
**HUMAN HEALTH AND ECOLOGICAL IMPACT ANALYSIS
FOR A PROPOSED RENEWABLE ENERGY FACILITY
IN PALM BEACH COUNTY, FLORIDA**

**Prepared for:
Malcolm Pirnie, Inc.
8201 Peters Road, Suite 3400
Plantation, FL 33324
and the
Solid Waste Authority of Palm Beach County
7501 North Jog Road
West Palm Beach, Florida 33412**

**Prepared by:
CPF Associates, Inc.
7708 Takoma Avenue
Takoma Park, Maryland 20917**

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LIST OF ACRONYMS AND ABBREVIATIONS

ACI	Activated Carbon Injection
AERMOD	American Meteorological Society/Environmental Protection Agency Regulatory Model
Authority	Solid Waste Authority of Palm Beach County
BACT	Best Available Control Technology
BCF	Bioconcentration factor
CAA	U.S. Clean Air Act
COPC	Chemical of Potential Concern
DEFRA	United Kingdom Department for Environment, Food and Rural Affairs
ERA	Ecological Risk Assessment
ESP	Electrostatic Precipitator
ESV	Ecotoxicity Screening Value
E/T	Endangered and Threatened species
FAC	Florida Administrative Code
FDEP	Florida Department of Environmental Protection
FF	Fabric Filter Baghouse
FIFRA	Federal Insecticide Fungicide and Rodenticide Act
HHRAP	Human Health Risk Assessment Protocol for Hazardous Waste Combustion Facilities
HI	Hazard Index
HQ	Hazard Quotient
IEUBK	Integrated Exposure Uptake Biokinetic Model
IRAP	Industrial Risk Assessment Program
ISWM	Integrated Solid Waste Management
MACT	Maximum Achievable Control Technology
MSW	Municipal Solid Waste
NAS	U.S. National Academy of Sciences
NCRRF	North County Resource Recovery Facility
NOAEL	No Observable Adverse Effects Level
NSPS	New Source Performance Standards
PCBs	Polychlorinated Biphenyls
PCDDs/PCDFs	Polychlorinated Dibenzo-P-Dioxins and Polychlorinated Dibenzofurans
PPSA	Florida Electrical Power Plant Siting Act
PSD	Prevention of Significant Deterioration
RCRA	U.S. Resource Conservation and Recovery Act
RDF	Refuse Derived Fuel
RfC	Reference Concentration
RfD	Reference Dose
RMPF	Recovered Materials Processing Facility
SDA	Spray Dryer Absorber
SERAFM	Spreadsheet-Based Ecological Risk Assessment for Fate of Mercury Model
SNCR	Selective Non-Catalytic Reduction
2,3,7,8-TCDD	2,3,7,8-Tetrachlorodibenzo-P-Dioxin
TCLP	Toxicity Characteristic Leaching Procedure
TEF	Toxic Equivalency Factor
TEQ	2,3,7,8-TCDD Toxic Equivalents
tpd	Tons per day

EXECUTIVE SUMMARY

The Solid Waste Authority of Palm Beach County (Authority) owns a 1,800 ton per day refuse-derived fuel (RDF) facility (Existing Facility) which operates as part of the Authority's Integrated Solid Waste Management system. The Existing Facility is located on the Authority's 1,320-acre Palm Beach Renewable Energy Park in West Palm Beach. The Authority has proposed construction and operation of a new 3,000 ton-per-day mass burn renewable energy facility (Proposed Facility) in response to residential and commercial growth in Palm Beach County that has occurred since the Existing Facility became operational in 1989, and also to extend the Authority's landfill capacity. The Proposed Facility is expected to be located adjacent to the Existing Facility.

This document presents a Human Health and Ecological Impact Analysis (Analysis) that was performed to address questions related to human and environmental health that may arise during the course of the permitting process for the Proposed Facility. This analysis is not a formal requirement for the permitting process, but was conducted to ensure that the Proposed Facility would not have an adverse impact on human health and the environment. This Analysis was performed by CPF Associates, Inc., a Washington, D.C.-based scientific and regulatory consulting firm with over 25 years experience in evaluating the potential impacts of municipal solid waste management technologies. Supporting input to the analysis was provided by Malcolm Pirnie.

This Analysis relied on air dispersion and particle deposition modeling conducted by Malcolm Pirnie. Malcolm Pirnie used U.S. Environmental Protection Agency (USEPA) and Florida Department of Environmental Protection (FDEP) approved air models to calculate air concentrations and deposition rates associated with the Proposed and Existing Facilities. CPF then used these results in U.S. Environmental Protection Agency (USEPA) fate and transport models to calculate chemical concentrations in a variety of environmental media including soil, produce, surface water, fish and locally-raised animal food products. The Analysis addressed ten chemicals or chemical classes that were selected for detailed evaluation as follows: arsenic, beryllium, cadmium, lead, mercury, PCDDs/PCDFs (polychlorinated dioxins and furans), hydrogen chloride, hydrogen fluoride, sulfuric acid and ammonia. Overall, the models and input assumptions used in this Analysis are expected to provide conservative (i.e., health protective) estimates of potential environmental concentrations.

The calculated environmental concentrations associated with stack emissions from the Proposed and Existing Facilities were compared with available typical environmental levels in surface water, sediment, air, soil and fish. These comparisons showed that the incremental environmental concentrations calculated based on stack emissions from the two facilities are consistent with or well below typical environmental levels and will not measurably increase the typical concentrations of chemicals in the environment.

The human health risk assessment was conducted following current USEPA guidance and is summarized below:

- The human health risk assessment calculated exposures to the ten selected chemicals or chemical classes for several different types of individuals who could hypothetically be exposed to stack emissions: adult and child residents, adult and child farmers, adults and children assumed to eat fish caught from several water bodies, and a nursing infant. In risk assessment terminology, these groups of individuals are known as "receptors". Each adult or child receptor was assumed to be simultaneously exposed through a variety of pathways (e.g., the farmer receptor was assumed to

be exposed via inhalation, soil ingestion, homegrown produce ingestion, and ingestion of home-raised or locally-raised beef, pork, poultry and eggs). Each adult receptor was also conservatively assumed to be the mother of a breast-fed infant with the potential for transmission of chemicals from the mother through nursing.

- A variety of evaluations were performed in the human health risk assessment. Chronic long-term excess lifetime cancer risks were found to be at least 10 times lower than USEPA's combustion risk assessment target risk level of 1×10^{-5} (one in 100,000) and were below Florida's common target risk level of 1×10^{-6} (one in 1,000,000). Chronic long-term noncancer effects were predicted not to occur with a large margin of safety (i.e., calculated exposures were at least 100 times lower than the common regulatory noncancer target exposure levels). Calculated infant, child and adult exposures to PCDDs/PCDFs were determined to be at least 10 times lower than the USEPA-identified typical background levels. An analysis of short-term acute inhalation effects showed that adverse short-term effects will not occur with a large margin of safety (i.e., calculated short-term air concentrations were at least 15 times lower than health-based reference air concentrations).

An ecological risk assessment was also conducted in accordance with USEPA guidelines and is summarized below. The ecological risk assessment addressed the same set of compounds evaluated in the human health risk assessment.

- The ecological risk assessment evaluated potential impacts to wildlife and other species that were considered to be at greatest risk based on habitat use, exposure potential and population status. The species selected for evaluation consisted of aquatic life, the wood stork, the Everglades Snail Kite, the river otter and plants.
- Adverse impacts to aquatic life, terrestrial wildlife and plants were predicted not to occur with a large margin of safety (i.e., exposures to ecological receptors were at least 10 times lower than comparison ecotoxicity screening values).

In conclusion, the Human Health and Ecological Impact Analysis showed that potential risks associated with stack emissions from the Proposed and Existing Facilities were below regulatory and other target risk levels for both human health and ecological receptors. These conclusions are consistent with studies of other modern waste-to-energy combustion facilities that are designed, constructed, and operated in accordance with federal, state, and local environmental laws and regulations. Additionally, the calculated incremental environmental concentrations in air, soil, surface water, sediment and fish associated with stack emissions from the Proposed and Existing Facilities will not measurably increase the typical concentrations of chemicals in the environment. Based on this Analysis, the Proposed Facility is not anticipated to have an adverse impact on human health or the environment.

LIST OF ACRONYMS AND ABBREVIATIONS (Continued)

TSCA	U.S. Toxic Substance Control Act
USCOM	U.S. Conference of Mayors
USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
WCA	Water Catchment Area
WTE	Waste-to-Energy
WTERT	Waste to Energy Research and Technology Council

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1.0 INTRODUCTION

This report presents a Human Health and Ecological Impact Analysis (Analysis) for a new 3,000 ton-per-day (tpd) mass burn renewable energy facility (Proposed Facility) in Palm Beach County, Florida. This section presents general background on the project and objectives of this analysis. Section 2 discusses the use of Waste-to-Energy (WTE) as a waste disposal and renewable energy technology as well as federal, state, and county regulatory programs relevant to the protection of human health and the environment. Section 3 presents information from the scientific literature, and from governmental and research agency reviews, regarding potential environmental and health impacts associated with waste combustion facilities. Section 4 describes the site-specific characteristics of the Proposed Facility and its vicinity. Section 5 describes the risk assessment methodology used. Section 6 presents a human health risk assessment and Section 7 presents an ecological risk assessment of the potential impacts associated with emissions from the Proposed Facility.

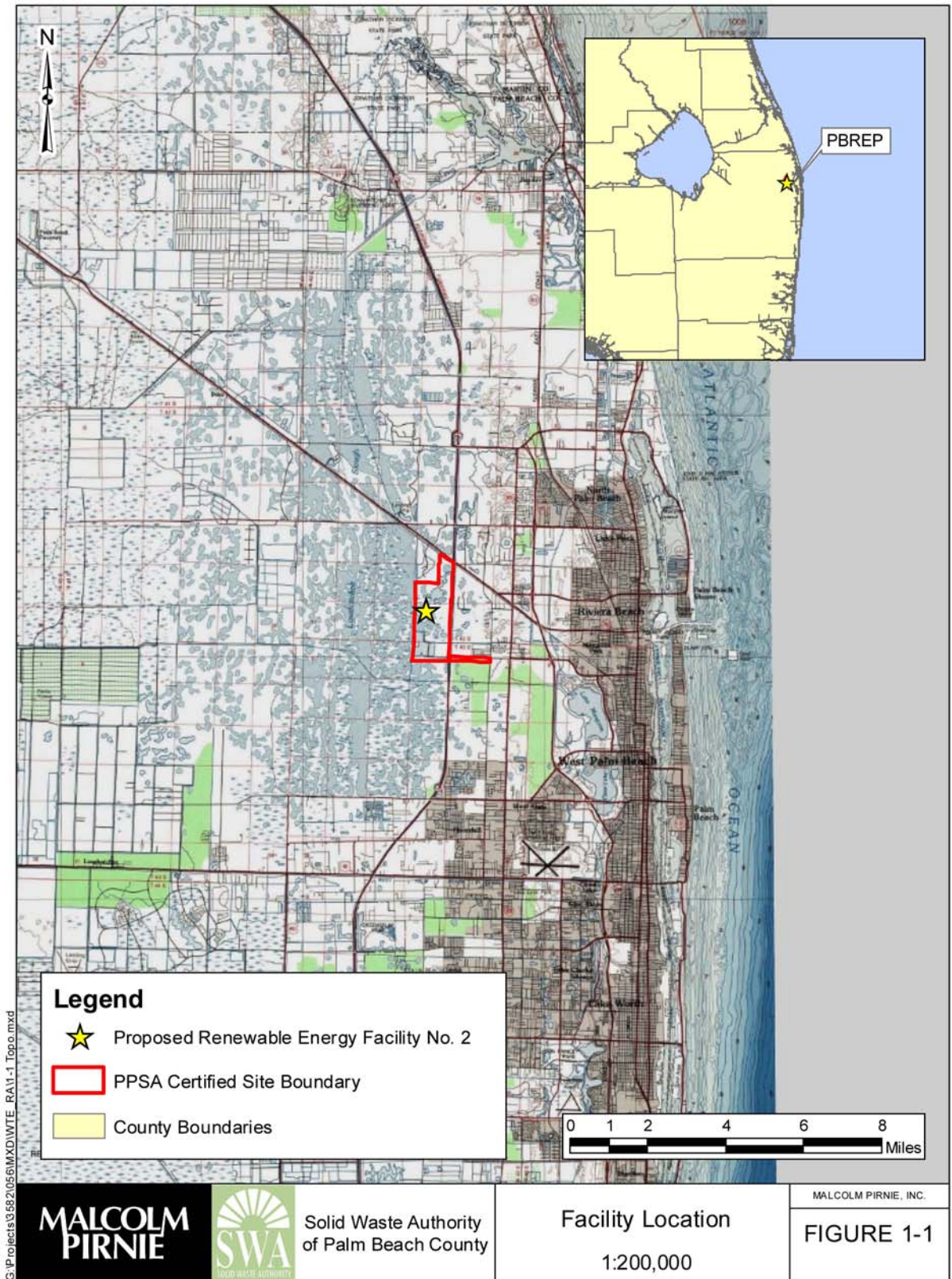
1.1 The Proposed Project

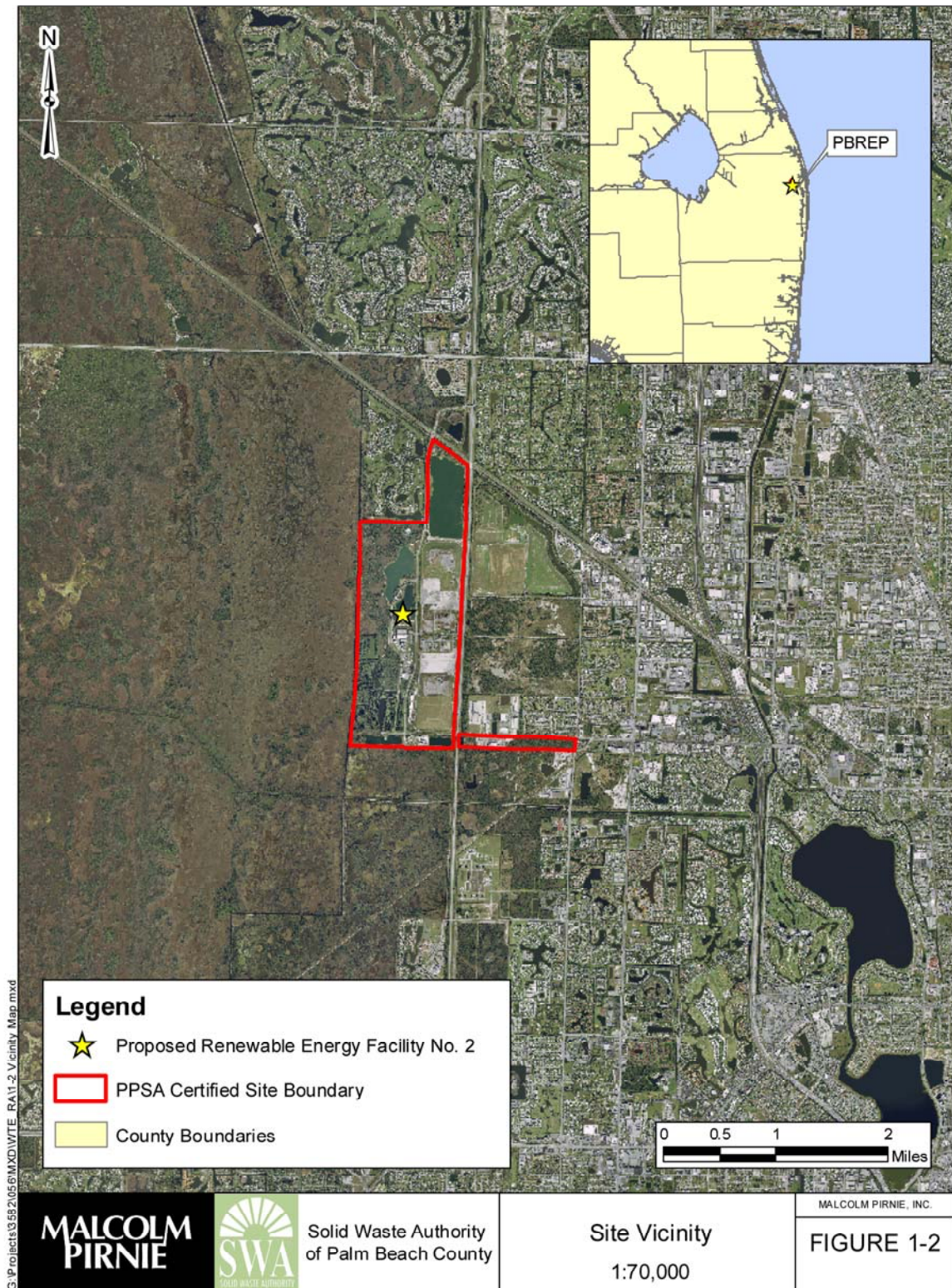
The Solid Waste Authority of Palm Beach County (Authority) owns a 1,800 tpd refuse-derived fuel (RDF) facility (Existing Facility) which operates as part of the Authority's Integrated Solid Waste Management (ISWM) system. The Existing Facility, also referred to as the North County Resource Recovery Facility (NCRRF), is located in West Palm Beach, Florida. The Existing Facility is comprised of equipment for the production of RDF from raw municipal solid waste (MSW), and two units that combust RDF, produce steam and convert the steam to electricity. The generated electricity powers several of the Authority's facilities located at the 1,320-acre Palm Beach Renewable Energy Park (Energy Park) and the excess, enough to power approximately 30,000 homes, is sold to Florida Power and Light. The Existing Facility is located on the Energy Park, approximately 5 miles (8 km) northwest of downtown West Palm Beach, as indicated in Figures 1-1 and 1-2.

The Authority has proposed construction and operation of the Proposed Facility as a new MSW mass burn renewable energy facility in response to residential and commercial growth in Palm Beach County (County) that has occurred since the Existing Facility became operational in 1989, and also to extend the Authority's landfill capacity. The Proposed Facility is expected to be located adjacent to the Existing Facility, would process up to 3,000 tpd of MSW and, similar to the Existing Facility, would generate electricity for sale.

1.2 Objectives of This Analysis

The permit process for the Proposed Facility requires the submittal of a number of application documents. These include development of a Florida Electrical Power Plant Siting Act (PPSA) Site Certification Modification Application as well as Prevention of Significant Deterioration (PSD) program permit to comply with the U.S. Clean Air Act. PPSA approval to construct the Proposed Facility will be determined by the State of Florida's Siting Board (i.e., Governor and Cabinet). The PSD permit will be issued by the Florida Department of Environmental Protection (FDEP).





The Analysis presented in this document was performed to address questions related to human and environmental health that may arise during the course of the Proposed Facility permitting process. This analysis is not a formal requirement of any local, state or Federal agency or law. However, the Authority chose to move forward with conducting this Analysis to ensure that the Proposed Facility would not have an adverse impact on human health and the environment.

1.3 Methods of This Analysis

This Analysis consisted of several parts. First, information regarding the operation of the Authority's ISWM System, including the Existing Facility and the Proposed Facility, was obtained and reviewed. Second, information about the regulatory context of WTE was evaluated and the implications investigated for the Proposed Facility. Following these activities, a scientific literature search and review was conducted to obtain information relevant to the Analysis, including general information about analogous facilities and specific information about the Palm Beach County environment. The Authority's engineer, Malcolm Pirnie, performed survey work to obtain site-specific information that was pertinent to the Analysis. Malcolm Pirnie also conducted air dispersion and deposition modeling to address the behavior of stack emissions from both the Existing Facility and the Proposed Facility in the environment. The results of the modeling were used as inputs to the Analysis.

A risk assessment is an important tool that can be used to evaluate the probability of adverse effects from various types of activities or situations. This well-recognized method of analysis can assist in identifying the probability of adverse effects occurring as a result of exposure to chemicals. It is also often used in a regulatory context, in which risk assessment results are compared to regulatory target risk levels. The U.S. Environmental Protection Agency (USEPA), and numerous other regulatory and research organizations, including the National Academy of Sciences (NAS), have developed guidelines for the performance of risk assessments. These guidelines were followed in the assessment of the Proposed Facility.

This Analysis was performed by CPF Associates, Inc., a Washington, D.C.-based scientific and regulatory consulting firm with over 25 years experience in evaluating the potential impacts of municipal solid waste management technologies. Supporting input to the analysis was provided by Malcolm Pirnie. Appendix A provides biographies of the CPF and Malcolm Pirnie scientists who participated in this effort.

2.0 THE GENERAL CONTEXT OF WASTE-TO-ENERGY

In 2007, Americans generated 254 million tons of MSW at a rate of 4.62 pounds per person per day. Approximately 24.9% of this material was recycled and 8.5% was composted. The remaining required disposal, with 54% landfilled and 12.6% combusted for energy recovery (USEPA 2008a). This latter option is known as WTE, trash-to-energy, or resource recovery.

All methods of waste management involve some potential human health or environmental risks. In the United States, regulatory programs have been implemented to minimize the risks from MSW management activities. This section explores the use of WTE and places it in context at the federal, state, and county levels, with an emphasis on those regulatory factors relevant to the protection of human health and the environment.

2.1 Federal Regulations and Policies

At the national level, there are currently 87 WTE facilities operating in over 25 states, with most in the northeast (40 facilities) and south (23 facilities) (USEPA 2008a).¹ These facilities generate about 2,500 megawatts of electricity from the processing of approximately 90,000 tons of MSW each day. The electricity generated meets the energy needs of almost 2 million homes and may be viewed as a replacement for about 7.8 million tons of coal or more than 45 million barrels of crude oil each year (ERC 2009, Norris 2005).

At the federal level, the primary regulatory agency is the USEPA, which regulates both the management of MSW and the air emissions from WTE facilities. The primary vehicles for regulation are the Resource Conservation and Recovery Act (RCRA) and the Clean Air Act (CAA).

RCRA defines solid and hazardous wastes and sets up an overall U.S. waste management strategy. Among other things, RCRA forbids the disposal of hazardous and medical wastes at MSW disposal sites. This ensures that hazardous and medical wastes will not be combusted at the Existing or Proposed Facilities. RCRA also delegates specific regulatory programs for the management of MSW to the states. The federal role in this context is to establish minimum criteria that describe the best practicable environmental controls and monitoring requirements for solid waste disposal facilities. Other specific federal regulations that impact waste disposal in WTE facilities include the Toxic Substance Control Act (TSCA), which bans the disposal of polychlorinated biphenyls (PCBs) with MSW, and the Federal Insecticide Fungicide and Rodenticide Act (FIFRA), which regulates the disposal of pesticides and pesticide containers. RCRA also regulates the ash that is generated during the MSW combustion process, including a requirement that all ash must be tested for toxicity using the USEPA-required Toxicity Characteristic Leaching Procedure (TCLP).

The CAA is the other primary vehicle for the regulation of WTE facilities at the federal level. There are several provisions of the CAA that apply to WTE facilities, such as permitting requirements addressing the prevention of significant deterioration of air quality. The provisions of the CAA that are directly relevant to WTE facilities are the New Source Performance Standards (NSPS) for new large municipal waste combustors (MWCs) and Emission Guidelines for existing large MWCs that were adopted in 1995. New MWCs, such as the Proposed Facility, are regulated according to Subpart Eb of 40 CFR Part 60 (USEPA

¹ There are about 1,750 landfills across the U.S. with the most in the south (676), west (520) and midwest (425). Source: USEPA (2007).

1995a). Existing MWCs, such as the Existing Facility, are subject to Emission Guidelines which are contained in Subpart Cb of 40 CFR Part 60 (USEPA 1995b). In accordance with a requirement to conduct a 5-year review, USEPA in 2006 revised some of the emission standards based on several years of test data from operating MWCs (USEPA 2006).

The overall objective of the applicable NSPS and the Emission Guidelines is to ensure that emissions from WTE facilities do not occur at levels that could pose a public health threat. The NSPS for new sources in Subpart Eb requires the implementation of Maximum Achievable Control Technology (MACT) to limit emissions from large MWCs. In the CAA, MACT is defined as the maximum degree of reduction in emissions of designated air pollutants, taking into consideration various factors. In the case of MWCs, the designated pollutants subject to MACT include PCDDs/PCDFs (also referred to as dioxins and furans),² cadmium, lead, mercury, particulate matter, hydrogen chloride, sulfur dioxide, nitrogen oxides, and fugitive ash emissions. In addition to the MACT controls on these specific pollutants, the NSPS require the use of good combustion practices (combustion efficiency) and impose requirements for facility siting, operator training and certification, compliance and performance testing, and reporting and recordkeeping. Under the CAA, the State of Florida has a federally-approved State Implementation Plan (SIP) and the State has been delegated the authority to issue permits under the NSPS.

The impact of the NSPS and Emission Guidelines on WTE facilities has been substantial, resulting in a significant reduction of all major pollutants associated with WTE. Table 2-1 below compares U.S. emissions in 2000, after implementation of the NSPS and Emission Guidelines, to those in 1990.

Table 2-1
Reduction in Emissions Associated with USEPA's
New Source Performance Standards and Emission Guidelines

Pollutant	Reduction in %
PCDDs/PCDFs ²	99.7
Mercury	95.1
Cadmium	93.0
Lead	90.9
Hydrochloric acid	94.3
Sulfur dioxide	86.7
Particulate matter	89.8

Source: USEPA (2002).

Based on these data, USEPA (2002) concluded that the "performance of the MACT retrofits has been outstanding." The Agency also noted that "since 1990 (pre-MACT conditions), PCDD/PCDF emissions have been reduced by more than 99 percent and mercury emissions have been reduced by more than 95 percent." Since the potential for public health impacts usually is proportional to the amount of emissions, these significant reductions in WTE emissions should provide a positive impact on public health.

² Polychlorinated dioxins and furans are a class of chemicals known as polychlorinated dibenzodioxins (PCDDs) and polychlorinated dibenzofurans (PCDFs), sometimes referred to as dioxins and furans. There are 75 PCDDs and 135 PCDFs, with each individual compound referred to as a congener. Only 7 of the 75 PCDD congeners and 10 of the 135 PCDFs are considered to be toxic; these are compounds with chlorine molecule substitutions at the 2, 3, 7, and 8 positions on the compound. These 17 compounds were addressed in this risk assessment. In this document, the mixture of polychlorinated dioxins and furans are referred to as "PCDDs/PCDFs".

In 2003, USEPA concluded that the use of MACT at WTE facilities allows MSW to be used "as a clean, reliable, renewable source of energy." Further, USEPA noted that WTE facilities in the U.S. produce "electricity with less environmental impact than almost any other source of electricity" (USEPA 2003a).

2.2 State Regulations and Policies

Increases in Florida's population and per capita waste generation rates have resulted in large increases in MSW generation, as shown below:

Table 2-2
MSW Generated in Florida and Palm Beach County

Year	Million Tons MSW Collected Per Year		Pounds Per Capita Per Year	
	Florida	Palm Beach County	Florida	Palm Beach County
1992	20.2	1.35	8.4	9.3
1999	24.9	1.59	9.1	8.4
2002	29.2	1.84	9.6	8.5
2007	32.3	2.06	9.5	8.7

Source: Florida Department of Environmental Protection. Solid Waste Annual Reports.
At http://www.dep.state.fl.us/waste/quick_topics/publications/default.htm.

Between 1992 and 2007, the amount of MSW generated in Florida increased by more than 50%. In Palm Beach County, which currently ranks third in the state in overall MSW generation rates, MSW generation increased by 52% from 1992 to 2007.

Based on 2007 data, the largest components of Florida's MSW stream are paper (newspapers, corrugated paper, office paper, other paper) at 24%, construction and demolition debris (24%), yard trash (11%) and ferrous and non-ferrous metals (12%). In 2007, 3.77 million tons of MSW were processed by combustion (12%), 9.27 million tons by recycling or composting (28%), and 19.3 million tons by landfilling (60%) (FDEP 2008).

WTE capacity in Florida has grown from one facility in 1982 to 12 operating facilities in 2008 which now process more than 10,000 tons of MSW per day (FDEP 2003, FDEP 2009). These facilities generate more than 500 megawatts of electricity daily. The WTE capacity in Florida is greater than any other state in the U.S. The primary reasons for the growth of WTE in Florida are the vulnerability of groundwater resources to potential leachate emissions from landfills and the lack of suitable landfill space. In addition, the energy crisis of the mid-1970s led to increased reliance on alternative energy technologies. Potential shortages and high costs of fossil fuels, and the need to reduce dependence on non-U.S. fuel sources, underscore the desirability of WTE compared with oil or natural gas. The largest operating WTE facility in the state is the Pinellas County Resource Recovery Facility (3,150 tpd), followed by the Miami-Dade County Resource Recovery Facility (3,000 tpd), and Broward County's two resource recovery facilities (2,250 tpd each) (FDEP 2003).

The State of Florida regulates WTE facilities under Chapter 403, Florida Statutes, and Chapter 62, Florida Administrative Code (FAC), which provides for the implementation of the NSPS (Subpart Eb 40 CFR 60).

Under Florida law, a WTE facility must seek approval under the PPSA if the facility will generate 75 MW or more electricity. A WTE facility that generates less than 75 MW may seek approval under the PPSA or seek individual permits. In either case, a WTE facility is subject to comprehensive and detailed review procedures to ensure that the facility will comply with all applicable local, state, and federal environmental regulations.

2.3 Non-Governmental Organization Activity

Several non-governmental organizations have addressed questions regarding the utility of WTE facilities. In 2005 and again in 2009, the U.S. Conference of Mayors (USCOM) adopted resolutions that support the use of WTE as a component of a comprehensive solid waste disposal management strategy. The USCOM cited WTE as an essential source of renewable energy that offers significant environmental and renewable benefits, and provides for greater energy diversity and increased energy security for the U.S. (USCOM 2005, USCOM 2009).

The Waste-to-Energy Research and Technology Council (WTERC) has sponsored a significant amount of research regarding the environmental, energy, and policy implications of WTE. A recent WTERC-sponsored review of available information concluded that WTE should be considered as a component of a renewable energy portfolio (Psomopoulos et al. 2009). The benefits of WTE cited by these researchers include low emissions, reduction of greenhouse gas emissions, decreased dependency on fossil fuels, and increased recycling rates in communities with WTE facilities compared to those without WTE facilities.

2.4 Palm Beach County

Palm Beach County is located on the southeast coast of Florida. Its population was 1,131,191 in 2000, and was estimated at 1,294,654 in 2008. About 46% of the population lives in unincorporated areas and the remainder in 38 incorporated municipalities, the largest of which are West Palm Beach, Boynton Beach and Delray Beach.³

The Authority is responsible for the implementation of an ISWM System that provides for the collection, transportation, and disposition of solid waste within the County (SWAPBC 2006). Facilities under the Authority's ISWM system include five solid waste transfer stations and several types of waste processing facilities. Figure 2-1 is a map of the locations of solid waste facilities within the County that are managed by the Authority.⁴ Site #6 on Figure 2-1 corresponds to the Energy Park where the Proposed Facility will be located.

All waste processing facilities operated by the Authority are located at the Energy Park, which is within the municipality of West Palm Beach. The waste processing facilities at the Energy Park include the Existing Facility, a ferrous processing facility, a recovery materials processing facility, a compost facility, a Class III solid waste landfill, a Class I landfill and a biosolids pelletization facility. Figure 2-2 shows the locations of these waste processing facilities on the Energy Park. Table 2-3 summarizes the activities performed at each of these facilities.

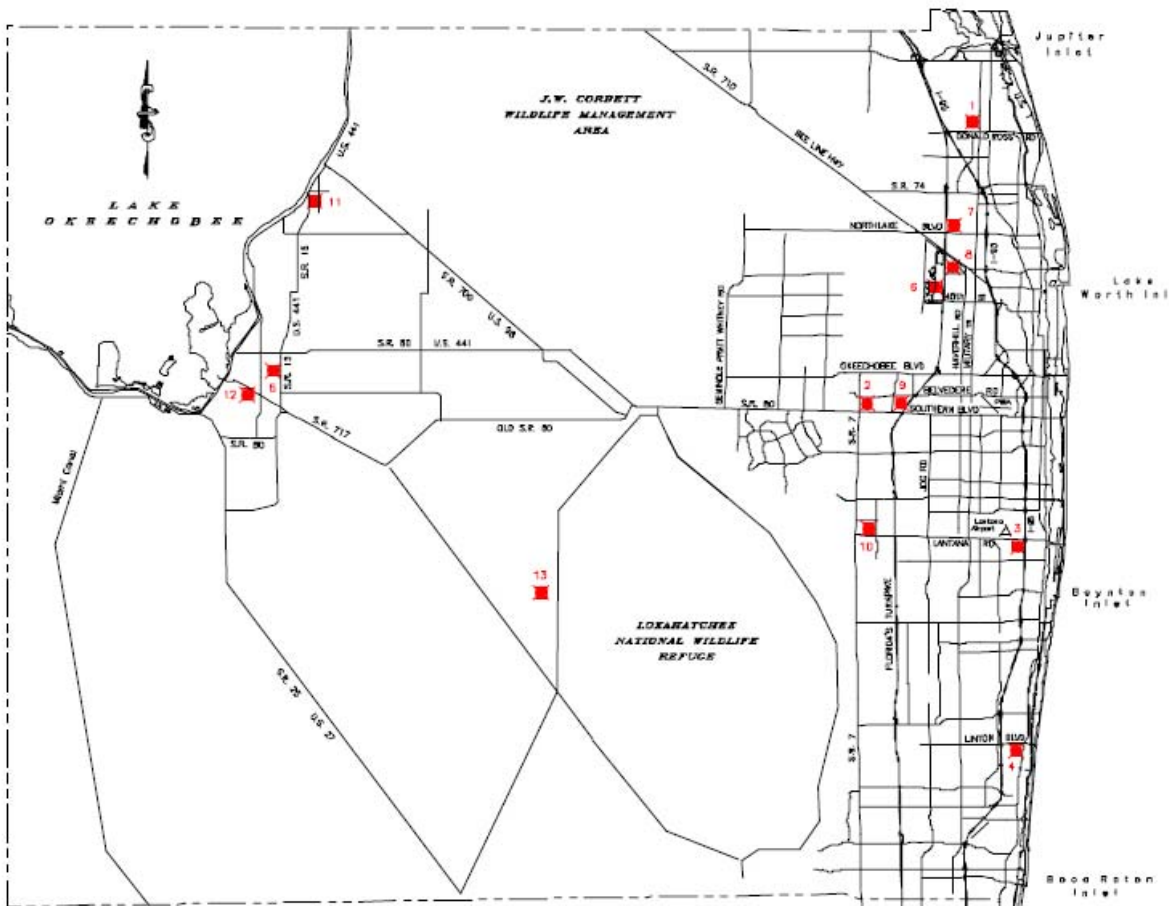
³ Palm Beach County Profile. Update 3/9/2009.

<http://www.co.palmbeach.fl.us/pzb/Planning/population/countyprofile.pdf>

⁴ The Authority owns and operates five of the six transfer stations in Palm Beach County. The Town of Palm Beach owns and operates the sixth transfer station. Source:

http://www.swa.org/site/information_and_documents/facilities_and_operations.htm

Figure 2-1
Location of Solid Waste Authority Facilities in Palm Beach County



LEGEND

- | | |
|------------------------------------|---|
| 1 North County Transfer Station | 7 West Lake Park Road Landfill |
| 2 West Central Transfer Station | 8 Dyer Boulevard Park (closed landfill) |
| 3 Central County Transfer Station | 9 Cross State Landfill |
| 4 South County Transfer Station | 10 Lantana Landfill |
| 5 Glades Regional Transfer Station | 11 Pahokee Landfill |
| 6 North County Facility | 12 Belle Glade Landfill |
| | 13 Western Site |

Source: SWAPBC (2006).



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**MALCOLM
PIRNIE**



Solid Waste Authority
of Palm Beach County

RENEWABLE ENERGY PARK FACILITIES

1:24,000

MALCOLM PIRNIE, INC.

July 2010
FIGURE 2-2

Table 2-3
Waste Processing and Management Facilities at the Energy Park

Facility	Activity
Existing Facility	Processes MSW into RDF. The RDF is combusted to produce steam and the steam is then converted to electricity which is used for other activities on the Energy Park and also is sold to Florida Power and Light.
Class I landfill	Accepts ash and residue from the Existing Facility, as well as garbage, sludge, and other special wastes that require landfilling in a Class I landfill in accordance with federal, state, and local regulations. This landfill does not accept hazardous, medical or radioactive wastes.
Class III landfill	Accepts materials that are not required to be disposed of in a Class I landfill, collectively referred to as "trash". Typical items include furniture, construction debris, roofing material, wood, carpet, household waste, and vegetative debris. A variety of items are prohibited from disposal in the Class III landfill, such as whole tires, automotive batteries, appliances containing refrigerant (e.g., refrigerators) and appliances containing combustible gas (e.g., propane). An on-site program recovers prohibited items and transports them to one of the on-site facilities for recycling or to an alternate disposal site. This landfill does not accept hazardous, medical, putrescible, or radioactive wastes.
Ferrous processing facility	Cleans and densifies ferrous metals recovered in the RDF production process, and white goods (e.g., refrigerators) and scrap ferrous recovered from the Class III landfill. Mixed ferrous material is shredded and then separated into ferrous and non-ferrous materials using magnets. The non-ferrous material is returned to the Existing Facility for combustion. The ferrous materials and white goods (after removal of any CFCs which may be present) are compacted, and then taken by truck to be recycled.
Recovery materials processing facility	Receives, sorts, processes, and prepares for market materials collected through the Authority's recycling program. These materials include aluminum products, glass, plastic containers, drink and juice boxes, newspapers, paper bags, magazines, cardboard and telephone books. Also sorts and separates metals received at the site. Separated ferrous metals are sent to the on-site ferrous processing facility. Other separated materials are shipped off site for recycling.
Compost facility	Accepts mulch produced by the Authority from vegetative debris from curbside collection routes and also wastewater residuals generated primarily by the City of West Palm Beach. The material is converted into compost which is approved for all horticultural applications.
Biosolids pelletization facility	Dries and pelletizes sludge which is then sold to fertilizer blenders as a component of commercial fertilizers. The facility, which recently began operations, uses landfill gas to power the sludge dryers.

Sources: SWAPBC (2009a); SWA website – Facilities and Operations at http://www.swa.org/site/information_and_documents/facilities_and_operations.htm; and personal communication with Malcolm Pirnie, May 2010.

The Authority's ISWM plan includes a comprehensive program for waste reduction and recycling. This program includes collection and processing programs for recyclable materials (ferrous materials, aluminum, glass containers, plastic containers, newsprint, and other paper products). The Authority also has special waste recycling programs for yard waste, construction and demolition debris, tires, white goods and used oil. Programs for household hazardous waste collection at Authority transfer stations as well as at the Energy Park are also in place (SWAPBC 2006, 2009a, FDEP 2009). Volume II of the PPSA Application contains the Authority's Materials Separation Plan which provides a comprehensive description of the Authority's integrated solid waste management system.

A comprehensive analysis of projected population and waste generation rates was conducted by the Authority to assist in solid waste management planning for the County, both with respect to long-term capacity needs and lead time necessary to develop new capacity (SWAPBC 2006). Based on this evaluation, the Authority is planning to develop a new transfer station, expand several existing transfer stations, construct a new landfill, and construct the Proposed Facility (SWAPBC 2006, 2009a). Construction of the new landfill was postponed in 2009.

3.0 HUMAN HEALTH AND ENVIRONMENTAL IMPACTS OF WASTE-TO-ENERGY

Numerous studies have been conducted to determine whether WTE facilities pose concerns to human health and the environment. These include evaluations by governmental agencies and research institutions and a wide variety of scientific studies of waste combustion facilities. Overall, these studies have determined that adverse public health impacts are not anticipated from exposure to emissions from modern WTE facilities, that there is no consistent evidence for significantly elevated levels of ill-health in populations living around MSW combustion facilities and that there are no measurable increases in environmental levels of emitted compounds in the vicinity of modern WTE facilities. This section presents information from the scientific literature and governmental and research agency reviews regarding potential environmental and health impacts associated with WTE facilities and other waste combustion facilities.

3.1 Governmental Agency and Research Institution Reviews

Many governmental agencies and research institutions have evaluated the health and environmental impacts of WTE. These include evaluations performed by the U.S. National Academy of Sciences (NAS 2000), the German Federal Ministry for the Environment (German FME 2005), several environmental and health agencies in the UK (DEFRA 2004, UKDOH 2000, UKHPA 2009), the Ontario Ministry of Environment (MOE 1999), and the World Health Organization (WHO 2007). In addition, a number of independent reviews provide further insight into the potential human health and environmental impacts of WTE facilities (Chrostowski 2007, Jacques Whitford 2009, Rabl and Spadaro 2002). Overall, the conclusions of these studies support the finding that modern WTE facilities in compliance with U.S. and European Union standards are substantially improved over older generation facilities, and that these modern WTE facilities are not expected to be associated with adverse impacts to either public health or the environment.

The U.S. National Academy of Sciences/National Research Council's (NAS/NRC) report on waste incineration and public health is one of the most important studies conducted on this subject (NAS 2000). The NAS/NRC report concluded that stack emissions from a modern MSW WTE facility regulated under the U.S. Clean Air Act NSPS will not cause adverse health or environmental effects if it is designed and operated in accordance with current state and federal regulations.

The German Federal Ministry for the Environment published a study on waste incineration and dioxin which concluded that, as a result of stringent regulations, WTE facilities are no longer significant in terms of emissions of dioxins, dust and heavy metals (German FME 2005). A comparative risk assessment conducted by the Ontario Ministry of Environment (MOE 1999) for a large-scale incinerator and a modern landfill, each with a disposal capacity of 6.6 million tonnes over 20 years, concluded that no significant human health effects are likely in a typical suburban community located near an incinerator or a landfill.

Several comprehensive reviews conducted in the United Kingdom (UK) over the past decade have concluded that any potential adverse health effects among those living near to modern, well regulated MSW combustors is likely to be very small, if detectable at all. In 2004, the UK Department for Environment, Food, and Rural Affairs (DEFRA) commissioned a comprehensive review of numerous forms of MSW management, including combustion. Based on a review of available health effects studies, the study authors found no consistent evidence for significantly elevated levels of ill-health in populations potentially affected by MSW incinerator emissions. Based on the DEFRA study, the UK Minister of State,

Environment and Agri-Environment stated: *“the report shows that risks to human health from incineration are small in comparison with other known risks. We must acknowledge the role of incineration with energy recovery as a sustainable waste management option although the priority must be waste minimisation, reuse and recycling”* (DEFRA 2004).

Most recently, the UK Health Protection Agency revisited the available research on the potential links between MSW combustor emissions and potential health effects (UKHPA 2009). The Agency concluded that *“while it is not possible to rule out adverse health effects from modern, well regulated municipal waste incinerators with complete certainty, any potential damage to the health of those living close-by is likely to be very small, if detectable. This view is based on detailed assessments of the effects of air pollutants on health and on the fact that modern and well managed municipal waste incinerators make only a very small contribution to local concentrations of air pollutants.”* The report also summarized the findings of the UK Committee on Carcinogenicity of Chemicals in Food, Consumer Products and the Environment which also reviewed recent data and concluded that *“any potential risk of cancer due to residency near to municipal waste incinerators is exceedingly low and probably not measurable by the most modern techniques. Since any possible health effects are likely to be very small, if detectable, studies of public health around modern, well managed municipal waste incinerators are not recommended.”*

A number of other reviews provide additional insight into the potential human health and environmental impacts of WTE facilities. A publication by one of the members of the NAS/NRC Committee (Chrostowski 2007) updated the 2000 NAS report and concluded that *“The additional studies conducted since the NRC report was published confirm its conclusions of little health risk from newer, well-operated facilities. The NSPS appears to have been very successful in reducing emissions to levels below those of health concern. Other studies have shown that WTE is attractive compared to landfilling from a greenhouse gas generation perspective, primarily because the dominant gas emitted from landfills is methane, compared to carbon dioxide from WTE plants... Given the availability of fuel for WTE plants, concern over global climate change, emphasis on reliance on domestic fuel sources, and problems with siting of landfills, WTE is becoming a more attractive technology for the twenty-first century.”* In 2009, an independent, study of environmental surveillance practices was conducted at the request of the Durham Region Government in Ontario, Canada for a proposed WTE facility (Jacques Whitford 2009). This study concluded that a modern incineration facility that employs air pollution control technologies consistent with European Union standards⁵ and Ontario guidelines,⁶ which are similar to those in place in the U.S., would be unlikely to impact the health of local residents or the environment.

3.2 Scientific Studies

A variety of different and complementary types of scientific studies have been conducted to determine the potential for environmental and health impacts from MSW combustion facilities. These different types of evaluations include epidemiological studies, biomonitoring studies, risk assessments, and environmental monitoring studies. Together, these analyses provide a comprehensive database of information about the potential human health and environmental impacts of WTE facilities.

⁵ European Union directive 2000/76/EC at http://www.central2013.eu/fileadmin/user_upload/Downloads/Document_Centre/OP_Resources/Incineration_Directive_2000_76.pdf

⁶ Ontario A-7 Guideline at <http://www.ene.gov.on.ca/envision/gp/A7.pdf>

3.2.1 Epidemiological Studies

The potential public health impacts of emissions from waste combustion facilities have been evaluated in epidemiological studies that look at people living in the vicinity of these facilities. Epidemiologic studies involve a comparison of the numerical incidence of health effects in a potentially exposed population to those in a control population. A statistically significant increase of an illness in the exposed population suggests that there is an association between exposure and the illness. It should be kept in mind that this does not necessarily mean that the exposure caused the disease. There are many other factors that need to be considered before one can make the leap from association to causation.

Dozens of epidemiological studies related to waste combustion facilities have been reported in the scientific literature. A review of each individual study is beyond the scope of this Analysis, however, several comprehensive reviews of these studies have been published since 2000 (Rushton 2003, Franchini et al. 2004, Hu and Shy 2001, Smith 2007). These reviews conclude that the epidemiological database does not provide consistent evidence for an association between waste combustion facilities and health effects. Because these studies include pre-NSPS technology and, in several cases, combustion of materials other than MSW, they are not useful in evaluating the current state-of-the-art WTE facilities in the U.S.

All the review articles note a number of significant limitations affecting the epidemiological studies. These limitations make it essentially impossible for epidemiological studies to establish any causal link between waste combustors and health effects, although they may provide some direction for areas of further research.⁷

3.2.2 Human Biomonitoring Studies

Many biomonitoring studies have been conducted in the vicinity of waste combustors. Biomonitoring involves the analysis of human tissues or excreta for evidence of exposure to chemical substances or evidence of effects caused by the exposure.

In 2009, a review of human biomonitoring studies related to waste combustors was conducted on behalf of the Durham Region Government in Ontario, Canada (Jacques Whitford 2009). Based on a systematic review of 25 recent human biomonitoring studies of residents living in the vicinity of waste combustion facilities, the review concluded that *“there is not a significant relationship between exposure to chemical emissions from incinerators and measured chemical levels in human media such as blood, urine, breast milk and hair”* and that there is *“no correlation between chemicals emitted from modern municipal waste incineration facilities and those measured in the human biomonitoring programs.”* Based on these observations, the Jacques Whitford report recommended against human biomonitoring among populations residing around waste combustion facilities. The report noted that any such study would require a detailed protocol, ethical review by an external board, and a clear objective that could be scientifically answered by the study, which the report determined would be questionable based on current evidence. The report concluded that there is no justification for this level of environmental surveillance for a new WTE facility with modern air pollution controls.

⁷ For example, a critical limitation in epidemiological studies is the assessment of exposure, which has generally been based on distance between residences or residential areas and waste combustion facilities, rather than any actual data or measurement of exposure related to landfills. This limitation results in the misclassification of exposure, a problem which weakens epidemiological studies.

3.2.3 Risk Assessments

Numerous risk assessments have been conducted for WTE facilities in both the U.S. and the European Union (where there are about 400 operating WTE facilities) to evaluate whether emissions pose risks to public health. Risk assessment studies use standardized procedures to calculate potential exposures to people resulting from chemical emissions and to determine whether these levels of exposure may pose risks to human health. These assessments have examined dozens of compounds emitted from WTE facilities, including PCDDs/PCDFs and mercury, the compounds generally considered to be of greatest potential concern, and have evaluated long-term cancer and non-cancer health effects as well as short-term acute health effects.

The results from risk assessments have consistently shown that adverse public health impacts are not anticipated from exposure to emissions from WTE facilities. Risk assessments of WTE facilities in the U.S. that operate in accordance with the NSPS have shown that the risks associated with these facilities are below risks of concern to regulatory and public health agencies. These include risk assessments performed for facilities in Maryland, Washington, Florida, Minnesota and Pennsylvania (Rao et al. 2003, Pioneer 2001, Clement 1992, CPF Associates 2002, CPF Associates 2005, Cambridge Environmental 2007, MPCA 2006).

Results from studies performed for facilities outside of the U.S. also show no adverse impacts. A risk assessment of a WTE facility in France concluded that the contribution of modern municipal waste combustors to population exposure to health-related pollutants is small (Boudet et al. 1999). A risk assessment for a WTE facility in Italy found that risks were well below maximum acceptable levels and concluded that health risks due to emissions from a properly equipped and operated modern WTE facility may have relatively small health significance for the surrounding population (Cangialosi et al. 2008). A health risk assessment of a proposed WTE facility in the UK concluded that risks due to WTE facility emissions were small compared to risks from other more familiar causes (Roberts and Chen 2006). A risk assessment performed for a proposed WTE facility in Ontario concluded that the facility would not likely cause any measurable adverse health effects in the community (Cantox 2007).

The results of two recent risk assessments conducted for WTE facilities in Lee County and Hillsborough County, Florida, provide insight into the potential risks associated with the Proposed Facility. The risk assessments performed for these two facilities are pertinent because they are state-of-the-art facilities operated in accordance with the NSPS, as is the Proposed Facility, and they are similar with respect to waste stream composition, emission controls, land use, climate, and state regulatory programs, although they might not be strictly comparable due to differences in waste capacity. In addition, the Lee and Hillsborough projects involved expansions of existing facilities, consistent with the Proposed Facility project. These similarities mean that the two previously conducted risk assessments, which will be summarized in the remainder of this section, are uniquely applicable to the Proposed Facility and can indicate the likelihood of potential risks associated with the Proposed Facility.

3.2.3.1 Lee County, Florida

MSW from Lee County and Hendry County is processed at the Lee County Solid Waste Energy Recovery Facility, which began operation in 1994. Lee County proposed to add a third combustion unit to the WTE facility to accommodate excess MSW that is being generated. The third unit was awarded a permit in 2006. The total capacity of the facility is 1,980 TPD. A series of studies over more than a 10 year period were used in the Lee County ERF risk assessment process (Clement 1992, CPF Associates 2002).

Two studies conducted in 1992 evaluated the potential human health and ecological impacts of the currently operating Lee County WTE facility. These studies concluded that construction and operation of the facility would not adversely affect humans or threatened or endangered species. Lee County also initiated a biological monitoring program in 1993 to determine if operation of the facility was correlated with mercury levels in aquatic life. The program results suggest that mercury concentrations in aquatic life in the area are generally similar to the levels typical of South Florida and not associated with operation of the WTE facility.

The risk assessment for the expanded facility relied on air dispersion and particle deposition modeling conducted to calculate air concentrations and deposition rates associated with the proposed WTE facility (i.e., operation of the two existing units plus the proposed third unit). This information was then used in USEPA's environmental fate and transport models to calculate chemical concentrations in soil, produce, surface water, beef and fish. Air concentrations were calculated for all of the chemicals regulated under the facility's air permit. Mercury and PCDD/PCDF concentrations were calculated for the other environmental media. The model inputs included a substantial amount of local site-specific data. Overall, the models and input assumptions were expected to provide conservative (i.e., health protective) calculations of potential environmental concentrations.

The calculated environmental concentrations associated with stack emissions from the proposed three-unit Lee County WTE facility were compared with typical environmental levels. These comparisons showed that the environmental concentrations associated with the proposed three-unit WTE facility were consistent with or below typical environmental concentrations, thus the proposed expansion was determined to not measurably increase the typical concentrations of chemicals in the environment.

The human health risk assessment was conducted following USEPA guidance and is summarized below:

- Potential human health risks were evaluated in two types of risk assessments. An inhalation risk assessment was performed for all chemicals currently regulated under the facility's air permit using permit limit-based emission rates. A more refined multiple pathway risk assessment was also performed for mercury and PCDDs/PCDFs using emission rates based on long-term stack gas measurements.
- In the inhalation risk assessment, inhalation exposures were calculated for two hypothetical groups of people, an adult resident and a child resident. In the multiple pathway risk assessment, exposures were calculated for 12 different hypothetical groups of people, including adults, children and infants. The exposure pathways considered in the multiple pathway assessment were inhalation, soil ingestion, ingestion of produce, beef and fish, and ingestion of breast-milk.
- A variety of evaluations were performed in the human health risk assessment. Chronic long-term excess lifetime cancer risks were found to be at least 10 times lower than USEPA's (1998a) combustion risk assessment target risk level of 1×10^{-5} (one in 100,000) and did not exceed Florida's common target risk level of 1×10^{-6} (one in 1,000,000). Chronic long-term noncancer effects were predicted not to occur, with a large margin of safety (i.e., calculated exposures were at least 10 times lower than the common regulatory noncancer target exposure levels). An analysis of short-term acute inhalation adverse effects showed that these effects would not occur with a large margin of safety (i.e., calculated short-term air concentrations were at least 100 times lower than health-based reference air concentrations).

An ecological risk assessment was also conducted in accordance with USEPA guidelines and is summarized below.

- The ecological assessment focused on mercury and PCDDs/PCDFs which, among the compounds present in WTE facility emissions, are expected to be of greatest potential concern to aquatic and terrestrial wildlife of the area.
- The ecological risk assessment evaluated potential impacts to wildlife species that were considered to be at greatest risk based on habitat use, exposure potential and population status. The species selected for evaluation consisted of aquatic life, the wood stork, the snail kite, the white pelican, and the river otter.
- Adverse impacts to aquatic and terrestrial wildlife were predicted not to occur, with a large margin of safety (i.e., exposures to ecological receptors were at least 10 times lower than comparison toxicity reference values).

In conclusion, the risk assessment showed that potential risks from stack emissions from the expansion of the Lee County WTE facility, in its proposed configuration with three combustion units, were below regulatory and other target risk levels for both human health and ecological receptors. Additionally, the environmental concentrations in air, soil, surface water, beef and fish associated with emissions from the three-unit WTE facility were calculated to be consistent with or below typical environmental levels and would not measurably increase the typical concentrations of chemicals in the environment.

3.2.3.2 Hillsborough County, Florida

Hillsborough County owns a WTE facility, that processes solid waste collected from the County. The original facility began operation in 1987 with three 400 tpd combustion units. In 2000, the emissions control system was updated to comply with the NSPS. In 2004, the County proposed adding a fourth unit with 600 TPD capacity to accommodate increased waste generation rates due largely to population growth in the County. The permit to proceed with the expansion was awarded to the County in 2007 and the new unit went on line in 2009. The current capacity of this facility is 1,800 tpd. As part of the permit process for the proposed new unit, a risk assessment was performed.

The risk assessment was composed of two parts, a multiple pathway human health risk assessment and an ecological evaluation of the potential impacts of facility emissions (CPF Associates 2005). The risk assessment evaluated the potential impacts of the WTE facility assuming continuous operation of all four MSW combustion units and was conducted according to USEPA guidance.

Potential human health risks were evaluated in a refined multiple pathway risk assessment for mercury and PCDDs/PCDFs, the compounds that have been shown to dominate risk assessment results for WTE facility emissions. The multiple pathway risk assessment relied on emission rates based on stack gas measurements. The multiple pathway risk assessment calculated exposures for 12 different hypothetical receptors: four adult receptors, four child receptors and four breast-fed infant receptors. Each adult or child receptor was hypothesized to be simultaneously exposed through multiple pathways. Each adult receptor was also assumed to be the mother of a breast-fed infant.

The risk evaluations that were performed in the risk assessment included chronic long-term excess lifetime cancer risks, the potential for chronic non-cancer health effects, a margin of exposure approach

that compares calculated doses of PCDDs/PCDFs to typical background U.S. exposure levels, and a comparison of PCDD/PCDF infant exposures to a background infant intake level. The findings of the human health risk assessment were as follows:

- All of the excess lifetime cancer risks were at least 10 times below USEPA's target cancer risk level of 1×10^{-5} and did not exceed Florida's target risk level of 1×10^{-6} . The total excess lifetime cancer risks ranged from 8×10^{-8} for a hypothetical child resident or child of a beef farmer to 1×10^{-6} for a hypothetical adult fisher scenario.
- All of the noncancer hazard index values were at least 20 times below the target hazard index of 1.0. The highest hazard index result was 0.05 for an adult fisher scenario.
- The maximum average daily doses to PCDDs/PCDFs were 50 times below USEPA's current estimate of background PCDD/PCDF exposure of 1 pg TEQs/kg-day (i.e., 1 picogram of 2,3,7,8-TCDD toxic equivalents (TEQs) per kilogram body weight per day). As a result, TEQ exposures to people due to emissions from the proposed four-unit RRF would not cause a measurable change in typical background exposures.
- Hypothetical infant exposures to PCDDs/PCDFs due to breast-milk ingestion were more than 100 times below the target exposure level of 60 pg TEQs/kg-day identified by USEPA. These results showed that infant TEQ exposures due to emissions from the proposed four-unit facility would not cause a measurable change in typical breast-fed infant TEQ exposure levels.

The ecological risk assessment evaluated potential effects of modeled emissions on ecological receptors within the WTE facility area. The ecological risk assessment followed USEPA guidelines for ecological risk assessment and incorporated regional-specific information on wildlife habitats and species. The ecological assessment focused on mercury and PCDDs/PCDFs, the compounds in WTE facility emissions expected to be of greatest potential concern to aquatic and terrestrial wildlife of the area. The assessment evaluated potential impacts on the natural communities of a nearby river and freshwater ponds in the facility vicinity, and focused on three ecological receptors - aquatic life, the Wood Stork (*Mycteria Americana*) (representing piscivorous birds), and the river otter (representing piscivorous mammals) - that were considered to be at greatest risk based on habitat use, exposure potential and population status.

Potential risks were evaluated by calculating hazard quotients which reflect the ratio of a predicted exposure level to a toxicity reference value (TRV) derived for the protection of fish or wildlife species. The ecological risk assessment showed that the hazard quotients for aquatic life and the selected terrestrial species were all less than the target level of 1.0 by at least a factor of 25. These results indicated that aquatic and terrestrial wildlife would not be at risk from adverse effects of exposures to chemicals released during the operation of the expanded Hillsborough County WTE facility.

In sum, the human health and ecological risk assessment showed that potential risks from emissions from the expanded Hillsborough County WTE facility were below regulatory and other target risk levels for both human health and ecological receptors. These conclusions were consistent with previous studies performed for other WTE facilities in the U.S. and are considered to be a reflection of implementation of regulations, and strict operational and emission controls that are used for this type of facility. Based on this analysis, it was concluded that the proposed modification to the WTE facility would not be anticipated to have an adverse impact on human health or the environment.

3.2.3.3 Lessons Drawn from Risk Assessments

Although there are site-specific differences among these Florida facilities, there are many common threads both from risk assessment and regulatory points of view. First and foremost, both of these facilities were designed to comply with the NSPS. All contain state-of-the art emission controls that are designed to fit the criteria for MACT. Since USEPA's overall objective in promulgating the NSPS was protection of human health and the environment, it should be anticipated that facilities compliant with the NSPS would have a negligible environmental health impact. Second, the risk assessments show that the risks associated with operating these facilities are below risks of concern to regulatory and public health agencies. Third, the results of the risk assessments show that, although the risks are low, they are dominated by exposure to PCDDs/PCDFs as potential human carcinogens and mercury as a neurotoxin. Last, the risk assessments also show that indirect exposure pathways, such as the consumption of fish, are the most significant sources of exposure, regardless of the absolute value of the risks.

3.2.4 Environmental Monitoring Studies

Environmental monitoring studies have been conducted around numerous WTE facilities to evaluate whether they have an adverse impact on the environment. Environmental monitoring studies rely on measurements of chemicals in the natural environment to assess potential impacts on the local environment.

Environmental monitoring studies for waste combustion facilities have included collection of measurements from many different environmental media such as ambient air, soil, agricultural products, vegetation and animals. These studies show that emissions from a modern WTE facility complying with U.S. NSPS requirements do not produce measurable changes in environmental chemical concentrations or the levels of chemicals in animal tissues.

In 2009, a review of environmental monitoring studies related to waste combustors was conducted by Jacques Whitford (2009). Based on a systematic review of recent scientific literature, the study evaluated 59 articles addressing environmental monitoring of air, soil, vegetation and fauna in the vicinity of waste combustion facilities. The review concluded *"that older incineration facilities and/or those with less advanced or no air pollution control technology may have impacted the environment immediately surrounding the facility. The study results indicate that a modern incineration facility, such as the one being proposed by the Regions of Durham and York, that employ maximum achievable control technology for air pollution, would be unlikely to impact the health of local residents or the environment."* The study concluded that the findings of the review do not justify implementation of ambient air monitoring or environmental monitoring (soil, vegetation, agricultural products) in the vicinity of a modern WTE facility.

While a description of each published environmental monitoring study is beyond the scope of this report, the results of one particularly comprehensive study are summarized below. This work focused on the Montgomery County, Maryland WTE facility where environmental monitoring studies showed that operation of the facility did not cause environmental impacts (Weston 1998, Weston 2000). The Montgomery County WTE facility has been operating since 1995 in a semi-rural area and uses state-of-the-art air pollution control equipment. Two environmental monitoring studies were conducted by an independent consulting firm to study the potential environmental impacts of the facility's operations.

- The first Montgomery County study (Weston 1998) measured air concentrations before the facility went into operation (pre-operation) and after the facility had been operating for approximately two years (post-operational), focusing on the maximum impact location. The study concluded that no major differences in air quality were observed when pre-operational and post-operational measurements were compared. Additionally, the report concluded that the facility did not have a significant impact on air quality in the surrounding region.
- The second study (Weston 2000) measured chemical concentrations in soil, earthworms, cow's milk, forage/hay, vegetables, surface water and sediment, and fish tissue. Again, both pre-operational and post-operational sampling was conducted. PCDDs/PCDFs were included among the many evaluated compounds. The results showed that there were no statistically significant or consistent patterns of impact detected between the pre-operational and post-operational phases of the study. The study concluded that the operation of the facility had not caused unacceptable increases in concentrations of the evaluated compounds.

3.3 Conclusions

In summary, numerous scientific studies and reviews have been conducted to determine the potential or environmental and health impacts from MSW combustion facilities. Collectively, the database of information provided by these studies has consistently shown that modern WTE facilities employing state-of-the-art pollution control measures, and operating in compliance with current U.S. regulations including the CAA, RCRA, and state and local requirements, are not associated with adverse impacts to either public health or the environment.

4.0 SITE-SPECIFIC CHARACTERISTICS OF THE FACILITY AND ITS VICINITY

4.1 Facility Characteristics

4.1.1 Facility Overview

The Existing Facility has been in operation since 1989. It is comprised of equipment for the production of RDF from raw MSW, and two units that combust RDF, produce steam and convert the steam to electricity. The electricity generated by the Existing Facility powers some of the Authority's Energy Park facilities and the excess is sold to Florida Power and Light. The facility currently processes in excess of 850,000 tons of MSW per year, of which 585,000 tons per year of RDF are combusted, 28,000 tons per year are recovered and recycled ferrous metals, 2,800 tons per year are recovered and recycled non-ferrous metals, and the remainder is landfilled.⁸

The Proposed Facility will increase MSW processing capacity in the County by up to 1 million tons per year and extend the Authority's landfill capacity. The Proposed Facility is expected to be located adjacent to the Existing Facility and, similar to the Existing Facility, would generate electricity for sale. The Proposed Facility will have three identical 1,000 tpd MWCs, each of which will be equipped with air pollution control technologies and exhaust through an individual flue and enclosed in a common concrete stack.

4.1.2 Air Pollution Control Equipment

The environmental controls proposed for the Proposed Facility and the Existing Facility consist of a combination of air pollution control equipment and operating practices that reflect best available control technologies and minimize potential emissions of concern.

Each MSW combustion unit at the Proposed Facility will be equipped with a selective non-catalytic reduction (SNCR) system for control of nitrogen oxides emissions, a spray dryer absorber (SDA) with limestone injection for control of acid gas emissions, a fabric filter (FF) baghouse for control of metals and particulate matter emissions, an activated carbon injection (ACI) system for control of mercury emissions, and implementation of good combustion practices to minimize emissions of products of incomplete combustion.

The Authority is also refurbishing the Existing Facility through the installation of several new air pollution control systems, even though this facility currently complies with its air standards. Emissions from the Existing Facility are controlled at present through the use of SDAs to remove large particles, sulfur dioxide and acid gases, and electrostatic precipitators (ESPs) to remove small particles. This equipment constituted state-of-the-art at the time the Existing Facility was constructed in 1989. Improvements being undertaken by the Authority will include replacing the SDAs, replacing the ESPs with new FF baghouses to improve control of particulate matter emissions, installation of a SNCR system to improve control of nitrogen oxide (NO_x) emissions, addition of an ACI system to improve control of mercury emissions, and installation of a new combustion control system and improved overfire air system to reduce carbon monoxide (CO) emissions and help to further reduce NO_x emissions. A variety of

⁸ SWA website – Facilities and Operations.

http://www.swa.org/site/information_and_documents/facilities_and_operations.htm

maintenance and repair activities will also be conducted. It is anticipated that the refurbishment of the Existing Facility will be completed in early 2011.

The air pollution control equipment is supplemented with continuous monitors which are used to ensure proper combustion conditions and operation of emission controls. These include continuous emission monitoring systems for NO_x, sulfur dioxide (SO₂), CO and opacity (an indicator for particulate matter). In addition, continuous monitoring of various operating parameters is conducted (e.g., steam flow, temperature in the air pollution control equipment and activated carbon injection rate).

4.1.3 Emission Limits

Emission limits have been proposed for the Proposed Facility, as described in the Authority's PSD and PPSA permit applications, based on consideration of the air pollution control equipment to be used, the NSPS, and emission limits that have been most recently specified for new MSCs in the U.S. and Florida. The MWCs most recently permitted in Florida are the Lee County and Hillsborough County WTE facilities. Both of these facilities are similar to the Proposed Facility with respect to operation, equipment, and general location in the U.S.

The protectiveness of the emission limits proposed for the Proposed Facility can be evaluated by comparison with the limits imposed under the CAA and in place at the Lee County and Hillsborough County WTE facilities. Table 4-1 presents the existing and proposed emission limits for the Existing Facility and Proposed Facility, respectively, along with the permit limits for the Lee County and Hillsborough County WTE facilities and the CAA regulations for MWCs (i.e., NSPS for new MWCs and Emission Guidelines for existing MWCs). It should be noted that Florida has established a permit limit for mercury well below the Federal NSPS limit for new MSW combustors (i.e., 28 µg/dscm versus 50 µg/dscm, respectively). As can be seen from this table, the emission limits proposed for the Proposed Facility are equivalent to or more stringent than both the NSPS and permit limits in place for the additional Lee County and Hillsborough County WTE facilities. The proposed emission limits for the Proposed Facility are also more stringent than the comparable limits for the Existing Facility.

Stack test measurements collected at the Existing Facility demonstrate that its emissions are consistently below the facility's permit limits. For example, over the past six years measurements of PCDDs/PCDFs and mercury, two of the most important compounds from a health and environmental perspective, have been much lower than the Existing Facility emission limits, as shown in Table 4-2. After refurbishment of the Existing Facility, emissions of PCDDs/PCDFs, mercury and other compounds should be lower than under current conditions.

Section 3 of the PPSA application and Section 5 of the Authority's PSD application discuss the air pollution control devices in greater detail and demonstrate that each of these systems reflects Best Available Control Technology (BACT). The PSD application also demonstrates that the Proposed Facility will comply with the emissions requirements of the NSPS. In addition, the emission limits for the Existing Facility are at least as stringent as the applicable Emission Guidelines for existing MWCs in 40 CFR 60 Subpart Cb. Given these facts, it is anticipated that the Authority's waste combustion facilities will be able to meet USEPA's environmental and public health goals with respect to pollutant emissions.

**Table 4-1
Comparison of Emission Limits**

Facility Name:	Lee County Waste-to-Energy Facility, FL		Hillsborough County Resource Recovery Facility, FL		Palm Beach County Waste-to-Energy Facilities, FL		40 CFR 60, Subpart Eb (NSPS)	40 CFR 60, Subpart Cb (Emission Guidelines)
Combustion Unit Type:	New 3rd Unit (291.5 MMBtu/hr)	Original two units (275 MMBtu/hr)	New 4th Unit (250 MMBtu/hr)	Original three units (150 MMBtu/hr)	New Mass Burn WTE Facility (PBREF2) 3 or 4 Units	Existing RDF facility (NCRRF) 2 Units		
MSW Throughput (Nominal)	660 TPD	660 TPD per Unit	600 TPD	400 TPD per Unit	3,000 TPD	1,800 TPD		
Compound	Emission Limit (a) ¹	Emission Limit (b) ²	Emission Limit (c) ¹	Emission Limit (d) ¹	Proposed Emission Limit (e) ¹	Emission Limit (f) ¹	Emission Limit	Emission Limit
Particulate Matter	20.6 mg/dscm (PM and PM10)	0.010 gr/dscf (PM and PM10)	12 mg/dscm (PM and PM10)	27 mg/dscm (or 0.012 gr/dscf)	12 mg/dscm for PM, PM10, and PM2.5	25 mg/dscm (g) 27 mg/dscm (h)	20 mg/dscm	25 mg/dscm (0.011 gr/dscf)
Nitrogen Oxides	110 ppmvd (12-mo rolling avg.); 150 ppmv (24-hr average)	180 ppmvd (24-hr avg.)	90 ppmvd (12-mo rolling avg.); 110 ppmvd (24-hr avg.)	205 ppmvd (24-hr avg.)	85 ppmvd (12-mo rolling avg.); 100 ppmvd (24-hr avg.)	250 ppmvd (24-hr avg.)	150 ppmvd (24-hr); 180 ppmvd for first year	205 ppmvd for mass burn waterwall; 250 ppmvd for RDF
Sulfur Dioxide	26 ppmvd or 80% reduction	29 ppmvd or 80% reduction	26 ppmvd or 80% reduction	29 ppmvd or 75% reduction	24 ppmvd or 80% reduction	29 ppmvd or 75% reduction	30 ppmvd or 80% reduction	29 ppmvd or 75% reduction
Carbon Monoxide	80 ppmvd (12-mo. rolling avg.); 100 ppmvd (4-hr avg.)	100 ppmvd (4-hr avg.)	80 ppmvd (30-day rolling avg.) 100 ppmvd (4-hr avg.)	100 ppmvd (4-hr avg.)	80 ppmvd (30-day rolling avg.) 100 ppmvd (4-hr avg.)	200 ppmvd (24-hr avg.)	100 ppmvd (4-hr avg.) for mass burn non-rotary units; 150 ppmvd (24-hr avg.) for RDF	100 ppmvd (4-hr avg.) for mass burn non-rotary units; 200 ppmvd (24-hr avg.) for RDF
Cadmium	0.02 mg/dscm	0.04 mg/dscm	0.01 mg/dscm	0.04 mg/dscm	0.01 mg/dscm	0.035 mg/dscm (g) 0.04 mg/dscm (h)	0.01 mg/dscm	0.035 mg/dscm (35 µg/dscm)
Mercury	0.028 mg/dscm or 85% reduction	0.07 mg/dscm or 85% reduction	0.028 mg/dscm or 85% reduction	0.07 mg/dscm or 85% reduction	0.025 mg/dscm or 85% reduction (quarterly test); 0.015 mg/dscm (12-mo rolling)	0.05 mg/dscm (g) 0.07 mg/dscm (h)	0.05 mg/dscm (50 µg/dscm) or 85% reduction	0.05 mg/dscm (50 µg/dscm) or 85% reduction
Lead	0.2 mg/dscm	0.44 mg/dscm	0.14 mg/dscm	0.44 mg/dscm	0.14 mg/dscm	0.44 mg/dscm	0.14 mg/dscm	0.4 mg/dscm (400 µg/dscm)
Arsenic	--	9.10E-06 lb/MMBtu	--	--	--	--	--	--
Beryllium	--	1.35E-07 lb/MMBtu	--	1.48 µg/dscm	--	7.3E-07 lb/MMBtu	--	--
Hydrogen Chloride	25 ppmvd or 95% reduction	25 ppmvd or 95% reduction	25 ppmvd or 95% reduction	29 ppmvd or 95% reduction	20 ppmvd	29 ppmvd or 95% reduction	25 ppmvd or 95% reduction	29 ppmvd or 95% reduction
Sulfuric Acid Mist (H ₂ SO ₄)	15 ppmvd	0.036 lb/MMBtu	--	0.072 gr/dscf ²	5 ppmvd	--	--	--
Hydrogen Fluoride	3.5 ppmvd	5 ppmvd	--	6.74 mg/dscm	3.5 ppmvd	3.2E-03 lb/MMBtu	--	--
Dioxin/Furan (PCDD/PCDF)	13 ng/dscm	30 ng/dscm	13 ng/dscm	30 ng/dscm	13 ng/dscm	30 ng/dscm (g) 60 ng/dscm (h)	13 ng/dscm	30 ng/dscm (units without ESPs) 35 ng/dscm (units with ESPs)
Volatile Organic Compounds	--	37 ppmvd	--	0.01 gr/dscf ² or 0.2 lb/ton	7 ppmvd	1.6E-02 lb/MMBtu	--	--
Visible Emissions (Opacity)	10%	10%	10%	10%	10%	10%	10%	10%
Ammonia	15 ppmvd (design); 30 ppmvd	50 ppmvd	@ 195 MMBtu/hr - 10 ppmvd, @ 260 MMBtu/hr - 15 ppmvd	--	15 ppmvd	--	--	--

(a) Data in this column obtained from FDEP permit package for extension of the construction permit expiration date for Unit 3 at the Lee County Resource Recovery Facility (issued February 2007).

(b) Data in this column obtained from FDEP Title V permit renewal for the Lee County Resource Recovery Facility (effective April 2006). Where the Subpart Cb Emission Guideline is more stringent, the Subpart Cb limits applies.

(c) Data in this column obtained from FDEP permit for the construction of Unit 4 at the Hillsborough County Resource Recovery Facility (issued October 2006).

(d) Data in this column obtained from FDEP Title V permit renewal for the Hillsborough County Resource Recovery Facility (effective May 2007). Where the Subpart Cb Emission Guideline is more stringent, the Subpart Cb limit applies.

(e) Data in this column reflects the proposed emission limits for the Palm Beach Renewable Energy Facility No. 2.

(f) These data reflect emission limits for the existing North County Regional Resource Recovery Facility as obtained from the FDEP Title V permit renewal (effective July 2006). Where the Subpart Cb Emission Guideline is more stringent, the Subpart Cb limit applies.

(g) Effective as of April 2009.

(h) Effective through April 2009.

¹ All concentration limits shown are corrected to 7% oxygen.

² Limits shown are corrected to 12% CO₂.

-- indicates no limit specified.

Table 4-2
Summary of PCDD/PCDF and Mercury Stack Test Measurements
From the Existing Facility (2003-2008)

Year	Mercury (mg/dscm, at 7% O ₂)		(PCDDs/PCDFs) (ng/dscm, at 7% O ₂)	
	Unit 1	Unit 2	Unit 1	Unit 2
2003	0.009	0.012	19	16
2004	0.015	0.008	23	22
2005	0.007	0.009	19	12
2006	0.005	0.008	7	5
2007	0.006	0.004	6	7
2008	0.006	0.007	10	5
Emission Limits	0.07 (a)		60 (a)	
	0.05 (b)		30 (b)	

(a) FDEP-specified permit limits, effective through April 2009

(b) USEPA Subpart Cb emission guidelines, effective as of April 2009

4.2 Project Environment

4.2.1 Facility Setting

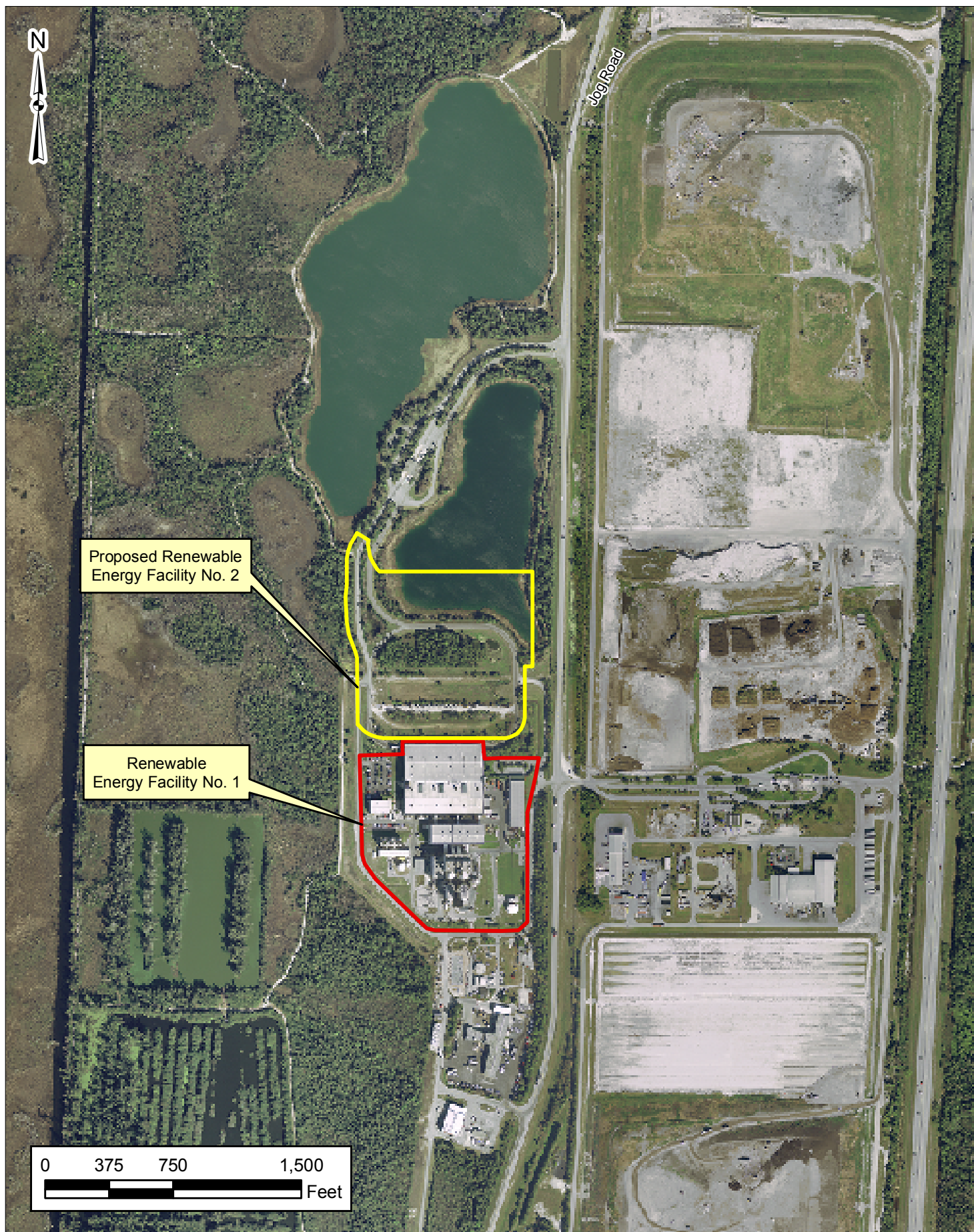
The Proposed Facility would be located adjacent to the Existing Facility, about 5 miles (8 km) northwest of downtown West Palm Beach on the Authority's 1,320-acre Energy Park. The street address for the Existing Facility is 6255 North Jog Road in West Palm Beach. The locations of the Proposed Facility and Existing Facility on the Energy Park are shown in Figure 4-1. In addition to these two facilities, the Energy Park includes a variety of other waste processing facilities (see Table 2-3), three constructed borrow lakes north of the Proposed Facility (South, Middle and North Lakes) and two south of the Proposed Facility location (Southeast and Southwest Lakes) which were historically used to provide fill for construction and landfill activities (see Figure 2-2) and, to the southwest of the Proposed Facility, an abandoned shell rock pit that was allowed to be naturalized in 1989 when the Existing Facility began operation and has provided rookery habitat for birds.

The Palm Beach County area is characterized by low and level terrain and a mild and often humid climate. The predominant wind directions in the County are from the east and southeast, blowing towards the west and northwest (occurring roughly 30% of the time), as illustrated by a wind rose from the Palm Beach County International Airport (see Figure 4-2).

4.2.2 Land Use in Facility Vicinity

The Energy Park is generally bordered by Florida's Turnpike on the east, the City of West Palm Beach's extensive Water Catchment Area (WCA)⁹ on the west and south and the residential Iron Horse Development on the north. Land use within the immediate vicinity of the site is predominantly undeveloped, or developed for industrial or commercial use, as shown in Figure 4-3. The closest

⁹ A water catchment area is a natural surface water reservoir.



**MALCOLM
PIRNIE**



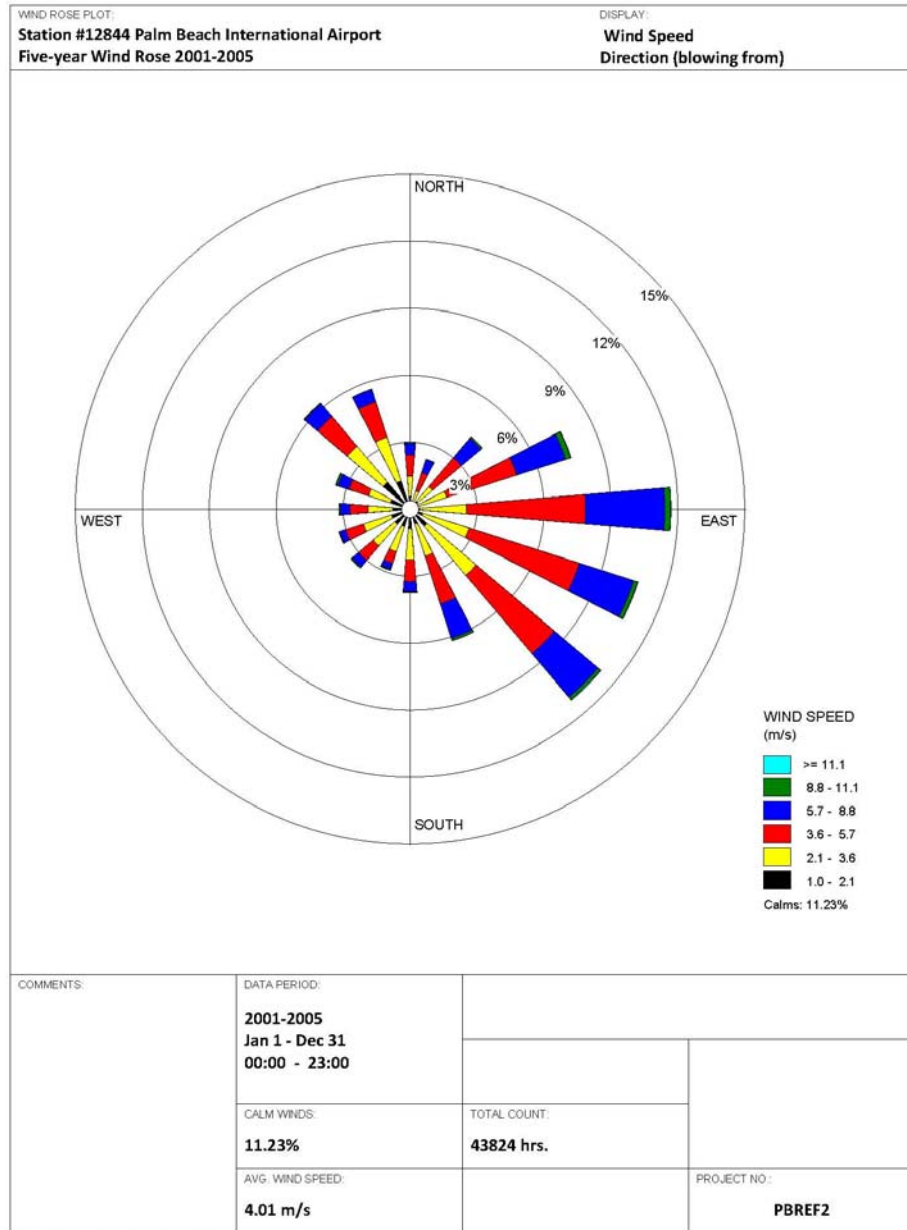
Solid Waste Authority
of Palm Beach County

Location of Proposed
and Existing WTE Facilities
1:9,000

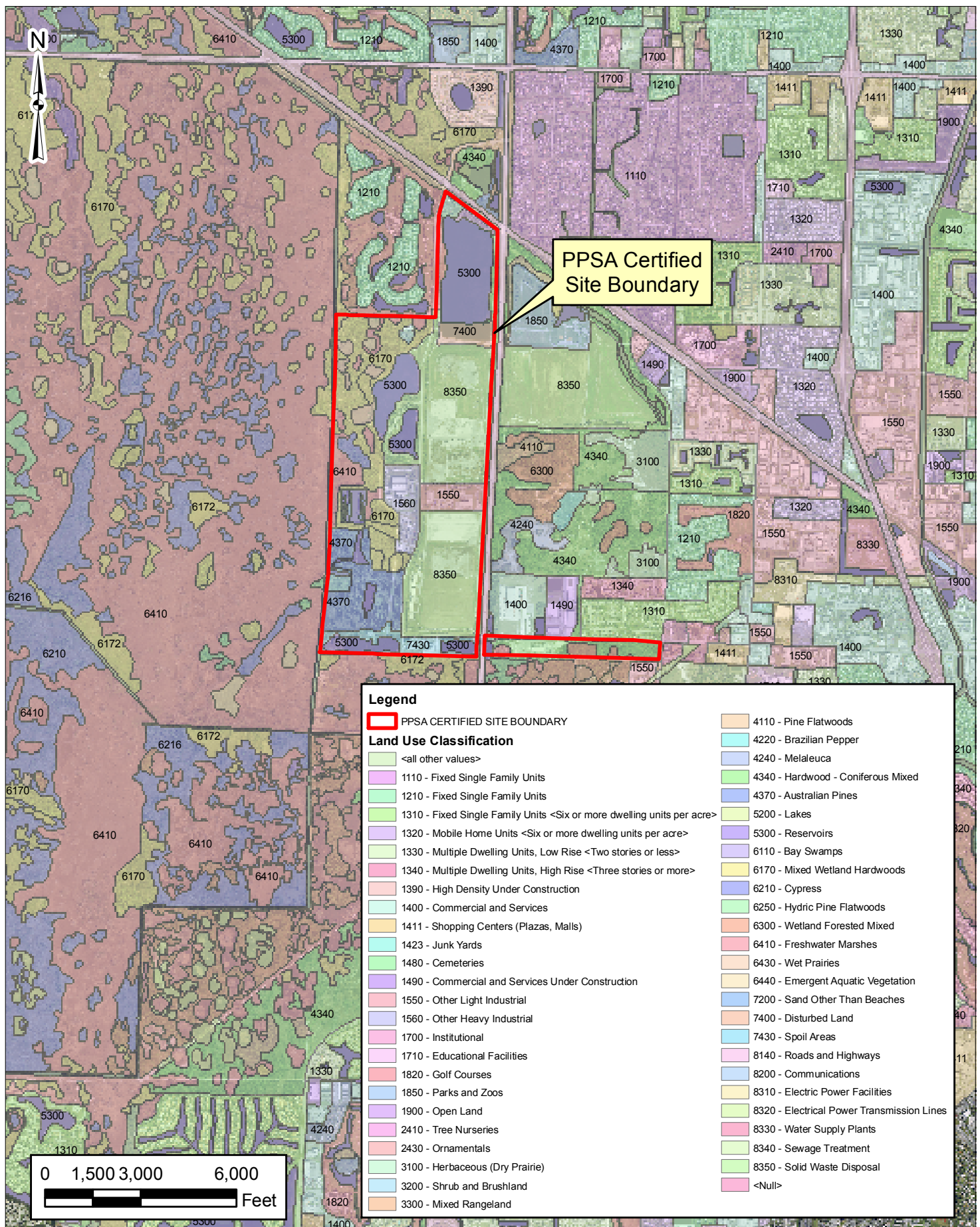
MALCOLM PIRNIE, INC.

July 2010
FIGURE 4-1

Figure 4-2
Wind Rose From Palm Beach International Airport (2001-2005)



WRPLOT View - Lakes Environmental Software



**MALCOLM
PIRNIE**



Solid Waste Authority
of Palm Beach County

Land Use in Proposed
Renewable Energy
Facility Vicinity
1:48,000

MALCOLM PIRNIE, INC.

July 2010
FIGURE 4-3

residential areas to the Proposed Facility are the gated single family Iron Horse residential development, located 0.9 miles (1.4 km) to the north, and multi-family residential dwellings located 1.3 miles (2 km) to the southeast, which includes the Gramercy Park residential area.

4.2.3 Demographics and Population Activity Patterns

The population of Palm Beach County has grown over the past decade in a similar fashion to other parts of the state. Based on the 2000 census, the total population of Palm Beach County was 1,131,191, with about 7% residing within the West Palm Beach municipality. The only residential area within one mile of the Proposed Facility is the Iron Horse Country Club development. The dominant types of employment in the County include occupations in trade, transportation and utilities, professional and business services, education and health services, and leisure and hospitality, accounting for about 19%, 18%, 14% and 13% of the workforce, respectively. About 1.5% of the County workforce is employed in agriculture, natural resources and mining.¹⁰

As noted above, most of the land in the Proposed Facility vicinity is zoned, or used, for commercial and industrial activities. Residential areas are not present closer than 0.9 mile to the facility and are limited in extent within 2 miles. In addition to residential, commercial and industrial land uses, land in the County is used for agricultural purposes. According to the U.S. Department of Agriculture's (USDA) Census of Agriculture, there were 1,263 farms in Palm Beach County in 2007, up slightly from the 1,110 farms in 2002. The top crop item by acreage was sugarcane, accounting for approximately 56% of the total farmland acreage in use in the County. The highest market value agricultural commodities in the County in 2007 and 2002, not including sugarcane, were vegetables, melons, potatoes and sweet potatoes, followed by other crops and hay. The top livestock types by numbers of animals were cattle and calves, followed by laying hens, although the market value of these categories was much smaller than the other major County-produced commodities. In 2007 and 2002, the USDA census identified no farms in the County for milk or other dairy products from cows (USDA 2007).

Malcolm Pirnie conducted two windshield surveys within a 6.2 mile (10 km) radius of the Proposed Facility site to determine the specific types of agricultural, livestock farming and other land uses in this part of the County. The first windshield survey was conducted within 5 km of the Proposed Facility in May 2008, while the second was conducted within 5-10 km of the Proposed Facility in December 2008. Neither windshield survey identified commercial or industrial food processing facilities, or any agricultural farms with the exception of several small home gardens and some crop trees in the yards of single family residences (e.g., banana, mango, and citrus). There were no livestock farms within 5 km of the Proposed Facility site. Within 5-10 km of the facility, five small residential livestock farms were identified, each with several different types of animals (e.g., cattle, sheep, goats, pigs, chickens, and turkeys). The closest farm to the Proposed Facility site was roughly 4.9 miles (7.9 km) to the west-southwest of the Proposed Facility site. The largest farm, located roughly 5.2 miles (8.4 km) to the southwest of the Proposed Facility site, had about 20-30 animals total, including sheep, goats, chickens, and cattle.

Drinking water in Palm Beach County is obtained from a mix of surface water and groundwater. While most of the drinking water Countywide comes from groundwater withdrawn from the surficial aquifer,¹¹

¹⁰ www.eflorida.com/profiles

¹¹ www.dep.state.fl.us/swapp/aquifer.aso. The surficial aquifer is generally present under unconfined, or water-table, conditions and is comprised mostly of unconsolidated sand, shelly sand, and shell

the City of West Palm Beach water supply is obtained mainly from surface water. Water is supplied to the City's drinking water treatment plant from Clear Lake which is located more than 5 miles to the southeast of the Proposed Facility. Surface water flows into Clear Lake via Lake Mangonia and the M Canal (see Figure 4-4). Under non-drought conditions, most of the water in the M Canal is provided by withdrawals from the WCA (about 75%) with the remainder coming from Lake Okeechobee (about 25%).¹² The water levels in the WCA are routinely monitored through a series of canals and inter-connections with the M Canal in order to manage flow from the M Canal into the WCA and from the WCA into the M Canal. Under drought conditions, such as those occurring in the spring of 2008 when water levels in the WCA and Lake Okeechobee were exceedingly low, the City may tap into alternative water sources, such as using groundwater from the West Palm Beach Wellfield¹³ located about 3 miles to the south-southeast of the Proposed Facility site or obtaining surface water redirected from other areas (e.g., other water catchment areas or reservoirs) (SFWMD 2008). Figure 4-4 shows the locations of the WCA, the M Canal, Clear Lake, the Water Treatment Plant and the City's groundwater wellfield.

Both the WCA and the M Canal are classified as Class I potable water supplies under Florida's Surface Water Quality Standards (FAC 62-302.400) because they provide a source of water to the City's drinking water treatment plant, although neither water body is directly used as a source of drinking water. The City's drinking water treatment plant includes a multi-step process that treats incoming water in order to meet or exceed State and Federal drinking water standards. This process includes coagulation, flocculation, sedimentation, filtration, disinfection and fluoridation.¹⁴

Fishing is a popular activity in Florida, including in Palm Beach County. Freshwater fishing occurs in the numerous ponds, lakes and canals that are present throughout the County. These types of water bodies are also present in the vicinity of the Proposed Facility site. During the May 2008 windshield survey conducted within 5 km of the facility, a few people were observed fishing from lakes or with fishing gear north of the Iron Horse Country Club development and north of Northlake Boulevard. People have also been observed fishing from the roadside canal alongside the Florida Turnpike near its intersection with the M Canal.¹⁵ No one was observed fishing from the lakes, ponds or freshwater canals located within 5-10 km of the Proposed Facility during the December survey. The water bodies closest to the Proposed Facility that provide potential fishing locations accessible to the public include the M canal, the roadside canal running north-south alongside the Florida Turnpike to the east and Iron Horse Lake to the north of the Authority's Energy Park. The Authority prohibits fishing in all of the lakes located on its Energy Park and access to these water bodies is limited by on-site fencing. Based on input from the Grassy Waters Nature Center,¹⁶ fishing in the WCA occurs on the north side of Northlake Boulevard from a catch and release fishing lake but not elsewhere in the WCA south of Northlake Boulevard.

¹² <http://www.cityofwpb.com/utilities/cwmp/watercatchmentarea.pdf>

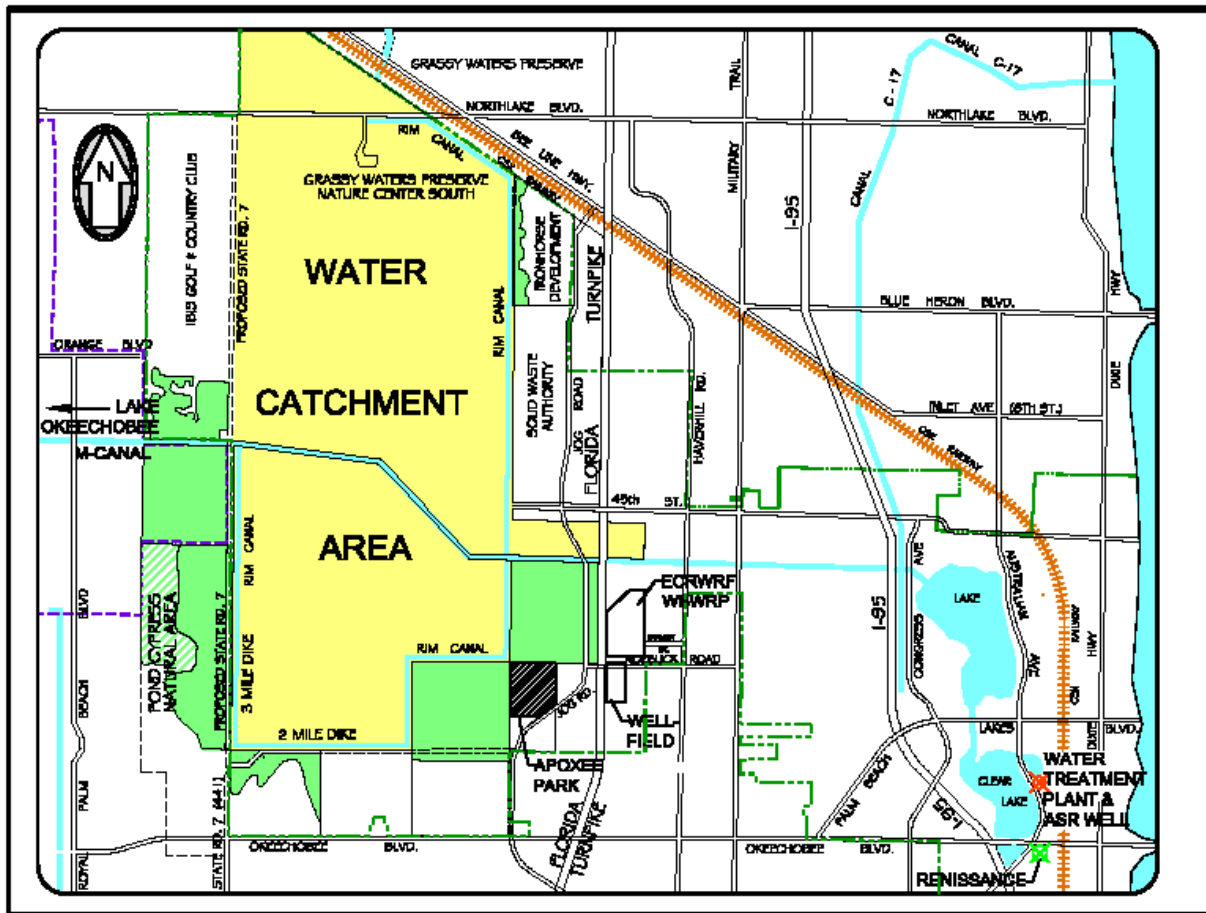
¹³ The Wellfield is part of a complex water reclamation project operated by the City of West Palm Beach to supplement the City's water supplies. The Wellfield taps groundwater that is recharged from the Water Catchment Area which in turn receives supplemental water that has been treated by the Water Based Water Reclamation Project (WBWRP). The WBWRP receives treated effluent from the adjacent East Central Regional Water Reclamation Facility (ECRWF) and performs further treatment prior to discharge to a portion of the Water Catchment Area wetland (City of West Palm Beach 2009).

¹⁴ http://www.cityofwpb.com/utilities/water_treatment.html

¹⁵ Personal communication between Nichole Lynch-Cruz, Malcolm Pirnie and Sarah Foster, CPF Associates. June 2008.

¹⁶ Personal communication between Virginia Carmack, Grassy Waters Nature Center, Grassy Waters Preserve, and Nichole Lynch-Cruz, Malcolm Pirnie. September 29, 2009.

Figure 4-4
City of West Palm Beach Water Catchment Area and the M Canal



Source: City of West Palm Beach, Public Utilities.
<http://www.cityofwpb.com/utilities/cwmrp/watercatchmentarea.pdf>

4.2.4 Ecological Setting

The ecological setting of the Proposed Facility site was characterized based on information from regional or local data sources, along with information compiled for the PPSA application. Section 2.3.6 in Volume I of the PPSA application provides information about the ecology of the Energy Park.

Based on a land use analysis performed by Malcolm Pirnie, most of the land within 10 km to the north, east and south of the Proposed Facility is classified as low impact or high impact urban, having been developed for residential, commercial, or industrial purposes. This developed land includes some areas of open water, mostly lakes in residential areas in addition to canals. The remainder of the area within 10 km of the Proposed Facility, mostly to the west, is predominantly comprised of extensive freshwater marshland and pinelands, interspersed with cypress swamp and sawgrass marsh areas. A smaller portion of the area within 10 km of the Proposed Facility is used for agricultural purposes, mostly limited to areas more than 8 km west of the Proposed Facility.

Freshwater marshes are wetlands with an open expanse of grasses, sedges, rushes and other herbaceous plants. Freshwater marshes generally contain relatively few, if any, trees and shrubs. Sawgrass marshes are freshwater marsh areas dominated by sawgrass, ranging from almost pure stands to mixed stands. Herbaceous marsh plants (e.g., maidencane, arrowhead, and spikerush) and small trees and brush commonly occur with sawgrass. Water depths in sawgrass marshes can vary during the year from a few inches to several feet. Marshes have standing water for much of the year and provide habitat for a variety of terrestrial and aquatic species, including fish, invertebrates, reptiles, amphibians, and mammals. Cypress swamps are generally wet, wooded areas where standing water occurs for at least part of the year. During the dry season, the mucky swamp soils may dry out. A variety of animals may spend part of their lives in the swamp, moving as the water levels rise and fall, including wading birds and mammals. Pinelands are the most common plant communities in Florida. They occur on nearly level land, and are dominated by longleaf pine and slash pine trees. Understory plants commonly include saw palmettos, herbs and ferns. Wildlife that may be found in pinelands include mammals, birds, snakes and tortoises (USGS 2005). Agricultural areas in the County often occupy habitat that was drained beginning at the turn of the last century and are predominantly used to grow sugarcane. Agricultural fields are organized around a system of canals and ditches that provide irrigation. A wide variety of terrestrial and aquatic species occur in agricultural areas, including birds, mammals, and reptiles (UF 2005).

In addition to the habitats described above, the Energy Park includes several constructed borrow lakes historically used to provide fill for construction and landfill activities and an abandoned shell rock pit. One of the on-site lakes (South Lake) was historically stocked with apple snails, and has been known to be used as a feeding ground for the Everglades Snail Kite although it apparently has not been re-stocked during the last 10 years. South Lake will be filled prior to construction of the Proposed Facility, however, Middle Lake, just to the northwest of South Lake, could provide a potential feeding ground for the Everglades Snail Kite. The shell rock pit was allowed to become naturalized and now provides rookery habitat for a variety of birds.

Based on the evaluation of ecological information for the PPSA application, including database reviews, field surveys and consultation results, the Proposed Facility site offers no critical habitat for wildlife. Portions of the site, however, are within the habitat range of a number of State and Federal listed species. Currently available information regarding endangered or threatened species in the County overall and specifically on the Energy Park is presented in Table 4-3. As can be seen, a number of State and Federal listed species have been observed on the Energy Park or could potentially occur based on the presence of appropriate habitat.

Table 4-3
List of Endangered or Threatened Species in Palm Beach County and
Observed at the Authority's Energy Park

Common Name	Genus and Species	Federal Status	State Status	Observed on Solid Waste Authority Jog Road Campus
Plants and Lichens				
Atlantic Coast Florida Lantana	<i>Lantana depressa</i> var. <i>floridana</i>	Not listed	Endangered	no
Bahama Brake	<i>Pteris bahamensis</i>	Not listed	Threatened	no
Banded Wild-pine	<i>Tillandsia flexuosa</i>	Not listed	Threatened	no (*)
Beach Jacquemontia	<i>Jacquemontia reclinata</i>	Endangered	Endangered	no
Burrowing Four-o'clock	<i>Okenia hypogaea</i>	Not listed	Endangered	no (*)
Celestial Lily	<i>Nemastylis floridana</i>	Not listed	Endangered	no
Coastal Hoary-pea	<i>Tephrosia angustissima</i> var. <i>curtissii</i>	Not listed	Endangered	no
Coastal Vervain	<i>Glandularia maritima</i>	Not listed	Endangered	no
Cutthroat Grass	<i>Panicum abscissum</i>	Not listed	Endangered	no
Dancing-lady Orchid	<i>Tolumnia bahamensis</i>	Not listed	Endangered	no (*)
Fahkahatchee Ladies' -tresses	<i>Sacoila lanceolata</i> var. <i>paludicola</i>	Not listed	Threatened	no (*)
Four-petal Pawpaw	<i>Asimina tetramera</i>	Endangered	Endangered	no (*)
Giant Orchid	<i>Pteroglossaspis ecrinata</i>	Not listed	Threatened	no (*)
Golden Leather Fern	<i>Acrostichum aureum</i>	Not listed	Threatened	no (*)
Hand Fern	<i>Ophioglossum palmatum</i>	Not listed	Endangered	no (*)
Johnson's Seagrass	<i>Halophila johnsonii</i>	Threatened	Not listed	no
Large-flowered Rosemary	<i>Conradina grandiflora</i>	Not listed	Threatened	no (*)
Many-flowered Grass-pink	<i>Calopogon multiflorus</i>	Not listed	Endangered	no
Nodding Pinweed	<i>Lechea cernua</i>	Not listed	Threatened	no
Okeechobee Gourd	<i>Cucurbita okeechobeensis</i>	Endangered	Endangered	no
Perforate Reindeer Lichen	<i>Cladonia perforata</i>	Endangered	Endangered	no
Pine Pinweed	<i>Lechea divaricata</i>	Not listed	Endangered	no
Ray Fern	<i>Schizaea pennula</i>	Not listed	Endangered	no
Sand-dune Spurge	<i>Chamaesyce cumulicola</i>	Not listed	Endangered	no
Sea Lavender	<i>Argusia gnaphalodes</i>	Not listed	Endangered	no
Silver Palm	<i>Coccothrinax argentata</i>	Not listed	Threatened	no
Small's Flax	<i>Linum carteri</i> var. <i>smallii</i>	Not listed	Endangered	no
Tiny Polygala	<i>Polygala smallii</i>	Endangered	Endangered	no
Toothed Maiden Fern	<i>Thelypteris serrata</i>	Not listed	Endangered	no
Amphibians				
Gopher frog	<i>Rana capito</i>	Not listed	Species of special concern	no (*)
Reptiles				
American Alligator	<i>Alligator mississippiensis</i>	threatened (a)	Species of special concern	yes
Loggerhead	<i>Caretta caretta</i>	Threatened	Threatened	no
Green Turtle	<i>Chelonia mydas</i>	Endangered	Endangered	no
American Crocodile	<i>Crocodylus acutus</i>	Threatened	Endangered	no
Leatherback	<i>Dermochelys coriacea</i>	Endangered	Endangered	no
Eastern Indigo Snake	<i>Drymarchon couperi</i>	Threatened	Threatened	no
Hawksbill	<i>Eretmochelys imbricata</i>	Endangered	Endangered	no
Gopher Tortoise	<i>Gopherus polyphemus</i>	Not listed	Threatened	yes
Kemp's Ridley	<i>Lepidochelys kempii</i>	Endangered	Endangered	no
Florida Pine Snake	<i>Pituophis melanoleucus mugitus</i>	Not listed	Species of special concern	no

Table 4-3 (Continued)
List of Endangered or Threatened Species in Palm Beach County and
Observed at the Authority's Energy Park

Common Name	Genus and Species	Federal Status	State Status	Observed on Solid Waste Authority Jog Road Campus
Birds				
Florida Scrub-jay	<i>Aphelocoma coerulescens</i>	Threatened	Threatened	no
Limpkin	<i>Aramus guarauna</i>	Not listed	Species of special concern	yes
Florida Burrowing Owl	<i>Athene cunicularia floridana</i>	Not listed	Species of special concern	no
Crested Caracara	<i>Caracara cheriway</i>	Threatened	Threatened	no
Piping Plover	<i>Charadrius melodus</i>	Threatened	Threatened	no
Little Blue Heron	<i>Egretta caerulea</i>	Not listed	Species of special concern	yes
Snowy Egret	<i>Egretta thula</i>	Not listed	Species of special concern	yes
Tricolored Heron	<i>Egretta tricolor</i>	Not listed	Species of special concern	yes
White Ibis	<i>Eudocimus albus</i>	Not listed	Species of special concern	yes
Peregrine Falcon	<i>Falco peregrinus</i>	Not listed	Endangered	no
Southeastern American Kestrel	<i>Falco sparverius paulus</i>	Not listed	Threatened	no
Florida Sandhill Crane	<i>Grus canadensis pratensis</i>	Not listed	Threatened	yes
American Oystercatcher	<i>Haematopus palliatus</i>	Not listed	Species of special concern	yes
Bald Eagle	<i>Haliaeetus leucocephalus</i>	Not listed	Not listed	yes
Wood Stork	<i>Mycteria americana</i>	Endangered	Endangered	yes
Osprey	<i>Pandion haliaetus</i>	Not listed	Species of special concern	no
Brown Pelican	<i>Pelecanus occidentalis</i>	Not listed	Species of special concern	no
Red-cockaded Woodpecker	<i>Picoides borealis</i>	Endangered	Species of special concern	no
Roseate Spoonbill	<i>Platalea ajaja</i>	Not listed	Species of special concern	yes
Everglades Snail Kite	<i>Rostrhamus sociabilis plumbeus</i>	Endangered	Endangered	yes
Black Skimmer	<i>Rynchops niger</i>	Not listed	Species of special concern	no
Least Tern	<i>Sterna antillarum</i>	Not listed	Threatened	no
Mammals				
Florida Mouse	<i>Peromyscus floridanus</i>	Not listed	Species of special concern	no
Florida Panther	<i>Puma concolor coryi</i>	Endangered	Endangered	no
Sherman's Fox Squirrel	<i>Sciurus niger shermani</i>	Not listed	Species of special concern	no
Florida Black Bear	<i>Ursus americanus floridanus</i>	Not listed	Threatened	no
(a) Treated as threatened due to similarity of appearance to a species which is federally listed.				
Source for Palm Beach County, Florida listed species: Florida Natural Areas Inventory. http://www.fnai.org/trackinglist.cfm .				
Source for species found on Solid Waste Authority campus: Malcolm Pirnie.				
(*) Species has not been observed on Jog Road campus but habitat for this species exists on the campus and they are known to occur within 10 km of the campus.				

5.0 RISK ASSESSMENT METHODOLOGY

The remainder of this report presents a description of the methods used for, and results of, a risk assessment of the Proposed Facility. The risk assessment was composed of two parts, a multiple pathway human health risk assessment and an ecological evaluation of the potential impacts of the Proposed Facility's emissions. These assessments evaluated the potential impacts associated with operation of the Proposed Facility in addition to the Existing Facility.

The risk assessment was conducted to be consistent with guidance provided by USEPA. The human health risk assessment generally followed USEPA's 2005 *Human Health Risk Assessment Protocol for Hazardous Waste Combustion Facilities* (HHRAP) (USEPA 2005). Although this guidance was developed for hazardous waste combustors, large portions of its risk assessment methodology are generally applicable to other types of waste combustors, including WTE facilities. The ecological risk assessment was a screening-level analysis based on USEPA ecological risk assessment principals as outlined in the *Ecological Risk Assessment Guidance for Superfund* (USEPA 1997). Other sources of information and guidance from USEPA and published scientific reports were also considered for the risk assessment where applicable.¹⁷

The human health risk assessment calculations were implemented using software developed by Lakes Environmental called IRAP-h View, which is a proprietary, commercially-available program. The Lakes software was programmed specifically to reflect USEPA's 2005 HHRAP. This software has been widely used in the U.S. (e.g., most USEPA Regions and several states) and among its benefits are reliance on standardized algorithms, quality-assured programmed calculations, readily available USEPA-specified chemical-specific data, and the ability to address many compounds. The IRAP program was also used for the environmental fate and transport calculations in both the human health and ecological risk evaluations, except for mercury modeling in water bodies. Mercury modeling in water bodies was performed using USEPA's Spreadsheet-based Ecological Risk Assessment for Fate of Mercury (SERAFM) model, an alternative model recommended in HHRAP that incorporates more recent advances in scientific understanding of the physical, chemical, and biological processes controlling mercury speciation and partitioning in water bodies (USEPA 2009a, Knights 2008). The SERAFM mercury model is available as a downloadable file from USEPA's SERAFM website.¹⁸ The ecological risk calculations were performed using an Excel spreadsheet derived from USEPA's ecological risk assessment guidance.

In general, the risk assessment incorporated site-specific data where possible and available in place of standardized default assumptions. The site-specific values used in the analysis are noted in the following sections. In the absence of site-specific information, health-protective default values recommended by the USEPA were generally used. Overall, the models and input data used in the risk assessment are expected to collectively provide conservative (i.e., health protective) estimates of potential risks.

¹⁷ For example, see USEPA (1999, 2003b, 2008, 2009a) and USEPA Region 4 guidance at <http://www.epa.gov/region4/waste/ots/ecolbul.htm>.

¹⁸ <http://www.epa.gov/ceampubl/swater/serafm/index.html>.

6.0 HUMAN HEALTH RISK ASSESSMENT

The human health risk assessment evaluated potential exposures and risks associated with emissions from both the Proposed Facility stack and the Existing Facility stack. All of the algorithms used to calculate environmental concentrations, exposures and potential human health risks associated with stack emissions were obtained directly from USEPA models.

The key steps in a human health risk assessment are based on the logical flow of information through the risk assessment process and are supported by USEPA guidance and the U.S. National Academy of Sciences (NAS 1983). The key steps consist of:

- Hazard Identification
- Exposure Assessment
- Risk Characterization
- Discussion of Uncertainties

The application of these steps to the Authority's project is described below.

6.1 Hazard Identification

The Hazard Identification step involves the selection of chemicals for evaluation as well as the compilation of health effects (i.e., toxicity) data for each selected chemical.

6.1.1 Selection of Chemicals of Potential Concern for Stack Emissions

Chemicals of potential concern (COPC) were selected for quantitative evaluation in the human health risk assessment based on compounds with proposed permit limits for the Proposed Facility, compounds with permit limits at the adjacent Existing Facility, and compounds with permit limits at the Lee and Hillsborough County, Florida WTE facilities, as follows:

- Metals emitted only in the solid phase - arsenic, beryllium, cadmium, lead
- Mercury emitted as elemental mercury vapor, divalent mercury vapor and particle-bound divalent mercury
- PCDDs/PCDFs (polychlorinated dioxins and furans)
- Acid gases – hydrogen chloride, hydrogen fluoride, sulfuric acid
- Ammonia

Criteria pollutants regulated under the CAA (other than lead) were not selected because these are addressed in detail in the PSD permit application.

6.1.2 Toxicity Characterization - Chronic Health Effects Criteria

The toxicity data used to evaluate chronic, long-term risks include oral cancer slope factors and inhalation unit risk factors for predicting excess lifetime cancer risks, and oral reference doses (RfDs) and inhalation reference concentrations (RfCs) for predicting the potential for long-term non-cancer effects. These

toxicity data were compiled for each selected compound from the toxicity data sources recommended by HHRAP. Table 6-1 presents the chronic toxicity criteria currently available for the selected compounds and used in this risk assessment.

The risk assessment evaluated potential risks associated with emissions of mixtures of PCDDs/PCDFs in accordance with USEPA methods (USEPA 2005). In this approach, PCDD/PCDF mixtures were evaluated using toxic equivalency factors (TEFs) which relate the toxicity of each 2,3,7,8-congener to the toxicity of 2,3,7,8-TCDD, the most well-studied and most toxic congener among the PCDDs/PCDFs. In this system, the TEF for 2,3,7,8-TCDD is 1.0 and the other congeners have TEF values ranging from 1.0 to 0.0003. For example, the TEF for 2,3,7,8-TCDF is 0.1, which means that the potential toxicity of 2,3,7,8-TCDF is considered to be 10 times lower than that for 2,3,7,8-TCDD. To apply the TEF concept, the TEF of each congener present in a mixture is multiplied by its respective concentration or exposure and the products are summed to obtain the total TCDD toxic equivalents (TEQs) of the mixture. Table 6-2 presents the PCDD/PCDF TEFs that were used in the human health risk assessment. These TEFs are consensus values recommended by the World Health Organization that USEPA expects to recommend for use in evaluating mixtures of PCDDs/PCDFs (USEPA 2009b, Van den Berg et al. 2006).

The chronic toxicity criteria for two PCDDs/PCDFs, 1,2,3,6,7,8-HxCDD and 1,2,3,7,8,9-HxCDD, were based on values provided specifically for these congeners in IRIS, and repeated in USEPA's HHRAP guidance, rather than relying on the use of TEFs. This is consistent with input from USEPA (USEPA 2010) recommending that risk assessments use the oral cancer slope factor and inhalation unit risk factor applicable to each of these two PCDD/PCDF congeners as reported in IRIS.

6.1.3 Toxicity Characterization - Acute Health Effects Criteria

In addition to long-term toxicity data, the potential for short-term acute effects associated with stack emissions was evaluated using acute reference air concentrations. These concentrations, representing the short-term (i.e., typically 1-hour average) level in air above which adverse effects may occur, were obtained from the published literature following HHRAP guidance. Table 6-3 presents the acute toxicity criteria currently available for the selected compounds and used in this risk assessment.

