PORTMIAMI FUMIGATION & COLD CHAIN PROCESSING FACILITY PROGRAM & DEVELOPMENT STUDY

Source: PortMiami

Source: PortMiami

McLaren Global Facility
Source: USDA

Source: USDA

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1.Executive Summary

1.1 Introduction

Miami-Dade County (PortMiami) has been awarded $33.5 million by the United States Department of Transportation (USDOT) to construct a Cold Chain Processing and Fumigation Facility (“Facility”) to support the safe flow of agricultural and food products free of pests and diseases, domestically and internationally and further the treatment requirements of the Code of Federal Regulation Title 7, Part 305 – Phytosanitary Treatment (CFR 305.5-305.8). The project proposes the construction of a state-of-the-art Cold Chain Processing and Fumigation Facility within ten (10) miles of PortMiami on County-owned land.

The Cold Chain Processing and Fumigation Facility will: (1) advance technology-supported safety and design efficiency improvements; (2) bring facilities to a state of good repair and improve resiliency; (3) promote efficient trade in energy resources; (4) promote exports of manufacturing, agriculture, or other goods; and (5) support the safe flow of agricultural and food products, free of pests and disease, domestically and internationally.

1.2 Purpose and Need

As part of the planning process, PortMiami (“Port”) was tasked to complete the Cold Chain Processing and Fumigation Facility Program and Development Study (“Study”) for the project.

The Study determined that by having fumigation services and cold chain processing in the same site, the County can optimize its limited real estate by providing a one-stop multi-service facility to increase its competitiveness in the South Florida and national markets, reduce truck traffic, and lower diesel emissions across the County. Therefore, PortMiami reached out to several industry leaders to assist in preparation of this Study for a Cold Chain Processing and Fumigation Facility with the following objectives:

- Define current and future cold chain processing and fumigation needs for the Port based on industry experience.
- Generate recommendations for the Facility.

The Port undertook a data-collection effort by creating and distributing a questionnaire about existing local and regional market conditions for Cold Chain Processing and Fumigation facilities. The responses to the questionnaire and follow up meetings with industry leaders identified key operational needs and deficiencies to meet existing and future service demand.

Based on these responses and research, this Study identifies the need for the Facility and provides recommendations to accommodate increase demand, with expansion capability to accommodate future demands.

1.3 Recommendations

The following recommendations will frame the Facility's functions to assist the potential private sector partner to optimize the facility while simultaneously achieving and sustaining the County's objective of successfully serving the multipurposed Cold Chain Processing and Fumigation markets. These recommendations are not intended to limit creativity or unforeseen business strategies that achieve the noted objective. The proposed facility shall be, at a minimum, consistent with the grant application. For instance, the proposed facility shall be, at a minimum, 100,000 square feet with a minimum of 80 truck bays.

The Facility is anticipated to be advertised as a design-build, finance, operate and maintain project through a public-private partnership (P3). This approach will promote an early completion that further increases efficiency and reduces delays. The P3 is a cooperative arrangement between PortMiami and a private sector partner, typically of a long-term nature.

a) Lease Length and Structure
   - The study's findings recommend a minimum of a 25-year lease agreement.
   - Triple Net Lease (NNN): The private sector partner pays all expenses, including lease payments, real estate taxes, property insurance, and any property maintenance costs.
   - The private sector partner pays all utilities, maintenance/operation/repair (including building, roof, and equipment).
   - The lease rate will have a 3% escalation, at an annual basis, as is typical for port leases.
   - The County ground lease is for the vacant land only. The selected private sector partner will manage the design, construction, maintenance, and operation of the Facility in conjunction with the port.

b) Building Ratio of Fumigation and Cold Chain Processing
   - The study's findings require that phytosanitary treatment be provided and comprise between 10-20% of the building's serviceable space (approximately 15,000 to 30,000 for a 150,000-sf facility).
   - All other functions, such as inspection, support, and office/administrative spaces are separate and not included in the service space ratios. The private sector partner shall determine the size and ratio of all inspection, support, and office/administration spaces.
   - The facility build-out conditions may support office and/or administrative spaces above a fully optimized ground level Cold Chain Processing and Fumigation space.

c) Building Programming
   - United States Department of Agriculture (USDA), USDA Animal Health Inspection Service (APHIS), US Customs and Border Protection (CBP) and the Food and Drug Administration (FDA) may require an inspection space or video feed to a centralized one.[1]

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[1] *Steve Berens – Chief Strategy Officer. Chief Strategy Officer.* www.iporteast.com

d) Building Footprint and Height

- The conceptual planning study finds that an approximate building footprint of 150,000 feet (sf) maximizes the site while addressing the site access and circulation constraints (Appendix A). The conceptual footprint serves as a basis and not a final layout. The private sector partner shall determine the size and ratio of the final build-out.
- The Study mandates that the building height complies with Aviation Planning, Land Use and Grants Division and Federal Aviation Administration (FAA) height requirements.

2. Project Overview

2.1 Study Background

PortMiami is a vital economic engine contributing $43 billion annually with 334,000 direct and indirect jobs in 2019. The Port is one of the top 15 coastal ports that handled the greatest number of loaded foreign and domestic twenty-foot equivalent units (TEUs) of containerized cargo in 2016, as identified by the U.S. Army Corps of Engineers.

PortMiami is a designated Department of Miami-Dade County government (Miami-Dade Seaport Department), and is owned by, and operated as an 'enterprise fund' of the County. An enterprise fund is used to account for activity in which the cost of providing goods and services is primarily recovered through the fees charged to the users. The Port is on an island and occupies approximately 520 acres of land.

Cargo business continues to increase, and cargo densification projects are underway since land is limited on the island that makes up PortMiami. The expansion of the Panama Canal, which was completed in June 2016, provides the container ships up to about 14,000 TEUs, or post-Panamax ships. Prior to the expansion, the maximum size vessels that could transit the locks was about 4,500 TEUs. The impact of the larger Panama Canal is already affecting the size of the vessels moving through the Canal. Due to this shift in the cargo industry, the demand for U.S. East Coast ports to house incoming cargo has been increasing at a remarkable rate.

PortMiami ("Port"), handled about 1,120,913 TEUs of containerized cargo in 2019. According to the Port's 2035 Master Plan, the demand for containerized cargo handling is projected to be nearly 2.7 million TEUs by 2035.[2]

Since PortMiami's real estate is limited, it is critical to optimize the footprint to generate the best outcome for the county. Finding space inland to accommodate support services such as phytosanitary treatment and cold chain processing, helps the island real estate maximize its location and value. Locating Facility inland also optimizes its potential to serve various markets from a more central site.

PortMiami was awarded funding from the Federal Port infrastructure Development Grant Program to develop the Facility on County-owned land. The facility will promote increased international trade to and from PortMiami, a principal United States trade gateway to Central, South America and the Caribbean. The grant funds will support design and construction costs including, but not limited to, a building shell, cold processing technology, and a minimum of one (1) new phytosanitary treatment system.

The County's intent with this Project is to minimize public sector investment while optimizing the private sector partner's investment to create a long-term competitive facility. PortMiami, through Internal

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[2] *2035 Master Plan Executive Summary*

Services Department ("ISD"), will release a Request for Proposals ("RFP") for submissions to design, construct, finance, operate, and maintain the facility. The Project's design, construction, operation, maintenance, and property management shall be completed and led by a private sector partner, after undergoing the County's RFP procurement process.

This study develops a broad market understanding for the Facility. The Study is framed by the grant specifications and addresses typical airport and seaport commodities to determine the functionality, programming requirements, and space allocation of a Facility. It will analyze PortMiami's existing cargo business, provide projections, and generate a concise report which supports existing and projected cargo volumes.

2.2 Site Description

The Cold Chain Processing and Fumigation Site is located within the State of Florida and Miami-Dade County jurisdiction. It is represented by the Florida's 25th Congressional District. Specifically, the Cold Chain Processing and Fumigation Site is located on the southwestern edge of Miami International Airport. The facility will be built on a 14-acre Miami-Dade County-owned site and completed in a single phase. The selected site is owned by Miami-Dade County and located in Miami International Airport's (MIA) property and is bounded by NW 12th Street to the south, Milan Dairy Road to the west, railroad tracks to the north, and industrial and commercial lot to the east *(Figure 1).*

- Geospatial Data

  The geographical coordinates are 25.782950° N 80.317596° W.

- Qualified Opportunity Zones

  The Cold Chain Processing and Fumigation Site is located within a QOZ Tract 12086009100. The term "Qualified Opportunity Zone (QOZ)" means a population census tract that is a low- income community that is designated pursuant to 26 U.S.C. 1400Z-1.

Figure 1 - Final Site Location

2.3 Project Description

Construction of a building on approximately 150,000 square footprint to house a third-party operated, state-of-the-art Cold Chain Processing and Fumigation facility. The Facility will further the phytosanitary treatment requirements of the Electronic Code of Federal Regulations 7 CFR 305.5-305.8 and provide space for cold chain processing. PortMiami and MIA will share the Facility. The Electronic Code of Federal Regulations (e-CFR) is a currently updated version of the Code of Federal Regulations (CFR).

2.4 Study Objectives

The purpose of this Study is to provide recommendations that may assist the potential applicant(s) intention to optimize the site while simultaneously achieving and sustaining the county's objective of successfully serving the multi-scaled Cold Chain Processing and Fumigation markets (*Figure 1*). Specifically, this Study covers the following:

a) Assess the current and projected market conditions in South Florida and the eastern region as they relate to Cold Chain Processing and Fumigation to inform the new facility's proposed functionality and space allocation
b) assessment of existing site conditions, including zoning and height restrictions
c) identification of existing and/or anticipated environmental concerns
d) assessment of existing fumigation operations at MIA and PortMiami to establish requirements for the new facility

e) provision of rough-order-of-magnitude (ROM) cost estimates to support the evaluation of the preferred concept[3]

2.5 Funding Structure

The project's funding structure is comprised of the following:

- PortMiami Contribution Non-Federal $ 10,032,410 or 17%
- Private sector partner Contribution Non-Federal $ 13,500,000 or 24%
- Port Infrastructure Development Grant Federal $ 33,500,000 or 59% match of the total project cost and cannot to exceed $33,500,000
- **Total Project Cost: $ 57,032,410 or 100%**

Any additional costs will be the responsibility of the private sector partner.

2.6 Overview of a Phytosanitary Facility

Phytosanitary inspections address all potential pest threats, including hitchhiking pests, misidentified goods, and contamination. Emphasis is paid to systemic pest threats known to commonly occur in the pathway. The USDA Animal Health Inspection Agency (APHIS), an agency within the USDA responsible for protecting the health of animals and plants, determines whether a pest is actionable, indicating that it poses a risk to U.S. agriculture, economy, or environment, and is neither established nor controlled within the United States. If the pest is actionable, the shipment is prohibited entry unless the risk is mitigated with an approved treatment. PortMiami's imported or exported perishable materials are subject to fumigation to eliminate the pest risk.[4]

a) Benefits

Fumigants are gaseous forms of chemicals and are useful in phytosanitary treatments. Phytosanitary treatment helps eliminate pests or disease from entering or leaving the region, state, or country. This line of protection assures no invasive pests or pathogens enter or leave local conditions and native ecosystems.

b) Types of Treatment

The 2018 USDA Treatment Manual defines fumigation and identifies authorized fumigates as the following:

"Fumigation as the act of releasing and dispersing a toxic chemical, so it reaches the target organism in a gaseous state. Chemicals applied as aerosols, smokes, mists, and fogs are suspensions of particulate matter in air and are not fumigants.

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[3] *2019 Fumigation Facility Project Book. Prepared for the Miami Dade Aviation Department. Prepared by Ricondo*

[4] *United States Department of Agriculture (USDA). Economic Research Report 1 Number 168. The Effects of Phytosanitary Regulations on U.S. Imports of Fresh Fruits and Vegetables. Peyton Ferrier. July 2014*

Due to the reduction in number of labeled fumigants, there is seldom a choice in selecting fumigants. When there is a choice, factors such as the commodity to be treated, pest and stages present, type of structure, and cost should be considered in selecting a fumigant.

***USDA's authorized fumigants** include, but are not limited:*

- ***Electron beam, Gamma, and/or Xray Irradiation** – Recently approved by the USDA and FDA;*
- ***Methyl bromide** (MB);*
- ***Phosphine (PH)** (There are two chemicals used for phosphine: AP– aluminum phosphide; and MP–magnesium phosphide); and*
- ***Sulfuryl fluoride (SF)** (Vikane)*

Much of the information on fumigants is based on Methyl bromide, with modifications as needed for the other fumigants."[5]

2.7 Overview of a Cold Chain Processing Facility

Cold chain processing is the technology and process that allows for the safe handling, staging, and transport of temperature-sensitive goods and products along the supply chain.

a.) Benefits

The benefits of cold chain processing include eliminating pathogens and food safety risks, increasing food quality and shelf life, optimize thermal use, and increase the overall cold chain efficiency and productivity.

When cargo is separated by distances careful calibration is required to maintain the product's optimal condition from source to consumer. The greater the distance, the more likely cargo can be damaged during one of the complex transport steps. Cargo may be damaged by potential shock or inappropriate temperature variations. For instance, without being maintained at lower temperatures perishable foods have proven to degrade in quality with time as adverse chemical reactions alter the product's outcome.

Time and coordination are carefully managed to efficiently move perishables while maintaining them in their most ideal state for consumption. Businesses, such as those in the medical, pharmaceutical, and food industries, are increasingly rely on cold chain to mitigate product damaged or compromised by unintended temperature variations.

From an economic development perspective, the cold chain enables many developing economies to take part in the global perishable products market either as producers or as consumers. Consumers with increasing purchase power have become preoccupied with healthy eating and delivery, therefore

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[5] *2018 United States Department of Agriculture (USDA) Treatment Manual*

producers and retailers have responded with an array of exotic fresh fruits originating from around the world [6].

Increasingly, fruit is now shipped directly to South Florida for delivery to local grocery stores faster and at a lower cost than shipping through traditional northern ports. It also provides opportunities for ocean-to-air transshipment.[7]

The benefits of the cold chain processing is to capture the perishable cargo that now moves into Florida via non-Florida ports by truck, resulting in increased environmental, safety, infrastructure costs to the nation, as well as increasing the cost of perishable foods to the Florida consumers while reducing shelf life Using Piers data, Martin Associates estimated the share of imports from the West Coast of South America and Central America that are consumed in Florida and moving through various Atlantic Coast ports as well as the Florida ports. As shown in (*Figure 2)*, 40% of the Florida consumed imports from the West Coast of South America and Central America use ports other than Florida ports. As noted, most of these West Coast South American and Central American imports are perishable commodities, most likely moving into Florida from the Delaware River ports, as well as from Savannah. In addition, in the recent months, the Port of Wilmington, NC has entered the perishable goods import market, and is also likely to serve certain Florida Markets soon [8].

Figure 2 - Imports from West Coast South America and Central America Consumed in Florida by Port of Import

Ports	TEUS	Share
Non-Florida Ports	136,408	40.1%
Port Everglades	83,666	24.6%
Tampa/Manatee	84,739	24.9%
Miami	34,052	10.0%
Jacksonville	1,609	0.5%
Total	340,473	100.0%

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[6] *Rodrigue, J-P (ed) (2017), The Geography of Transport Systems, Fourth Edition, New York: Routledge.*

[7] *PortMiami Cold Chain Processing and Fumigation Facility and Cargo Yard Resiliency Improvements - Benefit-Cost Analysis Appendix. 2019. Martin Associates*

[8] *PortMiami Cold Chain Processing and Fumigation Facility and Cargo Yard Resiliency Improvements - Benefit-Cost Analysis Appendix. 2019. Martin Associates*

b.) Types of Cold Chain Processes

The main elements of a cold chain involve:

- **Cooling systems**. Bringing commodities such as food to the appropriate temperature for processing, storage, and transportation.
- **Cold storage.** Providing facilities for the storage of goods over a period, either waiting to be ship to a distant market, at an intermediary location for processing and distribution and close to the market for distribution.
- **Cold transport**. Having conveyances available to move goods while maintaining stable temperature and humidity conditions as well as protecting their integrity.
- **Cold processing and distribution**. Providing facilities for the transformation and processing of goods as well as ensuring sanitary conditions. Consolidating and deconsolidating loads (crates, boxes, pallets) for distribution.[2]

3. Existing Conditions

3.1 Overview of the PortMiami Cargo Operators

PortMiami is one of the world's leading hubs for global commerce and tourism. Its gateway location in the Facility of the Western Hemisphere makes the Port a significant conduit for international trade and commerce. PortMiami stands as the U.S. container port closest to the Panama Canal, providing shippers fast access to Florida's booming local consumer base and the entire U.S. market. More than $1 billion in capital infrastructure projects have been invested to transform PortMiami into a major U.S. global gateway at a depth of -50/-52 feet, it is the only major logistics hub south of Virginia capable of handling fully laden post-Panamax vessels.

a) PortMiami to Mexico

PortMiami is the closest U.S. East Coast port to Mexico's thriving Gulf Coast. Its existing containerized cargo services to Veracruz, and Altamira provide shippers an ideal gateway for Mexican manufactured goods and agricultural products.

Advantages of PortMiami-Mexico's All-Water Route includes faster to market services, substantial transportation cost savings, and increased supply chain certainty.

Deep water accessibility and intermodal connections to the national rail system among other deployed infrastructure improvements make PortMiami an ideal gateway for Mexican exports to Florida and the Southeastern United States.

b) Near-Dock Rail

In partnership with PortMiami, Florida East Coast (FEC) Railway offers the fastest access to Southeastern U.S. consumer markets and beyond from the port. With the deepening of our channel to –50 feet, PortMiami's rail access offers increased speed to market and more opportunity for shippers and ocean carriers alike.

c) Container Terminals

As a landlord port, PortMiami maintains operating agreements with cargo terminal operators. PortMiami's three cargo tenants are Seaboard Marine, Port of Miami Terminal Operating Company (POMTOC), and South Florida Container Terminal (SFCT). The terminal operators furnish dock, container storage, and other marine terminal services.

SEABOARD MARINE

POMTOC

SOUTH FLORIDA CONTAINER TERMINAL PORT OF MIAMI, FLORIDA

d) Container Terminal Sizes & Locations at PortMiami

e) Container Terminal Throughput (2020)

TERMINALS	FY 2020
SEABOARD MARINE	456,188
POMTOC	287,379
SFCT	323,171
Grand Total All Terminals	**1,066,738**

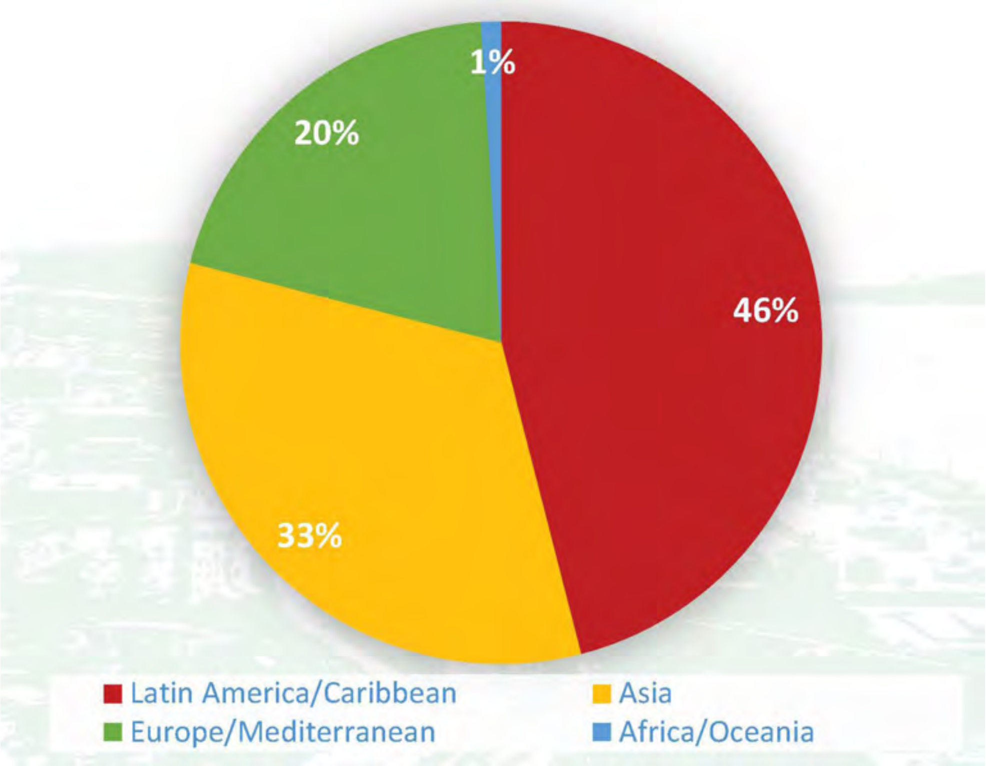
Source: PortMiami Billing

f) Total Trade by Region

Latin America and the Caribbean are PortMiami's largest trade region, accounting for approximately 50% of the port's container traffic in FY 2020. PortMiami is focused on building trade with this key market as well as new markets in Asia, Mediterranean, and Europe. With the completion of the Deep

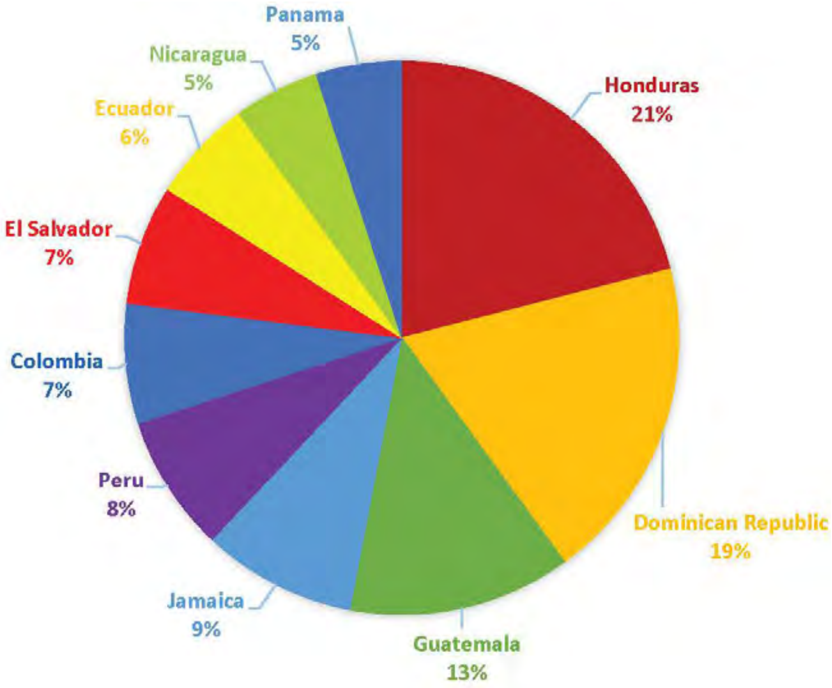
Dredge Project, trade with Asia has continued to increase as PortMiami benefits from a shift in trade from West Coast to East Coast ports. During the pandemic PortMiami has seen additional Asia cargo shift to the east coast with October, November, and December 2020 cargo numbers outpacing the same months in 2019.

Figure 3 - Regional Trade – Market Share by Region



Source: PIERS-FY2020

Figure 4 – Market Share by Country



Source: PIERS-FY2019

Figure 5 - Latin America & the Caribbean Cargo Statistics

Latin America & the Caribbean Cargo Statistics	
Services	13
Total Cargo Ships Docked	542
Total TEUs	479,547
Total Tonnage	4,005,297
Value	25,656,590

Source: PortMiami Billing

Figure 6 - Historical Snapshot

Cargo Volumes							
Item	2014	2015	2016	2017	2018	2019	2020
TEUs	876,708	1,007,782	1,028,156	1,020,192	1,083,586	1,120,913	1,066,738
Cargo Ships Docked	1,649	1,348	1,231	1,422	1,081	958	868
Inbound Tonnage	3,886,315	3,961,208	3,871,906	4,567,926	4,749,255	5,745,632	5,792,134
Outbound Tonnage	4,222,135	4,019,319	3,827,980	4,045,813	4,028,719	4,375,938	3,933,140
Total Tonnage	8,108,450	7,980,527	7,699,886	8,613,739	8,777,974	10,121,570	9,725,274

Source: PortMiami Billing

3.2 Existing Site Conditions

The site presently comprises of mostly asphalt and landscape surface areas. Miami International Airport's southernmost runway is located to the north of the site. The south, east and west are predominantly utilized for low density industrial and commercial purposes.

