility's other MWC units also demonstrated compliance with the MACT standard.

5.0 SITE-SPECIFIC CHARACTERISTICS OF THE FACILITY

5.1 Project Environment

The Hillsborough County RRF is located in southwest Florida, several miles east of Tampa, at 350 N. Falkenburg Road (see Figure 5-1). The area is characterized by low and level terrain and a mild and often humid climate.

5.2 Land Use

The RRF is located on a 50.4 acre site within a 353 acre tract of land (hereafter referred to as the "property") that is owned by Hillsborough County. The property includes the existing RRF and a water treatment facility, and is zoned for "Planned Development" (PD-1) to accommodate multi-use public developments, such as the RRF and the water treatment plant. The property is located within an Urban Service Area (USA) identified in the County's future comprehensive land use plan as a location where the County plans a substantial amount of urban infrastructure.

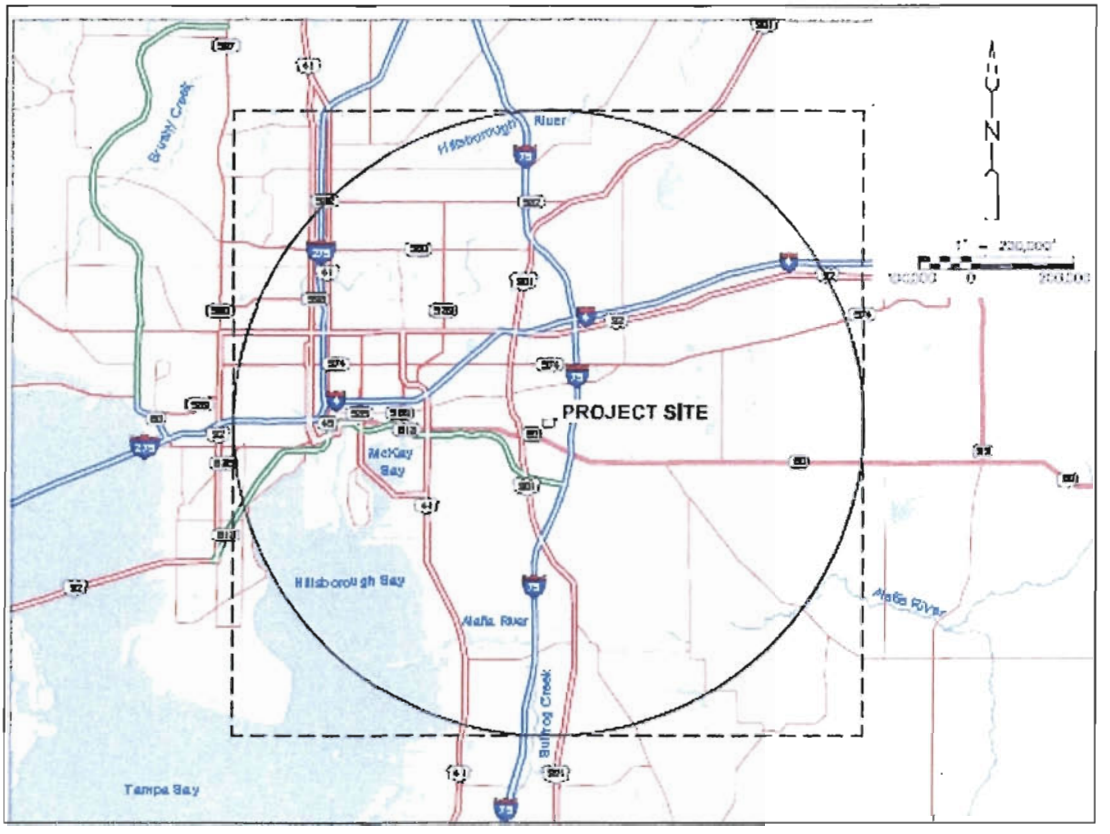
On its immediate borders, the property is surrounded to the north and west by land owned by Hillsborough County and Tampa Bay Water. To the north, on Hillsborough County property, is the Falkenburg Jail, County Animal Services and the District 2 Sheriff's office. The Seaboard System railroad borders the property to the south, a Tampa Electric Company (TECO) electrical transmission line easement borders on the west, and Falkenburg Road borders the property to the east (see Figures 5-2 and 5-3).

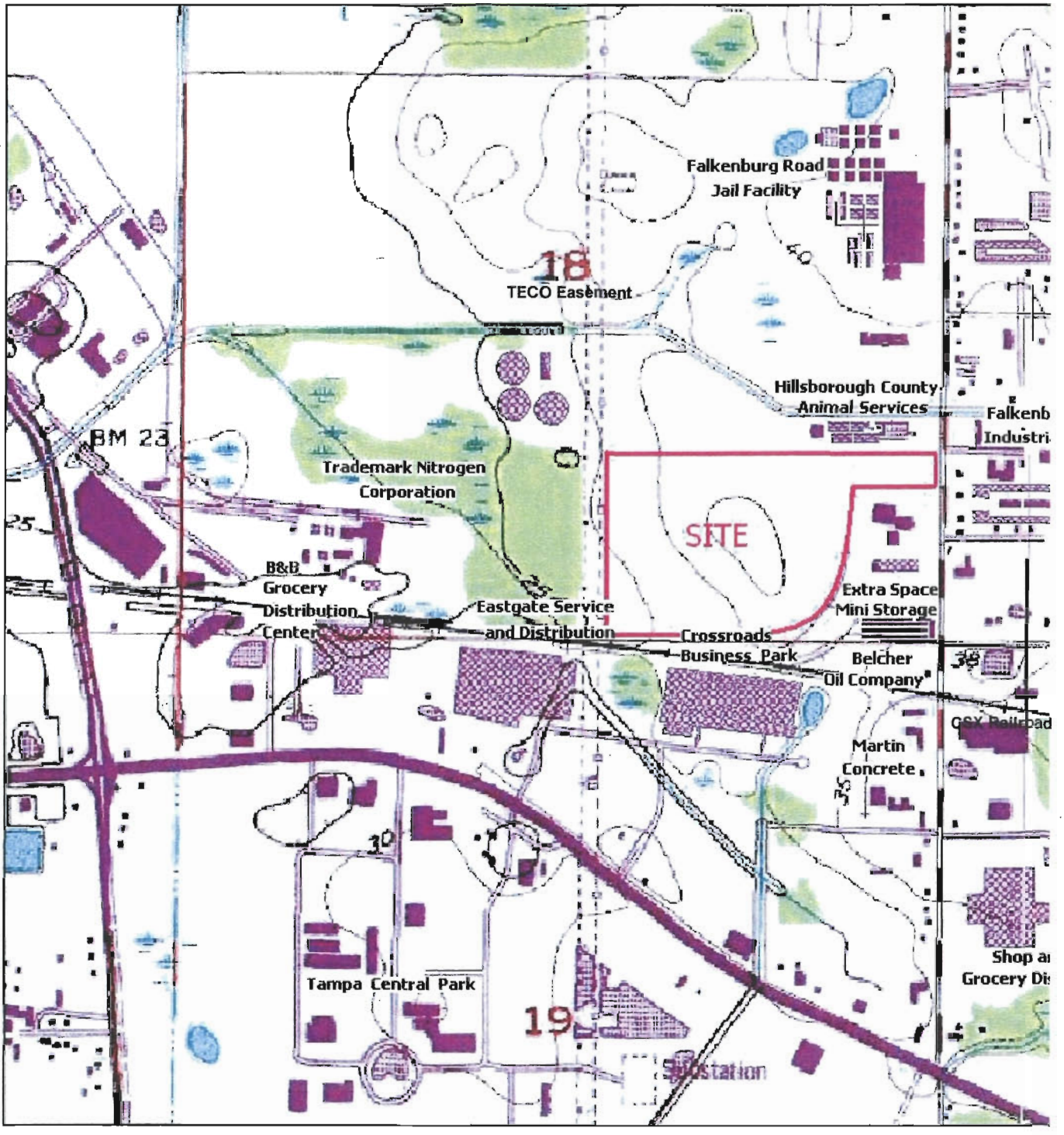
Almost all the land within 1 mile (1.6 kilometers) of the property is zoned or currently used for commercial and industrial purposes. The nearest residential area is located east of Falkenburg Road in Woodberry Estates, about ½ mile away (about 0.8 km) from the property boundary and about 0.8 miles (about 1.3 km) from the RRF. Residential development is more prevalent beyond 2 miles from the facility.

