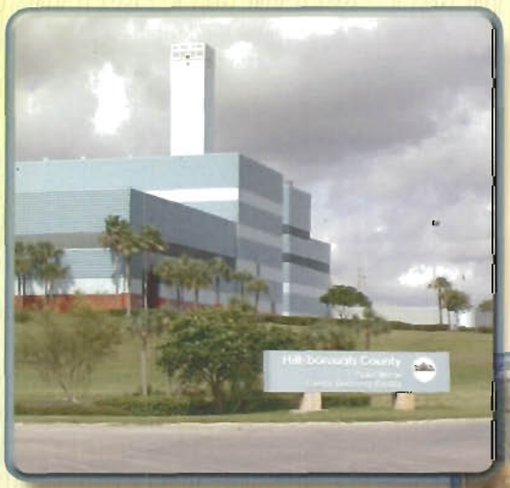
CDM



Application for Power Plant Site Certification

Hillsborough County Resource Recovery Facility Expansion

Volume I

Hillsborough County
Florida

CDM
1715 North Westshore Boulevard, Suite 875
Tampa, Florida 33607
tel: 813 281-2900
fax: 813 288-8787

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

Contents

Volume I - Application

Executive Summary

Section 4 Effects of Site Preparation and Plant and Associated Facilities Construction

Section 5 Effects of Plant Operation

Tables

Figures

Volume II – Appendices

Volume III – Prevention of Significant Deterioration Air Permit Application

Appendices

Tables

Figures

Executive Summary for Hillsborough County's PPSA Application

ES.1 Introduction

This document summarizes the key facts presented in Hillsborough County's Application for Power Plant Site Certification ("Application"). In its Application, Hillsborough County ("County") is seeking authorization to construct and operate a new 600-tpd boiler that will increase the solid waste processing capacity of the Hillsborough County Resource Recovery Facility ("Facility"). The Application also seeks authorization to increase the Facility's steam electrical generating capacity from 39 megawattts ("MW") to 47 MW (net capacity). The County has prepared this Application to satisfy the requirements set forth in the Florida Electrical Power Plant Siting Act ("PPSA"), Sections 403.501-.518, Florida Statutes, and the PPSA rules adopted by the Florida Department of Environmental Protection ("FDEP") in Chapter 62-17, F.A.C.

ES.2 Background

In the early 1980's, the Board of County Commissioners of Hillsborough County decided that the County should use a resource recovery facility to (a) reduce the volume of the County's solid waste and (b) generate electricity from solid waste that would otherwise be discarded in a landfill. Accordingly, the County filed an application under the PPSA to construct and operate the County's Facility. The application was approved in 1984 and the Facility began operation in 1987.

The Facility is an essential component of the Comprehensive Master Plan ("Plan") for Hillsborough County and the Cities of Tampa, Temple Terrace and Plant City. The Plan provides for state-of-the-art technology and innovative approaches to recycling, waste reduction, and waste disposal. In accordance with the Plan, the County has developed: (a) an aggressive recycling program that significantly reduces the quantity of materials requiring disposal; (b) a waste-to-energy facility for waste reduction and energy recovery from those materials that are not recycled; and (c) a landfill for the disposal of ash and by-pass waste (i.e., materials that are not recycled or processed in the Facility). Hillsborough County and the three cities have used a cooperative, regional approach to solid waste management issues, while providing environmentally protective, cost-efficient programs for local residents. Hillsborough County is one of the counties in Florida that consistently complies with the State of Florida's recycling goal of 30%.

ES.3 Need for Facility Expansion

Despite the County's comprehensive recycling program, the amount of solid waste generated in the County has increased each year since the Facility began operation, primarily due to population growth. The amount of solid waste generated in the County now significantly exceeds the Facility's design capacity. Consequently, large

quantities of solid waste currently are being diverted from the Facility to the County landfill.

In 2005, the Board of County Commissioners decided to expand the Facility, consistent with the County's long-standing Plan, rather than dispose of ever-increasing amounts of solid waste in a landfill. The Board's decision was based on a thorough evaluation of the County's solid waste disposal options.

ES.4 The Site and Surrounding Areas

The Facility is located in an unincorporated area of Hillsborough County that is southeast of the City of Tampa, west of Interstate 75 ("I-75"), and north of the Crosstown Expressway. The Facility was built on a 50.4-acre site, which is in the southern portion of a 353-acre tract of land owned by Hillsborough County. The site is bounded: on the south by the Falkenburg Road Wastewater Treatment Facility and a railroad track that is owned by CSX Railroad; on the west by a 230 Kilovolt ("KV") transmission line corridor and easement owned by the Tampa Electric Company ("TECO"); on the north by vacant improved pasture land, the Falkenburg Road Jail, the Hillsborough County Department of Animal Services, and the Hillsborough County Sheriff's Office (District 2); and on the east by Falkenburg Road and vacant land. The nearest residential area is more than one mile away, on the opposite (east) side of I-75.

Before the existing Facility was approved under the PPSA, the County Commission amended the County's comprehensive land use plan and rezoned the site to allow the Facility to be built and operated on the site. The site is designated as "Public/Quasi-Public" in the comprehensive plan. The site is zoned as a "Planned Development - Industrial" area. The site and the Facility, including the proposed expansion of the Facility, are consistent and in compliance with the County's existing land use plans and zoning ordinances.

ES.5 The Existing Facility and the Proposed Project

The Facility uses "mass burn" technology for the combustion of non-hazardous, municipal solid waste. The Facility has three combustion/steam generation units, each with a nominal capacity of 400 tons per day ("tpd") and a continuous design rated capacity of 440 tpd when burning a reference waste with 4,500 Btu per pound. The three units have a combined nominal capacity of 1200 tpd and a combined design rated capacity of 1,320 tpd.

The Facility was originally designed and built to accommodate the addition of a fourth combustion unit, thus making the proposed expansion project relatively simple, without disrupting large areas of the site. The primary components of the proposed project will include: (a) the construction of a new 600 tpd combustion unit and the associated air pollution control system; (b) the installation of a new nominal 17 MW steam turbine generator; (c) the expansion of the ash handling and refuse

building; and (d) the addition of a new transformer yard, a new lime silo, and a new settling basin. When the expansion project is completed, the Facility will have four combustion units, which will be able to process approximately 1,800 tpd of solid waste and generate approximately 47 MW of electricity (net capacity).

The new combustion unit will be equipped with the same air pollution control systems that have worked well at the existing Facility. A fabric filter (baghouse) will be used to remove particulate matter from the new unit's airborne emissions. A spray dry absorber (scrubber) will control acid gases, a carbon injection system will control mercury, and an enhanced selective non-catalytic reduction system ("SNCR") will control nitrogen oxides ("NOx"). Continuous emissions monitoring systems ("CEMS") will be used to ensure that the Facility is operating in compliance with the applicable emissions limits at all times. The air pollution controls and monitoring systems at the Facility will comply with the U.S. Environmental Protection Agency's ("EPA") standards for municipal waste combustors, which are based on the use of Maximum Achievable Control Technology ("MACT").

ES.6 Effects of Facility Construction and Operation

The construction and operation of the Facility's fourth unit will have minimal impacts on the environment. Construction activities will only occur in disturbed upland areas that are part of or adjacent to the Facility's existing footprint. No construction will occur in a wetland, surface water, or sensitive habitat. Construction activities will not cause any adverse impacts on any cultural, historic, or archaeological resources.

The basic operation of the Facility will not change when the fourth unit is installed. The solid waste storage and handling areas in the Facility are enclosed and maintained under negative air pressure. Consequently, dust and odors outside of the Facility are minimized. Only municipal solid waste and similar materials will be used as fuel at the Facility. The Facility will not accept hazardous waste, biomedical waste, or other prohibited materials.

The Facility's water supply and management system will remain the same after the fourth unit becomes operational. The Facility will not discharge any industrial or domestic wastewater to any ground water or surface water body. All of the Facility's wastewater will continue to be sent by pipeline to the co-located Falkenburg Advanced Wastewater Treatment Plant (WWTP). Treated wastewater from the Falkenburg WWTP will be used to satisfy the Facility's need for cooling water. Potable water will continue to be provided to the Facility from an existing City of Tampa water supply pipeline. Stormwater will be treated and managed in the existing system of swales and detention/retention ponds on the site.

The Facility expansion will not require the construction of any new pipeline, water supply well, stormwater management facility, or electric transmission line.

The operation of the fourth unit will not have a significant impact on ambient air quality. The maximum impacts on air quality due to the operation of the fourth unit will be much less than the levels allowed under the federal and state ambient air quality standards (AAQS), Prevention of Significant Deterioration (PSD) increments, and other applicable regulations. The maximum impacts from the operation of all four units at the Facility also will be less than the AAQS, PSD increments, and other applicable standards.

ES.7 Benefits of the Project

The expansion of the Facility will provide significant benefits to the citizens and businesses of Hillsborough County. The Facility reduces the volume of municipal solid waste by approximately 90%, thus reducing the amount of landfill capacity needed for the disposal of solid waste. Expanding the Facility with a fourth unit will extend the useful life of the County's landfill and postpone the need to build a new landfill in Hillsborough County. By producing electricity, the Facility reduces the amount of electricity needed from a traditional power plant that burns fossil fuels. The Facility expansion will eliminate the need to use approximately 4 million barrels of oil and thus will save at least $200 million in oil purchases over the next 20 years.

The construction and operation of the Facility will provide significant direct and indirect benefits to the citizens of Hillsborough County. Jobs will be created by the construction and operation of the fourth unit. The sale of energy will generate revenue for the County. The expansion project will provide an ecologically sound and economical method to dispose of solid waste. The County landfill's potential threat to groundwater will be reduced because the landfill will be used to dispose of the Facility's ash, rather than raw garbage. The Facility will recover and beneficially use the energy from the solid waste, which otherwise would be discarded and not utilized.

Section 1
Need for Power and the Proposed Facility

Hillsborough County, Florida is submitting this Application for Power Plant Site Certification (Application) seeking authorization for construction and operation of a new 600-tpd boiler at the Hillsborough County Resource Recovery Facility (Facility). The expansion will increase the solid waste processing capacity of the Facility from 1200 tpd to 1800 tpd. The Application also seeks authorization for an increase of the Facility's steam electrical generating capacity from 39 MW to 47 MW. Hillsborough County (County) has prepared this Application to satisfy the requirements set forth in the Florida Electrical Power Plant Siting Act (PPSA), Sections 403.501-518, Florida Statutes, and the PPSA rules adopted by the Florida Department of Environmental Protection (FDEP) in Chapter 62-17,F.A.C.

The primary objective of the proposed facility expansion is to dispose of solid waste generated within the unincorporated areas of the County. The County's decision to expand the Facility comes after considerable investigation by the Board of County Commissioners into alternative methods of resolving the growing solid waste disposal needs of the County, primarily due to high population growth in the County. The combustion of solid waste at the resource recovery facility represents the most feasible alternative to sanitary landfilling for the County. The generation of electricity provides a secondary benefit of expanding the resource recovery facility. Other benefits include economic benefits to the residents of the County, reduction of use of fossil fuels in traditional power plants, generation of jobs, revenues to County by sale of energy, increase in the useful life of the existing landfills, decreases the potential threat to groundwater from landfilling solid waste, etc.

Since 1984, the Florida Legislature has encouraged the use of resource recovery facilities as a means of managing the state's solid waste. In Section 377.709(1), Florida Statutes, the Legislature declared that "it is critical to encourage energy conservation in order to protect the health, prosperity, and general welfare of this State and its citizens." The Legislature further declared 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." The Legislature directed the Florida Public Service Commission ('PSC") "to establish a funding program to encourage the development by local governments of solid waste facilities that use solid waste as a primary source of fuel for the production of electricity."

The Legislature's support for resource recovery facilities continues to this day. In 2005, the Legislature encouraged local governments to consider the use of a resource recovery facility before expanding solids waste landfills. Chapter 2005-259 (H.B 77) requires utilities and cooperatives to offer a purchase contract to producers of renewable energy; provides for establishment of purchase and contract requirements and rules; revises waste-to-energy facility permitting requirements and encourages

certain permit applicants to consider construction of such facilities (Effective October 1, 2005).

In Section 403.519, Florida Statutes, the Legislature has authorized the Florida Public Service Commission with the responsibility of determining whether construction of a proposed electrical generating facility is necessary to meet the present or expected need for electricity in peninsular Florida. An affirmative determination of need must be issued by the Public Service Commission before an electrical power plant can be approved under the Florida Electrical Power Plant Siting Act ("Act"), Sections 403.501 - .518, Florida Statutes. Certification under the Act must be obtained for the construction of any facility that will use steam to generate 75 MW or more of electricity. Certification under the Act may be obtained for a smaller facility, at the option of the applicant, pursuant to Section 403.506(1), Florida Statutes.

In 1983, the County requested the Public Service Commission to issue an affirmative determination of need for the County's resource recovery facility for construction of the proposed electrical generating facility. The Public Service Commission concluded that the resource recovery facility would contribute to the reliability of the state's electrical supply and would be cost-effective. A copy of the Boards Final Order is included in Appendix 2.3.

The Facility has already been approved as an electrical generating facility by the federal government. On August 29, 1983, the County filed an application with the Federal Energy Regulatory Commission (FERC) for certification of its proposed resource recovery facility as a qualifying small power production facility pursuant to Section 201 of the Public Utility Regulatory Policies Act of 1978 (PURPA) and rules promulgated by FERC. Notice of the application was published in the Federal Register on September 20, 1983. On November 16, 1983, the FERC granted the County's application for certification of its resource recovery project as a qualifying small power production facility.

In 1984, the Governor and Cabinet, sitting as the Siting Board, approved the construction and operation of the Facility pursuant to the Act. The Facility was authorized to operate three boilers, each capable of processing a nominal 400 tons per day (tpd) of solid waste, with a total capacity of 1200 tpd. The Facility also was approved for an ultimate site capacity of 1600 tpd. Accordingly, the Facility was designed with space and equipment to eventually be expanded by an additional 400-tpd unit.

However, the County's population, and the quantity of municipal solid waste (MSW) generated in the County, has grown more rapidly than originally anticipated. As a result, the County has decided to increase the capacity of the existing facility by adding a new boiler with a nominal rated capacity of 600 tpd (based on MSW with a nominal higher heating value of 5,000 BTU/lb).

This application for certification under the Florida Electrical Power Plant Siting Act seeks authorization to construct and operate the new 600-tpd boiler, thus increasing the Facility's solid waste processing capacity from 1200 tpd to 1800 tpd. This application also seeks authorization to increase the facility's steam electrical generating capacity from 39 MW to 47 MW.

Although the County previously obtained a determination of need from the PSC for the existing facility, a PSC determination of need is not required for the County's expansion project. In 1994, the Florida Legislature created certain exemptions from the PSC process for resource recovery facilities. Section 377.709(6), Florida Statutes, now provides that a resource recovery facility "shall be exempt from the need determination process outlined in s. 403.519",Florida Statutes, if the resource recovery facility proposes an expansion that will increase the facility's steam electrical generating capacity by 50 MW or less. The PSC applied this statutory exemption in a case involving the expansion of Lee County's resource recovery facility with a new 600-tpd boiler, and issued a declaratory statement confirming that a PSC determination of need was not required for Lee County's project. Since the County's proposed 600-tpd expansion project will increase the Facility's steam electrical generating capacity by less than 50 MW, it is clear that a PSC determination of need is not required for the proposed expansion of the Facility.

Section 2
Site and Vicinity Characterization

2.1 Site and Associated Facilities Delineation

2.1.1 Site Delineation and Ownership

This section briefly describes the dimensions, location and uses of the County's existing Facility site at 350 N. Falkenburg Road in Brandon, Florida. Proposed modifications to the Facility and their locations are described. The site dimensions have not changed since the original certification application in 1983.

Exhibit 1
Existing Facility

The existing Facility (see Exhibits 1, 2, and 3) is located southeast of the City of Tampa, west of Interstate 75 (I-75), and north of the Crosstown Expressway, in an unincorporated area of Hillsborough County. The Facility was built on a 50.4-acre site located in the southern portion of a 353-acre tract of land that is situated in Section 18, Township 29 and Range 20. The site was purchased by Hillsborough County from Seaboard System Railroad, Inc., on June 1, 1984.

The site is bounded on the south by a railroad track that is owned by CSX Railroad; on the west by a 230 Kilovolt (KV) transmission line corridor and easement owned by the Tampa Electric Company (TECO), and lands owned by Tampa Bay Water; on the north by vacant improved pasture land, the Falkenburg Road Jail, Hillsborough County Department of Animal Services, and Hillsborough County Sheriff's Office (District 2); and on the east by Falkenburg Road and

some vacant land. **Figure 2-1** shows the delineation of the site boundaries and identifies some of the key features of the area surrounding the site. The boundary survey and the legal description for the 50.4-acre Facility site is shown in **Figure 2-2**. The boundary survey and deed for the entire 353-acre tract is included in **Appendix 1-1.**

Abutting and adjacent properties are delineated on **Figure 2-3**. All of the land abutting the site to the south is owned by CSX Railroad and used for a railroad track. North and east of the site is land owned by Hillsborough County. A 225-foot portion of the eastern boundary of the site abuts the Falkenburg Road right-of-way. Abutting the site to the west is a 200-foot wide Tampa Electric Company easement that is used for electrical transmission lines.

Exhibit 2
Facility Property

Appendix 1-2 contains a complete list of property owners within 150 feet of the site, subdivisions within 250 feet of the site, and the County's property assessment map. The nearest private homes are located east of Falkenburg Road along Woodberry Road.

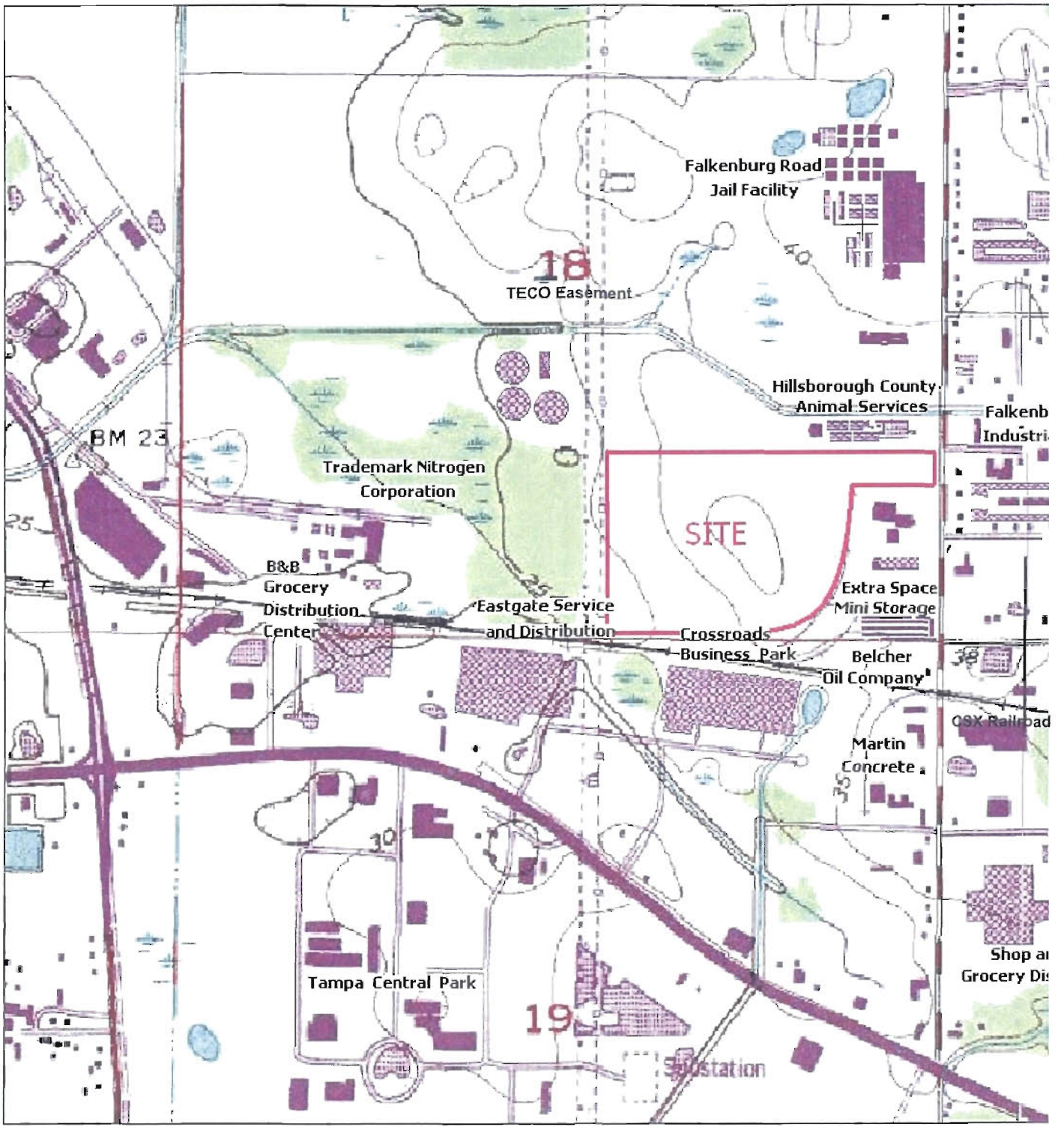
Exhibit 3
North Wall of Facility / Location of Expansion

2.1.2 Existing and Proposed Site Uses

Figure 2-4 shows an aerial photograph of the Facility site and the surrounding area. The existing land uses for the site are a solid waste energy recovery facility, a water treatment facility and unimproved pasture land. Less than half of the 50.4-acre site is actually developed with buildings or other improvements. Access to the site is from Falkenburg Road. The majority of the developed portion of the site is setback from Falkenburg Road, on the western side of the parcel. The existing buildings are buffered to the east and west by a retention pond and some landscaping. The wastewater treatment facility is located on the southern portion of the parcel, bordered by the railroad corridor.

Figure 2-5 presents the Facility layout. This site plan shows the Facility has been situated in the northwestern portion of the site to allow good traffic circulation within the site and to provide open space between the Facility and Falkenburg Road. It presents the layout and location of the Facility and the associated structures that were constructed on the site. The site plan is based on the Solid Waste Energy Recovery Facility Application for Power Plant Site Certification that was prepared by Camp, Dresser and McKee (dated August, 1984) and approved by the Siting Board. The ultimate layout for the site after the Facility expansion is essentially the same as presented in the original site plan, which included plans for expansion. The site plan for the expansion project is described in Section 3 of this application.

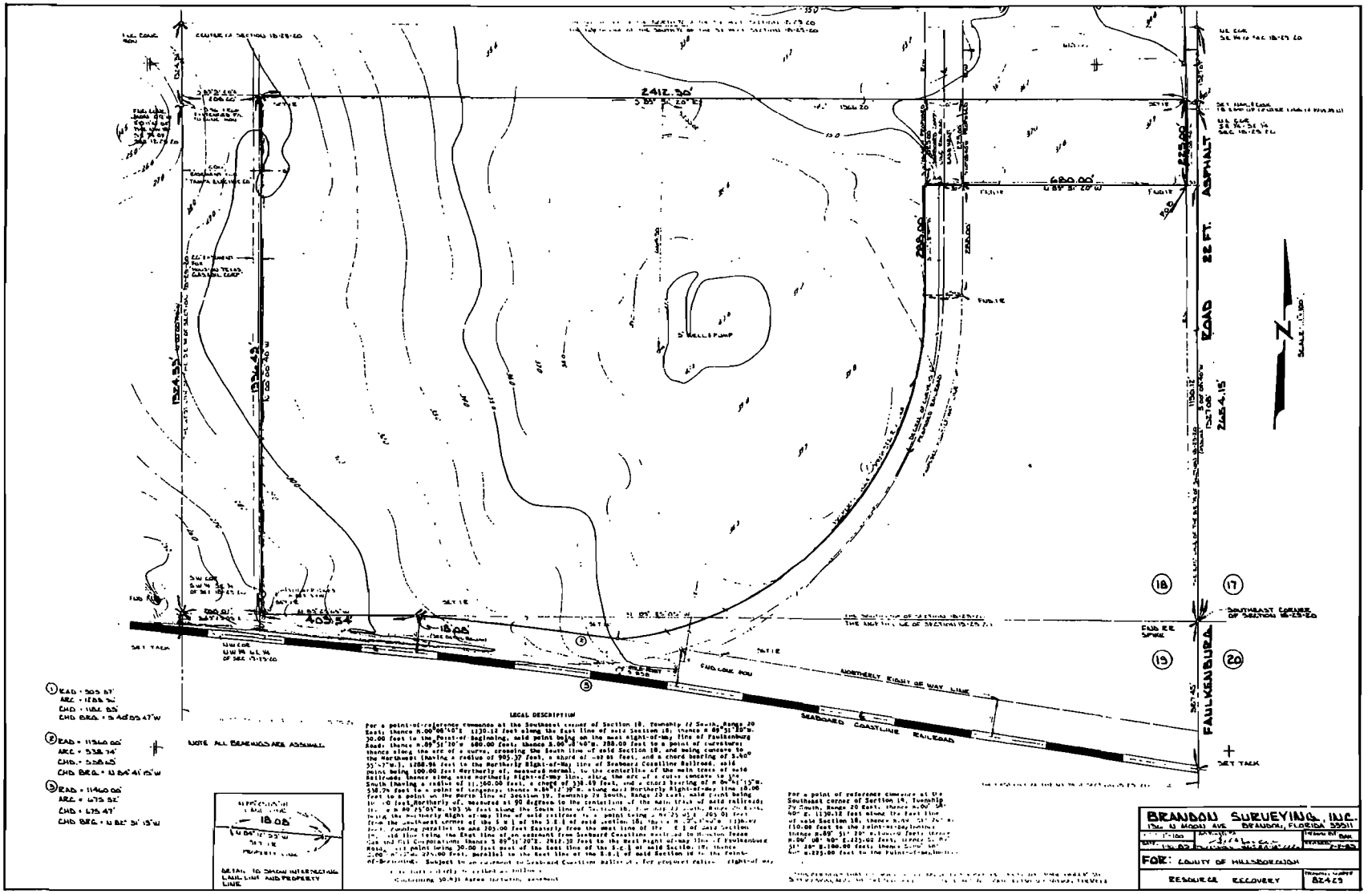
At present, approximately 3.5 acres or about 7 percent of the site is occupied by the Facility and related structures. The proposed expansion project will increase the size of the resource



Hillsborough County
Energy Recovery Project

Figure 2.1
Site Boundaries

Scale
NTS

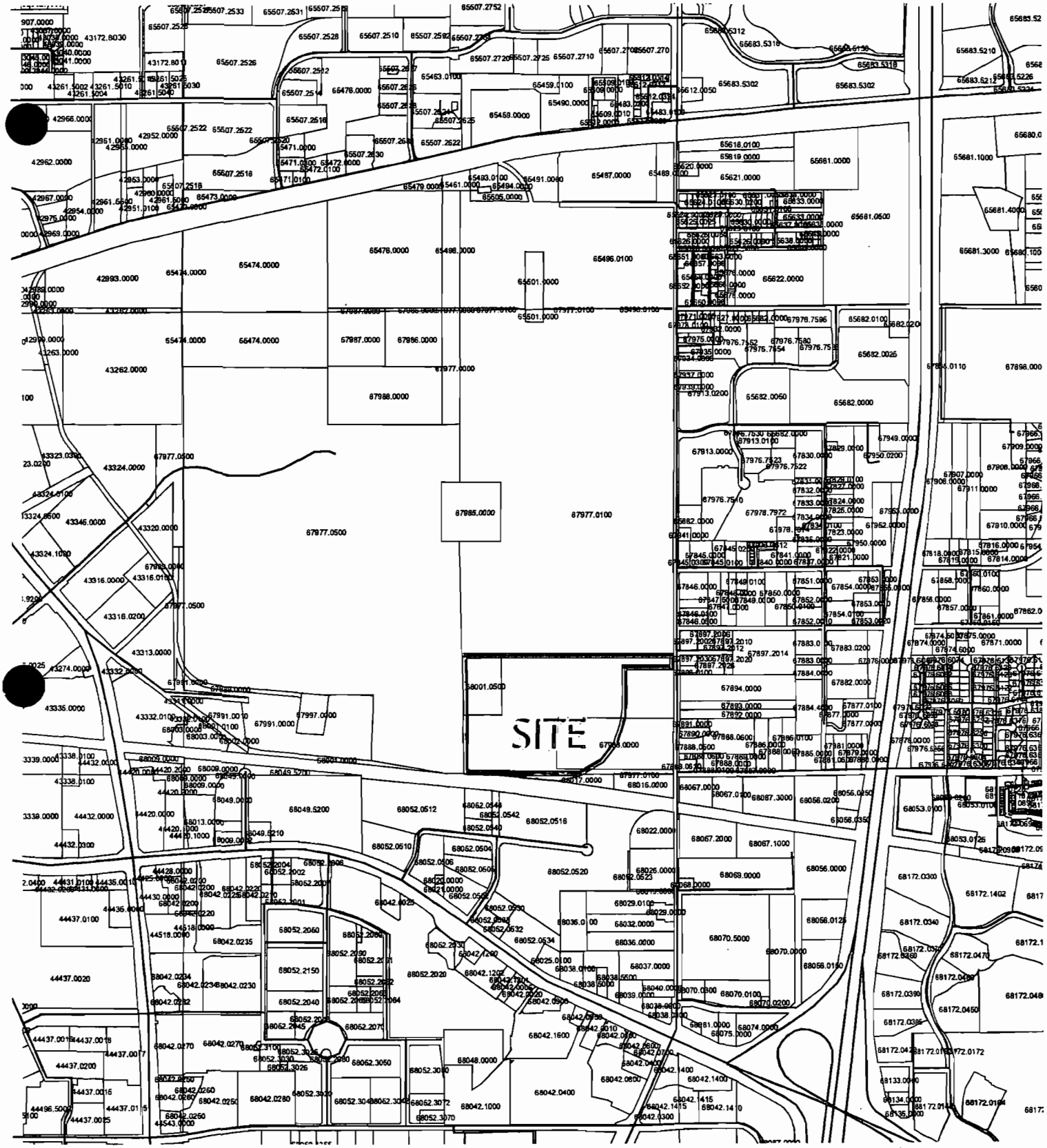


HILLSBOROUGH COUNTY
ENERGY RECOVERY PROJECT

FIGURE 2.2

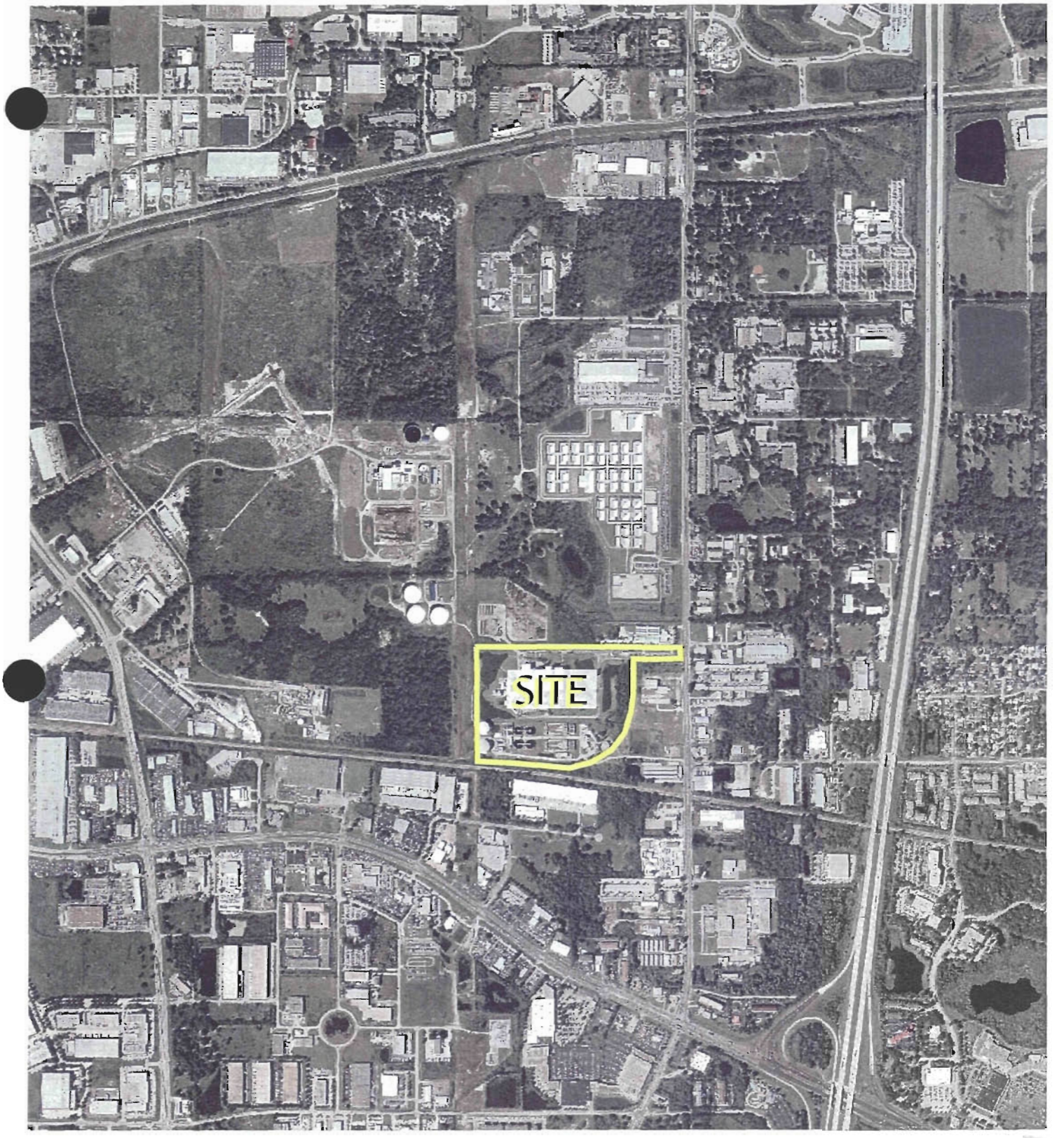
BOUNDARY SURVEY AND LEGAL DISCRIPTION

FEET
200 0 200 400 600



Hillsborough County
Energy Recovery Project

Figure 2.3
Abutting & Adjacent
Properties



Hillsborough County Energy Recovery Project

N

Scale
0 1500'

Figure 2.4
Aerial Photograph of Site

Aerial Taken (11/2003)

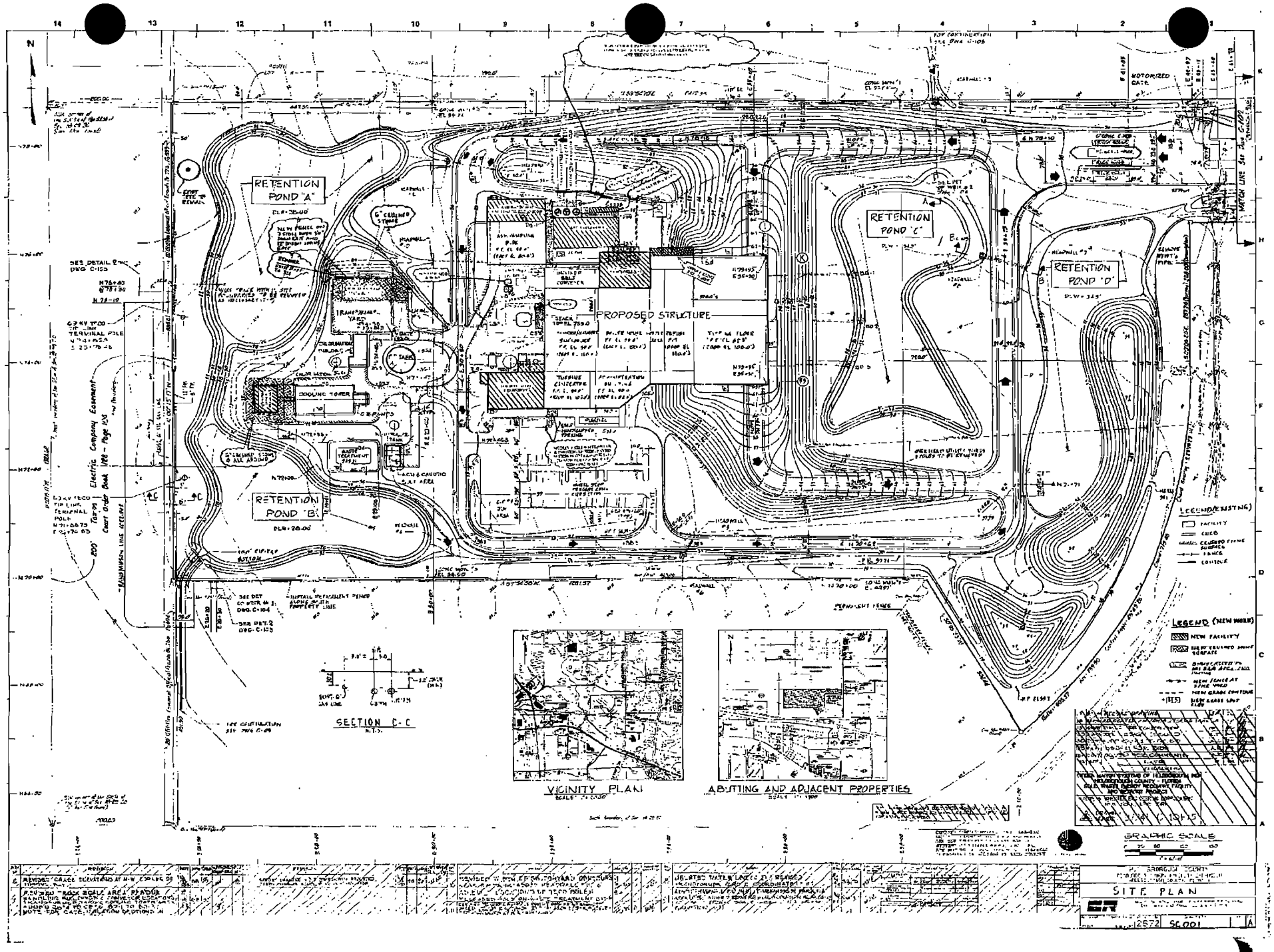


Figure 2.5 Facility Layout

recovery structures by only 0.3 acres. About 2.3 acres or 4.6 percent of the site is and will be used for the wastewater treatment plant structures. About 7.8 acres or 15.5 percent of the site is and will continue to be used for roadways and parking. After the proposed expansion project is completed, approximately 60 percent of the site will continue to be used for open space, buffering, and landscaping. A complete summary of existing and proposed land uses, as well as the acreage devoted to those uses, is presented in **Table 2-1.**

Table 2-1
Existing and Proposed Site Uses

	Existing Use				Proposed Use				
	Resource Recovery Facility		Wastewater Treatment Plant		Resource Recovery Facility		Total Proposed Use		
	Acres	% of Site	Acres	% of Site	Acres	% of Site	Acres	% of Site	Change in Acreage
Structures	3.5	6.9	2.3	4.6	3.8	7.5	6.1	12.1	+0.3
Roadways & Parking	6.1	12.1	1.7	3.4	6.1	12.1	7.8	15.5	None
Open Areas & Landscaping	20.6	40.9	9.7	19.2	20.3	40.3	30.0	59.5	-0.3
Retention Basins	6.2	12.3	0.3	0.6	6.2	12.3	6.5	12.9	None
Total Area	36.4	72.2	14.0	27.8	36.4	72.2	50.4	100.0	None

No portion of the site is located in the 100-year flood zone as defined by the Federal Emergency Management Agency (FEMA). The 100-year flood zone in the vicinity of the site is shown in **Figure 2-6.**

2.2 Sociopolitical Environment

This section provides a brief discussion of the governmental entities, demographics, planning issues, and other factors that are present within a five-mile radius of the Facility as shown in **Figures 2-7a and 2-7b.**

2.2.1 Governmental Jurisdictions

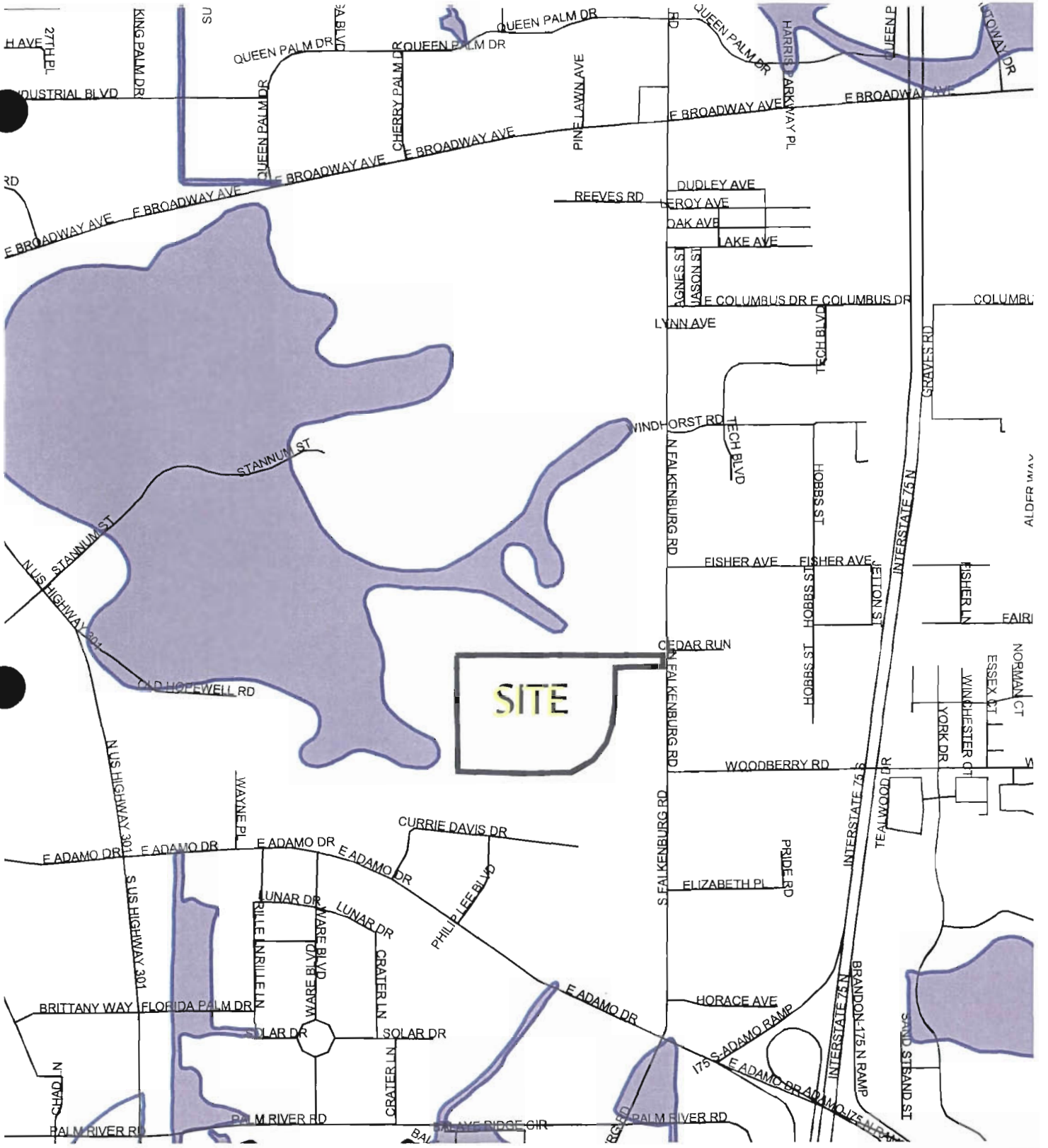
Most of the area within a five-mile radius of the Facility is within the unincorporated portion of Hillsborough County. As shown on **Figure 2-7b,** portions of the City of Tampa and the City of Temple Terrace are within five miles of the site. The City of Tampa extends to the Tampa By-

Pass Canal, which is approximately 1.7 miles west of the site. Temple Terrace is approximately five miles north of the site, and north of Interstate 4 (I-4).