The **Runway Protection Zone** (RPZ) serves to address the safety of both the flight path and the property. As defined in the FAA's AC 150/5300-13A, the RPZ is "an area at ground level prior to the threshold or beyond the runway end to enhance the safety and protection of people and property on the ground." Therefore, the RPZ should remain clear of all above-ground objects or at least be cleared of all facilities associated with incompatible land uses defined in FAA's Interim Guidance on Land Uses within a Runway Protection Zone *(Figure 7).*

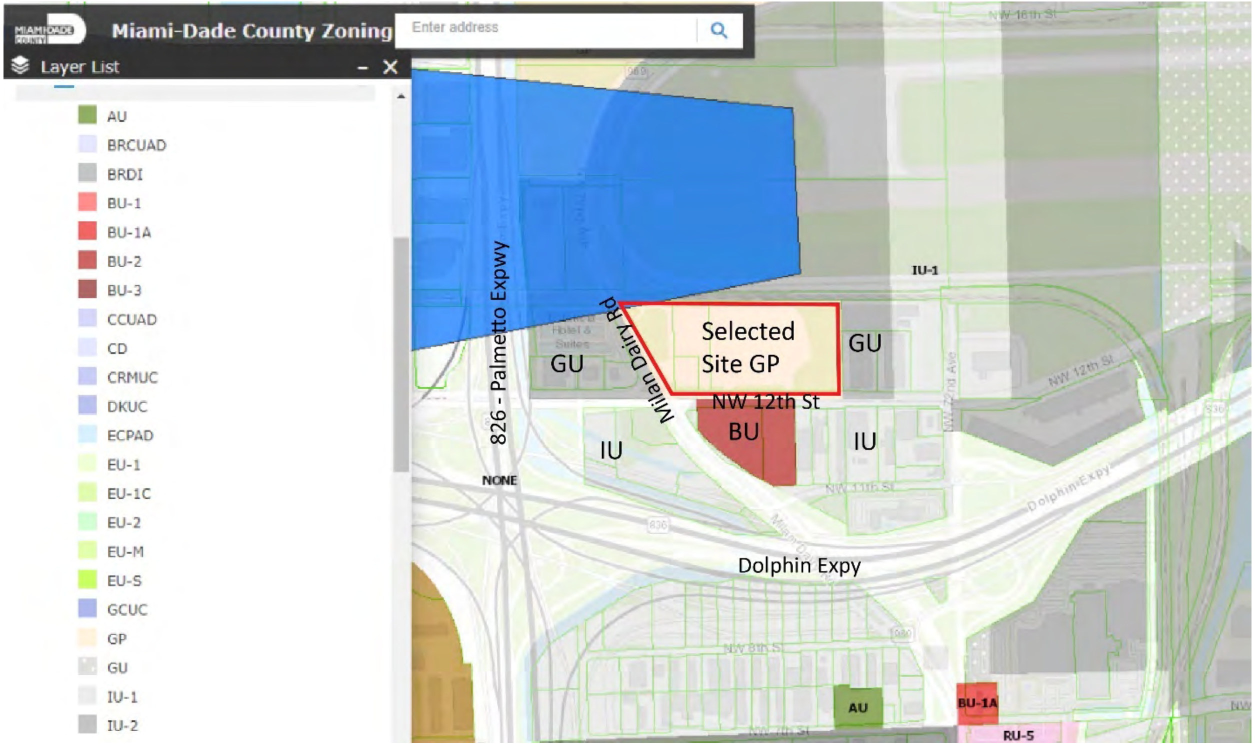
Figure 7 - Existing Site Conditions

3.3 Planning & Zoning

The Miami Dade Aviation Department's (MDAD) Planning and Zoning Division establishes the requirements for the designated Site. Refer to the Fumigation Facility Project Book, prepared by Ricondo & Associates, Inc., for the MDAD (Appendix A).

Figure 8 - Site Location

Figure 9 - Existing Zoning



a.) <u>Zoning</u>

The Site is zoned GP, or Governmental Property. Miami-Dade County's Zoning Code Chapter 33 defines and assigns permissible uses to the Site's zone as follows *(Figure 9)*:

ARTICLE XXXIIIC. - GP, GOVERNMENTAL PROPERTY

Sec. 33-284.22. - Uses permitted.

No land, body of water and/or structure shall be maintained, used or permitted to be used, and no structure shall be hereafter maintained, erected, constructed, moved, reconstructed or structurally altered or permitted to be erected, constructed, moved, reconstructed or structurally altered for any purpose in a GP District which is designed, arranged, or intended to be used or occupied for any purpose other than the following:

Public parks, playgrounds and buildings, and structures supplementary and incidental to such uses;

a) Fire stations;
b) Police stations;
c) Public auto inspection stations;
d) Public water and sewer treatment and distribution facilities;
e) Public libraries;
f) Public buildings and Facilities;
g) Public hospitals, nursing homes and health facilities;
h) Public auditoriums, arenas, museums, art galleries;
i) Maximum and minimum detention facilities;
j) Solid waste collection and disposal facilities;
k) Public maintenance and equipment yards;
l) Public bus stations and rapid transit stations and facilities;
m) Public airports, including those particular uses allowed under the applicable airport zoning regulations;
n) And other similar governmental uses.

Sec. 33-284.23. - Designation of property.

All governmental property in the unincorporated area of Miami-Dade County heretofore and hereafter purchased and/or designated for a governmental use shall be so noted in the public records and maps of the Department. If a specific governmental use or uses has or have been designated pursuant to Section 33-303 of the Code for a particular property, the public records and maps of the Department shall so reflect said designation(s). All land subject to the permitted uses enumerated in Section 33-284.22(a) and owned in fee simple by a governmental entity shall be designated as governmental property. The designation GP shall be deemed an overlay zoning district and shall be in addition to any other zoning district by which the property is designated. If applicable, a GP District shall automatically revert to its other district classification if the property is no longer utilized as provided in Section 33-284.22(a) of the Code.

The property located to the south across NW 12th Street is zoned BU-2, Special Business Use Zoning Districts. This District Permits: Retail Large scale commercial developments such as regional malls and office parks which serve the needs of large urban areas.

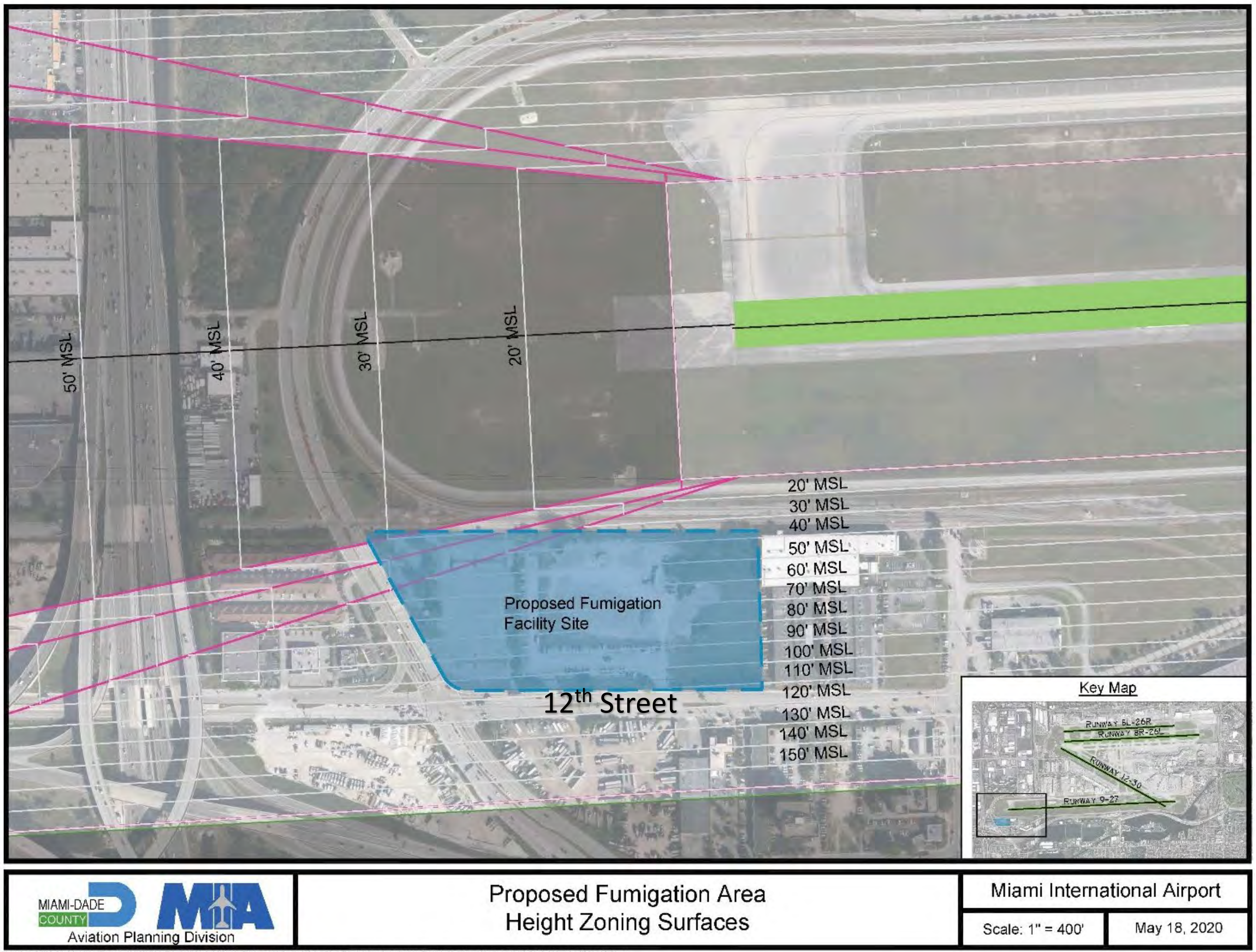
The properties located to the east and west are zoned IU-2, or Heavy Manufacturing District.

The properties located to the southeast and southwest are zoned IU-1, or Industrial, Light Manufacturing District. This District Permits: Light Industrial Manufacturing. Wholesale Distribution Facilities *(Figure 9).*

b.) <u>Height Requirements</u>

The Site height requirement increases from north to south as a response to the flight requirements of the flight runway located immediately north of the Site *(Figure 10)*.

Figure 10 - Height Limits



3.4 Access & Circulation

PortMiami and the Cold Chain Processing and Fumigation Site (Figure 1) are within a ten-mile radius of each other. Miami's two main economic engines are linked multimodally by the SR 836 Dolphin Expressway that connects to the state and national expressway system, in addition to rail connectivity. With direct access from I-395 to I-95 via the PortMiami tunnel, truck and cargo travel maintains direct and convenient access to the airport via State Road 836 on the south side.

The I-395/SF 836/I-195 Project, a partnership between the Florida Department of Transportation (FDOT) and the Miami-Dade Expressway Authority (MDX), is a major improvement to the roadway entries and exits to PortMiami. Construction is expected to be completed in fall of 2024 at cost of $818 million.

The primary roadway connection for cargo truck traffic originating at the Port passes through the Port of Miami Tunnel to SR 836 where it is facilitated via an exit at Milam Dairy Road from State Road 836 at NW 11th Street, approximately 1/4 mile to the southeast.

There is an existing rail line located on the northern boundary of the Cold Chain Processing and Fumigation Facility site. This rail access to the site establishes an additional means of convenient multimodal connection to both PortMiami and the national rail system. Florida East Coast Railway (FEC) rail connects PortMiami to the Hialeah Intermodal Rail Yard, directly northwest of Miami International Airport. Partnering with the FEC, the U.S. Department of Transportation and the State, PortMiami invested $47 million to re-introduce on-port rail service and restore the tracks linking the Port and the rail yard, providing direct cargo access to the national rail system. FEC has approximately 350 miles of rail along the east coast of Florida and connects with the national rail system in Jacksonville. PortMiami also has 9,000 linear feet of rail track in its on-dock railyard. FEC also serves PortMiami via the Hialeah railyard (73 acres) and serves Central Florida via the Titusville railyard (60 acres). Finally, quality inland container yard has an additional 20 acres of railyard serving Miami.

3.5 Environmental Considerations

The purpose of Environmental Site Assessments (ESA) is to is to evaluate previous uses at the site and in a Phase II study, determine the presence, or absence of, petroleum products or hazardous waste in the subsurface of the site. This practice is intended for use on a voluntary basis by parties who wish to evaluate known *releases* or *likely release areas* identified by the *user* or *Phase II Assessor*, and/or to assess the *presence* or likely *presence* of *substances.*

The ESA was completed by MDAD. Phase I was completed in 2015, and a Phase II in 2018 as can be found in Appendix U. The private developer will need to take this into consideration during the development and permitting of the site.

4. Market Conditions

Over the course of the next ten (10) years, the value of imports is anticipated to rise dramatically, with one of the highest growth commodities expected to be horticultural products, at almost 4% per year, largely composed of the sales of fresh fruit and vegetables. The U.S. Department of Agriculture Economic Research Service reports that fresh produce imports will rise 45% from 2016 to 2027, which implies that in the next decade over 3/4 of our fruits and half our vegetables will be imported from outside of the U.S.

4.1 South Florida Market

Florida is the 3rd most populated state in the nation, with a population of 21.6 million, an annual growth rate of 1.6%, and over 127 million visitors a year. The Florida market for fruits, vegetables, flowers, and other perishables is substantial. South Florida, comprised of Miami-Dade County, Broward County and Palm Beach County, represents a population of over 6.7 million and a growth rate of approximately 1%. Miami-Dade County alone has a population of 2.7 million and 16.5 million annual visitors, including 6.7 million day-trippers and cruise passengers. With this increased population and visitor growth, the demand on the consumption of fruits and vegetables is increasing. Fruit is increasingly shipped directly to South Florida for delivery to local grocery stores faster and at a lower cost than shipping through traditional Northern ports. It also provides opportunities for ocean-to-air transshipment.

a.) PortMiami Refrigerated (Reefer) Growth

The following are PortMiami's refrigerated cargo numbers from 2016-2020.

Table 1. – Top 10 Imports Reefer Commodities

Rank 2020	Top 10 Imports Reefer Commodities FY2020 - By TEU	FY2016	Var. FY 16/17		FY2017	Var. FY 17/18		FY2018	Var. FY 18/19		FY2019	Var. FY 19/20		FY2020
			%	TEUs		%	TEUs		%	TEUs		%	TEUs	
1	ASPARAGUS, FRESH OR CHILLED	868	5.52%	48	916	214.31%	1,963	2,879	50.52%	1,454	4,333	77.14%	3,343	7,676
2	SHRIMPS AND PRAWNS, FROZEN	3,023	18.50%	559	3,582	15.73%	563	4,145	11.30%	468	4,614	-6.86%	-317	4,297
3	MELONS - CATALOUPES & WATERMELONS, FRESH	4,137	-38.43%	-1,590	2,547	17.57%	448	2,995	79.97%	2,395	5,389	-35.95%	-1,937	3,452
4	LEGUMINOUS VEGETABLES, NESOI, FRESH OR CHILLED	1,334	-24.20%	-323	1,011	46.47%	470	1,481	12.58%	186	1,667	76.58%	1,277	2,944
5	BANANAS AND PLANTAINS, FRESH OR DRIED	4,089	-28.00%	-1,145	2,944	116.97%	3,443	6,387	-51.26%	-3,274	3,113	-19.35%	-602	2,511
6	BEANS (VIGNA SPP., PHASEOLUS SPP.) FRESH OR CHILLD	1,364	15.85%	216	1,581	29.66%	469	2,049	8.84%	181	2,230	-8.46%	-189	2,042
7	GUAVAS , MANGOES, FRESH OR DRIED	1,192	34.27%	408	1,600	18.81%	301	1,901	-2.64%	-50	1,851	10.02%	185	2,036
8	FISH, FROZEN	1,994	7.51%	150	2,144	-15.72%	-337	1,807	-5.82%	-105	1,702	-34.53%	-588	1,114
9	GARLIC, FRESH OR CHILLED	881	-19.05%	-168	713	8.68%	62	775	53.67%	416	1,191	69.62%	829	2,021
10	POTATOES UNCOOKD/COOKED, FROZEN	398	80.54%	321	719	45.04%	324	1,042	-4.53%	-47	995	52.47%	522	1,517
Total for Top 10		**19,279**	**-7.90%**	**-1,524**	**17,756**	**43.40%**	**7,705**	**25,461**	**6.38%**	**1,624**	**27,086**	**9.32%**	**2,524**	**29,610**
Total Imported Refirgerated TEUs		**49,522**	**-16.32%**	**-8,081**	**41,441**	**37.10%**	**15,376**	**56,817**	**12.31%**	**6,993**	**63,810**	**11.32%**	**7,221**	**71,031**

Findings:

a) The total imports reefer from FY2016 to FY2020 had an increase of 43.43%, accounted for a gain of 21,510 TEUs.

b) 4 imported reefer commodities shown significant increase:
   i. Asparagus imports, from FY2016 to FY2020 had an increase of 784%, accounted for a gain of 6,808 TEUs.
   ii. Leguminous Vegetables imports, from FY2016 to FY2020 had an increase of 120.71%, accounted for a gain of 1,610 TEUs.
   iii. Garlic imports, from FY2016 to FY2020 had an increase of 129.32%, accounted for a gain of 1,140 TEUs.
   iv. Potato, from FY2016 to FY2020 had an increase of 281.14%, accounted for a gain of 1,119 TEUs

Table 2. – Top 10 Exports Reefer Commodities

Rank 2020	Top 10 Exports Reefer Commodities FY2020 - By TEU	FY2016	Var. FY 16/17		FY2017	Var. FY 17/18		FY2018	Var. FY 18/19		FY2019	Var. FY 19/20		FY2020
			%	TEUs		%	TEUs		%	TEUs		%	TEUs	
1	FOOD PREPARATIONS NESOI	4,733	39.49%	1,869	6,602	-1.48%	-98	6,504	-31.98%	-2,080	4,424	-59.39%	-2,627	1,797
2	MEAT & ED OFFAL OF POULTRY, FRESH, CHILL OR FROZEN	1,210	38.89%	470	1,680	-20.86%	-351	1,330	-50.08%	-666	664	117.41%	779	1,443
3	FROZ CHICKEN PAWS	33	2109.60%	688	721	75.81%	546	1,267	-55.63%	-705	562	145.52%	818	1,381
4	CHEESE AND CURD	2	1000.00%	20	22	545.45%	120	142	97.89%	139	281	363.86%	1,022	1,303
5	VEGT/FRUIT/NUTS ETC NESOI PREP/PRES BY VINEGAR ETC	2	50.00%	1	3	-66.67%	-2	1	11528.00%	115	116	530.68%	617	733
6	COCOA PREPARATIONS, NOT IN BULK FORM, NESOI	265	-13.41%	-36	229	-48.93%	-112	117	123.49%	145	262	130.90%	343	604
7	MISCELLANEOUS CARGO	2,713	-95.62%	-2,594	119	135.85%	161	280	174.36%	488	768	-37.38%	-287	481
8	MEDICAMENTS NESOI, MEASURED DOSES, RETAIL PK NESOI	2	-66.50%	-1	1	66753.73%	447	448	12.05%	54	502	-7.08%	-36	466
9	APPLES, FRESH	87	-95.40%	-83	4	750.00%	30	34	470.59%	160	194	97.94%	190	384
10	ORANGE JUICE, FROZEN, SWEETENED OR NOT	379	87.62%	332	710	-31.47%	-224	487	4.74%	23	510	-32.11%	-164	346
Total for Top 10		9,424	7.08%	667	10,091	5.14%	519	10,610	-21.93%	-2,327	8,283	7.92%	656	8,939
Total Imported Refirgerated TEUs		20,503	7.54%	1,546	22,049	1.49%	329	22,379	-4.95%	-1,108	21,271	19.09%	4,061	25,332

Findings:

a) The total exports reefer from FY2016 to FY2020 had an increase of 23.55%, accounted for a gain of 4,829 TEUs.

Table 3. – Top 10 Imports Reefer Countries

Rank 2020	Top 10 Imports Reefer Countries FY2020 - By TEU	FY2016	Var. FY 16/17		FY2017	Var. FY 17/18		FY2018	Var. FY 18/19		FY2019	Var. FY 19/20		FY2020
			%	TEUs		%	TEUs		%	TEUs		%	TEUs	
1	GUATEMALA	9,722	-18.73%	-1,821	7,901	33.66%	2,659	10,560	6.17%	652	11,212	31.83%	3,569	14,780
2	PERU	1,820	29.48%	537	2,357	118.95%	2,803	5,160	29.80%	1,538	6,697	60.98%	4,084	10,781
3	ECUADOR	2,672	-24.11%	-644	2,028	139.10%	2,821	4,849	-10.72%	-520	4,329	58.47%	2,531	6,860
4	CHINA	4,485	9.58%	430	4,914	34.92%	1,716	6,630	-22.94%	-1,521	5,109	-27.59%	-1,410	3,699
5	HONDURAS	2,953	-24.27%	-717	2,236	20.45%	457	2,694	6.28%	169	2,863	27.86%	798	3,660
6	DOMINICAN REPUBLIC	368	123.86%	455	823	102.65%	845	1,668	3.03%	50	1,718	107.80%	1,852	3,571
7	SPAIN	677	132.39%	897	1,574	39.55%	623	2,196	9.68%	213	2,409	25.48%	614	3,023
8	INDIA	1,376	66.42%	914	2,290	19.94%	457	2,746	18.92%	519	3,266	-18.41%	-601	2,664
9	INDONESIA	1,944	-8.61%	-167	1,777	20.81%	370	2,146	14.54%	312	2,458	-4.66%	-115	2,344
10	COLOMBIA	1,082	-8.52%	-92	990	15.60%	154	1,144	57.02%	652	1,796	19.73%	354	2,151
Total for Top 10		27,098	-0.77%	-209	26,889	47.99%	12,905	39,793	5.19%	2,064	41,857	27.90%	11,677	53,534
Total Imported Refirgerated TEUs		49,522	-16.32%	-8,081	41,441	37.10%	15,376	56,817	12.31%	6,993	63,810	11.32%	7,221	71,031

Findings:

a) 4 countries for imports shown significant increase:

- i. Peru, from FY2016 to FY2020 had an increase of 492%, or a gain of 8,961TEUs.
- ii. Guatemala, from FY2016 to FY2020 had an increase of 52%, or a gain of 5,059 TEUs.
- iii. Ecuador, from FY2016 to FY2020 had an increase of 156%, or a gain of 4,188 TEUs.
- iv. Dominican Republic, from FY2016 to FY2020 had an increase of 871%, or a gain of 3,203 TEUs.

Table 4. – Top 10 Exports Reefer Countries

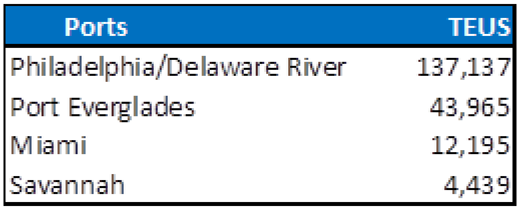
Rank 2020	Top 10 Exports Reefer Countries FY2020 - By TEU	FY2016	Var. FY 16/17		FY2017	Var. FY 17/18		FY2018	Var. FY 18/19		FY2019	Var. FY 19/20		FY2020
			%	TEUs		%	TEUs		%	TEUs		%	TEUs	
1	DOMINICAN REPUBLIC	1,388	23.00%	319	1,707	19.31%	330	2,037	53.12%	1,082	3,119	27.30%	851	3,971
2	JAMAICA	1,632	8.26%	135	1,766	17.08%	302	2,068	35.93%	743	2,811	-6.26%	-176	2,635
3	HAITI	1,152	62.34%	718	1,871	15.68%	293	2,164	-26.06%	-564	1,600	42.57%	681	2,281
4	TRINIDAD AND TOBAGO	790	25.89%	205	994	122.20%	1,215	2,210	-16.02%	-354	1,856	18.06%	335	2,191
5	PANAMA	2,478	-38.47%	-953	1,525	-11.87%	-181	1,344	8.34%	112	1,456	29.96%	436	1,892
6	HONDURAS	648	-58.84%	-381	267	11.76%	31	298	62.23%	185	483	272.04%	1,315	1,798
7	COLOMBIA	1,804	7.36%	133	1,937	-11.02%	-213	1,723	16.97%	292	2,016	-20.83%	-420	1,596
8	COSTA RICA	2,705	-72.91%	-1,972	733	-16.26%	-119	614	2.92%	18	632	116.03%	733	1,365
9	GUATEMALA	405	22.68%	92	497	52.77%	262	759	-12.47%	-95	664	57.56%	382	1,046
10	SAUDI ARABIA	414	-30.74%	-127	287	61.39%	176	462	50.66%	234	697	38.07%	265	962
Total for Top 10		13,415	-13.66%	-1,832	11,583	18.09%	2,096	13,678	12.10%	1,655	15,333	28.71%	4,403	19,736
Total Imported Refirgerated TEUs		20,503	7.54%	1,546	22,049	1.49%	329	22,379	-4.95%	-1,108	21,271	19.09%	4,061	25,332

<u>Findings:</u>

a) 4 countries for exports shown significant increase:
    i. Dominican Republic, from FY2016 to FY2020 had an increase of 186.07%, accounted for a gain of 2,583 TEUs.
    ii. Trinidad and Tobago, from FY2016 to FY2020 had an increase of 177.37%, accounted for a gain of 1,401 TEUs.
    iii. Honduras, from FY2016 to FY2020 had an increase of 177.61%, accounted for a gain of 1,150 TEUs.
    iv. Haiti, from FY2016 to FY2020 had an increase of 97.96%, accounted for a gain of 1,129 TEUs.