5.3 Human Receptors

The population of Hillsborough County has grown over the past decade in similar fashion to other parts of the state. The County-wide population was estimated by the U.S. census to grow by about 1% from 2000 (population 998,948) to 2004 (population 1,101,261). Based on 2000 census data, the population in census tracts partially or wholly within 5 miles of the RRF was 157,572 (about 16% of the County population). The dominant types of employment in the County include professional and business services, other services, and healthcare and social

Figure 5-1
General Facility Area





Hillsborough County
Energy Recovery Project

Figure 5-2
Facility Location

N

Scale
0 1500'

Hillsborough County Energy Recovery Project

Figure 5-3
Aerial Photograph of Site

Aerial Taken (11/2003)

assistance, accounting for about 23%, 23% and 9%, of the workforce, respectively. Roughly 2% of the labor force is employed in agriculture, natural resources and mining.

As noted above, most of the land in the facility vicinity is zoned, or used, for commercial and industrial activities. Residential areas do not occur within about 0.8 miles from the RRF and are limited in extent within 2 miles. In addition to residential, commercial and industrial land uses, County land is used for agricultural purposes. According to the Florida Agricultural Statistics Service, there were about 2,900 farms in Hillsborough County in 2002, down 19% from the number present in 1997. The highest market value agricultural commodities in the County in 2002 were fruits/berries. The top livestock type was cattle and the top crop item was oranges, a predominance that also applies to Lee County, Florida. A driving/windshield survey was conducted within an 8-mile radius of the Hillsborough RRF to determine the specific types of agricultural and livestock land uses in this part of the County. The windshield survey identified a variety of agricultural and livestock land uses, consisting of cattle grazing at 17 locations, two dairy farms, 23 orange groves, nine strawberry farms and one tomato farm. Cattle grazing was observed in various locations to the south, northwest and north of the facility at least 4 miles away. The orange groves and strawberry farms were only to the north and northeast of the facility and at least 4 miles away. The two dairy farms were further from the facility than the cattle grazing areas, located 5.7 miles to the south-southwest and 5.3 miles to the north. The tomato farm was located about 8 miles to the northeast of the facility. Home gardens may also be maintained by residents in the County.

Fishing is a popular activity in Florida, including Hillsborough County. In general, fishing may occur in rivers, canals, lakes and ponds. The water bodies closest to the RRF that may be used for fishing include the Hillsborough River, Palm River, Six Mile Creek (which flows into Palm River), the Alafia River, a variety of lakes including Woodbury, Gornto, Chapman, and Tenmile, and ponds scattered throughout the facility area. Fishing is prohibited in the Tampa Bypass Canal, which flows into Six Mile Creek.

Groundwater is used for domestic, industrial, irrigation and public water supply purposes in the County. Roughly two dozen municipal supply wells draw groundwater from areas within 5 miles of the facility; the nearest of these wells is about 1.5 miles east of the RRF facility. The majority of the wells draw from the deep Floridan aquifer with a much smaller percentage using water from the surficial aquifer. In most areas of the County, including the RRF facility vicinity, the surficial aquifer is underlain by a clay layer that separates the surficial aquifer from the Floridan aquifer.

5.4 Ecological Receptors

A detailed description of the ecology and vegetation in the RRF facility area is provided in Volume I of the PPSA application. The following paragraphs provide a brief summary of the information in the PPSA application.

There are no federally-designated wildlife refuges or critical habitats within 5 miles of the RRF site. While portions of the site appear to be within the habitat range of federally-listed species, including the Florida golden aster and wood stork (endangered), and the bald eagle, eastern indigo snake and Florida scrub jay (threatened), critical habitats have not been defined within the facility area for any of these species. Appendices to the PPSA application list wildlife species in various habitats in the general facility area. Species discussed in some detail in the PPSA application that are common to Hillsborough County and southwest Florida include the bald eagle, the burrowing owl, the Florida sandhill crane, the Southeastern American kestrel, a variety of wading birds, American alligators, gopher tortoises, Sherman's fox squirrel, the Florida scrub jay and the black bear. The PPSA application indicates that the proposed project would not create conflicts with any species listed by the U.S. Fish and Wildlife Service and the Florida Game and Fresh Water Fish Commission, nor would it have any effects on area ecology. The impact assessment in the PPSA application also concludes that the RRF expansion project will not have impacts on existing non-aquatic species populations, relative abundance, species composition, distribution or dominance, or gradient distribution.

A detailed description of vegetation and land uses in the facility area is provided in Volume I of the PPSA application. As noted in that document, there are no natural wetlands located within the facility site, although there are two conveyance ditches along the northern and eastern boundary. These ditches are highly disturbed and contain predominantly nuisance species, but they do meet the regulatory definitions for wetlands. The conveyance ditches connect on-site retention ponds with outflow ditches off-site.

6.0 RISK ASSESSMENT

This section presents a description of the methods used for, and results of, a risk assessment of the proposed Hillsborough RRF. The risk assessment was composed of two parts, a multiple pathway human health risk assessment and an ecological evaluation of the potential impacts of facility emissions. The risk assessment evaluated the potential impacts of the RRF with all four MWC units in operation on a continuous basis (8760 hours per year).

6.1 Multiple Pathway Human Health Risk Assessment

A multiple pathway risk assessment was conducted for the proposed expansion of the Hillsborough RRF, focusing on mercury and PCDDs/PCDFs, the compounds that, as discussed earlier in this report, have been shown to dominate the results of other solid waste combustion facility risk assessments. This assessment for Hillsborough County RRF was conducted according to guidance recommended by EPA (1998a) and it followed the same multiple pathway risk assessment methodology applied in the Lee County RRF risk assessment (CPF 2002).

6.1.1 Hazard Identification

The risk assessment evaluated the potential for long-term chronic risks, both excess lifetime cancer risks and the potential for noncancer effects. Toxicological criteria for both cancer and chronic noncancer effects were compiled for mercury and PCDDs/PCDFs from EPA's Integrated Risk Information System (IRIS) and other sources cited in EPA's guidance for risk assessments of hazardous waste combustors (EPA 1998a). These criteria are presented Table 6-1.

6.1.2 Exposure Assessment

Based on a review of local land use information, discussed above, and regulatory guidance, a set of hypothetical exposure pathways was identified for evaluation in the risk assessment. The matrix of pathways is shown in Table 6-2. It addresses several general receptors (adults, children, and infants), different categories of behavior (typical resident, beef farmer, and fisher), and a number of routes of exposure (inhalation, soil ingestion, produce ingestion, fish ingestion). Each adult or child receptor was hypothesized to be simultaneously exposed through multiple pathways (e.g., the child resident was exposed via inhalation, soil ingestion, and ingestion of locally-grown produce). Each adult receptor was also assumed to be the mother of a breast-fed infant.

The information needed to calculate exposures through each of these pathways includes environmental concentrations in ambient air, soil, produce, beef and

Table 6-1
Chronic Toxicity Criteria for the Hillsborough County Facility Project

Chronic Oral and Inhalation Toxicity Criteria

	Non-Cancer Toxicity Criteria					Cancer Toxicity Criteria				
Chemical	Chronic Oral Reference Dose (mg/kg/day)	Chronic Inhalation Reference Concentration (mg/m^3)	Safety Factor (oral/ inhalation) (a)	Toxicological Endpoint (oral/ inhalation)	Reference Dose/ Concentration Source	Oral Cancer Slope Factor $(mg/kg/day)^{-1}$	Inhalation Cancer Unit Risk Factor $(ug/m3)^{-1}$	Tumor Type or Target Tissue (oral/ inhalation)	USEPA Weight of Evidence (b)	Slope Factor and Unit Risk Source
Mercury										
Divalent (c)	3.0E-04	3.0E-04	1000 / 30	immunological / neurological	IRIS	NA	NA	NA	C	IRIS
Elemental	--	3.0E-04	-- / 30	-- / neurological	IRIS	NA	NA	NA	D	IRIS
Methyl	1.0E-04	--	10 / --	neurological & developmental / --	IRIS	NA	NA	NA	C	IRIS
PCDDs/PCDFs (as 2,3,7,8-TCDD)	NA	NA	--	--	--	1.5E+05	3.3E+01	liver	B2	EPA 1998/ EPA 1999

Notes:
NA = Not applicable
-- = No data available
IRIS = Integrated Risk Information System (10/2002)

EPA 1998 = U.S. Environmental Protection Agency. 1998. Human Health Risk Assessment Protocol for Hazardous Waste Combustion Facilities. Peer Review Draft. Solid Waste and Emergency Response. EPA 530-D-98-001A. July 1998.

EPA 1999 = U.S. Environmental Protection Agency. 1999. Errata to the 1998 Human Health Risk Assessment Protocol for Hazardous Waste Combustion Facilities. Memorandum from B. Johnson, Economics, Methods and Risk Analysis Division. August 2, 1999.