The following areas of interest are located within five-miles of the site:

- County Parks
- State Fairgrounds
- Seminole Indian Reservation

These sites are shown on **Figures 2-7a** and **2-7b**.



Hillsborough County
Energy Recovery Project

Figure 2.6
Flood Hazard Areas

Scale
0 1500'

N

Based on 1992 FIRM Panel Updates

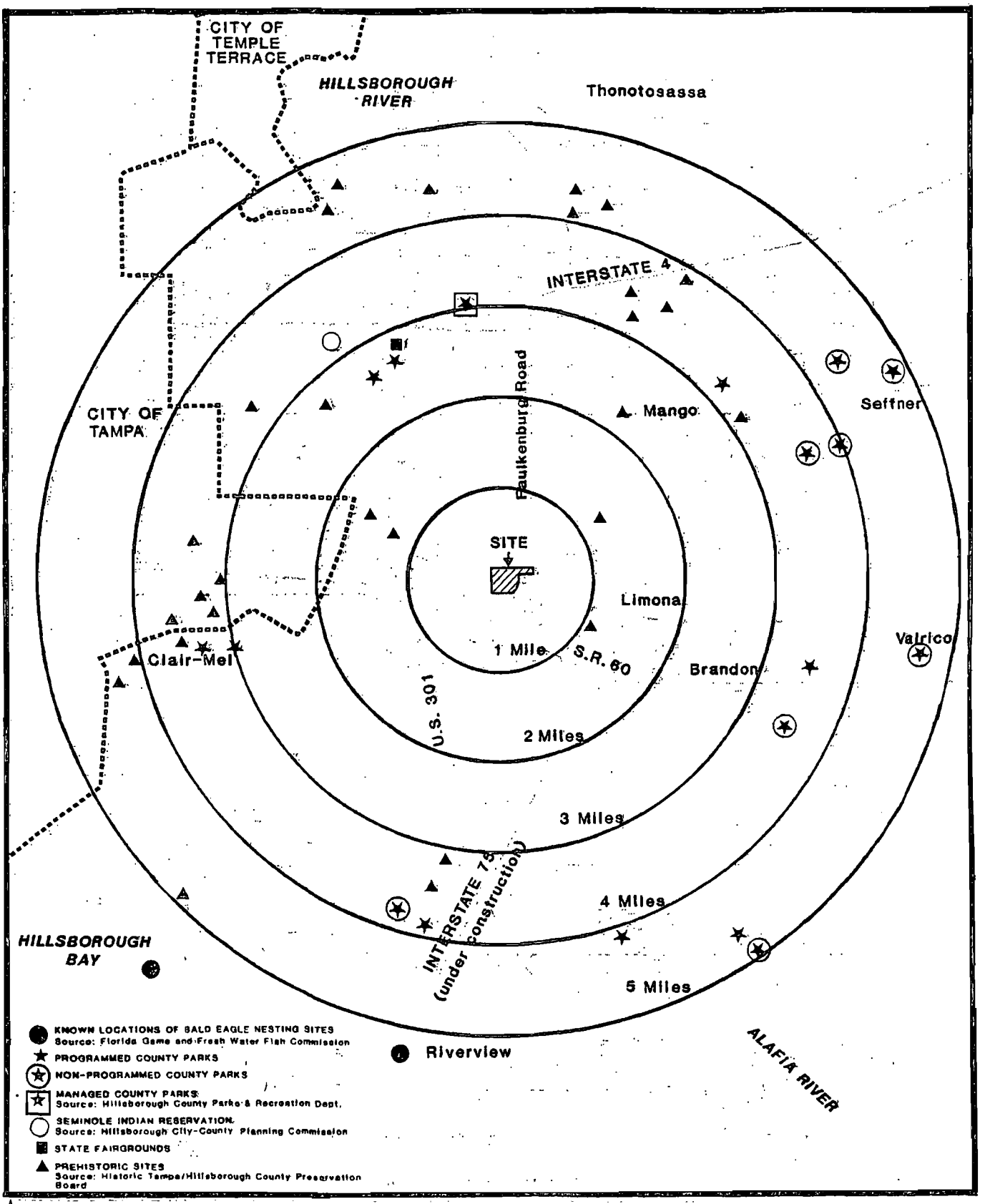


Figure 2.7a

Governmental Jurisdictions Map

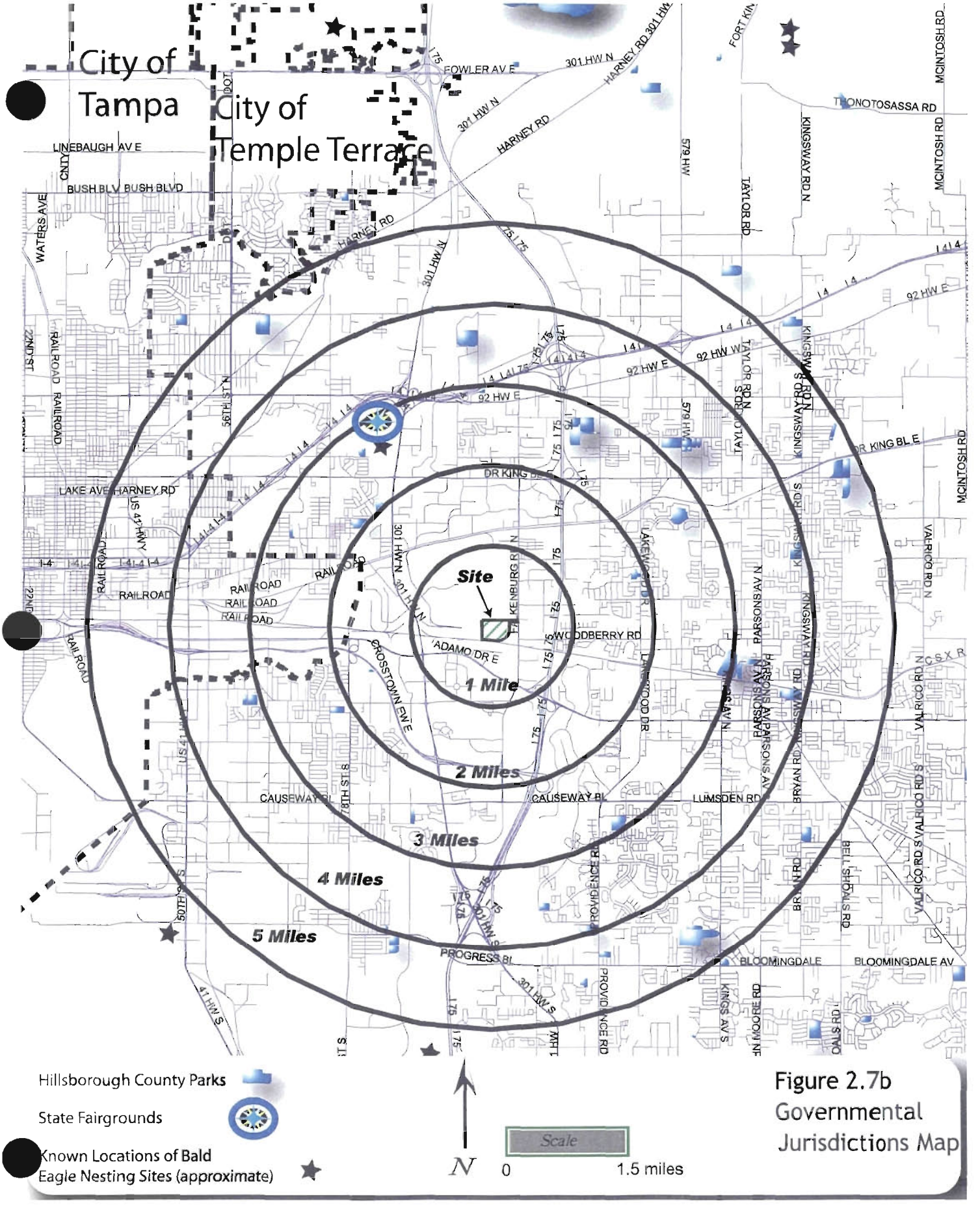


Figure 2.7b
Governmental Jurisdictions Map

Other than County parks, the State Fairgrounds and the Seminole Indian Reservation, there are no federal, state, regional or local areas of interest, as identified in Section 2.2.1 of the Florida Department of Environmental Protection's Instruction Guide for Certification Applications, within five miles of the site. Specifically, there are no national parks, forests, seashores, wildlife refuges, wilderness areas, memorials and monuments or other properties listed in the National Register of Historic Places, or as National Landmarks, marine sanctuaries, estuarine sanctuaries, Roadless Area Review and Evaluation areas, game management areas, areas of critical state concern, conservation and recreation lands, state archeological landmarks or landmark zones, aquatic preserves, Outstanding Florida Waters, special management areas established by law, or military landholdings within five miles of the site.

Nationally registered historic landmarks in the Hillsborough County area are presented as supplemental information in **Appendix 8-2.** As stated previously, according to the Historic Tampa/Hillsborough County Preservation Board, none of the National Register entries are located within five miles of the site.

2.2.2 Zoning and Land Use Plans

In 1984, the Board of County Commissioners of Hillsborough County changed the zoning and land use designations of the site to allow the construction and operation of the Facility. Specifically, the site was rezoned in 1984 as Planned Development Industrial (PD-I), and the land use designation under the County's comprehensive plan was changed to Public/Semi-Public. After the County filed its application for approval of the Facility under the Florida Electrical Power Plant Siting Act, the Siting Board found that the site is consistent and in compliance with existing land use plans and zoning ordinances. The proposed expansion of the Facility is also consistent and in compliance with the existing land use plans and zoning ordinances, as described below. The Siting Board's final order is contained in **Appendix 2-3.**

Under the Comprehensive Planning Act of 1975, Hillsborough County adopted the Horizon 2000 Comprehensive Plan (Plan). The Plan established a comprehensive growth management plan for Hillsborough County. The Land Use Element of the Plan established land use categories, which served as a guide for coordinating the development of both privately owned lands and public facilities.

The County was obligated to adopt a Comprehensive Plan, including a Land Use Element, to comply with the state's land use regulations and Part II, Chapter 163, Florida Statutes. The County's Plan and Future Land Use Element comply with the applicable state requirements; are consistent with the State Comprehensive Plan, and the Comprehensive Regional Policy Plan; and are subject to the state's implementing regulations.

The current Hillsborough Comprehensive Plan was adopted by the Hillsborough County Board of County Commissioners on December 3, 1998 (Ordinance 98-56) with an effective date of March 1, 1999. The Future Land Use Element for unincorporated Hillsborough County is projected to the year 2015. The County's Planning Commission is already working on an update in conjunction with the required Evaluation and Appraisal Report (EAR), which is due

in 2005. This EAR update will make projections out to the year 2025. For the purposes of this application, projections from the County's 2015 plan will be used.

Under the current land use regulations, the site of the Facility has been classified as Public/Quasi-Public (P/QP). Typical uses under this classification are major existing and programmed government-owned facilities, and other public uses. This category also accommodates quasi-public uses such as private establishments generally available to the public for use. These include churches, hospitals, schools, clubs, major (regional, district or community) recreation services and related uses, tourist attractions, and utility and transportation facilities.

In 1984, the 50.4-acre site of the Facility, as well as the rest of the 353-acre parcel purchased by the County, was rezoned as Planned Development Industrial (PD-I) to accommodate a multi-purpose, public use development consisting of a resource recovery facility and a subregional wastewater treatment plant.

The zoning district for the Facility is still a Planned Development Industrial (PD-I; PD 83-274). This zoning was originally approved on May 29, 1984. The PD zoning places conditions on the site and the facilities on the site. The last modification to the PD occurred in July 2004. This modification only modified access and internal parking requirements, mainly for the benefit of the animal services facility that is located at the entrance to the Facility site. The modification received final approval on July 27, 2004.

2.2.2.1 Land Use Plans

The Hillsborough Comprehensive Plan (December 1998) has the following elements:

- Future Land Use Element*
- Transportation Element as amended on October 27, 1994 (Ord 94-10), effective date January 16, 1995, and June 19, 1996 (Ord 96-10), effective date July 13, 1996
- Housing Element*
- Economically Disadvantaged Groups Element*
- Recreation and Open Space Element*
- Conservation and Aquifer Recharge Element*
- Coastal Management Element*
- Potable Water Element*
- Sanitary Sewerage Element*
- Stormwater Management Element*

- Solid Waste Element*
- Capital Improvements Element*
- Intergovernmental Coordination Element*
- Legal Status of the Comprehensive Plan

*Elements as amended on December 3, 1998 (Ordinance #98-56).

Figure 2-8 shows the land use categories for the five-mile area around the site. The site is currently designated for Public/Quasi-Public (P/QP) uses. Section VI of the Hillsborough Comprehensive Plan lists these typical uses for this category:

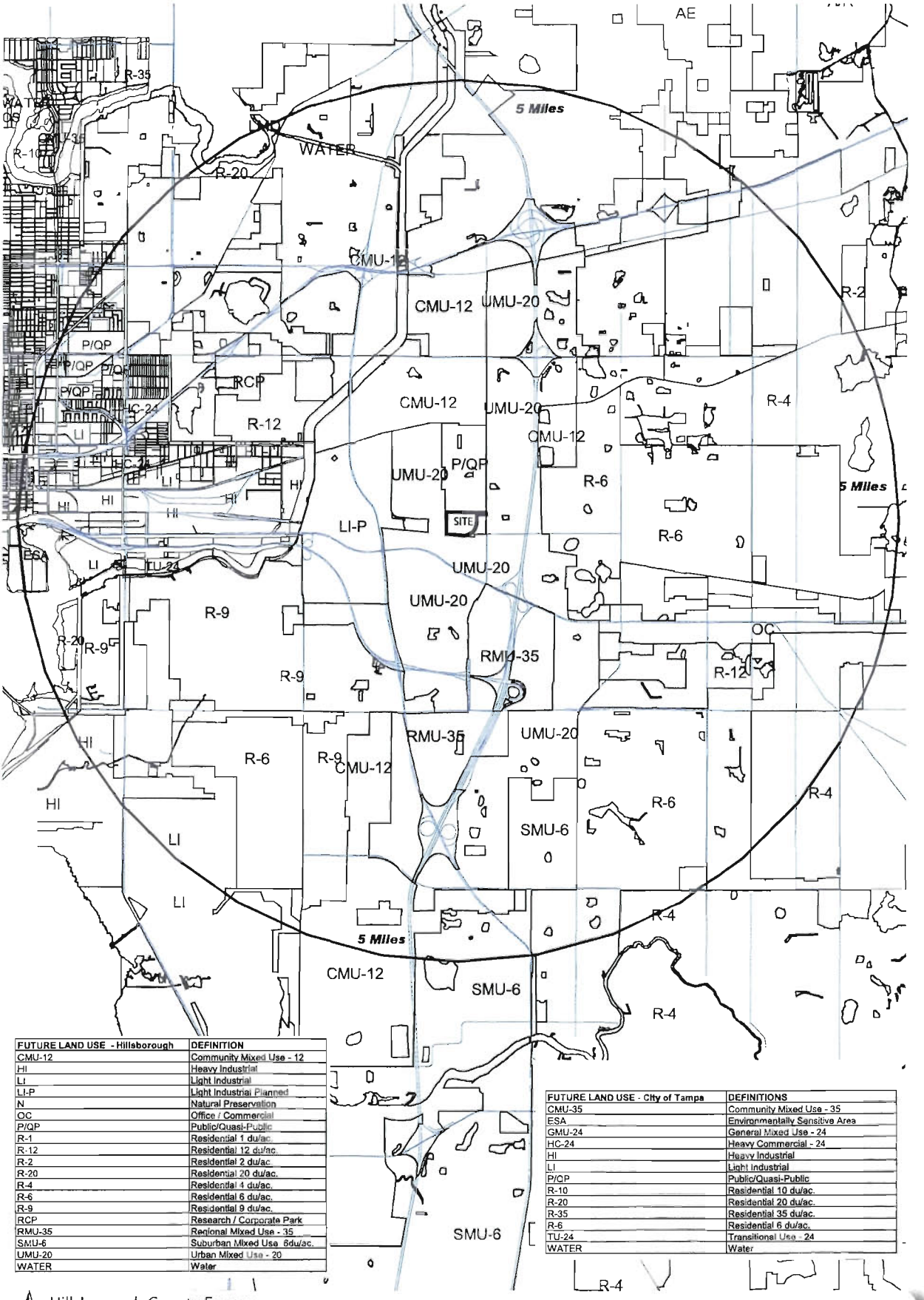
> **"major existing and programmed government-owned facilities, and other public uses. This category also accommodates quasi-public uses such as private establishments generally available to the public for use; for example, churches, hospitals, schools, clubs, major (regional, district or community) recreation services and related uses, tourist attractions, and utility and transportation facilities."**

By designating the land use of the site as Public/Quasi-Public, the County's Comprehensive Plan Map identifies the site as the location of a major public use and an existing government-owned facility. The proposed expansion of the Facility, like the operation of the existing Facility, is consistent and in compliance with the Public/Quasi-Public designation under the County's Comprehensive Plan.

The area surrounding this site has land uses of Public/Quasi-Public to the north, Urban Mixed Uses (UMU-20) to the west and east of the project site and Community Mixed Use (CMU -12) to the north of the project site. The UMU-20 land use category is mainly for uses such as higher density residential uses, regional scale commercial uses, business park, research park and other mixed uses. The CMU-12 land use category permits higher density residential, community scale retail commercial uses, research corporate park uses and other mixed uses. Within a one-mile radius, residential development is rather limited and the existing development patterns are more concentrated with light industrial, commercial and retail uses. On the eastern side of Falkenburg Road and moving further away from the project site, residential development intensifies with mainly single family development. East of I-75, land uses include residential (RES-6) which permits densities up to 6 dwelling units per acre.

2.2.2.2 Consistency with the Comprehensive Plan

As noted previously, Hillsborough County changed the land use designation of the site from Light Industrial (LI) to Public/Semi-Public (P) by adopting Ordinance #84-5 on February 27, 1984. The adoption of that ordinance occurred after receiving testimony and documents at an advertised formal public hearing (February 27, 1984) and after receiving a favorable recommendation from the Hillsborough County City-County Planning Commission (HCCCPC resolution adopted on June 27, 1983).



FUTURE LAND USE - Hillsborough	DEFINITION
CMU-12	Community Mixed Use - 12
HI	Heavy Industrial
LI	Light Industrial
LI-P	Light Industrial Planned
N	Natural Preservation
OC	Office / Commercial
P/QP	Public/Quasi-Public
R-1	Residential 1 du/ac.
R-12	Residential 12 du/ac.
R-2	Residential 2 du/ac.
R-20	Residential 20 du/ac.
R-4	Residential 4 du/ac.
R-6	Residential 6 du/ac.
R-9	Residential 9 du/ac.
RCP	Research / Corporate Park
RMU-35	Regional Mixed Use - 35
SMU-6	Suburban Mixed Use - 6du/ac.
UMU-20	Urban Mixed Use - 20
WATER	Water

FUTURE LAND USE - City of Tampa	DEFINITIONS
CMU-35	Community Mixed Use - 35
ESA	Environmentally Sensitive Area
GMU-24	General Mixed Use - 24
HC-24	Heavy Commercial - 24
HI	Heavy Industrial
LI	Light Industrial
P/QP	Public/Quasi-Public
R-10	Residential 10 du/ac.
R-20	Residential 20 du/ac.
R-35	Residential 35 du/ac.
R-6	Residential 6 du/ac.
TU-24	Transitional Use - 24
WATER	Water

N

Hillsborough County Energy Recovery Project

Scale

0 1 mile

Figure 2.8

Land Use Plan - 5-Mile Area

With the adoption of the current Hillsborough County Comprehensive Plan 2015, the land use for the project site was changed to Public/Quasi Public (P/QP) (Ordinance 98-56). During the adoption process of the Comprehensive Plan, all Semi-Public sites were changed to Quasi-Public sites.

The Future Land Use Element of the County's Comprehensive Plan outlines goals, objectives and policies, which will guide the future land uses for public and private development within the unincorporated parts of Hillsborough County. The site is located within the Urban Service Area (USA) where the County has planned a substantial amount of urban infrastructure. The Land Use Element and the Solid Waste Element applicable sections are listed in **Appendix 2-2.**

Local Land Use Compatibility

The entire area surrounding the site has been designated UMU-20 and CMU-12. Both of these land uses permit higher density residential, research parks and commercial and retail in various intensities (See **Figure 2-8**). In general, there is little residential land use within a one-mile radius of the Facility. Residential development surrounds the Facility beyond the two-mile radius, especially towards the Brandon and Gibsonton area, as well as west towards the City of Tampa. The density ranges from Residential-1 to Residential-12, which permits densities from one dwelling unit per acre up to 12 dwelling units/acre, respectively. Within five miles are various land use classifications permitting commercial and retail uses as well as office complexes. The following is a general listing of land uses within the five-mile radius: low, medium and high density residential, commercial, office, mixed uses, Developments of Regional Impact for office parks, Public/Quasi-Public, light industrial, and heavy industrial. Land uses within the city limits of Tampa include medium to high density residential, heavy industrial, Public/Quasi Public, and light industrial. **Section 2.2.3** describes the current land uses around the site.

As previously noted, the Facility was built and began commercial operations approximately 20 years ago. Many of the current land uses near the Facility were built after it was in operation. The encroachment of these new land uses into the area, and the Facility's track record of successful and compatible operations, demonstrate that the Facility has little or no adverse impact on surrounding land uses. The Facility's impacts will not materially change as a result of the proposed expansion project. Consequently, the proposed expansion project, like the existing Facility, will be compatible with the surrounding land uses.

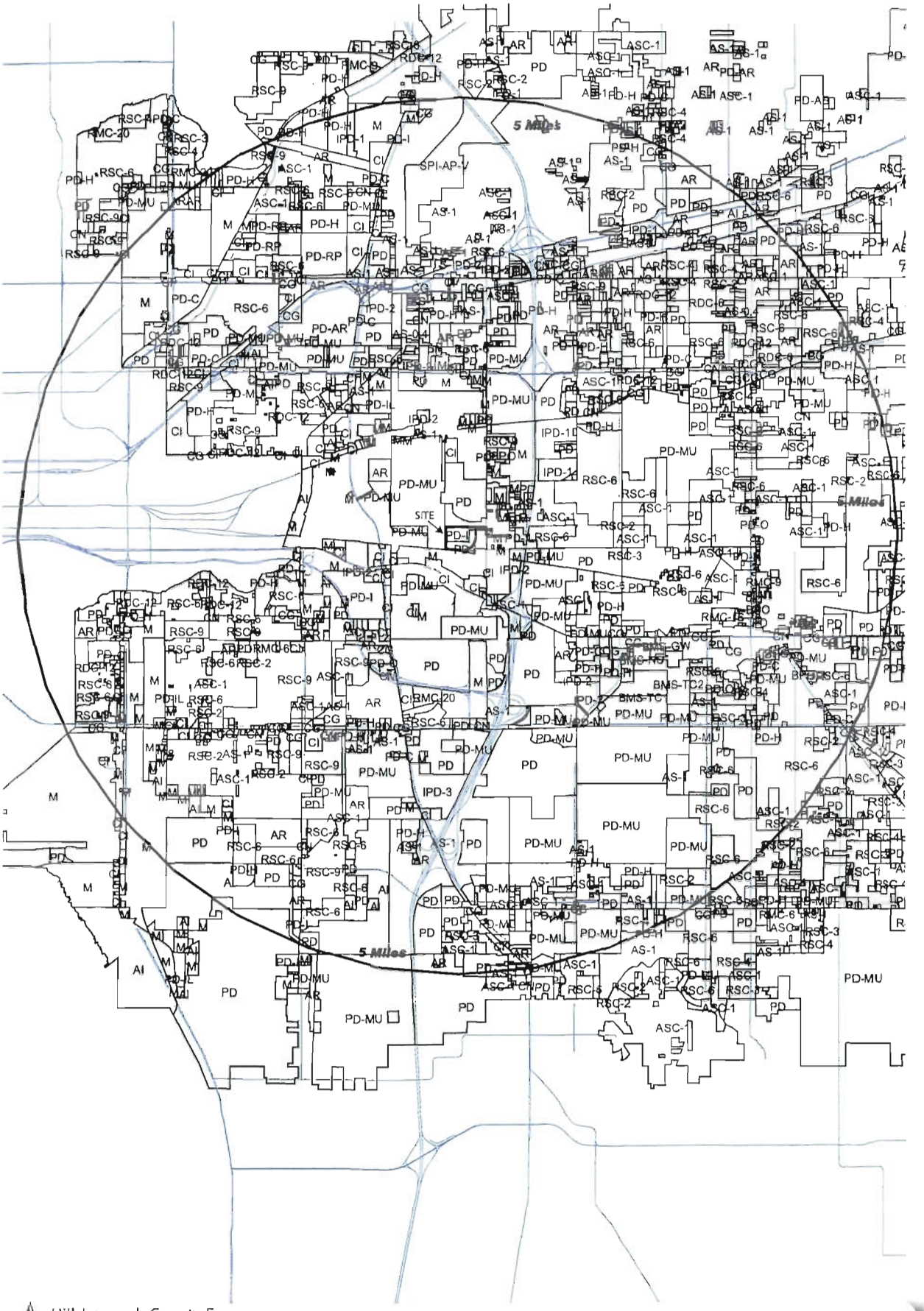
2.2.2.3 Zoning Regulations

The Hillsborough County Zoning Regulations were adopted by the Board of County Commissioners on December 6, 1976 and subsequently amended. These zoning regulations established districts that regulated land uses within the unincorporated areas of Hillsborough County and regulated land uses and developments within those districts. The Hillsborough Land Development Code was adopted in 1996. It replaced the zoning ordinance in effect at that time.

Figure 2-9 shows the generalized zoning designations for the five-mile radius area around the site. Generally, the greatest amount of residentially-zoned land within the five-mile radius

area is within the City of Tampa, west of the site. Other large residential areas exist in Brandon, east of the site. North and south of the site, there is significantly less residential development. Zoning districts surrounding the existing site include Planned Developments either for mixed uses or industrial, manufacturing, interstate planned development, agriculture, low to medium residential and commercial.

The site is currently zoned Planned Development Industrial (PD-I). The current zoning district is in compliance with the Land Development Code and the Comprehensive Code, and compatible with the surrounding land use of P/QP. The proposed expansion project is consistent and in compliance with the Planned Development Industrial zoning for the site.



Hillsborough County Energy Recovery Project

Figure 2.9

Generalized Zoning - 5-Mile Area

2.2.3 Demography and Ongoing Land Use

2.2.3.1 Existing Populations

The populations of the cities within Hillsborough County from 1980 to 2003 are shown in Table 2-2.

Table 2-2
Hillsborough County Population 1980 – 2003

Year	Tampa	Plant City	Temple Terrace	Unincorporated County	Total Hillsborough County Population
1980 1970-1980	271,523	17,064	11,097	347,201	646,960
1990 1980-1990	280,015	22,754	16,444	514,841	834,054
2000 1990-2000	303,447	29,915	20,918	644,668	998,948
2003 2000-2003	321,490	31,930	21,790	708,310	1,083,520

2.2.3.2 Existing Land Use

The following matrix shows land uses within one mile of the site:

Existing Land Use Matrix		
Vantage Business Center 301, Center Pointe Business Park, Florida Expo Park; warehouses and office complex, CMU-12 land use;	Sabel Industrial park, Railroad – CSX, Hillsborough Warehouse, Sheriff District 2 office, Falkenburg Jail, Animal Services, P/QP, CMU-12 land uses;	Citigroup Center, Hillsborough County Community College, retail and commercial businesses, Fire station, UMU-20, CMU-12 land uses;
Hopewell Industrial Center, Tampa East, Vacant lands, Bypass canal, Conley RV center, Verizon offices, Transmission line, UMU-20, LI-P, P/QP land uses	Site , P/QP land use	Commercial businesses, retail, small to medium size warehouses, Falkenburg Industrial Park, Tax Collector, Pinebrooke Business Park, UMU-20, RES-6 land uses;

Existing Land Use Matrix (Continued)		
Silo Bend Industrial park, Hawthorne Place Apts, Tampa Traingle Business Park, Palm River Business Park, Car dealerships, retail and commercial businesses, restaurants, UMU-20, HI, and LI-P land uses;	Selmon Expressway, Courtney Palms Apts, Interstate Park of Commerce, Fire station, RR-CSX, Salvation Army, Central Park Industrial Park, Crossroads Business Park, Wastewater Treatment plant, Retail, Hackney Distribution Center; P/QP, UMU-20, RMU-35 land uses	Commercial Businesses, Brandon Town Center, Regency Square Shopping Center, Lake Kathy, I-75, Retail, Hillsboro Memorial Gardens Cemetery, Hotel, restaurants; UMU-20, RES-6 land uses;

Existing adjacent land uses include vacant agricultural land, commercial, light and heavy industrial uses, and residential. The existing land use using Level II categories of the Florida Land Use and Cover Classification System (FLUCCS) for an area extending five miles from the Facility is shown in **Figure 2-10**. Major industrial and commercial activities near the site are shown in **Figure 2-11**.

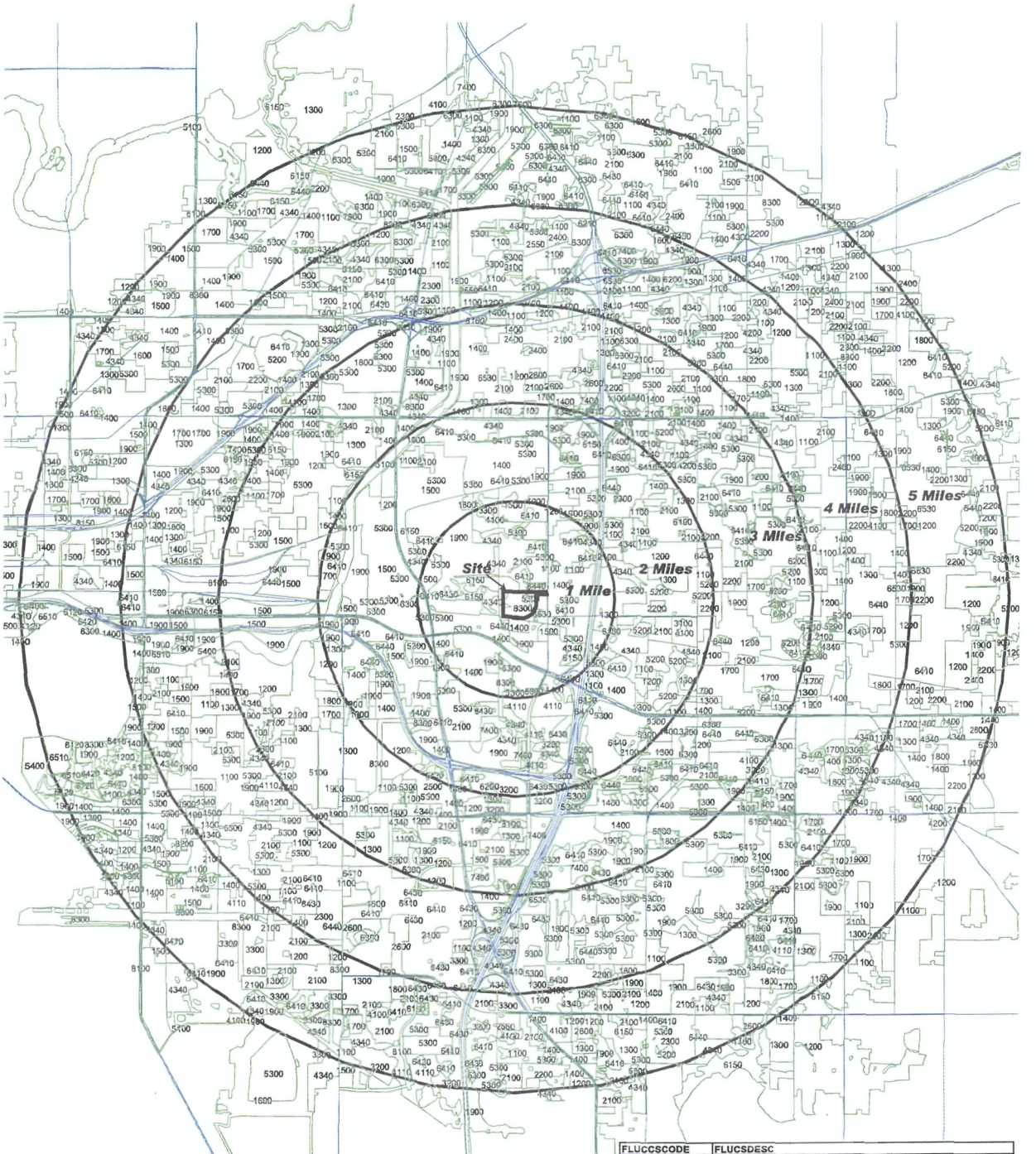
The predominant existing land use at the site is utilities (FLUCCS - 830). The majority of the site is occupied by the Facility (FLUCCS - 830), Wastewater Treatment Plant (FLUCCS - 834), and surrounding support areas. Other portions of the project site include retention ponds (FLUCCS - 530) and ditches (FLUCCS - 510). In addition, there are several small grassy areas (FLUCCS - 210) that occur in between the utility components and parking lots but are cleared and maintained for landscape aesthetics.

Land directly north of the site is owned by Hillsborough County and currently used for the County jail, animal services, and the sheriff's office. There are some vacant parts of the site. Further north of the site, along Broadway Avenue, there are light and heavy industrial uses, warehouses and small office complexes (Sabal Park, Cross Pointe).

Directly adjacent to the site, on the west, is an undeveloped wooded area and the TECO easement. Currently, there are several parcels to the west of the project site that are still undeveloped.

Immediately south of the site is the wastewater treatment plant, located on property owned by Hillsborough County. South of this, between CSX Railroad and State Road 60 (SR-60), is a commercial and industrial park development and several small businesses.

South of SR-60 is the commercial and office development identified as Tampa Central Park and the Crosstown Center.