Furthermore, the September 11, 2019 report by John Martin & Associates found that, *"The benefits of the development of the Cold Chain Processing and Fumigation Center is to capture the perishable cargo that now moves into Florida via non-Florida ports by truck, resulting in increased environmental, safety, infrastructure costs to the nation, as well as increasing the cost of perishable foods to the Florida consumers while reducing shelf life Using Piers data, Martin Associates estimated the share of imports from the West Coast of South America and Central America that are consumed in Florida and moving through various Atlantic Coast ports as well as the Florida ports."*

Key Ports Handling Perishable Cargo from South America and Central America



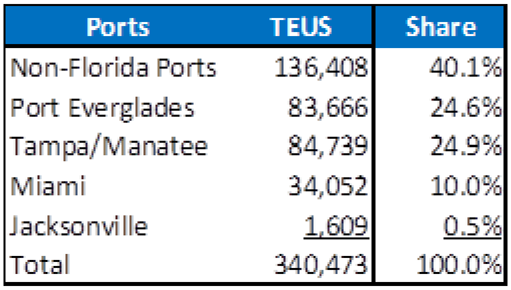
Ports	TEUS
Philadelphia/Delaware River	137,137
Port Everglades	43,965
Miami	12,195
Savannah	4,439

Source: Piers, 2018

As shown in Exhibit 2, 40% of the Florida consumed imports from the West Coast of South America and Central America use ports other than Florida ports. As noted, the majority of these West Coast South American and Central American imports are perishable commodities, most likely moving into Florida from the Delaware River ports, as well as from Savannah. In addition, in the recent months, the Port of Wilmington, NC has entered into the perishable goods import market, and is also likely to serve certain Florida Markets in the near future.

Exhibit 2

Imports from West Coast South America and Central America Consumed in Florida by Port of Import



Ports	TEUS	Share
Non-Florida Ports	136,408	40.1%
Port Everglades	83,666	24.6%
Tampa/Manatee	84,739	24.9%
Miami	34,052	10.0%
Jacksonville	1,609	0.5%
Total	340,473	100.0%

Source: Piers, 2018

It is important to emphasize that the TEUs identified in Exhibit 2 underestimate the volume of perishables that move into Florida from out of state ports, since the Piers data only identifies cargo that moves from the port of entry to a final destination under an international bill of lading and clears customs at the point of destination. A large share of the imported perishables clear customs at the port of entry, and then move to near-port cold storage warehouses where they are re-loaded (transloaded) into domestic refrigerated trucks for the move to final consumption. Therefore, the Piers data does not include these international shipments that are transloaded at the port of entry, for the further trip to final consumption. As a result, the Piers data regarding final consumption point, such as the state of Florida, underestimates the actual flow of perishable cargo that is discharged at the Delaware River ports and the other South Atlantic ports and ultimately consumed in Florida.[1]

To develop a more comprehensive estimate of the volume of perishables that move from the port of import into the state of Florida, IHS Transearch data was used. This data base identifies the perishable cargo that is trucked from each import port Business Economic Area (BEA) into each BEA in the state of Florida. Focus was on the volume of domestic trucked perishable cargo (consisting of the commodities identified above) that was moved from each non-Florida port BEA into each Florida BEA for consumption. Exhibit 3 shows the domestic tonnage that was trucked from each non-Florida port BEA into each Florida BEA."

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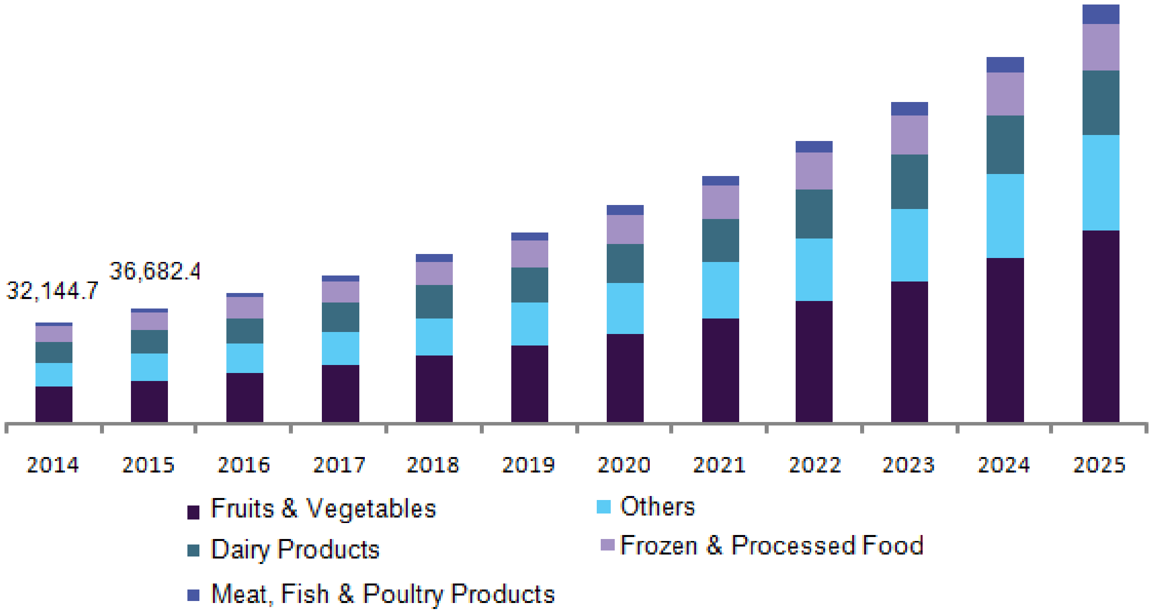
[1] In addition to not capturing the transloaded perishable cargo moving into Florida from out of state ports, the Piers data also under reports the final geographic destination of imports by state since a large percentage of imports do not indicate a final consignee, and its location, since the cargo is moved by freight forwarders, that don't reflect the actual point of consumption; or in some cases the headquarters location of an importer is reported on the shipping bill of lading rather than the ultimate geographic destination.

a.1 Organic Products (Imported and Non-Imported)

Organic products are an increasingly demanding submarket that anticipates significant growth nationally and South Florida. The US Department of Agriculture and Marine reports, *"Current health concerns coupled with rising awareness regarding the use of pesticides, antibiotics and genetically modified organisms (GMO's) in food products has largely increased demand for organic food in the United States."* [9]The global organic foods and beverages market is expected to grow at a compound annual growth rate of 15.7% from 2018 to 2025 to reach USD 397.76 billion by 2025.[10] A cold storage facility should be able to attract additional volumes of organics in the future.

Figure 11 – US Organic Food Market Revenue by Product, 2014 – 2025 (USD Million) -- Grand View Research



The current or future emerging product line trends in the cargo industry anticipated to be market influencers include online groceries, meal kitting, (tropical) flowers, pharmaceutical commerce, biological drugs, and vaccines.[11]

a.2 Online Groceries

The Business Insider Article, published May 29, 2020 online, reports the growth of online groceries has changed significantly and prompted by the coronavirus pandemic of 2020. According to the article,

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[9] *US Department of Agriculture and Marine - REVIEW OF ORGANIC FOOD SECTOR AND STRATEGY FOR ITS DEVELOPMENT 2019 – 2025.pdf*

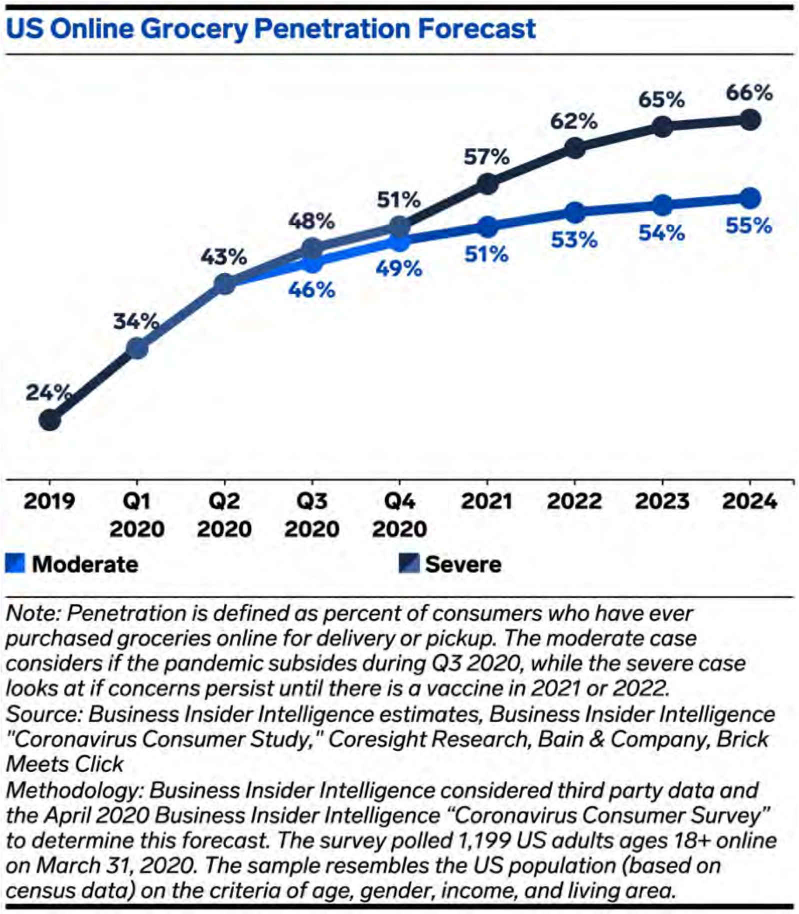
[10] *Global Market Analysis. Organic Food and Beverages Market Size, Share & Trends Analysis Report by Product (Organic Food, Organic Beverage), By Region, And Segment Forecasts, 2018 - 2025 Grand View Research. https://www.grandviewresearch.com/industry-analysis/organic-foods-beverages-market#:~:text=b.,USD%20189.33%20billion%20in%202020.&text=The%20global%20organic%20foods%20and%20beverages%20market%20is%20expected%20to,USD%20397.76%20billion%20by%202025.*

[11] *CBRE – PortMiami Questionnaire Response. Fumigation and Cold Chain Processing. May 29, 2020. File name: PortMiami_CBRE.pdf*

the U.S. the online groceries industry will more than double from $14.2 billion in 2017 to $29.7 billion in 2021. [12]

The Business Insider notes, *"Previously, some consumers resisted the shopping method because they wanted to pick out their groceries themselves and avoid extra fees, but the pandemic has forced many to change their priorities. And the sudden focus on online grocery is set to alter consumer behavior well after the pandemic subsides, accelerating the industry's penetration in the US."*[13]

Figure 12 - Business Insider - US Online Grocery Penetration Forecast



Note: Penetration is defined as percent of consumers who have ever purchased groceries online for delivery or pickup. The moderate case considers if the pandemic subsides during Q3 2020, while the severe case looks at if concerns persist until there is a vaccine in 2021 or 2022.
Source: Business Insider Intelligence estimates, Business Insider Intelligence "Coronavirus Consumer Study," Coresight Research, Bain & Company, Brick Meets Click
Methodology: Business Insider Intelligence considered third party data and the April 2020 Business Insider Intelligence "Coronavirus Consumer Survey" to determine this forecast. The survey polled 1,199 US adults ages 18+ online on March 31, 2020. The sample resembles the US population (based on census data) on the criteria of age, gender, income, and living area.

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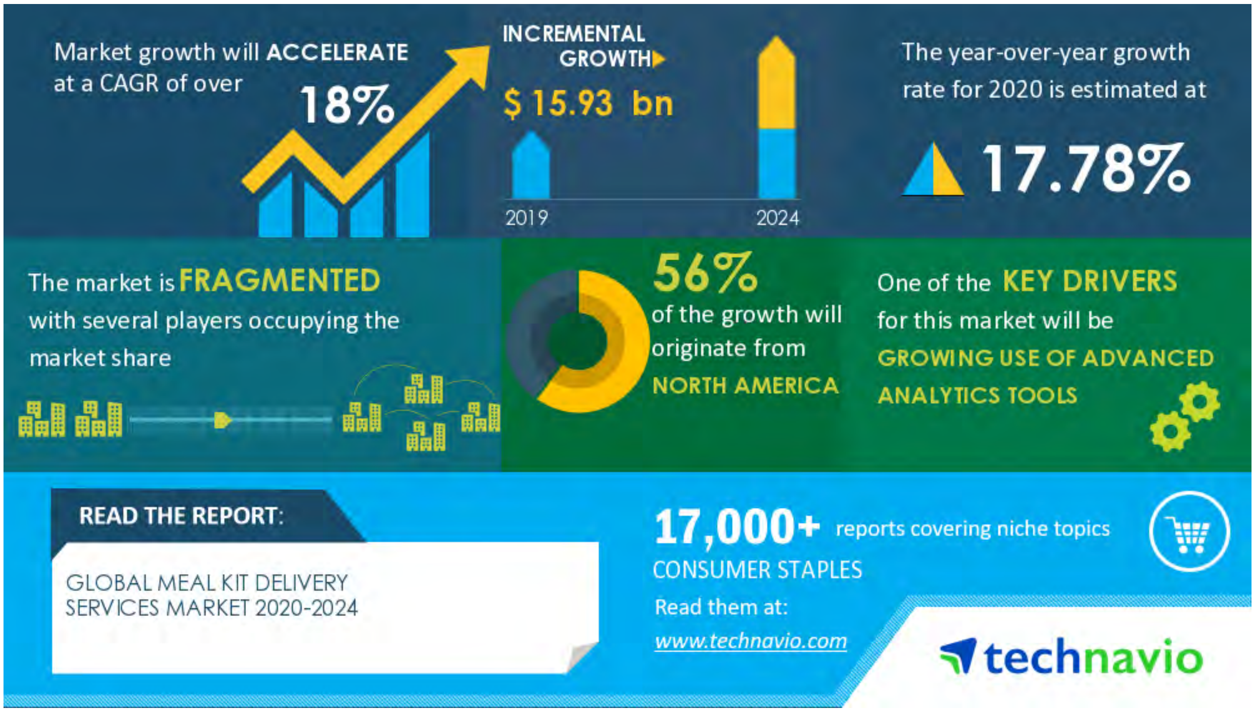
[12] *Business Insider. THE ONLINE GROCERY REPORT: The coronavirus pandemic is thrusting online grocery into the spotlight in the US — here are the players that will emerge at the top of the market. https://www.businessinsider.com/online-grocery-report-2020?utm_source=copy-link&utm_medium=referral&utm_content=topbar*

[13] *Business Insider. THE ONLINE GROCERY REPORT: The coronavirus pandemic is thrusting online grocery into the spotlight in the US — here are the players that will emerge at the top of the market. https://www.businessinsider.com/online-grocery-report-2020?utm_source=copy-link&utm_medium=referral&utm_content=topbar*

a.3 Meal Kitting

According to Technavio, a global market research company, the global meal kit delivery service market will grow at a compound annual growth rate of over 18%, with an incremental growth of $15.93 billion between 2020-2024. The 2020 growth rate is 17.78%.[14]

Figure 13 - Technavio - Meal Kitting Market Research



a.4 Flowers – One of the recent trends in the shipment of perishables is the change in mode of flower transport, from air to sea. The international flower market has historically transported flowers from the South American and Central America market by air. Since 2017, there has been an exponential growth towards maritime transport. While in 2017 only 50,000 stems (approximately 1/3 of a 40 ft. container) was transported by ocean via PortMiami, in 2018. almost 27 million stems (approximately 400 TEUs) were transported. This represents an increase of 54,000%. This figure has increased further, up to 50 million stems (approximately 740 TEUs) have already been received during FY 2020. Predominantly, these flowers arrive from Colombia, Guatemala, Ecuador, Costa Rica, and Mexico, where the new express routes by Seaboard Marine have been initiated. With the reduction of flights to and from the aforementioned countries during the pandemic experienced a significant switch to ocean freight for flowers. The study found that much of the modal shift of perishables via ocean will not revert but continue to increase.

a.5 Life Sciences and Pharmaceutical Commerce – Life Sciences is the study of living organisms, including botany, zoology, and physiology, and biochemistry. Pharmaceuticals is a section of biochemistry. The

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[14] *Technavio – Global Market Research.www.technavio.com*

pharmaceutical and life science industry is primarily concentrated in Europe and the United States, with the top 10 pharmaceutical companies located in both regions.[15] By 2023 the US prescription drug spending will have increased to $600 billion, up from $500 billion in 2019.[16] The healthcare sector is anticipated to comprise approximately 20% of the US economy by 2026.

The United States is the largest market for biopharmaceuticals, accounting for around a third of the global market, and is the world leader in biopharmaceutical R&D. According to the Pharmaceutical Research and Manufacturers Association (PhRMA), U.S. firms conduct over half the world's R&D in pharmaceuticals ($75 billion) and hold the intellectual property rights on most new medicines. The overall economic impact of the biopharmaceutical industry on the U.S. economy is substantial. The industry accounted for more than $1.3 trillion in economic output, representing 4 percent of total U.S. output in 2015 alone. This total economic impact includes $558 billion in revenue from biopharmaceutical businesses and $659 billion from suppliers and worker spending.[17]

Between March 2020 and September 2020 pharma and medical equipment imports at PortMiami have increase +225%, or by approximately $668,753,931.

a.6 Biological Drugs – Biological drugs are typically derived from living cells and are used in the prevention and treatment of various diseases such as cancer, blood disorders, auto-immune diseases, and other medical disorders. Biological drugs have more complex structures compared to that of conventional drugs.

According to a new market report published by Persistence Market Research "Global Market Study on Biological Drugs**:** North America to Witness Highest Growth By 2020", the global biological drugs market was valued at US$ 161,056,500 in 2014 and is expected to grow at a CAGR of 10.1% from 2014 to 2020, to reach US$ 287,139,700 by 2020.[18]

a.7 Vaccines – The Facility for Disease Control defines vaccines as *"A product that stimulates a person's immune system to produce immunity to a specific disease, protecting the person from that disease."*

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[15] www.InvestingNews.com. *Pharmaceutical Industry Overview: Top International Regions for Drug Companies* *Nicole Rashotte - January 20th, 2020*

[16] www.STATnews.com. *Drug prices are forecast to grow slowly over the next five years, but some will still feel pain.* By *Ed Silverman @Pharmalot . January 29, 2019*

[17] *SelectUSA.gov.* https://www.selectusa.gov/pharmaceutical-and-biotech-industries-united-states

[18] *Biospace.com. Global Biological Drugs Market to Register CAGR 10.1% Rise in Growth by 2020. Published May 13, 2020.* https://www.biospace.com/article/global-biological-drugs-market-to-register-cagr-10-1-percent-rise-in-growth-by-2020/#:~:text=According%20to%20a%20new%20market,to%202020%2C%20to%20reach%20US%24

The Global Vaccines market accounted for $38.36 billion in 2018 and is expected to reach $81.27 billion by 2027 growing at a CAGR of 8.7% during the forecast period.[19]

While the factors like growing awareness on immunization, strong vaccine pipeline and the increasing focus of the key pharmaceutical players to develop innovative vaccines are driving the growth of the market. [20] There are high growth prospects in emerging markets and an increase in the adoption of combination vaccines in prevention strategies by the government provide new growth opportunities in the future.

a. FY2020 (Oct. 2019 – Sept. 2020) Pandemic Market Status[21]

While the 2020 Coronavirus Pandemic has impacted PortMiami's cargo business, with fiscal year 2020 ending down 4.83% over fiscal year 2019, certain markets continue to grow despite the pandemic. The following market data demonstrates the continued South Florida cargo business demand and how PortMiami is continuing to meet those demands during fiscal year 2020.

b. FY2020 Reefer - Miami Imports:

- PortMiami rose to #8 nationwide for US reefer imports in FY2020, up from #9 in FY2019.
- In FY2020 Reefer increased by +4% or 7,232 TEUs at PortMiami.
- During the pandemic (March 2020 – September 2020) reefer imports at PortMiami grew +6.8% adding 2,490 TEUS.

c. Pharma & Medical Equipment (Mar.-Sept. 2020) Imports by Value

- During the COVID-19 pandemic (March 2020-September 2020), PortMiami has seen an increase for Pharma & Medical Equipment imports from Latin America and the Caribbean, Asia, and Europe.
- Pharma & Medical Equipment increased +225% at PortMiami over the same period in 2019.

d. Limited Industrial Land

This growth and population demand have also translated to the industrial/warehouse real estate market. Vacancy rates for industrial and warehouse space in Miami-Dade County is between 3.8 and 4.0% which indicates a healthy real estate market for this type of use. Growth is constrained by the scarcity of industrial lands, and the supply of available sites are costly and limited. The availability of a Miami-Dade County owned site to include a Cold Chain Processing and Fumigation Facility is a unique

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[19] *GlobalNewswire.com. Research and Markets* April 21, 2020. *Global Vaccines Industry Report 2020: Market Projected to Cross $81 Billion by 2027 - Increase in the Adoption of Combination Vaccines in Prevention Strategies by the Government*

[20] *Globalnewswire.com. Global Newswire. Global Vaccines Industry Report 2020: Market Projected to Cross $81 Billion by 2027 - Increase in the Adoption of Combination Vaccines in Prevention Strategies by the Government* *https://www.globenewswire.com/news-release/2020/04/21/2019313/0/en/Global-Vaccines-Industry-Report-2020-Market-Projected-to-Cross-81-Billion-by-2027-Increase-in-the-Adoption-of-Combination-Vaccines-in-Prevention-Strategies-by-the-Government.html*

[21] *2020 Piers Data - Port Import/Export Reporting*

opportunity to create a multimodal hub that will service the local community and increase cargo throughout at PortMiami.

The perishable import market consisting of the commodities identified above move into the Southeastern U.S. through a select number of ports. Due to a lesser presence and footprint in South Florida this market is dominated by the Delaware River ports of Philadelphia (PA), Wilmington (DE), Chester (PA), and Gloucester City (NJ).

The key target perishable import markets for the Cold Chain Processing and Fumigation Facility consists of perishable products originating in South and Central America, as well as Mexico and the Caribbean. This market includes bananas, plantains, blueberries, apples, mangoes, pears, seafood, pineapples, avocados, melons, papayas, grapes, and citrus fruit. In addition to these commodities, fresh flowers also represent a key target market, particularly for air cargo. Perishable exports include Florida citrus, Florida seafood, and U.S. agricultural products such as beef, pork, and poultry. [22]

e. <u>South Florida Fumigation Market</u>

AQI Treatment Fee - Until 2015, the USDA did not require any "treatment fee" for fresh agricultural products imported into the United States that after inspection were deemed as subject to possible treatment or mandatory treatment. In 2015, the USDA adjusted all fees and established the AQI Fee to reimburse treatment program costs. This fee was set at $47 per treatment and escalated every year for the next five-years, ultimately reaching $237 per treatment, effective December 28, 2019. However, the decision to adopt a fee "per treatment" has placed PortMiami at a disadvantage since the commercial nature of enclosures varies drastically. In the Southeast (Florida), an "enclosure" is one 40-foot trailer that holds up to 20 pallets of commodity for fumigation (a treatment). On the contrary, an "enclosure" in the Northeast can be considered a warehouse that can hold up to 2,400 pallets at a time for fumigation (treatment). The discrepancy between these two figures represents a dramatic cost advantage to the Northeast U.S. Ports, which can ultimately be marketed and passed down as savings that cannot be done in the Southeast.

f. <u>U.S. Industry Cost for Fumigation</u>

The two largest agricultural commodities being imported into U.S. requiring fumigation as a condition of entry: Chilean grapes and Peruvian asparagus. In 2017, the Southeast (SE) represented only 24% of the Northeast (NE) volume requiring fumigation, but paid substantially more, even though SE volumes are less. Thus in 2018, the SE paid over $778,586 more in AQI fees. In other words, for 2018, if both import volumes were equal the SE could have paid $3.27 Million compared to the NE paying only $21,868 for the same imported volume. Clearly this fee structure is inherently unfair and places a burden on trade.

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[22] *PortMiami Cold Chain Processing and Fumigation Center and Cargo Yard Resiliency Improvements - Benefit-Cost Analysis Appendix. 2019. Martin Associates*

g. History of Cold Treatment North of the 39 Degree Latitude

To protect the U.S. mainland from the importation of fruit flies, the USDA's phytosanitary regulations used to limit finishing of cold treatment to facilities operated only in areas north of the 39-degree latitude and east of 104-degree longitude. In the past, fruits and vegetables were imported to the U.S. during winter months, because the areas north of 39th parallel have cold and snow, where the fruit flies and their larvae could not survive and become established.[6]

Cold Treatment in South Florida is relatively young market when compared to the northeast. The South Florida market is growing rapidly and presenting a competitive edge with its geographic location, network, and increased footprint.

h. Transportation Efficiencies

The centralized location of Cold Chain Processing and Fumigation Facility has a very significant benefit-cost ratio, reflecting the strong merits of the project due the reduction in truck traffic on the nation's highways, in turn resulting in significant environmental benefits, safety benefits, external truck benefits, and economic competitive benefits.