(a) Safety factors are the products of uncertainty factors and modifying factors. Uncertainty factors used to develop reference doses generally consist of multiples of 10, with each factor representing a specific area of uncertainty in the data available. The standard uncertainty factors include the following:
A 10-fold factor to account for the variation in sensitivity among the members of the human population; a 10-fold factor to account for the uncertainty in extrapolating animal data to humans; a 10-fold factor to account for uncertainty in extrapolating from less than chronic NOAELs to chronic NOAELs; and a 10-fold factor to account for the uncertainty in extrapolating from LOAELs to NOAELs. Modifying factors are applied at the discretion of the reviewer to cover other uncertainties in the data.

(b) USEPA Weight of evidence classification scheme for carcinogens:
A--Human Carcinogen, sufficient evidence from human epidemiological studies; B1--Probable Human Carcinogen, limited evidence from epidemiological studies;
B2--Probable Human Carcinogen, inadequate or no evidence from epidemiological studies and adequate evidence from animal studies;
C--Possible Human Carcinogen, limited evidence in animals in the absence of human data; D--Not Classified as to human carcinogenicity; and E--Evidence of Noncarcinogenicity.

(c) The inhalation RfC for elemental mercury was used for divalent mercury per USEPA 1998 guidance (which recommends this practice due to lack of available toxicity data).

Table 6-2
Exposure Pathways and Receptors
Considered in the Hillsborough Multiple Pathway Risk Assessment

Exposure Pathway	Receptor				
	Adult and Child Resident	Adult and Child River Fisher	Adult and Child Pond Fisher	Adult and Child Beef Farmer	Breast-Fed Infant (a)
Inhalation	✓	✓	✓	✓	
Incidental Soil Ingestion	✓	✓	✓	✓	
Ingestion of Locally-Grown Produce	✓	✓	✓	✓	
Ingestion of Fish from Palm River		✓			
Ingestion of Fish from Typical Pond			✓		
Ingestion of Locally-Raised Beef				✓	
Ingestion of Breast-milk					✓

(a) A breast-fed infant exposure to PCDD/PCDFs was evaluated for each adult receptor consistent with EPA (1998a) guidance.

fish. The methods used to calculate these concentrations were based on EPA fate and transport models and were the same as those used for the Lee County RRF risk assessment (CPF 2002). In general, these methods involve combining air dispersion and deposition modeling results and emission rates with EPA fate and transport algorithms. The fate and transport algorithms used to calculate concentrations of mercury and PCDDs/PCDFs in air, soil, produce, and beef were obtained from EPA (1998a) guidance for combustion risk assessments. The algorithms used to calculate PCDD/PCDF concentrations in fish were also from EPA (1998a) guidance. However, the algorithms used to calculate mercury concentrations in fish were obtained from EPA's refined mercury model (IEM-2M). IEM-2M models individual chemical species of mercury and, unlike the default approaches in EPA (1998a), includes specific transformation rates affecting mercury compounds in soil, water and sediments. The IEM-2M model was developed by EPA, applied in EPA's Mercury Report to Congress, and used by the Agency in developing the MACT rule for waste combustors (EPA 1997, 1999a, Lyon et al. 1998). The IEM-2M model has also been used for numerous waste combustion facility risk assessments in the United States.

Air dispersion and deposition modeling provides the information necessary to calculate ambient air concentrations and deposition rates for the selected chemicals of concern, which are in turn used in the fate and transport modeling. Dispersion and deposition modeling for the Hillsborough RRF was performed by CDM for the proposed four-unit facility. CDM performed the modeling using EPA's Industrial Source Complex Short-Term (ISCST) model. The model was applied across a 20 km-by-20 km modeling domain with the facility stack at its center. The ISCST modeling was conducted using a unitized emission rate of 1 g/sec, which produced two types of unitized results - air concentrations in $\mu g/m^3$ per 1 g/sec and deposition rates in g/m^2-sec per 1 g/sec. The unitized modeling results used in the risk assessment for each exposure pathway are presented in Table 6-3. A more detailed description of CDM's modeling is provided in the PPSA and PSD applications.

Chemical-specific ambient air concentrations and deposition rates were then calculated by multiplying the unitized ISCST modeling results by the chemical-specific emission rates. CDM developed emission rates for mercury and PCDDs/PCDFs for the proposed four-unit facility based on stack gas concentrations measured in 2000-2002 from the existing facility (see Table 6-4). Emission rates were based on average stack gas concentrations, instead of permit limits, to more accurately reflect long-term operating conditions and thus allow a more refined estimate of potential long-term risks.

Table 6-3
Unitized Long-Term Average Air Concentrations and Deposition Rates Modeled for the Hillsborough County Energy Recovery Facility Risk Assessment (Combined Impacts of Existing and Proposed Units)

Receptor and Location	Input Modeling Data for Multiple Pathway Risk Assessment (a)						Modeling Area or Location
	Vapor Phase Air Concentration [($\mu g/m^3$)/(1 g/sec)] (Cyv or Cywv)	Particle Phase Air Concentration [($\mu g/m^3$)/(1 g/sec)] (Cyp)	Wet Deposition from Vapor [(g/m^2-yr)/(1 g/sec)] (Dywv or Dywwv)	Dry Deposition from Particle - Surface Area weighted (e) [(g/m^2-yr)/(1 g/sec)] (Dydp)	Wet Deposition from Particle - Surface Area weighted (e) [(g/m^2-yr)/(1 g/sec)] (Dywp)	Combined Wet and Dry Deposition from Particle - Surface Area weighted (e) [(g/m^2-yr)/(1 g/sec)] (Dytwp)	
Surface Water Locations							
Pond Watershed Area	0.0048	0.0051	0.0035	0.000048	0.00196	0.0020	Average calculated across several km area surrounding the stack within the modeling domain and beyond the property boundary. (b)
Palm River Watershed Area	0.0055	0.0058	0.0050	0.000051	0.0026	0.0026	Average calculated across Palm River watershed area within the modeling domain and beyond the property boundary.
Maximum Impact Point							
Maximum deposition impact point - assumed farm & residence	0.000005	0.000005	0.13	0.000005	0.057	0.057	Maximum model results were identified within the modeling domain, beyond the property boundary and excluding nearby industrial and commercial zoned areas, at 0.3 km (0.2 miles) north of the stack. Note that there is no farm or residential use currently at this location. (c)
Cattle Grazing Location							
Beef cattle grazing area	0.0031	0.0034	0.0013	0.00003	0.00092	0.00094	Average calculated by CDM across a nearby area used for cattle grazing, and also located within the modeling domain and beyond the property boundary. (d)

(a) The dispersion and deposition modeling was performed and analyzed by CDM. The results reflect the combined impact of the County's three existing municipal solid waste combustion units in addition to the proposed fourth combustion unit. The listed model results are annual averages based on 1988 meteorological data because maximum total deposition rates (which have a greater impact on potential risks than air concentrations) occurred for 1988 data, out of the five years that were modeled (1986-1990), for receptors beyond the property boundary and excluding nearby commercial and industrial zoned areas. Meteorological data used in the modeling was obtained from Tampa International Airport (National Weather Service Station #12842).

(b) The pond area includes a range of typical ponds in the facility area.

(c) The listed values are based on the maximum impact point for total deposition rates, which occurs roughly 0.3 km (0.2 miles) to the north of the stack. Maximum values for air concentrations and dry deposition occur at a different location than these values, at roughly 2.5 km (1.3 miles) west of the stack.

(d) The grazing area is located roughly 7 km (4.3 miles) north-north-west of the facility and was identified based on a drive-through land use survey performed by CDM. Modeling results for 1988 (the maximum total deposition rate year) were lower for other areas used for grazing that were also identified during the land use survey.

(e) Surface area weighted means that the particle size distribution used in the ISCST modeling was weighted based on particle surface area. This treatment of particle size data in ISCST modeling is recommended for mercury and PCDDs/PCDFs by USEPA (1998).