FLUCCSCODE	FLUCSDESC
1100	RESIDENTIAL, LOW DENSITY < 2 DWELLING UNITS
1200	RESIDENTIAL, MED DENSITY 2->5 DWELLING UNIT
1300	RESIDENTIAL, HIGH DENSITY
1400	COMMERCIAL AND SERVICES
1500	INDUSTRIAL
1600	EXTRACTIVE
1700	INSTITUTIONAL
1800	RECREATIONAL
1900	OPEN LAND
2100	CROPLAND AND PASTURELAND
2200	TREE CROPS
2300	FEEDING OPERATIONS
2400	NURSERIES AND VINEYARDS
2500	SPECIALTY FARMS
2550	TROPICAL FISH FARMS
2600	OTHER OPEN LANDS <RURAL>
3100	HERBACEOUS
3200	SHRUB AND BRUSHLAND
3300	MIXED RANGELAND

FLUCCSCODE	FLUCSDESC
4100	UPLAND CONIFEROUS FOREST
4110	PINE FLATWOODS
4300	UPLAND HARDWOOD FORESTS - PART 2
4340	HARDWOOD CONIFER MIXED
5100	STREAMS AND WATERWAYS
5200	LAKES
5300	RESERVOIRS
5400	BAYS AND ESTUARIES
6100	WETLAND HARDWOOD FORESTS
6120	MANGROVE SWAMPS
6150	STREAM AND LAKE SWAMPS (BOTTOMLAND)
6200	WETLAND CONIFEROUS FORESTS
6210	CYPRESS
6300	WETLAND FORESTED MIXED
6410	FRESHWATER MARSHES
6420	SALTWATER MARSHES
6430	WET PRAIRIES
6440	EMERGENT AQUATIC VEGETATION
6510	TIDAL FLATS/SUBMERGED SHALLOW PLATFORM
6530	INTERMITTENT PONDS
7400	DISTURBED LAND
8100	TRANSPORTATION
8200	COMMUNICATIONS
8300	UTILITIES

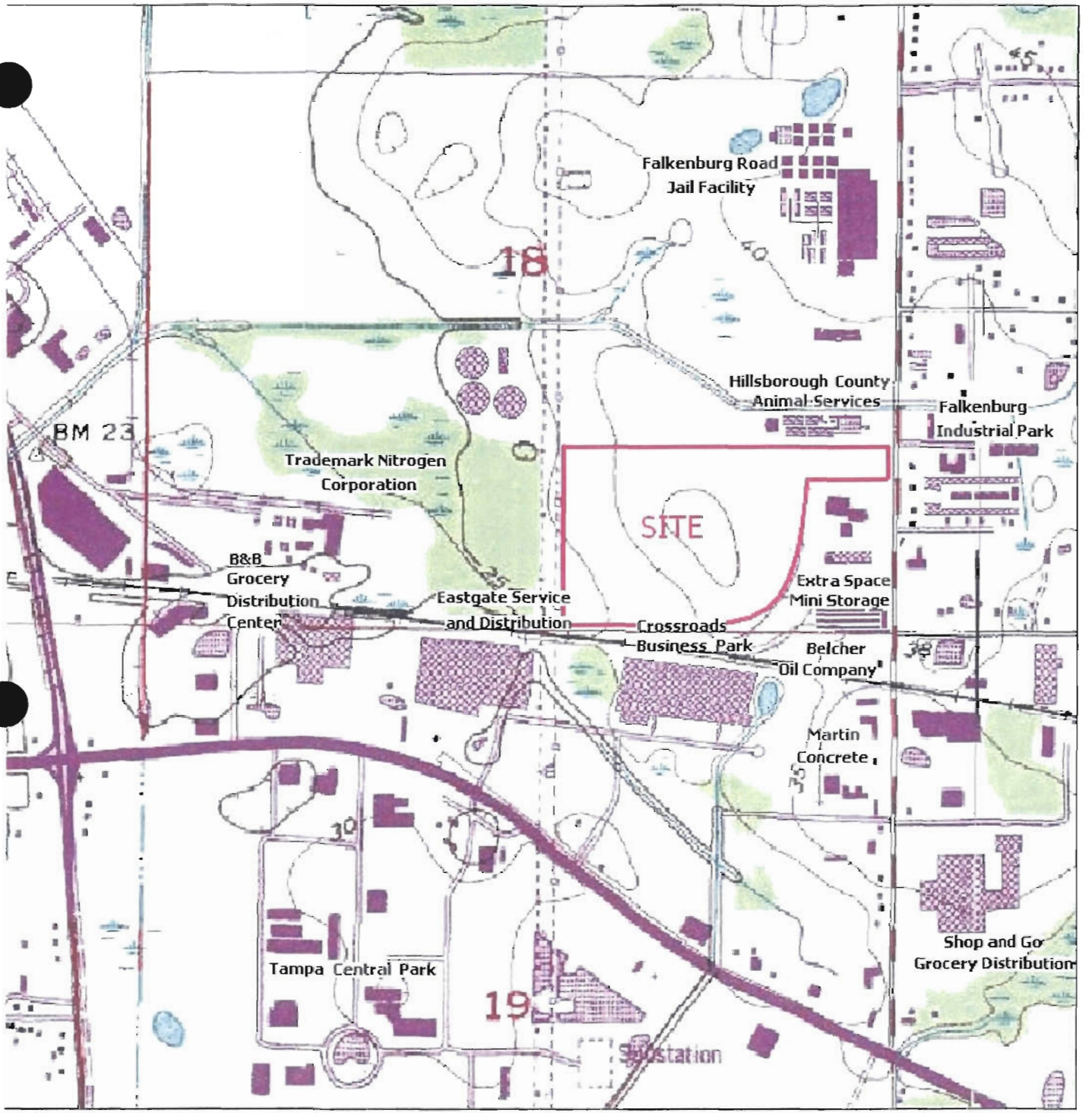
Hillsborough County Energy Recovery Project

Scale

N 0 1 mile

Figure 2.10

Existing Land Use
5-Mile Area



Hillsborough County
Energy Recovery Project

Scale
NTS

Figure 2.11
Major Industrial And
Commercial Activities
Near The Site

Southeast of the site, west of Falkenburg Road and north of SR-60, is an industrial/commercial area comprised of various businesses and small warehouses complexes (CTI, Eastshore Center, Trennex).

Various other warehouses and office complexes are on the eastern side of Falkenburg Road (Automotive Store, CCN, Pinebrooke Business Park, Tax Collector and several small private businesses). There are a few residential dwelling units at the corner of Falkenburg Road and Columbus Drive, which are bordered to the north by more businesses and some vacant lands. Northeast of the project site, is a fire station, Sabal Park and Citigroup Center. Both of these are large office complexes.

The nearest established neighborhood, Woodberry Estates, is east of Interstate 75 along Woodberry Road about 2600 feet east of the site's closest boundary and approximately 4200 feet east of where the Facility is located on this site. The area to the east towards Brandon has developed mostly with residential uses and commercial uses along the main arterials like SR-60, south along Falkenburg Road, and along the I-75 Corridor.

Within the five-mile radius are several sites that are owned by the local government, Hillsborough County, on which a jail, a sheriff complex, animal services, and two fire stations are located. The Hillsborough school district has several schools located within this range as well as a campus for the Community College, located approximately one mile to the northeast of the subject site. There are also several US Post Office locations within the five-mile radius.

2.2.4 Easements, Title, Agency Works

Expansion of the Facility will not require additional easements or titles from government agencies. Power generated by the Facility will continue to be transmitted to Florida Power and Light's Buckingham Substation within the transmission line corridor on the site. Water and wastewater lines are within existing County rights-of-way.

2.2.5 Regional, Scenic, Cultural, and Natural Landmarks

Based on the research performed in conjunction with **Section 2.2.1** "Governmental Jurisdictions," the following areas were found to exist within five miles of the site:

- County Parks
- State Fairgrounds
- Seminole Indian Reservation

None of these areas of cultural interest would be affected by the proposed plant or its emissions.

Information provided in "The Cultural Resources of the Unincorporated Portions of Hillsborough County: An Inventory of the Built Environment," by the Historic Tampa/Hillsborough County Preservation Board is provided in **Section 2.2.1.**

2.2.6 Archaeological and Historic Sites

The site does not have any archaeologically or historically significant sites or areas considered to be potentially significant archaeologically or historically as identified by the Department of State, Division of Archives, History, and Records Management (DAHRM).

In 1984, the Florida Department of State's Bureau of Historic Preservation, Division of Archives, History and Records Management, informed the County that no significant cultural resources would be affected by the construction of the County's Facility. Copies of correspondence from the Florida Division of Archives, History, and Records Management pertaining to the County's project are presented in **Appendix 8-1.**

During the original site selection activities for the Facility, the DAHRM was contacted to determine the historic/archaeological significance of the property. According to DAHRM, the Florida Master Site File indicated no known sites on the property. However, since sites were known to exist in similar geographical and environmental areas nearby, a survey was recommended by the State Historic Preservation Officer (SHPO).

In addition, during the original site selection process, Hillsborough County retained the services of Dr. J. Raymond Williams of the University of South Florida, Department of Anthropology to do a walkover reconnaissance survey and subsurface testing. The report, "An Archaeological and Historical Survey of the Falkenburg Road Resource Recovery Facility Tract, Hillsborough County, Florida," was prepared in May 1983 by Williams, Newman, Estabrook, and Johnson and is included in **Appendix 8-3.**

The results of this archeological and historical survey indicated that the project will have no impact on any cultural resources, prehistoric or historic. A current consultation with Staff Archaeologist Lisa N. Lamb of Pan-American Consulting, Inc. of Tampa, Florida, indicated that it is highly unlikely that any evidence changed within the bounds of the property tract after the original survey was conducted and thus no new study or review was justified.

The archaeological and historical survey has been reviewed by the DAHRM. In correspondence dated June 21, 1983, to Hillsborough County, the DAHRM noted that "...the proposed project is unlikely to affect any significant archaeological or historic resources, and may proceed without further involvement with this agency." A copy of this correspondence is also included in **Appendix 8-1.**

No impacts of significant archeological or historic sites are expected as a result of construction activities associated with expansion of the Facility because the expansion is occurring on the existing Facility site footprint. In the unlikely event that a potential archeological site should be unearthed during expansion construction, officials of the State Division of Historical Resources will be contacted to determine its significance.

2.2.7 Socioeconomics and Public Service

2.2.7.1 Social and Economic Characteristics

Current and Projected Population

The study area is mainly within the Brandon area of Hillsborough County. **Table 2-3** details the census population counts for those census tracts partially or wholly within five miles of the site. The census tract (122.05) which contains the site had a 2000 population of 7,067. The 2000 census population of those tracts partially or wholly within five miles of the site was 157,572. As shown on **Figure 2-12**, the total area within those census tracts partially within the five-mile area is considerably larger than the five-mile radius area itself. **Figure 2-13** shows the 2000 census tracts near the site, including those within the City of Tampa.

Table 2-3

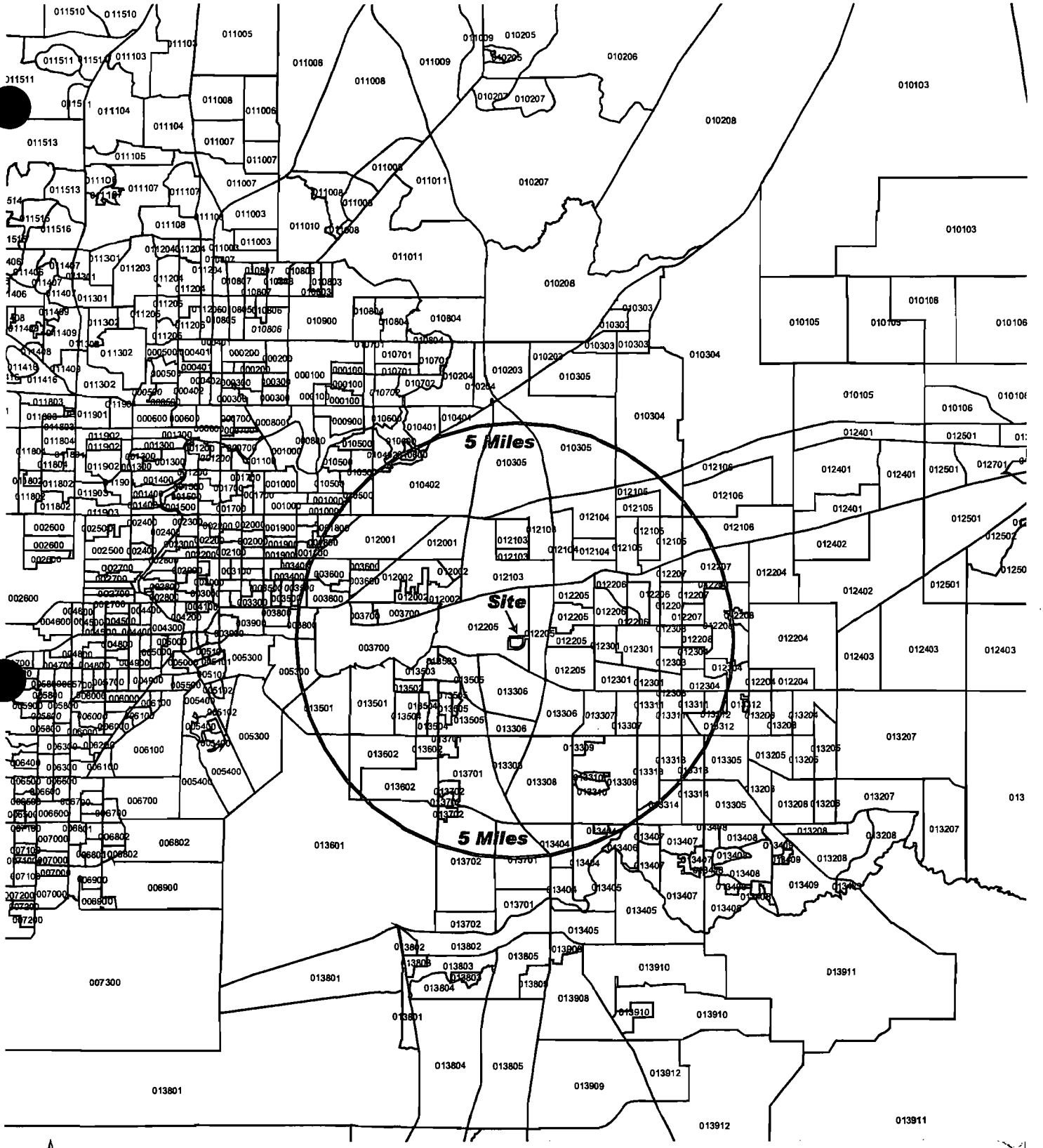
Population Within a 5 Mile Radius

Age Under 5	Age 5 – 17	Age 18 – 21	Age 22 – 29	Age 30 – 39	Age 40 – 49	Age 50 – 64	Age 65 Up
11,273	31,833	8,183	18,307	26,876	24,034	22,986	13,669

Source: Census 2000

Civilian Labor Force

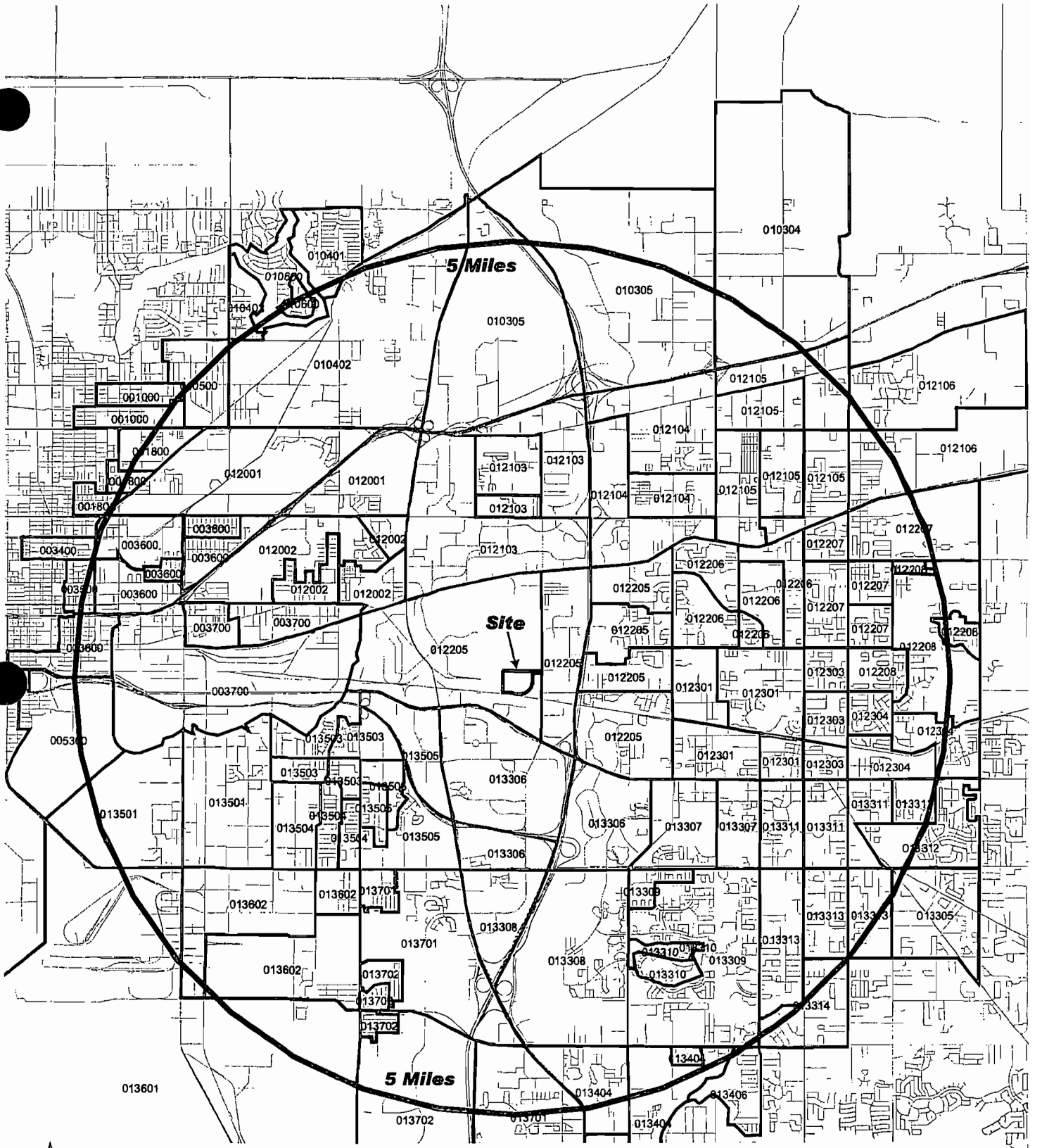
The civilian labor force in Hillsborough County as a whole has increased by about 21 percent from 1990 to 2000. The annual average labor force of 466,230 in the year 1990 increased to 564,858 in the year 2000. This represents 98,628 new workers in the labor force. During the same period, employment increased by 106,443 or about 24 percent from 443,789 employed residents in the year 1990 to 550,232 in the year 2000. This resulted in a net reduction of the unemployment rate, from 4.8 percent in 1990 to 2.6 percent in 2000. Unemployment rates during the 10-year time period varied from less than 3 percent to over 7 percent. Labor force statistics are shown in **Table 2-4**.



Hillsborough County Energy Recovery Project

Figure 2.12

2000 Census Tracts in Hillsborough County



Hillsborough County Energy Recovery Project

Figure 2.13

2000 Census Tracts Near the Site

Table 2-4

Labor Force Trends Hillsborough County 1984 – 2002

Year	Annual Average Labor Force	Employed Residents	Unemployed Residents	Unemployment Rate
1990	466,230	443,789	22,441	4.8%
1991	451,299	423,330	27,969	6.2%
1992	463,017	429,982	33,035	7.1%
1993	465,143	435,167	29,976	6.4%
1994	487,826	461,488	26,338	5.4%
1995	489,853	468,599	21,254	4.3%
1996	494,975	476,009	18,966	3.8%
1997	512,104	494,954	17,150	3.3%
1998	530,529	515,830	14,699	2.8%
1999	557,628	542,471	14,158	2.7%
2000	564,858	550,232	14,626	2.6%

Source: Florida Department of Labor and Employment Security, 2003

Major Employers in Hillsborough County

The ten largest employers in Hillsborough County and the number of people employed at each is presented below.

Verizon Florida
Business Line: Telecommunications
Number of Employees.....10,000

Bank of America
Business Line: Financial Services
Number of Employees.....6,762

St Joseph's Hospital
Business Line: Healthcare
Number of Employees.....4,504

TECO Energy
Business Line: Utility
Number of Employees.....4,000

Citigroup
Business Line: Financial Services
Number of Employees.....3,000

Caspers Company
Business Line: Food
Number of Employees.....2,850

Capital One
Business Line: Financial Services
Number of Employees.....2,800

Chase Manhattan Bank
Business Line: Financial Services
Number of Employees.....2,750

University Community Hospital
Business Line: Healthcare
Number of Employees.....2,586

Busch Gardens
Business Line: Entertainment
Number of Employees..... 2,500

Source: Enterprise Florida Hillsborough County

Employment by Industrial Sector

In terms of actual numbers of persons employed within a given industrial sector, professional and businesses services and other services provided the most jobs in 2002 for the employees in Hillsborough County. Agriculture and mining provided the smallest number of jobs for

individuals living within this area. **Table 2-5** presents a breakdown of employment figures by largest industries in the Tampa Bay Region.

Table 2-5
Employment by Industry Hillsborough County

Construction & Real Estate	6.9%
Education Services	6.8%
Finance & Insurance	7.2%
Government (including military)	4.5%
Healthcare & Social Assistance	9.0%
Information	3.8%
Agriculture, Natural Resources & Mining	2.0%
Manufacturing	5.2%
Other Services	23.1%
Professional & Business Services	22.8%
Transportation / Warehousing / Wholesale Trade	8.7%
Total	601,777

Source: Enterprise Florida 2002

Source of Income

Throughout the three subareas of the City of Tampa, Temple Terrace, and Unincorporated Hillsborough County, the primary source of income for households is wage or salary. More than 45% of people are employed within the professional and business and other services categories.

Baseline Employment Projection

Baseline employment projections for the years 1999 and 2015 are shown in **Table 2-6**. Approximately 48 percent of the projected employment for Hillsborough County is within the regional services category.

Table 2-6 Employment Projection Hillsborough County		
	1999	**2015**
Industrial	138,012	181,060
Regional Commercial	47,926	68,128
Local Commercial	76,232	106,222
Regional Service	313,464	437,192
Local Service	76,629	104,208
Total	652,263	896,810

Source: Hillsborough County MPO 2015 LRTP

General Income Characteristics

According to Census 2000 data, the Temple Terrace subarea, with a median income of $44,508, has the largest proportion of upper income households. In contrast, the City of Tampa subarea has a median income of $34,415. The statistics for the unincorporated Hillsborough County subarea are closer to those for Temple Terrace with a median income of $40,663. Plant City has a median income of $37,584. **Table 2-7** provides the median incomes for the census tracts within the five-mile radius.

Table 2-7 Population Counts by Income Range for Census Tracts Within 5 Mile Radius					
Less 10k	4,317	35k-39k	3,829	100k-124k	2,421
10k-14k	3,463	40-44k	3,688	125k-149k	965
15k-19k	3,376	45k-49k	3,545	150k-199k	525
20k-24k	3,887	50k-59k	5,922	200k-More	505
25k-29k	4,055	60k-74k	6,705	ABOVE_BELOW	152,969
30k-34k	4,251	75k-99k	5,876	BELOW_POV	17,353
				ABOVE_POV	135,616

Employment by Occupation

Table 2-8 shows a breakdown of employment and wages for the Tampa Bay Region by industry for the year 2002. Highest salaries were within the information, transportation, and finance categories.

Table 2-8
Average Wages in Industry

All Industries	$33,970
Construction & Real Estate	$36,120
Education Services	$30,945
Finance & Insurance	$46,317
Government (including military)	$37,948
Healthcare & Social Assistance	$37,644
Information	$53,302
Agriculture, Natural Resources & Mining	$14,315
Manufacturing	$36,792
Other Services	$23,192
Professional & Business Services	$33,520
Transportation / Warehousing / Wholesale Trade	$42,595

Source: Enterprise Florida 2002

Housing

Over the last 20 years, housing units have increased significantly. Increases within the unincorporated area have been higher than within the City of Tampa or Temple Terrace. The Brandon, Valrico, and Riverview areas have experienced a higher increase in building activity than other areas within Hillsborough County. Housing unit statistics are presented in **Table 2-9**.

The unincorporated Hillsborough County portion of the five-mile area has the greatest population of owner-occupied housing units (77 percent) while the City of Tampa has the lowest (63 percent). Tampa also has the lowest proportion of occupied housing units (60 percent) with Temple Terrace having the greatest (94 percent).

Building Activity

Single-family units represented the largest proportion of building activity for the last 4 years. The number of permits in the southern part of Hillsborough County increased more than in

other parts of the County. In the Brandon, Riverview, and Balm/Wimauma area, single and multi-family permits increased at a higher percentage than other areas.

Table 2-9
Building Permit Activity for Residential and Non-Residential

Year	Residential (Units)	Non-Residential (Millions of Dollars)
2000	12,034	$316.7
2001	11,370	$493.4
2002	12,502	$272.5
2003	15,579	$328
2004 1st quarter	2,610	$73.5

Source: Planning Commission Hillsborough County

2.2.7.2 Area Public Service and Utilities

Education

Schools within the five-mile area of the site include:

Elementary Schools	Middle Schools	High Schools
Limona Elementary	Mclane Middle School	Brandon High
Yates Elementary	Mann Middle School	Armwood High
Clairmel Elementary	Dowdell Middle School	
Palm River Elementary	Jenkins Middle School	
Seffner Elementary	Burnett Middle School	
Brooker Elementary		
Kingswood Elementary		
Bing Elementary		
Kingswood Elementary		
Lopez Elementary		

Private: Brandon Academy

None of the schools are within one mile of the site.

Transportation

The site is located off of Falkenburg Road, approximately one-half mile west of Interstate 75 in Hillsborough County. The site is approximately one-half mile north of SR-60 (Adamo Drive), and 1.5 miles south of SR 574 (MLK Boulevard).

A traffic analysis was conducted to assess the impact on the surrounding roadways. The traffic analysis demonstrated that none of the surrounding roadways or intersections will be adversely affected by the construction of the expansion or the operation of the Facility after the expansion. The traffic analysis is included in **Appendix 11-2.**

Fire Fighting Facilities

The site is located within the Brandon Fire District. The nearest station is Brandon Fire Station #2 at 10050 Palm River Road. There is another fire station off Falkenburg Road, north of the Broadway Ave intersection.

Police Protection

The site is located within Patrol District Area 2, Brandon Proper. The office location for this district is at 2310 Falkenburg Road, just north of the project site. Part of the five-mile radius is located within District 4, which has offices in Ruskin and patrols the area south of Brandon Boulevard.

Recreation Facilities

Major recreational areas (state parks and County parks) are addressed in **Section 2.2.1** "Governmental Jurisdictions." Camp Florida is located southwest of Lakewood Drive about 1.5 miles east of the Facility location. Limona Park is located off Lakewood Drive about 1.5 miles west of the site. There is also a YMCA within the area and various other small community parks.

Electricity and Gas

There is a 200 foot wide TECO easement with three 230 kV lines directly adjacent to the site. The County is currently negotiating a Small Power Production Agreement with TECO. A gas pipeline owned by Houston Texas Gas and Oil is directly to the west of the site.

Water Supply Facilities

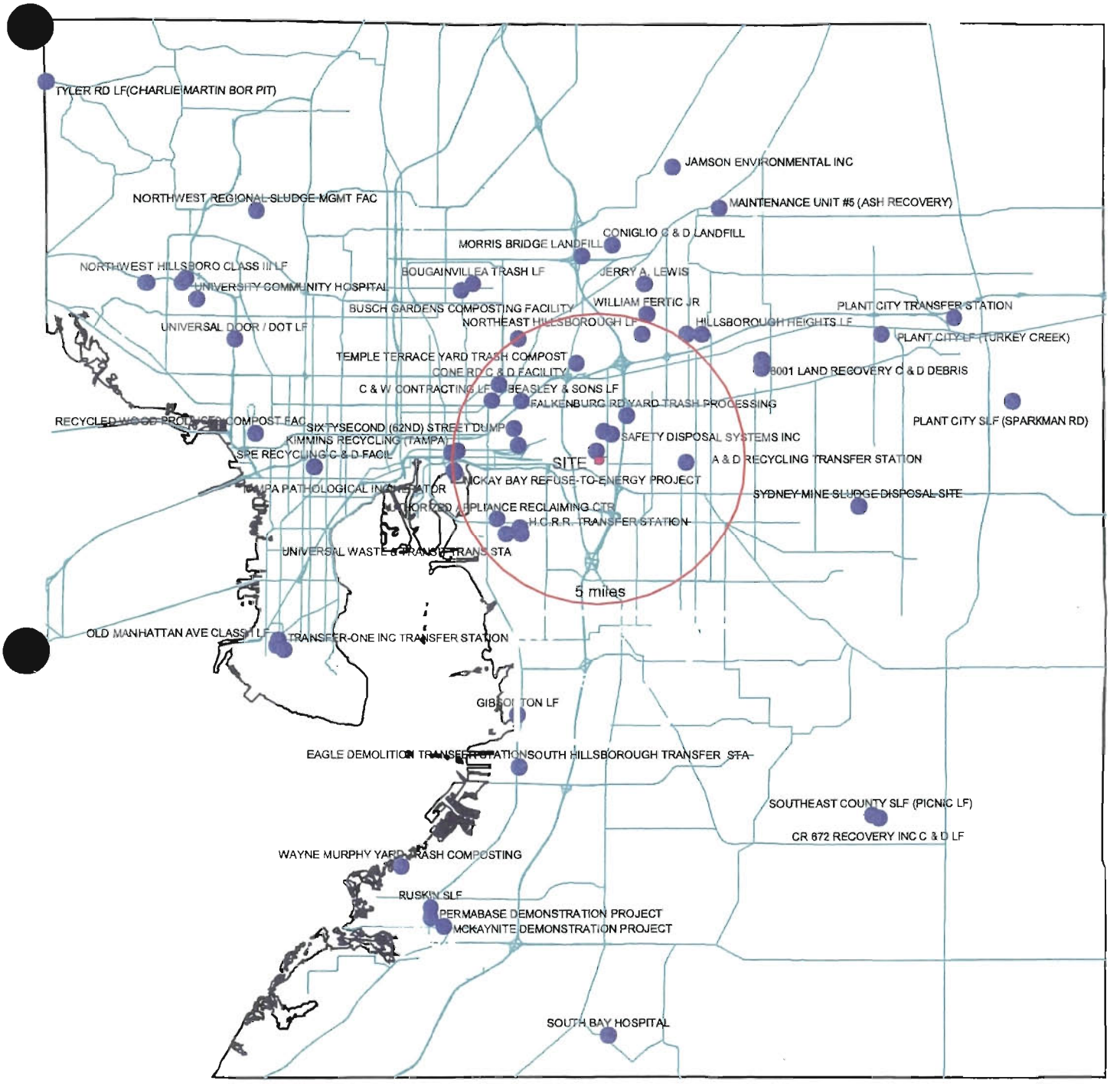
The existing potable water service to the site is a twelve (12) inch City of Tampa water main that runs along Falkenburg Road. The existing main provides water at a static pressure of 40-45 psi.

Wastewater Treatment Facilities

The Northwest Brandon Subregional Wastewater Treatment Plant (WWTP) is co-located with the Facility on the Falkenburg Road site. It is the responsibility of the Contractor (currently Covanta) to discharge wastewater to the County's adjacent wastewater treatment plant in accordance with County pretreatment standards.

Solid Waste Disposal

The project site currently accepts about 1,200 tons per day of solid waste from Hillsborough County transfer stations and private contractors. The closest landfill is approximately 20 miles to the south at the Southeast County Landfill. For the year 2000, Hillsborough County, including the three cities, generated approximately 807,693 tons of solid waste. Due to the projected population increase, the total solid waste generated in the County is expected to increase to an estimated 884,692 tons in the year 2015. **Figure 2-14** shows the solid waste management facilities in Hillsborough County.



N

Hillsborough County Energy Recovery Project

Scale

NTS

Figure 2.14
Solid Waste Management Facilities In Hillsborough County

2.3 Biophysical Environment

The proposed Facility expansion is located southeast of the City of Tampa, west of I-75, and north of SR-60 along the South Falkenburg Road in unincorporated Hillsborough County. The site is within the jurisdiction of the Southwest Florida Water Management District (SWFWMD). The project location is shown in **Figure 2-1**.

The Facility does not use groundwater or surface water in any of its operations. Water currently used at the Facility in its operation is provided to the plant from the Hillsborough County wastewater system in the form of reclaimed water. The source of additional water required for the Facility expansion will also be reclaimed water from the Hillsborough County wastewater treatment plants. Therefore, a Water Use Permit for the expansion project is not required from the SWFWMD.

2.3.1 Geohydrology

The following sub-sections describe the major geologic aspects of the site and associated Facility areas. This includes a description of the geotechnical studies designed to determine the suitability of the site for its intended purposes. These studies were undertaken to determine the structural and environmental suitability of the site. The study description includes identification and justification of the sampling pattern, sampling method, and analytical techniques. Most of these studies were performed before the existing Facility was built.

Currently, the Facility does not have holding or cooling ponds, ash ponds, FDG sludge or coal piles, or any other similar potential contamination sources. The County does not intend to construct any of the fore-mentioned elements at the Facility in the future. Therefore, data concerning site-specific aquifer characteristics, which relate to potential pollutant transport, have not been included.

2.3.1.1 Geologic Description of the Site-Area

The geological formation at the study area consists of sedimentary deposits several hundred feet in thickness. These deposits form the aquifers (water-bearing formations) and confining units in the study area. The principal potable water-bearing units in the study area are the surficial aquifer system (SAS) and the Upper Floridan Aquifer (UFA). These aquifers, in some areas, are separated by a discontinuous intermediate confining unit of the Floridan Aquifer system. Where the intermediate confining unit is missing, the UFA and SAS are hydraulically connected. A middle confining unit separates the UFA from the Lower Floridan Aquifer (LFA). A lower confining unit separates the LFA from the formations below it. The LFA generally contains no potable saline water, which is not suitable for industrial or agricultural use. A generalized geohydrologic section of the Floridan aquifer system is presented in Table **2-10**.

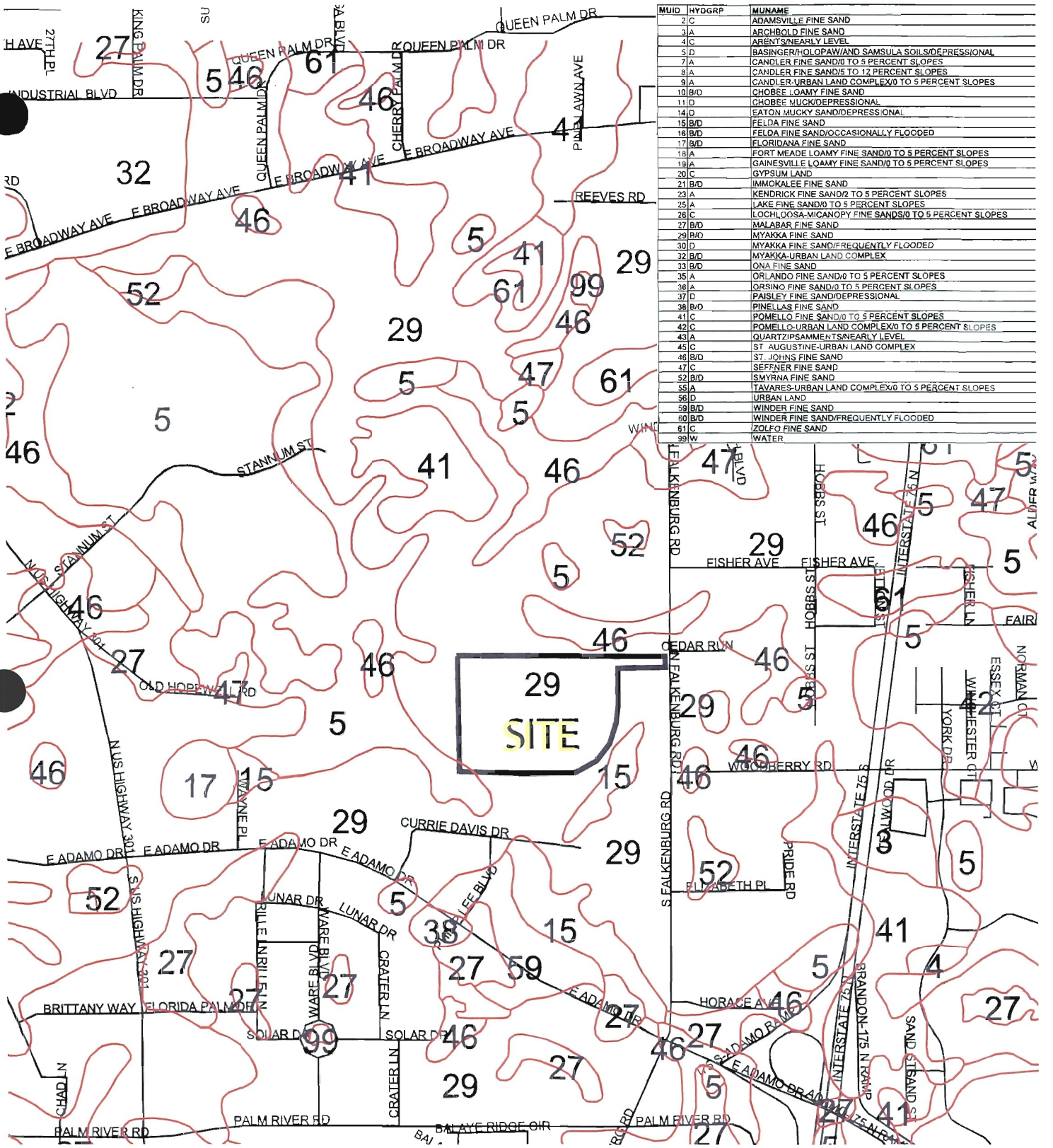
Table 2-10

Geohydrologic Framework of Floridan Aquifer System

System	Series	Stratigraphic Unit	General Lithology	Major Lithologic Unit	Hydrogeologic Unit	
Quaternary	Holocene and Pleistocene	Surficial sand, terrace sand, phosphorite	Predominantly fine sand; interbedded clay marl, shell, and phosphorite.	Sand	SURFICIAL AQUIFER SYSTEM	
Tertiary	Pliocene	Undifferentiated deposits	Clayey and pebbly sand; clay, marl, shell, phosphatic.	Clastic	Confining unit	
	Miocene	Hawthorn Formation	Dolomite, sand, clay, and limestone; silty, phosphatic.	Carbonate and clastic	Aquifer	INTERMEDIATE AQUIFER SYSTEM
		Tampa Limestone	Limestone, sandy, phosphatic, fossiliferous; sand and clay in lower part in some areas.		Confining unit	
	Oligocene	Suwannee Limestone	Limestone, sandy limestone, fossiliferous.	Carbonate	FLORIDAN AQUIFER SYSTEM	
	Eocene	Ocala Limestone	Limestone, chalky, foraminiferal, dolomitic near bottom.		Upper Floridan aquifer	
		Avon Park Formation	Limestone and hard brown dolomite; intergranular evaporitein lower part in some areas.		Middle confining unit	
		Oldsmar Formation	Dolomite and limestone with intergranular gypsum in most areas.		Lower Floridan aquifer	
	Paleocene	Cedar Keys Formation	Dolomite and limestone with beds of anhydrite.	Carbonate with evaporites	Sub-Floridan confining unit	

[Modified from Ryder, 1985; and Lopez and Fretwell, 1992]

The United States Department of Agriculture (USDA) Soil Conservation Service (SCS) "Hillsborough County Soil Survey" defines three major surficial soil types on the site: Rc (Rutledge fine sand), Lh (Leon fine sand), and Lk (Leon fine sand, light colored surface). The SCS soils classifications onsite and adjacent to the site are shown on **Figure 2-15**. A "Summary of Important Characteristics" of the soils from the Hillsborough County Soil Survey (September 1958) and the "Estimated Soil Properties for Engineering" taken from the Hillsborough Soil and Water Conservation District Soil Survey Supplement (June 1981) are included in **Appendix 10**.