Environmental benefits are generated due to the reduced vehicle miles traveled (VMT) with the Cold Chain Processing and Fumigation Facility. Emissions of air pollutants are generated by vehicle per VMT. The centrally located and multipurpose facility minimizes destinations and emissions.

Safety benefits are defined in terms of reduced accidents and associated injuries as the result of the reduced vehicle truck miles traveled due to the centrally located and multipurpose Cold Chain Processing and Fumigation Facility.

External truck cost savings consist of reduced costs of highway/pavement repair, highway congestion, and noise pollution, due to reduced truck vehicle miles traveled resulting from the centrally located and multipurpose Cold Chain Processing and Fumigation Facility. At present, produce is trucked to the Northeast to be treated, then returned to South Florida for distribution and consumption. With the I-95 corridor at or above capacity in many segments between Philadelphia and Miami, the removal of thousands of trucks from this corridor will provide relief in an order of National significance.

The economic competitiveness benefits resulting from the centrally located and multipurpose Cold Chain Processing and Fumigation Facility consists of the transportation cost savings to the nation's importers as the result of lower truck costs due to the savings in miles traveled to the key consumption destinations in in Florida.[23]

i. Facility Cost

As per the industry leader questionnaires, the cost to build a state-of-the-art cold chain processing facility could range from \$12-\$20 per square foot for new construction in the Miami area. A 150,000 square foot facility could cost between \$1.8 - \$3 million dollars, respectively.

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[23] *2019 PortMiami Cold Chain Processing and Fumigation Center and Cargo Yard Resiliency Improvements -Benefit-Cost Analysis. By Martin Associates – PortMiami Cargo Yard Resiliency Improvements and Fumigation and Cold Chain Processing Center Project Application*

4.2 Industry Questionnaires

a. Summary

During the market study process PortMiami reached out to the public with a questionnaire asking for cargo industry leaders to provide Cold Chain Processing and Fumigation expertise and market assessments. The questionnaire includes inquiries regarding the current and anticipated fumigation and cold chain processing business and real estate markets as they relate to South Florida and PortMiami.

The purpose was to seek market guidance to help further inform and provide insight regarding the market study's findings to help shape the study's recommendations for the cold chain processing and fumigation facility. The following notes summarize the industry leader's responses to the questionnaire:

- Projects regarding current and future cargo volumes in South Florida: As ports enter a new era of improved channels, post Panamax ships, Miami's increasing presence as a pharma-hub, and improved intermodal access and circulation, projected cargo volumes in South Florida will continue to demonstrate increased annual demand. Cold chain processing and storage demand was high prior to the pandemic and has only increased (ie. E-commerce, pharmaceuticals, meal kitting). For instance, The Bridge Development Partner's, LLC, questionnaire response references the following, "According to *an April report from commercial real estate firm, C.B. Richard Ellis (CBRE), an additional 75 million to 100 million square feet of freezer and cooler space is needed to meet booming demand for direct-to-consumer and buy-online/pick-up-in-store services, a trend that has been accelerate by the pandemic.*"
- Recommended Lease Structure: A longer lease structure is more desirable to amortize costs across a longer timeframe.
- Average Price Per Square Foot: Ground lease rates being between $12-20 per square foot NNN, depending on location.
- Recommend Minimum Square Feet: A minimum of 150,000 is required in South Florida to position the facility competitively in the market.
- Fumigation to Cold Chain Building Ratio: Mixed responses with an overall minimum footprint for fumigation services.
- Building Planning and Design Recommendations: Higher ceiling heights for the cold chain processing space is beneficial to optimize temperature control. Increased ceiling heights is the norm for all cold chain processing facilities.
- Building Planning Recommendations: Programming office, administrative services, and other non-cargo processing program on the second level optimizes the ground level operations and leasing opportunities.
- Future Market Trends: Future market trends that will increase include pharmaceuticals, online grocery, biological drugs, meal kitting, flowers, and vaccines.
- E-beam irradiation technology, approved by the USDA, will generate growth opportunities, and minimize the space required for phytosanitary treatment.

The questionnaire responses help shape the market study findings and confirm the recommendations.

For more information, please refer to the Appendix C for the questionnaire sample and Appendices D – N submitted by the industry leaders.

5. Recommendations

5.1 Recommendations

The purpose of the following recommendations is to frame the Facility's functions that may assist the potential private sector partner to optimize the facility while simultaneously achieving and sustaining the County's objective of successfully serving the multipurposed Cold Chain Processing and Fumigation markets. The following recommendations are not intended to limit creativity or unforeseen business strategies that achieve the noted objective. The proposed facility shall be, at a minimum, consistent with the grant application. For instance, the proposed facility shall be, at a minimum, 100,000 square feet with a minimum of 80 truck bays.

The Facility is anticipated to be advertised as a design-build, finance, operate and maintain project through a public-private partnership (P3). This approach will promote an early completion that further increase efficiency and reduce delays. The P3 is a cooperative arrangement between PortMiami and a private sector partner, typically of a long-term nature.

a) <u>Lease Length and Structure</u>
  - The study's findings recommend a minimum of a 25-year lease agreement.
  - Triple Net Lease (NNN): The private sector partner pays all expenses, including lease payments, real estate taxes, property insurance, and any property maintenance costs.
  - The private sector partner pays all utilities, maintenance/operation/repair (including building, roof, and equipment).
  - The lease rate will have a 3% escalation, at an annual basis, as is typical for port leases.
  - The County ground lease is for the vacant land only. The selected private sector partner will manage the design, construction, maintenance, and operation of the Facility in conjunction with the port.

b) <u>Building Ratio of Fumigation and Cold Chain Processing</u>
  - The study's findings require that phytosanitary treatment be provided and comprise between 10 - 20% of the building's serviceable space (approximately 15,000 to 30,000 for a 150,000-sf facility).
  - All other functions, such as inspection, support, and office/administrative spaces are separate and not included in the service space ratios. The private sector partner shall determine the size and ratio of all inspection, support, and office/administration spaces.
  - The facility build-out conditions may support office and/or administrative spaces above a fully optimized ground level Cold Chain Processing and Fumigation space.

c) Building Programming

- USDA/APHIS/CBP and the FDA may require an inspection space or video feed to a centralized one.[24]

d) Building Footprint and Height

- The conceptual planning study finds that an approximate building footprint of 150,000square feet (sf) maximizes the site while addressing the site access and circulation constraints (Appendix A). The conceptual footprint serves as a basis and not a final layout. The private sector partner shall determine the size and ratio of the final build-out.
- The Study mandates that the building height complies with Aviation Planning, Land Use and Grants Division and FAA height requirements.

6. Schedule

6.1 Preliminary Project Schedule

The project schedule is currently subject to change. Please refer to the Appendix B for the most current schedule.

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[24] *Steve Berens – Chief Strategy Officer. Chief Strategy Officer. www.iporteast.com*

7. Appendix

Appendix A – Site Boundary Survey

Appendix B - Conceptual Planning Layout

Appendix C – Project Schedule (Subject to Change)

Appendix D - PortMiami Questionnaire for Industry Leader Input

Appendix E – Steve Berens (Inland Port of Pennsylvania) - Questionnaire Response

Appendix F - CBRE - Questionnaire Response

Appendix G – Michael Mandich (Mandich Group) - Questionnaire Response

Appendix H – Bradlee Lord (Seagis Property Group, LP) - Questionnaire Response

Appendix I – Gary Goldfarb (Interport Logistics) – Questionnaire Response

Appendix J – Jones Lang Lassalle (JLL) - Questionnaire Response

Appendix K – Barbara Pimentel (SPR **Cold Storage & Distribution, LLC.)** – Questionnaire Response

Appendix L – Robert H. Faye (Florida Freezer Limited Partnership) – Questionnaire Response

Appendix M – Marty Koehler (Hellmann Logistics) – Questionnaire Response

Appendix N – Transwestern – Questionnaire Response

Appendix O – Grupo Drago (Riccardo Drago) – Questionnaire Response

Appendix P – Bridge Development Partners, Inc. – Questionnaire Response

Appendix Q – Cargo Yard Resiliency Improvements + Fumigation & Cold Chain Processing Facility PortMiami Grant Application

Appendix R - Fumigation Facility Project Book - MDAD - by Ricondo

Appendix S - The Effects of Phytosanitary Regulations on U.S. Import of Fresh Fruits and Vegetables

Appendix T - USDA-APHIS-PPQ Phytosanitary Irradiation Program

Appendix U – 2020 Piers Data Update – PortMiami

Appendix V – MDAD Limited Phase II Environmental Site Assessment – Land Parcel 3 (MIA)

APPENDIX A

Site Boundary Survey

TRIANGLE
Surveying & Mapping, Inc.
8609 NW 66th Street
Miami, Florida, 33166
305 597-9701
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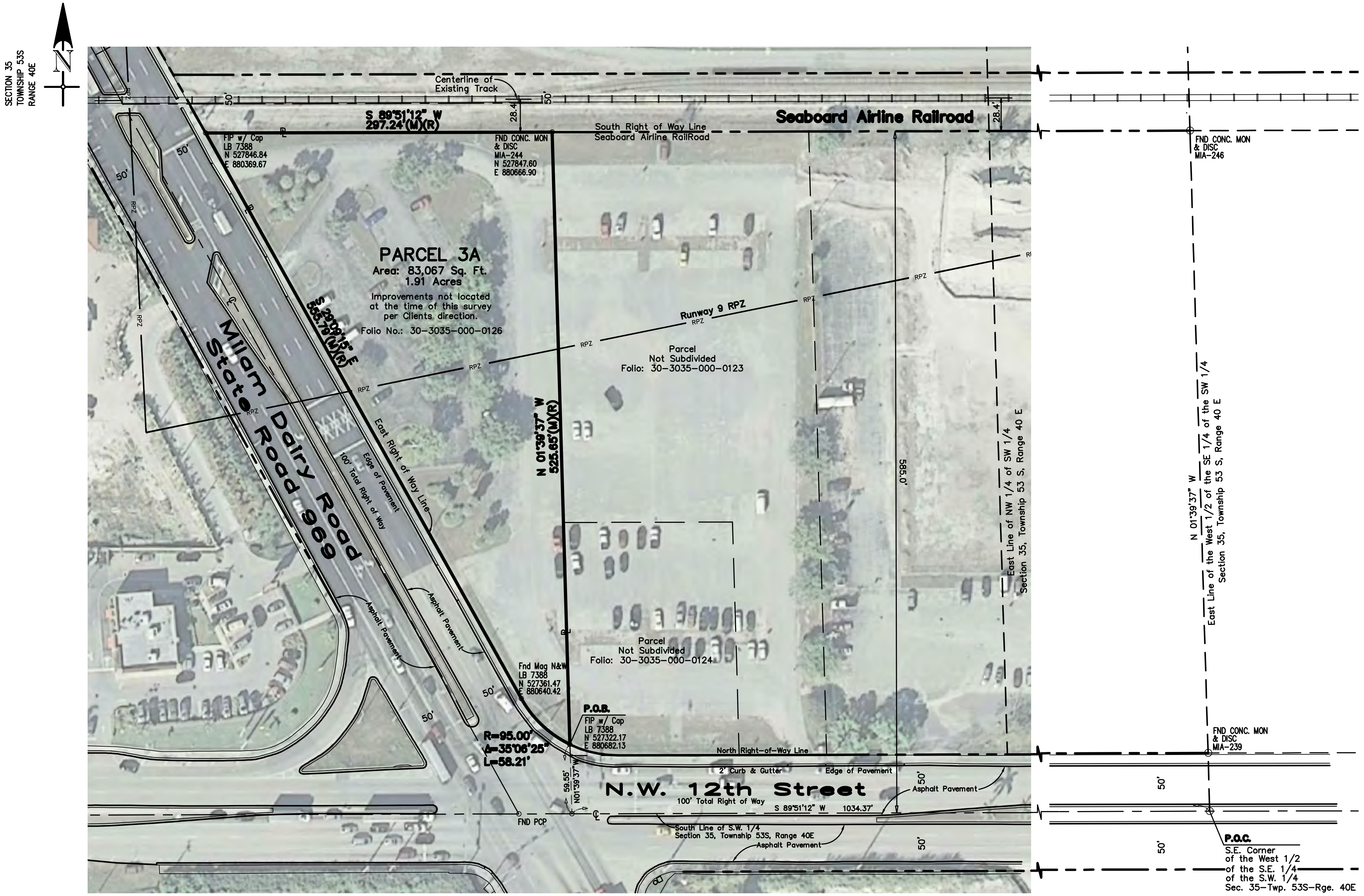
218 N. Florida Street
Bushnell, Florida 33513
352 569-1326
www.TRIANGLESM.com

SKETCH OF BOUNDARY SURVEY

This document is intended only for the specific purpose and client for which it was prepared.

Miami-Dade County Aviation Department
Parcel 3-A

Not valid without the signature and original raised seal of a Florida licensed surveyor and mapper.



LEGAL DESCRIPTION:

A portion of the SW 1/4 of the SW 1/4 of Section 35, Township 53 South, Range 40 East, Miami-Dade County, Florida, lying East of State Road 969 (Milam Dairy Road) and North of NW 12th Street and more particularly described as follows:

Commence at the Southeast corner of the West 1/2 of the Southeast 1/4 of the Southwest 1/4 of Section 35, Township 53 South, Range 40 East, Miami-Dade County, Florida; thence run in a Westerly direction along the South line of the Southwest 1/4 of said Section 35 for a distance of 1034.37 feet to a point; thence run N01°39'37"W along a line parallel to the East line of the West 1/2 of the Southeast 1/4 of the Southwest 1/4 of said section 35 for a distance of 59.55 feet to the Point of Beginning of the tract of land herein described; thence continue N01°39'37"W along a line parallel to the East line of the West 1/2 of the SE 1/4 of the SW 1/4 of said Section 35 for a distance of 525.65 feet to a point on the South right-of-way line of the Seaboard Airline Railroad said line also being 585 feet North of as measured at right angles to the South line of the Southwest ¼ of said Section 35; thence run S89°51'12"W along the South right-of-way line of the Seaboard Airline Railroad and also being along a line parallel to the South line of the Southwest 1/4 of said Section 35 for a distance of 297.24 feet to a point on the East right-of-way line of State Road 969 (Milam Dairy Road); thence run S29°09'15"E along the East right-of-way line of State Road 969 (Milam Dairy Road) for a distance of 555.79 feet to a point of curvature of a circular curve concave to the Northeast; thence Southeasterly along the arc of said circular curve to the left, having for its elements a radius of 95.00 feet and a central angle of 35°06'25" for an arc distance of 58.21 feet to the Point of Beginning. Said parcel contains 83,067 square feet more or less or 1.91 Acres more or less.

ABBREVIATIONS

(M)	Measured
(R)	Record
(P)	Plat
P.O.B.	Point of Beginning
P.O.C.	Point of Commencement
RPZ	Runway Protection Zone
FND	Found
SIP	Set 1/2" Iron Pipe W/ Cap LB7388
PCP	Permanent Control Point
CONC.	Concrete
MON	Monument
W/	With
MIA	Miami International Airport
O/S	Off Set
Sq.	Square
Ft.	Feet
Sec.	Section
Twp.	Township
Rge.	Range
℄	Centerline
℘	Property Line

SURVEYOR'S NOTES:

The client designated the Parcel to be Surveyed.

The description for the Parcel was retrieved from the Miami-Dade County Clerks Office and is shown hereon.

No improvements are shown nor were they located at the time of this Survey at the direction of Miami-Dade County Aviation Department.

No underground footings were located.

No encroachments were noted by this survey, except as shown hereon.

Bearings and Coordinates shown hereon refer to Florida State Plane Coordinate system, East zone (0901), North American Datum (N.A.D.) 1983 (1990 adjustment) US Survey Feet.

The property boundary is based on platted information, the fractional breakdown of Section 35, Township 53 South, Range 40 East as related to recovered monumentation and notorious evidence of occupation including Miami International Airport (MIA) monuments recovered as witness to the existing Parcel Boundary.

Any notorious evidence of occupation and/or use of the described parcel for Right-of-Way, Ingress or Egress is shown on this survey drawing. However, this survey does not purport to reflect any recorded instruments or Right-of-Way other than shown on the recorded plat or stated in the legal description as it appears on this drawing.

The ownership of the fences and/or walls as shown hereon was not determined.

Background aerials (2009) were provided by Miami-Dade County and are for graphical reference only.

SURVEYOR'S NOTES (continued):

Runway Protection Zone (RPZ) shown was provided by Miami-Dade County Aviation Department Technical Support Staff in Auto Cadd format and is GEO-referenced as provided directly into our digital file.

This survey is intended for the use of the parties to whom this survey is certified to and for. Any reproduction is not an original. This surveyor retains an original to verify these dated contents for validity.

The National Flood Insurance Rate Map No. 12086C0287L for Florida Community No. 120635, FIRM Date 09/11/09, with an effective date of 09/11/09, published by the United States Department of Housing and Urban Development, delineates the herein described land to be situated within Flood Zone "X" with no base flood elevation.

This sketch shown hereon in its graphic form is the record depiction of the surveyed lands described herein and will in no circumstances be supplanted in authority by any other graphic or digital format of this Survey. This map is intended to be displayed at a scale of 1"=50' or smaller. At the maximum intended displayed scale the survey and sketch's positional accuracy value occupies 1/20" on the display.

SURVEYOR'S CERTIFICATION:

This is to certify to the herein named firm and/or persons that the "BOUNDARY SURVEY" of the herein described property is true and correct to the best of our knowledge and belief as surveyed and platted under our direction on December 22, 2010. I further certify that this survey meets the Minimum Technical Standard Requirements as set forth in Rules 5J-17.051 and 5J-17.052 as adopted by the Florida Board of Professional Surveyors and Mappers pursuant to Chapter 472.027 Florida Statutes.

Triangle Surveying & Mapping, Inc.

John Liptak
Professional Surveyor and Mapper #5664
State of Florida

1	Bounday Update (Original Sketch dated June 11, 2008)	DR	01/24/2011

Date: 12/22/10	Project: 2500.04
Scale: 1" = 50'	Checked by: JL
F.B. 127/185	Drawn by: JET
Sheet: 1 of 1	Sketch: 1531-3A
Ref:	

TRIANGLE
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8609 NW 66th Street
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305 597-9701
LB 7388

218 N. Florida Street
Bushnell, Florida 33513
352 569-1326
www.TRIANGLESM.com

SKETCH OF BOUNDARY SURVEY

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Miami-Dade County Aviation Department
Parcel 3-B

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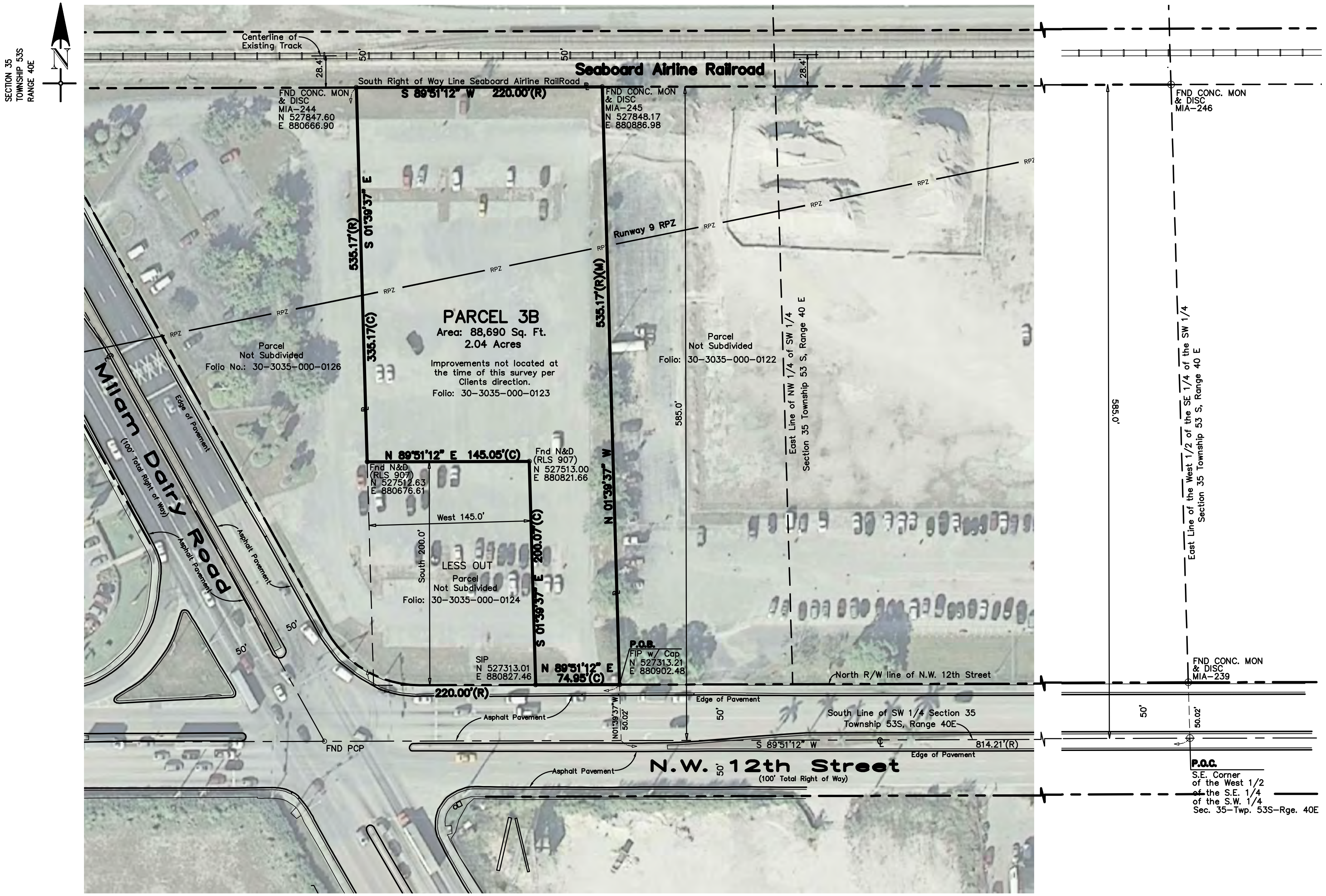

LEGAL DESCRIPTION:

All of the following described tract of land excepting the South 200 feet of the West 145 feet thereof; Commence at the Southeast corner of the West 1/2 of the Southeast 1/4 of the Southwest 1/4 of Section 35, Township 53 South, Range 40 East, Dade County, Florida; thence run in a Westerly direction along the South line of the Southwest 1/4 of said Section 35 for a distance of 814.21 feet to a point; thence run in a Northerly direction along a line parallel to the East line of the West 1/2 of the Southeast 1/4 of the Southwest 1/4 of the section 35 for a distance of 50.02 feet to a point 50 feet North of, as measured at right angles to, the South line of the Southwest 1/4 of said Section 35, being a point on the North right-of-way line of Northwest 12th Street and being the Point of Beginning of the tract of land herein described; thence continue in a Northerly direction along a line parallel to the East line of the West 1/2 of the Southeast 1/4 of the Southwest 1/4 of said Section 35 for a distance of 535.17 feet to a point on the South right-of-way line of the Seaboard Airline Railroad and also being 585 feet North of as measured at right angles to the South line of the Southwest 1/4 of said Section 35; thence run in a Westerly direction along the South right-of-way line of the Seaboard Airline Railroad and also being along a line parallel to the South line of the Southwest 1/4 of said Section 35 for a distance of 220 feet to a point; thence run in a Southerly direction along a line parallel to the East line of the West 1/2 of the Southeast 1/4 of the Southwest 1/4 of said Section 35 for a distance of 535.17 feet to a point 50 feet North of, as measured at right angles to the South line of the Southwest 1/4 of said Section 35 and being a point on the North right-of-way line of Northwest 12 Street; thence run in a Easterly direction along a line parallel to the South line of the Southwest 1/4 of said Section 35 being along the North right-of-way line of Northwest 12th Street for a distance of 220 feet to the Point of Beginning. Said parcel contains 88,690 square feet more or less or 2.04 Acres more or less.