Table 6-4
Chemical Emission Rates Used in the Multiple Pathway Risk Assessment for the Hillsborough County Facility (Emission Rates Based on Stack Test Measurements)

Chemical	Chemical Emission Rate (Existing and Proposed Units Combined) (g/sec) (a)
Mercury	
Total mercury	8.63E-04
Total mercury: locally available (b)	2.16E-04
Divalent (vapor phase): locally available (c)	1.76E-04
Divalent (particulate phase): locally available (c)	3.11E-05
Elemental; locally available (c)	5.18E-06
PCDDs/PCDFs (d)	
2,3,7,8-TCDD	3.72E-10
1,2,3,7,8-PeCDD	1.45E-09
1,2,3,4,7,8-HxCDD	1.79E-09
1,2,3,6,7,8-HxCDD	6.11E-09
1,2,3,7,8,9-HxCDD	4.20E-09
1,2,3,4,6,7,8-HpCDD	6.20E-08
OCDD	1.54E-07
2,3,7,8-TCDF	3.09E-09
1,2,3,7,8-PeCDF	4.97E-09
2,3,4,7,8-PeCDF	6.08E-09
1,2,3,4,7,8-HxCDF	5.52E-09
1,2,3,6,7,8-HxCDF	6.11E-09
2,3,4,6,7,8-HxCDF	7.39E-09
1,2,3,7,8,9-HxCDF	1.73E-09
1,2,3,4,6,7,8-HpCDF	1.65E-08
1,2,3,4,7,8,9-HpCDF	3.03E-09
OCDF	7.11E-09
Total for 2,3,7,8-PCDDs/PCDFs	2.91E-07
Total for all PCDDs/PCDFs (e)	7.50E-07

(a) The emission rates for the new and 3 existing MWC units are based on 2000-2002 average stack test results for the existing Hillsborough County RRF MWC Units 1-3. For the new unit, the average emission rates were also multiplied by a factor of 1.5 (660 tpd/440 tpd) to account for the increased capacity of the new Unit 4.

(b) The portion of total mercury emitted that was assumed to remain locally available for the risk analysis was calculated based on the assumed speciation of mercury in the stack gas plus EPA guidance on the portion of each species expected to remain locally available. CDM assumed that total mercury emissions would be comprised of 60% elemental mercury, 30% divalent vapor phase mercury and 10% divalent particle phase mercury, based on data for large municipal waste combustors in U.S. EPA's Mercury Report to Congress. Additionally, the fraction of each species not expected to enter the global Hg cycle and thus be available for local impacts was identified, per U.S. EPA 1998 Combustion Risk Assessment Guidance (Section 2 and Figure 2-4), as 0.01 for elemental Hg, 0.68 for divalent vapor phase Hg, and 0.36 for divalent particle phase mercury. Accordingly, the fraction of total mercury expected to remain locally available was calculated as: [(0.68*30%)+(0.36*10%)+(0.01*60%)]/100% = 0.25

(c) The total mercury emission rate (6.84E-3 lb/hr = 8.63E-4 g/sec) was divided by CDM between the mercury species as follows: 60% elemental mercury, 30% divalent vapor phase mercury and 10% divalent particle phase mercury. The emission rates were also adjusted to for the fraction of each species expected to not enter the global Hg cycle and thus be available for local impacts (i.e., 0.01 for elemental Hg; 0.68 for divalent vapor phase Hg; and 0.36 for divalent particle phase mercury based on U.S. EPA 1998 Guidance, Section 2 and Figure 2-4). For example, the divalent vapor phase emission rate = 8.63E-04 g/sec*0.3*0.68 = 1.76E-04 g/sec.

(d) The PCDD/PCDF emission rates were calculated from a total PCDD/PCDF emission rate of 1.71E-05 lb/hr and a fractional distribution of congeners based on two years of stack test measurements (Ogden Energy Group, Report No. 2554, 9/8/00 and Covanta, Report No. 2686, 8/29/01).

(e) Includes all congeners (i.e., non-2,3,7,8-congeners as well as 2,3,7,8-congeners).

A variety of site-specific information was used in the fate and transport algorithms, as shown in Table 6-5. The site-specific information was compiled by CDM based on review of local information and contacts with local officials. With the exception of site-specific data shown in Table 6-5, all other parameters used to calculate environmental concentrations were EPA default values either presented in the Agency's combustion risk assessment guidance (EPA 1998a) or provided in the Agency's documentation for the IEM-2M mercury model (EPA 1997, EPA 1999a, Lyon et al. 1998).

Potential human exposures were calculated from the environmental concentrations in each environmental medium and exposure assumptions describing the rates of exposure for each pathway (e.g., vegetable ingestion rates, soil ingestion rates, beef ingestion rates), and data on body weight, exposure frequency (i.e., days/year exposed) and exposure duration (i.e., total years exposed). All of the exposure assumptions were defaults obtained from EPA (1998a) for each of the hypothetical receptor types evaluated in this assessment - adults, children and infants. These parameter values were intentionally derived by EPA to produce a conservative (i.e., health protective) estimate of exposure. For example, an important EPA default value assumes that beef farmers obtain 100% of the beef they ingest from their own locally raised beef cattle, which have, in turn, obtained 100% of their food from locally-grown feed crops. This assumption is not supported by local official information, but was evaluated to ensure that the health risk assessment conservatively addressed potential risks.

6.1.3 Health Risk Assessment Results

Potential long-term risks associated with exposure to mercury and PCDDs/PCDFs through the multiple pathways were calculated by combining calculated exposures with toxicity values for cancer and noncancer effects.

Excess Lifetime Cancer Risks and Potential for Noncancer Effects

Table 6-6 presents the excess lifetime cancer risks for oral and inhalation exposure pathways separately and combined for each receptor. The specific exposure pathways included for each hypothetical receptor are also presented.

All of the excess lifetime cancer risks were at least 10 times below EPA's target cancer risk level of $1x10^{-5}$ and did not exceed Florida's target risk level of $1x10^{-6}$. The total excess lifetime cancer risks ranged from $8x10^{-8}$ for the hypothetical child resident or child of a beef farmer to $1x10^{-6}$ for the hypothetical adult pond fisher scenario.

Table 6-5
Site-specific Input Parameters for
Hillsborough County Facility Risk Assessment

Parameter Name	Value	Units	Source
Input Parameters Used to Calculate Soil Concentrations			
Ambient air temperature	295	K	Identified by CDM for the Tampa International Airport from Gale Research, Climate of the States, 3rd Ed., 1951-1980 period of record (72°F)
Average annual recharge	5.1	cm/yr	The recharge rates in the modelling area varies from 0-2 inches/year. Recharge rate data were provided by Southwest Florida Water Management District.
Average annual runoff from pervious areas	20	cm/yr	Value calculated by CDM based on stormwater modeling using site-specific precipitation data.
Time period over which deposition occurs	30	yr	Assumed facility lifetime
USLE rainfall (or erosivity) factor (Used to calculate Unit Soil Loss using Universal Soil Loss Equation)	500	yr^{-1}	Site-specific data provided in Hillsborough County Soil Survey, USDA May 1989 and TMDL USLE Software Program US EPA 2001
USLE erodibility factor (Used to calculate Unit Soil Loss using Universal Soil Loss Equation)	0.12	ton/acre	Site-specific data provided Hillsborough County Soil Survey, USDA May 1989 and TMDL USLE Software Program US EPA 2001
USLE length-slope factor (Used to calculate Unit Soil Loss using Universal Soil Loss Equation)	0.18	none	Site-specific data provided Hillsborough County Soil Survey, USDA May 1989 and TMDL USLE Software Program US EPA 2001
USLE cover management factor (Used to calculate Unit Soil Loss using Universal Soil Loss Equation)	0.08	none	Site-specific data provided Hillsborough County Soil Survey, USDA May 1989 and TMDL USLE Software Program US EPA 2001
USLE supporting practice factor (Used to calculate Unit Soil Loss using Universal Soil Loss Equation)	1	none	Site-specific data provided Hillsborough County Soil Survey, USDA May 1989 and TMDL USLE Software Program US EPA 2001
Palm River Input Parameters			
River: Total watershed area receiving deposition	2.66E+07	m^2	Watershed area was calculated by CDM using data from USGS topographic maps and County GIS data (10.3 square miles)

Table 6-5
Site-specific Input Parameters for
Hillsborough County Facility Risk Assessment