MUID	HYDGRP	MUNAME
2	C	ADAMSVILLE FINE SAND
3	A	ARCHBOLD FINE SAND
4	C	ARENTS/NEARLY LEVEL
5	D	BASINGER/HOLOPAW/AND SAMSULA SOILS/DEPRESSIONAL
7	A	CANDLER FINE SAND/0 TO 5 PERCENT SLOPES
8	A	CANDLER FINE SAND/5 TO 12 PERCENT SLOPES
9	A	CANDLER-URBAN LAND COMPLEX/0 TO 5 PERCENT SLOPES
10	B/D	CHOBEE LOAMY FINE SAND
11	D	CHOBEE MUCK/DEPRESSIONAL
14	D	EATON MUCKY SAND/DEPRESSIONAL
15	B/D	FELDA FINE SAND
16	B/D	FELDA FINE SAND/OCCASIONALLY FLOODED
17	B/D	FLORIDANA FINE SAND
18	A	FORT MEADE LOAMY FINE SAND/0 TO 5 PERCENT SLOPES
19	A	GAINESVILLE LOAMY FINE SAND/0 TO 5 PERCENT SLOPES
20	C	GYPSUM LAND
21	B/D	IMMOKALEE FINE SAND
23	A	KENDRICK FINE SAND/2 TO 5 PERCENT SLOPES
25	A	LAKE FINE SAND/0 TO 5 PERCENT SLOPES
26	C	LOCHLOOSA-MICANOPY FINE SANDS/0 TO 5 PERCENT SLOPES
27	B/D	MALABAR FINE SAND
29	B/D	MYAKKA FINE SAND
30	D	MYAKKA FINE SAND/FREQUENTLY FLOODED
32	B/D	MYAKKA-URBAN LAND COMPLEX
33	B/D	ONA FINE SAND
35	A	ORLANDO FINE SAND/0 TO 5 PERCENT SLOPES
36	A	ORSINO FINE SAND/0 TO 5 PERCENT SLOPES
37	D	PAISLEY FINE SAND/DEPRESSIONAL
38	B/D	PINELLAS FINE SAND
41	C	POMELLO FINE SAND/0 TO 5 PERCENT SLOPES
42	C	POMELLO-URBAN LAND COMPLEX/0 TO 5 PERCENT SLOPES
43	A	QUARTZIPSAMMENTS/NEARLY LEVEL
45	C	ST. AUGUSTINE-URBAN LAND COMPLEX
46	B/D	ST. JOHNS FINE SAND
47	C	SEFFNER FINE SAND
52	B/D	SMYRNA FINE SAND
55	A	TAVARES-URBAN LAND COMPLEX/0 TO 5 PERCENT SLOPES
56	D	URBAN LAND
59	B/D	WINDER FINE SAND
60	B/D	WINDER FINE SAND/FREQUENTLY FLOODED
61	C	ZOLFO FINE SAND
99	W	WATER

N

Scale

0 1500'

Hillsborough County
Energy Recovery Project

Figure 2.15
Soil Survey Data

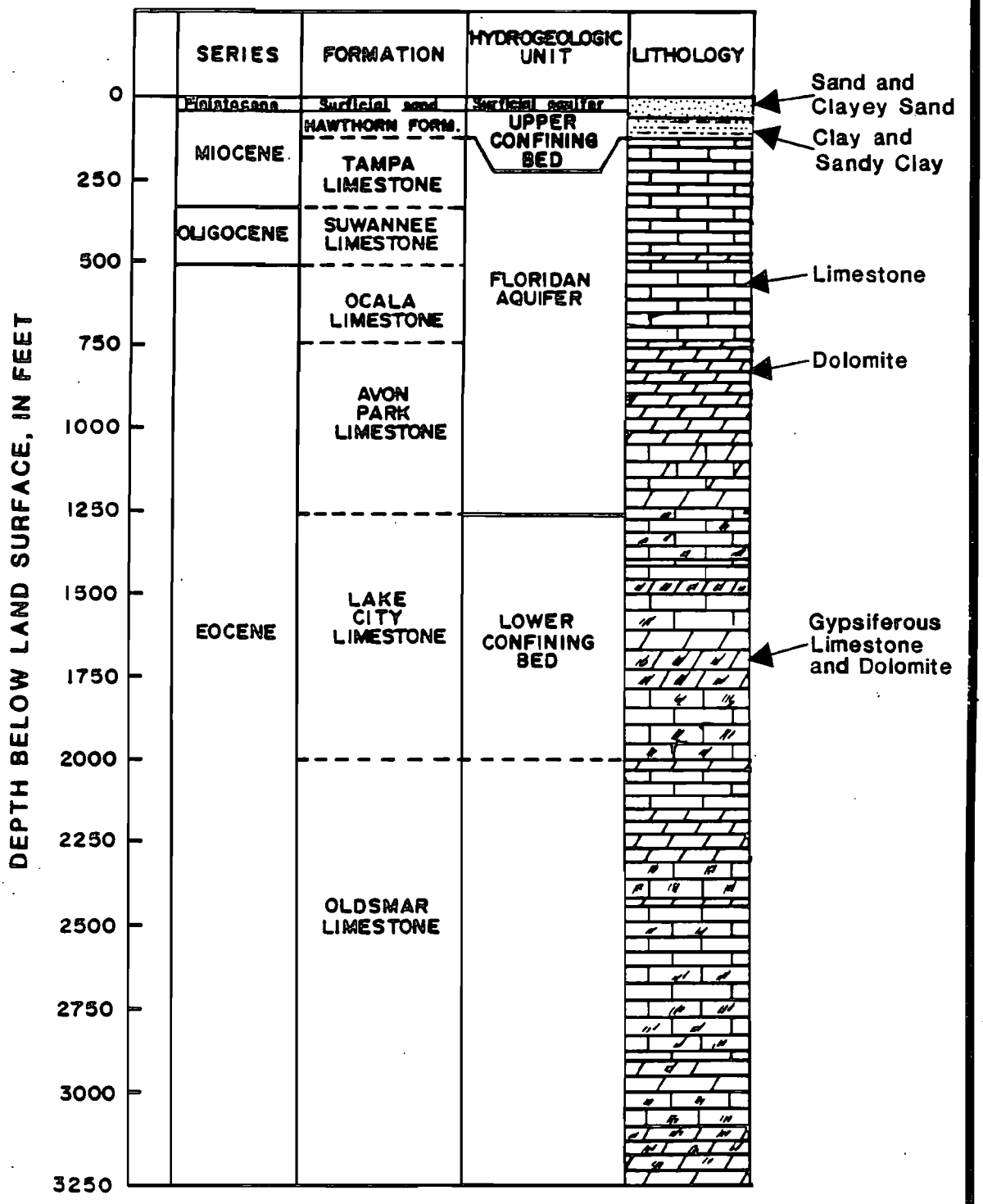
In general, the Rutledge fine sand reflects areas with a seasonal high water table and nearly level, or slightly depressed, relief. Ponding can occur with this soil type. The Leon fine sand also represents areas with high water table and a 0% to 2% slope. The Lh and Lk soils have relatively slow surface runoff and medium to rapid internal drainage if drainage improvements lower the natural high water table.

Table 2-10 presents the study area stratigraphy. The shallow and intermediate depth geologic units expected to be beneath the study area range in age from Recent to Eocene, and include (youngest to oldest): surficial (unconsolidated sands), the Hawthorn Formation, the Tampa Limestone, the Suwannee Limestone, the Ocala Limestone, the Avon Park Limestone, the Lake City Limestone, and the Oldsmar Limestone. The latter two formations contain salt water and are not known to be used for potable water supply. While detailed information is not available for extreme depths, the shallow and intermediate formations are well documented using the loggings from a large number of wells throughout central Hillsborough County. **Figure 2-16** presents a generalized geologic column of soil to a depth of 3,250 feet. **Figures 2-17, 2-18,** and **2-19** present the soil boring locations and geological cross-sections taken on the Facility site.

The study area is located within the Coastal Lowlands Physiographic Division of Florida. The Coastal Lowlands consist primarily of marine terraces, which are below 100 feet in altitude. The study area elevation ranges from 28-41 feet above Mean Sea Level (MSL) with a topographic high in the east central portion of the site, gently sloping to lower elevations in the southwest.

The uppermost geological deposit, the Hawthorn Formation, includes all deposits of Miocene age, which are younger than the Tampa Limestone. The Hawthorn Formation in this area consists predominantly of green to blue sandy clay and clayey sand. The top of the Hawthorn Formation is generally encountered between 10 and 20 feet deep below ground surface in the area.

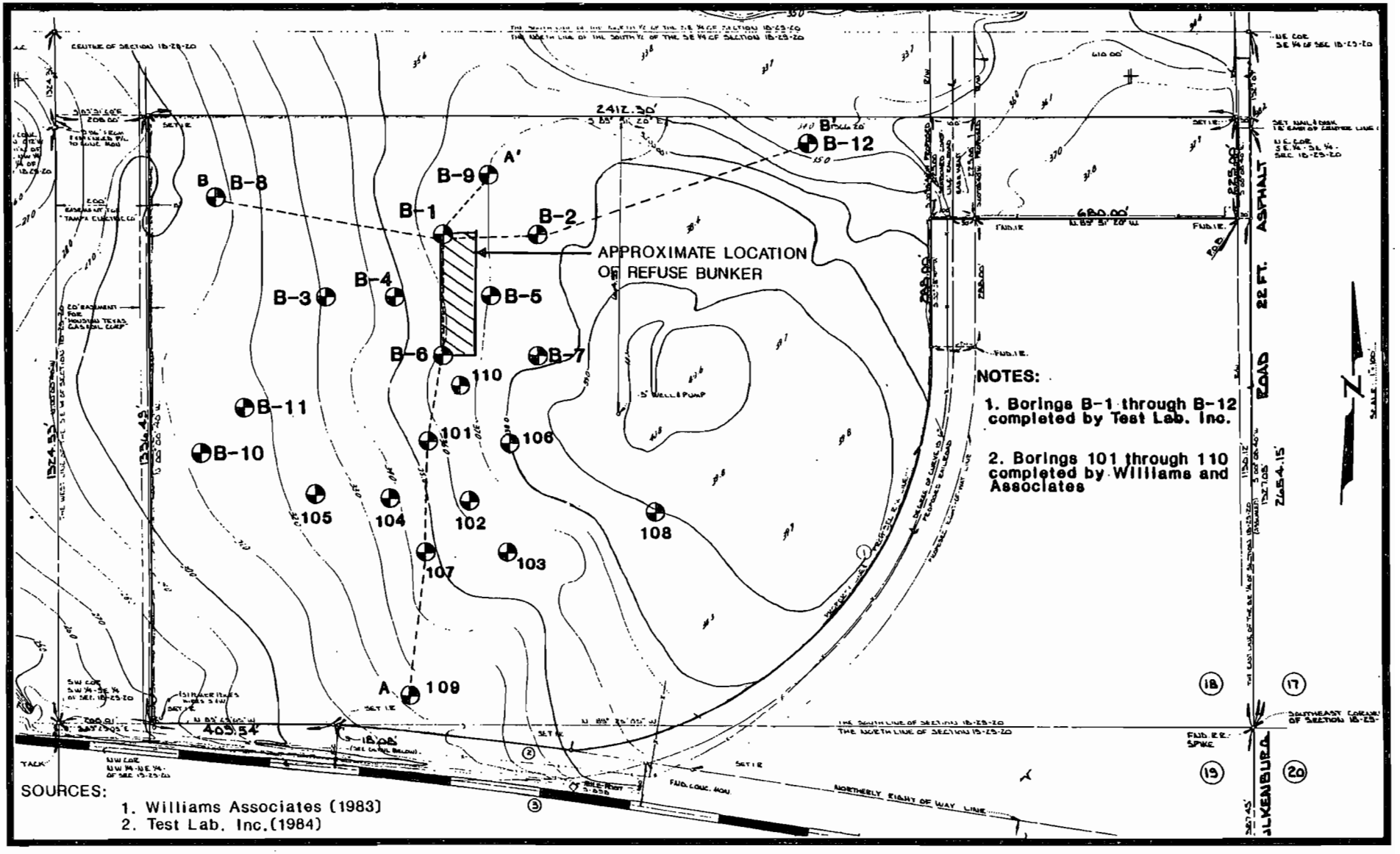
Beneath the Hawthorn Formation in the Hillsborough County area lies the Tampa Limestone. The Tampa Limestone is commonly a hard dense grey, white, or tan sandy limestone, which is generally fossiliferous while some parts are crystalline and dolomitic.



Source: Hickey (1981)

HILLSBOROUGH COUNTY
ENERGY RECOVERY PROJECT

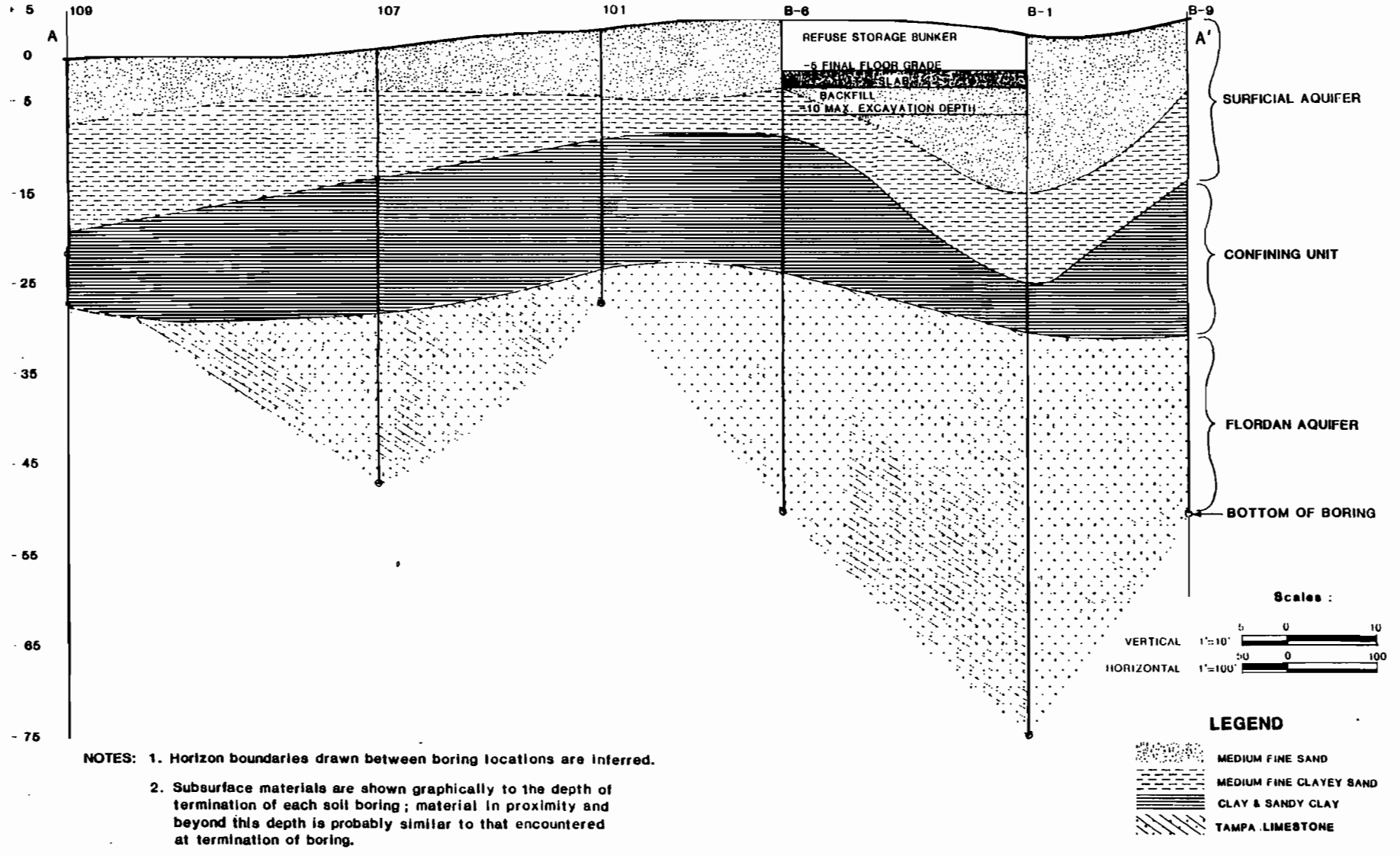
FIGURE 2.16
GENERALIZED GEOLOGIC COLUMN



HILLSBOROUGH COUNTY
ENERGY RECOVERY PROJECT

FIGURE 2.17
LOCATIONS OF SOIL BORINGS AND GEOLOGIC CROSS-SECTIONS

FEET
150 0 150 300 450



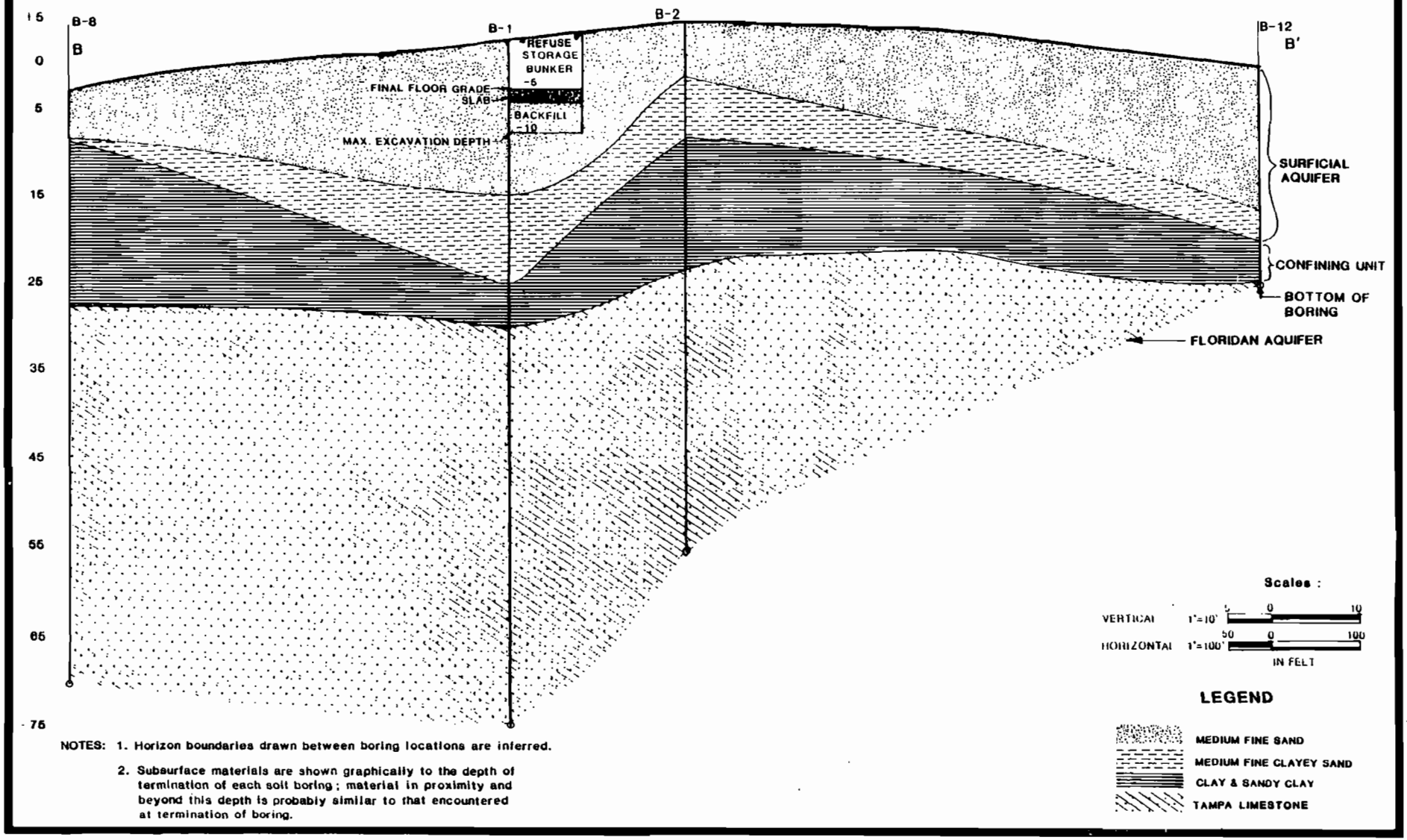
NOTES: 1. Horizon boundaries drawn between boring locations are inferred.

2. Subsurface materials are shown graphically to the depth of termination of each soil boring; material in proximity and beyond this depth is probably similar to that encountered at termination of boring.

HILLSBOROUGH COUNTY
ENERGY RECOVERY PROJECT

FIGURE 2.18

GEOLOGIC CROSS-SECTIONS A-A'



NOTES: 1. Horizon boundaries drawn between boring locations are inferred.

2. Subsurface materials are shown graphically to the depth of termination of each soil boring; material in proximity and beyond this depth is probably similar to that encountered at termination of boring.

HILLSBOROUGH COUNTY
ENERGY RECOVERY PROJECT

FIGURE 2.19

GEOLOGIC CROSS-SECTIONS B-B'

The top of this formation ranges in depth from about 250 feet below sea level in the southern part of Hillsborough County. It is estimated that the depth to this formation in the vicinity of the site is in the general range of 25 to 45 feet below ground level.

The Suwannee Limestone includes all deposits of Oligocene age. The upper part of the Suwannee is generally a cream-white to tan, soft to hard, granular, porous limestone with some beds of crystalline and dolomitic limestone. The lower part of the Suwannee is generally tan to gray, is more crystalline and/or dolomitic, contains fewer fossils, and is generally harder.

The Ocala Formation is of Eocene age and consists of a highly fossiliferous, soft, chalky, cream, tan, and grayish-tan limestone in the upper portion. The lower part is similar to the upper part except that it contains beds of brown to tan hard crystalline dolomite and dolomitic limestone.

The Avon Park Limestone, generally found at depths in excess of 600 feet, is of Eocene age. Lithologically, it ranges from white to tan coquinoid or granular soft limestone to dark brown, hard, crystalline dolomite. Most of this formation is dolomitized to some degree and is very fossiliferous, containing bryozoans, coral, echinoids, mollusks, and foraminifera. It is generally more than 200 feet thick in Hillsborough County.

2.3.1.2 Detailed Site Lithologic Description

Information contained in this section has been developed primarily from exploratory borings installed on site and its immediate vicinity, as part of the site selection and geotechnical investigation efforts of Hillsborough County's resource recovery program. Generally, the exploratory borings were installed to determine a continuous lithologic description from land surface through the top of the rock.

As part of the County's Facility siting during the early 1980s, a number of geotechnical studies were performed by the County. These studies included the following:

- "Report of Preliminary Subsurface Exploration, Proposed Solid Waste Management Recovery Facility, Hillsborough County, Florida," prepared by Williams and Associates, Inc., dated 1 November 1982.
- "Report of a Preliminary Subsurface Exploration, Proposed Solid Waste Energy Recovery Facility, Falkenburg Road Site, and Hillsborough County, Florida," prepared by Williams and Associates, Inc., dated 29 March 1983, revised 12 December 1983.
- "Report of Preliminary Geotechnical Study, Resource Recovery Facility, Falkenburg Road Site, Hillsborough County, Florida," prepared by Test Lab Inc., dated 20 April 1984.

These reports were presented to the Florida Department of Environmental Protection (FDEP) along with the original permit application for the Facility. The Williams and Associates (1983) and the Test Lab (1984) reports contain detailed site lithologic descriptions and soil boring logs, which have been summarized in this section. These two complete geotechnical reports are contained in **Appendix 10** to this application. The 1982 Williams and Associates report

examined four preliminary sites, one of which is located several hundred feet north of the present site, and is therefore not included in the application appendices.

The March 29, 1983 report prepared by Williams & Associates, Inc. entitled, "Report of a Preliminary Subsurface Exploration Proposed Solid Waste Energy Recovery Facility Falkenburg Road Site, Hillsborough County, Florida," is included in **Appendix 10-4**. This report details both field and laboratory testing which was performed with the intent of developing preliminary or conceptual soil-related criteria for foundation design. The report includes descriptions of sampling design methodology, field and laboratory procedures, and a report of results for soil borings, utilizing undisturbed samples, NX corings, grain size analysis, moisture content, and consolidation tests. Test results are summarized in **Section 2.3.1.4**. Ten soil test borings were made at the site at the locations shown on **Figure 2-17**. These borings were made at locations recommended by Williams and Associates.

The Test Lab Inc. (1984) report details field and laboratory testing that was performed to determine the general nature of the subsurface conditions at the Facility site and the types of foundation systems that might be used to support the Facilities.

As part of this effort, twelve soil test borings were made at the site at the locations shown on **Figure 2-17**. These borings were made at locations recommended by Test Lab Inc. These locations were staked in the field by County personnel, who also determined the ground surface elevation at each location.

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 were obtained at 2.5-foot intervals to a depth of 10 feet and at 5-foot intervals thereafter. The subsurface data obtained from the field exploration program are presented on the logs, which accompany the Test Lab report in **Appendix 10-3**. Cross sections developed from these logs are shown in **Figures 2-18** and **2-19**.

Laboratory test programs, limited to determining soil index properties, were undertaken by both Williams and Associates (1983) and Test Lab Inc. (1984) to better ascertain the physical characteristics of the various soil strata found at the site. The results of these tests, which include grain size analyses and determination of Atterberg limits, are found in the respective reports in **Appendix 10**, and are summarized in **Section 2.3.1.4**.

The field exploration program of Test Lab Inc. revealed generally similar subsurface conditions existing in the various areas investigated on the site. These subsurface conditions were similar to those found in the southern portion of the tract soil/rock strata as indicated in the soil borings.

- ***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 feet to 22 feet in thickness, but is typically 10 feet thick.

- ***Stratum No. 2:*** This is 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 0-15 feet, but is typically 5 feet thick.

- ***Stratum No.3:*** This is a thick complex stratum of interbedded semicohesive 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 feet thick.

- ***Stratum No. 4:*** This stratum, which is the Tampa Formation, is the limestone bedrock. The nature of this stratum is quite variable, typically being a hard light tannish white calcareous sandy clay containing rock fragments, hard limestone lineses, some weathered zones, and occasional green and gray sandy clay lenses. Generally, the upper part of the stratum is poorly indurated and softer, probably the result of weathering. At depth, 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.

2.3.1.3 Geologic Maps

The information presented herein was prepared in 1983 to support the original permit application for this Facility. The successful implementation of the originally proposed Facility at this location is a testimony to the integrity of the tests performed and their results as presented in this section.

Tables 2-11 and **2-12** show the depth and thickness of the clay-confining unit and the top of the Tampa Limestone, as encountered by Williams and Associates (1983) and Test Lab Inc. (1984) during test hole construction on and around the site. It is significant to note that the clay-confining unit, which separates the surficial aquifer from the Floridan aquifer, is continuous throughout the site and at least five feet thick at all boring locations. Although the planned Facility will not produce water-borne contaminants, this confining unit is highlighted because of its low permeability and adsorptive capacity. This subsurface feature would attenuate contaminants, if any, from leachate or runoff.

Table 2-11
Site Boring Data from Williams and Associates Report (1983)

Boring No.	Depth to Clay Unit (ft)	Thickness of Clay Unit (ft)	Depth to Limestone (ft)
101	13.5	15.0	28.5
102	13.5	20.0	33.5
103	13.5	15.0	28.5
104	9.5	19.0	28.5
105	13.5	13.5	27.0
106	18.5	20.0	38.5
107	13.5	15.0	28.5
108	13.5	≥8.0[1]	-
109	9.5	≥3.0[1]	-
110	18.5	15.0	33.5

Source: CDM after Williams and Associates (1983)

[1]Borings terminated at -21.5 feet

Table 2-12
Site Boring Data from Test Lab, Inc (1984)

Boring No.	Depth to Clay Unit (ft)	Thickness of Clay Unit (ft)	Depth to Limestone (ft)
B-1	17.5	15	32.5
B-2	17.5	10	27.5
B-3	12.0	10	27.0[1]
B-4	12.0	15	32.0[1]
B-5	17.0	5.0	37.0[3]
B-6	12.0	15.0	27.0
B-7	27.0	5.0	47.0[2]
B-8	5.0	19.0	24.0
B-9	17.0	17.5[3]	34.5
B-10	17.5	6.5[4]	-
B-11	17.5	8.0[4]	-
B-12	19.5	5.5[4]	-

Source: CDM after Test Lab Inc. (1984)

[1]Weathered limestone overlain by 5.0 feet of very loose green clayey fine sand.

[2]Weathered limestone overlain by 15.0 feet of clayey fine sand.

[3]Includes 5.0 feet of loose light greenish tan clayey fine sand.

[4]Boring terminated -25.0

From the standpoint of potential impact from the Facility to subsurface geologic features, the geology of the site may be generalized as follows:

1. Surficial Sands: These deposits may be subject to the greatest disturbance during construction, and would be most susceptible to environmental impact from surface or near surface disturbance.

2. Clay Confining Unit: These deposits of very low permeability material separate the limestone bedrock from the overlying undifferentiated sands. Because of the low permeability and high adsorptive capacity of this material, this "confining" layer could act as a barrier to vertical mixing of groundwater between the surficial and the Floridan

aquifers. It provides a hydraulic barrier, which inhibits the vertical movement of water to the more environmentally sensitive underlying limestone formations.

3. Limestone Bedrock: The limestone bedrock which underlies the unconsolidated surficial deposits constitutes the major water supply source for much of the region and is, therefore, the most sensitive geologic feature.

2.3.1.4 Bearing Strength

As discussed before, two site-specific preliminary geotechnical studies were completed by Williams and Associates, Inc. and Test Lab Inc. to determine general foundation suitability characteristics. The first report (see **Appendix 10-4**), completed in March 1983 by Williams and Associates, Inc. evaluated an area located within the present site boundaries but situated more southerly on the site relative to the proposed location of the Facility.

The second preliminary geotechnical report was prepared by Test Lab Inc. in April 1984 and is presented in **Appendix 10-3**. The Test Lab Inc. report evaluated an area on the site, which includes the location of structures and facilities. This section provides a summary of findings and preliminary evaluations of subsurface conditions from a foundation suitability perspective and recommendations as reported by Test Lab Inc. and Williams and Associates Inc.

The Test Lab Inc. (1984) report identified certain subsurface conditions at the site, which will require specific site preparation and subsurface foundation design. However, these subsurface conditions, as listed below, are considered typical of those normally encountered in the area:

- Cohesionless surface soils with generally loose consistency
- Weak and potentially compressive nature of the soft and loose zones within the deeper underlying semicohesive and cohesive soils
- Poorly indurated or highly weathered zones within the limestone bedrock.

The Test Lab, Inc. report emphasized that these generally typical and normally encountered conditions were quite similar to those revealed by the earlier Williams and Associates (1983) report, and that no "unusual or significantly different conditions" were found. Both reports offered general design considerations for dealing with this type of subsurface condition.

The Williams and Associates (1983) report stated that for relatively light loads (i.e., "column loads less than 20 kips"), post-construction settlement due to consolidation will likely be less than 1 inch, and therefore that shallow foundation support for lightly loaded components is therefore quite feasible. Soil bearing pressures of up to 3,000 pounds per square foot (total load) are available for design of the more lightly loaded components. According to Williams and Associates, 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. These minimum dimensions are considered necessary to provide confinement, which cohesionless bearing soils require to develop adequate shear strength.

For heavily loaded components of the Facility, individual pile compressive capacities of up to 60 tons were estimated. The Williams and Associates report recommends that minimum pile sections consist of 12-inch x 12 inch precast, prestressed concrete pile, and a closed-end concrete-filled pipe pile with a minimum diameter of 10 inches. The report also made other preliminary recommendations related to pile driving.

In general, the subsurface data identified in the original siting analysis indicate that any potentially limiting conditions can be overcome by appropriate site preparation and foundation design, such as the use of piles or other appropriate procedure. Such specific site preparation and subsurface/foundation designs and procedures will be established during the final design of the Facility expansion project.

2.3.2 Subsurface Hydrology

The physical, chemical, and hydrological characteristics of subsurface waters that have the potential to be affected by the construction or operation of the proposed Facility and associated components are described in this section. Localized and temporary disturbance of the surficial aquifer is expected to occur during the Facility's construction. However, the long-term operation of the Facility is not expected to have an effect on subsurface waters. The wastewater effluent from the Facility is pretreated and discharged into the sanitary sewer system. Therefore, the operation of the Facility is not expected to affect the subsurface waters.

2.3.2.1 Subsurface Hydrologic Data for the Site

The hydrologic system in the southern two-thirds of west-central Florida differs from that in the north (Sinclair, et al., 1985). Differences are based on degree of confinement of the hydrologic systems. As discussed in **Section 2.3.1.1**, the surfical aquifer and the Upper Floridan aquifer contain potable water. The water table in the surfical aquifer generally occurs within 1-3 feet below ground surface. During the original soil investigation, which included installation of soil borings by Williams and Associates, the water table was observed to occur generally within one foot of the surface across much of the site, and some areas were noted to have standing water at the surface. Field investigations in August 1983 (wet season) by Williams and Associates indicated that surface water was observed only in the vicinity of the southwest corner of the site, which coincides with the topographic low area of the site. The subsequent field investigations completed in April 1984 (dry season) by Test Lab, Inc. noted that water table elevations were within 2 to 3 feet of the ground surface in the northern part of the site. In general, the water table parallels topography with an average seasonal fluctuation of five feet or less.

The Upper Floridan aquifer within the site area is generally separated from the surficial aquifer by a confining layer. **Figure 2-20** is a portion of a regional water contour map showing the potentiometric surface of the Floridan aquifer. The surficial aquifer is comprised of marine and aeoliar sands of Pleistocene age, and ranges from 15 to 25 feet in thickness in Hillsborough County. The aquifer is recharged directly through rainfall, and supplies small, low yield domestic wells. The general groundwater flow direction for the surficial aquifer within the Facility area is from northeast to southwest direction. **Figure 2-21** shows the groundwater levels for the surficial aquifer for the project area.

In most areas of Hillsborough County, the surficial aquifer is underlain by clay that acts as a leaky confining unit, which separates the surfical aquifer from the underlying Floridan aquifer. In the northern portion of the County, the clay is absent and the surficial aquifer and the Floridan aquifer are in direct connection.

The Floridan aquifer, consisting of limestone and dolomite beds, has an average thickness in the region of up to 1,000 feet. The potentiometric surface of the Floridan aquifer was not measured during test drilling on site.

Based upon data provided in the Test Lab Inc. geotechnical report, the following sequence of subsurface deposits, in descending order, comprise the groundwater matrix at the Falkenburg Road site (summarized in **Section 2.3.1.2**):

- Fine Sand
- Clayey Sand
- Clay
- Calcareous Cemented Marl and Limestone

As previously discussed, variations occur in these lithologies and in the elevation of top and bottom of each of these units across the site. Geologic cross sections of the site are presented in **Figures 2-18** and **2-19**.

The first two strata appear to represent two subunits of the surficial aquifer as described by Sinclair, et al. (1985). These units probably do not represent a significant aquifer with respect to total water withdrawal. The units generally do not have sufficient hydraulic conductivity or thickness to be used as a supply for all but small domestic wells.

The third stratum, comprised predominantly of clay but grading to clayey sand, represents the confining unit for the limestone of the Floridan aquifer, which lies below. Groundwater above this confining unit is under unconfined or water-table conditions, and groundwater in the Floridan aquifer below is in a confined state. The confining unit appears to be continuous across the site, based upon results of test borings.