Table 6-1
Chronic Toxicity Criteria for Selected Compounds (a)

Chemical (CAS #)	Non-Cancer Toxicity Criteria					Cancer Toxicity Criteria				
	Chronic Oral Reference Dose (mg/kg/day)	Chronic Inhalation Reference Concentration (mg/m ³)	Safety Factor (oral/ inhalation) (b)	Toxicological Endpoint (oral/ inhalation)	Reference Dose/ Concentration Source	Oral Cancer Slope Factor (mg/kg/day) ⁻¹	Inhalation Cancer Unit Risk Factor (ug/m3) ⁻¹	Tumor Type or Target Tissue (oral/ inhalation)	USEPA Weight of Evidence (c)	Slope Factor and Unit Risk Factor Source
Ammonia (7664-41-7)	--	1E-01	-- / 30	-- / respiratory	IRIS	--	--	--	--	--
Arsenic (7440-38-2)	3.0E-04	1.5E-05 (g)	3 / 30	skin / developmental	IRIS/CALEPA	1.5E+00	4.3E-03	skin/lung	A	IRIS
Beryllium (7440-41-7)	2.0E-03	2.0E-05	300 / 10	intestinal / respiratory tract & sensitization	IRIS	--	2.4E-03	lung	B1	IRIS
Cadmium (7440-43-9) (diet)	1.0E-03	2.0E-05	10 / 30	proteinuria / kidney, respiratory	IRIS/CALEPA	--	1.8E-03	lung	B1	IRIS
Hydrogen chloride (HCl) (7647-01-0)	--	2.0E-02	-- / 300	-- / nasal, respiratory tract	IRIS	--	--	--	--	--
Hydrogen fluoride (HF) (7664-39-3)	4.0E-02	1.4E-02	1 / 10	bone, teeth / bone, teeth, respiratory	CALEPA	--	--	--	--	--
Lead (7439-92-1)	(d)	(d)	--	blood, neurological	--	--	--	--	B2	IRIS
Mercury										
Divalent (as mercuric chloride) (7487-94-7) (i)	3.0E-04	3.0E-04 (h)	1000 / 30	immunological / neurological	IRIS	--	--	--	C	IRIS
Elemental (7439-97-6)	(f)	3.0E-04	-- / 30	-- / neurological	IRIS	--	--	--	D	IRIS
Methyl (22967-92-6)	1.0E-04	--	10 / --	neurological & developmental / --	IRIS	--	--	--	C	IRIS
PCDDs/PCDFs (e)										
2,3,7,8-TCDD (1746-01-6)	(e)	(e)	--	--	--	1.5E+05	33	liver	B2	HHRAP/ HEAST
1,2,3,6,7,8-HxCDD (57653-85-7) & 1,2,3,7,8,9-HxCDD (19408-74-3)	(e)	(e)	--	--	--	6.2E+03	1.3	liver	B2	IRIS
Other 2,3,7,8-PCDD/ PCDF congeners	(e)	(e)	--	--	--	1.5E+05 * TEF	33 * TEF	--	--	--
Sulfuric acid (7664-93-9)	--	--	--	--	--	--	--	--	--	--

Table 6-1 (Continued)
Chronic Toxicity Criteria for Selected Compounds (a)

Notes for Toxicity Criteria Table

-- = No data available or not applicable.
 IRIS = Integrated Risk Information System
 TEF = 2,3,7,8-TCDD toxic equivalency factor

- (a) Hierarchy for chronic toxicity data, based on 2005 HHRAP: 1) EPA's Integrated Risk Information System (IRIS); 2) EPA's provisional peer-reviewed toxicity values (PPRTV) (as reported in USEPA Region 3's Regional Screening Level Table, April 2009, http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/Generic_Tables/pdf/master_sl_table_run_APRIL2009.pdf); 3) Other - a) CALEPA (California Environmental Protection Agency) chronic reference exposure level (REL) and unit risk factor (URF); b) Agency for Toxic Substances and Disease Registry (ATSDR) chronic minimum risk level (MRL); c) USEPA's 1997 Health Effects Assessment Summary Tables (HEAST).
- (b) Safety factors are the products of uncertainty factors and modifying factors. Uncertainty factors used to develop reference doses generally consist of multiples of 10, with each factor representing a specific area of uncertainty in the data available. The standard uncertainty factors include the following:
 A 10-fold factor to account for the variation in sensitivity among the members of the human population; a 10-fold factor to account for the uncertainty in extrapolating animal data to humans;
 a 10-fold factor to account for uncertainty in extrapolating from less than chronic NOAELs to chronic NOAELs; and a 10-fold factor to account for the uncertainty in extrapolating from LOAELs to NOAELs. Modifying factors are applied at the discretion of the reviewer to cover other uncertainties in the data.
- (c) USEPA Weight of evidence classification scheme for carcinogens:
 A--Human Carcinogen, sufficient evidence from human epidemiological studies; B1--Probable Human Carcinogen, limited evidence from epidemiological studies;
 B2--Probable Human Carcinogen, inadequate or no evidence from epidemiological studies and adequate evidence from animal studies;
 C--Possible Human Carcinogen, limited evidence in animals in the absence of human data; D--Not Classified as to human carcinogenicity; and E--Evidence of Noncarcinogenicity.
- (d) EPA has not developed a reference dose for lead. HHRAP recommends that the USEPA's integrated Exposure Uptake Biokinetic (IEUBK) model be used if calculated soil concentrations exceed a benchmark level of 400 mg/kg in soil.
- (e) The non-cancer effects of PCDDs/PCDFs are assessed by comparing the incremental exposures associated with stack emissions with typical background exposure values, in accordance with HHRAP.
- (f) HHRAP recommends that elemental mercury only be evaluated via the inhalation pathway.
- (g) The inhalation criterion was based on a drinking water study and was derived by CALEPA using route-to-route extrapolation.
- (h) The inhalation RfC for elemental mercury was used for divalent mercury.
- (i) Divalent mercury was evaluated as mercuric chloride, consistent with HHRAP guidance which notes that this compound is thought to be the dominant divalent species in emissions.

Table 6-2
Toxic Equivalency Factors (TEFs) for PCDDs/PCDFs
for the Human Health Risk Assessment

Compound Name	CAS #	Toxic Equivalency Factor (TEF) (a)
PCDDs		
TetraCDD, 2,3,7,8-	1746-01-6	1
PentaCDD, 1,2,3,7,8-	40321-76-4	1
HexaCDD, 1,2,3,4,7,8-	39227-28-6	0.1
HexaCDD, 1,2,3,6,7,8- (b)	57653-85-7	0.1
HexaCDD, 1,2,3,7,8,9 - (b)	19408-74-3	0.1
HeptaCDD, 1,2,3,4,6,7,8-	35822-46-9	0.01
OctaCDD, 1,2,3,4,6,7,8,9-	3268-87-9	0.0003
PCDFs		
TetraCDF, 2,3,7,8-	51207-31-9	0.1
PentaCDF, 1,2,3,7,8-	57117-41-6	0.03
PentaCDF, 2,3,4,7,8-	57117-31-4	0.3
HexaCDF, 1,2,3,4,7,8-	70648-26-9	0.1
HexaCDF, 1,2,3,6,7,8-	57117-44-9	0.1
HexaCDF, 1,2,3,7,8,9-	72918-21-9	0.1
HexaCDF, 2,3,4,6,7,8-	60851-34-5	0.1
HeptaCDF, 1,2,3,4,6,7,8-	67562-39-4	0.01
HeptaCDF, 1,2,3,4,7,8,9-	55673-89-7	0.01
OctaCDF, 1,2,3,4,6,7,8,9-	39001-02-0	0.0003

(a) Source: Van den Berg et al. (2006), USEPA (2009b).

Table 6-3
Acute Toxicity Criteria for Selected Compounds (a)

Chemical	Acute Reference Air Concentration (mg/m³)	Acute Reference Air Concentration Source	Safety Factor (b)	Toxicological Endpoint
Ammonia	3.2	CALEPA acute REL	3	eye & respiratory irritation
Arsenic	2E-04	CALEPA acute REL	1000	decreased fetal weight in mice
Beryllium	0.01	TEEL-1	--	--
Cadmium	0.03	TEEL-1	--	--
Hydrogen chloride (HCl)	2.1	CALEPA acute REL	1	respiratory system effects (sore throat, nasal discharge)
Hydrogen fluoride (HF)	0.24	CALEPA acute REL	10	eye & respiratory irritation
Lead	0.15	TEEL-1	--	--
Mercury (elemental)	6E-04	CALEPA acute REL	3000	nervous system effects in rat offspring
Mercury (divalent)	2.0	TEEL-1	--	--
PCDDs/PCDFs (as 2,3,7,8-TCDD)				
TetraCDD, 2,3,7,8-	0.0015	TEEL-1	--	--
PentaCDD, 1,2,3,7,8-	0.0025	TEEL-1	--	--
HexaCDD, 1,2,3,4,7,8-	0.00125	TEEL-1	--	--
HexaCDD, 1,2,3,6,7,8-	0.015	TEEL-1	--	--
HexaCDD, 1,2,3,7,8,9 -	0.015	TEEL-1	--	--
HeptaCDD, 1,2,3,4,6,7,8-	0.5	TEEL-1	--	--
OctaCDD, 1,2,3,4,6,7,8,9-	0.01	TEEL-1	--	--
TetraCDF, 2,3,7,8-	0.002	TEEL-1	--	--
PentaCDF, 1,2,3,7,8-	0.0075	TEEL-1	--	--
PentaCDF, 2,3,4,7,8-	0.0006	TEEL-1 (c)	--	--
HexaCDF, 1,2,3,4,7,8-	0.0075	TEEL-1	--	--
HexaCDF, 1,2,3,6,7,8-	0.0025	TEEL-1	--	--
HexaCDF, 1,2,3,7,8,9-	0.125	TEEL-1	--	--
HexaCDF, 2,3,4,6,7,8-	0.0015	TEEL-1	--	--
HeptaCDF, 1,2,3,4,6,7,8-	0.15	TEEL-1	--	--
HeptaCDF, 1,2,3,4,7,8,9-	0.25	TEEL-1	--	--
OctaCDF, 1,2,3,4,6,7,8,9-	0.0075	TEEL-1	--	--
Sulfuric acid	0.12	CALEPA acute REL	1	respiratory system effects (changes in airway function)

Notes to Toxicity Criteria Table

-- = No data available or not applicable.

(a) Acute toxicity criteria were obtained according to the data source hierarchy outlined in HHRAP, as follows: CALEPA acute reference exposure level (REL)(www.oehha.org/air/allrels.html); USEPA AEGL-1 (Level 1 acute exposure guideline levels for 1-hour exposure duration)(www.epa.gov/oppt/aegl/pubs/chemlist.htm); ERPG-1 (level 1 emergency response planning guideline level)(www.aiha.org/1documents/committees/ERP-erpglevels.pdf); and TEEL-1 (Level 1 temporary emergency exposure limits)(www.atlintl.com/DOE/teels/teel.html).

(b) Safety factors are the products of uncertainty factors and modifying factors. Uncertainty factors generally consist of multiples of 10, with each factor representing a specific area of uncertainty in the data available.

(c) The TEEL-1 for 2,3,4,7,8-PentaCDF was based on a revised value to be published in PAC/TEEL Revision 26 (Email communication from D. Freshwater, Department of Energy, Office of Emergency Operations, to S. Foster, CPF Associates. Re: Request for TEEL review. June 15, 2010.)

6.2 Exposure Assessment

In a risk assessment, exposure is defined as contact between an organism or receptor and a chemical of potential concern. The key steps involved in a combustion source exposure assessment consist of:

- Calculation of stack emission rates
- Air dispersion and deposition modeling
- Population analysis
- Identification of exposure pathways
- Evaluation of environmental concentrations
- Calculation of human exposures

A brief discussion of each of these steps is provided below.

6.2.1 Emission Rates

One of the most important inputs to a combustion source exposure assessment is the chemical emission rate. In this risk assessment, emission rates were developed by Malcolm Pirnie for both the Proposed Facility stack and the Existing Facility stack.

One set of emission rates was developed for each evaluated stack for the chronic long-term risk assessment calculations, as shown in Table 6-4. More detailed documentation of the emission rates is provided in Appendix B. These emission rates were generally intended to reflect actual long-term operating conditions, dependant on the availability of applicable data. For the Proposed Facility, the long-term emission rates were based on measured stack exhaust data from similar facilities for PCDDs/PCDFs and mercury and, for the other compounds, proposed permit limits for this facility or permit limits in place at the Lee County, Florida WTE plant. For the Existing Facility, the long-term emission rates were based on projected actual emissions documented by Malcolm Pirnie (2009) or, in the absence of such data, average measured or expected concentrations from the Existing Facility adjusted to reflect the operation of new air pollution control equipment, or the permit limit in place at the Miami-Dade RDF facility.

A separate set of emission rates were developed for each evaluated stack for the acute short-term risk assessment, as shown in Table 6-5. Details about these emission rates are provided in Appendix B. The short-term emission rates were generally intended to reflect maximum plausible short-term emissions associated with normal facility operations. For the Proposed Facility, the short-term emission rates were based on proposed permit limits, or in their absence, permit limits in place at the Lee County, Florida WTE facility. For the Existing Facility, the short-term emission rates were based on existing permit limits and maximum allowable emission levels or, in their absence, maximum expected stack concentrations taking into account the new air pollution control equipment or the permit limit in place at the Miami-Dade RDF facility.

Stack emission rates for mercury required for the HHRAP risk calculations addressed three forms of mercury - particulate phase divalent mercury, vapor phase divalent mercury and vapor phase elemental mercury. The partitioning of mercury emissions between the three forms was based on stack test data for the Existing Facility and on USEPA guidance (2001a, 2005) for the Proposed Facility, as described in the emission rate tables and in Appendix B.

Table 6-4
Chemical Emission Rates Used in the Chronic Multipathway Human Health Risk Assessment

Chemical	Chemical Emission Rate (g/sec)	
	Proposed WTE Facility (a)	Refurbished RDF Facility (b)
Ammonia	1.33	1.03
Arsenic	1.34E-03	9.07E-04
Beryllium	1.99E-05	7.37E-06
Cadmium	1.26E-03	7.62E-04
Lead	1.76E-02	0.023
Hydrogen chloride	3.81	1.9
Hydrogen fluoride	0.37	0.06
Mercury		
Total mercury	1.51E-03	3.40E-04
Total mercury: locally available (c)	3.71E-04	7.99E-05
Divalent (vapor phase): locally available (c)	3.08E-04	7.61E-05
Divalent (particulate phase): locally available (c)	5.43E-05	1.55E-06
Elemental: locally available (c)	9.05E-06	2.24E-06
PCDDs/PCDFs (d)		
2,3,7,8-TCDD	1.46E-09	2.73E-09
1,2,3,7,8-PeCDD	5.02E-09	4.94E-09
1,2,3,4,7,8-HxCDD	5.20E-09	2.07E-09
1,2,3,6,7,8-HxCDD	1.20E-08	3.23E-09
1,2,3,7,8,9-HxCDD	1.35E-08	4.17E-09
1,2,3,4,6,7,8-HpCDD	7.67E-08	1.20E-08
OCDD	1.52E-07	1.93E-08
2,3,7,8-TCDF	8.65E-09	4.59E-08
1,2,3,7,8-PeCDF	1.63E-08	1.51E-08
2,3,4,7,8-PeCDF	2.03E-08	1.69E-08
1,2,3,4,7,8-HxCDF	3.73E-08	2.43E-08
1,2,3,6,7,8-HxCDF	2.06E-08	1.45E-08
2,3,4,6,7,8-HxCDF	3.37E-09	1.12E-08
1,2,3,7,8,9-HxCDF	2.28E-08	1.61E-09
1,2,3,4,6,7,8-HpCDF	8.73E-08	3.03E-08
1,2,3,4,7,8,9-HpCDF	9.72E-09	3.38E-09
OCDF	3.36E-08	7.41E-09
Total for 2,3,7,8-PCDDs/PCDFs	5.26E-07	2.19E-07
Total for all PCDDs/PCDFs (e)	1.43E-06	1.02E-06
Sulfuric acid	2.56	1.99

(a) The emission rates for the proposed WTE facility reflect total emissions from three 1,000 ton per day MSW combustion units. The emission rates are based on proposed permit limits for all compounds except the following: arsenic and beryllium values are based on permit limits at the Lee County, FL WTE facility; total mercury is based on the average concentration from 3 years of representative available stack test data from Florida facilities; and PCDDs/PCDFs are based on the average concentration from stack test data (1994-2001) from the Lee County, FL WTE facility.

(b) The emission rates for the refurbished RDF facility reflect total emissions from two units each with a design capacity of approximately 900 ton per day of RDF. The emission rates are based on projected actual emissions for the refurbished RDF facility as documented in the June 2009 RAI submittal to FDEP for the refurbishment project (Malcolm Pirnie's submittal dated June 30, 2009 to the FDEP concerning the Request for Additional Information on the permit application for the North County Resource Recovery Facility Refurbishment Project), except for the following: the arsenic value is based on the permit limit for the Miami-Dade RDF unit; values for PCDDs/PCDFs and mercury are based on the average concentration from 5 years (2004-2008) of stack test data adjusted to reflect the operation of new air pollution control equipment; and the emission rates for ammonia and sulfuric acid reflect maximum expected concentrations based on the operation of new air pollution control equipment.

(c) Mercury emissions assumed to remain locally available for input to the risk analysis were calculated based on the assumed speciation of mercury in the stack gas plus USEPA guidance on the portion of each species expected to remain locally available. Based on data in U.S. EPA's Mercury Report to Congress for large municipal waste combustors, total mercury emissions in the proposed WTE facility were assumed to be comprised of 60% elemental mercury, 30% divalent vapor phase mercury and 10% divalent particle phase mercury. The breakdown for the refurbished RDF was based on stack test data (66% elemental mercury, 33% divalent vapor phase mercury and 1% divalent particle phase mercury). Additionally, the percent of each species not expected to enter the global mercury cycle and thus be available for local impacts was identified, per HHRAP Figure 2-4, as 1% for elemental mercury, 68% for divalent vapor phase mercury, and 36% for divalent particle phase mercury. For example, the fraction of total mercury expected to remain locally available was calculated, for the proposed WTE facility, as:

$$[(0.68 \times 30\%) + (0.36 \times 10\%) + (0.01 \times 60\%)] / 100\% = 0.246$$

(d) The congener-specific PCDD/PCDF emission rates were calculated from total PCDD/PCDF emission rates and a fractional distribution of congeners for each facility. The congener distribution for the proposed WTE facility was based on an average of test data (from 1994-2001) from the Lee County, FL WTE facility. The congener distribution for the refurbished RDF facility was based on 5 years of stack test data (2004-2008).

(e) Includes all congeners (i.e., non-2,3,7,8-congeners as well as 2,3,7,8-congeners).

Table 6-5
Chemical Emission Rates Used in the Acute Human Health Risk Assessment

Chemical	Chemical Emission Rate (g/sec)	
	Proposed WTE Facility (a)	Refurbished RDF Facility (b)
Ammonia	1.57	1.22
Arsenic	1.58E-03	1.07E-03
Beryllium	2.34E-05	8.29E-05
Cadmium	1.48E-03	4.00E-03
Lead	2.07E-02	0.045
Hydrogen chloride	4.48	4.35
Hydrogen fluoride	0.43	0.36
Mercury		
Total mercury	3.70E-03	2.92E-03
Total mercury: locally available (c)	9.09E-04	6.86E-04
Divalent (vapor phase): locally available (c)	7.54E-04	6.53E-04
Divalent (particulate phase): locally available (c)	1.33E-04	1.33E-05
Elemental: locally available (c)	2.22E-05	1.92E-05
PCDDs/PCDFs (d)		
2,3,7,8-TCDD	1.96E-09	8.39E-09
1,2,3,7,8-PeCDD	6.73E-09	1.52E-08
1,2,3,4,7,8-HxCDD	6.98E-09	6.35E-09
1,2,3,6,7,8-HxCDD	1.61E-08	9.93E-09
1,2,3,7,8,9-HxCDD	1.81E-08	1.28E-08
1,2,3,4,6,7,8-HpCDD	1.03E-07	3.70E-08
OCDD	2.04E-07	5.92E-08
2,3,7,8-TCDF	1.16E-08	1.41E-07
1,2,3,7,8-PeCDF	2.19E-08	4.65E-08
2,3,4,7,8-PeCDF	2.73E-08	5.19E-08
1,2,3,4,7,8-HxCDF	5.00E-08	7.46E-08
1,2,3,6,7,8-HxCDF	2.77E-08	4.45E-08
2,3,4,6,7,8-HxCDF	4.52E-09	3.43E-08
1,2,3,7,8,9-HxCDF	3.05E-08	4.96E-09
1,2,3,4,6,7,8-HpCDF	1.17E-07	9.30E-08
1,2,3,4,7,8,9-HpCDF	1.30E-08	1.04E-08
OCDF	4.50E-08	2.28E-08
Total for 2,3,7,8-PCDDs/PCDFs	7.06E-07	6.73E-07
Total for all PCDDs/PCDFs (e)	1.92E-06	3.12E-06
Sulfuric acid	3.01	2.34

(a) The emission rates for the proposed WTE facility reflect total emissions from three 1,000 ton per day MSW combustion units. The emission rates are based on proposed permit limits for all compounds except the following: arsenic and beryllium values are based on permit limits at the Lee County, FL WTE facility.

(b) The emission rates for the refurbished RDF facility reflect total emissions from two units each with a design capacity of approximately 900 ton per day of RDF. The emission rates are based on applicable permit limits at the existing facility except for the following: the arsenic value is based on the permit limit for the Miami-Dade RDF unit; values for PCDDs/PCDFs and mercury are based on maximum allowable emission levels; and values for sulfuric acid and ammonia reflect maximum expected stack concentrations based on the operation of new air pollution control equipment.

(c) Mercury emissions assumed to remain locally available for input to the risk analysis were calculated based on the assumed speciation of mercury in the stack gas plus USEPA guidance on the portion of each species expected to remain locally available. Based on data in U.S. EPA's Mercury Report to Congress for large municipal waste combustors, total mercury emissions in the proposed WTE facility were assumed to be comprised of 60% elemental mercury, 30% divalent vapor phase mercury and 10% divalent particle phase mercury. The breakdown for the refurbished RDF was based on stack test data (66% elemental mercury, 33% divalent vapor phase mercury and 1% divalent particle phase mercury). Additionally, the percent of each species not expected to enter the global mercury cycle and thus be available for local impacts was identified, per HHRAP Figure 2-4, as 1% for elemental mercury, 68% for divalent vapor phase mercury, and 36% for divalent particle phase mercury. For example, the fraction of total mercury expected to remain locally available was calculated, for the proposed WTE facility, as:

$$[(0.68 \times 30\%) + (0.36 \times 10\%) + (0.01 \times 60\%)] / 100\% = 0.246$$

(d) The congener-specific PCDD/PCDF emission rates were calculated from total PCDD/PCDF emission rates and a fractional distribution of congeners for each facility. The congener distribution for the proposed WTE facility was based on an average of test data (from 1994-2001) from the Lee County, FL WTE facility. The congener distribution for the refurbished RDF facility was based on 5 years of stack test data (2004-2008).

(e) Includes all congeners (i.e., non-2,3,7,8-congeners as well as 2,3,7,8-congeners).

6.2.2 Air Dispersion and Deposition Modeling

Air dispersion and deposition modeling is required in order to calculate chemical concentrations and ultimately human exposures from stack emissions. The air dispersion and deposition modeling was conducted by Malcolm Pirnie using the USEPA-approved AERMOD model. The modeling addressed emissions from both the Existing Facility stack and the Proposed Facility stack. The air dispersion and deposition modeling was consistent with guidance provided in Chapter 3 of USEPA's HHRAP guidance document.

The remainder of this section focuses on general model application issues and incorporation of modeling results into the risk assessment. An air dispersion and deposition modeling protocol specifically addressing the risk assessment and prepared by Malcolm Pirnie is included as Appendix C to this document. This appendix provides additional details about the modeling conducted for this project.

6.2.2.1 Model Application

The general application of modeling results in the risk assessment is summarized below:

- Long-term chronic risks were calculated using annual average modeling results. Annual average ambient air concentrations and annual average deposition rates (wet and dry for both vapor phase and particle phase emissions) were used to calculate concentrations in a variety of environmental media relevant to the risk assessment.
- Short-term acute inhalation risks were calculated using 1-hour average ambient air modeling results.

Stack Input Parameters and Meteorological Data

The modeling for the chronic risk assessment for the Proposed Facility relied on stack gas exhaust assumptions (e.g., stack gas exit velocity, stack gas exit temperature) that reflect actual anticipated long-term facility operating conditions. Modeling for the acute risk assessment for the Proposed Facility was performed using the highest off-site short-term 1-hour average modeled impacts determined from a worst-case operating scenario analysis which evaluated a set of plausible stack gas exhaust parameters provided in the PSD permit application. Modeling for the Existing Facility was conservatively based on the operating parameters from the facility's air permit.

Five years of meteorological data, from 2001 through 2005, were used in the AERMOD modeling. These data included hourly surface measurements obtained from the Palm Beach International Airport and upper air data from Florida International University, Miami. Palm Beach International Airport is the nearest National Weather Service (NWS) station to the site (approximately 6.9 miles southeast of the facility location).

In accordance with HHRAP, the air dispersion and deposition modeling was performed using a unitized 1 gram per second (1 g/sec) emission rate for each evaluated stack. Using this unitized emissions approach, the model output is expressed in units of micrograms per cubic meter of air ($\mu\text{g}/\text{m}^3$) per 1 g/sec for air concentrations and grams per square meter per year ($\text{g}/\text{m}^2\text{-year}$) per 1 g/sec for deposition rates. Chemical-specific results can then be calculated by multiplying the unitized model output by the chemical-specific emission rates.

Deposition Modeling

Both dry and wet deposition are important components in the facility risk assessment. The risk assessment considered four possible sources of deposition, consistent with HHRAP:

- Dry deposition of particles
- Wet deposition of particles
- Dry deposition of gases
- Wet deposition of gases

Particle Phase Deposition Modeling:

Wet and dry deposition modeling of particles requires information on the size distribution of emitted particles from the stacks. These particle size distributions were identified by Malcolm Pirnie and are included in the air modeling protocol appendix. Consistent with USEPA HHRAP guidance, a mass-weighted particle size distribution was used to represent emissions of metals (except mercury) that would form particles in the combustion zone, while a surface area-weighted particle size distribution was used to reflect organic compounds and mercury that most likely exit the combustion area as gases and then adsorb onto the surface of already-formed particles. The AERMOD-calculated particle phase deposition rates are then imported into IRAP for the indirect exposure pathway risk calculations (i.e., ingestion pathway risks).

Vapor Phase Deposition Modeling:

The AERMOD model requires input of four chemical-specific parameters that are used in algorithms to calculate vapor phase deposition rates. These chemical-specific parameters consist of: diffusivity in air (D_a), diffusivity in water (D_w), cuticular resistance (r_{cl}) and Henry's law constant (H). The AERMOD-calculated vapor phase deposition rates are then imported into IRAP for the indirect exposure pathway risk calculations.

The HHRAP risk assessment methodology, and the IRAP software, were both developed assuming input of only two sets of vapor phase modeling results, one representing mercury and one representing all other vapor phase compounds. The vapor phase input data options in IRAP thus only allow for two sets of modeled results and can only provide two chemical-specific vapor phase modeling outputs.

Consistent with HHRAP guidance and the capabilities of the IRAP software, two sets of chemical-specific parameters were input to AERMOD for import to the IRAP software, one set for mercury and the other for a surrogate compound selected to represent vapor phase compounds other than mercury. For mercury, the chemical-specific inputs to AERMOD for use in the IRAP software were based on divalent mercury because preliminary AERMOD modeling showed much higher vapor phase deposition rates for divalent mercury than for elemental mercury. An additional mercury AERMOD run was also performed using chemical-specific inputs for elemental mercury for use in the SERAFM mercury water body model.

The surrogate compound to represent vapor phase constituents other than mercury was selected based on USEPA's sensitivity analyses of AERMOD to chemical-specific inputs (USEPA 2007), a previous risk assessment that addressed this issue (MPCA 2006), chemical-specific properties provided in USEPA guidance (Wesely et al. 2002) and the importance of indirect versus inhalation exposure pathways for each selected compound. USEPA's AERMOD sensitivity analysis demonstrated that wet and dry vapor phase deposition rates can vary substantially across a range of evaluated compounds. Among the list of

selected compounds for the this Analysis, vapor phase compounds other than mercury that are important via indirect pathways are PCDDs/PCDFs. The other selected compounds either are not present to an appreciable degree in the vapor phase (arsenic, beryllium, cadmium and lead) or are only important via the inhalation pathway of exposure (acid gases and ammonia). Therefore, the surrogate compound was selected from among the PCDD/PCDF congeners. The selection of a surrogate compound was previously addressed in a risk assessment for a proposed WTE facility in Minnesota (MPCA 2006). In that project, an AERMOD sensitivity analysis showed that larger values for diffusivity in air and water (i.e., larger D_a and D_w) and lower values for the Henry's law constant (i.e., smaller H) resulted in greater vapor phase deposition rates. The modeled deposition rates were not sensitive to cuticular resistance values (i.e., r_{cl} values). Table 6-6 presents the necessary AERMOD chemical-specific parameter values as well as the vapor phase fractions for each PCDD/PCDF congener (since indirect exposure pathway risks tend to increase with decreasing vapor phase fractions). In order to select a surrogate PCDD/PCDF congener, a metric taking into account these parameters was calculated,¹⁹ the resulting metric values were ranked from largest to smallest, and then the compound with the highest value for the calculated metric which also has a published value for r_{cl} was selected, as shown in Table 6-6. Using this method, the selected PCDD/PCDF congener for the AERMOD modeling was 2,3,7,8-TCDD.

The chemical-specific input parameters that were used in the AERMOD modeling are summarized in Table 6-7.

Modeled Receptor Grid

The dispersion/deposition modeling was performed across an area that extends out 10 km (6.2 miles) from the facility in the north, south, east and west cardinal directions; this produces a 20 km-by-20 km square study area with the Proposed Facility stack at its center. This modeling domain is not only recommended in HHRAP but also is reflective of results from other combustion source modeling exercises which show that maximum air impacts generally occur within the first 3 km downwind of the stack and maximum deposition impacts (i.e., wet plus dry deposition) occur within 1 km of the stack.

6.2.2.2 Model Outputs

The AERMOD dispersion/deposition modeling runs provided many different types of annual average unitized outputs (i.e., outputs based on a 1 g/sec stack gas emission rate) that were used in the risk calculations, as follows:

- Ambient air concentrations
 - Ambient air concentrations of mass-weighted particles
 - Ambient air concentrations of surface area-weighted particles
 - Ambient air concentrations of vapors
 - Ambient air concentrations of mercury vapor (divalent)
 - Ambient air concentrations of mercury vapor (elemental)

¹⁹ Metric = $D_a * D_w * \text{vapor phase fraction} / H$

Table 6-6
Chemical-Specific Parameter Values for PCDD/PCDF Congeners
Considered for the AERMOD Modeling

Compound Name	CAS #	Diffusivity in Air (D_a) (cm ² /sec)	Diffusivity in Water (D_w) (cm ² /sec)	Henry's law constant (H) (atm-m ³ /mol)	Cuticular Resistance (r_{cl}) (sec/cm)	Vapor Phase Fraction (fr) (unitless)	Calculated Ranking Metric ($D_a * D_w * fr / H$)
PentaCDD, 1,2,3,7,8-	40321-76-4	9.9E-02	8.0E-06	2.60E-06	--	0.12	3.6E-02
TetraCDD, 2,3,7,8-	1746-01-6	1.0E-01	5.6E-06	3.29E-05	7.84	0.66	1.2E-02
PentaCDF, 1,2,3,7,8-	57117-41-6	2.2E-02	8.0E-06	5.00E-06	--	0.27	9.6E-03
PentaCDF, 2,3,4,7,8-	57117-31-4	2.2E-02	8.0E-06	4.98E-06	3.99	0.22	7.9E-03
TetraCDF, 2,3,7,8-	51207-31-9	2.4E-02	6.0E-06	1.44E-05	9.67	0.77	7.6E-03
HexaCDD, 1,2,3,6,7,8-	57653-85-7	9.4E-02	8.0E-06	1.10E-05	--	0.029	2.0E-03
HexaCDD, 1,2,3,4,7,8-	39227-28-6	9.4E-02	8.0E-06	1.07E-05	1.2	0.024	1.7E-03
HexaCDF, 1,2,3,7,8,9-	72918-21-9	2.1E-02	8.0E-06	1.10E-05	--	0.09	1.4E-03
HexaCDF, 1,2,3,6,7,8-	57117-44-9	2.1E-02	8.0E-06	7.31E-06	NA	0.052	1.2E-03
HexaCDD, 1,2,3,7,8,9 -	19408-74-3	9.4E-02	8.0E-06	1.10E-05	--	0.016	1.1E-03
HexaCDF, 2,3,4,6,7,8-	60851-34-5	2.1E-02	8.0E-06	1.10E-05	--	0.055	8.5E-04
HeptaCDF, 1,2,3,4,7,8,9-	55673-89-7	2.0E-02	8.0E-06	1.40E-05	NA	0.057	6.6E-04
HexaCDF, 1,2,3,4,7,8-	70648-26-9	2.1E-02	8.0E-06	1.43E-05	11.1	0.049	5.8E-04
OctaCDD, 1,2,3,4,6,7,8,9-	3268-87-9	8.7E-02	8.0E-06	6.75E-06	4.94	0.002	2.1E-04
HeptaCDD, 1,2,3,4,6,7,8-	35822-46-9	9.0E-02	8.0E-06	1.20E-05	0.597	0.003	1.8E-04
OctaCDF, 1,2,3,4,6,7,8,9-	39001-02-0	1.9E-02	8.0E-06	1.88E-06	1.42	0.002	1.7E-04
HeptaCDF, 1,2,3,4,6,7,8-	67562-39-4	2.0E-02	8.0E-06	1.41E-05	12.7	0.01	1.2E-04
Data Source:		HHRAP 2005 (Appendix A-2)	HHRAP 2005 (Appendix A-2)	HHRAP 2005 (Appendix A-2)	Wesely et al. 2002 (Tables D.4 & D.5)	HHRAP 2005 (Appendix A-2)	Calculated

-- = Parameter value not available.

Table 6-7
Chemical-Specific Parameter Values Selected for Input to the AERMOD Modeling

Compound Name	CAS #	Diffusivity in Air (D_a) (cm ² /sec)	Diffusivity in Water (D_w) (cm ² /sec)	Henry's law constant (H) (atm-m ³ /mol)	Cuticular Resistance (r_{ci}) (sec/cm)
Surrogate compound for PCDDs/PCDFs (2,3,7,8-TCDD)	1746-01-6	0.10	5.6E-06	3.3E-05	7.84
Divalent mercury (mercuric chloride)	7487-94-7	0.045	5.20E-06	7.10E-10	1.00E+05
Elemental mercury	7439-97-6	0.011	3.0E-05	7.1E-03	1.00E+05
Data Source:		HHRAP 2005 (Appendix A-2)	HHRAP 2005 (Appendix A-2)	HHRAP 2005 (Appendix A-2)	Wesely et al. 2002 (Table D.4 for TCDD and Table 7 for mercury)

- Dry deposition rates
 - o Dry deposition of mass-weighted particles
 - o Dry deposition of surface area-weighted particles
 - o Dry deposition of vapors
 - o Dry deposition of mercury vapor (divalent)
 - o Dry deposition of mercury vapor (elemental)
- Wet deposition rates
 - o Wet deposition of mass-weighted particles
 - o Wet deposition of surface area-weighted particles
 - o Wet deposition of vapors
 - o Wet deposition of mercury vapor (divalent)
 - o Wet deposition of mercury vapor (elemental)

In addition, the dispersion/deposition modeling runs also provided several different types of 1-hour average unitized outputs (i.e., outputs based on a 1 g/sec stack gas emission rate) that were used in the short-term acute risk calculations, as follows:

- Ambient air concentrations of mass-weighted particles
- Ambient air concentrations of surface area-weighted particles
- Ambient air concentrations of vapors
- Ambient air concentrations of mercury vapor (divalent)
- Ambient air concentrations of mercury vapor (elemental)

Selected examples of isopleths illustrating the unitized modeling output for each evaluated stack are provided in Appendix D. These isopleths show that maximum annual average concentrations and deposition rates for both facilities occur to the west of the site, generally within about 0.5 miles (0.8 km). Maximum 1-hour air concentrations for the Proposed Facility occur within about 0.4 miles (0.64 km) to the north and at about 1.2 miles (2 km) to the south-southeast. Maximum 1-hour air concentrations for the Existing Facility occur within about 0.5 miles (0.8 km) to the north and south, and about 1.2 miles (2 km) to the south-southeast.

6.2.3 Population Analysis

The next step in the exposure assessment involved identifying populations in the facility area through demographic and land use data, and information on population activity patterns. This information has been summarized in Section 4.2.2 above.

6.2.4 Identification of Exposure Pathways

The next exposure assessment step was the selection of a set of receptors and exposure pathways for evaluation in the risk assessment. Potential exposures were calculated for several different types of individuals who could hypothetically be exposed to emissions, following HHRAP guidance: adult and child residents, adult and child residents assumed to eat fish caught from nearby water bodies, adult and child farmers, and a nursing infant. In risk assessment terminology, these groups of individuals are known as “receptors”. Each adult or child receptor was assumed to be exposed through a variety of pathways that were selected based on site-specific information as well as HHRAP guidance. The HHRAP guidance includes the following default exposure pathways: inhalation of air; ingestion of soil, produce, beef, poultry, eggs, fish, dairy milk, and pork; and ingestion of breast-milk by an infant.

Based on the information discussed above related to land uses and local population activity patterns, in addition to HHRAP guidance regarding default exposure pathways, a matrix of exposure pathways and human receptors was identified for this risk assessment. This matrix, shown in Table 6-8, includes the following components:

- The selected exposure pathways consist of: inhalation, incidental ingestion of soil, ingestion of different types of local foods (homegrown produce, locally-caught fish, locally-raised beef, locally-raised poultry, locally-produced eggs, and locally-raised pork), and ingestion of breast milk. These pathways are either known to occur in the area or are specified as default exposure pathways in HHRAP that could potentially occur in the Proposed Facility area.²⁰
- Three hypothetical resident receptors were selected based on the maximum impact locations in three residential areas to the north, southeast and west of the Proposed Facility. These receptors are located in the residential areas where the highest annual average air and deposition impacts were predicted to occur. Two of these receptors are located in the residential areas closest to the facility: the Iron Horse Development to the north and the multi-family residential area to the southeast. The third receptor is located in a residential area bordering the far side of the WCA to the west of the Proposed Facility. These receptors are referred to as “RES_1” (north of facility), “RES_2” (southeast of facility), and “RES_3” (west of facility) in this Analysis. Potential air and deposition impacts were lower in all other areas that are currently or could potentially be used for residential purposes and thus selection of these locations is expected to provide a conservative estimate of potential residential risks.²¹ The resident receptors were assumed to be exposed via inhalation, incidental soil ingestion and homegrown produce ingestion, consistent with HHRAP.
- Three hypothetical fisher receptors were evaluated, as described below. The fisher receptors were assumed to be exposed via fish ingestion.
 - Three different water bodies, illustrated in Figure 6-1, were selected to evaluate the fish ingestion pathway based on a variety of criteria, including proximity to the Proposed Facility, dispersion and deposition modeling results, past observations or knowledge of water bodies use for fishing, water body flow characteristics, and ease of public accessibility to local water bodies for fishing. Based on this information, the three selected water bodies were Iron Horse Lake, the M Canal and a nearby roadside canal.

²⁰ Dairy milk ingestion was not included because County agricultural data and the windshield surveys showed no dairy farms within 10 km of the facility site.

²¹ Maximum impact locations in residential areas were determined by examining the AERMOD isopleths that illustrated both unitized air concentrations and unitized deposition rates (see Appendix D) and also the detailed AERMOD results. This examination showed that maximum annual average unitized air concentrations and unitized total deposition rates occurred at the same modeled location for each stack within each of the three residential areas.

Table 6-8
Matrix of Exposure Pathways and Receptors
Evaluated in the Multiple Pathway Human Health Risk Assessment

Receptor	Adult and Child Resident (a)			Adult and Child Fisher			Adult and Child Farmer	Breast-Fed Infant (b)
Location	North of facility	Southeast of facility	West of facility	Iron Horse Lake	M Canal	Nearby Roadside Canal	Maximum impact farm location	Evaluated at the location of each adult receptor
Receptor ID	RES_1	RES_2	RES_3	FISH_1	FISH_2	FISH_3	FARMER	
Exposure Pathway								
<i>Chronic Long-Term Exposure</i>								
Inhalation	✓	✓	✓				✓	
Incidental Soil Ingestion	✓	✓	✓				✓	
Ingestion of Homegrown Produce	✓	✓	✓				✓	
Ingestion of Locally-Caught Fish from Iron Horse Lake				✓				
Ingestion of Locally-Caught Fish from the M Canal					✓			
Ingestion of Locally-Caught Fish from Nearby Roadside Canal						✓		
Ingestion of Locally-Raised Beef							✓	
Ingestion of Locally-Raised Poultry							✓	
Ingestion of Locally-Produced Eggs							✓	
Ingestion of Locally-Raised Pork							✓	
Ingestion of Breast-milk								✓
<i>Acute Short-Term Exposure</i>								
Inhalation	✓	✓	✓				✓	

(a) The residential receptors were located at the maximum impact modeled grid points within each of the three evaluated residential areas.

(b) A breast-fed infant exposure to PCDDs/PCDFs was evaluated for each adult receptor consistent with HHRAP guidance.

Figure 6-1
Water Bodies Evaluated for the Fish Ingestion Exposure Pathway



IRAP-h View - Lakes Environmental Software

- O Iron Horse Lake is the closest lake to the Proposed Facility beyond the Authority's Energy Park with the highest potential deposition impacts. While Iron Horse Lake may be used occasionally for recreational fishing purposes, it is not accessible to the general public (i.e., it is restricted to residents of the Iron Horse development) and fish caught from this lake are not known to be ingested. It was included in this assessment, however, to represent a typical lake with little water flow that could be used for fishing in the facility vicinity where potential facility impacts are expected to be greater than for other more distant lakes. The receptor assumed to fish from Iron Horse Lake was also assumed to reside in the Iron Horse development. This receptor is referred to as "FISH_1" in this report.
- O Canals are prevalent throughout the West Palm Beach area and may be used for fishing. The M Canal is the largest actively-managed canal in the facility vicinity and is known to be used for recreational fishing, and thus it was also selected for detailed evaluation. In addition, a nearby segment of a smaller canal bordering the Florida Turnpike, referred to as the "roadside canal", was selected for inclusion in the risk assessment. A smaller canal was selected since these types of water bodies are also known to be fished and they have lower flow rates, and thus potentially higher emissions-related impacts, than larger managed canals such as the M Canal. The specific segment of roadside canal selected for this evaluation was located along the Florida Turnpike immediately southeast of the Energy Park. This segment was selected based on an evaluation of deposition modeling results, because this section of the canal, compared to other locations closer to the Proposed Facility is wider, deeper, and more accessible, thus making it more attractive for fishing, and because fishing activity has been observed in this segment but not in other canal areas closer to the Proposed Facility.²² These receptors are referred to as "FISH_2" for the M Canal and "FISH_3" for the roadside canal.
- O The plausibility of the three selected fish ingestion pathways is related to, among other factors, the likelihood that fish caught in these water bodies would in fact routinely be ingested. There is no data or evidence indicating that fish caught from any of these water bodies is routinely ingested. For the purposes of this assessment, however, it was hypothetically assumed that each of these water bodies would provide a regular supply of locally-caught fish for human consumption. This assumption is not realistic for the roadside canal and possibly for Iron Horse Lake, since these water bodies are unlikely to be capable of providing a steady quantity of fish for consistent yearlong household consumption. Additionally, for each water body, the HHRAP default ingestion rate assumptions were used (i.e., ingestion of ¼ pound of fish, 5.4 times per week for an adult and 0.8 times per week for a child, every week of the year). This overall approach for the fish ingestion scenarios is expected to overestimate potential risks associated with this exposure pathway. It also ensures that the potential impact of stack emissions on fish caught from other more distant water bodies, where potential facility impacts would be lower, are addressed.

²² Sources: Personal communication with Malcolm Pirnie and observations from Malcolm Pirnie June 2008 windshield survey.

- A farmer receptor was also evaluated. The location for this receptor was based on the maximum impacts modeled among the several residential farms where livestock or evidence of livestock farming was observed during the Malcolm Pirnie windshield surveys. The selected location is about 6 miles (9.6 km) to the west of the Proposed Facility. The farmer receptor was hypothetically assumed to be exposed simultaneously via numerous pathways: inhalation, incidental soil ingestion, ingestion of homegrown produce, and ingestion of locally-raised beef, locally-raised poultry, locally-produced eggs and locally-raised pork. This scenario is likely to provide a conservative estimate of potential risks because there is no indication that all of these animal products are routinely ingested by residents at any of the farm locations in the vicinity of the Proposed Facility. The designation for this receptor in this report is "FARMER."
- A breast-fed infant was also selected as a hypothetical receptor, consistent with HHRAP guidance. Each of the adult receptors was assumed to be the mother of a breast-fed infant.

Figure 6-2 illustrates the locations of the residential and farmer receptors selected for detailed evaluation in this risk assessment.

In addition to the exposure pathways listed in Table 6-8, the drinking water pathway was also addressed in the risk assessment. As noted earlier in this report, the M Canal and the WCA supply water to the City of Palm Beach water treatment plant, but neither of these water bodies is directly used for drinking water. As a result, a different methodology was used to address drinking water rather than the quantitative multi-pathway risk assessment used for the other selected exposure pathways. The drinking water pathway was addressed by comparing modeled chemical concentrations in the M Canal and the WCA, both of which are classified as Class I water bodies, to Florida Class I surface water quality standards which apply to drinking water. These are the same standards that Florida applies to treated drinking water supplies. This comparison is provided later in this report in the Ecological Risk Assessment section (Section 7.4).

6.2.5 Calculation of Environmental Concentrations

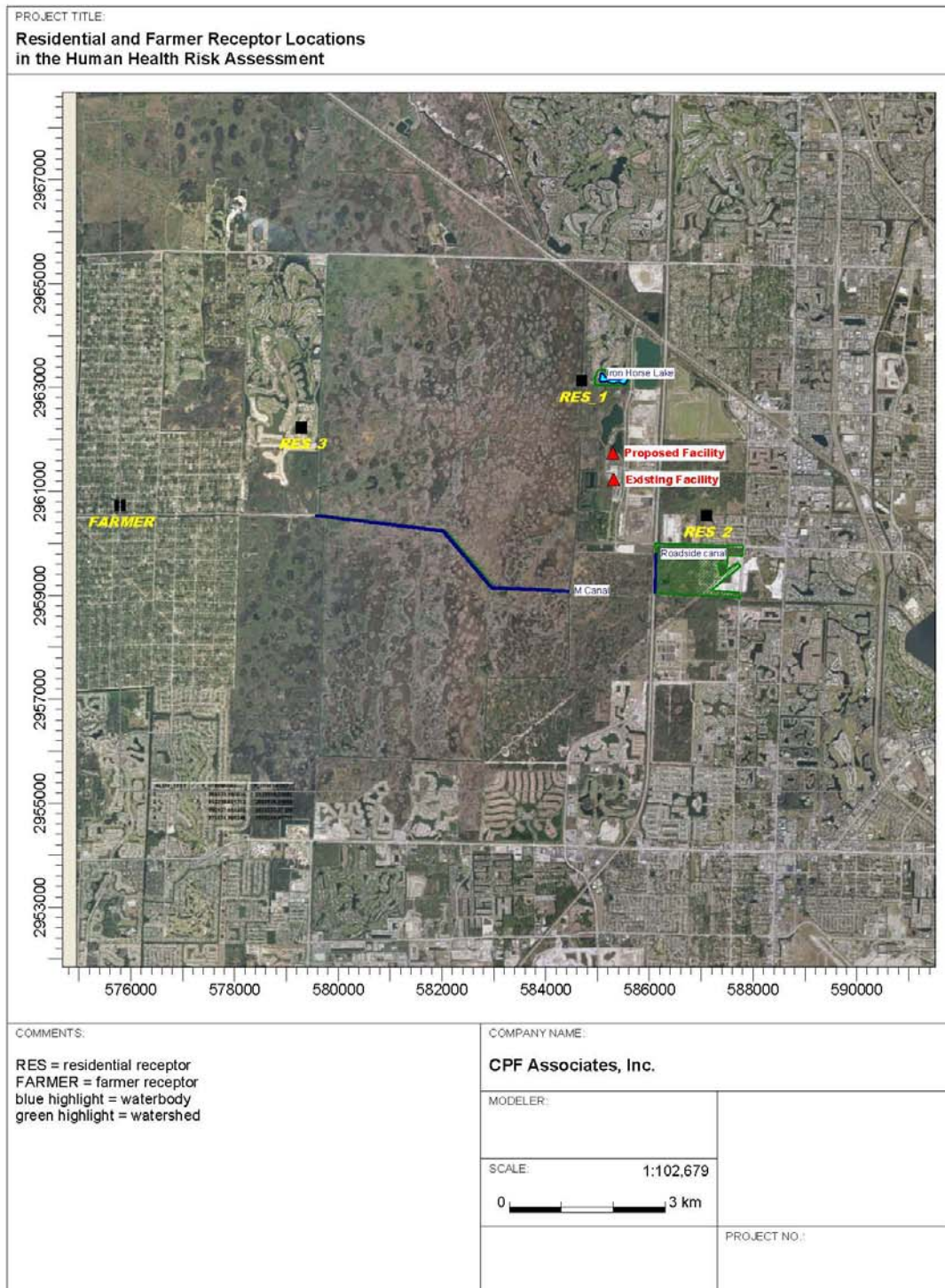
The next step was the calculation of chemical concentrations in each environmental medium of interest. These are referred to as exposure point concentrations. For example, concentrations were calculated in air, soil, produce, fish, livestock products, and human breast milk.

The fate and transport modeling equations used to calculate exposure point concentrations were based on HHRAP methods, with the exception of mercury modeling in water bodies. The HHRAP-based calculations were performed using the Lakes Environmental IRAP software program. Mercury modeling in water bodies was performed using SERAFM, a mercury model recommended in the HHRAP guidance.²³

The input parameters used in IRAP and SERAFM were based on site-specific data if available or, in their absence, on default values provided in HHRAP or SERAFM or recommended by USEPA. For example, chemical-physical properties describing each compound and its behavior in the environment are identified in HHRAP and SERAFM and were used in calculating environmental concentrations, with a few exceptions. The first exception related to three compounds selected for evaluation (ammonia, hydrogen fluoride and sulfuric acid) that are not addressed in HHRAP for which chemical-physical properties were

²³ <http://www.epa.gov/ceampubl/swater/serafm/index.html>.

Figure 6-2
Hypothetical Residential and Farmer Receptor Locations



IRAP-h View - Lakes Environmental Software

compiled. Appendix E presents the properties that were compiled for these additional compounds. Second, the fraction of divalent mercury present in the vapor phase was modified from the HHRAP default (0.85) to reflect facility-specific emissions data. The modified fraction vapor value (0.91) was based on the average of the vapor-phase divalent mercury fractions for the Proposed Facility (0.85) and the Existing Facility (0.98), since the IRAP software can accommodate only one input for this parameter.

A variety of environmental parameters that are not chemical-specific are also needed to calculate environmental concentrations and these parameters were based on site-specific information where possible (e.g., meteorological data, such as precipitation and evapotranspiration rates, and water body characteristics such as water temperature, water flow rate, water body surface area, size of watershed area, total suspended solids, and depth of water column). Tables 6-9 and 6-10 summarize the site-specific parameters used in the environmental fate and transport modeling for the human health risk assessment. Appendix F includes more detailed tables for the evaluated water bodies that provide the basis for each parameter used in the fate and transport modeling. The values for all other parameters (i.e., those not listed in these tables or in Appendix F) were based on the defaults presented in HHRAP or, for mercury water body modeling, in SERAFM.

The unitized air dispersion and deposition modeling results from AERMOD are also needed to calculate exposure point concentrations. These are combined with the chemical-specific emission rates to calculate chemical-specific air concentrations and deposition rates. The annual average unitized results were used in the chronic multiple pathway risk assessment, while the 1-hour average unitized results were used in the acute inhalation risk assessment, as described below:

- The annual average unitized modeling results used in the multiple pathway risk assessment are shown in Table 6-11 for the Proposed Facility and in Table 6-12 for the Existing Facility. As indicated in these tables, exposure scenarios that were assumed to occur at specific locations (i.e., the three residential receptors and the farmer receptor) were evaluated using the AERMOD unitized results for modeled points corresponding to these locations. All of the other exposure scenarios in the multiple pathway risk assessment were associated with water bodies and watershed areas, for which the unitized modeling results were averaged by Malcolm Pirnie across all modeled receptor grid points located within each area for use in the risk assessment. Appendix G provides the detailed AERMOD results for each water body and watershed area.
- The 1-hour average unitized modeling results are shown in Table 6-13 for both the Proposed Facility and the Existing Facility. These values were compiled for several specific locations addressed in the acute inhalation risk assessment, including the locations of the three residential receptors and the farmer receptor as well as the maximum 1-hour average impact points beyond the boundary of the Proposed and Existing Facilities.

6.2.6 Calculation of Human Exposures

The last exposure assessment step was the calculation of human exposures in the Proposed Facility area for each pathway. These calculations relied on the methods laid out in HHRAP, which are programmed into the IRAP software. The information needed to accomplish this consisted of the predicted environmental exposure point concentrations, rates of exposure for each pathway (e.g., food ingestion rates, soil ingestion rates), and data on body weight, exposure frequency (i.e., days/year exposed) and exposure duration (i.e., total years exposed). The exposure assumptions addressed children and adults, as well as a breast-fed infant, and were based on the default values provided in HHRAP. For example,

Table 6-9
Site-Specific Parameters Used in Fate and Transport Modeling

Parameter (HHRAP variable name)	Units	Value	Source
Erosivity/rainfall factor (usle_rf)	yr ⁻¹	450	Provided by Malcolm Pirnie. Based on USDA Agriculture Handbook #537, rainfall erosion index map
Erodability factor (usle_k)	ton/acre	0.1	Provided by Malcolm Pirnie. Based on USGS soil information within modeled area
Annual average evapotranspiration (e_v)	cm/yr	128	Provided by Malcolm Pirnie. Based on South Florida Waste Management District data from Abtew (2003) (50.45 inches/yr)
Annual average wind speed (w)	m/sec	4.3	Provided by Malcolm Pirnie. Based on Long-term average from Palm Beach International Airport
Annual average precipitation (p)	cm/yr	156	Provided by Malcolm Pirnie. Based on long-term average from Palm Beach International Airport, 30-year period of record (1971-2000) (61 inches/yr)
Annual average runoff (RO)	cm/yr	25	Provided by Malcolm Pirnie. Based on value for southern Florida provided in Geraghty et al. (1973) Water Atlas of the United States
Annual average irrigation (i)	cm/yr	0	Assumed
Ambient air temperature (t)	K	297	Provided by Malcolm Pirnie. Based on long-term average from Palm Beach International Airport, 30-year period of record (1971-2000) (24°C)
Surface light intensity	E/m ² -day	32	Midpoint of summer and winter mean values for Miami (Lee and Downum 1991) (a)

(a) This value is only used in the SERAFM model.

Table 6-10
Site-Specific Fate and Transport Modeling Parameters
for Water Bodies Evaluated in the Human Health Risk Assessment (a)

Parameter	Units	Roadside Canal	Iron Horse Lake	M Canal
<i>Parameters used in HHRAP Modeling (variable name in parentheses)</i>				
Water body area (wa_w)	m ²	1.58E+4	4.93E+4	1.46E+5
Watershed area (wa_l)	m ²	1.38E+6	1.02E+5	8.39E+4
Percent impervious	%	3	35	0
Impervious watershed area (wa_i)	m ²	3.86E+4	3.57E+4	0
Flow rate (vf)	m ³ /yr	8.9E+6	1.4E+5	1.5E+8
Current velocity (mu)	m/sec	0.12	5.2E-5	0.41
Total suspended solids (tss)	mg/L	6	8	6
Water column depth (d_w)	m	0.4	0.79	1.3
Cover management factor (C)	unitless	0.003	0.003	0.003
<i>Parameters used in SERAFM Modeling</i>				
Hydraulic residence time	yr	7.1E-4	0.27	1.3E-3
Percent watershed area that is wetland	%	95	0	100
Percent watershed area that is riparian	%	0	0	0
Percent watershed area that is upland	%	2	65	0
Anoxic water body	--	No	no	no
Stratified water body	--	No	yes	no
Epilimnion depth	m	0.4	0.55	1.3
Hypolimnion depth	m	0.05 (b)	0.24	0.05 (b)
Dissolved organic carbon (DOC)	mg/L	7.1	4.6	11.8
Water pH	--	7.3	8	7.8
Water temperature	°C	29	31	26
Trophic status (c)	--	Eutrophic	Mesotrophic	Eutrophic

(a) Input parameters were provided by Malcolm Pirnie. See Appendix F for more detailed information about the input parameters used to model each water body and the basis for each parameter value.

(b) SERAFM requires input of depth for the hypolimnion. This listed value is the default for a non-stratified water body.

(c) The trophic status options in SERAFM are oligotrophic, mesotrophic, eutrophic and dystrophic, selected largely based on dissolved organic carbon concentrations in the water column.

Table 6-11
Unitized Long-Term Annual Average Air Concentrations and Deposition Rates
for the Human Health Risk Assessment: Proposed Facility Stack

Potential Receptor (receptor abbreviation)	Vapor Phase Air Concentration [(µg/m ³)/(1 g/sec)] (Cyv or Cywv)			Particle Phase Air Concentration [(µg/m ³)/(1 g/sec)] (Cyp)		Wet Deposition from Vapor [(g/m ² -yr)/(1 g/sec)] (Dyww)		
	Vapor Phase Air Concentration for Divalent Mercury	Vapor Phase Air Concentration for Elemental Mercury	Vapor Phase Air Concentration for All Other Compounds	Particle Phase Air Concentration for Surface Area Weighted Particles (particle bound) (b)	Particle Phase Air Concentration for Mass Weighted Particles (b)	Wet Deposition from Vapor for Divalent Mercury	Wet Deposition from Vapor for Elemental Mercury	Wet Deposition from Vapor for All Other Compounds
Resident and Farmer Locations								
Maximum impact residential location - north of facility (RES_1)	1.79E-02	1.80E-02	1.80E-02	1.80E-02	1.80E-02	9.14E-04	4.02E-08	8.66E-06
Maximum impact residential location - southeast of facility (RES_2)	4.81E-03	4.83E-03	4.83E-03	4.83E-03	4.81E-03	4.52E-04	3.16E-08	6.79E-06
Maximum impact residential location - west of facility (RES_3)	5.00E-03	5.04E-03	5.02E-03	5.04E-03	5.00E-03	1.76E-04	1.47E-08	3.14E-06
Maximum impact farm location (FARMER)	3.54E-03	3.58E-03	3.56E-03	3.59E-03	3.55E-03	1.16E-04	1.08E-08	2.31E-06
Waterbody and Watershed Locations								
Iron Horse Lake waterbody area (evaluated for receptor FISH_1)	9.18E-03	9.21E-03	9.20E-03	9.21E-03	9.19E-03	8.73E-04	5.15E-08	1.11E-05
Iron Horse Lake watershed area	8.56E-03	8.59E-03	8.58E-03	8.59E-03	8.57E-03	8.39E-04	5.36E-08	1.15E-05
M Canal waterbody area (evaluated for receptor FISH_2)	4.60E-03	4.62E-03	4.61E-03	4.63E-03	4.59E-03	2.80E-04	1.72E-08	3.71E-06
M Canal watershed area	4.60E-03	4.62E-03	4.61E-03	4.63E-03	4.59E-03	2.80E-04	1.72E-08	3.71E-06
Roadside canal waterbody area (evaluated for receptor FISH_3)	4.85E-03	4.87E-03	4.87E-03	4.87E-03	4.85E-03	4.68E-04	2.50E-08	5.39E-06
Roadside canal watershed area	4.53E-03	4.56E-03	4.55E-03	4.55E-03	4.54E-03	4.27E-04	2.73E-08	5.87E-06
(a) Long-term average modeling results are 5-year averages based on modeling with 5 years of surface meteorological data from the Palm Beach International Airport.								
(b) Particles were modeled in two ways in accordance with USEPA guidance, using a mass-weighted particle size distribution to represent emissions of metals (except mercury) and using a surface area-weighted particle size distribution to represent emissions of organic compounds and mercury.								

Table 6-11 (Continued)
Unitized Long-Term Annual Average Air Concentrations and Deposition Rates
for the Human Health Risk Assessment: Proposed Facility Stack

	Dry Deposition from Vapor [[g/m2-yr]/(1 g/sec)] (Dydv)			Mass Weighted Particle Deposition [[g/m2-yr]/(1 g/sec)] (b)			Surface Area Weighted Particle Deposition (particle bound) [[g/m2-yr]/(1 g/sec)] (b)			
Potential Receptor (receptor abbreviation)	Dry Deposition from Vapor for Divalent Mercury	Dry Deposition from Vapor for Elemental Mercury	Dry Deposition from Vapor for All Other Compounds	Dry Deposition from Particle - Mass weighted (Dydp)	Wet Deposition from Particle - Mass weighted (Dywp)	Combined Wet and Dry Deposition from Particle - Mass weighted (Dytwp)	Dry Deposition from Particle - Surface Area weighted (Dydp)	Wet Deposition from Particle - Surface Area weighted (Dywp)	Combined Wet and Dry Deposition from Particle - Surface Area weighted (Dytwp)	Modeled Receptor Location or Area
Resident and Farmer Locations										
Maximum impact residential location - north of facility (RES_1)	5.41E-03	3.36E-04	1.82E-03	6.31E-03	2.08E-03	8.39E-03	7.13E-04	1.45E-04	8.58E-04	UTM coordinates X = 584695.23 Y = 2963136.29
Maximum impact residential location - southeast of facility (RES_2)	1.50E-03	3.67E-05	4.24E-04	1.66E-03	9.59E-04	2.62E-03	1.95E-04	6.76E-05	2.62E-04	UTM coordinates X = 587095.23 Y = 2960536.29
Maximum impact residential location - west of facility (RES_3)	1.26E-03	4.64E-04	9.44E-04	1.60E-03	2.55E-04	1.85E-03	1.77E-04	1.93E-05	1.96E-04	UTM coordinates X = 579295.23 Y = 2962236.29
Maximum impact farm location (FARMER)	8.78E-04	3.20E-04	6.41E-04	1.01E-03	1.32E-04	1.15E-03	1.09E-04	1.04E-05	1.19E-04	UTM coordinates X = 575795.23 Y = 2960736.29
Waterbody and Watershed Locations										
Iron Horse Lake waterbody area (evaluated for receptor FISH_1)	2.78E-03	7.10E-05	8.12E-04	2.72E-03	2.01E-03	4.73E-03	3.31E-04	1.40E-04	4.71E-04	Average calculated across receptor grid points located within waterbody surface area or watershed area within the modeling domain (see appendix for detailed data)
Iron Horse Lake watershed area	2.58E-03	6.74E-05	7.58E-04	2.50E-03	1.92E-03	4.42E-03	3.06E-04	1.33E-04	4.40E-04	
M Canal waterbody area (evaluated for receptor FISH_2)	1.18E-03	4.28E-04	8.56E-04	1.56E-03	4.77E-04	2.03E-03	1.76E-04	3.48E-05	2.10E-04	
M Canal watershed area	1.18E-03	4.28E-04	8.56E-04	1.56E-03	4.77E-04	2.03E-03	1.76E-04	3.48E-05	2.10E-04	
Roadside canal waterbody area (evaluated for receptor FISH_3)	1.36E-03	4.49E-05	4.22E-04	1.27E-03	9.42E-04	2.21E-03	1.49E-04	6.70E-05	2.16E-04	
Roadside canal watershed area	1.29E-03	2.89E-05	3.81E-04	1.24E-03	8.42E-04	2.08E-03	1.43E-04	6.01E-05	2.03E-04	
(a) Long-term average modeling results are 5-year averages based on modeling with 5 years of surface meteorological data from the Palm Beach International Airport.										
(b) Particles were modeled in two ways in accordance with USEPA guidance, using a mass-weighted particle size distribution to represent emissions of metals (except mercury) and using a surface area-weighted particle size distribution to represent emissions of organic compounds and mercury.										

Table 6-12
Unitized Long-Term Annual Average Air Concentrations and Deposition Rates
for the Human Health Risk Assessment: Existing Facility Stack

Potential Receptor (receptor abbreviation)	Vapor Phase Air Concentration [(µg/m ³)/(1 g/sec)] (Cyv or Cywv)			Particle Phase Air Concentration [(µg/m ³)/(1 g/sec)] (Cyp)		Wet Deposition from Vapor [(g/m ² -yr)/(1 g/sec)] (Dyww)		
	Vapor Phase Air Concentration for Divalent Mercury	Vapor Phase Air Concentration for Elemental Mercury	Vapor Phase Air Concentration for All Other Compounds	Particle Phase Air Concentration for Surface Area Weighted Particles (particle bound) (b)	Particle Phase Air Concentration for Mass Weighted Particles (b)	Wet Deposition from Vapor for Divalent Mercury	Wet Deposition from Vapor for Elemental Mercury	Wet Deposition from Vapor for All Other Compounds
Resident and Farmer Locations								
Maximum impact residential location - north of facility (RES_1)	1.21E-02	1.22E-02	1.21E-02	1.22E-02	1.21E-02	6.95E-04	3.43E-08	7.39E-06
Maximum impact residential location - southeast of facility (RES_2)	7.02E-03	7.05E-03	7.05E-03	7.05E-03	7.01E-03	4.62E-04	1.70E-08	3.66E-06
Maximum impact residential location - west of facility (RES_3)	6.56E-03	6.60E-03	6.58E-03	6.62E-03	6.56E-03	1.88E-04	1.89E-08	4.05E-06
Maximum impact farm location (FARMER)	4.89E-03	4.95E-03	4.92E-03	4.96E-03	4.91E-03	1.28E-04	1.51E-08	3.23E-06
Waterbody and Watershed Locations								
Iron Horse Lake waterbody area (evaluated for receptor FISH_1)	7.47E-03	7.51E-03	7.50E-03	7.51E-03	7.47E-03	6.12E-04	3.14E-08	6.76E-06
Iron Horse Lake watershed area	6.93E-03	6.96E-03	6.95E-03	6.96E-03	6.93E-03	6.21E-04	3.88E-08	8.36E-06
M Canal waterbody area (evaluated for receptor FISH_2)	7.28E-03	7.32E-03	7.30E-03	7.33E-03	7.27E-03	3.18E-04	2.04E-08	4.39E-06
M Canal watershed area	7.28E-03	7.32E-03	7.30E-03	7.33E-03	7.27E-03	3.18E-04	2.04E-08	4.39E-06
Roadside canal waterbody area (evaluated for receptor FISH_3)	7.64E-03	7.67E-03	7.67E-03	7.67E-03	7.64E-03	5.77E-04	2.82E-08	6.06E-06
Roadside canal watershed area	6.49E-03	6.52E-03	6.51E-03	6.52E-03	6.49E-03	5.07E-04	3.59E-08	7.71E-06
	(a) Long-term average modeling results are 5-year averages based on modeling with 5 years of surface meteorological data from the Palm Beach International Airport.							
	(b) Particles were modeled in two ways in accordance with USEPA guidance, using a mass-weighted particle size distribution to represent emissions of metals (except mercury) and using a surface area-weighted particle size distribution to represent emissions of organic compounds and mercury.							

Table 6-12 (Continued)
Unitized Long-Term Annual Average Air Concentrations and Deposition Rates
for the Human Health Risk Assessment: Existing Facility Stack

	Dry Deposition from Vapor [[g/m2-yr]/(1 g/sec)] (Dydv)			Mass Weighted Particle Deposition [[g/m2-yr]/(1 g/sec)] (b)			Surface Area Weighted Particle Deposition (particle bound) [[g/m2-yr]/(1 g/sec)] (b)			
Potential Receptor (receptor abbreviation)	Dry Deposition from Vapor for Divalent Mercury	Dry Deposition from Vapor for Elemental Mercury	Dry Deposition from Vapor for All Other Compounds	Dry Deposition from Particle - Mass weighted (Dydp)	Wet Deposition from Particle - Mass weighted (Dywp)	Combined Wet and Dry Deposition from Particle - Mass weighted (Dytwp)	Dry Deposition from Particle - Surface Area weighted (Dydp)	Wet Deposition from Particle - Surface Area weighted (Dywp)	Combined Wet and Dry Deposition from Particle - Surface Area weighted (Dytwp)	Modeled Receptor Location or Area
Resident and Farmer Locations										
Maximum impact residential location - north of facility (RES_1)	3.63E-03	1.47E-04	1.14E-03	3.95E-03	1.46E-03	5.41E-03	4.60E-04	1.03E-04	5.63E-04	UTM coordinates X = 584695.23 Y = 2963136.29
Maximum impact residential location - southeast of facility (RES_2)	2.23E-03	5.40E-05	6.10E-04	2.55E-03	1.00E-03	3.55E-03	2.97E-04	7.04E-05	3.67E-04	UTM coordinates X = 587095.23 Y = 2960536.29
Maximum impact residential location - west of facility (RES_3)	1.63E-03	6.01E-04	1.22E-03	1.91E-03	2.50E-04	2.16E-03	2.07E-04	1.91E-05	2.26E-04	UTM coordinates X = 579295.23 Y = 2962236.29
Maximum impact farm location (FARMER)	1.16E-03	4.30E-04	8.61E-04	1.25E-03	1.35E-04	1.38E-03	1.32E-04	1.09E-05	1.43E-04	UTM coordinates X = 575795.23 Y = 2960736.29
Waterbody and Watershed Locations										
Iron Horse Lake waterbody area (evaluated for receptor FISH_1)	2.22E-03	5.90E-05	6.72E-04	2.08E-03	1.30E-03	3.38E-03	2.60E-04	9.16E-05	3.52E-04	Average calculated across receptor grid points located within waterbody surface area or watershed area within the modeling domain (see appendix for detailed data)
Iron Horse Lake watershed area	2.05E-03	5.53E-05	6.23E-04	1.90E-03	1.31E-03	3.22E-03	2.40E-04	9.27E-05	3.32E-04	
M Canal waterbody area (evaluated for receptor FISH_2)	1.89E-03	6.89E-04	1.36E-03	2.44E-03	5.60E-04	3.00E-03	2.68E-04	4.07E-05	3.08E-04	
M Canal watershed area	1.89E-03	6.89E-04	1.36E-03	2.44E-03	5.60E-04	3.00E-03	2.68E-04	4.07E-05	3.08E-04	
Roadside canal waterbody area (evaluated for receptor FISH_3)	2.20E-03	6.17E-05	6.57E-04	2.09E-03	1.22E-03	3.32E-03	2.42E-04	8.62E-05	3.28E-04	
Roadside canal watershed area	1.93E-03	4.28E-05	5.56E-04	1.91E-03	1.05E-03	2.95E-03	2.19E-04	7.40E-05	2.93E-04	
(a) Long-term average modeling results are 5-year averages based on modeling with 5 years of surface meteorological data from the Palm Beach International Airport.										
(b) Particles were modeled in two ways in accordance with USEPA guidance, using a mass-weighted particle size distribution to represent emissions of metals (except mercury) and using a surface area-weighted particle size distribution to represent emissions of organic compounds and mercury.										

Table 6-13
Unitized 1-Hour Average Air Concentrations for the
Acute Inhalation Human Health Risk Assessment

		Vapor Phase Air Concentration [[µg/m3]/(1 g/sec)] (C _{yv} or C _{yww}) (a)			Particle Phase Air Concentration [[µg/m3]/(1 g/sec)] (C _{yp}) (a)		
Potential Receptor (receptor abbreviation)		Vapor Phase Air Concentration for Divalent Mercury	Vapor Phase Air Concentration for Elemental Mercury	Vapor Phase Air Concentration for All Other Compounds	Particle Phase Air Concentration for Surface Area Weighted Particles (particle bound) (b)	Particle Phase Air Concentration for Mass Weighted Particles (b)	Modeled Receptor Location
Residential and Farmer Locations							
Maximum impact residential location - north of facility (RES_1)							
	Proposed WTE Facility	6.83E-01	6.85E-01	6.85E-01	6.85E-01	6.84E-01	UTM coordinates X = 584695.23 Y = 2963136.29
	Refurbished RDF Facility	5.83E-01	5.85E-01	5.84E-01	5.85E-01	5.86E-01	
Maximum impact residential location - southeast of facility (RES_2)							
	Proposed WTE Facility	4.48E-01	4.49E-01	4.48E-01	4.49E-01	4.51E-01	UTM coordinates X = 587095.23 Y = 2960536.29
	Refurbished RDF Facility	5.81E-01	5.82E-01	5.81E-01	5.82E-01	5.85E-01	
Maximum impact residential location - west of facility (RES_3)							
	Proposed WTE Facility	2.75E-01	2.77E-01	2.74E-01	2.78E-01	2.78E-01	UTM coordinates X = 579295.23 Y = 2962236.29
	Refurbished RDF Facility	3.23E-01	3.38E-01	3.33E-01	3.37E-01	3.36E-01	
Maximum impact farm location (FARMER)							
	Proposed WTE Facility	2.23E-01	2.26E-01	2.24E-01	2.28E-01	2.28E-01	UTM coordinates X = 575795.23 Y = 2960736.29
	Refurbished RDF Facility	2.76E-01	2.81E-01	2.75E-01	2.83E-01	2.81E-01	
Non-Residential Areas							
Maximum impact point beyond proposed WTE and refurbished RDF facilities boundary (but not over waterbody) (ACUTE_1)							
	Proposed WTE Facility	9.06E-01	9.07E-01	9.07E-01	9.07E-01	9.08E-01	UTM coordinates X = 584995.23 Y = 2962236.29
	Refurbished RDF Facility	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	
(a) The one-hour average modeling results shown here are the maximum values calculated by the AERMOD model using 5-years of input meteorological data (i.e., the single highest result out of a total of 43,800 hours modeled).							
(b) Particles were modeled in two ways in accordance with USEPA guidance, using a mass-weighted particle size distribution to represent emissions of metals (except mercury) and using a surface area-weighted particle size distribution to represent emissions of organic compounds and mercury.							

the default exposure durations from HHRAP are 30 years for the adult resident and adult fisher, 40 years for the adult farmer, and 6 years for the child resident, fisher and farmer. Table 6-14 presents the USEPA-based exposure parameter values used in this risk assessment.

6.3 Risk Characterization

In the risk characterization, potential risks associated with the proposed project were addressed.

6.3.1 Chronic Long-Term Risks

Chronic long-term risks associated with stack emissions were calculated by combining the exposure estimates with toxicity values for cancer and non-cancer effects. Cancer risks reflect the upper bound probability that an individual may develop cancer over a 70-year lifetime under the assumed exposure conditions. The risks are referred to as "upper bound" because they are unlikely to be underestimated and, in fact, may range from as low as zero to the upper bound value. Cancer risks were calculated separately for each chemical and summed across chemicals for each exposure pathway. Risks were added across pathways as relevant for specific hypothetical population groups that were evaluated (e.g., adult resident, child resident). The cancer risks were evaluated relative to USEPA's waste combustion target risk level of 10 in one million (1×10^{-5}) (USEPA 1998a) and Florida's target risk level of 1 in one million (1×10^{-6}). A cancer risk of 10 in one million (1 in 100,000 or 1×10^{-5}), for example, means that an individual could have, at most, a one in 100,000 chance of developing cancer over a 70-year lifetime under the evaluated exposure conditions. In comparison, each person in the U.S. has a background risk of developing cancer over a 70-year lifetime of about one in three (CDC 2009, FDOH 2005).

The potential for non-cancer health effects was determined by comparing the calculated exposures with non-cancer reference doses (RfDs) and reference air concentrations (RfCs). A hazard quotient was calculated for each chemical by dividing its exposure by its reference dose or reference concentration. Each chemical and pathway was evaluated separately, and then, as a conservative next step, the results were added across all chemicals regardless of differences in target organs or health effects endpoints and also added across pathways as relevant. The sum of a number of hazard quotients is referred to as a hazard index. Each final hazard index result, therefore, reflected exposure to mixtures of chemicals through multiple exposure pathways. This result was evaluated against the commonly used regulatory non-cancer hazard index target level of 1.0. If the result, summed across all compounds, exceeds the target level, then this exercise is repeated for subgroups of compounds with similar target organs and health effect endpoints.

Table 6-15 presents the excess lifetime cancer risks and the results of the chronic noncancer risk evaluation for each receptor. These results reflect the combined risk across all evaluated exposure pathways and all evaluated compounds for each receptor. Detailed results by exposure pathway are provided in Appendix H. These risk results demonstrate the following:

- All of the excess lifetime cancer risks were at least 10 times below USEPA's target cancer risk level of 1×10^{-5} and were below Florida's target risk level of 1×10^{-6} . The total excess lifetime cancer risks ranged from 2×10^{-9} for the hypothetical child fish ingestion scenario involving the M Canal to 9×10^{-7} for the hypothetical adult fish ingestion scenario involving Iron Horse Lake. Even if the highest fish ingestion risk for Iron Horse Lake is added to the risk for a hypothetical adult resident in the Iron Horse Development, the total cancer risk result would not exceed Florida's target risk level of 1×10^{-6} .

Table 6-14
Exposure Parameters Used in the Human Health Risk Assessment

Parameter	Units	USEPA (2005) Parameter Abbreviation	Residential and Fishing Scenarios		Farming Scenario		Breast- Fed Infant
			Adult	Child	Adult	Child	
Body weight	kg	BW	70	15	70	15	9.4
Exposure frequency	days/yr	EF	350	350	350	350	365
Number of years exposure	yrs	ED	30	6	40	6	1
incidental soil ingestion	kg/day	CR _{soil}	0.0001	0.0002	0.0001	0.0002	--
Ingestion of locally-raised above ground produce	kg dry weight/kg BW-day (a)	CR _{ag}	0.00032	0.00077	0.00047	0.00113	--
	kg/day (b)	--	0.022	0.012	0.033	0.017	--
Ingestion of locally-raised produce protected	kg dry weight/kg BW-day (a)	CR _{pp}	0.00061	0.0015	0.00064	0.00157	--
	kg/day (b)	--	0.043	0.023	0.045	0.024	--
Ingestion of locally-raised below ground produce	kg dry weight/kg BW-day (a)	CR _{bg}	0.00014	0.00023	0.00017	0.00028	--
	kg/day (b)	--	0.010	0.003	0.012	0.004	--
Ingestion of locally-raised beef	kg dry weight/kg BW-day (a)	CR _{beef}	--	--	0.00122	0.00075	--
	kg/day (b)	--	--	--	0.085	0.011	--
Ingestion of locally-raised pork	kg dry weight/kg BW-day (a)	CR _{pork}	--	--	0.00055	0.00042	--
	kg/day (b)	--	--	--	0.039	0.006	--
Ingestion of locally-raised poultry	kg dry weight/kg BW-day (a)	CR _{chicken}	--	--	0.00066	0.00045	--
	kg/day (b)	--	--	--	0.046	0.007	--
Ingestion of locally-raised eggs	kg dry weight/kg BW-day (a)	CR _{eggs}	--	--	0.00075	0.00054	--
	kg/day (b)	--	--	--	0.053	0.008	--
Ingestion of locally-caught fish (fishing scenario only)	kg fresh weight/kg BW-day (a)	CR _{fish}	0.00125	0.00088	--	--	--
	kg/day (b)	--	0.088	0.013	--	--	--
Fraction of ingested item that is locally-raised or locally-grown	unitless	F	1.0	1.0	1.0	1.0	--
Ingestion of breast milk (kg/day)		IR _{milk}	--	--	--	--	0.688

-- = Not applicable.

(a) USEPA's default ingestion rates are expressed on a per body weight basis. They were obtained from USEPA (2005).

(b) Ingestion rates in kg/day were calculated by multiplying the body weight based ingestion rates by body weight.

Table 6-15
Chronic Human Health Risk Assessment Results

Receptor Name	Scenario	Description	Excess Lifetime Cancer Risk (a)	Total Non-Cancer Hazard Index (b)	Exposure Pathways
Residential Receptors					
RES_1	resident_adult	Maximum impact residential location north of facility	1.E-07	9.E-03	Inhalation Soil ingestion Homegrown produce ingestion (c)
	resident_child		4.E-08	1.E-02	
RES_2	resident_adult	Maximum impact residential location southeast of facility	5.E-08	3.E-03	
	resident_child		1.E-08	3.E-03	
RES_3	resident_adult	Maximum impact residential location west of facility	4.E-08	3.E-03	
	resident_child		1.E-08	3.E-03	
Farmer Receptor					
FARMER	farmer_adult	Maximum impact farm location (west of facility)	2.E-07	2.E-03	Inhalation Soil ingestion Homegrown produce ingestion Locally raised beef ingestion Locally raised poultry ingestion Locally raised egg ingestion Locally raised pork ingestion (c)
	farmer_child		2.E-08	2.E-03	
Fish Ingestion Pathway Receptors					
FISH_1	fisher_adult	Fish ingestion evaluation for Iron Horse Lake	9.E-07	1.E-03	Locally caught fish ingestion (c)
	fisher_child		1.E-07	9.E-04	
FISH_2	fisher_adult	Fish ingestion evaluation for the M Canal	2.E-08	4.E-05	
	fisher_child		2.E-09	3.E-05	
FISH_3	fisher_adult	Fish ingestion evaluation for the roadside canal	9.E-08	1.E-03	
	fisher_child		1.E-08	7.E-04	

(a) The additional (excess) lifetime cancer risks reflect exposure to all potential carcinogens evaluated. The regulatory target cancer risk level used by USEPA for combustion sources is 1E-5 (1 in 100,000). A value of 1E-5 is 10 times higher than 1E-6 and 100 times higher than 1E-7.

(b) The listed hazard index values for non-cancer effects reflect exposure to all evaluated compounds, regardless of the type of health effects. If a hazard index, based on the sum of hazard quotients for all compounds, is above 1, then the hazard index values are recalculated for groups of compounds having the same type of health effect and/or a more detailed evaluation may be conducted. USEPA uses a target hazard index value, for compounds grouped according to specific types of health effects, of 0.25 for combustion sources. A common regulatory target hazard index value used by most states and many other USEPA programs, for compounds grouped according to specific types of health effects, is 1.

(c) It was conservatively assumed that 100% of the produce and animal food products ingested by human receptors, as well as animal feeds ingested by animals, were homegrown. It was also conservatively assumed that 100% of fish ingested were caught exclusively in either Iron Horse Lake, the M Canal or the roadside canal.

- All of the hazard index values were at least 100 times below the target hazard index of 1.0. The highest hazard index result was 0.01 for the hypothetical child resident in the Iron Horse Development, primarily due to the inhalation exposure pathway.

In addition, the potential for chronic risks associated with ingestion of mercury in fish was further evaluated by comparing the calculated methyl mercury fish tissue concentrations to USEPA's (2010b) fish tissue based methyl mercury water quality criterion of 0.3 mg/kg wet weight. This criterion is a concentration of methyl mercury in fish that USEPA calculated to protect human health. The incremental methyl mercury fish tissue concentrations (in trophic level 4 fish) due to stack emissions from the Proposed and Existing Facilities were calculated to range from 3×10^{-6} to 1×10^{-4} mg/kg, orders of magnitude lower than USEPA's fish tissue criterion.

6.3.2 Margin of Exposure for PCDDs/PCDFs

The USEPA has not developed a non-cancer reference dose for PCDDs/PCDFs. As an alternative, a margin of exposure approach developed by USEPA was applied to compare the calculated doses in the risk assessment to typical background U.S. exposure levels, consistent with HHRAP guidance. As outlined in HHRAP, the maximum PCDD/PCDF toxic equivalent (TEQ) average daily dose predicted for an adult receptor in the risk assessment associated with stack emissions was compared to a typical background level of 1 pg TEQs/kg-day.

The maximum average daily doses predicted in this risk assessment ranged from 0.1 to 0.0008 pg TEQs/kg-day, from 10 to more than 1,000 times lower than the typical background level. The highest result (0.1 pg TEQs/kg-day) was associated with the adult fish ingestion scenario for Iron Horse Lake, an extremely conservative scenario which assumed that an adult would routinely rely on fish caught solely from Iron Horse Lake as a food source, ingesting $\frac{1}{4}$ pound of fish, 5.4 times per week for 30 years.

6.3.3 Infant Exposure to PCDDs/PCDFs

The USEPA has not developed risk assessment methods to quantitatively evaluate the potential risks to a breast-fed infant from exposure to PCDDs/PCDFs. In this study, infant exposures to PCDDs/PCDFs were evaluated as an adjunct to the adult exposure scenarios evaluated for stack emissions. Hypothetical infant exposures were evaluated following the approach presented in HHRAP, which is programmed into the IRAP software. In this method, the average daily dose to PCDDs/PCDFs, expressed as 2,3,7,8-TCDD toxic equivalents (TEQs), from breast milk ingestion is calculated and then compared to the HHRAP comparison background level for a nursing infant (i.e., 60 pg TEQs/kg-day). It is important to recognize, however, that this method is a default regulatory approach; it does not reflect actual knowledge of the potential health effects, if any, of short-term exposure via breast-milk ingestion on an infant.

Hypothetical infant exposures to PCDDs/PCDFs due to breast-milk ingestion were calculated to range from 0.003 to 0.4 pg TEQs/kg-day, more than 150 times lower than the HHRAP comparison level.

6.3.4 Acute Short-Term Risks

The potential for short-term acute inhalation risks associated with stack emissions was also evaluated, consistent with HHRAP. This was accomplished by comparing modeled short-term, 1-hour average air concentrations with acute reference air concentrations in a manner similar to the evaluation of non-cancer risks. This evaluation focused on the maximum modeled 1-hour average air concentrations

predicted beyond the boundary of the Proposed Facility and the Existing Facility as well as the maximum modeled concentrations at each of the residential and farmer receptors evaluated for chronic long-term risks. (One-hour average air concentrations for all other hours of the year were lower than the maximum values evaluated.)

An acute hazard quotient was calculated by dividing each chemical's modeled 1-hour average air concentration by its acute reference concentration. Quotients below one are not expected to result in health effects. Quotients above one indicate a potential for health effects, but actual health effects are still unlikely to occur because conservative (i.e., health protective) methods are used to derive the acute reference concentrations. For example, safety factors are incorporated into many of the acute reference air concentrations. As a conservative first step, acute hazard quotients were summed across all compounds regardless of differences in the types of health effects endpoints. If this result exceeds a target level of 1.0, then the hazard quotients should be re-summed for subgroups of compounds having the same type of health effect or a more detailed evaluation may be conducted.

Table 6-16 summarizes the results of the acute inhalation analysis. Detailed results by chemical are provided in Appendix H. As Table 6-16 shows, the hazard index values, when conservatively calculated from the summed hazard quotients across all chemicals, were all more than 15 times below the target level of one, indicating that adverse acute inhalation effects are not expected to occur. The total hazard index values ranged from 0.02 at the farmer location and one of the residential receptor locations to 0.06 at the maximum impact point beyond the facilities' boundary.

6.3.5 Evaluation of Lead

Lead was evaluated differently than the other selected compounds, by comparing calculated soil concentrations associated with stack emissions to USEPA's (1998a) screening level in soil (100 mg/kg) and comparing calculated ambient air concentrations associated with stack emissions to the National Ambient Air Quality Standard (0.15 $\mu\text{g}/\text{m}^3$). The ambient air quality standard for lead is based on a 3-month rolling average whereas the air modeling results for lead were calculated as maximum 24-hour averages. Since maximum 24-hour average concentrations are greater than the longer-term 3-month average concentrations, comparing maximum 24-hour average modeling results to the NAAQS is a conservative (i.e., health protective) approach for assessing lead in air. If the calculated concentrations exceed the screening levels, USEPA recommends that additional evaluation of potential blood lead levels be performed using the Integrated Uptake Biokinetic Model (IEUBK), which is discussed in HHRAP. In this study, the incremental lead soil concentrations due to stack emissions at the evaluated residential receptor locations were calculated to be no higher than 0.0001 mg/kg, and the air concentrations due to stack emissions were calculated to be no higher than 0.02 $\mu\text{g}/\text{m}^3$. These results are well below USEPA's screening levels, indicating that no further evaluation of lead is warranted.

6.4 Discussion of Uncertainties

All risk assessments involve the use of assumptions, judgment and incomplete data to varying degrees. This results in uncertainty in the final estimates of risk. In accordance with standard risk assessment practice, this section of the analysis presents discussions of key uncertainties affecting the human health risk assessment.

The results of any risk assessment inherently reflect uncertainty because of the many complexities involved in the analysis. This risk assessment, for example, involved the integration of many steps, each of which is characterized by some uncertainty. These steps included the following:

Table 6-16
Acute Inhalation Human Health Risk Assessment Results

Receptor Name	Description	Total Hazard Index
<i>Residential and Farmer Locations</i>		
RES_1	Maximum impact residential location north of facility	4E-02
RES_2	Maximum impact residential location southeast of facility	3E-02
RES_3	Maximum impact residential location west of facility	2E-02
FARMER	Maximum impact farm location (west of facility)	2E-02
<i>Non-Residential Area</i>		
ACUTE_1	Maximum impact point beyond Proposed and Existing Facilities boundary	6E-02

(a) These results are conservatively based on the highest 1-hour average air concentration calculated for each specified receptor location and compound out of a total of 43,800 hours evaluated by the AERMOD model. The concentrations for all other hours were lower than those used to calculate these hazard quotients.

(b) The listed hazard index values for acute inhalation effects reflect exposure to all evaluated compounds, regardless of the type or mechanism of health effects. If a hazard index, based on the sum of hazard quotients for all compounds, is above 1, then the hazard index values are recalculated for groups of compounds having the same type of health effect and/or a more detailed evaluation may be conducted. The common regulatory target hazard index value for compounds grouped according to specific types of health effects is 1.

- Calculating chemical emission rates
- Modeling air concentrations and deposition rates associated with chemical emissions
- Calculating chemical concentrations in the environment (e.g., soil, beef, produce, and fish) using mathematical models in conjunction with many chemical/physical properties and assumed or site-specific information about the environment in the facility area
- Calculating potential exposures to humans through multiple pathways using a combination of default and site-specific exposure parameters
- Calculating potential risks using toxicity information derived in some instances from human data but predominantly derived by extrapolation from experimental data produced in animal studies

There are four types of uncertainty generally associated with a risk assessment, as described in HHRAP and based on Finkel (1990):

- Variable uncertainty
- Model uncertainty
- Decision-rule uncertainty
- Variability

Variable uncertainty results from uncertainties in the parameter values used in equations in the risk assessment. These uncertainties may stem from measurement, random or systematic errors associated with the numerical values assigned to input parameters. Variable uncertainty may be reducible through additional research or analysis (i.e., better data). Uncertain variables in this risk assessment include chemical-specific input parameters (e.g., biotransfer factors for fish, invertebrates, livestock and produce, and cancer slope factors), and parameters describing the physical environment (e.g., characteristics of surface water bodies).

Model uncertainty is associated with models used in the risk assessment. The types of models incorporated into risk assessments include animal models used as surrogates for testing the human toxicity of chemicals, dose-response models used to develop chemical toxicity criteria, and fate and transport mathematical models used to calculate environmental concentrations of chemicals (e.g., HHRAP equations, AERMOD and SERAFM). Model uncertainty can stem from use of surrogate variables, excluded variables, abnormal conditions, and incorrect model structure.

Decision-rule uncertainty relates to uncertainties stemming from decisions applied in the risk assessment, including methods used to select chemicals for detailed evaluation, the decision to use USEPA default values in the analysis, the decision to use site-specific information to develop input parameters where information was available, and the decision to use USEPA-specified toxicity criteria to evaluate cancer and non-cancer risks.

Variability is related to variations in physical and biological processes, such as the natural differences in how much people weigh or how much they eat. Variability cannot be reduced by doing additional research but it can be addressed by incorporating information on the range of values that might be present in a population. In this risk assessment, many single point values were used for parameters that are known to vary across the population, and most of these were USEPA default values. Although this means that the risk results do not reflect variability in the population, when considered together the single point values, particularly USEPA's defaults, are expected to be more likely to overestimate risks than underestimate risks.

Table 6-17 summarizes some of the key elements of uncertainty associated with this analysis and also indicates whether each is expected to underestimate and/or overestimate potential risks. The risk assessment results presented earlier in this report reflect the combination of these potential sources of uncertainty. Collectively, however, the assumptions used in this assessment are considered more likely to overestimate risks than underestimate them.

Table 6-17
Uncertainties in the Human Health Risk Assessment

Uncertainty	Effect of Uncertainty on Potential Risk
<i>Selection of Chemicals</i>	
Ten compounds or classes of compounds were evaluated quantitatively in the risk assessment, including those shown in previous combustion source assessments to dominate risk results	Over- or under-estimation
<i>Toxicity Characterization</i>	
Conservatively derived cancer slope factors and reference doses were used to assess risks	Over-estimation
Excess lifetime cancer risks for most PCDDs/PCDFs were evaluated using toxicity equivalency factors	Over- or under-estimation
Acute inhalation toxicity criteria were derived from a variety of sources, and incorporated safety factors to account for even sensitive members of the population	Over- or under-estimation
<i>Quantification of Stack Emission Rates</i>	
Emission rates for several compounds were set at proposed permit levels that are higher than actually expected to occur at the facility	Over-estimation
<i>Calculation of Environmental Concentrations</i>	
The AERMOD model was used to calculate ambient air concentrations and deposition rates	Over- or under-estimation
USEPA fate and transport mathematical equations from HHRAP and SERAFM were used to calculate environmental concentrations	Over- or under-estimation
Numerous USEPA default input parameters were used to calculate concentrations	Over-estimation
Mercury speciation in soil and water was based on USEPA default speciation fractions	Over- or under-estimation
Chemical concentrations in produce and in animal products were based on biotransfer coefficients, often derived using regression equations	Over- or under-estimation
Input parameters used to calculate chemical concentrations in water bodies were estimated from site-specific information as well as default assumptions	Over- or under-estimation
A number of scenarios calculated concentrations in produce and animal meat products at a single point rather than across the acreages necessary to support these practices	Over-estimation
<i>Calculation of Human Exposures</i>	
USEPA default assumptions for exposure duration, exposure frequency, and ingestion and inhalation rates were used to calculate exposures	Over-estimation
The fish ingestion exposure scenarios assume 100% of all fish ingested come from fish caught only from specific water bodies	Over-estimation
The food ingestion scenarios assumed that 100% of ingested produce, beef, poultry, eggs and pork were homegrown or home raised.	Over-estimation
<i>Risk Characterization</i>	
Potential exposure to PCDDs/PCDFs were evaluated for infants and adults by comparison with estimates of current background exposure levels	Over- or under-estimation

7.0 ECOLOGICAL RISK ASSESSMENT

A screening-level ecological risk assessment (ERA) was performed to evaluate the potential for adverse ecological effects due to facility emissions following USEPA's ecological risk assessment principles (USEPA 1997, USEPA 1998b). The ecological risk assessment quantitatively evaluated potential risks to selected ecological receptors associated with emissions from the Proposed and Existing Facilities. A separate ecological evaluation was also performed by Malcolm Pirnie for the PPSA application process. The PPSA ecological evaluation included habitat and wildlife surveys, an evaluation of water quantity and quality at the site and a wetlands assessment. In addition, the Authority coordinated with the Florida Fish & Wildlife Conservation Commission and the U.S. Fish & Wildlife Service for the review of possible impacts to listed and other protected species. The methods and conclusions of this work can be found in Volume II, Appendix 10.7.3 of the PPSA Application for the Proposed Facility.

The screening-level ERA included in this Analysis, in accordance with USEPA's definition, consisted of a screening level problem formulation, ecological effects evaluation, exposure estimate and risk calculation. Each of these items is discussed below.

7.1 Problem Formulation

In the problem formulation stage, a conceptual model was developed to address the following items:

- Environmental setting of the project
- Environmental fate and transport mechanisms
- Mechanisms of ecotoxicity that are associated with emitted chemicals and likely categories of receptors that could be affected
- The existence of complete exposure pathways
- Selection of endpoints to screen for ecological risk

7.1.1 Environmental Setting

The environmental setting of the project was described earlier in Section 4.2.4. Based on this information, which was obtained from regional and local data sources, along with information in the PPSA application, the marshes and swamps, along with the on-site rookery and Middle Lake, represent the principal wildlife habitats in the facility area. In particular, the expansive WCA wetland to the west of the Proposed Facility site provides habitat for a wide variety of birds and other species.

7.1.2 Environmental Fate and Transport

The ecological risk assessment focused on the same set of compounds evaluated in the human health risk assessment: arsenic, beryllium, cadmium, lead, mercury, PCDDs/PCDFs, hydrogen chloride, hydrogen fluoride, sulfuric acid, and ammonia. These compounds may be released into air from the Proposed and Existing Facilities' stacks.

Once released into air, the emitted chemicals can be dispersed in the Proposed Facility area and can also deposit onto land or water surfaces. Some portion of the land-deposited compounds may be transported into the soil column along with infiltrating precipitation or may enter surface water bodies via surface water and soil runoff. Compounds reaching water bodies, depending on their chemical/physical characteristics, may be dispersed in the water column and some portion may also sorb to suspended

particulate matter and sediment.

The ionic compounds, hydrogen chloride, hydrogen fluoride, sulfuric acid, and ammonia will all dissociate in contact with water whether it be surface water, soil pore water, or atmospheric moisture. The degree of dissociation depends on the pH of the medium and the dissociation constant of the particular compound. Under most environmental conditions, the dominant dissociation products will be chloride, fluoride, sulfate, and ammonium ions. Toxic effects of these materials, if any, will be due to exposure to the ions (or in the case of ammonia, the un-ionized fraction), rather than to the parent compound.

Metals and metalloids such as arsenic, beryllium, cadmium, lead, and mercury will exist as inorganic covalent compounds or ion pairs under most environmental conditions. The main exception to this is mercury which may exist in a stable elemental form or as organometallic compounds in addition to inorganic covalent and ionic compounds. Arsenic may also form organometallic compounds in the environment, especially as a result of biochemical action. The form of the chemical may differ depending on the environment in which it finds itself. For example, lead may be found as lead chloride in stack emissions due to the preponderance of chloride; in many soils lead may transform to lead carbonate due to the availability of carbonate ions; in anaerobic sediments, the lead may be found as lead sulfide. In general chemical species that are highly soluble in water (e.g., lead nitrate) are more bioavailable and more toxic than insoluble or slightly soluble species (e.g. lead sulfide). To a great extent, the bioavailability and toxicity of metallic species depends on the exact form in which it is found in the environment.

Organic chemicals such as PCDDs/PCDFs are subject to degradation via a variety of chemical (e.g., hydrolysis), microbial, and physical processes. PCDDs and PCDFs predominantly undergo microbial degradation and photolysis. The rate and extent of these processes depend on chemical-specific properties and environmental conditions. Typically, these reactions are detoxification mechanisms that result in the formation of metabolites that are less harmful to ecological receptors.

Many of these fate and transport processes were evaluated using the modeling equations presented in HHRAP (and incorporated into IRAP) and in the SERAFM model.

7.1.3 Ecotoxicity and Potential Receptors

The next portion of the ecological risk assessment briefly discusses potential mechanisms of ecotoxicity that are associated with the selected chemicals of potential concern and likely categories of receptors that could be affected. Among the selected compounds, mercury and PCDDs/PCDFs have been found to account for the majority of potential ecological risks in previously conducted WTE facility risk assessments (CPF 2002). Other metals (i.e., arsenic, beryllium, cadmium, and lead) and inorganics (i.e., hydrogen chloride, hydrogen fluoride, sulfuric acid, and ammonia) can also have potential ecological effects. The material in the following sections has been abstracted from USEPA Region V ecotoxicity profiles, USEPA's ambient water quality criteria documents, and Eisler (2000). There is insufficient information for beryllium or sulfate to be able to generalize the ecological toxicity of these materials.

Ammonia

Ammonia is an environmentally ubiquitous product of metabolism of nitrogenous compounds such as proteins. It also is a component of the natural nitrogen cycle that includes species such as nitrogen gas, nitrite, nitrate, oxides of nitrogen, and organic nitrogen. The toxicity of ammonia is directly related to the degree of ionization which, itself, is largely a function of water pH. At low pH values, most ammonia is

ionized in the form of the ammonium ion. As pH increases, the fraction of un-ionized ammonia increases. Un-ionized ammonia is a chemically neutral molecule that is able to diffuse across epithelial membranes of aquatic organisms much more readily than the charged ammonium ion. Ammonia is a unique compound because it is endogenously produced compound that organisms have developed various strategies to excrete, typically by passive diffusion of un-ionized ammonia from the gills. High external un-ionized ammonia concentrations reduce or reverse diffusive gradients and cause the buildup of ammonia in gill tissue or blood. In contrast to aquatic organisms, ammonia generally has low toxicity for terrestrial organisms. Excesses of ammonia can accelerate plant growth and contribute to changes at an ecosystem level such as eutrophication.

Arsenic

In plants, arsenic has been shown to cause wilting, chlorosis, browning, dehydration, mortality, and inhibition of light activation. Arsenic is a carcinogen (cancer-causing), teratogen, and possible mutagen (causing mutations in genes/DNA) in mammals. Chronic exposure can result in fatigue, gastrointestinal distress, anemia, neuropathy, and skin lesions that can develop into skin cancer in mammals. It can cause death in soil microbiota and earthworms. Cancer-causing and genetic mutation-causing effects occur in aquatic organisms, with those effects including behavioral impairments, growth reduction, appetite loss, and metabolic failure. Aquatic bottom feeders are more susceptible to arsenic. In birds tolerance to arsenic varies among species, but effects include destruction of gut blood vessels, blood-cell damage, muscular incoordination, debility, slowness, jerkiness, falling, hyperactivity, fluffed feathers, drooped eyelids, immobility, seizures, and systemic, growth, behavioral, and reproductive problems.

Cadmium

Cadmium is highly toxic to wildlife; it is cancer-causing and teratogenic and potentially mutation-causing, with severe sublethal and lethal effects at low environmental concentrations. It is associated with increased mortality, and it affects respiratory functions, enzyme levels, muscle contractions, growth reduction, and reproduction. It bioaccumulates at all trophic levels, accumulating in the livers and kidneys of fish. Crustaceans appear to be more sensitive to cadmium than fish and mollusks. Cadmium can be toxic to plants at lower soil concentrations than other heavy metals and is more readily taken up than other metals. On the other hand, some insects can accumulate high levels of cadmium without adverse effects.

Chloride

Chloride is an essential element for aquatic and terrestrial biota, representing the main extracellular anion in animals, including humans. It is a highly mobile ion that easily crosses cell membranes and is involved in maintaining proper osmotic pressure, water balance, and acid-base balance in animal tissues. Recent studies indicate that the chloride ion also plays an active role in renal function, neurophysiology, and nutrition.

Although chloride is an essential element for maintaining normal physiological functions in all aquatic organisms, elevated or fluctuating concentrations of this substance can be detrimental. More specifically, exposure to elevated levels of chloride in water can disrupt osmoregulation in aquatic organisms leading to impaired survival, growth, and/or reproduction. Because excess chloride is most frequently actively excreted from animal tissues via the kidneys or equivalent renal organs to achieve osmoregulatory balance, the bioaccumulation potential of chloride is low. Several factors such as dissolved oxygen concentration, temperature, exposure time and the presence of other contaminants influence chloride

toxicity. However, few studies have systematically evaluated the influence of confounding variables on chloride toxicity in aquatic environments.

Fluoride

Fluoride ions are directly toxic to aquatic life, and accumulate in the tissues, at concentrations where absorption rates exceed excretion rates. Some accumulation occurs in all tissues, but in most tissues subsequent losses may occur when ambient fluoride levels decrease. However, in bone, tooth and scales, accumulation is permanent and cumulative. Temperature affects fluoride toxicity, in part because metabolic rates and thus uptake rates double for every 10 degree C rise in temperature. The duration of exposure also affects toxicity. The fluoride level necessary to cause death of half a population decreases as the time of exposure increases.

Fluoride accumulates in hard or mineralized tissues such as bones, teeth and invertebrate exoskeletons. In bone, the presumed process is fluoride ion exchange in the hydroxyapatite complex. In the amorphous crustacean skeletons, most fluoride is likely to be simply calcium fluoride precipitated in the open matrix. Dietary studies have shown that fish accumulate fluoride in hard tissues and in parts of South-East Asia this results in some human populations having a high fluoride diet. Marine mammals and birds which live on fish can also receive excessive fluoride in their diets from this source. Those parts of the fish in contact with the water, such as scales, fins and gills, have the highest fluoride levels. Skin is very high in fluoride and predators consuming the whole fish are subject to much higher fluoride levels than man who often removes the skin first.

The toxic effects of fluoride can be affected in several ways. Alternating high and low fluoride levels have been shown to be more toxic than a steady dose of the same total amount over a period of time. Fluoride toxicosis is reduced if the diet is high in calcium, sodium chloride, aluminum oxide, calcium carbonate, aluminum sulphate, aluminum chloride or aluminum acetate. Aluminum salts must be fed simultaneously; they will not deplete already deposited fluoride. Aluminum compounds may, however, affect dietary phosphorus retention and, if used to alleviate fluoride toxicosis, supplemental phosphorus may have to be fed as well.

Most plants do not take up much fluoride from the soil or from irrigation water; the major fluoride source is airborne deposition. Neutral and alkaline soils deactivate fluoride or restrict its uptake. Lower fluoride levels may be required for hydroponically-grown plants, but there are insufficient data to set a criterion for this use at present. Much of the total fluoride on a forage crop likely comes from the soil in which it is growing, not by uptake through the roots, but by deposition of soil particles on the surface of the plant.

Fluoride toxicity in aquatic organisms is known to be affected by water hardness and temperature. Other constituents of the water, such as chloride, may also affect fluoride toxicity.

Lead

Lead is cancer-causing, and adversely effects reproduction, liver and thyroid function, and disease resistance. The main potential ecological impacts of wetland contaminants result from direct exposure of algae, benthic invertebrates, and embryos and fingerlings of freshwater fish and amphibians to lead. Lead adversely affects algae, invertebrates, and fish. There are also limited adverse effects in amphibians, including loss of sodium, reduced learning capability, and developmental problems. Fish exposed to high

levels of lead exhibit a wide-range of effects including muscular and neurological degeneration and destruction, growth inhibition, mortality, reproductive problems, and paralysis. Lead adversely affects invertebrate reproduction; algal growth is affected. Lead partitions primarily to sediments, but becomes more bioavailable under low pH, hardness and organic matter content (among other factors). Lead bioaccumulates in algae, macrophytes and benthic organisms, but the inorganic forms of lead do not biomagnify.

At elevated levels in plants, lead can cause reduced growth, photosynthesis, mitosis, and water absorption. Birds and mammals suffer effects from lead poisoning such as damage to the nervous system, kidneys, liver, sterility, growth inhibition, developmental retardation, and detrimental effects in blood.

Lead poisoning in higher organisms has been associated with lead shot and organolead compounds, but not with food chain exposure to inorganic lead (other than lead shot, sinkers or paint). There are complex interactions with other contaminants and diet. Lead poisoning in higher organisms primarily affects hematologic and neurologic processes.

Mercury

Mercury is a mutagen (mutation-causing), teratogen, and carcinogen (cancer-causing), with toxicity and environmental effects varying with the form of mercury, dose, and route of ingestion, and with the exposed organism's species, sex, age, and general condition. There is a high potential for bioaccumulation and biomagnification with mercury, with biomagnified concentrations reported in fish up to 100,000 times the ambient water concentrations. Methylmercury is the most toxic form. Inorganic mercury is methylated primarily by bacteria in both anaerobic and aerobic environments. The organic mercury compounds are more readily absorbed and poorly excreted in comparison with inorganic forms. The primary targets of acute exposures are the central nervous system and kidneys in fish, birds and mammals.

In invertebrates, effects range from non-observable to chromosomal abnormalities in some flies and reduced segment regeneration in worms. Mercury can inhibit frog metamorphosis and has many effects in fish. In water, at concentrations at or well below even 1 ppb (part-per-billion), mercury can cause effects including: loss of appetite, brain lesions, cataracts, abnormal motor coordination, and behavioral changes. There are also effects on reproduction, growth, behavior, metabolism, blood chemistry, osmoregulation, and oxygen exchange at relatively low concentrations of mercury. Juveniles are commonly more susceptible than adults.

Upper trophic level fish, birds and mammals are particularly vulnerable because of the pronounced biomagnification of organomercury. There are numerous effects in birds, including delayed testicular development, altered mating behavior, reduced fertility, reduced survivability and growth in young, and gonadal atresia. In mammals, it has been shown that mercury can cause ataxia, aphagia, tremors, and diminished movement coordination. There are varied neurological and reproductive effects as well.

PCDDs/PCDFs

The most toxic of the chlorinated dioxin or furan congeners is 2,3,7,8-TCDD. Other congeners are evaluated toxicologically based on their degree of biological similarity to the 2,3,7,8-TCDD congener. It has been associated with lethal, cancer-causing, teratogenic, reproductive, mutation-causing, tissue damaging, and immunotoxic effects. In fish, the following effects were observed: reduced growth, fin

necrosis, death, declining interest in feeding (5-8 days postexposure), skin discoloration, reduced resistance to fungal infestations, reduced swimming, teratogenesis, tissue damage, degeneration and necrosis of the liver in fry, and opercular defects in fry. In general, older and larger fish die last; and smaller or younger specimens succumb first. Bioaccumulation of PCDDs/PCDFs occurs in almost all food chains. Among fish, body burdens of 2,3,7,8-TCDD increased with increasing concentration in the water column and with increasing duration of exposure; on removal to uncontaminated water, less than 50% was lost in 109 days.

Invertebrates, plants, and amphibians were comparatively resistant to 2,3,7,8-TCDD.

Birds have exhibited the following effects from dioxins: death, enlarged livers, severe emaciation, high accumulations of uric acid salts in connective tissues, and fluid accumulations in the pericardial and abdominal cavities, excessive drinking, loss of appetite, hypoactivity, emaciation, weakness, debility, muscular incoordination, increased reaction to stimuli, fluffed feathers, huddled position, unkempt appearance, falling, tremors, spasms, convulsions, necrosis, fatty degeneration, and immobility. Birds may bioaccumulate from fish prey, but dioxins do not appear to biomagnify.

In mammals, poisoning by 2,3,7,8-TCDD is typically characterized by loss of body weight and delayed lethality; large interspecies differences exist in lethal dosages and toxic effects. For example, 2,3,7,8-TCDD produces prominent chloracne-type skin lesions in humans and monkeys, and severe liver damage in rats, mice, and rabbits. Other effects include tissue damage, atrophy of the thymus, edema, hemorrhagic tracheitis, pleural hemorrhage, and dystrophic lesions of the liver, skin hyperkeratosis, gastric ulcers, and lung and kidney lesions, teratogenesis, carcinogenesis (in the liver, pharynx, lungs, skin, and thyroid), and fetotoxicity. Suppression of thymus-dependent cellular immunity, particularly in young animals, may contribute to their death. Developing mammalian fetuses are especially sensitive to 2,3,7,8-TCDD, and maternal exposure results in increased frequencies of stillbirths. Among live births, exposure to 2,3,7,8-TCDD produces teratogenic effects such as cystic kidney, cleft palate, and spinal column deformities; dioxin poisoning also produces decreased litter size at birth, increased number of stillborns, and reduced survival and growth of young in both the F1 and F2 generations (first and second generations of offspring--e.g., children and grandchildren of animals exposed to a chemical). Higher dose levels in monkeys for extended periods (i.e., 500 ppt in diets equivalent to about 0.011 ug/kg body weight daily for 9 months) caused death (63%) or, among survivors, abortion, chloracne, nail loss, scaly and dry skin, and progressive weakness. Most treated monkeys remained fairly alert to external stimuli until just prior to death. On removal from the 500 ppt 2,3,7,8-TCDD diet and transfer to an uncontaminated diet, a severely affected monkey became pregnant and gave birth to a well-developed infant after an uneventful gestation. This suggests that some 2,3,7,8-TCDD damaging effects are not permanent.

7.1.4 Exposure Pathways

Potential exposure pathways in terrestrial wildlife include inhalation of airborne chemicals, dermal contact with chemicals deposited onto the soil, and ingestion of contaminated surface water, soil, sediment, or food. Of these, potential dietary exposures via the food web are typically associated with the greatest potential wildlife risks. USEPA's draft guidance for combustion facility ecological risk assessment (USEPA 1999) emphasizes dietary (food web) exposure pathways as being important for terrestrial wildlife exposure. In addition, the collective scientific literature also indicates that dietary exposures are the most important route of chemical accumulation in air-breathing species (Carey et al. 1998).

Plants in the Proposed Facility vicinity could be exposed to chemicals directly as a result of particle deposition onto leaf surfaces or via gas exchange through leaf stomata or across cuticles, or indirectly via root uptake of surface-deposited chemicals that have been incorporated into the soil matrix.

The dominant exposure route for aquatic life is ingestion of bioaccumulated xenobiotics through the food web. Aquatic life can be directly exposed to chemicals in the water column via a number of pathways, with respiration typically the most significant exposure pathway. Aquatic life also can be exposed directly or indirectly to chemicals in sediments.

7.1.5 Receptors and Endpoints for Evaluation

As noted above, the habitats within the Proposed Facility area are home to a variety of mammals, birds, aquatic life, plants, reptiles and amphibians, including a number of endangered or threatened (E/T) species. A list of E/T species that could be present in the Proposed Facility vicinity and that have been observed on the Energy Park was presented previously in Table 4-3.

Given the diversity of mammals, birds, aquatic life, plants, reptiles and amphibians that may use habitat in the Proposed Facility vicinity, it is not possible to assess risks to all species in a screening-level ecological risk assessment. Consequently, this assessment focused on those species predicted to be at greatest risk considering habitat use, exposure potential and population status. The specific criteria that were used to select receptor species for this assessment are discussed below.

- *Habitat Selectivity.* Species were considered for evaluation if they could inhabit or otherwise utilize habitat in the Proposed Facility vicinity, in particular the freshwater marshes, canals, and lakes located in the vicinity as well as the rookery on the Energy Park. These habitats were identified as the principal areas of concern in this risk assessment.
- *Foraging Guild.* Guilds are groups of species that exploit the same class of environmental resources (e.g., food, nesting sites) in a similar manner. Important attributes that define guilds include major food, feeding substrate, and foraging techniques. Species were preferentially considered for evaluation if they are aquatic carnivores. Two of the selected compounds in emissions, mercury and PCDDs/PCDFs, are known to bioaccumulate or biomagnify in complex aquatic food webs that are based on invertebrates and fish and, likely due to this characteristic, are also known to account for the majority of calculated ecological risks in WTE facility risk assessments. In addition, many piscivorous birds frequently forage at the same location thus causing repeated exposure. Terrestrial food webs for wildlife do not have as great a potential for bioaccumulation as aquatic food webs. For example, an insectivorous bird is substantially less likely to be exposed to a bioaccumulated chemical than a piscivorous one because exposure is less likely for insects than fish.
- *Trophic Position.* The ecological risk assessment gave preference to species at higher positions in the food web. For example, both mercury and PCDDs/PCDFs are known to bioaccumulate in aquatic food webs such that concentrations increase with increasing trophic position. As a result, species located at the top of the food web will have greater exposures than species located near the bottom and, therefore, are more vulnerable to increased exposures and effects. This has been well documented in the general literature for all habitat types, and for the south Florida ecosystem as well (Cleckner et al. 1998, Duvall and Barron 2000, USEPA 2001b).

- *Population Status.* Preference was given to E/T species that are known to occur at the Energy Park. In general, E/T species are considered to be at potentially greater risk of impact from chemical exposures because their populations are already imperiled due to a combination of stressors. In south Florida, habitat loss is one of the principal factors leading to the population decline in E/T species (USFWS 1999). Chemical exposures at levels sufficient to cause toxic effects would be an additional stressor that could lead to additional population decline. The E/T species that occur in Palm Beach County and are known to occur at the Energy Park were listed previously.
- *Toxicity and Data Availability.* Preference was given to species with available toxicity and exposure characterization information. For example, due to the wide availability of surface water and sediment toxicity criteria, aquatic life was selected for detailed evaluation in the ecological risk assessment. Plant species were selected for evaluation although toxicity information is not available for all the selected compounds. Representative species of birds and mammals were also selected due to the availability of toxicity data. Reptiles and amphibians were not selected for evaluation because too few data are available to assess toxicity in these receptor groups (Duvall and Barron 2000, Meyers-Schone 2000), although they are discussed later in this report.

Based on these criteria, and previous ecological risk assessments conducted for WTE facilities in Lee and Hillsborough Counties in Florida (CPF 2002, CPF 2005), the following receptors and endpoints were selected for quantitative evaluation in the ecological assessment.