Parameter Name	Value	Units	Source
River: Impervious watershed area receiving deposition	1.70E+06	m^2	Calculated by CDM based on an analysis of land use categories (e.g residential, rural) and the percentage of impervious area within each category for the watershed area
River: Waterbody surface area	1.0E+06	m^2	GIS analysis performed by CDM was used to determine the Palm river surface area within the modeling domain and beyond the facility boundary
River: Waterbody temperature	298	K	Average value calculated based on data collected by the Southwest Florida Water Management District
River: Average volumetric flow rate through water body	1.80E+08	m^3/yr	Annual average flow rate was estimated by CDM based on the data collected by USGS for the Palm river flowing into the McKay Bay
River: Current velocity	0.02	m/s	An average value calculated based on data provided by CDM on: 1) the velocity at the Palm River monitoring data station S-160 (0.015 m/sec based on 5 years of data) and 2) The estimated velocity at the Palm River bridge (0.02 m/sec) based on the calculated river flow rate (1.8E+08 m3/yr) and cross sectional area (274.2 m2) at the bridge.
River: Depth of water column	3.9	m	Value based on analysis of typical Palm River water depth and rainfall data by CDM
River: Total suspended solids (annual average)	4.6	mg/L	Annual average value calculated by CDM based on the USGS Water Resources Data and SWFWMD data from a river gauging station on the Palm River and also within the modeling domain (20 km by 20 km box with stack at center of box)
Pond Input Parameters			
Pond: Total watershed area receiving deposition	3.8E+05	m^2	Watershed area was calculated by CDM using data from USGS topographic maps, County GIS data, and the Watershed Atlas (0.15 square miles)
Pond: Impervious watershed area receiving deposition	8.9E+04	m^2	Calculated by CDM based on an analysis of land use in the watershed area of a typical lake and the percentage of impervious area within each category for the watershed area

Table 6-5
Site-specific Input Parameters for
Hillsborough County Facility Risk Assessment

Parameter Name	Value	Units	Source
Pond: Waterbody surface area	4.11E+04	m^2	Average value calculated by CDM to be representative of lakes in vicinity of facility and within modeling domain, based on analysis of lakes shown on USGS topographical maps, watershed atlas and GIS analysis.
Pond: Waterbody temperature	296	K	Average value calculated based on data collected by the Southwest Florida Water Management District.
Pond: Average volumetric flow rate through water body	6.10E+04	m^3/yr	Flow rate was estimated by CDM based on the annual volume of water in the typical lake removed by either surface water flow or ground water flow.
Pond: Current velocity	4.7E-08	m/s	Velocity was calculated based on data provided by CDM on the typical pond flow rate (1.4E+5 m3/yr) and cross-sectional area of a typical pond bottom (5.4E+04 m2).
Pond: Depth of water column	1.2	m	Value based on analysis of typical lake water depth and rainfall data by CDM
Average annual wind speed	3.8	m/s	Identified by CDM for the Tampa International Airport from Gale Research, Climate of the States, 3rd Ed., 1951-1980 period of record (8.6 mph)
Pond: Total suspended solids	22.8	mg/L	Estimated by CDM based on analysis of data from Watershed Atlas and SWFMWD for the representative pond and surrounding ponds in the area
Beef Pathway Parameters			
Quantity of plant eaten by the animal each day - forage	8.6	kg plant tissue DW/day	Site-specific information based on input from interviews with local USDA officials by CDM.
Quantity of plant eaten by the animal each day - silage	0	kg plant tissue DW/day	Negligible intake of silage. Site-specific information based on input from interviews with local USDA officials by CDM.
Quantity of plant eaten by the animal each day - grain	0.44	kg plant tissue DW/day	Site-specific information based on input from interviews with local USDA officials by CDM.

Table 6-6
Summary of Excess Lifetime Cancer Risks
Hillsborough County - Human Health Risk Assessment:
Existing and Proposed Units Combined

Receptor	Total Excess Lifetime Cancer Risk (a)			Exposure Pathways Included	Evaluated Chemicals
	Oral	Inhalation	Total		
Adult Receptors					
Resident	1E-07	8E-13	1E-07	Soil ingestion, produce ingestion, inhalation	PCDDs/PCDFs
Beef Farmer	1E-07	8E-13	1E-07	Soil ingestion, produce ingestion, beef ingestion, inhalation	PCDDs/PCDFs
Fisher - Palm River	7E-07	8E-13	7E-07	Soil ingestion, produce ingestion, fish ingestion, inhalation	PCDDs/PCDFs
Fisher - Nearby Pond	1E-06	8E-13	1E-06	Soil ingestion, produce ingestion, fish ingestion, inhalation	PCDDs/PCDFs
Child Receptors					
Resident	8E-08	3E-13	8E-08	Soil ingestion, produce ingestion, inhalation	PCDDs/PCDFs
Beef Farmer	8E-08	3E-13	8E-08	Soil ingestion, produce ingestion, beef ingestion, inhalation	PCDDs/PCDFs
Fisher - Palm River (c)	1E-07	3E-13	1E-07	Soil ingestion, produce ingestion, fish ingestion, inhalation	PCDDs/PCDFs
Fisher - Nearby Pond	2E-07	3E-13	2E-07	Soil ingestion, produce ingestion, fish ingestion, inhalation	PCDDs/PCDFs

(a) A risk of 1E-6, for example, is equivalent to $1x10^{6}$ and equals a 1 in 1,000,000 excess lifetime cancer risk.

Table 6-7 presents the results of the chronic noncancer risk evaluation. The total hazard index is provided for oral and inhalation pathways separately and then combined for each evaluated receptor. All of the hazard index values were at least 20 times below the target hazard index of 1.0. The highest hazard index result was 0.05 for the adult pond fisher scenario.

Dioxin Exposure Evaluation

Maximum PCDD/PCDF average daily doses calculated for hypothetical child and adult receptors in this risk assessment were compared to typical background levels. The PCDD/PCDF doses were expressed as 2,3,7,8-TCDD toxic equivalents (TEQs), consistent with standard risk assessment practice. The maximum average daily doses predicted in this risk assessment were 0.02 pg TEQs/kg-day for both an adult and a child, both based on the hypothetical pond fisher scenario. This dose level is 50 times below EPA's current estimate of background PCDD/PCDF exposure of 1 pg TEQs/kg-day. As a result, TEQ exposures to people due to emissions from the proposed four-unit RRF will not cause a measurable change in typical background exposures.

Hypothetical infant exposures to PCDDs/PCDFs due to breast-milk ingestion were also calculated, and were found to range from 0.05 to 0.5 pg TEQs/kg-day, more than 100 times below the target exposure level of 60 pg TEQs/kg-day identified by EPA (1998a). These results show that infant TEQ exposures due to emissions from the proposed four-unit RRF facility will not cause a measurable change in typical breast-fed infant TEQ exposure levels.

6.2 Ecological Risk Evaluation

An ecological risk assessment was conducted to evaluate the potential impact of facility emissions on ecological receptors in the area. This assessment focused on mercury and PCDDs/PCDFs, the most important compounds from an ecological perspective associated with MSW combustion facility emissions. This assessment generally followed the same methodology applied in the Lee County RRF risk assessment (CPF 2002) and EPA guidance (EPA 1998b, 1999b).

6.2.1 Habitats and Selected Receptors

As described in the PPSA application, there are no federally-designated wildlife refuges or critical habitats within 5 miles of the site. The facility area, however, is within the habitat range of several federally-listed species. A detailed discussion of endangered, threatened, rare or special concern species in Hillsborough County is provided in Appendix 12 to the PPSA application. Based on information presented in the PPSA application, the detailed evaluation provided in the Lee County RRF risk assessment

Table 6-7
Summary of Potential for Noncancer Health Risks
Hillsborough County - Human Health Risk Assessment:
Existing and Proposed Units Combined