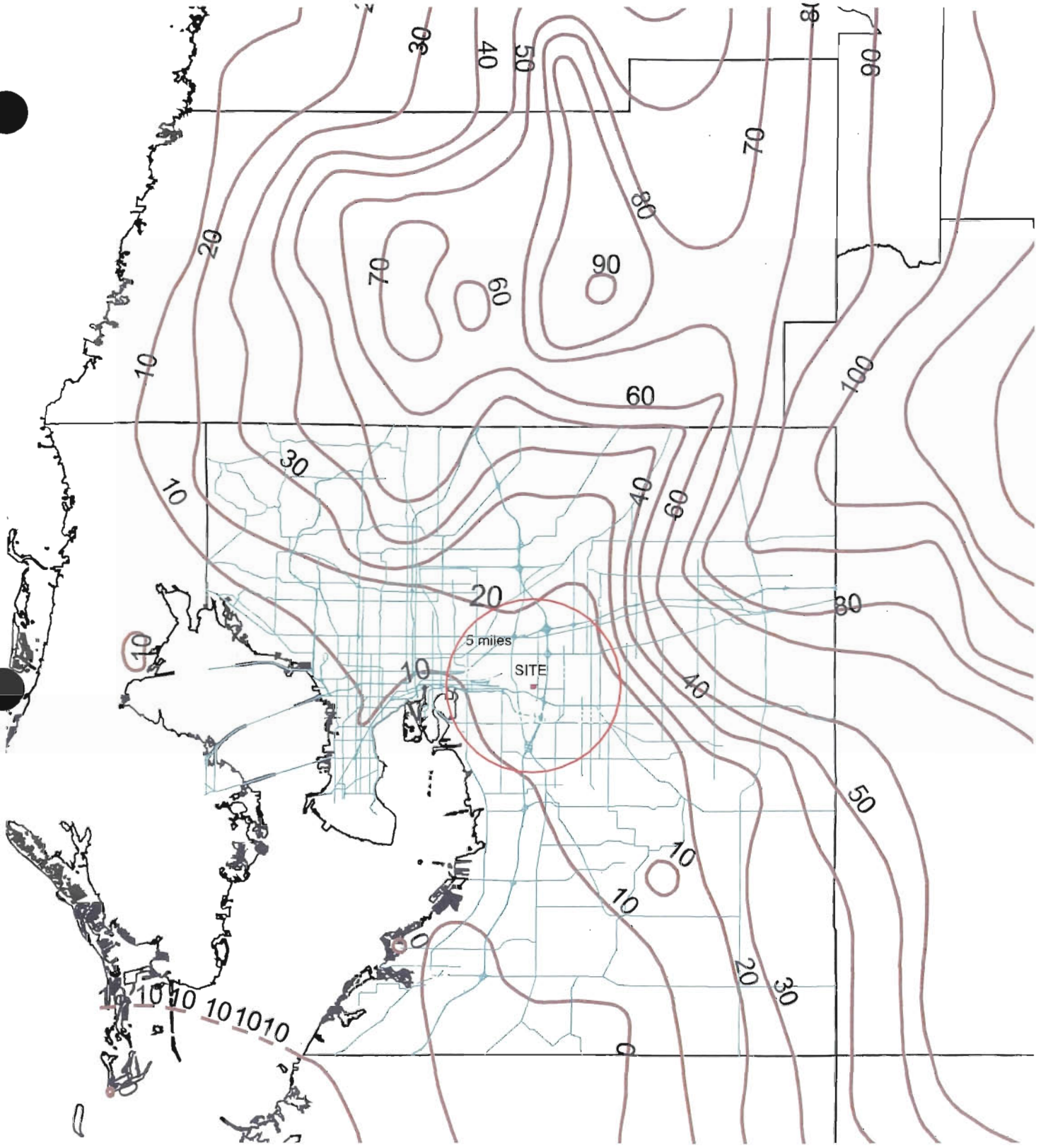
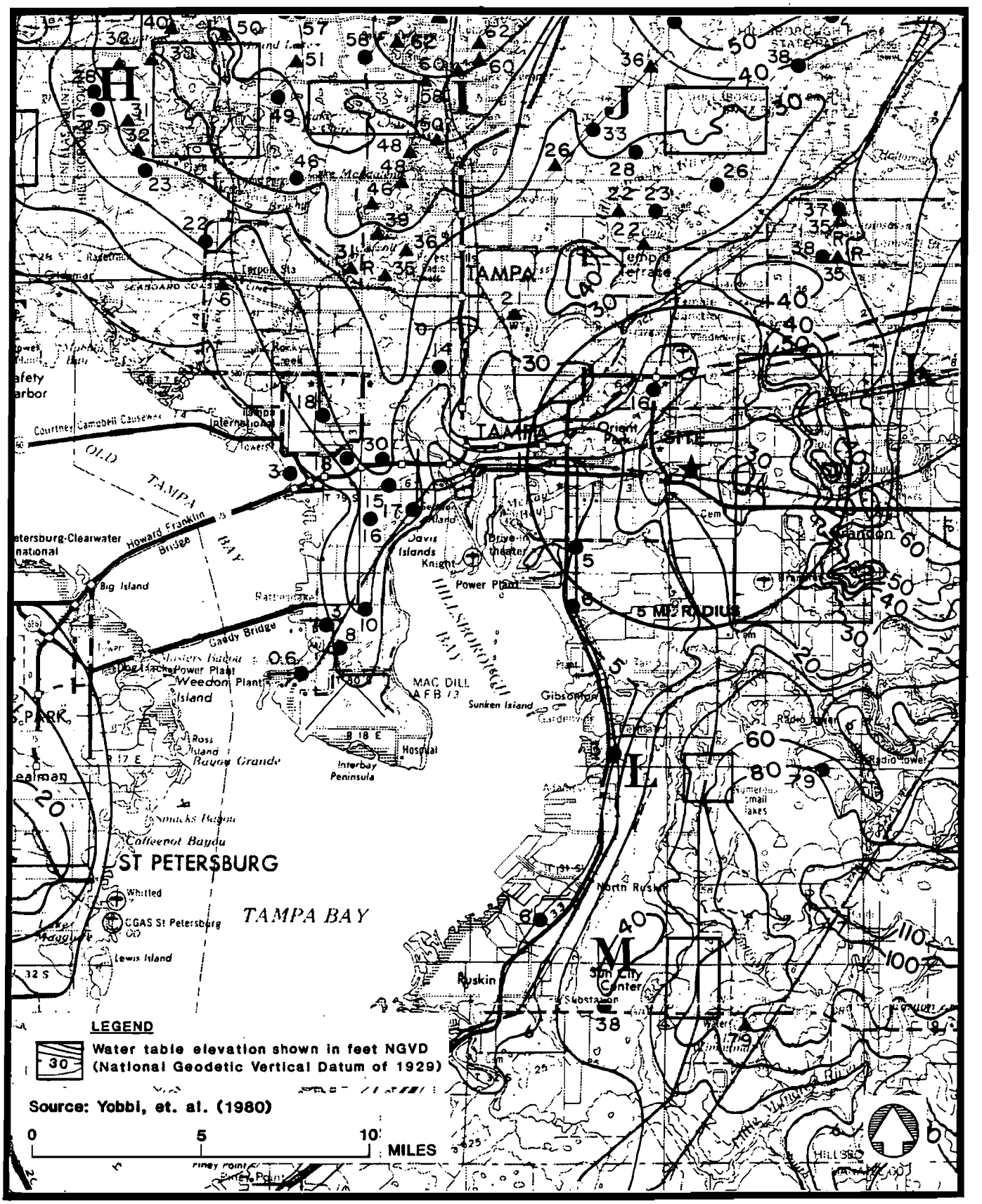


Figure 2.20
Potentiometric Surface of the Floridan Aquifer
May 2003



HILLSBOROUGH COUNTY
ENERGY RECOVERY PROJECT

FIGURE 2.21

GROUND-WATER LEVELS IN THE SURFICIAL AQUIFER, MAY 1980

Based upon published data, recharge rates to the surficial deposits have been estimated by CDM to vary from 0.4 to 2.5 inches per month, depending upon wet or dry season. SWFWMD (Aquifer Characteristics within the SWFWMD, 2000) reported the transmissivity of the Floridan aquifer near the site to be between 51,500 gpd/ft (Index #168) to 4,260,000 gpd/ft (Index #171) with a storage coefficient of about 3.0×10^{-4} to 4.5×10^{-2}. The regional gradient of the potentiometric surface of the Floridan aquifer is southwestward, from the topographically high area in the northeast, toward the Gulf of Mexico (Sinclair, 1977; Yobbi 1980; Yobbi 1983, Barr and Schiner, 1983, Swancar and Hutchinson, 1992). **Table 2-13** provides a summary of reported published values for various aquifer characteristics including thickness, transmissivity and storage (storativity).

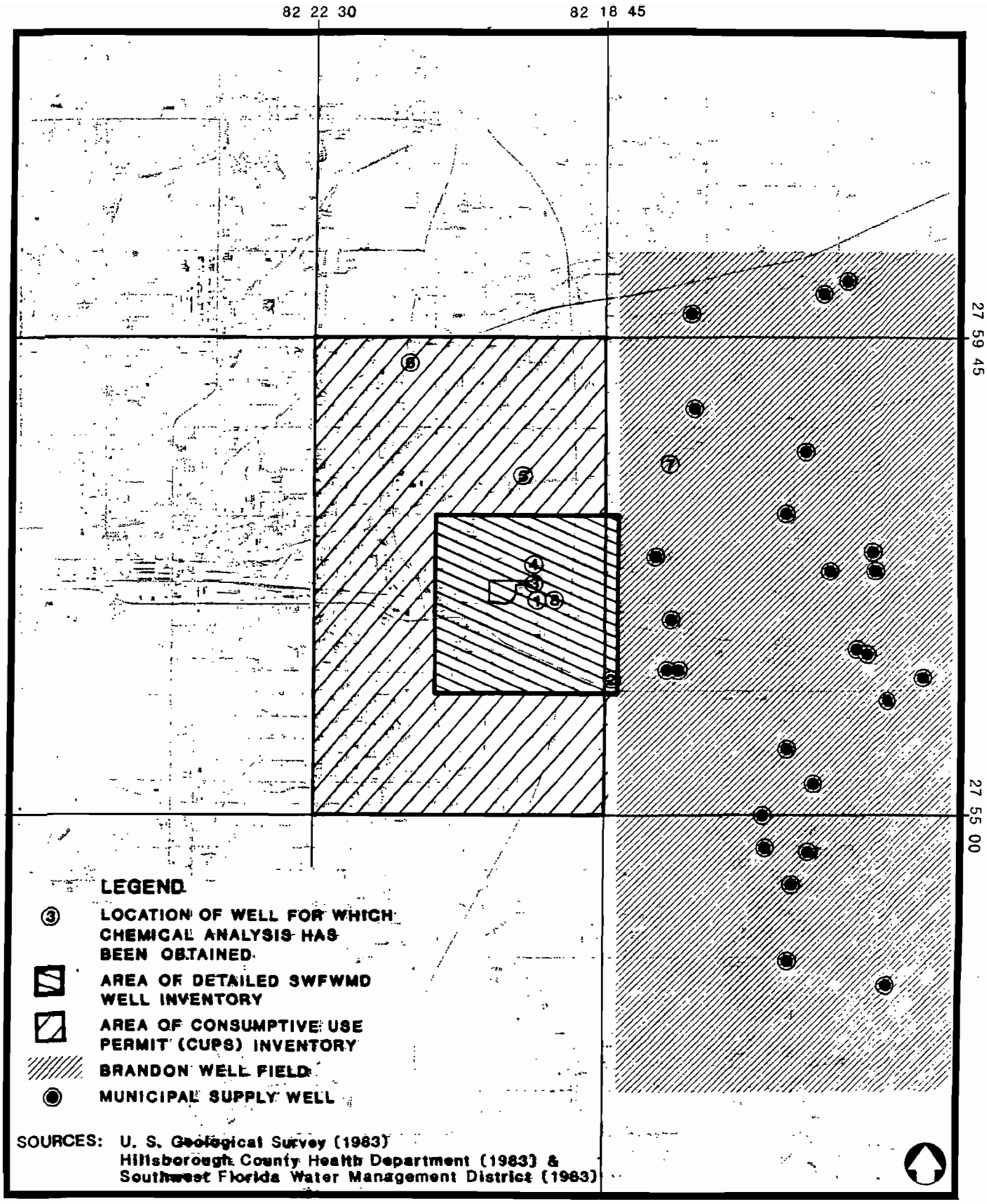
Table 2-13

Reported Values for Aquifer Characteristics

References	Area	Aquifer	Thickness (ft)	Aquifer Transmissivity (gpd/ft)	Storage Coefficient	Confining Unit Permeability or Leakance (gfd/ft^3)	Hydraulic Conductivity (ft/d)
Fernandez (1982)	Pinellas County	Surficial	-	-	-	-	2.1
		Confining	-	-	-	-	50 ft/yr (in confining unit)
Geraghtv & Miller (1982)	Tampa Bypass Canal	Upper Floridan	-	400.000	$5x10^{-4}$	$1x10^{-3}$	
Geraghty & Miller (1982a)	East Central Regional Well Field	900' depth Floridan	-	200,300-267,300	$7x10^{-5}$ to $1.2x10^{-3}$	$2.2x10^{-3}$ to $9.8x10^{-4}$	
Hickey (1981)	Tampa Bay	Surficial	30	448	-	-	20
		Upper Confining Bed	70	0.42	-	-	$8x10^{-4}$
		Upper Floridan	180	225	-	-	167
		Middle Floridan	400	300 to 3000	-	-	0.1 to 1
		Lower Floridan	530	7,493,000	-	-	1.890
Stewart et al (1978)	Temple Terrace	Upper Floridan	-	972,400	$3x10^{-4}$	-	$5.2x10^{-5}$ to 2.6
Sinclair (1977)	Northwest Hillsborough County (Section 21)	Surficial	40	2020-3216	$0.20x10^{-3}$	-	-
Stewart (1968)	Northwest Hillsborough County	Floridan	1,000	550,000	$1.0x10^{-4}$	$5.35x10^{-5}$	-

Fernandez (1983) has reported that the rate of horizontal movement of groundwater in the surficial aquifer for an area within Pinellas County to be about 1.2 feet/year, and has reported a rate of downward vertical migration through the confining bed to be on the order of .005 feet/year. Theoretically, a slug of groundwater could move through a ten-foot thickness of the confining unit at the site in approximately 2000 years, assuming no alternation of hydraulic properties.

The Hillsborough County Health Department has provided the results of chemical analyses of water samples taken from selected community and non-community public water systems, which utilize groundwater from surficial aquifer wells in the vicinity of the Falkenburg Road site. The locations of the wells from which sample analyses were obtained are shown in **Figure 2-22**, with results of selected parameters shown relative to various regulated levels in **Table 2-14.** From these results it can be concluded that the groundwater contained in the surficial deposits in the vicinity of the site is of generally good quality, with most wells examined showing most water quality parameters as being well within established state and federal primary and secondary drinking water standards.



HILLSBOROUGH COUNTY
ENERGY RECOVERY PROJECT

FIGURE 2.22
AREAS OF INVENTORY OF PUBLIC & PRIVATE WATER WELLS

1 0 1 2 MILES

Table 2-14

Results of Selected Water Quality Parameters for Wells Near the Facility

Parameter	Well Location								
	MCL	1	2	3	4	5	6	7	8
Total Dissolved Solids	500*	150	165	177	180	226	260	230	464
Chlorides as Cl	250**	3	12	8.4	8.6	11.3	14.8	16	60
Sulfate as SO_4	250**	1.0	10.0	7.7	13.1	3.9	34.0	22.1	17.0
Fluoride	1.4-2.4*	0.22	0.15	0.28	0.909	0.23	0.14	0.19	0.36
pH	Minimum 6.5+	7.2	7.6	7.9	7.9	7.4	7.4	7.6	7.3
Iron as Fe	0.3**	0.08	0.05	0.05	<0.02	0.17	<0.02	0.02	0.84
Copper as Cu	1.0*	0.1	<0.1	-	<0.1	<0.1	<0a.01	BDL	<0.005
Color (Reported in Standard Unit)	15**	5	0	10	1	12	2	0	25
Color (Reported as Threshold Odor Number)	3**	2	-	none	1	1	4	-	1
H2S (Hydrogen Sulfide)	.002†	0.49	<0.05	none	0.06	0.20	0.80	-	<0.04
Sodium as Na	160*†	9.5	-	9.3	-	-	-	6.2	12.0
Nitrate as N	10*	-	-	0.38 (as NO)	2.7	0.39	8.7	0.3	0.05

Source: CDM from Hillsborough County Health Department Records

*National and State Primary Maximum Contaminant Level (MCL)

**National and State Secondary MCL

†State of Florida MCL

Notes:

1 All wells finished in surficial aquifer.

2. Well locations shown in **Figure 2-22**

2.3.2.2 Karst Hydrogeology

Karst geology occurs as manifestation of chemical diagenesis. The term diagenesis refers to any chemical change that occurs in a sediment following deposition (Domenico and Schwartz, 1990). A landscape that exhibits irregularities in surface form caused by rock dissolution is known as a karst landscape. Karst landscape is usually formed on limestone. However, the karst features are obvious where the limestone is exposed. Where karst processes affect rocks that are covered by relatively insoluable deposits, the presence of buried karst features forms a distinctive type of terrain known as mantled karst (USGS, 1999). Key characteristics of karst topography are its predominantly vertical and subsurface drainage, relative lack of surficial drainage systems, and the development of circular depressions and sinks. The terrain of the site area would be classified as buried karst, as the limestone base is generally covered with an overburden of approximately 30 feet.

The topography of the site area is predominantly karst-controlled. The site lies near the edge of an area that Hall and Metcalf (1979) have termed the Brandon Karst Area. This is an area of about 40 square miles, which is centered around the communities of Brandon, Seffner, Valrico, and Mango. **Figure 2-23** shows the location of major sinkholes with respect to the site location.

During the original phase of the project, analysis of high-resolution color aerial photography indicated the presence of a circular terrain feature on the site, which may have been karst-related. This area was subsequently examined which revealed the pattern to be a "grass pond." Geotechnical reports prepared for Hillsborough County in 1983 and 1984 concluded that there was no evidence of any advanced solution activity beneath the site.

Following preliminary siting and site studies, the only real means of insuring substructural integrity is to take test borings at the location of every important column or load-bearing member on site in order to assure the immediate absence of voids, which may be indicators of advanced solution activity. This will be done prior to the final foundation design. If such voids are determined to be present, there are numerous design factors, which may be considered in order to overcome any potential site limitations.

2.3.3 Site Water Budget and Area Users

Table 2-15 presents a compilation of hydrologic data representative of the site area and includes information on rainfall and temperature, evapotranspiration, evaporation, runoff, and groundwater recharge, as required by Section 2.3.3 of the DEP Instruction Guide for Certification Applications.

The monthly evapotranspiration potential was calculated using the Blaney-Criddle formula, which describes a linear relation between evapotranspiration potential and

mean air temperature. The proportionality factor is the product of a crop/location coefficient and a day length factor (see Chaw, 1964):

$$U = k\sum_{1}^{m} pt = kF$$

where

$$F = \sum_{1}^{m} pt$$

m = months

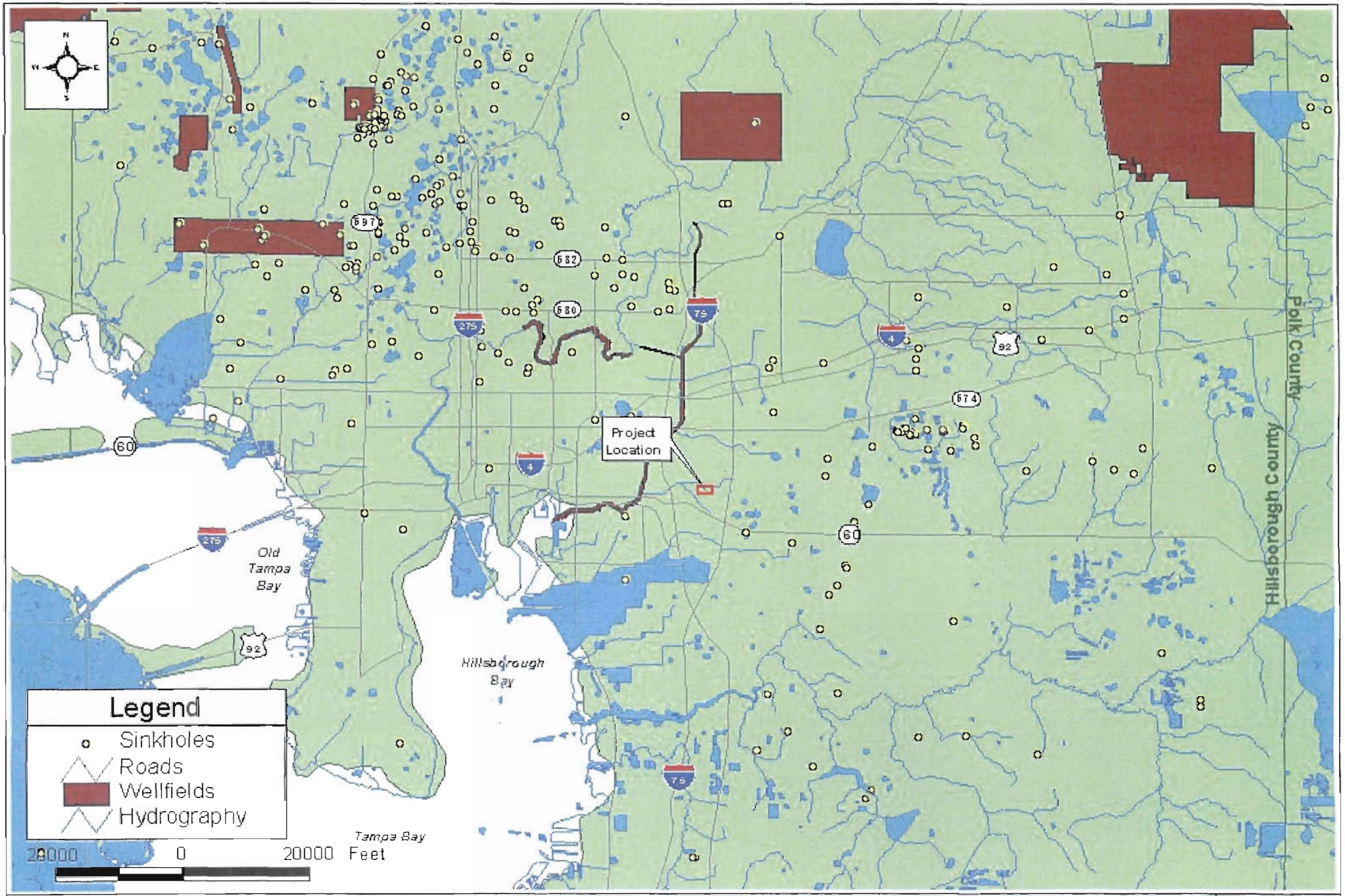
p = percent of daytime hours of the year, occurring during the period, divided by 100 (See **Table 11-4**, Chaw(1964))

t = mean monthly temperature in °F

U = evapotranspiration or consumptive for a given period in inches

For this analysis, the crop was considered to be pasture grass with a coefficient of 0.75. There are no surface water bodies (except retention ponds) on the site so there is no evaporation from a free surface.

Table 2-15 indicates that under average conditions, site runoff will occur most frequently during the rainy summer months of July and August. Depending on localized drainage conditions, runoff may occur at others times as well. This is particularly true during tropical storms or hurricanes.



Sinkhole and Wellfield Distribution
Hillsborough County Energy Recovery Project

Figure 2.23

Table 2-15

Hydrologic Data Representative for the Site Area

Parameter Description	Units	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Ambient Air Temperature	°F	61.0	63.0	66.5	72.0	77.5	81.5	82.5	82.5	81.0	75.0	67.5	62.0
Ambient Air Relative Humidity	%	71.5%	72.0%	71.5%	69.5%	68.5%	69.5%	72.0%	74.5%	75.0%	74.5%	72.0%	67.5%
Ambient Air Water Vapor Pressure	mm Hg	9.8	10.6	11.9	13.9	16.4	19.0	20.3	21.1	20.2	16.5	12.4	9.6
Barometric Pressure	mb	1,017	1,016	1,015	1,014	1,012	1,013	1,014	1,014	1,013	1,014	1,015	1,017
	mm Hg	782	781	780	780	778	779	780	780	779	779	781	782
Wind Speed	mph	6.8	6.9	7.3	7.5	7.0	6.2	5.8	4.8	4.8	5.7	6.3	6.5
Wind Speed Function	--	102.4	102.8	106.8	108.9	103.8	96.9	93.1	86.1	86.1	92.3	97.3	99.6
Cloud Cover	%	53%	47%	48%	47%	46%	58%	63%	61%	60%	47%	46%	52%
Solar Radiation - shortwave at surface	BTU/ft²/day	1,210	1,447	1,754	1,994	2,205	2,124	1,976	1,828	1,672	1,480	1,317	1,110
Net Shortwave Solar Radiation	BTU/ft²/day	1,174	1,403	1,701	1,934	2,139	2,060	1,917	1,773	1,622	1,436	1,278	1,077
Net Longwave Atmospheric Radiation	BTU/ft²/day	2,321	2,363	2,477	2,650	2,844	3,074	3,169	3,179	3,111	2,796	2,506	2,327
Average Rainfall	inches/day	0.071	0.102	0.099	0.053	0.083	0.195	0.227	0.254	0.209	0.068	0.053	0.080
Monthly % of Daylight Hours	%	7.4	7.07	8.37	8.67	9.46	9.39	9.58	9.17	8.32	8.02	7.28	7.27
Monthly Evaporation Potential	inches	3.38	3.13	4.08	4.62	5.46	5.7	5.89	5.64	5.05	4.51	3.6	3.38
Mean Monthly Percipitation	inches	2.1314	2.86119	3.08289	1.59667	2.57889	5.84822	7.02644	7.87511	6.27133	2.09341	1.58455	2.4725
Groundwater Recharge	in/month	0	0	0	0	0	0.61	1.86	0	0	0	0	0

Source: TIA Station (1960-2003)

Major water uses in the area are divided into domestic, industrial, irrigation, and public supply. SWFWMD has provided a well construction permit listing for all wells greater than 2-inches in diameter within Sections 17, 18, 19 and 20 in Township 29S Range 20E. This listing has been included in **Appendix 9-1**. In addition, SWFWMD has provided a list of Water Use Permits (WUP) – (issued for wells greater than five inches in diameter) which have been issued for the latitude/longitude boundaries defined by 27°59'45", 27°55'00", 82°22'30", 82°18'45". This inventory is included in **Appendix 9-2.** There are no consumptive use wells at the Facility.

Under the SWFWMD rules for Water Use Permits, a permit for the use of groundwater is required if:

1) The withdrawal during any single day is to exceed one million gallons or if the average annual daily withdrawal exceeds 100,000 gallons per day on an annual basis; and

2) If the withdrawal is from a well having an inside diameter of six inches or more.

A significant area related to Hillsborough County's water supply is the location of the Brandon well field, shown on **Figure 2.22**. This well field, a significant portion of which is located within five miles of the site, covers an area of 2.5 miles by 9 miles. Within this area are 25 municipal supply wells, which pumped between 5.8 and 11.8 mgd in 1981 and 1982, respectively. **Figure 2.22** also shows the location of these wells within the well field, the nearest of which is about 1.5 miles east of the Faulkenburg Road site.

The Hillsborough County Health Department was contacted for chemical analysis of water from the nearby wells. A summary of chemical analytical data is presented in **Table 2-14**. The locations of the wells are shown on **Figure 2.22**. These analyses indicated that the water quality parameters analyzed generally meet the national primary and secondary drinking water standards from these wells.

2.3.4 Surficial Hydrology

2.3.4.1 Hydrologic Characterization

During the original permitting process, it was noted that the Facility could potentially affect two ditches, which approach the site's northern and southwestern borders. Little information was available on the physical, chemical, or hydrological characteristics of the two ditches, especially on a seasonal basis. To provide baseline information on the chemical characteristics, both the ditches were field sampled on October 31, 1983.

The unnamed ditch to the north of the site drains a mixed light industrial-residential area to the west of the site. Station 1 is located on this ditch. Station 2 was located on a second unnamed ditch, which drains a wetlands area to the southeast of the site. Stations 3 and 4 were located downstream of Stations 1 and 2, respectively, before the confluence of the two ditches. Prior to stations 3 and 4, both ditches pass

through a wetland area. Station 5 was located downstream of the merged ditches, just prior to the Tampa Bay Bypass Canal.

Results of chemical analyses are presented in **Table 2-16**. Compared to water quality of the Tampa Bypass Canal (the receiving waters into which the ditches ultimately discharge) at the S-160 Station (USGS, 1981), water quality in both ditches was determined to be generally degraded. Levels of nitrogen compounds (nitrate, ammonia) were shown to be generally higher in the ditches than in the canal, with the exception of nitrite-nitrogen. High turbidity and suspended solids levels were seen in the ditch bordering the northern boundary of the site (Stations 1 and 4). These high levels are thought to be the result of some temporary discharge upstream and would possibly not be found in further sampling. Conditions at Station 2 are of particular interest because site discharges are proposed to occur in the vicinity of this station. Water quality at this station is generally the best of the stations sampled. Surprisingly, however, the lowest dissolved oxygen level was recorded at this station was 2.6 mg/l. This concentration, if persistent, would prohibit establishment of a healthy biological population. As discussed in subsequent sections (Ecology, **Section 2.3.5**) benthic organisms found at this station do not indicate that lowered DO is a continual occurrence.

No information is available on seasonal variations in flow in either ditch. Based on the dimensions of these ditches, maximum flow which could be handled at Station 2, is approximately 65 cubic feet per second (cfs).

Table 2-16

Water Quality of Surface Waters in Vicinity of Site[1]
(mg/1 unless otherwise noted)

Station	1	2	3	4	5
Parameter					
Temperature (°C)	24	22.5	22	22	24
pH (units)	7.35	6.9	7.2	7.9	7.4
Dissolved Oxygen	10.1	2.6	4.80	6.40	8.35
Turbidity (NTU)	196	4.9	31	126	39
Total Alkalinity, $CaCO_3$	29	151	92	33	129
Ammonia Nitrogen	0.08	0.31	0.29	0.43	0.16
Total Kjeldahl Nitrogen	1.1	0.77	1.2	1.4	1.2
Nitrate Nitrogen	.010	0.03	0.28	0.07	2.2
Nitrite Nitrogen	<0.01	<0.01	<0.01	<0.01	0.04
Total Phosphate (T-PO_4)	0.58	0.15	2.0	0.38	0.50
Total Suspended Solids	27	9.0	60	61	26
Total Hardness, $CaCO_3$	111	238	182	85.6	227

[1]Samples collected October 31, 1983

2.3.4.2 Measurement Programs

As described in a previous section, the baseline water quality at the ditches was performed during the first phase of the permitting process for the facility. In order to characterize the chemical condition of the two ditches in the vicinity of the site, a limited sampling program was conducted on October 31, 1983. Grab samples were collected at each station in appropriately washed containers. Samples for dissolved oxygen (Winkler technique), ammonia, total Kjeldahl nitrogen, and total phosphate were preserved as specified in "Methods for Chemical Analysis of Water and Wastes" (EPA-600/4-79-020). All samples were immediately placed on ice for transport to the laboratory. Temperature and pH were measured according to methods specified in either "Standard Methods for Examination of Water and Wastewater" (APHA, 1982) or "Methods for Chemical Analysis of Water and Wastes" (EPA 600/4-79-020).

2.3.5 Vegetation/Land Use

In the initial permitting process, the land use and vegetative cover types were described at the Facility site before construction. Since the original data was compiled over 20 years ago, this data has been updated. The community types have been classified to Levels III and IV of the Florida Land Use and Cover Forms Classification System (FLUCFCS).

The vegetation/land use types for the 50.4-acre project site include Brazilian pepper (4220), conveyance ditches (5100), retention ponds (5300), and utilities (8300). In October 2004, the site was inspected by a biologist familiar with Florida flora and fauna in order to ascertain the type and extent of vegetation and to determine whether any jurisdictional wetlands exist onsite.

The methodology used to determine the extent of a wetland is found in Florida Administrative Code 62-340 (F.A.C.), which is entitled "Delineation of the Landward Extent of Wetlands and Surface Waters." Concisely, wetlands are identified using any two of three criteria found in Section 62-340 (F.A.C.). Those criteria are: (1) wetland plants, (2) hydric soils, in which the list of hydric soils is provided by the Natural Resources Conservation Service, and, (3) evidence of hydrology (either inundation or saturation of soils for a specific time period).

The site inspection revealed no natural wetlands located within the 50.4-acre site. Two jurisdictional upland-cut conveyance ditches exist along the northern and eastern boundary, both of which are highly disturbed and contain predominantly nuisance species, however, the vegetation meets the criteria set forth in the above-mentioned wetland delineation rules. Vegetation within the ditches includes Carolina willow (*Salix caroliniana*), Brazilian pepper (*Schinus terrebinthifolius*), primrose willow (*Ludwidgia peruviana*), beggartick (*Bidens pilosa*), Britton's wild petunia (*Ruellia brittoniana*), saltbush (*Baccharis halimifolia*), blackberry (*Rubus spp*), and creeping ox-eye (*Wedelia trilobata*). These conveyance ditches connect the retention ponds with outflow ditches offsite.

The retention ponds (5300) onsite are composed of a mowed, maintained bank of Bahia grass (*Paspalum notatum*) and coinwort (*Hydrocotyle* spp.) and do not provide much habitat or cover. Other vegetation along the banks of the ponds include alligator weed (*Alternanthera philoxeroides*), torpedo grass (*Panicum repens*), spikerush (*Eleocharis* spp.), buttonweed (*Diodia virginiana*), flatsedge (*Cyperus* spp.), and water hyssop (*Bacopa caroliniana*). There are also areas of mowed and maintained grass interspersed between the parking areas and the retention ponds of the Facility. These areas are dominated by Bahia grass and are periodically improved with brush control and fertilizer application.

The adjacent land use to the north of the site has been converted to various other municipal (Hillsborough County) land use and services including municipal jails (1760), animal shelters (2530) and public works staging areas (1750). However, a

portion of this adjacent northern parcel remains primarily improved pasture (2100). Vegetation includes dog fennel (*Eupatorium capillifolium*), Bahia grass, smutgrass (*Sporoblus* spp.), ragweed (*Ambrosia artemisiifolia*), beggartick, and caesarweed (*Urena lobata*). This pasture area is no longer used for cattle grazing although horses have been seen grazing within the past year. Within the improved pasture area are upland-cut ditches (5100), stormwater ponds (5300), stream and lake swamp wetlands (6150), freshwater marshes (6430), and emergent aquatic wetlands (6440) interspersed. Although most of this northern adjacent parcel is open pasture, there are also scattered small – to medium-sized trees which consists predominantly of slash pine (*Pinus ellottii*), live oak (*Quercus virginiana*), and cabbage palm (*Sabal palmetto*). These areas have been disturbed due to historical agricultural activities and contain a large number of exotic and nuisance trees and shrubs such as monkeypod (*Pithecellobium dulce*), Brazilian pepper, lead tree (*Leucaena leucocephala*), and cogongrass (*Imperata cylindrica*).

A large conveyance ditch (5100) also occurs along the northern boundary of the project site and into the improved pasture area. The ditch was inundated at the time of inspection and had an estimated average depth of two inches. The vegetation consists of many nuisance species and no wildlife species were observed in the conveyance ditch. The ditch had an estimated width of four to six feet. Vegetation included Carolina willow, primrose willow, wax myrtle, smartweed (*Polygonum* spp.), elephant ear (*Colocasia esculenta*), hemp vine (*Mikania* spp.), beggartick, rattlebox (*Sesbania* spp.), common ragweed, Britton's wild petunia (*Ruellia brittoniana*), saltbush (*Baccharis halimifolia*), and blackberry (*Rubus* spp).

The adjacent land use to the south of the site includes the CSX railroad line (8100), a drainage ditch (5100) with spoil banks, and a Brazilian pepper area (4220). Vegetation along this small area included Brazilian pepper and cogongrass (*Imperata cylindrica*). Communities of these small, shrub-like trees are often established along burrow-pits, levees, dikes, and in old disturbed fields.

The adjacent land use to the east of the site includes an abandoned light industrial building (1550), a wetland mitigation area (6410), and an intermittent pond (6530). The mitigation area is planted with native herbaceous species including sand cordgrass (*Spartina bakeri*), pickerelweed (*Pontedaria cordata*) and arrowhead (*Sagittaria lancifolia*). This wetland is in excellent condition. It has been maintained and monitored for a period of time to meet success criteria for an environmental resource permit not associated with this project or site. Also adjacent to this mitigation area is an area classified as intermittent pond (6530). Vegetation within this intermittent pond includes smutgrass, water primrose (*Ludwidgia octovalvis*), rattlebox, and saltbush.

The adjacent land use to the west of the project site is improved pasture (2100) within a TECO easement (8300). Vegetation includes dog fennel (*Eupatorium capillifolium*), Bahia grass (*Paspalum notatum*), smutgrass (*Sporoblus* spp.), common

ragweed (*Ambrosia artemisiifolia*), beggartick (*Bidens pilosa*), and caesarweed (*Urena lobata*) which commonly comprise pasture vegetation.

Along the west line of the S.E. ¼ of Section 18, Township 29 South, Range 20 East, adjacent to the TECO easement and the project site are hardwood – conifer mixed woodlands (4340) which are dominated by live oak (*Quercus virginiana*), slash pine (*Pinus ellottii*), and wax-myrtle (*Myrica cerifera*). Within this hardwood forest is a bottomland or lake swamp wetland (6150) containing laurel oak (*Quercus laurifolia*), water oak (*Quercus nigra*), primrose willow (*Ludwidgia peruviana*), smartweed (*Polygonum* spp.), and blackberry (*Rubus* spp). This forested area historically has remained a natural undeveloped area with impacts from cattle grazing. The established canopy provides shading that reduces the invasion of exotic and nuisance species. There will be no anticipated impacts within this area from the proposed Facility expansion.

A land use/vegetation map at a scale of 1:1500 (1"=1500') is provided in **Figure 2-24**, based upon the Level III and IV Classifications of the Florida Land Use and Cover Classification System. This class of data was obtained from medium and low altitude aerial photography supplemented by ground level confirmation of observed data. Global Information Systems Software (GIS) was used to delineate land use on the Facility site and surrounding areas.

According to the U.S. Department of Interior, Fish and Wildlife Service (USFWS), National Wetland Inventory (NWI), there are two wetlands, which exist within the 50.4-acre project site (NWI Brandon, Florida, Quadrangle, 1992). These appear in the south-central portion of the Facility site within the area of the Wastewater Treatment Plant. These small wetland areas no longer exist within the Facility site and were converted to utilities (8300) land uses within the past 30 years. A portion of a NWI-mapped wetland also appears along the northern property boundary. Most of this wetland area still exists on the adjacent parcel to the north; however, the onsite portion has since been converted to part of the Facility access road.

Wetlands were also described using the USFWS "Classification of Wetlands and Deepwater Habitats of the United States" (1979). It is highly probable that considerable onsite activity has extensively modified the conditions that existed when the original aerial photographs were interpreted. Indeed, ground level analysis did not reveal the presence of the wetland areas indicated on the USFWS and GIS maps.

A list of wetland vegetative indicator species for various wetland communities in Southwest Florida, including Hillsborough County, is found in **Appendix 12-1** – Ecology. This list was taken from the Florida Department of Environmental Protection's website at: http://www.dep.state.fl.us/water/wetlands/delineation. Due to the disturbed nature of the site and the dominant vegetation in the adjacent

property currently Brazilian pepper, the area provides little vegetative biodiversity or native plant communities.

Hillsborough County Energy Recovery Project

Scale
0 1500'

N

Figure 2.24
Vegetation &
Land Use Map

Aerial Taken (11/2003)

Ecology

"Important" species of plants and animals include (1) species listed as endangered or threatened by the USFWS, (2) species listed by the Florida Game and Fresh Water Fish Commission (FFWCC) in F.A.C. 39-27 as endangered, threatened, or species of special concern, (3) species listed as game, furbearers, or freshwater game fish in F.A.C. 39-1, and (4) those species which are indicators of, endemic to, or are otherwise unique to specific plant communities and habitat types. Of significance to this permit application are those important species found on-site or within five miles of the site, which would be expected to be affected by the proposed project.

Existing background information was reviewed to determine the likelihood for occurrence by listed species based on habitats found on site and known geographic ranges. Data sources and information collected and evaluated for the study include:

- Hillsborough County November 2003 aerial photographs
- FDEP Land Boundary Information System (LABINS) website (http://labins.org)
- USGS quadrangle map of Brandon, Florida
- Soil Survey of Hillsborough County, 1983 (United States Department of Agriculture (USDA), Soil Conservation Service (SCS)
- *Wildlife Methodology Guidelines*, Section 18.D (Florida Freshwater Fish and Wildlife Commission)
- *Guide to the Vascular Plants of Florida* (Wunderlin, Richard P., 1998)
- Florida Natural Areas Inventory (FNAI) website and database (http://www.fnai.org)
- Florida Land Use, Cover and Forms Classification System (FDOT 1999)
- *Guide to the Natural Communities of Florida* (Florida Natural Areas Inventory, June 1998).
- Guidelines for gopher tortoise relocation (FFWCC August, 2001)
- FFWCC website listing of endangered species (http://floridaconservation.org/endanger)
- USFWS website listing of endangered species (http://endangered.fws.gov)
- Florida's Breeding Bird Atlas webpage (http://www.wildflorida.org/bba/maps.htm)
- FFWCC Bald Eagle Nest Locator website (http://wld.fwc.state.fl.us/eagle)

- *Field Guide to North American Birds, Eastern Region,* National Audubon Society, 3rd Edition, 1977.
- *Field Guide to Florida,* National Audubon Society, 1st Edition, 1998.
- USGS National Wetlands Inventory Website (http://wetlands.fws.gov/)

The U.S. Department of the Interior, Fish and Wildlife Service (USFWS), was contacted in October, 2004 for updated data pertaining to the project site. Data from the USFWS website reconfirms the findings contained in the County's original application, which states that no federally-designated wildlife refuges or critical habitats are located within five miles of the site. This data remains accurate according to the USFWS website data (http://northflorida.fws.gov/), the critical habitat list from the Code of Federal Regulations, 50 CFR 17.95 (http://www.gpoaccess.gov/ecfr/), and according to the Florida Fish and Wildlife Conservation Commission (see **Appendix 12-1 – Ecology**). However, portions of the Facility site appear to be within the range of federally listed species according to the USFWS website. These include the Florida golden aster, wood stork, (endangered) and the bald eagle, eastern indigo snake, and Florida scrub jay (threatened).