ABBREVIATIONS

(C)	Calculated
(M)	Measured
(R)	Record
(P)	Plat
P.O.B.	Point of Beginning
P.O.C.	Point of Commencement
RPZ	Runway Protection Zone
FND	Found
FIP	Found Iron Pipe
SIP	Set 1/2" Iron Pipe W/ Cap LB7388
PCP	Permanent Control Point
CONC.	Concrete
MON	Monument
W/	With
MIA	Miami International Airport
O/S	Off Set
Sq.	Square
Ft.	Feet
Sec.	Section
Twp.	Township
Rge.	Range
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⅊	Property Line

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This sketch shown hereon in its graphic form is the record depiction of the surveyed lands described herein and will in no circumstances be supplanted in authority by any other graphic or digital format of this Survey. This map is intended to be displayed at a scale of 1"=100' or smaller. At the maximum intended displayed scale the survey and sketch's positional accuracy value occupies 1/20" on the display.

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△1	Bounday Update (Original Sketch dated June 11, 2008)	DR	01/24/2011

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Scale: 1" = 80'	Checked by: JL
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Ref:	

Drawing name: C:\PROJECTS\SURVEY REQUESTS (2010-2013)\Triangle Surveying & Mapping\Full Survey Update for Parcels 3,4 & 5\Deliverables\Parcel 3B 2400-04 Parcel 3B-R2.dwg Parcel 3B Feb 10, 2011 2:48pm : hinfanzon

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Miami-Dade County Aviation Department
Parcel 3-C

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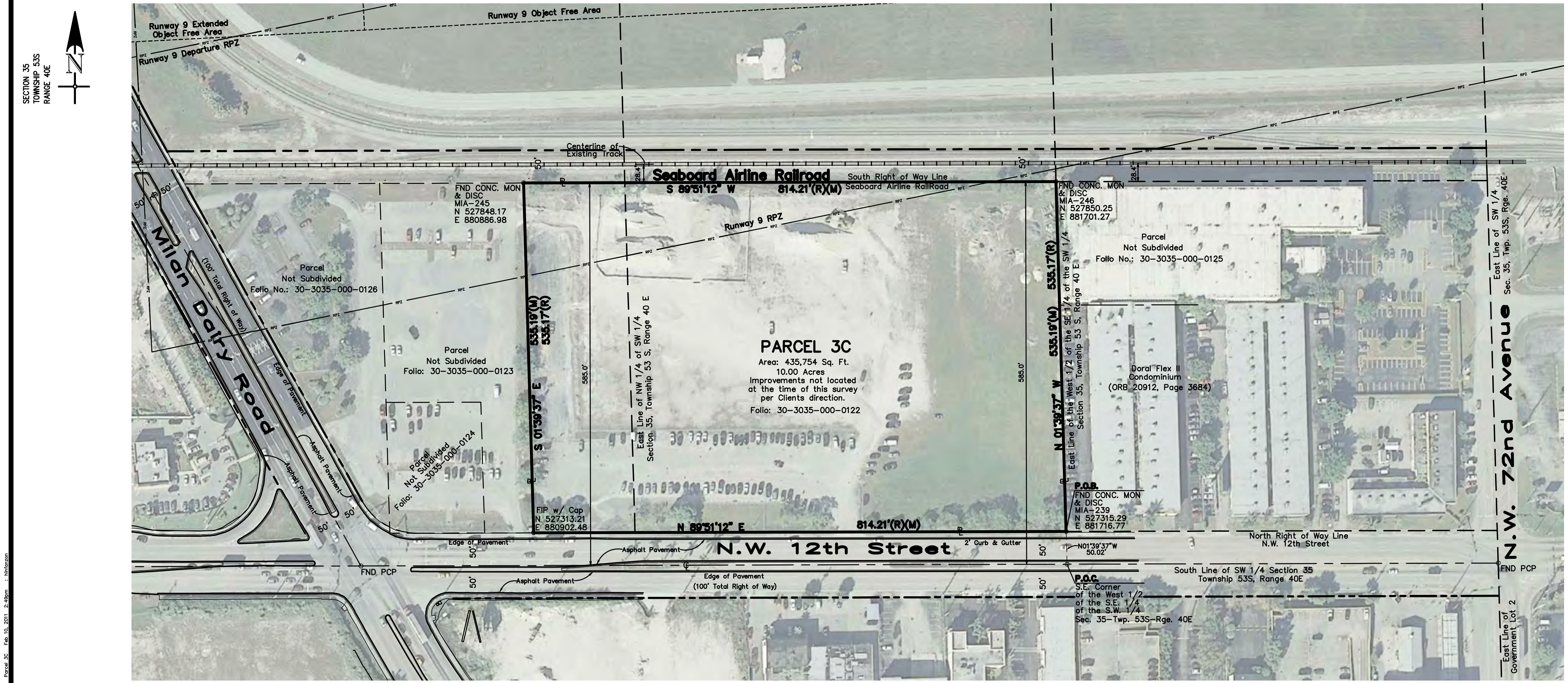

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MON	Monument
W/	With
MIA	Miami International Airport
O/S	Off Set
Sq.	Square
Ft.	Feet
Sec.	Section
Twp.	Township
Rge.	Range
ORB	Official Records Book
℄	Centerline
⅊	Property Line

SURVEYOR'S NOTES:

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This sketch shown hereon in its graphic form is the record depiction of the surveyed lands described herein and will in no circumstances be supplanted in authority by any other graphic or digital format of this Survey. This map is intended to be displayed at a scale of 1"=100' or smaller. At the maximum intended displayed scale the survey and sketch's positional accuracy value occupies 1/20" on the display.

LEGAL DESCRIPTION:

Commence at the Southeast corner of West 1/2 of the Southeast 1/4 of the Southwest 1/4 of Section 35, Township 53 South, Range 40 East, Dade County, Florida; thence run in a Northerly direction along the East line of the West 1/2 of the Southeast 1/4 of the Southwest 1/4 of said Section 35 for a distance of 50.02 feet to a point 50 feet North of, as measured at right angles to the South line of Southwest 1/4 of said Section 35 and also being the Point of Beginning of the tract of land herein described; thence continue in a Northerly direction along the East line of the West 1/2 of the Southeast 1/4 of the Southwest 1/4 of said Section 35 for a distance of 535.17 feet to a point on the South right-of-way line of Seaboard Airline Railroad and also being 585 feet North of, as measured at right angles to, the South line of the Southwest 1/4 of said Section 35; thence run in a Westerly direction along the South right-of-way line of the Seaboard Airline Railroad and also being along a line parallel to the South line of the Southwest 1/4 of said Section 35 for a distance of 814.21 feet to a point; thence run in a Southerly direction along a line parallel to the East line of the West 1/2 of the Southeast 1/4 of the Southwest 1/4 of said Section 35 for a distance of 535.17 feet to a point 50 feet North of, as measured at right angles to, the South line of the Southwest 1/4 of said Section 35; thence run in an Easterly direction along a line parallel to the South line of the Southwest 1/4 of said Section 35 for a distance of 814.21 feet to the Point or place of Beginning. Said parcel contains 435,754 square feet more or less or 10.00 Acres more or less.

SURVEYOR'S CERTIFICATION:

This is to certify to the herein named firm and/or persons that the "BOUNDARY SURVEY" of the herein described property is true and correct to the best of our knowledge and belief as surveyed and platted under our direction on December 22, 2010. I further certify that this survey meets the Minimum Technical Standard Requirements as set forth in Rules 5J-17.051 and 5J-17.052 as adopted by the Florida Board of Professional Surveyors and Mappers pursuant to Chapter 472.027 Florida Statutes.

Triangle Surveying & Mapping, Inc.

John Liptak
Professional Surveyor and Mapper #5664
State of Florida

Date: 12/22/10	Project: 2500.04
Scale: 1" = 80'	Checked by: JL
F.B. 127/185	Drawn by: JET
Sheet: 1 of 1	Sketch: 1531-3C
Ref:	

△1	Bounday Update (Original Sketch dated June 11, 2008)	DR	01/24/2011

Drawing name: C:\PROJECTS\SURVEY REQUESTS (2010-2013)\Triangle Surveying & Mapping\Full Survey Update for Parcels 3,4 & 5\Deliverables\Parcel 3C 2400-04 Parcel 3C-R2.dwg Parcel 3C Feb 10, 2011 2:49pm : hinfanzon

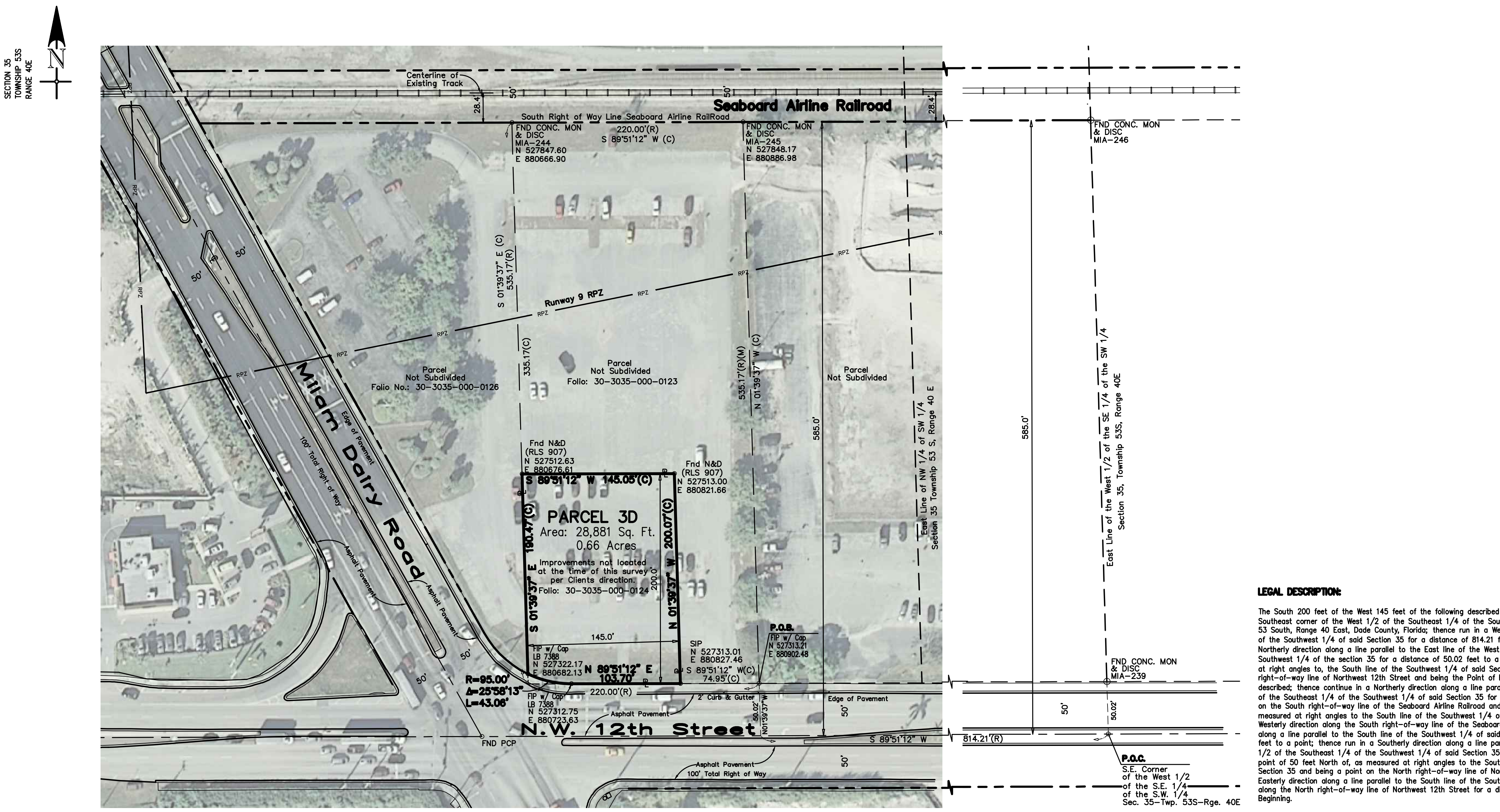
TRIANGLE
Surveying & Mapping, Inc.
8609 NW 66th Street
Miami, Florida, 33166
305 597-9701
LB 7388
218 N. Florida Street
Bushnell, Florida 33513
352 569-1326
www.TRIANGLESM.com

SKETCH OF BOUNDARY SURVEY

This document is intended only for the specific purpose and client for which it was prepared.

Miami-Dade County Aviation Department
Parcel 3-D

Not valid without the signature and original raised seal of a Florida licensed surveyor and mapper.



LEGAL DESCRIPTION:

The South 200 feet of the West 145 feet of the following described property: Commence at the Southeast corner of the West 1/2 of the Southeast 1/4 of the Southwest 1/4 of Section 35, Township 53 South, Range 40 East, Dade County, Florida; thence run in a Westerly direction along the South line of the Southwest 1/4 of said Section 35 for a distance of 814.21 feet to a point; thence run in a Northerly direction along a line parallel to the East line of the West 1/2 of the Southeast 1/4 of the Southwest 1/4 of the section 35 for a distance of 50.02 feet to a point 50 feet North of, as measured at right angles to, the South line of the Southwest 1/4 of said Section 35, being a point on the North right-of-way line of Northwest 12th Street and being the Point of Beginning of the tract of land herein described; thence continue in a Northerly direction along a line parallel to the East line of the West 1/2 of the Southeast 1/4 of the Southwest 1/4 of said Section 35 for a distance of 535.17 feet to a point on the South right-of-way line of the Seaboard Airline Railroad and also being 585 feet North of as measured at right angles to the South line of the Southwest 1/4 of said Section 35; thence run in a Westerly direction along the South right-of-way line of the Seaboard Airline Railroad and also being along a line parallel to the South line of the Southwest 1/4 of said Section 35 for a distance of 220 feet to a point; thence run in a Southerly direction along a line parallel to the East line of the West 1/2 of the Southeast 1/4 of the Southwest 1/4 of said Section 35 for a distance of 535.17 feet to a point of 50 feet North of, as measured at right angles to the South line of the Southwest 1/4 of said Section 35 and being a point on the North right-of-way line of Northwest 12 Street; thence run in a Easterly direction along a line parallel to the South line of the Southwest 1/4 of said Section 35 being along the North right-of-way line of Northwest 12th Street for a distance of 220 feet to the Point of Beginning.

Less the external area at the Southwest corner of the above described Parcel formed by a circular curve concave to the Northeast and having for its elements a radius of 95.00 feet, a central angle of 25°58'13" and an arc length of 43.06 feet.

ABBREVIATIONS

(C)	Calculated
(M)	Measured
(R)	Record
(P)	Plat
P.O.B.	Point of Beginning
P.O.C.	Point of Commencement
RPZ	Runway Protection Zone
FND	Found
FIP	Found Iron Pipe
SIP	Set 1/2" Iron Pipe W/ Cap LB7388
PCP	Permanent Control Point
CONC.	Concrete
MON	Monument
W/	With
MIA	Miami International Airport
O/S	Off Set
Sq.	Square
Ft.	Feet
Sec.	Section
Twp.	Township
Rge.	Range
℄	Centerline
⅊	Property Line

SURVEYOR'S NOTES:

The client designated the Parcel to be Surveyed.

The description for the Parcel was retrieved from the Miami-Dade County Clerks Office and is shown hereon.

No improvements are shown nor were they located at the time of this Survey at the direction of Miami-Dade County Aviation Department.

No underground footings were located.

No encroachments were noted by this survey, except as shown hereon.

Bearings and Coordinates shown hereon refer to Florida State Plane Coordinate system, East zone (0901), North American Datum (N.A.D.) 1983 (1990 adjustment) US Survey Feet.

The property boundary is based on platted information, the fractional breakdown of Section 35, Township 53 South, Range 40 East as related to recovered monumentation and notorious evidence of occupation including Miami International Airport (MIA) monuments recovered as witness to the existing Parcel Boundary.

Any notorious evidence of occupation and/or use of the described parcel for Right-of-Way, Ingress or Egress is shown on this survey drawing. However, this survey does not purport to reflect any recorded instruments or Right-of-Way other than shown on the recorded plat or stated in the legal description as it appears on this drawing.

The ownership of the fences and/or walls as shown hereon was not determined.

Background aerials (2009) were provided by Miami-Dade County and are for graphical reference only.

SURVEYOR'S NOTES (continued):

Runway Protection Zone (RPZ) shown was provided by Miami-Dade County Aviation Department Technical Support Staff in Auto Cadd format and is GEO-referenced as provided directly into our digital file.

This survey is intended for the use of the parties to whom this survey is certified to and for. Any reproduction is not an original. This surveyor retains an original to verify these dated contents for validity.

The National Flood Insurance Rate Map No. 12086C0287L for Florida Community No. 120635, FIRM Date 09/11/09, with an effective date of 09/11/09, published by the United States Department of Housing and Urban Development, delineates the herein described land to be situated within Flood Zone "X" with no base flood elevation.

This sketch shown hereon in its graphic form is the record depiction of the surveyed lands described herein and will in no circumstances be supplanted in authority by any other graphic or digital format of this Survey. This map is intended to be displayed at a scale of 1"=50' or smaller. At the maximum intended displayed scale the survey and sketch's positional accuracy value occupies 1/20" on the display.

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Triangle Surveying & Mapping, Inc.

John Liptak
Professional Surveyor and Mapper #5664
State of Florida

Date: 12/22/10	Project: 2500.04
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APPENDIX B
Conceptual Planning Layout

Conceptual Building Layout

APPENDIX B

CONCEPT ONLY DRAFT | 2019.08.27

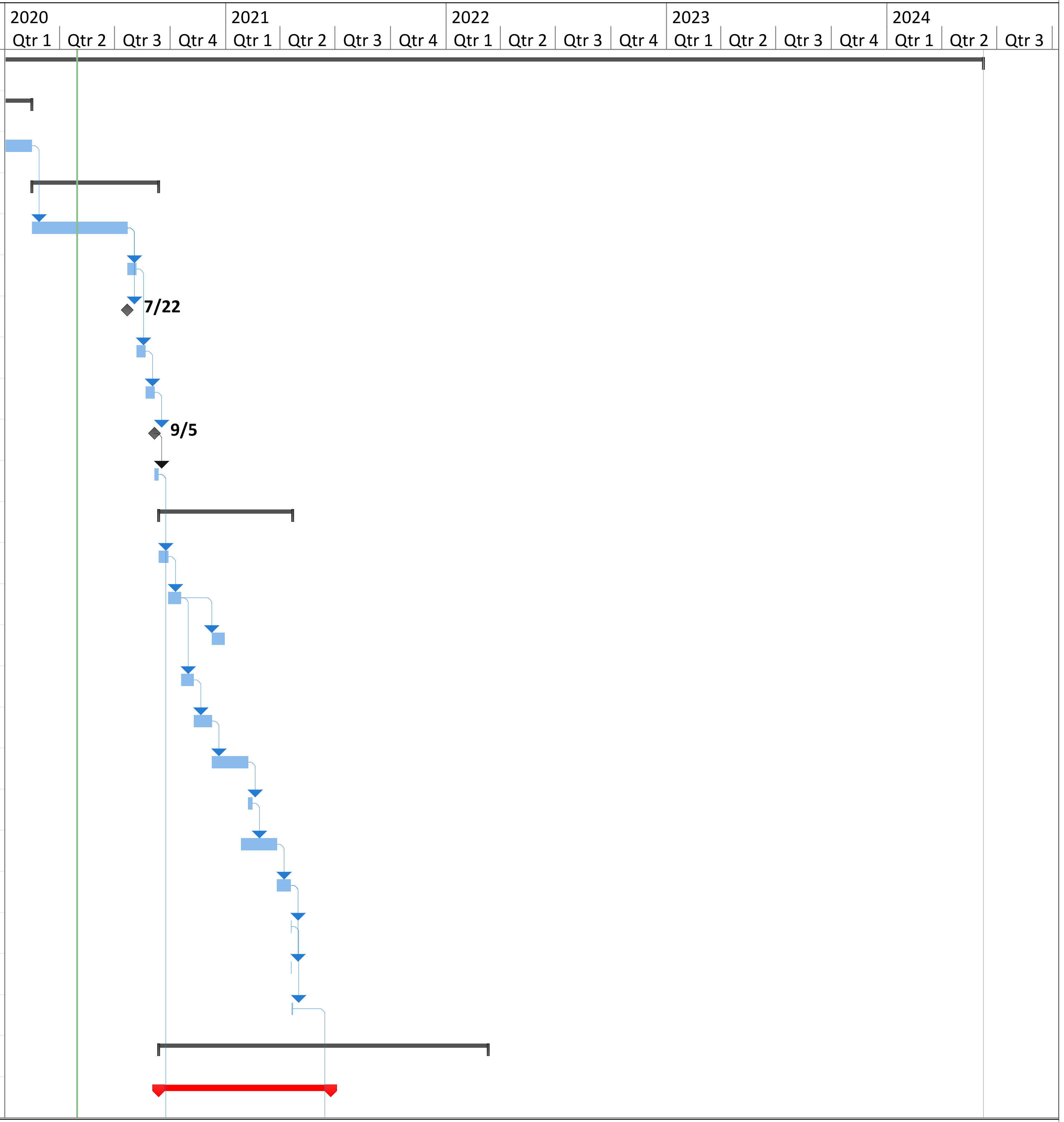
APPENDIX C

Project Schedule (Subject to Change)

APPENDIX C

DRAFT Schedule for Cargo Garage

ID	ℹ	Task Mode	Task Name	Duration	Start	Finish	Predecessors
1			**Fumigation Building**	**1684 days**	**Wed 10/30/19**	**Sun 6/9/24**	
2			**Project Initiation**	**108 days**	**Wed 10/30/19**	**Sat 2/15/20**	
3	▦		CPFS Routing	108 days	Wed 10/30/19	Sat 2/15/20	
4			**Conceptual Design**	**210 days**	**Sat 2/15/20**	**Sat 9/12/20**	
5			Market Study	158 days	Sat 2/15/20	Wed 7/22/20	3
6			Acquire EDP DCP	15 days	Wed 7/22/20	Thu 8/6/20	5
7			Handover meeting from Planning to Design	0 days	Wed 7/22/20	Wed 7/22/20	5
8	▦		Evaluation of Site & Circulation to/from Site	15 days	Thu 8/6/20	Fri 8/21/20	6
9			Evaluation of Program	15 days	Fri 8/21/20	Sat 9/5/20	8
10	▦		Stakeholder Meeting	0 days	Sat 9/5/20	Sat 9/5/20	9
11			Preliminary Cost Estimate	7 days	Sat 9/5/20	Sat 9/12/20	10
12			**Prepare Design Build Bid Package**	**222 days**	**Sat 9/12/20**	**Thu 4/22/21**	
13	▦		Preliminary Project Kick-Off and Planning & Stakeholder Research	16 days	Sat 9/12/20	Mon 9/28/20	11
14	▦		Programming / Scope Definition / Site Planning	21 days	Mon 9/28/20	Mon 10/19/20	13
15			Survey / Geotechnical / Environmental Investigations	21 days	Wed 12/9/20	Wed 12/30/20	14FS+51 days
16			Scope Confirmation with Stakeholders	21 days	Mon 10/19/20	Mon 11/9/20	14
17			Final Selection of Concept/Budget	30 days	Mon 11/9/20	Wed 12/9/20	16
18			50% Design Criteria / Draft Contract Documents / Front End Docs / Cost	60 days	Wed 12/9/20	Sun 2/7/21	17
19			POM / Stakeholder Review, QA/QC (AECOM)	7 days	Sun 2/7/21	Sun 2/14/21	18
20	▦		100% Design Criteria / Contract Documents / Front End Docs / Cost	60 days	Tue 1/26/21	Sat 3/27/21	19FS-19 days
21			POM / Stakeholder Review, QA/QC (AECOM)	23 days	Sat 3/27/21	Mon 4/19/21	20
22			Final Revision	1 day	Mon 4/19/21	Tue 4/20/21	21
23			Final Cost Estimate	1 day	Mon 4/19/21	Tue 4/20/21	21
24			Compile Packages to Create Design Criteria	2 days	Tue 4/20/21	Thu 4/22/21	22
25			**Procure Design Builder**	**546 days**	**Sat 9/12/20**	**Sat 3/12/22**	
26			**Part I - Teaming Agreement**	**285 days**	**Sat 9/12/20**	**Thu 6/24/21**	