Receptor/ Health Endpoint	Total Hazard Index (a)			Exposure Pathways Included	Evaluated Chemicals
	Oral	Inhalation	Total		
Adult Receptors					
Resident	Soil ingestion, produce ingestion, inhalation				
Developmental	3.1E-05	--	3.E-05		methyl Hg
Neurological	3.1E-05	2.5E-09	3.E-05		methyl Hg, Hg0
Kidney	3.1E-04	2.5E-09	3.E-04		divalent Hg
Immune system	3.1E-04	2.5E-09	3.E-04		divalent Hg
Beef Farmer	Soil ingestion, produce ingestion, beef ingestion, inhalation				
Developmental	3.1E-05	--	3.E-05		methyl Hg
Neurological	3.1E-05	2.5E-09	3.E-05		methyl Hg, Hg0
Kidney	3.1E-04	2.5E-09	3.E-04		divalent Hg
Immune system	3.1E-04	2.5E-09	3.E-04		divalent Hg
Fisher - Palm River	Soil ingestion, produce ingestion, fish ingestion, inhalation				
Developmental	4.7E-02	--	5.E-02		methyl Hg
Neurological	4.7E-02	2.5E-09	5.E-02		methyl Hg, Hg0
Kidney	3.1E-04	2.5E-09	3.E-04		divalent Hg
Immune system	3.1E-04	2.5E-09	3.E-04		divalent Hg
Fisher - Pond	Soil ingestion, produce ingestion, fish ingestion, inhalation				
Developmental	4.6E-02	--	5.E-02		methyl Hg
Neurological	4.6E-02	2.5E-09	5.E-02		methyl Hg, Hg0
Kidney	3.1E-04	2.5E-09	3.E-04		divalent Hg
Immune system	3.1E-04	2.5E-09	3.E-04		divalent Hg
Child Receptors					
Resident	Soil ingestion, produce ingestion, inhalation				
Developmental	3.6E-05	--	4.E-05		methyl Hg
Neurological	3.6E-05	5.7E-09	4.E-05		methyl Hg, Hg0
Kidney	5.7E-04	5.5E-09	6.E-04		divalent Hg
Immune system	5.7E-04	5.5E-09	6.E-04		divalent Hg
Beef Farmer	Soil ingestion, produce ingestion, beef ingestion, inhalation				
Developmental	3.6E-05	--	4.E-05		methyl Hg
Neurological	3.6E-05	5.7E-09	4.E-05		methyl Hg, Hg0
Kidney	5.7E-04	5.5E-09	6.E-04		divalent Hg
Immune system	5.7E-04	5.5E-09	6.E-04		divalent Hg
Fisher - Palm River	Soil ingestion, produce ingestion, fish ingestion, inhalation				
Developmental	2.9E-02	--	3.E-02		methyl Hg
Neurological	2.9E-02	5.7E-09	3.E-02		methyl Hg, Hg0
Kidney	2.7E-03	5.5E-09	3.E-03		divalent Hg
Immune system	2.7E-03	5.5E-09	3.E-03		divalent Hg
Fisher - Pond	Soil ingestion, produce ingestion, fish ingestion, inhalation				
Developmental	2.9E-02	--	3.E-02		methyl Hg
Neurological	2.9E-02	5.7E-09	3.E-02		methyl Hg, Hg0
Kidney	2.7E-03	5.5E-09	3.E-03		divalent Hg
Immune system	2.7E-03	5.5E-09	3.E-03		divalent Hg

-- = Not applicable.

(a) In this table, for a given chemical, the oral and inhalation hazard quotients were conservatively added even if the target organ/endpoint was different for the two routes of exposure.

(CPF 2002), and consideration of several key criteria as they apply specifically to the Hillsborough County RRF area, receptors were selected for evaluation in this assessment. The criteria that were considered included habitat selectivity (if species could inhabit or use habitat in the facility area), foraging guild (preferential selection of species that are aquatic carnivores), trophic position (preferential selection of species at higher positions in the food web), population status (preferential selection of species that are endangered or threatened), and toxicity and data availability (preference for species with available toxicity and exposure characterization information).

Based on these considerations, three receptors were selected for evaluation: aquatic life, wood stork, and river otter. Aquatic life inhabiting rivers, ponds and wetlands in the area could be exposed to mercury and PCDDs/PCDFs emitted from the RRF. Benthic dwelling aquatic organisms were evaluated in this assessment because mercury and PCDDs/PCDFs tend to partition to sediments and thus benthic dwelling organisms are likely to be at greatest risk. The wood stork is a federally endangered species that has been observed in the general facility vicinity. The wood stork feeds almost exclusively on small fish from shallow water bodies and thus could be exposed to chemicals that have accumulated in fish. This species was selected as an indicator for all piscivorous birds (e.g., cormorant, tern). The river otter is an aquatic mammal with a diet that consists primarily of fish. Otter and other mustelids have a demonstrated sensitivity to a range of environmental pollutants, including mercury, and due to their dietary reliance on fish, may be exposed to bioaccumulative compounds such as mercury and PCDDs/PCDFs. This species was selected as an indicator for piscivorous mammals (e.g., weasel).

6.2.2 Toxicity Assessment

Toxicity reference values (TRVs) were derived for aquatic life, birds, and mammals to support the risk evaluation. The TRVs used in this assessment were obtained from published reviews and criteria documents developed by or on behalf of (in order of preference) the State of Florida, the U.S. EPA (EPA 1997, EPA 1999b), and the National Oceanic and Atmospheric Administration (NOAA). Table 6-8 lists the TRVs used for aquatic and terrestrial wildlife in this assessment. These values represent the maximum concentration or dose to which an organism could be exposed without adverse toxicological effects.

6.2.3 Exposure Assessment

Ecological exposures were evaluated using calculated concentrations of mercury and PCDDs/PCDFs in the environment. The environmental concentrations were calculated, as described above, using EPA (1998a) fate and transport models, and site-specific input parameters for a typical pond and the Palm River, where available.

Table 6-8
Toxicity Reference Values (TRVs) for Ecological Receptors

Receptor	Mercury (a)				2,3,7,8-TCDD (a)			
	Value	Units	Basis	Source	Value	Units	Basis	Source
Aquatic Life								
Sediment	0.13	mg/kg dw in sediment	toxic effect level	MacDonald 1994	0.000035	mg/kg dw in sediment	Pond and river - upper effects threshold based on bioassays with *Hyalella azteca*; value calculated for pond assuming an foc of 0.04 (EPA 1998 default value)	NOAA 1999
Terrestrial Wildlife								
Birds	0.026	mg/kg body weight	alteration of reproduction and behavior in mallard duck exposed for 3-generations; uncertainty factor of 3 applied to low-effect level	USEPA 1997	0.00001	mg/kg body weight	no-effect level in ring-necked pheasants subchronically exposed	USEPA 1999
Mammal	0.018	mg/kg body weight	histopathological lesions in nerve tissue of mink following subchronic exposure; uncertainty factor of 3 applied to no-effect level	USEPA 1997	0.000001	mg/kg body weight	reproduction no-effect level for chronic exposure in rat	USEPA 1999

(a) Aquatic TRVs based on total mercury; terrestrial TRVs for methyl mercury. The TRV for PCDDs/PCDFs is expressed in terms of 2,3,7,8-TCDD, because this is the congener for which the greatest amount of toxicity data is available, and it is the congener believed to be most toxic to fish and wildlife.

Sources:

MacDonald, D.D. 1994. Approach to the Assessment of Sediment Quality in Florida Coastal Waters. November 1994. Prepared for FDEP – Office of Water Policy by MacDonald Environmental Services Ltd., Ladysmith, British Columbia.

NOAA. 1999. Screening Quick Reference Tables (SQuiRTs). NOAA-reported value 0.0088 ug/kg was the lowest reliable value reported among Upper Effects Thresholds (UET) tests, and was calculated on a 1% TOC basis. Site-specific values calculated here using foc for pond and river.

USEPA. 1997, Mercury Report to Congress. Volume VI. An Ecological Assessment for Anthropogenic Mercury Emissions in the United States. EPA 452/R-97-008.

USEPA. 1999. Screening Level Ecological Risk Assessment Protocol for Hazardous Waste Combustion Facilities. EPA 530-D-99-001C.

Aquatic life exposures were evaluated using chemical concentrations in the sediment of the Palm River and a typical pond. Mercury sediment concentrations were expressed as total mercury and were calculated using EPA's combustion fate and transport algorithms (EPA 1998a) in conjunction with EPA's IEM-2M model (EPA 1997, 1999a), as noted above. PCDD/PCDF concentrations in sediment were calculated using EPA (1998a) fate and transport algorithms and expressed as 2,3,7,8-TCDD toxic equivalents (TEQs) using toxic equivalency factors for fish developed by the World Health Organization.

Wood stork exposures were evaluated using several very conservative assumptions that will overestimate risk results. First, exposures were calculated assuming that 100% of the bird's diet consisted of fish at the top of the food web (trophic level IV fish), although actual dietary intake includes a combination of prey at lower trophic levels characterized by lower potential tissue concentrations due to less bioaccumulation. This screening-level approach is, however, useful for using the wood stork as an indicator of piscivorous birds. In addition, this assessment assumed that all food was obtained from the water bodies in the facility area that were evaluated (i.e., Palm River and a typical pond). Piscivorous birds, however, are know to forage over very large areas, meaning that actual exposures related to facility emissions would be lower than calculated in this analysis. Fish tissue concentrations used to calculate wood stork exposures were calculated using TEQs for birds developed by the World Health Organization. The exposure assumptions used for the wood stork were based on input from the Fish and Wildlife Service's South Florida Ecological Services Office and were identical to those used in the Lee County RRF risk assessment (i.e., fish ingestion rate of 0.41 kg fresh weight/day and body weight of 2.38 kg).

River otter exposures were evaluated assuming that 100% of the mammal's diet consisted of fish at the top of the food web (trophic level IV fish), although actual dietary intake includes a substantial amount of prey at lower trophic levels. In addition, this assessment assumed that all food was obtained from the water bodies in the facility area that were evaluated (i.e., Palm River and a typical pond). Fish tissue concentrations used to calculate river otter exposures were calculated using TEQs for mammals developed by the World Health Organization. The exposure assumptions used for the river otter were based on EPA (1997) and were identical to those used in the Lee County RRF risk assessment (i.e., fish ingestion rate of 1.2 kg fresh weight/day and body weight of 7.4 kg).