- *Aquatic Life.* Aquatic life inhabiting lakes, canals and wetlands in the area could be exposed to deposited compounds emitted from the Proposed and Existing Facilities. Risks to organisms in both the water column and in the benthic sediments were therefore evaluated in this assessment. The assessment endpoint is maintenance of species abundance and diversity within the area's aquatic community. The measures of effect (measurement endpoints) are alterations of growth, reproduction, or survival in individual species. Seven (7) nearby water bodies were selected for detailed evaluation in assessing potential aquatic life risks based on the environmental setting in the Proposed Facility vicinity in conjunction with an evaluation of the deposition modeling results. Table 7-1 lists these water bodies, and Figure 7-1 illustrates the locations of these water bodies relative to the Proposed Facility.
- *Wood Stork (*Mycteria americana*).* The wood stork is a listed federal and state endangered species that has been observed at the Energy Park. The wood stork feeds almost exclusively on small fish from shallow water bodies and thus could be exposed to chemicals that have accumulated in fish. The feeding range for the wood stork has been estimated to range from 5-40 miles from the colony during nesting. Non-breeding storks may travel greater distances for food. During the breeding season, the wood stork may feed from 50-200 different feeding sites (USFWS 1990). This species was selected as an indicator for all piscivorous birds. The assessment endpoint is maintenance of the long-term health and reproductive capacity of any piscivorous bird foraging in the study area. The measures of effect (measurement endpoints) are alteration of reproduction or survival of exposed birds.
- *Everglades Snail Kite (*Rostrhamus sociabilis plumbeus*).* The Everglades Snail Kite is a medium-sized hawk that forages in relatively shallow wetland vegetation either within marsh systems or lake littoral zones (USFWS 2009a). The Everglades Snail Kite is a listed federal and state endangered species and has been known to feed from South Lake within the Energy Park which

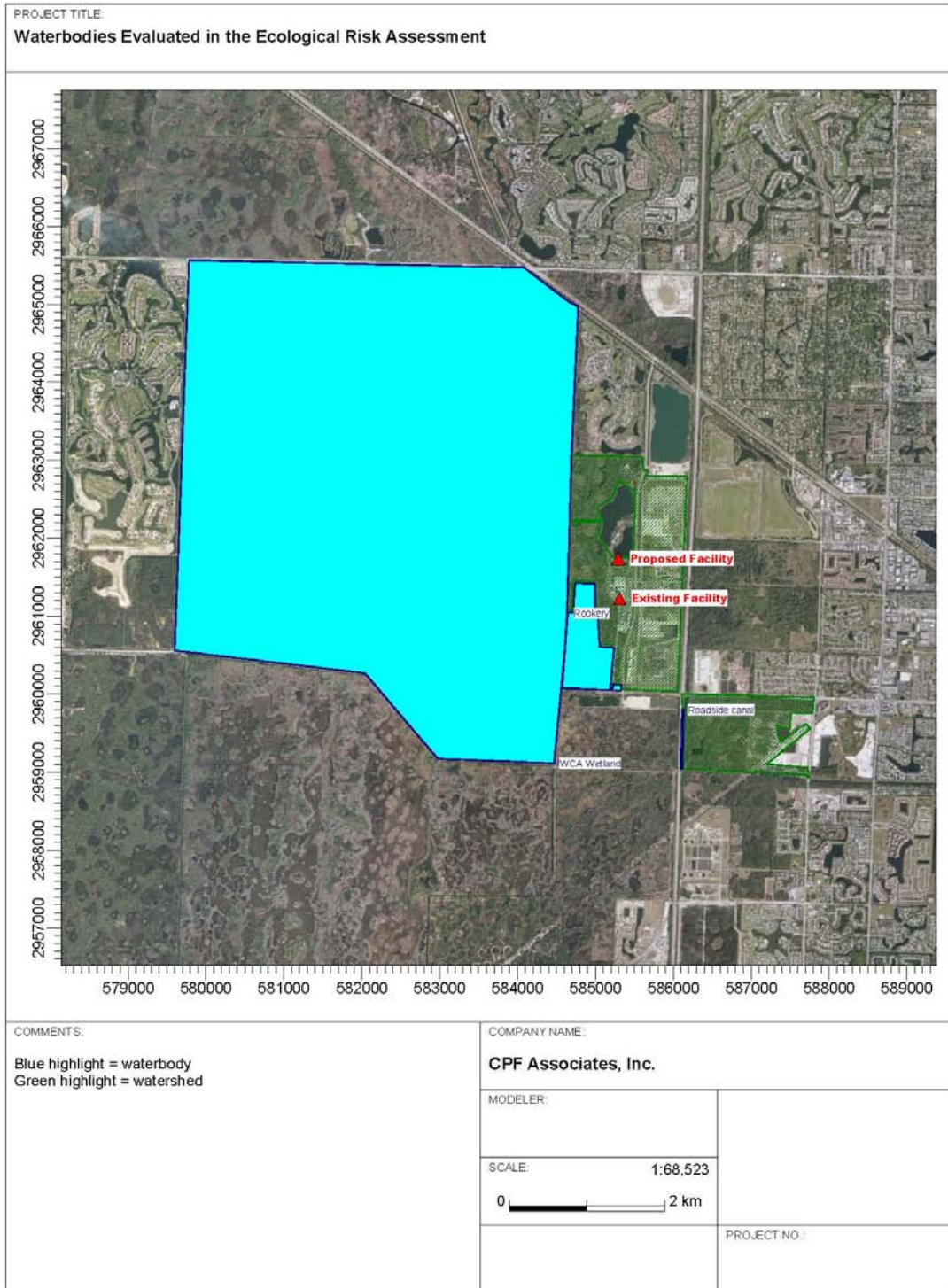
Table 7-1
Water Bodies and Associated Watersheds
Addressed in the Ecological Risk Assessment

Water Body Name	Description	Watershed
Nearby roadside canal	Nearby roadside canal adjacent to Florida Turnpike and southeast of the Proposed Facility	Yes
Iron Horse Lake	Lake in Iron Horse residential development north of the Proposed Facility	Yes
WCA Wetland (a)	WCA wetland area north of M Canal and west of the Proposed Facility	No watershed
Middle Lake	Constructed lake north of the Proposed Facility facility in the Energy Park (b)	Yes
Rookery	Rookery area southwest of the Proposed Facility in the Energy Park	Yes
M Canal	Segment of M Canal south and southwest of the Proposed Facility and bordering WCA Wetland	Yes
Portion of WCA Wetland	Portion of WCA wetland area closest to the Proposed Facility	No watershed

(a) WCA = West Palm Beach Water Catchment Area.

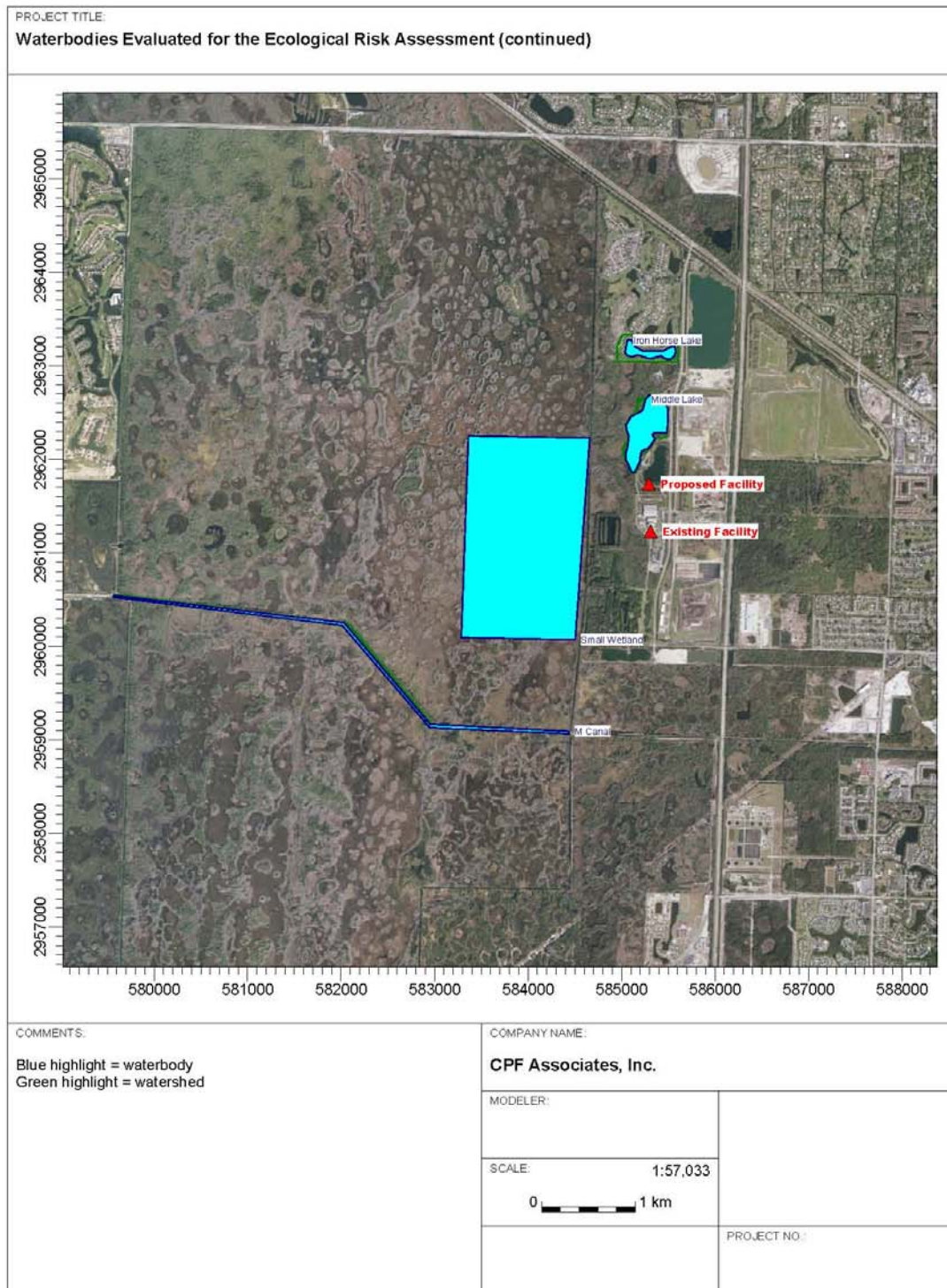
(b) South Lake, located between the Proposed Facility and Middle Lake, will be filled in before construction of the Proposed Facility.

Figure 7-1
Water Bodies Evaluated in the Ecological Risk Assessment
(WCA Wetland, Rookery and Roadside Canal)



IRAP-h View - Lakes Environmental Software

Figure 7-1 (Continued)
Water Bodies Evaluated in the Ecological Risk Assessment
(Portion of WCA Wetland, Iron Horse Lake, Middle Lake and M Canal)



IRAP-h View - Lakes Environmental Software

in the past was stocked with freshwater Florida apple snails (*Pomacea paludosa*), the exclusive food eaten by the Everglades Snail Kite. South Lake will be filled by the time construction begins on the Proposed Facility, however, Middle Lake could provide an alternate feeding site close to the facility for the Everglades Snail Kite. The Everglades Snail Kite will generally stay in one area as long as they can find food, but will seek another location that has food available if foraging conditions decline (USFWS 2009a). Apple snails are predominantly herbivorous (Howels 2001) and, thus, the principal prey of the Everglades Snail Kite is unlikely to accumulate chemicals to the same degree as fish located higher in the food web. Apple snails are important food for a variety of other birds including the limpkin and other species including young alligators. The abundance of apple snails is primarily related to habitat and water levels. The Everglades Snail Kite was selected as a species of concern for this evaluation because they are an endangered species, a snail-eating bird considered to be representative of other species feeding on the apple snail, they have been observed in the Proposed Facility vicinity, and their almost exclusive reliance on only a single prey species is believed to increase their overall vulnerability to extirpation. The measurement endpoints for this species are identical to those for wood stork.

- *River Otter (Lutra Canadensis)*. The river otter is an aquatic mammal with a diet that consists primarily of fish. Otter and other mustelids have a demonstrated sensitivity to a range of environmental pollutants, including mercury, and due to their dietary reliance on fish, may be exposed to bioaccumulative compounds such as mercury and PCDDs/PCDFs. The otter has not been observed in the vicinity of the Proposed Facility, however, this species was selected as an indicator for all piscivorous mammals and omnivores whose diet at least partially includes fish. The assessment endpoint for this evaluation is maintenance of the long-term health and reproductive capacity of otter populations of the study area. The measures of effect (measurement endpoints) are alteration of reproduction or survival of exposed otter.
- *Plants*. Habitat for several E/T species is present at the Energy Park, although these plants have not been observed at the Energy Park. Plants may be exposed to emitted compounds as a result of direct deposition onto plant surfaces, via gas exchange into the leaf, or indirectly as a result of root uptake from soil or water. The assessment endpoint for plants is maintenance of long-term health and reproductive capacity. The measures of effect (measurement endpoints) are alteration of survival and growth.
- *Amphibians and reptiles*. The Energy Park includes habitat for the gopher frog, a state-listed amphibian (i.e., species of special concern), although this species has not been observed there. Both the American alligator, a Florida species of special concern (based on its similarity of appearance to a species which is Federally listed), and the Gopher Tortoise, a state-listed threatened species, have been observed at the Energy Park. These receptors will be discussed in the uncertainty section of the ecological risk assessment because there is insufficient toxicological data to evaluate them quantitatively in a manner similar to the other selected receptors.

Table 7-2 summarizes the receptors and exposure pathways that were quantitatively evaluated in the ecological risk assessment. The specific water bodies associated with each of the receptors in this table represent a range of water body types and locations that are known to be used or could potentially be used by each of the receptors.

Table 7-2
Receptors and Exposure Pathways
Evaluated in the Ecological Risk Assessment

Receptor	Aquatic Life	Aquatic Life	Wood Stork <i>(Mycteria americana)</i> Federal and State endangered species	Everglades Snail Kite <i>(Rostrhamus socialbilis plumbeus)</i> Federal and State endangered species	River Otter <i>(Lutra Canadensis)</i>	Plants
Receptor Category	Aquatic Life	Aquatic Life	Piscivorous bird	Snail-eating bird	Piscivorous mammal	Plants
Exposure Pathway	Contact with surface water	Contact with sediment	Dietary intake of fish	Dietary intake of Florida apple snail	Dietary intake of fish	Deposition, gas exchange, root uptake
Exposure Location						
Roadside canal	✓	✓	✓			
Iron Horse Lake	✓	✓				
WCA Wetland	✓	✓	✓			
Middle Lake	✓	✓		✓		
Rookery	✓	✓	✓			
M Canal	✓	✓			✓	
Portion of WCA Wetland	✓	✓	✓			
Land in facility vicinity (a)						✓

(a) Plants were evaluated at the maximum combined annual average impact locations beyond the boundaries of the Proposed and Existing Facilities.

5.3.2 Toxicity Assessment

Ecotoxicity screening values (ESVs) were identified for each selected receptor in order to calculate potential ecological risks. The ESVs in general represent the maximum concentrations or doses to which an organism could be exposed below which adverse toxicological effects are unlikely to occur. They are generally derived based on no observable adverse effect levels (NOAELs) reported in laboratory studies, and in some instances incorporate additional safety factors to account for variability in species sensitivity or for less-than-lifetime exposures in the study species. The ESV for PCDDs/PCDFs are expressed in terms of 2,3,7,8-TCDD, because this is the congener for which the greatest amount of toxicity data is available, and it is the congener believed to be most toxic to fish and wildlife.

The ESVs were compiled, as available, for birds, mammals, plants, and aquatic life (surface water and sediment). For this assessment, ESVs were obtained from standards, criteria, guidance, or ecological benchmarks from the data sources listed below, in order of preference.

Birds & Mammals

- Mercury Report to Congress (1997)
- USEPA (1999)
- CalTox database (CEPA 2002)
- Sample et al. (1996)
- Schafer et al. (1983), Schafer and Bowles (1985)

Plants

- USEPA (1999)
- Efromyson et al. (1997)
- USEPA Soil Screening Levels (USEPA 2003b)

Aquatic Life – Surface Water

- Florida water quality standards (FAC 62-302.530)
- National water quality standards (USEPA 2009c)
- USEPA (1999)
- USEPA (2009d)

Aquatic Life – Sediment

- MacDonald (1994)
- USEPA (1999)
- NOAA (2009)

No published ESVs for reptiles and amphibians were identified based on a search from a variety of sources, including USEPA's Screening Level Protocol (USEPA 1999), Environment Canada's Reptile and Amphibian Toxicology Literature (RATL) database (Environment Canada 2000), California's Ecotox Database (CA-OEHHA 2003), USEPA's Soil Screening Levels (USEPA 2003b), and USEPA guidance for evaluating PCDDs/PCDFs in ecological risk assessments (USEPA 2008).

Table 7-3 below presents the ESVs for the selected compounds.

7.3 Exposure Assessment

Exposures to aquatic life were evaluated based on calculated concentrations in the water column and sediment, which were directly compared to surface water and sediment ESVs. Exposures to plants were evaluated based on calculated concentrations in soil which were compared to plant ESVs. Potential exposures to the terrestrial receptors (wood stork, Everglades Snail Kite and river otter) were evaluated by calculating dietary intakes of fish or snails, as applicable, and comparing these to dietary ESVs.

The same methods applied for the human health risk assessment were used to obtain concentrations for the ecological risk assessment. Concentrations in the water column, sediment, soil and fish were based on annual average concentration outputs from USEPA's HHRAP equations, as implemented using the IRAP software, for all compounds except mercury, for which concentrations in the water column, sediment and fish were based on USEPA's SERAFM model. The fate and transport modeling input parameters for the additional water bodies evaluated in the ecological risk assessment (i.e., those water bodies not already addressed in Table 6-10) are summarized in Table 7-4. Appendix F includes more detailed tables with input parameters for the evaluated water bodies.

The unitized AERMOD inputs used to calculate concentrations in soil, in order to assess plants, were based on the maximum combined annual average impacts from both evaluated facilities. The maximums for air concentrations and dry deposition rates occurred roughly 800 m (2,600 feet) west of the Proposed Facility, in the WCA wetland. The maximums for wet deposition occurred roughly 600 m (1,970 feet) south of the Proposed Facility, a few hundred feet south of the Existing Facility. For the purposes of assessing plants, it was conservatively assumed that these maximum impacts occurred at the same location. This approach will overestimate potential concentrations in plants.

There were three compounds for which surface water concentrations were not based on either IRAP or SERAFM modeling: hydrogen chloride, hydrogen fluoride and ammonia in surface water. These compounds were modeled differently for consistency with their surface water quality standards. Hydrogen chloride and hydrogen fluoride were modeled by calculating the amounts of each deposited directly on each evaluated water body and entering each water body due to gaseous diffusion from air. The water body concentrations were then converted to total chlorides and total fluorides, respectively, to compare to their water quality standards. Ammonia was also modeled similarly but its water body concentrations were used as a basis for calculating concentrations of un-ionized ammonia based on water temperature and pH as provided in FDEP (1997), for comparison to its water quality standard. Details of these calculations are provided in Appendix I.

Dietary exposures for the wood stork, Everglades snail kite and river otter were expressed as dosages (mg/kg body weight per day) and were quantified using the following generic equation:

$$\text{Intake} = [C_{\text{diet}} * \text{IR} * \text{FI}] / \text{BW}$$

where

Intake = average daily chemical intake throughout the exposure period (mg/kg bw - day)
 C_{diet} = chemical concentration in the diet (mg chemical/kg fresh weight (fw) diet)

Table 7-3
Ecotoxicity Screening Values (ESVs) for Selected Compounds

Chemical (CAS #)	Surface Water		Sediment		Diet - Birds		Diet - Mammals		Plants	
	ESV (µg/L in water column) (d)	Source (a)	ESV (mg/kg dw in sediment)	Source	ESV (mg/kg body weight - day)	Source	ESV (mg/kg body weight - day)	Source	ESV (mg/kg dw in soil)	Source (a)
Ammonia (7664-41-7)	20 (Class I and Class III WQC) as un-ionized ammonia	FAC 62-302.530	--	--	--	--	--	--	--	--
Arsenic (7440-38-2)	10 (Class I WQC) 50 (Class III WQC)	FAC 62-302.530	7.2	Macdonald 1994	2.46	USEPA 1999, Appendix E	1.25	USEPA 1999, Appendix E	1	USEPA 1999, Appendix E
Beryllium (7440-41-7)	0.0077 (Class I WQC) 0.13 (Class III WQC)	FAC 62-302.530	--	--	--	--	0.66	USEPA 1999, Appendix E	0.1	USEPA 1999, Appendix E
Cadmium	0.52 (Class I and Class III WQC) (b)	FAC 62-302.530	0.676	Macdonald 1994	1.45	USEPA 1999, Appendix E	0.0252	USEPA 1999, Appendix E	0.2	USEPA 1999, Appendix E
Hydrogen chloride (HCl) (7647-01-0)	WQC for chlorides: 250,000 (Class I WQC) -- (Class III WQC) (e)	--	--	--	--	--	--	--	--	--
Hydrogen fluoride (HF) (7664-39-3)	WQC for fluorides: 1,500 (Class I WQC) 10,000 (Class III WQC) (f)	--	--	--	--	--	--	--	--	--
Lead (7439-92-1)	9.7 (Class I and Class III WQC) (b)	FAC 62-302.530	30.2	Macdonald 1994	0.025	USEPA 1999, Appendix E	0.0375	USEPA 1999, Appendix E	4.6	USEPA 1999, Appendix E
Mercury										
Total mercury	0.012 (Class I and Class III WQC)	FAC 62-302.530	0.13	Macdonald 1994	--	--	--	--	--	--
Divalent (7487-94-7)	--	--	--	--	3.25	USEPA 1999, Appendix E	1.01	USEPA 1999, Appendix E	0.35	USEPA 1999, Appendix E
Methyl (22967-92-6)	--	--	--	--	0.026	MRTC 1997	0.018	MRTC 1997	--	--
PCDDs/PCDFs (as 2,3,7,8-TCDD, CAS #1746-01-6)	3.80E-06	USEPA 1999, Appendix E	0.00041 (c)	USEPA 1999, Appendix E	0.00001	USEPA 1999, Appendix E	0.000001	USEPA 1999, Appendix E	--	--
Sulfuric acid (7664-93-9)	--	--	--	--	--	--	--	--	--	--

Notes

-- = No data available or not applicable.

dw = dry weight

ESV = Ecotoxicity screening value

MRTC = USEPA Mercury Report to Congress

USEPA = U.S. Environmental Protection Agency

WQC = Florida Water Quality Criteria.

See text for citations

(a) FAC 62-302.530 = Florida Surface Water Criteria from Florida Administrative Code (FAC) 62-302.530. Class I criteria are intended to be protective of potable water supplies. Class III criteria are intended to be protective of recreation, propagation and maintenance of a healthy, well-balanced population of fish and wildlife. Surface water in Florida is classified as Class III except for certain waters, including the City of West Palm Beach Water Catchment Area and the M Canal, both of which are classified as Class I surface water. Listed WQC are applicable to predominantly fresh waters.

(b) Hardness based criterion. Calculated assuming water hardness of 240 mg/L CaCO₃ based on data reported in the South Florida Water Management District DBHYDRO database (based on average of >5,000 measurements from surface water in Palm Beach County from 2004-2009) (<http://my.sfwmd.gov/dbhydroplsql>).

(c) Calculated by USEPA (1999) from a freshwater threshold reference value of 0.000038 ug/L assuming a default fraction organic carbon (foc) in sediments of 0.04.

(d) WQC for arsenic, beryllium and mercury are based on total concentrations in water. WQC for cadmium and lead are based on dissolved concentrations. WQC for ammonia based on un-ionized ammonia. The USEPA (1999) ESV for PCDDs/PCDFs is based on the dissolved concentration.

(e) In the absence of surface water criteria for hydrogen chloride, the criteria for chlorides may be used, after converting modeled concentrations due to emissions to chloride equivalents.

(f) In the absence of surface water criteria for hydrogen fluoride, the criteria for fluorides may be used, after converting modeled concentrations due to emissions to fluoride equivalents.

Table 7-4
Site-Specific Fate and Transport Modeling Parameters
for Additional Water Bodies Evaluated in the Ecological Risk Assessment (a)

Parameter (variable name)	Units	WCA Wetland	Middle Lake	Rookery	Portion of WCA Wetland
<i>Parameters used in HHRAP Modeling (and HHRAP variable name)</i>					
Water body area (wa_w)	m ²	2.80E+7	2.05E+5	6.24E+5	2.72E+6
Watershed area (wa_l)	m ²	0	3.85E+4	3.30E+6	0
Percent impervious	%	NA	0	12	NA
Impervious watershed area (wa_i)	m ²	NA	0	3.96E+5	NA
Flow rate (vf)	m ³ /yr	1.1E+8	1.0E+5	8.9E+6	1.1E+7
Current velocity (mu)	m/sec	6.4E-4	1.4E-6	3.7E-4	1.4E-4
Total suspended solids (tss)	mg/L	4	2	16	4
Water column depth (d_w)	m	1.1	7	2	1.1
Cover management factor (C)	unitless	NA	0.003	0.04	NA
<i>Parameters used in SERAFM Modeling</i>					
Hydraulic residence time	yr	0.28	14	0.14	0.28
Percent watershed area that is wetland	%	NA	72.5	41.5	NA
Percent watershed area that is riparian	%	NA	0	0	NA
Percent watershed area that is upland	%	NA	27.5	46.5	NA
Anoxic water body	--	no	No	No	no
Stratified water body	--	yes	Yes	Yes	yes
Epilimnion depth	m	0.77	2.1	1.4	0.77
Hypolimnion depth	m	0.33	4.9	0.6	0.33
Dissolved organic carbon (DOC)	mg/L	16.2	1.1	6.7	16.2
Water pH	--	7.6	8.26	7.6	7.6
Water temperature	°C	30	32	30	30
Trophic status (b)	--	Eutrophic	Oligotrophic	Eutrophic	Eutrophic

NA = Not applicable because no watershed area.

(a) Input parameters were provided by Malcolm Pirnie. Input parameters for the other water bodies evaluated in the ecological risk assessment (Roadside canal, Iron Horse Lake and M Canal) were presented earlier in Section 5.2.2. See Appendix F for more detailed information about the input parameters used to model each water body and the basis for each parameter value.

(b) The trophic status options in SERAFM are oligotrophic, mesotrophic, eutrophic and dystrophic, selected largely based on dissolved organic carbon concentrations in the water column and site-specific observations.

IR = daily ingestion rate in kg (fw) food/day
FI = fraction of diet obtained from the evaluated water body
BW = body weight

This method calculates exposure based on chemical concentrations in the diet, food ingestion rates, the fraction of diet assumed to be from the evaluated water body, and the receptor's body weight, an approach consistent with food chain model methods outlined in USEPA (1999).

It was conservatively assumed that the diet of the wood stork and the river otter would be comprised entirely of trophic level 4 fish, even though both receptors ingest some food from lower trophic levels where chemical concentrations would be lower than for trophic level 4 fish. The concentrations in fish tissue were obtained from IRAP or SERAFM model results. For the Everglades snail kite, it was assumed that the diet would consist entirely of Florida apple snails, where concentrations in the apple snail were calculated using invertebrate bioconcentration factors (BCFs) and sediment concentrations obtained from IRAP or SERAFM results. The BCFs are expressed in units of mg chemical/kg body weight (fresh weight) invertebrate per mg chemical/kg dry weight sediment. For all selected compounds except PCDDs/PCDFs, the sediment-to-invertebrate BCFs were obtained from USEPA (1999). The BCF for PCDDs/PCDFs was based on a more recent invertebrate study that focused specifically on PCDDs/PCDFs (Currie et al. 2000) rather than rely on the default value in USEPA (1999) which is based on an over 15-year old non-specific regression equation published by Southworth et al. (1978) that relies on the octanol:water partition coefficient (Kow). Appendix J describes the method used to calculate sediment-to-invertebrate BCFs from the Currie et al. (2000) study.

The exposure factors for each receptor are presented in Table 7-5. The BCFs used to calculate concentrations in the Florida apple snail are shown in Table 7-6.

As noted above, PCDDs/PCDFs were evaluated using ESVs based on 2,3,7,8-TCDD. Congener-specific toxic equivalency factors (TEFs) for fish, birds, and mammals were used to relate the toxicity of each congener to the toxicity of 2,3,7,8-TCDD. The USEPA TEFs that were used in this assessment are shown in Table 7-7. To apply the TEF concept in the ecological risk assessment, the congener-specific TEF was multiplied by its respective concentration in a given medium and the products were summed to obtain the total TCDD toxic equivalents (TEQs) of the mixture (USEPA 2008b). This calculation was performed for each environmental medium and each food item addressed in the ecological risk assessment. Detailed tables outlining the application of this approach in this assessment are provided in Appendix K.

7.4 Risk Characterization

Screening level ecological risks were evaluated using a quotient approach in which calculated environmental concentrations or dietary intakes for each compound were divided by the chemical-specific ESVs. In this approach, hazard quotients less than 1 indicate that adverse effects from chemical-specific exposures are unlikely to occur. A hazard quotient (HQ) greater than 1 does not necessarily mean that adverse ecological effects will occur, for example because safety factors are incorporated into some of the ESVs. Rather, this type of result means there is an increased chance that adverse ecological effects might occur and that a more refined ecological risk assessment should be conducted to further evaluate the potential for ecological effects.

The HQs calculated for aquatic life in surface water and in sediment, presented in Tables 7-8 and 7-9, respectively, were all at least 15 times below the target value of 1.0. The surface water results were calculated for all the evaluated water bodies using Class III Florida ambient water quality criteria for compounds with surface water ESVs. HQs were also calculated for the M Canal and the WCA using Class I

Table 7-5
Exposure Parameters for Terrestrial Receptors Evaluated in the Ecological Risk Assessment

Receptor	Food Ingestion Rate (kg FW/d)	Body Weight (kg)	Dietary Composition (%)				Screening-Level Assumption for This Assessment
			Benthic invertebrates	Trophic II fish	Trophic III fish	Trophic IV Fish	
Snail Kite (a)	0.602	0.446	100	0	0	0	100% benthic invertebrates
Wood Stork (b)	0.42	2.4	0	29	60	11	100% Trophic IV fish
River Otter (c)	1.2	7.4	0	0	80	20	100% Trophic IV fish

FW = fresh weight

(a) South Florida Water Management District (2006).

(b) Rumbold et al. (2008).

(c) USEPA Mercury Study Report to Congress (USEPA 1997b).

Table 7-6
Sediment-to-Invertebrate Bioconcentration Factors

Chemical (CAS #)	Sediment-to-Invertebrate Bioconcentration Factor (BCF) (mg chemical / kg wet tissue) / (mg chemical / kg dry sediment)	Source
Ammonia (7664-41-7)	--	--
Arsenic (7440-38-2)	0.9 (a)	USEPA (1999), Appendix C
Beryllium (7440-41-7)	0.9 (a)	USEPA (1999), Appendix C
Cadmium	3.4	USEPA (1999), Appendix C
Hydrogen chloride (HCl) (7647-01-0)	--	--
Hydrogen fluoride (HF) (7664-39-3)	--	--
Lead (7439-92-1)	0.63	USEPA (1999), Appendix C
Mercury		USEPA (1999), Appendix C
Divalent (7487-94-7)	0.068	
Methyl (22967-92-6)	0.48	
PCDDs/PCDFs (b)		Currie et al. (2000) and USEPA (1995c, 1999) (b)
2,3,7,8-TCDD	2.3	
1,2,3,7,8-PeCDD	2.1	
1,2,3,4,7,8-HxCDD	0.71	
1,2,3,7,8,9-HxCDD	0.32	
1,2,3,6,7,8-HxCDD	0.28	
1,2,3,4,6,7,8-HpCDD	0.12	
OCDD	0.028	
2,3,7,8-TCDF	1.8	
1,2,3,7,8-PeCDF	0.51	
2,3,4,7,8-PeCDF	3.7	
1,2,3,4,7,8-HxCDF	0.17	
1,2,3,7,8,9-HxCDF	1.4	
1,2,3,6,7,8-HxCDF	0.44	
2,3,4,6,7,8-HxCDF	1.5	
1,2,3,4,6,7,8-HpCDF	0.025	
1,2,3,4,7,8,9-HpCDF	0.90	
OCDF	0.037	
Sulfuric acid (7664-93-9)	--	--

-- = No data available or not applicable.

(a) USEPA (1999) provides a default value, due to the lack of empirical data for this compound, based on the arithmetic average of the available BCFs for other inorganic COPCs.

(b) See appendix for additional information on the derivation of the BCFs for PCDDs/PCDFs.

Table 7-7
Toxic Equivalency Factors (TEFs) for PCDDs/PCDFs
for the Ecological Risk Assessment

Compound Name	Bird Toxic Equivalency Factor (TEF)	Fish Toxic Equivalency Factor (TEF)	Mammal Toxic Equivalency Factor (TEF)
PCDDs			
TetraCDD, 2,3,7,8-	1	1	1
PentaCDD, 1,2,3,7,8-	1	1	1
HexaCDD, 1,2,3,4,7,8-	0.05	0.5	0.1
HexaCDD, 1,2,3,6,7,8-	0.01	0.01	0.1
HexaCDD, 1,2,3,7,8,9 -	0.1	0.01	0.1
HeptaCDD, 1,2,3,4,6,7,8-	<0.001	0.001	0.01
OctaCDD, 1,2,3,4,6,7,8,9-	0.0001	<0.0001	0.0003
PCDFs			
TetraCDF, 2,3,7,8-	1	0.05	0.1
PentaCDF, 1,2,3,7,8-	0.1	0.05	0.03
PentaCDF, 2,3,4,7,8-	1	0.5	0.3
HexaCDF, 1,2,3,4,7,8-	0.1	0.1	0.1
HexaCDF, 1,2,3,6,7,8-	0.1	0.1	0.1
HexaCDF, 1,2,3,7,8,9-	0.1	0.1	0.1
HexaCDF, 2,3,4,6,7,8-	0.1	0.1	0.1
HeptaCDF, 1,2,3,4,6,7,8-	0.01	0.01	0.01
HeptaCDF, 1,2,3,4,7,8,9-	0.01	0.01	0.01
OctaCDF, 1,2,3,4,6,7,8,9-	0.0001	<0.0001	0.0003

Source: USEPA (2008b).

Table 7-8
Hazard Quotients for Aquatic Life: Surface Water

Chemical (a)	ESV (ug/L) (c, d)		ESV Concentration Basis	Water Concentration (ug/L) (b)				Hazard Quotient (Using Class I ESVs)				Hazard Quotient (Using Class III ESVs)			
	Class I (d)	Class III (d)		Middle Lake	Iron Horse Lake	WCA Wetland	Roadside Canal	Middle Lake	Iron Horse Lake	WCA Wetland	Roadside Canal	Middle Lake	Iron Horse Lake	WCA Wetland	Roadside Canal
Ammonia	20	20	as un-ionized ammonia	1.1	0.050	0.029	0.0006	NA	NA	1E-03	NA	6E-02	3E-03	1E-03	3E-05
Arsenic	10	50	total	7.6E-08	6.3E-08	3.8E-08	1.8E-08	NA	NA	4E-09	NA	2E-09	1E-09	8E-10	4E-10
Beryllium	0.0077	0.13	total	9.5E-10	8.0E-10	4.5E-10	2.1E-10	NA	NA	6E-08	NA	7E-09	6E-09	3E-09	2E-09
Cadmium	0.52	0.52	dissolved	6.9E-08	5.7E-08	3.4E-08	1.6E-08	NA	NA	7E-08	NA	1E-07	1E-07	7E-08	3E-08
Hydrogen chloride (as chlorides)	250,000	--	Based on chlorides (e)	13	1.5	2.5	0.0053	NA	NA	1E-05	NA	--	--	--	--
Hydrogen fluoride (as fluorides)	1,500	10,000	Based on fluorides (e)	0.86	0.12	0.18	0.00083	NA	NA	1E-04	NA	9E-05	1E-05	2E-05	8E-08
Lead	9.7	9.7	dissolved	1.3E-06	1.1E-06	7.0E-07	3.5E-07	NA	NA	7E-08	NA	1E-07	1E-07	7E-08	4E-08
Mercury (total) (f)	0.012	0.012	total	3.8E-05	3.8E-05	2.8E-05	2.5E-05	NA	NA	2E-03	NA	3E-03	3E-03	2E-03	2E-03
PCDDs/PCDFs (as 2,3,7,8-TCDD)	3.80E-06		dissolved	1.2E-12	9.3E-13	9.8E-13	1.1E-13	NA	NA	3E-07	NA	NA	NA	3E-07	NA

Hazard Quotients for Aquatic Life: Surface Water (Continued)

Chemical (a)	ESV (ug/L) (c, d)		ESV Concentration Basis	Water Concentration (ug/L) (b)			Hazard Quotient (Using Class I ESVs)			Hazard Quotient (Using Class III ESVs)		
	Class I	Class III		Rookery	M Canal	Portion of WCA Wetland	Rookery	M Canal	Portion of WCA Wetland	Rookery	M Canal	Portion of WCA Wetland
Ammonia	20	20	as un-ionized ammonia	0.011	0.0012	0.067	NA	6E-05	3E-03	6E-04	6E-05	3E-03
Arsenic	10	50	total	1.2E-07	3.3E-09	9.2E-08	NA	3E-10	9E-09	2E-09	7E-11	2E-09
Beryllium	0.0077	0.13	total	1.3E-09	3.9E-11	1.1E-09	NA	5E-09	1E-07	1E-08	3E-10	8E-09
Cadmium	0.52	0.52	dissolved	1.0E-07	3.0E-09	8.2E-08	NA	6E-09	2E-07	2E-07	6E-09	2E-07
Hydrogen chloride (as chlorides)	250,000	--	Based on chlorides (e)	0.85	0.0059	5.7	NA	2E-08	2E-05	--	--	--
Hydrogen fluoride (as fluorides)	1,500	10,000	Based on fluorides (e)	0.054	0.00084	0.38	NA	6E-07	3E-04	5E-06	8E-08	4E-05
Lead	9.7	9.7	dissolved	2.3E-06	6.5E-08	1.8E-06	NA	7E-09	2E-07	2E-07	7E-09	2E-07
Mercury (total) (f)	0.012	0.012	total	4.3E-05	1.5E-06	5.8E-05	NA	1E-04	5E-03	4E-03	1E-04	5E-03
PCDDs/PCDFs (as 2,3,7,8-TCDD)	3.80E-06		dissolved	1.1E-12	1.7E-14	2.4E-12	NA	5E-09	6E-07	NA	5E-09	6E-07

-- = Not calculated because there are no Class III ambient water quality criteria.

ESV = Ecotoxicity screening value.

NA = Not applicable. The Class I Standards only apply to the M Canal and the WCA.

TEQ = 2,3,7,8-TCDD toxic equivalents.

(a) Compounds shown in the table are those with ecotoxicity screening values (ESVs).

(b) Concentrations for arsenic, beryllium, cadmium, lead and PCDDs/PCDFs were calculated using USEPA's (2005) HHRAP modeling equations which are programmed into the IRAP software. Concentrations for mercury were calculated using USEPA's SERAFM mercury model. Concentrations of un-ionized ammonia, chlorides and fluorides were calculated using a screening-level approach that addressed both direct deposition onto the waterbody and also diffusion of gaseous air concentrations into the waterbody.

(c) Basis for ESVs is provided in Table 7-3.

(d) Florida ambient water quality criteria for Class I and Class III waters (FAC 62-302.530). Class I criteria are intended to be protective of potable water supplies. Class III criteria are intended to be protective of recreation, propagation and maintenance of a healthy, well-balanced population of fish and wildlife. Surface water in Florida is classified as Class III except for certain waters, including the City of West Palm Beach Water Catchment Area and the M Canal, both of which are classified as Class I surface water.

(e) Hydrogen chloride and hydrogen fluoride concentrations were converted to chloride and fluoride concentrations, respectively, for comparison to the Florida water quality criteria.

(f) Concentration for total mercury (mercuric chloride + methyl).

**Table 7-9
Hazard Quotients for Aquatic Life: Sediment**

Chemical (a)	ESV (mg/kg dw sediment) (c)	Sediment Concentration (mg/kg) (b)				Hazard Quotient			
		Middle Lake	Iron Horse Lake	WCA Wetland	Roadside Canal	Middle Lake	Iron Horse Lake	WCA Wetland	Roadside Canal
Arsenic	7.2	2.2E-06	1.8E-06	1.1E-06	5.2E-07	3.E-07	3.E-07	2.E-07	7.E-08
Cadmium	0.676	5.2E-06	4.3E-06	2.5E-06	1.2E-06	8.E-06	6.E-06	4.E-06	2.E-06
Lead	30.2	1.2E-03	9.8E-04	6.3E-04	3.1E-04	4.E-05	3.E-05	2.E-05	1.E-05
Mercury (total) (d)	0.13	5.0E-05	3.8E-05	3.5E-05	5.7E-02	4.E-04	3.E-04	3.E-04	4.E-01
PCDDs/PCDFs (as TEQs)	4.1E-04	1.7E-07	1.3E-07	1.3E-07	1.4E-08	4.E-04	3.E-04	3.E-04	3.E-05

Hazard Quotients for Aquatic Life: Sediment (Continued)

Chemical (a)	ESV (mg/kg dw sediment) (c)	Sediment Concentration (mg/kg) (b)			Hazard Quotient		
		Rookery	M Canal	Portion of WCA Wetland	Rookery	M Canal	Portion of WCA Wetland
Arsenic	7.2	3.4E-06	9.7E-08	2.7E-06	5.E-07	1.E-08	4.E-07
Cadmium	0.676	7.8E-06	2.2E-07	6.1E-06	1.E-05	3.E-07	9.E-06
Lead	30.2	2.0E-03	5.8E-05	1.6E-03	7.E-05	2.E-06	5.E-05
Mercury (total) (d)	0.13	1.4E-04	1.0E-03	7.3E-05	1.E-03	8.E-03	6.E-04
PCDDs/PCDFs (as TEQs)	4.1E-04	1.3E-07	2.0E-09	3.0E-07	3.E-04	5.E-06	7.E-04

ESV = Ecotoxicity screening value.
TEQ = 2,3,7,8-TCDD toxic equivalents.
dw = dry weight

(a) Compounds shown in the table are those with ecotoxicity screening values (ESVs).

(b) Concentrations for all compounds except mercury were calculated using USEPA's (2005) HHRAP modeling equations which are programmed into the IRAP software. Concentrations for mercury were calculated using USEPA's SERAFM mercury model.

(c) Basis for ESVs is provided in Table 7-3.

(d) Concentration for total mercury (divalent mercury, as mercuric chloride, plus methyl mercury).

Florida ambient water quality criteria in accordance with their water classifications by the State. The surface water HQs ranged from a high of 0.06 to a low of 7E-11. The highest HQ value of 0.06 was for ammonia in Middle Lake. The sediment HQs ranged from a high of 0.4 to a low of 7E-8. The highest sediment HQ value of 0.4 was for mercury in the roadside canal. These results indicate that emissions from the Proposed and Existing Facilities would not adversely affect aquatic receptors and also would not adversely impact surface water that may be supplied from the M Canal or the WCA to the County's drinking water treatment plant at Clear Lake.

The HQs calculated for the evaluated bird species, the wood stork and the Everglades snail kite, which are shown in Table 7-10, were all below the target value of 1.0. The HQs ranged from a high of 0.07 to a low of 1E-7. The highest HQ value of 0.07 was based on ingestion of lead in apple snails from Middle Lake by the Everglades snail kite.

The hazard quotients calculated for the evaluated mammal species, the river otter, are shown in Table 7-11. These results were all below the target value of 1.0, with HQs ranging from a high of 4E-5 to a low of 6E-10.

The hazard quotients calculated for plants are shown in Table 7-12. These results were all below the target value of 1.0, with HQs ranging from a high of 0.01 to a low of 2E-8.

These results indicate that adverse ecological effects from exposure to stack emissions from both the Proposed Facility and the Existing Facility are not expected to occur for any of the evaluated receptors.

7.5 Discussion of Uncertainties

The final step in the ecological risk assessment is a discussion of uncertainties. This section of the risk assessment reviews some of the key uncertainties affecting the analysis, including identification of receptors, calculation of exposures and the ecotoxicity screening values.

7.5.1 Selection of Compounds

Ten compounds were selected for evaluation in this risk assessment. Among these, one (sulfuric acid) did not have TRVs available from the data sources consulted (see above), and three others that are present as gases in ambient air (ammonia, hydrogen chloride, and hydrogen fluoride) only had screening-level TRVs available for water. These uncertainties could potentially under-estimate ecological risks. On the other hand, the chemicals with TRVs that were addressed included those compounds considered to be of most concern to ecological receptors (i.e., PCDDs/PCDFs and mercury).

7.5.2 Exposure Assessment

The food chain models are expected to overestimate potential risks because they incorporate conservative assumptions in calculating potential exposures. The screening level risk calculations for the wood stork, Everglades snail kite and river otter incorporated the following conservative (i.e., protective) assumptions: a bioavailability from all ingested items of 100%, an exposure period assumed to occur during the most sensitive receptor life stage, the assumption that each individual species in a community or class-specific guild would be equally exposed, the assumption that 100% of ingested food items were potentially contaminated, and the assumption that receptors spend their entire life cycles in the evaluated local habitat areas. Collectively, these assumptions are expected to overestimate potential exposures and associated risks.

Table 7-10
Hazard Quotients for Terrestrial Wildlife Feeding in Nearby Water Bodies: Birds

Chemical (a)	Fish Concentration (Trophic Level 4) (mg/kg fw)				Intake (mg/kg bw - day)				ESV (mg/kg bw - day)	Hazard Quotient			
	WCA Wetland	Roadside Canal	Rookery	Portion of WCA Wetland	WCA Wetland	Typical Canal	Rookery	Small Wetland		WCA Wetland	Typical Canal	Rookery	Small Wetland
Arsenic	4.3E-06	2.0E-06	1.3E-05	1.1E-05	7.6E-07	3.5E-07	2.3E-06	1.9E-06	2.46	3.E-07	1.E-07	9.E-07	8.E-07
Cadmium	3.1E-05	1.4E-05	9.4E-05	7.4E-05	5.5E-06	2.5E-06	1.7E-05	1.3E-05	1.45	4.E-06	2.E-06	1.E-05	9.E-06
Lead	6.3E-08	3.1E-08	2.0E-07	1.6E-07	1.1E-08	5.5E-09	3.5E-08	2.8E-08	0.025	4.E-07	2.E-07	1.E-06	1.E-06
Mercury (methyl)	2.60E-05	7.9E-05	2.1E-05	5.7E-05	4.6E-06	1.4E-05	3.7E-06	1.0E-05	0.026	2.E-04	5.E-04	1.E-04	4.E-04
PCDDs/PCDFs (as TEQs)	2.9E-08	3.8E-09	3.8E-08	7.2E-08	5.1E-09	6.7E-10	6.6E-09	1.3E-08	0.00001	5.E-04	7.E-05	7.E-04	1.E-03

bw = body weight.
 ESV = Ecotoxicity screening value.
 fw = fresh weight; bw = body weight
 TEQ = 2,3,7,8-TCDD toxic equivalents.

(a) Compounds shown in the table are those with ecotoxicity screening values (ESVs) and for which fish tissue concentrations are calculated by USEPA's SERAFM mercury model and USEPA's HHRAP model (which is programmed in the IRAP software).

Snail Kite (snail eating bird)

Chemical (a)	Snail Concentration (mg/kg fw) (b)	Intake (mg/kg bw - day)	ESV (mg/kg bw - day)	Hazard Quotient
	Middle Lake	Middle Lake		Middle Lake
Arsenic	2.0E-06	2.7E-06	2.46	1E-06
Cadmium	1.8E-05	2.4E-05	1.45	2E-05
Lead	7.4E-04	1.0E-03	0.025	4E-02
Mercury (divalent)	3.3E-06	4.4E-06	3.25	1E-06
Mercury (methyl)	6.4E-07	8.6E-07	0.026	3E-05
PCDDs/PCDFs (as TEQs)	5.5E-07	7.4E-07	0.00001	7E-02

bw = body weight.
 ESV = Ecotoxicity screening value.
 fw = fresh weight; bw = body weight
 TEQ = 2,3,7,8-TCDD toxic equivalents.

(a) Compounds shown in the table are those with ecotoxicity screening values (ESVs).
 (b) Snail concentrations were calculated by multiplying chemical-specific sediment-to-invertebrate bioconcentration factors by the calculated chemical concentrations in sediment.

Table 7-11
Hazard Quotients for Terrestrial Wildlife Feeding in Nearby Water Bodies: Mammals

Chemical (a)	Fish Concentration (Trophic Level 4) (mg/kg fw)	Intake (mg/kg bw - day)	ESV	Hazard Quotient
	M Canal	M Canal	(mg/kg bw - day)	M Canal
Arsenic	3.8E-07	6.2E-08	1.25	5E-08
Beryllium	2.4E-09	3.9E-10	0.66	6E-10
Cadmium	2.7E-06	4.4E-07	0.0252	2E-05
Lead	5.8E-09	9.4E-10	0.0375	3E-08
Mercury (methyl)	2.8E-06	4.5E-07	0.018	3E-05
PCDDs/PCDFs (as TEQs)	2.3E-10	3.8E-11	0.000001	4E-05

bw = body weight.

ESV = Ecotoxicity screening value.

fw = fresh weight; bw = body weight

TEQ = 2,3,7,8-TCDD toxic equivalents.

(a) Compounds shown in the table are those with ecotoxicity screening values (ESVs) and for which fish tissue concentrations are calculated by USEPA's SERAFM mercury model and USEPA's HHRAP model (which is programmed in the IRAP software).

Table 7-12
Hazard Quotients for Plants

Chemical (a)	Soil Concentration (mg/kg dw) (b)	ESV (mg/kg dw in soil)	Hazard Quotient
Arsenic	2.1E-08	1	2E-08
Beryllium	3.0E-07	0.1	3E-06
Cadmium	1.2E-06	0.2	6E-06
Lead	4.3E-04	4.6	9E-05
Mercury (divalent)	4.7E-03	0.35	1E-02

dw = dry weight.

ESV = Ecotoxicity screening value.

(a) Compounds shown in the table are those with ecotoxicity screening values (ESVs) for plants.

(b) Soil concentrations were based on the maximum annual average impacts from both evaluated facilities combined.

Dietary compositions for the wood stork and river otter were conservatively biased (i.e., protective) by assuming that 100% of ingested food was comprised of trophic level 4 fish, even though each species diet is comprised of a variety of foods from varying trophic levels. Accordingly, the fish tissue concentrations in the food chain analysis were based on results for fish only at the top of the aquatic food web. This assumption may overestimate potential exposures and associated risks.

7.5.3 Toxicity Reference Values

Toxicity reference values for the selected species and communities were based on values identified by USEPA or based on standards, criteria, databases or literature sources noted above. In general, TRVs are a major source of uncertainty in an ecological risk assessment. The results of different studies from which TRVs may be obtained often vary by several orders of magnitude, depending on various forms of the chemical, test species, and test endpoints. The sensitivity of receptors addressed in an ecological risk assessment may be different than the sensitivity of species used in toxicity tests reported in the literature. Assumptions about the similarity of the chemical speciation between laboratory tests and site conditions must also be made in the absence of speciation analyses. This is a source of uncertainty, since toxicity may vary with the form of the chemical in the environment. Thus, the actual toxicities of chemicals evaluated in this ecological risk assessment could be higher or lower than indicated by the TRVs. On the other hand, many of the TRVs used in this analysis incorporate uncertainty factors which provide an added margin of safety.

7.5.4 Selection of Receptors

Three State or Federal listed species that could potentially be present at the Energy Park were not able to be evaluated due to a lack of ESVs. These include one amphibian that has not been observed at the Energy Park but for which habitat is present (the Gopher Frog), and two reptiles that have been observed at the Energy Park (the American Alligator and the Gopher Tortoise). As a result, potential risks to these species are evaluated in this section, by qualitatively discussing factors relevant to the health status of each and the potential for these factors to be adversely affected by stack emissions from the Proposed and Existing Facilities.

American Alligator

The American Alligator, a listed Federal and Florida species based on its similarity of appearance to the endangered species, the American Crocodile, occurs throughout the southeast U.S. Alligators reside in fresh water lakes, slow-moving rivers and associated wetlands, and in man-made canals. The creation of canals in Southern Florida has influenced Alligator movement and habitat selection (Phillips et al 2003). Adult alligator density is higher in canal habitats than in natural marshes (Mazzotti et al. 2003a), and the home range of alligators is larger for those residing in canals than in marshes (about 270 acres versus about 140-200 acres, respectively) (Phillips et al. 2003). Alligators consume fish, turtles, snails and small animals that may come to drink from the water's edge. The lifespan of an alligator can be as long as 30 years or more. Alligators are ecologically important in South Florida for a variety of reasons, including that they are top predators in their ecosystem, they create trails and holes that provide refuge for aquatic life during the dry season, and their nests provide nesting sites for turtles and snakes. Because of its ecological importance, the American Alligator has been selected as an indicator species to monitor future success in Everglades restoration efforts (Mazzotti et al. 2003b).

In the mid-1960's, due to hunting and habitat loss, the American Alligator population was considered to be at risk of extinction and was listed as endangered. Subsequently, the American Alligator population significantly

rebounded and by the mid-1980's, it was pronounced by the US Fish and Wildlife Service to be fully recovered and was removed from the list of endangered species. Although the American Alligator is a success story in the Southeast US, and it is abundant enough to support regulated annual harvests, it continues to be a listed species due to its similarity of appearance to the American crocodile (*Crocodylus acutus*), which is still considered to be at risk (USFWS 2008, FFW 2009).

Factors that are known to be important to the health of alligator populations in Southern Florida include habitat availability, land development, water management, salinity, habitat and system productivity, and effects of habitat changes associated with the Everglades restoration efforts (Mazzotti et al. 2003a, Mazzotti et al. 2003b). The Proposed Facility is not expected to impact any of these parameters.

The presence of environmental compounds has also been noted as a potential concern to alligators, including endocrine-disrupting compounds (EDCs) and mercury (Campbell 2003). EDCs are synthetic compounds that can mimic or block hormones or can disrupt the body's normal hormonal functions. Chemicals that are known human endocrine disruptors include pharmaceutical drugs (e.g., diethylstilbesterol), PCDDs/PCDFs, polychlorinated biphenyls (PCBs), and pesticides. In the Everglades area, the primary sources of endocrine-related compounds, which include DDE, methoxychlor, chlordane, dieldrin, toxaphene, atrazine and diazoxon, are agricultural sites and pesticides (Wiebe et al. 2003). These compounds are not likely to be detectable in emissions from WTE facilities because they are not major components of the MSW waste stream and the trace amounts that may be present are almost entirely destroyed during the combustion process. Studies of the effect of EDCs on the American alligator have been conducted both in the laboratory and also in Lake Apopka, Florida, a highly polluted lake historically contaminated with many pesticides from industrial sites and effluents from a municipal sewage treatment facility. These studies show that EDCs can disrupt normal sexual development in the embryo, and can also adversely affect growth and behavior (Campbell 2003). Among the group of EDCs, the most toxic are considered to be PCDDs/PCDFs, a class of compounds which were evaluated in this ecological risk assessment. The inorganic compound considered to be of most concern to the American alligator is mercury, which was also assessed in the ecological risk assessment. Although this risk assessment showed no impact of stack emissions on the evaluated ecological receptors for PCDDs/PCDFs or mercury, thereby reducing the likelihood of potential risks to the American alligator, the lack of TRVs and established risk assessment methodologies to address EDCs and other compounds for reptiles and amphibians adds uncertainty to this analysis.

Gopher Tortoise

The Gopher Tortoise typically inhabits relatively well-drained sandy soils with a sparse tree canopy and abundant low-growing vegetation. Gopher tortoises, which can live for 40-60 years, feed on low-growing plants (e.g., broadleaf grasses) and seasonal fruits (e.g., blackberries, paw-paws). They require relatively deep sandy soils for burrows which can range from about 3-52 feet in length and 9-23 feet in depth. The burrows, which are shared by more than 300 commensal species, including burrowing owls, mice, snakes, and gopher frogs, provide protection against bad weather, predators and fire. Periodic natural cycles of fire are important in maintaining a healthy Gopher Tortoise habitat (FFW 2009b, USFWS 2009b).

Gopher tortoises are currently listed as a threatened species by the Florida Fish and Wildlife Conservation Commission. The Gopher Tortoise is not currently listed at the Federal level, but the US Fish and Wildlife Service recently announced that it may warrant Federal protection as a E/T species and is conducting a review to re-evaluate its listing status (USFWS 2009b). Two major reports in 2006 on the Gopher Tortoise, a biological status report prepared for the Florida Fish and Wildlife Commission and a listing petition submitted to the US Department of Interior and Fish and Wildlife Service, identified the main threats to this species as: habitat destruction, fragmentation and degradation particularly from urbanization and development,

agriculture, phosphate and heavy metals mining and fire suppression, illegal exploitation, and disease, particularly upper respiratory tract disease. Environmental contamination was not noted as a risk factor in either report (FFW 2006, Save Our Big Scrub 2006). To the extent that the Proposed Facility would have negligible or no impact on these primary threats, there is not likely to be an adverse impact on the Gopher Tortoise.

Gopher Frog

The Gopher Frog is found throughout most of the Florida peninsula. They spend most of their lives in upland terrestrial habitats relying on burrows and other underground refuges for shelter, particularly the burrows of the Gopher Tortoise. These underground refuges provide protection from adverse weather conditions (i.e., desiccation and extreme warm and cold temperatures), from periodic fires that are essential to maintain the Gopher Frog habitat, and from predators. Pinelands are the upland habitat primarily inhabited by Gopher Frogs. The Gopher Frog returns to wetlands from late fall to early spring to breed and lay eggs. They are nocturnal, and may range more than a mile away from breeding locations (FFW 2009c, IFAS 2009).

The Gopher Frog is listed as a Species of Special Concern in Florida and but is not a Federally-listed species. The main threats to this species have been identified as habitat loss and degradation, disruption of natural fire cycles, lack of availability of burrows due to declines in Gopher Tortoise or other burrowing animal populations, recreational all-terrain vehicle traffic, and the introduction of fish that prey on Gopher Frog eggs and tadpoles in water bodies used by the Gopher Frog for breeding (IFAS 2009, Jensen and Richter 2005, USACE 1997). To the extent that the Proposed Facility will not affect these factors, adverse impacts on the Gopher Frog are not anticipated.

Although standardized toxicity reference values are not available for amphibians, the US Navy sponsored development of a guidance manual for conducting screening-level ecological risk assessments for amphibians (ENSR 2004). The guidance manual presents literature-derived screening values for a number of the compounds evaluated in this report (cadmium, lead, and mercury). The screening level values are ranges of effects concentrations for a variety of endpoints compiled from amphibian aquatic toxicity studies. Table 7-13 presents the ranges of concentrations at which effects in amphibians were observed, as reported in the ENSR (2004) report. Also shown in this table are the Florida Class III ambient water quality standards which are generally substantially lower than the effects concentrations, indicating that the state standards are, as intended, protective against potential adverse effects to a broad range of aquatic life, including amphibians.

Although effects levels differ from ESVs which are often derived from no effects levels, and/or incorporate safety factors, they can be compared to the modeled surface water concentrations calculated in this analysis to obtain some insight into the potential for adverse effects. The calculated incremental surface water concentrations associated with emissions from the evaluated facilities are shown in Table 7-13. As can be seen, the calculated incremental concentrations are well below the effects concentration ranges reported in ENSR (2004). These results suggest that cadmium, lead and mercury emissions from the Proposed and Existing Facilities are not likely to result in adverse effects to amphibians.

Table 7-13
Summary of Amphibian Effects Concentrations Reported in Surface Water Toxicity Studies

Data	Compound					
	Cadmium		Lead		Mercury	
Data from ENSR (2004)						
Type of Effect	Effects Concentration Range (µg/L)	# of Studies	Effects Concentration Range (µg/L)	# of Studies	Effects Concentration Range (µg/L)	# of Studies
Developmental	1.3 - 6,750 no effects level: 9	(11) (1)	70 - 10,000	(4)	0.15 - 5,000	(9)
Behavioral	1 - 1.3	(2)	750 - 1,000 no effects level: 500-1,000	(3) (1)	NA	--
Biochemical/Cellular/ Physiological	1.1 - 4,000 no effects level: 300	(3) (1)	500 - 1,000	(2)	NA	--
Growth	227 no effects level: 30-106	(1) (2)	NA	--	50 - 250	(1)
Reproductive	1.34	(1)	NA	--	0.49	(1)
Mortality (LC50) (a)	205 - 250,000	(16)	40 - 1,895,800	(7)	1 - 19,020	(19)
Florida Ambient Water Quality Criteria						
Class III Standard (b)	0.27 (dissolved)		3.2 (dissolved)		0.012 (total)	
Incremental concentrations due to stack emissions in evaluated waterbodies						
Modeled Concentration	<0.0002		<0.003		<0.00006	

NA = Not available.

LC50 = median lethal concentration of the compound at which 50% mortality occurred among the test species

(a) The durations of exposure tested in the mortality studies ranged from 24-hours to 8 days.

(b) Florida Class III Surface Water Criteria from Florida Administrative Code (FAC) 62-302.530. Class III criteria are intended to be protective of recreation, propagation and maintenance of a healthy, well-balanced population of fish and wildlife.

8.0 COMPARISON TO TYPICAL ENVIRONMENTAL CONCENTRATIONS

The environmental concentrations calculated in this Analysis may be put into context by comparison with typical environmental levels. This section compares the calculated environmental concentrations associated with stack emissions from the Proposed and Existing Facilities with readily available environmental data.

Table 8-1 presents data on the concentrations of the evaluated compounds typically present in surface water, sediment, soil and air. In general, published data from Florida were compiled where available. In the absence of readily accessible Florida data, information representative of the U.S. was compiled. In some cases, typical environmental data applicable to the project region were not readily available. Table 8-1 also provides the incremental calculated concentrations associated with emissions from the Proposed and Existing Facilities. A comparison of these data shows that the facility-associated incremental concentrations are generally lower than typical environmental concentrations, usually by more than two orders of magnitude. Only a few results even closely approximate typical environmental concentrations. The lead air concentrations are within or lower than the range of typical rural concentrations and lower than urban concentrations. The un-ionized ammonia concentrations in surface water, which were calculated using a very conservative screening-level model, are nonetheless still well within the range of typical concentrations. The total mercury concentrations in sediment were either below or at the low end of typical environmental levels, and the methyl mercury sediment concentrations were either below or within the range of typical environmental levels. The total mercury concentrations in soil were either below or within the range of typical environmental levels.

The compounds that dominated the risk assessment results for the fish ingestion pathway were PCDDs/PCDFs and mercury, consistent with results from other WTE facility risk assessments. The mean U.S. fish tissue concentration for PCDDs/PCDFs reported in USEPA's Draft Dioxin Reassessment (USEPA 2003c) is 1×10^{-6} mg/kg expressed as 2,3,7,8-TCDD TEQs. The TEQ fish tissue concentrations calculated in this Analysis were all lower than 3×10^{-8} mg/kg, 30 or more times lower than the mean U.S. concentration. Concentrations of methyl mercury reported by the South Florida Water Management District (SFWMD 2010) in largemouth bass range from 0.02 – 1.5 mg/kg, with a median concentration of 0.38 mg/kg. The methyl mercury fish tissue concentrations calculated in this Analysis (for trophic level 4 fish) ranged from 3×10^{-6} to 1×10^{-4} mg/kg, more than 100 times lower than the measured environmental levels.

These comparisons show that the environmental concentrations calculated based on stack emissions from the Proposed and Existing Facilities are consistent with or well below typical environmental levels. In addition, considering the sensitivity of instrumentation used for environmental chemical analysis, it can be concluded that the Proposed and Existing Facilities will not measurably increase the typical concentrations of chemicals in the environment.

Table 8-1
Comparison of Typical Environmental Concentrations To
Calculated Incremental Concentrations Associated with Stack Emissions

	Surface Water		Sediment		Soil		Air	
Chemical (CAS #)	(µg/L in water column)	Source (data location)	(mg/kg dw in sediment)	Source (data location)	(mg/kg)	Source (data location)	(ug/m3)	Source (data location)
Ammonia								
Typical environmental concentration	0.07 - 8.8 (means) (<0.02 - 69) (un-ionized)	SFWMD 2010 (South Florida)	NA		NA		0.14 - 2.8	ATSDR 2004 (U.S.)
Calculated incremental concentration associated with two WTE facilities	0.0006 - 1.1 (un-ionized)						0.089	
Arsenic								
Typical environmental concentration	0.138 - 1,700	ATSDR 2007 (U.S.)	0.1 - 4,000	ATSDR 2007 (U.S.)	0.02 - 7.01	Chen et al. 1999 (baseline Florida data)	<0.001 - 0.003 (remote) 0.001 - 0.028 (rural) 0.02 - 0.03 (urban)	ATSDR 2007 (U.S.)
Calculated incremental concentration associated with two WTE facilities	< 2E-4 (dissolved & total)		< 4E-6		< 3E-8		< 1E-4	
Beryllium								
Typical environmental concentration	1.1 - 20.8 (means) (dissolved) 4.4 (mean) (total)	ATSDR 2002 (U.S.)	--		0.04 - 4.15	Chen et al. 1999 (baseline Florida data)	<5E-4	ATSDR 2002 (U.S.)
Calculated incremental concentration associated with two WTE facilities	< 2E-6 (dissolved & total)		< 2E-6		< 4E-7		< 1E-6	
Cadmium								
Typical environmental concentration	--		--		<0.004 - 0.33	Chen et al. 1999 (baseline Florida data)	0.0001 - 0.005 (rural) 0.002 - 0.015 (urban)	ATSDR 2008 (U.S.)
Calculated incremental concentration associated with two WTE facilities	<2E-4 (dissolved & total)		<8E-6		<2E-6		<8E-5	
Hydrogen chloride (HCl)								
Typical environmental concentration	22,000 - 152,000 (chloride)	USGS 1995 (South Florida data)	NA		NA		--	
Calculated incremental concentration associated with two WTE facilities	0.0053 - 13 (chloride)						<0.21	
Hydrogen fluoride (HF)								
Typical environmental concentration	60 - 600 (fluorides)	USGS 1995 (South Florida data)	NA		NA		--	
Calculated incremental concentration associated with two WTE facilities	0.00083 - 0.86 (fluoride)						<0.014	
Lead								
Typical environmental concentration	3.9 (mean) (5 - 30)	ATSDR 2007 (U.S.)	4.7 - 17.9	ATSDR 2007 (Dade County, FL)	0.69 - 42	Chen et al. 1999 (baseline Florida data)	0.001 - 0.002 (rural) <0.05 (urban) 0.04 (mean)	ATSDR 2007 (U.S.)
Calculated incremental concentration associated with two WTE facilities	<3E-3 (dissolved & total)		<3E-3		<5E-4		0.00017 - 0.0016	
Mercury								
Typical environmental concentration								
Total mercury	0.0022 - 0.0023 (medians) (0.00091 - 0.0083)	Liu et al. 2008 (a) (South Florida data)	0.05 - 0.4	Gilmour et al. 1998 (South Florida)	0.00075 - 0.0396	Chen et al. 1999 (baseline Florida data)	0.0014 - 0.0033 (total gaseous)	ATSDR 1999 (Florida)
Methyl (22967-92-6)			<0.0001 - 0.005	Gilmour et al. 1998 (South Florida)				
Calculated incremental concentration associated with two WTE facilities	<6E-5 (total Hg, total concentration)		3.5E-5 - 5.7E-2 (total) 9.3E-7 - 1.5E-3 (methyl)		0.00041 - 0.0047 (total)		<2E-5 (total)	
PCDDs/PCDFs (as 2,3,7,8-TCDD TEQs)								
Typical environmental concentration	--		5.3E-6 (mean) (<1E-6 - 2.0E-5)	USEPA 2003c (U.S.)	9.3E-6 (mean, urban) (2E-6 - 2.1E-5) 2.7E-6 (mean, rural) (1.1E-7 - 5.7E-6)	USEPA 2003c (U.S.)	1.2E-7 (mean, urban) (3E-8 - 2E-5) 1.3E-8 (mean, rural) (4E-9 - 2E-8)	USEPA 2003c (U.S.)
Calculated incremental concentration associated with two WTE facilities	<5E-9		<3E-7		<8E-8		<2E-9	

Notes

NA = not applicable

-- = Applicable background data not available.

(a) Median values were reported for dry and wet seasons separately and are shown as a range above.

(b) 2008 Data for largemouth bass in Water Catchment Areas (WCAs) 1, 2 and 3. These WCAs are located more than 10 miles away from the project site to the southeast.

9.0 SUMMARY AND CONCLUSIONS

9.1 Introduction

This document presents a Human Health and Ecological Impact Analysis that was performed to address questions related to human and environmental health that may arise during the course of the Proposed Facility permitting process. This Analysis is not a formal requirement for the permitting process, but was conducted to ensure that the Proposed Facility would not have an adverse impact on human health and the environment.

This Analysis was performed by CPF Associates, Inc., a Washington, D.C.-based scientific and regulatory consulting firm with over 25 years experience in evaluating the potential impacts of municipal solid waste management technologies. Supporting input to the Analysis was provided by Malcolm Pirnie.

9.2 Studies of Human Health and Environmental Impacts of Waste-to-Energy

Numerous studies have been conducted to determine whether WTE facilities pose concerns to human health and the environment. These include evaluations by governmental agencies and research institutions and a wide variety of scientific studies of waste combustion facilities. Overall, these studies have determined that adverse public health impacts are not anticipated from exposure to emissions from modern WTE facilities, that there is no credible evidence for significantly elevated levels of ill-health in populations living around MSW combustion facilities, that WTE facilities have not negatively impacted the local ecology, and that there are no measurable increases in environmental levels of emitted compounds in the vicinity of modern WTE facilities.

9.3 Selection of Compounds for the Analysis

In this Analysis, ten chemicals or chemical classes that are potentially present in stack emissions were selected for detailed evaluation, based on those compounds with proposed permit limits for the Proposed Facility, or permit limits in place at the Existing Facility or the Lee and Hillsborough County, Florida WTE facilities. This list includes those compounds that have been found to account for the majority of potential risks in analyses of other WTE facilities. The selected compounds consisted of the following:

- Metals - arsenic, beryllium, cadmium, lead, mercury
- PCDDs/PCDFs (polychlorinated dioxins and furans)
- Acid gases - hydrogen chloride, hydrogen fluoride, sulfuric acid
- Ammonia

9.4 Environmental Impacts

Air dispersion and particle deposition modeling was conducted by Malcolm Pirnie to calculate chemical concentrations in air and chemical deposition rates onto the earth's surface within a 400 square kilometer (154 square mile) study area surrounding the Proposed Facility. The modeling addressed stack emissions from both the Proposed and Existing Facilities. These modeling results were then used in mathematical models developed by the USEPA to calculate the fate and transport of each chemical in the environment. The primary fate and transport modeling methods used in this Analysis were obtained from USEPA's *Human Health Risk Assessment Protocol for Hazardous Waste Combustion Facilities* (HHRAP). The HHRAP calculations were implemented using a commercially-available software program called IRAP-h View which was programmed specifically to reflect USEPA's HHRAP methodology. The HHRAP methods were used for all

compounds in all media except for water body modeling of mercury and three ionic gaseous compounds (ammonia, hydrogen chloride and hydrogen fluoride). Mercury in water bodies was modeled using USEPA's Spreadsheet-based Ecological Risk Assessment for Fate of Mercury (SERAFM) model, an alternative model recommended in HHRAP that incorporates more recent advances in scientific understanding of the physical, chemical, and biological processes controlling mercury speciation and partitioning in water bodies. The three gaseous compounds were modeled in water bodies using a conservative screening-level approach to allow evaluation of their impacts relative to water quality standards.

Concentrations were calculated in a variety of environmental media, including air, surface water, sediment, fish, soil, and foods for the selected chemicals or chemical classes. The input assumptions used to calculate environmental concentrations were based on default values provided by USEPA supplemented by site-specific data where available. Overall, the models and input assumptions used in this Analysis are expected to provide conservative (i.e., health protective) estimates of potential environmental concentrations.

The calculated environmental concentrations associated with stack emissions from the Proposed and Existing Facilities were compared with available typical environmental levels in surface water, sediment, air, soil and fish. These comparisons showed that the incremental environmental concentrations calculated based on stack emissions from the two facilities are consistent with or well below typical environmental levels. As a result, it can be concluded that stack emissions from the Proposed and Existing Facilities will not measurably increase the typical concentrations of chemicals in the environment.

9.5 Human Health Risk Assessment

The human health risk assessment evaluated potential risks associated with stack emissions from both the Proposed and Existing Facilities. The risk assessment was performed following current USEPA guidance, including but not limited to USEPA's HHRAP guidance. The risk assessment also incorporated site-specific information when it was available.

The human health risk assessment calculated exposures to the ten chemicals or chemical classes selected for detailed evaluation for several different types of individuals who could hypothetically be exposed to stack emissions: adult and child residents, adult and child farmers, adults and children assumed to eat fish caught from several water bodies (the M Canal, Iron Horse Lake and a typical roadside canal), and a nursing infant. In risk assessment terminology, these groups of individuals are known as "receptors". Each adult or child receptor was assumed to be simultaneously exposed through a variety of pathways (e.g., the farmer receptor was assumed to be exposed via inhalation, soil ingestion, homegrown produce ingestion, and ingestion of home-raised beef, pork, poultry and eggs). Each adult receptor was also conservatively assumed to be the mother of a breast-fed infant with the potential for transmission of chemicals from the mother through nursing.

A variety of risk evaluations were performed in the Analysis. Chronic long-term risks were calculated by combining the exposure estimates for each receptor and each chemical with chronic human health toxicity criteria. Acute inhalation risks were calculated by comparing short-term air concentrations to acute toxicity criteria. Chemical-specific toxicological data for both the chronic and acute assessments were obtained from the USEPA or from other public health agencies, organizations or databases recommended by the USEPA. Both cancer risks and the potential for chronic noncancer effects were calculated for each adult and child receptor. The cancer risks were evaluated relative to a target risk level of 10 in one million (1×10^{-5}) which is a criterion used by USEPA for waste combustion risk assessments and the State of Florida target risk level of 1 in one million (1×10^{-6}). A cancer risk of 1×10^{-5} means that an individual could have, at most, a one in 100,000 chance of developing cancer over a 70-year lifetime under the evaluated exposure conditions. The potential

for noncancer effects was evaluated by comparing hazard index values to the common regulatory target level of 1.0, with the hazard index values determined by comparing the calculated exposures to noncancer toxicity criteria. A margin of exposure approach developed by USEPA, which involves comparing calculated doses of PCDDs/PCDFs to typical background U.S. exposure levels, was used to evaluate potential child and adult exposures to dioxins and furans. Exposures to infants were calculated for PCDDs/PCDFs and also compared to a background infant intake level. Finally, the potential for short-term acute inhalation risks was evaluated by comparing predicted maximum short-term air concentrations with acute reference concentrations.

The risk assessment results were all below the target risk levels, as described below:

- All of the excess lifetime cancer risks were at least 10 times below USEPA's target cancer risk level of 1×10^{-5} and were below Florida's target risk level of 1×10^{-6} . The total excess lifetime cancer risks ranged from 2×10^{-9} for a hypothetical child fish ingestion scenario involving the M Canal to 9×10^{-7} for a hypothetical adult fish ingestion scenario involving Iron Horse Lake. Even if the highest fish ingestion risk for Iron Horse Lake is added to the risk for a hypothetical adult resident in the Iron Horse Development, the total cancer risk result would not exceed Florida's target risk level of 1×10^{-6} .
- All of the hazard index values were at least 100 times below the target hazard index of 1.0, indicating that adverse noncancer effects were predicted not to occur with a large margin of safety. The highest hazard index result was 0.01 for a hypothetical child resident in the Iron Horse Development.
- The maximum PCDD/PCDF average daily doses predicted for children and adults were from 10 to more than 1,000 times lower than USEPA's estimate of typical background PCDD/PCDF exposures of 1 pg TEQs/kg-day.
- Infant exposures to PCDDs/PCDFs were more than 150 times lower than USEPA's comparison level of 60 pg TEQs/kg-day.
- The maximum short-term (1-hour average) air concentrations were compared with acute reference inhalation criteria and all found to be at least 15 times lower than the corresponding criteria.

9.6 Ecological Risk Assessment

An ecological risk assessment was also conducted to evaluate potential effects of modeled emissions on ecological receptors within the Proposed Facility area. This Analysis followed USEPA guidelines for ecological risk assessment, including but not limited to USEPA's *Ecological Risk Assessment Guidance for Superfund* and it also incorporated regional- and site-specific information on wildlife habitats and species in order to identify species and habitats of concern. The ecological assessment addressed the same set of compounds evaluated in the human health risk assessment.

The ecological risk assessment focused on potential impacts on the natural communities in the vicinity of the Proposed Facility, including several canal and wetland water bodies. The assessment focused on those wildlife and other species that were considered to be at greatest risk based on habitat use, exposure potential and population status. Special consideration was given to species that are considered to be threatened or endangered by federal or state wildlife agencies. The specific criteria used to select species for evaluation included habitat selectivity, foraging guild, trophic position, population status, and toxicity and data availability. The species selected for quantitative evaluation consisted of aquatic life, the wood stork (representing piscivorous birds), the Everglades snail kite (representing a snail-eating bird), the river otter (representing piscivorous mammals), and plants.

Exposures to aquatic life were evaluated based on calculated concentrations in the water column and sediment of seven different water bodies near the Proposed Facility that were selected for detailed examination. Exposures to plants were evaluated based on calculated concentrations in soil. Potential exposures to the terrestrial receptors (wood stork, Everglades snail kite and river otter) were evaluated by calculating dietary intakes of fish or snails, as applicable.

Potential risks were quantitatively evaluated by calculating hazard quotients (HQs). A hazard quotient is the ratio of the predicted exposure level to an ecotoxicity screening value (ESV) derived for the protection of aquatic life, wildlife species or plants. The ESVs in general represent the maximum concentrations or doses to which an organism could be exposed below which adverse toxicological effects are unlikely to occur. Hazard quotients less than 1 indicate that adverse effects from chemical-specific exposures are unlikely to occur.

The hazard quotients for aquatic life, the selected wildlife species and plants were all less than the target level of 1.0. The HQs calculated for aquatic life in surface water and sediment were at least 15 times below the target value of 1.0. The HQs calculated for the evaluated bird species, the wood stork and the Everglades snail kite, were at least 10 times below the target value of 1.0. The hazard quotients calculated for the evaluated mammal species, the river otter, were more than 10,000 times below the target value of 1.0. The hazard quotients calculated for plants were 100 or more times lower than the target value of 1.0. These results indicate that adverse ecological effects from exposure to stack emissions from both the Proposed and Existing Facilities are not expected to occur for any of the evaluated receptors.

9.7 Conclusions

All risk assessments involve the use of assumptions, judgment and incomplete data to varying degrees. This results in uncertainty in the final estimates of risk. Uncertainties in this analysis include toxicity criteria used to evaluate risks, USEPA's fate and transport mathematical models that were used to calculate chemical concentrations in environmental media, and use of many default input parameters from USEPA guidance. Overall, however, the assumptions and methods used in this Analysis were conservative and, therefore, the risk assessment results are considered much more likely to be overestimated than underestimated.

In conclusion, the Human Health and Ecological Impact Evaluation presented in this document showed that potential risks associated with stack emissions from the Proposed and Existing Facilities were below regulatory and other target risk levels for both human health and ecological receptors. These conclusions are consistent with studies of other modern waste-to-energy combustion facilities in the U.S. that are designed, constructed, and operated in accordance with federal, state, and local laws and regulations. Additionally, the calculated environmental concentrations in air, soil, surface water, sediment and fish associated with stack emissions from the Proposed and Existing Facilities will not measurably increase the typical concentrations of chemicals in the environment. Based on this Analysis, the Proposed Facility is not anticipated to have an adverse impact on human health or the environment.

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APPENDICES

APPENDIX A

BIOGRAPHIES OF KEY SCIENTIFIC STAFF

**PAUL C. CHROSTOWSKI, PH.D., QEP, FRSH
CPF ASSOCIATES, INC.**

EDUCATION

Ph.D. Environmental Engineering and Science, Drexel University, Philadelphia, PA (1981).

M.S. Environmental Science, Drexel University, Philadelphia, PA (Environmental Chemistry and Health Specializations, USPHS Traineeship) (1979).

B.S. Chemistry, University of California, Berkeley, California (American Chemical Society Certified, Honors) (1976).

PROFESSIONAL CERTIFICATION

Dr. Chrostowski is a Qualified Environmental Professional (QEP) (#02970014) and a Fellow of the Royal Society of Health (FRSH).

EXPERIENCE

Dr. Chrostowski is a founding member of CPF Associates, Inc. He is an environmental health scientist with over 30 years experience in environmental science and engineering work on behalf of both government and private clients. Previously, he was Director of Environment, Health & Safety programs at The Weinberg Group, Vice President and Senior Science Advisor at ICF/Clement, Senior Scientist at EA Engineering, Science & Technology, Assistant Professor at Vassar College, a consultant in private practice and a pollution control/industrial hygiene technician in industry. He has specialized experience in the scientific and technical aspects of federal, state, and international regulatory programs including the CAA, CERCLA/SARA, RCRA, TSCA, FIFRA, OSHA, waste management technologies and ecological assessment. In addition to EPA and OSHA programs, Dr. Chrostowski has developed substantial expertise in indoor air quality, odor analysis, microbiological risk assessment, the risk analysis of hazardous material transportation, and the risk analysis of FDA-regulated products. Dr. Chrostowski has conducted research into environmentally-friendly new product development and has directed registration and approval petition processes for the environmental and occupational aspects of new products, pesticides, and pharmaceuticals. Dr. Chrostowski's research interests include the behavior of complex mixtures, pharmacokinetics, application of quantitative management tools to environmental strategy development and evaluation, biomonitoring, mass transfer phenomena, applied statistics, and mathematical modeling. Dr. Chrostowski is active in numerous professional societies and expert panels and has authored or co-authored over 100 publications or presentations in the environmental field. In addition to his technical work, Dr. Chrostowski has taught university-level environmental sciences and has presented expert testimony in litigation cases, regulatory, and permitting hearings and public meetings and has conducted technical negotiations on behalf of private and governmental clients. Dr. Chrostowski was a member of the National Research Council's committee on Health Effects of Waste Incineration and assisted the presidential/Congressional Commission on Risk Assessment and Risk Management regarding risk assessment of municipal waste combustors.

**SARAH A. FOSTER
CPF ASSOCIATES, INC.**

EDUCATION

M.S., Environmental Health Sciences, Air Pollution Control Program Harvard University School of Public Health, Cambridge, MA (1985).

B.A., Political Science (Environmental Law/Energy Policy), Williams College, Williamstown, MA (1981).

EXPERIENCE

Ms. Foster is a founding member of CPF Associates, Inc. She has over 20 years of consulting experience in environmental health sciences, with expertise in developing strategies for and conducting exposure and risk analyses related to environmental issues and commercial and consumer products. Previously, Ms. Foster was a Senior Consultant with The Weinberg Group, a Project Manager at the Clement Division of ICF/Kaiser, an Environmental Analyst with the U.S. Environmental Protection Agency's Office of Policy Analysis, and a researcher for the Harvard Public Health School's Six City Study. Her areas of specialty include the application of quantitative methods for evaluating potential risks, including multiple chemical, multiple exposure pathway risk assessments for waste management technologies, air toxics sources and waste sites, Monte Carlo simulation, environmental epidemiology, and good risk assessment practice principles. She has managed and performed over 100 comprehensive risk assessment projects for combustion sources, waste sites and consumer and commercial products, with specialized knowledge in the conduct of risk assessments for municipal solid waste combustors, hazardous waste incinerators, landfills and emissions reported under SARA Title III. She has developed and applied a wide variety of environmental fate and transport models, and critically analyzed and compiled a broad array of human activity pattern data, in exposure assessment projects involving multiple inhalation, ingestion and dermal pathways as well as the use of household tap water. She has also developed and applied innovative risk assessment methods to assess risks from combustion sources, indoor water use, waste sites, and pesticides and anti-microbial materials that include geostatistical kriging and stochastic simulation. Ms. Foster has analyzed the historical state-of-knowledge of toxicological and environmental health sciences. Ms. Foster has numerous publications focusing on risk assessment, air toxics and emissions from industrial sources and is a member of several professional societies. She also has considerable experience in developing and conducting risk assessment training courses.

MALCOLM PIRNIE SCIENTISTS CONTRIBUTING TO THE RISK ASSESSMENT

Phyllis G. Diosey, Ph.D., QEP

Dr. Diosey is an Associate in Malcolm Pirnie's Air Quality/Odor Services Group, specializing in air quality assessment and modeling of stationary and mobile sources in support of federal, state, and local air permitting, environmental impact assessment, health risk assessment, odor impact assessment, emergency response, and accidental release analyses. She has received a B.A. in Mathematics, a B.S. and M.S. in Aeronautics and Astronautics, and a PhD in Geoscience. She is experienced in the use of a wide variety of computerized emissions and atmospheric dispersion models, including AERMOD, CALPUFF, ISC3, SLAB, DEGADIS, CAL3QHC/HCR, and MOBILE6. She has led modeling efforts for a number of waste-to-energy facilities, wastewater treatment plants, cement manufacturing and slag grinding facilities, sewage sludge incinerators, landfills, etc. Dr. Diosey has conducted laboratory and field research on atmospheric dispersion and meteorological phenomena related to air quality. In addition, she participated in numerous domestic and international meteorological field investigations of dispersion-related topics, and participated in international bilateral meetings on air pollution-related meteorology and photochemical smog.

Joel S. Cohn, P.E.

Mr. Cohn is a senior project engineer with Malcolm Pirnie specializing in air quality permitting and Clean Air Act compliance services. Joel has an M.S. in Environmental Engineering and more than 15 years of air quality project experience assisting clients with permitting, air emission inventories, air quality dispersion modeling, and regulatory compliance initiatives. For newly proposed facilities and plant expansions, he has led complex New Source Review (NSR) permitting efforts under the Prevention of Significant Deterioration (PSD) and Nonattainment Area permitting programs. He has also assisted a wide-variety of industrial and municipal facilities with Title V permitting projects and MACT compliance strategies. Additionally, he has prepared emission rate profiles for combustion sources to support the completion of multi-pathway human health and ecological risk assessments. Mr. Cohn's extensive air quality experience also includes leading permitting efforts for new power generating plants and waste-to-energy facilities located throughout the Mid-Atlantic and Southeastern United States.

Stephen Rice

Mr. Rice is an experienced environmental scientist with many years of involvement in diverse environmental studies, including physicochemical monitoring, ecological indices, and toxicological testing and monitoring. Steve has a B.S. in Biology and an M.S. in Environmental Science, in addition to several licenses and certifications related to wetlands delineation and evaluation. He performs taxonomic surveys, which include threatened and endangered species and their habitats. He specializes in the use of GIS in the analysis of aquatic and terrestrial habitat quality, in which he has over 17 years of experience. Mr. Rice is a project manager for endangered species, wetlands and other permitting issues and a member of the Malcolm Pirnie Planning and Permitting Knowledge Team.

Lorraine Farrell, P.E.

Ms. Farrell is a senior project engineer with Malcolm Pirnie, Inc. specializing in air quality dispersion modeling. Lorraine has an M.S. in Chemical Engineering and over ten years of air quality project experience assisting clients with air quality dispersion modeling in support of regulatory impact evaluation and assessment, air permitting, and air emission inventories. Ms. Farrell is experienced in the use of a variety of computerized emission and air dispersion models used for mobile and stationary source analyses. Lorraine has extensive experience in evaluating ambient impacts with respect to Prevention of Significant Deterioration (PSD) and ambient air quality standards for various federal, municipal, and industrial facilities.

APPENDIX B

CHEMICAL EMISSION RATES

Table RA-1
Chronic Emission Rates for HHERA (Annual Basis)
Solid Waste Authority of Palm Beach County

<u>New WTE Facility - PBREF2</u>				
MWC Operating Data:				
Combined Exhaust Flow, dscfm at 7% oxygen			284,808	
Activity Factor ¹			93.5%	
Combined Heat Input, MMBtu/year ¹			10,238,250	
Pollutant	Emission Factor ²	Units	Combined Emission Rate ³	
			lb/hr	gram/sec
Arsenic (As)	9.10E-06	lb/MMBtu	1.06E-02	1.34E-03
Beryllium (Be)	1.35E-07	lb/MMBtu	1.58E-04	1.99E-05
Cadmium (Cd)	10	µg/dscm	9.98E-03	1.26E-03
Lead (Pb)	140	µg/dscm	0.140	1.76E-02
HCl	20	ppm _{vd}	30.25	3.81
HF	3.5	ppm _{vd}	2.90	0.37
H ₂ SO ₄	5	ppm _{vd}	20.31	2.56
Ammonia	15	ppm _{vd}	10.57	1.33
Mercury (Hg)	see Table RA-5			
PCDD/PCDF	see Table RA-7			

Notes:

- 1) An activity factor is included in the emission rate calculations to obtain annual values for evaluating chronic impacts. The combined heat input value (MMBtu/year) incorporates the activity factor.
- 2) Emission factors for all pollutants except As and Be reflect proposed permit limits for the PBREF2 and are corrected to 7% oxygen. As and Be emission factors are based on permit limits for Lee County, FL Units 1 & 2.
- 3) Combined emission rate is the combined total emission rate from three 1000 TPD MWC units.
- 4) Example calculations are provided below (these sample calculations are also applicable to Tables RA-2, RA-3 and RA-4):

$$\begin{aligned}
 \text{Arsenic Emission Rate} &= 9.10\text{E-}06 \text{ lb/MMBtu} \times 10,238,250 \text{ MMBtu/yr} \times \text{yr}/8,760 \text{ hr} \\
 &= 1.064\text{E-}02 \text{ lb/hr} \times 453.6 \text{ gram/lb} \times \text{hr}/3600 \text{ sec} \\
 &= 1.34\text{E-}03 \text{ gram/sec}
 \end{aligned}$$

$$\begin{aligned}
 \text{Cadmium Emission Rate} &= 10 \text{ µg/dscm} \times 284,808 \text{ dscfm} \times \text{gram}/10^6 \text{ µg} \times \text{m}^3/35.31 \text{ ft}^3 \times \text{min}/60 \text{ sec} \\
 &= 1.344\text{E-}03 \text{ gram/sec} \times 93.5/100 \\
 &= 1.26\text{E-}03 \text{ gram/sec}
 \end{aligned}$$

$$\begin{aligned}
 \text{HCl Emission Rate} &= 284,808 \text{ dscfm} \times 1 \text{ atm} / (0.7302 \text{ atm-ft}^3/\text{lb mol-R}) / 528 \text{ °R} \times 20 \text{ ppm} \times 10^{-6} \\
 &= 1.477\text{E-}02 \text{ lb-mol/min} \times 60 \text{ min/hr} \times 36.5 \text{ lb/lb-mol} \times 93.5/100 \\
 &= 30.25 \text{ lb/hr} \times 453.6 \text{ gram/lb} \times \text{hr}/3600 \text{ sec} \\
 &= 3.81 \text{ gram/sec}
 \end{aligned}$$

Table RA-2
Chronic Emission Rates for HHERA (Annual Basis)
Solid Waste Authority of Palm Beach County

<u>Refurbished Existing RDF Facility - NCRRF</u>				
MWC Operating Data:				
Exhaust Flow Per Unit, dscfm at 7% oxygen			110,504	
Combined Exhaust Flow, dscfm at 7% oxygen			221,008	
Activity Factor ¹			93.5%	
Combined Heat Input, MMBtu/year ¹			7,002,964	
Pollutant	Emission Factor²	Units	Combined Emission Rate³	
			lb/hr	gram/sec
Arsenic (As)	9.3	µg/dscm	7.20E-03	9.07E-04
Beryllium (Be)	7.32E-08	lb/MMBtu	5.85E-05	7.37E-06
Cadmium (Cd)	7.56E-06	lb/MMBtu	6.04E-03	7.62E-04
Lead (Pb)	2.25E-04	lb/MMBtu	0.180	0.023
HCl	1.89E-02	lb/MMBtu	15.11	1.90
HF	5.90E-04	lb/MMBtu	0.472	0.06
H ₂ SO ₄	5	ppm _{vd}	15.76	1.99
Ammonia	15	ppm _{vd}	8.20	1.03
Mercury (Hg)	see Table RA-5			
PCDD/PCDF	see Table RA-7			

Notes:

1) An activity factor (as documented in the June 2009 ROI submittal to DEP for the refurbishment project) was included in the emission rate calculations to obtain annual values for evaluating chronic impacts. The combined heat input value (MMBtu/year) incorporates the activity factor.

2) Emission factors for Be, Cd, Pb, HCl, and HF reflect projected actual emissions for the refurbished RDF units as documented in the June 2009 RAI submittal to FDEP for the refurbishment project. Emission factor for arsenic is the permit limit for Miami-Dade RDF Units. Emission factors for other pollutants reflect maximum expected concentrations corrected to 7% oxygen and are based on the operation of new air pollution control equipment.

3) Combined emission rate is the combined total emission rate from two RDF units. Each unit has a 1,000 TPD nominal design capacity for MSW (or approximately 900 TPD for RDF).

Table RA-3
Acute Emission Rates for HHERA (Short-term Basis)
Solid Waste Authority of Palm Beach County

New WTE Facility - PBREF2

MWC Operating Data:

Combined Exhaust Flow, dscfm at 7% oxygen	284,808
Maximum Continuous Rating (MCR) Adjustment ¹	110.0%
Maximum Combined Heat Input, MMBtu/hr ¹	1375.0

Pollutant	Emission Factor ²	Units	Combined Emission Rate ³	
			lb/hr	gram/sec
Arsenic (As)	9.10E-06	lb/MMBtu	1.25E-02	1.58E-03
Beryllium (Be)	1.35E-07	lb/MMBtu	1.86E-04	2.34E-05
Cadmium (Cd)	10	µg/dscm	1.17E-02	1.48E-03
Lead (Pb)	140	µg/dscm	0.164	2.07E-02
HCl	20	ppm _{vd}	35.59	4.48
HF	3.5	ppm _{vd}	3.41	0.43
H ₂ SO ₄	5	ppm _{vd}	23.91	3.01
Ammonia	15	ppm _{vd}	12.43	1.57
Mercury (Hg)	see Table RA-6			
PCDD/PCDF	see Table RA-8			

Notes:

- 1) A short-term adjustment at 110% of the maximum continuous rating (MCR) of the MWCs is included in the emission rate calculations for pollutants with concentration based emission factors to obtain values for evaluating acute impacts. The maximum combined heat input value (MMBtu/hr) incorporates the MCR adjustment.
- 2) Emission factors for all pollutants except As and Be reflect proposed permit limits for the PBREF2 and are corrected to 7% oxygen. As and Be emission factors are based on permit limits for Lee County, FL Units 1 & 2.
- 3) Combined emission rate is the combined total emission rate from three 1000 TPD MWC units.

Table RA-4
Acute Emission Rates for HHERA (Short-term Basis)
Solid Waste Authority of Palm Beach County

Refurbished Existing RDF Facility - NCRRF

MWC Operating Data:

Exhaust Flow Per Unit, dscfm at 7% oxygen	110,504
Combined Exhaust Flow, dscfm at 7% oxygen	221,008
Maximum Continuous Rating (MCR) Adjustment ¹	110.0%
Maximum Combined Heat Input, MMBtu/hr ¹	901.6

Pollutant	Emission Factor ²	Units	Combined Emission Rate ³	
			lb/hr	gram/sec
Arsenic (As)	9.3	µg/dscm	8.47E-03	1.07E-03
Beryllium (Be)	7.3E-07	lb/MMBtu	6.58E-04	8.29E-05
Cadmium (Cd)	0.035	mg/dscm	0.0319	0.004
Lead (Pb)	4.0E-04	lb/MMBtu	0.361	0.045
HCl	25	ppm _{vd}	34.52	4.35
HF	3.2E-03	lb/MMBtu	2.89	0.36
H ₂ SO ₄	5	ppm _{vd}	18.54	2.34
Ammonia	15	ppm _{vd}	9.65	1.22
Mercury (Hg)	see Table RA-6			
PCDD/PCDF	see Table RA-8			

Notes:

- 1) A short-term adjustment at 110% of the maximum continuous rating (MCR) of the MWCs is included in the emission rate calculations for pollutants with concentration based emission factors (mg/dscm or ppm_{vd}) to obtain values for evaluating acute impacts. The maximum combined heat input value (MMBtu/hr) incorporates the MCR adjustment.
- 2) Emission factors for Be, Cd, Pb, HCl, and HF reflect applicable NCRRF permit limits and emission factor for As is the permit limit for Miami-Dade RDF Units. Emission factors for pollutants without permit limits reflect maximum expected concentrations and are based on the operation of new air pollution control equipment. All concentrations are corrected to 7% oxygen.
- 3) Combined emission rate is the combined total emission rate from two RDF units. Each unit has a 1,000 TPD nominal design capacity for MSW (or approximately 900 TPD for RDF).

Table RA-5
Chronic Mercury (Hg) Emission Rates for HHERA
Solid Waste Authority of Palm Beach County

Proposed PBREF2 Combined Exhaust Flow, dscfm at 7% O ₂	284,808
Hg Emissions for Proposed PBREF2, mg/dscm @ 7% O ₂	0.012
Activity Factor	93.5%

	Proposed PBREF2 ^(1,3) 3 Units Combined		Refurbished WTE ^(2,3) 2 Units Combined	
	<u>lb/hour</u>	<u>gm/sec</u>	<u>lb/hr</u>	<u>gm/sec</u>
Total Hg Emission Rate	1.20E-02	1.51E-03	2.70E-03	3.40E-04
Total Hg Locally Available	2.94E-03	3.71E-04	6.34E-04	7.99E-05
Elemental Hg - Locally Available	7.18E-05	9.05E-06	1.78E-05	2.24E-06
Total Divalent Hg - Locally Available	2.87E-03	3.62E-04	6.16E-04	7.76E-05
Divalent Vapor phase - Locally Available	2.44E-03	3.08E-04	6.04E-04	7.61E-05
Divalent Particulate Phase- Locally Available	4.31E-04	5.43E-05	1.23E-05	1.55E-06

1) For the proposed WTE facility, the total Hg emission rate is based on average concentration from available stack test data (3-yr) from representative Florida WTE facilities. The locally deposited elemental and divalent phase breakdowns are based on HHRAP recommended speciation as shown below:

Hg Phase	% of total Emitted	% locally Available	% locally Available from total Emitted
Elemental Vapor	60	1	0.6
Divalent Vapor	30	68	20.4
Divalent particle	10	36	3.6

2) For the refurbished WTE facility, the breakdown of locally deposited elemental and divalent phase Hg emissions is based on the average of five years stack testing data (2004 - 2008) and HHRAP recommended values (% locally available values). A reduction of 50% was assumed since mercury emissions from the refurbished units will be controlled by a carbon injection system. The breakdown of Hg for the refurbished WTE is as follows:

Hg Phase	% of total Emitted	% locally Available	% locally Available from total Emitted
Elemental Vapor	65.86	1	0.66
Divalent Vapor	32.88	68	22.36
Divalent particle	1.27	36	0.46

3) An activity factor is included in the emission rate calculations to obtain annual values for evaluating chronic impacts. For example, the total Hg emission rate for the proposed WTE facility is calculated as shown below:

$$\begin{aligned}
 \text{Total Hg Emission Rate} &= 0.012 \text{ mg/dscm} \times 284,808 \text{ dscfm} \times \text{gram}/10^3 \text{ mg} \times \text{m}^3/35.31 \text{ ft}^3 \times \text{min}/60 \text{ sec} \\
 &= 1.613\text{E-}03 \text{ gram/sec} \times (93.5/100) \\
 &= 1.51\text{E-}03 \text{ gram/sec}
 \end{aligned}$$

Table RA-6
Acute Mercury (Hg) Emission Rates for HHERA
Solid Waste Authority of Palm Beach County

Proposed PBREF2 Combined Exhaust Flow, dscfm at 7% O ₂	284,808
Refurbished WTE Exhaust Flow Per Unit, dscfm at 7% O ₂	110,504
Proposed PBREF2 Hg Permit Limit, mg/dscm @ 7% O ₂	0.025
Refurbished WTE Hg Maximum Expected Conc., mg/dscm @ 7% O ₂	0.028

	Proposed PBREF2 ⁽¹⁾		Refurbished WTE ⁽²⁾	
	3 Units Combined		2 Units Combined	
	<u>lb/hr</u>	<u>gm/sec</u>	<u>lb/hr</u>	<u>gm/sec</u>
Total Hg Emission Rate	2.93E-02	3.70E-03	2.32E-02	2.92E-03
Total Hg Locally Available	7.22E-03	9.09E-04	5.44E-03	6.86E-04
Elemental Hg - Locally Available	1.76E-04	2.22E-05	1.53E-04	1.92E-05
Total Divalent Hg - Locally Available	7.04E-03	8.87E-04	5.29E-03	6.66E-04
Divalent Vapor phase - Locally Available	5.99E-03	7.54E-04	5.18E-03	6.53E-04
Divalent Particulate Phase- Locally Available	1.06E-03	1.33E-04	1.06E-04	1.33E-05

1) For the proposed WTE facility, the total Hg emission rate is based on the anticipated permit limit of 0.025 mg/dscm and peak short-term operations at 110% of the maximum continuous rating of the MWCs. The locally deposited elemental and divalent vapor and particle phase breakdowns are based on HHRAP recommended speciation as shown below:

Hg Phase	% of total Emitted	% locally Available	% locally Available from total Emitted
Elemental Vapor	60	1	0.6
Divalent Vapor	30	68	20.4
Divalent particle	10	36	3.6

2) For the refurbished WTE facility, Hg emissions are based on the anticipated maximum level of 0.028 mg/dscm reflecting the use of a carbon injection system to be installed. The breakdown of Hg emissions into elemental and divalent phases for the refurbished WTE is as follows as calculated from stack test data (2004 - 2008) and HHRAP recommended values (% locally available values):

Hg Phase	% of total Emitted	% locally Available	% locally Available from total Emitted
Elemental Vapor	65.86	1	0.66
Divalent Vapor	32.88	68	22.36
Divalent particle	1.27	36	0.46

Table RA-7
Chronic PCDD/PCDF Emission Rates for HHERA
Solid Waste Authority of Palm Beach County

Congener	Proposed PBREF2 ^(1,3)		Refurbished WTE ^(2,3)	
	3 Units Combined		2 Units Combined	
	<u>lb/hour</u>	<u>gm/sec</u>	<u>lb/hr</u>	<u>gm/sec</u>
Total Emission Rate	4.18E-06	5.26E-07	1.74E-06	2.19E-07
2,3,7,8-TCDD	1.16E-08	1.46E-09	2.17E-08	2.73E-09
1,2,3,7,8-PeCDD	3.98E-08	5.02E-09	3.92E-08	4.94E-09
1,2,3,4,7,8-HxCDD	4.13E-08	5.20E-09	1.64E-08	2.07E-09
1,2,3,6,7,8-HxCDD	9.53E-08	1.20E-08	2.57E-08	3.23E-09
1,2,3,7,8,9-HxCDD	1.07E-07	1.35E-08	3.31E-08	4.17E-09
1,2,3,4,6,7,8-HpCDD	6.09E-07	7.67E-08	9.55E-08	1.20E-08
OCDD	1.21E-06	1.52E-07	1.53E-07	1.93E-08
2,3,7,8-TCDF	6.87E-08	8.65E-09	3.65E-07	4.59E-08
1,2,3,7,8-PeCDF	1.29E-07	1.63E-08	1.20E-07	1.51E-08
2,3,4,7,8-PeCDF	1.61E-07	2.03E-08	1.34E-07	1.69E-08
1,2,3,4,7,8-HxCDF	2.96E-07	3.73E-08	1.93E-07	2.43E-08
1,2,3,6,7,8-HxCDF	1.64E-07	2.06E-08	1.15E-07	1.45E-08
1,2,3,7,8,9-HxCDF	1.81E-07	2.28E-08	1.28E-08	1.61E-09
2,3,4,6,7,8-HxCDF	2.67E-08	3.37E-09	8.85E-08	1.12E-08
1,2,3,4,6,7,8-HpCDF	6.93E-07	8.73E-08	2.40E-07	3.03E-08
1,2,3,4,7,8,9-HpCDF	7.71E-08	9.72E-09	2.69E-08	3.38E-09
OCDF	2.66E-07	3.36E-08	5.88E-08	7.41E-09

Notes:

1) For the proposed PBREF2, the congener emission rates shown are based on the congener distribution and average test data from a representative facility (Lee County, 1994-2001 test data with an average total PCDD/PCDF concentration of 11.4 ng/dscm).

2) For the refurbished WTE, the congener emission rates shown are average values from 5-years of stack testing (2004-2008) with an average total PCDD/PCDF concentration of 11.6 ng/dscm. To account for the carbon injection system to be installed for as part of the refurbishment project, a 10% reduction in emissions was assumed.

3) An activity factor (93.5%) is included in the emission rate calculations to obtain annual values for evaluating chronic impacts.

Table RA-8
Acute PCDD/PCDF Emission Rates for HHERA
Solid Waste Authority of Palm Beach County

Proposed PBREF2 Dioxin/Furan Permit Limit, ng/dscm @ 7% O₂ 13
 Refurbished WTE Dioxin/Furan Applicable Limit, ng/dscm @ 7% O₂ 30

Congener	Proposed PBREF2 ⁽¹⁾		Refurbished WTE ⁽²⁾	
	3 Units Combined		2 Units Combined	
	<u>lb/hour</u>	<u>gm/sec</u>	<u>lb/hr</u>	<u>gm/sec</u>
Total Congener Emission Rate	5.60E-06	7.06E-07	5.34E-06	6.73E-07
2,3,7,8-TCDD	1.56E-08	1.96E-09	6.66E-08	8.39E-09
1,2,3,7,8-PeCDD	5.34E-08	6.73E-09	1.21E-07	1.52E-08
1,2,3,4,7,8-HxCDD	5.54E-08	6.98E-09	5.04E-08	6.35E-09
1,2,3,6,7,8-HxCDD	1.28E-07	1.61E-08	7.88E-08	9.93E-09
1,2,3,7,8,9-HxCDD	1.43E-07	1.81E-08	1.02E-07	1.28E-08
1,2,3,4,6,7,8-HpCDD	8.17E-07	1.03E-07	2.94E-07	3.70E-08
OCDD	1.62E-06	2.04E-07	4.70E-07	5.92E-08
2,3,7,8-TCDF	9.22E-08	1.16E-08	1.12E-06	1.41E-07
1,2,3,7,8-PeCDF	1.74E-07	2.19E-08	3.69E-07	4.65E-08
2,3,4,7,8-PeCDF	2.17E-07	2.73E-08	4.12E-07	5.19E-08
1,2,3,4,7,8-HxCDF	3.97E-07	5.00E-08	5.92E-07	7.46E-08
1,2,3,6,7,8-HxCDF	2.20E-07	2.77E-08	3.53E-07	4.45E-08
1,2,3,7,8,9-HxCDF	2.42E-07	3.05E-08	3.94E-08	4.96E-09
2,3,4,6,7,8-HxCDF	3.59E-08	4.52E-09	2.72E-07	3.43E-08
1,2,3,4,6,7,8-HpCDF	9.30E-07	1.17E-07	7.38E-07	9.30E-08
1,2,3,4,7,8,9-HpCDF	1.03E-07	1.30E-08	8.25E-08	1.04E-08
OCDF	3.57E-07	4.50E-08	1.81E-07	2.28E-08

Notes:

1) For the proposed PBREF2, the congener emission rates shown are based on the congener distribution for a representative facility (Lee County, 1994-2001 test data with an average total PCDD/PCDF concentration of 11.4 ng/dscm). The emission rates were conservatively adjusted (increased) to reflect an anticipated permit limit of 13 ng/dscm for the proposed WTE and peak short-term operations at 110% of the maximum continuous rating of the MWCs.

2) For the refurbished WTE, the congener emission rates shown are based on the congener distribution from 5-years of stack testing (2004-2008 with an average total PCDD/PCDF concentration of 11.6 ng/dscm). The emission rates were adjusted (increased) to reflect the maximum allowable limit of 30 ng/dscm for the refurbished WTE.

APPENDIX C

AIR DISPERSION AND DEPOSITION MODELING PROTOCOL PREPARED BY MALCOLM PIRNIE, INC.

C. Air Dispersion and Deposition Modeling Protocol

C.1. INTRODUCTION

Air dispersion and deposition modeling was performed to provide estimates of downwind ambient concentration and wet and dry deposition rates for the human health and ecological impact evaluation. The municipal waste combustor (MWC) units at both the refurbished North County Resource Recovery Facility (Existing Facility) and the proposed Palm Beach Renewable Energy Facility No. 2 (Proposed Facility) were modeled in order to provide unitized impacts for input into the human health and ecological risk assessment. These unitized impacts were determined using refined computerized dispersion and deposition modeling as recommended by the United States Environmental Protection Agency's (USEPA) *Human Health Risk Assessment Protocol for Hazardous Waste Combustion Facilities*, or HHRAP (USEPA, 2005).

C.2. MODELING METHODOLOGY

Air dispersion and deposition modeling combines facility information (i.e., source parameters and building information) with physical, site-specific data from the surrounding area (i.e., meteorology, terrain, and land use information) to estimate ambient air concentrations in addition to deposition fluxes from both wet and dry removal processes. The modeling was performed at specific receptor locations (e.g., residential and farmer locations) and at designated areas (e.g., watersheds and waterbodies). The modeling output was then provided to CPF Associates, Inc. to provide the necessary input for evaluating the potential for human and ecological exposure due to the MWC stack emissions.

C.2.1. Model Selection

The modeling analysis for the risk assessment was conducted using the USEPA-approved AERMOD dispersion model (American Meteorological Society/Environmental Protection Agency Regulatory Model, USEPA, 2004a). The analysis used the latest version of AERMOD (currently version 09292). Although the HHRAP guidance was based on the use of the Industrial Source Complex Short-Term Model (ISCST3), the HHRAP guidance also discussed AERMOD as a potential replacement once it gained regulatory acceptance. AERMOD is a state-of-the-science dispersion model that has now officially replaced the ISCST3 model as the preferred regulatory model by the USEPA and the Florida Department of Environmental Protection (FDEP). Similar to ISC, AERMOD is capable of predicting particle and vapor deposition, as well as air concentration. AERMOD was performed in accordance with *Appendix W of 40 CFR Part 51: Guideline on Air Quality Models* (USEPA, 2008) guidance provided in the

User's Guide for the AMS/EPA Regulatory Model-AERMOD (USEPA, 2004a) and *Addendum* (USEPA, 2006), and recommendations provided in HHRAP. The modeling was performed with a commercial version of the AERMOD model (*BREEZE* Software, Trinity Consultants, Inc.). This commercial version of the AERMOD program combines the regulatory executable files of the AERMOD system with Windows-based pre- and post-processing programs to allow easier data input entry and advanced data processing and graphing capabilities.

C.2.2. Model Input Parameters

AERMOD requires site-specific information including exhaust parameters of the MWC stacks from the two facilities, hourly meteorological data, receptor locations (including terrain elevation), and the selection of project-specific model options (land-use, building wake information, averaging time, etc.).

C.2.2.1. Source Information

The operating parameters for the Proposed Facility and the Existing Facility were evaluated for both chronic and acute exposure scenarios. Chronic exposure for both stacks was evaluated based on actual anticipated long-term (annual average) operating parameters. Acute exposure for the Proposed Facility was evaluated based on worst-case short-term operating parameters as evaluated for the Prevention of Significant Deterioration (PSD) modeling analysis. Acute exposure for the Existing Facility was evaluated based on permitted operating parameters which were developed based on historical operating data. Table C1 summarizes the stack parameters that were used in the modeling analysis.

The emission rates in the model were unitized at 1.0 gram per second (g/s) for each stack. Compounds potentially emitted from the MWC stacks are dispersed and deposited as either vapors or particulates (i.e., particles or particle-bound). AERMOD allows the partitioning of these different phases and was run in four basic modes:

1. **Vapor phase mode** to determine the vapor phase ambient concentration, dry vapor deposition, wet vapor deposition, and total vapor deposition.
2. **Mercury vapor phase mode** to determine the ambient concentration, dry vapor deposition, wet vapor deposition, and total deposition. Separate model runs were conducted for elemental mercury and divalent mercury.
3. **Particle-phase mode** (based on mass weighting of the particles emitted from the stacks) to determine the particle-phase ambient concentration and dry, wet, and total deposition fluxes of particles.
4. **Particle-bound phase mode** (based on surface area weighting of the particles emitted from the stacks) to determine the particle-bound phase ambient concentration and dry, wet, and total deposition fluxes of contaminants that condense on the surfaces of particles leaving the stacks.

For the vapor-phase mode, AERMOD requires that four pollutant-specific parameters be provided. These parameters include:

- Diffusivity in air, D_a
- Diffusivity in water, D_w
- Henry's Law constant, H
- Cuticular resistance, r_{cl}

These four pollutant-specific parameters were defined for a surrogate compound, 2,3,7,8-TCDD (as directed by CPF Associates, Inc.) to represent vapor phase constituents (other than mercury), and for elemental and divalent mercury. Values for the diffusivities and the Henry's Law constant were obtained from the HHRAP guidance; values for the cuticular reference were obtained from the guidance document *Deposition Parameterizations for the Industrial Source Complex (ISC3) Model* (Wesely et al. 2002). The pollutant-specific vapor phase values that were used in the modeling analysis are summarized in Table C2.

For the particle and particle-bound phases, particle size plays a key role in determining the fate of particles in air flow, and the wet and dry particle removal rates. The particle size distributions for both the Proposed Facility and the Existing Facility were based upon stack sampling from a similarly controlled mass burn facility (Hahn and Sussman, 1986). Table C3 presents the particle size distribution used in the modeling analysis. The particle size distribution based on total mass was used to model deposition of compounds in the particle phase, while the particle size distribution based on total surface area was used to model deposition of particle phase compounds. The particle density for both stacks was assumed to be 1.0 gram per cubic centimeter (g/cm^3) as recommended in HHRAP.

C.2.2.2. Meteorological Data

The modeling analysis used five years of AERMOD formatted hourly meteorological data (2001 through 2005). The meteorological data was provided by the FDEP, and was the same data that was used for the air quality analysis for the air permit and power plant siting analysis. The data from 2001 through 2005 is based on hourly surface data from Palm Beach International Airport and upper air data from Florida International University, Miami. Palm Beach International Airport, the nearest National Weather Service (NWS) station is approximately 6.9 miles southeast of the site. A five-year average wind rose (wind blowing from) is presented in Figure C1. In developing the data, the FDEP data used single values of albedo, Bowen ratio, and surface roughness for all seasons over the twelve (12) default AERMET sectors. These sector-averaged values were included in the AERMET data file provided by FDEP.

C.2.2.3. Receptor Locations

Receptors were developed using a Cartesian grid network centered on the Proposed Facility MWC stack, as proposed for the PSD modeling analysis. Setup of the receptor grid network followed HHRAP guidance. Two sets of Cartesian grids were used:

- 100 meter-spaced grid from the location of the Proposed Facility stack out to 3 kilometers;
- 500 meter-spaced grid from 3 kilometers out to 10 kilometers.

Figure C2 presents a schematic of the receptor grids. Impacts at locations of interest for the risk assessment, such as residential and farmer locations and watersheds and waterbodies, were developed from the gridded receptor locations. In addition, receptors were also placed around the Proposed Facility fenceline and the Existing Facility fenceline at a spacing of 50 meters, as indicated in Figure C2. Because the public will have limited access within the fence lines of both the Proposed and Existing Facilities (for example, at drop-off areas and at visitor centers), grid receptors within the fence lines were also included in the model.

Terrain in the vicinity of the project site is relatively flat. Terrain elevations at each receptor location within the modeling domain were evaluated based on electronic terrain data from FDEP Land Boundary Information System (LABINS). The terrain files were in NAD27 datum, zone 17. All receptors were placed at ground level. The terrain data was processed using the AERMAP pre-processing program (USEPA, 2004c, 2009b). AERMAP processes publically available Digital Elevation Model (DEM) data or National Elevation Dataset (NED) data and creates a file suitable for use by AERMOD. The AERMAP file contains elevation and hill height scaling factors for each receptor in the air dispersion and deposition study. The latest version of AERMAP (currently version 09040) was used for the analysis.

C.2.2.4. Model Control Options

The AERMOD modeling system includes a number of options to allow for a more site-specific analysis. The selection of these options for the risk assessment dispersion and deposition modeling is discussed below.