As shown on **Figure 2-7b**, one eagle nest has been found just inside the five-mile study area, although this nest area is not defined as critical habitat. In fact, critical habitats have not been defined for any of the five listed species. Since the construction of the expansion project will only affect an extremely small area (0.3 acres) of uplands already affected by the operation of the Facility for the last 20 years, it is anticipated that the expansion project will not adversely affect any of the above federally-listed species.

The FFWCC and FNAI were contacted to request their assessment of the potential for the occurrence of listed species within the project area. The USFWS now directs applicants to the USFWS website listing of threatened and endangered species for the respective region and state (http://northflorida.fws.gov/). Based on the results of the background information review and on-site habitat types and known ranges, a list of potentially occurring species was developed. A listing of endangered, threatened, rare, or species of special concern, which are found in Hillsborough County, provided a database of organisms, which have the potential to occur on the project site. This list is included in **Appendix 12-1 – Ecology**. The FFWCC indicated that the proposed project would not adversely affect any listed species within the project area. However, according to FNAI, within the five-mile search radius, there are occurrences of listed species and areas of 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*). As shown on **Figure 2-7b**, one active eagle nest has been

found just inside the five-mile study area (S/T/R - 2/29S/19E). No impacts to the nest are anticipated. The FNAI data also showed that above-listed species occurrences are out of the vicinity of the proposed Facility expansion and would not create conflicts within the project area. No element occurrences were shown within the 50.4-acre project site.

Field observations were conducted in October 2004 by an environmental scientist familiar with Florida flora and faunal species. The survey was conducted to ensure that no rare species inhabit the area to be used for the proposed expansion of the Facility. Field observation methods consisted of multiple pedestrian transects and detailed field observations throughout all habitat types existing on the Facility site. These observations began in the early morning and continued into early afternoon. Pedestrian transects were consistent because most of the vegetative cover/land use within the project site consists of paved parking lots and low pasture grasses. Wildlife sightings were noted from the survey and recorded, however, none of these observations were within the area of the Facility expansion. **Table 2-17** provides a list of notable wildlife sighted on or adjacent to the Facility site.

Table 2-17
Wildlife Sighting Results

Name	Genus/Species	Status
Wood Stork	Mycteria Americana	State Endangered
Mourning Dove	Zenaida macrousa	Game animal
White Ibis	Eudocimus albus	Species of Special Concern
Mallard Duck	Anas platyrhynchos	Game animal
Little Blue Heron	Egretta caerulea	Species of Special Concern
Mockingbird	Mimus polyglottos	N/A

No federally listed species were observed during the limited survey period. However, three state-listed species were observed. Based on the duration of the survey, size of the property, and limitations of the survey coverage, the results are not conclusive regarding potential utilization of the site by some of the listed potential species. **Appendix 12-1** provides a summary of listed wildlife species and the likelihood for their occurrence within various habitats. Other species that have the potential to occur on the site, as well as the result of the observations for specific target species, are discussed in further detail below.

Bald eagles (*Haliaeetus leucocephalus*) may forage in the wetlands to the north of the project site. No nests were observed on or near the site, nor does the FFWCC have

record of a nest closer than 3.7 miles to the site. Since there will be no impacts to the wetlands on or adjacent to the site, no impacts are anticipated to this species.

Burrowing owls (*Speotyto cunicularia*) build their nests in high sandy ground, preferably open habitats with short grasses and few trees. Their distinctive burrows clearly indicate their presence. No burrows were observed during the wildlife survey and there will be no impacts to the improved pasture area due to this project, therefore, no impacts are anticipated to this species.

Florida sandhill cranes (*Grus canadensis pratensis*) nest in grassy marshes, which maintain standing water during the birds' nesting season. They forage in wet prairies, marshy lake margins, and pastures. They may utilize the offsite wetlands to the north for nesting and foraging, however, most of the wetlands are dominated by nuisance species and do not represent ideal nesting or foraging habitat. Sandhill cranes were not observed on the site during the October 1, 2004 site visit. Impacts to this species are anticipated to be low due to the previous loss of habitat.

Southeastern American kestrels (*Falco sparverious paulus*) utilize open pine habitats, woodland edges, prairies, and pastures with low tree canopy cover for foraging. Kestrels usually nest in tall dead tree cavities, typically abandoned woodpecker holes, with an unobstructed view of surroundings. They forage in improved pastures, mixed rangeland, open pine woods, and forested upland and wetland areas. Kestrel foraging habitat occurs throughout the improved pasture areas offsite in the northern parcel and TECO easement. There are no impacts to the improved pasture areas offsite; therefore, no impacts to this species are anticipated.

Wading bird species targeted include: woodstork (*Mycteria americana*), limpkin (*Aramus guarauna*), little blue heron (*Egretta caerulea*), snowy egret (*Egretta thula*), tricolored heron (*Egretta tricolor*), rosate spoonbill (*Ajaia ajaja*), and white ibis (*Eudocimus albus*). Wading bird observations were conducted onsite around the retention ponds and adjacent conveyance ditches during the morning hours of the wildlife survey. Wetlands and ponds were visually surveyed from the perimeters and observations were made in the pond interiors. The FNAI maps (**Appendix 12-1**) were consulted to identify the documented presence of wading bird rookeries in the vicinity and none were noted.

The attraction of listed wading birds to the site is the retention ponds and the food supply available. During the October 2004 site visit, three listed wading birds were observed: wood stork, white ibis, and little blue heron. Because no impacts to any of the ponds or wetlands are proposed, the likelihood for impact to these species from the project is low. In addition, there are large freshwater marshes just north of the Facility. The wetlands offsite will be isolated from direct effects of the expansion due to the large buffer existing between the project and the nearest adjacent wetland (>300 feet). In addition, any dewatering activity will be contained within onsite ponds and ditches long enough to avoid any secondary impacts.

Adjacent habitat for these wading birds is offered north and west of the site in numerous wetlands with equal or greater habitat value and functions.

American alligators (*Alligator mississippiensis*) utilize a wide variety of water bodies and wetlands, potentially including the scrub-shrub wetland on the Facility site. Signs of their nesting were investigated. No alligators or possible nest sites were noted during the October 1, 2004 site visit. Because no impacts to this wetland area are proposed, impacts to this species are not expected.

Gopher tortoises (*Gopherus polyphemus*) occupy a wide variety of upland sites. No burrows were observed on the Facility site; therefore, no impacts are anticipated to this species. A number of commensal species are associated with gopher tortoises, including gopher frogs (*Rana capito*), short-tailed snake (*Stilosoma extenuatum*), Florida pine snake (*Pituophis melanoleucus mugitus*), the Florida mouse (*Podomys floridanus*), and the eastern indigo snake (*Drymarchon corais couperi*). None of these commensal species were observed during the wildlife survey. The likelihood of occurrence of these species within the proposed project area is anticipated to be low due to lack of undisturbed habitat on the Facility site.

Sherman's fox squirrel (*Sciurus niger shermani*) occupies a wide variety of habitats including sand hills (high pine), pine flatwoods, pastures, and other open, ruderal habitats with scattered pines and oaks. Longleaf pine cones and seeds are an important food source. Nesting occurs in pine trees and feeding in open areas such as the improved pasture. No fox squirrels were observed during the wildlife survey. Longleaf pines were observed west of the TECO easement and project site, although no nests were noted during the survey. The likelihood of impacts to this species is considered to be low due to the project not impacting the adjacent parcel.

The Florida scrub jay (*Aphelocoma coerulescens*) occupies xeric oak scrub, sand hills, pine scrub and scrub oak habitat. There is no scrub jay habitat within the site, therefore the potential for the occurrence of this species is low. The likelihood of impact to this species is therefore considered to be low.

Black Bear (*Ursus americanus*) occupies woods, swamps and frequents solid waste dumps. Habitat does not exist for the black bear on this site. Signs of the black bear are torn apart stumps, turned over boulders, hair on shaggy barked rubbing trees, none of which were observed during the wildlife survey. Potential impacts to this species are not anticipated.

Species-environmental relationships

There are no species present within the boundary of the Facility site, which are endemic or unique to this site. The species and habitats are common to Hillsborough County and southwest Florida. As initially discussed, the project site has been heavily impacted by drainage, clearing, and maintenance. As such, it offers little or no areas of prime habitat for wildlife. It is not anticipated that the

proposed project will have any effects on area ecology. The site has also been invaded by exotic tree species, reducing vegetative diversity and offering few areas for foraging and cover. Existing fauna should not be displaced by the proposed expansion; however, if fauna onsite is forced to move, adjacent habitat to the north will provide wildlife habitat equal to or greater than that existing onsite. The location of the Facility expansion is adjacent to the existing Facility and will have no impact on any species habitat.

2.3.5.1 Pre-Existing Stresses

As reported in the original application, pre-existing environmental stresses within the Facility boundary are evident. Prior to Facility construction, the site had been impacted by cattle grazing. This activity stressed vegetation and natural communities within the site and adjacent area. Prior to cattle grazing, logging of the site occurred. This activity most likely removed the mature oak-pine canopy and made the surrounding habitat unsuitable for many species of wildlife. More recently, an infestation of exotic plants, namely Brazilian pepper, has made the area unusable by a majority of wildlife species. Drainage of the site has been improved by the construction of the original Facility and offsite wetlands remain in approximately the same size and location.

2.3.5.2 Measurement Programs

In 1983 and 2004, all upland and wetland vegetation community types were delineated on 1:200 (1"= 200') Hillsborough County aerials and ground-truthed by a biologist familiar with Florida flora and fauna to ensure accuracy. Community types were classified based upon the Level III and IV Classifications of the Florida Land Use and Cover Classification System (FLUCFCS). This class of data was obtained from medium and low altitude aerial photography supplemented by ground level confirmation of observed data. Global Information Systems Software (GIS) was used to delineate land use on the Facility site and surrounding areas as shown on **Figure 2-24**.

2.3.6 Noise

A complete technical analysis of baseline ambient noise conditions was completed for this application and is contained in its entirety in **Appendix 11-1**. This study includes detailed methodologies, which were utilized in order to estimate operational impacts associated with the Facility.

Raw data results of monitoring completed using a hand-held sound pressure level meter are presented in **Appendix 11-1**. These measurements were made at predetermined locations as is explained below.

Existing ambient sound levels were measured on September 17, 2004 and October 1, 2004, at seven different locations in the site vicinity in order to establish baseline conditions during day and night-time periods. These baseline condition monitoring sites are represented in **Figure 2-25** as numbered circles. Site 1 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).

Site 2 was selected because it is the closest residence to the proposed expansion area and access road whilst still remaining on site property. Site 3 was selected because it is in the direct vicinity of the closest main residential area to the site and Falkenburg Road. Monitoring Site 4 was selected because it is the closest commercial manufacturing facility to the PI (Point of Intersection) of the access road and Falkenburg Road. Sites 5 through 7 were selected to determine the impact, if any, on the southern bordering distribution (warehousing/light industrial) facilities located just south of the existing railway.

The noise levels recorded at each of the seven sites are presented in **Tables 3-1- 3-4** of **Appendix 11-1**. These levels are in decibels using the A-weighting network, and are designated dBA. The higher the decibel level, the louder the sound. A change of ten times the energy level of the sound is represented as a 10-dBA change in the sound level scale.

The Hillsborough County Environmental Protection Commission has criteria for ambient noise levels based on the receiving land use and time of day. Residential, public space and open space areas are assigned the most stringent sound level limits followed by commercial or business areas and manufacturing or industrial areas. Monitoring Sites 1, 2, 4, 5, 6, and 7 are all within manufacturing/industrial areas; therefore, the sound level limits at these sites are higher than at the other site. Monitoring Site 3 falls under the residential, public space, and public right-of-way category for sound level limits. Limits for this category, as shown in **Table 2-18**, are lower than the limits for manufacturing/industrial areas. A comparison of the measured sound levels with the County sound level limits shows that limits are currently exceeded at monitoring Site 3.

Hillsborough County Energy Recovery Project

Figure 2.25
Noise Monitoring Locations

Aerial Taken (11/2003)

Table 2-18

Noise Baseline Data Summary
September 17, 2004 – October 1, 2004

Site	Time	L_{eq} (dBA)	Hillsborough County Noise Criteria Sound Level Limit (dBA)[b]
1 (B&A)[c]	8:00am 6:00pm 10:00pm	64.1 63.3 50.7	75 75 75
2 (B&A)[d]	8:00am 6:00pm 10:00pm	68.7 66.7 61.0	75 75 75
3 (B&A)[c]	8:00am 6:00pm 10:00pm	74.8[a] 75.0[a] 65.1[a]	60 60 55
4 (B&A)[c]	8:00am 6:00pm 10:00pm	73.6 73.2 67.1	75 75 75
5 (B&A)[c]	8:00am 6:00pm 10:00pm	64.8 64.5 52.8	75 75 75
6 (B&A)[c]	8:00am 6:00pm 10:00pm	58.2 60.7 50.6	75 75 75
7 (B&A)[c]	8:00am 6:00pm 10:00pm	52.1 50.6 45.4	75 75 75

Source: Burcaw & Associates Incorporated, Public Sector Department

a - Level currently exceeds limits as set by Hillsborough County Environmental Protection Commission
b - Hillsborough County Environmental Protection Commission (http://www.epchc.org/Noise.htm)
c - Recorded on September 17, 2004
d - Recorded on October 1, 2004

Section 3
The Plant and Directly Associated Facilities

3.1 Background

3.1.1 Purpose

The Hillsborough County Resource Recovery Facility (Facility) is a component of the Comprehensive Master Plan for Hillsborough County and the Cities of Tampa, Temple Terrace and Plant City. The solid waste component of this comprehensive master plan outlines an integrated waste management system that includes recycling, waste reduction, and landfilling in addition to combustion at the Facility.

Due to population growth that shows no signs of slowing in the near future, the County currently combusts only a portion of the MSW produced by County residents. The County diverts waste above the 1,200 tpd capacity of the Facility to a landfill. After considering all solid waste disposal options, including landfilling, composting, and resource recovery, the County Commission decided to expand the Facility to increase its waste disposal capacity and electrical power generation.

Currently, the Cities of Tampa, Plant City, and Temple Terrace each maintain a solid waste collection system within their respective boundaries. The County controls the collection system in the unincorporated areas using franchise collectors. Residential waste is generally collected twice a week, with more frequent collection, as necessary, for commercial waste.

The purpose of this section is to describe the existing facility and the proposed expansion. This section will also estimate the character and magnitude of discharges from the proposed expansion of the Facility.

3.1.2 History

In 1984, the County applied for site certification under the Florida Electrical Power Plant Siting Act to construct and operate the Facility. Environmental concerns and siting difficulties associated with landfill disposal methods and increasing prices of energy and recyclable materials originally stimulated the County's interest in resource recovery. The Facility went into operation in 1987. Since then, the Facility has met or exceeded its guaranteed availability of 85 percent of the stated capacity of 1,200 tons of municipal solid waste (MSW) each day. This results in a daily power generation of about 29 MW (equivalent in energy value to approximately 1,200 barrels of oil).

The Southeast County landfill accepts unprocessible waste, processible waste above the capacity of the Facility, overflow waste from the City of Tampa, and all waste from Plant City and Temple Terrace. In previous years, other city and County landfills were used that have since been closed. The Southeast County landfill replaced the Hillsborough Heights Landfill in 1984. The County used the Taylor Road Landfill until February of 1980. The City of Tampa owns its own resource recovery facility, known as the McKay Bay Waste-to-Energy Facility. Overflow waste from the McKay Bay Facility is transferred

to the Southeast County Landfill. In April 1981, the County's Northwest Landfill was closed.

Prior to construction of the Facility in 1984, the Hillsborough County Board of County Commissioners (BOCC) endorsed the Facility as the long-term solution to Hillsborough County's solid waste disposal problems. The BOCC reaffirmed this opinion in 2005 by choosing to expand the Facility to handle increased MSW production in the County.

The Facility uses mass burn technology to combust MSW, recover heat energy in the form of steam, and convert that steam energy to electricity. A full service vendor, Covanta Hillsborough, Inc. (Covanta) operates the Facility under a long-term operations agreement with Hillsborough County. It is anticipated that Covanta will provide design, construction, start-up, and acceptance testing services for the Facility expansion.

Commercial-scale resource recovery first began in the United States in the late 1970s, but European countries have been recovering energy from solid waste for over 50 years. In terms of energy produced, a ton of solid waste equals approximately one barrel of oil. Resource recovery becomes even more attractive as one considers the rising price of oil and the country's desire to decrease dependence on foreign sources.

On April 15, 1982, the Board authorized establishment of the County's Resource Recovery program. The Board approved the management team that would guide this long-term project to completion. The management team included the consultants (engineers, investment bankers, bond counsel and financial advisors) and County project management staff and decision-makers. A Resource Recovery Project Oversight Committee was also established to help guide the project through key decision points, and to provide policy recommendations to the Board through the County Administration. The Committee, which consisted of senior County staff members, reviewed and made recommendations on key issues such as site selection, facility size, financing approach, vendor selection, and final contracts. One person from each of the governments of the cities of Temple Terrace and Plant City participated as non-voting members on the Oversight Committee.

On October 27, 1982, the Board approved the selection of the recommended site. The site embodied a central location, good road access, a compatible land use and favorable environmental conditions. By selecting a site near the County's waste generation center, transportation times and costs were minimized. Site selection was the result of months of detailed study by Camp Dresser & McKee Inc. and County staff. Air, traffic, noise, water and aesthetic issues were examined in detail. A specific siting method was developed to evaluate the suitability of candidate sites for the resource recovery facility. The basic approach used consisted of a progression of data collection and reviews in increasingly greater detail. In the early phase of the study, a total of 35 potential sites were identified representing all areas within the County. Following field investigation, the list of potential sites was narrowed to 23 for further screening. Twelve sites were eliminated because they were unsuited for construction of a resource recovery facility.

The remaining 23 sites received a detailed evaluation and rating through the use of specific siting criteria developed by the consulting engineers. These criteria included engineering, zoning, and environmental considerations. Candidate sites were systematically eliminated as evaluation became more detailed. After completing these studies, Camp Dresser & McKee Inc., recommended that the County select the Falkenburg Road site for construction of the Resource Recovery Facility. The areas adjoining the site were zoned light industrial, M-1A and heavy industrial, M-1 with some commercial and industrial interests nearby.

In addition to the Resource Recovery Facility, the County also constructed an advanced secondary wastewater treatment plant (WWTP) at the site. The WWTP was designed to treat municipal wastewater, industrial wastewater from the surrounding area, and wastewater from the Resource Recovery Facility. In return, the WWTP supplies cooling water to the Resource Recovery Facility.

The County owns the Resource Recovery Facility, but an independent contractor operates the facility under a 20-year contract. This contract will expire on September 30, 2007. The County anticipates that it will negotiate with the contractor for a continuation of the contractor's services.

In 1997, the County upgraded the air pollution controls (APC) and monitoring systems at the Facility in compliance with the Environmental Protection Agency's (EPA) Emission Guidelines for "large" Municipal Waste Combustors, which are codified at 40 CFR 60, Subpart Cb. The new APC equipment consisted of a spray dryer absorber (SDA), a fabric filter (FF), an activated carbon injection (ACI) system and a selective non-catalytic reduction (SNCR) system for each boiler. In addition, upgraded auxiliary fuel burners were installed in the combustion zone of each boiler. Certain continuous emission monitors (CEMs) were installed in the outlet ducts of the economizer/boiler and FF. Other CEMs were installed only in the FF outlet ducts. New induced draft (ID) fans were also installed.

3.1.3 Current Conditions

The Facility is a "mass-burn" type facility with a continuous design rated capacity of 1,200 tons per day. It uses three combustion/steam generation units, each with a continuous design rated nominal capacity of 400 tons per day. The design layout for the Facility allows for the addition of a fourth combustion/steam generation unit. The tipping area and refuse pit were designed to handle at least 1,600 tons per day (tpd) and thus accommodate the eventual expansion of the Facility. In addition, the stack was constructed with four (4) flues. The Facility has one steam turbine-generator that generates energy of about 450 kWh/ton of waste burnt. The energy is sold to the Tampa Electric Company (TECO). Power lines from the facility's electrical switchyard connect to TECO's electrical transmission line right-of-way, which abuts the western boundary of the facility site. The county and operating contractor share energy revenues.

Because the Facility uses mass-burn technology, waste is not preprocessed prior to combustion (with the exception of some limited size reduction for oversized items). MSW is delivered by truck to the Facility. Ash residue is removed in the same manner. MSW is dumped into the refuse bunker inside the building directly from transfer trailers and packer trucks. All waste is stored inside the building so that waste is not visible from the outside. Two overhead cranes mix the MSW in the bunker and load the charging hoppers as required. The APCs are the same as those described in **Section 3.1.2** that were installed in 1997.

3.1.4 Expansion

Hillsborough County desires to expand the capacity of the Hillsborough County Waste-to-Energy Facility from the existing capacity of 1200 tons per day to 1800 tons per day. The proposed equipment will include a new 600 ton per day stoker fed combustion unit, a nominal 16.7 megawatt turbine - generator set, Air Pollution Control (APC) equipment and all associated auxiliary equipment. The proposed APC equipment is described in greater detail in **Appendix 13**.

3.2 Site Layout

3.2.1 Layout

The site plan shown in **Figure 2-5**, illustrates the building layout and perimeter of the site. All structures are set back at least 100 feet from property lines and adjacent roadways. All structures are set back a minimum of 100 feet from all property lines and adjacent roadways. Although the resource recovery facility and wastewater treatment plant remain separate with individual fencing and parking, the overall facility design and layout is coordinated (i.e. roadways, fences, retention basins, buffers, signs, etc).

The natural site drainage is to the west. Site grading respects existing drainage patterns where possible. However, substantial site grading was required to construct a resource recovery facility with multiple levels of vehicle access. Maximum side slopes for site fill is three horizontal to one vertical (3:1) and special revegetation techniques were required to minimize erosion and siltation. Maximum roadway grades of 3 percent for site access were used to reduce required truck shifting and associated noise. Maximum roadway grades of 6 percent were used for site egress.

The setback allowed adequate space for stormwater collection through the use of surface swales along roadways. Additional infiltration of stormwater was encouraged through use of these swales. A more complete description of the on-site drainage system is provided in **Section 3.8**.

The roadways were designed with minimum turning radii of 35 feet to accommodate truck traffic, a divided entrance road/one-way system for safety, a 14 foot lane width for two lane roads, and a 20 foot roadway width for one-way/divided roads.

Parking spaces are provided for the facility in addition to those required by the zoning regulations due to the site's location (not readily accessible by mass transit), and to accommodate potential visitors and shift overlaps. Automobile parking is separated from truck circulation and parking to minimize potential conflicts. The roadway speed limit is 30 mph. Truck scales are placed very close to the Facility entrance to reduce the potential for excessive truck speeds. The entire site is graded and landscaped. A planted buffer (minimum 50 foot width) was developed along the site property lines along with earthen mounds to provide screening of the Facility. The fencing has been set back from the property line and is incorporated into the buffer planting. Planting materials are limited to large evergreen and deciduous trees within the buffer planting. Buffer plantings are in naturalized groupings, not in straight lines, creating an irregular edge rather than a formal straight line so that the adjacent open lands blend with the open lands of the facilities, as illustrated on the Site Plan, **Figure 2-5**. This provides an informal, natural appearance to the open lands surrounding the Facility. Substantial mass planting of large trees on the banks close to the resource recovery facility reduces the overall visual impact of the structure. However, due to facility height, no planting effectively screens all of the site structures. The site layout, grading, and plantings are shown on the General Site Development Plan.

3.2.2 External Appearance

The Facility consists of two contiguous buildings, the administration building and the processing building. The administration building is about 30 feet high, 110 feet long and 30 feet wide. It contains offices and is located in the southeast corner of the processing building. The processing building is rectangular, measuring approximately 360 feet by 260 feet. It varies in height, depending on the processing function housed in that portion of the building. At the eastern side, it is about 60 feet high for refuse unloading activities. Immediately to the west of this portion of the building, the height increases to about 100 feet where refuse storage and furnace charging occurs. Continuing westward across the building, the height increases to 140 feet over the boilers and finally decreases to about 40 feet for the generators and electrical rooms. The stack height is 220 feet. The width of the building is reduced from 178 feet (refuse unloading, refuse storage and furnace charging) to 129 feet for the boilers, generators and electrical rooms. The three dimensional rendering of the current Facility is shown in **Figure 3-1**. The three dimensional rendering of the expanded Facility is shown in **Figure 3-2**.

The net effect of these conditions is a stepped appearance, which helps to reduce the visual impact of the structure. This is most apparent in views from the north and south where the profile is visible. Viewing from the east side, along Falkenburg Road, shows the most perceivable reduction in visual impact as the building steps up away from the street.

The Facility is completely enclosed. The structures are painted with colors that blend well with its natural background. The stack and top portions of the building are painted a light blue color which blends with the sky. Overall, the building, landscaping and color scheme gives the Facility an attractive appearance.

Figure 3.1
Rendering of Current Facility

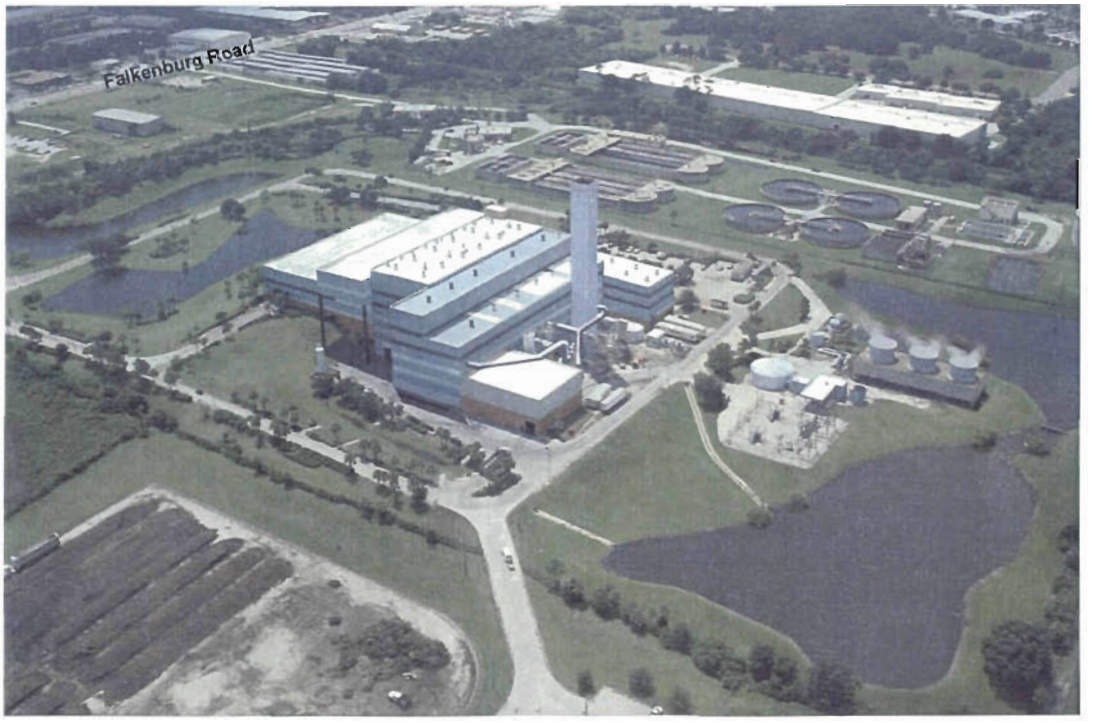


Figure 3.2
Rendering of Expanded Facility

3.3 Fuel

The Resource Recovery Facility will use municipal solid wasted collected from the unincorporated areas of Hillsborough County as its primary fuel. Natural gas will be used for start-up, shutdown and upset conditions. Since the municipal solid waste is heterogeneous, generalizations must be made as to its heating value, moisture content and resulting ash content. These factors vary continually.

The term "municipal solid waste" applies to the non-hazardous solid wastes generated within the County. Solid wastes to be disposed of and processed at the Facility are divided into the following classifications which indicate their general characteristics and their source of generation:

- *Residential Wastes*. Mixed domestic household wastes (including yard wastes) generated by individuals or families in single or multiple family dwellings.

- *Commercial Wastes*. Wastes generated by the commercial and retail sector of the County. The physical characteristics of these wastes are similar to residential wastes, consisting primarily of combustible materials in the form of paper and food wastes from offices, restaurants and retail establishments.

- *Institutional Wastes*. Wastes generated by hospitals, schools and churches. These wastes have characteristics similar to residential and commercial wastes with the exception of biomedical waste. The Facility does not accept biomedical or radioactive waste.

- *Industrial Wastes*. Wastes generated by industrial process and manufacturing operations, including general housekeeping and support activity wastes associated with industry. However, the Facility does not accept any wastes classified as hazardous or infectious by federal and state regulations.

All calculations, analyses and performance data for the Facility have been based on an as-fired solid waste with a higher heating value of 5,000 BTU per pound and 21 percent moisture content by weight.

The solid waste is delivered in standard, municipal type, packer vehicles, open-bodied dump trucks, and transfer trailers with capacities up to 75 cubic yards. Residents must make arrangements with the franchise haulers responsible for their area for garbage collection. Residents are not permitted to drop off discard waste at the Facility. The Facility receives waste six days per week. The Facility is designed to operate continuously (8760 hours per year).

The Facility includes a completely enclosed tipping floor with twelve, 16-foot wide, tipping bays. Each tipping bay includes back-up wheel stops to prevent vehicles from entering the solid waste storage pit. Solid waste is stored in a completely enclosed storage pit which has a bottom elevation below the tipping floor. The pit has storage capacity for three days of solid waste deliveries (i.e. 4,800 tons of solid waste at a density

of 450 pounds per cubic yard). The solid waste storage and handling areas are enclosed and under negative air pressure because they supply the combustion air used during Facility operations. Because these areas are maintained under negative air pressure, odors are minimized outside of the refuse storage area and refuse unloading building.

Bulky waste is removed from the waste stream or reduced in size by a rotary shredder. This helps prevent blockage between the charging hopper and the combustion/steam generating units. Two overhead solid waste handling cranes charge the combustion units and the rotary shredder, and maintain the solid waste storage area. The cranes are the traveling bridge type, with a grapple. Each crane is capable of meeting the solid waste handling requirements of the entire Facility.

3.4 Air Emissions and Controls

3.4.1 Air Emissions Types and Sources

Currently, the Facility has three boilers each with a nominal rated capacity of 400 tpd of MSW for a nominal total of 1,200 tpd. The expansion project will add a fourth unit rated at 600 tpd, increasing the total nominal facility capacity to 1,800 tpd. The flue for the new boiler is already encased in the existing stack. The refuse storage pit and the residue storage area are enclosed. The refuse storage pit is under negative pressure as combustion air will be taken from this area. There will be no on-site storage of either refuse or residue except within these controlled areas.

Loading and unloading of trucks takes place within the enclosed buildings. Trucks enter and leave the site on paved roads. Trucks hauling waste are covered to minimize litter at the site and during transportation. Evaporative emissions from the cooling tower will be equivalent in quality to water from advanced secondary treatment facilities. A discussion of the emissions from the cooling tower is contained in **Section 5.1.4** of this application.

Facility emissions are produced from stack gases and sources such as the carbon and lime storage silos. A complete description of emissions and emission sources is presented in **Appendix 13**.

3.4.2 Air Emission Controls

The APC equipment at Units 1 through 3 consists of spray dryer absorber (SDA), a fabric filter (FF), an activated carbon injection (ACI) system, and a selective non-catalytic reduction (SNCR) system. The combustion zone of each boiler has an auxiliary fuel burner to control combustion during periods of start-up, shutdown, and upset conditions. Continuous emission monitors (CEM) are installed in the outlet ducts of the economizer/boiler and FF. Additional CEM sample lines are installed in the stack.

The proposed fourth Unit will consist of spray dryer absorber (SDA), a fabric filter (FF), an activated carbon injection (ACI) system, and enhanced selective non-catalytic reduction (SNCR) system. The enhanced SNCR system consists of SNCR and flue gas recirculation (FGR). This will prove the performance over the existing units and reduce

emissions. Like the existing units, the combustion zone of the boiler will have an auxiliary fuel burner to control combustion. A continuous emission monitors (CEM) will be installed in the outlet ducts of the economizer/boiler and FF.

3.4.3 Best Available Control Technology

The Best Available Control Technology (BACT) analysis, presented in the PSD Permit Application, evaluates the environmental, economic, and energy aspects of alternative control techniques and methods. The complete discussion of the BACT selection process is presented in the Section 3, Volume III.

Table 3-1 compares the existing permit limits for facility emissions with the NSPS emission limits and proposes emission limits for the expanded Facility.

Table 3-1
Proposed Permit Limits for the Expanded Facility

Pollutant	Existing Permit Emission Limit [1]	New Source Performance Standards (NSPS) Emission Limit	Proposed Unit Permit Emission Limit [1]
Particulate Matter (PM) [4]	27 mg/dscm [2]	24 mg/dscm [2]	20 mg/dscm [2]
Sulfur Dioxide (SO_2)	29 ppmvd or 75% reduction [2]	30 ppmvd or 80% reduction by weight or volume [2,7]	26 ppmvd or 80% reduction [2]
Nitrogen Oxides (NO_x)	205 ppmvd [2]	180 ppmvd [2] (First year). 150 ppmvd [2] (Subsequent years).	110 ppmvd [2] (Subsequent years) 150 ppmvd [2] – 24-hr avg.
Carbon Monoxide (CO)	100 ppmvd [2]	100 ppmvd [2] – 4-hour. Avg.	80 ppmvd [2] – 12 mo. rolling avg. 100 ppmvd [2] – 4-hour avg.
Volatile Organic Compounds (VOC)	0.01 gr/dscf [3] or 0.2 lb/ton	No NSPS limit	0.1 lb/ton
Lead (Pb)	0.44 mg/dscm [2]	0.20 mg/dscm [2]	0.2 mg/dscm [2]
Mercury (Hg)	0.070 mg/dscm or 85% reduction [2]	0.080 mg/dscm or 85% reduction by weight [2,7]	0.028 mg/dscm or 85% reduction [2]
Cadmium (Cd)	0.040 mg/dscm [2]	0.020 mg/dscm [2]	0.02 mg/dscm [2]

Table 3-1
Proposed Permit Limits for the Expanded Facility

Pollutant	Existing Permit Emission Limit [1]	New Source Performance Standards (NSPS) Emission Limit	Proposed Unit Permit Emission Limit [1]
Hydrogen chloride (HCl)	29 ppmvd or 95% reduction [2]	25 ppmvd or 95% reduction by weight or volume [2,7]	25 ppmvd or 95% reduction [2]
Fluoride (as HF)	6.74 mg/dscm [2]	No NSPS limit	3.5 ppmvd [2]
Sulfuric Acid Mist (H_2SO_4)	0.072 gr/dscf [3] or 0.2 lb/ton	No NSPS limit	15 ppmvd [3]
Dioxins/Furans [6]	30 ng/dscm [2]	13 ng dscm (total mass) [2]	13 ng/dscm [2]
Ammonia (NH_3) [8]	No Limit	No NSPS limit	50 ppmvd [2] (First year)

[1] Estimated controlled emission concentration for each MWC unit, unless otherwise noted. Averaging periods are 3 hours, unless otherwise noted. If expressed as two alternate limits (with "or"), it is whichever limit is more stringent, unless followed by footnote 7.
[2] Corrected to 7% O_2.
[3] Corrected to 12% CO_2.
[4] For purposes of analysis, PM_{10} is assumed equivalent to PM.
[5] Emissions Guidelines limit for large MWC units.
[6] Total tetra- through octa-PCDD and PCDF.
[7] That which is less stringent.
[8] Ammonia is a possible reagent (urea is another possible reagent) in the selective non-catalytic reduction system. Limit is for unreacted ammonia "slip".

3.4.4 Design Data for Control Equipment

The APC equipment currently installed at the Facility is discussed in **Section 3.4.2**. With the expansion, similar equipment will be installed to handle emissions from the fourth unit. Final design data for the new equipment is not currently available.

3.4.5 Design Approach

The philosophy for designing the APC equipment for the Hillsborough County Solid Waste-to- Energy Facility expansion involves four major components:

1. A Spray Dry Adsorber (SDA) to remove acid gases.

2. A carbon injection system to remove mercury.

3. A fabric filter baghouse to remove particulate matter.

4. An aqueous ammonia injection system enhanced by flue gas recirculation to remove NOx gases.

The SDA will employ a rotary atomizer to spray lime slurry into the flue gas stream. The lime slurry will mix with the flue gas in the SDA vessel to remove acid gases.

A carbon injection system will be installed for mercury removal. The dry, activated carbon will be injected into the flue gas stream as it leaves the combustion unit. The carbon particles will attach to the mercury molecules and then be removed from the flue gas downstream in the fabric filter baghouse.

A fabric filter baghouse utilizing an air to cloth ratio of 3:1 at MCR flow will be provided to remove particulate from the combustion process, calcium compounds resulting from acid gas removal in the SDA, and carbon particles with adsorbed mercury molecules from the carbon injection system.

3.5 Plant Water Use

During normal operation of the resource recovery facility, all plant process water will be drawn from the co-located Falkenburg Advanced Wastewater Treatment Plant (WWTP) and all wastewater discharge would go directly to the WWTP. Potable water will be used in small quantities in the personnel areas of the plant, washrooms, etc. No plant water will be drawn from or discharged directly to any surface or groundwater body. Currently the Facility potable water usage is approximately 55,300 gallons per day calculated based on the values reported in the Facility monthly status reports starting from year 2004. After the Facility expansion, the potable water usage within the Facility will be approximately 83,000 gallons per day, an increase of about 27,700 gallons per day.

The quantities of water used and wastewater discharged as presented in this section are approximate amounts and subject to change pending the specific features of the selected vendor. The Facility currently uses approximately 0.87 million gallons of reclaimed water per day for process use. Evaporative losses account to about 0.77 million gallons per day (mgd) and another 2,870 gallons per day is lost as cooling tower drift. The combined Process and liquid (sanitary) waste stream from the Facility accounts to approximately 0.202 million gallons per day going directly to the WWTP.