6.2.4 Ecological Risk Assessment Results

Aquatic and terrestrial wildlife risks were evaluated using a hazard quotient approach, in which quotients less than 1 indicate that adverse effects from chemical-specific exposures are unlikely to occur, whereas quotients greater than 1 indicate that adverse effects are possible.

Tables 6-9 and 6-10 present the calculated hazard quotients for aquatic life, the wood stork and the river otter. As can be seen, the results are at least 25 times lower than the threshold level of 1, indicating that aquatic and terrestrial wildlife are not predicted to be at risk from adverse effects due to operation of a four-unit Hillsborough County RRF.

6.3 Discussion of Uncertainties

All risk assessments involve the use of assumptions, judgment and incomplete data to varying degrees. As a result, the results of any risk assessment inherently reflect uncertainty. This risk assessment, for example, involved the integration of many steps, each of which is characterized by some uncertainty. These steps include:

- the calculation of chemical emission rates,
- the modeling of potential air concentrations and deposition rates associated with chemical emissions,
- the calculation of chemical concentrations in the environment (e.g., soil, beef, fish and produce) using mathematical models in conjunction with many chemical/physical properties and assumed or site-specific information about the environment in the facility area,
- the calculation of potential exposures to humans, aquatic life and wildlife using a combination of standard and site-specific exposure parameters, and
- the calculation of potential risks using toxicity information derived using health-protective assumptions from experimental studies.

The human health and ecological risk assessment results presented above reflect the combination of these potential sources of uncertainty. Collectively, however, the assumptions used in this risk assessment are considered more likely to overestimate potential risks than underestimate them. For example, many conservative (i.e., health protective) assumptions, including reliance on default values and mathematical models specified in EPA guidance, were used in this risk assessment in an effort to ensure that potential risks would not be underestimated.

Table 6-9
Hazard Quotients for Aquatic Life in the Palm River and Pond

Chemical	TRV (mg/kg)		Sediment Concentration (mg/kg)		Hazard Quotient	
	River	Pond	Palm River	Pond	Palm River	Pond
mercury (total)	0.13	0.13	3.3E-03	3.1E-03	3.E-02	2.E-02
PCDDs/PCDFs (as TEQs)	3.5E-05	3.5E-05	5.0E-08	1.0E-07	1.E-03	3.E-03

TEQ = 2,3,7,8-TCDD toxic equivalents.

Table 6-10
Hazard Quotients for Terrestrial Wildlife Feeding in the Palm River and Pond

Wood stork (piscivorous bird)

Chemical	Fish Concentration (mg/kg fw)		Intake (mg/kg bw - day)		TRV (mg/kg bw)	Hazard Quotient	
	Palm River	Pond	Palm River	Pond		Palm River	Pond
PCDDs/PCDFs (as TEQs)	1.2E-08	2.5E-08	2.0E-09	4.3E-09	0.00001	2.E-04	4.E-04
Mercury (methyl)	4.1E-03	4.1E-03	7.2E-04	7.1E-04	0.026	3.E-02	3.E-02

River Otter (piscivorous mammal)

Chemical	Fish Concentration (mg/kg fw)		Intake (mg/kg bw - day)		TRV (mg/kg bw)	Hazard Quotient	
	Palm River	Pond	Palm River	Pond		Palm River	Pond
PCDDs/PCDFs (as TEQs)	6.1E-09	1.3E-08	1.0E-09	2.1E-09	0.000001	1.E-03	2.E-03
Mercury (methyl)	4.1E-03	4.1E-03	6.7E-04	6.6E-04	0.018	4.E-02	4.E-02

TEQ = 2,3,7,8-TCDD toxic equivalents
fw = fresh weight; bw = body weight
TRV = toxicity reference value

7.0 SUMMARY AND CONCLUSIONS

7.1 Introduction

This document presents a Human Health and Ecological Impact Analysis that was performed to address questions related to human and environmental health that may arise during the course of the permit process for the proposed fourth municipal solid waste combustion unit at Hillsborough County's RRF. This study is not a formal requirement of the permit process for the fourth MWC unit, but was conducted to ensure that issues of potential concern related to the proposed unit were evaluated.

This study was performed by CPF Associates, Inc., a Washington, D.C.-based scientific and regulatory consulting firm with over 20 years experience in evaluating the potential impacts of municipal solid waste management technologies.

7.2 Previous and Ongoing Studies

Studies of the potential human health and ecological impacts of the waste-to-energy facilities have been widely conducted and were reviewed in this report. These studies indicate that stack emissions from a modern municipal solid waste (MSW) waste-to-energy plant will not cause adverse health effects if it is designed and operated in accordance with current state and federal regulations.

7.3 Regulatory and Operational Evaluation

The combination of regulatory and operational requirements in place for W-T-E facilities at the Federal and State levels collectively ensures that that a modern W-T-E facility, including the Hillsborough County RRF, will operate in a manner protective of human health and the environment. The safety of the Hillsborough Facility is, in particular, enhanced as a result of EPA's New Source Performance Standards (NSPS) and associated emission limits in conjunction with requirements from the State of Florida, including a more stringent emission limit for mercury. In addition, Hillsborough County has a very aggressive recycling program and solid waste management program that reduces the introduction of unwanted materials in the solid waste to better control emissions.

The Hillsborough Facility is, and will be, equipped with Best Available Control Technologies, the same technologies that are in place at the Lee County W-T-E facility. These technologies include spray dryer absorbers with fabric filters to remove particles, sulfur dioxide and acid gases; activated carbon injection to remove mercury; and selective non-catalytic reduction to reduce NOx emissions. The air pollution control equipment combination of spray dryer absorber, fabric

filter and activated carbon injection has also been shown to reduce emissions of dioxins and furans.

7.4 Human Health Risk Assessment

The human health risk assessment presented in this report evaluated potential risks associated with operation of four waste combustion units at the Hillsborough County RRF (three existing units and the proposed fourth unit). The risk assessment was performed following EPA guidance, including but not limited to EPA's 1998 *Human Health Risk Assessment Protocol for Hazardous Waste Combustion Facilities*. Where possible, the risk assessment also incorporated site-specific information.

Potential human health risks were evaluated in a refined multiple pathway risk assessment for mercury and PCDDs/PCDFs, the compounds that have been shown to dominate risk assessment results for WTE facility emissions. The multiple pathway risk assessment relied on emission rates based on stack gas measurements. The multiple pathway risk assessment calculated exposures for 12 different hypothetical receptors: four adult receptors, four child receptors and four breast-fed infant receptors. For example, the four hypothetical child receptors were: child resident, child of an adult beef farmer, child of an adult who fishes in the Palm River, and child of an adult who fishes in a typical pond. Each adult or child receptor was hypothesized to be simultaneously exposed through multiple pathways (e.g., the child resident was exposed via inhalation, soil ingestion, and ingestion of locally-grown produce). Each adult receptor was also assumed to be the mother of a breast-fed infant.

The risk evaluations that were performed in the risk assessment included chronic long-term excess lifetime cancer risks, the potential for chronic non-cancer health effects, a margin of exposure approach that compares calculated doses of PCDDs/PCDFs to typical background U.S. exposure levels, and a comparison of PCDD/PCDF infant exposures to a background infant intake level. The findings of the risk assessment were as follows:

- All of the excess lifetime cancer risks were at least 10 times below EPA's target cancer risk level of $1x10^{-5}$ and did not exceed Florida's target risk level of $1x10^{-6}$. The total excess lifetime cancer risks ranged from $8x10^{-8}$ for the hypothetical child resident or child of a beef farmer to $1x10^{-6}$ for the hypothetical adult pond fisher scenario.

- All of the noncancer hazard index values were at least 20 times below the target hazard index of 1.0. The highest hazard index result was 0.05 for the adult pond fisher scenario.

- The maximum average daily doses to PCDDs/PCDFs were 50 times below EPA's current estimate of background PCDD/PCDF exposure of 1

pg TEQs/kg-day. As a result, TEQ exposures to people due to emissions from the proposed four-unit RRF will not cause a measurable change in typical background exposures.

- Hypothetical infant exposures to PCDDs/PCDFs due to breast-milk ingestion were more than 100 times below the target exposure level of 60 pg TEQs/kg-day identified by EPA. These results show that infant TEQ exposures due to emissions from the proposed four-unit facility will not cause a measurable change in typical breast-fed infant TEQ exposure levels.