C.2.2.4.1. GEP Stack Height and Building Downwash

The modeling analysis included an analysis of Good Engineering Practice (GEP) stack height, and the effects of building downwash on the dispersion of the contaminants from the two MWC stacks through the use of the PRIME version of the Building Profile Input Program (BPIPPRM, USEPA, 2004d). The building and source parameter data were used to calculate the predominant building dimensions associated with each of the MWC stacks at wind directions of every 10 degrees. This output was used by AERMOD in determining downwash effects on the dispersion of plumes. Based on the GEP stack

height analysis, the stack heights for the PBREF2 and for the NCRRF are below GEP stack height; therefore, building wake effects were included in the analysis.

C.2.2.4.2. Land Use

The land use classification procedure recommended by USEPA as outlined in the *Guideline on Air Quality Models* was used to identify whether rural or urban dispersion coefficients were applicable for the permit modeling as well as this modeling analysis. The procedure involves classifying the land use within a 3-km radius circle centered on the Proposed Facility using Auer's land use typing scheme (Auer, 1978). If more than fifty percent of the area within this 3-km radius circle consists of Auer's industrial, commercial or compact residential land types, then urban dispersion coefficients are used in the modeling; otherwise, rural dispersion coefficients would be used. Figure C3 shows the land uses within 3-km of the project and a breakdown of the classifications. Based upon the analysis, the land use is designated as primarily rural; therefore, rural dispersion coefficients were used for the analysis.

C.2.2.4.3. Other Model Control Options

Following HHRAP guidance, other model options included buoyancy-induced dispersion, final plume rise, the effects of stack-tip downwash, and calm wind processing.

C.3. MODEL OUTPUT

Since unitized emission rates (1 gram per second, or g/s) from each stack were used in the modeling analysis, the resulting output was unitized impacts in terms of micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) per g/s (or $\mu\text{g}/\text{m}^3$ per g/s) for concentration and grams per square meter per year per g/s (or $\text{g}/\text{m}^2/\text{yr}$ per g/s) for deposition.

The AERMOD model output predicted annual average values of unitized ambient air concentration, dry deposition, wet deposition and total deposition for vapor, particle, and particle-bound phases at each receptor location for each individual stack. For short-term acute effects, the model output was in the form of unitized ambient air concentration for vapor, particle, and particle-bound phases; deposition modeling results were not required for the short-term acute effects. The following output was generated from AERMOD:

- Vapor-phase:
 - Unitized vapor-phase air concentration
 - Unitized dry vapor deposition
 - Unitized wet vapor deposition
 - Unitized total deposition (i.e., wet and dry)

- Particle-phase:
 - Unitized air concentration
 - Unitized dry deposition
 - Unitized wet deposition
 - Unitized total deposition (i.e., wet and dry)
- Particle-bound phase:
 - Unitized air concentration
 - Unitized dry deposition
 - Unitized wet deposition
 - Unitized total deposition (i.e., wet and dry)

These model outputs were provided for 2,3,7,8-TCDD, divalent mercury, and elemental mercury.

C.4. REFERENCES

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Wesely, M.L., Doskey, P.V. and Shannon, J.D., 2002. *Deposition Parameterizations for the Industrial Source Complex (ISC3) Model*. Environmental Research Division, Argonne National Laboratory.

Table C1
Stack Parameters for the Proposed Facility and the Existing Facility MWC Stacks

Source	UTM Coordinates		Stack Base Elevation (from MSL)		Stack Height (above base)		Effective Stack Diameter		Exhaust Flowrate		Exhaust Velocity		Exhaust Temperature	
	East (m)	North (m)	(ft)	(m)	(ft)	(m)	(ft)	(m)	(ft ³ /min)	(m ³ /sec)	(ft/min)	(m/s)	(deg F)	(deg K)
Proposed Facility Stack - short-term	585295.23	2961736.29	24.0	7.32	310.0	94.5	14.0	4.26	509,193	240.31	3,319.0	16.84	285.0	413.7
Proposed Facility Stack - annual	585295.23	2961736.29	24.0	7.32	310.0	94.5	14.0	4.26	552,930	260.95	3,604.1	18.29	285.0	413.7
Existing Facility Stack	585320.0	2961238.9	17.0	5.18	250.0	76.2	11.5	3.49	344,680	162.67	3,341.6	16.98	310.0	427.6

Notes:

1. UTM coordinates are defined for the center of the stack. UTM coordinates are in NAD27 datum, zone 17.
2. MSL = Mean Sea Level
3. Stack height is the height above base elevation to the top of the flue.
4. For the Existing Facility stack, the stack diameter is an equivalent stack diameter based on two of three flues operating. Exhaust parameters are at the design condition of 1,800 tons per day.
5. For the Proposed Facility stack, the stack diameter is an effective stack diameter reflecting a "merged stack" based on a single flue fixed at a design exit velocity of 60 ft/sec (18.29 m/s). The exhaust flow rate is the combined rate for all MWCs at 3,000 tons per day at the worst case operating condition for short-term and at the design operating condition for annual.

Table C2
AERMOD Vapor-Phase Pollutant-Specific Deposition Parameters

Compound	CAS #	Diffusivity in Air (D_a)	Diffusivity in Water (D_w)	Henry's Law Constant, (H)		Cuticular Resistance (r_{cl})
		(cm^2/sec)	(cm^2/sec)	($\text{atm}\cdot\text{m}^3/\text{mol}$)	($\text{Pa}\cdot\text{m}^3/\text{mol}$)	(sec/cm)
2,3,7,8-TCDD	1746-01-6	0.10	5.60E-06	3.3E-05	3.34	7.84
Divalent mercury	7487-94-7	0.045	5.20E-06	7.10E-10	7.19E-05	1.00E+05
Elemental mercury	7439-97-6	0.011	3.0E-05	7.1E-03	719.41	1.00E+05

Notes:

1. 2,3,7,8-TCDD was used as the surrogate compound to represent vapor phase constituents other than mercury.
2. Values for the diffusivity and Henry's Law constant were obtained from HHRAP 2005 (Appendix A-2).
3. Values for the cuticular resistance were obtained from Wesely et al. 2002 (Table D.4 for TCDD and Table 7 for mercury).

Table C3
Particle Size Distribution for the Proposed and Existing Facility Stack Emissions

Particle Size (um)		Mean Particle Diameter (um)	Particle Phase (Mass Fraction)	Particle Bound Phase (Surface Area Fraction)
Lower	Upper			
0	0.6	0.38	0.53	0.8983
0.6	1	0.82	0.04	0.0316
1	1.6	1.32	0.03	0.0147
1.6	3.2	2.46	0.1	0.0263
3.2	5	4.11	0.08	0.0126
5	7.3	6.11	0.08	0.0085
7.3	10.8	8.96	0.06	0.0043
10.8	17.4	13.98	0.08	0.0037

Notes:

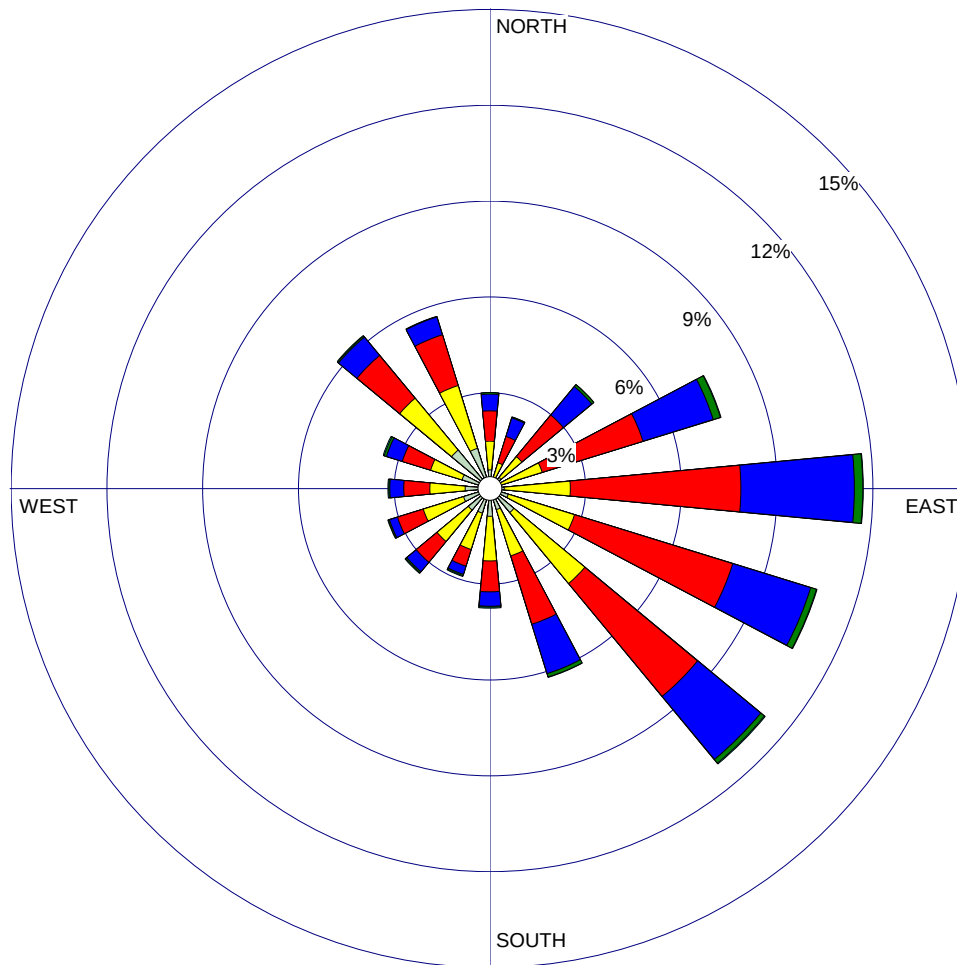
1. Data from the Wurzburg, Germany facility. Hahn, J.L. and D.B. Sussman, 1986. Dioxin Emissions from Modern, Mass-fired, Stoker/Boilers with Advanced Air Pollution Control Equipment. Ogden Projects, Inc. Paramus, NJ. Poster Presentation at ***Dioxin 86***, Fukuoka, Japan, September 1986.

WIND ROSE PLOT:

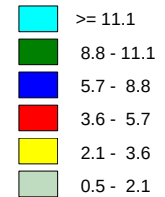
Station #12844 Palm Beach International Airport
Five-year Annual Wind Rose 2001 - 2005

DISPLAY:

Wind Speed
Direction (blowing from)



WIND SPEED
(m/s)



Calms: 11.23%

COMMENTS:

January - December

DATA PERIOD:

2001-2005
Jan 1 - Dec 31
00:00 - 23:00

CALM WINDS:

11.23%

AVG. WIND SPEED:

4.01 m/s

TOTAL COUNT:

43824 hrs.

PROJECT NO.:

WRPLOT View - Lakes Environmental Software

**MALCOLM
PIRNIE**

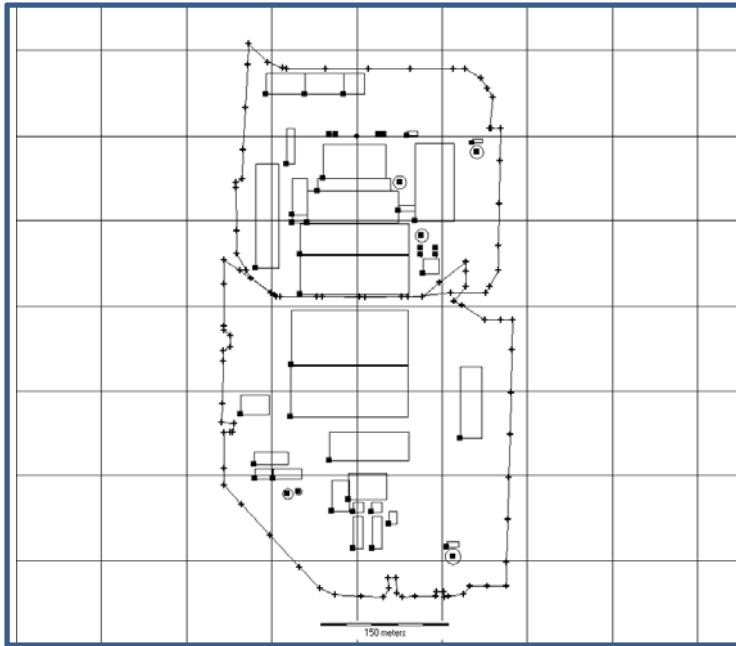


Solid Waste Authority
of Palm Beach County

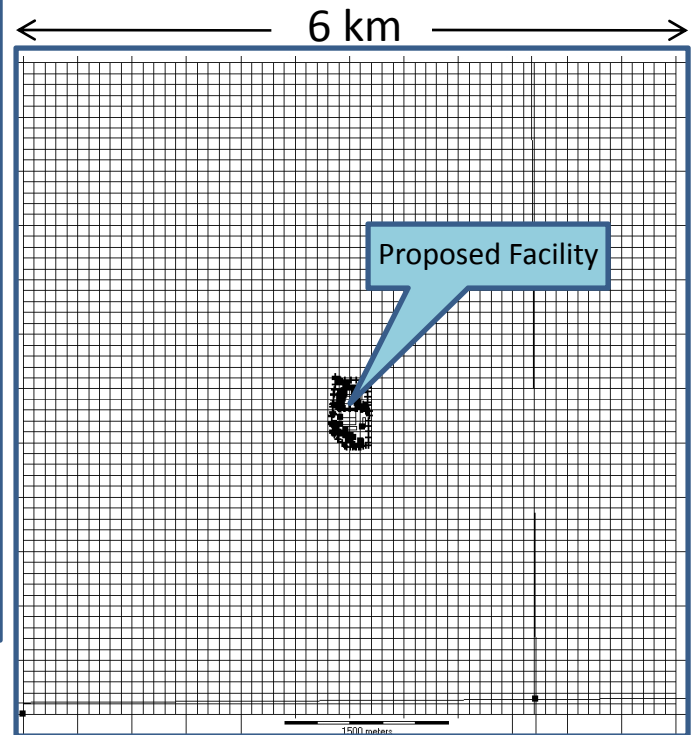
Five-year Annual Wind Rose
2001 – 2005

MALCOLM PIRNIE, INC.

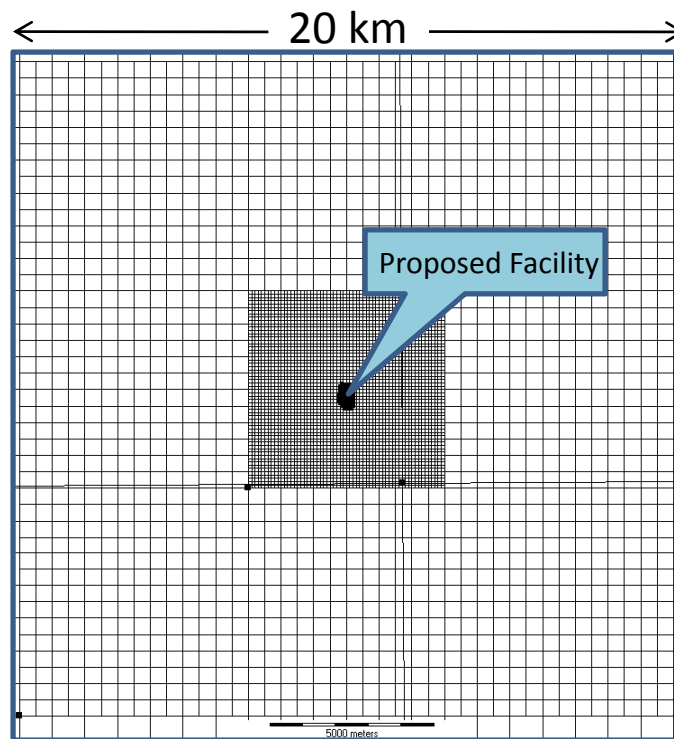
July 2010
FIGURE C1



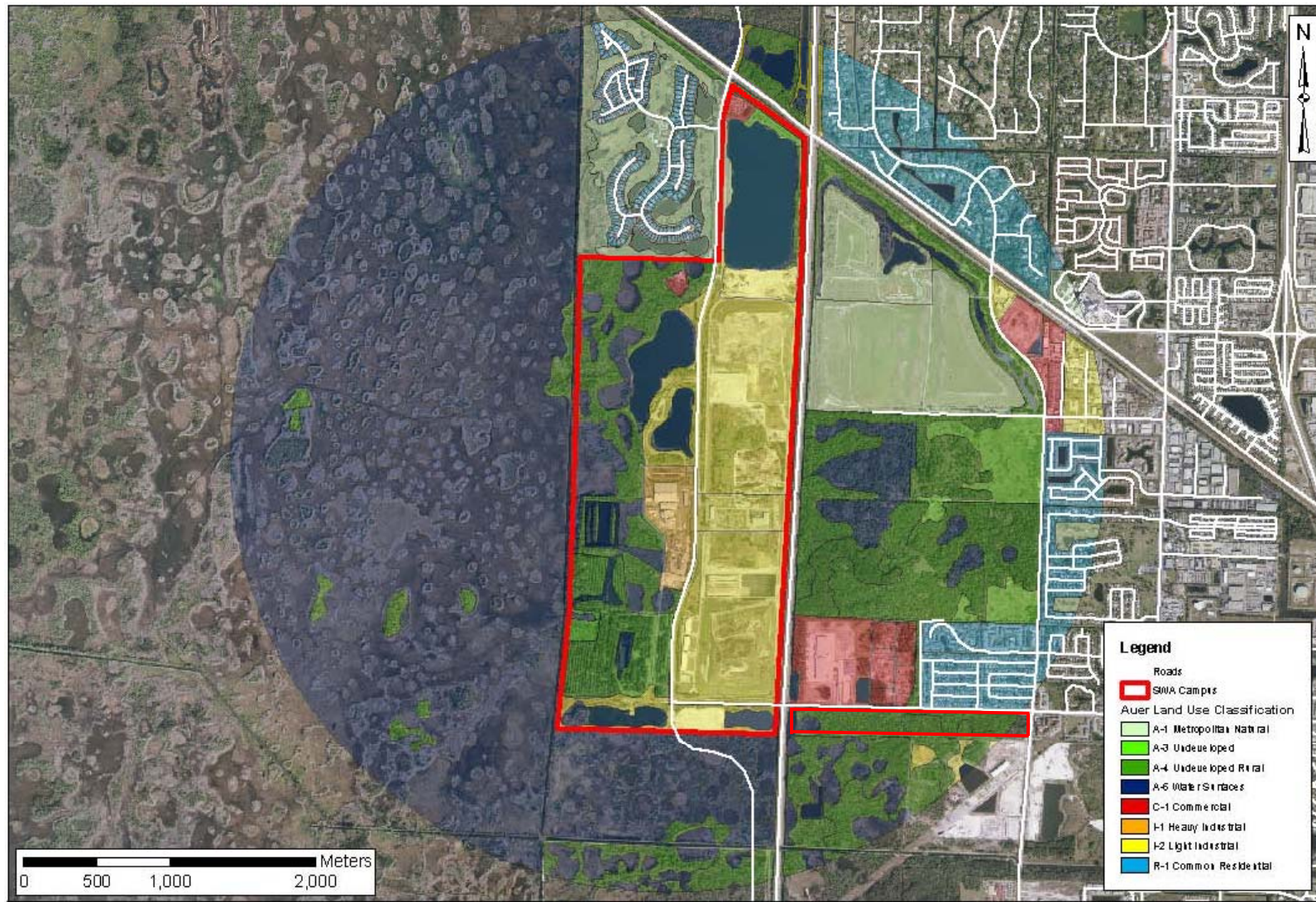
50-meter spaced fenceline receptors



100-meter spaced grid



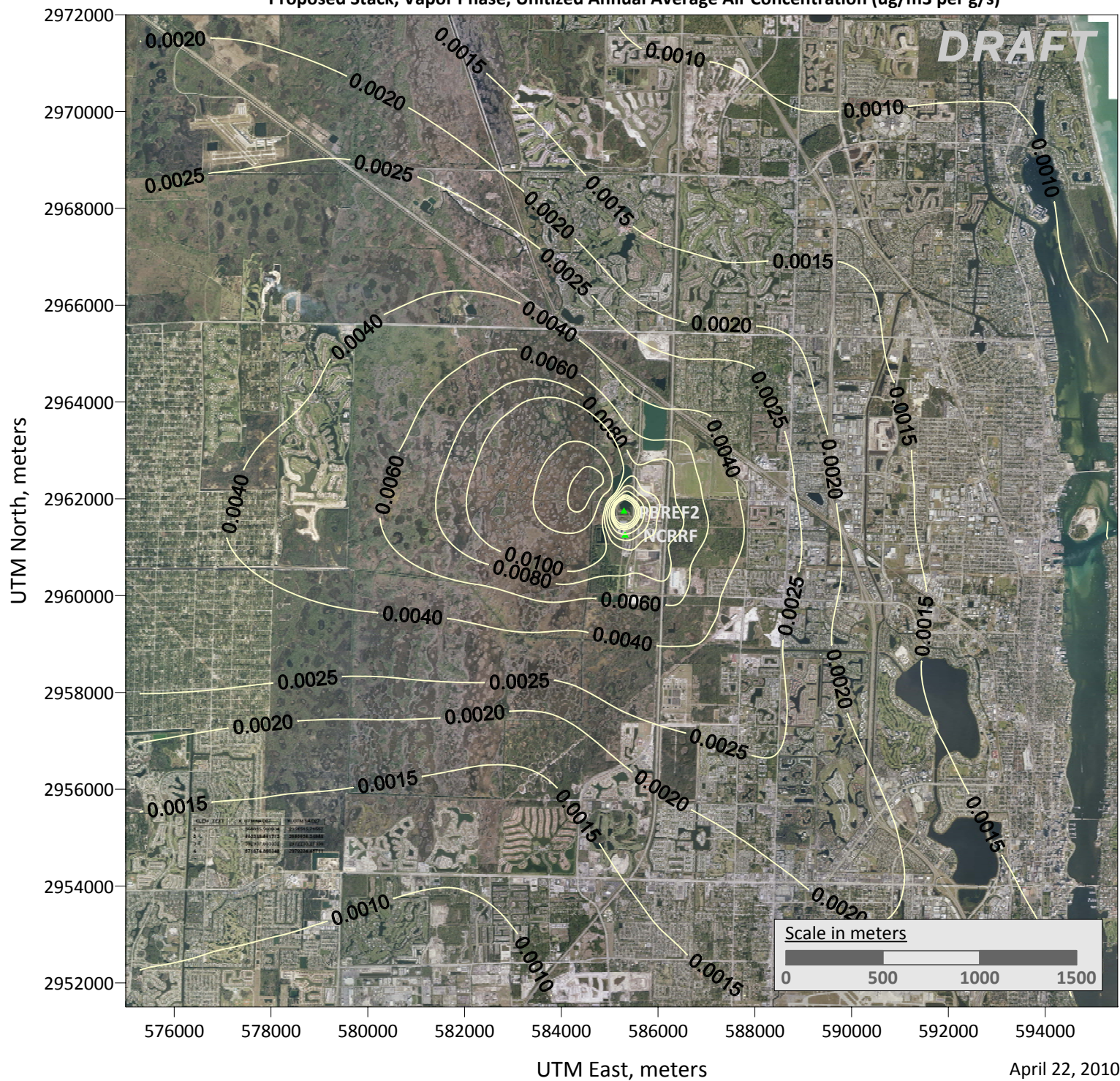
500-meter spaced grid



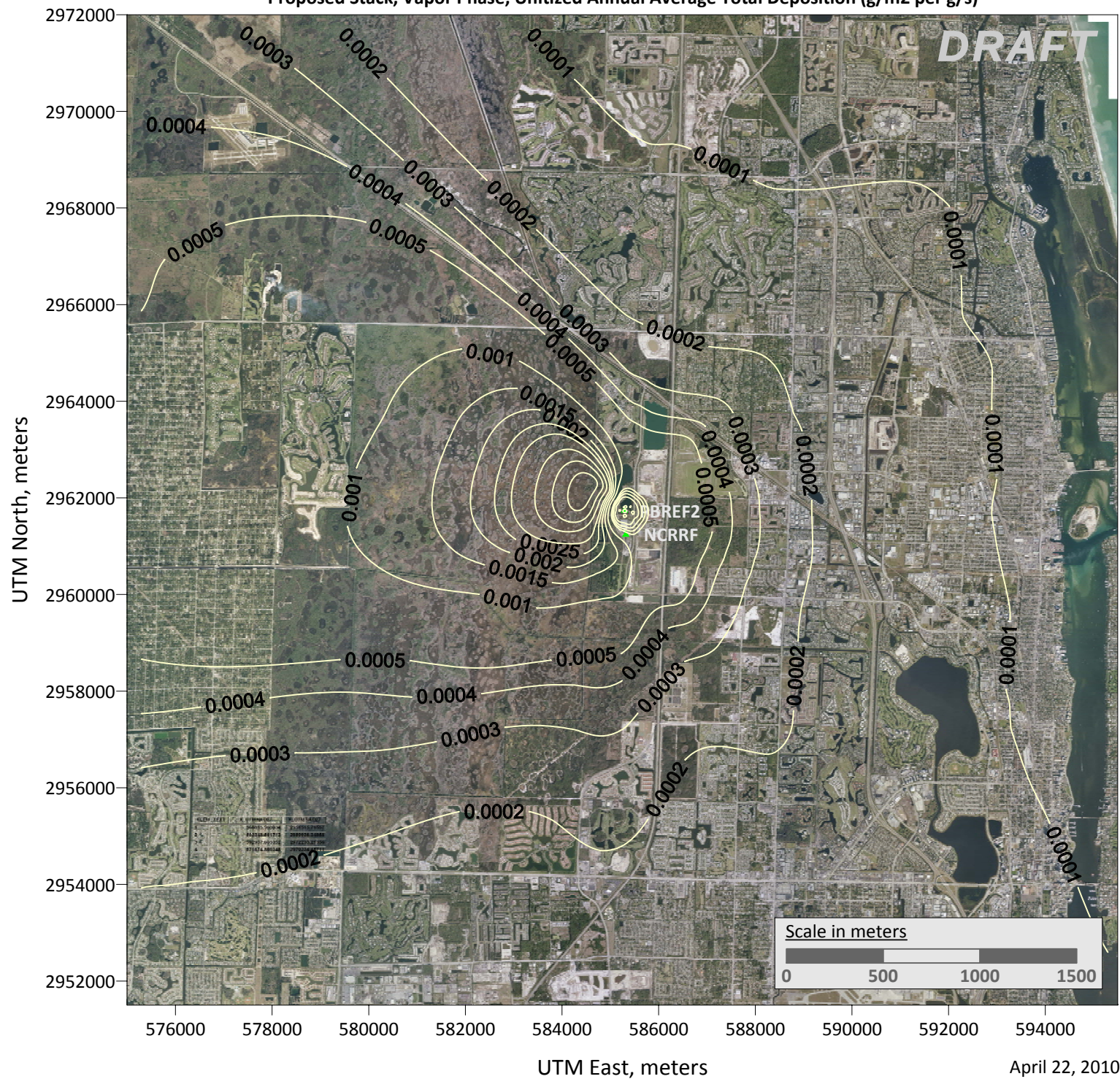
APPENDIX D

ISOPLETHS OF AERMOD UNITIZED MODELING RESULTS

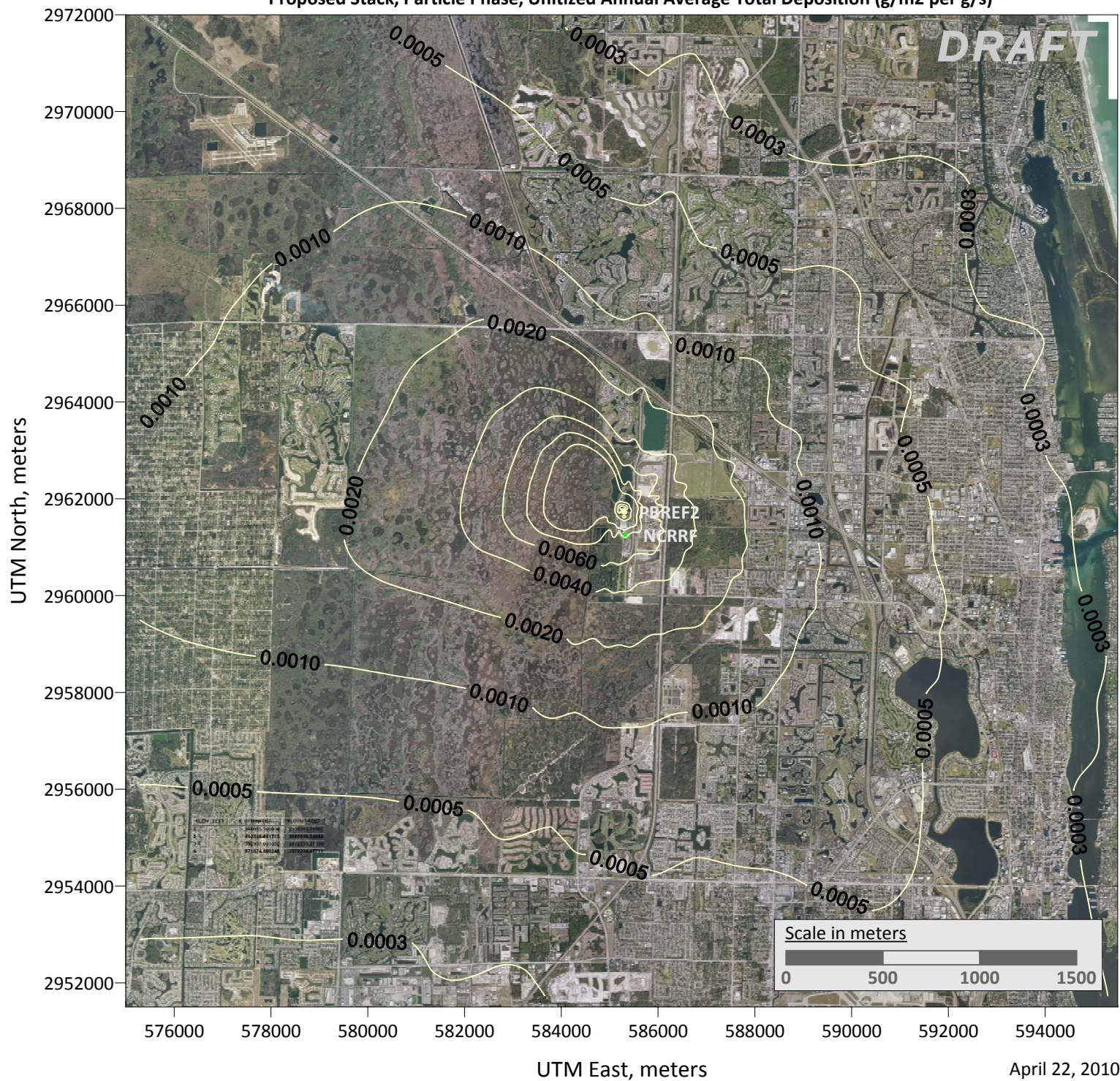
Solid Waste Authority of Palm Beach County - AERMOD Analysis (2001-2005)
Proposed Stack, Vapor Phase, Unitized Annual Average Air Concentration ($\mu\text{g}/\text{m}^3$ per g/s)



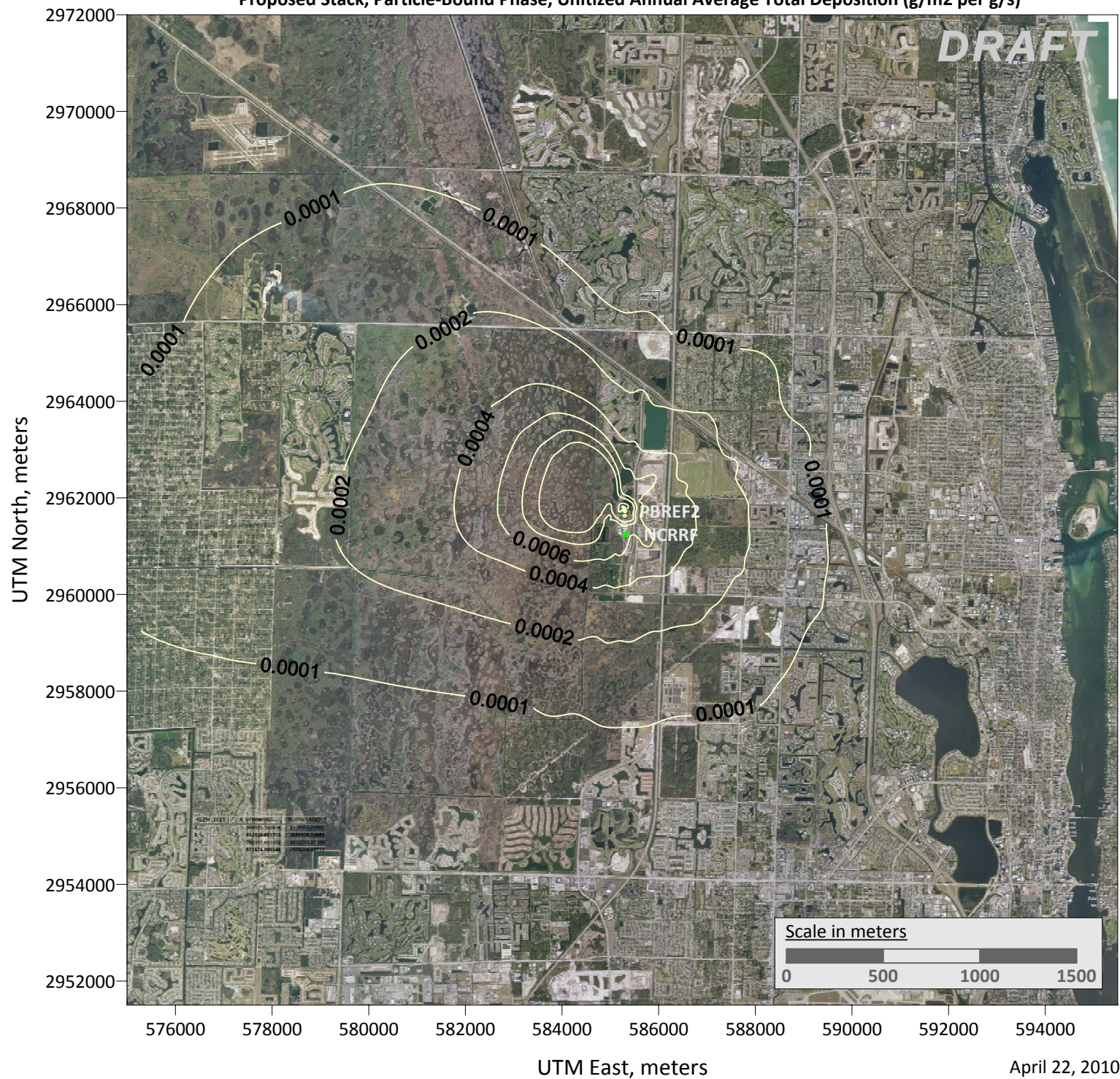
Solid Waste Authority of Palm Beach County - AERMOD Analysis (2001-2005)
Proposed Stack, Vapor Phase, Unitized Annual Average Total Deposition (g/m2 per g/s)



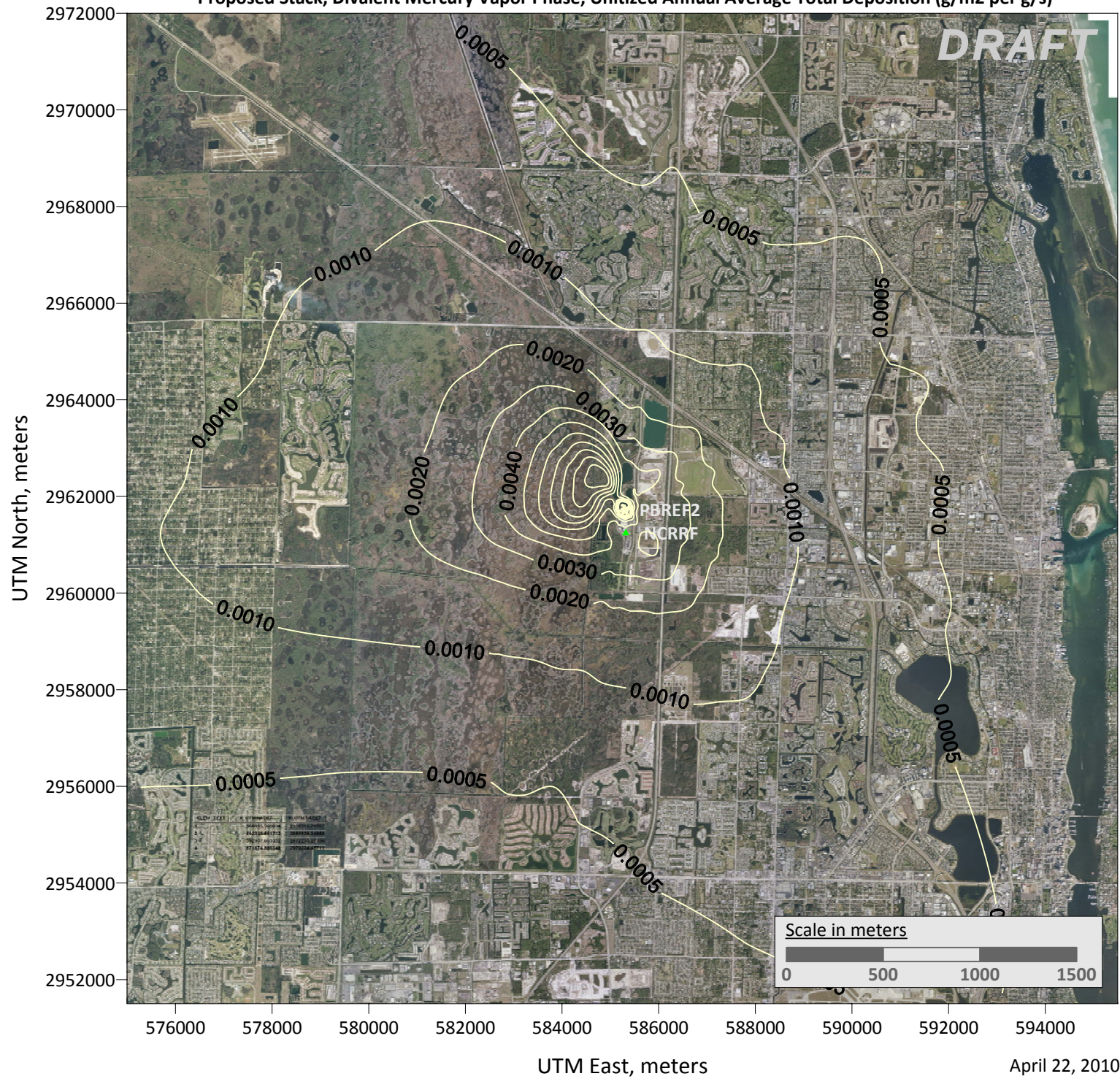
Solid Waste Authority of Palm Beach County - AERMOD Analysis (2001-2005)
Proposed Stack, Particle Phase, Unitized Annual Average Total Deposition (g/m2 per g/s)



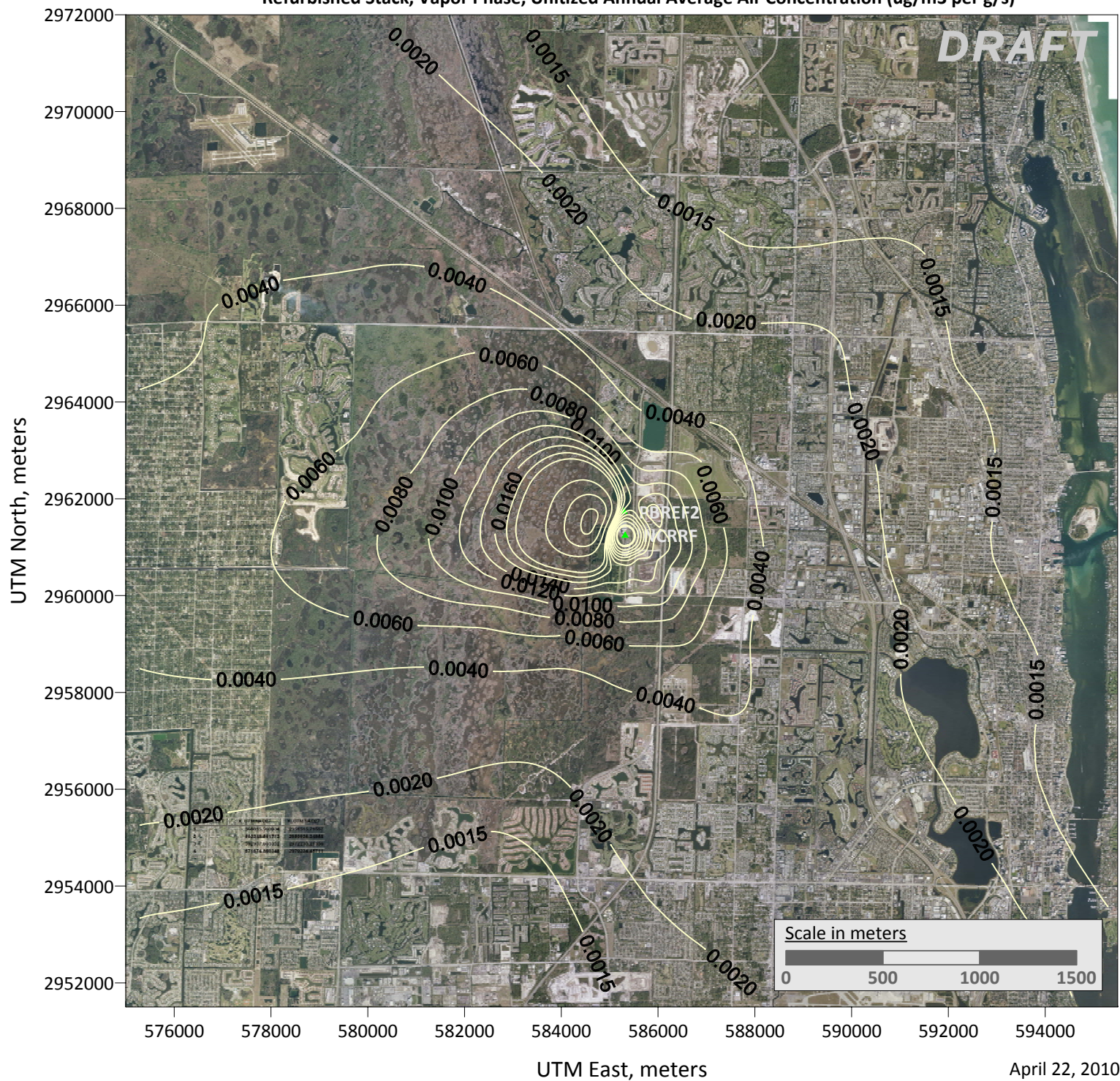
Solid Waste Authority of Palm Beach County - AERMOD Analysis (2001-2005)
Proposed Stack, Particle-Bound Phase, Unitized Annual Average Total Deposition (g/m² per g/s)



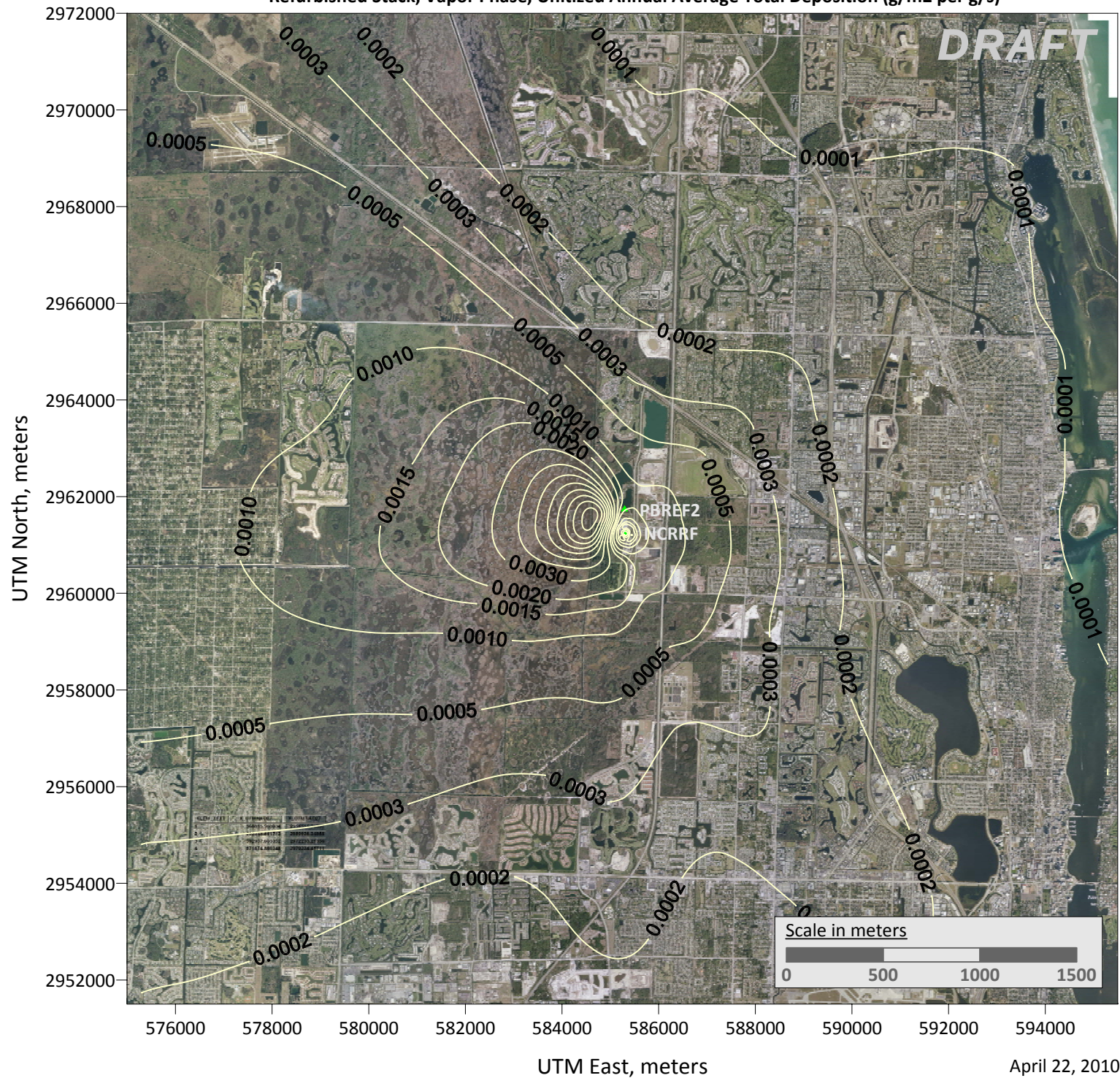
Solid Waste Authority of Palm Beach County - AERMOD Analysis (2001-2005)
Proposed Stack, Divalent Mercury Vapor Phase, Unitized Annual Average Total Deposition (g/m² per g/s)



Solid Waste Authority of Palm Beach County - AERMOD Analysis (2001-2005)
Refurbished Stack, Vapor Phase, Unitized Annual Average Air Concentration ($\mu\text{g}/\text{m}^3$ per g/s)

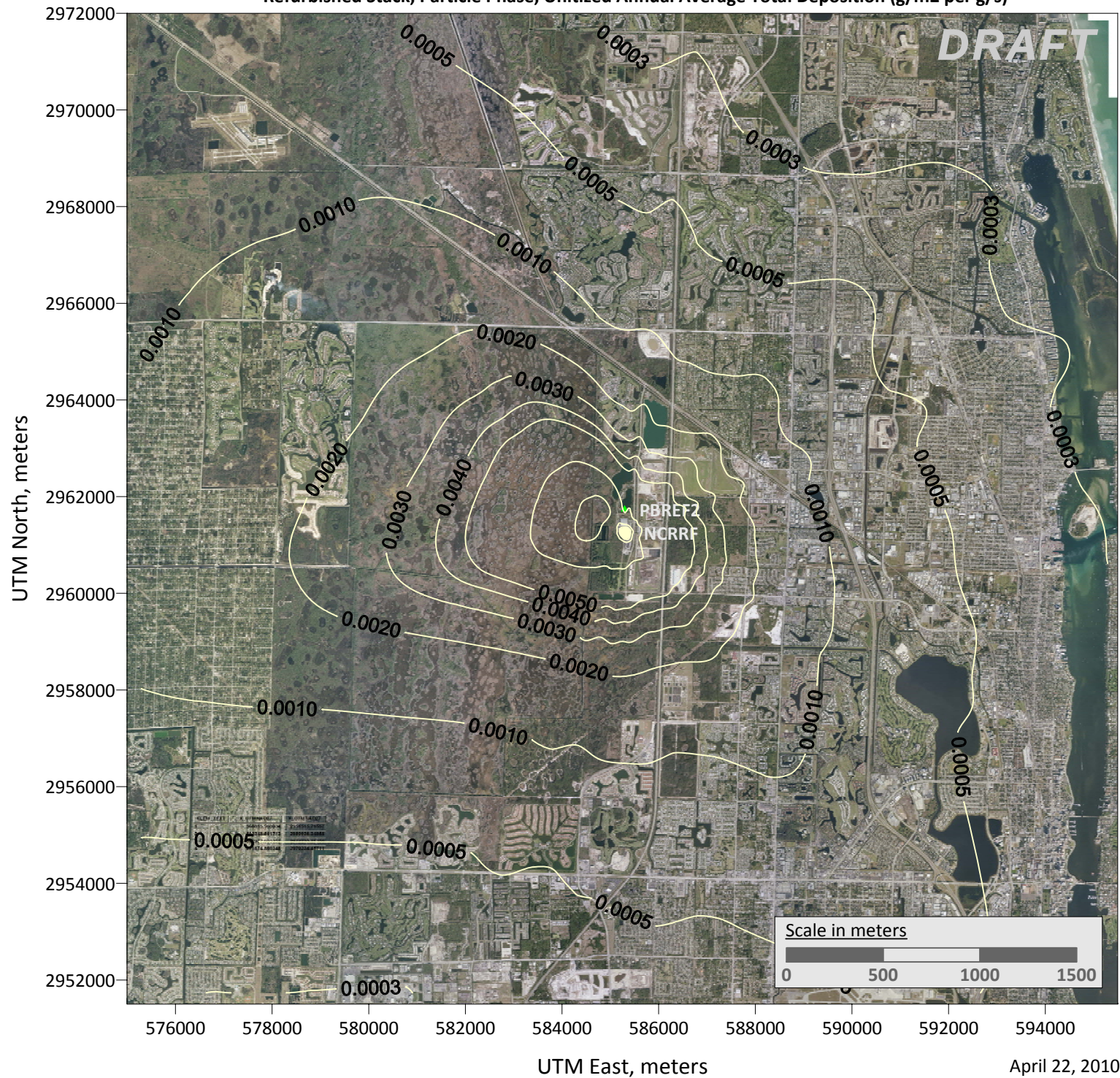


Solid Waste Authority of Palm Beach County - AERMOD Analysis (2001-2005)
Refurbished Stack, Vapor Phase, Unitized Annual Average Total Deposition (g/m² per g/s)

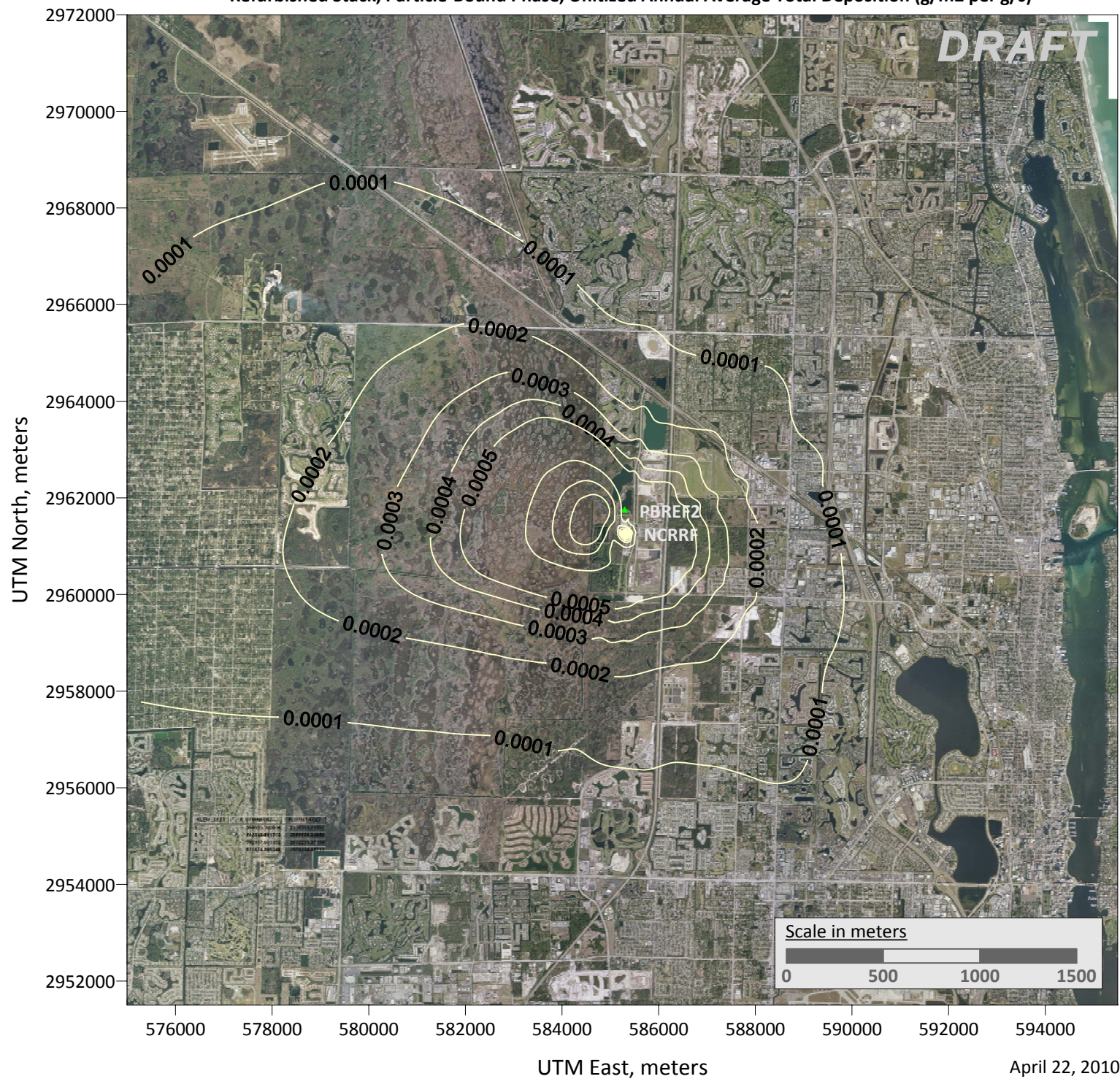


April 22, 2010

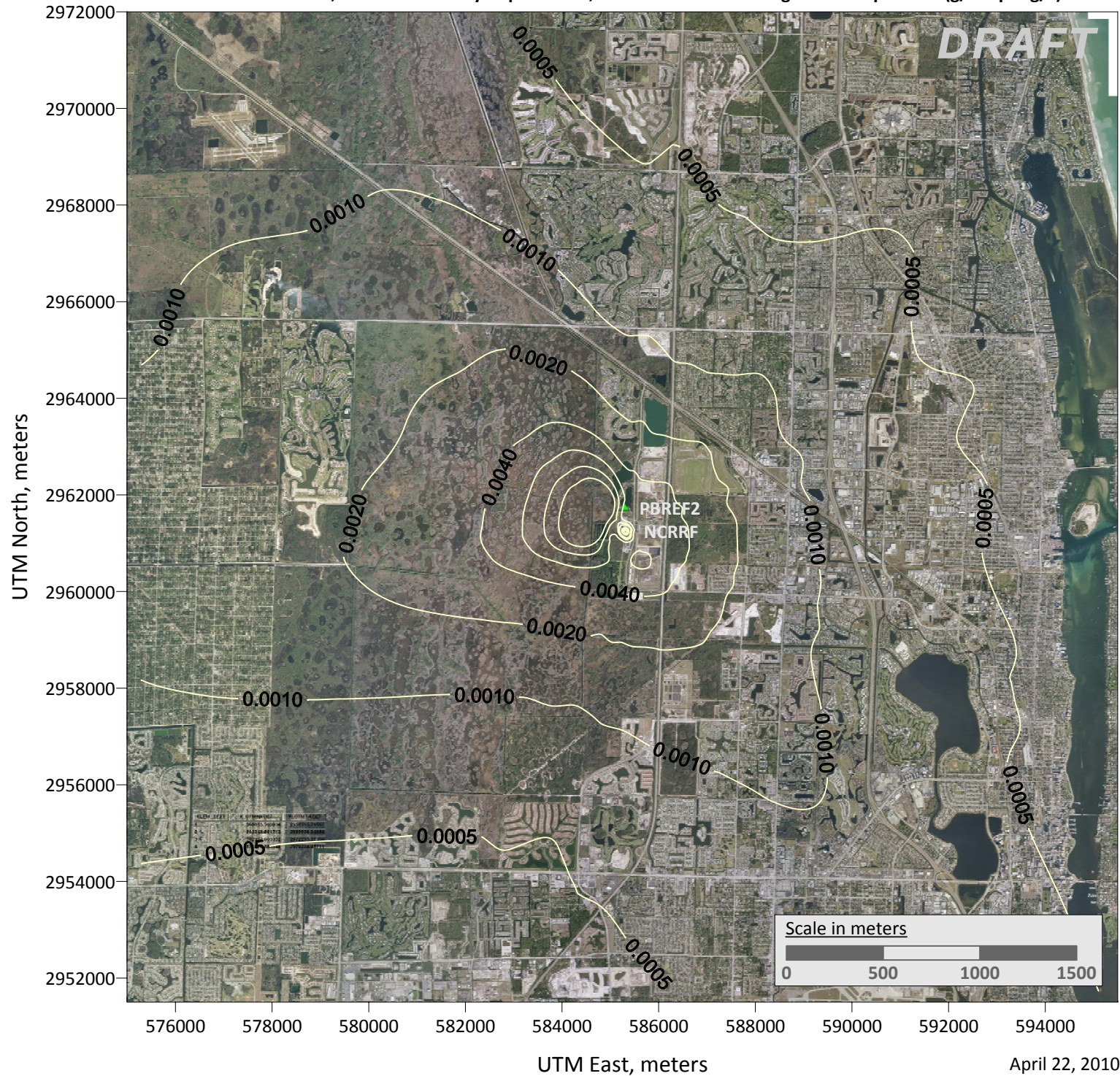
Solid Waste Authority of Palm Beach County - AERMOD Analysis (2001-2005)
Refurbished Stack, Particle Phase, Unitized Annual Average Total Deposition (g/m2 per g/s)



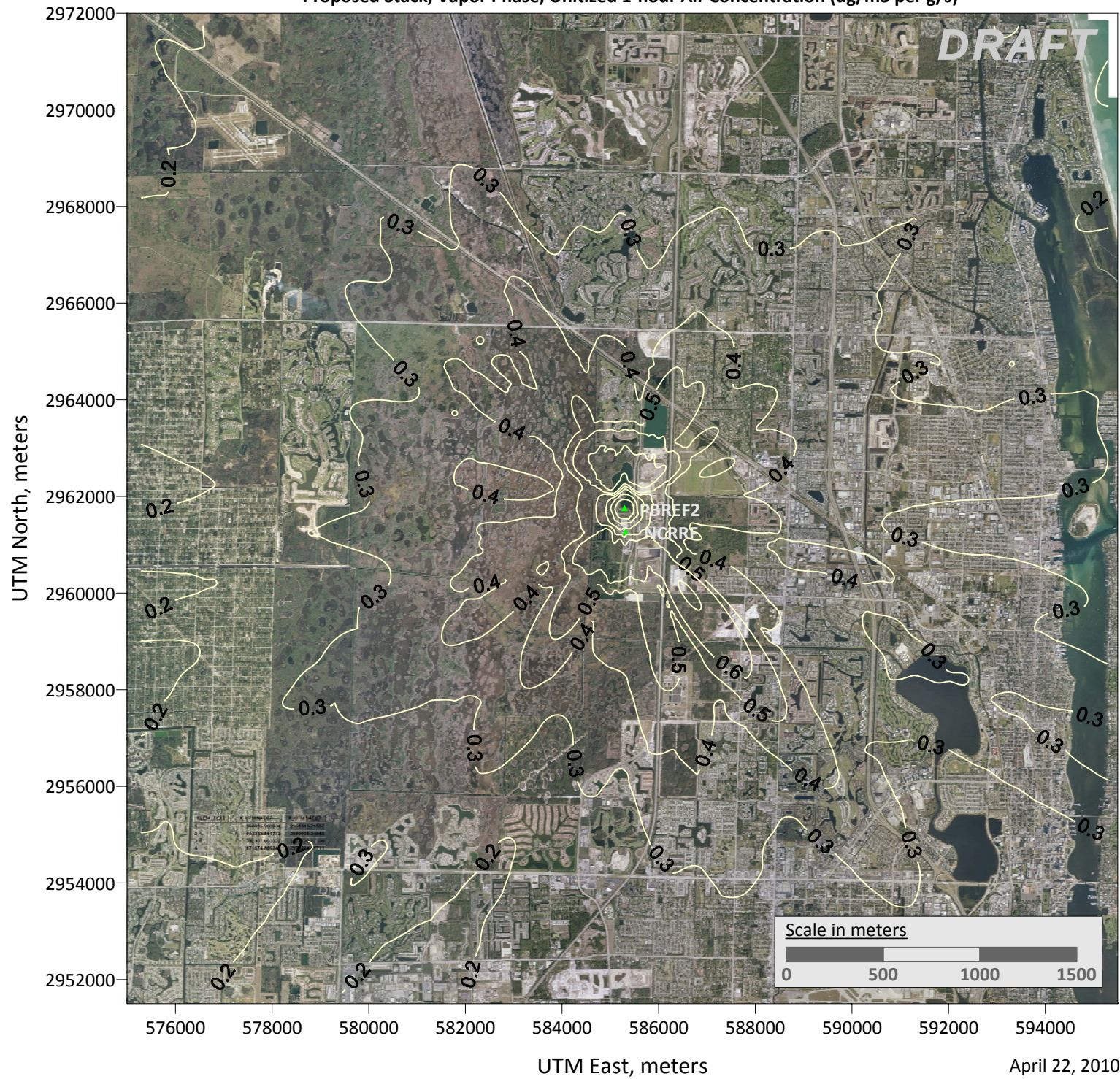
Solid Waste Authority of Palm Beach County - AERMOD Analysis (2001-2005)
Refurbished Stack, Particle-Bound Phase, Unitized Annual Average Total Deposition (g/m2 per g/s)



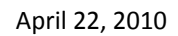
Solid Waste Authority of Palm Beach County - AERMOD Analysis (2001-2005)
Refurbished Stack, Divalent Mercury Vapor Phase, Unitized Annual Average Total Deposition (g/m2 per g/s)



Solid Waste Authority of Palm Beach County - AERMOD Analysis (2001-2005)
Proposed Stack, Vapor Phase, Unitized 1-hour Air Concentration ($\mu\text{g}/\text{m}^3$ per g/s)



DRAFT



APPENDIX E

**CHEMICAL-PHYSICAL PARAMETERS FOR COMPOUNDS NOT INCLUDED IN
USEPA'S HHRAP GUIDANCE**

APPENDIX E

CHEMICAL-PHYSICAL PARAMETERS FOR COMPOUNDS NOT INCLUDED IN USEPA'S HHRAP

A wide variety of chemical-physical properties are required to calculate environmental concentrations and potential risks for compounds in a combustion source risk assessment. In its 2005 Human Health Risk Assessment Protocol for Hazardous Waste Combustion Facilities (HHRAP), the U.S. Environmental Protection Agency (USEPA) identified these properties for many compounds. In this risk assessment, there were three additional compounds selected for evaluation (ammonia, hydrogen fluoride and sulfuric acid) that are not addressed in HHRAP and for which chemical-physical properties needed to be compiled.

Table 1 lists the properties compiled for these additional compounds. The three compounds are all present as gases in the ambient air, however, they dissociate in aqueous environments (including water, biota and soil moisture) and are not present in these media as intact discrete chemical compounds. These compounds were not evaluated for indirect (non-inhalation) exposure pathways in this assessment because the concept of hydrophobicity, upon which USEPA's HHRAP methodology for plant and animal biotransfer factors for compounds that are not metals is based, does not apply to ionic inorganic substances. As a result, a subset of the chemical physical properties was compiled using the methods described in Appendix A-2 of USEPA's HHRAP report. The chemical-physical parameters used in USEPA's fate and transport modeling equations to calculate concentrations in plants and animals (e.g., plant, beef, poultry, pork and egg biotransfer coefficients) were not applicable and thus were not compiled.

TABLE 1
CHEMICAL-SPECIFIC PARAMETERS FOR COMPOUNDS NOT IN USEPA'S HHRAP

Parameter		Molecular weight (g/mole) (a)	Melting point (K) (b)	Melting point (oC) (b)	Vapor pressure (atm) @25°C (or 20-30°C) (a)	Vapor pressure (mmHg or Torr) @25°C (or 20-30°C) (a)	Solubility in H2O (mg/L) @25°C (or 20-30°C) (b)	Henry's law constant (atm·m³/mol) (b)	Diffusivity in air (cm²/sec) (c)	Diffusivity in water (cm²/sec) (c)	Fraction of air concentration in vapor phase (unitless) (d)	Octanol:water partition coefficient (unitless) (e)	Soil organic carbon:water partition coefficient (mL H2O/ g soil) (e)
	HHRAP/IRAP-h View parameter name	MW	Tm		Vp		S	H	Da	Dw	fv	Kow	Koc
CAS #	Compound name												
7664-41-7	Ammonia	17.03	195.3	-77.7	9.87E+00	7.50E+03	4.82E+05	1.61E-05	0.2590	6.93E-05	1.0	0	0
7664-39-3	Hydrogen fluoride	20.01	189.45	-83.55	1.21E+00	9.17E+02	1.00E+06	1.04E-04	0.3880	3.30E-05	1.0	0	0
7664-93-9	Sulfuric acid	98.08	283.3	10.3	7.80E-08	5.93E-05	1.00E+06	7.65E-12	0.0893	1.03E-05	1.0	0	0
Sources:													
(a) CHEMFATE (www.esc.syrres.com/eSc/chemfate.htm) – USEPA (2005) HHRAP Appendix A-2 recommended source													
(b) Physprop (www.syrres.com/eSc/physdemo.htm) - USEPA (2005) HHRAP Appendix A-2 recommended source													
(c) Ammonia and hydrogen fluoride: USEPA's Water9 Model - USEPA (2005) HHRAP Appendix A-2 recommended source. Sulfuric acid: Per HHRAP, if no value is available in USEPA's WATER9 model, calculate based on molecular weight - HHRAP Equations A-2-4 and A-2-5													
(d) Calculate according to HHRAP Equation A-2-1													
(e) The concept of hydrophobicity is not relevant for these compounds. Thus Kow and Koc were set to 0 and values for biotransfer factors for plants and animal products, which are derived in HHRAP methods from the octanol:water partition coefficient, were also set to 0.													

APPENDIX F

DETAILED WATERBODY FATE AND TRANSPORT MODELING PARAMETERS

Table 1
Input Parameters for the Typical Roadside Canal Fate and Transport Modeling
(Typical Roadside Canal: waterbody #1)

Parameter (parameter symbol)	Parameter Value	Units	Basis for Value
Site-Specific Input Parameters for use with USEPA HHRAP Fate and Transport Modeling			
Waterbody area (wa_w)	1.58E+4	m ²	Calculated by Malcolm Pirnie using GIS data, USGS topographic maps and aerial photographs. Consists of segment of roadside canal bordering the Florida Turnpike where fishing has been observed and where the canal is wider and more accessible than other segments closer to facility site.
Watershed area (wa_l)	1.38E+6	m ²	Calculated by Malcolm Pirnie using GIS data, USGS topographic maps and aerial photographs
Percent impervious	3	%	Calculated by Malcolm Pirnie using GIS data, USGS topographic maps and aerial photographs
Impervious watershed area (wa_i)	4.14E+4	m ²	Calculated: Total watershed area * fraction impervious
Flow rate (vf)	8.9E+6	m ³ /yr	Provided by Malcolm Pirnie. Based on measured flow rate in canal exiting the rookery, assuming flow in that canal is the same as flow in the roadside canal (a)
Current velocity (mu)	0.12	m/sec	Calculated by Malcolm Pirnie based on water flow rate in waterbody and cross-sectional canal area (b)
Total suspended solids (tss)	6	mg/L	Provided by Malcolm Pirnie. Based on measurement collected 9/1/2009.
Water column depth (d_w)	0.4	m	Provided by Malcolm Pirnie. Midpoint between water depth measured at low flow conditions (0.5 feet based on 9/1/2009 measurement) and depth at high flow conditions (estimated at 2 feet). (0.4 m = 1.3 feet)
Cover management factor (usle_c)	0.003	unitless	Provided by Malcolm Pirnie. Based on USDA Agricultural Handbook Number 537 and pervious watershed land cover types.
Additional Input Parameters for use with USEPA SERAFM Mercury Model			
Watershed Location (East or West)	East	--	Based on site location
Percent Wetland (in watershed area)	95	--	Provided by Malcolm Pirnie.
Percent Riparian (in watershed area)	0	--	Provided by Malcolm Pirnie.

Table 1
Input Parameters for the Typical Roadside Canal Fate and Transport Modeling
(Typical Roadside Canal: waterbody #1)

Parameter (parameter symbol)	Parameter Value	Units	Basis for Value
Percent Upland (in watershed area)	2	--	Provided by Malcolm Pirnie. Calculated: Portion of watershed area that is not impervious, wetland or riparian
Depth of pervious soil layer (zs)	0.1	m	SERAFM default
Epilimnion Depth	0.4	m	Assumed to be same as water column depth for a non-stratified waterbody (personal communication with C. Knightes 2009) (c)
Hypolimnion Depth	0.05	m	SERAFM default for non-stratified water body (personal communication with C. Knightes 2009) (c)
Stratification	no	--	Provided by Malcolm Pirnie. Based on 9/1/2009 sampling and observations. This parameter is not used in the SERAFM model calculations, but is considered when identifying parameters for epilimnion and hypolimnion.
Anoxic Hypolimnion	no	--	Provided by Malcolm Pirnie. Based on 9/1/2009 sampling and observations. This parameter is not used in the SERAFM model calculations, but is considered when identifying methylation rates in the water column.
Hydraulic Residence Time	7.1E-4	yr	Calculated: Total water volume in waterbody / waterbody flow rate = total water column depth * waterbody surface area / total water body flow rate (calculated from parameters shown above)(g)
Average wind speed 10 m above water surface (u)	4.3	m/s	Provided by Malcolm Pirnie. Long-term average based on NCDC data.
Water pH	7.3	--	Provided by Malcolm Pirnie. Based on measurement collected 9/1/2009.
Epilimnion Water Temp	29	C	Provided by Malcolm Pirnie. Based on measurement collected 9/1/2009.
Hypolimnion Water Temp	29	C	Set equal to epilimnion temperature (personal communication with C. Knightes 2009) (c)
Air Temp (Ta)	24	C	Provided by Malcolm Pirnie. Long-term average based on NCDC data (297 K)
Annual Precipitation (P)	156	cm/yr	Provided by Malcolm Pirnie. Long-term average based on USGS data (61 inches/year)
Dissolved Organic Carbon (DOC) Epilimnion	7.1	mg/L	Provided by Malcolm Pirnie. Based on measurement collected 9/1/2009.
Dissolved Organic Carbon (DOC) Hypolimnion	7.1	mg/L	Assumed to equal value for epilimnion.
Color (as PtCo)	0	PtCo	SERAFM default

Table 1
Input Parameters for the Typical Roadside Canal Fate and Transport Modeling
(Typical Roadside Canal: waterbody #1)

Parameter (parameter symbol)	Parameter Value	Units	Basis for Value
Trophic Status	Eutrophic		Provided by Malcolm Pirnie. (Eutrophic definition- high productivity, nutrient rich, high suspended algae, DOC > 5 mg/L.)
Depth of sediment layer (d_sed)	0.03	m	SERAFM default
sediment particle diameter (d_s)	4.55	μm	Set at value necessary to calibrate solids balance in the SERAFM model, consistent with directions from C. Knightes (personal communication with C. Knightes 2009) (c). The specified value produced a total suspended solids concentration in the water column (TSS_1 parameter in SERAFM model) equivalent to the TSS provided by Malcolm Pirnie.
Abiotic solids in water inflow (Sabio_in)	6	g/m ³ (mg/L)	For evaluation of a segment of a flowing canal system, used the total suspended solids concentration, following recommendation from C. Knightes (personal communication with C. Knightes 2010) (d)
Phytoplankton biotic solids in water inflow (Sbio_phyto,in)	0	g/m ³	SERAFM default (personal communication with C. Knightes 2009) (c)
Zooplankton biotic solids in water inflow (Sbio_zoo,in)	0	g/m ³	SERAFM default (personal communication with C. Knightes 2009) (c)
Cloud cover - Fraction Cloud Reductance Factor	0.65	unitless	SERAFM default
Surface light intensity	32	E/m ² -day (same as mol/m ² -day)	Midpoint of summer and winter mean values for Miami (Lee and Downum 1991) (e)
Methylation rate constant, epilimnion	0	per day	SERAFM default (personal communication with C. Knightes 2009) (c)
Methylation rate constant, hypolimnion	0	per day	SERAFM default, assumed to equal value for epilimnion (personal communication with C. Knightes 2009) (c)
Methylation rate constant, sediment	0.013	per day	Hintelmann et al. 2000 (f)
Demethylation rate constant, epilimnion	0.05	per day	SERAFM default (personal communication with C. Knightes 2009) (c)
Demethylation rate constant, hypolimnion	0.05	per day	SERAFM default, assumed to equal value for epilimnion (personal communication with C. Knightes 2009) (c)
Demethylation rate constant, sediment	0.47	per day	Hintelmann et al. 2000 (f)
Biotic Reduction rate constant, water column	0.03	per day	SERAFM default (personal communication with C. Knightes 2009) (c)

Table 1
Input Parameters for the Typical Roadside Canal Fate and Transport Modeling
(Typical Roadside Canal: waterbody #1)

Parameter (parameter symbol)	Parameter Value	Units	Basis for Value
Photo-Degradation rate constant (MeHg --> Hg ⁰), water column	0.0002	per day per E/m ² -day	Default parameter value provided by C. Knightes (personal communication with C. Knightes 2009) (c)
Photo-Reduction rate constant (HgII --> Hg ⁰) Visible Light, water column	0.77	per day per E/m ² -day	Default parameter value provided by C. Knightes (personal communication with C. Knightes 2009) (c)
Photo-Reduction rate constant (HgII --> Hg ⁰) UV-B, water column	0.67	per day per E/m ² -day	Default parameter value provided by C. Knightes (personal communication with C. Knightes 2009) (c)
Photo-Oxidation rate constant (Hg ⁰ --> HgII) UV-B, water column	0.6	per day per E/m ² -day	Default parameter value provided by C. Knightes (personal communication with C. Knightes 2009) (c)
Dark Oxidation rate constant, water column	1.44	per day	Default parameter value provided by C. Knightes (personal communication with C. Knightes 2009) (c)
Trophic Level 4 bioaccumulation factor (BAF) for fish	6.80E+06	L/kg fresh weight tissue	SERAFM default, same as HHRAP default

(a) Assumed to be equal to yearly average flow via outfall canal out of the Rookery/shell pit areas. Directly measured data from a roadside canal or ditch were not available.

(b) Current velocity was calculated as flow rate (m³/yr) / cross-sectional waterbody area (m²) * conversion factor (to convert from m/yr to m/sec), where cross-sectional area = average canal width perpendicular to water flow direction * lake depth (i.e., 6 m * 0.4 m).

(c) Knightes, C. 2009. Personal communication between Chris Knightes (SERAFM model developer), USEPA National Exposure Research Laboratory, Athens, GA, and Sarah Foster, CPF Associates, Inc. February 2009, March 2009, July 2009.

(d) Knightes, C. 2010. Personal communication between Chris Knightes (SERAFM model developer), USEPA National Exposure Research Laboratory, Athens, GA, and Sarah Foster, CPF Associates, Inc. May 2010.

(e) Lee, D.W. and Downum, K.R. 1991. The spectral distribution of biologically active solar radiation at Miami, Florida, USA. Int. J. Biometeorol. 35:48-54.

(f) Sources: Average of sediment methylation and demethylation rate constants measured in a tracer study by Hintelmann et al. 2000 and personal communication with C. Knightes, USEPA, June 2010. (Hintelmann, H., Keppel-Jones, K. and Evans, R.D. 2000. Constants of mercury methylation and demethylation rates in sediments and comparison of tracer and ambient mercury availability. Env. Tox. & Chem. 19:2204-2211.)

(g) In the SERAFM model, the water inflow and outflow rates are calculated from the hydraulic residence time, the waterbody surface area, and the epilimnion depth (not the total water column depth).

Table 2
Input Parameters for Iron Horse Lake Fate and Transport Modeling
(Iron Horse Lake: waterbody #2)

Parameter (parameter symbol)	Parameter Value	Units	Basis for Value
Site-Specific Input Parameters for use with USEPA HHRAP Fate and Transport Modeling			
Waterbody area (wa_w)	4.93E+4	m ²	Calculated by Malcolm Pirnie using GIS data, USGS topographic maps and aerial photographs
Watershed area (wa_l)	1.02E+5	m ²	Calculated by Malcolm Pirnie using GIS data, USGS topographic maps and aerial photographs
Percent impervious	35	%	Calculated by Malcolm Pirnie using GIS data, USGS topographic maps and aerial photographs
Impervious watershed area (wa_i)	3.57E+4	m ²	Calculated: Total watershed area * fraction impervious
Flow rate (vf)	1.4E+5	m ³ /yr	Calculated by Malcolm Pirnie based on sum of estimated groundwater flow and rainfall flow into lake and evapotranspiration flow out of lake (a)
Current velocity (mu)	5.2E-5	m/sec	Calculated by Malcolm Pirnie based on water flow rate in waterbody and cross-sectional lake area (b)
Total suspended solids (tss)	8	mg/L	Provided by Malcolm Pirnie. Based on measurement collected 9/1/2009.
Water column depth (d_w)	0.79	m	Provided by Malcolm Pirnie. Based on measurement collected 9/1/2009. (0.79 m = 2.6 feet)
Cover management factor (usle_c)	0.003	unitless	Provided by Malcolm Pirnie. Based on USDA Agricultural Handbook Number 537 and pervious watershed land cover types.
Additional Input Parameters for use with USEPA SERAFM Mercury Model			
Watershed Location (East or West)	East	--	Based on site location
Percent Wetland (in watershed area)	0	--	No wetlands in watershed
Percent Riparian (in watershed area)	0	--	No riparian areas in watershed
Percent Upland (in watershed area)	65	--	Calculated: Portion of watershed area that is not impervious, wetland or riparian
Depth of pervious soil layer (zs)	0.1	m	SERAFM default
Stratification	yes	--	Provided by Malcolm Pirnie. Based on 9/1/2009 sampling and observations. This parameter is not used in the SERAFM model calculations, but is considered when identifying parameters for epilimnion and hypolimnion.

Table 2
Input Parameters for Iron Horse Lake Fate and Transport Modeling
(Iron Horse Lake: waterbody #2)

Parameter (parameter symbol)	Parameter Value	Units	Basis for Value
Epilimnion Depth	0.55	m	Provided by Malcolm Pirnie. For a stratified waterbody, assumed to be top 70% of total water column depth.
Hypolimnion Depth	0.24	m	Provided by Malcolm Pirnie. For a stratified waterbody, assumed to be bottom 30% of total water column depth.
Anoxic Hypolimnion	no	--	Provided by Malcolm Pirnie. Based on 9/1/2009 sampling and observations.
Hydraulic Residence Time	0.27	yr	Calculated: Total water volume in waterbody / waterbody flow rate = total water column depth * waterbody surface area / total water body flow rate (calculated from parameters shown above)(g)
Average wind speed 10 m above water surface (u)	4.3	m/s	Provided by Malcolm Pirnie. Long-term average based on NCDC data.
Water pH	8	--	Provided by Malcolm Pirnie. Based on measurements collected 9/1/2009.
Epilimnion Water Temp	31	C	Provided by Malcolm Pirnie. Based on measurements collected 9/1/2009. (304 K)
Hypolimnion Water Temp	31	C	Set equal to epilimnion temperature (personal communication with C. Knightes 2009) (c)
Air Temp (Ta)	24	C	Provided by Malcolm Pirnie. Long-term average based on NCDC data (297 K)
Annual Precipitation (P)	156	cm/yr	Provided by Malcolm Pirnie. Long-term average based on USGS data (61 inches/year)
Dissolved Organic Carbon (DOC) Epilimnion	4.6	mg/L	Provided by Malcolm Pirnie. Based on measurement collected 9/1/2009.
Dissolved Organic Carbon (DOC) Hypolimnion	4.6	mg/L	Assumed to equal value for epilimnion.
Color (as PtCo)	0	PtCo	SERAFM default
Trophic Status	Mesotrophic		Provided by Malcolm Pirnie. (Mesotrophic definition - intermediate productivity level, clear lake with submerged aquatic plants, medium nutrient level, DOC 3-5 mg/L.)
Depth of sediment layer (d_sed)	0.03	m	SERAFM default
sediment particle diameter (d_s)	0.36	μm	Set at value necessary to calibrate solids balance in the SERAFM model, consistent with directions from C. Knightes (personal communication with C. Knightes 2009) (c). The specified value produced a total suspended solids concentration in the water column (TSS_1 parameter in SERAFM model) equivalent to the TSS provided by Malcolm Pirnie,

Table 2
Input Parameters for Iron Horse Lake Fate and Transport Modeling
(Iron Horse Lake: waterbody #2)

Parameter (parameter symbol)	Parameter Value	Units	Basis for Value
Abiotic solids in water inflow (Sabio_in)	0	g/m ³ (mg/L)	SERAFM default for a waterbody with no water inflow or outflow source (personal communication with C. Knightes 2009) (c)
Phytoplankton biotic solids in water inflow (Sbio_phyto,in)	0	g/m ³	SERAFM default (personal communication with C. Knightes 2009) (c)
Zooplankton biotic solids in water inflow (Sbio_zoo,in)	0	g/m ³	SERAFM default (personal communication with C. Knightes 2009) (c)
Cloud cover - Fraction Cloud Reductance Factor	0.65	unitless	SERAFM default
Surface light intensity	32	E/m ² -day (same as mol/m ² -day)	Midpoint of summer and winter mean values for Miami (Lee and Downum 1991) (e)
Methylation rate constant, epilimnion	0	per day	Based on lake in Florida (Lake Barco) that was evaluated by USEPA using the SERAFM model (personal communication with C. Knightes 2009, Knightes et al. 2008) (c,d)
Methylation rate constant, hypolimnion	0	per day	Based on lake in Florida (Lake Barco) that was evaluated by USEPA using the SERAFM model (personal communication with C. Knightes 2009, Knightes et al. 2008) (c,d)
Methylation rate constant, sediment	0.013	per day	Hintelmann et al. 2000 (f)
Demethylation rate constant, epilimnion	0.04	per day	Based on lake in Florida (Lake Barco) that was evaluated by USEPA using the SERAFM model (personal communication with C. Knightes 2009, Knightes et al. 2008) (c,d)
Demethylation rate constant, hypolimnion	0.04	per day	Based on lake in Florida (Lake Barco) that was evaluated by USEPA using the SERAFM model (personal communication with C. Knightes 2009, Knightes et al. 2008) (c,d)
Demethylation rate constant, sediment	0.47	per day	Hintelmann et al. 2000 (f)
Biotic Reduction rate constant, water column	0.04	per day	Based on lake in Florida (Lake Barco) that was evaluated by USEPA using the SERAFM model (personal communication with C. Knightes 2009, Knightes et al. 2008) (c,d)
Photo-Degradation rate constant (MeHg --> Hg0), water column	0.0002	per day per E/m ² -day	Parameter value provided by C. Knightes (personal communication with C. Knightes 2009) (c)
Photo-Reduction rate constant (HgII --> Hg0) Visible Light, water column	0.77	per day per E/m ² -day	Parameter value provided by C. Knightes (personal communication with C. Knightes 2009) (c)

Table 2
Input Parameters for Iron Horse Lake Fate and Transport Modeling
(Iron Horse Lake: waterbody #2)

Parameter (parameter symbol)	Parameter Value	Units	Basis for Value
Photo-Reduction rate constant (HgII --> Hg0) UV-B, water column	0.67	per day per E/m ² -day	Parameter value provided by C. Knightes (personal communication with C. Knightes 2009) (c)
Photo-Oxidation rate constant (Hg0 --> HgII) UV-B, water column	0.6	per day per E/m ² -day	Parameter value provided by C. Knightes (personal communication with C. Knightes 2009) (c)
Dark Oxidation rate constant, water column	1.44	per day	Parameter value provided by C. Knightes (personal communication with C. Knightes 2009) (c)
Trophic Level 4 bioaccumulation factor (BAF) for fish	6.80E+06	L/kg fresh weight tissue	SERAFM default, same as HHRAP default

(a) Flow out due to evapotranspiration was calculated as evapotranspiration rate (m/yr) * waterbody surface area (m²). Flow in due to groundwater was based on regional groundwater flow of 27.7 m³/yr (3.1E-05 ft³/sec) obtained from site-specific hydraulic conductivity test (Alterra Engineering and Testing, Hydraulic Conductivity Test for South Florida Water Management District site, September 9, 2007). Rainfall flow in was calculated as flow from impervious watershed area + flow from pervious watershed area + flow from rainfall directly onto waterbody. Flow from pervious watershed area was calculated assuming 71% of flow runs off into waterbody based on localized rainfall data for Palm Beach International Airport and considering site soils that are not permanently saturated (i.e., 112 cm/yr runs off of soils that are not permanently saturated / 156 cm/yr rainfall).

(b) Current velocity was calculated as flow rate (m³/yr) / cross-sectional waterbody area (m²) * conversion factor (to convert from m/yr to m/sec), where cross-sectional area = average lake width perpendicular to groundwater flow direction * lake depth (i.e., 110 m * 0.79 m).

(c) Knightes, C. 2009. Personal communication between Chris Knightes (SERAFM model developer), USEPA National Exposure Research Laboratory, Athens, GA, and Sarah Foster, CPF Associates, Inc. February – March, 2009.

(d) Knightes, C.D., Sunderland, E., Barber, M.C., Johnston, J. and Ambrose, R.B. 2008. Application of Ecosystem Scale Fate and Bioaccumulation Models to Predict Fish Mercury Response Times to Changes in Atmospheric Deposition. Manuscript provided by C. Knightes, February 2009.

(e) Lee, D.W. and Downum, K.R. 1991. The spectral distribution of biologically active solar radiation at Miami, Florida, USA. Int. J. Biometeorol. 35:48-54.

(f) Sources: Average of sediment methylation and demethylation rate constants measured in a tracer study by Hintelmann et al. 2000 and personal communication with C. Knightes, USEPA, June 2010. (Hintelmann, H., Keppel-Jones, K. and Evans, R.D. 2000. Constants of mercury methylation and demethylation rates in sediments and comparison of tracer and ambient mercury availability. Env. Tox. & Chem. 19:2204-2211.)

(g) In the SERAFM model, the water inflow and outflow rates are calculated from the hydraulic residence time, the waterbody surface area, and the epilimnion depth (not the total water column depth).

Table 3
Input Parameters for Water Catchment Area (WCA) Wetland and Portion of Wetland
Fate and Transport Modeling
(WCA Wetland: waterbody #3 and Portion of WCA Wetland: waterbody #7)

Parameter (parameter symbol)	Parameter Value		Units	Basis for Value
	WCA Wetland	Portion of WCA Wetland		
Site-Specific Input Parameters for use with USEPA HHRAP Fate and Transport Modeling				
Waterbody area (wa_w)	2.80E+7	2.72E+6	m ²	Calculated by Malcolm Pirnie using GIS data, USGS topographic maps and aerial photographs
Watershed area (wa_l)	0		m ²	Determined by Malcolm Pirnie based on analysis of water and canal location and flow information related to the WCA wetland area
Percent impervious	--		%	Not applicable because no watershed area
Impervious watershed area (wa_i)	--		m ²	Not applicable because no watershed area
Flow rate (vf)	1.1E+8	1.1E+7	m ³ /yr	Provided by Malcolm Pirnie. For WCA wetland, based on water flow analysis for the Water Catchment Area and associated canals; average monthly flow for outflow to WCA-north (north of Northlake Blvd) from WCA reported at 122 ft ³ /second (1.1E+8 m ³ /yr)(a) For portion of WCA wetland, flow was calculated assuming the same hydraulic residence time as entire WCA wetland (c)
Current velocity (mu)	6.4E-4	1.4E-4	m/sec	Calculated by Malcolm Pirnie based on water flow rate in waterbody and cross-sectional waterbody area (b)
Total suspended solids (tss)	4		mg/L	Provided by Malcolm Pirnie. Based on measurement collected 9/1/2009.
Water column depth (d_w)	1.1		m	Provided by Malcolm Pirnie. Based on measurement collected 9/1/2009. (1.1 m = 3.6 feet)
Cover management factor (usle_c)	--		unitless	Not applicable because no watershed area
Additional Input Parameters for use with USEPA SERAFM Mercury Model				
Watershed Location (East or West)	East		--	Based on site location
Percent Wetland (in watershed area)	0		--	Provided by Malcolm Pirnie. Not applicable (no watershed area)
Percent Riparian (in watershed area)	0		--	Provided by Malcolm Pirnie. Not applicable (no watershed area)
Percent Upland (in watershed area)	0		--	Provided by Malcolm Pirnie. Not applicable (no watershed area)

Table 3
Input Parameters for Water Catchment Area (WCA) Wetland and Portion of Wetland
Fate and Transport Modeling
(WCA Wetland: waterbody #3 and Portion of WCA Wetland: waterbody #7)

Parameter (parameter symbol)	Parameter Value		Units	Basis for Value
	WCA Wetland	Portion of WCA Wetland		
Depth of pervious soil layer (zs)	0.1		m	SERA FM default (Not applicable as no watershed area)
Stratification	yes		--	Provided by Malcolm Pirnie. Based on 9/1/2009 sampling and observations. This parameter is not used in the SERAFM model calculations, but is considered when identifying parameters for epilimnion and hypolimnion.
Epilimnion Depth	0.77		m	Provided by Malcolm Pirnie. For a stratified waterbody, assumed to be top 70% of total water column depth.
Hypolimnion Depth	0.33		m	Provided by Malcolm Pirnie. For a stratified waterbody, assumed to be bottom 30% of total water column depth.
Anoxic Hypolimnion	no		--	Provided by Malcolm Pirnie. Based on 9/1/2009 sampling and observations. This parameter is not used in the SERAFM model calculations, but is considered when identifying methylation rates in the water column.
Hydraulic Residence Time	0.28		yr	Calculated: Total water volume in waterbody / waterbody flow rate = total water column depth * waterbody surface area / total water body flow rate (calculated from parameters shown above)(h)
Average wind speed 10 m above water surface (u)	4.3		m/s	Provided by Malcolm Pirnie. Long-term average based on NCDC data.
Water pH	7.6		--	Provided by Malcolm Pirnie. Based on measurements collected 9/1/2009.
Epilimnion Water Temp	30		C	Provided by Malcolm Pirnie. Based on measurements collected 9/1/2009. (303 K)
Hypolimnion Water Temp	30		C	Set equal to epilimnion temperature (personal communication with C. Knightes 2009) (d)
Air Temp (Ta)	24		C	Provided by Malcolm Pirnie. Long-term average based on NCDC data (297 K)
Annual Precipitation (P)	156		cm/yr	Provided by Malcolm Pirnie. Long-term average based on USGS data (61 inches/year)
Dissolved Organic Carbon (DOC) Epilimnion	16.2		mg/L	Provided by Malcolm Pirnie. Based on measurement collected 9/1/2009.
Dissolved Organic Carbon (DOC) Hypolimnion	16.2		mg/L	Assumed to equal value for epilimnion.
Color (as PtCo)	0		PtCo	SERA FM default

Table 3
Input Parameters for Water Catchment Area (WCA) Wetland and Portion of Wetland
Fate and Transport Modeling
(WCA Wetland: waterbody #3 and Portion of WCA Wetland: waterbody #7)

Parameter (parameter symbol)	Parameter Value		Units	Basis for Value
	WCA Wetland	Portion of WCA Wetland		
Trophic Status	Eutrophic			Provided by Malcolm Pirnie. (Eutrophic definition- high productivity, nutrient rich, high suspended algae, DOC > 5 mg/L.)
Depth of sediment layer (d_sed)	0.03		m	SERAFM default
sediment particle diameter (d_s)	0.135	0.115	μm	Set at value necessary to calibrate solids balance in the SERAFM model, consistent with directions from C. Knightes (personal communication with C. Knightes 2009) (d). The specified value produced a total suspended solids concentration in the water column (TSS_1 parameter in SERAFM model) equivalent to the TSS provided by Malcolm Pirnie.
Abiotic solids in water inflow (Sabio_in)	3		g/m ³ (mg/L)	Calculated following methodology provided by C. Knightes and based on data for total suspended solids, dissolved organic carbon and total organic carbon (personal communication with C. Knightes 2009) (d,e)
Phytoplankton biotic solids in water inflow (Sbio_phyto,in)	0		g/m ³	SERAFM default (personal communication with C. Knightes 2009) (d)
Zooplankton biotic solids in water inflow (Sbio_zoo,in)	0		g/m ³	SERAFM default (personal communication with C. Knightes 2009) (d)
Cloud cover - Fraction Cloud Reductance Factor	0.65		unitless	SERAFM default
Surface light intensity	32		E/m ² -day (same as mol/m ² -day)	Midpoint of summer and winter mean values for Miami (Lee and Downum 1991) (f)
Methylation rate constant, epilimnion	0		per day	SERAFM default (personal communication with C. Knightes 2009) (d)
Methylation rate constant, hypolimnion	0		per day	SERAFM default, assumed to equal value for epilimnion (personal communication with C. Knightes 2009) (d)
Methylation rate constant, sediment	0.013		per day	Hintelmann et al. 2000 (g)
Demethylation rate constant, epilimnion	0.05		per day	SERAFM default (personal communication with C. Knightes 2009) (d)
Demethylation rate constant, hypolimnion	0.05		per day	SERAFM default, assumed to equal value for epilimnion (personal communication with C. Knightes 2009) (d)

Table 3
Input Parameters for Water Catchment Area (WCA) Wetland and Portion of Wetland
Fate and Transport Modeling
(WCA Wetland: waterbody #3 and Portion of WCA Wetland: waterbody #7)

Parameter (parameter symbol)	Parameter Value		Units	Basis for Value
	WCA Wetland	Portion of WCA Wetland		
Demethylation rate constant, sediment	0.47		per day	Hintelmann et al. 2000 (g)
Biotic Reduction rate constant, water column	0.03		per day	SERAFM default (personal communication with C. Knightes 2009) (d)
Photo-Degradation rate constant (MeHg --> Hg0), water column	0.0002		per day per E/m ² -day	Parameter value provided by C. Knightes (personal communication with C. Knightes 2009) (d)
Photo-Reduction rate constant (HgII -> Hg0) Visible Light, water column	0.77		per day per E/m ² -day	Parameter value provided by C. Knightes (personal communication with C. Knightes 2009) (d)
Photo-Reduction rate constant (HgII -> Hg0) UV-B, water column	0.67		per day per E/m ² -day	Parameter value provided by C. Knightes (personal communication with C. Knightes 2009) (d)
Photo-Oxidation rate constant (Hg0 -> HgII) UV-B, water column	0.6		per day per E/m ² -day	Parameter value provided by C. Knightes (personal communication with C. Knightes 2009) (d)
Dark Oxidation rate constant, water column	1.44		per day	Parameter value provided by C. Knightes (personal communication with C. Knightes 2009) (d)
Trophic Level 4 bioaccumulation factor (BAF) for fish	6.80E+06		L/kg fresh weight tissue	SERAFM default, same as HHRAP default

(a) Source for WCA water flow rate: CDM. 2005. Water Catchment Area Hydraulic Modeling and Flow Improvement Study. March 2005.

(b) Current velocity was calculated as flow rate (m³/yr) / cross-sectional waterbody area (m²) * conversion factor (to convert from m/yr to m/sec), where cross-sectional area = width perpendicular to water flow (m) * water depth (m). For the WCA wetland, the width, provided by Malcolm Pirnie, was the length of E-W width perpendicular to dominant S-to-N water flow direction in WCA wetland (4940 m = 16207 feet). For the smaller portion of the wetland, where dominant flow is from east to west, the width was based on the length of the N-S width perpendicular to the E-W flow direction (2130 m = 6,988 feet).

(c) Flow for portion of WCA wetland calculated as follows: water volume / residence time = depth (1.1 m) * waterbody surface area (2.72E+6 m²) / residence time (0.28 yr assumed to be the same as for entire WCA wetland).

APPENDIX F

(d) Knightes, C. 2009. Personal communication between Chris Knightes (SERA FM model developer), USEPA National Exposure Research Laboratory, Athens, GA, and Sarah Foster, CPF Associates, Inc. February – March, 2009.

(e) Abiotic solids concentration in water inflow to waterbody (Sabio_in) was calculated as the difference between total suspended solids and organic carbon on suspended solids, as follows: $Sabio_in = TSS - TOC_{ss}$, where TSS = total suspended solids (mg/L) and TOC_{ss} = total organic carbon on suspended solids (mg OC/L). TOC_{ss} was calculated as the difference between total organic carbon and dissolved organic carbon, as follows: $TOC_{ss} = TOC - DOC$, where TOC = total organic carbon, dissolved + suspended (mg/L) and DOC = dissolved organic carbon (mg/L). Values for the WCA wetland were as follows: TSS = 4 mg/L; TOC = 17.2 mg/L and DOC = 16.2 mg/L (provided by Malcolm Pirnie, 9/1/2009 measurements).

(f) Lee, D.W. and Downum, K.R. 1991. The spectral distribution of biologically active solar radiation at Miami, Florida, USA. *Int. J. Biometeorol.* 35:48-54.

(g) Sources: Average of sediment methylation and demethylation rate constants measured in a tracer study by Hintelmann et al. 2000 and personal communication with C. Knightes, USEPA, June 2010. (Hintelmann, H., Keppel-Jones, K. and Evans, R.D. 2000. Constants of mercury methylation and demethylation rates in sediments and comparison of tracer and ambient mercury availability. *Env. Tox. & Chem.* 19:2204-2211.)

(h) In the SERAFM model, the water inflow and outflow rates are calculated from the hydraulic residence time, the waterbody surface area, and the epilimnion depth (not the total water column depth).

Table 4
Input Parameters for Middle Lake Fate and Transport Modeling
(Middle Lake: waterbody #4)

Parameter (parameter symbol)	Parameter Value	Units	Basis for Value
Site-Specific Input Parameters for use with USEPA HHRAP Fate and Transport Modeling			
Waterbody area (wa_w)	2.05E+5	m ²	Calculated by Malcolm Pirnie using GIS data, USGS topographic maps and aerial photographs, and historical lake construction drawing
Watershed area (wa_l)	3.85E+4	m ²	Calculated by Malcolm Pirnie using GIS data, USGS topographic maps and aerial photographs, and historical lake construction drawing
Percent impervious	0	%	Calculated by Malcolm Pirnie using GIS data, USGS topographic maps and aerial photographs
Impervious watershed area (wa_i)	0	m ²	Calculated: Total watershed area * fraction impervious
Flow rate (vf)	1.0E+5	m ³ /yr	Calculated by Malcolm Pirnie based on sum of estimated groundwater flow and rainfall flow into lake minus evapotranspiration flow out of lake (a)
Current velocity (mu)	1.4E-6	m/sec	Calculated by Malcolm Pirnie based on water flow rate in waterbody and cross-sectional lake area (b)
Total suspended solids (tss)	2	mg/L	Provided by Malcolm Pirnie. Based on measurement collected in South Lake 9/1/2009.
Water column depth (d_w)	7	m	Provided by Malcolm Pirnie. Based on measurement collected 3/31/2010. (7 m = 23 feet)
Cover management factor (usle_c)	0.003	unitless	Provided by Malcolm Pirnie. Based on USDA Agricultural Handbook Number 537 and pervious watershed land cover types.
Additional Input Parameters for use with USEPA SERAFM Mercury Model			
Watershed Location (East or West)	East	--	Based on site location
Percent Wetland (in watershed area)	72.5	--	Provided by Malcolm Pirnie.
Percent Riparian (in watershed area)	0	--	Provided by Malcolm Pirnie. No riparian areas in watershed.
Percent Upland (in watershed area)	27.5	--	Provided by Malcolm Pirnie. (Portion of watershed area that is not impervious, wetland or riparian.)
Depth of pervious soil layer (zs)	0.1	m	SERAFM default

Table 4
Input Parameters for Middle Lake Fate and Transport Modeling
(Middle Lake: waterbody #4)

Parameter (parameter symbol)	Parameter Value	Units	Basis for Value
Stratification	yes	--	Provided by Malcolm Pirnie. Based on 9/1/2009 sampling and observations in South Lake. This parameter is not used in the SERAFM model calculations, but is considered when identifying parameters for epilimnion and hypolimnion.
Epilimnion Depth	2.1	m	Provided by Malcolm Pirnie. For a stratified waterbody, assumed to be top 30% of total water column depth.
Hypolimnion Depth	4.9	m	Provided by Malcolm Pirnie. For a stratified waterbody, assumed to be bottom 70% of total water column depth.
Anoxic Hypolimnion	no	--	Provided by Malcolm Pirnie. Based on 9/1/2009 sampling and observations in South Lake. This parameter is not used in the SERAFM model calculations, but is considered when identifying methylation rates in the water column.
Hydraulic Residence Time	14	yr	Calculated: Total water volume in waterbody / waterbody flow rate = total water column depth * waterbody surface area / total water body flow rate (calculated from parameters shown above)(f)
Average wind speed 10 m above water surface (u)	4.3	m/s	Provided by Malcolm Pirnie. Long-term average based on NCDC data.
Water pH	8.26	--	Provided by Malcolm Pirnie. Based on measurements collected in South Lake 9/1/2009.
Epilimnion Water Temp	32	C	Provided by Malcolm Pirnie. Based on measurements collected in South Lake 9/1/2009. (305 K)
Hypolimnion Water Temp	32	C	Set equal to epilimnion temperature (personal communication with C. Knightes 2009) (c)
Air Temp (Ta)	24	C	Provided by Malcolm Pirnie. Long-term average based on NCDC data (297 K)
Annual Precipitation (P)	156	cm/yr	Provided by Malcolm Pirnie. Long-term average based on USGS data (61 inches/year)
Dissolved Organic Carbon (DOC) Epilimnion	1.1	mg/L	Provided by Malcolm Pirnie. Based on measurement collected in South Lake 9/1/2009.
Dissolved Organic Carbon (DOC) Hypolimnion	1.1	mg/L	Assumed to equal epilimnion value.
Color (as PtCo)	0	PtCo	SERAFM default
Trophic Status	Oligotrophic		Provided by Malcolm Pirnie. (Oligotrophic definition – low primary productivity resulting from low nutrient content, DOC < 3 mg/L.)

Table 4
Input Parameters for Middle Lake Fate and Transport Modeling
(Middle Lake: waterbody #4)

Parameter (parameter symbol)	Parameter Value	Units	Basis for Value
Depth of sediment layer (d_sed)	0.03	m	SERAFM default
sediment particle diameter (d_s)	0.26	μm	Set at value necessary to calibrate solids balance in the SERAFM model, consistent with directions from C. Knightes (personal communication with C. Knightes 2009) (c). The specified value produced a total suspended solids concentration in the water column (TSS_1 parameter in SERAFM model) equivalent to the TSS provided by Malcolm Pirnie.
Abiotic solids in water inflow (Sabio_in)	0	g/m^3 (mg/L)	SERAFM default for a waterbody with no water inflow or outflow source (personal communication with C. Knightes 2009) (c)
Phytoplankton biotic solids in water inflow (Sbio_phyto,in)	0	g/m^3	SERAFM default (personal communication with C. Knightes 2009) (c)
Zooplankton biotic solids in water inflow (Sbio_zoo,in)	0	g/m^3	SERAFM default (personal communication with C. Knightes 2009) (c)
Cloud cover - Fraction Cloud Reductance Factor	0.65	unitless	SERAFM default
Surface light intensity	32	$\text{E/m}^2\text{-day}$ (same as $\text{mol/m}^2\text{-day}$)	Midpoint of summer and winter mean values for Miami (Lee and Downum 1991) (d)
Methylation rate constant, epilimnion	0	per day	SERAFM default (personal communication with C. Knightes 2009) (c)
Methylation rate constant, hypolimnion	0	per day	SERAFM default, assumed to equal value for epilimnion (personal communication with C. Knightes 2009) (c)
Methylation rate constant, sediment	0.013	per day	Hintelmann et al. 2000 (e)
Demethylation rate constant, epilimnion	0.05	per day	SERAFM default (personal communication with C. Knightes 2009) (c)
Demethylation rate constant, hypolimnion	0.05	per day	SERAFM default, assumed to equal value for epilimnion (personal communication with C. Knightes 2009) (c)
Demethylation rate constant, sediment	0.47	per day	Hintelmann et al. 2000 (e)
Biotic Reduction rate constant, water column	0.03	per day	SERAFM default (personal communication with C. Knightes, 2009) (c)
Photo-Degradation rate constant (MeHg --> Hg0), water column	0.0002	per day per $\text{E/m}^2\text{-day}$	Parameter value provided by C. Knightes (personal communication with C. Knightes 2009) (c)

Table 4
Input Parameters for Middle Lake Fate and Transport Modeling
(Middle Lake: waterbody #4)

Parameter (parameter symbol)	Parameter Value	Units	Basis for Value
Photo-Reduction rate constant (HgII --> Hg0) Visible Light, water column	0.77	per day per E/m ² -day	Parameter value provided by C. Knightes (personal communication with C. Knightes 2009) (c)
Photo-Reduction rate constant (HgII --> Hg0) UV-B, water column	0.67	per day per E/m ² -day	Parameter value provided by C. Knightes (personal communication with C. Knightes 2009) (c)
Photo-Oxidation rate constant (Hg0 --> HgII) UV-B, water column	0.6	per day per E/m ² -day	Parameter value provided by C. Knightes (personal communication with C. Knightes 2009) (c)
Dark Oxidation rate constant, water column	1.44	per day	Parameter value provided by C. Knightes (personal communication with C. Knightes 2009) (c)
Trophic Level 4 bioaccumulation factor (BAF) for fish	6.80E+06	L/kg fresh weight tissue	SERAFM default, same as HHRAP default

(a) Flows calculated as follows: Flow out due to evapotranspiration was calculated as evapotranspiration rate (m/yr) * waterbody surface area (m²). Flow in due to groundwater was based on regional groundwater flow of 27.7 m³/yr (3.1E-05 ft³/sec) obtained from site-specific hydraulic conductivity test (Alterra Engineering and Testing, Hydraulic Conductivity Test for South Florida Water Management District site, September 9, 2007). Rainfall flow in was calculated as flow from impervious watershed area + flow from pervious watershed area + flow from rainfall directly onto waterbody. Flow from pervious watershed area was calculated assuming 71% of flow runs off into waterbody based on localized rainfall data for Palm Beach International Airport and considering site soils that are not permanently saturated (i.e., 112 cm/yr runs off of soils that are not permanently saturated / 156 cm/yr rainfall).

(b) Current velocity was calculated as flow rate (m³/yr) / cross-sectional waterbody area (m²) * conversion factor (to convert from m/yr to m/sec), where cross-sectional area = average lake width perpendicular to groundwater flow direction * lake depth (i.e., 190 m * 6.7 m).

(c) Knightes, C. 2009. Personal communication between Chris Knightes (SERAFM model developer), USEPA National Exposure Research Laboratory, Athens, GA, and Sarah Foster, CPF Associates, Inc. February – March, 2009.

(d) Lee, D.W. and Downum, K.R. 1991. The spectral distribution of biologically active solar radiation at Miami, Florida, USA. Int. J. Biometeorol. 35:48-54.

(e) Sources: Average of sediment methylation and demethylation rate constants measured in a tracer study by Hintelmann et al. 2000 and personal communication with C. Knightes, USEPA, June 2010. (Hintelmann, H., Keppel-Jones, K. and Evans, R.D. 2000. Constants of mercury methylation and demethylation rates in sediments and comparison of tracer and ambient mercury availability. Env. Tox. & Chem. 19:2204-2211.)

(f) In the SERAFM model, the water inflow and outflow rates are calculated from the hydraulic residence time, the waterbody surface area, and the epilimnion depth (not the total water column depth).

Table 5
Input Parameters for the Rookery Fate and Transport Modeling
(Rookery: waterbody #5)

Parameter (parameter symbol)	Parameter Value	Units	Basis for Value
Site-Specific Input Parameters for use with USEPA HHRAP Fate and Transport Modeling			
Waterbody area (wa_w)	6.24E+5	m ²	Calculated by Malcolm Pirnie using GIS data, USGS topographic maps and aerial photographs.
Watershed area (wa_l)	3.30E+6	m ²	Calculated by Malcolm Pirnie using GIS data, USGS topographic maps and aerial photographs
Percent impervious	12	%	Calculated by Malcolm Pirnie using GIS data, USGS topographic maps and aerial photographs
Impervious watershed area (wa_i)	3.96E+5	m ²	Calculated: Total watershed area * fraction impervious
Flow rate (vf)	8.9E+6	m ³ /yr	Provided by Malcolm Pirnie. Based on measured flow rate in canal exiting the rookery on the Solid Waste Authority property campus
Current velocity (mu)	3.7E-4	m/sec	Calculated by Malcolm Pirnie based on water flow rate in waterbody and cross-sectional waterbody area (a)
Total suspended solids (tss)	16	mg/L	Provided by Malcolm Pirnie. Based on measurement collected 9/1/2009.
Water column depth (d_w)	2	m	Provided by Malcolm Pirnie. Depth was measured at 2.3 m on 9/1/2009 at the deepest water location behind a weir in the rookery. Because the average depth across the waterbody is lower than behind the weir, this parameter value was set at 2 m. (2 m = 6.6 feet)
Cover management factor (usle_c)	0.04	unitless	Provided by Malcolm Pirnie. Based on USDA Agricultural Handbook Number 537 and pervious watershed land cover types.
Additional Input Parameters for use with USEPA SERAFM Mercury Model			
Watershed Location (East or West)	East	--	Based on site location
Percent Wetland (in watershed area)	41.5	--	Provided by Malcolm Pirnie.
Percent Riparian (in watershed area)	0	--	Provided by Malcolm Pirnie.
Percent Upland (in watershed area)	46.5	--	Provided by Malcolm Pirnie. Calculated: Portion of watershed area that is not impervious, wetland or riparian
Depth of pervious soil layer (zs)	0.1	m	SERAFM default

Table 5
Input Parameters for the Rookery Fate and Transport Modeling
(Rookery: waterbody #5)

Parameter (parameter symbol)	Parameter Value	Units	Basis for Value
Stratification	yes	--	Provided by Malcolm Pirnie. Based on 9/1/2009 sampling and observations. This parameter is not used in the SERAFM model calculations, but is considered when identifying parameters for epilimnion and hypolimnion.
Epilimnion Depth	1.4	m	Provided by Malcolm Pirnie. For a stratified waterbody, assumed to be top 70% of total water column depth.
Hypolimnion Depth	0.6	m	Provided by Malcolm Pirnie. For a stratified waterbody, assumed to be bottom 30% of total water column depth.
Anoxic Hypolimnion	no	--	Provided by Malcolm Pirnie. Based on 9/1/2009 sampling and observations. This parameter is not used in the SERAFM model calculations, but is considered when identifying methylation rates in the water column.
Hydraulic Residence Time	0.14	yr	Calculated: Total water volume in waterbody / waterbody flow rate = total water column depth * waterbody surface area / total water body flow rate (calculated from parameters shown above)(f)
Average wind speed 10 m above water surface (u)	4.3	m/s	Provided by Malcolm Pirnie. Long-term average based on NCDC data.
Water pH	7.6	--	Provided by Malcolm Pirnie. Based on measurements collected 9/1/2009.
Epilimnion Water Temp	30	C	Provided by Malcolm Pirnie. Based on measurements collected 9/1/2009. (303 K)
Hypolimnion Water Temp	30	C	Set equal to epilimnion temperature (personal communication with C. Knightes 2009) (c)
Air Temp (Ta)	24	C	Provided by Malcolm Pirnie. Long-term average based on NCDC data (297 K)
Annual Precipitation (P)	156	cm/yr	Provided by Malcolm Pirnie. Long-term average based on USGS data (61 inches/year)
Dissolved Organic Carbon (DOC) Epilimnion	6.7	mg/L	Provided by Malcolm Pirnie. Based on measurement collected 9/1/2009.
Dissolved Organic Carbon (DOC) Hypolimnion	6.7	mg/L	Assumed to equal value for epilimnion.
Color (as PtCo)	0	PtCo	SERAFM default
Trophic Status	Eutrophic		Provided by Malcolm Pirnie. Based on 9/1/2009 sampling and observations.
Depth of sediment layer (d_sed)	0.03	m	SERAFM default

Table 5
Input Parameters for the Rookery Fate and Transport Modeling
(Rookery: waterbody #5)

Parameter (parameter symbol)	Parameter Value	Units	Basis for Value
sediment particle diameter (d_s)	1.46	μm	Set at value necessary to calibrate solids balance in the SERAFM model, consistent with directions from C. Knightes (personal communication with C. Knightes 2009) (c). The specified value produced a total suspended solids concentration in the water column (TSS_1 parameter in SERAFM model) equivalent to the TSS provided by Malcolm Pirnie.
Abiotic solids in water inflow (Sabio_in)	0	g/m ³ (mg/L)	Calculated following methodology provided by C. Knightes (personal communication with C. Knightes 2009) (c). Based on data for total suspended solids, dissolved organic carbon and total organic carbon (provided by Malcolm Pirnie, 9/1/2009 measurements) (b)
Phytoplankton biotic solids in water inflow (Sbio_phyto,in)	0	g/m ³	SERAFM default (personal communication with C. Knightes 2009) (c)
Zooplankton biotic solids in water inflow (Sbio_zoo,in)	0	g/m ³	SERAFM default (personal communication with C. Knightes 2009) (c)
Cloud cover - Fraction Cloud Reductance Factor	0.65	unitless	SERAFM default
Surface light intensity	32	E/m ² -day (same as mol/m ² -day)	Midpoint of summer and winter mean values for Miami (Lee and Downum 1991) (d)
Methylation rate constant, epilimnion	0	per day	SERAFM default (personal communication with C. Knightes 2009) (c)
Methylation rate constant, hypolimnion	0	per day	SERAFM default, assumed to equal value for epilimnion (personal communication with C. Knightes 2009) (c)
Methylation rate constant, sediment	0.013	per day	Hintelmann et al. 2000 (e)
Demethylation rate constant, epilimnion	0.05	per day	SERAFM default (personal communication with C. Knightes 2009) (c)
Demethylation rate constant, hypolimnion	0.05	per day	SERAFM default, assumed to equal value for epilimnion (personal communication with C. Knightes 2009) (c)
Demethylation rate constant, sediment	0.47	per day	Hintelmann et al. 2000 (e)
Biotic Reduction rate constant, water column	0.03	per day	SERAFM default (personal communication with C. Knightes 2009) (c)
Photo-Degradation rate constant (MeHg --> Hg0), water column	0.0002	per day per E/m ² -day	Default parameter value provided by C. Knightes (personal communication with C. Knightes 2009) (c)

Table 5
Input Parameters for the Rookery Fate and Transport Modeling
(Rookery: waterbody #5)

Parameter (parameter symbol)	Parameter Value	Units	Basis for Value
Photo-Reduction rate constant (HgII --> Hg0) Visible Light, water column	0.77	per day per E/m ² -day	Default parameter value provided by C. Knightes (personal communication with C. Knightes 2009) (c)
Photo-Reduction rate constant (HgII --> Hg0) UV-B, water column	0.67	per day per E/m ² -day	Default parameter value provided by C. Knightes (personal communication with C. Knightes 2009) (c)
Photo-Oxidation rate constant (Hg0 --> HgII) UV-B, water column	0.6	per day per E/m ² -day	Default parameter value provided by C. Knightes (personal communication with C. Knightes 2009) (c)
Dark Oxidation rate constant, water column	1.44	per day	Default parameter value provided by C. Knightes (personal communication with C. Knightes 2009) (c)
Trophic Level 4 bioaccumulation factor (BAF) for fish	6.80E+06	L/kg fresh weight tissue	SERAFM default, same as HHRAP default

(a) Current velocity was calculated as flow rate (m³/yr) / cross-sectional waterbody area (m²) * conversion factor (to convert from m/yr to m/sec), where cross-sectional area = average waterbody width perpendicular to water flow direction * waterbody depth (i.e., 378 m width * 2 m depth).