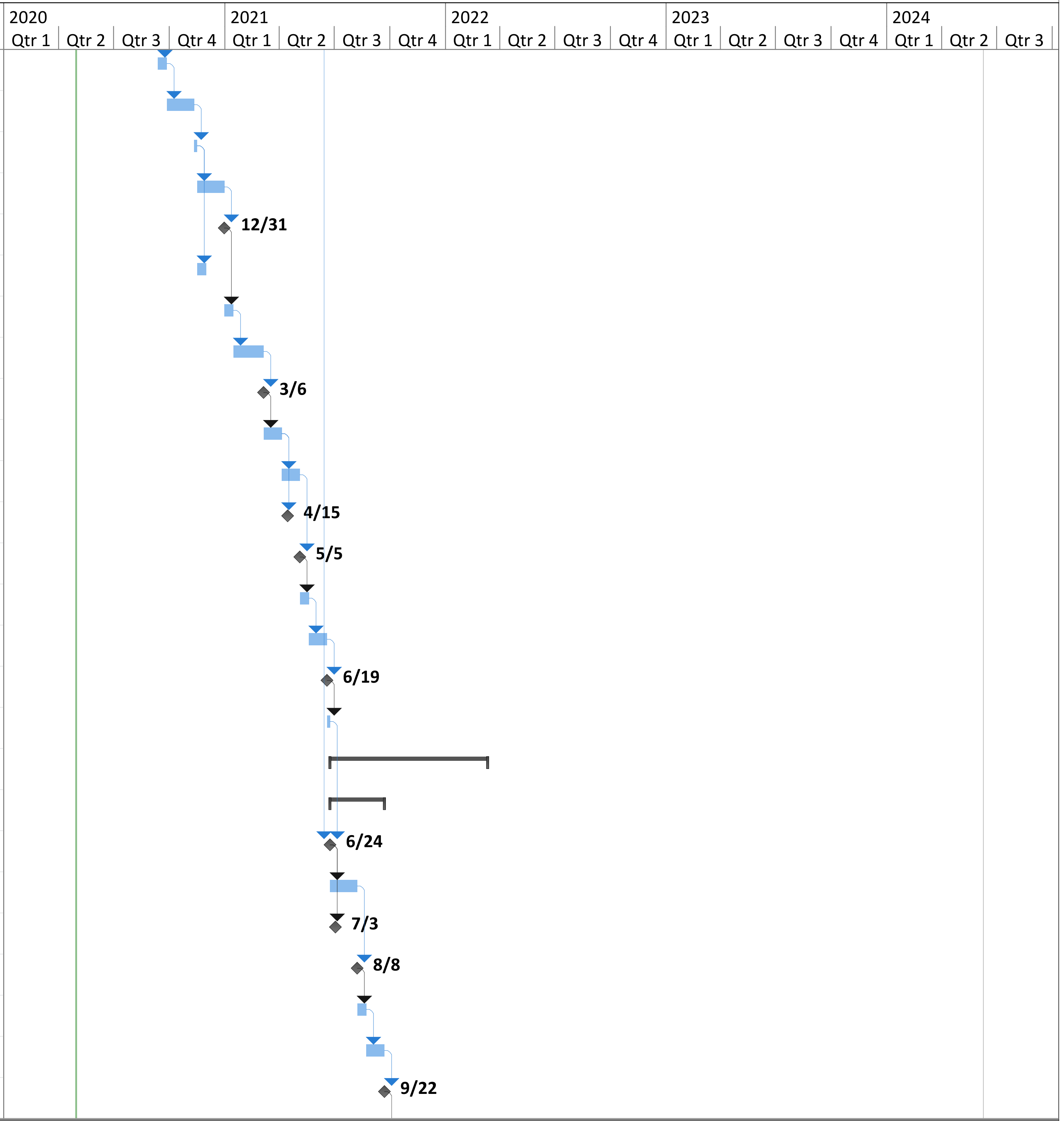


DRAFT CT H Schedule

Task	Project Summary	Inactive Milestone	Manual Summary Rollup	Deadline
Split	External Tasks	Inactive Summary	Manual Summary	Progress
Milestone ◆	External Milestone ◆	Manual Task	Start-only	Manual Progress
Summary	Inactive Task	Duration-only	Finish-only	

DRAFT Schedule for Cargo Garage

ID	ⓘ	Task Mode	Task Name	Duration	Start	Finish	Predecessors
27	▦		Prepare Scope and Goals Analysis	15 days	Sat 9/12/20	Sun 9/27/20	11
28			Review and Revisions of Scope and Goals Analysis	45 days	Sun 9/27/20	Wed 11/11/20	27
29			Final Approved Draft Submitted to ISD/SBD to review Technical	5 days	Wed 11/11/20	Mon 11/16/20	28
30			ISD/SBD to review SBE-A&E, Construction and Goods and Services	45 days	Mon 11/16/20	Thu 12/31/20	29
31			Signed SBD Memo to be forwarded to SBD w/Director's Signature	0 days	Thu 12/31/20	Thu 12/31/20	30
32			Prepare/Route RTA	15 days	Mon 11/16/20	Tue 12/1/20	29
33			SBD Issues Project Worksheet, which Seaport includes in RTA	15 days	Thu 12/31/20	Fri 1/15/21	31
34			RTA Routed downtown (OMB, Mayor, Clerk of the Board)	50 days	Fri 1/15/21	Sat 3/6/21	33
35			RTA Submitted to ISD to draft RDBS	0 days	Sat 3/6/21	Sat 3/6/21	34
36			Draft RDBS submitted to Seaport Contracts and PM Staff for review	30 days	Sat 3/6/21	Mon 4/5/21	35
37			Advertisement (Teams Prepare Step 1 Submittal - Teaming Agreement)	30 days	Mon 4/5/21	Wed 5/5/21	36
38			Project Briefing	0 days	Thu 4/15/21	Thu 4/15/21	36FS+10 days
39			Submittal Date for Step 1	0 days	Wed 5/5/21	Wed 5/5/21	37
40			Compliance Review by ISD	15 days	Wed 5/5/21	Thu 5/20/21	39
41			Selection Committee Review of the Submittal	30 days	Thu 5/20/21	Sat 6/19/21	40
42			Step 1 Meeting	0 days	Sat 6/19/21	Sat 6/19/21	41
43			Notification of Advancing Teams	5 days	Sat 6/19/21	Thu 6/24/21	42
44			**Part II - Design Build Fee Proposal**	**261 days**	**Thu 6/24/21**	**Sat 3/12/22**	
45			**DB Contract Solicitation and Review**	**90 days**	**Thu 6/24/21**	**Wed 9/22/21**	
46	▦		Advertisement	0 days	Thu 6/24/21	Thu 6/24/21	24,43
47			Preparation of Step 2 Submittal (Technical and Price Proposals)	45 days	Thu 6/24/21	Sun 8/8/21	46
48			Pre-Bid Meeting	0 days	Sat 7/3/21	Sat 7/3/21	46FS+9 days
49			Submittal Date for Step 2	0 days	Sun 8/8/21	Sun 8/8/21	47
50			Proposal Review by ISD	15 days	Sun 8/8/21	Mon 8/23/21	49
51			Proposal Review by Selection Committee	30 days	Mon 8/23/21	Wed 9/22/21	50
52			Step 2 Meeting (Oral Presentation)	0 days	Wed 9/22/21	Wed 9/22/21	51

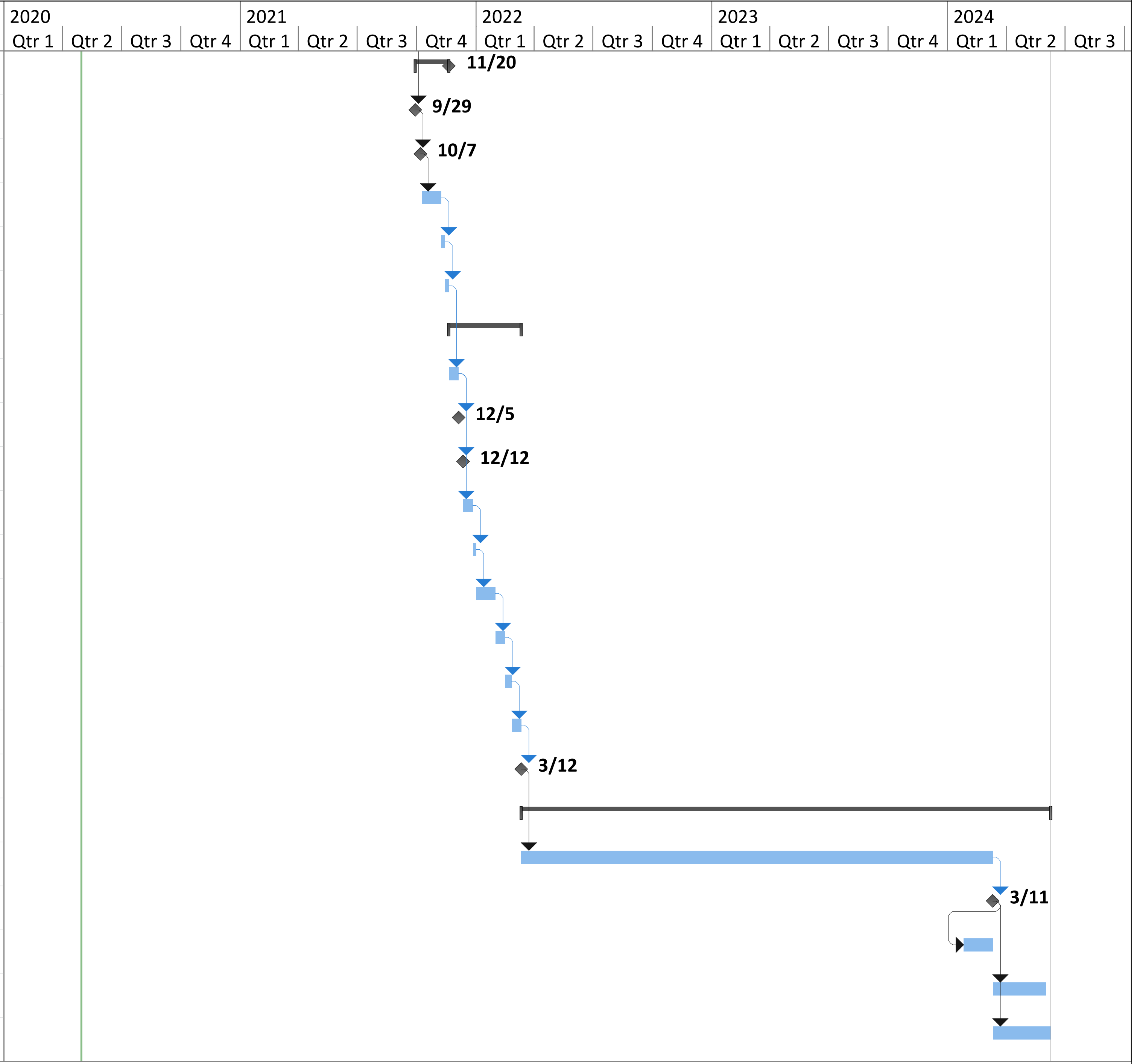


DRAFT CT H Schedule

Task	▬	Project Summary	▬	Inactive Milestone	◇	Manual Summary Rollup	▬	Deadline	⬇
Split	┈	External Tasks	▬	Inactive Summary	▬	Manual Summary	▬	Progress	─
Milestone	◆	External Milestone	◆	Manual Task	▬	Start-only	[	Manual Progress	─
Summary	▬	Inactive Task		Duration-only	▬	Finish-only	]		

DRAFT Schedule for Cargo Garage

ID	ⓘ	Task Mode	Task Name	Duration	Start	Finish	Predecessors
53			**Negotiation Approval and Negotiation**	**52 days**	**Wed 9/29/21**	**Sat 11/20/21**	
54			Negotiation Memo Submitted to Mayor	0 days	Wed 9/29/21	Wed 9/29/21	52FS+7 days
55			Negotiation Memo Received from Mayor	0 days	Thu 10/7/21	Thu 10/7/21	54FS+8 days
56			Negotiations	30 days	Sat 10/9/21	Mon 11/8/21	55FS+2 days
57			Ask for Condition of Award Docs	6 days	Mon 11/8/21	Sun 11/14/21	56
58			DB Signs Contract	6 days	Sun 11/14/21	Sat 11/20/21	57
59			**Contract Award**	**112 days**	**Sat 11/20/21**	**Sat 3/12/22**	
60			Recommendation for Award	15 days	Sat 11/20/21	Sun 12/5/21	58
61			Protest Period	0 days	Sun 12/5/21	Sun 12/5/21	60
62			BCC	0 days	Sun 12/12/21	Sun 12/12/21	60FS+7 days
63			Receipt and approval of Contract Documents, Bonds, Certifications of	15 days	Sun 12/12/21	Mon 12/27/21	60FS+7 days
64			Request Committee Date	5 days	Mon 12/27/21	Sat 1/1/22	63
65			Committee Date	30 days	Sat 1/1/22	Mon 1/31/22	64
66			BCC	15 days	Mon 1/31/22	Tue 2/15/22	65
67			Veto Period	10 days	Tue 2/15/22	Fri 2/25/22	66
68			Finalize Contracts for Risk Management, County Attorney	15 days	Fri 2/25/22	Sat 3/12/22	67
69			NTP	0 days	Sat 3/12/22	Sat 3/12/22	68
70			**Design Build**	**820 days**	**Sat 3/12/22**	**Sun 6/9/24**	
71			Design / Permit / Demo / Construction	730 days	Sat 3/12/22	Mon 3/11/24	69
72			Construction TCO (Substantial Completion)	0 days	Mon 3/11/24	Mon 3/11/24	71
73			POM Testing and Commissioning	45 days	Fri 1/26/24	Mon 3/11/24	72FS-45 days
74			Contingency Time	82 days	Mon 3/11/24	Sat 6/1/24	72
75			Final Construction Completion	90 days	Mon 3/11/24	Sun 6/9/24	72



DRAFT CT H Schedule

Task	▬	Project Summary	⌐¬	Inactive Milestone	◇	Manual Summary Rollup	▬	Deadline	⇩
Split	┈	External Tasks	▬	Inactive Summary	⌐¬	Manual Summary	⌐¬	Progress	─
Milestone	◆	External Milestone	◆	Manual Task	▬	Start-only	[	Manual Progress	─
Summary	⌐¬	Inactive Task		Duration-only	▬	Finish-only	]		

APPENDIX D
PortMiami Questionnaire for Industry Leader Input

APPENDIX D

2020.03.24

Fumigation and Cold Chain Processing Facility – Industry Leader Criteria/Questionnaire

Project Description

Construction of an approximately 100,0000 square feet building to house a third-party operated, state-of-the-art fumigation and cold chain processing facility able to further the phytosanitary treatment requirements of 7 CFR 305.5-305.8 and provide space for cold chain processing. Given the lack of land area at PortMiami, the facility will be built on a 14-acre Miami-Dade County-owned site and completed in a single phase.

Site Description

The selected site is owned by Miami-Dade County and located in Miami International Airport's (MIA) property and is bounded by NW 12th Street to the south, Milam Dairy Road to the west, a railroad to the north, and industrial and commercial lot to the west.

Figure 1 - Final Site Location

Funding Structure

PortMiami Contribution (Non-Federal)	$ 10,032,410.00	17%
Private Partner Contribution (Non-Federal)	$ 13,500,000.00	24%
Port Infrastructure Development Grant (Federal)	$ 33,500,000.00	59%
Total Project Cost:	$ 57,032,410.00	100%

Questionnaire

The purpose of this section is to help PortMiami assess the fumigation and cold chain processing market conditions in Broward and Dade counties by providing observations to develop a competitive fumigation and cold chain processing facility at MIA.

a) Can you share insight or projections regarding current and/or future cargo volumes in South Florida?

b) What is the recommended lease structure for a fumigation and cold chain processing facility in Miami-Dade County/Broward County?

c) What is the average price per square foot of a standard storage warehouse prepared for fumigation and/or cold chain processing?

d) What is the recommended minimum square feet for a fumigation and cold chain processing facility in Miami-Dade County/Broward County?

e) Assuming 150,000 structure is the minimum size to offset construction and begin generating revenue - What is your recommended ratio of fumigation space to cold chain processing for a space of up to 150,000 sf? The goal is to generate a minimum percentage of fumigation to cold chain processing space the future facility could provide to be competitive in the local and regional marketplace.

f) Are there any current or future emerging product lines that are anticipated to be market drivers/influencers (ie. Pharmaceuticals and MIA designating it the world's "pharma hub")?

g) Does nationwide precedence exist for multi-tenant fumigation and/or cold chain processing facility (ie. Multiple tenants under one shell structure)?

Fumigation

1. What is the standard lease (timeframe) for a fumigation facility in Miami-Dade County/Broward County?

2. What is the average price per square foot of fumigation space in Miami-Dade County/Broward County?

3. What are the typical commodities being processed through the fumigation spaces in Miami-Dade County/Broward County?

Cold Chain Processing

1. What is the standard lease (timeframe) for a fumigation facility in Miami-Dade County/Broward County?

2. What is the average price per square foot of cold chain processing space in Miami-Dade County/Broward County?

3. What are the typical commodities being processed through the fumigation spaces in Miami-Dade County/Broward County?

Please provide any additional questions or criteria for a fumigation and cold chain processing facility that we may not have covered.

Additional Notes:

APPENDIX E

Steve Berens (Inland Port of Pennsylvania) - Questionnaire Response

APPENDIX E

2020.03.24

Fumigation and Cold Chain Processing Center – Industry Leader Criteria/Questionnaire | Steve Berens – Inland Port of Pennsylvania

Project Description

Construction of an approximately 100,0000 square feet building to house a third-party operated, state-of-the-art fumigation and cold chain processing center able to further the phytosanitary treatment requirements of 7 CFR 305.5-305.8 and provide space for cold chain processing. Given the lack of land area at PortMiami, the facility will be built on a 14-acre Miami-Dade County-owned site and completed in a single phase.

Site Description

The selected site is owned by Miami-Dade County and located in Miami International Airport's (MIA) property and is bounded by NW 12th Street to the south, Milam Dairy Road to the west, a railroad to the north, and industrial and commercial lot to the west.

Figure 1 - Final Site Location

Funding Structure

PortMiami Contribution Non-Federal $ 10,032,410.00 17%
Private Partner and FDOT Contribution Non-Federal $ 13,500,000.00 24%
Port Infrastructure Development Grant Federal $ 33,500,000.00 59%
Total Project Cost: $ 57,032,410.00 100%

Questionnaire

The purpose of this section is to help PortMiami assess the fumigation and cold chain processing market conditions in Broward and Dade counties by providing observations to develop a competitive fumigation and cold chain processing facility at MIA.

a) Can you share insight or projections regarding current and/or future cargo volumes in South Florida?
    a. Given shortage of cold storage, having a cold storage facility capable of order fulfillment, fumigation and cold treatment acceptance facility. Right now, the majority of cold imports form vessels land in Savannah, Georgia for the southeast market. Why? Because they have built the DC infrastructure as the gravitational pull for the port – including cold storage.

b) What is the recommended lease structure for a fumigation and cold chain processing facility in Miami-Dade County/Broward County?
    a. Depending on the viewpoint of the owner – the sub-lessor or operator would probably seek a 25-year lease and would want design inputs. If just the land underneath the facility is being leased (Hawaii), then the winning bidder would own the building and operate or contract out the daily operation of the building.

c) What is the average price per square foot of a standard storage warehouse prepared for fumigation and/or cold chain processing?

    a. Some further research would need to be done on comps in the Miami area. We have seen cold storage go for anywhere between $7.50-$15.00/sqf/year – and *on-port or near-port* locations typically command a 25+% premium. Fumigation space in the south really isn't any different than any dry warehouse (Northern fumigation has to have a heating capability) But all fumigation space has to be well sealed, positive ventilation capable. Having fumigation capable space adjacent to cold storage is a smart move.

d) What is the recommended minimum square feet for a fumigation and cold chain processing center in Miami-Dade County/Broward County?
    a. Depends on volumes and actual products as not all products need fumigation. Our experience is that having a 8:1 ratio is acceptable.

e) Assuming 150,000 structure is the minimum size to offset construction and begin generating revenue - What is your recommended ratio of fumigation space to cold chain processing for a space of up to 150,000 sf? The goal is to generate a minimum percentage of fumigation to cold chain processing space the future facility could provide to be competitive in the local and regional marketplace.

8:1 but having designed-convertible space can impact that.

f) Are there any current or future emerging product lines that are anticipated to be market drivers/influencers (ie. Pharmaceuticals and MIA designating it the world's "pharma hub")?
   a. Product lines of interest: meat (would need sub-zero), Floral and high-end FFV via aircraft, then mass FFV via ocean carrier. Pharma synergies should be explored with Puerto Rico, and South America. Some sales synergies in meat also possible given that most importers are headquartered near-by – even though they use Northern ports.

g) Does nationwide precedence exist for multi-tenant fumigation and/or cold chain processing center (ie. Multiple tenants under one shell structure)
   a. If by tenant you mean *customer,* then yes – due to seasonality of various products, then various customers sign on for dedicated amount of space under one roof.
   b. If by tenant, you mean multiple operators, no. But customer's QA reps for inspection purposes / product pull allowed on premises.
   c. USDA/APHIS/FDA would have their own inspection space or video feed to a centralized one

Fumigation

1. What is the standard lease (timeframe) for a fumigation facility in Miami-Dade County/Broward County? If Port Miami is the lessor, then perhaps 25 years is in order.

2. What is the average price per square foot of fumigation space in Miami-Dade County/Broward County? Varies by size and function.

3. What are the typical commodities being processed through the fumigation spaces in Miami-Dade County/Broward County? Typically, grapes, blueberries, some stone fruit – but again, depends on the region that its grown and the APHIS reqs for *that* region,

Cold Chain Processing

1. What is the standard lease (timeframe) for a fumigation facility in Miami-Dade County/Broward County? If Port Miami is the lessor, then perhaps 25 years is in order.

2. What is the average price per square foot of cold chain processing space in Miami-Dade County/Broward County? Varies by size and function.

3. What are the typical commodities being processed through the fumigation spaces in Miami-Dade County/Broward County?

Please provide any additional questions or criteria for a fumigation and cold chain processing center that we may not have covered.

Additional Notes:

APPENDIX F

CBRE - Questionnaire Response

APPENDIX F

PORTMIAMI

QUESTIONNAIRE RESPONSE

FUMIGATION AND COLD CHAIN PROCESSING CENTER

MAY 29, 2020

CBRE

Q.

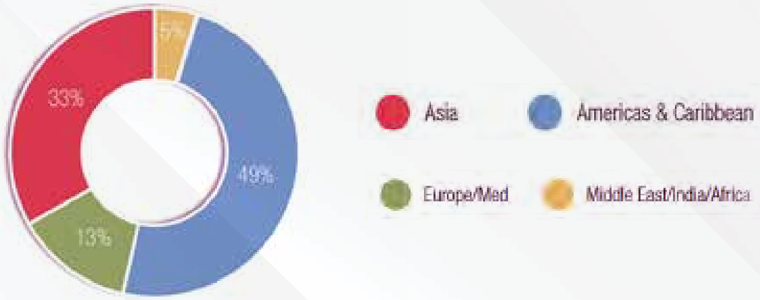
a.) Can you share insight or projections regarding current and/or future cargo volumes in South Florida?

PORTMIAMI CARGO

PortMiami Cargo Volumes			
Item	2016	2017	2018
TEUs	1,028,156	1,020,192	1,083,586
Cargo Ships Docked	1,231	1,422	1,081
Inbound Tonnage	3,871,906	4,567,926	4,749,255
Outbound Tonnage	3,827,980	4,045,813	4,028,719
Total Tonnage	7,699,886	8,613,739	8,777,974

MIA CARGO

Miami International Cargo Volumes			
Item	2017	2018	2019
Freight Tons	2,245,190	2,305,941	2,270,365
Mail Tons	38,958	42,083	36,659
Domestic Cargo Tons	337,528	382,904	413,737
International Cargo Tons	1,946,619	1,965,121	1,893,287
Total Cargo Tons	2,284,148	2,348,024	2,307,025



COLD STORAGE OUTLOOK

Market forces will continue to generate a growing demand for refrigerated warehousing. Gateway markets like Miami are expected to capture the majority of this demand. Of particulasr influence is the demand from online grocery companies.