7.5 Ecological Risk Assessment

The ecological risk assessment evaluated potential effects of modeled emissions on ecological receptors within the RRF area. The ecological risk assessment followed EPA guidelines for ecological risk assessment and combustion facility ecological assessment, including but not limited to EPA's 1999 *Screening Level Ecological Risk Assessment Protocol for Hazardous Waste Combustion Facilities* and incorporated regional-specific information on wildlife habitats and species use to identify species and habitats of concern. The ecological assessment focused on mercury and PCDDs/PCDFs as these compounds have been shown to dominate W-T-E facility risk assessment results.

The ecological risk assessment focused on potential impacts on the natural communities of the Palm River and freshwater ponds. The assessment focused on three indicator species, aquatic life, the wood stork, and the river otter, that were considered to be at greatest risk based on habitat use, exposure potential and population status and were considered to represent three broad classes of wildlife (aquatic life, piscivorous birds and piscivorous mammals).

Potential risks were evaluated by calculating hazard quotients which reflect the ratio of a predicted exposure level to a toxicity reference value (TRV) derived for the protection of fish or wildlife species. The ecological risk assessment showed that the hazard quotients for aquatic life and the selected terrestrial species were all less than the target level of 1.0 by at least a factor of 25. These results indicate that aquatic and terrestrial wildlife are not predicted to be at risk from adverse effects of exposures to chemicals released during the operation of the Hillsborough County ERF.

7.6 Conclusions

The Human Health and Ecological Impact Analysis presented in this document showed that potential risks from emissions from the Hillsborough County RRF, in its proposed configuration with four combustion units, were below regulatory and other target risk levels for both human health and ecological receptors. These conclusions are consistent with previous studies performed for other waste-to-

energy combustion facilities in the U.S. and are considered to be a reflection of implementation of regulations, and strict operational and emission controls that are used for this type of facility. Based on this analysis, the proposed modification to the RRF is not anticipated to have an adverse impact on human health or the environment.

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ATTACHMENT A

BIOGRAPHIES OF CPF ASSOCIATES, INC. SCIENTISTS

PAUL C. CHROSTOWSKI, Ph.D., QEP

EDUCATION

Ph.D. Environmental Engineering and Science, Drexel University, Philadelphia, PA (1981).

M.S. Environmental Science, Drexel University, Philadelphia, PA (Environmental Chemistry and Health Specializations, USPHS Traineeship) (1979).

B.S. Chemistry, University of California, Berkeley, California (American Chemical Society Certified, Honors) (1976).

PROFESSIONAL CERTIFICATION

Dr. Chrostowski is a Qualified Environmental Professional (QEP) (#02970014) and a Fellow of the Royal Society of Health (FRSH).

EXPERIENCE

Dr. Chrostowski is a founding member of CPF Associates, Inc. He is an environmental health scientist with over 30 years experience in environmental science and engineering work on behalf of both government and private clients. Previously, he was Director of Environment, Health & Safety programs at The Weinberg Group, Vice President and Senior Science Advisor at ICF/Clement, Senior Scientist at EA Engineering, Science & Technology, Assistant Professor at Vassar College, a consultant in private practice and a pollution control/industrial hygiene technician in industry. He has specialized experience in the scientific and technical aspects of federal, state, and international regulatory programs including the CAA, CERCLA/SARA, RCRA, TSCA, FIFRA, OSHA, waste management technologies and ecological assessment. In addition to EPA and OSHA programs, Dr. Chrostowski has developed substantial expertise in indoor air quality, odor analysis, microbiological risk assessment, the risk analysis of hazardous material transportation, and the risk analysis of FDA-regulated products. Dr. Chrostowski has conducted research into environmentally-friendly new product development and has directed registration and approval petition processes for the environmental and occupational aspects of new products, pesticides, and pharmaceuticals. Dr. Chrostowski's research interests include the behavior of complex mixtures, pharmacokinetics, application of quantitative management tools to environmental strategy development and evaluation, biomonitoring, use of epidemiology in risk assessment, mass transfer phenomena, applied statistics, and mathematical modeling for risk management decision making. Dr. Chrostowski is active in numerous professional societies and expert panels and has authored or co-authored over 100 publications or presentations in the environmental field. In addition to his technical work, Dr. Chrostowski has taught university-level environmental sciences and has presented expert testimony in litigation cases, regulatory, and permitting hearings and public meetings and has conducted technical negotiations on behalf of private and governmental clients. Dr. Chrostowski was a member of the National Research Council's committee on Health Effects of Waste Incineration and assisted the presidential/Congressional Commission on Risk Assessment and Risk Management regarding risk assessment of municipal waste combustors.

SARAH A. FOSTER

EDUCATION

M.S., Environmental Health Sciences, Air Pollution Control Program Harvard University School of Public Health, Cambridge, MA (1985).

B.A., Political Science (Environmental Law/Energy Policy), Williams College, Williamstown, MA (1981).

EXPERIENCE

Ms. Foster is a founding member of CPF Associates, Inc. She has over 20 years of consulting experience in environmental health sciences, with expertise in developing strategies for and conducting exposure and risk analyses related to environmental issues and commercial and consumer products. Previously, Ms. Foster was a Senior Consultant with The Weinberg Group, a Project Manager at the Clement Division of ICF/Kaiser, an Environmental Analyst with the U.S. Environmental Protection Agency's Office of Policy Analysis, and a researcher for the Harvard Public Health School's Six City Study. Her areas of specialty include the application of quantitative methods for evaluating potential risks, including multiple chemical, multiple exposure pathway risk assessments for waste management technologies, air toxics sources and waste sites, Monte Carlo simulation, environmental epidemiology, and good risk assessment practice principles. She has managed and performed over 100 comprehensive risk assessment projects for combustion sources, waste sites and consumer and commercial products, with specialized knowledge in the conduct of risk assessments for municipal solid waste combustors, hazardous waste incinerators, landfills and emissions reported under SARA Title III. She has developed and applied a wide variety of environmental fate and transport models, and critically analyzed and compiled a broad array of human activity pattern data, in exposure assessment projects involving multiple inhalation, ingestion and dermal pathways as well as the use of household tap water. She has also developed and applied innovative risk assessment methods to assess risks from combustion sources, indoor water use, waste sites, and pesticides and anti-microbial materials that include geostatistical kriging and stochastic simulation. Ms. Foster has analyzed issues regarding contaminated site remedy selection, cleanup goals, cost and liability allocation evaluations under CERCLA, RCRA and state regulatory programs, and the historical state-of-knowledge of toxicological and environmental health sciences. Ms. Foster has also evaluated global environmental issues associated with pharmaceuticals and medical devices. In conjunction with many of her risk assessment and regulatory toxicology projects, Ms. Foster has provided risk communication and technical support for public, regulatory and permit hearings, and for litigation. Ms. Foster has numerous publications focusing on risk assessment, air toxics and emissions from industrial sources and is a member of several professional societies. She also has considerable experience in developing and conducting risk assessment training courses.

RETENTION POND A

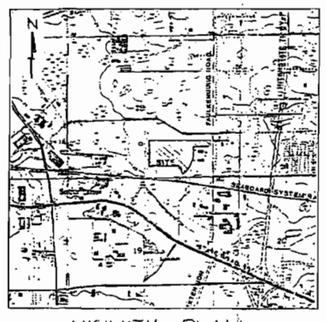
RETENTION POND C

RETENTION POND D

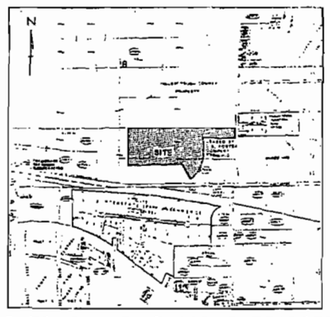
RETENTION POND B

PROPOSED STRUCTURE

SECTION C-C



VICINITY PLAN



ABUTTING AND ADJACENT PROPERTIES

GRAPHIC SCALE

0 25 50 100 150

NOTE:

ALL WORK INDICATED THUS [ ] IS INCLUDED IN THIS CONTRACT FOR EROSION PROTECTION

DWG. ISSUED 4-12-83

OGDEN MARTIN SYSTEMS OF HILLSBOROUGH, INC.
HILLSBOROUGH COUNTY - FLORIDA
SOLID WASTE ENERGY RECOVERY FACILITY

REMEDIAL SITE WORK - SH 1

BURNS AND ROE INDUSTRIAL SERVICES CORP.

4280-01 C-107 A

Appendix 5-1
Pre-Development Site Conditions