(b) Abiotic solids concentration in water inflow to waterbody (Sabio_in) was calculated as the difference between total suspended solids and organic carbon on suspended solids, as follows: Sabio_in = TSS – TOC_{ss}, where TSS = total suspended solids (mg/L) and TOC_{ss} = total organic carbon on suspended solids (mg OC/L). TOC_{ss} was calculated as the difference between total organic carbon and dissolved organic carbon, as follows: TOC_{ss} = TOC – DOC, where TOC = total organic carbon, dissolved + suspended (mg/L) and DOC = dissolved organic carbon (mg/L). Values for the rookery were as follows: TSS = 16 mg/L; TOC = 26.9 mg/L; and DOC = 6.7 mg/L (values provided by Malcolm Pirnie, based on 9/1/2009 measurements). When these calculations yield a result <0, as in this case, Sabio_in is set to 0 (C. Knightes 2009).

(c) Knightes, C. 2009. Personal communication between Chris Knightes (SERAFM model developer), USEPA National Exposure Research Laboratory, Athens, GA, and Sarah Foster, CPF Associates, Inc. February 2009, March 2009, July 2009.

(d) Lee, D.W. and Downum, K.R. 1991. The spectral distribution of biologically active solar radiation at Miami, Florida, USA. Int. J. Biometeorol. 35:48-54.

(e) Sources: Average of sediment methylation and demethylation rate constants measured in a tracer study by Hintelmann et al. 2000 and personal communication with C. Knightes, USEPA, June 2010. (Hintelmann, H., Keppel-Jones, K. and Evans, R.D. 2000. Constants of mercury methylation and demethylation rates in sediments and comparison of tracer and ambient mercury availability. Env. Tox. & Chem. 19:2204-2211.)

(f) In the SERAFM model, the water inflow and outflow rates are calculated from the hydraulic residence time, the waterbody surface area, and the epilimnion depth (not the total water column depth).

Table 6
Input Parameters for the M Canal Fate and Transport Modeling
(M Canal: waterbody #6)

Parameter (parameter symbol)	Parameter Value	Units	Basis for Value
Site-Specific Input Parameters for use with USEPA HHRAP Fate and Transport Modeling			
Waterbody area (wa_w)	1.46E+5	m ²	Calculated by Malcolm Pirnie using GIS data, USGS topographic maps and aerial photographs. Consists of portion of M Canal bordering southern portion of Water Catchment Area wetland (waterbody #3).
Watershed area (wa_l)	8.39E+4	m ²	Calculated by Malcolm Pirnie using GIS data, USGS topographic maps and aerial photographs
Percent impervious	0	%	Calculated by Malcolm Pirnie using GIS data, USGS topographic maps and aerial photographs
Impervious watershed area (wa_i)	0	m ²	Calculated: Total watershed area * fraction impervious
Flow rate (vf)	1.5E+8	m ³ /yr	Provided by Malcolm Pirnie. Based on water flow analysis for the Water Catchment Area and associated canals. M Canal flow based on average outflow from the M canal just past the eastern edge of WCA wetland (165 cfs = 1.5E+8 m3/yr) (a)
Current velocity (mu)	0.41	m/sec	Calculated by Malcolm Pirnie based on water flow rate in waterbody and cross-sectional canal area (b)
Total suspended solids (tss)	6	mg/L	Provided by Malcolm Pirnie. Based on measurement collected 9/1/2009.
Water column depth (d_w)	1.3	m	Provided by Malcolm Pirnie. Based on measurement collected 9/1/2009. (1.3 m = 4.3 feet)
Cover management factor (usle_c)	0.003	unitless	Provided by Malcolm Pirnie. Based on USDA Agricultural Handbook Number 537 and pervious watershed land cover types.
Additional Input Parameters for use with USEPA SERAFM Mercury Model			
Watershed Location (East or West)	East	--	Based on site location
Percent Wetland (in watershed area)	100%	--	Provided by Malcolm Pirnie.
Percent Riparian (in watershed area)	0	--	Provided by Malcolm Pirnie.
Percent Upland (in watershed area)	0	--	Provided by Malcolm Pirnie. (Portion of watershed area that is not impervious, wetland or riparian.)

Table 6
Input Parameters for the M Canal Fate and Transport Modeling
(M Canal: waterbody #6)

Parameter (parameter symbol)	Parameter Value	Units	Basis for Value
Depth of pervious soil layer (zs)	0.1	m	SERA FM default
Stratification	no	--	Provided by Malcolm Pirnie. Based on 9/1/2009 sampling and observations. This parameter is not used in the SERA FM model calculations, but is considered when identifying parameters for epilimnion and hypolimnion.
Epilimnion Depth	1.3	m	Assumed to be same as water column depth for a non-stratified waterbody (personal communication with C. Knightes 2009) (c)
Hypolimnion Depth	0.05	m	SERA FM default for non-stratified water body (personal communication with C. Knightes 2009) (c)
Anoxic Hypolimnion	no	--	Provided by Malcolm Pirnie. Based on 9/1/2009 sampling and observations. This parameter is not used in the SERA FM model calculations, but is considered when identifying methylation rates in the water column.
Hydraulic Residence Time	1.3E-3	yr	Calculated: Total water volume in waterbody / waterbody flow rate = total water column depth * waterbody surface area / total water body flow rate (calculated from parameters shown above)(g)
Average wind speed 10 m above water surface (u)	4.3	m/s	Provided by Malcolm Pirnie. Long-term average based on NCDC data.
Water pH	7.8	--	Average of pH data from early 2004 to mid-2009 for nearby canal sampling sites in South Florida Water Management District DBHYDRO database (http://my.sfwmd.gov/dbhydroplsql)
Epilimnion Water Temp	26	C	Average of temperature data from early 2004 to mid-2009 for nearby canal sampling sites in South Florida Water Management District DBHYDRO database (299 K) (http://my.sfwmd.gov/dbhydroplsql)
Hypolimnion Water Temp	26	C	Set equal to epilimnion temperature (personal communication with C. Knightes 2009) (c)
Air Temp (Ta)	24	C	Provided by Malcolm Pirnie. Long-term average based on NCDC data (297 K)
Annual Precipitation (P)	156	cm/yr	Provided by Malcolm Pirnie. Long-term average based on USGS data (61 inches/year)
Dissolved Organic Carbon (DOC) Epilimnion	11.8	mg/L	Provided by Malcolm Pirnie. Based on measurement collected 9/1/2009.
Dissolved Organic Carbon (DOC) Hypolimnion	11.8	mg/L	Assumed to equal epilimnion value.

Table 6
Input Parameters for the M Canal Fate and Transport Modeling
(M Canal: waterbody #6)

Parameter (parameter symbol)	Parameter Value	Units	Basis for Value
Color (as PtCo)	0	PtCo	SERAFM default
Trophic Status	Eutrophic		Provided by Malcolm Pirnie. (Eutrophic definition- high productivity, nutrient rich, high suspended algae, DOC > 5 mg/L.)
Depth of sediment layer (d_sed)	0.03	m	SERAFM default
sediment particle diameter (d_s)	3.26	μm	Set at value necessary to calibrate solids balance in the SERAFM model, consistent with directions from C. Knightes (personal communication with C. Knightes 2009) (c). The specified value produced a total suspended solids concentration in the water column (TSS_1 parameter in SERAFM model) equivalent to the TSS provided by Malcolm Pirnie.
Abiotic solids in water inflow (Sabio_in)	6	g/m^3 (mg/L)	For evaluation of a segment of a flowing canal system, used the total suspended solids concentration, following recommendation from C. Knightes (personal communication with C. Knightes 2010) (d)
Phytoplankton biotic solids in water inflow (Sbio_phyto,in)	0	g/m^3	SERAFM default (personal communication with C. Knightes 2009) (c)
Zooplankton biotic solids in water inflow (Sbio_zoo,in)	0	g/m^3	SERAFM default (personal communication with C. Knightes 2009) (c)
Cloud cover - Fraction Cloud Reductance Factor	0.65	unitless	SERAFM default
Surface light intensity	32	$\text{E/m}^2\text{-day}$ (same as $\text{mol/m}^2\text{-day}$)	Midpoint of summer and winter mean values for Miami (Lee and Downum 1991) (e)
Methylation rate constant, epilimnion	0	per day	SERAFM default (personal communication with C. Knightes 2009) (c)
Methylation rate constant, hypolimnion	0	per day	SERAFM default, assumed to equal value for epilimnion (personal communication with C. Knightes 2009) (c)
Methylation rate constant, sediment	0.013	per day	Hintelmann et al. 2000 (f)
Demethylation rate constant, epilimnion	0.05	per day	SERAFM default (personal communication with C. Knightes 2009) (c)
Demethylation rate constant, hypolimnion	0.05	per day	SERAFM default, assumed to equal value for epilimnion (personal communication with C. Knightes 2009) (c)
Demethylation rate constant, sediment	0.47	per day	Hintelmann et al. 2000 (f)

Table 6
Input Parameters for the M Canal Fate and Transport Modeling
(M Canal: waterbody #6)

Parameter (parameter symbol)	Parameter Value	Units	Basis for Value
Biotic Reduction rate constant, water column	0.03	per day	SERAFM default (personal communication with C. Knightes 2009) (c)
Photo-Degradation rate constant (MeHg --> Hg ⁰), water column	0.0002	per day per E/m ² -day	Parameter value provided by C. Knightes (personal communication with C. Knightes 2009) (c)
Photo-Reduction rate constant (HgII --> Hg ⁰) Visible Light, water column	0.77	per day per E/m ² -day	Parameter value provided by C. Knightes (personal communication with C. Knightes 2009) (c)
Photo-Reduction rate constant (HgII --> Hg ⁰) UV-B, water column	0.67	per day per E/m ² -day	Parameter value provided by C. Knightes (personal communication with C. Knightes 2009) (c)
Photo-Oxidation rate constant (Hg ⁰ --> HgII) UV-B, water column	0.6	per day per E/m ² -day	Parameter value provided by C. Knightes (personal communication with C. Knightes 2009) (c)
Dark Oxidation rate constant, water column	1.44	per day	Parameter value provided by C. Knightes (personal communication with C. Knightes 2009) (c)
Trophic Level 4 bioaccumulation factor (BAF) for fish	6.80E+06	L/kg fresh weight tissue	SERAFM default, same as HHRAP default

(a) Source for water flow rate: CDM. 2005. Water Catchment Area Hydraulic Modeling and Flow Improvement Study. March 2005.

(b) Current velocity was calculated as flow rate (m³/yr) / cross-sectional waterbody area (m²) * conversion factor (to convert from m/yr to m/sec), where cross-sectional area = average canal width perpendicular to water flow direction * lake depth (i.e., 9 m * 1.3 m).

(c) Knightes, C. 2009. Personal communication between Chris Knightes (SERAFM model developer), USEPA National Exposure Research Laboratory, Athens, GA, and Sarah Foster, CPF Associates, Inc. February 2009, March 2009, July 2009.

(d) Knightes, C. 2010. Personal communication between Chris Knightes (SERAFM model developer), USEPA National Exposure Research Laboratory, Athens, GA, and Sarah Foster, CPF Associates, Inc. May 2010.

(e) Lee, D.W. and Downum, K.R. 1991. The spectral distribution of biologically active solar radiation at Miami, Florida, USA. Int. J. Biometeorol. 35:48-54.

(f) Sources: Average of sediment methylation and demethylation rate constants measured in a tracer study by Hintelmann et al. 2000 and personal communication with C. Knightes, USEPA, June 2010. (Hintelmann, H., Keppel-Jones, K. and Evans, R.D. 2000. Constants of mercury methylation and demethylation rates in sediments and comparison of tracer and ambient mercury availability. Env. Tox. & Chem. 19:2204-2211.)

(g) In the SERAFM model, the water inflow and outflow rates are calculated from the hydraulic residence time, the waterbody surface area, and the epilimnion depth (not the total water column depth).

APPENDIX G

AERMOD UNITIZED MODELING RESULTS FOR WATERBODY AND WATERSHED AREAS

Solid Waste Authority Palm Beach Renewable Energy Facility No. 2
Proposed Stack

Annual
Waterbody #1 - Typical Canal

Receptor ID	X	Y	Vapor Phase				Particle Phase				Particle Bound Phase				Divalent Mercury Vapor Phase				Elemental Mercury Vapor Phase			
			AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO
222	586095.23	2959036.29	4.14E-03	3.72E-04	3.66E-04	5.32E-06	4.12E-03	1.83E-03	1.04E-03	7.90E-04	4.14E-03	1.80E-04	1.23E-04	5.66E-05	4.12E-03	1.54E-03	1.13E-03	4.10E-04	4.14E-03	4.40E-05	4.40E-05	2.47E-08
283	586095.23	2959136.29	4.31E-03	3.85E-04	3.80E-04	5.37E-06	4.30E-03	1.93E-03	1.09E-03	8.32E-04	4.31E-03	1.89E-04	1.29E-04	5.95E-05	4.29E-03	1.61E-03	1.19E-03	4.26E-04	4.32E-03	4.42E-05	4.41E-05	2.50E-08
344	586095.23	2959236.29	4.50E-03	3.99E-04	3.94E-04	5.39E-06	4.49E-03	2.03E-03	1.15E-03	8.75E-04	4.50E-03	1.98E-04	1.36E-04	6.24E-05	4.48E-03	1.69E-03	1.25E-03	4.43E-04	4.50E-03	4.44E-05	4.43E-05	2.51E-08
405	586095.23	2959336.29	4.70E-03	4.15E-04	4.10E-04	5.38E-06	4.69E-03	2.13E-03	1.22E-03	9.18E-04	4.71E-03	2.08E-04	1.43E-04	6.54E-05	4.69E-03	1.77E-03	1.31E-03	4.59E-04	4.71E-03	4.46E-05	4.46E-05	2.50E-08
466	586095.23	2959436.29	4.93E-03	4.32E-04	4.27E-04	5.36E-06	4.91E-03	2.25E-03	1.29E-03	9.61E-04	4.93E-03	2.19E-04	1.51E-04	6.83E-05	4.91E-03	1.86E-03	1.38E-03	4.76E-04	4.93E-03	4.49E-05	4.49E-05	2.49E-08
527	586095.23	2959536.29	5.17E-03	4.51E-04	4.46E-04	5.36E-06	5.16E-03	2.37E-03	1.37E-03	1.00E-03	5.18E-03	2.31E-04	1.60E-04	7.13E-05	5.15E-03	1.95E-03	1.46E-03	4.92E-04	5.18E-03	4.53E-05	4.53E-05	2.49E-08
588	586095.23	2959636.29	5.44E-03	4.72E-04	4.67E-04	5.40E-06	5.43E-03	2.51E-03	1.45E-03	1.05E-03	5.44E-03	2.44E-04	1.69E-04	7.44E-05	5.42E-03	2.05E-03	1.54E-03	5.10E-04	5.45E-03	4.58E-05	4.58E-05	2.51E-08
649	586095.23	2959736.29	5.74E-03	4.95E-04	4.90E-04	5.52E-06	5.73E-03	2.66E-03	1.55E-03	1.10E-03	5.74E-03	2.58E-04	1.80E-04	7.78E-05	5.72E-03	2.17E-03	1.64E-03	5.28E-04	5.74E-03	4.65E-05	4.65E-05	2.56E-08
# of data pts																						
8			Average																			

Solid Waste Authority Palm Beach Renewable Energy Facility No. 2
Proposed Stack

Annual
Waterbody #2 - Iron Horse

Receptor ID	X	Y	Vapor Phase				Particle Phase				Particle Bound Phase				Divalent Mercury Vapor Phase				Elemental Mercury Vapor Phase			
			AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO
2712	584995.23	2963136.29	1.26E-02	1.10E-03	1.09E-03	1.03E-05	1.25E-02	6.09E-03	4.02E-03	2.07E-03	1.26E-02	6.13E-04	4.69E-04	1.44E-04	1.25E-02	4.70E-03	3.79E-03	9.09E-04	1.26E-02	9.51E-05	9.51E-05	4.79E-08
2713	585095.23	2963136.29	1.07E-02	9.39E-04	9.31E-04	7.67E-06	1.07E-02	5.13E-03	3.28E-03	1.86E-03	1.07E-02	5.20E-04	3.91E-04	1.29E-04	1.07E-02	4.04E-03	3.22E-03	8.21E-04	1.07E-02	7.56E-05	7.56E-05	3.57E-08
2714	585195.23	2963136.29	9.17E-03	8.15E-04	8.07E-04	7.68E-06	9.16E-03	4.53E-03	2.68E-03	1.84E-03	9.17E-03	4.57E-04	3.28E-04	1.29E-04	9.15E-03	3.57E-03	2.76E-03	8.09E-04	9.17E-03	6.77E-05	6.76E-05	3.57E-08
2715	585295.23	2963136.29	8.00E-03	7.25E-04	7.16E-04	9.27E-06	7.99E-03	4.20E-03	2.26E-03	1.94E-03	8.00E-03	4.18E-04	2.83E-04	1.35E-04	7.98E-03	3.26E-03	2.42E-03	8.40E-04	8.00E-03	6.46E-05	6.46E-05	4.31E-08
2716	585395.23	2963136.29	7.26E-03	6.71E-04	6.56E-04	1.44E-05	7.25E-03	4.15E-03	1.98E-03	2.17E-03	7.26E-03	4.05E-04	2.54E-04	1.51E-04	7.24E-03	3.13E-03	2.21E-03	9.22E-04	7.26E-03	6.33E-05	6.32E-05	6.69E-08
2717	585495.23	2963136.29	6.88E-03	6.45E-04	6.24E-04	2.14E-05	6.87E-03	4.34E-03	1.83E-03	2.51E-03	6.88E-03	4.11E-04	2.38E-04	1.73E-04	6.86E-03	3.14E-03	2.09E-03	1.05E-03	6.88E-03	6.25E-05	6.24E-05	9.96E-08
2774	585095.23	2963236.29	9.85E-03	8.63E-04	8.56E-04	6.88E-06	9.84E-03	4.64E-03	2.97E-03	1.68E-03	9.86E-03	4.72E-04	3.55E-04	1.17E-04	9.83E-03	3.71E-03	2.95E-03	7.55E-04	9.86E-03	6.89E-05	6.88E-05	3.20E-08
# of data pts		Average	9.20E-03	8.23E-04	8.12E-04	1.11E-05	9.19E-03	4.73E-03	2.72E-03	2.01E-03	9.21E-03	4.71E-04	3.31E-04	1.40E-04	9.18E-03	3.65E-03	2.78E-03	8.73E-04	9.21E-03	7.11E-05	7.10E-05	5.15E-08
7																						

Solid Waste Authority Palm Beach Renewable Energy Facility No. 2
Proposed Stack

Annual
Waterbody #3 - Grassy Waters Wetland

Receptor ID	X	Y	Vapor Phase				Particle Phase				Particle Bound Phase				Divalent Mercury Vapor Phase				Elemental Mercury Vapor Phase			
			AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO
4353	583295.23	2959236.29	3.99E-03	7.25E-04	7.21E-04	3.77E-06	3.98E-03	1.85E-03	1.29E-03	5.52E-04	4.00E-03	1.92E-04	1.52E-04	4.02E-05	3.98E-03	1.29E-03	9.81E-04	3.14E-04	4.00E-03	3.50E-04	3.50E-04	1.75E-08
4354	583795.23	2959236.29	3.94E-03	6.97E-04	6.93E-04	4.70E-06	3.92E-03	1.97E-03	1.32E-03	6.50E-04	3.95E-03	1.99E-04	1.52E-04	4.69E-05	3.93E-03	1.35E-03	9.94E-04	3.54E-04	3.94E-03	3.23E-04	3.23E-04	2.19E-08
4355	584295.23	2959236.29	3.91E-03	6.72E-04	6.64E-04	7.89E-06	3.89E-03	2.27E-03	1.40E-03	8.77E-04	3.91E-03	2.20E-04	1.57E-04	6.26E-05	3.90E-03	1.48E-03	1.02E-03	4.56E-04	3.91E-03	2.94E-04	2.94E-04	3.67E-08
4393	582795.23	2959736.29	4.95E-03	9.29E-04	9.24E-04	4.57E-06	4.93E-03	2.23E-03	1.62E-03	6.07E-04	4.96E-03	2.34E-04	1.90E-04	4.41E-05	4.94E-03	1.58E-03	1.23E-03	3.47E-04	4.96E-03	4.63E-04	4.63E-04	2.13E-08
4394	583295.23	2959736.29	5.31E-03	9.92E-04	9.87E-04	4.68E-06	5.29E-03	2.43E-03	1.76E-03	6.69E-04	5.32E-03	2.54E-04	2.06E-04	4.83E-05	5.30E-03	1.67E-03	1.30E-03	3.68E-04	5.31E-03	4.92E-04	4.92E-04	2.18E-08
4395	583795.23	2959736.29	5.48E-03	1.00E-03	9.97E-04	4.78E-06	5.46E-03	2.64E-03	1.85E-03	7.95E-04	5.49E-03	2.71E-04	2.14E-04	5.69E-05	5.47E-03	1.78E-03	1.37E-03	4.11E-04	5.49E-03	4.85E-04	4.85E-04	2.22E-08
4396	584295.23	2959736.29	5.28E-03	9.36E-04	9.29E-04	7.14E-06	5.26E-03	2.86E-03	1.89E-03	9.66E-04	5.29E-03	2.82E-04	2.14E-04	6.84E-05	5.27E-03	1.86E-03	1.38E-03	4.83E-04	5.29E-03	4.29E-04	4.29E-04	3.32E-08
4433	582295.23	2960236.29	6.04E-03	1.15E-03	1.15E-03	4.70E-06	6.02E-03	2.64E-03	2.07E-03	5.71E-04	6.06E-03	2.79E-04	2.37E-04	4.15E-05	6.03E-03	1.87E-03	1.54E-03	3.29E-04	6.05E-03	5.87E-04	5.87E-04	2.18E-08
4434	582795.23	2960236.29	6.46E-03	1.23E-03	1.22E-03	6.64E-06	6.44E-03	2.94E-03	2.19E-03	7.50E-04	6.48E-03	3.09E-04	2.55E-04	5.39E-05	6.45E-03	2.03E-03	1.62E-03	4.09E-04	6.47E-03	6.19E-04	6.19E-04	3.09E-08
4435	583295.23	2960236.29	7.11E-03	1.35E-03	1.34E-03	6.81E-06	7.09E-03	3.30E-03	2.41E-03	8.88E-04	7.12E-03	3.45E-04	2.81E-04	6.35E-05	7.10E-03	2.23E-03	1.76E-03	4.64E-04	7.12E-03	6.79E-04	6.79E-04	3.17E-08
4436	583795.23	2960236.29	7.85E-03	1.49E-03	1.48E-03	6.35E-06	7.83E-03	3.70E-03	2.69E-03	1.00E-03	7.86E-03	3.84E-04	3.12E-04	7.13E-05	7.83E-03	2.45E-03	1.95E-03	5.00E-04	7.85E-03	7.43E-04	7.43E-04	2.95E-08
4437	584295.23	2960236.29	7.83E-03	1.44E-03	1.43E-03	6.86E-06	7.81E-03	4.02E-03	2.78E-03	1.24E-03	7.84E-03	4.05E-04	3.17E-04	8.73E-05	7.82E-03	2.59E-03	2.01E-03	5.80E-04	7.83E-03	6.95E-04	6.95E-04	3.19E-08
4469	579795.23	2960736.29	5.14E-03	9.73E-04	9.70E-04	3.09E-06	5.12E-03	2.04E-03	1.72E-03	3.14E-04	5.16E-03	2.10E-04	1.87E-04	2.34E-05	5.12E-03	1.53E-03	1.32E-03	2.02E-04	5.15E-03	4.94E-04	4.93E-04	1.44E-08
4470	580295.23	2960736.29	5.52E-03	1.05E-03	1.05E-03	3.41E-06	5.50E-03	2.25E-03	1.89E-03	3.61E-04	5.54E-03	2.32E-04	2.06E-04	2.67E-05	5.50E-03	1.65E-03	1.43E-03	2.24E-04	5.53E-03	5.36E-04	5.36E-04	1.59E-08
4471	580795.23	2960736.29	5.99E-03	1.15E-03	1.15E-03	3.75E-06	5.96E-03	2.50E-03	2.09E-03	4.14E-04	6.01E-03	2.59E-04	2.29E-04	3.04E-05	5.97E-03	1.80E-03	1.55E-03	2.49E-04	6.00E-03	5.87E-04	5.87E-04	1.74E-08
4472	581295.23	2960736.29	6.56E-03	1.27E-03	1.27E-03	3.93E-06	6.54E-03	2.80E-03	2.33E-03	4.69E-04	6.58E-03	2.91E-04	2.57E-04	3.43E-05	6.55E-03	1.97E-03	1.70E-03	2.74E-04	6.58E-03	6.51E-04	6.51E-04	1.83E-08
4473	581795.23	2960736.29	7.27E-03	1.42E-03	1.41E-03	3.68E-06	7.25E-03	3.13E-03	2.62E-03	5.16E-04	7.29E-03	3.28E-04	2.90E-04	3.75E-05	7.26E-03	2.17E-03	1.88E-03	2.94E-04	7.28E-03	7.28E-04	7.28E-04	1.71E-08
4474	582295.23	2960736.29	8.11E-03	1.58E-03	1.58E-03	3.03E-06	8.09E-03	3.50E-03	2.94E-03	5.61E-04	8.13E-03	3.70E-04	3.29E-04	4.06E-05	8.10E-03	2.39E-03	2.08E-03	3.12E-04	8.12E-03	8.16E-04	8.16E-04	1.41E-08
4475	582795.23	2960736.29	9.06E-03	1.76E-03	1.76E-03	3.04E-06	9.03E-03	3.94E-03	3.27E-03	6.65E-04	9.07E-03	4.19E-04	3.71E-04	4.78E-05	9.04E-03	2.65E-03	2.30E-03	3.58E-04	9.07E-03	9.09E-04	9.09E-04	1.41E-08
4476	583295.23	2960736.29	1.00E-02	1.95E-03	1.94E-03	6.93E-06	1.00E-02	4.57E-03	3.57E-03	9.94E-04	1.01E-02	4.82E-04	4.12E-04	7.05E-05	1.00E-02	3.01E-03	2.51E-03	5.00E-04	1.01E-02	9.94E-04	9.94E-04	3.22E-08
4477	583795.23	2960736.29	1.11E-02	2.15E-03	2.14E-03	1.11E-05	1.11E-02	5.37E-03	3.91E-03	1.45E-03	1.12E-02	5.58E-04	4.56E-04	1.02E-04	1.11E-02	3.44E-03	2.76E-03	6.80E-04	1.12E-02	1.09E-03	1.09E-03	5.16E-08
4478	584295.23	2960736.29	1.21E-02	2.32E-03	2.31E-03	9.61E-06	1.21E-02	6.04E-03	4.32E-03	1.73E-03	1.21E-02	6.19E-04	4.99E-04	1.20E-04	1.21E-02	3.81E-03	3.04E-03	7.66E-04	1.21E-02	1.17E-03	1.17E-03	4.47E-08
4510	579795.23	2961236.29	5.46E-03	1.03E-03	1.03E-03	4.34E-06	5.43E-03	2.13E-03	1.82E-03	3.12E-04	5.48E-03	2.21E-04	1.98E-04	2.35E-05	5.44E-03	1.61E-03	1.40E-03	2.16E-04	5.47E-03	5.16E-04	5.16E-04	2.02E-08
4511	580295.23	2961236.29	5.94E-03	1.13E-03	1.13E-03	4.48E-06	5.92E-03	2.38E-03	2.02E-03	3.57E-04	5.97E-03	2.48E-04	2.21E-04	2.67E-05	5.93E-03	1.76E-03	1.52E-03	2.36E-04	5.96E-03	5.67E-04	5.67E-04	2.09E-08
4512	580795.23	2961236.29	6.57E-03	1.26E-03	1.25E-03	4.61E-06	6.54E-03	2.69E-03	2.28E-03	4.13E-04	6.59E-03	2.81E-04										

Solid Waste Authority Palm Beach Renewable Energy Facility No. 2
Proposed Stack

Annual
Waterbody #3 - Grassy Waters Wetland

Receptor ID	X	Y	Vapor Phase				Particle Phase				Particle Bound Phase				Divalent Mercury Vapor Phase				Elemental Mercury Vapor Phase			
			AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO
4642	584295.23	2962736.29	2.71E-02	5.11E-03	5.10E-03	1.20E-05	2.71E-02	1.27E-02	1.03E-02	2.44E-03	2.71E-02	1.33E-03	1.16E-03	1.70E-04	2.71E-02	8.33E-03	7.26E-03	1.07E-03	2.71E-02	2.31E-03	2.31E-03	5.58E-08
4674	579795.23	2963236.29	4.98E-03	9.54E-04	9.50E-04	3.52E-06	4.96E-03	1.87E-03	1.58E-03	2.94E-04	5.01E-03	2.01E-04	1.79E-04	2.22E-05	4.96E-03	1.45E-03	1.25E-03	2.03E-04	5.00E-03	4.58E-04	4.58E-04	1.64E-08
4675	580295.23	2963236.29	5.42E-03	1.05E-03	1.04E-03	3.59E-06	5.40E-03	2.09E-03	1.75E-03	3.45E-04	5.45E-03	2.25E-04	1.99E-04	2.58E-05	5.40E-03	1.59E-03	1.37E-03	2.27E-04	5.44E-03	4.99E-04	4.99E-04	1.67E-08
4676	580795.23	2963236.29	6.01E-03	1.17E-03	1.16E-03	3.43E-06	5.98E-03	2.38E-03	1.98E-03	4.01E-04	6.04E-03	2.56E-04	2.26E-04	2.98E-05	5.99E-03	1.77E-03	1.52E-03	2.52E-04	6.03E-03	5.55E-04	5.55E-04	1.60E-08
4677	581295.23	2963236.29	6.82E-03	1.33E-03	1.33E-03	3.01E-06	6.79E-03	2.74E-03	2.28E-03	4.59E-04	6.85E-03	2.96E-04	2.62E-04	3.39E-05	6.80E-03	2.01E-03	1.73E-03	2.79E-04	6.84E-03	6.31E-04	6.31E-04	1.40E-08
4678	581795.23	2963236.29	7.94E-03	1.56E-03	1.56E-03	2.75E-06	7.91E-03	3.24E-03	2.70E-03	5.37E-04	7.96E-03	3.50E-04	3.11E-04	3.94E-05	7.92E-03	2.34E-03	2.02E-03	3.16E-04	7.96E-03	7.36E-04	7.36E-04	1.28E-08
4679	582295.23	2963236.29	9.46E-03	1.87E-03	1.87E-03	3.06E-06	9.42E-03	3.94E-03	3.28E-03	6.61E-04	9.49E-03	4.26E-04	3.78E-04	4.82E-05	9.44E-03	2.80E-03	2.42E-03	3.76E-04	9.48E-03	8.78E-04	8.78E-04	1.42E-08
4680	582795.23	2963236.29	1.15E-02	2.28E-03	2.27E-03	4.96E-06	1.14E-02	4.91E-03	4.05E-03	8.55E-04	1.15E-02	5.29E-04	4.67E-04	6.19E-05	1.15E-02	3.43E-03	2.96E-03	4.72E-04	1.15E-02	1.06E-03	1.06E-03	2.31E-08
4681	583295.23	2963236.29	1.41E-02	2.77E-03	2.76E-03	1.08E-05	1.40E-02	6.25E-03	5.05E-03	1.19E-03	1.41E-02	6.66E-04	5.80E-04	8.55E-05	1.41E-02	4.30E-03	3.66E-03	6.33E-04	1.41E-02	1.28E-03	1.28E-03	5.05E-08
4682	583795.23	2963236.29	1.72E-02	3.20E-03	3.19E-03	7.54E-06	1.71E-02	7.65E-03	6.23E-03	1.42E-03	1.72E-02	8.09E-04	7.08E-04	1.01E-04	1.71E-02	5.23E-03	4.53E-03	6.94E-04	1.72E-02	1.44E-03	1.44E-03	3.51E-08
4683	584295.23	2963236.29	1.92E-02	2.75E-03	2.73E-03	1.56E-05	1.91E-02	9.01E-03	6.97E-03	2.04E-03	1.92E-02	9.24E-04	7.81E-04	1.43E-04	1.91E-02	6.35E-03	5.43E-03	9.25E-04	1.92E-02	9.71E-04	9.71E-04	7.27E-08
4715	579795.23	2963736.29	4.72E-03	9.03E-04	9.01E-04	2.37E-06	4.70E-03	1.77E-03	1.48E-03	2.92E-04	4.74E-03	1.91E-04	1.69E-04	2.20E-05	4.70E-03	1.39E-03	1.19E-03	2.00E-04	4.74E-03	4.29E-04	4.29E-04	1.10E-08
4716	580295.23	2963736.29	5.14E-03	9.91E-04	9.88E-04	2.13E-06	5.12E-03	1.96E-03	1.64E-03	3.25E-04	5.17E-03	2.12E-04	1.88E-04	2.44E-05	5.13E-03	1.52E-03	1.30E-03	2.17E-04	5.16E-03	4.69E-04	4.69E-04	9.92E-09
4717	580795.23	2963736.29	5.70E-03	1.11E-03	1.10E-03	2.10E-06	5.67E-03	2.22E-03	1.85E-03	3.74E-04	5.73E-03	2.41E-04	2.13E-04	2.79E-05	5.68E-03	1.69E-03	1.45E-03	2.43E-04	5.72E-03	5.20E-04	5.20E-04	9.75E-09
4718	581295.23	2963736.29	6.42E-03	1.25E-03	1.25E-03	2.31E-06	6.39E-03	2.56E-03	2.12E-03	4.40E-04	6.45E-03	2.77E-04	2.45E-04	3.27E-05	6.40E-03	1.92E-03	1.64E-03	2.78E-04	6.44E-03	5.87E-04	5.87E-04	1.07E-08
4719	581795.23	2963736.29	7.33E-03	1.44E-03	1.43E-03	3.14E-06	7.30E-03	3.00E-03	2.47E-03	5.25E-04	7.36E-03	3.24E-04	2.85E-04	3.89E-05	7.31E-03	2.21E-03	1.89E-03	3.26E-04	7.35E-03	6.70E-04	6.70E-04	1.46E-08
4720	582295.23	2963736.29	8.47E-03	1.66E-03	1.65E-03	5.40E-06	8.43E-03	3.58E-03	2.91E-03	6.75E-04	8.50E-03	3.85E-04	3.36E-04	4.96E-05	8.45E-03	2.59E-03	2.19E-03	4.05E-04	8.49E-03	7.70E-04	7.70E-04	2.51E-08
4721	582795.23	2963736.29	9.83E-03	1.91E-03	1.90E-03	9.06E-06	9.80E-03	4.27E-03	3.43E-03	8.41E-04	9.86E-03	4.56E-04	3.95E-04	6.14E-05	9.81E-03	3.05E-03	2.56E-03	4.93E-04	9.85E-03	8.76E-04	8.76E-04	4.23E-08
4722	583295.23	2963736.29	1.14E-02	2.11E-03	2.10E-03	5.47E-06	1.14E-02	4.97E-03	4.02E-03	9.55E-04	1.14E-02	5.28E-04	4.59E-04	6.88E-05	1.14E-02	3.50E-03	3.00E-03	5.09E-04	1.14E-02	9.41E-04	9.41E-04	2.54E-08
4723	583795.23	2963736.29	1.27E-02	2.01E-03	2.00E-03	1.10E-05	1.27E-02	5.82E-03	4.49E-03	1.33E-03	1.27E-02	6.04E-04	5.09E-04	9.44E-05	1.27E-02	4.14E-03	3.48E-03	6.63E-04	1.27E-02	7.90E-04	7.90E-04	5.12E-08
4724	584295.23	2963736.29	1.22E-02	1.36E-03	1.35E-03	6.25E-06	1.21E-02	5.44E-03	4.14E-03	1.31E-03	1.22E-02	5.63E-04	4.71E-04	9.23E-05	1.21E-02	4.17E-03	3.54E-03	6.27E-04	1.22E-02	3.17E-04	3.17E-04	2.90E-08
4756	579795.23	2964236.29	4.53E-03	8.65E-04	8.63E-04	1.71E-06	4.51E-03	1.68E-03	1.40E-03	2.78E-04	4.56E-03	1.82E-04	1.61E-04	2.11E-05	4.52E-03	1.34E-03	1.15E-03	1.97E-04	4.55E-03	4.07E-04	4.07E-04	7.98E-09
4757	580295.23	2964236.29	4.92E-03	9.44E-04	9.42E-04	1.86E-06	4.90E-03	1.86E-03	1.55E-03	3.18E-04	4.95E-03	2.02E-04	1.78E-04	2.40E-05	4.90E-03	1.47E-03	1.25E-03	2.20E-04	4.94E-03	4.43E-04	4.43E-04	8.66E-09
4758	580795.23	2964236.29	5.39E-03	1.04E-03	1.04E-03	2.30E-06	5.36E-03	2.09E-03	1.73E-03	3.63E-04	5.41E-03	2.26E-04	1.99E-04	2.74E-05	5.37E-03	1.63E-03	1.38E-03	2.48E-04	5.41E-03	4.86E-04	4.86E-04	1.07E-08
4759	581295.23	2964236.29	5.95E-03	1.15E-03	1.15E-03	3.48E-06	5.92E-03	2.38E-03	1.94E-03	4.37E-04	5.97E-03	2.57E-04	2.24E-04	3.28E-05	5.93E-03	1.82E-03	1.53E-03	2.93E-04	5.96E-03	5.35E-04	5.35E-04	1.62E-08
4760	581795.23	2964236.29	6.61E-03	1.28E-03	1.27E-03	5.51E-06	6.58E-03	2.73E-03	2.20E-03	5.36E-04	6.64E-03	2.94E-04	2.54E-04	3.99E-05	6.59E-03	2.06E-03	1.71E-03	3.49E-04	6.63E-03	5.91E-04	5.91E-04	2.57E-08
4761	582295.23</																					

Solid Waste Authority Palm Beach Renewable Energy Facility No. 2
Proposed Stack

Annual
Waterbody #4 - Middle Borrow Lake

Receptor ID	X	Y	Vapor Phase				Particle Phase				Particle Bound Phase				Divalent Mercury Vapor Phase				Elemental Mercury Vapor Phase			
			AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO
1981	585095.23	2961936.29	2.91E-03	5.42E-04	4.66E-04	7.55E-05	2.92E-03	1.67E-02	7.52E-04	1.60E-02	2.91E-03	1.18E-03	1.16E-04	1.07E-03	2.91E-03	6.36E-03	7.08E-04	5.65E-03	2.91E-03	1.69E-04	1.69E-04	3.51E-07
2042	585095.23	2962036.29	6.97E-03	1.04E-03	9.65E-04	7.04E-05	6.99E-03	1.56E-02	2.50E-03	1.31E-02	6.98E-03	1.19E-03	3.09E-04	8.76E-04	6.97E-03	6.67E-03	2.00E-03	4.66E-03	6.97E-03	3.05E-04	3.04E-04	3.27E-07
2103	585095.23	2962136.29	1.20E-02	1.39E-03	1.35E-03	3.89E-05	1.20E-02	1.39E-02	4.64E-03	9.27E-03	1.20E-02	1.16E-03	5.40E-04	6.23E-04	1.20E-02	7.08E-03	3.71E-03	3.37E-03	1.20E-02	3.02E-04	3.02E-04	1.81E-07
2104	585195.23	2962136.29	6.34E-03	6.26E-04	5.90E-04	3.56E-05	6.35E-03	1.11E-02	2.08E-03	9.00E-03	6.34E-03	8.68E-04	2.64E-04	6.04E-04	6.34E-03	5.21E-03	1.94E-03	3.26E-03	6.34E-03	5.85E-05	5.84E-05	1.65E-07
2164	585095.23	2962236.29	1.54E-02	1.55E-03	1.53E-03	2.73E-05	1.55E-02	1.31E-02	5.90E-03	7.18E-03	1.54E-02	1.16E-03	6.78E-04	4.84E-04	1.54E-02	7.53E-03	4.86E-03	2.67E-03	1.54E-02	2.40E-04	2.40E-04	1.27E-07
2165	585195.23	2962236.29	9.21E-03	8.56E-04	8.29E-04	2.70E-05	9.22E-03	9.90E-03	3.09E-03	6.81E-03	9.21E-03	8.38E-04	3.79E-04	4.59E-04	9.21E-03	5.38E-03	2.86E-03	2.53E-03	9.21E-03	7.29E-05	7.27E-05	1.25E-07
2166	585295.23	2962236.29	5.94E-03	5.83E-04	5.54E-04	2.98E-05	5.94E-03	8.26E-03	1.66E-03	6.60E-03	5.94E-03	6.76E-04	2.28E-04	4.48E-04	5.93E-03	4.27E-03	1.81E-03	2.46E-03	5.94E-03	5.08E-05	5.06E-05	1.38E-07
2225	585095.23	2962336.29	1.70E-02	1.61E-03	1.59E-03	2.42E-05	1.71E-02	1.23E-02	6.31E-03	5.95E-03	1.70E-02	1.13E-03	7.25E-04	4.03E-04	1.70E-02	7.62E-03	5.37E-03	2.25E-03	1.70E-02	1.97E-04	1.97E-04	1.13E-07
2226	585195.23	2962336.29	1.12E-02	1.01E-03	9.94E-04	2.06E-05	1.12E-02	9.06E-03	3.71E-03	5.35E-03	1.12E-02	8.11E-04	4.49E-04	3.62E-04	1.12E-02	5.50E-03	3.47E-03	2.03E-03	1.12E-02	8.47E-05	8.46E-05	9.59E-08
2227	585295.23	2962336.29	7.76E-03	7.41E-04	7.16E-04	2.42E-05	7.77E-03	7.63E-03	2.27E-03	5.36E-03	7.76E-03	6.63E-04	2.98E-04	3.65E-04	7.75E-03	4.44E-03	2.41E-03	2.03E-03	7.76E-03	6.61E-05	6.60E-05	1.12E-07
2228	585395.23	2962336.29	6.90E-03	6.96E-04	6.52E-04	4.39E-05	6.90E-03	8.25E-03	1.92E-03	6.33E-03	6.90E-03	6.90E-04	2.62E-04	4.28E-04	6.89E-03	4.54E-03	2.19E-03	2.35E-03	6.90E-03	6.52E-05	6.50E-05	2.04E-07
2286	585095.23	2962436.29	1.74E-02	1.60E-03	1.57E-03	2.18E-05	1.75E-02	1.12E-02	6.23E-03	5.01E-03	1.74E-02	1.06E-03	7.18E-04	3.40E-04	1.74E-02	7.38E-03	5.45E-03	1.93E-03	1.74E-02	1.70E-04	1.70E-04	1.01E-07
2287	585195.23	2962436.29	1.22E-02	1.10E-03	1.08E-03	1.65E-05	1.23E-02	8.35E-03	3.98E-03	4.37E-03	1.22E-02	7.77E-04	4.80E-04	2.97E-04	1.22E-02	5.48E-03	3.78E-03	1.70E-03	1.22E-02	9.22E-05	9.21E-05	7.66E-08
2288	585295.23	2962436.29	9.00E-03	8.45E-04	8.24E-04	2.01E-05	9.00E-03	7.14E-03	2.66E-03	4.48E-03	9.00E-03	6.47E-04	3.41E-04	3.06E-04	8.99E-03	4.53E-03	2.80E-03	1.73E-03	9.00E-03	7.69E-05	7.68E-05	9.35E-08
2289	585395.23	2962436.29	7.90E-03	7.79E-04	7.40E-04	3.90E-05	7.90E-03	7.66E-03	2.23E-03	5.43E-03	7.90E-03	6.65E-04	2.96E-04	3.69E-04	7.90E-03	4.56E-03	2.50E-03	2.05E-03	7.90E-03	7.53E-05	7.51E-05	1.81E-07
2349	585295.23	2962536.29	9.68E-03	8.97E-04	8.79E-04	1.72E-05	9.69E-03	6.66E-03	2.84E-03	3.82E-03	9.68E-03	6.23E-04	3.61E-04	2.62E-04	9.67E-03	4.49E-03	2.99E-03	1.50E-03	9.68E-03	8.22E-05	8.21E-05	7.98E-08
2350	585395.23	2962536.29	8.51E-03	8.21E-04	7.88E-04	3.36E-05	8.52E-03	7.04E-03	2.38E-03	4.65E-03	8.52E-03	6.30E-04	3.13E-04	3.16E-04	8.51E-03	4.45E-03	2.66E-03	1.79E-03	8.52E-03	8.02E-05	8.01E-05	1.56E-07
2410	585295.23	2962636.29	9.87E-03	9.05E-04	8.90E-04	1.52E-05	9.87E-03	6.19E-03	2.86E-03	3.33E-03	9.87E-03	5.91E-04	3.62E-04	2.29E-04	9.85E-03	4.35E-03	3.02E-03	1.33E-03	9.87E-03	8.30E-05	8.29E-05	7.06E-08
2411	585395.23	2962636.29	8.73E-03	8.28E-04	7.99E-04	2.86E-05	8.73E-03	6.41E-03	2.42E-03	3.99E-03	8.74E-03	5.88E-04	3.16E-04	2.72E-04	8.72E-03	4.25E-03	2.69E-03	1.56E-03	8.74E-03	8.09E-05	8.08E-05	1.33E-07
# of data pts	Average		9.74E-03	9.69E-04	9.37E-04	3.21E-05	9.75E-03	9.81E-03	3.18E-03	6.63E-03	9.74E-03	8.39E-04	3.91E-04	4.48E-04	9.73E-03	5.48E-03	3.01E-03	2.47E-03	9.74E-03	1.24E-04	1.24E-04	1.49E-07
19																						

Solid Waste Authority Palm Beach Renewable Energy Facility No. 2
Proposed Stack

Annual
Waterbody #5 - Rookery/Shell Pits

Receptor ID	X	Y	Vapor Phase				Particle Phase				Particle Bound Phase				Divalent Mercury Vapor Phase				Elemental Mercury Vapor Phase			
			AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO
878	584595.23	2960136.29	6.84E-03	1.22E-03	1.21E-03	1.13E-05	6.82E-03	4.09E-03	2.59E-03	1.50E-03	6.84E-03	3.93E-04	2.88E-04	1.05E-04	6.83E-03	2.52E-03	1.83E-03	6.88E-04	6.84E-03	5.54E-04	5.54E-04	5.24E-08
879	584695.23	2960136.29	6.80E-03	1.20E-03	1.19E-03	1.25E-05	6.79E-03	4.23E-03	2.63E-03	1.60E-03	6.81E-03	4.01E-04	2.90E-04	1.11E-04	6.79E-03	2.56E-03	1.83E-03	7.23E-04	6.81E-03	5.35E-04	5.35E-04	5.81E-08
880	584795.23	2960136.29	6.81E-03	1.18E-03	1.17E-03	1.06E-05	6.79E-03	4.11E-03	2.67E-03	1.44E-03	6.81E-03	3.92E-04	2.92E-04	1.00E-04	6.80E-03	2.49E-03	1.84E-03	6.55E-04	6.81E-03	5.16E-04	5.16E-04	4.91E-08
881	584895.23	2960136.29	6.84E-03	1.16E-03	1.15E-03	9.05E-06	6.82E-03	3.97E-03	2.69E-03	1.28E-03	6.84E-03	3.82E-04	2.93E-04	8.97E-05	6.82E-03	2.44E-03	1.84E-03	5.96E-04	6.84E-03	4.98E-04	4.98E-04	4.21E-08
882	584995.23	2960136.29	6.89E-03	1.14E-03	1.13E-03	1.31E-05	6.88E-03	4.10E-03	2.69E-03	1.41E-03	6.90E-03	3.91E-04	2.92E-04	9.91E-05	6.88E-03	2.52E-03	1.85E-03	6.66E-04	6.90E-03	4.78E-04	4.78E-04	6.09E-08
883	585095.23	2960136.29	6.94E-03	1.12E-03	1.10E-03	1.78E-05	6.93E-03	4.26E-03	2.64E-03	1.61E-03	6.95E-03	4.01E-04	2.88E-04	1.13E-04	6.93E-03	2.61E-03	1.85E-03	7.57E-04	6.95E-03	4.52E-04	4.52E-04	8.29E-08
885	585295.23	2960136.29	7.02E-03	9.97E-04	9.81E-04	1.61E-05	7.01E-03	4.14E-03	2.46E-03	1.68E-03	7.02E-03	3.88E-04	2.71E-04	1.17E-04	7.01E-03	2.62E-03	1.87E-03	7.51E-04	7.02E-03	3.58E-04	3.58E-04	7.48E-08
939	584595.23	2960236.29	7.35E-03	1.32E-03	1.31E-03	1.09E-05	7.34E-03	4.31E-03	2.77E-03	1.54E-03	7.36E-03	4.17E-04	3.10E-04	1.07E-04	7.34E-03	2.67E-03	1.97E-03	6.97E-04	7.36E-03	6.07E-04	6.07E-04	5.07E-08
940	584695.23	2960236.29	7.27E-03	1.29E-03	1.28E-03	1.32E-05	7.26E-03	4.54E-03	2.81E-03	1.73E-03	7.28E-03	4.30E-04	3.11E-04	1.20E-04	7.26E-03	2.73E-03	1.96E-03	7.70E-04	7.28E-03	5.83E-04	5.83E-04	6.13E-08
941	584795.23	2960236.29	7.25E-03	1.27E-03	1.25E-03	1.22E-05	7.23E-03	4.49E-03	2.85E-03	1.64E-03	7.25E-03	4.26E-04	3.12E-04	1.14E-04	7.24E-03	2.69E-03	1.96E-03	7.31E-04	7.25E-03	5.60E-04	5.60E-04	5.66E-08
942	584895.23	2960236.29	7.25E-03	1.24E-03	1.23E-03	9.77E-06	7.24E-03	4.30E-03	2.88E-03	1.42E-03	7.26E-03	4.12E-04	3.13E-04	9.92E-05	7.24E-03	2.61E-03	1.96E-03	6.46E-04	7.26E-03	5.38E-04	5.38E-04	4.54E-08
943	584995.23	2960236.29	7.29E-03	1.22E-03	1.21E-03	1.28E-05	7.28E-03	4.37E-03	2.87E-03	1.50E-03	7.29E-03	4.17E-04	3.12E-04	1.04E-04	7.28E-03	2.66E-03	1.97E-03	6.90E-04	7.29E-03	5.15E-04	5.15E-04	5.95E-08
944	585095.23	2960236.29	7.33E-03	1.19E-03	1.17E-03	1.87E-05	7.32E-03	4.57E-03	2.83E-03	1.74E-03	7.34E-03	4.29E-04	3.07E-04	1.22E-04	7.32E-03	2.77E-03	1.97E-03	8.03E-04	7.34E-03	4.86E-04	4.86E-04	8.70E-08
945	585195.23	2960236.29	7.37E-03	1.13E-03	1.12E-03	1.73E-05	7.36E-03	4.48E-03	2.74E-03	1.74E-03	7.38E-03	4.20E-04	2.99E-04	1.21E-04	7.36E-03	2.75E-03	1.97E-03	7.85E-04	7.38E-03	4.43E-04	4.43E-04	8.05E-08
1000	584595.23	2960336.29	7.95E-03	1.44E-03	1.43E-03	1.07E-05	7.93E-03	4.57E-03	2.98E-03	1.59E-03	7.95E-03	4.45E-04	3.34E-04	1.11E-04	7.93E-03	2.84E-03	2.12E-03	7.13E-04	7.95E-03	6.69E-04	6.69E-04	4.97E-08
1001	584695.23	2960336.29	7.79E-03	1.40E-03	1.38E-03	1.33E-05	7.78E-03	4.82E-03	3.00E-03	1.82E-03	7.80E-03	4.59E-04	3.33E-04	1.26E-04	7.78E-03	2.91E-03	2.10E-03	8.01E-04	7.80E-03	6.37E-04	6.37E-04	6.19E-08
1002	584795.23	2960336.29	7.72E-03	1.36E-03	1.35E-03	1.39E-05	7.71E-03	4.90E-03	3.04E-03	1.86E-03	7.73E-03	4.63E-04	3.34E-04	1.29E-04	7.71E-03	2.91E-03	2.10E-03	8.13E-04	7.72E-03	6.09E-04	6.09E-04	6.44E-08
1003	584895.23	2960336.29	7.69E-03	1.33E-03	1.32E-03	1.10E-05	7.68E-03	4.68E-03	3.07E-03	1.61E-03	7.70E-03	4.47E-04	3.35E-04	1.12E-04	7.68E-03	2.80E-03	2.09E-03	7.15E-04	7.69E-03	5.82E-04	5.82E-04	5.12E-08
1004	584995.23	2960336.29	7.70E-03	1.30E-03	1.29E-03	1.25E-05	7.69E-03	4.66E-03	3.07E-03	1.60E-03	7.71E-03	4.44E-04	3.33E-04	1.11E-04	7.69E-03	2.81E-03	2.09E-03	7.20E-04	7.70E-03	5.54E-04	5.54E-04	5.82E-08
1005	585095.23	2960336.29	7.73E-03	1.27E-03	1.25E-03	1.95E-05	7.71E-03	4.90E-03	3.02E-03	1.88E-03	7.73E-03	4.59E-04	3.28E-04	1.31E-04	7.72E-03	2.93E-03	2.08E-03	8.51E-04	7.73E-03	5.21E-04	5.21E-04	9.05E-08
1006	585195.23	2960336.29	7.75E-03	1.20E-03	1.18E-03	1.88E-05	7.74E-03	4.82E-03	2.91E-03	1.91E-03	7.75E-03	4.50E-04	3.18E-04	1.32E-04	7.74E-03	2.92E-03	2.08E-03	8.47E-04	7.75E-03	4.73E-04	4.73E-04	8.75E-08
1061	584595.23	2960436.29	8.63E-03	1.58E-03	1.57E-03	1.07E-05	8.62E-03	4.90E-03	3.22E-03	1.68E-03	8.64E-03	4.79E-04	3.63E-04	1.16E-04	8.62E-03	3.04E-03	2.30E-03	7.42E-04	8.63E-03	7.42E-04	7.42E-04	4.96E-08
1062	584695.23	2960436.29	8.38E-03	1.51E-03	1.50E-03	1.30E-05	8.37E-03	5.09E-03	3.21E-03	1.88E-03	8.39E-03	4.88E-04	3.58E-04	1.30E-04	8.37E-03	3.08E-03	2.26E-03	8.19E-04	8.38E-03	6.99E-04	6.98E-04	6.03E-08
1063	584795.23	2960436.29	8.23E-03	1.47E-03	1.45E-03	1.52E-05	8.22E-03	5.31E-03	3.24E-03	2.07E-03	8.24E-03	5.00E-04	3.57E-04	1.43E-04	8.22E-03	3.13E-03	2.24E-03	8.90E-04	8.23E-03	6.62E-04	6.62E-04	7.08E-08
1064	584895.23	2960436.29	8.14E-03	1.42E-03	1.41E-03	1.28E-05	8.13E-03	5.12E-03	3.26E-03	1.86E-03	8.15E-03	4.85E-04	3.57E-04	1								

Solid Waste Authority Palm Beach Renewable Energy Facility No. 2
Proposed Stack

Annual
Waterbody #5 - Rookery/Shell Pits

Receptor ID	X	Y	Vapor Phase				Particle Phase				Particle Bound Phase				Divalent Mercury Vapor Phase				Elemental Mercury Vapor Phase			
			AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO
1613	584895.23	2961336.29	9.29E-03	1.72E-03	1.69E-03	2.52E-05	9.30E-03	8.26E-03	3.01E-03	5.25E-03	9.29E-03	7.38E-04	3.84E-04	3.54E-04	9.29E-03	4.21E-03	2.24E-03	1.97E-03	9.29E-03	8.04E-04	8.04E-04	1.17E-07
# of data pts		Average	8.92E-03	1.58E-03	1.57E-03	1.61E-05	8.92E-03	5.78E-03	3.40E-03	2.38E-03	8.93E-03	5.46E-04	3.83E-04	1.63E-04	8.91E-03	3.37E-03	2.38E-03	9.93E-04	8.93E-03	7.15E-04	7.15E-04	7.47E-08
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Solid Waste Authority Palm Beach Renewable Energy Facility No. 2
Proposed Stack

Annual
Waterbody #6 - M Canal

Receptor ID	X	Y	Vapor Phase				Particle Phase				Particle Bound Phase				Divalent Mercury Vapor Phase				Elemental Mercury Vapor Phase			
			AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO
265	584295.23	2959136.29	3.71E-03	6.34E-04	6.27E-04	7.72E-06	3.69E-03	2.16E-03	1.32E-03	8.40E-04	3.72E-03	2.09E-04	1.49E-04	6.01E-05	3.70E-03	1.41E-03	9.67E-04	4.41E-04	3.72E-03	2.75E-04	2.75E-04	3.59E-08
260	583795.23	2959136.29	3.72E-03	6.54E-04	6.50E-04	4.77E-06	3.70E-03	1.86E-03	1.24E-03	6.24E-04	3.72E-03	1.89E-04	1.44E-04	4.51E-05	3.71E-03	1.28E-03	9.40E-04	3.45E-04	3.72E-03	3.01E-04	3.01E-04	2.22E-08
255	583295.23	2959136.29	3.78E-03	6.82E-04	6.78E-04	3.57E-06	3.76E-03	1.76E-03	1.22E-03	5.37E-04	3.79E-03	1.83E-04	1.43E-04	3.92E-05	3.77E-03	1.24E-03	9.29E-04	3.06E-04	3.79E-03	3.27E-04	3.27E-04	1.66E-08
373	582895.23	2959336.29	4.12E-03	7.63E-04	7.59E-04	3.85E-06	4.10E-03	1.84E-03	1.33E-03	5.12E-04	4.13E-03	1.94E-04	1.56E-04	3.75E-05	4.11E-03	1.31E-03	1.01E-03	3.03E-04	4.13E-03	3.75E-04	3.75E-04	1.79E-08
673	582395.23	2959836.29	4.92E-03	9.22E-04	9.16E-04	5.78E-06	4.90E-03	2.20E-03	1.61E-03	5.91E-04	4.93E-03	2.31E-04	1.88E-04	4.31E-05	4.91E-03	1.59E-03	1.24E-03	3.45E-04	4.93E-03	4.60E-04	4.60E-04	2.69E-08
4428	579795.23	2960236.29	4.65E-03	8.82E-04	8.79E-04	2.61E-06	4.63E-03	1.83E-03	1.55E-03	2.82E-04	4.67E-03	1.89E-04	1.68E-04	2.11E-05	4.64E-03	1.40E-03	1.21E-03	1.87E-04	4.67E-03	4.51E-04	4.51E-04	1.21E-08
4429	580295.23	2960236.29	4.89E-03	9.33E-04	9.31E-04	2.36E-06	4.87E-03	1.96E-03	1.66E-03	2.99E-04	4.92E-03	2.03E-04	1.81E-04	2.22E-05	4.88E-03	1.47E-03	1.28E-03	1.94E-04	4.91E-03	4.79E-04	4.79E-04	1.10E-08
4430	580795.23	2960236.29	5.16E-03	9.88E-04	9.86E-04	2.05E-06	5.14E-03	2.09E-03	1.77E-03	3.17E-04	5.18E-03	2.18E-04	1.95E-04	2.35E-05	5.15E-03	1.55E-03	1.35E-03	2.03E-04	5.18E-03	5.09E-04	5.09E-04	9.54E-09
4431	581295.23	2960236.29	5.45E-03	1.05E-03	1.04E-03	1.92E-06	5.43E-03	2.23E-03	1.88E-03	3.50E-04	5.47E-03	2.35E-04	2.09E-04	2.58E-05	5.43E-03	1.64E-03	1.42E-03	2.19E-04	5.46E-03	5.39E-04	5.39E-04	8.94E-09
4432	581795.23	2960236.29	5.73E-03	1.10E-03	1.10E-03	2.45E-06	5.71E-03	2.40E-03	1.98E-03	4.21E-04	5.75E-03	2.54E-04	2.23E-04	3.09E-05	5.72E-03	1.74E-03	1.48E-03	2.55E-04	5.74E-03	5.65E-04	5.64E-04	1.14E-08
# of data pts	Average		4.61E-03	8.60E-04	8.56E-04	3.71E-06	4.59E-03	2.03E-03	1.56E-03	4.77E-04	4.63E-03	2.10E-04	1.76E-04	3.48E-05	4.60E-03	1.46E-03	1.18E-03	2.80E-04	4.62E-03	4.28E-04	4.28E-04	1.72E-08

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Solid Waste Authority Palm Beach Renewable Energy Facility No. 2
Proposed Stack

Annual
Waterbody #7 - Localized Area Within Grassy Waters Wetlands

Receptor ID	X	Y	Vapor Phase				Particle Phase				Particle Bound Phase				Divalent Mercury Vapor Phase				Elemental Mercury Vapor Phase			
			AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO
866	583395.23	2960136.29	6.83E-03	1.30E-03	1.29E-03	5.37E-06	6.81E-03	3.16E-03	2.31E-03	8.48E-04	6.84E-03	3.30E-04	2.69E-04	6.07E-05	6.82E-03	2.13E-03	1.69E-03	4.43E-04	6.84E-03	6.50E-04	6.50E-04	2.50E-08
867	583495.23	2960136.29	6.96E-03	1.32E-03	1.32E-03	5.24E-06	6.94E-03	3.23E-03	2.36E-03	8.66E-04	6.98E-03	3.37E-04	2.75E-04	6.19E-05	6.95E-03	2.17E-03	1.72E-03	4.48E-04	6.97E-03	6.62E-04	6.62E-04	2.44E-08
868	583595.23	2960136.29	7.09E-03	1.34E-03	1.34E-03	5.49E-06	7.08E-03	3.30E-03	2.41E-03	8.90E-04	7.11E-03	3.44E-04	2.81E-04	6.35E-05	7.08E-03	2.21E-03	1.76E-03	4.56E-04	7.10E-03	6.72E-04	6.72E-04	2.55E-08
869	583695.23	2960136.29	7.21E-03	1.36E-03	1.36E-03	5.93E-06	7.19E-03	3.38E-03	2.46E-03	9.18E-04	7.22E-03	3.51E-04	2.86E-04	6.54E-05	7.20E-03	2.25E-03	1.79E-03	4.67E-04	7.22E-03	6.80E-04	6.80E-04	2.76E-08
870	583795.23	2960136.29	7.31E-03	1.38E-03	1.37E-03	6.26E-06	7.29E-03	3.45E-03	2.50E-03	9.48E-04	7.32E-03	3.57E-04	2.90E-04	6.74E-05	7.30E-03	2.29E-03	1.81E-03	4.78E-04	7.32E-03	6.85E-04	6.85E-04	2.91E-08
871	583895.23	2960136.29	7.38E-03	1.38E-03	1.38E-03	6.32E-06	7.37E-03	3.52E-03	2.54E-03	9.84E-04	7.39E-03	3.63E-04	2.93E-04	6.98E-05	7.37E-03	2.33E-03	1.84E-03	4.90E-04	7.39E-03	6.85E-04	6.85E-04	2.94E-08
872	583995.23	2960136.29	7.41E-03	1.38E-03	1.37E-03	6.22E-06	7.39E-03	3.59E-03	2.56E-03	1.03E-03	7.42E-03	3.68E-04	2.95E-04	7.31E-05	7.40E-03	2.36E-03	1.86E-03	5.05E-04	7.41E-03	6.80E-04	6.80E-04	2.89E-08
873	584095.23	2960136.29	7.37E-03	1.36E-03	1.36E-03	6.11E-06	7.36E-03	3.64E-03	2.56E-03	1.08E-03	7.38E-03	3.71E-04	2.95E-04	7.64E-05	7.36E-03	2.38E-03	1.86E-03	5.21E-04	7.38E-03	6.66E-04	6.66E-04	2.84E-08
874	584195.23	2960136.29	7.29E-03	1.34E-03	1.33E-03	6.20E-06	7.28E-03	3.68E-03	2.56E-03	1.12E-03	7.30E-03	3.72E-04	2.93E-04	7.92E-05	7.28E-03	2.39E-03	1.86E-03	5.35E-04	7.30E-03	6.48E-04	6.48E-04	2.88E-08
875	584295.23	2960136.29	7.18E-03	1.31E-03	1.30E-03	7.04E-06	7.17E-03	3.73E-03	2.55E-03	1.18E-03	7.19E-03	3.74E-04	2.91E-04	8.31E-05	7.17E-03	2.41E-03	1.86E-03	5.58E-04	7.19E-03	6.26E-04	6.26E-04	3.27E-08
876	584395.23	2960136.29	7.05E-03	1.28E-03	1.27E-03	8.18E-06	7.03E-03	3.79E-03	2.55E-03	1.24E-03	7.06E-03	3.76E-04	2.89E-04	8.73E-05	7.04E-03	2.43E-03	1.85E-03	5.84E-04	7.06E-03	6.01E-04	6.01E-04	3.80E-08
877	584495.23	2960136.29	6.93E-03	1.24E-03	1.24E-03	9.19E-06	6.91E-03	3.88E-03	2.56E-03	1.32E-03	6.93E-03	3.80E-04	2.87E-04	9.27E-05	6.92E-03	2.45E-03	1.84E-03	6.16E-04	6.93E-03	5.76E-04	5.76E-04	4.27E-08
927	583395.23	2960236.29	7.26E-03	1.38E-03	1.37E-03	6.26E-06	7.24E-03	3.37E-03	2.47E-03	9.05E-04	7.27E-03	3.52E-04	2.88E-04	6.46E-05	7.25E-03	2.27E-03	1.80E-03	4.68E-04	7.27E-03	6.94E-04	6.94E-04	2.91E-08
928	583495.23	2960236.29	7.41E-03	1.41E-03	1.40E-03	5.81E-06	7.39E-03	3.45E-03	2.52E-03	9.24E-04	7.42E-03	3.60E-04	2.94E-04	6.59E-05	7.40E-03	2.31E-03	1.84E-03	4.73E-04	7.42E-03	7.09E-04	7.09E-04	2.70E-08
929	583595.23	2960236.29	7.57E-03	1.44E-03	1.43E-03	5.62E-06	7.55E-03	3.53E-03	2.58E-03	9.45E-04	7.58E-03	3.68E-04	3.01E-04	6.73E-05	7.56E-03	2.35E-03	1.88E-03	4.79E-04	7.58E-03	7.23E-04	7.23E-04	2.61E-08
930	583695.23	2960236.29	7.72E-03	1.47E-03	1.46E-03	5.86E-06	7.70E-03	3.61E-03	2.64E-03	9.72E-04	7.73E-03	3.76E-04	3.07E-04	6.91E-05	7.71E-03	2.40E-03	1.91E-03	4.88E-04	7.72E-03	7.35E-04	7.35E-04	2.73E-08
931	583795.23	2960236.29	7.85E-03	1.49E-03	1.48E-03	6.35E-06	7.83E-03	3.70E-03	2.69E-03	1.00E-03	7.86E-03	3.84E-04	3.12E-04	7.13E-05	7.83E-03	2.45E-03	1.95E-03	5.00E-04	7.85E-03	7.43E-04	7.43E-04	2.95E-08
932	583895.23	2960236.29	7.95E-03	1.50E-03	1.49E-03	6.70E-06	7.93E-03	3.78E-03	2.74E-03	1.04E-03	7.96E-03	3.91E-04	3.17E-04	7.36E-05	7.94E-03	2.49E-03	1.98E-03	5.13E-04	7.96E-03	7.48E-04	7.48E-04	3.12E-08
933	583995.23	2960236.29	8.02E-03	1.51E-03	1.50E-03	6.76E-06	8.00E-03	3.86E-03	2.78E-03	1.08E-03	8.03E-03	3.97E-04	3.21E-04	7.65E-05	8.01E-03	2.53E-03	2.01E-03	5.27E-04	8.03E-03	7.47E-04	7.47E-04	3.14E-08
934	584095.23	2960236.29	8.02E-03	1.50E-03	1.49E-03	6.65E-06	8.01E-03	3.93E-03	2.79E-03	1.14E-03	8.03E-03	4.02E-04	3.22E-04	8.03E-05	8.01E-03	2.57E-03	2.02E-03	5.45E-04	8.03E-03	7.38E-04	7.38E-04	3.09E-08
935	584195.23	2960236.29	7.95E-03	1.47E-03	1.47E-03	6.53E-06	7.93E-03	3.98E-03	2.79E-03	1.19E-03	7.96E-03	4.04E-04	3.20E-04	8.38E-05	7.94E-03	2.58E-03	2.02E-03	5.61E-04	7.96E-03	7.19E-04	7.19E-04	3.03E-08
936	584295.23	2960236.29	7.83E-03	1.44E-03	1.43E-03	6.86E-06	7.81E-03	4.02E-03	2.78E-03	1.24E-03	7.84E-03	4.05E-04	3.17E-04	8.73E-05	7.82E-03	2.59E-03	2.01E-03	5.80E-04	7.83E-03	6.95E-04	6.95E-04	3.19E-08
937	584395.23	2960236.29	7.67E-03	1.40E-03	1.39E-03	8.04E-06	7.66E-03	4.08E-03	2.77E-03	1.32E-03	7.68E-03	4.06E-04	3.14E-04	9.22E-05	7.66E-03	2.61E-03	2.00E-03	6.09E-04	7.68E-03	6.67E-04	6.67E-04	3.74E-08
938	584495.23	2960236.29	7.50E-03	1.36E-03	1.35E-03	9.24E-06	7.49E-03	4.15E-03	2.76E-03	1.39E-03	7.51E-03	4.08E-04	3.11E-04	9.72E-05	7.49E-03	2.62E-03	1.98E-03	6.39E-04	7.51E-03	6.36E-04	6.36E-04	4.29E-08
988	583395.23	2960336.29	7.72E-03	1.47E-03	1.47E-03	7.50E-06	7.70E-03	3.61E-03	2.64E-03	9.71E-04	7.74E-03	3.77E-04	3.07E-04	6.91E-05	7							

Solid Waste Authority Palm Beach Renewable Energy Facility No. 2
Proposed Stack

Annual
Waterbody #7 - Localized Area Within Grassy Waters Wetlands

Receptor ID	X		Y		Vapor Phase				Particle Phase				Particle Bound Phase				Divalent Mercury Vapor Phase				Elemental Mercury Vapor Phase			
					AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO
1171	583395.23	2960636.29	9.46E-03	1.82E-03	1.81E-03	8.71E-06	9.44E-03	4.41E-03	3.31E-03	1.10E-03	9.48E-03	4.62E-04	3.84E-04	7.77E-05	9.45E-03	2.90E-03	2.35E-03	5.46E-04	9.47E-03	9.24E-04	9.24E-04	4.05E-08		
1172	583495.23	2960636.29	9.66E-03	1.86E-03	1.85E-03	9.31E-06	9.64E-03	4.55E-03	3.37E-03	1.17E-03	9.68E-03	4.75E-04	3.92E-04	8.27E-05	9.65E-03	2.97E-03	2.40E-03	5.74E-04	9.67E-03	9.42E-04	9.42E-04	4.33E-08		
1173	583595.23	2960636.29	9.88E-03	1.90E-03	1.89E-03	9.92E-06	9.86E-03	4.69E-03	3.45E-03	1.25E-03	9.90E-03	4.89E-04	4.01E-04	8.78E-05	9.87E-03	3.05E-03	2.45E-03	6.04E-04	9.89E-03	9.62E-04	9.62E-04	4.61E-08		
1174	583695.23	2960636.29	1.01E-02	1.95E-03	1.94E-03	1.01E-05	1.01E-02	4.83E-03	3.53E-03	1.31E-03	1.01E-02	5.03E-04	4.11E-04	9.18E-05	1.01E-02	3.13E-03	2.51E-03	6.26E-04	1.01E-02	9.84E-04	9.84E-04	4.70E-08		
1175	583795.23	2960636.29	1.04E-02	1.99E-03	1.99E-03	9.57E-06	1.03E-02	4.96E-03	3.62E-03	1.34E-03	1.04E-02	5.15E-04	4.21E-04	9.42E-05	1.03E-02	3.21E-03	2.57E-03	6.37E-04	1.04E-02	1.01E-03	1.01E-03	4.45E-08		
1176	583895.23	2960636.29	1.06E-02	2.04E-03	2.03E-03	8.62E-06	1.06E-02	5.08E-03	3.71E-03	1.37E-03	1.06E-02	5.27E-04	4.31E-04	9.62E-05	1.06E-02	3.28E-03	2.63E-03	6.45E-04	1.06E-02	1.03E-03	1.03E-03	4.01E-08		
1177	583995.23	2960636.29	1.08E-02	2.08E-03	2.08E-03	7.95E-06	1.08E-02	5.21E-03	3.80E-03	1.41E-03	1.08E-02	5.40E-04	4.41E-04	9.88E-05	1.08E-02	3.35E-03	2.70E-03	6.55E-04	1.08E-02	1.05E-03	1.05E-03	3.69E-08		
1178	584095.23	2960636.29	1.10E-02	2.12E-03	2.11E-03	8.03E-06	1.10E-02	5.34E-03	3.88E-03	1.46E-03	1.10E-02	5.52E-04	4.50E-04	1.02E-04	1.10E-02	3.42E-03	2.75E-03	6.72E-04	1.10E-02	1.07E-03	1.07E-03	3.73E-08		
1179	584195.23	2960636.29	1.11E-02	2.13E-03	2.13E-03	8.73E-06	1.11E-02	5.47E-03	3.94E-03	1.53E-03	1.11E-02	5.62E-04	4.56E-04	1.06E-04	1.11E-02	3.49E-03	2.79E-03	6.93E-04	1.11E-02	1.07E-03	1.07E-03	4.06E-08		
1180	584295.23	2960636.29	1.12E-02	2.13E-03	2.12E-03	9.29E-06	1.12E-02	5.58E-03	3.98E-03	1.60E-03	1.12E-02	5.70E-04	4.58E-04	1.12E-04	1.12E-02	3.54E-03	2.82E-03	7.19E-04	1.12E-02	1.07E-03	1.07E-03	4.32E-08		
1181	584395.23	2960636.29	1.10E-02	2.09E-03	2.08E-03	9.29E-06	1.10E-02	5.66E-03	3.96E-03	1.70E-03	1.10E-02	5.73E-04	4.55E-04	1.18E-04	1.10E-02	3.56E-03	2.81E-03	7.50E-04	1.10E-02	1.04E-03	1.04E-03	4.32E-08		
1182	584495.23	2960636.29	1.07E-02	2.01E-03	2.00E-03	9.13E-06	1.07E-02	5.67E-03	3.89E-03	1.79E-03	1.07E-02	5.69E-04	4.45E-04	1.24E-04	1.07E-02	3.54E-03	2.76E-03	7.78E-04	1.07E-02	9.88E-04	9.88E-04	4.24E-08		
1183	584595.23	2960636.29	1.03E-02	1.91E-03	1.90E-03	1.02E-05	1.03E-02	5.69E-03	3.79E-03	1.90E-03	1.03E-02	5.63E-04	4.31E-04	1.32E-04	1.03E-02	3.52E-03	2.70E-03	8.19E-04	1.03E-02	9.23E-04	9.23E-04	4.74E-08		
1232	583395.23	2960736.29	1.02E-02	1.98E-03	1.97E-03	8.11E-06	1.02E-02	4.72E-03	3.63E-03	1.09E-03	1.03E-02	4.97E-04	4.20E-04	7.70E-05	1.02E-02	3.09E-03	2.55E-03	5.40E-04	1.03E-02	1.01E-03	1.01E-03	3.77E-08		
1233	583495.23	2960736.29	1.04E-02	2.02E-03	2.01E-03	9.05E-06	1.04E-02	4.87E-03	3.69E-03	1.18E-03	1.05E-02	5.11E-04	4.28E-04	8.33E-05	1.04E-02	3.17E-03	2.59E-03	5.77E-04	1.05E-02	1.03E-03	1.03E-03	4.21E-08		
1234	583595.23	2960736.29	1.07E-02	2.06E-03	2.05E-03	9.79E-06	1.06E-02	5.03E-03	3.76E-03	1.27E-03	1.07E-02	5.26E-04	4.37E-04	8.94E-05	1.07E-02	3.25E-03	2.64E-03	6.11E-04	1.07E-02	1.05E-03	1.05E-03	4.55E-08		
1235	583695.23	2960736.29	1.09E-02	2.10E-03	2.09E-03	1.05E-05	1.09E-02	5.20E-03	3.83E-03	1.36E-03	1.09E-02	5.42E-04	4.46E-04	9.58E-05	1.09E-02	3.34E-03	2.70E-03	6.47E-04	1.09E-02	1.07E-03	1.07E-03	4.90E-08		
1236	583795.23	2960736.29	1.11E-02	2.15E-03	2.14E-03	1.11E-05	1.11E-02	5.37E-03	3.91E-03	1.45E-03	1.12E-02	5.58E-04	4.56E-04	1.02E-04	1.11E-02	3.44E-03	2.76E-03	6.80E-04	1.12E-02	1.09E-03	1.09E-03	5.16E-08		
1237	583895.23	2960736.29	1.14E-02	2.20E-03	2.19E-03	1.08E-05	1.14E-02	5.51E-03	4.01E-03	1.51E-03	1.14E-02	5.72E-04	4.67E-04	1.05E-04	1.14E-02	3.52E-03	2.83E-03	6.99E-04	1.14E-02	1.11E-03	1.11E-03	5.04E-08		
1238	583995.23	2960736.29	1.16E-02	2.25E-03	2.24E-03	9.80E-06	1.16E-02	5.64E-03	4.10E-03	1.54E-03	1.16E-02	5.85E-04	4.77E-04	1.08E-04	1.16E-02	3.60E-03	2.89E-03	7.08E-04	1.16E-02	1.14E-03	1.14E-03	4.56E-08		
1239	584095.23	2960736.29	1.18E-02	2.29E-03	2.28E-03	8.88E-06	1.18E-02	5.78E-03	4.19E-03	1.58E-03	1.19E-02	5.97E-04	4.87E-04	1.11E-04	1.18E-02	3.67E-03	2.95E-03	7.20E-04	1.19E-02	1.16E-03	1.16E-03	4.13E-08		
1240	584195.23	2960736.29	1.20E-02	2.32E-03	2.31E-03	8.84E-06	1.20E-02	5.91E-03	4.27E-03	1.65E-03	1.20E-02	6.09E-04	4.94E-04	1.15E-04	1.20E-02	3.75E-03	3.01E-03	7.39E-04	1.20E-02	1.17E-03	1.17E-03	4.11E-08		
1241	584295.23	2960736.29	1.21E-02	2.32E-03	2.31E-03	9.61E-06	1.21E-02	6.04E-03	4.32E-03	1.73E-03	1.21E-02	6.19E-04	4.99E-04	1.20E-04	1.21E-02	3.81E-03	3.04E-03	7.66E-04	1.21E-02	1.17E-03	1.17E-03	4.47E-08		
1242	584395.23	2960736.29	1.20E-02	2.30E-03	2.29E-03	1.03E-05	1.20E-02	6.14E-03	4.32E-03	1.82E-03	1.20E-02	6.24E-04	4.98E-04	1.26E-04	1.20E-02	3.85E-03	3.05E-03	7.97E-04	1.20E-02	1.15E-03	1.15E-03	4.77E-08		
1243	584495.23	2960736.29	1.18E-02	2.23E-03	2.22E-03	1.02E-05	1.18E-02	6.19E-03	4.25E-03	1.94E-03	1.18E-02	6.23E-04												

Solid Waste Authority Palm Beach Renewable Energy Facility No. 2
Proposed Stack

Annual
Waterbody #7 - Localized Area Within Grassy Waters Wetlands

Receptor ID	X	Y	Vapor Phase				Particle Phase				Particle Bound Phase				Divalent Mercury Vapor Phase				Elemental Mercury Vapor Phase			
			AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO
1424	584295.23	2961036.29	1.52E-02	2.96E-03	2.94E-03	1.55E-05	1.52E-02	7.78E-03	5.44E-03	2.34E-03	1.52E-02	7.98E-04	6.37E-04	1.61E-04	1.52E-02	4.75E-03	3.76E-03	9.97E-04	1.52E-02	1.50E-03	1.50E-03	7.20E-08
1425	584395.23	2961036.29	1.51E-02	2.93E-03	2.91E-03	1.38E-05	1.51E-02	7.81E-03	5.39E-03	2.42E-03	1.51E-02	7.99E-04	6.32E-04	1.66E-04	1.51E-02	4.76E-03	3.74E-03	1.02E-03	1.51E-02	1.48E-03	1.48E-03	6.41E-08
1426	584495.23	2961036.29	1.48E-02	2.86E-03	2.85E-03	1.28E-05	1.48E-02	7.82E-03	5.30E-03	2.53E-03	1.48E-02	7.94E-04	6.21E-04	1.74E-04	1.48E-02	4.73E-03	3.68E-03	1.05E-03	1.48E-02	1.44E-03	1.44E-03	5.93E-08
1427	584595.23	2961036.29	1.43E-02	2.75E-03	2.74E-03	1.37E-05	1.43E-02	7.83E-03	5.14E-03	2.69E-03	1.43E-02	7.85E-04	6.01E-04	1.84E-04	1.43E-02	4.69E-03	3.59E-03	1.10E-03	1.43E-02	1.38E-03	1.38E-03	6.36E-08
1476	583395.23	2961136.29	1.44E-02	2.83E-03	2.83E-03	5.38E-06	1.43E-02	6.44E-03	5.37E-03	1.08E-03	1.44E-02	6.85E-04	6.09E-04	7.60E-05	1.43E-02	4.13E-03	3.61E-03	5.20E-04	1.44E-02	1.46E-03	1.46E-03	2.50E-08
1477	583495.23	2961136.29	1.49E-02	2.93E-03	2.92E-03	5.04E-06	1.48E-02	6.66E-03	5.55E-03	1.11E-03	1.49E-02	7.09E-04	6.31E-04	7.83E-05	1.48E-02	4.26E-03	3.73E-03	5.32E-04	1.49E-02	1.51E-03	1.51E-03	2.34E-08
1478	583595.23	2961136.29	1.53E-02	3.02E-03	3.02E-03	4.79E-06	1.53E-02	6.87E-03	5.72E-03	1.15E-03	1.53E-02	7.33E-04	6.52E-04	8.13E-05	1.53E-02	4.39E-03	3.84E-03	5.49E-04	1.53E-02	1.56E-03	1.56E-03	2.23E-08
1479	583695.23	2961136.29	1.58E-02	3.11E-03	3.10E-03	4.76E-06	1.57E-02	7.08E-03	5.87E-03	1.22E-03	1.58E-02	7.56E-04	6.71E-04	8.56E-05	1.58E-02	4.51E-03	3.94E-03	5.74E-04	1.58E-02	1.60E-03	1.60E-03	2.21E-08
1480	583795.23	2961136.29	1.62E-02	3.18E-03	3.17E-03	5.12E-06	1.61E-02	7.30E-03	5.99E-03	1.31E-03	1.62E-02	7.79E-04	6.87E-04	9.19E-05	1.61E-02	4.63E-03	4.03E-03	6.09E-04	1.62E-02	1.64E-03	1.64E-03	2.38E-08
1481	583895.23	2961136.29	1.65E-02	3.24E-03	3.23E-03	6.18E-06	1.65E-02	7.53E-03	6.08E-03	1.45E-03	1.65E-02	8.02E-04	7.01E-04	1.01E-04	1.65E-02	4.75E-03	4.09E-03	6.63E-04	1.65E-02	1.66E-03	1.66E-03	2.87E-08
1482	583995.23	2961136.29	1.67E-02	3.27E-03	3.27E-03	8.29E-06	1.67E-02	7.78E-03	6.13E-03	1.65E-03	1.67E-02	8.24E-04	7.09E-04	1.15E-04	1.67E-02	4.87E-03	4.13E-03	7.40E-04	1.67E-02	1.68E-03	1.68E-03	3.85E-08
1483	584095.23	2961136.29	1.68E-02	3.29E-03	3.28E-03	1.14E-05	1.68E-02	8.05E-03	6.13E-03	1.92E-03	1.68E-02	8.45E-04	7.13E-04	1.33E-04	1.68E-02	4.98E-03	4.14E-03	8.40E-04	1.68E-02	1.68E-03	1.68E-03	5.28E-08
1484	584195.23	2961136.29	1.68E-02	3.28E-03	3.26E-03	1.44E-05	1.67E-02	8.28E-03	6.08E-03	2.21E-03	1.68E-02	8.62E-04	7.10E-04	1.52E-04	1.67E-02	5.07E-03	4.13E-03	9.48E-04	1.68E-02	1.67E-03	1.67E-03	6.71E-08
1485	584295.23	2961136.29	1.66E-02	3.24E-03	3.22E-03	1.68E-05	1.66E-02	8.47E-03	5.98E-03	2.49E-03	1.66E-02	8.74E-04	7.02E-04	1.71E-04	1.66E-02	5.13E-03	4.08E-03	1.05E-03	1.66E-02	1.64E-03	1.64E-03	7.81E-08
1486	584395.23	2961136.29	1.63E-02	3.17E-03	3.15E-03	1.81E-05	1.63E-02	8.58E-03	5.83E-03	2.75E-03	1.63E-02	8.76E-04	6.88E-04	1.88E-04	1.63E-02	5.14E-03	4.01E-03	1.14E-03	1.63E-02	1.60E-03	1.60E-03	8.42E-08
1487	584495.23	2961136.29	1.58E-02	3.07E-03	3.06E-03	1.69E-05	1.58E-02	8.53E-03	5.64E-03	2.89E-03	1.58E-02	8.65E-04	6.67E-04	1.98E-04	1.58E-02	5.08E-03	3.90E-03	1.18E-03	1.58E-02	1.55E-03	1.55E-03	7.85E-08
1488	584595.23	2961136.29	1.51E-02	2.92E-03	2.90E-03	1.49E-05	1.51E-02	8.40E-03	5.38E-03	3.02E-03	1.51E-02	8.43E-04	6.37E-04	2.06E-04	1.51E-02	4.97E-03	3.75E-03	1.22E-03	1.51E-02	1.46E-03	1.46E-03	6.94E-08
1537	583395.23	2961236.29	1.55E-02	3.05E-03	3.05E-03	7.58E-06	1.54E-02	7.04E-03	5.82E-03	1.22E-03	1.55E-02	7.45E-04	6.58E-04	8.62E-05	1.54E-02	4.48E-03	3.90E-03	5.78E-04	1.55E-02	1.57E-03	1.56E-03	3.52E-08
1538	583495.23	2961236.29	1.61E-02	3.18E-03	3.17E-03	7.37E-06	1.61E-02	7.32E-03	6.06E-03	1.27E-03	1.61E-02	7.76E-04	6.87E-04	8.92E-05	1.61E-02	4.64E-03	4.05E-03	5.95E-04	1.61E-02	1.63E-03	1.63E-03	3.42E-08
1539	583595.23	2961236.29	1.67E-02	3.30E-03	3.30E-03	7.00E-06	1.67E-02	7.60E-03	6.29E-03	1.31E-03	1.67E-02	8.07E-04	7.15E-04	9.20E-05	1.67E-02	4.81E-03	4.20E-03	6.10E-04	1.67E-02	1.70E-03	1.70E-03	3.25E-08
1540	583695.23	2961236.29	1.73E-02	3.42E-03	3.41E-03	6.53E-06	1.73E-02	7.87E-03	6.51E-03	1.35E-03	1.73E-02	8.36E-04	7.42E-04	9.48E-05	1.73E-02	4.97E-03	4.34E-03	6.25E-04	1.73E-02	1.76E-03	1.76E-03	3.04E-08
1541	583795.23	2961236.29	1.78E-02	3.53E-03	3.52E-03	6.06E-06	1.78E-02	8.12E-03	6.71E-03	1.40E-03	1.79E-02	8.64E-04	7.66E-04	9.83E-05	1.78E-02	5.11E-03	4.47E-03	6.43E-04	1.79E-02	1.82E-03	1.82E-03	2.82E-08
1542	583895.23	2961236.29	1.83E-02	3.62E-03	3.61E-03	5.75E-06	1.83E-02	8.35E-03	6.87E-03	1.48E-03	1.83E-02	8.90E-04	7.87E-04	1.03E-04	1.83E-02	5.24E-03	4.57E-03	6.69E-04	1.83E-02	1.86E-03	1.86E-03	2.67E-08
1543	583995.23	2961236.29	1.86E-02	3.68E-03	3.68E-03	5.87E-06	1.86E-02	8.56E-03	6.98E-03	1.58E-03	1.87E-02	9.12E-04	8.02E-04	1.10E-04	1.86E-02	5.35E-03	4.64E-03	7.08E-04	1.87E-02	1.89E-03	1.89E-03	2.73E-08
1544	584095.23	2961236.29	1.88E-02	3.71E-03	3.70E-03	6.86E-06	1.88E-02	8.75E-03	7.00E-03	1.75E-03	1.88E-02	9.31E-04	8.0									

Solid Waste Authority Palm Beach Renewable Energy Facility No. 2
Proposed Stack

Annual
Waterbody #7 - Localized Area Within Grassy Waters Wetlands

Receptor ID	X	Y	Vapor Phase				Particle Phase				Particle Bound Phase				Divalent Mercury Vapor Phase				Elemental Mercury Vapor Phase			
			AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO
1725	583895.23	2961536.29	2.37E-02	4.70E-03	4.68E-03	1.27E-05	2.36E-02	1.10E-02	9.02E-03	1.94E-03	2.37E-02	1.16E-03	1.03E-03	1.35E-04	2.36E-02	6.81E-03	5.96E-03	8.44E-04	2.37E-02	2.38E-03	2.38E-03	5.88E-08
1726	583995.23	2961536.29	2.47E-02	4.90E-03	4.89E-03	1.32E-05	2.47E-02	1.15E-02	9.42E-03	2.12E-03	2.47E-02	1.22E-03	1.08E-03	1.46E-04	2.46E-02	7.12E-03	6.21E-03	9.06E-04	2.47E-02	2.48E-03	2.48E-03	6.15E-08
1727	584095.23	2961536.29	2.55E-02	5.07E-03	5.06E-03	1.40E-05	2.55E-02	1.21E-02	9.76E-03	2.33E-03	2.55E-02	1.28E-03	1.12E-03	1.60E-04	2.55E-02	7.40E-03	6.42E-03	9.79E-04	2.55E-02	2.57E-03	2.57E-03	6.53E-08
1728	584195.23	2961536.29	2.60E-02	5.18E-03	5.17E-03	1.51E-05	2.60E-02	1.25E-02	9.97E-03	2.58E-03	2.61E-02	1.32E-03	1.14E-03	1.77E-04	2.60E-02	7.61E-03	6.55E-03	1.07E-03	2.61E-02	2.63E-03	2.63E-03	7.02E-08
1729	584295.23	2961536.29	2.61E-02	5.20E-03	5.18E-03	1.64E-05	2.61E-02	1.28E-02	9.97E-03	2.87E-03	2.62E-02	1.35E-03	1.15E-03	1.97E-04	2.61E-02	7.72E-03	6.55E-03	1.17E-03	2.61E-02	2.63E-03	2.63E-03	7.62E-08
1730	584395.23	2961536.29	2.55E-02	5.06E-03	5.05E-03	1.77E-05	2.56E-02	1.29E-02	9.67E-03	3.21E-03	2.56E-02	1.34E-03	1.12E-03	2.20E-04	2.55E-02	7.66E-03	6.37E-03	1.29E-03	2.55E-02	2.56E-03	2.56E-03	8.23E-08
1731	584495.23	2961536.29	2.39E-02	4.72E-03	4.70E-03	1.84E-05	2.40E-02	1.25E-02	8.91E-03	3.57E-03	2.39E-02	1.29E-03	1.05E-03	2.44E-04	2.39E-02	7.33E-03	5.92E-03	1.41E-03	2.39E-02	2.37E-03	2.37E-03	8.57E-08
1732	584595.23	2961536.29	2.11E-02	4.12E-03	4.10E-03	1.79E-05	2.11E-02	1.16E-02	7.63E-03	3.93E-03	2.11E-02	1.18E-03	9.14E-04	2.67E-04	2.11E-02	6.68E-03	5.15E-03	1.53E-03	2.11E-02	2.05E-03	2.05E-03	8.32E-08
1781	583395.23	2961636.29	1.89E-02	3.73E-03	3.71E-03	1.43E-05	1.88E-02	8.48E-03	7.06E-03	1.43E-03	1.89E-02	9.00E-04	8.00E-04	1.00E-04	1.89E-02	5.43E-03	4.76E-03	6.76E-04	1.89E-02	1.86E-03	1.86E-03	6.64E-08
1782	583495.23	2961636.29	2.00E-02	3.95E-03	3.94E-03	1.50E-05	2.00E-02	9.02E-03	7.49E-03	1.53E-03	2.00E-02	9.57E-04	8.50E-04	1.07E-04	2.00E-02	5.75E-03	5.04E-03	7.14E-04	2.00E-02	1.97E-03	1.97E-03	6.96E-08
1783	583595.23	2961636.29	2.12E-02	4.19E-03	4.17E-03	1.57E-05	2.11E-02	9.60E-03	7.96E-03	1.64E-03	2.12E-02	1.02E-03	9.04E-04	1.15E-04	2.12E-02	6.09E-03	5.34E-03	7.56E-04	2.12E-02	2.09E-03	2.09E-03	7.30E-08
1784	583695.23	2961636.29	2.24E-02	4.44E-03	4.42E-03	1.65E-05	2.24E-02	1.02E-02	8.45E-03	1.77E-03	2.24E-02	1.08E-03	9.61E-04	1.24E-04	2.24E-02	6.45E-03	5.65E-03	8.02E-04	2.24E-02	2.22E-03	2.22E-03	7.66E-08
1785	583795.23	2961636.29	2.37E-02	4.70E-03	4.68E-03	1.73E-05	2.37E-02	1.09E-02	8.96E-03	1.92E-03	2.37E-02	1.15E-03	1.02E-03	1.33E-04	2.37E-02	6.83E-03	5.97E-03	8.54E-04	2.37E-02	2.35E-03	2.35E-03	8.05E-08
1786	583895.23	2961636.29	2.50E-02	4.96E-03	4.94E-03	1.82E-05	2.50E-02	1.16E-02	9.47E-03	2.09E-03	2.50E-02	1.22E-03	1.08E-03	1.44E-04	2.50E-02	7.21E-03	6.30E-03	9.13E-04	2.50E-02	2.48E-03	2.48E-03	8.46E-08
1787	583995.23	2961636.29	2.62E-02	5.21E-03	5.19E-03	1.91E-05	2.62E-02	1.22E-02	9.96E-03	2.27E-03	2.62E-02	1.30E-03	1.14E-03	1.57E-04	2.62E-02	7.58E-03	6.60E-03	9.79E-04	2.62E-02	2.61E-03	2.61E-03	8.88E-08
1788	584095.23	2961636.29	2.73E-02	5.43E-03	5.41E-03	2.01E-05	2.73E-02	1.29E-02	1.04E-02	2.49E-03	2.73E-02	1.36E-03	1.19E-03	1.72E-04	2.73E-02	7.92E-03	6.87E-03	1.05E-03	2.73E-02	2.72E-03	2.72E-03	9.32E-08
1789	584195.23	2961636.29	2.80E-02	5.58E-03	5.56E-03	2.10E-05	2.81E-02	1.34E-02	1.07E-02	2.74E-03	2.81E-02	1.42E-03	1.23E-03	1.88E-04	2.80E-02	8.20E-03	7.06E-03	1.14E-03	2.81E-02	2.80E-03	2.80E-03	9.77E-08
1790	584295.23	2961636.29	2.84E-02	5.65E-03	5.63E-03	2.21E-05	2.84E-02	1.38E-02	1.08E-02	3.05E-03	2.84E-02	1.46E-03	1.25E-03	2.09E-04	2.84E-02	8.37E-03	7.13E-03	1.24E-03	2.84E-02	2.83E-03	2.83E-03	1.03E-07
1791	584395.23	2961636.29	2.80E-02	5.56E-03	5.54E-03	2.33E-05	2.80E-02	1.40E-02	1.06E-02	3.42E-03	2.80E-02	1.46E-03	1.23E-03	2.33E-04	2.80E-02	8.37E-03	7.00E-03	1.37E-03	2.80E-02	2.78E-03	2.78E-03	1.08E-07
1792	584495.23	2961636.29	2.65E-02	5.24E-03	5.21E-03	2.47E-05	2.65E-02	1.37E-02	9.86E-03	3.88E-03	2.65E-02	1.42E-03	1.16E-03	2.64E-04	2.65E-02	8.10E-03	6.58E-03	1.53E-03	2.65E-02	2.60E-03	2.60E-03	1.15E-07
1793	584595.23	2961636.29	2.35E-02	4.61E-03	4.58E-03	2.66E-05	2.36E-02	1.30E-02	8.52E-03	4.48E-03	2.35E-02	1.32E-03	1.02E-03	3.04E-04	2.35E-02	7.50E-03	5.77E-03	1.73E-03	2.35E-02	2.27E-03	2.27E-03	1.24E-07
1842	583395.23	2961736.29	1.93E-02	3.82E-03	3.80E-03	1.26E-05	1.93E-02	8.54E-03	7.19E-03	1.36E-03	1.94E-02	9.12E-04	8.17E-04	9.53E-05	1.93E-02	5.51E-03	4.87E-03	6.39E-04	1.93E-02	1.89E-03	1.89E-03	5.86E-08
1843	583495.23	2961736.29	2.05E-02	4.05E-03	4.04E-03	1.33E-05	2.05E-02	9.10E-03	7.65E-03	1.45E-03	2.05E-02	9.72E-04	8.70E-04	1.02E-04	2.05E-02	5.84E-03	5.17E-03	6.75E-04	2.05E-02	2.01E-03	2.01E-03	6.18E-08
1844	583595.23	2961736.29	2.18E-02	4.31E-03	4.30E-03	1.41E-05	2.18E-02	9.71E-03	8.14E-03	1.56E-03	2.18E-02	1.04E-03	9.27E-04	1.09E-04	2.18E-02	6.20E-03	5.49E-03	7.16E-04	2.18E-02	2.14E-03	2.14E-03	6.54E-08
1845	583695.23	2961736.29	2.31E-02	4.58E-03	4.57E-03	1.49E-05	2.31E-02	1.04E-02	8.67E-03	1.69E-03	2.31E-02	1.11E-03	9.8									

Solid Waste Authority Palm Beach Renewable Energy Facility No. 2
Proposed Stack

Annual
Waterbody #7 - Localized Area Within Grassy Waters Wetlands

Receptor ID	X	Y	Vapor Phase				Particle Phase				Particle Bound Phase				Divalent Mercury Vapor Phase				Elemental Mercury Vapor Phase			
			AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO
2026	583495.23	2962036.29	2.08E-02	4.14E-03	4.13E-03	1.22E-05	2.08E-02	9.05E-03	7.66E-03	1.39E-03	2.09E-02	9.77E-04	8.79E-04	9.80E-05	2.08E-02	5.92E-03	5.26E-03	6.64E-04	2.08E-02	2.01E-03	2.01E-03	5.68E-08
2027	583595.23	2962036.29	2.21E-02	4.41E-03	4.40E-03	1.30E-05	2.21E-02	9.67E-03	8.16E-03	1.50E-03	2.22E-02	1.04E-03	9.37E-04	1.05E-04	2.21E-02	6.30E-03	5.59E-03	7.06E-04	2.22E-02	2.14E-03	2.14E-03	6.05E-08
2028	583695.23	2962036.29	2.35E-02	4.70E-03	4.69E-03	1.38E-05	2.35E-02	1.03E-02	8.70E-03	1.63E-03	2.36E-02	1.11E-03	1.00E-03	1.14E-04	2.35E-02	6.70E-03	5.95E-03	7.52E-04	2.35E-02	2.28E-03	2.28E-03	6.43E-08
2029	583795.23	2962036.29	2.50E-02	5.00E-03	4.99E-03	1.47E-05	2.50E-02	1.10E-02	9.26E-03	1.77E-03	2.50E-02	1.19E-03	1.07E-03	1.23E-04	2.50E-02	7.12E-03	6.32E-03	8.04E-04	2.50E-02	2.42E-03	2.42E-03	6.82E-08
2030	583895.23	2962036.29	2.65E-02	5.32E-03	5.30E-03	1.55E-05	2.65E-02	1.18E-02	9.84E-03	1.93E-03	2.65E-02	1.27E-03	1.13E-03	1.34E-04	2.65E-02	7.57E-03	6.70E-03	8.63E-04	2.65E-02	2.57E-03	2.57E-03	7.19E-08
2031	583995.23	2962036.29	2.80E-02	5.63E-03	5.61E-03	1.62E-05	2.80E-02	1.25E-02	1.04E-02	2.12E-03	2.80E-02	1.35E-03	1.20E-03	1.47E-04	2.80E-02	8.02E-03	7.09E-03	9.29E-04	2.80E-02	2.72E-03	2.72E-03	7.55E-08
2032	584095.23	2962036.29	2.95E-02	5.93E-03	5.92E-03	1.69E-05	2.95E-02	1.33E-02	1.10E-02	2.34E-03	2.95E-02	1.43E-03	1.27E-03	1.62E-04	2.94E-02	8.46E-03	7.45E-03	1.01E-03	2.95E-02	2.86E-03	2.86E-03	7.88E-08
2033	584195.23	2962036.29	3.07E-02	6.20E-03	6.19E-03	1.75E-05	3.07E-02	1.41E-02	1.14E-02	2.61E-03	3.08E-02	1.51E-03	1.33E-03	1.80E-04	3.07E-02	8.88E-03	7.78E-03	1.10E-03	3.08E-02	2.98E-03	2.98E-03	8.12E-08
2034	584295.23	2962036.29	3.17E-02	6.41E-03	6.39E-03	1.76E-05	3.17E-02	1.47E-02	1.18E-02	2.92E-03	3.18E-02	1.58E-03	1.38E-03	2.01E-04	3.17E-02	9.23E-03	8.02E-03	1.21E-03	3.17E-02	3.07E-03	3.07E-03	8.17E-08
2035	584395.23	2962036.29	3.22E-02	6.50E-03	6.49E-03	1.70E-05	3.22E-02	1.52E-02	1.19E-02	3.27E-03	3.22E-02	1.62E-03	1.40E-03	2.25E-04	3.22E-02	9.46E-03	8.13E-03	1.33E-03	3.22E-02	3.09E-03	3.09E-03	7.88E-08
2036	584495.23	2962036.29	3.18E-02	6.41E-03	6.40E-03	1.55E-05	3.18E-02	1.54E-02	1.17E-02	3.67E-03	3.18E-02	1.63E-03	1.38E-03	2.51E-04	3.18E-02	9.49E-03	8.02E-03	1.47E-03	3.18E-02	3.03E-03	3.03E-03	7.19E-08
2037	584595.23	2962036.29	3.01E-02	6.05E-03	6.04E-03	1.43E-05	3.02E-02	1.51E-02	1.09E-02	4.20E-03	3.01E-02	1.59E-03	1.30E-03	2.87E-04	3.01E-02	9.24E-03	7.58E-03	1.66E-03	3.01E-02	2.84E-03	2.84E-03	6.66E-08
2086	583395.23	2962136.29	1.94E-02	3.87E-03	3.86E-03	1.16E-05	1.94E-02	8.40E-03	7.10E-03	1.30E-03	1.95E-02	9.07E-04	8.16E-04	9.17E-05	1.94E-02	5.54E-03	4.91E-03	6.30E-04	1.94E-02	1.87E-03	1.87E-03	5.38E-08
2087	583495.23	2962136.29	2.06E-02	4.12E-03	4.11E-03	1.20E-05	2.06E-02	8.96E-03	7.56E-03	1.39E-03	2.07E-02	9.67E-04	8.69E-04	9.82E-05	2.06E-02	5.88E-03	5.22E-03	6.65E-04	2.06E-02	1.98E-03	1.98E-03	5.58E-08
2088	583595.23	2962136.29	2.19E-02	4.38E-03	4.37E-03	1.24E-05	2.19E-02	9.56E-03	8.05E-03	1.50E-03	2.19E-02	1.03E-03	9.26E-04	1.06E-04	2.19E-02	6.25E-03	5.55E-03	7.05E-04	2.19E-02	2.11E-03	2.11E-03	5.76E-08
2089	583695.23	2962136.29	2.33E-02	4.67E-03	4.65E-03	1.28E-05	2.33E-02	1.02E-02	8.58E-03	1.63E-03	2.33E-02	1.10E-03	9.88E-04	1.14E-04	2.33E-02	6.65E-03	5.90E-03	7.49E-04	2.33E-02	2.25E-03	2.25E-03	5.94E-08
2090	583795.23	2962136.29	2.47E-02	4.97E-03	4.96E-03	1.31E-05	2.47E-02	1.09E-02	9.13E-03	1.78E-03	2.48E-02	1.18E-03	1.05E-03	1.24E-04	2.47E-02	7.07E-03	6.27E-03	8.01E-04	2.48E-02	2.39E-03	2.39E-03	6.09E-08
2091	583895.23	2962136.29	2.62E-02	5.28E-03	5.27E-03	1.33E-05	2.62E-02	1.16E-02	9.70E-03	1.94E-03	2.63E-02	1.26E-03	1.12E-03	1.35E-04	2.62E-02	7.51E-03	6.65E-03	8.59E-04	2.63E-02	2.53E-03	2.53E-03	6.18E-08
2092	583995.23	2962136.29	2.78E-02	5.60E-03	5.58E-03	1.32E-05	2.77E-02	1.24E-02	1.03E-02	2.12E-03	2.78E-02	1.34E-03	1.19E-03	1.47E-04	2.77E-02	7.97E-03	7.04E-03	9.23E-04	2.78E-02	2.68E-03	2.68E-03	6.13E-08
2093	584095.23	2962136.29	2.92E-02	5.91E-03	5.89E-03	1.27E-05	2.92E-02	1.32E-02	1.08E-02	2.31E-03	2.93E-02	1.42E-03	1.26E-03	1.60E-04	2.92E-02	8.42E-03	7.43E-03	9.91E-04	2.93E-02	2.82E-03	2.82E-03	5.88E-08
2094	584195.23	2962136.29	3.06E-02	6.19E-03	6.18E-03	1.17E-05	3.06E-02	1.39E-02	1.14E-02	2.52E-03	3.06E-02	1.50E-03	1.32E-03	1.74E-04	3.06E-02	8.84E-03	7.78E-03	1.07E-03	3.06E-02	2.95E-03	2.95E-03	5.44E-08
2095	584295.23	2962136.29	3.17E-02	6.42E-03	6.41E-03	1.08E-05	3.17E-02	1.46E-02	1.18E-02	2.77E-03	3.17E-02	1.57E-03	1.37E-03	1.91E-04	3.17E-02	9.23E-03	8.07E-03	1.15E-03	3.17E-02	3.05E-03	3.05E-03	5.00E-08
2096	584395.23	2962136.29	3.24E-02	6.56E-03	6.55E-03	1.05E-05	3.24E-02	1.51E-02	1.20E-02	3.11E-03	3.24E-02	1.62E-03	1.41E-03	2.14E-04	3.24E-02	9.53E-03	8.26E-03	1.28E-03	3.24E-02	3.10E-03	3.10E-03	4.88E-08
2097	584495.23	2962136.29	3.24E-02	6.54E-03	6.53E-03	1.18E-05	3.24E-02	1.56E-02	1.20E-02	3.59E-03	3.24E-02	1.66E-03	1.41E-03	2.46E-04	3.24E-02	9.72E-03	8.26E-03	1.46E-03	3.24E-02	3.07E-03	3.07E-03	5.46E-08
2098	584595.23	2962136.29	3.13E-02	6.31E-03	6.30E-03	1.66E-05	3.13E-02	1.59E-02	1.16E-02	4.32E-03	3.13E-02	1.66E-03	1.37E-03	2.95E-04	3.13E-02	9.74E-03	8.02E-03	1.72E-03	3.13E-02	2.94E-03	2.94E-03	7.73E-08
# of data pts	Average		1.72E-02	3.38E-03	3.37E-03	1.17E-05	1.72E-02	8.18E-03	6.32E-03	1.86E-03	1.72E-02	8.60E-04	7.31E-04	1.29E-04	1.72E-02	5.13E-03	4.32E-03	8.15E-04	1.72E-02	1.68E-03	1.68E-03	5.43E-08
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Solid Waste Authority Palm Beach Renewable Energy Facility No. 2
Proposed Stack

Annual
Watershed #1 - Typical Canal Watershed

Receptor ID	X	Y	Vapor Phase				Particle Phase				Particle Bound Phase				Divalent Mercury Vapor Phase				Elemental Mercury Vapor Phase			
			AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO
223	586195.23	2959036.29	4.14E-03	3.63E-04	3.58E-04	4.71E-06	4.13E-03	1.81E-03	1.03E-03	7.79E-04	4.14E-03	1.78E-04	1.23E-04	5.59E-05	4.12E-03	1.55E-03	1.14E-03	4.05E-04	4.14E-03	3.74E-05	3.74E-05	2.19E-08
224	586295.23	2959036.29	4.14E-03	3.56E-04	3.51E-04	4.19E-06	4.12E-03	1.78E-03	1.03E-03	7.53E-04	4.14E-03	1.76E-04	1.22E-04	5.41E-05	4.12E-03	1.54E-03	1.14E-03	3.94E-04	4.14E-03	3.27E-05	3.27E-05	1.95E-08
225	586395.23	2959036.29	4.13E-03	3.50E-04	3.46E-04	3.95E-06	4.12E-03	1.75E-03	1.03E-03	7.24E-04	4.14E-03	1.73E-04	1.21E-04	5.20E-05	4.11E-03	1.52E-03	1.14E-03	3.82E-04	4.14E-03	2.93E-05	2.93E-05	1.83E-08
226	586495.23	2959036.29	4.13E-03	3.47E-04	3.43E-04	3.83E-06	4.12E-03	1.72E-03	1.03E-03	6.97E-04	4.14E-03	1.71E-04	1.21E-04	5.01E-05	4.12E-03	1.51E-03	1.14E-03	3.71E-04	4.14E-03	2.69E-05	2.69E-05	1.78E-08
227	586595.23	2959036.29	4.13E-03	3.43E-04	3.40E-04	3.81E-06	4.12E-03	1.71E-03	1.02E-03	6.80E-04	4.13E-03	1.69E-04	1.21E-04	4.89E-05	4.11E-03	1.50E-03	1.13E-03	3.63E-04	4.13E-03	2.52E-05	2.51E-05	1.77E-08
228	586695.23	2959036.29	4.11E-03	3.40E-04	3.36E-04	3.92E-06	4.10E-03	1.70E-03	1.02E-03	6.79E-04	4.11E-03	1.69E-04	1.20E-04	4.89E-05	4.09E-03	1.49E-03	1.12E-03	3.62E-04	4.12E-03	2.38E-05	2.38E-05	1.82E-08
229	586795.23	2959036.29	4.06E-03	3.36E-04	3.32E-04	4.14E-06	4.05E-03	1.70E-03	1.01E-03	6.84E-04	4.07E-03	1.68E-04	1.19E-04	4.93E-05	4.05E-03	1.48E-03	1.11E-03	3.64E-04	4.07E-03	2.28E-05	2.28E-05	1.92E-08
230	586895.23	2959036.29	3.99E-03	3.30E-04	3.26E-04	4.49E-06	3.98E-03	1.69E-03	1.00E-03	6.91E-04	4.00E-03	1.67E-04	1.17E-04	4.98E-05	3.97E-03	1.46E-03	1.09E-03	3.68E-04	4.00E-03	2.19E-05	2.19E-05	2.09E-08
231	586995.23	2959036.29	3.90E-03	3.24E-04	3.19E-04	4.94E-06	3.89E-03	1.68E-03	9.85E-04	6.93E-04	3.90E-03	1.65E-04	1.15E-04	5.00E-05	3.88E-03	1.44E-03	1.07E-03	3.70E-04	3.90E-03	2.11E-05	2.11E-05	2.30E-08
232	587095.23	2959036.29	3.79E-03	3.16E-04	3.11E-04	5.35E-06	3.78E-03	1.65E-03	9.66E-04	6.86E-04	3.79E-03	1.62E-04	1.13E-04	4.95E-05	3.77E-03	1.41E-03	1.05E-03	3.69E-04	3.79E-03	2.05E-05	2.05E-05	2.49E-08
233	587195.23	2959036.29	3.67E-03	3.08E-04	3.03E-04	5.49E-06	3.66E-03	1.61E-03	9.46E-04	6.68E-04	3.68E-03	1.59E-04	1.10E-04	4.83E-05	3.65E-03	1.38E-03	1.02E-03	3.62E-04	3.68E-03	1.99E-05	1.98E-05	2.55E-08
234	587295.23	2959036.29	3.56E-03	3.00E-04	2.95E-04	5.26E-06	3.55E-03	1.56E-03	9.26E-04	6.38E-04	3.57E-03	1.54E-04	1.08E-04	4.62E-05	3.55E-03	1.34E-03	9.95E-04	3.49E-04	3.57E-03	1.93E-05	1.93E-05	2.45E-08
235	587395.23	2959036.29	3.46E-03	2.92E-04	2.87E-04	4.76E-06	3.45E-03	1.51E-03	9.07E-04	6.02E-04	3.47E-03	1.49E-04	1.06E-04	4.36E-05	3.45E-03	1.30E-03	9.71E-04	3.31E-04	3.47E-03	1.87E-05	1.87E-05	2.22E-08
236	587495.23	2959036.29	3.37E-03	2.84E-04	2.80E-04	4.27E-06	3.36E-03	1.45E-03	8.88E-04	5.67E-04	3.38E-03	1.45E-04	1.04E-04	4.11E-05	3.35E-03	1.26E-03	9.48E-04	3.13E-04	3.38E-03	1.82E-05	1.82E-05	1.99E-08
237	587595.23	2959036.29	3.28E-03	2.77E-04	2.73E-04	4.07E-06	3.27E-03	1.41E-03	8.68E-04	5.42E-04	3.29E-03	1.41E-04	1.01E-04	3.93E-05	3.27E-03	1.23E-03	9.26E-04	3.01E-04	3.29E-03	1.77E-05	1.77E-05	1.89E-08
238	587695.23	2959036.29	3.19E-03	2.70E-04	2.66E-04	4.22E-06	3.18E-03	1.37E-03	8.48E-04	5.27E-04	3.20E-03	1.37E-04	9.90E-05	3.83E-05	3.17E-03	1.20E-03	9.04E-04	2.95E-04	3.20E-03	1.72E-05	1.72E-05	1.96E-08
284	586195.23	2959136.29	4.31E-03	3.76E-04	3.71E-04	4.69E-06	4.30E-03	1.90E-03	1.09E-03	8.13E-04	4.31E-03	1.87E-04	1.28E-04	5.82E-05	4.29E-03	1.61E-03	1.19E-03	4.18E-04	4.32E-03	3.77E-05	3.77E-05	2.18E-08
285	586295.23	2959136.29	4.31E-03	3.69E-04	3.65E-04	4.24E-06	4.29E-03	1.86E-03	1.08E-03	7.82E-04	4.31E-03	1.84E-04	1.28E-04	5.60E-05	4.29E-03	1.60E-03	1.19E-03	4.06E-04	4.31E-03	3.31E-05	3.31E-05	1.97E-08
286	586395.23	2959136.29	4.31E-03	3.64E-04	3.60E-04	4.05E-06	4.29E-03	1.83E-03	1.08E-03	7.50E-04	4.31E-03	1.81E-04	1.27E-04	5.38E-05	4.29E-03	1.59E-03	1.19E-03	3.93E-04	4.31E-03	2.99E-05	2.99E-05	1.88E-08
287	586495.23	2959136.29	4.31E-03	3.60E-04	3.56E-04	3.97E-06	4.30E-03	1.81E-03	1.08E-03	7.26E-04	4.31E-03	1.79E-04	1.27E-04	5.21E-05	4.29E-03	1.57E-03	1.19E-03	3.82E-04	4.31E-03	2.76E-05	2.76E-05	1.84E-08
288	586595.23	2959136.29	4.30E-03	3.57E-04	3.53E-04	4.01E-06	4.29E-03	1.80E-03	1.08E-03	7.16E-04	4.30E-03	1.78E-04	1.26E-04	5.14E-05	4.28E-03	1.56E-03	1.18E-03	3.77E-04	4.30E-03	2.59E-05	2.59E-05	1.86E-08
289	586695.23	2959136.29	4.27E-03	3.53E-04	3.49E-04	4.19E-06	4.26E-03	1.79E-03	1.07E-03	7.19E-04	4.27E-03	1.77E-04	1.25E-04	5.16E-05	4.25E-03	1.55E-03	1.17E-03	3.78E-04	4.27E-03	2.46E-05	2.46E-05	1.95E-08
290	586795.23	2959136.29	4.20E-03	3.48E-04	3.43E-04	4.50E-06	4.19E-03	1.79E-03	1.06E-03	7.26E-04	4.20E-03	1.76E-04	1.24E-04	5.22E-05	4.18E-03	1.53E-03	1.15E-03	3.81E-04	4.20E-03	2.36E-05	2.35E-05	2.09E-08
291	586895.23	2959136.29	4.10E-03	3.41E-04	3.36E-04	4.96E-06	4.09E-03	1.77E-03	1.04E-03	7.31E-04	4.11E-03	1.74E-04	1.22E-04	5.26E-05	4.08E-03	1.51E-03	1.13E-03	3.85E-04	4.11E-03	2.27E-05	2.27E-05	2.31E-08
292	586995.23	2959136.29	3.98E-03	3.33E-04	3.27E-04	5.44E-06	3.97E-03	1.75E-03	1.02E-03	7.28E-04	3.99E-03	1.72E-04	1.19E-04	5.24E-05</								