Aside from disruptions in US and China from the current Covid-19 crisis, other potential threats include:

- Labor shortages
- Trucking issues
- National security
- Agricultural disruptions

PORT EVERGLADES

PORT EVERGLADES
BROWARD COUNTY, FLORIDA
Florida's Powerhouse Port™

Top 10 Import Commodities, Sorted by FY2019

Commodity:	FY2016	FY2017	FY2018	FY2019	FYTD2020
Bananas And Plantains, Fresh Or Dried	27,629	26,879	22,534	27,988	13,135
Melons And Papayas, Fresh	32,305	30,669	31,501	21,842	5,953
Dates, Figs, Pineapples, Avocados Etc, Fr Or Dried	4,453	6,671	7,707	7,642	3,071
Vegetables Nesoi, Fresh Or Chilled	3,994	6,164	7,324	7,319	2,709
Fruit Juices (& Grape Must) & Veg Juice, No Spirit	1,421	997	4,474	5,841	335
Miscellaneous Cargo	813	2,600	3,234	3,915	102
Cassava, Arrowroot Etc, Fresh Or Dry; Sago Pith	1,029	2,260	2,541	2,813	964
Fruit Nesoi, Fresh	2,581	2,875	2,495	2,284	9,793
Citrus Fruit, Fresh Or Dried	1,301	1,361	1,832	1,867	398
Fish, Frozen (No Fish Fillets Or Other Fish Meat)	1,776	1,401	1,550	1,830	304
Total Import Refrigerated TEUs:	**94,318**	**101,459**	**106,352**	**104,759**	**48,166**

Top 10 Export Commodities, Sorted by FY2019

Commodity:	FY2016	FY2017	FY2018	FY2019	FYTD2020
Food Preparations Nesoi	15,288	17,319	15,849	13,516	1,650
Miscellaneous Cargo	5,201	5,578	6,672	7,165	1,844
Meat & Ed Offal Of Poultry, Fresh, Chill Or Frozen	4,896	8,610	4,930	3,105	1,027
Containers For One Or More Modes Of Transport	933	6,035	3,597	2,305	48
Motor Cars & Vehicles For Transporting Persons	245	1,037	2,922	2,126	672
Fruit Juices (& Grape Must) & Veg Juice, No Spirit	435	576	1,073	1,162	453
Live Plants Nesoi, Cuttings Etc.; Mushroom Spawn	699	495	704	694	77
Meat Of Bovine Animals, Fresh Or Chilled	150	131	441	649	97
Medicaments Nesoi, Mixed Or Not, In Dosage Etc Fm	9	3	445	625	671
Onions, Shallots, Garlic, Leeks Etc, Fr Or Chilled	262	251	318	476	46
Total Export Refrigerated TEUs:	**37,991**	**51,448**	**47,845**	**44,624**	**21,273**

Top 10 Import Shiplines, Sorted by FY2019

Shipline:	FY2016	FY2017	FY2018	FY2019	FYTD2020
Crowley Liner Services	15,333	28,209	36,162	24,681	10,495
Great White Fleet Ltd	22,829	20,999	14,963	21,183	10,993
Agriex Shipping Limited	-	-	6,698	16,019	9,268
King Ocean Services	3,035	6,684	10,243	11,650	4,232
Hapag Lloyd	3,405	4,449	4,746	6,068	1,999
Hamburg Sud	3,185	4,326	6,541	5,772	1,119
Dole Ocean Cargo Express	7,431	7,497	5,734	5,446	2,240
Mediterranean Shipping Company	5,048	6,800	5,436	4,760	3,639
Sealand	3,043	1,993	4,369	3,589	2,549
Seaboard Marine Ltd	819	536	538	2,295	1,206
Total Import Refrigerated TEUs:	**94,318**	**101,459**	**106,352**	**104,759**	**48,166**

Top 10 Export Shiplines, Sorted by FY2019

Shipline:	FY2016	FY2017	FY2018	FY2019	FYTD2020
Crowley Liner Services	18,496	31,659	24,968	20,397	7,593
King Ocean Services	6,574	7,423	8,981	10,046	5,539
Hamburg Sud	2,559	3,515	3,783	4,201	1,681
Hybur Shipping	2,060	2,617	2,877	2,865	1,919
Seacor Island Lines Llc	519	1,767	1,692	1,876	1,132
Mediterranean Shipping Company	1,701	941	1,370	1,822	1,523
Seaboard Marine Ltd	1,421	1,210	1,581	1,322	679
Sealand	232	262	811	565	222
Hapag Lloyd	129	608	716	395	520
American President Lines	208	192	68	343	4
Total Export Refrigerated TEUs:	**37,991**	**51,448**	**47,845**	**44,624**	**21,273**

Top 10 Import Trading Partners, Sorted by FY2019

Trading Partner:	FY2016	FY2017	FY2018	FY2019	FYTD2020
Guatemala	37,638	36,513	39,904	34,949	19,745
Honduras	29,473	27,403	25,327	27,154	10,921
Costa Rica	3,049	11,140	9,590	11,873	5,160
Panama	4,483	5,429	3,172	5,657	3,991
Colombia	2,063	3,120	5,793	4,907	1,227
Chile	3,803	4,992	5,082	4,745	13
Peru	1,398	1,580	2,378	2,209	406
Germany	397	506	920	2,123	404
Dominican Republic	625	1,485	2,754	2,006	737
Bahamas	2,872	1,095	735	1,803	3,014
Total Import Refrigerated TEUs:	**94,318**	**101,459**	**106,352**	**104,759**	**48,166**

Top 10 Export Trading Partners, Sorted by FY2019

Trading Partner:	FY2016	FY2017	FY2018	FY2019	FYTD2020
Netherlands Antilles	4,878	5,443	5,545	6,641	3,177
Guatemala	3,098	8,042	5,825	4,248	1,043
Costa Rica	411	2,775	5,351	3,198	1,823
Cayman Islands	1,732	2,522	3,256	3,179	2,017
Dominican Republic	3,947	4,405	4,413	3,170	1,117
Virgin Island	4,080	4,178	2,695	3,069	1,508
Panama	440	744	1,498	2,549	1,097
Bahamas	1,756	1,653	1,971	2,270	1,768
Chile	1,483	2,013	1,945	1,917	571
Haiti	1,286	1,300	613	1,881	488
Total Export Refrigerated TEUs:	**37,991**	**51,448**	**47,845**	**44,624**	**21,273**

Q. *b.) What is the recommended lease structure for a fumigation and cold chain processing facility in Miami-Dade County/Broward County?*

PortMiami's project will be primarily a cold storage facility. If it is decided to install ebeam irradiation capabilities (versus the harmful methyl bromide used in fumigation that is being phased out), the space required for an ebeam processing area can be as small as 7,000 sf up to 15,000 sf or so.

When considering a 150,000 sf cold storage facility this is a small percentage of space needed for food safety processing. As such, most of this facility will be highly productive for cold storage and distribution and as such, a standard type lease arrangement can be used – lease cost per square foot.

NATIONAL RANGE

- For clear heights 38'-60'
- Size range 125,000-250,000 sf
- Lease rates (nnn) $14.29 - $19.89 psf
- Product type – cooler and freezer
- Geography – California, Illinois, New Jersey

Q.

c.) What is the average price per square foot of a standard storage warehouse prepared for fumigation and/or cold chain processing?

Pricing

Asking rates across Florida vary widely depending on age, quality and location in relation to highways and ports/airport/rail.

Local projects that best compare include:

AMERICA'S GATEWAY PARK

ASKING RATE $12.00 PSF NNN

- Only available cooler facility close to MIA
- 52,000 SF available
- OE typically $2.25-$2.50 PSF
- Owner prefers single-tenant

FLAGLER LOGISTICS PARK

ASKING RATE $12.50 PSF NNN

- 14,000 SF cooler available
- OE typically $2.32 PSF
- For cooler to be installed in exosting warehouse space; cost is $40-$50 PSF
- For freezer to be installed in exosting warehouse space; cost is $60-$65 PSF

SOUTH FLORIDA COLD STORAGE COMPS

N MIAMI COLD STORAGE

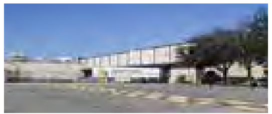
LOCATION:	MIAMI
TOTAL SF:	228,338 SF
OCCUPANY:	100%
OWNER:	-
TANANCY:	MULTI-TENANT
RENT/SF:	$10.30/$17.92 MG
PARKING:	OPEN
YEAR BUILT:	1953
LOADING:	29 DHD
CLEAR HEIGHT:	23 FT
CLASS:	C
PRIMARY TENANT:	ARTICA ICE CREAM
USE:	FREEZER/COLD STORAGE

MIRAMAR BUSINESS CENTER

LOCATION:	MIRAMAR
TOTAL SF:	85,660 SF
OCCUPANY:	100%
OWNER:	STATE BOARD ADMIN FL
TANANCY:	MULTI-TENANT
RENT/SF:	$9.40 NNN
PARKING:	1.96/1000 SF
YEAR BUILT:	2009
LOADING:	31 DHD, 2 DRIVE IN
CLEAR HEIGHT:	30 FT
CLASS:	A
PRIMARY TENANT::	GLOBAL PERISHABLES
USE:	COLD STORAGE/ WAREHOUSE

PREFERRED FREEZER COUNTYLINE

LOCATION:	HIALEAH
TOTAL SF:	185,731 SF
OCCUPANY:	100%
OWNER:	-
TANANCY:	SINGLE-TENANT
RENT/SF:	$27.46
PARKING:	.34/1000 SF
YEAR BUILT:	2020
LOADING:	15 DHD
CLEAR HEIGHT:	29-58 FT
COLUMNS:	-
PRIMARY TENANT:	PREFERRED FREEZER SVCS.
USE:	B-T-S FREEZER/COLD LOADING DOCK, OFFICE



SUPERVALU

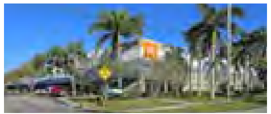
LOCATION:	BROWARD
TOTAL SF:	778,816 SF
OCCUPANY:	100%
OWNER:	FORTRESS
TANANCY:	SINGLE TENANT
RENT/SF:	$6.98 NNN
PARKING:	SURFACE
YEAR BUILT:	1974
LOADING:	48 DH
CLEAR HEIGHT:	24-28 FT
COLUMNS:	-
PRIMARY TENANT:	SUPERVALU
USE:	FREEZER/COOLER/DRY STORAGE

AERO MIAMI II

LOCATION:	MIAMI
TOTAL SF:	127,322 SF
OCCUPANY:	100%
OWNER:	-
TANANCY:	MULTI-TENANT
RENT/SF:	$14.50-$15.78 NNN
PARKING:	SURFACE
YEAR BUILT:	2001
LOADING:	DH
CLEAR HEIGHT:	32 FT
COLUMNS:	-
PRIMARY TENANT:	TAMPA CARGO/SE ROBINSON
USE:	COLD STRORAGE/ REFRIG DOCK CITY GROUND LEASE

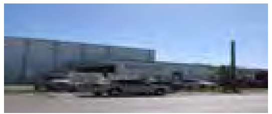
MORAN FOODS

LOCATION:	BROWARD
TOTAL SF:	250,441 SF
OCCUPANY:	100%
OWNER:	-
TANANCY:	SINGLE TENANT
RENT/SF:	$7.35 NNN
PARKING:	OPEN
YEAR BUILT:	1985
LOADING:	DH
CLEAR HEIGHT:	27-34 FT
CLASS:	B
PRIMARY TENANT:	MORAN FOODS
USE:	FREEZER/COOLER/ PROCESSING



HOLLYWOOD PARK 14

LOCATION:	HOLLYWOOD
TOTAL SF:	65,098 SF
OCCUPANY:	100%
OWNER:	PROLOGIS
TANANCY:	MULTI-TENANT
RENT/SF:	$7.25-$14.15 NNN
PARKING:	.66/1000 SF
YEAR BUILT:	1976
LOADING:	100 DHD
CLEAR HEIGHT:	27-29 FT
CLASS:	B
PRIMARY TENANT:	KEY IMPOACT
USE:	COLD STORAGE / COMMERCIAL KITCHEN



COLD STORAGE WAREHOUSE

LOCATION:	MIAMI
TOTAL SF:	63,706 SF
OCCUPANY:	72%
OWNER:	MIAMI BUSINESS PARK
TANANCY:	MULTI-TENANT
RENT/SF:	$16.00 MG
PARKING:	OPEN
YEAR BUILT:	1962 (REN 2014)
LOADING:	5 DHD
CLEAR HEIGHT:	12-30 FT
CLASS:	C
PRIMARY TENANT:	VARIOUS SEAFOOD
USE:	FREEZER/COOLER/DRY STORAGE

SOUTHEAST FROZEN FOODS

LOCATION:	MIMAI
TOTAL SF:	234,739 SF
OCCUPANY:	82%
OWNER:	-
TANANCY:	MULTI-TENANT
RENT/SF:	$8.27-$12.92 NNN
PARKING:	.78/1000 SF
YEAR BUILT:	1968
LOADING:	32 DHD
CLEAR HEIGHT:	14-26 FT
CLASS:	C
PRIMARY TENANT:	SUPERVALU
USE:	FREEZER/COOLER/ REFRIG. DOCK AREA

MIAMI BUINESS PARK

LOCATION:	MIAMI
TOTAL SF:	342,733 SF
OCCUPANY:	67%
OWNER:	INDUSTRIAL REALTY
TANANCY:	MULTI-TENANT
RENT/SF:	$9.25 NNN
PARKING:	.41/1000 SF
YEAR BUILT:	1954
LOADING:	61 DHD
CLEAR HEIGHT:	16-21 FT
CLASS:	C
PRIMARY TENANT:	PREFERRED FREEZER
USE:	FREEZER/COOLER/DRY STORAGE

Q.

d.) What is the recommended minimum square feet for a fumigation and cold chain processing center in Miami-Dade County/Broward County?

We are currently researching the space required for fumigation. We do know the space requirement for ebeam as stated in section b.

Q.

e.) Assuming 150,000 structure is the minimum size to offset construction and begin generating revenue - What is your recommended ratio of fumigation space to cold chain processing for a space of up to 150,000 sf? The goal is to generate a minimum percentage of fumigation to cold chain processing space the future facility could provide to be competitive in the local and regional marketplace.

Ebeam will require no more than 10% of the space

Fumigation may cost more; we are currently resarching this and will provide additional detail once completed.

Q. *f.) Are there any current or future emerging product lines that are anticipated to be market drivers/influencers (ie. Pharmaceuticals and MIA designating it the world's "pharma hub")?*

PRODUCT LINE TRENDS

ONLINE GROCERY

BIOLOGIC DRUGS

MEAL KITTING

TROPICAL FLOWERS

VACCINES

PHARMACEUTICAL COMMERCE

Q.

g.) Does nationwide precedence exist for multi-tenant fumigation and/or cold chain processing center (ie. Multiple tenants under one shell structure)?

MULTI-TENANT FUMIGATION

The use of ebeam irradiation will generate a new sales channel for Port Miami as many large retailers are asking growers and distributors to irradiate their products to remover spoilage bacteria and pests. We also know ocean carriers are requiring ebeam processing and this is now becoming more of a consideration where ocean carriers will set up their ports. .

FUMIGATION

It is problematic for fumigation to be done in a cold storage facility primarily because the product has to be warmed up to about 85°F. This requires excess labor and also damages the fruit as it breaks the cold chain. After the product is warmed it is covered with a canvas with hoses snaked through the maze of pallets underneath. This process requires a very large space (football field size). After the process, which takes hours to complete, the canvas is lifted and the product has to be placed back in refrigeration to get back to temperature. Aside from compromising the quality of the product through heating, some of the products are discolored due to residue from the ozone depleting and carcinogenic methyl bromide. When you consider the proposed 150,000 sf cold storage facility, the fumigation process would require a large portion of that to be at ambient temperature reducing the value of the investment. Aside from that, the process works well.

As stated, the ebeam can be integrated into a cold storage facility thus keeping the cold chain intact while sustaining optimal quality of the product. Unlike fumigation, ebeam irradiation has been proven to extend the shelf life of products while reducing/eliminating pests, spoilage bacteria and indicator organisms (i.e. listeria, E-coli, Salmonella). We have an established relationship with Frank Yiannas, FDA Deputy Commissioner for Food Policy & Response, he is working on the next generation of food safety that is being driven by technology and innovation; fumigation is not on his list of new technology and innovation.

Standard Lease Term

Minimum term of 10 years, typical terms approach 20 years

Q. *2.) What is the average price per square foot of fumigation space in Miami-Dade County/Broward County?*

Fumigation space is unique and is so integrated into the building itself that it is difficult to provide meaningful data that you should be considering. The capital cost of fumigation equipment, as well as an ebeam, will be of great importance to consider along with the ancillary effects of each on the commodities being processed. Our team is well-connected to industry experts and will investigate multiple cost scenarios for you do to consider in ultimately determining an accurate price per square foot.

Q. *3.) What are the typical commodities being processed through the fumigation spaces in Miami-Dade County/ Broward County?*

PortMiami and Port Everglades currently have a significantly smaller capacity when compared to produce processing leaders like The Port of Philadelphia but volumes continue to climb. A revised cold treatment program that allows once-restricted grapes and blueberries from Peru and Uruguay to come into South Florida ports is working well and has been expanded to include citrus from Peru and apples and pears from Argentina. Additionally Peruvian asparagus, Costa Rican bananas, pineapples from Guatemala and nearly 125 million stems of flowers are being processed at PortMiami.

Increasingly fruit is now shipped directly to South Florida for delivery to local grocery stores faster and at a lower cost than shipping through traditional Northern ports. It also provides opportunities for ocean-to-air transshipment.

Q.

1.) What is the recommended lease structure for a fumigation and cold chain processing facility in Miami-Dade County/Broward County?

LEASE TERMS

Our recommendation is, at minimum, a 20-year net lease, whereby tenant pays all expenses, including real estate taxes, property insurance, property management (to the extent there will be a third-party management company, or directly to the Port if the port self-manages); tenant will also pay all utilities, maintenance/repair (including building, roof, and equipment); we should expect a lease with escalations, either annual bumps or at some other negotiated interval; escalations can either be based on CPI (typically U index, All Cities, as published by the BLS), or a negotiated escalation (i.e. 2% annually)

For clear heights 38′-60′
Size range 125,000-250,000 sf
Lease rates (nnn) $14.29 - $19.89 psf
Product type – cooler and freezer

Q.

2.) What is the average price per square foot of cold chain processing space in Miami-Dade County/Broward County?

The best way to anser this question ios in the form of an example:
The cost of an ebeam is about $10MM. The cost to build a state of the art cold storage facility can range from $150 to $200 in the Miami area. As this will be a federally funded project prevailing wage labor will be used which can push cost above $200/sf. For example, the Philadelphia (PA) port had a quote for close to $300/sf for a new water front cold storage

Q.

3.) What are the typical commodities being processed through the fumigation spaces in Miami-Dade County/ Broward County?

Typical commodities are mostly produce items, but with ebeam a host of other products can be processed such as juices, dairy, beef, poultry as well medical equipment (would not do that in a food warehouse).

PORTMIAMI

APPENDIX

Additional Information

CBRE

WHO

WHO ARE THE MAIN PLAYERS?

The two largest cold storage companies make up more than half of the total market by space occupied in North America.

Lineage Logistics is the leader, accounting for 31.8% of the cold-storage market with over 1.1 billion cubic feet of space in the U.S. and Canada. Americold takes up 29% with 1 billion cubic feet. Other key players include United States Cold Storage (8.9%) and VersaCold Logistics (3.8%), both having a combined 444 million cubic feet of refrigerated warehouse space in the U.S.

31.8%	**Lineage**
29.0%	**Americold**
8.9%	**USCS**
3.8%	**VersaCold**

HOW

HOW MUCH COLD STORAGE SPACE IS THERE?

The U.S. Department of Agriculture (USDA) estimates that there is 3.6 billion cubic feet* of industrial food commodity cold storage space in the U.S.

Cold storage warehouses are primarily measured by the cubic footage of storage area. Therefore, there is a premium on clear height—typically between 40 and 60 feet or more in modern facilities—and the number of pallet positions they can hold. There is limited new construction due to the relatively small number of operators and the specialized nature of the industry. Barriers to entry, such as high construction costs and restrictive government food-grade storage regulations, prevent overbuilding. The average age of cold storage warehouses in the U.S. is approximately 34 years.

*estimated at 714 million sq. ft.

WHAT

WHAT IS THE IMPACT OF E-COMMERCE ON COLD STORAGE?

Online grocery shopping will play a significant role in the demand for cold storage space.

Nearly half of U.S. consumers already shop for packaged food products online. This is expected to rise to 70% by 2022, translating into an estimated $100 billion spent per year on online grocery, according to the Food Marketing Institute (FMI) and Nielsen. A large portion of this will likely be perishable food items, requiring more freezer/cooler space for storage and distribution. CBRE estimates cold storage space demand of between 70 million and 100 million sq. ft. over the next five years.

GLOBAL TRADE DEMAND INDICATORS

NOTES ON CROSS-BORDER TRADE TO THE U.S.

- Inventory to sales ratio has recently spiked, as retail sales have dropped off across the last two months. The last time it was as high as the current 1.45 was exactly 10 years ago to the month, when in April 2009 the ratio stood at 1.46.
- The recent pandemic has offered lessons on inventory within the supply chain. Goods distributors are planning to carry a higher inventory to guard against future disruption.
- Within the U.S., the ATA's advanced seasonally-adjusted (SA) For-Hire Truck Tonnage Index for April—at 104.9 (2015=100)— was down 12.2%, following a 0.4% gain in March. This came on the heels of a 1.8% February gain over January, which came in at an index of 119.
- On an annual basis, the April SA reading was off 113%, which ATA said represents the largest annual decline going back to April 2009. March's annual SA decline, by comparison, was 3.5%, and on a year-to-date basis through April SA tonnage is down 1.3%.

navis®
PART OF CARGOTEC CORPORATION

A research project by Navis a part of the Cargotec Corporation, surveyed over 165 customers across the globe regarding the impact terminals are seeing during COVID-19, the top concerns they are facing and how technology is playing a role in the shift to remote operations. According to the report, due to COVID-19, 89% of respondents are seeing a moderate or greater impact on their business, causing the need to adapt their operational strategies to the changing landscape.

panjiva
RESEARCH

- According to global trade intelligence firm Panjiva, April shipments—at 1,126,970—saw a 13% annual increase, well ahead of March's -10% reading, and on a year-to-date basis through March, U.S.-bound shipments—at 3,836,078—were off 1.6% compared to the same period a year ago, an improvement over the -6.8% year-to-date drop through March.

- Even though there was clear improvement in April shipments, Panjiva reported containerized shipments lagged, down 5.1% annually in April to 2.24 million TEU (Twenty-Foot Equivalent Units) and down 5.2% year-to-date through April, to 8.71 million TEU.

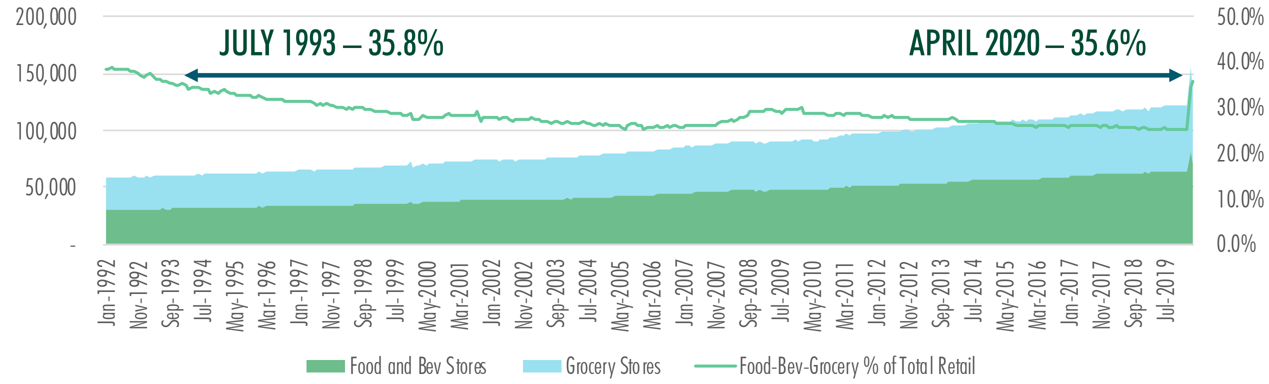
- Researchers suggest that the rise in U.S.-bound shipments were boosted by the surge in LCL (less-than-container) shipments coming from China, and was effectively driven by a mixture of an increase in e-commerce and drop-ship flows, as well as some Chinese factories coming back online not being fully re-opened and only have partial output ability.\

- Some countries shipped at considerable gains. Shipments out of Vietnam to the U.S. rose 27.7% in April, with South Korea up 16.1%, and Singapore up 18%, as these countries were able to maintain industrial production amid COVID-19. Shipments out of the EU were up 1.9%, which is remarkable given the industrial shutdown in EMEA.

U.S. FOOD & BEVERAGE STORES + GROCERY STORE SALES

TOTAL SALES AND AS A SHARE OF TOTAL U.S. RETAIL SALES

- Despite being surpassed by restaurant sales in 2015, grocery sales have been on a steady rise since data began being collected by the U.S. Census in 1992.
- In April, the total retail share of grocery stores and food and beverage stores hit 35.6%, which is the highest monthly share of those segments since July 1993. This could indicate a trend, with U.S. consumers shifting expenditure away from discretionary products and back to essentials.



JULY 1993 – 35.8%

APRIL 2020 – 35.6%

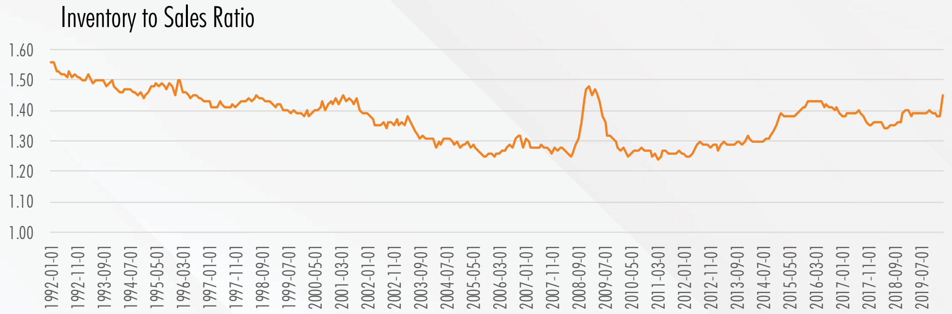
Source: BEA, Oxford Economics, CBRE Research, April 2020.