The Facility after expansion is expected to use approximately 1.3 million gallons of reclaimed water per day. Evaporative losses will account for about 1.16 million gallons per day (mgd) and another 4,300 gallons per day will be lost as cooling tower drift. The combined Process and liquid (sanitary) waste stream from the Facility after expansion will be approximately 0.303 million gallons per day going directly to the WWTP. The details of the water use and wastewater discharge from the Facility and after the expansion are provided in **Table 3-2.**

Table 3-2
Water and Wastewater Usage for Current and Future Conditions

Details	Current Water Usage	Expected Water Usage
Water Consumption (mgd)		
Reclaimed Water for Process Use	0.867	1.3
Evaporative Losses	0.773	1.16
Cooling Tower Drift	0.028	0.043
Potable Water Use	0.055	0.083
Wastewater Discharge (mgd)		
Wastewater Discharge –Process and Sanitary to WWTP	0.202	0.303

3.5.1 Heat Dissipation System

3.5.1.1 System Design

Cooling water will be used in a closed loop system which employs water cooled condensers to condense the low pressure steam discharged from the turbine. Cooling water circulates through the condensers absorbing waste heat that is then dissipated from the condenser cooling water by passage through a wet, mechanical draft, cross flow cooling tower. The expansion project will include a third cell added to the cooling tower.

Consumptive water use will be limited to losses from the cooling tower system in the form of evaporation and drift. Any other water discharged from the plant will be discharged by pipeline directly to the co-located Falkenburg Advanced Wastewater Treatment Plant.

The location of the cooling tower system is shown on the Site Development Plan, **Figure 2-5**. The cooling tower and boiler blowdown and the demineralization backflush water flow to the residue quench tank. As part of the expansion project, the demineralizer will be replaced with a reverse osmosis system. During normal operation, water only leaves the ash residue quench tank in such quantities as are removed in the wet ash. Any water discharged from the residue discharger during shutdown or cleanout is piped directly to the co-located WWTP.

The cooling water from the condenser is pumped to the cooling tower system where it is cooled by evaporation. Heat removed from the cooling water is transferred to the atmosphere by evaporation. Loss of water from cooling ponds will not occur because cooling ponds will not he utilized in the system.

No water intake structure, in the conventional sense exists in the Facility, because all water will be taken by pipeline from the WWTP. Similarly, no water is discharged from the Facility, except by pipeline to the onsite WWTP, where it will be treated for reuse. There will be no discharge of wastewater to any surface water body or groundwater.

3.5.1.2 Source of Cooling Water

All cooling tower make-up water will be obtained through a direct pipeline link with the Falkenburg Wastewater Treatment Plant. Cooling water use will be about 1.3 million gallons per day of treated effluent from the WWTP. The reuse water from the WWTP will comply with the water quality standards for water used in spray irrigation of areas accessible to the public.

3.5.1.3 Dilution System

Since all cooling water intake and discharge will be part of a closed loop cooling water circulation system between the Facility and the co-located WWTP, no dilution of the cooling water will occur, other than mixing with incoming WWTP flows. The WWTP will treat all water prior to discharge. No plant outfall will be utilized.

3.5.1.4 Blowdown

Liquid flows from blowdown systems will occur at three locations: 1) blowdown from the boiler steam drums; 2) blowdown from the cooling towers; and 3) blowdown from the boiler feedwater demineralizers (to be replaced by a new reverse osmosis system). All blowdown flows will be collected in the blowdown tank and discharged to the ash residue quencher/discharger to be eventually disposed of with the residue. Since no intake structures are required, no intake structure trash disposal will be required.

3.5.1.5 Injection Wells

No injection wells are included in the overall design of the Facility.

3.5.2 Domestic/Sanitary Wastewater

Sanitary waste flows will be generated within the plant only in the personnel service areas, i.e. washrooms, etc. The plant employs about 42 people in the course of normal operation, with fluctuating staff increases from time to time as contractors and other "specialty" staff are retained for work in the plant on a "task specific" basis. The expansion is expected to employ 8 additional people. Visitors are expected at the plant, but an accurate estimate of the number of persons has not been made at this time.

The liquid (sanitary) waste stream produced by personnel within the Facility will be insignificant by the fact that it is piped directly to the co-located Falkenburg Wastewater Treatment Plant which is treating a much greater sanitary flow (approximately 9.0 million gallons per day). The facility plan will provide for adequate treatment of the sanitary flow from the Facility.

3.5.3 Potable Water Systems

The existing potable water service to the site is a twelve (12) inch City of Tampa water main that runs along Falkenburg Road. The existing twelve (12) inch main provides water at a static pressure of 40-45 psi. According to the County Department of Water and Wastewater Utilities, this water main has sufficient capacity to supply the potable water needs of the Facility after the expansion project is completed, which is estimated to be about 83,000 gallons per day.

3.5.4 Process Water Systems

The process water requirements for the expanded plant will be 1.3 million gallons per day of effluent from the co-located wastewater treatment plant. **Table 3-3** shows the projected quality of the WWTP effluent. The Facility uses the effluent for both cooling tower and boiler water makeup and, once expanded, will discharge about 303,000 gallons per day back to the WWTP.

Table 3-3
Falkenburg Wastewater Treatment Plant Effluent Water Quality

Parameters	Cooling Water Characteristics
Conductivity, MMHO	5,349
pH	6.8
'M'- Alkalinity as $CaCO_3$ mg/L	40
Total Hardness as $CaCO_3$ mg/L	1,274
Calcium Hardness as $CaCO_3$ mg/L	951
Magnesium Hardness as $CaCO_3$ mg/L	323
Iron as Fe mg/L	0.38
Copper as Cu mg/L	0.06
Zinc as Zn mg/L	0.05
Sodium as Na mg/L	727
Potassium as K mg/L	88
Tolyltriazole mg/L	0.3
Co-polymer mg/L	52
Chloride as Cl mg/L	734

Table 3-3 (Continued) Falkenburg Wastewater Treatment Plant Effluent Water Quality	
Parameters	**Cooling Water Characteristics**
Sulfate as SO_4 mg/L	1,966
Nitrate as NO_3 mg/L	22
Ortho-phosphate as PO_4 mg/L	9.8
Silica as SiO_2 mg/L	108

3.6 Chemical and Biocide Waste

Both anti-corrosion and anti-fouling agents are used at the Facility in the boilers and in the cooling tower. Blowdown is treated at the co-located wastewater treatment plant. There are no discharges from chemical processing, water treatment or waste piles that may enter the local environment as a result of plant operation.

3.7 Solid and Hazardous Wastes

3.7.1 Wastes (Including Ash)

The residues of combustion consist of noncombustible by-products, bottom ash, fly ash and siftings. The residue removal system is designed to remove these materials from the combustion system for disposal. The bottom ash and siftings from the combustible units are water quenched and then dewatered. Redundant capacity for the main residue conveyors is provided. As part of the expansion, the General Kinematics main conveyor and Grizzly Scalper will be replaced with a new Slipstick type conveyor or equivalent. Either a new finger screen or grizzly scalper will be added to remove oversized pieces (+10 inches) from the ash residue stream. The ash management plan is contained in **Appendix 11-3**.

The residue removal system consists of a completely enclosed truck loading area with two (2) loading bays. The system incorporates a bifurcated chute to serve the two loading bays. Residue is hauled from the Facility by truck to the Southeast County Landfill. The residue delivered to and disposed of at the designated landfill will meet all local, state and federal regulations which govern such disposal. The residue contains no more than 4% combustible material by dry weight content and no more than 0.75% putrescible material by dry weight content. Along with the expansion of combustion capacity, the residue storage building will be expanded to provide sufficient storage space for ash residue and ferrous material. **Section 3.1.4** provides additional details about the storage building expansion.

Under normal facility operating conditions, no other solid wastes are produced at the Facility except for minute amounts of waste, primarily office trash. Since the plant is a facility for the processing of solid waste, the Facility disposes of its own office trash.

3.7.2 Hazardous Wastes

No hazardous waste is generated on-site, nor is any accepted for processing with the municipal solid waste, therefore, there are no hazardous wastes requiring disposal. The identification of any apparently hazardous materials by the crane operators and scale house personnel is addressed in **Section 5.4.2.**

3.8 On-Site Drainage System

The site grading plan is shown in **Appendix 5-1.** The primary tool for management of on-site drainage is a set of four retention/detention basins and two discharge points. The drainage areas and retention basins sizes are shown in **Table 3-4.** The entire site is divided into 3 drainage areas: West, North 1, and North 2 that correspond to the site discharge to the receiving water. Runoff from West drainage area drains to retention basins A and B, runoff from North 1 drainage area drains to retention basin C, and runoff from North 2 drainage area drains to retention basin D. The overflow from the retention basins discharges to the receiving waters located next to the facility boundary.

Table 3-4

Drainage Areas and Retention Basin Sizes

Sub-Basin	Sub-Basin Drainage Area (acres)	Retention Basin Area (acre)	Average Depth of Basin (feet)	Existing Storage Volume of Basin (acre-ft)	Required Storage Volume of Basin (acre-ft)
West	21.5	3.46	2.0	6.92	5.40
North 1	7.8	1.46	2.5	3.66	2.19
North 2	8.8	1.55	1.5	2.32	1.95

The post-development conditions include turbine building expansion, cooling tower expansion, ash handling enclosure expansion, APC enclosure, refuse building expansion and construction of a new transformer yard, new boiler #4, new lime and silo building, new settling basin, new truck unloading area and some minor site modifications. All the construction activities such as the additions or expansions will be in the West drainage area only. There will be no construction in North 1 and North 2 drainage areas.

On-site transport of stormwater to the discharge points is accomplished with stabilized grassed drainage swales. The site discharges to receiving waters through:

- A drainage ditch running east-west about 250 feet north of the boundary of the site; and
- A channel flowing in a northwesterly direction from an area about 250 feet west of the boundary of the site.

The capacity of both receiving channels is estimated to be more than adequate to handle the planned peak discharge rates of 25 cfs and 35 cfs, respectively. The northern drainage ditch is a fairly large channel, estimated during site inspection to be about ten feet deep and six to seven feet wide. A flow of 25 cfs is well within the range that can be accommodated in the ditch.

The channel running along the western boundary of the site is shallower and wider than the northern ditch. Site inspection revealed that portions of the western channel were obstructed by heavy vegetation which may limit channel capacity. Channel capacity was estimated at 65 cfs based on the combined capacity of twin 30-inch diameter culverts located just to the north of the Seaboard System Railroad. Eventually the ditch and the channel intersect and flow southwestward toward the Tampa Bypass Canal. The canal functions to provide flood control.

In general, water quality in both streams is degraded as compared to water quality in the Tampa Bypass Canal. Levels of nitrogen compounds are higher in the streams than in the canal, with the exception of nitrate-nitrogen. High turbidity and suspended solids levels were seen in the ditch bordering the northern boundary of the site.

Groundwater in the vicinity of the site is used for potable water supply. The majority of the wells draw from the Floridian aquifer and a much smaller percentage utilizes the surficial aquifer. The Brandon well field removes the greatest amount of groundwater for potable supply. Water retained in the basins either percolates to the underlying groundwater's or evaporates. In most areas, the surficial aquifer is underlain by clay that acts as a confining unit separating the surficial aquifer from the Floridian aquifer.

The designs for the stormwater retention/detention basins are based upon and satisfy the criteria and rules developed by Hillsborough County, SWFWMD, and the Florida Department of Environmental Regulation. The requirements of these criteria are that: (1) the post-development peak flow rate from the project site in a 25-year storm of critical duration must not exceed the pre-development peak flow rate in a 10-year storm of critical duration; (2) the post-development runoff volume discharged during a 25-year 24-hour rainfall will not be increased beyond the pre-developed volume naturally running off during that same rainfall; and the Facility must retain and discharge by percolation through soil, evaporation, or evapotranspiration a volume equivalent to the first one-half inch of runoff, so that the capacity to store an additional one-half inch is again provided within 72 hours following a storm event.

3.8.1 Pre-Development Site Conditions

To determine the peak flows for the pre-development site conditions, the site was divided into three areas: West, North-1, and North-2 that correspond with the site discharge points of the post-development drainage areas. The acreages of the pre-development drainage areas are shown in **Table 3-5**.

Table 3-5
Pre-Development Drainage Areas

Pre-Development Drainage Area	Acreage
West	21.5
North-1	7.8
North-2	8.8

Several alternate flow paths to the discharge point of each drainage area were outlined and a time of concentration analysis performed for each path. The time of concentration for each path was computed based on the Federal Aviation Authority Formula (FAA) developed by Army Corp of Engineers which is widely used for the urbanized areas. The results of that analysis are shown in **Table 3-6**.

Representative time of concentration values for North 1, North 2, and West drainage areas are 10 minutes, 60 minutes, and 45 minutes, respectively. The pre-developed site conditions of the site were shown in **Appendix 5-1.**

Using the Rational Method, a peak discharge rate was calculated for each drainage area during both a 25-year and 10-year storm of critical duration. A composite runoff coefficient was computed for each drainage area utilizing the percentages of impervious and pervious acreage in each area.

For the pre-developed condition, a runoff coefficient equal to 0.30 describes a pasture area and a runoff coefficient equal to 0.95 describes an impervious area is considered. Because this value is only applicable to storms with return periods of five to ten years, the indicated runoff coefficient was increased by 1.2 times for the 25-year storm under the assumption that nearly all of the rainfall in excess of that expected from the 10-year recurrence interval would become runoff. This multiplication factor is obtained from "Design and Construction of Sanitary and Storm Sewers, ASCE Manual of Practice No.37, 1970. Revised by D.Earl Jones Jr ".

Rainfall Intensity- Duration –Frequency Curves and Rainfall Intensity (inches/hour) for Zone 6 (West Central Florida) were obtained from Volume 2A of PROCEDURES Florida Department of Transportation Drainage Manual. Based on the time of concentration (in

minutes) obtained for each drainage area, the rainfall intensity (in inches per hour) is extrapolated from the graph and the peak discharge flow rate is calculated as shown in **Table 3-7**. Details of the calculations for the pre-development conditions are contained in **Appendix 5-1.**

Table 3-7 summarizes the results of the pre-development peak discharge analysis. In order to meet the criterion regarding peak discharge from the project site following development, flow going to the northern drainage ditch must be limited to 25 cfs and flow to the western channel must be held at 35 cfs.

Table 3-6
Time of Concentration for Pre-Development Site Conditions

Path	Slope, %	Length, Feet	Runoff Coefficient	Time of Concentration, Mini[1]
West Drainage Area				
1A	3.9	570	0.30	22
2A	0.7	30	0.95	1
2B	1.4	81	0.95	1
2C	0.5	70	0.95	3
2D	3.1	50	0.30	2
2E		60		3
2F		290		17
				25
3A	9.0	210	0.30	10
3B	0.7	420	0.30	33
				43
North 1 Drainage Area				
4A	16.5	10	0.3	0.4
4B		32		0.7
4C		45.5		0.8
4D		170		7.0
				9.3
North 2 Drainage Area				
5A	8.5	200	0.30	10
6A	0.3	680	0.30	57
7A	0.6	495	0.85	11

(1) Time of concentration was computed based on Federal Aviation Authority formula (FAA) developed by Army Corps of Engineers.

Table 3-7
Pre-Development Peak Discharge

Drainage Area	Acreage	Time of Concentration, min	Rainfall Intensity, inches/hr	Runoff Coefficient[1]	Peak Discharge, cfs
25-Year Storm					
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 Storm					
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

(1) Composite runoff value was computed for each drainage area utilizing the percentages of pervious and impervious acreage in each area. For 25-year storm interval, the indicated coefficients are multiplied by 1.2, respectively, and the product cannot exceed 1.0. This multiplication factor is obtained from the "Design and Construction of Sanitary and Storm Sewers, ASCE Manual of Practice No.37, 1970. Revised by D. Earl Jones Jr ".

Soil Conservation Service (SCS) curve number procedure was utilized to obtain the total runoff volume discharged from the pre-developed site during a 25-year 24-hour storm. For each land areas to be evaluated SCS curve number procedure requires the following data

- Drainage area (acres)
- Time of concentration (minutes)
- Percent impervious and pervious
- Percentage of impervious that is directly drained
- Initial abstraction for pervious area (inches)
- Curve number for pervious area

The total runoff from each drainage area was computed from the following inputs as shown in **Table 3-8**. The total runoff from West, North 1, and North 2 drainage areas was 6.98 inches, 7.11 inches, and 7.49 inches, respectively for the pre-development conditions.

Table 3-8
Runoff for Pre-Development Site Conditions

Parameter	West	North 1	North 2
Time of Concentration, minutes	45	10	60
Percent Impervious	41	47	64
Percent Pervious	59	53	36
Initial abstraction for Pervious area, inches	0.29	0.26	0.18
Curve Number, CN[1]	87	88	92
Maximum storage of water, S'	1.45	1.30	0.92
Rainfall Volume for 24 hr 25 year rainfall, inches[2]	8.5	8.5	8.5
Total Volume of runoff, inches	**6.98**	**7.11**	**7.49**

(1) A composite curve number was computed utilizing the percentages of pervious (grass cover) and impervious area.

(2) Rainfall volume was obtained from Southwest Florida Water Management District (SWFWMD) 24 hour 25 year return period rainfall map for the given area.

3.8.2 Post-development Site Conditions

To determine the peak flows for the post-development site conditions, the site was again divided into three areas: West, North 1 and North 2 that correspond with the discharge points of the post-development drainage areas. **Table 3-9** shows the post-development drainage area at the facility site.

Table 3-9 Post-Development Drainage Areas	
Post-Development Drainage Area	**Acreage**
West	21.5
North-1	7.8
North-2	8.8

The post-development conditions include turbine building expansion, cooling tower expansion, ash handling enclosure expansion, refuse building expansion and construction of a new transformer yard, new boiler, new lime and silo building, new settling basin, new truck unloading area and some minor site modifications. All the construction activities such as the additions or expansions will be in the West drainage area only. There will be no construction in North 1 and North 2 drainage areas. The post-developed site conditions of the site were shown on **Figure 3-3.** The time of concentration for each drainage area was computed by using Federal Aviation Authority Formula (FAA) developed by Army Corps of Engineers. The results of the analysis showed that there will be no change in the time of concentration due to the addition of nearly 2% of impervious surfaces in West drainage area. Representative time of concentration values for North 1, North 2, and West drainage areas are 10 minutes, 60 minutes, and 45 minutes, respectively.

Using the Rational Method a peak discharge rate was calculated for each drainage area during both a 25-year and a 10-year storm of critical duration. A composite runoff coefficient was computed for each drainage area utilizing the percentages of impervious and pervious acreage in each area. The addition of 2% of impervious surface in the West drainage area was also considered in the computation. For the post-developed condition a runoff coefficient equal to 0.30 describes a pasture area and a runoff coefficient equal to 0.95 describes an impervious area is considered. This value was increased by 1.2 times for the 25-year storm. This multiplication factor is obtained from the "Design and Construction of Sanitary and Storm Sewers, ASCE Manual of Practice No.37, 1970. Revised by D. Earl Jones Jr ". Details of the calculations done for the post-development conditions are contained in **Appendix 5-1.**

Table 3-10 summarizes the results of the post-development peak discharge analysis. Rainfall intensity values were obtained from the PROCEDURES Florida Department of Transportation Drainage Manual.

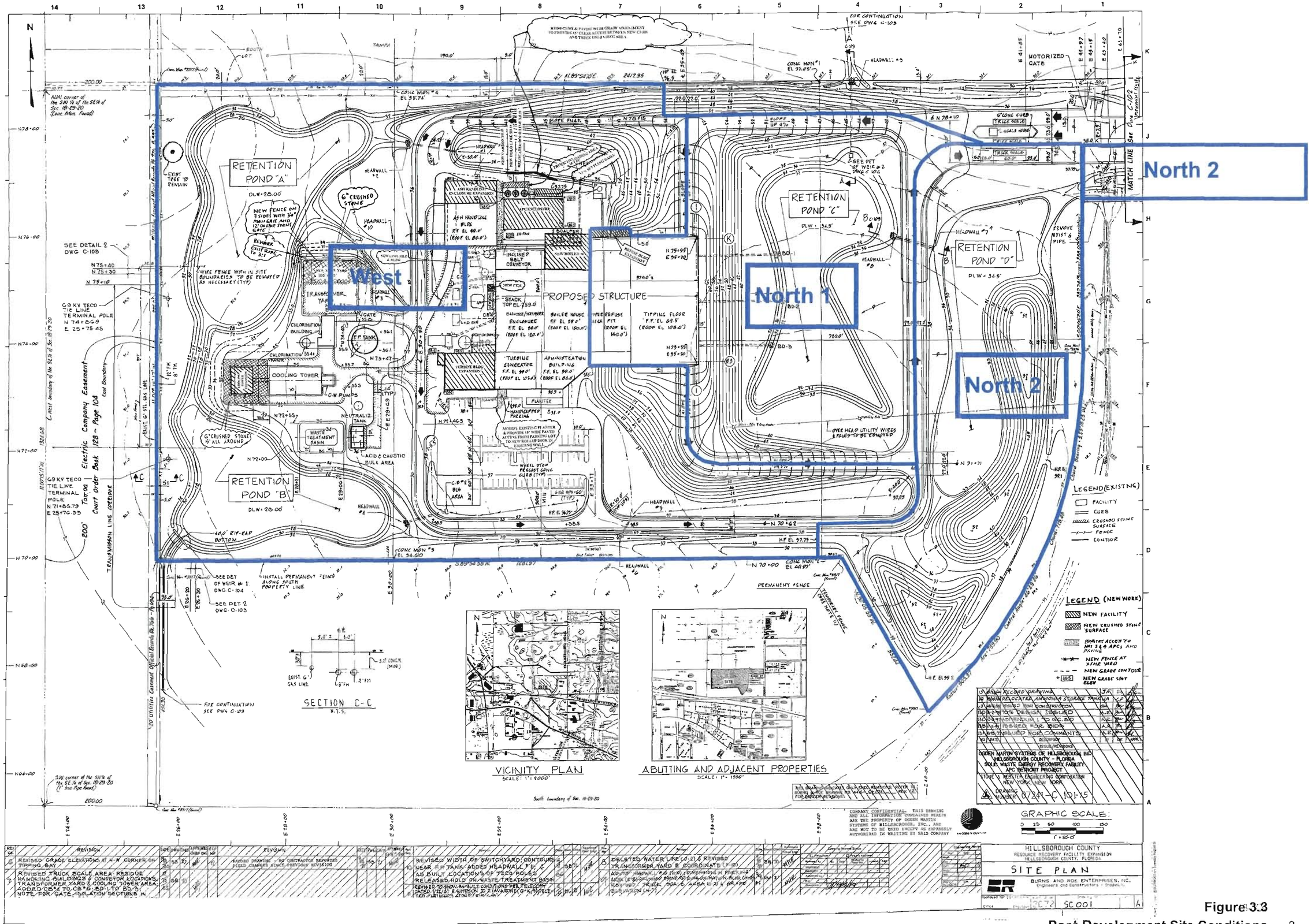


Figure 3.3

Post Development Site Conditions

Table 3-10

Post-Development Peak Discharge

Drainage Area	Acreage	Time of Concentration, min	Rainfall Intensity, inches/hr	Runoff Coefficient[1]	Peak Discharge, cfs
25-Year Storm					
West	21.5	45	4.2	0.70	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 Storm					
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

(1) Composite runoff value was computed for each drainage area utilizing the percentages of pervious and impervious acreage in each area for the post-development conditions. For 25-year storm interval, the indicated coefficients are multiplied by 1.2, respectively, and the product cannot exceed 1.0. This multiplication factor is obtained from the "Design and Construction of Sanitary and Storm Sewers, ASCE Manual of Practice No.37, 1970. Revised by D. Earl Jones Jr ".

Soil Conservation Service (SCS) curve number procedure was utilized to obtain the total runoff volume discharged from the post-developed site during a 25-year 24-hour storm. Runoff from the each of the drainage area was computed as shown in **Table 3-11.**

The total volume of runoff from the site from West, North 1, and North 2 drainage areas was 7.02 inches, 7.11 inches, and 7.49 inches, respectively for the post-development conditions. This is an increase of less than five percent over the volume naturally running off the predeveloped site in the West drainage area and is considered to be an acceptable increase relative to the second design criterion.

Table 3-11 Runoff for Post-Development Site Conditions			
Parameter	**West**	**North 1**	**North 2**
Time of Concentration, minutes	45	10	60
Percent Impervious	43	47	64
Percent Pervious	57	53	36
Initial abstraction for Pervious area, inches	0.28	0.26	0.18
Curve Number, CN[1]	88	89	92
Maximum storage of water, S'	1.41	1.29	0.92
Rainfall Volume for 24 hr 25 year rainfall, inches[2]	8.5	8.5	8.5
Total Volume of runoff, inches	**7.02**	**7.11**	**7.49**

(1) A composite curve number was computed utilizing the percentages of pervious (grass cover) and impervious area.

(2) Rainfall volume was obtained from Southwest Florida Water Management District (SWFWMD) 24 hour 25 year return period rainfall map for the given area.

3.8.3 Basin Design

The basin design described below was a check on the ability to store the additional runoff from the basin's drainage area in the existing retention basins after the post-development conditions. The existing retention basins A and B, C, and D have a storage volume of 6.92 acre-ft, 3.66 acre-ft, and 2.32 acre-ft, respectively.

The initial step in the basin design process was an allocation of limiting discharge rates to the individual basins located within each drainage area so that the total discharge from a drainage area was within the limits set earlier of 25 cfs to the northern ditch and 35 cfs to the western channel. The allocation was based on the percentage of the acreage in a drainage area that drained to a given basin. **Table 3-12** shows the limiting discharge values for each drainage area.

Table 3-12

Limiting Discharge Values for Each Drainage Area

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

Utilizing these limiting discharge values and the peak discharge values calculated for the post-developed site during a 25-year storm of critical duration, the USDA Soil Conservation Service (now called the Natural Resources Conservation Service) "Urban Hydrology for Small Watershed – Technical Release No. 55" was employed to determine the storage volume required for attenuation to peak discharge. The storage volume required for retention of the first one-half inch of runoff from the area draining to each basin was calculated. The total storage required is then calculated as storage for peak attenuation plus storage for retention.

Table 3-13 summarizes storage required for peak attenuation, storage required for retention and the total storage. The storage volume of the existing retention basins was computed based on the depth and the surface area of each retention basin. Details of the storage volume calculations for the each drainage area are contained in **Appendix 5-1.**

Table 3-13

Basin Storage Volume Requirements

Basin	Storage Required for Peak Attenuation, cu.ft	Storage Required for Retention, cu.ft	Total Storage Required, cu.ft	Total Storage Required, acre-ft	Total Storage Provided, acre-ft
West	196,220	39,023	235,243	5.40	6.92
North 1	81,259	14,157	95,416	2.19	3.66
North 2	69,059	15,899	84,958	1.95	2.32

It was noted that the storage volume provided at the site is greater than required to retain the first half inch of runoff and attenuate the peak discharge **(See Table 3-13)**. The calculations also prove that the existing retention basins are of sufficient storage volume capable of holding the additional runoff after the post development conditions.

3.9 Materials Handling

No heavy equipment such as large cranes, plant components such as boilers, or other voluminous materials such as limestone for an FGD system are transported to the site, unloaded, stored, or moved around the site during normal operation or maintenance of the facility. All equipment is housed inside a building, and all maintenance is performed within the building. The room where the steam turbine generator is housed has an overhead crane for maintenance of the turbine generator. The solid waste and residue is hauled in trucks. **Section 5.9** and **Appendix 11-2** describe and analyze the impact of the truck traffic.

Section 4
Effects of Site Preparation and Plant and Associated Facilities Construction

This overview of anticipated construction activities associated with the expansion of the Facility is provided as a preface to the discussion of the effects of site preparation and construction. The duration of field construction for the expansion of the Facility will be approximately 21 months. The entire design, construction, and start-up period will extend for approximately 28 months from notice to proceed to full plant operation. The principal construction phases will include limited site preparation (site clearing and preparation,) expansion of the Facility (building and process equipment erection, electrical and mechanical systems installation, instrumentation), and finalization (painting, landscaping, and clean-up). Completion of final construction activities may extend into the start-up period.

4.1 Land Impact

4.1.1 General Construction Impacts

Impact on Solid Waste Generation and Disposal

During construction associated with the expansion of the Facility, a variety of spent materials and solid waste will be generated, including vegetative matter, wood, paper products, concrete, scrap metal and lumber, and miscellaneous oils and fluids required for equipment operation. These will be disposed and/or recycled periodically using a licensed hauler to transport the materials to properly permitted disposal/recycling facilities.

Minimal site clearing activities are anticipated because the expansion is occurring within the existing Facility footprint. However, any non-marketable wood debris generated by the removal of landscape plants will go to an FDEP approved site for processing or disposal or burned on-site.

It is anticipated that small quantities of used oil and spent solvents may be generated on-site during equipment maintenance and various construction activities. Used oil will be generated at a rate of about one drum (55-gallon barrel) every two to three months. Typically, fewer spent solvents would be generated than used oil, except during certain phases of equipment installation. Drums of used soils and spent solvents will be stored on pallets within a protected area.

The drums will be properly labeled and covered with a weatherproof canvas or plastic drop cloth. Neither used oil nor spent solvents will be stored on-site for more than 90 days. Transport and disposal will be handled by properly licensed contractors.

It is estimated that approximately 60 tons of solid waste will be generated during construction associated with the Facility's expansion. Whenever practical, recyclable materials will be recovered from this waste stream.

Staging, Material, Lay down, and Workforce Parking Areas

The staging, materials lay down, storage, and workforce parking areas will be assigned to locations where construction activities are minimal. Staging will be assigned to an area adjacent to the main Facility, which will keep staged work as close to the actual construction area as possible. General workforce parking and a construction office will be located near the material laydown area. These areas will be prepared to minimize dust and potential run-off (e.g., silt screens, hay bales, gravel or mulch parking, etc.). Stormwater run-off will be directed to existing stormwater system. An erosion control plan will be required during construction.

Land Disturbance

Minimal disturbance to existing terrain is anticipated because the Facility expansion is occurring within the existing footprint of the site and adjacent to existing structures.

4.1.2 Roads

The project site is accessed from Falkenburg Road. Other than the main Facility access road, there are no other paved roads on-site and none will be built for this project.

4.1.3 Flood Zones

The Facility site is not located within the 100-year flood plain designated on the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps. Consequently, this section does not apply to this project.

4.1.4 Topography and Soils

The existing site topography will be minimally altered by the proposed Facility expansion. As construction progresses, a portion of the site area will be covered with impervious surfaces such as foundations and buildings. The estimated amount of additional impervious surface area is 0.32 acres.

The creation of new impervious surfaces will not change the site drainage features and percolation rates therefore no new storm water management facilities are needed for the expansion project.

The following measures will be suggested to the contractor to control soil erosion and air pollutants during construction:

- On-site traffic will be limited to the main access road and/or feeder roads as much as possible;
- Designated lay-down area and construction worker parking areas.

The existing site buffer zone will be maintained along the site border to minimize visual impacts during construction.

4.2 Impact on Surface Water Bodies and Uses

4.2.1 Impact Assessment

No impact to surface water bodies and uses is anticipated due to Facility expansion construction activities. There are no proposed intake or discharge structures for cooling water or other process waters; therefore, an NPDES discharge permit is not required related to the Facility expansion. The proposed expansion will create additional impervious surface area of 0.32 acres is found to have no impact on the existing retention/detention basins as discussed in **Section 3.8**.

4.2.2 Measuring and Monitoring Programs

Stormwater runoff from the construction areas will be directly discharged to onsite stormwater system. Furthermore, since the Facility is fully enclosed and roofed, storm water will not come into contact with solid waste and no significant impacts to the quality of surface waters in the vicinity are expected (e.g., no turbidity impact).

Stormwater runoff from the developed site will be directed to one of several on site retention basins. In accordance with SFWMD requirements, dry pretreatment will also be provided. This allows for siltation and filtration of storm water before it reaches the retention and/or detention basin(s). Since the majority of storm events in the Hillsborough County area are less than one inch in total rainfall, appreciable discharge from the site will occur infrequently.

4.3 Groundwater Impacts

4.3.1 Impact Assessment

The saturated thickness of the surficial aquifer below the site varies depending upon seasonal precipitation patterns and varying depths to the confining layer. During the wet season, the water table of the surficial aquifer is within one to five feet below ground surface. In the dry season, the water table of the surficial aquifer declines to depths of about three to seven feet below ground surface.

Minimal groundwater impacts are anticipated as a result of the Facility expansion. The Facility was originally designed on a large enough footprint to accommodate another unit without extending the existing foundation. Therefore, no dewatering activities will be required.

4.4 Ecological Impacts

4.4.1 Impact Assessment

Impacts to fish and wildlife populations caused by construction of the proposed expansion of the Facility are expected to be minimal. The Facility fenced area occupies approximately 17.3 acres of the 50.4-acre parcel. The Facility expansion will

be located within the main building itself, which was previously developed during the original Facility's construction. The open areas within the fenced area are composed of Bahia grass, gravel and paved lots, and stormwater retention and detention ponds. The existing habitats on-site are not unique or sensitive. The expansion will not impact any sensitive habitats outside the fenced area. In addition, with the possible exception of the American alligator, listed species do not currently inhabit the area within the fenced area of the site.

The Facility expansion and continued operation will result in the majority of the site remaining in its existing state. Only 0.32 acres of the site will be transformed from open area to a building or for other activities. Because of this fact, there are a limited number of factors to consider when assessing the significance of potential effect. One factor is that the site was originally disturbed for agricultural purposes and has been vegetationally and hydrologically altered by logging, drainage, and construction activities over the course of 20 years. Another factor is that there is little ecological diversity on the project site. There appears to be no plant species of unique interest on-site. The proposed expansion area is an area within the existing footprint of the Facility with little or no ecological value. The displacement of any fauna by the proposed project would be mitigated for by the availability of similar and adequate habitats adjacent to north of the expansion area where the fauna can migrate and reestablish. This area should provide an equal or greater amount of vegetative diversity and productive habitat than what currently exists in the expansion area.

The overall effect on the local ecosystem (both on and off-site) from construction activities will be minor. The existing habitats on-site will not be altered by Facility expansion. The present diversity of habitats onsite will not be impacted by the Facility expansion. There are no proposed impacts to wetlands.

4.5 Impact on Human Populations

The expansion of the Resource Recovery Facility will create both positive and negative impacts on the local and regional populations. Positive impacts will include the creation of construction jobs, the secondary influx of monies into the local economy from the construction workforce, and revenues from the purchase of construction equipment and supplies for the Facility expansion project. Negative impacts are anticipated to be minimal but could include possible short-term visual and noise impacts and traffic increases due to construction worker arrivals and departures and deliveries of equipment and supplies.

4.5.1 Sensitive Receptors

Sensitive receptors are individuals, institutions, or enterprises that are located in proximity to the project site that are affected by the construction. A summary of the demography and existing land use within a five-mile radius of the project site is presented in **Section 2.2**. Based on the demographic and land use section of this application, the predominant land uses on the Facility site's periphery include a

TECO power transmission line and associated easement, a CSX railroad corridor, and county property which is utilized by functions including an animal shelter, and a county jail.

A fairly comprehensive review of the land use and demographic features of the area surrounding the site is presented in **Section 2.2**. As indicated earlier, major land uses adjacent to the site include farm land and various mixed industrial activities. These land uses are not considered sensitive receptors for the purposes of this analysis.

The closest sensitive receptors to the project site are the light commercial and light industrial sites located on Falkenburg road. These properties and sites have existed on Falkenburg Road in the vicinity of the Resource Recovery Facility for 20 years and are not likely to be impacted by the expansion project.

On Falkenburg Road, other than the county facilities and light industrial sites, there are mixed commercial properties, office parks, and various mixed business sites. Fire stations are located both to the north and to the south of the Facility. Hillsborough Community College (HCC) has a Brandon campus located approximately a mile north off of Falkenburg. None of these properties should be adversely impacted by the expansion of this Facility.

Other sensitive receptors include commercial developments on roadways in the area including Broadway Ave and Woodberry Ave. These areas also include mostly commercial and industrial sites that are unlikely to be impacted.

The nearest established neighborhood, Woodberry Estates, is located off of Woodberry Road, east of Interstate 75, about 2,600 feet east of the site boundary. This neighborhood is located approximately 4,200 feet from the proposed facility and about 4,650 feet from the proposed stack location. There are no other schools, hospitals, churches or other potentially sensitive activities in the vicinity of the site. Interstate 75 is a significant buffer between the site and this neighborhood.

No effects on sensitive receptors are anticipated due to the Facility expansion. The distance from the Facility site to the nearest residential neighborhoods, and the presence of the existing industrial and commercial properties with no obvious effects from the current Facility, support this determination.

4.5.2 *Workforce*

During construction associated with the expansion of the Facility, the daily workforce is expected to average between 25 to 75 people. The initial phase of construction will require a workforce of approximately 50 people, while peak phases will require approximately 125 persons. The workforce from the eight to the eighteenth month of the construction schedule should average from 75 to 125 people. Throughout the course of the project construction, a total of approximately 750 people of various

construction trades may be employed. **Figure 4-1** illustrates the estimated workforce requirements during Facility construction.

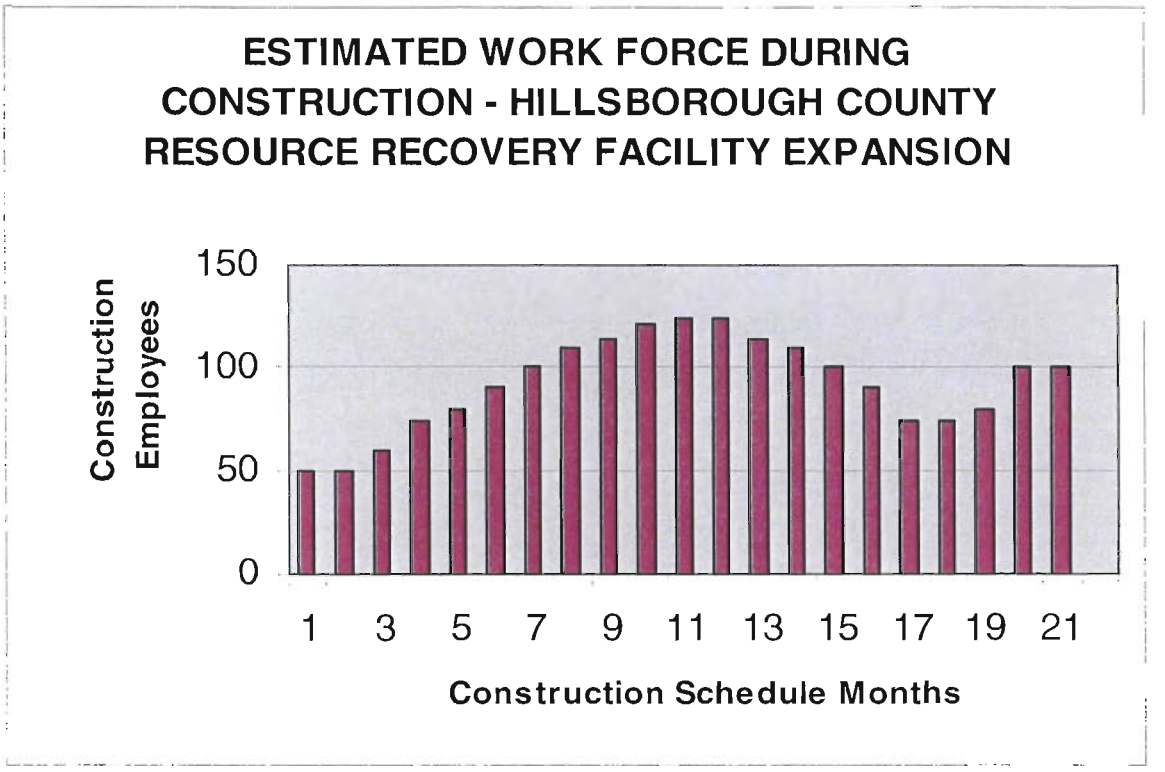


Figure 4.1
Estimated Workforce Requirements

Work Shift

The majority of activities required for the expansion of the Facility will take place on an eight hour per day shift, five days a week. Depending on construction progress and deadline constraints, alternative schedules, such as shifts of ten hours per day, four, five or six days per week and overtime, may be implemented. However, all remaining construction activities will be conducted on an eight hour per day, five day per week shift basis.