Solid Waste Authority Palm Beach Renewable Energy Facility No. 2
Proposed Stack

Annual
Watershed #1 - Typical Canal Watershed

Receptor ID	X	Y	Vapor Phase				Particle Phase				Particle Bound Phase				Divalent Mercury Vapor Phase				Elemental Mercury Vapor Phase			
			AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO
477	587195.23	2959436.29	3.94E-03	3.35E-04	3.30E-04	4.97E-06	3.93E-03	1.78E-03	1.08E-03	7.03E-04	3.95E-03	1.76E-04	1.26E-04	5.04E-05	3.93E-03	1.49E-03	1.13E-03	3.68E-04	3.95E-03	2.30E-05	2.29E-05	2.31E-08
478	587295.23	2959436.29	3.80E-03	3.24E-04	3.19E-04	4.90E-06	3.79E-03	1.72E-03	1.05E-03	6.73E-04	3.81E-03	1.70E-04	1.22E-04	4.84E-05	3.79E-03	1.44E-03	1.09E-03	3.54E-04	3.81E-03	2.22E-05	2.22E-05	2.28E-08
480	587495.23	2959436.29	3.52E-03	3.04E-04	2.98E-04	6.12E-06	3.51E-03	1.64E-03	9.85E-04	6.51E-04	3.53E-03	1.62E-04	1.15E-04	4.69E-05	3.51E-03	1.37E-03	1.02E-03	3.50E-04	3.53E-03	2.08E-05	2.08E-05	2.85E-08
527	586095.23	2959536.29	5.17E-03	4.51E-04	4.46E-04	5.36E-06	5.16E-03	2.37E-03	1.37E-03	1.00E-03	5.18E-03	2.31E-04	1.60E-04	7.13E-05	5.15E-03	1.95E-03	1.46E-03	4.92E-04	5.18E-03	4.53E-05	4.53E-05	2.49E-08
528	586195.23	2959536.29	5.18E-03	4.44E-04	4.39E-04	4.91E-06	5.17E-03	2.33E-03	1.37E-03	9.60E-04	5.18E-03	2.27E-04	1.59E-04	6.81E-05	5.16E-03	1.94E-03	1.46E-03	4.74E-04	5.19E-03	3.96E-05	3.96E-05	2.28E-08
529	586295.23	2959536.29	5.20E-03	4.39E-04	4.35E-04	4.79E-06	5.19E-03	2.29E-03	1.37E-03	9.25E-04	5.21E-03	2.24E-04	1.59E-04	6.57E-05	5.18E-03	1.92E-03	1.46E-03	4.60E-04	5.21E-03	3.58E-05	3.58E-05	2.23E-08
530	586395.23	2959536.29	5.21E-03	4.36E-04	4.32E-04	4.84E-06	5.20E-03	2.28E-03	1.37E-03	9.07E-04	5.21E-03	2.23E-04	1.58E-04	6.45E-05	5.19E-03	1.91E-03	1.46E-03	4.52E-04	5.21E-03	3.32E-05	3.32E-05	2.25E-08
531	586495.23	2959536.29	5.17E-03	4.31E-04	4.26E-04	5.07E-06	5.16E-03	2.27E-03	1.36E-03	9.08E-04	5.17E-03	2.22E-04	1.57E-04	6.46E-05	5.15E-03	1.90E-03	1.44E-03	4.52E-04	5.17E-03	3.13E-05	3.13E-05	2.36E-08
532	586595.23	2959536.29	5.06E-03	4.23E-04	4.17E-04	5.57E-06	5.05E-03	2.26E-03	1.34E-03	9.18E-04	5.07E-03	2.20E-04	1.54E-04	6.53E-05	5.04E-03	1.87E-03	1.42E-03	4.57E-04	5.07E-03	2.98E-05	2.98E-05	2.59E-08
533	586695.23	2959536.29	4.90E-03	4.11E-04	4.05E-04	6.24E-06	4.89E-03	2.23E-03	1.31E-03	9.22E-04	4.91E-03	2.16E-04	1.51E-04	6.57E-05	4.88E-03	1.84E-03	1.38E-03	4.61E-04	4.91E-03	2.86E-05	2.85E-05	2.90E-08
534	586795.23	2959536.29	4.71E-03	3.98E-04	3.91E-04	6.72E-06	4.70E-03	2.18E-03	1.27E-03	9.07E-04	4.72E-03	2.11E-04	1.47E-04	6.47E-05	4.70E-03	1.79E-03	1.33E-03	4.57E-04	4.72E-03	2.75E-05	2.75E-05	3.13E-08
535	586895.23	2959536.29	4.52E-03	3.84E-04	3.77E-04	6.63E-06	4.51E-03	2.10E-03	1.23E-03	8.68E-04	4.52E-03	2.04E-04	1.42E-04	6.20E-05	4.50E-03	1.72E-03	1.28E-03	4.41E-04	4.52E-03	2.65E-05	2.65E-05	3.08E-08
536	586995.23	2959536.29	4.34E-03	3.69E-04	3.63E-04	5.99E-06	4.32E-03	2.00E-03	1.19E-03	8.12E-04	4.34E-03	1.96E-04	1.38E-04	5.80E-05	4.32E-03	1.65E-03	1.24E-03	4.15E-04	4.34E-03	2.56E-05	2.55E-05	2.79E-08
537	587095.23	2959536.29	4.17E-03	3.56E-04	3.50E-04	5.30E-06	4.16E-03	1.91E-03	1.16E-03	7.57E-04	4.18E-03	1.88E-04	1.34E-04	5.41E-05	4.15E-03	1.58E-03	1.19E-03	3.89E-04	4.18E-03	2.47E-05	2.47E-05	2.46E-08
538	587195.23	2959536.29	4.01E-03	3.43E-04	3.38E-04	5.13E-06	4.00E-03	1.84E-03	1.12E-03	7.20E-04	4.02E-03	1.81E-04	1.30E-04	5.16E-05	4.00E-03	1.53E-03	1.15E-03	3.73E-04	4.02E-03	2.39E-05	2.38E-05	2.39E-08
542	587595.23	2959536.29	3.40E-03	2.98E-04	2.90E-04	7.90E-06	3.39E-03	1.64E-03	9.77E-04	6.67E-04	3.41E-03	1.62E-04	1.14E-04	4.81E-05	3.39E-03	1.36E-03	9.96E-04	3.64E-04	3.41E-03	2.08E-05	2.08E-05	3.69E-08
588	586095.23	2959636.29	5.44E-03	4.72E-04	4.67E-04	5.40E-06	5.43E-03	2.51E-03	1.45E-03	1.05E-03	5.44E-03	2.44E-04	1.69E-04	7.44E-05	5.42E-03	2.05E-03	1.54E-03	5.10E-04	5.45E-03	4.58E-05	4.58E-05	2.51E-08
589	586195.23	2959636.29	5.46E-03	4.66E-04	4.61E-04	5.10E-06	5.45E-03	2.46E-03	1.46E-03	1.01E-03	5.47E-03	2.40E-04	1.69E-04	7.13E-05	5.45E-03	2.04E-03	1.55E-03	4.91E-04	5.47E-03	4.05E-05	4.04E-05	2.37E-08
590	586295.23	2959636.29	5.49E-03	4.63E-04	4.58E-04	5.06E-06	5.48E-03	2.44E-03	1.46E-03	9.76E-04	5.49E-03	2.38E-04	1.69E-04	6.91E-05	5.47E-03	2.03E-03	1.55E-03	4.79E-04	5.50E-03	3.69E-05	3.69E-05	2.35E-08
591	586395.23	2959636.29	5.49E-03	4.59E-04	4.54E-04	5.20E-06	5.48E-03	2.43E-03	1.46E-03	9.67E-04	5.49E-03	2.37E-04	1.68E-04	6.86E-05	5.47E-03	2.02E-03	1.54E-03	4.75E-04	5.49E-03	3.44E-05	3.44E-05	2.42E-08
592	586495.23	2959636.29	5.40E-03	4.52E-04	4.46E-04	5.60E-06	5.40E-03	2.42E-03	1.45E-03	9.73E-04	5.41E-03	2.35E-04	1.66E-04	6.91E-05	5.39E-03	2.00E-03	1.52E-03	4.78E-04	5.41E-03	3.25E-05	3.25E-05	2.60E-08
593	586595.23	2959636.29	5.25E-03	4.41E-04	4.35E-04	6.28E-06	5.25E-03	2.40E-03	1.41E-03	9.82E-04	5.26E-03	2.32E-04	1.62E-04	6.98E-05	5.24E-03	1.96E-03	1.48E-03	4.83E-04	5.26E-03	3.11E-05	3.10E-05	2.92E-08
594	586695.23	2959636.29	5.05E-03	4.27E-04	4.20E-04	6.94E-06	5.04E-03	2.35E-03	1.37E-03	9.75E-04	5.06E-03	2.27E-04	1.58E-04	6.93E-05	5.03E-03	1.91E-03	1.43E-03	4.82E-04	5.06E-03	2.98E-05	2.98E-05	3.22E-08
595	586795.23	2959636.29	4.83E-03	4.11E-04	4.04E-04	7.05E-06	4.82E-03	2.27E-03	1.33E-03	9.40E-04	4.84E-03	2.20E-04	1.53E-04	6.69E-05	4.82E-03	1.85E-03	1.38E-03	4.69E-04	4.84E-03	2.87E-05	2.86E-05	3.28E-08
596	586895.23	2959636.29	4.63E-03	3.94E-04	3.88E-04	6.48E-06	4.61E-03	2.17E-03	1.28E-03	8.81E-04	4.63E-03	2.11E-04	1.48E-04	6.28E-05</								

Solid Waste Authority Palm Beach Renewable Energy Facility No. 2
Proposed Stack

Annual
Watershed #1 - Typical Canal Watershed

Receptor ID	X	Y	Vapor Phase				Particle Phase				Particle Bound Phase				Divalent Mercury Vapor Phase				Elemental Mercury Vapor Phase			
			AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO
771	586095.23	2959936.29	6.44E-03	5.51E-04	5.45E-04	6.03E-06	6.44E-03	3.02E-03	1.79E-03	1.23E-03	6.45E-03	2.92E-04	2.05E-04	8.64E-05	6.43E-03	2.43E-03	1.85E-03	5.75E-04	6.45E-03	4.84E-05	4.84E-05	2.80E-08
772	586195.23	2959936.29	6.51E-03	5.50E-04	5.44E-04	6.09E-06	6.50E-03	3.01E-03	1.81E-03	1.20E-03	6.51E-03	2.90E-04	2.06E-04	8.44E-05	6.49E-03	2.43E-03	1.86E-03	5.63E-04	6.51E-03	4.41E-05	4.41E-05	2.83E-08
773	586295.23	2959936.29	6.48E-03	5.45E-04	5.39E-04	6.43E-06	6.47E-03	3.00E-03	1.80E-03	1.20E-03	6.48E-03	2.89E-04	2.05E-04	8.42E-05	6.46E-03	2.41E-03	1.85E-03	5.61E-04	6.48E-03	4.11E-05	4.11E-05	2.99E-08
774	586395.23	2959936.29	6.31E-03	5.33E-04	5.26E-04	7.25E-06	6.31E-03	2.97E-03	1.77E-03	1.21E-03	6.32E-03	2.86E-04	2.01E-04	8.50E-05	6.30E-03	2.38E-03	1.81E-03	5.67E-04	6.32E-03	3.90E-05	3.89E-05	3.37E-08
775	586495.23	2959936.29	6.06E-03	5.15E-04	5.07E-04	8.12E-06	6.06E-03	2.92E-03	1.72E-03	1.20E-03	6.07E-03	2.80E-04	1.95E-04	8.46E-05	6.04E-03	2.31E-03	1.75E-03	5.67E-04	6.07E-03	3.72E-05	3.71E-05	3.78E-08
776	586595.23	2959936.29	5.77E-03	4.94E-04	4.85E-04	8.21E-06	5.76E-03	2.80E-03	1.65E-03	1.15E-03	5.77E-03	2.69E-04	1.88E-04	8.12E-05	5.75E-03	2.22E-03	1.67E-03	5.48E-04	5.77E-03	3.56E-05	3.56E-05	3.82E-08
777	586695.23	2959936.29	5.48E-03	4.70E-04	4.63E-04	7.35E-06	5.47E-03	2.65E-03	1.59E-03	1.06E-03	5.48E-03	2.56E-04	1.81E-04	7.52E-05	5.46E-03	2.11E-03	1.60E-03	5.11E-04	5.48E-03	3.41E-05	3.41E-05	3.42E-08
778	586795.23	2959936.29	5.21E-03	4.48E-04	4.41E-04	6.58E-06	5.20E-03	2.50E-03	1.52E-03	9.84E-04	5.21E-03	2.44E-04	1.74E-04	6.97E-05	5.19E-03	2.00E-03	1.52E-03	4.77E-04	5.21E-03	3.28E-05	3.27E-05	3.06E-08
779	586895.23	2959936.29	4.95E-03	4.27E-04	4.21E-04	6.84E-06	4.93E-03	2.40E-03	1.45E-03	9.42E-04	4.95E-03	2.34E-04	1.67E-04	6.68E-05	4.93E-03	1.91E-03	1.45E-03	4.61E-04	4.95E-03	3.15E-05	3.14E-05	3.18E-08
780	586995.23	2959936.29	4.68E-03	4.08E-04	4.00E-04	7.86E-06	4.67E-03	2.31E-03	1.39E-03	9.25E-04	4.68E-03	2.26E-04	1.60E-04	6.56E-05	4.66E-03	1.84E-03	1.38E-03	4.58E-04	4.69E-03	3.02E-05	3.02E-05	3.66E-08
781	587095.23	2959936.29	4.42E-03	3.88E-04	3.79E-04	9.00E-06	4.40E-03	2.23E-03	1.33E-03	9.09E-04	4.42E-03	2.18E-04	1.53E-04	6.46E-05	4.40E-03	1.77E-03	1.31E-03	4.56E-04	4.42E-03	2.90E-05	2.90E-05	4.20E-08
782	587195.23	2959936.29	4.18E-03	3.71E-04	3.61E-04	9.80E-06	4.17E-03	2.15E-03	1.27E-03	8.81E-04	4.18E-03	2.10E-04	1.47E-04	6.28E-05	4.17E-03	1.70E-03	1.25E-03	4.49E-04	4.19E-03	2.79E-05	2.78E-05	4.57E-08
783	587295.23	2959936.29	3.98E-03	3.55E-04	3.45E-04	9.92E-06	3.97E-03	2.06E-03	1.22E-03	8.41E-04	3.99E-03	2.02E-04	1.42E-04	6.01E-05	3.97E-03	1.63E-03	1.19E-03	4.35E-04	3.99E-03	2.68E-05	2.67E-05	4.62E-08
784	587395.23	2959936.29	3.82E-03	3.41E-04	3.31E-04	9.38E-06	3.80E-03	1.97E-03	1.17E-03	7.95E-04	3.82E-03	1.94E-04	1.37E-04	5.69E-05	3.81E-03	1.56E-03	1.14E-03	4.15E-04	3.83E-03	2.57E-05	2.56E-05	4.38E-08
785	587495.23	2959936.29	3.68E-03	3.27E-04	3.19E-04	8.44E-06	3.66E-03	1.88E-03	1.13E-03	7.49E-04	3.69E-03	1.87E-04	1.33E-04	5.37E-05	3.67E-03	1.50E-03	1.10E-03	3.92E-04	3.69E-03	2.47E-05	2.46E-05	3.93E-08
786	587595.23	2959936.29	3.55E-03	3.15E-04	3.08E-04	7.33E-06	3.54E-03	1.80E-03	1.10E-03	7.03E-04	3.56E-03	1.79E-04	1.29E-04	5.05E-05	3.54E-03	1.43E-03	1.06E-03	3.69E-04	3.56E-03	2.37E-05	2.37E-05	3.42E-08
787	587695.23	2959936.29	3.43E-03	3.03E-04	2.97E-04	6.35E-06	3.42E-03	1.72E-03	1.06E-03	6.60E-04	3.44E-03	1.72E-04	1.25E-04	4.74E-05	3.42E-03	1.38E-03	1.03E-03	3.47E-04	3.44E-03	2.28E-05	2.27E-05	2.96E-08
788	587795.23	2959936.29	3.32E-03	2.92E-04	2.86E-04	5.59E-06	3.30E-03	1.65E-03	1.03E-03	6.20E-04	3.32E-03	1.66E-04	1.21E-04	4.46E-05	3.30E-03	1.32E-03	9.95E-04	3.28E-04	3.32E-03	2.19E-05	2.19E-05	2.60E-08
# of data pts	Average		4.55E-03	3.87E-04	3.81E-04	5.87E-06	4.54E-03	2.08E-03	1.24E-03	8.42E-04	4.55E-03	2.03E-04	1.43E-04	6.01E-05	4.53E-03	1.72E-03	1.29E-03	4.27E-04	4.56E-03	2.89E-05	2.89E-05	2.73E-08
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Solid Waste Authority Palm Beach Renewable Energy Facility No. 2
Proposed Stack

Annual
Watershed #2 - Iron Horse Watershed

Receptor ID	X	Y	Vapor Phase				Particle Phase				Particle Bound Phase				Divalent Mercury Vapor Phase				Elemental Mercury Vapor Phase			
			AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO
2712	584995.23	2963136.29	1.26E-02	1.10E-03	1.09E-03	1.03E-05	1.25E-02	6.09E-03	4.02E-03	2.07E-03	1.26E-02	6.13E-04	4.69E-04	1.44E-04	1.25E-02	4.70E-03	3.79E-03	9.09E-04	1.26E-02	9.51E-05	9.51E-05	4.79E-08
2718	585595.23	2963136.29	6.62E-03	6.20E-04	6.03E-04	1.63E-05	6.61E-03	3.94E-03	1.75E-03	2.19E-03	6.62E-03	3.80E-04	2.28E-04	1.52E-04	6.61E-03	2.95E-03	2.02E-03	9.27E-04	6.63E-03	6.15E-05	6.15E-05	7.57E-08
2773	584995.23	2963236.29	1.14E-02	9.99E-04	9.90E-04	9.14E-06	1.14E-02	5.44E-03	3.58E-03	1.86E-03	1.14E-02	5.50E-04	4.20E-04	1.29E-04	1.14E-02	4.26E-03	3.43E-03	8.30E-04	1.14E-02	8.33E-05	8.32E-05	4.25E-08
2775	585195.23	2963236.29	8.55E-03	7.59E-04	7.52E-04	7.22E-06	8.54E-03	4.16E-03	2.47E-03	1.70E-03	8.55E-03	4.21E-04	3.03E-04	1.19E-04	8.53E-03	3.32E-03	2.56E-03	7.55E-04	8.55E-03	6.27E-05	6.27E-05	3.36E-08
2776	585295.23	2963236.29	7.54E-03	6.82E-04	6.73E-04	8.58E-06	7.53E-03	3.88E-03	2.10E-03	1.78E-03	7.54E-03	3.89E-04	2.64E-04	1.24E-04	7.52E-03	3.05E-03	2.27E-03	7.81E-04	7.55E-03	6.03E-05	6.02E-05	3.99E-08
2777	585395.23	2963236.29	6.88E-03	6.33E-04	6.20E-04	1.28E-05	6.87E-03	3.82E-03	1.86E-03	1.96E-03	6.88E-03	3.75E-04	2.39E-04	1.37E-04	6.86E-03	2.93E-03	2.08E-03	8.48E-04	6.89E-03	5.91E-05	5.91E-05	5.95E-08
2778	585495.23	2963236.29	6.52E-03	6.09E-04	5.89E-04	1.99E-05	6.51E-03	4.02E-03	1.72E-03	2.30E-03	6.52E-03	3.83E-04	2.23E-04	1.59E-04	6.50E-03	2.95E-03	1.97E-03	9.78E-04	6.52E-03	5.83E-05	5.82E-05	9.23E-08
2779	585595.23	2963236.29	6.27E-03	5.86E-04	5.70E-04	1.67E-05	6.27E-03	3.74E-03	1.63E-03	2.10E-03	6.28E-03	3.60E-04	2.14E-04	1.46E-04	6.26E-03	2.80E-03	1.90E-03	8.99E-04	6.28E-03	5.75E-05	5.74E-05	7.78E-08
2834	584995.23	2963336.29	1.04E-02	9.08E-04	8.99E-04	8.10E-06	1.04E-02	4.88E-03	3.20E-03	1.67E-03	1.04E-02	4.95E-04	3.78E-04	1.17E-04	1.04E-02	3.87E-03	3.10E-03	7.61E-04	1.04E-02	7.38E-05	7.38E-05	3.76E-08
2835	585095.23	2963336.29	9.08E-03	7.95E-04	7.89E-04	6.27E-06	9.07E-03	4.22E-03	2.69E-03	1.53E-03	9.08E-03	4.31E-04	3.23E-04	1.07E-04	9.06E-03	3.41E-03	2.71E-03	7.00E-04	9.08E-03	6.30E-05	6.29E-05	2.91E-08
# of data pts	Average		8.58E-03	7.69E-04	7.58E-04	1.15E-05	8.57E-03	4.42E-03	2.50E-03	1.92E-03	8.59E-03	4.40E-04	3.06E-04	1.33E-04	8.56E-03	3.42E-03	2.58E-03	8.39E-04	8.59E-03	6.75E-05	6.74E-05	5.36E-08

Solid Waste Authority Palm Beach Renewable Energy Facility No. 2
Proposed Stack

Annual
Watershed #4 - Middle Borrow Lake Watershed

Receptor ID	X	Y	Vapor Phase				Particle Phase				Particle Bound Phase				Divalent Mercury Vapor Phase				Elemental Mercury Vapor Phase			
			AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO
2043	585195.23	2962036.29	3.08E-03	3.59E-04	3.11E-04	4.79E-05	3.09E-03	1.34E-02	8.83E-04	1.25E-02	3.08E-03	9.65E-04	1.26E-04	8.39E-04	3.08E-03	5.34E-03	8.98E-04	4.45E-03	3.08E-03	4.08E-05	4.06E-05	2.23E-07
2102	584995.23	2962136.29	1.78E-02	2.83E-03	2.77E-03	5.31E-05	1.79E-02	1.65E-02	7.09E-03	9.42E-03	1.78E-02	1.45E-03	8.13E-04	6.33E-04	1.78E-02	8.60E-03	5.15E-03	3.45E-03	1.78E-02	1.05E-03	1.05E-03	2.47E-07
2105	585295.23	2962136.29	3.77E-03	3.96E-04	3.57E-04	3.81E-05	3.77E-03	9.39E-03	9.35E-04	8.45E-03	3.77E-03	7.13E-04	1.42E-04	5.71E-04	3.77E-03	4.18E-03	1.10E-03	3.08E-03	3.77E-03	3.32E-05	3.30E-05	1.77E-07
2167	585395.23	2962236.29	5.48E-03	5.68E-04	5.21E-04	4.79E-05	5.48E-03	8.83E-03	1.47E-03	7.36E-03	5.48E-03	7.05E-04	2.09E-04	4.96E-04	5.47E-03	4.41E-03	1.72E-03	2.69E-03	5.48E-03	5.08E-05	5.06E-05	2.22E-07
2229	585495.23	2962336.29	7.19E-03	7.08E-04	6.82E-04	2.65E-05	7.19E-03	7.03E-03	2.08E-03	4.96E-03	7.19E-03	6.15E-04	2.81E-04	3.35E-04	7.19E-03	4.21E-03	2.35E-03	1.86E-03	7.19E-03	6.80E-05	6.79E-05	1.23E-07
2290	585495.23	2962436.29	7.87E-03	7.69E-04	7.44E-04	2.46E-05	7.87E-03	6.60E-03	2.24E-03	4.36E-03	7.88E-03	5.95E-04	2.99E-04	2.96E-04	7.87E-03	4.21E-03	2.55E-03	1.66E-03	7.88E-03	7.64E-05	7.63E-05	1.14E-07
2351	585495.23	2962536.29	8.26E-03	7.96E-04	7.71E-04	2.44E-05	8.26E-03	6.27E-03	2.30E-03	3.97E-03	8.26E-03	5.75E-04	3.05E-04	2.70E-04	8.25E-03	4.16E-03	2.62E-03	1.54E-03	8.26E-03	8.02E-05	8.00E-05	1.13E-07
2409	585195.23	2962636.29	1.24E-02	1.10E-03	1.09E-03	1.20E-05	1.24E-02	7.01E-03	3.83E-03	3.18E-03	1.24E-02	6.82E-04	4.64E-04	2.18E-04	1.24E-02	5.05E-03	3.76E-03	1.29E-03	1.24E-02	9.26E-05	9.25E-05	5.60E-08
2348	585195.23	2962536.29	1.26E-02	1.12E-03	1.11E-03	1.38E-05	1.26E-02	7.67E-03	3.99E-03	3.69E-03	1.26E-02	7.33E-04	4.81E-04	2.52E-04	1.26E-02	5.32E-03	3.86E-03	1.46E-03	1.26E-02	9.44E-05	9.43E-05	6.43E-08
# of data pts	Average		8.72E-03	9.61E-04	9.29E-04	3.20E-05	8.73E-03	9.19E-03	2.76E-03	6.44E-03	8.72E-03	7.81E-04	3.47E-04	4.34E-04	8.71E-03	5.05E-03	2.67E-03	2.39E-03	8.72E-03	1.76E-04	1.76E-04	1.49E-07
9																						

Solid Waste Authority Palm Beach Renewable Energy Facility No. 2
Proposed Stack

Annual
Watershed #5 - Rookery/Shell Pits Watershed

Receptor ID	X	Y	Vapor Phase				Particle Phase				Particle Bound Phase				Divalent Mercury Vapor Phase				Elemental Mercury Vapor Phase			
			AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO
817	584595.23	2960036.29	6.38E-03	1.13E-03	1.12E-03	1.14E-05	6.36E-03	3.87E-03	2.42E-03	1.45E-03	6.39E-03	3.70E-04	2.68E-04	1.02E-04	6.37E-03	2.38E-03	1.71E-03	6.72E-04	6.39E-03	5.07E-04	5.07E-04	5.31E-08
818	584695.23	2960036.29	6.38E-03	1.11E-03	1.10E-03	1.14E-05	6.36E-03	3.91E-03	2.46E-03	1.45E-03	6.38E-03	3.72E-04	2.71E-04	1.01E-04	6.37E-03	2.38E-03	1.71E-03	6.66E-04	6.38E-03	4.92E-04	4.92E-04	5.31E-08
819	584795.23	2960036.29	6.40E-03	1.10E-03	1.09E-03	9.16E-06	6.39E-03	3.76E-03	2.49E-03	1.27E-03	6.41E-03	3.61E-04	2.73E-04	8.86E-05	6.39E-03	2.31E-03	1.72E-03	5.90E-04	6.41E-03	4.77E-04	4.76E-04	4.26E-08
820	584895.23	2960036.29	6.45E-03	1.08E-03	1.07E-03	8.76E-06	6.43E-03	3.69E-03	2.51E-03	1.18E-03	6.45E-03	3.56E-04	2.74E-04	8.28E-05	6.43E-03	2.29E-03	1.73E-03	5.61E-04	6.45E-03	4.61E-04	4.61E-04	4.07E-08
821	584995.23	2960036.29	6.51E-03	1.07E-03	1.06E-03	1.33E-05	6.50E-03	3.85E-03	2.51E-03	1.34E-03	6.52E-03	3.67E-04	2.73E-04	9.43E-05	6.50E-03	2.38E-03	1.74E-03	6.45E-04	6.52E-03	4.44E-04	4.44E-04	6.20E-08
822	585095.23	2960036.29	6.57E-03	1.05E-03	1.03E-03	1.69E-05	6.56E-03	3.96E-03	2.47E-03	1.49E-03	6.58E-03	3.74E-04	2.69E-04	1.05E-04	6.56E-03	2.46E-03	1.74E-03	7.13E-04	6.57E-03	4.20E-04	4.20E-04	7.86E-08
823	585195.23	2960036.29	6.63E-03	1.00E-03	9.90E-04	1.49E-05	6.62E-03	3.87E-03	2.41E-03	1.46E-03	6.64E-03	3.66E-04	2.63E-04	1.02E-04	6.62E-03	2.44E-03	1.75E-03	6.84E-04	6.63E-03	3.86E-04	3.86E-04	6.92E-08
884	585195.23	2960136.29	7.00E-03	1.07E-03	1.05E-03	1.60E-05	6.98E-03	4.16E-03	2.57E-03	1.59E-03	7.00E-03	3.92E-04	2.81E-04	1.11E-04	6.98E-03	2.59E-03	1.86E-03	7.31E-04	7.00E-03	4.14E-04	4.14E-04	7.45E-08
885	585295.23	2960136.29	7.02E-03	9.97E-04	9.81E-04	1.61E-05	7.01E-03	4.14E-03	2.46E-03	1.68E-03	7.02E-03	3.88E-04	2.71E-04	1.17E-04	7.01E-03	2.62E-03	1.87E-03	7.51E-04	7.02E-03	3.58E-04	3.58E-04	7.48E-08
886	585395.23	2960136.29	6.98E-03	9.02E-04	8.85E-04	1.67E-05	6.97E-03	4.11E-03	2.32E-03	1.79E-03	6.99E-03	3.83E-04	2.59E-04	1.24E-04	6.97E-03	2.66E-03	1.88E-03	7.85E-04	6.99E-03	2.86E-04	2.86E-04	7.77E-08
887	585495.23	2960136.29	6.93E-03	8.03E-04	7.89E-04	1.44E-05	6.92E-03	3.91E-03	2.19E-03	1.72E-03	6.94E-03	3.67E-04	2.47E-04	1.19E-04	6.92E-03	2.66E-03	1.90E-03	7.55E-04	6.94E-03	2.13E-04	2.13E-04	6.68E-08
888	585595.23	2960136.29	6.91E-03	7.23E-04	7.11E-04	1.21E-05	6.90E-03	3.73E-03	2.10E-03	1.63E-03	6.91E-03	3.52E-04	2.39E-04	1.13E-04	6.89E-03	2.66E-03	1.94E-03	7.20E-04	6.91E-03	1.53E-04	1.53E-04	5.63E-08
889	585695.23	2960136.29	6.93E-03	6.70E-04	6.60E-04	1.03E-05	6.92E-03	3.64E-03	2.04E-03	1.60E-03	6.93E-03	3.45E-04	2.34E-04	1.11E-04	6.91E-03	2.69E-03	1.98E-03	7.10E-04	6.93E-03	1.10E-04	1.10E-04	4.80E-08
890	585795.23	2960136.29	6.99E-03	6.40E-04	6.31E-04	9.01E-06	6.98E-03	3.61E-03	2.02E-03	1.59E-03	6.99E-03	3.43E-04	2.32E-04	1.11E-04	6.97E-03	2.74E-03	2.02E-03	7.11E-04	6.99E-03	8.33E-05	8.32E-05	4.19E-08
891	585895.23	2960136.29	7.07E-03	6.24E-04	6.17E-04	7.46E-06	7.06E-03	3.54E-03	2.03E-03	1.52E-03	7.08E-03	3.39E-04	2.33E-04	1.06E-04	7.06E-03	2.74E-03	2.06E-03	6.82E-04	7.08E-03	6.68E-05	6.68E-05	3.47E-08
892	585995.23	2960136.29	7.19E-03	6.20E-04	6.13E-04	6.90E-06	7.18E-03	3.50E-03	2.05E-03	1.45E-03	7.19E-03	3.36E-04	2.35E-04	1.01E-04	7.17E-03	2.74E-03	2.09E-03	6.54E-04	7.19E-03	5.71E-05	5.71E-05	3.21E-08
945	585195.23	2960236.29	7.37E-03	1.13E-03	1.12E-03	1.73E-05	7.36E-03	4.48E-03	2.74E-03	1.74E-03	7.38E-03	4.20E-04	2.99E-04	1.21E-04	7.36E-03	2.75E-03	1.97E-03	7.85E-04	7.38E-03	4.43E-04	4.43E-04	8.05E-08
946	585295.23	2960236.29	7.38E-03	1.05E-03	1.04E-03	1.72E-05	7.37E-03	4.44E-03	2.61E-03	1.83E-03	7.39E-03	4.14E-04	2.88E-04	1.27E-04	7.37E-03	2.78E-03	1.97E-03	8.03E-04	7.39E-03	3.80E-04	3.80E-04	7.99E-08
947	585395.23	2960236.29	7.33E-03	9.44E-04	9.27E-04	1.77E-05	7.32E-03	4.40E-03	2.45E-03	1.94E-03	7.33E-03	4.08E-04	2.73E-04	1.34E-04	7.32E-03	2.82E-03	1.98E-03	8.38E-04	7.33E-03	2.98E-04	2.98E-04	8.24E-08
948	585495.23	2960236.29	7.27E-03	8.35E-04	8.20E-04	1.51E-05	7.26E-03	4.17E-03	2.31E-03	1.86E-03	7.27E-03	3.90E-04	2.61E-04	1.28E-04	7.26E-03	2.81E-03	2.01E-03	8.02E-04	7.27E-03	2.18E-04	2.17E-04	6.99E-08
949	585595.23	2960236.29	7.25E-03	7.49E-04	7.37E-04	1.25E-05	7.24E-03	3.97E-03	2.21E-03	1.76E-03	7.25E-03	3.74E-04	2.53E-04	1.22E-04	7.23E-03	2.82E-03	2.05E-03	7.65E-04	7.25E-03	1.53E-04	1.53E-04	5.81E-08
950	585695.23	2960236.29	7.29E-03	6.97E-04	6.86E-04	1.07E-05	7.28E-03	3.90E-03	2.16E-03	1.74E-03	7.29E-03	3.69E-04	2.48E-04	1.21E-04	7.27E-03	2.87E-03	2.10E-03	7.62E-04	7.29E-03	1.09E-04	1.09E-04	4.99E-08
951	585795.23	2960236.29	7.38E-03	6.69E-04	6.60E-04	9.09E-06	7.37E-03	3.86E-03	2.15E-03	1.71E-03	7.38E-03	3.66E-04	2.47E-04	1.19E-04	7.36E-03	2.91E-03	2.15E-03	7.53E-04	7.38E-03	8.26E-05	8.26E-05	4.22E-08
952	585895.23	2960236.29	7.49E-03	6.57E-04	6.49E-04	7.63E-06	7.49E-03	3.79E-03	2.17E-03	1.61E-03	7.50E-03	3.61E-04	2.49E-04	1.12E-04	7.48E-03	2.91E-03	2.20E-03	7.16E-04	7.50E-03	6.72E-05	6.72E-05	3.54E-08
953	585995.23	2960236.29	7.65E-03	6.57E-04	6.50E-04	7.44E-06	7.64E-03	3.77E-03	2.21E-03	1.55E-03	7.65E-03	3.60E-04	2.52E-04	1.08E-04	7.6							

Solid Waste Authority Palm Beach Renewable Energy Facility No. 2
Proposed Stack

Annual
Watershed #5 - Rookery/Shell Pits Watershed

Receptor ID	X		Y		Vapor Phase				Particle Phase				Particle Bound Phase				Divalent Mercury Vapor Phase				Elemental Mercury Vapor Phase			
					AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO
1250	585195.23	2960736.29	8.86E-03	1.43E-03	1.40E-03	2.79E-05	8.85E-03	6.40E-03	3.44E-03	2.96E-03	8.86E-03	5.82E-04	3.79E-04	2.02E-04	8.85E-03	3.63E-03	2.41E-03	1.22E-03	8.86E-03	5.76E-04	5.76E-04	1.30E-07		
1251	585295.23	2960736.29	8.72E-03	1.27E-03	1.24E-03	2.57E-05	8.72E-03	6.20E-03	3.17E-03	3.02E-03	8.72E-03	5.60E-04	3.54E-04	2.06E-04	8.71E-03	3.59E-03	2.37E-03	1.22E-03	8.72E-03	4.62E-04	4.62E-04	1.19E-07		
1252	585395.23	2960736.29	8.56E-03	1.07E-03	1.04E-03	2.49E-05	8.56E-03	6.02E-03	2.89E-03	3.13E-03	8.56E-03	5.42E-04	3.29E-04	2.13E-04	8.55E-03	3.62E-03	2.38E-03	1.25E-03	8.56E-03	3.18E-04	3.18E-04	1.16E-07		
1253	585495.23	2960736.29	8.51E-03	9.09E-04	8.89E-04	1.91E-05	8.51E-03	5.62E-03	2.71E-03	2.91E-03	8.51E-03	5.13E-04	3.14E-04	1.99E-04	8.50E-03	3.61E-03	2.45E-03	1.17E-03	8.51E-03	1.97E-04	1.97E-04	8.87E-08		
1254	585595.23	2960736.29	8.71E-03	8.33E-04	8.18E-04	1.52E-05	8.70E-03	5.53E-03	2.68E-03	2.86E-03	8.71E-03	5.08E-04	3.12E-04	1.96E-04	8.69E-03	3.72E-03	2.57E-03	1.15E-03	8.71E-03	1.28E-04	1.27E-04	7.06E-08		
1255	585695.23	2960736.29	9.08E-03	8.17E-04	8.05E-04	1.20E-05	9.08E-03	5.44E-03	2.77E-03	2.68E-03	9.08E-03	5.05E-04	3.21E-04	1.84E-04	9.07E-03	3.80E-03	2.71E-03	1.09E-03	9.08E-03	9.47E-05	9.47E-05	5.57E-08		
1256	585795.23	2960736.29	9.51E-03	8.33E-04	8.21E-04	1.17E-05	9.51E-03	5.47E-03	2.90E-03	2.56E-03	9.51E-03	5.10E-04	3.34E-04	1.76E-04	9.50E-03	3.88E-03	2.83E-03	1.05E-03	9.51E-03	8.06E-05	8.05E-05	5.44E-08		
1257	585895.23	2960736.29	9.70E-03	8.46E-04	8.32E-04	1.31E-05	9.71E-03	5.52E-03	3.00E-03	2.52E-03	9.71E-03	5.15E-04	3.42E-04	1.73E-04	9.69E-03	3.93E-03	2.89E-03	1.04E-03	9.71E-03	7.41E-05	7.41E-05	6.08E-08		
1258	585995.23	2960736.29	9.42E-03	8.29E-04	8.14E-04	1.52E-05	9.42E-03	5.46E-03	2.98E-03	2.48E-03	9.43E-03	5.10E-04	3.39E-04	1.70E-04	9.41E-03	3.87E-03	2.85E-03	1.02E-03	9.43E-03	7.03E-05	7.02E-05	7.05E-08		
1310	585095.23	2960836.29	9.08E-03	1.56E-03	1.54E-03	1.98E-05	9.07E-03	6.49E-03	3.67E-03	2.82E-03	9.08E-03	5.98E-04	4.05E-04	1.92E-04	9.07E-03	3.64E-03	2.49E-03	1.15E-03	9.08E-03	6.71E-04	6.71E-04	9.22E-08		
1311	585195.23	2960836.29	8.84E-03	1.44E-03	1.41E-03	3.10E-05	8.84E-03	6.80E-03	3.45E-03	3.35E-03	8.84E-03	6.11E-04	3.82E-04	2.29E-04	8.83E-03	3.77E-03	2.41E-03	1.36E-03	8.84E-03	5.83E-04	5.83E-04	1.44E-07		
1312	585295.23	2960836.29	8.63E-03	1.26E-03	1.23E-03	2.87E-05	8.63E-03	6.58E-03	3.14E-03	3.44E-03	8.63E-03	5.87E-04	3.53E-04	2.34E-04	8.62E-03	3.71E-03	2.36E-03	1.36E-03	8.63E-03	4.57E-04	4.57E-04	1.33E-07		
1313	585395.23	2960836.29	8.44E-03	1.04E-03	1.02E-03	2.71E-05	8.44E-03	6.36E-03	2.84E-03	3.52E-03	8.44E-03	5.66E-04	3.27E-04	2.39E-04	8.43E-03	3.74E-03	2.36E-03	1.38E-03	8.44E-03	3.02E-04	3.02E-04	1.26E-07		
1314	585495.23	2960836.29	8.43E-03	8.86E-04	8.66E-04	2.02E-05	8.43E-03	5.96E-03	2.68E-03	3.28E-03	8.43E-03	5.38E-04	3.14E-04	2.23E-04	8.42E-03	3.75E-03	2.46E-03	1.29E-03	8.43E-03	1.81E-04	1.80E-04	9.37E-08		
1315	585595.23	2960836.29	8.71E-03	8.26E-04	8.11E-04	1.57E-05	8.71E-03	5.90E-03	2.71E-03	3.19E-03	8.71E-03	5.37E-04	3.19E-04	2.18E-04	8.70E-03	3.88E-03	2.61E-03	1.27E-03	8.71E-03	1.17E-04	1.17E-04	7.27E-08		
1316	585695.23	2960836.29	9.29E-03	8.35E-04	8.22E-04	1.29E-05	9.29E-03	5.84E-03	2.88E-03	2.97E-03	9.29E-03	5.38E-04	3.35E-04	2.03E-04	9.27E-03	3.99E-03	2.80E-03	1.19E-03	9.29E-03	9.11E-05	9.10E-05	6.00E-08		
1317	585795.23	2960836.29	9.86E-03	8.67E-04	8.53E-04	1.37E-05	9.87E-03	5.93E-03	3.05E-03	2.87E-03	9.86E-03	5.48E-04	3.51E-04	1.97E-04	9.85E-03	4.10E-03	2.95E-03	1.16E-03	9.86E-03	8.08E-05	8.07E-05	6.36E-08		
1318	585895.23	2960836.29	9.82E-03	8.66E-04	8.50E-04	1.63E-05	9.83E-03	5.93E-03	3.10E-03	2.84E-03	9.83E-03	5.49E-04	3.55E-04	1.95E-04	9.81E-03	4.10E-03	2.95E-03	1.15E-03	9.83E-03	7.62E-05	7.61E-05	7.59E-08		
1319	585995.23	2960836.29	9.38E-03	8.36E-04	8.19E-04	1.67E-05	9.38E-03	5.67E-03	3.04E-03	2.64E-03	9.38E-03	5.29E-04	3.48E-04	1.81E-04	9.36E-03	3.94E-03	2.86E-03	1.08E-03	9.38E-03	7.31E-05	7.30E-05	7.77E-08		
1371	585095.23	2960936.29	8.88E-03	1.54E-03	1.52E-03	2.04E-05	8.88E-03	6.77E-03	3.57E-03	3.20E-03	8.89E-03	6.16E-04	3.99E-04	2.18E-04	8.88E-03	3.71E-03	2.44E-03	1.27E-03	8.89E-03	6.66E-04	6.66E-04	9.49E-08		
1372	585195.23	2960936.29	8.50E-03	1.40E-03	1.37E-03	3.43E-05	8.50E-03	7.13E-03	3.30E-03	3.83E-03	8.51E-03	6.30E-04	3.70E-04	2.60E-04	8.50E-03	3.84E-03	2.32E-03	1.52E-03	8.50E-03	5.66E-04	5.66E-04	1.59E-07		
1373	585295.23	2960936.29	8.23E-03	1.20E-03	1.17E-03	3.26E-05	8.23E-03	6.93E-03	2.96E-03	3.97E-03	8.23E-03	6.06E-04	3.38E-04	2.69E-04	8.22E-03	3.78E-03	2.25E-03	1.54E-03	8.23E-03	4.32E-04	4.32E-04	1.51E-07		
1374	585395.23	2960936.29	8.05E-03	9.82E-04	9.52E-04	2.95E-05	8.05E-03	6.67E-03	2.66E-03	4.00E-03	8.05E-03	5.84E-04	3.12E-04	2.71E-04	8.04E-03	3.81E-03	2.27E-03	1.54E-03	8.05E-03	2.72E-04	2.72E-04	1.37E-07		
1375	585495.23	2960936.29	8.12E-03	8.38E-04	8.17E-04	2.13E-05	8.12E-03	6.31E-03	2.56E-03	3.74E-03	8.12E-03	5.60E-04	3.06E-04	2.54E-04	8.11E-03	3.85E-03	2.40E-03	1.45E-03	8.12E-03	1.57E-04	1.57E-04	9.90E-08		
1376	585595.23	2960936.29	8.56E-03	8.06E-04	7.90E-04	1.61E-05	8.56E-03	6.26E-03	2.69E-03	3.57E-03														

Solid Waste Authority Palm Beach Renewable Energy Facility No. 2
Proposed Stack

Annual
Watershed #5 - Rookery/Shell Pits Watershed

Receptor ID	X	Y	Vapor Phase				Particle Phase				Particle Bound Phase				Divalent Mercury Vapor Phase				Elemental Mercury Vapor Phase			
			AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO
1562	585895.23	2961236.29	8.08E-03	7.76E-04	7.43E-04	3.32E-05	8.08E-03	6.71E-03	2.71E-03	4.00E-03	8.08E-03	6.02E-04	3.31E-04	2.71E-04	8.07E-03	3.99E-03	2.46E-03	1.54E-03	8.08E-03	7.79E-05	7.77E-05	1.54E-07
1563	585995.23	2961236.29	8.31E-03	7.82E-04	7.60E-04	2.15E-05	8.30E-03	6.08E-03	2.91E-03	3.17E-03	8.31E-03	5.67E-04	3.52E-04	2.16E-04	8.30E-03	3.79E-03	2.55E-03	1.23E-03	8.31E-03	7.94E-05	7.93E-05	1.00E-07
1611	584695.23	2961336.29	1.48E-02	2.82E-03	2.80E-03	2.78E-05	1.48E-02	9.51E-03	5.04E-03	4.47E-03	1.48E-02	9.21E-04	6.18E-04	3.03E-04	1.47E-02	5.27E-03	3.54E-03	1.73E-03	1.48E-02	1.39E-03	1.39E-03	1.29E-07
1614	584995.23	2961336.29	6.60E-03	1.18E-03	1.15E-03	2.49E-05	6.61E-03	7.84E-03	2.08E-03	5.76E-03	6.60E-03	6.59E-04	2.71E-04	3.88E-04	6.60E-03	3.76E-03	1.62E-03	2.14E-03	6.60E-03	5.22E-04	5.22E-04	1.16E-07
1615	585095.23	2961336.29	4.43E-03	7.65E-04	7.26E-04	3.98E-05	4.43E-03	8.49E-03	1.33E-03	7.16E-03	4.43E-03	6.59E-04	1.79E-04	4.80E-04	4.42E-03	3.71E-03	1.12E-03	2.60E-03	4.43E-03	3.02E-04	3.02E-04	1.85E-07
1616	585195.23	2961336.29	3.23E-03	5.28E-04	4.83E-04	4.52E-05	3.23E-03	8.18E-03	9.07E-04	7.28E-03	3.23E-03	6.13E-04	1.26E-04	4.87E-04	3.22E-03	3.45E-03	8.16E-04	2.63E-03	3.23E-03	1.80E-04	1.80E-04	2.10E-07
1617	585295.23	2961336.29	2.89E-03	4.30E-04	3.62E-04	6.86E-05	2.89E-03	9.52E-03	7.07E-04	8.82E-03	2.89E-03	6.94E-04	1.05E-04	5.89E-04	2.89E-03	3.87E-03	7.25E-04	3.15E-03	2.89E-03	1.09E-04	1.09E-04	3.19E-07
1618	585395.23	2961336.29	3.15E-03	3.61E-04	3.17E-04	4.37E-05	3.15E-03	8.85E-03	7.34E-04	8.11E-03	3.15E-03	6.56E-04	1.12E-04	5.44E-04	3.15E-03	3.75E-03	8.33E-04	2.92E-03	3.15E-03	5.82E-05	5.80E-05	2.03E-07
1619	585495.23	2961336.29	3.84E-03	3.87E-04	3.58E-04	2.94E-05	3.85E-03	8.23E-03	9.78E-04	7.25E-03	3.85E-03	6.31E-04	1.43E-04	4.88E-04	3.84E-03	3.71E-03	1.08E-03	2.64E-03	3.85E-03	4.39E-05	4.38E-05	1.37E-07
1620	585595.23	2961336.29	4.86E-03	4.86E-04	4.48E-04	3.84E-05	4.86E-03	8.24E-03	1.36E-03	6.88E-03	4.86E-03	6.51E-04	1.88E-04	4.63E-04	4.85E-03	3.91E-03	1.40E-03	2.51E-03	4.86E-03	4.89E-05	4.87E-05	1.78E-07
1621	585695.23	2961336.29	5.93E-03	5.92E-04	5.49E-04	4.33E-05	5.93E-03	7.65E-03	1.75E-03	5.89E-03	5.93E-03	6.29E-04	2.32E-04	3.97E-04	5.92E-03	3.90E-03	1.72E-03	2.18E-03	5.93E-03	5.85E-05	5.83E-05	2.01E-07
1622	585795.23	2961336.29	6.88E-03	6.75E-04	6.37E-04	3.77E-05	6.88E-03	7.02E-03	2.15E-03	4.87E-03	6.88E-03	6.04E-04	2.75E-04	3.29E-04	6.87E-03	3.84E-03	2.01E-03	1.82E-03	6.88E-03	6.79E-05	6.77E-05	1.75E-07
1623	585895.23	2961336.29	7.68E-03	7.29E-04	7.07E-04	2.19E-05	7.68E-03	6.29E-03	2.56E-03	3.73E-03	7.68E-03	5.72E-04	3.19E-04	2.53E-04	7.68E-03	3.72E-03	2.30E-03	1.42E-03	7.68E-03	7.50E-05	7.49E-05	1.02E-07
1624	585995.23	2961336.29	8.24E-03	7.71E-04	7.53E-04	1.87E-05	8.24E-03	6.22E-03	2.92E-03	3.31E-03	8.25E-03	5.81E-04	3.56E-04	2.25E-04	8.24E-03	3.80E-03	2.53E-03	1.27E-03	8.25E-03	7.88E-05	7.87E-05	8.67E-08
1672	584695.23	2961436.29	1.56E-02	2.97E-03	2.95E-03	2.26E-05	1.56E-02	9.70E-03	5.29E-03	4.41E-03	1.56E-02	9.53E-04	6.55E-04	2.98E-04	1.56E-02	5.40E-03	3.70E-03	1.70E-03	1.56E-02	1.46E-03	1.46E-03	1.05E-07
1673	584795.23	2961436.29	1.20E-02	2.25E-03	2.21E-03	3.34E-05	1.20E-02	9.47E-03	3.84E-03	5.63E-03	1.20E-02	8.71E-04	4.92E-04	3.79E-04	1.20E-02	4.91E-03	2.80E-03	2.11E-03	1.20E-02	1.07E-03	1.07E-03	1.55E-07
1674	584895.23	2961436.29	8.49E-03	1.55E-03	1.51E-03	3.52E-05	8.50E-03	9.08E-03	2.55E-03	6.54E-03	8.50E-03	7.80E-04	3.40E-04	4.39E-04	8.49E-03	4.37E-03	1.95E-03	2.41E-03	8.49E-03	7.09E-04	7.09E-04	1.64E-07
1675	584995.23	2961436.29	5.38E-03	9.47E-04	9.13E-04	3.35E-05	5.39E-03	8.69E-03	1.49E-03	7.20E-03	5.39E-03	6.94E-04	2.11E-04	4.83E-04	5.38E-03	3.86E-03	1.24E-03	2.62E-03	5.38E-03	4.04E-04	4.04E-04	1.56E-07
1676	585095.23	2961436.29	3.01E-03	5.07E-04	4.70E-04	3.73E-05	3.01E-03	9.10E-03	7.40E-04	8.36E-03	3.01E-03	6.74E-04	1.14E-04	5.60E-04	3.01E-03	3.71E-03	7.03E-04	3.00E-03	3.01E-03	1.86E-04	1.86E-04	1.73E-07
1677	585195.23	2961436.29	1.72E-03	3.02E-04	2.38E-04	6.40E-05	1.72E-03	1.10E-02	3.55E-04	1.06E-02	1.72E-03	7.70E-04	6.20E-05	7.08E-04	1.72E-03	4.15E-03	4.08E-04	3.74E-03	1.72E-03	7.76E-05	7.73E-05	2.97E-07
1678	585295.23	2961436.29	1.42E-03	2.56E-04	1.64E-04	9.17E-05	1.42E-03	1.23E-02	2.58E-04	1.20E-02	1.42E-03	8.50E-04	4.87E-05	8.01E-04	1.42E-03	4.55E-03	3.40E-04	4.21E-03	1.42E-03	4.15E-05	4.10E-05	4.26E-07
1679	585395.23	2961436.29	1.73E-03	2.12E-04	1.66E-04	4.62E-05	1.73E-03	1.09E-02	3.14E-04	1.06E-02	1.73E-03	7.70E-04	5.85E-05	7.12E-04	1.72E-03	4.20E-03	4.32E-04	3.77E-03	1.73E-03	2.43E-05	2.41E-05	2.15E-07
1680	585495.23	2961436.29	2.50E-03	2.82E-04	2.32E-04	4.99E-05	2.50E-03	1.03E-02	5.32E-04	9.79E-03	2.50E-03	7.46E-04	8.90E-05	6.57E-04	2.50E-03	4.15E-03	6.55E-04	3.49E-03	2.50E-03	2.56E-05	2.53E-05	2.32E-07
1681	585595.23	2961436.29	3.66E-03	3.98E-04	3.40E-04	5.78E-05	3.66E-03	8.98E-03	8.96E-04	8.08E-03	3.66E-03	6.76E-04	1.35E-04	5.41E-04	3.66E-03	3.89E-03	9.88E-04	2.90E-03	3.66E-03	3.57E-05	3.55E-05	2.69E-07
1682	585695.23	2961436.29	4.98E-03	5.05E-04	4.63E-04	4.19E-05	4.99E-03	7.46E-03	1.36E-03	6.10E-03	4.98E-03	6.00E-04	1.									

Solid Waste Authority Palm Beach Renewable Energy Facility No. 2
Proposed Stack

Annual
Watershed #5 - Rookery/Shell Pits Watershed

Receptor ID			Vapor Phase				Particle Phase				Particle Bound Phase				Divalent Mercury Vapor Phase				Elemental Mercury Vapor Phase			
	X	Y	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO
1857	584895.23	2961736.29	9.27E-03	1.73E-03	1.67E-03	6.02E-05	9.28E-03	1.14E-02	2.69E-03	8.67E-03	9.27E-03	9.51E-04	3.70E-04	5.81E-04	9.26E-03	5.25E-03	2.11E-03	3.14E-03	9.27E-03	7.55E-04	7.54E-04	2.80E-07
1858	584995.23	2961736.29	3.92E-03	7.32E-04	6.51E-04	8.10E-05	3.93E-03	1.28E-02	9.20E-04	1.19E-02	3.92E-03	9.43E-04	1.49E-04	7.93E-04	3.92E-03	5.05E-03	8.46E-04	4.21E-03	3.92E-03	2.70E-04	2.70E-04	3.76E-07
1859	585095.23	2961736.29	8.31E-04	2.40E-04	1.19E-04	1.21E-04	8.32E-04	1.84E-02	1.34E-04	1.83E-02	8.31E-04	1.25E-03	3.09E-05	1.22E-03	8.31E-04	6.50E-03	1.66E-04	6.33E-03	8.31E-04	4.17E-05	4.11E-05	5.60E-07
1860	585195.23	2961736.29	1.80E-05	2.33E-04	2.19E-06	2.30E-04	1.80E-05	3.76E-02	1.84E-06	3.76E-02	1.80E-05	2.49E-03	7.25E-07	2.49E-03	1.80E-05	1.27E-02	3.34E-06	1.27E-02	1.80E-05	1.66E-06	5.85E-07	1.07E-06
1861	585295.23	2961736.29	2.16E-14	1.46E-15	1.46E-15	3.44E-18	2.16E-14	2.79E-14	2.67E-14	1.20E-15	2.16E-14	3.49E-15	3.42E-15	7.59E-17	2.16E-14	8.27E-15	7.91E-15	3.60E-16	2.16E-14	9.70E-18	9.69E-18	1.60E-20
1863	585495.23	2961736.29	5.18E-04	1.16E-04	4.90E-05	6.67E-05	5.18E-04	1.42E-02	7.66E-05	1.41E-02	5.18E-04	9.52E-04	1.88E-05	9.34E-04	5.18E-04	4.95E-03	1.20E-04	4.83E-03	5.18E-04	4.63E-06	4.32E-06	3.10E-07
1864	585595.23	2961736.29	1.89E-03	2.19E-04	1.75E-04	4.36E-05	1.89E-03	9.56E-03	3.70E-04	9.19E-03	1.89E-03	6.79E-04	6.78E-05	6.11E-04	1.89E-03	3.69E-03	4.68E-04	3.23E-03	1.89E-03	1.57E-05	1.55E-05	2.03E-07
1865	585695.23	2961736.29	3.63E-03	3.66E-04	3.34E-04	3.19E-05	3.64E-03	7.61E-03	8.69E-04	6.74E-03	3.63E-03	5.84E-04	1.35E-04	4.50E-04	3.63E-03	3.37E-03	9.51E-04	2.42E-03	3.63E-03	3.18E-05	3.16E-05	1.48E-07
1866	585795.23	2961736.29	5.35E-03	5.16E-04	4.91E-04	2.50E-05	5.36E-03	6.74E-03	1.47E-03	5.27E-03	5.35E-03	5.60E-04	2.07E-04	3.53E-04	5.35E-03	3.41E-03	1.47E-03	1.94E-03	5.35E-03	4.88E-05	4.87E-05	1.16E-07
1867	585895.23	2961736.29	6.82E-03	6.44E-04	6.24E-04	2.04E-05	6.82E-03	6.35E-03	2.05E-03	4.29E-03	6.82E-03	5.62E-04	2.73E-04	2.89E-04	6.81E-03	3.55E-03	1.93E-03	1.62E-03	6.82E-03	6.37E-05	6.36E-05	9.47E-08
1868	585995.23	2961736.29	7.84E-03	7.32E-04	7.15E-04	1.72E-05	7.84E-03	6.12E-03	2.52E-03	3.60E-03	7.84E-03	5.67E-04	3.24E-04	2.43E-04	7.84E-03	3.67E-03	2.29E-03	1.38E-03	7.84E-03	7.42E-05	7.41E-05	7.98E-08
1869	586095.23	2961736.29	8.41E-03	7.78E-04	7.63E-04	1.48E-05	8.41E-03	5.91E-03	2.84E-03	3.07E-03	8.41E-03	5.64E-04	3.56E-04	2.09E-04	8.40E-03	3.72E-03	2.51E-03	1.21E-03	8.41E-03	7.93E-05	7.92E-05	6.89E-08
1916	584695.23	2961836.29	2.29E-02	4.51E-03	4.47E-03	3.59E-05	2.30E-02	1.33E-02	7.95E-03	5.38E-03	2.29E-02	1.34E-03	9.77E-04	3.64E-04	2.29E-02	7.64E-03	5.59E-03	2.05E-03	2.29E-02	2.12E-03	2.11E-03	1.67E-07
1917	584795.23	2961836.29	1.72E-02	3.34E-03	3.30E-03	4.32E-05	1.73E-02	1.23E-02	5.65E-03	6.64E-03	1.72E-02	1.17E-03	7.19E-04	4.48E-04	1.72E-02	6.60E-03	4.12E-03	2.48E-03	1.72E-02	1.53E-03	1.53E-03	2.01E-07
1918	584895.23	2961836.29	1.09E-02	2.08E-03	2.03E-03	5.17E-05	1.10E-02	1.18E-02	3.28E-03	8.53E-03	1.09E-02	1.02E-03	4.42E-04	5.73E-04	1.09E-02	5.66E-03	2.55E-03	3.11E-03	1.09E-02	9.06E-04	9.05E-04	2.40E-07
1919	584995.23	2961836.29	5.06E-03	9.38E-04	8.83E-04	5.49E-05	5.07E-03	1.27E-02	1.29E-03	1.14E-02	5.06E-03	9.58E-04	1.96E-04	7.62E-04	5.06E-03	5.20E-03	1.14E-03	4.07E-03	5.06E-03	3.67E-04	3.67E-04	2.55E-07
1920	585095.23	2961836.29	1.31E-03	2.60E-04	2.02E-04	5.74E-05	1.31E-03	1.71E-02	2.47E-04	1.69E-02	1.31E-03	1.18E-03	4.92E-05	1.13E-03	1.31E-03	6.21E-03	2.81E-04	5.93E-03	1.31E-03	7.16E-05	7.14E-05	2.67E-07
1924	585495.23	2961836.29	8.03E-04	1.46E-04	7.55E-05	7.07E-05	8.04E-04	1.35E-02	1.20E-04	1.34E-02	8.04E-04	9.18E-04	2.86E-05	8.90E-04	8.03E-04	4.82E-03	1.87E-04	4.63E-03	8.03E-04	6.70E-06	6.37E-06	3.28E-07
1925	585595.23	2961836.29	2.23E-03	2.58E-04	2.06E-04	5.17E-05	2.23E-03	9.82E-03	4.24E-04	9.40E-03	2.23E-03	7.05E-04	7.83E-05	6.26E-04	2.23E-03	3.86E-03	5.45E-04	3.31E-03	2.23E-03	1.81E-05	1.79E-05	2.40E-07
1926	585695.23	2961836.29	3.90E-03	3.95E-04	3.61E-04	3.47E-05	3.90E-03	7.55E-03	8.79E-04	6.67E-03	3.90E-03	5.86E-04	1.40E-04	4.46E-04	3.90E-03	3.41E-03	1.00E-03	2.41E-03	3.90E-03	3.40E-05	3.38E-05	1.61E-07
1927	585795.23	2961836.29	5.49E-03	5.40E-04	5.07E-04	3.29E-05	5.49E-03	6.83E-03	1.39E-03	5.43E-03	5.49E-03	5.68E-04	2.04E-04	3.64E-04	5.49E-03	3.48E-03	1.47E-03	2.01E-03	5.49E-03	5.04E-05	5.03E-05	1.53E-07
1928	585895.23	2961836.29	6.82E-03	6.61E-04	6.28E-04	3.24E-05	6.82E-03	6.52E-03	1.90E-03	4.62E-03	6.82E-03	5.72E-04	2.61E-04	3.11E-04	6.81E-03	3.63E-03	1.88E-03	1.75E-03	6.82E-03	6.48E-05	6.47E-05	1.51E-07
1929	585995.23	2961836.29	7.74E-03	7.41E-04	7.10E-04	3.07E-05	7.74E-03	6.29E-03	2.30E-03	3.98E-03	7.74E-03	5.74E-04	3.05E-04	2.68E-04	7.73E-03	3.74E-03	2.19E-03	1.54E-03	7.74E-03	7.47E-05	7.46E-05	1.43E-07
1930	586095.23	2961836.29	8.23E-03	7.81E-04	7.53E-04	2.81E-05	8.23E-03	6.04E-03	2.58E-03	3.46E-03	8.23E-03	5.67E-04	3.33E-04	2.34E-04	8.22E-03	3.76E-03	2.39E-03	1.37E-03	8.23E-03	7.94E-05	7.93E-05	1.31E-07
1977	584695.23	2961936.29	2.48E-02	4.92E-03	4.89E-03	2.61E-05	2.48E-02	1.39E-02	8.67E-03	5.26E-03	2											

Solid Waste Authority Palm Beach Renewable Energy Facility No. 2
Proposed Stack

Annual
Watershed #5 - Rookery/Shell Pits Watershed

Receptor ID	X	Y	Vapor Phase				Particle Phase				Particle Bound Phase				Divalent Mercury Vapor Phase				Elemental Mercury Vapor Phase			
			AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO
2161	584795.23	2962236.29	2.94E-02	5.54E-03	5.51E-03	2.67E-05	2.95E-02	1.72E-02	1.15E-02	5.70E-03	2.94E-02	1.70E-03	1.31E-03	3.88E-04	2.94E-02	1.02E-02	7.98E-03	2.21E-03	2.94E-02	2.47E-03	2.47E-03	1.24E-07
2162	584895.23	2962236.29	2.68E-02	4.49E-03	4.45E-03	3.96E-05	2.69E-02	1.78E-02	1.07E-02	7.09E-03	2.68E-02	1.69E-03	1.21E-03	4.79E-04	2.68E-02	1.03E-02	7.63E-03	2.67E-03	2.68E-02	1.81E-03	1.81E-03	1.84E-07
2163	584995.23	2962236.29	2.21E-02	2.90E-03	2.86E-03	3.97E-05	2.22E-02	1.64E-02	8.87E-03	7.48E-03	2.21E-02	1.50E-03	9.98E-04	5.04E-04	2.21E-02	9.47E-03	6.69E-03	2.78E-03	2.21E-02	8.70E-04	8.70E-04	1.84E-07
2167	585395.23	2962236.29	5.48E-03	5.68E-04	5.21E-04	4.79E-05	5.48E-03	8.83E-03	1.47E-03	7.36E-03	5.48E-03	7.05E-04	2.09E-04	4.96E-04	5.47E-03	4.41E-03	1.72E-03	2.69E-03	5.48E-03	5.08E-05	5.06E-05	2.22E-07
2168	585495.23	2962236.29	6.18E-03	6.10E-04	5.81E-04	2.91E-05	6.18E-03	7.57E-03	1.80E-03	5.77E-03	6.18E-03	6.36E-04	2.48E-04	3.88E-04	6.17E-03	4.13E-03	2.00E-03	2.13E-03	6.18E-03	5.53E-05	5.51E-05	1.35E-07
2169	585595.23	2962236.29	7.45E-03	7.03E-04	6.81E-04	2.27E-05	7.45E-03	7.33E-03	2.39E-03	4.93E-03	7.45E-03	6.46E-04	3.14E-04	3.32E-04	7.44E-03	4.18E-03	2.33E-03	1.85E-03	7.45E-03	6.19E-05	6.18E-05	1.05E-07
2170	585695.23	2962236.29	8.68E-03	8.15E-04	7.87E-04	2.81E-05	8.69E-03	7.78E-03	2.88E-03	4.90E-03	8.69E-03	6.96E-04	3.66E-04	3.30E-04	8.68E-03	4.56E-03	2.70E-03	1.86E-03	8.69E-03	6.92E-05	6.90E-05	1.30E-07
2171	585795.23	2962236.29	9.26E-03	8.61E-04	8.39E-04	2.20E-05	9.26E-03	7.24E-03	2.98E-03	4.26E-03	9.26E-03	6.64E-04	3.75E-04	2.89E-04	9.25E-03	4.49E-03	2.85E-03	1.64E-03	9.26E-03	7.52E-05	7.51E-05	1.02E-07
2172	585895.23	2962236.29	9.24E-03	8.54E-04	8.41E-04	1.26E-05	9.24E-03	6.10E-03	2.86E-03	3.24E-03	9.24E-03	5.85E-04	3.64E-04	2.21E-04	9.23E-03	4.06E-03	2.78E-03	1.28E-03	9.24E-03	7.91E-05	7.90E-05	5.83E-08
2173	585995.23	2962236.29	9.02E-03	8.32E-04	8.23E-04	8.82E-06	9.01E-03	5.30E-03	2.72E-03	2.58E-03	9.02E-03	5.25E-04	3.48E-04	1.77E-04	9.01E-03	3.70E-03	2.66E-03	1.04E-03	9.02E-03	8.05E-05	8.04E-05	4.10E-08
2174	586095.23	2962236.29	8.73E-03	8.07E-04	7.98E-04	8.84E-06	8.73E-03	4.89E-03	2.59E-03	2.29E-03	8.74E-03	4.91E-04	3.34E-04	1.57E-04	8.72E-03	3.48E-03	2.55E-03	9.30E-04	8.74E-03	7.98E-05	7.97E-05	4.11E-08
2221	584695.23	2962336.29	3.26E-02	6.15E-03	6.13E-03	2.18E-05	3.27E-02	1.73E-02	1.27E-02	4.60E-03	3.26E-02	1.75E-03	1.44E-03	3.14E-04	3.26E-02	1.06E-02	8.81E-03	1.83E-03	3.26E-02	2.76E-03	2.76E-03	1.01E-07
2222	584795.23	2962336.29	3.18E-02	5.48E-03	5.45E-03	3.03E-05	3.19E-02	1.81E-02	1.26E-02	5.54E-03	3.18E-02	1.79E-03	1.41E-03	3.76E-04	3.18E-02	1.10E-02	8.88E-03	2.15E-03	3.18E-02	2.30E-03	2.30E-03	1.41E-07
2223	584895.23	2962336.29	2.90E-02	4.19E-03	4.16E-03	3.77E-05	2.91E-02	1.78E-02	1.16E-02	6.21E-03	2.90E-02	1.71E-03	1.29E-03	4.20E-04	2.90E-02	1.09E-02	8.54E-03	2.36E-03	2.90E-02	1.47E-03	1.47E-03	1.75E-07
2224	584995.23	2962336.29	2.38E-02	2.67E-03	2.65E-03	2.46E-05	2.38E-02	1.51E-02	9.31E-03	5.84E-03	2.38E-02	1.44E-03	1.04E-03	3.95E-04	2.38E-02	9.58E-03	7.36E-03	2.22E-03	2.38E-02	6.16E-04	6.16E-04	1.14E-07
2229	585495.23	2962336.29	7.19E-03	7.08E-04	6.82E-04	2.65E-05	7.19E-03	7.03E-03	2.08E-03	4.96E-03	7.19E-03	6.15E-04	2.81E-04	3.35E-04	7.19E-03	4.21E-03	2.35E-03	1.86E-03	7.19E-03	6.80E-05	6.79E-05	1.23E-07
2230	585595.23	2962336.29	8.03E-03	7.63E-04	7.42E-04	2.04E-05	8.03E-03	6.79E-03	2.49E-03	4.30E-03	8.03E-03	6.17E-04	3.27E-04	2.90E-04	8.02E-03	4.21E-03	2.58E-03	1.63E-03	8.03E-03	7.21E-05	7.20E-05	9.47E-08
2231	585695.23	2962336.29	9.05E-03	8.40E-04	8.21E-04	1.96E-05	9.05E-03	6.91E-03	2.98E-03	3.93E-03	9.05E-03	6.44E-04	3.78E-04	2.66E-04	9.04E-03	4.34E-03	2.82E-03	1.52E-03	9.05E-03	7.62E-05	7.61E-05	9.12E-08
2232	585795.23	2962336.29	9.75E-03	9.02E-04	8.78E-04	2.40E-05	9.75E-03	7.18E-03	3.22E-03	3.97E-03	9.76E-03	6.70E-04	4.01E-04	2.69E-04	9.74E-03	4.57E-03	3.03E-03	1.55E-03	9.76E-03	7.93E-05	7.91E-05	1.11E-07
2233	585895.23	2962336.29	9.86E-03	9.05E-04	8.87E-04	1.83E-05	9.85E-03	6.61E-03	3.16E-03	3.45E-03	9.86E-03	6.28E-04	3.93E-04	2.35E-04	9.85E-03	4.39E-03	3.02E-03	1.37E-03	9.86E-03	8.07E-05	8.06E-05	8.48E-08
2234	585995.23	2962336.29	9.48E-03	8.69E-04	8.57E-04	1.14E-05	9.47E-03	5.71E-03	2.96E-03	2.74E-03	9.48E-03	5.59E-04	3.71E-04	1.88E-04	9.47E-03	3.98E-03	2.87E-03	1.11E-03	9.48E-03	8.03E-05	8.03E-05	5.31E-08
2235	586095.23	2962336.29	8.98E-03	8.22E-04	8.15E-04	7.66E-06	8.97E-03	4.94E-03	2.74E-03	2.19E-03	8.98E-03	4.97E-04	3.46E-04	1.51E-04	8.96E-03	3.58E-03	2.67E-03	9.04E-04	8.98E-03	7.86E-05	7.85E-05	3.56E-08
2282	584695.23	2962436.29	3.31E-02	5.80E-03	5.78E-03	2.43E-05	3.32E-02	1.74E-02	1.29E-02	4.50E-03	3.31E-02	1.75E-03	1.44E-03	3.07E-04	3.31E-02	1.09E-02	9.11E-03	1.79E-03	3.31E-02	2.48E-03	2.48E-03	1.13E-07
2283	584795.23	2962436.29	3.20E-02	4.91E-03	4.87E-03	3.30E-05	3.20E-02	1.77E-02	1.25E-02	5.16E-03	3.20E-02	1.75E-03	1.40E-03	3.50E-04	3.19E-02	1.12E-02	9.16E-03	2.01E-03	3.20E-02	1.86E-03	1.86E-03	1.54E-07
2284	584895.23	2962436.29	2.87E-02	3.59E-03	3.57E-03	2.62E-05	2.87E-02	1.62E-02	1.12E-02	5.05E-03	2.87E-02	1.59E-03	1.2									

Solid Waste Authority Palm Beach Renewable Energy Facility No. 2
Proposed Stack

Annual
Watershed #5 - Rookery/Shell Pits Watershed

Receptor ID	X	Y	Vapor Phase				Particle Phase				Particle Bound Phase				Divalent Mercury Vapor Phase				Elemental Mercury Vapor Phase			
			AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO
2469	585095.23	2962736.29	1.47E-02	1.30E-03	1.29E-03	1.38E-05	1.47E-02	7.91E-03	4.83E-03	3.08E-03	1.47E-02	7.78E-04	5.67E-04	2.11E-04	1.47E-02	5.75E-03	4.49E-03	1.26E-03	1.47E-02	1.15E-04	1.15E-04	6.39E-08
2470	585195.23	2962736.29	1.17E-02	1.04E-03	1.03E-03	1.07E-05	1.17E-02	6.36E-03	3.58E-03	2.78E-03	1.17E-02	6.27E-04	4.35E-04	1.92E-04	1.17E-02	4.69E-03	3.54E-03	1.15E-03	1.17E-02	8.85E-05	8.85E-05	4.95E-08
2471	585295.23	2962736.29	9.56E-03	8.78E-04	8.64E-04	1.35E-05	9.56E-03	5.71E-03	2.77E-03	2.93E-03	9.56E-03	5.52E-04	3.50E-04	2.02E-04	9.54E-03	4.12E-03	2.92E-03	1.19E-03	9.56E-03	8.10E-05	8.10E-05	6.27E-08
2472	585395.23	2962736.29	8.51E-03	8.04E-04	7.79E-04	2.47E-05	8.50E-03	5.85E-03	2.37E-03	3.48E-03	8.51E-03	5.46E-04	3.07E-04	2.38E-04	8.49E-03	4.00E-03	2.62E-03	1.38E-03	8.51E-03	7.90E-05	7.89E-05	1.15E-07
2473	585495.23	2962736.29	8.07E-03	7.70E-04	7.45E-04	2.49E-05	8.07E-03	5.62E-03	2.20E-03	3.42E-03	8.08E-03	5.23E-04	2.89E-04	2.34E-04	8.06E-03	3.86E-03	2.50E-03	1.36E-03	8.08E-03	7.81E-05	7.80E-05	1.16E-07
2474	585595.23	2962736.29	7.88E-03	7.46E-04	7.30E-04	1.60E-05	7.88E-03	4.97E-03	2.18E-03	2.80E-03	7.89E-03	4.78E-04	2.86E-04	1.92E-04	7.87E-03	3.60E-03	2.48E-03	1.13E-03	7.89E-03	7.72E-05	7.72E-05	7.45E-08
2475	585695.23	2962736.29	7.90E-03	7.43E-04	7.28E-04	1.52E-05	7.89E-03	4.87E-03	2.25E-03	2.62E-03	7.90E-03	4.74E-04	2.94E-04	1.79E-04	7.88E-03	3.57E-03	2.50E-03	1.07E-03	7.90E-03	7.62E-05	7.61E-05	7.05E-08
2476	585795.23	2962736.29	8.09E-03	7.48E-04	7.36E-04	1.17E-05	8.08E-03	4.73E-03	2.41E-03	2.32E-03	8.10E-03	4.69E-04	3.09E-04	1.59E-04	8.08E-03	3.49E-03	2.52E-03	9.64E-04	8.10E-03	7.48E-05	7.47E-05	5.45E-08
2477	585895.23	2962736.29	8.31E-03	7.57E-04	7.45E-04	1.14E-05	8.30E-03	4.71E-03	2.56E-03	2.15E-03	8.32E-03	4.71E-04	3.23E-04	1.48E-04	8.30E-03	3.45E-03	2.54E-03	9.13E-04	8.32E-03	7.29E-05	7.29E-05	5.29E-08
2478	585995.23	2962736.29	8.46E-03	7.65E-04	7.54E-04	1.20E-05	8.45E-03	4.76E-03	2.66E-03	2.10E-03	8.47E-03	4.76E-04	3.32E-04	1.44E-04	8.45E-03	3.47E-03	2.57E-03	9.02E-04	8.47E-03	7.07E-05	7.07E-05	5.57E-08
2479	586095.23	2962736.29	8.49E-03	7.68E-04	7.53E-04	1.47E-05	8.48E-03	4.85E-03	2.68E-03	2.16E-03	8.49E-03	4.80E-04	3.31E-04	1.49E-04	8.47E-03	3.52E-03	2.58E-03	9.35E-04	8.50E-03	6.82E-05	6.81E-05	6.85E-08
2526	584695.23	2962836.29	2.49E-02	2.98E-03	2.97E-03	1.46E-05	2.49E-02	1.21E-02	9.25E-03	2.89E-03	2.49E-02	1.23E-03	1.03E-03	1.99E-04	2.48E-02	8.60E-03	7.39E-03	1.21E-03	2.49E-02	8.11E-04	8.11E-04	6.80E-08
2527	584795.23	2962836.29	2.27E-02	2.39E-03	2.38E-03	1.15E-05	2.27E-02	1.11E-02	8.26E-03	2.82E-03	2.27E-02	1.12E-03	9.29E-04	1.94E-04	2.26E-02	8.04E-03	6.86E-03	1.18E-03	2.27E-02	4.89E-04	4.89E-04	5.32E-08
2528	584895.23	2962836.29	1.98E-02	1.89E-03	1.88E-03	1.24E-05	1.98E-02	9.89E-03	7.00E-03	2.89E-03	1.98E-02	9.94E-04	7.95E-04	1.99E-04	1.97E-02	7.24E-03	6.04E-03	1.20E-03	1.98E-02	2.75E-04	2.75E-04	5.77E-08
2529	584995.23	2962836.29	1.67E-02	1.50E-03	1.49E-03	1.41E-05	1.67E-02	8.60E-03	5.67E-03	2.94E-03	1.67E-02	8.55E-04	6.53E-04	2.02E-04	1.66E-02	6.31E-03	5.09E-03	1.22E-03	1.67E-02	1.56E-04	1.56E-04	6.57E-08
2530	585095.23	2962836.29	1.36E-02	1.20E-03	1.19E-03	1.17E-05	1.36E-02	7.06E-03	4.40E-03	2.66E-03	1.36E-02	7.02E-04	5.18E-04	1.84E-04	1.36E-02	5.26E-03	4.14E-03	1.11E-03	1.36E-02	1.03E-04	1.03E-04	5.42E-08
2531	585195.23	2962836.29	1.10E-02	9.85E-04	9.76E-04	9.63E-06	1.10E-02	5.83E-03	3.35E-03	2.47E-03	1.10E-02	5.79E-04	4.08E-04	1.71E-04	1.10E-02	4.38E-03	3.35E-03	1.04E-03	1.10E-02	8.35E-05	8.35E-05	4.47E-08
2532	585295.23	2962836.29	9.22E-03	8.45E-04	8.33E-04	1.21E-05	9.22E-03	5.28E-03	2.67E-03	2.61E-03	9.23E-03	5.17E-04	3.36E-04	1.81E-04	9.21E-03	3.90E-03	2.82E-03	1.08E-03	9.23E-03	7.77E-05	7.76E-05	5.63E-08
2533	585395.23	2962836.29	8.25E-03	7.75E-04	7.54E-04	2.14E-05	8.25E-03	5.35E-03	2.29E-03	3.06E-03	8.25E-03	5.07E-04	2.97E-04	2.10E-04	8.24E-03	3.77E-03	2.54E-03	1.24E-03	8.25E-03	7.58E-05	7.57E-05	9.93E-08
2534	585495.23	2962836.29	7.83E-03	7.44E-04	7.19E-04	2.48E-05	7.82E-03	5.32E-03	2.13E-03	3.18E-03	7.83E-03	4.97E-04	2.78E-04	2.18E-04	7.81E-03	3.69E-03	2.41E-03	1.28E-03	7.83E-03	7.49E-05	7.47E-05	1.15E-07
2535	585595.23	2962836.29	7.62E-03	7.19E-04	7.03E-04	1.53E-05	7.61E-03	4.65E-03	2.08E-03	2.57E-03	7.62E-03	4.50E-04	2.73E-04	1.77E-04	7.60E-03	3.43E-03	2.38E-03	1.05E-03	7.62E-03	7.39E-05	7.38E-05	7.11E-08
2587	584695.23	2962936.29	2.24E-02	2.51E-03	2.50E-03	1.13E-05	2.24E-02	1.07E-02	8.18E-03	2.54E-03	2.24E-02	1.09E-03	9.17E-04	1.76E-04	2.24E-02	7.79E-03	6.71E-03	1.08E-03	2.24E-02	5.94E-04	5.94E-04	5.25E-08
2588	584795.23	2962936.29	2.03E-02	2.04E-03	2.03E-03	1.04E-05	2.03E-02	9.80E-03	7.26E-03	2.54E-03	2.03E-02	9.95E-04	8.19E-04	1.76E-04	2.03E-02	7.24E-03	6.16E-03	1.08E-03	2.03E-02	3.63E-04	3.63E-04	4.84E-08
2589	584895.23	2962936.29	1.78E-02	1.66E-03	1.64E-03	1.21E-05	1.78E-02	8.81E-03	6.17E-03	2.64E-03	1.78E-02	8.86E-04	7.04E-04	1.82E-04	1.78E-02	6.54E-03	5.43E-03	1.11E-03	1.78E-02	2.13E-04	2.12E-04	5.60E-08
2590	584995.23	2962936.29	1.52E-02	1.35E-03	1.34E-03	1.29E-05	1.52E-02	7.68E-03	5.07E-03	2.61E-03	1.52E-02	7.66E-04	5.86E-04	1.80E-04	1.52E-02	5.73E-03	4.63E-03	1.10E-03	1.52E-02	1.30E-04	1.30E-04	5.99E-08
2591	585095.23	2962936.29	1.26E-02	1.11E-03	1.10E-03	1.00E-05	1.26E-02	6.34E-03	4.00E-03	2.34E-03	1.26E-02	6.35E-04	4.73E-04	1.62E-04	1.26E-02	4.82E-03	3.82E-03	9.96E-04	1.26E-02	9.23E-05	9.23E-05	4.65E-08
2592	585195.23	2962936.29	1.04E-02	9.30E-04	9.21E-04	8.84E-06	1.04E-02	5.36E-03	3.14E-03	2.22E-03	1.04E-02	5.36E-04	3.82E-04	1.54E-04	1.04E-02	4.11E-03	3.16E-03	9.47E-04	1.04E-02	7.82E-05	7.82E-05	4.11E-08
2593	585295.23	2962936.29	8.87E-03	8.09E-04	7.98E-04	1.10E-05	8.86E-03	4.90E-03	2.55E-03	2.35E-03	8.87E-03	4.83E-04	3.20E-04	1.63E-04	8.85E-03	3.69E-03	2.70E-03	9.86E-04	8.87E-03	7.35E-05	7.35E-05	5.11E-08
2594	585395.23	2962936.29	7.97E-03	7.45E-04	7.26E-04	1.86E-05	7.97E-03	4.92E-03	2.21E-03	2.71E-03	7.98E-03	4.71E-04	2.84E-04	1.87E-04	7.96E-03	3.56E-03	2.44E-03	1.				

Solid Waste Authority Palm Beach Renewable Energy Facility No. 2
Proposed Stack

Annual
Watershed #6 - M Canal Watershed

Receptor ID	X	Y	Vapor Phase				Particle Phase				Particle Bound Phase				Divalent Mercury Vapor Phase				Elemental Mercury Vapor Phase			
			AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO
265	584295.23	2959136.29	3.71E-03	6.34E-04	6.27E-04	7.72E-06	3.69E-03	2.16E-03	1.32E-03	8.40E-04	3.72E-03	2.09E-04	1.49E-04	6.01E-05	3.70E-03	1.41E-03	9.67E-04	4.41E-04	3.72E-03	2.75E-04	2.75E-04	3.59E-08
260	583795.23	2959136.29	3.72E-03	6.54E-04	6.50E-04	4.77E-06	3.70E-03	1.86E-03	1.24E-03	6.24E-04	3.72E-03	1.89E-04	1.44E-04	4.51E-05	3.71E-03	1.28E-03	9.40E-04	3.45E-04	3.72E-03	3.01E-04	3.01E-04	2.22E-08
255	583295.23	2959136.29	3.78E-03	6.82E-04	6.78E-04	3.57E-06	3.76E-03	1.76E-03	1.22E-03	5.37E-04	3.79E-03	1.83E-04	1.43E-04	3.92E-05	3.77E-03	1.24E-03	9.29E-04	3.06E-04	3.79E-03	3.27E-04	3.27E-04	1.66E-08
373	582895.23	2959336.29	4.12E-03	7.63E-04	7.59E-04	3.85E-06	4.10E-03	1.84E-03	1.33E-03	5.12E-04	4.13E-03	1.94E-04	1.56E-04	3.75E-05	4.11E-03	1.31E-03	1.01E-03	3.03E-04	4.13E-03	3.75E-04	3.75E-04	1.79E-08
673	582395.23	2959836.29	4.92E-03	9.22E-04	9.16E-04	5.78E-06	4.90E-03	2.20E-03	1.61E-03	5.91E-04	4.93E-03	2.31E-04	1.88E-04	4.31E-05	4.91E-03	1.59E-03	1.24E-03	3.45E-04	4.93E-03	4.60E-04	4.60E-04	2.69E-08
4428	579795.23	2960236.29	4.65E-03	8.82E-04	8.79E-04	2.61E-06	4.63E-03	1.83E-03	1.55E-03	2.82E-04	4.67E-03	1.89E-04	1.68E-04	2.11E-05	4.64E-03	1.40E-03	1.21E-03	1.87E-04	4.67E-03	4.51E-04	4.51E-04	1.21E-08
4429	580295.23	2960236.29	4.89E-03	9.33E-04	9.31E-04	2.36E-06	4.87E-03	1.96E-03	1.66E-03	2.99E-04	4.92E-03	2.03E-04	1.81E-04	2.22E-05	4.88E-03	1.47E-03	1.28E-03	1.94E-04	4.91E-03	4.79E-04	4.79E-04	1.10E-08
4430	580795.23	2960236.29	5.16E-03	9.88E-04	9.86E-04	2.05E-06	5.14E-03	2.09E-03	1.77E-03	3.17E-04	5.18E-03	2.18E-04	1.95E-04	2.35E-05	5.15E-03	1.55E-03	1.35E-03	2.03E-04	5.18E-03	5.09E-04	5.09E-04	9.54E-09
4431	581295.23	2960236.29	5.45E-03	1.05E-03	1.04E-03	1.92E-06	5.43E-03	2.23E-03	1.88E-03	3.50E-04	5.47E-03	2.35E-04	2.09E-04	2.58E-05	5.43E-03	1.64E-03	1.42E-03	2.19E-04	5.46E-03	5.39E-04	5.39E-04	8.94E-09
4432	581795.23	2960236.29	5.73E-03	1.10E-03	1.10E-03	2.45E-06	5.71E-03	2.40E-03	1.98E-03	4.21E-04	5.75E-03	2.54E-04	2.23E-04	3.09E-05	5.72E-03	1.74E-03	1.48E-03	2.55E-04	5.74E-03	5.65E-04	5.64E-04	1.14E-08
# of data pts	Average		4.61E-03	8.60E-04	8.56E-04	3.71E-06	4.59E-03	2.03E-03	1.56E-03	4.77E-04	4.63E-03	2.10E-04	1.76E-04	3.48E-05	4.60E-03	1.46E-03	1.18E-03	2.80E-04	4.62E-03	4.28E-04	4.28E-04	1.72E-08

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Solid Waste Authority Palm Beach Renewable Energy Facility No. 2
Refurbished Stack

Annual
Waterbody #1 - Typical Canal

Receptor ID	X	Y	Vapor Phase				Particle Phase				Particle Bound Phase				Divalent Mercury Vapor Phase				Elemental Mercury Vapor Phase			
			AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO
222	586095.23	2959036.29	6.25E-03	5.48E-04	5.42E-04	5.47E-06	6.23E-03	2.64E-03	1.63E-03	1.01E-03	6.26E-03	2.62E-04	1.90E-04	7.18E-05	6.22E-03	2.26E-03	1.76E-03	4.98E-04	6.26E-03	5.68E-05	5.67E-05	2.54E-08
283	586095.23	2959136.29	6.58E-03	5.74E-04	5.68E-04	5.50E-06	6.55E-03	2.79E-03	1.73E-03	1.06E-03	6.58E-03	2.77E-04	2.02E-04	7.51E-05	6.55E-03	2.38E-03	1.86E-03	5.17E-04	6.59E-03	5.76E-05	5.76E-05	2.56E-08
344	586095.23	2959236.29	6.94E-03	6.03E-04	5.97E-04	5.58E-06	6.91E-03	2.96E-03	1.85E-03	1.11E-03	6.94E-03	2.93E-04	2.15E-04	7.86E-05	6.91E-03	2.51E-03	1.98E-03	5.36E-04	6.94E-03	5.87E-05	5.87E-05	2.59E-08
405	586095.23	2959336.29	7.33E-03	6.35E-04	6.29E-04	5.72E-06	7.31E-03	3.14E-03	1.98E-03	1.17E-03	7.34E-03	3.12E-04	2.29E-04	8.24E-05	7.31E-03	2.66E-03	2.10E-03	5.57E-04	7.34E-03	6.00E-05	6.00E-05	2.66E-08
466	586095.23	2959436.29	7.78E-03	6.71E-04	6.65E-04	5.93E-06	7.75E-03	3.35E-03	2.12E-03	1.23E-03	7.78E-03	3.32E-04	2.45E-04	8.66E-05	7.75E-03	2.82E-03	2.24E-03	5.79E-04	7.78E-03	6.17E-05	6.16E-05	2.76E-08
527	586095.23	2959536.29	8.26E-03	7.11E-04	7.05E-04	6.25E-06	8.24E-03	3.59E-03	2.29E-03	1.30E-03	8.27E-03	3.55E-04	2.64E-04	9.15E-05	8.23E-03	3.00E-03	2.39E-03	6.06E-04	8.27E-03	6.37E-05	6.37E-05	2.90E-08
588	586095.23	2959636.29	8.80E-03	7.56E-04	7.50E-04	6.70E-06	8.78E-03	3.87E-03	2.47E-03	1.40E-03	8.81E-03	3.82E-04	2.84E-04	9.77E-05	8.77E-03	3.20E-03	2.56E-03	6.39E-04	8.81E-03	6.62E-05	6.62E-05	3.11E-08
649	586095.23	2959736.29	9.40E-03	8.08E-04	8.01E-04	7.36E-06	9.38E-03	4.20E-03	2.69E-03	1.51E-03	9.40E-03	4.13E-04	3.07E-04	1.06E-04	9.37E-03	3.43E-03	2.75E-03	6.81E-04	9.41E-03	6.93E-05	6.92E-05	3.42E-08
# of data pts			Average				7.64E-03	3.32E-03	2.09E-03	1.22E-03	7.67E-03	3.28E-04	2.42E-04	8.62E-05	7.64E-03	2.78E-03	2.20E-03	5.77E-04	7.67E-03	6.17E-05	6.17E-05	2.82E-08
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Solid Waste Authority Palm Beach Renewable Energy Facility No. 2
Refurbished Stack

Annual
Waterbody #2 - Iron Horse

Receptor ID	X	Y	Vapor Phase				Particle Phase				Particle Bound Phase				Divalent Mercury Vapor Phase				Elemental Mercury Vapor Phase			
			AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO
2712	584995.23	2963136.29	9.23E-03	8.25E-04	8.19E-04	6.18E-06	9.20E-03	4.05E-03	2.75E-03	1.30E-03	9.24E-03	4.24E-04	3.32E-04	9.15E-05	9.20E-03	3.37E-03	2.74E-03	6.23E-04	9.24E-03	6.93E-05	6.92E-05	2.87E-08
2713	585095.23	2963136.29	8.36E-03	7.48E-04	7.43E-04	4.78E-06	8.33E-03	3.60E-03	2.40E-03	1.20E-03	8.37E-03	3.80E-04	2.95E-04	8.50E-05	8.33E-03	3.05E-03	2.48E-03	5.79E-04	8.37E-03	6.19E-05	6.19E-05	2.22E-08
2714	585195.23	2963136.29	7.60E-03	6.85E-04	6.80E-04	5.50E-06	7.57E-03	3.35E-03	2.11E-03	1.25E-03	7.60E-03	3.52E-04	2.64E-04	8.85E-05	7.57E-03	2.84E-03	2.25E-03	5.92E-04	7.61E-03	5.83E-05	5.83E-05	2.56E-08
2715	585295.23	2963136.29	6.97E-03	6.35E-04	6.29E-04	6.25E-06	6.94E-03	3.17E-03	1.87E-03	1.30E-03	6.98E-03	3.31E-04	2.38E-04	9.23E-05	6.95E-03	2.67E-03	2.06E-03	6.09E-04	6.98E-03	5.65E-05	5.65E-05	2.90E-08
2716	585395.23	2963136.29	6.49E-03	5.97E-04	5.89E-04	7.51E-06	6.46E-03	3.03E-03	1.69E-03	1.34E-03	6.49E-03	3.14E-04	2.19E-04	9.46E-05	6.46E-03	2.54E-03	1.92E-03	6.20E-04	6.50E-03	5.56E-05	5.56E-05	3.49E-08
2717	585495.23	2963136.29	6.13E-03	5.72E-04	5.59E-04	1.26E-05	6.10E-03	3.12E-03	1.55E-03	1.57E-03	6.13E-03	3.15E-04	2.05E-04	1.10E-04	6.10E-03	2.52E-03	1.81E-03	7.14E-04	6.13E-03	5.49E-05	5.48E-05	5.88E-08
2774	585095.23	2963236.29	7.73E-03	6.90E-04	6.86E-04	4.49E-06	7.70E-03	3.31E-03	2.19E-03	1.12E-03	7.73E-03	3.50E-04	2.70E-04	7.94E-05	7.70E-03	2.83E-03	2.28E-03	5.46E-04	7.74E-03	5.66E-05	5.66E-05	2.09E-08
<u># of data pts</u>		Average	7.50E-03	6.79E-04	6.72E-04	6.76E-06	7.47E-03	3.38E-03	2.08E-03	1.30E-03	7.51E-03	3.52E-04	2.60E-04	9.16E-05	7.47E-03	2.83E-03	2.22E-03	6.12E-04	7.51E-03	5.90E-05	5.90E-05	3.14E-08
7																						

Solid Waste Authority Palm Beach Renewable Energy Facility No. 2
Refurbished Stack

Annual
Waterbody #3 - Grassy Waters Wetland

Receptor ID	X	Y	Vapor Phase				Particle Phase				Particle Bound Phase				Divalent Mercury Vapor Phase				Elemental Mercury Vapor Phase			
			AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO
4353	583295.23	2959236.29	6.22E-03	1.16E-03	1.15E-03	4.41E-06	6.20E-03	2.69E-03	2.03E-03	6.53E-04	6.24E-03	2.84E-04	2.36E-04	4.73E-05	6.21E-03	1.92E-03	1.55E-03	3.64E-04	6.24E-03	5.76E-04	5.76E-04	2.05E-08
4354	583795.23	2959236.29	6.32E-03	1.15E-03	1.15E-03	4.47E-06	6.30E-03	2.89E-03	2.11E-03	7.73E-04	6.34E-03	3.01E-04	2.45E-04	5.55E-05	6.31E-03	1.99E-03	1.59E-03	4.05E-04	6.33E-03	5.58E-04	5.58E-04	2.08E-08
4355	584295.23	2959236.29	6.19E-03	1.09E-03	1.09E-03	6.91E-06	6.17E-03	3.12E-03	2.18E-03	9.39E-04	6.21E-03	3.14E-04	2.48E-04	6.67E-05	6.18E-03	2.08E-03	1.61E-03	4.76E-04	6.20E-03	4.99E-04	4.99E-04	3.21E-08
4393	582795.23	2959736.29	7.96E-03	1.50E-03	1.49E-03	6.72E-06	7.93E-03	3.42E-03	2.67E-03	7.53E-04	7.98E-03	3.58E-04	3.04E-04	5.43E-05	7.94E-03	2.49E-03	2.07E-03	4.14E-04	7.97E-03	7.61E-04	7.61E-04	3.13E-08
4394	583295.23	2959736.29	8.56E-03	1.62E-03	1.61E-03	6.77E-06	8.53E-03	3.75E-03	2.87E-03	8.81E-04	8.58E-03	3.95E-04	3.32E-04	6.31E-05	8.54E-03	2.64E-03	2.17E-03	4.65E-04	8.58E-03	8.14E-04	8.13E-04	3.15E-08
4395	583795.23	2959736.29	9.26E-03	1.75E-03	1.74E-03	5.82E-06	9.23E-03	4.12E-03	3.15E-03	9.74E-04	9.28E-03	4.35E-04	3.65E-04	6.93E-05	9.24E-03	2.79E-03	2.30E-03	4.91E-04	9.27E-03	8.73E-04	8.73E-04	2.71E-08
4396	584295.23	2959736.29	9.35E-03	1.71E-03	1.71E-03	6.41E-06	9.33E-03	4.49E-03	3.28E-03	1.21E-03	9.37E-03	4.62E-04	3.78E-04	8.49E-05	9.34E-03	2.94E-03	2.37E-03	5.70E-04	9.37E-03	8.23E-04	8.23E-04	2.98E-08
4433	582295.23	2960236.29	1.05E-02	2.03E-03	2.03E-03	3.25E-06	1.04E-02	4.31E-03	3.74E-03	5.69E-04	1.05E-02	4.48E-04	4.07E-04	4.13E-05	1.05E-02	3.08E-03	2.76E-03	3.19E-04	1.05E-02	1.06E-03	1.06E-03	1.51E-08
4434	582795.23	2960236.29	1.15E-02	2.24E-03	2.24E-03	3.24E-06	1.15E-02	4.81E-03	4.14E-03	6.75E-04	1.16E-02	5.06E-04	4.58E-04	4.86E-05	1.15E-02	3.38E-03	3.02E-03	3.65E-04	1.15E-02	1.16E-03	1.16E-03	1.51E-08
4435	583295.23	2960236.29	1.26E-02	2.44E-03	2.43E-03	6.94E-06	1.26E-02	5.47E-03	4.48E-03	9.93E-04	1.26E-02	5.77E-04	5.07E-04	7.06E-05	1.26E-02	3.75E-03	3.24E-03	5.03E-04	1.26E-02	1.25E-03	1.25E-03	3.23E-08
4436	583795.23	2960236.29	1.40E-02	2.68E-03	2.67E-03	1.09E-05	1.40E-02	6.31E-03	4.88E-03	1.44E-03	1.40E-02	6.64E-04	5.64E-04	1.01E-04	1.40E-02	4.19E-03	3.52E-03	6.78E-04	1.40E-02	1.36E-03	1.36E-03	5.05E-08
4437	584295.23	2960236.29	1.54E-02	2.93E-03	2.93E-03	8.63E-06	1.54E-02	7.07E-03	5.41E-03	1.66E-03	1.54E-02	7.44E-04	6.29E-04	1.16E-04	1.54E-02	4.56E-03	3.82E-03	7.45E-04	1.54E-02	1.47E-03	1.47E-03	4.01E-08
4469	579795.23	2960736.29	7.46E-03	1.38E-03	1.38E-03	4.55E-06	7.43E-03	2.63E-03	2.31E-03	3.14E-04	7.50E-03	2.68E-04	2.45E-04	2.38E-05	7.43E-03	2.11E-03	1.88E-03	2.21E-04	7.48E-03	6.98E-04	6.98E-04	2.12E-08
4470	580295.23	2960736.29	8.06E-03	1.51E-03	1.50E-03	4.69E-06	8.03E-03	2.94E-03	2.58E-03	3.59E-04	8.10E-03	3.00E-04	2.73E-04	2.69E-05	8.03E-03	2.30E-03	2.05E-03	2.41E-04	8.08E-03	7.63E-04	7.63E-04	2.19E-08
4471	580795.23	2960736.29	8.81E-03	1.66E-03	1.66E-03	4.82E-06	8.78E-03	3.33E-03	2.91E-03	4.16E-04	8.86E-03	3.41E-04	3.10E-04	3.09E-05	8.79E-03	2.53E-03	2.27E-03	2.65E-04	8.84E-03	8.44E-04	8.44E-04	2.25E-08
4472	581295.23	2960736.29	9.79E-03	1.86E-03	1.86E-03	4.98E-06	9.75E-03	3.82E-03	3.34E-03	4.90E-04	9.83E-03	3.93E-04	3.57E-04	3.60E-05	9.76E-03	2.83E-03	2.53E-03	2.94E-04	9.81E-03	9.49E-04	9.49E-04	2.32E-08
4473	581795.23	2960736.29	1.11E-02	2.13E-03	2.13E-03	5.25E-06	1.10E-02	4.48E-03	3.89E-03	5.90E-04	1.11E-02	4.62E-04	4.19E-04	4.29E-05	1.11E-02	3.21E-03	2.88E-03	3.33E-04	1.11E-02	1.09E-03	1.09E-03	2.44E-08
4474	582295.23	2960736.29	1.29E-02	2.50E-03	2.49E-03	5.82E-06	1.28E-02	5.38E-03	4.65E-03	7.31E-04	1.29E-02	5.58E-04	5.05E-04	5.26E-05	1.28E-02	3.73E-03	3.34E-03	3.89E-04	1.29E-02	1.28E-03	1.28E-03	2.71E-08
4475	582795.23	2960736.29	1.54E-02	3.02E-03	3.01E-03	6.91E-06	1.54E-02	6.63E-03	5.69E-03	9.32E-04	1.54E-02	6.91E-04	6.24E-04	6.65E-05	1.54E-02	4.46E-03	3.99E-03	4.69E-04	1.54E-02	1.55E-03	1.55E-03	3.21E-08
4476	583295.23	2960736.29	1.90E-02	3.74E-03	3.73E-03	8.01E-06	1.89E-02	8.30E-03	7.11E-03	1.19E-03	1.90E-02	8.73E-04	7.89E-04	8.40E-05	1.90E-02	5.44E-03	4.87E-03	5.70E-04	1.90E-02	1.92E-03	1.92E-03	3.72E-08
4477	583795.23	2960736.29	2.35E-02	4.64E-03	4.63E-03	6.44E-06	2.35E-02	1.02E-02	8.81E-03	1.42E-03	2.36E-02	1.09E-03	9.93E-04	9.95E-05	2.35E-02	6.62E-03	5.96E-03	6.53E-04	2.36E-02	2.39E-03	2.39E-03	2.99E-08
4478	584295.23	2960736.29	2.71E-02	5.27E-03	5.25E-03	1.31E-05	2.71E-02	1.22E-02	9.83E-03	2.36E-03	2.71E-02	1.30E-03	1.14E-03	1.63E-04	2.71E-02	7.69E-03	6.69E-03	1.00E-03	2.71E-02	2.69E-03	2.69E-03	6.08E-08
4510	579795.23	2961236.29	7.49E-03	1.39E-03	1.39E-03	4.72E-06	7.47E-03	2.61E-03	2.30E-03	3.07E-04	7.53E-03	2.68E-04	2.45E-04	2.33E-05	7.47E-03	2.09E-03	1.88E-03	2.15E-04	7.52E-03	6.95E-04	6.95E-04	2.20E-08
4511	580295.23	2961236.29	8.13E-03	1.52E-03	1.52E-03	5.17E-06	8.11E-03	2.93E-03	2.57E-03	3.55E-04	8.18E-03	3.02E-04	2.75E-04	2.67E-05	8.11E-03	2.29E-03	2.06E-03	2.38E-04	8.16E-03	7.62E-04	7.62E-04	2.41E-08
4512	580795.23	2961236.29	8.97E-03	1.69E-03	1.69E-03	5.73E-06	8.94E-03	3.34E-03	2.92E-03	4.16E-04	9.01E-03	3.45E-04										

Solid Waste Authority Palm Beach Renewable Energy Facility No. 2
Refurbished Stack

Annual
Waterbody #3 - Grassy Waters Wetland

Receptor ID	X	Y	Vapor Phase				Particle Phase				Particle Bound Phase				Divalent Mercury Vapor Phase				Elemental Mercury Vapor Phase			
			AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO
4642	584295.23	2962736.29	2.16E-02	3.24E-03	3.22E-03	1.57E-05	2.16E-02	9.92E-03	7.89E-03	2.03E-03	2.16E-02	1.04E-03	8.93E-04	1.42E-04	2.16E-02	7.02E-03	6.09E-03	9.29E-04	2.16E-02	1.19E-03	1.19E-03	7.30E-08
4674	579795.23	2963236.29	6.08E-03	1.14E-03	1.14E-03	2.53E-06	6.06E-03	2.07E-03	1.78E-03	2.92E-04	6.12E-03	2.20E-04	1.98E-04	2.21E-05	6.06E-03	1.72E-03	1.52E-03	2.03E-04	6.11E-03	5.49E-04	5.49E-04	1.18E-08
4675	580295.23	2963236.29	6.53E-03	1.23E-03	1.23E-03	2.28E-06	6.50E-03	2.28E-03	1.96E-03	3.25E-04	6.57E-03	2.43E-04	2.19E-04	2.45E-05	6.51E-03	1.86E-03	1.64E-03	2.20E-04	6.56E-03	5.92E-04	5.92E-04	1.06E-08
4676	580795.23	2963236.29	7.13E-03	1.36E-03	1.35E-03	2.22E-06	7.09E-03	2.56E-03	2.19E-03	3.73E-04	7.17E-03	2.74E-04	2.46E-04	2.80E-05	7.10E-03	2.05E-03	1.81E-03	2.46E-04	7.15E-03	6.49E-04	6.49E-04	1.03E-08
4677	581295.23	2963236.29	7.90E-03	1.52E-03	1.51E-03	2.41E-06	7.87E-03	2.93E-03	2.49E-03	4.40E-04	7.94E-03	3.14E-04	2.81E-04	3.29E-05	7.88E-03	2.30E-03	2.02E-03	2.81E-04	7.93E-03	7.22E-04	7.22E-04	1.12E-08
4678	581795.23	2963236.29	8.88E-03	1.72E-03	1.71E-03	3.16E-06	8.84E-03	3.39E-03	2.87E-03	5.24E-04	8.92E-03	3.64E-04	3.26E-04	3.89E-05	8.85E-03	2.62E-03	2.29E-03	3.28E-04	8.91E-03	8.12E-04	8.12E-04	1.47E-08
4679	582295.23	2963236.29	1.01E-02	1.95E-03	1.95E-03	5.25E-06	1.00E-02	4.01E-03	3.34E-03	6.66E-04	1.01E-02	4.30E-04	3.81E-04	4.91E-05	1.01E-02	3.02E-03	2.62E-03	4.04E-04	1.01E-02	9.17E-04	9.17E-04	2.44E-08
4680	582795.23	2963236.29	1.15E-02	2.22E-03	2.21E-03	8.39E-06	1.15E-02	4.73E-03	3.91E-03	8.21E-04	1.16E-02	5.07E-04	4.47E-04	6.01E-05	1.15E-02	3.50E-03	3.01E-03	4.84E-04	1.16E-02	1.03E-03	1.03E-03	3.91E-08
4681	583295.23	2963236.29	1.31E-02	2.43E-03	2.43E-03	5.34E-06	1.31E-02	5.50E-03	4.56E-03	9.31E-04	1.32E-02	5.88E-04	5.20E-04	6.73E-05	1.31E-02	3.98E-03	3.48E-03	5.02E-04	1.32E-02	1.09E-03	1.09E-03	2.48E-08
4682	583795.23	2963236.29	1.44E-02	2.31E-03	2.30E-03	1.05E-05	1.43E-02	6.38E-03	5.09E-03	1.30E-03	1.44E-02	6.69E-04	5.77E-04	9.24E-05	1.43E-02	4.62E-03	3.96E-03	6.56E-04	1.44E-02	9.18E-04	9.18E-04	4.87E-08
4683	584295.23	2963236.29	1.37E-02	1.60E-03	1.59E-03	6.70E-06	1.36E-02	6.03E-03	4.71E-03	1.32E-03	1.37E-02	6.32E-04	5.38E-04	9.38E-05	1.36E-02	4.65E-03	4.01E-03	6.40E-04	1.37E-02	4.05E-04	4.05E-04	3.11E-08
4715	579795.23	2963736.29	5.81E-03	1.08E-03	1.08E-03	1.82E-06	5.78E-03	1.94E-03	1.67E-03	2.78E-04	5.85E-03	2.08E-04	1.87E-04	2.12E-05	5.78E-03	1.65E-03	1.45E-03	1.99E-04	5.83E-03	5.18E-04	5.18E-04	8.48E-09
4716	580295.23	2963736.29	6.25E-03	1.17E-03	1.17E-03	1.96E-06	6.22E-03	2.15E-03	1.83E-03	3.18E-04	6.28E-03	2.30E-04	2.06E-04	2.41E-05	6.22E-03	1.80E-03	1.58E-03	2.22E-04	6.27E-03	5.60E-04	5.60E-04	9.11E-09
4717	580795.23	2963736.29	6.75E-03	1.28E-03	1.27E-03	2.35E-06	6.72E-03	2.39E-03	2.03E-03	3.63E-04	6.79E-03	2.57E-04	2.29E-04	2.74E-05	6.72E-03	1.97E-03	1.72E-03	2.50E-04	6.78E-03	6.07E-04	6.07E-04	1.09E-08
4718	581295.23	2963736.29	7.32E-03	1.39E-03	1.39E-03	3.49E-06	7.29E-03	2.69E-03	2.26E-03	4.34E-04	7.36E-03	2.89E-04	2.56E-04	3.27E-05	7.30E-03	2.17E-03	1.88E-03	2.94E-04	7.35E-03	6.60E-04	6.60E-04	1.63E-08
4719	581795.23	2963736.29	7.98E-03	1.52E-03	1.52E-03	5.19E-06	7.95E-03	3.06E-03	2.53E-03	5.27E-04	8.03E-03	3.27E-04	2.88E-04	3.94E-05	7.96E-03	2.41E-03	2.06E-03	3.45E-04	8.01E-03	7.15E-04	7.15E-04	2.42E-08
4720	582295.23	2963736.29	8.74E-03	1.66E-03	1.65E-03	6.67E-06	8.70E-03	3.45E-03	2.84E-03	6.08E-04	8.78E-03	3.69E-04	3.24E-04	4.52E-05	8.72E-03	2.66E-03	2.27E-03	3.88E-04	8.77E-03	7.67E-04	7.67E-04	3.11E-08
4721	582795.23	2963736.29	9.58E-03	1.76E-03	1.75E-03	4.27E-06	9.53E-03	3.87E-03	3.19E-03	6.80E-04	9.62E-03	4.13E-04	3.64E-04	4.99E-05	9.55E-03	2.91E-03	2.52E-03	3.97E-04	9.61E-03	7.90E-04	7.90E-04	1.99E-08
4722	583295.23	2963736.29	1.03E-02	1.71E-03	1.71E-03	7.02E-06	1.03E-02	4.39E-03	3.51E-03	8.87E-04	1.03E-02	4.63E-04	3.99E-04	6.43E-05	1.03E-02	3.29E-03	2.80E-03	4.90E-04	1.03E-02	7.05E-04	7.05E-04	3.27E-08
4723	583795.23	2963736.29	1.03E-02	1.37E-03	1.36E-03	7.79E-06	1.03E-02	4.49E-03	3.51E-03	9.88E-04	1.04E-02	4.71E-04	4.00E-04	7.10E-05	1.03E-02	3.48E-03	2.96E-03	5.23E-04	1.04E-02	4.34E-04	4.34E-04	3.63E-08
4724	584295.23	2963736.29	9.05E-03	9.09E-04	9.05E-04	4.71E-06	9.01E-03	3.89E-03	2.92E-03	9.70E-04	9.07E-03	4.08E-04	3.39E-04	6.94E-05	9.01E-03	3.18E-03	2.68E-03	5.01E-04	9.07E-03	1.52E-04	1.52E-04	2.19E-08
4756	579795.23	2964236.29	5.60E-03	1.04E-03	1.04E-03	1.88E-06	5.57E-03	1.84E-03	1.57E-03	2.69E-04	5.63E-03	1.97E-04	1.77E-04	2.07E-05	5.57E-03	1.60E-03	1.40E-03	2.01E-04	5.62E-03	4.95E-04	4.95E-04	8.77E-09
4757	580295.23	2964236.29	5.92E-03	1.10E-03	1.10E-03	2.55E-06	5.90E-03	2.01E-03	1.70E-03	3.08E-04	5.96E-03	2.16E-04	1.92E-04	2.36E-05	5.90E-03	1.72E-03	1.49E-03	2.28E-04	5.95E-03	5.26E-04	5.26E-04	1.19E-08
4758	580795.23	2964236.29	6.27E-03	1.18E-03	1.17E-03	3.59E-06	6.24E-03	2.21E-03	1.85E-03	3.65E-04	6.31E-03	2.37E-04	2.09E-04	2.78E-05	6.25E-03	1.86E-03	1.59E-03	2.64E-04	6.30E-03	5.57E-04	5.57E-04	1.67E-08
4759	581295.23	2964236.29	6.65E-03	1.25E-03	1.24E-03	5.01E-06	6.61E-03	2.43E-03	2.01E-03	4.24E-04	6.68E-03	2.61E-04	2.29E-04	3.21E-05	6.62E-03	2.00E-03	1.70E-03	2.99E-04	6.67E-03	5.86E-04	5.86E-04	2.34E-08
4760	581795.23	2964236.29	7.06E-03	1.32E-03	1.31E-03	5.25E-06	7.03E-03	2.66E-03	2.19E-03	4.70E-04	7.10E-03	2.85E-04	2.50E-04	3.53E-05	7.04E-03	2.14E-03	1.82E-03	3.19E-04	7.09E-03	6.10E-04	6.10E-04	2.46E-08
4761	582295.2																					

Solid Waste Authority Palm Beach Renewable Energy Facility No. 2
Refurbished Stack

Annual
Waterbody #4 - Middle Borrow Lake

Receptor ID	X	Y	Vapor Phase				Particle Phase				Particle Bound Phase				Divalent Mercury Vapor Phase				Elemental Mercury Vapor Phase			
			AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO
1981	585095.23	2961936.29	2.53E-02	2.51E-03	2.49E-03	2.14E-05	2.53E-02	1.38E-02	8.67E-03	5.08E-03	2.53E-02	1.37E-03	1.03E-03	3.45E-04	2.53E-02	9.60E-03	7.63E-03	1.97E-03	2.53E-02	3.80E-04	3.80E-04	9.95E-08
2042	585095.23	2962036.29	2.37E-02	2.28E-03	2.26E-03	1.93E-05	2.37E-02	1.24E-02	8.04E-03	4.33E-03	2.38E-02	1.25E-03	9.54E-04	2.95E-04	2.37E-02	8.90E-03	7.20E-03	1.71E-03	2.38E-02	2.95E-04	2.95E-04	8.97E-08
2103	585095.23	2962136.29	2.17E-02	2.04E-03	2.02E-03	1.71E-05	2.17E-02	1.10E-02	7.25E-03	3.72E-03	2.17E-02	1.12E-03	8.61E-04	2.54E-04	2.17E-02	8.09E-03	6.59E-03	1.49E-03	2.17E-02	2.35E-04	2.35E-04	7.96E-08
2104	585195.23	2962136.29	1.72E-02	1.58E-03	1.57E-03	1.24E-05	1.72E-02	8.60E-03	5.34E-03	3.26E-03	1.72E-02	8.81E-04	6.57E-04	2.24E-04	1.72E-02	6.51E-03	5.19E-03	1.32E-03	1.72E-02	1.54E-04	1.54E-04	5.77E-08
2164	585095.23	2962236.29	1.97E-02	1.82E-03	1.81E-03	1.49E-05	1.97E-02	9.68E-03	6.47E-03	3.21E-03	1.97E-02	9.91E-04	7.71E-04	2.20E-04	1.97E-02	7.30E-03	5.98E-03	1.32E-03	1.97E-02	1.93E-04	1.93E-04	6.93E-08
2165	585195.23	2962236.29	1.60E-02	1.47E-03	1.45E-03	1.05E-05	1.60E-02	7.74E-03	4.93E-03	2.82E-03	1.60E-02	7.99E-04	6.05E-04	1.94E-04	1.60E-02	6.00E-03	4.84E-03	1.16E-03	1.60E-02	1.39E-04	1.39E-04	4.88E-08
2166	585295.23	2962236.29	1.33E-02	1.24E-03	1.23E-03	1.21E-05	1.33E-02	6.74E-03	3.84E-03	2.90E-03	1.33E-02	6.90E-04	4.90E-04	2.00E-04	1.33E-02	5.20E-03	4.02E-03	1.19E-03	1.33E-02	1.23E-04	1.23E-04	5.63E-08
2225	585095.23	2962336.29	1.78E-02	1.63E-03	1.62E-03	1.29E-05	1.78E-02	8.54E-03	5.75E-03	2.79E-03	1.78E-02	8.79E-04	6.87E-04	1.92E-04	1.78E-02	6.57E-03	5.40E-03	1.17E-03	1.78E-02	1.62E-04	1.62E-04	5.97E-08
2226	585195.23	2962336.29	1.48E-02	1.35E-03	1.34E-03	9.14E-06	1.47E-02	6.97E-03	4.50E-03	2.47E-03	1.48E-02	7.24E-04	5.53E-04	1.71E-04	1.47E-02	5.50E-03	4.46E-03	1.04E-03	1.48E-02	1.25E-04	1.25E-04	4.25E-08
2227	585295.23	2962336.29	1.25E-02	1.16E-03	1.15E-03	1.10E-05	1.25E-02	6.18E-03	3.60E-03	2.59E-03	1.25E-02	6.36E-04	4.57E-04	1.79E-04	1.25E-02	4.85E-03	3.78E-03	1.08E-03	1.25E-02	1.14E-04	1.14E-04	5.11E-08
2228	585395.23	2962336.29	1.10E-02	1.05E-03	1.03E-03	1.85E-05	1.10E-02	5.96E-03	3.04E-03	2.92E-03	1.11E-02	5.98E-04	3.97E-04	2.01E-04	1.10E-02	4.54E-03	3.35E-03	1.19E-03	1.11E-02	1.10E-04	1.10E-04	8.58E-08
2286	585095.23	2962436.29	1.61E-02	1.46E-03	1.45E-03	1.11E-05	1.61E-02	7.55E-03	5.10E-03	2.44E-03	1.61E-02	7.80E-04	6.11E-04	1.69E-04	1.60E-02	5.91E-03	4.86E-03	1.04E-03	1.61E-02	1.39E-04	1.39E-04	5.14E-08
2287	585195.23	2962436.29	1.36E-02	1.23E-03	1.23E-03	8.18E-06	1.35E-02	6.28E-03	4.08E-03	2.20E-03	1.36E-02	6.55E-04	5.02E-04	1.53E-04	1.35E-02	5.04E-03	4.09E-03	9.46E-04	1.36E-02	1.13E-04	1.13E-04	3.80E-08
2288	585295.23	2962436.29	1.17E-02	1.08E-03	1.07E-03	1.01E-05	1.16E-02	5.66E-03	3.33E-03	2.33E-03	1.17E-02	5.84E-04	4.23E-04	1.62E-04	1.16E-02	4.50E-03	3.52E-03	9.84E-04	1.17E-02	1.04E-04	1.04E-04	4.67E-08
2289	585395.23	2962436.29	1.04E-02	9.82E-04	9.66E-04	1.59E-05	1.04E-02	5.43E-03	2.85E-03	2.58E-03	1.04E-02	5.49E-04	3.71E-04	1.78E-04	1.04E-02	4.22E-03	3.14E-03	1.07E-03	1.04E-02	1.01E-04	1.01E-04	7.39E-08
2349	585295.23	2962536.29	1.08E-02	1.00E-03	9.91E-04	9.26E-06	1.08E-02	5.18E-03	3.07E-03	2.11E-03	1.08E-02	5.36E-04	3.89E-04	1.47E-04	1.08E-02	4.17E-03	3.26E-03	9.05E-04	1.08E-02	9.51E-05	9.51E-05	4.30E-08
2350	585395.23	2962536.29	9.73E-03	9.15E-04	9.01E-04	1.39E-05	9.71E-03	4.95E-03	2.65E-03	2.30E-03	9.74E-03	5.04E-04	3.44E-04	1.59E-04	9.71E-03	3.91E-03	2.94E-03	9.71E-04	9.74E-03	9.26E-05	9.25E-05	6.44E-08
2410	585295.23	2962636.29	1.01E-02	9.25E-04	9.17E-04	8.57E-06	1.00E-02	4.75E-03	2.82E-03	1.92E-03	1.01E-02	4.92E-04	3.58E-04	1.34E-04	1.00E-02	3.86E-03	3.02E-03	8.38E-04	1.01E-02	8.69E-05	8.68E-05	3.98E-08
2411	585395.23	2962636.29	9.09E-03	8.51E-04	8.38E-04	1.22E-05	9.07E-03	4.53E-03	2.46E-03	2.07E-03	9.10E-03	4.63E-04	3.19E-04	1.44E-04	9.07E-03	3.62E-03	2.73E-03	8.88E-04	9.10E-03	8.47E-05	8.47E-05	5.68E-08
# of data pts	Average		1.50E-02	1.40E-03	1.39E-03	1.31E-05	1.50E-02	7.46E-03	4.62E-03	2.84E-03	1.50E-02	7.63E-04	5.67E-04	1.96E-04	1.49E-02	5.70E-03	4.53E-03	1.17E-03	1.50E-02	1.50E-04	1.50E-04	6.08E-08
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Solid Waste Authority Palm Beach Renewable Energy Facility No. 2
Refurbished Stack

Annual
Waterbody #5 - Rookery/Shell Pits

Receptor ID	X	Y	Vapor Phase				Particle Phase				Particle Bound Phase				Divalent Mercury Vapor Phase				Elemental Mercury Vapor Phase			
			AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO
878	584595.23	2960136.29	1.35E-02	2.48E-03	2.47E-03	9.24E-06	1.34E-02	6.71E-03	4.88E-03	1.83E-03	1.35E-02	6.86E-04	5.59E-04	1.27E-04	1.35E-02	4.25E-03	3.45E-03	7.98E-04	1.35E-02	1.19E-03	1.19E-03	4.29E-08
879	584695.23	2960136.29	1.31E-02	2.39E-03	2.38E-03	1.16E-05	1.31E-02	6.84E-03	4.86E-03	1.98E-03	1.32E-02	6.89E-04	5.52E-04	1.37E-04	1.31E-02	4.29E-03	3.43E-03	8.55E-04	1.32E-02	1.13E-03	1.13E-03	5.37E-08
880	584795.23	2960136.29	1.28E-02	2.30E-03	2.29E-03	1.42E-05	1.28E-02	7.10E-03	4.87E-03	2.22E-03	1.28E-02	7.00E-04	5.47E-04	1.53E-04	1.28E-02	4.35E-03	3.41E-03	9.44E-04	1.28E-02	1.06E-03	1.06E-03	6.60E-08
881	584895.23	2960136.29	1.27E-02	2.24E-03	2.22E-03	1.80E-05	1.27E-02	7.52E-03	4.96E-03	2.56E-03	1.27E-02	7.25E-04	5.50E-04	1.76E-04	1.27E-02	4.48E-03	3.41E-03	1.07E-03	1.27E-02	1.00E-03	1.00E-03	8.36E-08
882	584995.23	2960136.29	1.28E-02	2.19E-03	2.17E-03	1.43E-05	1.27E-02	7.29E-03	5.09E-03	2.21E-03	1.28E-02	7.08E-04	5.57E-04	1.52E-04	1.27E-02	4.37E-03	3.44E-03	9.30E-04	1.28E-02	9.54E-04	9.54E-04	6.66E-08
883	585095.23	2960136.29	1.29E-02	2.14E-03	2.13E-03	1.72E-05	1.29E-02	7.35E-03	5.14E-03	2.22E-03	1.29E-02	7.11E-04	5.58E-04	1.53E-04	1.29E-02	4.42E-03	3.47E-03	9.52E-04	1.29E-02	9.03E-04	9.03E-04	7.98E-08
885	585295.23	2960136.29	1.30E-02	1.88E-03	1.86E-03	2.39E-05	1.29E-02	7.39E-03	4.72E-03	2.68E-03	1.30E-02	7.02E-04	5.19E-04	1.83E-04	1.29E-02	4.56E-03	3.45E-03	1.11E-03	1.30E-02	6.97E-04	6.97E-04	1.11E-07
939	584595.23	2960236.29	1.50E-02	2.80E-03	2.79E-03	9.14E-06	1.50E-02	7.38E-03	5.42E-03	1.97E-03	1.50E-02	7.60E-04	6.24E-04	1.36E-04	1.50E-02	4.66E-03	3.81E-03	8.46E-04	1.50E-02	1.36E-03	1.36E-03	4.25E-08
940	584695.23	2960236.29	1.46E-02	2.68E-03	2.67E-03	1.11E-05	1.46E-02	7.48E-03	5.35E-03	2.13E-03	1.46E-02	7.59E-04	6.12E-04	1.47E-04	1.46E-02	4.68E-03	3.77E-03	9.04E-04	1.46E-02	1.28E-03	1.28E-03	5.15E-08
941	584795.23	2960236.29	1.41E-02	2.56E-03	2.54E-03	1.39E-05	1.41E-02	7.64E-03	5.31E-03	2.33E-03	1.41E-02	7.60E-04	6.00E-04	1.60E-04	1.41E-02	4.70E-03	3.72E-03	9.77E-04	1.41E-02	1.19E-03	1.19E-03	6.45E-08
942	584895.23	2960236.29	1.38E-02	2.45E-03	2.43E-03	1.86E-05	1.37E-02	8.12E-03	5.34E-03	2.78E-03	1.38E-02	7.86E-04	5.96E-04	1.90E-04	1.37E-02	4.83E-03	3.69E-03	1.14E-03	1.38E-02	1.11E-03	1.11E-03	8.65E-08
943	584995.23	2960236.29	1.37E-02	2.37E-03	2.36E-03	1.75E-05	1.37E-02	8.11E-03	5.46E-03	2.65E-03	1.37E-02	7.82E-04	6.00E-04	1.82E-04	1.37E-02	4.78E-03	3.69E-03	1.09E-03	1.37E-02	1.05E-03	1.05E-03	8.15E-08
944	585095.23	2960236.29	1.38E-02	2.31E-03	2.29E-03	1.71E-05	1.38E-02	7.95E-03	5.52E-03	2.42E-03	1.38E-02	7.68E-04	6.02E-04	1.66E-04	1.38E-02	4.73E-03	3.71E-03	1.02E-03	1.38E-02	9.84E-04	9.84E-04	7.95E-08
945	585195.23	2960236.29	1.38E-02	2.21E-03	2.18E-03	2.74E-05	1.38E-02	8.30E-03	5.38E-03	2.92E-03	1.38E-02	7.87E-04	5.87E-04	2.00E-04	1.38E-02	4.92E-03	3.70E-03	1.22E-03	1.38E-02	8.94E-04	8.93E-04	1.27E-07
1000	584595.23	2960336.29	1.68E-02	3.16E-03	3.15E-03	9.96E-06	1.68E-02	8.16E-03	6.03E-03	2.12E-03	1.68E-02	8.46E-04	6.99E-04	1.47E-04	1.68E-02	5.13E-03	4.22E-03	9.04E-04	1.68E-02	1.56E-03	1.56E-03	4.63E-08
1001	584695.23	2960336.29	1.63E-02	3.02E-03	3.01E-03	1.06E-05	1.63E-02	8.20E-03	5.92E-03	2.29E-03	1.63E-02	8.39E-04	6.82E-04	1.58E-04	1.63E-02	5.11E-03	4.15E-03	9.58E-04	1.63E-02	1.46E-03	1.46E-03	4.92E-08
1002	584795.23	2960336.29	1.56E-02	2.85E-03	2.84E-03	1.37E-05	1.56E-02	8.31E-03	5.79E-03	2.52E-03	1.56E-02	8.33E-04	6.61E-04	1.73E-04	1.56E-02	5.10E-03	4.06E-03	1.04E-03	1.56E-02	1.35E-03	1.35E-03	6.37E-08
1003	584895.23	2960336.29	1.49E-02	2.68E-03	2.66E-03	1.79E-05	1.49E-02	8.61E-03	5.72E-03	2.89E-03	1.49E-02	8.41E-04	6.44E-04	1.97E-04	1.49E-02	5.15E-03	3.97E-03	1.17E-03	1.49E-02	1.23E-03	1.23E-03	8.31E-08
1004	584995.23	2960336.29	1.46E-02	2.56E-03	2.54E-03	2.14E-05	1.46E-02	8.99E-03	5.79E-03	3.20E-03	1.46E-02	8.59E-04	6.41E-04	2.18E-04	1.46E-02	5.22E-03	3.93E-03	1.29E-03	1.46E-02	1.14E-03	1.14E-03	9.95E-08
1005	585095.23	2960336.29	1.45E-02	2.46E-03	2.44E-03	1.80E-05	1.45E-02	8.59E-03	5.85E-03	2.74E-03	1.46E-02	8.28E-04	6.40E-04	1.87E-04	1.45E-02	5.04E-03	3.92E-03	1.12E-03	1.46E-02	1.06E-03	1.06E-03	8.36E-08
1006	585195.23	2960336.29	1.45E-02	2.34E-03	2.31E-03	2.90E-05	1.45E-02	8.96E-03	5.71E-03	3.25E-03	1.45E-02	8.46E-04	6.24E-04	2.22E-04	1.45E-02	5.22E-03	3.90E-03	1.33E-03	1.45E-02	9.56E-04	9.56E-04	1.35E-07
1061	584595.23	2960436.29	1.88E-02	3.57E-03	3.56E-03	1.20E-05	1.88E-02	9.06E-03	6.72E-03	2.34E-03	1.88E-02	9.43E-04	7.83E-04	1.61E-04	1.88E-02	5.66E-03	4.68E-03	9.83E-04	1.88E-02	1.77E-03	1.77E-03	5.56E-08
1062	584695.23	2960436.29	1.82E-02	3.41E-03	3.40E-03	1.11E-05	1.82E-02	9.04E-03	6.55E-03	2.49E-03	1.82E-02	9.32E-04	7.61E-04	1.71E-04	1.82E-02	5.61E-03	4.58E-03	1.03E-03	1.82E-02	1.67E-03	1.67E-03	5.17E-08
1063	584795.23	2960436.29	1.72E-02	3.18E-03	3.17E-03	1.29E-05	1.72E-02	9.03E-03	6.31E-03	2.72E-03	1.73E-02	9.14E-04	7.28E-04	1.86E-04	1.72E-02	5.54E-03	4.43E-03	1.11E-03	1.73E-02	1.53E-03	1.53E-03	5.99E-08
1064	584895.23	2960436.29	1.62E-02	2.93E-03	2.92E-03	1.73E-05	1.62E-02	9.14E-03	6.09E-03	3.05E-03	1.62E-02	9.02E-04	6.94E-04	2.								

Solid Waste Authority Palm Beach Renewable Energy Facility No. 2
Refurbished Stack

Annual
Waterbody #5 - Rookery/Shell Pits

Receptor ID	X	Y	Vapor Phase				Particle Phase				Particle Bound Phase				Divalent Mercury Vapor Phase				Elemental Mercury Vapor Phase			
			AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO
1613	584895.23	2961336.29	2.89E-02	5.46E-03	5.41E-03	5.16E-05	2.90E-02	1.74E-02	9.25E-03	8.18E-03	2.89E-02	1.72E-03	1.17E-03	5.50E-04	2.89E-02	9.82E-03	6.81E-03	3.00E-03	2.89E-02	2.48E-03	2.48E-03	2.40E-07
<u># of data pts</u>		Average	1.89E-02	3.43E-03	3.41E-03	2.26E-05	1.89E-02	1.07E-02	6.73E-03	3.96E-03	1.89E-02	1.06E-03	7.90E-04	2.69E-04	1.89E-02	6.26E-03	4.72E-03	1.54E-03	1.89E-02	1.61E-03	1.61E-03	1.05E-07
62																						

Solid Waste Authority Palm Beach Renewable Energy Facility No. 2
Refurbished Stack

Annual
Waterbody #6 - M Canal

Receptor ID	X	Y	Vapor Phase				Particle Phase				Particle Bound Phase				Divalent Mercury Vapor Phase				Elemental Mercury Vapor Phase			
			AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO
265	584295.23	2959136.29	5.78E-03	1.01E-03	1.01E-03	6.92E-06	5.75E-03	2.94E-03	2.03E-03	9.11E-04	5.79E-03	2.95E-04	2.30E-04	6.48E-05	5.77E-03	1.97E-03	1.50E-03	4.67E-04	5.79E-03	4.59E-04	4.59E-04	3.22E-08
260	583795.23	2959136.29	5.89E-03	1.07E-03	1.06E-03	4.33E-06	5.86E-03	2.70E-03	1.96E-03	7.42E-04	5.90E-03	2.81E-04	2.27E-04	5.34E-05	5.87E-03	1.87E-03	1.48E-03	3.92E-04	5.90E-03	5.12E-04	5.12E-04	2.01E-08
255	583295.23	2959136.29	5.85E-03	1.09E-03	1.08E-03	4.55E-06	5.83E-03	2.53E-03	1.90E-03	6.27E-04	5.87E-03	2.67E-04	2.22E-04	4.55E-05	5.84E-03	1.81E-03	1.46E-03	3.54E-04	5.87E-03	5.37E-04	5.37E-04	2.12E-08
373	582895.23	2959336.29	6.34E-03	1.18E-03	1.18E-03	4.88E-06	6.31E-03	2.70E-03	2.06E-03	6.43E-04	6.36E-03	2.84E-04	2.38E-04	4.68E-05	6.32E-03	1.98E-03	1.61E-03	3.66E-04	6.35E-03	5.92E-04	5.92E-04	2.27E-08
673	582395.23	2959836.29	8.24E-03	1.57E-03	1.56E-03	4.43E-06	8.20E-03	3.40E-03	2.81E-03	5.87E-04	8.26E-03	3.56E-04	3.13E-04	4.27E-05	8.22E-03	2.52E-03	2.18E-03	3.37E-04	8.25E-03	8.08E-04	8.08E-04	2.06E-08
4428	579795.23	2960236.29	7.05E-03	1.31E-03	1.30E-03	3.22E-06	7.03E-03	2.51E-03	2.20E-03	3.14E-04	7.09E-03	2.55E-04	2.31E-04	2.35E-05	7.03E-03	2.00E-03	1.80E-03	2.06E-04	7.08E-03	6.66E-04	6.66E-04	1.50E-08
4429	580295.23	2960236.29	7.51E-03	1.40E-03	1.40E-03	3.55E-06	7.49E-03	2.78E-03	2.41E-03	3.61E-04	7.55E-03	2.82E-04	2.55E-04	2.69E-05	7.49E-03	2.16E-03	1.94E-03	2.28E-04	7.54E-03	7.20E-04	7.20E-04	1.65E-08
4430	580795.23	2960236.29	8.07E-03	1.52E-03	1.52E-03	3.93E-06	8.04E-03	3.09E-03	2.67E-03	4.16E-04	8.10E-03	3.14E-04	2.84E-04	3.07E-05	8.04E-03	2.35E-03	2.10E-03	2.53E-04	8.09E-03	7.84E-04	7.84E-04	1.83E-08
4431	581295.23	2960236.29	8.73E-03	1.67E-03	1.66E-03	4.16E-06	8.69E-03	3.45E-03	2.98E-03	4.73E-04	8.76E-03	3.53E-04	3.18E-04	3.47E-05	8.70E-03	2.56E-03	2.29E-03	2.79E-04	8.75E-03	8.61E-04	8.61E-04	1.94E-08
4432	581795.23	2960236.29	9.52E-03	1.84E-03	1.83E-03	3.92E-06	9.49E-03	3.86E-03	3.33E-03	5.22E-04	9.56E-03	3.97E-04	3.59E-04	3.81E-05	9.50E-03	2.81E-03	2.51E-03	3.00E-04	9.55E-03	9.53E-04	9.53E-04	1.83E-08
# of data pts	Average		7.30E-03	1.37E-03	1.36E-03	4.39E-06	7.27E-03	3.00E-03	2.44E-03	5.60E-04	7.33E-03	3.08E-04	2.68E-04	4.07E-05	7.28E-03	2.20E-03	1.89E-03	3.18E-04	7.32E-03	6.89E-04	6.89E-04	2.04E-08

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Solid Waste Authority Palm Beach Renewable Energy Facility No. 2
Refurbished Stack

Annual
Waterbody #7 - Localized Area Within Grassy Waters Wetlands

Receptor ID			Vapor Phase				Particle Phase				Particle Bound Phase				Divalent Mercury Vapor Phase				Elemental Mercury Vapor Phase			
	X	Y	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO
866	583395.23	2960136.29	1.18E-02	2.25E-03	2.25E-03	8.77E-06	1.17E-02	5.20E-03	4.10E-03	1.10E-03	1.18E-02	5.47E-04	4.69E-04	7.79E-05	1.17E-02	3.56E-03	3.01E-03	5.50E-04	1.18E-02	1.15E-03	1.15E-03	4.08E-08
867	583495.23	2960136.29	1.20E-02	2.30E-03	2.29E-03	9.24E-06	1.20E-02	5.34E-03	4.17E-03	1.17E-03	1.20E-02	5.61E-04	4.79E-04	8.27E-05	1.20E-02	3.63E-03	3.05E-03	5.77E-04	1.20E-02	1.17E-03	1.17E-03	4.30E-08
868	583595.23	2960136.29	1.23E-02	2.34E-03	2.33E-03	9.72E-06	1.22E-02	5.48E-03	4.24E-03	1.24E-03	1.23E-02	5.77E-04	4.89E-04	8.73E-05	1.22E-02	3.71E-03	3.10E-03	6.04E-04	1.23E-02	1.19E-03	1.19E-03	4.52E-08
869	583695.23	2960136.29	1.25E-02	2.39E-03	2.38E-03	9.97E-06	1.25E-02	5.63E-03	4.33E-03	1.29E-03	1.26E-02	5.92E-04	5.01E-04	9.12E-05	1.25E-02	3.78E-03	3.16E-03	6.26E-04	1.26E-02	1.21E-03	1.21E-03	4.63E-08
870	583795.23	2960136.29	1.28E-02	2.45E-03	2.44E-03	9.53E-06	1.28E-02	5.76E-03	4.43E-03	1.33E-03	1.28E-02	6.07E-04	5.13E-04	9.36E-05	1.28E-02	3.85E-03	3.21E-03	6.37E-04	1.28E-02	1.24E-03	1.24E-03	4.43E-08
871	583895.23	2960136.29	1.31E-02	2.50E-03	2.50E-03	8.52E-06	1.31E-02	5.88E-03	4.53E-03	1.35E-03	1.31E-02	6.21E-04	5.26E-04	9.50E-05	1.31E-02	3.91E-03	3.27E-03	6.42E-04	1.31E-02	1.26E-03	1.26E-03	3.96E-08
872	583995.23	2960136.29	1.34E-02	2.56E-03	2.55E-03	7.60E-06	1.34E-02	6.01E-03	4.64E-03	1.38E-03	1.34E-02	6.35E-04	5.39E-04	9.68E-05	1.34E-02	3.98E-03	3.33E-03	6.47E-04	1.34E-02	1.29E-03	1.29E-03	3.53E-08
873	584095.23	2960136.29	1.36E-02	2.60E-03	2.59E-03	7.12E-06	1.36E-02	6.15E-03	4.74E-03	1.41E-03	1.37E-02	6.49E-04	5.50E-04	9.89E-05	1.36E-02	4.04E-03	3.38E-03	6.56E-04	1.36E-02	1.31E-03	1.31E-03	3.36E-08
874	584195.23	2960136.29	1.38E-02	2.63E-03	2.62E-03	7.86E-06	1.38E-02	6.29E-03	4.82E-03	1.47E-03	1.38E-02	6.63E-04	5.60E-04	1.03E-04	1.38E-02	4.10E-03	3.43E-03	6.76E-04	1.38E-02	1.32E-03	1.32E-03	3.66E-08
875	584295.23	2960136.29	1.39E-02	2.63E-03	2.62E-03	8.76E-06	1.39E-02	6.43E-03	4.88E-03	1.54E-03	1.39E-02	6.74E-04	5.66E-04	1.08E-04	1.39E-02	4.16E-03	3.46E-03	7.03E-04	1.39E-02	1.31E-03	1.31E-03	4.07E-08
876	584395.23	2960136.29	1.39E-02	2.61E-03	2.60E-03	8.37E-06	1.39E-02	6.53E-03	4.91E-03	1.62E-03	1.39E-02	6.81E-04	5.68E-04	1.13E-04	1.39E-02	4.20E-03	3.47E-03	7.25E-04	1.39E-02	1.29E-03	1.29E-03	3.89E-08
877	584495.23	2960136.29	1.37E-02	2.56E-03	2.55E-03	8.14E-06	1.37E-02	6.62E-03	4.90E-03	1.72E-03	1.37E-02	6.85E-04	5.66E-04	1.19E-04	1.37E-02	4.23E-03	3.47E-03	7.57E-04	1.37E-02	1.25E-03	1.25E-03	3.78E-08
927	583395.23	2960236.29	1.29E-02	2.48E-03	2.47E-03	8.15E-06	1.28E-02	5.63E-03	4.54E-03	1.09E-03	1.29E-02	5.94E-04	5.17E-04	7.72E-05	1.28E-02	3.83E-03	3.29E-03	5.44E-04	1.29E-02	1.27E-03	1.27E-03	3.79E-08
928	583495.23	2960236.29	1.31E-02	2.52E-03	2.51E-03	9.11E-06	1.31E-02	5.80E-03	4.61E-03	1.18E-03	1.31E-02	6.11E-04	5.27E-04	8.35E-05	1.31E-02	3.92E-03	3.34E-03	5.81E-04	1.31E-02	1.29E-03	1.29E-03	4.24E-08
929	583595.23	2960236.29	1.34E-02	2.57E-03	2.56E-03	9.77E-06	1.34E-02	5.96E-03	4.69E-03	1.27E-03	1.34E-02	6.28E-04	5.39E-04	8.94E-05	1.34E-02	4.01E-03	3.39E-03	6.15E-04	1.34E-02	1.31E-03	1.31E-03	4.54E-08
930	583695.23	2960236.29	1.37E-02	2.62E-03	2.61E-03	1.03E-05	1.37E-02	6.13E-03	4.78E-03	1.35E-03	1.37E-02	6.46E-04	5.51E-04	9.52E-05	1.37E-02	4.10E-03	3.45E-03	6.48E-04	1.37E-02	1.33E-03	1.33E-03	4.81E-08
931	583795.23	2960236.29	1.40E-02	2.68E-03	2.67E-03	1.09E-05	1.40E-02	6.31E-03	4.88E-03	1.44E-03	1.40E-02	6.64E-04	5.64E-04	1.01E-04	1.40E-02	4.19E-03	3.52E-03	6.78E-04	1.40E-02	1.36E-03	1.36E-03	5.05E-08
932	583895.23	2960236.29	1.43E-02	2.74E-03	2.73E-03	1.08E-05	1.43E-02	6.47E-03	4.98E-03	1.49E-03	1.44E-02	6.82E-04	5.78E-04	1.05E-04	1.43E-02	4.28E-03	3.58E-03	6.99E-04	1.44E-02	1.39E-03	1.39E-03	5.00E-08
933	583995.23	2960236.29	1.47E-02	2.81E-03	2.80E-03	9.74E-06	1.46E-02	6.62E-03	5.10E-03	1.52E-03	1.47E-02	6.99E-04	5.92E-04	1.07E-04	1.47E-02	4.36E-03	3.65E-03	7.06E-04	1.47E-02	1.42E-03	1.42E-03	4.53E-08
934	584095.23	2960236.29	1.50E-02	2.86E-03	2.86E-03	8.53E-06	1.50E-02	6.77E-03	5.22E-03	1.55E-03	1.50E-02	7.15E-04	6.06E-04	1.08E-04	1.50E-02	4.43E-03	3.72E-03	7.12E-04	1.50E-02	1.45E-03	1.45E-03	3.97E-08
935	584195.23	2960236.29	1.52E-02	2.91E-03	2.90E-03	7.96E-06	1.52E-02	6.91E-03	5.32E-03	1.59E-03	1.53E-02	7.30E-04	6.19E-04	1.11E-04	1.52E-02	4.50E-03	3.78E-03	7.22E-04	1.53E-02	1.47E-03	1.47E-03	3.70E-08
936	584295.23	2960236.29	1.54E-02	2.93E-03	2.93E-03	8.63E-06	1.54E-02	7.07E-03	5.41E-03	1.66E-03	1.54E-02	7.44E-04	6.29E-04	1.16E-04	1.54E-02	4.56E-03	3.82E-03	7.45E-04	1.54E-02	1.47E-03	1.47E-03	4.01E-08
937	584395.23	2960236.29	1.54E-02	2.93E-03	2.92E-03	9.63E-06	1.54E-02	7.21E-03	5.46E-03	1.75E-03	1.55E-02	7.55E-04	6.34E-04	1.22E-04	1.54E-02	4.62E-03	3.84E-03	7.77E-04	1.54E-02	1.46E-03	1.46E-03	4.48E-08
938	584495.23	2960236.29	1.53E-02	2.88E-03	2.87E-03	9.08E-06	1.53E-02	7.30E-03	5.46E-03	1.84E-03	1.53E-02	7.60E-04	6.32E-04	1.28E-04	1.53E-02	4.64E-03	3.84E-03	8.05E-04	1.53E-02	1.42E-03	1.42E-03	4.22E-08
988	583395.23	2960336.29	1.41E-02	2.74E-03	2.73E-03	6.19E-06	1.41E-02	6.09E-03	5.06E-03	1.03E-03	1.41E-02	6.45E-04										

Solid Waste Authority Palm Beach Renewable Energy Facility No. 2
Refurbished Stack

Annual
Waterbody #7 - Localized Area Within Grassy Waters Wetlands

Receptor ID	X	Y	Vapor Phase				Particle Phase				Particle Bound Phase				Divalent Mercury Vapor Phase				Elemental Mercury Vapor Phase			
			AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO
1171	583395.23	2960636.29	1.84E-02	3.62E-03	3.62E-03	5.73E-06	1.84E-02	7.96E-03	6.87E-03	1.09E-03	1.84E-02	8.43E-04	7.65E-04	7.72E-05	1.84E-02	5.25E-03	4.72E-03	5.30E-04	1.84E-02	1.87E-03	1.87E-03	2.66E-08
1172	583495.23	2960636.29	1.91E-02	3.76E-03	3.75E-03	5.37E-06	1.91E-02	8.25E-03	7.12E-03	1.12E-03	1.91E-02	8.76E-04	7.97E-04	7.94E-05	1.91E-02	5.43E-03	4.89E-03	5.42E-04	1.91E-02	1.95E-03	1.95E-03	2.49E-08
1173	583595.23	2960636.29	1.98E-02	3.90E-03	3.89E-03	5.10E-06	1.98E-02	8.54E-03	7.37E-03	1.17E-03	1.98E-02	9.10E-04	8.28E-04	8.24E-05	1.98E-02	5.61E-03	5.05E-03	5.58E-04	1.98E-02	2.02E-03	2.02E-03	2.37E-08
1174	583695.23	2960636.29	2.05E-02	4.03E-03	4.03E-03	5.03E-06	2.05E-02	8.84E-03	7.61E-03	1.23E-03	2.06E-02	9.45E-04	8.58E-04	8.66E-05	2.05E-02	5.79E-03	5.21E-03	5.82E-04	2.05E-02	2.08E-03	2.08E-03	2.34E-08
1175	583795.23	2960636.29	2.12E-02	4.16E-03	4.15E-03	5.33E-06	2.12E-02	9.16E-03	7.84E-03	1.32E-03	2.12E-02	9.80E-04	8.88E-04	9.26E-05	2.12E-02	5.98E-03	5.36E-03	6.16E-04	2.12E-02	2.15E-03	2.15E-03	2.48E-08
1176	583895.23	2960636.29	2.19E-02	4.28E-03	4.27E-03	6.25E-06	2.18E-02	9.49E-03	8.04E-03	1.45E-03	2.19E-02	1.02E-03	9.15E-04	1.01E-04	2.18E-02	6.17E-03	5.50E-03	6.67E-04	2.19E-02	2.21E-03	2.21E-03	2.90E-08
1177	583995.23	2960636.29	2.25E-02	4.39E-03	4.38E-03	8.15E-06	2.24E-02	9.85E-03	8.21E-03	1.64E-03	2.25E-02	1.05E-03	9.39E-04	1.14E-04	2.25E-02	6.36E-03	5.62E-03	7.40E-04	2.25E-02	2.26E-03	2.26E-03	3.79E-08
1178	584095.23	2960636.29	2.30E-02	4.48E-03	4.47E-03	1.11E-05	2.30E-02	1.02E-02	8.34E-03	1.90E-03	2.30E-02	1.09E-03	9.59E-04	1.32E-04	2.30E-02	6.56E-03	5.72E-03	8.38E-04	2.30E-02	2.30E-03	2.30E-03	5.15E-08
1179	584195.23	2960636.29	2.34E-02	4.55E-03	4.53E-03	1.42E-05	2.34E-02	1.06E-02	8.43E-03	2.18E-03	2.35E-02	1.13E-03	9.75E-04	1.51E-04	2.34E-02	6.75E-03	5.80E-03	9.45E-04	2.35E-02	2.32E-03	2.32E-03	6.58E-08
1180	584295.23	2960636.29	2.38E-02	4.59E-03	4.58E-03	1.62E-05	2.37E-02	1.09E-02	8.48E-03	2.45E-03	2.38E-02	1.15E-03	9.86E-04	1.69E-04	2.37E-02	6.89E-03	5.85E-03	1.04E-03	2.38E-02	2.34E-03	2.34E-03	7.55E-08
1181	584395.23	2960636.29	2.39E-02	4.61E-03	4.59E-03	1.77E-05	2.39E-02	1.12E-02	8.48E-03	2.70E-03	2.39E-02	1.18E-03	9.90E-04	1.85E-04	2.39E-02	7.00E-03	5.87E-03	1.13E-03	2.39E-02	2.33E-03	2.33E-03	8.24E-08
1182	584495.23	2960636.29	2.38E-02	4.58E-03	4.56E-03	1.70E-05	2.38E-02	1.13E-02	8.42E-03	2.86E-03	2.39E-02	1.18E-03	9.87E-04	1.96E-04	2.38E-02	7.01E-03	5.83E-03	1.18E-03	2.38E-02	2.31E-03	2.31E-03	7.90E-08
1183	584595.23	2960636.29	2.34E-02	4.48E-03	4.47E-03	1.40E-05	2.34E-02	1.12E-02	8.26E-03	2.93E-03	2.34E-02	1.17E-03	9.72E-04	2.01E-04	2.34E-02	6.92E-03	5.73E-03	1.20E-03	2.34E-02	2.25E-03	2.25E-03	6.50E-08
1232	583395.23	2960736.29	1.98E-02	3.91E-03	3.90E-03	7.98E-06	1.98E-02	8.68E-03	7.44E-03	1.24E-03	1.99E-02	9.15E-04	8.27E-04	8.74E-05	1.98E-02	5.67E-03	5.08E-03	5.89E-04	1.98E-02	2.01E-03	2.01E-03	3.71E-08
1233	583495.23	2960736.29	2.07E-02	4.08E-03	4.08E-03	7.79E-06	2.07E-02	9.06E-03	7.78E-03	1.29E-03	2.08E-02	9.58E-04	8.68E-04	9.05E-05	2.07E-02	5.90E-03	5.29E-03	6.06E-04	2.07E-02	2.10E-03	2.10E-03	3.62E-08
1234	583595.23	2960736.29	2.16E-02	4.27E-03	4.26E-03	7.43E-06	2.16E-02	9.45E-03	8.13E-03	1.33E-03	2.17E-02	1.00E-03	9.09E-04	9.34E-05	2.16E-02	6.14E-03	5.52E-03	6.21E-04	2.17E-02	2.20E-03	2.20E-03	3.46E-08
1235	583695.23	2960736.29	2.26E-02	4.45E-03	4.44E-03	6.95E-06	2.26E-02	9.84E-03	8.47E-03	1.37E-03	2.26E-02	1.05E-03	9.51E-04	9.62E-05	2.26E-02	6.38E-03	5.74E-03	6.36E-04	2.26E-02	2.30E-03	2.30E-03	3.23E-08
1236	583795.23	2960736.29	2.35E-02	4.64E-03	4.63E-03	6.44E-06	2.35E-02	1.02E-02	8.81E-03	1.42E-03	2.36E-02	1.09E-03	9.93E-04	9.95E-05	2.35E-02	6.62E-03	5.96E-03	6.53E-04	2.36E-02	2.39E-03	2.39E-03	2.99E-08
1237	583895.23	2960736.29	2.45E-02	4.81E-03	4.81E-03	6.09E-06	2.44E-02	1.06E-02	9.13E-03	1.49E-03	2.45E-02	1.14E-03	1.03E-03	1.04E-04	2.45E-02	6.85E-03	6.17E-03	6.78E-04	2.45E-02	2.48E-03	2.48E-03	2.83E-08
1238	583995.23	2960736.29	2.53E-02	4.98E-03	4.97E-03	6.12E-06	2.53E-02	1.10E-02	9.41E-03	1.59E-03	2.54E-02	1.18E-03	1.07E-03	1.11E-04	2.53E-02	7.08E-03	6.36E-03	7.16E-04	2.54E-02	2.57E-03	2.57E-03	2.85E-08
1239	584095.23	2960736.29	2.61E-02	5.11E-03	5.11E-03	6.93E-06	2.61E-02	1.14E-02	9.64E-03	1.75E-03	2.61E-02	1.22E-03	1.10E-03	1.22E-04	2.61E-02	7.30E-03	6.52E-03	7.75E-04	2.61E-02	2.63E-03	2.63E-03	3.22E-08
1240	584195.23	2960736.29	2.67E-02	5.21E-03	5.20E-03	9.14E-06	2.67E-02	1.18E-02	9.79E-03	2.00E-03	2.67E-02	1.26E-03	1.12E-03	1.38E-04	2.67E-02	7.50E-03	6.63E-03	8.68E-04	2.67E-02	2.68E-03	2.68E-03	4.25E-08
1241	584295.23	2960736.29	2.71E-02	5.27E-03	5.25E-03	1.31E-05	2.71E-02	1.22E-02	9.83E-03	2.36E-03	2.71E-02	1.30E-03	1.14E-03	1.63E-04	2.71E-02	7.69E-03	6.69E-03	1.00E-03	2.71E-02	2.69E-03	2.69E-03	6.08E-08
1242	584395.23	2960736.29	2.71E-02	5.26E-03	5.24E-03	1.73E-05	2.71E-02	1.25E-02	9.76E-03	2.77E-03	2.72E-02	1.33E-03	1.14E-03	1.90E-04	2.71E-02	7.81E-03	6.66E-03	1.15E-03	2.71E-02	2.68E-03	2.68E-03	8.03E-08
1243	584495.23	2960736.29	2.68E-02	5.17E-03	5.15E-03	2.01E-05	2.68E-02	1.27E-02	9.55E-03	3.16E-03	2.68E-02	1.34E-03	1.1									

Solid Waste Authority Palm Beach Renewable Energy Facility No. 2
Refurbished Stack

Annual
Waterbody #7 - Localized Area Within Grassy Waters Wetlands

Receptor ID	X	Y	Vapor Phase				Particle Phase				Particle Bound Phase				Divalent Mercury Vapor Phase				Elemental Mercury Vapor Phase			
			AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO
1424	584295.23	2961036.29	3.97E-02	7.83E-03	7.81E-03	1.67E-05	3.97E-02	1.79E-02	1.50E-02	2.87E-03	3.98E-02	1.91E-03	1.71E-03	1.97E-04	3.97E-02	1.11E-02	9.95E-03	1.18E-03	3.97E-02	3.98E-03	3.98E-03	7.77E-08
1425	584395.23	2961036.29	4.09E-02	8.04E-03	8.02E-03	1.81E-05	4.09E-02	1.86E-02	1.54E-02	3.20E-03	4.09E-02	1.99E-03	1.77E-03	2.19E-04	4.09E-02	1.15E-02	1.02E-02	1.29E-03	4.09E-02	4.08E-03	4.08E-03	8.42E-08
1426	584495.23	2961036.29	4.10E-02	8.04E-03	8.02E-03	1.91E-05	4.10E-02	1.89E-02	1.54E-02	3.56E-03	4.10E-02	2.02E-03	1.77E-03	2.43E-04	4.10E-02	1.16E-02	1.02E-02	1.42E-03	4.10E-02	4.07E-03	4.07E-03	8.86E-08
1427	584595.23	2961036.29	3.94E-02	7.67E-03	7.65E-03	1.87E-05	3.94E-02	1.85E-02	1.45E-02	3.91E-03	3.94E-02	1.96E-03	1.69E-03	2.67E-04	3.94E-02	1.12E-02	9.69E-03	1.54E-03	3.94E-02	3.87E-03	3.87E-03	8.69E-08
1476	583395.23	2961136.29	2.39E-02	4.69E-03	4.67E-03	1.48E-05	2.39E-02	1.03E-02	8.87E-03	1.44E-03	2.39E-02	1.09E-03	9.92E-04	1.01E-04	2.39E-02	6.76E-03	6.07E-03	6.89E-04	2.39E-02	2.35E-03	2.35E-03	6.87E-08
1477	583495.23	2961136.29	2.55E-02	5.00E-03	4.99E-03	1.55E-05	2.54E-02	1.10E-02	9.48E-03	1.54E-03	2.55E-02	1.17E-03	1.06E-03	1.08E-04	2.54E-02	7.19E-03	6.47E-03	7.27E-04	2.55E-02	2.50E-03	2.50E-03	7.19E-08
1478	583595.23	2961136.29	2.72E-02	5.35E-03	5.33E-03	1.62E-05	2.72E-02	1.18E-02	1.01E-02	1.65E-03	2.72E-02	1.25E-03	1.14E-03	1.16E-04	2.72E-02	7.66E-03	6.89E-03	7.69E-04	2.72E-02	2.68E-03	2.68E-03	7.53E-08
1479	583695.23	2961136.29	2.91E-02	5.73E-03	5.71E-03	1.70E-05	2.91E-02	1.27E-02	1.09E-02	1.78E-03	2.92E-02	1.35E-03	1.22E-03	1.24E-04	2.91E-02	8.18E-03	7.37E-03	8.15E-04	2.91E-02	2.87E-03	2.87E-03	7.89E-08
1480	583795.23	2961136.29	3.12E-02	6.14E-03	6.12E-03	1.78E-05	3.12E-02	1.36E-02	1.17E-02	1.93E-03	3.12E-02	1.45E-03	1.32E-03	1.34E-04	3.12E-02	8.75E-03	7.88E-03	8.67E-04	3.12E-02	3.08E-03	3.08E-03	8.28E-08
1481	583895.23	2961136.29	3.35E-02	6.59E-03	6.57E-03	1.87E-05	3.34E-02	1.46E-02	1.26E-02	2.09E-03	3.35E-02	1.56E-03	1.42E-03	1.45E-04	3.34E-02	9.37E-03	8.44E-03	9.25E-04	3.35E-02	3.30E-03	3.30E-03	8.68E-08
1482	583995.23	2961136.29	3.59E-02	7.07E-03	7.05E-03	1.96E-05	3.59E-02	1.58E-02	1.35E-02	2.28E-03	3.59E-02	1.68E-03	1.53E-03	1.58E-04	3.59E-02	1.00E-02	9.04E-03	9.90E-04	3.59E-02	3.55E-03	3.55E-03	9.10E-08
1483	584095.23	2961136.29	3.84E-02	7.57E-03	7.55E-03	2.05E-05	3.84E-02	1.70E-02	1.45E-02	2.49E-03	3.84E-02	1.81E-03	1.64E-03	1.72E-04	3.84E-02	1.07E-02	9.66E-03	1.06E-03	3.84E-02	3.80E-03	3.80E-03	9.53E-08
1484	584195.23	2961136.29	4.09E-02	8.07E-03	8.05E-03	2.14E-05	4.09E-02	1.82E-02	1.54E-02	2.74E-03	4.10E-02	1.94E-03	1.75E-03	1.88E-04	4.09E-02	1.14E-02	1.03E-02	1.15E-03	4.10E-02	4.05E-03	4.05E-03	9.96E-08
1485	584295.23	2961136.29	4.32E-02	8.52E-03	8.50E-03	2.24E-05	4.32E-02	1.94E-02	1.63E-02	3.03E-03	4.33E-02	2.07E-03	1.86E-03	2.08E-04	4.32E-02	1.21E-02	1.08E-02	1.25E-03	4.33E-02	4.28E-03	4.28E-03	1.04E-07
1486	584395.23	2961136.29	4.50E-02	8.86E-03	8.84E-03	2.34E-05	4.50E-02	2.04E-02	1.70E-02	3.38E-03	4.50E-02	2.17E-03	1.94E-03	2.31E-04	4.50E-02	1.26E-02	1.13E-02	1.37E-03	4.50E-02	4.44E-03	4.44E-03	1.09E-07
1487	584495.23	2961136.29	4.57E-02	8.98E-03	8.95E-03	2.47E-05	4.58E-02	2.10E-02	1.72E-02	3.83E-03	4.58E-02	2.24E-03	1.98E-03	2.61E-04	4.57E-02	1.29E-02	1.14E-02	1.52E-03	4.58E-02	4.49E-03	4.49E-03	1.15E-07
1488	584595.23	2961136.29	4.45E-02	8.68E-03	8.66E-03	2.64E-05	4.46E-02	2.09E-02	1.65E-02	4.40E-03	4.46E-02	2.22E-03	1.92E-03	2.99E-04	4.45E-02	1.27E-02	1.10E-02	1.71E-03	4.46E-02	4.33E-03	4.33E-03	1.23E-07
1537	583395.23	2961236.29	2.43E-02	4.77E-03	4.76E-03	1.32E-05	2.43E-02	1.03E-02	8.98E-03	1.37E-03	2.44E-02	1.10E-03	1.01E-03	9.67E-05	2.43E-02	6.83E-03	6.18E-03	6.54E-04	2.44E-02	2.37E-03	2.37E-03	6.15E-08
1538	583495.23	2961236.29	2.60E-02	5.11E-03	5.09E-03	1.39E-05	2.60E-02	1.11E-02	9.61E-03	1.47E-03	2.61E-02	1.18E-03	1.08E-03	1.03E-04	2.60E-02	7.28E-03	6.59E-03	6.91E-04	2.60E-02	2.54E-03	2.54E-03	6.48E-08
1539	583595.23	2961236.29	2.78E-02	5.47E-03	5.46E-03	1.47E-05	2.78E-02	1.19E-02	1.03E-02	1.58E-03	2.79E-02	1.27E-03	1.16E-03	1.11E-04	2.78E-02	7.78E-03	7.05E-03	7.32E-04	2.79E-02	2.72E-03	2.72E-03	6.85E-08
1540	583695.23	2961236.29	2.99E-02	5.88E-03	5.86E-03	1.56E-05	2.99E-02	1.28E-02	1.11E-02	1.71E-03	2.99E-02	1.37E-03	1.25E-03	1.19E-04	2.99E-02	8.33E-03	7.55E-03	7.79E-04	2.99E-02	2.92E-03	2.92E-03	7.26E-08
1541	583795.23	2961236.29	3.21E-02	6.33E-03	6.31E-03	1.66E-05	3.21E-02	1.38E-02	1.20E-02	1.85E-03	3.22E-02	1.48E-03	1.35E-03	1.29E-04	3.21E-02	8.94E-03	8.11E-03	8.31E-04	3.22E-02	3.14E-03	3.14E-03	7.72E-08
1542	583895.23	2961236.29	3.46E-02	6.82E-03	6.80E-03	1.77E-05	3.46E-02	1.49E-02	1.29E-02	2.02E-03	3.47E-02	1.60E-03	1.46E-03	1.40E-04	3.46E-02	9.61E-03	8.72E-03	8.91E-04	3.46E-02	3.38E-03	3.38E-03	8.25E-08
1543	583995.23	2961236.29	3.73E-02	7.34E-03	7.33E-03	1.91E-05	3.72E-02	1.61E-02	1.39E-02	2.21E-03	3.73E-02	1.73E-03	1.58E-03	1.53E-04	3.72E-02	1.03E-02	9.38E-03	9.60E-04	3.73E-02	3.65E-03	3.65E-03	8.86E-08
1544	584095.23	2961236.29	4.01E-02	7.90E-03	7.88E-03	2.06E-05	4.01E-02	1.74E-02	1.50E-02	2.43E-03	4.01E-02	1.87E-03	1.7									

Solid Waste Authority Palm Beach Renewable Energy Facility No. 2
Refurbished Stack

Annual
Waterbody #7 - Localized Area Within Grassy Waters Wetlands

Receptor ID			Vapor Phase				Particle Phase				Particle Bound Phase				Divalent Mercury Vapor Phase				Elemental Mercury Vapor Phase			
	X	Y	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO
1725	583895.23	2961536.29	3.49E-02	6.93E-03	6.91E-03	1.59E-05	3.48E-02	1.47E-02	1.28E-02	1.93E-03	3.49E-02	1.60E-03	1.46E-03	1.34E-04	3.48E-02	9.68E-03	8.81E-03	8.69E-04	3.49E-02	3.35E-03	3.35E-03	7.40E-08
1726	583995.23	2961536.29	3.76E-02	7.49E-03	7.47E-03	1.67E-05	3.76E-02	1.59E-02	1.38E-02	2.11E-03	3.77E-02	1.73E-03	1.58E-03	1.47E-04	3.76E-02	1.04E-02	9.51E-03	9.36E-04	3.76E-02	3.61E-03	3.61E-03	7.79E-08
1727	584095.23	2961536.29	4.06E-02	8.09E-03	8.07E-03	1.75E-05	4.05E-02	1.72E-02	1.49E-02	2.34E-03	4.06E-02	1.87E-03	1.71E-03	1.62E-04	4.05E-02	1.13E-02	1.02E-02	1.01E-03	4.06E-02	3.89E-03	3.89E-03	8.15E-08
1728	584195.23	2961536.29	4.36E-02	8.71E-03	8.69E-03	1.82E-05	4.36E-02	1.86E-02	1.60E-02	2.60E-03	4.37E-02	2.03E-03	1.85E-03	1.79E-04	4.36E-02	1.21E-02	1.10E-02	1.10E-03	4.37E-02	4.18E-03	4.18E-03	8.44E-08
1729	584295.23	2961536.29	4.67E-02	9.33E-03	9.31E-03	1.84E-05	4.67E-02	2.01E-02	1.72E-02	2.90E-03	4.67E-02	2.18E-03	1.98E-03	2.00E-04	4.67E-02	1.30E-02	1.18E-02	1.21E-03	4.67E-02	4.47E-03	4.47E-03	8.57E-08
1730	584395.23	2961536.29	4.95E-02	9.90E-03	9.88E-03	1.80E-05	4.95E-02	2.14E-02	1.82E-02	3.25E-03	4.95E-02	2.33E-03	2.11E-03	2.23E-04	4.95E-02	1.38E-02	1.25E-02	1.33E-03	4.95E-02	4.73E-03	4.73E-03	8.37E-08
1731	584495.23	2961536.29	5.17E-02	1.03E-02	1.03E-02	1.67E-05	5.17E-02	2.26E-02	1.90E-02	3.64E-03	5.18E-02	2.46E-03	2.21E-03	2.49E-04	5.17E-02	1.45E-02	1.30E-02	1.46E-03	5.17E-02	4.91E-03	4.91E-03	7.75E-08
1732	584595.23	2961536.29	5.27E-02	1.05E-02	1.05E-02	1.52E-05	5.27E-02	2.33E-02	1.92E-02	4.13E-03	5.27E-02	2.53E-03	2.25E-03	2.82E-04	5.27E-02	1.49E-02	1.33E-02	1.64E-03	5.27E-02	4.95E-03	4.95E-03	7.04E-08
1781	583395.23	2961636.29	2.41E-02	4.76E-03	4.75E-03	1.19E-05	2.40E-02	1.00E-02	8.70E-03	1.30E-03	2.41E-02	1.08E-03	9.89E-04	9.21E-05	2.40E-02	6.75E-03	6.11E-03	6.37E-04	2.41E-02	2.30E-03	2.30E-03	5.55E-08
1782	583495.23	2961636.29	2.57E-02	5.09E-03	5.08E-03	1.24E-05	2.57E-02	1.07E-02	9.31E-03	1.40E-03	2.58E-02	1.16E-03	1.06E-03	9.86E-05	2.57E-02	7.20E-03	6.52E-03	6.73E-04	2.57E-02	2.46E-03	2.46E-03	5.77E-08
1783	583595.23	2961636.29	2.75E-02	5.47E-03	5.45E-03	1.28E-05	2.75E-02	1.15E-02	1.00E-02	1.51E-03	2.76E-02	1.25E-03	1.14E-03	1.06E-04	2.75E-02	7.70E-03	6.99E-03	7.12E-04	2.76E-02	2.63E-03	2.63E-03	5.97E-08
1784	583695.23	2961636.29	2.96E-02	5.88E-03	5.87E-03	1.32E-05	2.95E-02	1.24E-02	1.08E-02	1.63E-03	2.96E-02	1.34E-03	1.23E-03	1.14E-04	2.95E-02	8.26E-03	7.50E-03	7.56E-04	2.96E-02	2.83E-03	2.83E-03	6.15E-08
1785	583795.23	2961636.29	3.18E-02	6.34E-03	6.32E-03	1.36E-05	3.18E-02	1.34E-02	1.16E-02	1.77E-03	3.19E-02	1.45E-03	1.33E-03	1.24E-04	3.18E-02	8.87E-03	8.07E-03	8.07E-04	3.19E-02	3.05E-03	3.04E-03	6.32E-08
1786	583895.23	2961636.29	3.43E-02	6.84E-03	6.82E-03	1.38E-05	3.43E-02	1.44E-02	1.25E-02	1.94E-03	3.43E-02	1.57E-03	1.44E-03	1.35E-04	3.43E-02	9.55E-03	8.69E-03	8.64E-04	3.43E-02	3.28E-03	3.28E-03	6.43E-08
1787	583995.23	2961636.29	3.70E-02	7.39E-03	7.37E-03	1.39E-05	3.69E-02	1.56E-02	1.35E-02	2.12E-03	3.70E-02	1.70E-03	1.55E-03	1.47E-04	3.70E-02	1.03E-02	9.37E-03	9.29E-04	3.70E-02	3.54E-03	3.54E-03	6.44E-08
1788	584095.23	2961636.29	3.99E-02	7.98E-03	7.96E-03	1.35E-05	3.98E-02	1.69E-02	1.46E-02	2.32E-03	3.99E-02	1.84E-03	1.68E-03	1.61E-04	3.98E-02	1.11E-02	1.01E-02	9.99E-04	3.99E-02	3.81E-03	3.81E-03	6.27E-08
1789	584195.23	2961636.29	4.29E-02	8.60E-03	8.58E-03	1.26E-05	4.29E-02	1.83E-02	1.57E-02	2.52E-03	4.30E-02	1.99E-03	1.81E-03	1.75E-04	4.29E-02	1.20E-02	1.09E-02	1.07E-03	4.29E-02	4.10E-03	4.10E-03	5.87E-08
1790	584295.23	2961636.29	4.60E-02	9.22E-03	9.21E-03	1.16E-05	4.60E-02	1.96E-02	1.69E-02	2.76E-03	4.60E-02	2.14E-03	1.95E-03	1.91E-04	4.59E-02	1.28E-02	1.17E-02	1.16E-03	4.60E-02	4.38E-03	4.38E-03	5.37E-08
1791	584395.23	2961636.29	4.89E-02	9.80E-03	9.79E-03	1.09E-05	4.88E-02	2.10E-02	1.80E-02	3.07E-03	4.89E-02	2.29E-03	2.08E-03	2.11E-04	4.88E-02	1.37E-02	1.24E-02	1.27E-03	4.89E-02	4.64E-03	4.64E-03	5.08E-08
1792	584495.23	2961636.29	5.12E-02	1.03E-02	1.02E-02	1.15E-05	5.12E-02	2.24E-02	1.88E-02	3.51E-03	5.13E-02	2.43E-03	2.19E-03	2.41E-04	5.12E-02	1.45E-02	1.30E-02	1.43E-03	5.13E-02	4.83E-03	4.83E-03	5.34E-08
1793	584595.23	2961636.29	5.25E-02	1.05E-02	1.05E-02	1.45E-05	5.26E-02	2.34E-02	1.93E-02	4.13E-03	5.26E-02	2.53E-03	2.25E-03	2.82E-04	5.25E-02	1.50E-02	1.34E-02	1.65E-03	5.26E-02	4.91E-03	4.91E-03	6.74E-08
1842	583395.23	2961736.29	2.36E-02	4.69E-03	4.68E-03	1.08E-05	2.36E-02	9.82E-03	8.52E-03	1.31E-03	2.37E-02	1.06E-03	9.71E-04	9.25E-05	2.36E-02	6.64E-03	6.01E-03	6.34E-04	2.37E-02	2.26E-03	2.25E-03	5.04E-08
1843	583495.23	2961736.29	2.53E-02	5.02E-03	5.01E-03	1.10E-05	2.52E-02	1.05E-02	9.11E-03	1.41E-03	2.53E-02	1.14E-03	1.04E-03	9.92E-05	2.52E-02	7.09E-03	6.42E-03	6.70E-04	2.53E-02	2.41E-03	2.41E-03	5.13E-08
1844	583595.23	2961736.29	2.70E-02	5.38E-03	5.37E-03	1.11E-05	2.70E-02	1.13E-02	9.78E-03	1.52E-03	2.71E-02	1.23E-03	1.12E-03	1.07E-04	2.70E-02	7.58E-03	6.87E-03	7.09E-04	2.71E-02	2.58E-03	2.58E-03	5.17E-08
1845	583695.23	2961736.29	2.90E-02	5.78E-03	5.77E-03	1.11E-05	2.90E-02	1.21E-02	1.05E-02	1.64E-03												

Solid Waste Authority Palm Beach Renewable Energy Facility No. 2
Refurbished Stack

Annual
Waterbody #7 - Localized Area Within Grassy Waters Wetlands

Receptor ID	X	Y	Vapor Phase				Particle Phase				Particle Bound Phase				Divalent Mercury Vapor Phase				Elemental Mercury Vapor Phase			
			AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO
2026	583495.23	2962036.29	2.36E-02	4.71E-03	4.70E-03	5.40E-06	2.36E-02	9.77E-03	8.46E-03	1.31E-03	2.37E-02	1.06E-03	9.69E-04	9.30E-05	2.36E-02	6.69E-03	6.05E-03	6.34E-04	2.36E-02	2.23E-03	2.23E-03	2.51E-08
2027	583595.23	2962036.29	2.52E-02	5.03E-03	5.02E-03	5.52E-06	2.51E-02	1.05E-02	9.05E-03	1.41E-03	2.52E-02	1.14E-03	1.04E-03	9.98E-05	2.51E-02	7.13E-03	6.46E-03	6.74E-04	2.52E-02	2.38E-03	2.38E-03	2.56E-08
2028	583695.23	2962036.29	2.69E-02	5.37E-03	5.36E-03	5.82E-06	2.68E-02	1.12E-02	9.69E-03	1.52E-03	2.69E-02	1.22E-03	1.11E-03	1.07E-04	2.68E-02	7.63E-03	6.91E-03	7.20E-04	2.69E-02	2.54E-03	2.54E-03	2.70E-08
2029	583795.23	2962036.29	2.87E-02	5.74E-03	5.73E-03	6.40E-06	2.87E-02	1.20E-02	1.04E-02	1.65E-03	2.88E-02	1.31E-03	1.19E-03	1.16E-04	2.87E-02	8.16E-03	7.39E-03	7.72E-04	2.87E-02	2.70E-03	2.70E-03	2.98E-08
2030	583895.23	2962036.29	3.07E-02	6.13E-03	6.12E-03	7.55E-06	3.06E-02	1.30E-02	1.11E-02	1.81E-03	3.07E-02	1.41E-03	1.28E-03	1.27E-04	3.06E-02	8.74E-03	7.91E-03	8.37E-04	3.07E-02	2.88E-03	2.88E-03	3.51E-08
2031	583995.23	2962036.29	3.27E-02	6.53E-03	6.52E-03	9.51E-06	3.27E-02	1.40E-02	1.19E-02	2.01E-03	3.28E-02	1.51E-03	1.37E-03	1.41E-04	3.27E-02	9.37E-03	8.45E-03	9.20E-04	3.27E-02	3.06E-03	3.06E-03	4.42E-08
2032	584095.23	2962036.29	3.48E-02	6.93E-03	6.92E-03	1.23E-05	3.48E-02	1.50E-02	1.28E-02	2.26E-03	3.48E-02	1.62E-03	1.46E-03	1.58E-04	3.48E-02	1.00E-02	9.01E-03	1.02E-03	3.48E-02	3.24E-03	3.24E-03	5.70E-08
2033	584195.23	2962036.29	3.69E-02	7.31E-03	7.30E-03	1.61E-05	3.68E-02	1.61E-02	1.36E-02	2.54E-03	3.69E-02	1.73E-03	1.56E-03	1.77E-04	3.68E-02	1.07E-02	9.57E-03	1.13E-03	3.69E-02	3.40E-03	3.40E-03	7.47E-08
2034	584295.23	2962036.29	3.88E-02	7.64E-03	7.62E-03	2.03E-05	3.87E-02	1.72E-02	1.44E-02	2.80E-03	3.88E-02	1.84E-03	1.65E-03	1.94E-04	3.87E-02	1.13E-02	1.01E-02	1.24E-03	3.88E-02	3.53E-03	3.53E-03	9.42E-08
2035	584395.23	2962036.29	4.04E-02	7.84E-03	7.82E-03	1.88E-05	4.04E-02	1.80E-02	1.51E-02	2.93E-03	4.04E-02	1.93E-03	1.72E-03	2.03E-04	4.04E-02	1.19E-02	1.06E-02	1.27E-03	4.04E-02	3.59E-03	3.59E-03	8.74E-08
2036	584495.23	2962036.29	4.16E-02	7.85E-03	7.84E-03	1.38E-05	4.15E-02	1.86E-02	1.56E-02	3.05E-03	4.16E-02	1.99E-03	1.78E-03	2.11E-04	4.15E-02	1.23E-02	1.10E-02	1.29E-03	4.16E-02	3.53E-03	3.53E-03	6.44E-08
2037	584595.23	2962036.29	4.20E-02	7.57E-03	7.56E-03	1.64E-05	4.19E-02	1.93E-02	1.59E-02	3.49E-03	4.20E-02	2.05E-03	1.81E-03	2.41E-04	4.19E-02	1.27E-02	1.13E-02	1.45E-03	4.20E-02	3.30E-03	3.30E-03	7.63E-08
2086	583395.23	2962136.29	2.16E-02	4.31E-03	4.30E-03	4.94E-06	2.16E-02	8.93E-03	7.71E-03	1.22E-03	2.17E-02	9.70E-04	8.83E-04	8.70E-05	2.16E-02	6.16E-03	5.55E-03	6.03E-04	2.16E-02	2.04E-03	2.04E-03	2.30E-08
2087	583495.23	2962136.29	2.30E-02	4.58E-03	4.57E-03	5.19E-06	2.29E-02	9.53E-03	8.22E-03	1.31E-03	2.30E-02	1.03E-03	9.42E-04	9.30E-05	2.29E-02	6.55E-03	5.91E-03	6.40E-04	2.30E-02	2.16E-03	2.16E-03	2.41E-08
2088	583595.23	2962136.29	2.44E-02	4.87E-03	4.86E-03	5.64E-06	2.44E-02	1.02E-02	8.77E-03	1.41E-03	2.45E-02	1.11E-03	1.01E-03	9.97E-05	2.44E-02	6.97E-03	6.29E-03	6.81E-04	2.44E-02	2.29E-03	2.29E-03	2.62E-08
2089	583695.23	2962136.29	2.60E-02	5.18E-03	5.17E-03	6.46E-06	2.59E-02	1.09E-02	9.37E-03	1.52E-03	2.60E-02	1.18E-03	1.07E-03	1.08E-04	2.59E-02	7.43E-03	6.70E-03	7.30E-04	2.60E-02	2.44E-03	2.44E-03	3.00E-08
2090	583795.23	2962136.29	2.76E-02	5.51E-03	5.50E-03	7.85E-06	2.76E-02	1.17E-02	1.00E-02	1.67E-03	2.77E-02	1.27E-03	1.15E-03	1.18E-04	2.76E-02	7.93E-03	7.14E-03	7.91E-04	2.77E-02	2.58E-03	2.58E-03	3.65E-08
2091	583895.23	2962136.29	2.94E-02	5.85E-03	5.84E-03	9.83E-06	2.93E-02	1.25E-02	1.07E-02	1.85E-03	2.94E-02	1.36E-03	1.22E-03	1.30E-04	2.93E-02	8.47E-03	7.60E-03	8.67E-04	2.94E-02	2.74E-03	2.74E-03	4.57E-08
2092	583995.23	2962136.29	3.11E-02	6.19E-03	6.17E-03	1.24E-05	3.11E-02	1.34E-02	1.14E-02	2.06E-03	3.12E-02	1.45E-03	1.30E-03	1.44E-04	3.11E-02	9.03E-03	8.08E-03	9.50E-04	3.12E-02	2.88E-03	2.88E-03	5.75E-08
2093	584095.23	2962136.29	3.29E-02	6.51E-03	6.49E-03	1.58E-05	3.29E-02	1.44E-02	1.21E-02	2.27E-03	3.30E-02	1.54E-03	1.38E-03	1.59E-04	3.29E-02	9.61E-03	8.57E-03	1.04E-03	3.29E-02	3.02E-03	3.02E-03	7.35E-08
2094	584195.23	2962136.29	3.46E-02	6.79E-03	6.77E-03	1.84E-05	3.46E-02	1.52E-02	1.28E-02	2.46E-03	3.47E-02	1.63E-03	1.46E-03	1.71E-04	3.46E-02	1.02E-02	9.05E-03	1.11E-03	3.47E-02	3.13E-03	3.13E-03	8.59E-08
2095	584295.23	2962136.29	3.62E-02	6.99E-03	6.97E-03	1.59E-05	3.61E-02	1.59E-02	1.34E-02	2.53E-03	3.62E-02	1.71E-03	1.53E-03	1.76E-04	3.61E-02	1.06E-02	9.50E-03	1.13E-03	3.62E-02	3.19E-03	3.19E-03	7.41E-08
2096	584395.23	2962136.29	3.74E-02	7.05E-03	7.04E-03	1.22E-05	3.74E-02	1.66E-02	1.40E-02	2.64E-03	3.74E-02	1.78E-03	1.59E-03	1.83E-04	3.74E-02	1.11E-02	9.91E-03	1.15E-03	3.74E-02	3.17E-03	3.17E-03	5.66E-08
2097	584495.23	2962136.29	3.82E-02	6.92E-03	6.91E-03	1.42E-05	3.81E-02	1.73E-02	1.44E-02	2.99E-03	3.82E-02	1.84E-03	1.63E-03	2.07E-04	3.81E-02	1.15E-02	1.03E-02	1.27E-03	3.82E-02	3.02E-03	3.02E-03	6.59E-08
2098	584595.23	2962136.29	3.82E-02	6.50E-03	6.48E-03	2.04E-05	3.82E-02	1.79E-02	1.45E-02	3.46E-03	3.83E-02	1.88E-03	1.64E-03	2.38E-04	3.82E-02	1.19E-02	1.05E-02	1.44E-03	3.83E-02	2.69E-03	2.69E-03	9.48E-08
# of data pts		Average	2.95E-02	5.79E-03	5.78E-03	1.27E-05	2.94E-02	1.29E-02	1.08E-02	2.08E-03	2.95E-02	1.38E-03	1.24E-03	1.44E-04	2.94E-02	8.37E-03	7.46E-03	9.10E-04	2.95E-02	2.83E-03	2.83E-03	5.89E-08
269																						

Solid Waste Authority Palm Beach Renewable Energy Facility No. 2
Refurbished Stack

Annual
Watershed #1 - Typical Canal Watershed

Receptor ID	X	Y	Vapor Phase				Particle Phase				Particle Bound Phase				Divalent Mercury Vapor Phase				Elemental Mercury Vapor Phase			
			AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO
223	586195.23	2959036.29	6.24E-03	5.37E-04	5.32E-04	4.99E-06	6.22E-03	2.59E-03	1.62E-03	9.68E-04	6.25E-03	2.58E-04	1.89E-04	6.89E-05	6.22E-03	2.25E-03	1.76E-03	4.81E-04	6.25E-03	4.90E-05	4.89E-05	2.32E-08
224	586295.23	2959036.29	6.23E-03	5.29E-04	5.24E-04	4.77E-06	6.21E-03	2.55E-03	1.62E-03	9.26E-04	6.23E-03	2.54E-04	1.88E-04	6.59E-05	6.20E-03	2.23E-03	1.76E-03	4.64E-04	6.24E-03	4.37E-05	4.37E-05	2.22E-08
225	586395.23	2959036.29	6.20E-03	5.22E-04	5.17E-04	4.75E-06	6.17E-03	2.53E-03	1.62E-03	9.03E-04	6.20E-03	2.52E-04	1.88E-04	6.43E-05	6.17E-03	2.21E-03	1.75E-03	4.54E-04	6.20E-03	4.02E-05	4.01E-05	2.21E-08
226	586495.23	2959036.29	6.14E-03	5.16E-04	5.11E-04	5.00E-06	6.12E-03	2.53E-03	1.62E-03	9.06E-04	6.15E-03	2.51E-04	1.86E-04	6.46E-05	6.12E-03	2.20E-03	1.74E-03	4.55E-04	6.15E-03	3.76E-05	3.76E-05	2.32E-08
227	586595.23	2959036.29	6.06E-03	5.09E-04	5.03E-04	5.39E-06	6.04E-03	2.52E-03	1.61E-03	9.13E-04	6.06E-03	2.50E-04	1.85E-04	6.52E-05	6.03E-03	2.18E-03	1.72E-03	4.59E-04	6.07E-03	3.56E-05	3.56E-05	2.51E-08
228	586695.23	2959036.29	5.94E-03	5.00E-04	4.94E-04	5.95E-06	5.92E-03	2.51E-03	1.59E-03	9.15E-04	5.95E-03	2.47E-04	1.82E-04	6.53E-05	5.91E-03	2.15E-03	1.69E-03	4.61E-04	5.95E-03	3.40E-05	3.40E-05	2.77E-08
229	586795.23	2959036.29	5.79E-03	4.89E-04	4.82E-04	6.60E-06	5.77E-03	2.47E-03	1.57E-03	9.08E-04	5.79E-03	2.43E-04	1.79E-04	6.49E-05	5.76E-03	2.12E-03	1.66E-03	4.61E-04	5.80E-03	3.27E-05	3.26E-05	3.07E-08
230	586895.23	2959036.29	5.62E-03	4.77E-04	4.70E-04	6.72E-06	5.60E-03	2.41E-03	1.54E-03	8.75E-04	5.63E-03	2.37E-04	1.75E-04	6.26E-05	5.59E-03	2.07E-03	1.62E-03	4.48E-04	5.63E-03	3.14E-05	3.14E-05	3.12E-08
231	586995.23	2959036.29	5.45E-03	4.63E-04	4.57E-04	6.19E-06	5.42E-03	2.32E-03	1.50E-03	8.21E-04	5.45E-03	2.30E-04	1.71E-04	5.88E-05	5.42E-03	2.00E-03	1.58E-03	4.24E-04	5.46E-03	3.02E-05	3.02E-05	2.88E-08
232	587095.23	2959036.29	5.28E-03	4.49E-04	4.44E-04	5.51E-06	5.26E-03	2.23E-03	1.47E-03	7.65E-04	5.29E-03	2.21E-04	1.67E-04	5.49E-05	5.25E-03	1.94E-03	1.54E-03	3.98E-04	5.29E-03	2.91E-05	2.91E-05	2.56E-08
233	587195.23	2959036.29	5.12E-03	4.36E-04	4.30E-04	5.20E-06	5.09E-03	2.15E-03	1.43E-03	7.21E-04	5.12E-03	2.14E-04	1.62E-04	5.18E-05	5.09E-03	1.88E-03	1.50E-03	3.78E-04	5.13E-03	2.81E-05	2.81E-05	2.42E-08
234	587295.23	2959036.29	4.95E-03	4.22E-04	4.17E-04	5.46E-06	4.93E-03	2.08E-03	1.39E-03	6.95E-04	4.96E-03	2.08E-04	1.58E-04	5.00E-05	4.93E-03	1.82E-03	1.46E-03	3.68E-04	4.96E-03	2.71E-05	2.71E-05	2.54E-08
235	587395.23	2959036.29	4.79E-03	4.09E-04	4.03E-04	6.14E-06	4.76E-03	2.03E-03	1.35E-03	6.80E-04	4.79E-03	2.02E-04	1.53E-04	4.90E-05	4.76E-03	1.78E-03	1.41E-03	3.65E-04	4.79E-03	2.61E-05	2.61E-05	2.86E-08
236	587495.23	2959036.29	4.62E-03	3.96E-04	3.90E-04	6.95E-06	4.60E-03	1.97E-03	1.30E-03	6.68E-04	4.63E-03	1.97E-04	1.48E-04	4.83E-05	4.59E-03	1.73E-03	1.36E-03	3.64E-04	4.63E-03	2.52E-05	2.52E-05	3.24E-08
237	587595.23	2959036.29	4.46E-03	3.84E-04	3.76E-04	7.65E-06	4.44E-03	1.91E-03	1.26E-03	6.55E-04	4.47E-03	1.91E-04	1.44E-04	4.74E-05	4.43E-03	1.68E-03	1.32E-03	3.62E-04	4.47E-03	2.44E-05	2.43E-05	3.57E-08
238	587695.23	2959036.29	4.30E-03	3.71E-04	3.63E-04	8.02E-06	4.28E-03	1.85E-03	1.22E-03	6.36E-04	4.31E-03	1.85E-04	1.39E-04	4.61E-05	4.28E-03	1.63E-03	1.27E-03	3.57E-04	4.31E-03	2.35E-05	2.35E-05	3.75E-08
284	586195.23	2959136.29	6.56E-03	5.62E-04	5.57E-04	5.11E-06	6.54E-03	2.74E-03	1.73E-03	1.01E-03	6.57E-03	2.72E-04	2.01E-04	7.18E-05	6.53E-03	2.36E-03	1.86E-03	4.98E-04	6.57E-03	5.01E-05	5.01E-05	2.38E-08
285	586295.23	2959136.29	6.53E-03	5.54E-04	5.49E-04	4.97E-06	6.51E-03	2.70E-03	1.72E-03	9.73E-04	6.54E-03	2.69E-04	2.00E-04	6.91E-05	6.50E-03	2.34E-03	1.86E-03	4.82E-04	6.54E-03	4.51E-05	4.51E-05	2.31E-08
286	586395.23	2959136.29	6.48E-03	5.47E-04	5.41E-04	5.09E-06	6.46E-03	2.68E-03	1.72E-03	9.61E-04	6.48E-03	2.67E-04	1.98E-04	6.83E-05	6.45E-03	2.32E-03	1.84E-03	4.76E-04	6.49E-03	4.17E-05	4.17E-05	2.37E-08
287	586495.23	2959136.29	6.40E-03	5.39E-04	5.33E-04	5.46E-06	6.38E-03	2.68E-03	1.71E-03	9.70E-04	6.40E-03	2.66E-04	1.97E-04	6.90E-05	6.37E-03	2.30E-03	1.82E-03	4.80E-04	6.41E-03	3.93E-05	3.92E-05	2.54E-08
288	586595.23	2959136.29	6.28E-03	5.29E-04	5.23E-04	5.98E-06	6.25E-03	2.67E-03	1.69E-03	9.75E-04	6.28E-03	2.63E-04	1.94E-04	6.94E-05	6.25E-03	2.27E-03	1.79E-03	4.83E-04	6.28E-03	3.73E-05	3.73E-05	2.78E-08
289	586695.23	2959136.29	6.11E-03	5.17E-04	5.11E-04	6.71E-06	6.09E-03	2.64E-03	1.66E-03	9.72E-04	6.12E-03	2.59E-04	1.90E-04	6.93E-05	6.09E-03	2.24E-03	1.75E-03	4.85E-04	6.12E-03	3.57E-05	3.56E-05	3.12E-08
290	586795.23	2959136.29	5.93E-03	5.04E-04	4.97E-04	7.07E-06	5.90E-03	2.58E-03	1.63E-03	9.46E-04	5.93E-03	2.53E-04	1.86E-04	6.75E-05	5.90E-03	2.19E-03	1.71E-03	4.76E-04	5.94E-03	3.42E-05	3.42E-05	3.29E-08
291	586895.23	2959136.29	5.73E-03	4.89E-04	4.82E-04	6.66E-06	5.71E-03	2.48E-03	1.59E-03	8.91E-04	5.74E-03	2.45E-04	1.81E-04	6.36E-05	5.71E-03	2.12E-03	1.66E-03	4.52E-04	5.74E-03	3.29E-05	3.28E-05	3.10E-08
292	586995.23	2959136.29	5.55E-03	4.73E-04	4.67E-04	5.90E-06	5.52E-03	2.38E-03	1.55E-03	8.27E-04	5.55E-03	2.36E-04	1.77E-04	5.92E-05								

Solid Waste Authority Palm Beach Renewable Energy Facility No. 2
Refurbished Stack

Annual
Watershed #1 - Typical Canal Watershed

Receptor ID	X	Y	Vapor Phase				Particle Phase				Particle Bound Phase				Divalent Mercury Vapor Phase				Elemental Mercury Vapor Phase			
			AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO
477	587195.23	2959436.29	5.37E-03	4.70E-04	4.60E-04	9.43E-06	5.35E-03	2.46E-03	1.60E-03	8.66E-04	5.38E-03	2.45E-04	1.83E-04	6.19E-05	5.35E-03	2.06E-03	1.61E-03	4.47E-04	5.38E-03	3.32E-05	3.32E-05	4.40E-08
478	587295.23	2959436.29	5.15E-03	4.51E-04	4.41E-04	9.81E-06	5.13E-03	2.37E-03	1.54E-03	8.35E-04	5.16E-03	2.36E-04	1.76E-04	5.98E-05	5.13E-03	1.98E-03	1.55E-03	4.37E-04	5.16E-03	3.18E-05	3.18E-05	4.58E-08
480	587495.23	2959436.29	4.75E-03	4.15E-04	4.07E-04	8.67E-06	4.72E-03	2.17E-03	1.42E-03	7.49E-04	4.75E-03	2.18E-04	1.64E-04	5.39E-05	4.72E-03	1.82E-03	1.42E-03	3.98E-04	4.76E-03	2.92E-05	2.91E-05	4.04E-08
527	586095.23	2959536.29	8.26E-03	7.11E-04	7.05E-04	6.25E-06	8.24E-03	3.59E-03	2.29E-03	1.30E-03	8.27E-03	3.55E-04	2.64E-04	9.15E-05	8.23E-03	3.00E-03	2.39E-03	6.06E-04	8.27E-03	6.37E-05	6.37E-05	2.90E-08
528	586195.23	2959536.29	8.17E-03	6.98E-04	6.92E-04	6.39E-06	8.15E-03	3.56E-03	2.28E-03	1.28E-03	8.18E-03	3.51E-04	2.61E-04	8.99E-05	8.15E-03	2.96E-03	2.37E-03	5.96E-04	8.18E-03	5.77E-05	5.77E-05	2.97E-08
529	586295.23	2959536.29	8.03E-03	6.84E-04	6.77E-04	6.95E-06	8.01E-03	3.54E-03	2.25E-03	1.29E-03	8.03E-03	3.48E-04	2.57E-04	9.05E-05	8.00E-03	2.92E-03	2.32E-03	6.00E-04	8.03E-03	5.37E-05	5.37E-05	3.23E-08
530	586395.23	2959536.29	7.77E-03	6.64E-04	6.56E-04	7.90E-06	7.75E-03	3.49E-03	2.20E-03	1.29E-03	7.77E-03	3.42E-04	2.51E-04	9.10E-05	7.74E-03	2.86E-03	2.26E-03	6.05E-04	7.78E-03	5.06E-05	5.06E-05	3.67E-08
531	586495.23	2959536.29	7.45E-03	6.41E-04	6.32E-04	8.69E-06	7.42E-03	3.40E-03	2.13E-03	1.27E-03	7.45E-03	3.33E-04	2.43E-04	8.94E-05	7.42E-03	2.78E-03	2.18E-03	5.98E-04	7.46E-03	4.81E-05	4.80E-05	4.04E-08
532	586595.23	2959536.29	7.11E-03	6.14E-04	6.06E-04	8.21E-06	7.09E-03	3.25E-03	2.06E-03	1.19E-03	7.12E-03	3.19E-04	2.35E-04	8.37E-05	7.09E-03	2.66E-03	2.09E-03	5.64E-04	7.12E-03	4.58E-05	4.58E-05	3.82E-08
533	586695.23	2959536.29	6.80E-03	5.88E-04	5.81E-04	7.10E-06	6.78E-03	3.07E-03	1.99E-03	1.08E-03	6.81E-03	3.04E-04	2.27E-04	7.66E-05	6.77E-03	2.54E-03	2.02E-03	5.20E-04	6.81E-03	4.37E-05	4.37E-05	3.30E-08
534	586795.23	2959536.29	6.51E-03	5.64E-04	5.58E-04	6.76E-06	6.49E-03	2.94E-03	1.92E-03	1.01E-03	6.52E-03	2.91E-04	2.20E-04	7.16E-05	6.49E-03	2.43E-03	1.94E-03	4.90E-04	6.52E-03	4.17E-05	4.17E-05	3.15E-08
535	586895.23	2959536.29	6.23E-03	5.42E-04	5.34E-04	7.56E-06	6.20E-03	2.83E-03	1.85E-03	9.78E-04	6.23E-03	2.81E-04	2.12E-04	6.93E-05	6.20E-03	2.34E-03	1.86E-03	4.80E-04	6.24E-03	3.98E-05	3.98E-05	3.52E-08
536	586995.23	2959536.29	5.95E-03	5.20E-04	5.11E-04	8.89E-06	5.93E-03	2.74E-03	1.78E-03	9.60E-04	5.96E-03	2.72E-04	2.04E-04	6.82E-05	5.93E-03	2.26E-03	1.79E-03	4.78E-04	5.96E-03	3.80E-05	3.80E-05	4.14E-08
537	587095.23	2959536.29	5.69E-03	4.99E-04	4.89E-04	1.00E-05	5.66E-03	2.65E-03	1.71E-03	9.37E-04	5.69E-03	2.63E-04	1.96E-04	6.67E-05	5.66E-03	2.19E-03	1.71E-03	4.75E-04	5.69E-03	3.63E-05	3.63E-05	4.67E-08
538	587195.23	2959536.29	5.44E-03	4.78E-04	4.68E-04	1.04E-05	5.41E-03	2.54E-03	1.64E-03	9.00E-04	5.45E-03	2.53E-04	1.89E-04	6.43E-05	5.41E-03	2.10E-03	1.64E-03	4.63E-04	5.45E-03	3.47E-05	3.46E-05	4.84E-08
542	587595.23	2959536.29	4.60E-03	4.01E-04	3.94E-04	6.92E-06	4.58E-03	2.11E-03	1.40E-03	7.07E-04	4.61E-03	2.13E-04	1.63E-04	5.08E-05	4.58E-03	1.76E-03	1.39E-03	3.71E-04	4.61E-03	2.89E-05	2.89E-05	3.22E-08
588	586095.23	2959636.29	8.80E-03	7.56E-04	7.50E-04	6.70E-06	8.78E-03	3.87E-03	2.47E-03	1.40E-03	8.81E-03	3.82E-04	2.84E-04	9.77E-05	8.77E-03	3.20E-03	2.56E-03	6.39E-04	8.81E-03	6.62E-05	6.62E-05	3.11E-08
589	586195.23	2959636.29	8.68E-03	7.43E-04	7.36E-04	7.11E-06	8.66E-03	3.85E-03	2.46E-03	1.39E-03	8.68E-03	3.78E-04	2.81E-04	9.74E-05	8.65E-03	3.16E-03	2.52E-03	6.37E-04	8.69E-03	6.06E-05	6.06E-05	3.30E-08
590	586295.23	2959636.29	8.44E-03	7.23E-04	7.15E-04	7.96E-06	8.42E-03	3.81E-03	2.41E-03	1.40E-03	8.45E-03	3.73E-04	2.75E-04	9.81E-05	8.41E-03	3.10E-03	2.46E-03	6.42E-04	8.45E-03	5.67E-05	5.67E-05	3.70E-08
591	586395.23	2959636.29	8.08E-03	6.96E-04	6.87E-04	9.09E-06	8.06E-03	3.72E-03	2.33E-03	1.39E-03	8.09E-03	3.64E-04	2.66E-04	9.76E-05	8.06E-03	3.01E-03	2.37E-03	6.42E-04	8.09E-03	5.36E-05	5.35E-05	4.22E-08
592	586495.23	2959636.29	7.70E-03	6.66E-04	6.57E-04	9.00E-06	7.67E-03	3.56E-03	2.25E-03	1.31E-03	7.70E-03	3.49E-04	2.57E-04	9.24E-05	7.67E-03	2.88E-03	2.27E-03	6.13E-04	7.70E-03	5.09E-05	5.08E-05	4.18E-08
593	586595.23	2959636.29	7.33E-03	6.36E-04	6.28E-04	7.76E-06	7.30E-03	3.36E-03	2.17E-03	1.20E-03	7.33E-03	3.32E-04	2.47E-04	8.42E-05	7.30E-03	2.74E-03	2.18E-03	5.63E-04	7.34E-03	4.84E-05	4.84E-05	3.61E-08
594	586695.23	2959636.29	6.99E-03	6.08E-04	6.01E-04	7.17E-06	6.97E-03	3.19E-03	2.09E-03	1.11E-03	7.00E-03	3.16E-04	2.38E-04	7.80E-05	6.96E-03	2.61E-03	2.09E-03	5.25E-04	7.00E-03	4.61E-05	4.61E-05	3.33E-08
595	586795.23	2959636.29	6.67E-03	5.82E-04	5.74E-04	7.93E-06	6.64E-03	3.07E-03	2.01E-03	1.06E-03	6.67E-03	3.04E-04	2.29E-04	7.51E-05	6.64E-03	2.51E-03	2.00E-03	5.11E-04	6.68E-03	4.39E-05	4.39E-05	3.69E-08
596	586895.23	2959636.29	6.35E-03	5.57E-04	5.48E-04	9.42E-06	6.32E-03	2.97E-03	1.92E-03	1.04E-03	6.36E-03	2.94E-04	2.20E-04	7.38E-05								

Solid Waste Authority Palm Beach Renewable Energy Facility No. 2
Refurbished Stack

Annual
Watershed #1 - Typical Canal Watershed

Receptor ID	X	Y	Vapor Phase				Particle Phase				Particle Bound Phase				Divalent Mercury Vapor Phase				Elemental Mercury Vapor Phase			
			AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO
771	586095.23	2959936.29	1.07E-02	9.22E-04	9.12E-04	9.61E-06	1.06E-02	4.99E-03	3.17E-03	1.82E-03	1.07E-02	4.87E-04	3.60E-04	1.27E-04	1.06E-02	3.95E-03	3.15E-03	7.95E-04	1.07E-02	7.71E-05	7.71E-05	4.47E-08
772	586195.23	2959936.29	1.01E-02	8.83E-04	8.71E-04	1.12E-05	1.01E-02	4.86E-03	3.05E-03	1.82E-03	1.02E-02	4.73E-04	3.47E-04	1.26E-04	1.01E-02	3.82E-03	3.02E-03	7.97E-04	1.02E-02	7.22E-05	7.21E-05	5.22E-08
773	586295.23	2959936.29	9.55E-03	8.36E-04	8.25E-04	1.08E-05	9.53E-03	4.60E-03	2.91E-03	1.69E-03	9.56E-03	4.49E-04	3.32E-04	1.18E-04	9.53E-03	3.61E-03	2.86E-03	7.48E-04	9.56E-03	6.81E-05	6.80E-05	5.02E-08
774	586395.23	2959936.29	8.99E-03	7.89E-04	7.80E-04	9.09E-06	8.97E-03	4.28E-03	2.77E-03	1.51E-03	9.00E-03	4.22E-04	3.17E-04	1.05E-04	8.97E-03	3.39E-03	2.71E-03	6.74E-04	9.00E-03	6.43E-05	6.43E-05	4.23E-08
775	586495.23	2959936.29	8.49E-03	7.47E-04	7.38E-04	9.37E-06	8.46E-03	4.05E-03	2.64E-03	1.41E-03	8.49E-03	4.01E-04	3.02E-04	9.84E-05	8.46E-03	3.21E-03	2.57E-03	6.38E-04	8.49E-03	6.08E-05	6.08E-05	4.36E-08
776	586595.23	2959936.29	8.00E-03	7.08E-04	6.97E-04	1.15E-05	7.97E-03	3.89E-03	2.51E-03	1.38E-03	8.00E-03	3.84E-04	2.88E-04	9.64E-05	7.97E-03	3.06E-03	2.43E-03	6.33E-04	8.00E-03	5.75E-05	5.75E-05	5.34E-08
777	586695.23	2959936.29	7.54E-03	6.71E-04	6.58E-04	1.33E-05	7.51E-03	3.73E-03	2.39E-03	1.34E-03	7.54E-03	3.68E-04	2.75E-04	9.39E-05	7.51E-03	2.93E-03	2.30E-03	6.27E-04	7.55E-03	5.43E-05	5.43E-05	6.18E-08
778	586795.23	2959936.29	7.12E-03	6.35E-04	6.22E-04	1.33E-05	7.09E-03	3.54E-03	2.27E-03	1.26E-03	7.12E-03	3.51E-04	2.62E-04	8.89E-05	7.09E-03	2.78E-03	2.18E-03	6.00E-04	7.12E-03	5.13E-05	5.13E-05	6.21E-08
779	586895.23	2959936.29	6.74E-03	6.01E-04	5.89E-04	1.19E-05	6.72E-03	3.34E-03	2.17E-03	1.17E-03	6.75E-03	3.33E-04	2.51E-04	8.23E-05	6.72E-03	2.62E-03	2.06E-03	5.58E-04	6.75E-03	4.85E-05	4.84E-05	5.52E-08
780	586995.23	2959936.29	6.41E-03	5.69E-04	5.59E-04	9.99E-06	6.38E-03	3.15E-03	2.07E-03	1.07E-03	6.41E-03	3.16E-04	2.40E-04	7.59E-05	6.38E-03	2.48E-03	1.96E-03	5.16E-04	6.41E-03	4.58E-05	4.57E-05	4.65E-08
781	587095.23	2959936.29	6.09E-03	5.39E-04	5.30E-04	8.43E-06	6.07E-03	2.98E-03	1.98E-03	9.91E-04	6.10E-03	3.00E-04	2.30E-04	7.01E-05	6.07E-03	2.35E-03	1.87E-03	4.78E-04	6.10E-03	4.32E-05	4.32E-05	3.92E-08
782	587195.23	2959936.29	5.80E-03	5.11E-04	5.04E-04	7.19E-06	5.77E-03	2.81E-03	1.90E-03	9.12E-04	5.81E-03	2.85E-04	2.20E-04	6.46E-05	5.78E-03	2.23E-03	1.78E-03	4.43E-04	5.81E-03	4.09E-05	4.08E-05	3.34E-08
783	587295.23	2959936.29	5.53E-03	4.85E-04	4.79E-04	6.21E-06	5.50E-03	2.65E-03	1.81E-03	8.42E-04	5.53E-03	2.71E-04	2.11E-04	5.98E-05	5.50E-03	2.12E-03	1.70E-03	4.13E-04	5.54E-03	3.86E-05	3.86E-05	2.89E-08
784	587395.23	2959936.29	5.28E-03	4.61E-04	4.55E-04	5.58E-06	5.25E-03	2.52E-03	1.73E-03	7.90E-04	5.28E-03	2.58E-04	2.02E-04	5.63E-05	5.25E-03	2.02E-03	1.63E-03	3.91E-04	5.28E-03	3.66E-05	3.66E-05	2.59E-08
785	587495.23	2959936.29	5.04E-03	4.39E-04	4.33E-04	5.37E-06	5.01E-03	2.42E-03	1.66E-03	7.62E-04	5.05E-03	2.48E-04	1.93E-04	5.43E-05	5.02E-03	1.93E-03	1.55E-03	3.80E-04	5.05E-03	3.47E-05	3.46E-05	2.50E-08
786	587595.23	2959936.29	4.82E-03	4.19E-04	4.13E-04	5.50E-06	4.79E-03	2.33E-03	1.58E-03	7.50E-04	4.83E-03	2.39E-04	1.85E-04	5.36E-05	4.80E-03	1.86E-03	1.49E-03	3.77E-04	4.83E-03	3.29E-05	3.29E-05	2.56E-08
787	587695.23	2959936.29	4.62E-03	4.00E-04	3.95E-04	5.72E-06	4.59E-03	2.25E-03	1.51E-03	7.42E-04	4.63E-03	2.30E-04	1.77E-04	5.30E-05	4.60E-03	1.80E-03	1.42E-03	3.75E-04	4.63E-03	3.12E-05	3.12E-05	2.66E-08
788	587795.23	2959936.29	4.43E-03	3.83E-04	3.77E-04	5.78E-06	4.41E-03	2.17E-03	1.44E-03	7.24E-04	4.44E-03	2.21E-04	1.69E-04	5.19E-05	4.41E-03	1.73E-03	1.36E-03	3.69E-04	4.44E-03	2.97E-05	2.97E-05	2.69E-08
# of data pts	Average		6.51E-03	5.63E-04	5.56E-04	7.71E-06	6.49E-03	2.95E-03	1.91E-03	1.05E-03	6.52E-03	2.93E-04	2.19E-04	7.40E-05	6.49E-03	2.43E-03	1.93E-03	5.07E-04	6.52E-03	4.29E-05	4.28E-05	3.59E-08
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Solid Waste Authority Palm Beach Renewable Energy Facility No. 2
Refurbished Stack

Annual
Watershed #2 - Iron Horse Watershed

Receptor ID	X	Y	Vapor Phase				Particle Phase				Particle Bound Phase				Divalent Mercury Vapor Phase				Elemental Mercury Vapor Phase			
			AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO
2712	584995.23	2963136.29	9.23E-03	8.25E-04	8.19E-04	6.18E-06	9.20E-03	4.05E-03	2.75E-03	1.30E-03	9.24E-03	4.24E-04	3.32E-04	9.15E-05	9.20E-03	3.37E-03	2.74E-03	6.23E-04	9.24E-03	6.93E-05	6.92E-05	2.87E-08
2718	585595.23	2963136.29	5.86E-03	5.54E-04	5.37E-04	1.70E-05	5.84E-03	3.23E-03	1.46E-03	1.77E-03	5.87E-03	3.19E-04	1.94E-04	1.24E-04	5.84E-03	2.53E-03	1.73E-03	7.99E-04	5.87E-03	5.42E-05	5.41E-05	7.92E-08
2773	584995.23	2963236.29	8.48E-03	7.56E-04	7.50E-04	5.52E-06	8.45E-03	3.68E-03	2.49E-03	1.19E-03	8.49E-03	3.86E-04	3.02E-04	8.41E-05	8.45E-03	3.09E-03	2.51E-03	5.80E-04	8.49E-03	6.24E-05	6.23E-05	2.57E-08
2775	585195.23	2963236.29	7.07E-03	6.37E-04	6.32E-04	5.28E-06	7.04E-03	3.11E-03	1.94E-03	1.17E-03	7.07E-03	3.26E-04	2.43E-04	8.32E-05	7.04E-03	2.64E-03	2.08E-03	5.63E-04	7.08E-03	5.37E-05	5.37E-05	2.46E-08
2776	585295.23	2963236.29	6.52E-03	5.93E-04	5.87E-04	5.93E-06	6.49E-03	2.95E-03	1.73E-03	1.22E-03	6.52E-03	3.08E-04	2.21E-04	8.66E-05	6.49E-03	2.50E-03	1.92E-03	5.77E-04	6.53E-03	5.23E-05	5.22E-05	2.76E-08
2777	585395.23	2963236.29	6.09E-03	5.59E-04	5.52E-04	6.96E-06	6.07E-03	2.82E-03	1.57E-03	1.25E-03	6.10E-03	2.92E-04	2.04E-04	8.83E-05	6.07E-03	2.38E-03	1.79E-03	5.85E-04	6.10E-03	5.14E-05	5.14E-05	3.23E-08
2778	585495.23	2963236.29	5.77E-03	5.37E-04	5.25E-04	1.14E-05	5.75E-03	2.89E-03	1.45E-03	1.44E-03	5.77E-03	2.93E-04	1.91E-04	1.01E-04	5.75E-03	2.36E-03	1.70E-03	6.64E-04	5.78E-03	5.09E-05	5.08E-05	5.29E-08
2779	585595.23	2963236.29	5.53E-03	5.21E-04	5.05E-04	1.60E-05	5.51E-03	3.02E-03	1.37E-03	1.65E-03	5.53E-03	2.98E-04	1.82E-04	1.16E-04	5.51E-03	2.38E-03	1.63E-03	7.56E-04	5.54E-03	5.03E-05	5.02E-05	7.46E-08
2834	584995.23	2963336.29	7.82E-03	6.96E-04	6.91E-04	4.96E-06	7.78E-03	3.36E-03	2.27E-03	1.09E-03	7.82E-03	3.54E-04	2.76E-04	7.76E-05	7.79E-03	2.85E-03	2.31E-03	5.42E-04	7.83E-03	5.65E-05	5.65E-05	2.31E-08
2835	585095.23	2963336.29	7.17E-03	6.40E-04	6.35E-04	4.27E-06	7.13E-03	3.05E-03	2.01E-03	1.05E-03	7.17E-03	3.23E-04	2.48E-04	7.45E-05	7.14E-03	2.63E-03	2.11E-03	5.18E-04	7.17E-03	5.20E-05	5.20E-05	1.99E-08
# of data pts	Average		6.95E-03	6.32E-04	6.23E-04	8.36E-06	6.93E-03	3.22E-03	1.90E-03	1.31E-03	6.96E-03	3.32E-04	2.40E-04	9.27E-05	6.93E-03	2.67E-03	2.05E-03	6.21E-04	6.96E-03	5.53E-05	5.53E-05	3.88E-08

Solid Waste Authority Palm Beach Renewable Energy Facility No. 2
Refurbished Stack

Annual
Watershed #4 - Middle Borrow Lake Watershed

Receptor ID	X	Y	Vapor Phase				Particle Phase				Particle Bound Phase				Divalent Mercury Vapor Phase				Elemental Mercury Vapor Phase			
			AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO
2043	585195.23	2962036.29	1.82E-02	1.69E-03	1.67E-03	1.50E-05	1.82E-02	9.55E-03	5.70E-03	3.85E-03	1.82E-02	9.65E-04	7.03E-04	2.63E-04	1.82E-02	7.02E-03	5.50E-03	1.53E-03	1.82E-02	1.69E-04	1.69E-04	6.98E-08
2102	584995.23	2962136.29	2.68E-02	2.71E-03	2.70E-03	1.55E-05	2.68E-02	1.32E-02	9.43E-03	3.73E-03	2.68E-02	1.35E-03	1.10E-03	2.55E-04	2.68E-02	9.61E-03	8.11E-03	1.50E-03	2.68E-02	4.59E-04	4.59E-04	7.19E-08
2105	585295.23	2962136.29	1.40E-02	1.31E-03	1.29E-03	1.35E-05	1.40E-02	7.32E-03	4.04E-03	3.28E-03	1.40E-02	7.44E-04	5.18E-04	2.26E-04	1.39E-02	5.53E-03	4.21E-03	1.32E-03	1.40E-02	1.32E-04	1.32E-04	6.27E-08
2167	585395.23	2962236.29	1.16E-02	1.11E-03	1.09E-03	2.17E-05	1.16E-02	6.55E-03	3.20E-03	3.34E-03	1.16E-02	6.51E-04	4.21E-04	2.30E-04	1.16E-02	4.87E-03	3.53E-03	1.34E-03	1.17E-02	1.19E-04	1.19E-04	1.01E-07
2229	585495.23	2962336.29	1.02E-02	9.91E-04	9.63E-04	2.78E-05	1.02E-02	6.12E-03	2.73E-03	3.39E-03	1.02E-02	5.96E-04	3.63E-04	2.32E-04	1.02E-02	4.46E-03	3.10E-03	1.36E-03	1.02E-02	1.08E-04	1.08E-04	1.29E-07
2290	585495.23	2962436.29	9.63E-03	9.29E-04	9.03E-04	2.61E-05	9.61E-03	5.65E-03	2.56E-03	3.09E-03	9.64E-03	5.52E-04	3.40E-04	2.13E-04	9.61E-03	4.18E-03	2.92E-03	1.26E-03	9.64E-03	9.93E-05	9.92E-05	1.21E-07
2351	585495.23	2962536.29	9.04E-03	8.67E-04	8.43E-04	2.39E-05	9.01E-03	5.20E-03	2.39E-03	2.80E-03	9.04E-03	5.10E-04	3.16E-04	1.93E-04	9.01E-03	3.89E-03	2.73E-03	1.16E-03	9.04E-03	9.10E-05	9.09E-05	1.11E-07
2409	585195.23	2962636.29	1.14E-02	1.03E-03	1.03E-03	6.98E-06	1.14E-02	5.16E-03	3.35E-03	1.81E-03	1.14E-02	5.40E-04	4.14E-04	1.27E-04	1.14E-02	4.22E-03	3.42E-03	8.04E-04	1.14E-02	9.21E-05	9.21E-05	3.24E-08
2348	585195.23	2962536.29	1.24E-02	1.13E-03	1.12E-03	7.49E-06	1.24E-02	5.68E-03	3.69E-03	1.99E-03	1.24E-02	5.94E-04	4.56E-04	1.39E-04	1.24E-02	4.61E-03	3.74E-03	8.68E-04	1.24E-02	1.02E-04	1.02E-04	3.48E-08
# of data pts	Average		1.37E-02	1.31E-03	1.29E-03	1.76E-05	1.37E-02	7.15E-03	4.12E-03	3.03E-03	1.37E-02	7.23E-04	5.14E-04	2.09E-04	1.37E-02	5.38E-03	4.14E-03	1.24E-03	1.37E-02	1.52E-04	1.52E-04	8.16E-08
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Solid Waste Authority Palm Beach Renewable Energy Facility No. 2
Refurbished Stack

Annual
Watershed #5 - Rookery/Shell Pits Watershed

Receptor ID	X	Y	Vapor Phase				Particle Phase				Particle Bound Phase				Divalent Mercury Vapor Phase				Elemental Mercury Vapor Phase			
			AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO
817	584595.23	2960036.29	1.21E-02	2.21E-03	2.20E-03	9.73E-06	1.21E-02	6.13E-03	4.41E-03	1.72E-03	1.21E-02	6.23E-04	5.03E-04	1.20E-04	1.21E-02	3.90E-03	3.14E-03	7.62E-04	1.21E-02	1.05E-03	1.05E-03	4.52E-08
818	584695.23	2960036.29	1.19E-02	2.14E-03	2.13E-03	1.15E-05	1.19E-02	6.28E-03	4.42E-03	1.85E-03	1.19E-02	6.28E-04	4.99E-04	1.28E-04	1.19E-02	3.94E-03	3.13E-03	8.10E-04	1.19E-02	9.98E-04	9.98E-04	5.37E-08
819	584795.23	2960036.29	1.17E-02	2.08E-03	2.07E-03	1.49E-05	1.17E-02	6.65E-03	4.48E-03	2.17E-03	1.17E-02	6.49E-04	5.00E-04	1.50E-04	1.17E-02	4.06E-03	3.13E-03	9.31E-04	1.17E-02	9.47E-04	9.47E-04	6.93E-08
820	584895.23	2960036.29	1.17E-02	2.04E-03	2.03E-03	1.59E-05	1.17E-02	6.84E-03	4.59E-03	2.24E-03	1.17E-02	6.61E-04	5.06E-04	1.55E-04	1.17E-02	4.10E-03	3.15E-03	9.55E-04	1.17E-02	9.06E-04	9.06E-04	7.40E-08
821	584995.23	2960036.29	1.18E-02	2.01E-03	2.00E-03	1.23E-05	1.18E-02	6.59E-03	4.70E-03	1.89E-03	1.19E-02	6.43E-04	5.13E-04	1.31E-04	1.18E-02	4.01E-03	3.19E-03	8.18E-04	1.19E-02	8.68E-04	8.67E-04	5.73E-08
822	585095.23	2960036.29	1.20E-02	1.97E-03	1.96E-03	1.75E-05	1.20E-02	6.79E-03	4.73E-03	2.06E-03	1.20E-02	6.56E-04	5.13E-04	1.43E-04	1.20E-02	4.12E-03	3.22E-03	9.06E-04	1.20E-02	8.23E-04	8.23E-04	8.16E-08
823	585195.23	2960036.29	1.21E-02	1.89E-03	1.87E-03	2.37E-05	1.21E-02	6.97E-03	4.60E-03	2.37E-03	1.21E-02	6.64E-04	5.01E-04	1.63E-04	1.21E-02	4.24E-03	3.22E-03	1.03E-03	1.21E-02	7.54E-04	7.53E-04	1.10E-07
884	585195.23	2960136.29	1.30E-02	2.05E-03	2.03E-03	2.56E-05	1.30E-02	7.62E-03	5.00E-03	2.63E-03	1.30E-02	7.25E-04	5.44E-04	1.81E-04	1.30E-02	4.58E-03	3.46E-03	1.12E-03	1.30E-02	8.24E-04	8.23E-04	1.19E-07
885	585295.23	2960136.29	1.30E-02	1.88E-03	1.86E-03	2.39E-05	1.29E-02	7.39E-03	4.72E-03	2.68E-03	1.30E-02	7.02E-04	5.19E-04	1.83E-04	1.29E-02	4.56E-03	3.45E-03	1.11E-03	1.30E-02	6.97E-04	6.97E-04	1.11E-07
886	585395.23	2960136.29	1.28E-02	1.64E-03	1.62E-03	2.50E-05	1.28E-02	7.24E-03	4.35E-03	2.89E-03	1.28E-02	6.84E-04	4.86E-04	1.98E-04	1.28E-02	4.64E-03	3.46E-03	1.18E-03	1.28E-02	5.18E-04	5.18E-04	1.16E-07
887	585495.23	2960136.29	1.26E-02	1.41E-03	1.39E-03	2.01E-05	1.26E-02	6.76E-03	4.05E-03	2.71E-03	1.26E-02	6.45E-04	4.59E-04	1.86E-04	1.26E-02	4.64E-03	3.53E-03	1.11E-03	1.26E-02	3.44E-04	3.44E-04	9.34E-08
888	585595.23	2960136.29	1.27E-02	1.25E-03	1.24E-03	1.56E-05	1.26E-02	6.48E-03	3.91E-03	2.58E-03	1.27E-02	6.24E-04	4.47E-04	1.77E-04	1.26E-02	4.73E-03	3.67E-03	1.06E-03	1.27E-02	2.22E-04	2.22E-04	7.23E-08
889	585695.23	2960136.29	1.27E-02	1.17E-03	1.16E-03	1.25E-05	1.27E-02	6.36E-03	3.84E-03	2.52E-03	1.27E-02	6.15E-04	4.41E-04	1.74E-04	1.27E-02	4.80E-03	3.76E-03	1.05E-03	1.27E-02	1.53E-04	1.53E-04	5.82E-08
890	585795.23	2960136.29	1.27E-02	1.13E-03	1.12E-03	1.03E-05	1.27E-02	6.18E-03	3.85E-03	2.34E-03	1.27E-02	6.02E-04	4.40E-04	1.61E-04	1.27E-02	4.77E-03	3.80E-03	9.78E-04	1.27E-02	1.19E-04	1.19E-04	4.78E-08
891	585895.23	2960136.29	1.27E-02	1.11E-03	1.10E-03	1.05E-05	1.27E-02	6.11E-03	3.85E-03	2.26E-03	1.27E-02	5.95E-04	4.39E-04	1.56E-04	1.26E-02	4.73E-03	3.78E-03	9.49E-04	1.27E-02	1.03E-04	1.02E-04	4.88E-08
892	585995.23	2960136.29	1.23E-02	1.08E-03	1.06E-03	1.19E-05	1.23E-02	6.03E-03	3.79E-03	2.25E-03	1.23E-02	5.86E-04	4.31E-04	1.55E-04	1.23E-02	4.64E-03	3.70E-03	9.47E-04	1.23E-02	9.36E-05	9.36E-05	5.53E-08
945	585195.23	2960236.29	1.38E-02	2.21E-03	2.18E-03	2.74E-05	1.38E-02	8.30E-03	5.38E-03	2.92E-03	1.38E-02	7.87E-04	5.87E-04	2.00E-04	1.38E-02	4.92E-03	3.70E-03	1.22E-03	1.38E-02	8.94E-04	8.93E-04	1.27E-07
946	585295.23	2960236.29	1.37E-02	2.01E-03	1.98E-03	2.66E-05	1.37E-02	8.06E-03	5.04E-03	3.02E-03	1.37E-02	7.62E-04	5.55E-04	2.06E-04	1.37E-02	4.89E-03	3.66E-03	1.23E-03	1.37E-02	7.46E-04	7.45E-04	1.24E-07
947	585395.23	2960236.29	1.35E-02	1.72E-03	1.69E-03	2.72E-05	1.35E-02	7.85E-03	4.61E-03	3.24E-03	1.35E-02	7.37E-04	5.16E-04	2.21E-04	1.35E-02	4.96E-03	3.67E-03	1.29E-03	1.35E-02	5.38E-04	5.38E-04	1.26E-07
948	585495.23	2960236.29	1.34E-02	1.46E-03	1.44E-03	2.15E-05	1.34E-02	7.31E-03	4.29E-03	3.02E-03	1.34E-02	6.95E-04	4.89E-04	2.06E-04	1.33E-02	4.98E-03	3.77E-03	1.21E-03	1.34E-02	3.42E-04	3.42E-04	9.98E-08
949	585595.23	2960236.29	1.34E-02	1.31E-03	1.29E-03	1.65E-05	1.34E-02	7.07E-03	4.16E-03	2.91E-03	1.34E-02	6.78E-04	4.78E-04	1.99E-04	1.34E-02	5.11E-03	3.93E-03	1.18E-03	1.34E-02	2.15E-04	2.15E-04	7.65E-08
950	585695.23	2960236.29	1.35E-02	1.23E-03	1.22E-03	1.26E-05	1.35E-02	6.90E-03	4.14E-03	2.75E-03	1.35E-02	6.66E-04	4.76E-04	1.89E-04	1.35E-02	5.16E-03	4.03E-03	1.13E-03	1.35E-02	1.50E-04	1.50E-04	5.87E-08
951	585795.23	2960236.29	1.36E-02	1.20E-03	1.19E-03	1.15E-05	1.36E-02	6.76E-03	4.17E-03	2.59E-03	1.36E-02	6.55E-04	4.77E-04	1.78E-04	1.36E-02	5.14E-03	4.07E-03	1.06E-03	1.36E-02	1.21E-04	1.21E-04	5.32E-08
952	585895.23	2960236.29	1.34E-02	1.18E-03	1.16E-03	1.22E-05	1.34E-02	6.69E-03	4.17E-03	2.52E-03	1.34E-02	6.49E-04	4.75E-04	1.74E-04	1.34E-02	5.08E-03	4.04E-03	1.04E-03	1.34E-02	1.07E-04	1.07E-04	5.69E-08
953	585995.23	2960236.29	1.28E-02	1.13E-03	1.12E-03	1.47E-05	1.28E-02	6.55E-03	4.03E-03	2.51E-03	1.29E-02	6.33E-04	4.60E-04	1.73E-04	1.							