Construction Workforce Revenues

On a short-term basis, the Facility expansion construction will provide the benefits of a $100 million construction project in the area. The construction phase will provide jobs for the construction labor and will create additional revenue for the local economy from the purchase of construction materials and services. Secondary benefits will include the secondary spending into the local Tampa Bay area economy from the construction labor force and related employment increases in these service sector jobs, and increased employment opportunities and sales revenues for businesses providing construction materials to the Facility project site.

Workforce Availability

Most of the workforce for this project will be provided by the available labor pool in the Tampa Bay regional area. No major relocation of construction workers and families is anticipated. Therefore, no impact on available housing, schools or other community support assets is expected.

4.5.3 Traffic Associated with Construction

An updated, complete traffic impact analysis, performed to assess the impacts associated with Facility operation at the existing capacity of 1200 TPD, as well as at the projected Facility capacity of 1800 TPD, showed no significant impacts on the surrounding roadway network. This traffic analysis is provided in Appendix 10.13 of this application.

Construction associated with the expansion of the Hillsborough County Resource Recovery Facility will impact the level of traffic at the site entrance/exit located on Falkenburg Road and to the surrounding roadway network. This traffic impact is associated with the number of vehicles which will enter and exit the Facility site per day over the duration of construction. The four general categories of traffic which will enter and exit the site include vehicles associated with the general workforce, delivery of construction equipment, hauling of demolition material and delivery of heavy materials (concrete and steel), and delivery of major equipment for installation . The traffic anticipated over the duration of construction is indicated in **Figure 4-2.**

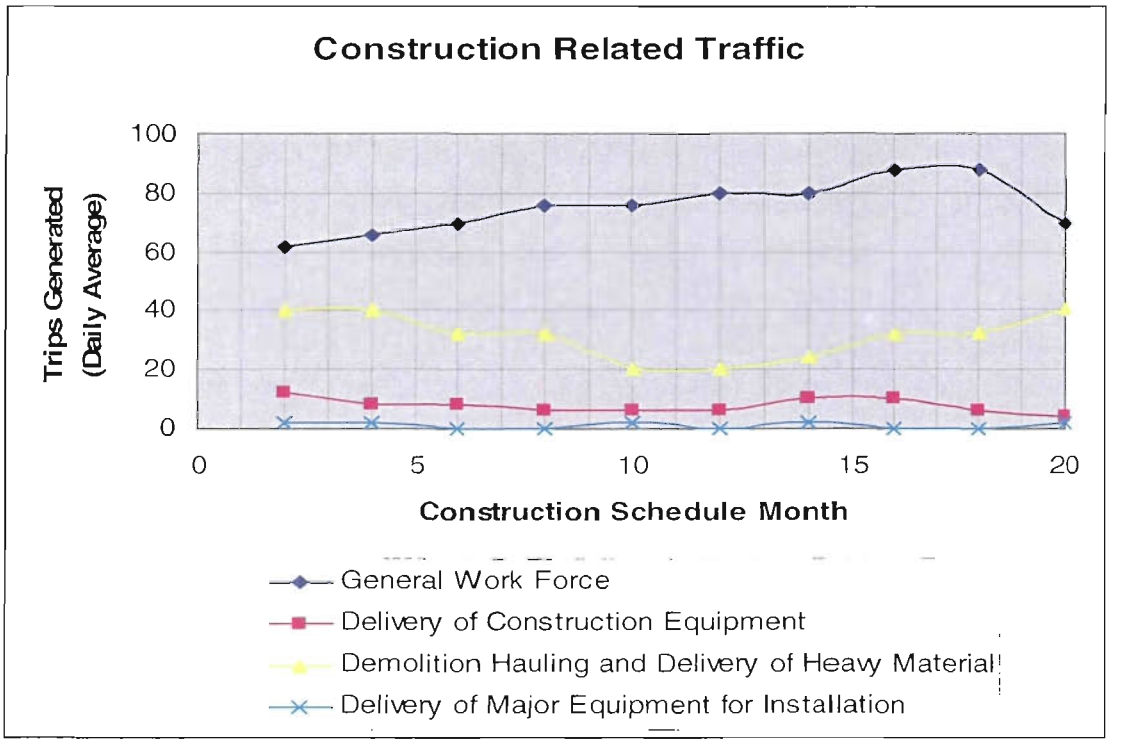


Figure 4-2
Construction Related Traffic

Traffic associated with the general workforce is expected to have the greatest impact on the Falkenburg Road site entrance. This daily traffic volume, consisting mainly of passenger vehicles, will closely follow the workforce requirements for the construction of the plant. The estimated number of vehicles expected to enter and exit the site under this general category was determined by assuming that seventy percent of the workforce will drive to the site and the remaining thirty percent will be passengers. These vehicles will typically enter the site at the start of the work day and exit following completion of the day's construction activity. Minimal construction worker traffic is anticipated during the hours of construction activity. A limited amount of traffic will be generated as a result of the construction activity which is not directly related to commuting workforce. This may include sub-contractor and inspector visits to the project site. This traffic is anticipated to be minimal and is included in this category.

The traffic resulting from the delivery of necessary construction equipment to the site is anticipated to have minimal impact over the duration of construction. The majority of this equipment will be brought to the site during the initial phase of construction. Once this equipment is transported to the site it will remain on-site until construction activities associated with the equipment are completed. The traffic associated with the delivery and removal of construction equipment from the site is indicated as point impacts in **Figure 4-2** due to the short duration of traffic (assuming one day for a piece of equipment to be delivered or removed from site).

Delivery of heavy construction materials including structural steel and concrete products along with the removal of demolition materials from the site will result in the greatest increase in truck traffic during project construction. The major items included under this category are the delivery of concrete, structural steel, pavement and other heavy materials. The traffic impact resulting from the hauling of demolition material and delivery of concrete and structural steel will be concurrent with phases of the construction schedule. These two activities, demolition and heavy material delivery, are expected to result in the highest level of traffic entering and exiting the site, with the exception of workforce traffic.

Truck traffic associated with construction activities will typically occur between the hours of 8 AM and 5 PM. Minor peaks in truck traffic volume from construction activities can be expected to occur for about an hour during mid-morning and for another hour starting shortly after lunch. At other periods during the day, truck traffic should be generated at a fairly uniform rate.

As indicated, truck traffic will reach its peak when demolition hauling and heavy materials delivery activities coincide. When this occurs, the average truck traffic volume should be about three to four truck trips per hour with daily peaks of about five to ten trips per hour. This increase represents only five percent or less of existing hourly traffic volumes on Falkenburg Road.

The level of traffic anticipated as a result of hauling major equipment for installation is not expected to be of great impact. This equipment will be delivered prior to, as well as during, the scheduled time for installation to insure that it is on-site and ready for installation. The estimated level of traffic associated with transporting this equipment to the site over the duration of construction is indicated in **Figure 4-2**.

Of the four general categories of construction traffic, commuting workers have the greatest potential for creating adverse effects. The daily volume from this source is the greatest of all categories considered. Additionally, the schedule of arriving and departing construction workers somewhat coincides with existing peak traffic periods on local roadways.

The maximum number of construction workers expected will be about 125 at any one day. As indicated, with an allowance for car pooling, absenteeism, and other modes of transport is it expected that vehicles of commuting employees will represent a number equal to 70 percent of the workforce. Therefore, it is expected that during maximum construction periods 88 vehicles will be added to local roadways from commuting construction workers in both the morning and afternoon peak traffic periods. This will reduce the available capacity of the roadway but will not result in any unacceptable roadway capacity problems.

4.6 Impact on Landmarks and Sensitive Areas

There are no landmarks or sensitive areas within the site limits or within the immediate vicinity of the site, therefore no impacts on landmarks and sensitive areas are anticipated.

4.7 Impact on Archaeological and Historic Sites

During the original permitting of the Facility, Ray Williams from the University of South Florida conducted an investigation of archeological and historical remains within the 50 acre tract. This archeological and historical survey was conducted for the Department of Solid Waste, Hillsborough County, Florida. A cultural resource assessment was performed, beginning with a literature review, The Florida Master Site File (FMSF) listed no historic or prehistoric sites known to be present within the tract boundaries. There was also a literature review which included examination of historical and archeological literature and historic records.

Field visits and testing culminated in the excavation of 34 sub-surface test pits to determine if any sites of historical or archeological significance 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. Test results found no material of archeological significance. An historic assessment indicated that no significant historic sites have existed on the property. Furthermore, no significant historic events have occurred on the property.

The results of this archeological and historical survey indicated that the project will have no impact on any cultural resources, prehistoric or historic. A current consultation with Staff Archaeologist Lisa N. Lamb of PanAmerican Consulting, Inc. of Tampa, Florida indicated that it is highly unlikely that any evidence has changed within the bounds of the property tract since the original survey was conducted and that no new study or revision was justified.

The archeological and historical survey conducted in 1983 for the original permitting of the Hillsborough County Resource Recovery Facility is located in **Appendix 8.3.**

4.8 Special Features

This section describes and discusses all special features associated with site preparation and plant and associated facilities construction that may have an influence on the environment and ecological systems of the plant site and adjacent areas as a result of the Facility expansion.

During construction associated with the expansion of the Facility, solid and liquid waste may be generated. The waste may consist of discarded packaging material, refuse produced by construction workers, earth spoils, sanitary waste, or used oils and other waste associated with this type of construction activity. Earth spoils will be transferred to a Class III landfill or other suitable area. Sanitary waste and used oils will be handled by the appropriate licensed haulers/disposers. Proper handling and disposal of these wastes onsite is essential to maintaining the aesthetic and ecological integrity of the site and surrounding areas.

4.9 Summary of Impacts and Benefits from Construction

Benefits from construction associated with the expansion of the Facility include:

- The employment of construction laborers throughout the course of construction, during which a total of approximately 750 workers will be employed.
- The sale of goods and services relating to the construction operations this should include increased employment for construction product companies providing goods and services to the construction site.
- Additional income to the area generated by the construction workforce, including retail and service oriented businesses, which will benefit from increased sales to the construction laborers.

Impacts from construction of the expansion Facility include:

- A temporary increase in solid waste generated due to construction activities.
- Localized, short-term air quality impacts from fugitive dust and fuel combustion emissions.

- Short-term visual and noise impacts (e.g., machinery and pile driving) and increased traffic during construction.
- The minimal disturbance of existing land and terrain.
- The minimal alteration of site topography.

4.10 Variances

No variances from standards or guidelines are anticipated.

Section 5
Effects of Plant Operation

This chapter describes (1) the operational interaction of the plant and associated facilities with the environment, and (2) Hillsborough County's plans and programs for monitoring the environmental impacts resulting from plant operation. In the discussion of environmental effects, effects that are considered unavoidable but are temporary or are subject to later amelioration are clearly distinguished from those which are determined to be irreversible or unavoidable. In addition, mitigation efforts are described which serve to reduce or eliminate the associated environmental impacts.

To the extent practicable, the impacts of operation of the Facility are quantified, and the source of each impact is described. In addition, impacts due to failure of control devices are estimated, where appropriate. Finally, this application discusses the relationship between local "short-term" and "long-term" effects.

5.1 Effects of the Operation on the Heat Dissipation System

As described in **Section 3.5.1**, a two-cell cooling tower is presently in operation . An additional cooling tower cell is proposed with this permit application. There will be no thermal discharges and therefore **Section 316** demonstrations are not applicable.

5.1.1 Temperature Effects on Receiving Body of Water

This section is not applicable to the project because the Facility does not discharge to any surface or ground water. Effluent discharged from the resource recovery facility is sent to the co-located Falkenburg Wastewater Treatment Plant which is designed to handle the quantity and quality of facility discharges.

5.1.2 Effects on Aquatic Life

This section is not applicable to the project, because effluent discharged from the Facility is sent to the co-located wastewater treatment plant.

5.1.3 Biological Effects of Modified Circulation

As described in original application, the Facility uses potable water from the existing water supply main in Falkenburg Road and uses effluent from the co-located WWTP for process water. Discharges from the Facility are sent back to the wastewater treatment plant. No water body will be directly affected by the operation of the Facility. Stormwater runoff is discussed in **Section 5.3.4**.

5.1.4 Effects of Offstream Cooling

It is estimated that the cooling tower on the expanded Facility will use 1.3 million gallons per day of treated effluent from the Wastewater Treatment Plant to "make up" for water lost to evaporation, drift, and discharged to the sanitary sewer. The WWTP

will provide secondary treatment of the influent wastewater followed by filtration and high-level disinfection. This level of treatment will continue to ensure the provision of a high quality effluent which is suitable for reuse in the Facility's cooling towers. Chlorination of the effluent stream will be provided in conformance with Chapter 62-610.460 of the Florida Administrative Code.

During the cooling process, approximately 0.015 percent of the make-up water is lost as droplets in the exhaust, called the cooling tower "drift". Therefore, approximately 4,300 gallons per day would be lost as drift. The drift will be of approximately the same quality as the treated wastewater used as make-up water. Once the droplets of water comprising the drift are vented from the tower, they are carried away from the Facility. The distance traveled is dependent on the size of the droplets formed. Aerosol particles or droplets larger than 600 microns in diameter (approximately 70 percent of the drift mass) would be expected to settle within 400 feet of the cooling towers. Smaller particles would be carried further (Furlong, 1974).

The nearest major residential area located is over 4,600 feet away from the Facility cooling towers. Almost all particles or droplets will have settled out, or will have been diluted. Additionly, prevailing winds are from the east, so that the drift will be moved predominantly to the west of the site.

The reuse water used in the cooling towers will comply with the requirements for reuse water used in public access areas. It complies with the FDEP requirements for effluent used in cooling towers with no setbacks or buffer areas.

5.1.5 Measurement Program

The existing reclaimed water supply system from the WWTP includes online water quality monitoring at the compliance monitoring point. The operating protocol ensures high level disinfection as is in compliance with Rule 62-610-463, F.A.C.

5.2 Effects of Chemical and Biocide Discharges

5.2.1 Industrial Wastewater Discharges

There are no offsite industrial discharges to surface waters from the operation of the Facility. Effluent from the Facility goes directly to the co-located Falkenburg Wastewater Treatment Plant. All applicable State and Federal discharge regulations and water quality standards for industrial wastewater including chemical and biocidal wastes, and oil and grease will be achieved. The Falkenburg WWTP will be designed for Class I reliability to safeguard against plant upsets.

5.2.1.1 Impact of Blowdown and Waste Discharges on the WWTP

Effluent discharge from the Facility consists primarily of two streams, sanitary wastes generated by the Facility's employees and blowdown. Blowdown is the wastewater collected from boilers and cooling towers.

The quantity of blowdown discharged from the Facility is minimal since blowdown is reused in the ash dischargers for residue quenching. The quality of cooling tower and boiler blowdown are dependent upon both the influent water quality and the maximum contaminant concentration tolerable in the recirculating loops. In general, the concentration of solids leaving the cooling tower and boiler loops as blowdown water is magnified due to evaporation. Wastewater discharges from the Facility to the WWTP must meet the maximum concentration and other restrictions shown on **Table 5.1**.

Table 5-1
Facility Wastewater Discharge Limits

Material Characteristic	Maximum Allowable Limits	
Arsenic as As	0.25	ppm
Cadmium as Cd	0.09	ppm
Chromium (total)	4.2	ppm
Copper as Cu	1.4	ppm
Lead as Pb	0.18	ppm
Mercury as Hg	0.002	ppm
Nickel as Ni	2.2	ppm
Selenium as Se	0.16	p pm
Silver as Ag	1.5	ppm
Zinc as Zn	3.2	ppm
pH	6.0 – 8.5	su

Because the WWTP is designed to treat wastewater generated by a variety of potential sources including industries, landfill leachate, sewage, and grease wastes, the resource recovery discharges do not adversely impact the operation or effectiveness of the plant. In addition, because the quantity of effluent discharged from the Facility represents a very small portion of the total wastewater flow treated at the WWTP (less than one percent), the concentration of dissolved solids in the effluent are diluted prior to treatment.

5.2.1.2 Impact of WWTP Effluent on Facility and Other Reuse

The concentration of dissolved solids in the WWTP effluent are acceptable for all

types of effluent disposal with the exception of boiler makeup at the resource recovery facility and possibly some industrial reuse applications. In order to prevent scale build-up and metal corrosion, dissolved minerals and suspended material are removed from the boiler make-up water using a treatment process . This treatment will take place at the resource recovery facility.

5.2.2 Cooling Tower Blowdown

The Falkenburg WWTP is currently permitted and operational. The ultimate capacity of the Falkenburg WWTP is 9 million gallons per day (MGD). Disposal of treated wastewater effluent at the resource recovery facility will not be the sole means of effluent disposal. Alternative methods of effluent disposal will include industrial and residential reuse.

5.2.3 Measurement Program

The Facility discharges to the WWTP are monitored for temperature and pH. As noted previously, the maximum concentrations and restrictions for the discharge were shown on **Table 5.1**.

5.3 Impacts on Water Supplies

5.3.1 Surface Water

There are no direct impacts to surface water associated with the operation of the Facility because the Facility does not directly discharge to a surface water body. The Facility obtains its process water from treated wastewater onsite. Cooling tower blowdown and other plant industrial and sanitary wastewater discharges to the existing Falkenburg Wastewater Treatment Plant. Therefore, there are no long-term impacts to surface water associated with the operation of the Facility nor there any impacts anticipated with the expansion of the Facility.

5.3.2 Groundwater

There are no significant impacts to groundwater quality or quantity associated with the normal operation of the existing and proposed facility structures or site operations. For the Facility expansion, there are no anticipated impacts to groundwater quantity or quality associated with the site operations.

The concrete refuse storage pit is sealed to prevent leachate from escaping to the surrounding soil and groundwater, and to prevent groundwater from seeping into the bunker. The refuse storage pit is pitched to allow collection and removal of any liquids which may accumulate on the bottom. The refuse pit is constructed so that the pit is surrounded/immersed in groundwater. Leakage of groundwater into the pit would occur only in the unlikely event of a crack or failure in the pit's concrete floor, through the water-tight, impermeable seal. For these reasons, the potential for impacts on ground and surface water quality, and on terrestrial and aquatic environments is insignificant.

As discussed in the original application, any release of chemical contaminants from the Facility to the groundwater at the site is not expected to result in any significant impact to groundwater quality of the more sensitive groundwater resources of the Floridan aquifer. To date, there have been no groundwater discharges at the Facility.

The direction of regional groundwater flow in the Floridan aquifer is generally toward the southwest. However, the direction of flow within the surficial aquifer is more variable and dependent upon topography, drainage, elevation of the water table, and the influence of groundwater pumping within the vicinity. Accordingly, the direction of surficial groundwater flow is expected to be generally toward the southwest corner of the site.

1. The bottom of the refuse pit will lie within the surficial materials (sand, clayey sand), and any release of chemical contamination would be confined to these surficial materials and would not affect the Floridan aquifer.

2. The Floridan aquifer and the surficial aquifer are separated by a clay confining unit of relatively low permeability which generally has a thickness of about 10 feet across the site. All indications are that this unit is continuous and possibly thicker in the vicinity of the site (see **Section 2.3.1.2** for discussion and mapping). This would provide an effective barrier between the surficial material and the Floridan aquifer.

3. The potentiometric surface of the Floridan aquifer lies generally within this confining unit, which means that a contaminated plume would be prevented from downward vertical migration into the Floridan aquifer by the upward vertical component of hydrostatic head exerted by the confined Floridan aquifer. Once a contaminant plume has descended to an equilibrium level above or within the confining unit, further plume movement would generally be restricted to lateral migration with little or no vertical mixing within the lithologic matrix.

5.3.3 Drinking Water

The closest private wells in the vicinity of the site have been located and are not expected to be affected in terms of quality or flow, either during construction or during the operational life of the proposed expansion. An existing water main in Falkenburg Road will supply potable water to the site. Complete well inventories for the surrounding areas have been provided by SWFWMD and are contained in **Appendix 9.3**.

5.3.4 Leachate and Runoff

Stormwater runoff from vegetated areas, paved surfaces, and rooftops is collected in the stormwater retention/detention basins. These areas are delineated on **Figure 3.3**. All refuse or residue storage areas will be enclosed so that no runoff will occur from these surfaces. Ground and surface water quality is thereby protected from materials that would have been carried away by runoff from storage areas.

5.3.5 Measurement Program

The retention pond in the southwest corner of the site is periodically checked by the County for turbidity, conductivity and oil and grease.

5.4 Solid/ Hazardous Waste Disposal Impacts

5.4.1 Solid Waste

This section discusses impacts created by the disposal of solid wastes on the site not already covered in **Section 5.2** or 5.3. This section also discusses the potential benefits to be gained from the resuse of solid wastes for power generation. The section concludes with a description of the impacts on directly affected offsite landfill operations.

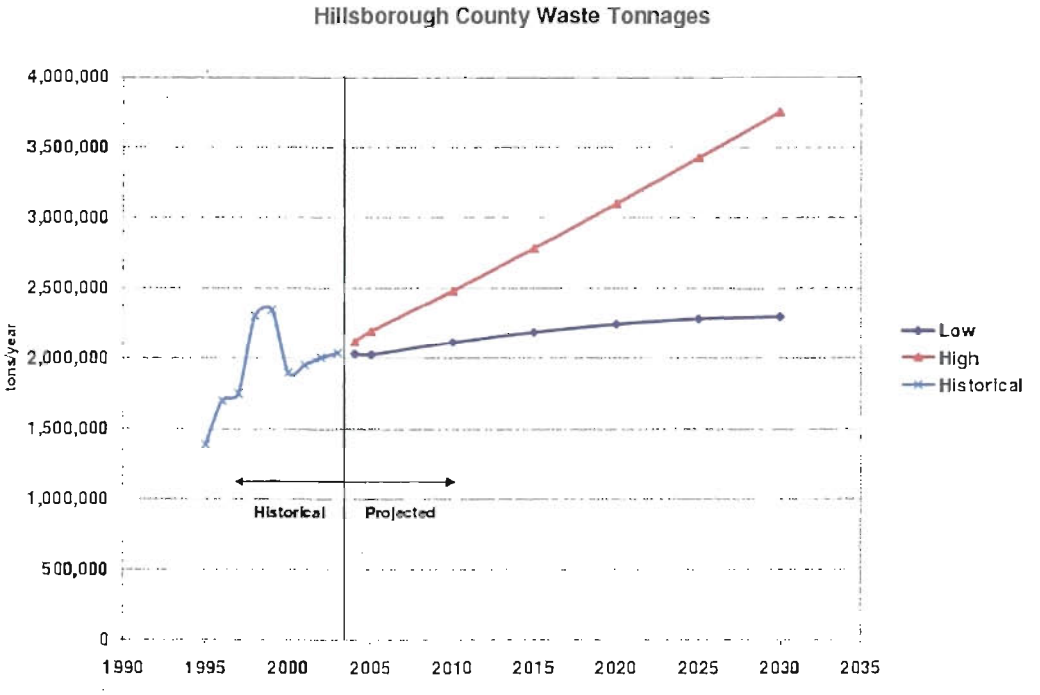


Figure 5-1
Projected Waste Tonnages

The Facility has a net beneficial impact on solid waste disposal in Hillsborough County. The estimated processible solid waste quantities expected to be delivered annually to the resource recovery facility through the year 2010 are shown in **Figure 5-1**.

5.4.2 Hazardous Waste

This section, as described, is not applicable to the proposed Facility expansion, because there will be no handling or disposal of hazardous wastes at this Facility.

The Facility will accept only municipal solid waste which includes residential,

commercial, and non-hazardous industrial (e.g., office and package wastes) wastes. Public and private users of the Facility are informed of these limitations. Signs are posted at the weigh-in station providing information on wastes accepted at the Facility. Routine visual inspections by personnel at the weigh-in station monitor the types of wastes received upon arrival at the Facility gates and random inspections of waste loads per 62-701, F.A.C. are conducted by the County's tipping floor attendant. The crane operators visually inspect waste in the pit while mixing MSW and feeding the combustion units . This would allow the detection of large potentially hazardous materials such as drums or gas cylinders to prevent charging into the furnace.

County employed spotters are stationed on the tipping floor of the Facility and its associated transfer stations. If hazardous waste is discovered in any load delivered to these facilities, it will be reloaded onto the vehicle that delivered it if possible. If the delivery vehicle has already left the Facility, any hazardous waste will be removed from the waste stream and kept in an isolated area until it can be disposed of properly.

5.4.3 Ash Testing

Chemical and toxicity testing of the combined ash residue (including both combustion residue and air pollution control devices) was conducted during acceptance testing. Further, quarterly total metals testing is conducted in accordance with 62-702 F.A.C.

Based on the USEPA and FDEP regulatory limits, the ash residue has always been non-hazardous. Therefore, the ash is suitable for disposal in a Class I Sanitary Landfill. The expansion project will not change the characteristics of the ash generated.

Solid waste generated by plant operations (employee refuse, packing material, etc.) is collected from receptacles located throughout the Facility and deposited into the main solid waste stream for processing. Materials not suitable for incorporation into the solid waste stream are separated for off-site disposal to an appropriate facility. All sanitary wastewaters will be collected and discharged to the headworks of the co-located wastewater treatment plant. Therefore, no impacts associated with sanitary and other waste discharges are anticipated during plant operations.

5.5 Sanitary and Other Waste Discharges

There will be no changes to sanitary waste discharges.

5.6 Air Quality Impacts

5.6.1 Impact Assessment

Air Quality impact analyses are provided in Volume III of the application.

5.6.2 Monitoring Program

A continuous emission monitoring program will be operated for opacity, oxygen,

sulfur dioxide, carbon monoxide and nitrogen oxide concentrations. The equipment will be installed, calibrated and maintained in accordance with applicable USEPA and FDEP regulations. Periodic compliance testing will also be conducted for pollutants with emission limiting standards in accordance with applicable USEPA and FDEP regulations.

5.7 Noise

A complete anaylisis of baseline ambient noise is presented in **Section 2.3.6**. The proposed Facility expansion is not expected to cause any perceptible increase in the noise levels that currently exist in the areas near the Facility. Noise impacts are further discussed in **Appendix 11.1**.

5.8 Changes in Non-Aquatic Species Populations

5.8.1 Impacts

The proposed expansion will occur within the existing Facility boundaries. It is anticipated that the Facility expansion will have no impacts on existing species populations, diversity, relative abundance, species composition, distribution, dominance, or gradient distribution of important non-aquatic species.

5.8.2 Monitoring

No significant impacts to non-aquatic species populations are expected. Therefore, long-term monitoring programs are not proposed.

5.9 Other Plant Operation Effects

Transportation impacts of the proposed Facility expansion and a complete traffic study is presented in **Appendix 11.2**. The expansion project is not expected to have any significant impacts on the surrounding roadways.

5.10 Archaeological Sites

For the original application, an archaeological and historical survey for the proposed site was completed in May 1983 (see **Appendix 8.3**). According to this report, the Florida Master Site File listed no historic or prehistoric resources known to be present within the tract boundaries. An historic assessment indicated that no significant historic sites have existed on the property. Furthermore, no significant historic events have occurred on the property, according to the report. The research concluded that the survey tract has no significant historic period or cultural resources: a fact that was confirmed by the field investigations.

The report concluded that the projected use of the property will not impact any historic or prehistoric cultural resources. The Florida Department of State, Division of Archives, History, and Records Management also concluded that the proposed project is unlikely to affect any significant archaeological or historic resources.

Therefore no significant prehistoric or historic cultural resources will be impacted by the proposed Facility expansion, since the expansion will be within the existing Facility boundaries.

5.11 Resources Committed

Numerous natural and human resources will be consumed, converted or made unavailable for future use if the proposed Facility expansion is implemented.

The resources used in the construction of the Facility will be committed to this project. Some building materials will be irretrievably used in the expansion of the Facility or irreversibly committed to the Facility. Certain lumber products and concrete structures would be committed as well as glass, ceramics, paint, insulation and steel paving materials. In addition to the materials consumed during construction, the energy and human labor expended cannot be retrieved. However, this type of commitment of resources is typical for major capital intensive projects.

Financial commitments include dedication of bond funds or other sources of construction funds. As with the commitment of labor and materials, the financial requirements for a major capital project are very typical.

The combustion process chemically alters many of the compounds within the waste stream. Therefore, the materials consumed in the combustion process are permanently lost. This, however, is considered a positive "reuse" of a material for the generation of energy which otherwise would have been buried in a landfill. The Facility expansion will generate over 1.7 billion kilowatt-hours of electricity during a 20-year life. In addition to the revenue earned on the electricity sold to the power company, the energy production translates into over $260 million reduction on oil expenditures over the 20 years and reduction in consumption of nearly 4 million barrels of oil. It also offers the potential for recovery of reusable materials such as ferrous and nonferrous metals.

5.12 Variances

It is not anticipated that any variances from applicable standards will be sought as part of the site certification proceedings.

Section 6
Transmission Lines and Other Linear Facilities

The expansion project will not involve the construction of any new transmission line corridors or other long narrow siting corridors (e.g., rail lines, influent or effluent pipelines, etc.) from the site.

The site abuts a 200-foot wide easement of the Tampa Electric Company (TECO). The environmental features of the corridor in the vicinity of the site are described in conjunction with the main site area descriptions in **Section 2**. These environmental features include existing land use, future land use, and zoning.

6.1 Transmission Lines

The abutting TECO easement contains three 230 kV transmission lines, as well as a 20-foot easement for the Houston Texas Gas and Oil Corporation. The nearest electric substation is located approximately 3000 feet due south of the site, adjacent to the TECO easement corridor.

Based upon information supplied by the contractor (Covanta), the Tampa Electric Company (TECO) will perform an interconnection study in the first quarter of 2006. The purpose of the study is twofold:

1. To determine the interconnection system required to serve the proposed facility expansion. The study will be an examination of alternative interconnection arrangements. It will consider the requirements of safe and reliable operation of the interconnected system and make a recommendation to guide in the contract negotiations.

2. To study the ability of the composite area expansion plan to satisfy TECO planning criteria.

The objectives of the study are:

1. To collect load flow data for the study year and planned future expansion.

2. To assess the steady state and transient stability performance of the alternative interconnection arrangements for normal and contingency conditions consistent with TECO planning criteria.

Major items will include:

- Steady-state voltage regulation and line loading will be evaluated in response to single and some multiple contingencies

- Transient stability analysis will be done on all alternatives interconnecting the proposed facility to the existing system. Twelve, twenty-four, and sixty cycle reclosing times will be modeled
- Detailed evaluation will be done at three different load levels - 100%, 60% and 40% of peak

The data required by TECO, which will be supplied by the contractor (Covanta), are:

1. Proposed system one-line diagrams, including impedances.
2. Plant load and generation. Projected duration curves.
3. Generator Ratings (including power factor) and WATT-VAR capability curves for all generators.
4. Proposed relay and protection scheme.
5. Stability data, as follows:

- All D and Q axis impedances and time constants for generator
- Generator inertia constant
- Generator saturation curve
- Excitation system type and constants for stability modeling
- Steam system and governor type and constants for stability modeling

If new power lines are required, TECO will be responsible for constructing the transmission line from the selected substation to the project boundary (including obtaining any required permits) within their existing right-of-way. If the study concludes that additional right-of-way is necessary, TECO will be responsible for obtaining it.

6.1.1 Electromagnetic Effects

Currently, the Hillsborough County Facility produces about 29 MW of electrical power. The proposed facility will produce about 46 MW as a product of combusting the refuse. Some of this energy will be used to power the Facility while the rest will be fed into the Tampa Electric Company (TECO) power grid. Currently, 230 kV high voltage transmission lines (HVTL) are located in the TECO easement to the west of the site. The existing transmission lines will accommodate the additional electricity generated from the new turbine generator. There will be no new transmission lines constructed after the expansion and, therefore, no further analyses of electromagnetic fields are required.

6.2 Associated Linear Facilities

This section is not applicable to the proposed project because there are no associated linear facilities.

Section 7
Economic and Social Effects of Plant Construction and Operation

The County's Facility expansion will provide several benefits to the community. These are summarized in the following list:

1. It provides an ecologically sound and economical method to dispose of solid waste.

2. It decreases the potential threat to groundwater from landfilling solid waste.

3. It recovers energy from the combustion of the solid waste, which otherwise would be discarded and not utilized.

4. It decreases the volume of the solid waste, thus reducing the volume of material (i.e., ash) that must be placed in a landfill. In turn, it reduces amount of land required for new landfill capacity and prolongs the life of the existing landfill.

5. It recovers energy from municipal solid waste and therefore decreases the need for fossil fuels.

6. The sale of energy generates revenue for the County.

7. It is an essential component of the County's integrated waste management plan.

It is sometimes difficult to quantify the economic and, in particular, the social ramifications of Facility construction and operation. The discussion below not only addresses those readily quantifiable cost items and benefit items (such as worker earnings), but also discusses the qualitative costs and benefits of the proposed project.

7.1 Socio-Economic Benefits

Land disposal of solid waste is becoming increasingly difficult in Hillsborough County. Permitting of additional landfills has been constrained by a rapid increase in land prices, a decrease in available land, public resistance, and regulations. Because of these restrictions on landfilling, County officials have pursued resource recovery as a more efficient method of solid waste disposal. The following paragraphs describe the benefits associated with a modern resource recovery facility.

The resource recovery system of disposal, although initially more expensive than landfilling, becomes more attractive as the prices of real estate and energy continue to increase. In addition, resource recovery is an ecologically sound method of waste disposal. The Facility will be designed in an aesthetically pleasing manner. The Facility site includes extensive landscaping and will continue to do so.

The expanded Facility will have a continuous, nominal design-rated capacity of 657,000 tons per year, and is expected to operate at or above its guaranteed capacity. Of the waste processed by the Facility, less than 25 percent by weight (containing less than 0.3 percent putrescible debris) will require landfilling. This significant decrease in waste tonnage corresponds to a 90 percent reduction in waste volume. Consequently, the annual land area requirement for landfilling will be substantially reduced. With resource recovery facilities serving the County and the City of Tampa, the estimated site life of the Southeast County Landfill can be extended.

Another benefit related to resource recovery is the reduced potential for damage to valuable surface water and groundwater resources. Landfilling of unprocessed garbage may result in water resources contamination by organic materials leaching out of the waste. In contrast, materials processed by resource recovery consist of burned-out matter discharged from the grate and flyash, which are relatively inert (i.e., containing less than 0.3 percent putrescible material).

A third benefit related to the resource recovery program is the generation of a minimum of 85 million kilowatt hours of electricity per year (based on a guaranteed tonnage of 186,000 tons/year and 450 KWH/ton net output). This energy production is equivalent to a decrease in use of imported crude oil by 186,000 barrels per year (or a minimum of 4.0 million barrels in 20 years). At current oil prices, this decrease in dependence on foreign crude oil translates into a reduction of about $260 million over 20 years in foreign spending, assuming $65 per barrel. Because no inflation was figured into this calculation, the $260 million is a very conservative number.

Currently, the Facility employs 42 people. With the expansion, an additional eight people are expected to be required to run the Facility.

There would also be indirect beneficial impacts from the resource recovery operation on industries throughout the regional economy. Examples include increased sales and jobs in industries, which supply the facility, and retail establishments, which supply goods and services to the workers in the affected businesses.

Benefits will also be derived from Facility construction. For the duration of construction, the direct benefits of a $100 million construction project will be felt in the local economy through provision of local jobs and the purchase of construction materials and services.

Indirect benefits from Facility construction include increased sales and jobs in industries, which supply the construction firms. These indirect benefits will also occur to retail establishments, which sell goods and services to workers employed by construction of the Facility.

A social benefit associated with the existing Facility development is the provision of a public education/visitors center at the site. Tours of the Facility and information on state-of-the-art resource recovery are available to all visitors.

7.2 Socio-Economic Costs

This section is a description of the costs associated with constructing and operating the energy recovery facility in Hillsborough County over a 20-year period.

The proposed expansion will be on the existing Facility site. Thus, no additional land will need to be purchased. The site is already appropriately zoned for this type of Facility. An expansion of the existing Facility will not affect real estate values of the adjacent industrial properties.

The costs associated with site preparation, access road and facility construction, utilities extension and all other legal, administrative, and financing costs (not including capitalized interest during construction and various reserve accounts) are estimated at approximately $100 million. The County will finance these costs through a line of credit and the issuance of revenue bonds. However, since the bonds have not yet been issued, a breakdown of costs plus interest is not currently available.

The operator of the Facility will receive from the County an annual operating and maintenance fee of approximately $7 million (based on 280,000 tons/year and 2004 costs). These costs, however, are not fixed; they will be periodically adjusted over the life of the operating agreement in accordance with selected price indices.

An evaluation of costs over a 20-year financing period was conducted in order to quantify the estimated cost/benefit of plant construction and provide a basis for comparison with continued landfilling of solid waste.

Items included in construction and maintenance are tipping or user's fees, bonding costs, energy revenues and general overhead and maintenance.

It should also be noted that Hillsborough County will have paid for the expansion at the end of the 20-year financing period. At the end of 20 years, the plant may be worth as much as 50 percent of the new Facility, assuming proper maintenance over this period. The present worth of the County-owned plant would decrease the cost by about $14 million, resulting in a total cost of $36 million. There are also some unquantifiable economic benefits, which may further reduce this cost. For example, the decreased risk of contaminating environmental resources is a real social and environmental benefit, which may be translated into economic benefits. Ecological/ environmental losses, e.g. displacement of wildlife, habitat disruption, and deterioration of aesthetic and scenic values, will be minimal and are therefore not cited as costs of the project.

Section 8
Site and Plant Design Alternatives

An analysis of alternatives to the expansion project is not required because this project is not subject to review in an Environmental Impact Statement (EIS) pursuant to the National Environmental Policy Act (NEPA).

8.1 Alternatives Sites

Because this application proposes to expand the existing waste-to-energy facility in Hillsborough County, a discussion of alternative sites is not applicable.

8.2 Proposed Site Design Alternatives

Because the site and facility already exist, there were few alternatives to consider. The only major alternative was the size of expansion. The Facility was originally designed to accommodate an additional 400 ton per day (tpd) unit, identical to the existing units. However, after considering the solid waste projections and population growth projections, the County decided to install a larger unit.

The largest unit that the existing Facility can readily accommodate is a nominally rated 600-tpd unit. To expand beyond this would require the construction of an entirely new waste-to-energy facility, which was not determined to be economically feasible.