Solid Waste Authority Palm Beach Renewable Energy Facility No. 2
Refurbished Stack

Annual
Watershed #5 - Rookery/Shell Pits Watershed

Receptor ID	X	Y	Vapor Phase				Particle Phase				Particle Bound Phase				Divalent Mercury Vapor Phase				Elemental Mercury Vapor Phase			
			AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO
1250	585195.23	2960736.29	1.22E-02	2.00E-03	1.97E-03	3.46E-05	1.23E-02	1.01E-02	4.49E-03	5.63E-03	1.23E-02	8.99E-04	5.20E-04	3.79E-04	1.22E-02	5.29E-03	3.20E-03	2.09E-03	1.22E-02	8.13E-04	8.13E-04	1.61E-07
1251	585295.23	2960736.29	1.17E-02	1.71E-03	1.65E-03	5.57E-05	1.17E-02	1.08E-02	3.97E-03	6.87E-03	1.17E-02	9.27E-04	4.66E-04	4.61E-04	1.17E-02	5.56E-03	3.03E-03	2.53E-03	1.17E-02	6.09E-04	6.09E-04	2.59E-07
1252	585395.23	2960736.29	1.19E-02	1.34E-03	1.29E-03	4.69E-05	1.19E-02	1.05E-02	3.60E-03	6.90E-03	1.19E-02	9.00E-04	4.36E-04	4.64E-04	1.18E-02	5.76E-03	3.24E-03	2.52E-03	1.19E-02	3.16E-04	3.16E-04	2.18E-07
1253	585495.23	2960736.29	1.31E-02	1.23E-03	1.20E-03	2.92E-05	1.31E-02	1.03E-02	3.92E-03	6.35E-03	1.31E-02	9.04E-04	4.76E-04	4.28E-04	1.31E-02	6.17E-03	3.82E-03	2.35E-03	1.31E-02	1.61E-04	1.60E-04	1.36E-07
1254	585595.23	2960736.29	1.45E-02	1.30E-03	1.28E-03	2.51E-05	1.45E-02	1.02E-02	4.45E-03	5.74E-03	1.45E-02	9.20E-04	5.32E-04	3.88E-04	1.45E-02	6.43E-03	4.29E-03	2.14E-03	1.45E-02	1.28E-04	1.28E-04	1.16E-07
1255	585695.23	2960736.29	1.46E-02	1.33E-03	1.30E-03	2.89E-05	1.46E-02	9.96E-03	4.61E-03	5.35E-03	1.46E-02	9.14E-04	5.52E-04	3.62E-04	1.46E-02	6.37E-03	4.36E-03	2.01E-03	1.46E-02	1.28E-04	1.28E-04	1.34E-07
1256	585795.23	2960736.29	1.44E-02	1.33E-03	1.30E-03	2.89E-05	1.44E-02	9.19E-03	4.66E-03	4.53E-03	1.44E-02	8.65E-04	5.59E-04	3.06E-04	1.44E-02	6.03E-03	4.31E-03	1.72E-03	1.44E-02	1.32E-04	1.32E-04	1.34E-07
1257	585895.23	2960736.29	1.43E-02	1.33E-03	1.29E-03	3.36E-05	1.43E-02	8.93E-03	4.80E-03	4.13E-03	1.43E-02	8.52E-04	5.72E-04	2.80E-04	1.43E-02	5.92E-03	4.33E-03	1.59E-03	1.43E-02	1.32E-04	1.32E-04	1.56E-07
1258	585995.23	2960736.29	1.40E-02	1.29E-03	1.27E-03	2.23E-05	1.40E-02	8.24E-03	4.93E-03	3.32E-03	1.40E-02	8.10E-04	5.84E-04	2.26E-04	1.40E-02	5.63E-03	4.33E-03	1.29E-03	1.40E-02	1.29E-04	1.29E-04	1.04E-07
1310	585095.23	2960836.29	1.13E-02	1.91E-03	1.87E-03	3.42E-05	1.13E-02	1.02E-02	3.56E-03	6.68E-03	1.13E-02	8.97E-04	4.49E-04	4.49E-04	1.13E-02	5.23E-03	2.79E-03	2.44E-03	1.13E-02	8.14E-04	8.14E-04	1.59E-07
1311	585195.23	2960836.29	8.90E-03	1.43E-03	1.39E-03	4.40E-05	8.91E-03	1.04E-02	2.89E-03	7.53E-03	8.90E-03	8.64E-04	3.59E-04	5.05E-04	8.90E-03	4.97E-03	2.24E-03	2.72E-03	8.90E-03	5.55E-04	5.55E-04	2.04E-07
1312	585295.23	2960836.29	8.14E-03	1.18E-03	1.11E-03	6.96E-05	8.15E-03	1.12E-02	2.46E-03	8.76E-03	8.14E-03	8.96E-04	3.10E-04	5.86E-04	8.13E-03	5.20E-03	2.05E-03	3.16E-03	8.14E-03	3.90E-04	3.90E-04	3.23E-07
1313	585395.23	2960836.29	8.65E-03	9.40E-04	8.86E-04	5.34E-05	8.66E-03	1.10E-02	2.38E-03	8.60E-03	8.65E-03	8.85E-04	3.08E-04	5.77E-04	8.65E-03	5.43E-03	2.33E-03	3.09E-03	8.65E-03	1.84E-04	1.84E-04	2.48E-07
1314	585495.23	2960836.29	1.04E-02	9.63E-04	9.31E-04	3.23E-05	1.04E-02	1.07E-02	2.97E-03	7.72E-03	1.04E-02	8.94E-04	3.75E-04	5.19E-04	1.04E-02	5.80E-03	3.00E-03	2.80E-03	1.04E-02	1.03E-04	1.03E-04	1.50E-07
1315	585595.23	2960836.29	1.20E-02	1.10E-03	1.06E-03	3.70E-05	1.20E-02	1.07E-02	3.53E-03	7.16E-03	1.20E-02	9.22E-04	4.40E-04	4.82E-04	1.20E-02	6.09E-03	3.47E-03	2.62E-03	1.20E-02	1.02E-04	1.02E-04	1.72E-07
1316	585695.23	2960836.29	1.27E-02	1.18E-03	1.14E-03	3.61E-05	1.27E-02	9.73E-03	3.84E-03	5.89E-03	1.27E-02	8.76E-04	4.79E-04	3.97E-04	1.27E-02	5.85E-03	3.67E-03	2.18E-03	1.27E-02	1.15E-04	1.15E-04	1.68E-07
1317	585795.23	2960836.29	1.35E-02	1.27E-03	1.23E-03	3.98E-05	1.35E-02	9.46E-03	4.31E-03	5.14E-03	1.35E-02	8.77E-04	5.30E-04	3.47E-04	1.35E-02	5.90E-03	3.97E-03	1.93E-03	1.35E-02	1.27E-04	1.27E-04	1.85E-07
1318	585895.23	2960836.29	1.42E-02	1.31E-03	1.28E-03	2.33E-05	1.42E-02	8.77E-03	4.84E-03	3.93E-03	1.42E-02	8.51E-04	5.85E-04	2.66E-04	1.41E-02	5.78E-03	4.28E-03	1.49E-03	1.42E-02	1.32E-04	1.32E-04	1.08E-07
1319	585995.23	2960836.29	1.44E-02	1.31E-03	1.29E-03	1.84E-05	1.43E-02	8.57E-03	5.19E-03	3.38E-03	1.44E-02	8.49E-04	6.20E-04	2.30E-04	1.43E-02	5.77E-03	4.47E-03	1.30E-03	1.44E-02	1.32E-04	1.32E-04	8.55E-08
1371	585095.23	2960936.29	8.64E-03	1.42E-03	1.39E-03	3.14E-05	8.65E-03	1.01E-02	2.32E-03	7.82E-03	8.64E-03	8.48E-04	3.23E-04	5.25E-04	8.64E-03	4.81E-03	1.98E-03	2.83E-03	8.64E-03	5.92E-04	5.92E-04	1.46E-07
1372	585195.23	2960936.29	5.27E-03	8.31E-04	7.70E-04	6.08E-05	5.28E-03	1.20E-02	1.33E-03	1.07E-02	5.27E-03	9.05E-04	1.93E-04	7.12E-04	5.27E-03	5.01E-03	1.24E-03	3.77E-03	5.27E-03	2.85E-04	2.85E-04	2.82E-07
1373	585295.23	2960936.29	4.23E-03	6.24E-04	5.34E-04	9.05E-05	4.23E-03	1.27E-02	9.79E-04	1.18E-02	4.23E-03	9.30E-04	1.47E-04	7.83E-04	4.23E-03	5.14E-03	1.00E-03	4.14E-03	4.23E-03	1.66E-04	1.65E-04	4.20E-07
1374	585395.23	2960936.29	4.88E-03	5.30E-04	4.69E-04	6.12E-05	4.88E-03	1.25E-02	1.10E-03	1.14E-02	4.88E-03	9.29E-04	1.65E-04	7.63E-04	4.87E-03	5.29E-03	1.26E-03	4.03E-03	4.88E-03	7.77E-05	7.74E-05	2.84E-07
1375	585495.23	2960936.29	6.68E-03	6.37E-04	5.93E-04	4.43E-05	6.69E-03	1.16E-02	1.67E-03	9.98E-03	6.68E-03	9.03E-04	2.34E-04	6.69E-04	6.68E-03	5.38E-03	1.82E-03	3.56E-03	6.68E-03	5.89E-05	5.87E-05	2.06E-07
1376	585595.23	2960936.29	8.53E-03	8.14E-04	7.66E-04	4.76E-05	8.54E-03	1.04E-02	2.24E-03	8.18E-03	8.53E-03											

Solid Waste Authority Palm Beach Renewable Energy Facility No. 2
Refurbished Stack

Annual
Watershed #5 - Rookery/Shell Pits Watershed

Receptor ID	X	Y	Vapor Phase				Particle Phase				Particle Bound Phase				Divalent Mercury Vapor Phase				Elemental Mercury Vapor Phase			
			AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO
1562	585895.23	2961236.29	1.32E-02	1.21E-03	1.19E-03	2.10E-05	1.32E-02	8.71E-03	4.14E-03	4.56E-03	1.32E-02	8.38E-04	5.31E-04	3.07E-04	1.32E-02	5.50E-03	3.79E-03	1.71E-03	1.32E-02	1.21E-04	1.21E-04	9.76E-08
1563	585995.23	2961236.29	1.43E-02	1.30E-03	1.28E-03	1.76E-05	1.43E-02	8.57E-03	4.77E-03	3.80E-03	1.43E-02	8.51E-04	5.94E-04	2.57E-04	1.43E-02	5.69E-03	4.23E-03	1.46E-03	1.43E-02	1.32E-04	1.32E-04	8.19E-08
1611	584695.23	2961336.29	4.75E-02	9.27E-03	9.24E-03	3.54E-05	4.75E-02	2.22E-02	1.69E-02	5.24E-03	4.75E-02	2.36E-03	2.01E-03	3.55E-04	4.75E-02	1.37E-02	1.16E-02	2.01E-03	4.75E-02	4.43E-03	4.43E-03	1.65E-07
1614	584995.23	2961336.29	1.65E-02	3.01E-03	2.95E-03	5.84E-05	1.66E-02	1.55E-02	4.68E-03	1.08E-02	1.65E-02	1.36E-03	6.36E-04	7.26E-04	1.65E-02	7.64E-03	3.75E-03	3.89E-03	1.65E-02	1.29E-03	1.29E-03	2.71E-07
1615	585095.23	2961336.29	5.96E-03	1.03E-03	9.71E-04	5.43E-05	5.97E-03	1.65E-02	1.33E-03	1.52E-02	5.96E-03	1.23E-03	2.15E-04	1.02E-03	5.96E-03	6.65E-03	1.28E-03	5.37E-03	5.96E-03	3.83E-04	3.82E-04	2.52E-07
1616	585195.23	2961336.29	9.26E-04	2.56E-04	1.24E-04	1.32E-04	9.27E-04	2.85E-02	1.33E-04	2.84E-02	9.26E-04	1.92E-03	3.27E-05	1.89E-03	9.25E-04	9.95E-03	1.87E-04	9.76E-03	9.26E-04	3.69E-05	3.63E-05	6.13E-07
1617	585295.23	2961336.29	7.64E-05	1.65E-04	7.73E-06	1.57E-04	7.65E-05	4.10E-02	7.05E-06	4.10E-02	7.64E-05	2.72E-03	2.83E-06	2.72E-03	7.64E-05	1.39E-02	1.56E-05	1.39E-02	7.64E-05	1.65E-06	9.22E-07	7.29E-07
1618	585395.23	2961336.29	2.44E-04	1.43E-04	2.26E-05	1.21E-04	2.45E-04	2.74E-02	2.58E-05	2.74E-02	2.44E-04	1.82E-03	8.57E-06	1.81E-03	2.44E-04	9.28E-03	5.12E-05	9.23E-03	2.44E-04	2.69E-06	2.13E-06	5.61E-07
1619	585495.23	2961336.29	1.76E-03	2.29E-04	1.59E-04	7.00E-05	1.76E-03	1.49E-02	2.60E-04	1.47E-02	1.76E-03	1.03E-03	5.86E-05	9.75E-04	1.76E-03	5.46E-03	3.95E-04	5.07E-03	1.76E-03	1.31E-05	1.28E-05	3.25E-07
1620	585595.23	2961336.29	4.77E-03	4.91E-04	4.30E-04	6.18E-05	4.78E-03	1.16E-02	9.23E-04	1.07E-02	4.77E-03	8.75E-04	1.60E-04	7.14E-04	4.77E-03	4.91E-03	1.15E-03	3.76E-03	4.77E-03	3.67E-05	3.64E-05	2.87E-07
1621	585695.23	2961336.29	8.11E-03	7.72E-04	7.35E-04	3.73E-05	8.12E-03	9.16E-03	1.87E-03	7.29E-03	8.11E-03	7.71E-04	2.84E-04	4.87E-04	8.10E-03	4.69E-03	2.08E-03	2.62E-03	8.11E-03	6.88E-05	6.86E-05	1.74E-07
1622	585795.23	2961336.29	1.10E-02	1.04E-03	1.00E-03	3.52E-05	1.10E-02	8.75E-03	2.89E-03	5.86E-03	1.10E-02	7.97E-04	4.05E-04	3.92E-04	1.10E-02	5.12E-03	2.96E-03	2.16E-03	1.10E-02	1.00E-04	1.00E-04	1.64E-07
1623	585895.23	2961336.29	1.30E-02	1.22E-03	1.18E-03	3.52E-05	1.30E-02	8.71E-03	3.75E-03	4.95E-03	1.30E-02	8.31E-04	4.99E-04	3.33E-04	1.30E-02	5.50E-03	3.63E-03	1.87E-03	1.30E-02	1.23E-04	1.23E-04	1.64E-07
1624	585995.23	2961336.29	1.39E-02	1.30E-03	1.26E-03	3.33E-05	1.39E-02	8.54E-03	4.30E-03	4.24E-03	1.39E-02	8.39E-04	5.53E-04	2.86E-04	1.39E-02	5.64E-03	4.00E-03	1.64E-03	1.39E-02	1.33E-04	1.33E-04	1.55E-07
1672	584695.23	2961436.29	4.96E-02	9.78E-03	9.75E-03	2.77E-05	4.96E-02	2.29E-02	1.77E-02	5.18E-03	4.96E-02	2.45E-03	2.10E-03	3.52E-04	4.96E-02	1.43E-02	1.23E-02	1.99E-03	4.96E-02	4.61E-03	4.61E-03	1.29E-07
1673	584795.23	2961436.29	4.34E-02	8.46E-03	8.43E-03	2.52E-05	4.34E-02	2.11E-02	1.50E-02	6.11E-03	4.34E-02	2.23E-03	1.81E-03	4.14E-04	4.34E-02	1.29E-02	1.06E-02	2.31E-03	4.34E-02	3.92E-03	3.92E-03	1.17E-07
1674	584895.23	2961436.29	3.34E-02	6.40E-03	6.37E-03	2.40E-05	3.35E-02	1.86E-02	1.11E-02	7.52E-03	3.34E-02	1.88E-03	1.37E-03	5.08E-04	3.34E-02	1.09E-02	8.08E-03	2.80E-03	3.34E-02	2.90E-03	2.90E-03	1.11E-07
1675	584995.23	2961436.29	2.15E-02	4.00E-03	3.95E-03	4.06E-05	2.15E-02	1.70E-02	6.60E-03	1.04E-02	2.15E-02	1.55E-03	8.52E-04	7.00E-04	2.15E-02	8.89E-03	5.11E-03	3.78E-03	2.15E-02	1.73E-03	1.73E-03	1.89E-07
1676	585095.23	2961436.29	1.00E-02	1.76E-03	1.69E-03	7.20E-05	1.01E-02	1.74E-02	2.67E-03	1.47E-02	1.00E-02	1.36E-03	3.78E-04	9.82E-04	1.00E-02	7.58E-03	2.35E-03	5.23E-03	1.00E-02	6.73E-04	6.73E-04	3.34E-07
1677	585195.23	2961436.29	3.24E-03	5.21E-04	4.13E-04	1.09E-04	3.25E-03	2.15E-02	6.25E-04	2.09E-02	3.24E-03	1.50E-03	1.13E-04	1.39E-03	3.24E-03	8.01E-03	7.60E-04	7.25E-03	3.24E-03	1.07E-04	1.07E-04	5.04E-07
1678	585295.23	2961436.29	1.45E-03	2.03E-04	1.40E-04	6.23E-05	1.45E-03	1.79E-02	1.89E-04	1.78E-02	1.45E-03	1.24E-03	4.86E-05	1.19E-03	1.45E-03	6.53E-03	3.33E-04	6.20E-03	1.45E-03	1.46E-05	1.44E-05	2.89E-07
1679	585395.23	2961436.29	1.82E-03	2.40E-04	1.67E-04	7.30E-05	1.83E-03	1.60E-02	2.41E-04	1.58E-02	1.82E-03	1.11E-03	5.99E-05	1.05E-03	1.82E-03	5.87E-03	4.14E-04	5.45E-03	1.82E-03	1.53E-05	1.49E-05	3.39E-07
1680	585495.23	2961436.29	3.62E-03	3.90E-04	3.30E-04	6.01E-05	3.63E-03	1.32E-02	6.12E-04	1.26E-02	3.62E-03	9.56E-04	1.19E-04	8.38E-04	3.62E-03	5.27E-03	8.73E-04	4.40E-03	3.62E-03	2.83E-05	2.80E-05	2.79E-07
1681	585595.23	2961436.29	6.50E-03	6.16E-04	5.92E-04	2.42E-05	6.51E-03	8.92E-03	1.35E-03	7.57E-03	6.50E-03	7.27E-04	2.19E-04	5.08E-04	6.50E-03	4.36E-03	1.65E-03	2.72E-03	6.50E-03	5.20E-05	5.19E-05	1.12E-07
1682	585695.23	2961436.29	9.49E-03	9.00E-04	8.65E-04	3.56E-05	9.50E-03	8.91E-03	2.23E-03	6.68E-03	9.49E-03											

Solid Waste Authority Palm Beach Renewable Energy Facility No. 2
Refurbished Stack

Annual
Watershed #5 - Rookery/Shell Pits Watershed

Receptor ID	X	Y	Vapor Phase				Particle Phase				Particle Bound Phase				Divalent Mercury Vapor Phase				Elemental Mercury Vapor Phase			
			AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO
1857	584895.23	2961736.29	4.26E-02	7.43E-03	7.40E-03	3.26E-05	4.27E-02	2.24E-02	1.58E-02	6.60E-03	4.27E-02	2.29E-03	1.84E-03	4.47E-04	4.26E-02	1.40E-02	1.14E-02	2.52E-03	4.26E-02	3.11E-03	3.11E-03	1.52E-07
1858	584995.23	2961736.29	3.42E-02	5.06E-03	5.01E-03	4.43E-05	3.42E-02	2.01E-02	1.24E-02	7.64E-03	3.42E-02	1.97E-03	1.46E-03	5.15E-04	3.42E-02	1.24E-02	9.54E-03	2.85E-03	3.42E-02	1.78E-03	1.78E-03	2.06E-07
1859	585095.23	2961736.29	2.42E-02	2.81E-03	2.78E-03	2.77E-05	2.43E-02	1.56E-02	8.29E-03	7.29E-03	2.42E-02	1.49E-03	1.00E-03	4.93E-04	2.42E-02	9.76E-03	7.04E-03	2.72E-03	2.42E-02	6.52E-04	6.52E-04	1.29E-07
1860	585195.23	2961736.29	1.57E-02	1.55E-03	1.51E-03	3.17E-05	1.57E-02	1.21E-02	4.75E-03	7.39E-03	1.57E-02	1.11E-03	6.11E-04	4.98E-04	1.57E-02	7.33E-03	4.59E-03	2.74E-03	1.57E-02	1.91E-04	1.91E-04	1.47E-07
1861	585295.23	2961736.29	1.09E-02	1.06E-03	1.03E-03	2.36E-05	1.09E-02	9.21E-03	2.79E-03	6.42E-03	1.09E-02	8.32E-04	3.96E-04	4.35E-04	1.09E-02	5.52E-03	3.12E-03	2.40E-03	1.09E-02	1.10E-04	1.10E-04	1.10E-07
1863	585495.23	2961736.29	9.95E-03	9.71E-04	9.41E-04	3.01E-05	9.95E-03	8.30E-03	2.30E-03	6.01E-03	9.95E-03	7.51E-04	3.47E-04	4.04E-04	9.94E-03	4.97E-03	2.76E-03	2.22E-03	9.95E-03	1.11E-04	1.11E-04	1.40E-07
1864	585595.23	2961736.29	1.15E-02	1.09E-03	1.07E-03	2.05E-05	1.15E-02	7.92E-03	2.94E-03	4.98E-03	1.15E-02	7.52E-04	4.17E-04	3.36E-04	1.15E-02	5.10E-03	3.23E-03	1.87E-03	1.15E-02	1.20E-04	1.20E-04	9.51E-08
1865	585695.23	2961736.29	1.32E-02	1.24E-03	1.22E-03	2.39E-05	1.32E-02	8.41E-03	3.64E-03	4.77E-03	1.32E-02	8.12E-04	4.91E-04	3.21E-04	1.32E-02	5.60E-03	3.78E-03	1.81E-03	1.32E-02	1.28E-04	1.28E-04	1.11E-07
1866	585795.23	2961736.29	1.43E-02	1.33E-03	1.31E-03	2.14E-05	1.43E-02	8.43E-03	4.09E-03	4.33E-03	1.43E-02	8.29E-04	5.35E-04	2.94E-04	1.43E-02	5.82E-03	4.15E-03	1.67E-03	1.43E-02	1.33E-04	1.33E-04	9.94E-08
1867	585895.23	2961736.29	1.46E-02	1.34E-03	1.33E-03	1.28E-05	1.46E-02	7.65E-03	4.25E-03	3.40E-03	1.46E-02	7.79E-04	5.47E-04	2.32E-04	1.46E-02	5.59E-03	4.25E-03	1.34E-03	1.46E-02	1.34E-04	1.34E-04	5.96E-08
1868	585995.23	2961736.29	1.43E-02	1.31E-03	1.30E-03	8.43E-06	1.43E-02	6.83E-03	4.18E-03	2.65E-03	1.43E-02	7.17E-04	5.35E-04	1.81E-04	1.43E-02	5.21E-03	4.15E-03	1.06E-03	1.43E-02	1.31E-04	1.31E-04	3.91E-08
1869	586095.23	2961736.29	1.37E-02	1.25E-03	1.24E-03	8.70E-06	1.37E-02	6.37E-03	4.01E-03	2.36E-03	1.37E-02	6.73E-04	5.12E-04	1.61E-04	1.37E-02	4.91E-03	3.96E-03	9.57E-04	1.37E-02	1.25E-04	1.25E-04	4.04E-08
1916	584695.23	2961836.29	4.84E-02	9.16E-03	9.14E-03	1.93E-05	4.84E-02	2.25E-02	1.82E-02	4.31E-03	4.84E-02	2.39E-03	2.09E-03	2.95E-04	4.84E-02	1.45E-02	1.28E-02	1.74E-03	4.84E-02	4.12E-03	4.12E-03	8.95E-08
1917	584795.23	2961836.29	4.62E-02	8.20E-03	8.18E-03	2.46E-05	4.62E-02	2.26E-02	1.75E-02	5.14E-03	4.62E-02	2.35E-03	2.00E-03	3.50E-04	4.62E-02	1.44E-02	1.24E-02	2.02E-03	4.62E-02	3.51E-03	3.51E-03	1.14E-07
1918	584895.23	2961836.29	4.15E-02	6.52E-03	6.49E-03	3.74E-05	4.15E-02	2.18E-02	1.56E-02	6.13E-03	4.15E-02	2.21E-03	1.80E-03	4.15E-04	4.15E-02	1.39E-02	1.15E-02	2.35E-03	4.15E-02	2.48E-03	2.48E-03	1.74E-07
1919	584995.23	2961836.29	3.43E-02	4.44E-03	4.41E-03	2.70E-05	3.44E-02	1.85E-02	1.26E-02	5.95E-03	3.43E-02	1.86E-03	1.46E-03	4.04E-04	3.43E-02	1.22E-02	9.95E-03	2.27E-03	3.43E-02	1.31E-03	1.31E-03	1.25E-07
1920	585095.23	2961836.29	2.57E-02	2.71E-03	2.69E-03	2.30E-05	2.58E-02	1.49E-02	8.88E-03	5.97E-03	2.57E-02	1.46E-03	1.06E-03	4.04E-04	2.57E-02	9.95E-03	7.68E-03	2.27E-03	2.57E-02	4.98E-04	4.98E-04	1.07E-07
1924	585495.23	2961836.29	1.11E-02	1.08E-03	1.06E-03	2.63E-05	1.11E-02	7.82E-03	2.73E-03	5.09E-03	1.11E-02	7.38E-04	3.93E-04	3.44E-04	1.11E-02	5.11E-03	3.20E-03	1.91E-03	1.11E-02	1.28E-04	1.28E-04	1.22E-07
1925	585595.23	2961836.29	1.19E-02	1.14E-03	1.12E-03	2.03E-05	1.19E-02	7.52E-03	3.10E-03	4.42E-03	1.19E-02	7.32E-04	4.33E-04	2.99E-04	1.19E-02	5.12E-03	3.44E-03	1.68E-03	1.19E-02	1.31E-04	1.31E-04	9.41E-08
1926	585695.23	2961836.29	1.32E-02	1.23E-03	1.22E-03	1.66E-05	1.32E-02	7.53E-03	3.68E-03	3.85E-03	1.32E-02	7.53E-04	4.93E-04	2.61E-04	1.32E-02	5.31E-03	3.81E-03	1.49E-03	1.32E-02	1.34E-04	1.33E-04	7.69E-08
1927	585795.23	2961836.29	1.40E-02	1.31E-03	1.28E-03	2.19E-05	1.40E-02	8.00E-03	4.10E-03	3.90E-03	1.41E-02	7.97E-04	5.33E-04	2.64E-04	1.40E-02	5.63E-03	4.11E-03	1.53E-03	1.41E-02	1.34E-04	1.34E-04	1.02E-07
1928	585895.23	2961836.29	1.43E-02	1.32E-03	1.30E-03	1.74E-05	1.43E-02	7.72E-03	4.24E-03	3.47E-03	1.43E-02	7.79E-04	5.42E-04	2.37E-04	1.43E-02	5.58E-03	4.21E-03	1.38E-03	1.43E-02	1.31E-04	1.31E-04	8.09E-08
1929	585995.23	2961836.29	1.40E-02	1.28E-03	1.27E-03	1.14E-05	1.40E-02	7.01E-03	4.16E-03	2.84E-03	1.40E-02	7.23E-04	5.28E-04	1.95E-04	1.40E-02	5.27E-03	4.12E-03	1.15E-03	1.40E-02	1.26E-04	1.26E-04	5.30E-08
1930	586095.23	2961836.29	1.34E-02	1.22E-03	1.21E-03	7.36E-06	1.34E-02	6.21E-03	3.97E-03	2.25E-03	1.34E-02	6.56E-04	5.02E-04	1.54E-04	1.34E-02	4.85E-03	3.92E-03	9.26E-04	1.34E-02	1.20E-04	1.20E-04	3.42E-08
1977	584695.23	2961936.29	4.51E-02	8.08E-03	8.06E-03	1.96E-05	4.51E-02	2.12E-02	1.71E-02	4.17E-03	4.51E-02											

Solid Waste Authority Palm Beach Renewable Energy Facility No. 2
Refurbished Stack

Annual
Watershed #5 - Rookery/Shell Pits Watershed

Receptor ID	X	Y	Vapor Phase				Particle Phase				Particle Bound Phase				Divalent Mercury Vapor Phase				Elemental Mercury Vapor Phase			
			AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO
2161	584795.23	2962236.29	3.12E-02	3.86E-03	3.84E-03	1.49E-05	3.12E-02	1.47E-02	1.15E-02	3.23E-03	3.12E-02	1.53E-03	1.31E-03	2.22E-04	3.12E-02	1.05E-02	9.19E-03	1.33E-03	3.12E-02	1.08E-03	1.08E-03	6.94E-08
2162	584895.23	2962236.29	2.79E-02	3.02E-03	3.01E-03	1.28E-05	2.79E-02	1.32E-02	1.00E-02	3.21E-03	2.79E-02	1.37E-03	1.15E-03	2.21E-04	2.79E-02	9.71E-03	8.39E-03	1.32E-03	2.79E-02	6.32E-04	6.32E-04	5.93E-08
2163	584995.23	2962236.29	2.39E-02	2.33E-03	2.32E-03	1.48E-05	2.39E-02	1.16E-02	8.27E-03	3.32E-03	2.40E-02	1.19E-03	9.64E-04	2.28E-04	2.39E-02	8.63E-03	7.27E-03	1.36E-03	2.40E-02	3.39E-04	3.39E-04	6.87E-08
2167	585395.23	2962236.29	1.16E-02	1.11E-03	1.09E-03	2.17E-05	1.16E-02	6.55E-03	3.20E-03	3.34E-03	1.16E-02	6.51E-04	4.21E-04	2.30E-04	1.16E-02	4.87E-03	3.53E-03	1.34E-03	1.17E-02	1.19E-04	1.19E-04	1.01E-07
2168	585495.23	2962236.29	1.08E-02	1.05E-03	1.02E-03	2.89E-05	1.08E-02	6.55E-03	2.87E-03	3.68E-03	1.08E-02	6.37E-04	3.85E-04	2.52E-04	1.08E-02	4.72E-03	3.26E-03	1.46E-03	1.08E-02	1.17E-04	1.17E-04	1.34E-07
2169	585595.23	2962236.29	1.04E-02	9.99E-04	9.83E-04	1.53E-05	1.04E-02	5.54E-03	2.74E-03	2.80E-03	1.04E-02	5.62E-04	3.70E-04	1.92E-04	1.04E-02	4.26E-03	3.13E-03	1.13E-03	1.04E-02	1.15E-04	1.15E-04	7.11E-08
2170	585695.23	2962236.29	1.03E-02	9.86E-04	9.71E-04	1.49E-05	1.03E-02	5.41E-03	2.77E-03	2.64E-03	1.03E-02	5.53E-04	3.72E-04	1.81E-04	1.03E-02	4.20E-03	3.12E-03	1.08E-03	1.03E-02	1.12E-04	1.12E-04	6.93E-08
2171	585795.23	2962236.29	1.05E-02	9.88E-04	9.77E-04	1.12E-05	1.05E-02	5.26E-03	2.92E-03	2.34E-03	1.05E-02	5.46E-04	3.86E-04	1.61E-04	1.05E-02	4.14E-03	3.16E-03	9.74E-04	1.05E-02	1.08E-04	1.08E-04	5.20E-08
2172	585895.23	2962236.29	1.07E-02	9.94E-04	9.84E-04	1.01E-05	1.07E-02	5.23E-03	3.09E-03	2.14E-03	1.07E-02	5.48E-04	4.01E-04	1.47E-04	1.07E-02	4.11E-03	3.20E-03	9.09E-04	1.07E-02	1.04E-04	1.04E-04	4.69E-08
2173	585995.23	2962236.29	1.08E-02	9.92E-04	9.82E-04	9.82E-06	1.08E-02	5.21E-03	3.19E-03	2.02E-03	1.08E-02	5.47E-04	4.08E-04	1.39E-04	1.08E-02	4.09E-03	3.21E-03	8.72E-04	1.08E-02	9.98E-05	9.97E-05	4.57E-08
2174	586095.23	2962236.29	1.07E-02	9.81E-04	9.68E-04	1.28E-05	1.07E-02	5.29E-03	3.21E-03	2.08E-03	1.07E-02	5.49E-04	4.05E-04	1.44E-04	1.07E-02	4.10E-03	3.19E-03	9.07E-04	1.07E-02	9.48E-05	9.48E-05	5.93E-08
2221	584695.23	2962336.29	2.98E-02	3.89E-03	3.88E-03	1.54E-05	2.97E-02	1.39E-02	1.10E-02	2.89E-03	2.98E-02	1.45E-03	1.25E-03	1.99E-04	2.97E-02	9.89E-03	8.67E-03	1.22E-03	2.98E-02	1.20E-03	1.20E-03	7.15E-08
2222	584795.23	2962336.29	2.76E-02	3.18E-03	3.17E-03	1.20E-05	2.76E-02	1.29E-02	1.00E-02	2.86E-03	2.77E-02	1.34E-03	1.14E-03	1.97E-04	2.76E-02	9.42E-03	8.22E-03	1.20E-03	2.77E-02	7.78E-04	7.78E-04	5.58E-08
2223	584895.23	2962336.29	2.47E-02	2.54E-03	2.53E-03	1.18E-05	2.47E-02	1.16E-02	8.70E-03	2.88E-03	2.47E-02	1.20E-03	1.00E-03	1.98E-04	2.47E-02	8.67E-03	7.46E-03	1.20E-03	2.47E-02	4.56E-04	4.56E-04	5.47E-08
2224	584995.23	2962336.29	2.13E-02	2.02E-03	2.01E-03	1.40E-05	2.13E-02	1.02E-02	7.23E-03	2.97E-03	2.13E-02	1.05E-03	8.45E-04	2.04E-04	2.13E-02	7.71E-03	6.47E-03	1.24E-03	2.13E-02	2.59E-04	2.59E-04	6.52E-08
2229	585495.23	2962336.29	1.02E-02	9.91E-04	9.63E-04	2.78E-05	1.02E-02	6.12E-03	2.73E-03	3.39E-03	1.02E-02	5.96E-04	3.63E-04	2.32E-04	1.02E-02	4.46E-03	3.10E-03	1.36E-03	1.02E-02	1.08E-04	1.08E-04	1.29E-07
2230	585595.23	2962336.29	9.78E-03	9.40E-04	9.24E-04	1.56E-05	9.76E-03	5.19E-03	2.58E-03	2.62E-03	9.79E-03	5.26E-04	3.46E-04	1.80E-04	9.76E-03	4.03E-03	2.96E-03	1.07E-03	9.79E-03	1.06E-04	1.06E-04	7.25E-08
2231	585695.23	2962336.29	9.62E-03	9.18E-04	9.05E-04	1.34E-05	9.60E-03	4.94E-03	2.55E-03	2.39E-03	9.62E-03	5.07E-04	3.42E-04	1.64E-04	9.60E-03	3.90E-03	2.91E-03	9.91E-04	9.62E-03	1.03E-04	1.03E-04	6.24E-08
2232	585795.23	2962336.29	9.67E-03	9.13E-04	9.01E-04	1.20E-05	9.65E-03	4.85E-03	2.64E-03	2.22E-03	9.68E-03	5.02E-04	3.50E-04	1.52E-04	9.65E-03	3.85E-03	2.92E-03	9.32E-04	9.68E-03	1.00E-04	1.00E-04	5.58E-08
2233	585895.23	2962336.29	9.82E-03	9.13E-04	9.04E-04	9.03E-06	9.80E-03	4.74E-03	2.77E-03	1.97E-03	9.83E-03	4.97E-04	3.62E-04	1.36E-04	9.80E-03	3.79E-03	2.94E-03	8.45E-04	9.83E-03	9.66E-05	9.66E-05	4.20E-08
2234	585995.23	2962336.29	9.92E-03	9.12E-04	9.03E-04	9.28E-06	9.89E-03	4.72E-03	2.88E-03	1.85E-03	9.92E-03	4.98E-04	3.70E-04	1.28E-04	9.89E-03	3.76E-03	2.95E-03	8.10E-04	9.93E-03	9.26E-05	9.25E-05	4.31E-08
2235	586095.23	2962336.29	9.90E-03	9.03E-04	8.94E-04	9.17E-06	9.87E-03	4.70E-03	2.92E-03	1.78E-03	9.91E-03	4.95E-04	3.71E-04	1.23E-04	9.88E-03	3.73E-03	2.94E-03	7.91E-04	9.91E-03	8.82E-05	8.82E-05	4.26E-08
2282	584695.23	2962436.29	2.65E-02	3.22E-03	3.21E-03	1.20E-05	2.64E-02	1.22E-02	9.62E-03	2.57E-03	2.65E-02	1.27E-03	1.09E-03	1.78E-04	2.64E-02	8.90E-03	7.80E-03	1.10E-03	2.65E-02	8.82E-04	8.82E-04	5.60E-08
2283	584795.23	2962436.29	2.44E-02	2.65E-03	2.64E-03	1.03E-05	2.44E-02	1.12E-02	8.68E-03	2.55E-03	2.45E-02	1.17E-03	9.95E-04	1.76E-04	2.44E-02	8.40E-03	7.32E-03	1.09E-03	2.45E-02	5.66E-04	5.66E-04	4.78E-08
2284	584895.23	2962436.29	2.19E-02	2.16E-03	2.15E-03	1.14E-05	2.19E-02	1.02E-02	7.56E-03	2.62E-03	2.19E-02	1.06E-03	8.74									

Solid Waste Authority Palm Beach Renewable Energy Facility No. 2
Refurbished Stack

Annual
Watershed #5 - Rookery/Shell Pits Watershed

Receptor ID	X	Y	Vapor Phase				Particle Phase				Particle Bound Phase				Divalent Mercury Vapor Phase				Elemental Mercury Vapor Phase			
			AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO
2469	585095.23	2962736.29	1.19E-02	1.07E-03	1.06E-03	7.18E-06	1.19E-02	5.33E-03	3.61E-03	1.71E-03	1.19E-02	5.57E-04	4.37E-04	1.20E-04	1.19E-02	4.35E-03	3.57E-03	7.75E-04	1.19E-02	9.36E-05	9.35E-05	3.34E-08
2470	585195.23	2962736.29	1.05E-02	9.47E-04	9.41E-04	6.59E-06	1.04E-02	4.70E-03	3.03E-03	1.67E-03	1.05E-02	4.93E-04	3.76E-04	1.17E-04	1.04E-02	3.88E-03	3.13E-03	7.50E-04	1.05E-02	8.35E-05	8.35E-05	3.06E-08
2471	585295.23	2962736.29	9.32E-03	8.56E-04	8.48E-04	7.98E-06	9.29E-03	4.36E-03	2.59E-03	1.76E-03	9.33E-03	4.53E-04	3.29E-04	1.24E-04	9.29E-03	3.57E-03	2.79E-03	7.80E-04	9.33E-03	7.94E-05	7.94E-05	3.71E-08
2472	585395.23	2962736.29	8.49E-03	7.91E-04	7.80E-04	1.09E-05	8.46E-03	4.15E-03	2.28E-03	1.87E-03	8.49E-03	4.26E-04	2.95E-04	1.31E-04	8.46E-03	3.36E-03	2.54E-03	8.17E-04	8.49E-03	7.76E-05	7.75E-05	5.07E-08
2473	585495.23	2962736.29	7.92E-03	7.52E-04	7.33E-04	1.95E-05	7.89E-03	4.36E-03	2.07E-03	2.29E-03	7.92E-03	4.32E-04	2.73E-04	1.59E-04	7.89E-03	3.36E-03	2.38E-03	9.82E-04	7.93E-03	7.64E-05	7.63E-05	9.08E-08
2474	585595.23	2962736.29	7.55E-03	7.21E-04	7.02E-04	1.90E-05	7.53E-03	4.18E-03	1.94E-03	2.23E-03	7.55E-03	4.13E-04	2.58E-04	1.55E-04	7.53E-03	3.22E-03	2.27E-03	9.56E-04	7.56E-03	7.51E-05	7.50E-05	8.84E-08
2475	585695.23	2962736.29	7.30E-03	6.91E-04	6.80E-04	1.08E-05	7.27E-03	3.62E-03	1.87E-03	1.75E-03	7.30E-03	3.72E-04	2.50E-04	1.22E-04	7.28E-03	2.95E-03	2.19E-03	7.66E-04	7.30E-03	7.36E-05	7.36E-05	5.02E-08
2476	585795.23	2962736.29	7.15E-03	6.74E-04	6.64E-04	9.40E-06	7.12E-03	3.45E-03	1.84E-03	1.62E-03	7.15E-03	3.59E-04	2.46E-04	1.13E-04	7.12E-03	2.86E-03	2.15E-03	7.17E-04	7.15E-03	7.19E-05	7.18E-05	4.37E-08
2477	585895.23	2962736.29	7.08E-03	6.64E-04	6.54E-04	1.00E-05	7.05E-03	3.43E-03	1.85E-03	1.59E-03	7.08E-03	3.57E-04	2.46E-04	1.11E-04	7.06E-03	2.84E-03	2.13E-03	7.12E-04	7.09E-03	6.99E-05	6.99E-05	4.66E-08
2478	585995.23	2962736.29	7.09E-03	6.58E-04	6.50E-04	8.25E-06	7.06E-03	3.34E-03	1.89E-03	1.45E-03	7.09E-03	3.51E-04	2.50E-04	1.01E-04	7.06E-03	2.78E-03	2.12E-03	6.62E-04	7.09E-03	6.77E-05	6.76E-05	3.84E-08
2479	586095.23	2962736.29	7.11E-03	6.52E-04	6.46E-04	6.59E-06	7.08E-03	3.26E-03	1.94E-03	1.32E-03	7.11E-03	3.46E-04	2.53E-04	9.26E-05	7.09E-03	2.73E-03	2.11E-03	6.14E-04	7.12E-03	6.53E-05	6.52E-05	3.06E-08
2526	584695.23	2962836.29	1.66E-02	1.68E-03	1.67E-03	7.67E-06	1.66E-02	7.43E-03	5.66E-03	1.77E-03	1.66E-02	7.77E-04	6.53E-04	1.24E-04	1.66E-02	5.79E-03	4.98E-03	8.07E-04	1.66E-02	2.87E-04	2.87E-04	3.57E-08
2527	584795.23	2962836.29	1.53E-02	1.45E-03	1.45E-03	8.93E-06	1.52E-02	6.91E-03	5.07E-03	1.84E-03	1.53E-02	7.18E-04	5.89E-04	1.28E-04	1.52E-02	5.43E-03	4.59E-03	8.34E-04	1.53E-02	1.94E-04	1.93E-04	4.15E-08
2528	584895.23	2962836.29	1.38E-02	1.26E-03	1.25E-03	9.71E-06	1.37E-02	6.28E-03	4.44E-03	1.84E-03	1.38E-02	6.50E-04	5.22E-04	1.28E-04	1.37E-02	4.98E-03	4.14E-03	8.34E-04	1.38E-02	1.34E-04	1.34E-04	4.51E-08
2529	584995.23	2962836.29	1.23E-02	1.10E-03	1.10E-03	8.65E-06	1.22E-02	5.54E-03	3.81E-03	1.73E-03	1.23E-02	5.76E-04	4.55E-04	1.21E-04	1.22E-02	4.47E-03	3.68E-03	7.87E-04	1.23E-02	1.00E-04	1.00E-04	4.02E-08
2530	585095.23	2962836.29	1.08E-02	9.73E-04	9.67E-04	6.32E-06	1.08E-02	4.79E-03	3.24E-03	1.55E-03	1.08E-02	5.03E-04	3.94E-04	1.09E-04	1.08E-02	3.95E-03	3.24E-03	7.13E-04	1.09E-02	8.36E-05	8.36E-05	2.94E-08
2531	585195.23	2962836.29	9.62E-03	8.70E-04	8.64E-04	6.26E-06	9.59E-03	4.30E-03	2.76E-03	1.54E-03	9.63E-03	4.51E-04	3.43E-04	1.08E-04	9.59E-03	3.57E-03	2.87E-03	7.03E-04	9.63E-03	7.60E-05	7.59E-05	2.91E-08
2532	585295.23	2962836.29	8.65E-03	7.92E-04	7.85E-04	7.46E-06	8.62E-03	4.01E-03	2.38E-03	1.63E-03	8.65E-03	4.17E-04	3.03E-04	1.14E-04	8.62E-03	3.31E-03	2.58E-03	7.29E-04	8.65E-03	7.27E-05	7.26E-05	3.47E-08
2533	585395.23	2962836.29	7.92E-03	7.35E-04	7.25E-04	9.82E-06	7.89E-03	3.82E-03	2.11E-03	1.71E-03	7.92E-03	3.93E-04	2.73E-04	1.20E-04	7.89E-03	3.12E-03	2.36E-03	7.57E-04	7.93E-03	7.11E-05	7.11E-05	4.56E-08
2534	585495.23	2962836.29	7.41E-03	7.01E-04	6.83E-04	1.75E-05	7.39E-03	4.00E-03	1.92E-03	2.08E-03	7.42E-03	3.98E-04	2.53E-04	1.44E-04	7.39E-03	3.12E-03	2.22E-03	9.03E-04	7.42E-03	7.01E-05	7.00E-05	8.15E-08
2535	585595.23	2962836.29	7.07E-03	6.74E-04	6.55E-04	1.90E-05	7.05E-03	3.93E-03	1.81E-03	2.13E-03	7.08E-03	3.88E-04	2.40E-04	1.48E-04	7.05E-03	3.04E-03	2.11E-03	9.23E-04	7.08E-03	6.90E-05	6.89E-05	8.84E-08
2587	584695.23	2962936.29	1.49E-02	1.47E-03	1.46E-03	7.55E-06	1.49E-02	6.66E-03	5.00E-03	1.66E-03	1.49E-02	6.95E-04	5.79E-04	1.16E-04	1.49E-02	5.24E-03	4.47E-03	7.66E-04	1.49E-02	2.26E-04	2.26E-04	3.51E-08
2588	584795.23	2962936.29	1.37E-02	1.28E-03	1.27E-03	8.76E-06	1.37E-02	6.18E-03	4.47E-03	1.71E-03	1.37E-02	6.42E-04	5.23E-04	1.20E-04	1.37E-02	4.90E-03	4.11E-03	7.88E-04	1.37E-02	1.56E-04	1.56E-04	4.07E-08
2589	584895.23	2962936.29	1.24E-02	1.13E-03	1.12E-03	9.03E-06	1.24E-02	5.61E-03	3.93E-03	1.68E-03	1.24E-02	5.82E-04	4.65E-04	1.18E-04	1.24E-02	4.49E-03	3.72E-03	7.76E-04	1.24E-02	1.12E-04	1.12E-04	4.20E-08
2590	584995.23	2962936.29	1.11E-02	9.97E-04	9.89E-04	7.74E-06	1.11E-02	4.96E-03	3.40E-03	1.56E-03	1.11E-02	5.17E-04	4.08E-04	1.10E-04	1.11E-02	4.04E-03	3.32E-03	7.26E-04	1.11E-02	8.77E-05	8.77E-05	3.60E-08
2591	585095.23	2962936.29	9.91E-03	8.88E-04	8.82E-04	5.65E-06	9.87E-03	4.33E-03	2.92E-03	1.41E-03	9.91E-03	4.56E-04	3.56E-04	9.93E-05	9.88E-03	3.61E-03	2.95E-03	6.60E-04	9.92E-03	7.52E-05	7.52E-05	2.63E-08
2592	585195.23	2962936.29	8.87E-03	8.02E-04	7.96E-04	5.98E-06	8.84E-03	3.94E-03	2.51E-03	1.43E-03	8.88E-03	4.14E-04	3.13E-04	1.01E-04	8.84E-03	3.30E-03	2.64E-03	6.62E-04	8.88E-03	6.93E-05	6.93E-05	2.78E-08
2593	585295.23	2962936.29	8.03E-03	7.34E-04	7.27E-04	7.01E-06	8.00E-03	3.70E-03	2.19E-03	1.50E-03	8.04E-03	3.85E-04	2.79E-04	1.06E-04	8.00E-03	3.07E-03	2.39E-03	6.84E-04	8.04E-03	6.67E-05	6.67E-05	3.26E-08
2594	585395.23	2962936.29	7.40E-03	6.85E-04	6.76E-04	8.91E-06	7.37E-03	3.52E-03	1.95E-03	1.57E-03	7.40E-03	3.64E-04	2.53E-04	1.10E-04	7.37E-03	2.91E-03	2.20E-03	7.05.				

Solid Waste Authority Palm Beach Renewable Energy Facility No. 2
Refurbished Stack

Annual
Watershed #6 - M Canal Watershed

Receptor ID	X	Y	Vapor Phase				Particle Phase				Particle Bound Phase				Divalent Mercury Vapor Phase				Elemental Mercury Vapor Phase			
			AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO	AVERAGE CONC	TOTAL DEPO	DRY DEPO	WET DEPO
265	584295.23	2959136.29	5.78E-03	1.01E-03	1.01E-03	6.92E-06	5.75E-03	2.94E-03	2.03E-03	9.11E-04	5.79E-03	2.95E-04	2.30E-04	6.48E-05	5.77E-03	1.97E-03	1.50E-03	4.67E-04	5.79E-03	4.59E-04	4.59E-04	3.22E-08
260	583795.23	2959136.29	5.89E-03	1.07E-03	1.06E-03	4.33E-06	5.86E-03	2.70E-03	1.96E-03	7.42E-04	5.90E-03	2.81E-04	2.27E-04	5.34E-05	5.87E-03	1.87E-03	1.48E-03	3.92E-04	5.90E-03	5.12E-04	5.12E-04	2.01E-08
255	583295.23	2959136.29	5.85E-03	1.09E-03	1.08E-03	4.55E-06	5.83E-03	2.53E-03	1.90E-03	6.27E-04	5.87E-03	2.67E-04	2.22E-04	4.55E-05	5.84E-03	1.81E-03	1.46E-03	3.54E-04	5.87E-03	5.37E-04	5.37E-04	2.12E-08
373	582895.23	2959336.29	6.34E-03	1.18E-03	1.18E-03	4.88E-06	6.31E-03	2.70E-03	2.06E-03	6.43E-04	6.36E-03	2.84E-04	2.38E-04	4.68E-05	6.32E-03	1.98E-03	1.61E-03	3.66E-04	6.35E-03	5.92E-04	5.92E-04	2.27E-08
673	582395.23	2959836.29	8.24E-03	1.57E-03	1.56E-03	4.43E-06	8.20E-03	3.40E-03	2.81E-03	5.87E-04	8.26E-03	3.56E-04	3.13E-04	4.27E-05	8.22E-03	2.52E-03	2.18E-03	3.37E-04	8.25E-03	8.08E-04	8.08E-04	2.06E-08
4428	579795.23	2960236.29	7.05E-03	1.31E-03	1.30E-03	3.22E-06	7.03E-03	2.51E-03	2.20E-03	3.14E-04	7.09E-03	2.55E-04	2.31E-04	2.35E-05	7.03E-03	2.00E-03	1.80E-03	2.06E-04	7.08E-03	6.66E-04	6.66E-04	1.50E-08
4429	580295.23	2960236.29	7.51E-03	1.40E-03	1.40E-03	3.55E-06	7.49E-03	2.78E-03	2.41E-03	3.61E-04	7.55E-03	2.82E-04	2.55E-04	2.69E-05	7.49E-03	2.16E-03	1.94E-03	2.28E-04	7.54E-03	7.20E-04	7.20E-04	1.65E-08
4430	580795.23	2960236.29	8.07E-03	1.52E-03	1.52E-03	3.93E-06	8.04E-03	3.09E-03	2.67E-03	4.16E-04	8.10E-03	3.14E-04	2.84E-04	3.07E-05	8.04E-03	2.35E-03	2.10E-03	2.53E-04	8.09E-03	7.84E-04	7.84E-04	1.83E-08
4431	581295.23	2960236.29	8.73E-03	1.67E-03	1.66E-03	4.16E-06	8.69E-03	3.45E-03	2.98E-03	4.73E-04	8.76E-03	3.53E-04	3.18E-04	3.47E-05	8.70E-03	2.56E-03	2.29E-03	2.79E-04	8.75E-03	8.61E-04	8.61E-04	1.94E-08
4432	581795.23	2960236.29	9.52E-03	1.84E-03	1.83E-03	3.92E-06	9.49E-03	3.86E-03	3.33E-03	5.22E-04	9.56E-03	3.97E-04	3.59E-04	3.81E-05	9.50E-03	2.81E-03	2.51E-03	3.00E-04	9.55E-03	9.53E-04	9.53E-04	1.83E-08
# of data pts	Average		7.30E-03	1.37E-03	1.36E-03	4.39E-06	7.27E-03	3.00E-03	2.44E-03	5.60E-04	7.33E-03	3.08E-04	2.68E-04	4.07E-05	7.28E-03	2.20E-03	1.89E-03	3.18E-04	7.32E-03	6.89E-04	6.89E-04	2.04E-08

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APPENDIX H

DETAILED CHRONIC AND ACUTE HUMAN HEALTH RISK ASSESSMENT RESULTS

CHRONIC RISK ASSESSMENT RESULTS BY PATHWAY AND RECEPTOR

Human Health Risk Assessment Results by Receptor and Exposure Pathway				
Receptor	Scenario	Pathway	TOTAL CANCER RISK	TOTAL HAZARD QUOTIENT
FARMER	farmer_adult	air inhalation	3.37E-08	2.30E-03
FARMER	farmer_adult	above ground vegetables	1.26E-08	5.25E-05
FARMER	farmer_adult	beef	1.40E-07	2.44E-05
FARMER	farmer_adult	chicken	1.52E-10	4.68E-07
FARMER	farmer_adult	eggs	9.84E-11	5.32E-07
FARMER	farmer_adult	pork	8.13E-09	1.91E-08
FARMER	farmer_adult	soil	6.89E-10	2.01E-06
		Total	1.95E-07	2.38E-03
FARMER	farmer_child	air inhalation	5.06E-09	2.30E-03
FARMER	farmer_child	above ground vegetables	4.51E-09	1.26E-04
FARMER	farmer_child	beef	1.28E-08	1.50E-05
FARMER	farmer_child	chicken	1.38E-11	3.19E-07
FARMER	farmer_child	eggs	9.50E-12	3.83E-07
FARMER	farmer_child	pork	8.88E-10	1.46E-08
FARMER	farmer_child	soil	8.62E-10	1.87E-05
		Total	2.42E-08	2.46E-03
FISH_1	fisher_adult	fish	8.85E-07	1.32E-03
		Total	8.85E-07	1.32E-03
FISH_1	fisher_child	fish	1.25E-07	9.25E-04
		Total	1.25E-07	9.25E-04
FISH_2	fisher_adult	fish	1.76E-08	3.85E-05
		Total	1.76E-08	3.85E-05
FISH_2	fisher_child	fish	2.48E-09	2.71E-05
		Total	2.48E-09	2.71E-05
FISH_3	fisher_adult	fish	9.26E-08	9.73E-04
		Total	9.26E-08	9.73E-04
FISH_3	fisher_child	fish	1.30E-08	6.85E-04
		Total	1.30E-08	6.85E-04
RES_1	resident_adult	air inhalation	9.63E-08	9.06E-03
RES_1	resident_adult	above ground vegetables	3.10E-08	1.84E-04
RES_1	resident_adult	soil	1.45E-09	1.15E-05
		Total	1.29E-07	9.26E-03
RES_1	resident_child	air inhalation	1.93E-08	9.06E-03
RES_1	resident_child	above ground vegetables	1.49E-08	4.39E-04
RES_1	resident_child	soil	2.70E-09	1.07E-04
		Total	3.69E-08	9.61E-03
RES_2	resident_adult	air inhalation	3.52E-08	3.19E-03
RES_2	resident_adult	above ground vegetables	1.22E-08	6.90E-05
RES_2	resident_adult	soil	5.95E-10	4.00E-06

Human Health Risk Assessment Results by Receptor and Exposure Pathway				
Receptor	Scenario	Pathway	TOTAL CANCER RISK	TOTAL HAZARD QUOTIENT
		Total	4.80E-08	3.26E-03
RES_2	resident_child	air inhalation	7.03E-09	3.19E-03
RES_2	resident_child	above ground vegetables	5.86E-09	1.65E-04
RES_2	resident_child	soil	1.11E-09	3.73E-05
		Total	1.40E-08	3.39E-03
RES_3	resident_adult	air inhalation	3.48E-08	3.16E-03
RES_3	resident_adult	above ground vegetables	9.95E-09	5.59E-05
RES_3	resident_adult	soil	6.91E-10	2.89E-06
		Total	4.54E-08	3.22E-03
RES_3	resident_child	air inhalation	6.95E-09	3.16E-03
RES_3	resident_child	above ground vegetables	4.78E-09	1.34E-04
RES_3	resident_child	soil	1.29E-09	2.70E-05
		Total	1.30E-08	3.33E-03

**ACUTE INHALATION RISK ASSESSMENT RESULTS
BY COMPOUND AND RECEPTOR**

ACUTE INHALATION RISK ASSESSMENT RESULTS

Receptor	Source	Compound	ACUTE INHALATION HAZARD QUOTIENT
ACUTE_1	Proposed WTE	TetraCDD, 2,3,7,8-	1.19E-09
		HexaCDD, 1,2,3,7,8,9-	1.09E-09
		OctaCDD, 1,2,3,4,6,7,8,9-	1.85E-08
		HeptaCDD, 1,2,3,4,6,7,8-	1.87E-10
		OctaCDF, 1,2,3,4,6,7,8,9-	5.44E-09
		HexaCDD, 1,2,3,4,7,8-	5.06E-09
		PentaCDD, 1,2,3,7,8-	2.44E-09
		TetraCDF, 2,3,7,8-	5.26E-09
		HeptaCDF, 1,2,3,4,7,8,9-	4.72E-11
		PentaCDF, 2,3,4,7,8-	4.13E-08
		PentaCDF, 1,2,3,7,8-	2.65E-09
		HexaCDF, 1,2,3,6,7,8-	1.01E-08
		HexaCDD, 1,2,3,6,7,8-	9.74E-10
		HexaCDF, 2,3,4,6,7,8-	2.73E-09
		HeptaCDF, 1,2,3,4,6,7,8-	7.07E-10
		HexaCDF, 1,2,3,4,7,8-	6.05E-09
		HexaCDF, 1,2,3,7,8,9-	2.21E-10
		Lead	1.25E-04
		Mercury	3.35E-05
		Arsenic	7.17E-03
		Beryllium	2.12E-06
		Cadmium	4.48E-05
		Mercuric chloride	4.02E-07
		Hydrogen chloride	1.93E-03
		Hydrogen fluoride	1.63E-03
		Ammonia	4.45E-04
		Sulfuric acid	2.28E-02
		Total	3.41E-02
	Refurbished RDF	TetraCDD, 2,3,7,8-	5.59E-09
		HexaCDD, 1,2,3,7,8,9-	8.53E-10
		OctaCDD, 1,2,3,4,6,7,8,9-	5.92E-09
		HeptaCDD, 1,2,3,4,6,7,8-	7.40E-11
		OctaCDF, 1,2,3,4,6,7,8,9-	3.04E-09
		HexaCDD, 1,2,3,4,7,8-	5.08E-09
		PentaCDD, 1,2,3,7,8-	6.08E-09
		TetraCDF, 2,3,7,8-	7.05E-08
		HeptaCDF, 1,2,3,4,7,8,9-	4.16E-11
		PentaCDF, 2,3,4,7,8-	8.65E-08
		PentaCDF, 1,2,3,7,8-	6.20E-09
		HexaCDF, 1,2,3,6,7,8-	1.78E-08
		HexaCDD, 1,2,3,6,7,8-	6.62E-10
		HexaCDF, 2,3,4,6,7,8-	2.29E-08
		HeptaCDF, 1,2,3,4,6,7,8-	6.20E-10
		HexaCDF, 1,2,3,4,7,8-	9.95E-09
		HexaCDF, 1,2,3,7,8,9-	3.97E-11
		Lead	3.00E-04
		Mercury	3.20E-05
		Arsenic	5.35E-03
		Beryllium	8.29E-06

ACUTE INHALATION RISK ASSESSMENT RESULTS

Receptor	Source	Compound	ACUTE INHALATION HAZARD QUOTIENT
		Cadmium	1.33E-04
		Mercuric chloride	3.33E-07
		Hydrogen chloride	2.07E-03
		Hydrogen fluoride	1.50E-03
		Ammonia	3.81E-04
		Sulfuric acid	1.95E-02
		Total	2.93E-02
Total (Proposed WTE and Refurbished RDF Facilities Combined)			6E-02
FARMER	Proposed WTE	TetraCDD, 2,3,7,8-	2.94E-10
		HexaCDD, 1,2,3,7,8,9-	2.75E-10
		OctaCDD, 1,2,3,4,6,7,8,9-	4.65E-09
		HeptaCDD, 1,2,3,4,6,7,8-	4.70E-11
		OctaCDF, 1,2,3,4,6,7,8,9-	1.37E-09
		HexaCDD, 1,2,3,4,7,8-	1.27E-09
		PentaCDD, 1,2,3,7,8-	6.13E-10
		TetraCDF, 2,3,7,8-	1.30E-09
		HeptaCDF, 1,2,3,4,7,8,9-	1.18E-11
		PentaCDF, 2,3,4,7,8-	1.03E-08
		PentaCDF, 1,2,3,7,8-	6.63E-10
		HexaCDF, 1,2,3,6,7,8-	2.52E-09
		HexaCDD, 1,2,3,6,7,8-	2.45E-10
		HexaCDF, 2,3,4,6,7,8-	6.86E-10
		HeptaCDF, 1,2,3,4,6,7,8-	1.78E-10
		HexaCDF, 1,2,3,4,7,8-	1.52E-09
		HexaCDF, 1,2,3,7,8,9-	5.55E-11
		Lead	3.15E-05
		Mercury	8.25E-06
		Arsenic	1.80E-03
		Beryllium	5.33E-07
		Cadmium	1.12E-05
		Mercuric chloride	9.91E-08
		Hydrogen chloride	4.78E-04
		Hydrogen fluoride	4.01E-04
		Ammonia	1.10E-04
		Sulfuric acid	5.62E-03
		Total	8.46E-03
	Refurbished RDF	TetraCDD, 2,3,7,8-	1.55E-09
		HexaCDD, 1,2,3,7,8,9-	2.41E-10
		OctaCDD, 1,2,3,4,6,7,8,9-	1.68E-09
		HeptaCDD, 1,2,3,4,6,7,8-	2.09E-11
		OctaCDF, 1,2,3,4,6,7,8,9-	8.60E-10
		HexaCDD, 1,2,3,4,7,8-	1.44E-09
		PentaCDD, 1,2,3,7,8-	1.71E-09
		TetraCDF, 2,3,7,8-	1.95E-08
		HeptaCDF, 1,2,3,4,7,8,9-	1.18E-11
		PentaCDF, 2,3,4,7,8-	2.43E-08
		PentaCDF, 1,2,3,7,8-	1.74E-09
		HexaCDF, 1,2,3,6,7,8-	5.03E-09

ACUTE INHALATION RISK ASSESSMENT RESULTS

Receptor	Source	Compound	ACUTE INHALATION HAZARD QUOTIENT
		HexaCDD, 1,2,3,6,7,8-	1.87E-10
		HexaCDF, 2,3,4,6,7,8-	6.46E-09
		HeptaCDF, 1,2,3,4,6,7,8-	1.75E-10
		HexaCDF, 1,2,3,4,7,8-	2.81E-09
		HexaCDF, 1,2,3,7,8,9-	1.12E-11
		Lead	8.43E-05
		Mercury	8.83E-06
		Arsenic	1.50E-03
		Beryllium	2.33E-06
		Cadmium	3.75E-05
		Mercuric chloride	9.21E-08
		Hydrogen chloride	5.70E-04
		Hydrogen fluoride	4.13E-04
		Ammonia	1.05E-04
		Sulfuric acid	5.36E-03
		Total	8.09E-03
Total (Proposed WTE and Refurbished RDF Facilities Combined)			2E-02
RES_1	Proposed WTE	TetraCDD, 2,3,7,8-	8.95E-10
		HexaCDD, 1,2,3,7,8,9-	8.27E-10
		OctaCDD, 1,2,3,4,6,7,8,9-	1.40E-08
		HeptaCDD, 1,2,3,4,6,7,8-	1.41E-10
		OctaCDF, 1,2,3,4,6,7,8,9-	4.11E-09
		HexaCDD, 1,2,3,4,7,8-	3.83E-09
		PentaCDD, 1,2,3,7,8-	1.84E-09
		TetraCDF, 2,3,7,8-	3.97E-09
		HeptaCDF, 1,2,3,4,7,8,9-	3.56E-11
		PentaCDF, 2,3,4,7,8-	3.12E-08
		PentaCDF, 1,2,3,7,8-	2.00E-09
		HexaCDF, 1,2,3,6,7,8-	7.59E-09
		HexaCDD, 1,2,3,6,7,8-	7.35E-10
		HexaCDF, 2,3,4,6,7,8-	2.06E-09
		HeptaCDF, 1,2,3,4,6,7,8-	5.34E-10
		HexaCDF, 1,2,3,4,7,8-	4.57E-09
		HexaCDF, 1,2,3,7,8,9-	1.67E-10
		Lead	9.44E-05
		Mercury	2.53E-05
		Arsenic	5.40E-03
		Beryllium	1.60E-06
		Cadmium	3.37E-05
		Mercuric chloride	3.03E-07
		Hydrogen chloride	1.46E-03
		Hydrogen fluoride	1.23E-03
		Ammonia	3.36E-04
		Sulfuric acid	1.72E-02
		Total	2.58E-02
	Refurbished RDF	TetraCDD, 2,3,7,8-	3.27E-09
		HexaCDD, 1,2,3,7,8,9-	4.99E-10
		OctaCDD, 1,2,3,4,6,7,8,9-	3.46E-09

ACUTE INHALATION RISK ASSESSMENT RESULTS

Receptor	Source	Compound	ACUTE INHALATION HAZARD QUOTIENT
		HeptaCDD, 1,2,3,4,6,7,8-	4.33E-11
		OctaCDF, 1,2,3,4,6,7,8,9-	1.78E-09
		HexaCDD, 1,2,3,4,7,8-	2.97E-09
		PentaCDD, 1,2,3,7,8-	3.56E-09
		TetraCDF, 2,3,7,8-	4.12E-08
		HeptaCDF, 1,2,3,4,7,8,9-	2.43E-11
		PentaCDF, 2,3,4,7,8-	5.06E-08
		PentaCDF, 1,2,3,7,8-	3.63E-09
		HexaCDF, 1,2,3,6,7,8-	1.04E-08
		HexaCDD, 1,2,3,6,7,8-	3.87E-10
		HexaCDF, 2,3,4,6,7,8-	1.34E-08
		HeptaCDF, 1,2,3,4,6,7,8-	3.63E-10
		HexaCDF, 1,2,3,4,7,8-	5.82E-09
		HexaCDF, 1,2,3,7,8,9-	2.32E-11
		Lead	1.76E-04
		Mercury	1.87E-05
		Arsenic	3.14E-03
		Beryllium	4.86E-06
		Cadmium	7.81E-05
		Mercuric chloride	1.94E-07
		Hydrogen chloride	1.21E-03
		Hydrogen fluoride	8.76E-04
		Ammonia	2.23E-04
		Sulfuric acid	1.14E-02
		Total	1.71E-02
Total (Proposed WTE and Refurbished RDF Facilities Combined)			4E-02
RES_2	Proposed WTE	TetraCDD, 2,3,7,8-	5.86E-10
		HexaCDD, 1,2,3,7,8,9-	5.42E-10
		OctaCDD, 1,2,3,4,6,7,8,9-	9.16E-09
		HeptaCDD, 1,2,3,4,6,7,8-	9.25E-11
		OctaCDF, 1,2,3,4,6,7,8,9-	2.69E-09
		HexaCDD, 1,2,3,4,7,8-	2.51E-09
		PentaCDD, 1,2,3,7,8-	1.21E-09
		TetraCDF, 2,3,7,8-	2.60E-09
		HeptaCDF, 1,2,3,4,7,8,9-	2.33E-11
		PentaCDF, 2,3,4,7,8-	2.04E-08
		PentaCDF, 1,2,3,7,8-	1.31E-09
		HexaCDF, 1,2,3,6,7,8-	4.97E-09
		HexaCDD, 1,2,3,6,7,8-	4.82E-10
		HexaCDF, 2,3,4,6,7,8-	1.35E-09
		HeptaCDF, 1,2,3,4,6,7,8-	3.50E-10
		HexaCDF, 1,2,3,4,7,8-	2.99E-09
		HexaCDF, 1,2,3,7,8,9-	1.10E-10
		Lead	6.22E-05
		Mercury	1.66E-05
		Arsenic	3.56E-03
		Beryllium	1.06E-06
		Cadmium	2.22E-05

ACUTE INHALATION RISK ASSESSMENT RESULTS

Receptor	Source	Compound	ACUTE INHALATION HAZARD QUOTIENT
		Mercuric chloride	1.99E-07
		Hydrogen chloride	9.56E-04
		Hydrogen fluoride	8.03E-04
		Ammonia	2.20E-04
		Sulfuric acid	1.12E-02
		Total	1.69E-02
	Refurbished RDF	TetraCDD, 2,3,7,8-	3.25E-09
		HexaCDD, 1,2,3,7,8,9-	4.97E-10
		OctaCDD, 1,2,3,4,6,7,8,9-	3.45E-09
		HeptaCDD, 1,2,3,4,6,7,8-	4.31E-11
		OctaCDF, 1,2,3,4,6,7,8,9-	1.77E-09
		HexaCDD, 1,2,3,4,7,8-	2.96E-09
		PentaCDD, 1,2,3,7,8-	3.54E-09
		TetraCDF, 2,3,7,8-	4.10E-08
		HeptaCDF, 1,2,3,4,7,8,9-	2.42E-11
		PentaCDF, 2,3,4,7,8-	5.03E-08
		PentaCDF, 1,2,3,7,8-	3.61E-09
		HexaCDF, 1,2,3,6,7,8-	1.04E-08
		HexaCDD, 1,2,3,6,7,8-	3.85E-10
		HexaCDF, 2,3,4,6,7,8-	1.33E-08
		HeptaCDF, 1,2,3,4,6,7,8-	3.61E-10
		HexaCDF, 1,2,3,4,7,8-	5.79E-09
		HexaCDF, 1,2,3,7,8,9-	2.31E-11
		Lead	1.75E-04
		Mercury	1.86E-05
		Arsenic	3.13E-03
		Beryllium	4.85E-06
		Cadmium	7.80E-05
		Mercuric chloride	1.94E-07
		Hydrogen chloride	1.20E-03
		Hydrogen fluoride	8.72E-04
		Ammonia	2.22E-04
		Sulfuric acid	1.13E-02
		Total	1.70E-02
Total (Proposed WTE and Refurbished RDF Facilities Combined)			3E-02
RES_3	Proposed WTE	TetraCDD, 2,3,7,8-	3.60E-10
		HexaCDD, 1,2,3,7,8,9-	3.35E-10
		OctaCDD, 1,2,3,4,6,7,8,9-	5.67E-09
		HeptaCDD, 1,2,3,4,6,7,8-	5.73E-11
		OctaCDF, 1,2,3,4,6,7,8,9-	1.67E-09
		HexaCDD, 1,2,3,4,7,8-	1.55E-09
		PentaCDD, 1,2,3,7,8-	7.47E-10
		TetraCDF, 2,3,7,8-	1.59E-09
		HeptaCDF, 1,2,3,4,7,8,9-	1.44E-11
		PentaCDF, 2,3,4,7,8-	1.26E-08
		PentaCDF, 1,2,3,7,8-	8.09E-10
		HexaCDF, 1,2,3,6,7,8-	3.08E-09
		HexaCDD, 1,2,3,6,7,8-	2.98E-10

ACUTE INHALATION RISK ASSESSMENT RESULTS

Receptor	Source	Compound	ACUTE INHALATION HAZARD QUOTIENT
		HexaCDF, 2,3,4,6,7,8-	8.37E-10
		HeptaCDF, 1,2,3,4,6,7,8-	2.17E-10
		HexaCDF, 1,2,3,4,7,8-	1.85E-09
		HexaCDF, 1,2,3,7,8,9-	6.77E-11
		Lead	3.84E-05
		Mercury	1.02E-05
		Arsenic	2.20E-03
		Beryllium	6.50E-07
		Cadmium	1.37E-05
		Mercuric chloride	1.22E-07
		Hydrogen chloride	5.85E-04
		Hydrogen fluoride	4.91E-04
		Ammonia	1.34E-04
		Sulfuric acid	6.87E-03
		Total	1.03E-02
	Refurbished RDF	TetraCDD, 2,3,7,8-	1.87E-09
		HexaCDD, 1,2,3,7,8,9-	2.88E-10
		OctaCDD, 1,2,3,4,6,7,8,9-	2.00E-09
		HeptaCDD, 1,2,3,4,6,7,8-	2.49E-11
		OctaCDF, 1,2,3,4,6,7,8,9-	1.02E-09
		HexaCDD, 1,2,3,4,7,8-	1.71E-09
		PentaCDD, 1,2,3,7,8-	2.05E-09
		TetraCDF, 2,3,7,8-	2.35E-08
		HeptaCDF, 1,2,3,4,7,8,9-	1.40E-11
		PentaCDF, 2,3,4,7,8-	2.91E-08
		PentaCDF, 1,2,3,7,8-	2.08E-09
		HexaCDF, 1,2,3,6,7,8-	5.99E-09
		HexaCDD, 1,2,3,6,7,8-	2.23E-10
		HexaCDF, 2,3,4,6,7,8-	7.70E-09
		HeptaCDF, 1,2,3,4,6,7,8-	2.09E-10
		HexaCDF, 1,2,3,4,7,8-	3.35E-09
		HexaCDF, 1,2,3,7,8,9-	1.34E-11
		Lead	1.01E-04
		Mercury	1.03E-05
		Arsenic	1.80E-03
		Beryllium	2.79E-06
		Cadmium	4.48E-05
		Mercuric chloride	1.08E-07
		Hydrogen chloride	6.90E-04
		Hydrogen fluoride	5.00E-04
		Ammonia	1.27E-04
		Sulfuric acid	6.49E-03
		Total	9.77E-03
Total (Proposed WTE and Refurbished RDF Facilities Combined)			2E-02
IRAP-h View		Page 1	

APPENDIX I

CALCULATION OF WATERBODY CONCENTRATIONS FOR CHLORIDES, FLUORIDES AND UN-IONIZED AMMONIA

Evaluation of Ammonia in Surface Water

Input parameters					
Chemical Input Parameters					
Molecular weight (g/mole)		17.03			
Henry's law constant (atm-m3/mole) (a)		1.61E-05			
Unitless Henry's law constant (unitless) (b)		6.71E-04			
Facility Input Parameters (c)					
		Proposed WTE	Refurbished RDF		
Emission rate (g/sec)		1.33	1.03		
Vapor phase air concentration over waterbody (annual average unitized AERMOD output) (ug/m3 per 1 g/sec)	Roadside canal	4.87E-03	7.67E-03		
	Iron Horse Lake	9.20E-03	7.50E-03		
	Water Catchment Area (WCA)	8.98E-03	1.11E-02		
	Middle Lake	9.74E-03	1.50E-02		
	Rookery	8.92E-03	1.89E-02		
	M Canal	4.61E-03	7.30E-03		
	Small Wetland (portion of WCA)	1.72E-02	2.95E-02		
	Roadside canal	4.28E-04	6.63E-04		
	Iron Horse Lake	8.23E-04	6.79E-04		
	Water Catchment Area (WCA)	1.68E-03	2.05E-03		
Total (wet + dry) vapor phase deposition rate over waterbody (annual average unitized AERMOD output) (g/m2-yr per 1 g/sec)	Middle Lake	9.69E-04	1.40E-03		
	Rookery	1.58E-03	3.43E-03		
	M Canal	8.60E-04	1.37E-03		
	Small Wetland (portion of WCA)	3.38E-03	5.79E-03		
	Waterbody Input Parameters (c)				
	Waterbody surface area (m2)	Waterbody flow rate (m3/yr)	pH	Water temperature (°C)	Percent (%) un-ionized ammonia (d)
Roadside canal	1.58E+04	8.90E+06	7.3	29	2.5
Iron Horse Lake	4.93E+04	1.40E+05	8.0	31	7.5
Water Catchment Area (WCA)	2.80E+07	1.10E+08	7.6	30	2.5
Middle Lake	2.05E+05	1.0E+05	8.3	32	20
Rookery	6.24E+05	8.9E+06	7.6	30	2.5
M Canal	1.46E+05	1.5E+08	7.8	26	5.4
Small Wetland (portion of WCA)	2.72E+06	1.1E+07	7.6	30	2.5

(a) Physprop (www.syrres.com/eSc/physdemo.htm) - USEPA (2005) HHRAP Appendix A-2

recommended source

(b) Calculated: H/RT where $RT = 2.4E-2$ atm-m3/mol at 20oC.

(c) Parameters and AERMOD modeling results provided by Malcolm Pirnie.

(d) Percent un-ionized ammonia determined from table of pH and temperature data included in ammonia background materials related to its water quality criteria (table shown below). Source: Florida Department of Environmental Protection. 1997. Letter to G. Peralta, Dade County Environmental Resources Management from N. Turner, Standards and Evaluation Section. June 13, 1997.

Table 3.—Percent un-ionized ammonia in aqueous ammonia solutions*										
Temperature (°C)	pH Value									
	8.0	8.5	9.0	9.5	10.0	10.5	11.0	11.5	12.0	12.5
5	0.013	0.040	0.112	0.30	1.2	3.8	11	28	56	
10	0.019	0.059	0.19	0.59	1.8	5.6	16	37	65	
15	0.027	0.087	0.27	0.86	2.7	8.0	21	46	73	
20	0.040	0.13	0.40	1.3	3.8	11	28	56	93	
25	0.067	0.18	0.57	1.8	5.4	16	36	64	86	
30	0.080	0.25	0.80	2.5	7.5	20	45	72	89	

* [NH3] = 0.001 M, [NH4+] = 0.001 M

Calculation of Potential Water Concentrations for Un-ionized Ammonia

Waterbody	Concentration Due to Vapor Phase Diffusion from Ambient Air				Concentration Due to Direct Deposition onto Waterbody		Total Water Concentration		Florida Class I and Class III Water Quality Criteria for Ammonia (as un-ionized ammonia) (ug/L) (a)
	Total vapor phase concentration in ambient air over waterbody (both facilities combined)		Equilibrium concentration in liquid at air-liquid interface		Total vapor phase deposition rate onto waterbody (both facilities combined) (g/m2-yr)	Water concentration in waterbody due to direct deposition (ug/L)	As ammonia (ug/L)	As un-ionized ammonia (ug/L)	
	(ug/m3)	(g/cm3)	(g/cm3)	(ug/L)					
Roadside canal	1.4E-02	1.4E-14	2.1E-11	2.14E-02	1.25E-03	0.0022	0.024	0.00059	20
Iron Horse Lake	2.0E-02	2.0E-14	3.0E-11	2.98E-02	1.79E-03	0.63	0.66	0.050	
Water Catchment Area (WCA)	2.3E-02	2.3E-14	3.5E-11	3.48E-02	4.35E-03	1.1	1.1	0.029	
Middle Lake	2.8E-02	2.8E-14	4.2E-11	4.23E-02	2.73E-03	5.6	5.6	1.1	
Rookery	3.1E-02	3.1E-14	4.7E-11	4.67E-02	5.63E-03	0.40	0.44	0.011	
M Canal	1.4E-02	1.4E-14	2.0E-11	2.03E-02	2.55E-03	0.0025	0.023	0.0012	
Small Wetland (portion of WCA)	5.3E-02	5.3E-14	7.9E-11	7.94E-02	1.05E-02	2.6	2.7	0.067	
Calculations	(unitized air conc ug/m3 per g/sec WTE * emission rate g/sec WTE) + (unitized air conc ug/m3 per g/sec RDF * emission rate g/sec RDF)	air conc ug/m3 * 1 m3/1E+6 cm3 * 1 g/1E+6 ug	Liquid conc = air conc in g/cm3 / unitless Henry's law constant	conc in ug/L = conc in g/cm3 * 1000 cm3/L * 1e+6 ug/g	(unitized dep rate g/m2-yr per g/sec WTE * emission rate g/sec WTE) + (unitized dep rate g/m2-yr per 1 g/sec RDF * emission rate g/sec RDF)	conc in water in ug/L = total dep rate g/m2-yr * waterbody surf area m2 / waterbody flow rate m3/yr * 1 m3/1000 L * 1E+6 ug/g	Sum of equilibrium concentration in liquid at air-liquid interface + concentration due to direct deposition	Un-ionized ammonia conc = ammonia conc * % un-ionized/100	

(a) Florida Surface Water Criteria from Florida Administrative Code (FAC) 62-302.530. Class I criteria are intended to be protective of potable water supplies. Class III criteria are intended to be protective of recreation, propagation and maintenance of a healthy, well-balanced population of fish and wildlife. Surface water in Florida is classified as Class III except for certain waters, including the City of West Palm Beach Water Catchment Area and the M Canal, both of which are classified as Class I surface water. Listed WQC are applicable to predominantly fresh waters.

Evaluation of Hydrogen Fluoride in Surface Water

Input parameters			
Chemical Input Parameters			
Molecular weight (g/mole)		20.01	
Henry's law constant (atm-m3/mole) (a)		1.04E-04	
Unitless Henry's law constant (unitless) (b)		4.33E-03	
Facility Input Parameters (c)			
		Proposed WTE	Refurbished RDF
Emission rate (g/sec)		0.37	0.06
Vapor phase air concentration over waterbody (annual average unitized AERMOD output) (ug/m3 per 1 g/sec)	Roadside canal	4.87E-03	7.67E-03
	Iron Horse Lake	9.20E-03	7.50E-03
	Water Catchment Area (WCA)	8.98E-03	1.11E-02
	Middle Lake	9.74E-03	1.50E-02
	Rookery	8.92E-03	1.89E-02
	M Canal	4.61E-03	7.30E-03
	Small Wetland (portion of WCA)	1.72E-02	2.95E-02
	Roadside canal	4.28E-04	6.63E-04
	Iron Horse Lake	8.23E-04	6.79E-04
	Water Catchment Area (WCA)	1.68E-03	2.05E-03
Total (wet + dry) vapor phase deposition rate over waterbody (annual average unitized AERMOD output) (g/m2-yr per 1 g/sec)	Middle Lake	9.69E-04	1.40E-03
	Rookery	1.58E-03	3.43E-03
	M Canal	8.60E-04	1.37E-03
	Small Wetland (portion of WCA)	3.38E-03	5.79E-03
	Waterbody Input Parameters (c)		
		Waterbody surface area (m2)	Waterbody flow rate (m3/yr)
Roadside canal	1.58E+04	8.90E+06	
Iron Horse Lake	4.93E+04	1.40E+05	
Water Catchment Area (WCA)	2.80E+07	1.10E+08	
Middle Lake	2.05E+05	1.0E+05	
Rookery	6.24E+05	8.9E+06	
M Canal	1.46E+05	1.5E+08	
Small Wetland (portion of WCA)	2.72E+06	1.1E+07	

(a) Physprop (www.syrres.com/eSc/physdemo.htm) - USEPA (2005) HHRAP Appendix A-2 recommended source
(b) Calculated: H/RT where RT = 2.4E-2 atm-m3/mol at 20C.
(c) Parameters and AERMOD modeling results provided by Malcolm Pirnie.

Calculation of Potential Water Concentrations for Chlorides

Waterbody	Concentration Due to Vapor Phase Diffusion from Ambient Air				Concentration Due to Direct Deposition onto Waterbody		Total Water Concentration		Florida Class I Water Quality Criteria for Fluoride (ug/L) (a)	Florida Class III Water Quality Criterion for Fluoride (ug/L) (a)
	Total vapor phase concentration in ambient air over waterbody (both facilities combined)		Equilibrium concentration in liquid at air-liquid interface		Total vapor phase deposition rate onto waterbody (both facilities combined) (g/m2-yr)	Water concentration in waterbody due to direct deposition (ug/L)	As hydrogen fluoride (ug/L)	As fluoride (ug/L)		
	(ug/m3)	(g/cm3)	(g/cm3)	(ug/L)						
Roadside canal	2.3E-03	2.3E-15	5.2E-13	5.22E-04	1.98E-04	0.00035	0.00087	0.00083	1,500	10,000
Iron Horse Lake	3.9E-03	3.9E-15	8.9E-13	8.90E-04	3.45E-04	0.12	0.12	0.12		
Water Catchment Area (WCA)	4.0E-03	4.0E-15	9.2E-13	9.21E-04	7.45E-04	0.19	0.19	0.18		
Middle Lake	4.5E-03	4.5E-15	1.0E-12	1.04E-03	4.43E-04	0.91	0.91	0.86		
Rookery	4.4E-03	4.4E-15	1.0E-12	1.02E-03	7.90E-04	0.055	0.056	0.054		
M Canal	2.1E-03	2.1E-15	5.0E-13	4.95E-04	4.00E-04	0.00039	0.00088	0.00084		
Small Wetland (portion of WCA)	8.1E-03	8.1E-15	1.9E-12	1.88E-03	1.60E-03	0.40	0.40	0.38		
Calculations	unitized air conc ug/m3 per g/sec WTE * emission rate g/sec WTE + (unitized air conc ug/m3 per g/sec RDF * emission rate g/sec RDF)	air conc ug/m3 * 1 m3/1E+6 cm3 / 1 g/1E+6 ug	Liquid conc = air conc in g/cm3 / unitless Henry's law constant	conc in ug/L = conc in g/cm3 * 1000 cm3/L * 1e+6 ug/g	(unitized dep rate g/m2-yr per g/sec WTE * emission rate g/sec WTE) + (unitized dep rate g/m2-yr per 1 g /sec RDF * emission rate g/sec RDF)	conc in water in ug/L = total dep rate g/m2-yr * waterbody surf area m2 / waterbody flow rate m3/yr * 1 m3/1000 L * 1E+6 ug/g	Sum of equilibrium concentration in liquid at air-liquid interface + concentration due to direct deposition	Fluorides conc = HF conc * 19 g/mol F / 20.01 g/mole HF		

(a) Florida Surface Water Criteria from Florida Administrative Code (FAC) 62-302.530. Class I criteria are intended to be protective of potable water supplies. Class III criteria are intended to be protective of recreation, propagation and maintenance of a healthy, well-balanced population of fish and wildlife. Surface water in Florida is classified as Class III except for certain waters, including the City of West Palm Beach Water Catchment Area and the M Canal, both of which are classified as Class I surface water. Listed WQC are applicable to predominantly fresh waters.

Evaluation of Hydrogen Chloride in Surface Water

Input parameters			
Chemical Input Parameters			
Molecular weight (g/mole)		36.46	
Henry's law constant (atm-m ³ /mole) (a)		0.0024	
Unitless Henry's law constant (unitless) (b)		1.00E-01	
Facility Input Parameters (c)			
		Proposed WTE	Refurbished RDF
Emission rate (g/sec)		3.81	1.9
Vapor phase air concentration over waterbody (annual average unitized AERMOD output) (ug/m ³ per 1 g/sec)	Roadside canal	4.87E-03	7.67E-03
	Iron Horse Lake	9.20E-03	7.50E-03
	Water Catchment Area (WCA)		
	Middle Lake	8.98E-03	1.11E-02
	Rookery	9.74E-03	1.50E-02
	M Canal	8.92E-03	1.89E-02
	Small Wetland (portion of WCA)	4.61E-03	7.30E-03
	Roadside canal	1.72E-02	2.95E-02
	Iron Horse Lake	4.28E-04	6.63E-04
		8.23E-04	6.79E-04
Total (wet + dry) vapor phase deposition rate over waterbody (annual average unitized AERMOD output) (g/m ² -yr per 1 g/sec)	Water Catchment Area (WCA)		
	Middle Lake	1.68E-03	2.05E-03
	Rookery	9.69E-04	1.40E-03
	M Canal	1.58E-03	3.43E-03
	Small Wetland (portion of WCA)	8.60E-04	1.37E-03
		3.38E-03	5.79E-03
Waterbody Input Parameters (c)			
	Waterbody surface area (m ²)	Waterbody flow rate (m ³ /yr)	
Roadside canal	1.58E+04	8.90E+06	
Iron Horse Lake	4.93E+04	1.40E+05	
Water Catchment Area (WCA)	2.80E+07	1.10E+08	
Middle Lake	2.05E+05	1.0E+05	
Rookery	6.24E+05	8.9E+06	
M Canal	1.46E+05	1.5E+08	
Small Wetland (portion of WCA)	2.72E+06	1.1E+07	

(a) USEPA (2005) HHRAP.

(b) Calculated: H/RT where RT = 2.4E-2 atm-m³/mol at 20oC.

(c) Parameters and AERMOD modeling results provided by Malcolm Pirnie.

Calculation of Potential Water Concentrations for Chlorides

Waterbody	Concentration Due to Vapor Phase Diffusion from Ambient Air				Concentration Due to Direct Deposition onto Waterbody		Total Water Concentration		Florida Class I Water Quality Criteria for Chloride (ug/L) (a)	Florida Class III Water Quality Criterion for Chloride (ug/L) (a)
	Total vapor phase concentration in ambient air over waterbody (both facilities combined)		Equilibrium concentration in liquid at air-liquid interface		Total vapor phase deposition rate onto waterbody (both facilities combined) (g/m ² -yr)	Water concentration in waterbody due to direct deposition (ug/L)	As hydrogen chloride (ug/L)	As chlorides (ug/L)		
	(ug/m ³)	(g/cm ³)	(g/cm ³)	(ug/L)						
Roadside canal	3.3E-02	3.3E-14	3.3E-13	3.31E-04	2.89E-03	0.0051	0.0055	0.0053	250,000	Not available
Iron Horse Lake	4.9E-02	4.9E-14	4.9E-13	4.93E-04	4.43E-03	1.6	1.6	1.5		
Water Catchment Area (WCA)	5.5E-02	5.5E-14	5.5E-13	5.53E-04	1.03E-02	2.6	2.6	2.5		
Middle Lake	6.6E-02	6.6E-14	6.6E-13	6.56E-04	6.35E-03	13.0	13	13		
Rookery	7.0E-02	7.0E-14	7.0E-13	6.99E-04	1.25E-02	0.88	0.88	0.85		
M Canal	3.1E-02	3.1E-14	3.1E-13	3.14E-04	5.88E-03	0.006	0.0060	0.0059		
Small Wetland (portion of WCA)	1.2E-01	1.2E-13	1.2E-12	1.22E-03	2.39E-02	5.9	5.9	5.7		
Calculations	unitized air conc ug/m ³ per g/sec WTE * emission rate g/sec WTE + (unitized air conc ug/m ³ per g/sec RDF * emission rate g/sec RDF)	air conc ug/m ³ * 1 m ³ /1E+6 cm ³ * 1 g/1E+6 ug	Liquid conc = air conc in g/cm ³ / unitless Henry's law constant	conc in ug/L = conc in g/cm ³ * 1000 cm ³ /L * 1e+6 ug/g	(unitized dep rate g/m ² -yr per g/sec WTE * emission rate g/sec WTE) + (unitized dep rate g/m ² -yr per 1 g/sec RDF * emission rate g/sec RDF)	conc in water in ug/L = total dep rate g/m ² -yr * waterbody surf area m ² / waterbody flow rate m ³ /yr * 1 m ³ /1000 L * 1E+6 ug/g	Sum of equilibrium concentration in liquid at air-liquid interface + concentration due to direct deposition	Chlorides conc = HCl conc * 35.4 g/mol Cl / 36.46 g/mole HCl		

(a) Florida Surface Water Criteria from Florida Administrative Code (FAC) 62-302.530. Class I criteria are intended to be protective of potable water supplies. Class III criteria are intended to be protective of recreation, propagation and maintenance of a healthy, well-balanced population of fish and wildlife. Surface water in Florida is classified as Class III except for certain waters, including the City of West Palm Beach Water Catchment Area and the M Canal, both of which are classified as Class I surface water. Listed WQC are applicable to predominantly fresh waters.

APPENDIX J

CALCULATION OF SEDIMENT-TO-INVERTEBRATE BIOCONCENTRATION FACTORS FOR PCDDS/PCDFS

APPENDIX J

CALCULATION OF SEDIMENT-TO-INVERTEBRATE BIOCONCENTRATION FACTORS FOR PCDDs/PCDFs

The default sediment-to-invertebrate bioconcentration factors (BCFs) for PCDDs/PCDFs listed in USEPA (1999) were based on an over 15-year old non-specific regression equation published by Southworth et al. (1978) which is based solely on a chemical's octanol:water partition coefficient (K_{ow}). Rather than rely on this outdated methodology, a search of recently published literature was conducted to identify more appropriate (i.e., based on experimental data) sediment-to-benthic invertebrate BCFs for this class of compounds. The most recent and directly applicable study identified in the published literature evaluated bioaccumulation of 2,3,7,8-TCDF in crayfish from sediment (Currie et al., 2000). Assuming that the crayfish study results are applicable to apple snails, and recognizing that this study represents a vast improvement over the USEPA (1999) default, the Currie et al. study was used to derive BCFs for this assessment.

Currie et al. (2000) identified mean biota-to-sediment accumulation factors (BSAFs) for crayfish ranging from 0.06 - 5.23 g/kg lipid per g/kg sediment organic carbon. The highest single value provided in the Currie study (5.23 g/kg lipid per g/kg sediment organic carbon) was conservatively used as the basis for deriving the sediment-to-benthic invertebrate BCFs for apple snails. First, a BCF of 1.8 g 2,3,7,8-TCDF/kg tissue fresh weight per g/kg dry sediment was calculated from the Currie et al. value, using a snail lipid content of 1.4% from the U.S. Department of Agriculture's National Nutrient Database (USDA 2009), and USEPA's HHRAP default sediment organic carbon fraction of 0.04 (USEPA 2005). Second, sediment-to-benthic crayfish BCFs were then derived for the other PCDD/PCDF congeners, except 2,3,7,8-TCDF, using the methodology presented in USEPA's Protocol (USEPA 1999) which relies on USEPA (1995) bioaccumulation equivalency factors (BEFs). Table 1 presents the PCDD/PCDF sediment-to-benthic invertebrate BCFs calculated for this assessment.

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Table 1
Derivation of Sediment-to-Benthic Invertebrate PCDD/PCDF Bioconcentration Factors
for the Apple Snail

Congener	TCDD Bioaccumulation Equivalency Factors (BEFs) (d)	BSAF for crayfish from Currie et al. (2000) (g/kg lipid / g/kg sed OC) (a)	Calculated Sediment-to-Invertebrate BCF for Snail (g/kg tissue WW/ g/kg dry sed) (b)	Calculated Snail BCFs for PCDD/PCDF Congeners (c)
<i>Calculation of BCFs</i>				
2,3,7,8-TCDD	1		2.3	2.3
1,2,3,7,8-PeCDD	0.92			2.1
1,2,3,4,7,8-HxCDD	0.31			0.71
1,2,3,7,8,9-HxCDD	0.14			0.32
1,2,3,6,7,8-HxCDD	0.12			0.28
1,2,3,4,6,7,8-HpCDD	0.051			0.12
OCDD	0.012			0.028
2,3,7,8-TCDF	0.80	5.23	1.8	1.8
1,2,3,7,8-PeCDF	0.22			0.51
2,3,4,7,8-PeCDF	1.6			3.7
1,2,3,4,7,8-HxCDF	0.076			0.17
1,2,3,7,8,9-HxCDF	0.63			1.4
1,2,3,6,7,8-HxCDF	0.19			0.44
2,3,4,6,7,8-HxCDF	0.67			1.5
1,2,3,4,6,7,8-HpCDF	0.011			0.025
1,2,3,4,7,8,9-HpCDF	0.39			0.90
OCDF	0.016			0.037
<i>Input Parameters</i>				
snail fraction lipid (USDA National Nutrient Database)			0.014	
sediment foc (USEPA HHRAP 2005 default)			0.04	

BCF - Bioaccumulation factor

BEF - Bioaccumulation equivalency factor

BSAF = Biota-to-sediment accumulation factor

DW - dry weight; WW = wet weight

foc - fraction organic carbon

g/kg - grams per kilogram; mg/kg - milligrams per kilogram

(a) Value from Currie et al. (2000) was highest value reported during the study duration. The reported BSAFs ranged from 0.06 - 5.23 g/kg lipid per g/kg sediment organic carbon. Study was performed on crayfish.

(b) The 2,3,7,8-TCDF sediment-to-benthic organism BCF was calculated as: sediment-to-benthic BCF (g/kg tissue WW / g/kg dry sed) = BSAF (5.23 g/kg lipid / g/kg sed OC) * 0.014 kg lipid/kg tissue DW / (0.04 foc, kg sed OC/kg sed DW). The 2,3,7,8-TCDD sediment-to-benthic organism BCF was calculated as: 2,3,7,8-TCDF sediment-to-benthic organism BCF * TCDD BEF of 1 / TCDF BEF of 0.8.

(c) Congener specific BCFs were calculated using the snail-specific TCDD BCF (2.3) and the USEPA (1999) default BEFs (BCF=2.3 x BEF), except for 2,3,7,8-TCDF for which the congener-specific BCF was derived from the literature-reported BSAF for crayfish.

(d) TCDD bioaccumulation equivalency factors (BEFs) were obtained from USEPA (1995) and USEPA (1999).

APPENDIX K

CALCULATION OF PCDD/PCDF TOXIC EQUIVALENT (TEQ) CONCENTRATIONS FOR THE ECOLOGICAL RISK ASSESSMENT

**Calculated Water Concentrations for PCDDs/PCDFs
Using Fish TEFs**

		Dissolved Water Concentration (mg/kg)							
		Middle Lake		Iron Horse Lake		WCA Wetland		Roadside Canal	
Congener	Fish TEF	Individual Congener	2,3,7,8-TCDD equivalent	Individual Congener	2,3,7,8-TCDD equivalent	Individual Congener	2,3,7,8-TCDD equivalent	Individual Congener	2,3,7,8-TCDD equivalent
HpCDD, 1,2,3,4,6,7,8-	0.001	4.06E-13	4.1E-16	2.37E-13	2.4E-16	2.26E-13	2.3E-16	1.19E-14	1.2E-17
HpCDF, 1,2,3,4,6,7,8-	0.01	9.44E-13	9.4E-15	6.88E-13	6.9E-15	5.31E-13	5.3E-15	5.80E-14	5.8E-16
HpCDF, 1,2,3,4,7,8,9-	0.01	1.18E-13	1.2E-15	8.64E-14	8.6E-16	7.70E-14	7.7E-16	6.79E-15	6.8E-17
HxCDD, 1,2,3,4,7,8-	0.5	4.06E-14	2.0E-14	2.59E-14	1.3E-14	2.53E-14	1.3E-14	1.64E-15	8.2E-16
HxCDD, 1,2,3,6,7,8-	0.01	9.70E-14	9.7E-16	7.91E-14	7.9E-16	5.92E-14	5.9E-16	9.06E-15	9.1E-17
HxCDD, 1,2,3,7,8,9-	0.01	1.07E-13	1.1E-15	8.66E-14	8.7E-16	6.21E-14	6.2E-16	1.05E-14	1.0E-16
HxCDF, 1,2,3,4,7,8-	0.1	5.65E-13	5.7E-14	4.60E-13	4.6E-14	3.64E-13	3.6E-14	6.66E-14	6.7E-15
HxCDF, 1,2,3,6,7,8-	0.1	5.04E-13	5.0E-14	3.81E-13	3.8E-14	3.26E-13	3.3E-14	3.87E-14	3.9E-15
HxCDF, 1,2,3,7,8,9-	0.1	2.87E-13	2.9E-14	2.51E-13	2.5E-14	1.95E-13	1.9E-14	2.41E-14	2.4E-15
HxCDF, 2,3,4,6,7,8-	0.1	1.60E-13	1.6E-14	1.14E-13	1.1E-14	1.11E-13	1.1E-14	1.82E-14	1.8E-15
OCDD, 1,2,3,4,5,7,8,9-	0.0001	8.19E-13	8.2E-17	3.81E-13	3.8E-17	4.70E-13	4.7E-17	1.47E-14	1.5E-18
OCDF, 1,2,3,4,6,7,8,9-	0.0001	5.44E-13	5.4E-17	1.77E-13	1.8E-17	3.27E-13	3.3E-17	5.63E-15	5.6E-19
PeCDD, 1,2,3,7,8-	1	2.65E-13	2.7E-13	1.95E-13	2.0E-13	2.00E-13	2.0E-13	1.98E-14	2.0E-14
PeCDF, 1,2,3,7,8-	0.05	1.05E-12	5.2E-14	7.54E-13	3.8E-14	8.82E-13	4.4E-14	5.90E-14	3.0E-15
PeCDF, 2,3,4,7,8-	0.5	1.15E-12	5.8E-13	8.98E-13	4.5E-13	9.34E-13	4.7E-13	9.34E-14	4.7E-14
TCDD, 2,3,7,8-	1	5.69E-14	5.7E-14	4.41E-14	4.4E-14	6.10E-14	6.1E-14	1.04E-14	1.0E-14
TCDF, 2,3,7,8-	0.05	1.74E-12	8.7E-14	1.20E-12	6.0E-14	1.74E-12	8.7E-14	3.27E-13	1.6E-14
Total 2,3,7,8-TCDD equivalents			1.2E-12		9.3E-13		9.8E-13		1.1E-13

TEF = 2,3,7,8-TCDD toxic equivalency factor developed by WHO (Van den Berg 1998 as cited in USEPA 2008).

WCA = Water Catchment Area

		Dissolved Water Concentration (mg/kg)					
		Rookery		M Canal		Small Wetland: Portion of WCA Wetland	
Congener	Fish TEF	Individual Congener	2,3,7,8-TCDD equivalent	Individual Congener	2,3,7,8-TCDD equivalent	Individual Congener	2,3,7,8-TCDD equivalent
HpCDD, 1,2,3,4,6,7,8-	0.001	7.64E-14	7.6E-17	1.51E-15	1.5E-18	4.95E-13	5.0E-16
HpCDF, 1,2,3,4,6,7,8-	0.01	3.88E-13	3.9E-15	7.04E-15	7.0E-17	1.22E-12	1.2E-14
HpCDF, 1,2,3,4,7,8,9-	0.01	4.74E-14	4.7E-16	9.30E-16	9.3E-18	1.74E-13	1.7E-15
HxCDD, 1,2,3,4,7,8-	0.5	1.09E-14	5.5E-15	2.17E-16	1.1E-16	5.81E-14	2.9E-14
HxCDD, 1,2,3,6,7,8-	0.01	5.84E-14	5.8E-16	1.14E-15	1.1E-17	1.32E-13	1.3E-15
HxCDD, 1,2,3,7,8,9-	0.01	6.62E-14	6.6E-16	1.27E-15	1.3E-17	1.41E-13	1.4E-15
HxCDF, 1,2,3,4,7,8-	0.1	4.70E-13	4.7E-14	8.29E-15	8.3E-16	8.69E-13	8.7E-14
HxCDF, 1,2,3,6,7,8-	0.1	3.06E-13	3.1E-14	4.83E-15	4.8E-16	7.81E-13	7.8E-14
HxCDF, 1,2,3,7,8,9-	0.1	1.78E-13	1.8E-14	3.24E-15	3.2E-16	4.06E-13	4.1E-14
HxCDF, 2,3,4,6,7,8-	0.1	1.38E-13	1.4E-14	2.32E-15	2.3E-16	2.96E-13	3.0E-14
OCDD, 1,2,3,4,5,7,8,9-	0.0001	9.51E-14	9.5E-18	1.86E-15	1.9E-19	1.01E-12	1.0E-16
OCDF, 1,2,3,4,6,7,8,9-	0.0001	3.79E-14	3.8E-18	7.08E-16	7.1E-20	7.19E-13	7.2E-17
PeCDD, 1,2,3,7,8-	1	2.14E-13	2.1E-13	2.55E-15	2.5E-15	4.78E-13	4.8E-13
PeCDF, 1,2,3,7,8-	0.05	6.42E-13	3.2E-14	9.91E-15	5.0E-16	2.11E-12	1.1E-13
PeCDF, 2,3,4,7,8-	0.5	1.05E-12	5.3E-13	1.34E-14	6.7E-15	2.22E-12	1.1E-12
TCDD, 2,3,7,8-	1	8.03E-14	8.0E-14	2.42E-15	2.4E-15	1.54E-13	1.5E-13
TCDF, 2,3,7,8-	0.05	3.18E-12	1.6E-13	6.06E-14	3.0E-15	4.60E-12	2.3E-13
Total 2,3,7,8-TCDD equivalents			1.1E-12		1.7E-14		2.4E-12

TEF = 2,3,7,8-TCDD toxic equivalency factor developed by WHO (Van den Berg 1998 as cited in USEPA 2008).

WCA = Water Catchment Area

**Calculated Sediment Concentrations for PCDDs/PCDFs
Using Fish TEFs**

		Sediment Concentration (mg/kg)							
		Middle Lake (waterbody #4)		Iron Horse Lake (waterbody #2)		WCA Wetland (waterbody #3)		Roadside Canal (waterbody #1)	
Congener	Fish TEF	Individual Congener	2,3,7,8-TCDD equivalent	Individual Congener	2,3,7,8-TCDD equivalent	Individual Congener	2,3,7,8-TCDD equivalent	Individual Congener	2,3,7,8-TCDD equivalent
HpCDD, 1,2,3,4,6,7,8-	0.001	1.00E-06	1.0E-09	5.84E-07	5.8E-10	5.59E-07	5.6E-10	2.94E-08	2.9E-11
HpCDF, 1,2,3,4,6,7,8-	0.01	5.85E-07	5.8E-09	4.27E-07	4.3E-09	3.29E-07	3.3E-09	3.59E-08	3.6E-10
HpCDF, 1,2,3,4,7,8,9-	0.01	7.31E-08	7.3E-10	5.35E-08	5.4E-10	4.77E-08	4.8E-10	4.21E-09	4.2E-11
HxCDD, 1,2,3,4,7,8-	0.5	6.32E-08	3.2E-08	4.03E-08	2.0E-08	3.94E-08	2.0E-08	2.55E-09	1.3E-09
HxCDD, 1,2,3,6,7,8-	0.01	4.78E-08	4.8E-10	3.89E-08	3.9E-10	2.91E-08	2.9E-10	4.46E-09	4.5E-11
HxCDD, 1,2,3,7,8,9-	0.01	5.25E-08	5.3E-10	4.26E-08	4.3E-10	3.05E-08	3.1E-10	5.15E-09	5.2E-11
HxCDF, 1,2,3,4,7,8-	0.1	1.39E-07	1.4E-08	1.13E-07	1.1E-08	8.99E-08	9.0E-09	1.64E-08	1.6E-09
HxCDF, 1,2,3,6,7,8-	0.1	1.24E-07	1.2E-08	9.39E-08	9.4E-09	8.05E-08	8.1E-09	9.54E-09	9.5E-10
HxCDF, 1,2,3,7,8,9-	0.1	7.08E-08	7.1E-09	6.19E-08	6.2E-09	4.80E-08	4.8E-09	5.95E-09	5.9E-10
HxCDF, 2,3,4,6,7,8-	0.1	3.95E-08	3.9E-09	2.82E-08	2.8E-09	2.74E-08	2.7E-09	4.50E-09	4.5E-10
OCDD, 1,2,3,4,5,7,8,9-	0.0001	3.20E-06	3.2E-10	1.49E-06	1.5E-10	1.84E-06	1.8E-10	5.74E-08	5.7E-12
OCDF, 1,2,3,4,6,7,8,9-	0.0001	1.34E-06	1.3E-10	4.37E-07	4.4E-11	8.08E-07	8.1E-11	1.39E-08	1.4E-12
PeCDD, 1,2,3,7,8-	1	2.86E-08	2.9E-08	2.10E-08	2.1E-08	2.15E-08	2.2E-08	2.13E-09	2.1E-09
PeCDF, 1,2,3,7,8-	0.05	1.59E-07	8.0E-09	1.15E-07	5.7E-09	1.34E-07	6.7E-09	8.97E-09	4.5E-10
PeCDF, 2,3,4,7,8-	0.5	8.99E-08	4.5E-08	7.01E-08	3.5E-08	7.28E-08	3.6E-08	7.28E-09	3.6E-09
TCDD, 2,3,7,8-	1	8.86E-09	8.9E-09	6.87E-09	6.9E-09	9.49E-09	9.5E-09	1.61E-09	1.6E-09
TCDF, 2,3,7,8-	0.05	5.40E-08	2.7E-09	3.71E-08	1.9E-09	5.40E-08	2.7E-09	1.01E-08	5.1E-10
Total 2,3,7,8-TCDD equivalents			1.7E-07		1.3E-07		1.3E-07		1.4E-08

TEF = 2,3,7,8-TCDD toxic equivalency factor developed by WHO (Van den Berg 1998 as cited in USEPA 2008).
WCA = Water Catchment Area

		Sediment Concentration (mg/kg)					
		Rookery (waterbody #5)		M Canal (waterbody #6)		Small Wetland: Portion of WCA Wetland (waterbody #7)	
Congener	Fish TEF	Individual Congener	2,3,7,8-TCDD equivalent	Individual Congener	2,3,7,8-TCDD equivalent	Individual Congener	2,3,7,8-TCDD equivalent
HpCDD, 1,2,3,4,6,7,8-	0.001	1.88E-07	1.9E-10	3.71E-09	3.7E-12	1.22E-06	1.2E-09
HpCDF, 1,2,3,4,6,7,8-	0.01	2.40E-07	2.4E-09	4.36E-09	4.4E-11	7.54E-07	7.5E-09
HpCDF, 1,2,3,4,7,8,9-	0.01	2.94E-08	2.9E-10	5.76E-10	5.8E-12	1.08E-07	1.1E-09
HxCDD, 1,2,3,4,7,8-	0.5	1.70E-08	8.5E-09	3.38E-10	1.7E-10	9.04E-08	4.5E-08
HxCDD, 1,2,3,6,7,8-	0.01	2.87E-08	2.9E-10	5.61E-10	5.6E-12	6.50E-08	6.5E-10
HxCDD, 1,2,3,7,8,9-	0.01	3.26E-08	3.3E-10	6.26E-10	6.3E-12	6.92E-08	6.9E-10
HxCDF, 1,2,3,4,7,8-	0.1	1.16E-07	1.2E-08	2.04E-09	2.0E-10	2.14E-07	2.1E-08
HxCDF, 1,2,3,6,7,8-	0.1	7.55E-08	7.5E-09	1.19E-09	1.2E-10	1.93E-07	1.9E-08
HxCDF, 1,2,3,7,8,9-	0.1	4.40E-08	4.4E-09	7.99E-10	8.0E-11	1.00E-07	1.0E-08
HxCDF, 2,3,4,6,7,8-	0.1	3.41E-08	3.4E-09	5.71E-10	5.7E-11	7.30E-08	7.3E-09
OCDD, 1,2,3,4,5,7,8,9-	0.0001	3.72E-07	3.7E-11	7.27E-09	7.3E-13	3.96E-06	4.0E-10
OCDF, 1,2,3,4,6,7,8,9-	0.0001	9.35E-08	9.4E-12	1.75E-09	1.7E-13	1.77E-06	1.8E-10
PeCDD, 1,2,3,7,8-	1	2.31E-08	2.3E-08	2.75E-10	2.7E-10	5.15E-08	5.1E-08
PeCDF, 1,2,3,7,8-	0.05	9.76E-08	4.9E-09	1.51E-09	7.5E-11	3.20E-07	1.6E-08
PeCDF, 2,3,4,7,8-	0.5	8.20E-08	4.1E-08	1.04E-09	5.2E-10	1.73E-07	8.6E-08
TCDD, 2,3,7,8-	1	1.25E-08	1.2E-08	3.77E-10	3.8E-10	2.40E-08	2.4E-08
TCDF, 2,3,7,8-	0.05	9.87E-08	4.9E-09	1.88E-09	9.4E-11	1.43E-07	7.1E-09
Total 2,3,7,8-TCDD equivalents			1.3E-07		2.0E-09		3.0E-07

TEF = 2,3,7,8-TCDD toxic equivalency factor developed by WHO (Van den Berg 1998 as cited in USEPA 2008).
WCA = Water Catchment Area

**Calculated Fish Tissue Concentrations of PCDDs/PCDFs
Bird Exposures**

			Fish Concentration (mg/kg fw)							
							Small Wetland: Portion of			
			WCA Wetland (waterbody #3)		Roadside Canal (waterbody #1)		Rookery (waterbody #5)		WCA Wetland (waterbody #7)	
			Individual Congener	2,3,7,8-TCDD equivalent	Individual Congener	2,3,7,8-TCDD equivalent	Individual Congener	2,3,7,8-TCDD equivalent	Individual Congener	2,3,7,8-TCDD equivalent
Congener	BirdTEF									
HpCDD, 1,2,3,4,6,7,8-	0.001	*	4.89E-09	4.9E-12	2.58E-10	2.6E-13	1.65E-09	1.6E-12	1.07E-08	1.1E-11
HpCDF, 1,2,3,4,6,7,8-	0.01		2.88E-09	2.9E-11	3.14E-10	3.1E-12	2.10E-09	2.1E-11	6.60E-09	6.6E-11
HpCDF, 1,2,3,4,7,8,9-	0.01		4.17E-10	4.2E-12	3.68E-11	3.7E-13	2.57E-10	2.6E-12	9.46E-10	9.5E-12
HxCDD, 1,2,3,4,7,8-	0.05		2.76E-09	1.4E-10	1.79E-10	8.9E-12	1.19E-09	5.9E-11	6.33E-09	3.2E-10
HxCDD, 1,2,3,6,7,8-	0.01		2.04E-09	2.0E-11	3.12E-10	3.1E-12	2.01E-09	2.0E-11	4.55E-09	4.6E-11
HxCDD, 1,2,3,7,8,9-	0.1		2.14E-09	2.1E-10	3.61E-10	3.6E-11	2.28E-09	2.3E-10	4.85E-09	4.8E-10
HxCDF, 1,2,3,4,7,8-	0.1		6.29E-09	6.3E-10	1.15E-09	1.2E-10	8.11E-09	8.1E-10	1.50E-08	1.5E-09
HxCDF, 1,2,3,6,7,8-	0.1		5.64E-09	5.6E-10	6.68E-10	6.7E-11	5.28E-09	5.3E-10	1.35E-08	1.3E-09
HxCDF, 1,2,3,7,8,9-	0.1		3.36E-09	3.4E-10	4.16E-10	4.2E-11	3.08E-09	3.1E-10	7.00E-09	7.0E-10
HxCDF, 2,3,4,6,7,8-	0.1		1.92E-09	1.9E-10	3.15E-10	3.1E-11	2.39E-09	2.4E-10	5.11E-09	5.1E-10
OCDD, 1,2,3,4,5,7,8,9-	0.0001		3.21E-10	3.2E-14	1.00E-11	1.0E-15	6.50E-11	6.5E-15	6.93E-10	6.9E-14
OCDF, 1,2,3,4,6,7,8,9-	0.0001		1.41E-10	1.4E-14	2.43E-12	2.4E-16	1.64E-11	1.6E-15	3.10E-10	3.1E-14
PeCDD, 1,2,3,7,8-	1		3.39E-09	3.4E-09	3.36E-10	3.4E-10	3.63E-09	3.6E-09	8.11E-09	8.1E-09
PeCDF, 1,2,3,7,8-	0.1		2.11E-08	2.1E-09	1.41E-09	1.4E-10	1.54E-08	1.5E-09	5.05E-08	5.0E-09
PeCDF, 2,3,4,7,8-	1		1.15E-08	1.1E-08	1.15E-09	1.1E-09	1.29E-08	1.3E-08	2.72E-08	2.7E-08
TCDD, 2,3,7,8-	1		1.49E-09	1.5E-09	2.54E-10	2.5E-10	1.97E-09	2.0E-09	3.77E-09	3.8E-09
TCDF, 2,3,7,8-	1		8.50E-09	8.5E-09	1.60E-09	1.6E-09	1.55E-08	1.6E-08	2.25E-08	2.2E-08
Total 2,3,7,8-TCDD equivalents				2.9E-08		3.8E-09		3.8E-08		7.2E-08

TEF = 2,3,7,8-TCDD toxic equivalency factor developed by WHO (Van den Berg 1998 as cited in USEPA 2008).

* = TEF is <0.001.

WCA = Water Catchment Area

**Calculated Fish Tissue Concentrations of PCDDs/PCDFs
Otter Exposures**

Congener	Mammal TEF	Fish Concentration (mg/kg fw)	
		M Canal	
		Individual Congener	2,3,7,8-TCDD equivalent
HpCDD, 1,2,3,4,6,7,8-	0.01	3.25E-11	3.2E-13
HpCDF, 1,2,3,4,6,7,8-	0.01	3.82E-11	3.8E-13
HpCDF, 1,2,3,4,7,8,9-	0.01	5.04E-12	5.0E-14
HxCDD, 1,2,3,4,7,8-	0.1	2.36E-11	2.4E-12
HxCDD, 1,2,3,6,7,8-	0.1	3.93E-11	3.9E-12
HxCDD, 1,2,3,7,8,9-	0.1	4.39E-11	4.4E-12
HxCDF, 1,2,3,4,7,8-	0.1	1.43E-10	1.4E-11
HxCDF, 1,2,3,6,7,8-	0.1	8.35E-11	8.3E-12
HxCDF, 1,2,3,7,8,9-	0.1	5.59E-11	5.6E-12
HxCDF, 2,3,4,6,7,8-	0.1	4.00E-11	4.0E-12
OCDD, 1,2,3,4,5,7,8,9-	0.0003	1.27E-12	3.8E-16
OCDF, 1,2,3,4,6,7,8,9-	0.0003	3.06E-13	9.2E-17
PeCDD, 1,2,3,7,8-	1	4.32E-11	4.3E-11
PeCDF, 1,2,3,7,8-	0.03	2.37E-10	7.1E-12
PeCDF, 2,3,4,7,8-	0.3	1.65E-10	4.9E-11
TCDD, 2,3,7,8-	1	5.94E-11	5.9E-11
TCDF, 2,3,7,8-	0.1	2.96E-10	3.0E-11
Total 2,3,7,8-TCDD equivalents			2.3E-10

TEF = 2,3,7,8-TCDD toxic equivalency factor developed by WHO (Van den Berg 1998 as cited in USEPA 2005).

Calculated Concentrations in Snails in Middle Lake

Compound (a)	Middle Lake Sediment Concentration (mg/kg dw) (b)	BCF (mg/kg fw organism per mg/kg dw sediment) (c)	Snail Concentration (mg/kg fw) (d)		Bird TEF	TCDD TEQ Snail Concentration (mg/kg fw) (e)
HpCDD, 1,2,3,4,6,7,8-	1.00E-06	0.12	1.20E-07	<	0.001	1.20E-10
HpCDF, 1,2,3,4,6,7,8-	5.85E-07	0.025	1.46E-08		0.01	1.46E-10
HpCDF, 1,2,3,4,7,8,9-	7.31E-08	0.90	6.58E-08		0.01	6.58E-10
HxCDD, 1,2,3,4,7,8-	6.32E-08	0.71	4.49E-08		0.05	2.24E-09
HxCDD, 1,2,3,6,7,8-	4.78E-08	0.28	1.34E-08		0.01	1.34E-10
HxCDD, 1,2,3,7,8,9-	5.25E-08	0.32	1.68E-08		0.1	1.68E-09
HxCDF, 1,2,3,4,7,8-	1.39E-07	0.17	2.37E-08		0.1	2.37E-09
HxCDF, 1,2,3,6,7,8-	1.24E-07	0.44	5.46E-08		0.1	5.46E-09
HxCDF, 1,2,3,7,8,9-	7.08E-08	1.4	9.92E-08		0.1	9.92E-09
HxCDF, 2,3,4,6,7,8-	3.95E-08	1.5	5.92E-08		0.1	5.92E-09
OCDD, 1,2,3,4,5,7,8,9-	3.20E-06	0.028	8.97E-08		0.0001	8.97E-12
OCDF, 1,2,3,4,6,7,8,9-	1.34E-06	0.037	4.97E-08		0.0001	4.97E-12
PeCDD, 1,2,3,7,8-	2.86E-08	2.1	6.00E-08		1	6.00E-08
PeCDF, 1,2,3,7,8-	1.59E-07	0.51	8.11E-08		0.1	8.11E-09
PeCDF, 2,3,4,7,8-	8.99E-08	3.7	3.33E-07		1	3.33E-07
TCDD, 2,3,7,8-	8.86E-09	2.3	2.04E-08		1	2.04E-08
TCDF, 2,3,7,8-	5.40E-08	1.8	9.72E-08		1	9.72E-08
Total 2,3,7,8-TCDD equivalents (TCDD TEQs)						5.47E-07

BAF = bioconcentration factor.

fw = fresh weight (wet weight).

TEF = 2,3,7,8-TCDD toxic equivalency factor developed by WHO (Van den Berg 1998 as cited in USEPA 2008).

TEQ = 2,3,7,8-TCDD toxic equivalents.

NA = Not applicable.

(a) Compounds shown in the table are those with ecotoxicity screening values (ESVs) for birds.

(b) Sediment concentrations were obtained from USEPA's HHRAP model results (calculated using the IRAP software program).

TCDF value based on the methodology outlined in Appendix C of USEPA (1999) and the bioaccumulation equivalency factors in USEPA (1995c).

(d) Snail concentration (mg/kg fw snail) = sediment concentration mg/kg dw sediment * BAF mg/kg fw organism / mg/kg dw sediment.

(e) TCDD TEQ concentration = snail concentration * bird TEF.