INVENTORY TO SALES RATIO

TOTAL U.S. BUSINESS

1. Inventory to sales ratio has recently spiked, as retail sales have dropped off across the last two months. The last time it was as high as the current 1.45 was exactly 10 years ago to the month, when in April 2009 the ratio stood at 1.46.

2. The recent pandemic has offered lessons on inventory within the supply chain. Goods distributors are planning to carry a higher inventory to guard against future disruption.



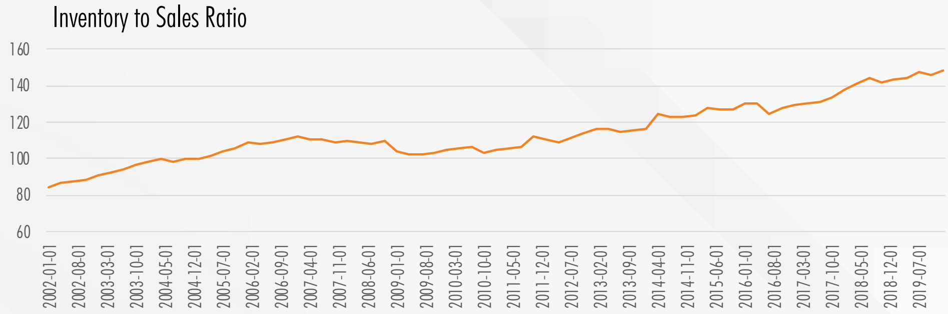
Inventory to Sales Ratio

Source: St. Louis FRED, CBRE Research, May 2020.

REAL IMPORTS OF GOODS

FOODS, FEED, AND BEVERAGES, IN BILLIONS OF USD

1. Import of perishable goods has been steadily increasing since 2009, reaching an all-time high in Q1 2020.



Inventory to Sales Ratio

Source: St. Louis FRED, CBRE Research, May 2020.

APPENDIX G

Michael Mandich (Mandich Group) - Questionnaire Response

APPENDIX G

2020.03.24

Fumigation and Cold Chain Processing Center – Criteria/Questionnaire Mandich Group

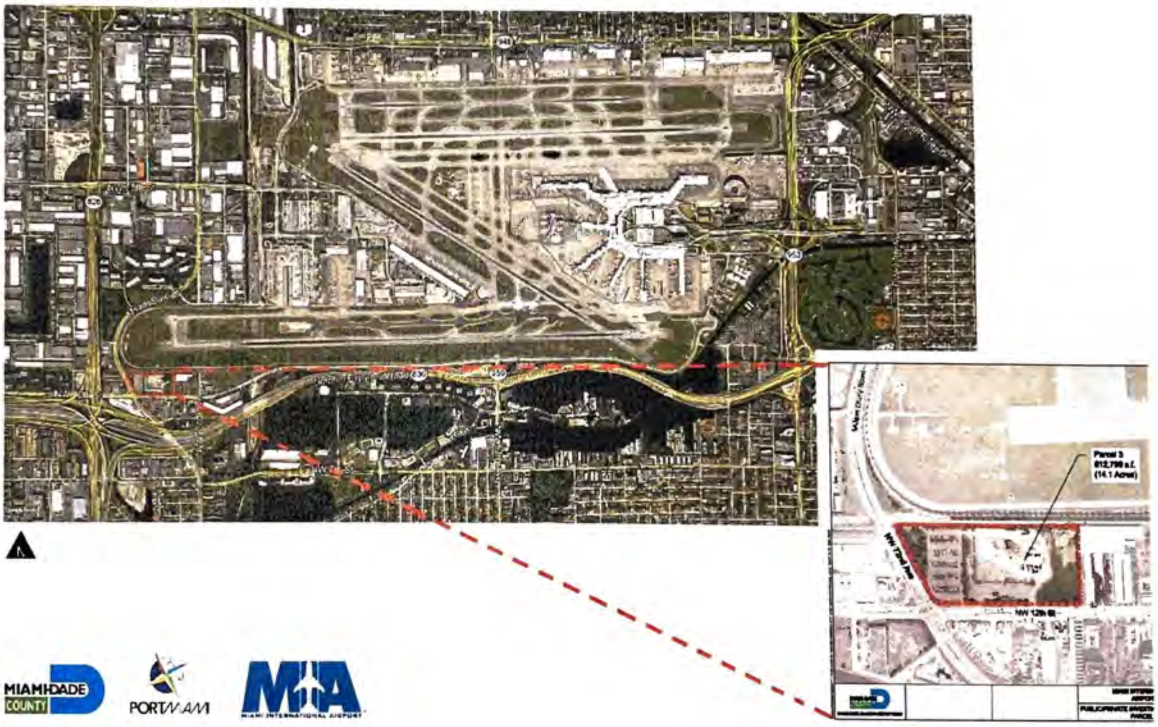
Project Description

Construction of an approximately 100,0000 square feet building to house a third-party operated, state-of-the-art fumigation and cold chain processing center able to further the phytosanitary treatment requirements of 7 CFR 305.5-305.8 and provide space for cold chain processing. Given the lack of land area at PortMiami, the facility will be built on a 14-acre Miami-Dade County-owned site and completed in a single phase.

Site Description

The selected site is owned by Miami-Dade County and located in Miami International Airport's (MIA) property and is bounded by NW 12th Street to the south, Milam Dairy Road to the west, a railroad to the north, and industrial and commercial lot to the west.

Figure 1 - Final Site Location



Funding Structure

PortMiami Contribution Non-Federal $ 10,032,410.00 17%
Private Partner and FDOT Contribution Non-Federal $ 13,500,000.00 24%
Port Infrastructure Development Grant Federal $ 33,500,000.00 59%
Total Project Cost: $ 57,032,410.00 100%

Questionnaire

The purpose of this section is to help PortMiami assess the fumigation and cold chain processing market conditions in Broward and Dade counties by providing observations to develop a competitive fumigation and cold chain processing facility at MIA.

a) **Can you share insight or projections regarding current and/or future cargo volumes in South Florida?** , 82% Pop Growth - Growing tourism sector despite COVID Location to South and Central Am is a benefit to shippers.

b) **What is the recommended lease structure for a fumigation and cold chain processing facility in Miami-Dade County/Broward County?** Ground lease 99 years
Per Port of Tampa Lease with Port logistics Refrigerated Services $26,523 per acre

CPI Increases
Capped 3%
2-year deferral for Construction

c) **What is the average price per square foot of a standard storage warehouse prepared for fumigation and/or cold chain processing?** $175 - $200 per sq ft w/racking and equipment

d) **What is the recommended minimum square feet for a fumigation and cold chain processing center in Miami-Dade County/Broward County?** ~~[illegible]~~ 150,000 sq ft

e) **Assuming 150,000 structure is the minimum size to offset construction and begin generating revenue - What is your recommended ratio of fumigation space to cold chain processing for a space of up to 150,000 sf? The goal is to generate a minimum percentage of fumigation to cold chain processing space the future facility could provide to be competitive in the local and regional marketplace.** 5 - 10%

f) **Are there any current or future emerging product lines that are anticipated to be market drivers/influencers (ie. Pharmaceuticals and MIA designating it the world's "pharma hub")?**

g) **Does nationwide precedence exist for multi-tenant fumigation and/or cold chain processing center (ie. Multiple tenants under one shell structure)?** Not ideal. One operator would create a more efficient operation

Fumigation

1. **What is the standard lease (timeframe) for a fumigation facility in Miami-Dade County/Broward County?** Mirror the groundlease unless talking about a tenant which would more or less be 10 years
2. **What is the average price per square foot of fumigation space in Miami-Dade County/Broward County?** $175 - $200 sq ft
3. **What are the typical commodities being processed through the fumigation spaces in Miami-Dade County/Broward County?** Apples, Bananas, Citrus, Grapes, Mangoes Papayas, Peaches, Pears, Pineapples, Plums, Broccoli, Cucumbers Melons Squash

Cold Chain Processing

1. What is the standard lease (timeframe) for a fumigation facility in Miami-Dade County/Broward County? 50+ years for Ground lease 7-10 years w/tenant
2. What is the average price per square foot of cold chain processing space in Miami-Dade County/Broward County? $250-$300 sq/ft including land
3. What are the typical commodities being processed through the fumigation spaces in Miami-Dade County/Broward County? Fruits & Vegetables

Please provide any additional questions or criteria for a fumigation and cold chain processing center that we may not have covered.

Additional Notes:

APPENDIX H

Bradlee Lord (Seagis Property Group, LP) - Questionnaire Response

APPENDIX H

2020.03.24

Fumigation and Cold Chain Processing Center – Criteria/Questionnaire – Bradlee Lord Response

Project Description

Construction of an approximately 100,0000 square feet building to house a third-party operated, state-of-the-art fumigation and cold chain processing center able to further the phytosanitary treatment requirements of 7 CFR 305.5-305.8 and provide space for cold chain processing. Given the lack of land area at PortMiami, the facility will be built on a 14-acre Miami-Dade County-owned site and completed in a single phase.

Site Description

The selected site is owned by Miami-Dade County and located in Miami International Airport's (MIA) property and is bounded by NW 12th Street to the south, Milam Dairy Road to the west, a railroad to the north, and industrial and commercial lot to the west.

Figure 1 - Final Site Location

Funding Structure

PortMiami Contribution Non-Federal $ 10,032,410.00 17%
Private Partner and FDOT Contribution Non-Federal $ 13,500,000.00 24%
Port Infrastructure Development Grant Federal $ 33,500,000.00 59%
Total Project Cost: $ 57,032,410.00 100%

Questionnaire

The purpose of this section is to help PortMiami assess the fumigation and cold chain processing market conditions in Broward and Dade counties by providing observations to develop a competitive fumigation and cold chain processing facility at MIA.

a) Can you share insight or projections regarding current and/or future cargo volumes in South Florida?
   Unsure
b) What is the recommended lease structure for a fumigation and cold chain processing facility in Miami-Dade County/Broward County?
   Ground lease at a low NNN structure with the airport for 100+ years. Lease the facility to an operator for 10-20 years with options to renew in the $12-15 per square foot Industrial Gross range.
c) What is the average price per square foot of a standard storage warehouse prepared for fumigation and/or cold chain processing?
   Unsure but cooler/freezer space goes for anywhere between $10-$20 per square foot depending on the size of the space down in SFL. Bigger tends to be cheaper.
d) What is the recommended minimum square feet for a fumigation and cold chain processing center in Miami-Dade County/Broward County?
   Unsure
e) Assuming 150,000 structure is the minimum size to offset construction and begin generating revenue - What is your recommended ratio of fumigation space to cold chain processing for a space of up to 150,000 sf? The goal is to generate a minimum percentage of fumigation to cold chain processing space the future facility could provide to be competitive in the local and regional marketplace.
   Considering the perishables will probably need to move out of the facility quickly to its next destination, more fumigation could be more cost effective, but I am no expert.
f) Are there any current or future emerging product lines that are anticipated to be market drivers/influencers (ie. Pharmaceuticals and MIA designating it the world's "pharma hub")?
   Unsure
g) Does nationwide precedence exist for multi-tenant fumigation and/or cold chain processing center (ie. Multiple tenants under one shell structure)?
   Unsure

Fumigation

1. What is the standard lease (timeframe) for a fumigation facility in Miami-Dade County/Broward County?
   Unsure
2. What is the average price per square foot of fumigation space in Miami-Dade County/Broward County?
   Unsure.

3. What are the typical commodities being processed through the fumigation spaces in Miami-Dade County/Broward County?

   Unsure

Cold Chain Processing

1. What is the standard lease (timeframe) for a fumigation facility in Miami-Dade County/Broward County?

   10-15 years
2. What is the average price per square foot of cold chain processing space in Miami-Dade County/Broward County?

   Cold Storage is $200+ PSF for new construction with tall clear height (40'+)
3. What are the typical commodities being processed through the fumigation spaces in Miami-Dade County/Broward County?

   Unsure

Please provide any additional questions or criteria for a fumigation and cold chain processing center that we may not have covered.

Additional Notes:

Higher ceiling heights for the cold chain part of the property will benefit you in the long run. Depending on what the airport will allow, north of 40' clear would be preferred for temperature-controlled space due to the use of cubic feet versus square feet.

APPENDIX I

Gary Goldfarb (Interport Logistics) – Questionnaire Response

APPENDIX I

2020.03.24 Gary M. Goldfarb response

Fumigation and Cold Chain Processing Center – Criteria/Questionnaire

Project Description

Construction of an approximately 100,0000 square feet building to house a third-party operated, state-of-the-art fumigation and cold chain processing center able to further the phytosanitary treatment requirements of 7 CFR 305.5-305.8 and provide space for cold chain processing. Given the lack of land area at PortMiami, the facility will be built on a 14-acre Miami-Dade County-owned site and completed in a single phase.

Site Description

The selected site is owned by Miami-Dade County and located in Miami International Airport's (MIA) property and is bounded by NW 12th Street to the south, Milam Dairy Road to the west, a railroad to the north, and industrial and commercial lot to the west.

Figure 1 - Final Site Location

Funding Structure

PortMiami Contribution Non-Federal $ 10,032,410.00 17%
Private Partner and FDOT Contribution Non-Federal $ 13,500,000.00 24%
Port Infrastructure Development Grant Federal $ 33,500,000.00 59%
Total Project Cost: $ 57,032,410.00 100%

Questionnaire

The purpose of this section is to help PortMiami assess the fumigation and cold chain processing market conditions in Broward and Dade counties by providing observations to develop a competitive fumigation and cold chain processing facility at MIA.

a) Can you share insight or projections regarding current and/or future cargo volumes in South Florida?

b) What is the recommended lease structure for a fumigation and cold chain processing facility in Miami-Dade County/Broward County?

Could be a straight lease or a lease with profit share. Under lease with profit share, the lessee could pay for the actual cost of amortizing the investment and provide a 7% profit share to the county. That would allow the County to participate in the incremental success of the facility.

c) What is the average price per square foot of a standard storage warehouse prepared for fumigation and/or cold chain processing?

$ 14.00 to $ 16.00 psf Industrial Gross

d) What is the recommended minimum square feet for a fumigation and cold chain processing center in Miami-Dade County/Broward County?

Building needs to be a minimum of 150,000 sq. ft. with Frozen, Chilled and Dry space. Fumigation can occur in chambers within the building. Drive in doors are important for fumigation during peek times.

e) Assuming 150,000 structure is the minimum size to offset construction and begin generating revenue - What is your recommended ratio of fumigation space to cold chain processing for a space of up to 150,000 sf? The goal is to generate a minimum percentage of fumigation to cold chain processing space the future facility could provide to be competitive in the local and regional marketplace.

I believe the ratio to be 30/70, 30% being fumigation

f) Are there any current or future emerging product lines that are anticipated to be market drivers/influencers (ie. Pharmaceuticals and MIA designating it the world's "pharma hub")?

Pharma does not require fumigation and pharma buildings are being built right now. This should be focused on getting the current Philadelphia bound cargo to Miami.

g) Does nationwide precedence exist for multi-tenant fumigation and/or cold chain processing center (ie. Multiple tenants under one shell structure)?

Have not seen one. We participated in IAH (Houston) development of their fumigation facility, but no storage.

Fumigation

1. What is the standard lease (timeframe) for a fumigation facility in Miami-Dade County/Broward County?
2. What is the average price per square foot of fumigation space in Miami-Dade County/Broward County?
3. What are the typical commodities being processed through the fumigation spaces in Miami-Dade County/Broward County?

Cold Chain Processing

1. What is the standard lease (timeframe) for a fumigation facility in Miami-Dade County/Broward County?

   5 to 10 years

2. What is the average price per square foot of cold chain processing space in Miami-Dade County/Broward County?

   $ 14.00 to $ 16.00 Industrial Gross

3. What are the typical commodities being processed through the fumigation spaces in Miami-Dade County/Broward County?

   Flowers and leafy vegetables, as well as fruit. Some pallets and tile from pest ridden origins, but mostly perishable produce.

Please provide any additional questions or criteria for a fumigation and cold chain processing center that we may not have covered.

Additional Notes:

APPENDIX J

Jones Lang Lassalle (JLL) - Questionnaire Response

APPENDIX J

2020.03.24

Fumigation and Cold Chain Processing Center – Criteria/Questionnaire – JLL Response

Project Description

Construction of an approximately 100,0000 square feet building to house a third-party operated, state-of-the-art fumigation and cold chain processing center able to further the phytosanitary treatment requirements of 7 CFR 305.5-305.8 and provide space for cold chain processing. Given the lack of land area at PortMiami, the facility will be built on a 14-acre Miami-Dade County-owned site and completed in a single phase.

Site Description

The selected site is owned by Miami-Dade County and located in Miami International Airport's (MIA) property and is bounded by NW 12th Street to the south, Milam Dairy Road to the west, a railroad to the north, and industrial and commercial lot to the west.

Figure 1 - Final Site Location

Funding Structure

PortMiami Contribution Non-Federal $ 10,032,410.00 17%
Private Partner and FDOT Contribution Non-Federal $ 13,500,000.00 24%
Port Infrastructure Development Grant Federal $ 33,500,000.00 59%
Total Project Cost: $ 57,032,410.00 100%

Questionnaire

The purpose of this section is to help PortMiami assess the fumigation and cold chain processing market conditions in Broward and Dade counties by providing observations to develop a competitive fumigation and cold chain processing facility at MIA.

a) Can you share insight or projections regarding current and/or future cargo volumes in South Florida? Modest growth based on 10-year projection.

b) What is the recommended lease structure for a fumigation and cold chain processing facility in Miami-Dade County/Broward County? A Triple Net (NNN) structure is recommended whereby Landlord is responsible solely for the roof and structure including Floor slab. Tenant is responsible for everything else including cold storage equipment maintenance, repairs, and replacements. Due to the significant capital investment a lease term of a minimum of 10 years is recommended to help offset amortization costs.

c) What is the average price per square foot of a standard storage warehouse prepared for fumigation and/or cold chain processing? This varies according to the specifics of the facility. Is it Coolers or Freezers, what is the temperature range, did Tenant or Landlord pa for the coolers? An average is $14-$17 psf, NNN for new product. $11 psf-$13 psf for older buildings with obsolete equipment.

d) What is the recommended minimum square feet for a fumigation and cold chain processing center in Miami-Dade County/Broward County? 50,000 SF. If not the demising costs skyrocket.

e) Assuming 150,000 structure is the minimum size to offset construction and begin generating revenue - What is your recommended ratio of fumigation space to cold chain processing for a space of up to 150,000 sf? The goal is to generate a minimum percentage of fumigation to cold chain processing space the future facility could provide to be competitive in the local and regional marketplace. 20/80 Cold Storage. Cold Storage has a larger pool of potential prospects vs Fumigation

f) Are there any current or future emerging product lines that are anticipated to be market drivers/influencers (ie. Pharmaceuticals and MIA designating it the world's "pharma hub") Online Grocers but has not been seen. Pharma on modest scale

g) Does nationwide precedence exist for multi-tenant fumigation and/or cold chain processing center (ie. Multiple tenants under one shell structure)? JLL (consider irradiation) Yes, there are many. There are multiple Cold Storage 3PL operators that house multiple occupants within a single facility

Fumigation

1. What is the standard lease (timeframe) for a fumigation facility in Miami-Dade County/Broward County? A Triple Net (NNN) structure is recommended whereby Landlord is responsible solely for the roof and structure including Floor slab. Tenant is responsible for everything else including cold storage equipment maintenance, repairs, and replacements. Due to the significant capital investment a lease term of a minimum of 10 years is recommended to help offset amortization costs.

2. What is the average price per square foot of fumigation space in Miami-Dade County/Broward County? Can't not answer

3. What are the typical commodities being processed through the fumigation spaces in Miami-Dade County/Broward County?

Cold Chain Processing

1. What is the standard lease (timeframe) for a fumigation facility in Miami-Dade County/Broward County? Do not have this

2. What is the average price per square foot of cold chain processing space in Miami-Dade County/Broward County? $11 psf NNN -$14 psf NNN depending on age, quality etc

3. What are the typical commodities being processed through the fumigation spaces in Miami-Dade County/Broward County? Aside from usual suspects its recommended that irradiation be explored as option to offer in addition

Please provide any additional questions or criteria for a fumigation and cold chain processing center that we may not have covered.

Additional Notes:

APPENDIX K

Barbara Pimentel (SPR Cold Storage & Distribution, LLC.) – Questionnaire Response

2020.03.24

Fumigation and Cold Chain Processing Center – Criteria/Questionnaire – Barbara Pimentel

Project Description

Construction of an approximately 100,0000 square feet building to house a third-party operated, state-of-the-art fumigation and cold chain processing center able to further the phytosanitary treatment requirements of 7 CFR 305.5-305.8 and provide space for cold chain processing. Given the lack of land area at PortMiami, the facility will be built on a 14-acre Miami-Dade County-owned site and completed in a single phase.

Site Description

The selected site is owned by Miami-Dade County and located in Miami International Airport's (MIA) property and is bounded by NW 12th Street to the south, Milam Dairy Road to the west, a railroad to the north, and industrial and commercial lot to the west.

Figure 1 - Final Site Location

Funding Structure

PortMiami Contribution Non-Federal $ 10,032,410.00 17%
Private Partner and FDOT Contribution Non-Federal $ 13,500,000.00 24%
Port Infrastructure Development Grant Federal $ 33,500,000.00 59%
Total Project Cost: $ 57,032,410.00 100%

Questionnaire

The purpose of this section is to help PortMiami assess the fumigation and cold chain processing market conditions in Broward and Dade counties by providing observations to develop a competitive fumigation and cold chain processing facility at MIA.

a) Can you share insight or projections regarding current and/or future cargo volumes in South Florida? *The demand is projected to outsize current cold storage availability and industry revenue is projected to increase at an annualized rate of 2.8% to $6.5 billion by 2024.*

b) What is the recommended lease structure for a fumigation and cold chain processing facility in Miami-Dade County/Broward County? *sorry but I'm not familiar with this - no comments*

c) What is the average price per square foot of a standard storage warehouse prepared for fumigation and/or cold chain processing? *It could run between $16 to $20 (triple net) per sq. ft.*

d) What is the recommended minimum square feet for a fumigation and cold chain processing center in Miami-Dade County/Broward County*? at least 150K sq. ft –roughly 3.5 acres for building only and additional 2 to 2.5 acres for container fumigation area – these numbers do not include: office space, staff parking, etc…..*

e) Assuming 150,000 structure is the minimum size to offset construction and begin generating revenue - What is your recommended ratio of fumigation space to cold chain processing for a space of up to 150,000 sf? The goal is to generate a minimum percentage of fumigation to cold chain processing space the future facility could provide to be competitive in the local and regional marketplace. *2 to 2.5 acres for container fumigation area*

f) Are there any current or future emerging product lines that are anticipated to be market drivers/influencers (ie. Pharmaceuticals and MIA designating it the world's "pharma hub")? *Definitely pharma*

g) Does nationwide precedence exist for multi-tenant fumigation and/or cold chain processing center (ie. Multiple tenants under one shell structure)? ???

Fumigation *sorry but I'm not familiar with this - no comments*

1. What is the standard lease (timeframe) for a fumigation facility in Miami-Dade County/Broward County?
2. What is the average price per square foot of fumigation space in Miami-Dade County/Broward County?

3. What are the typical commodities being processed through the fumigation spaces in Miami-Dade County/Broward County? *Tropical and exotic produce, Flowers (Asparagus is a flower*)

Cold Chain Processing

1. What is the standard lease (timeframe) for a fumigation facility in Miami-Dade County/Broward County? *5 to 10 years*

2. What is the average price per square foot of cold chain processing space in Miami-Dade County/Broward County?

3. What are the typical commodities being processed through the fumigation spaces in Miami-Dade County/Broward County? *Tropical and exotic produce, Flowers (Asparagus is a flower*)

Please provide any additional questions or criteria for a fumigation and cold chain processing center that we may not have covered.

Additional Notes:

APPENDIX L

Robert H. Faye (Florida Freezer Limited Partnership) – Questionnaire Response

APPENDIX L

2020.03.24

Fumigation and Cold Chain Processing Center – Criteria/Questionnaire – Robert Fay

Project Description

Construction of an approximately 100,0000 square feet building to house a third-party operated, state-of-the-art fumigation and cold chain processing center able to further the phytosanitary treatment requirements of 7 CFR 305.5-305.8 and provide space for cold chain processing. Given the lack of land area at PortMiami, the facility will be built on a 14-acre Miami-Dade County-owned site and completed in a single phase.

Site Description

The selected site is owned by Miami-Dade County and located in Miami International Airport's (MIA) property and is bounded by NW 12th Street to the south, Milam Dairy Road to the west, a railroad to the north, and industrial and commercial lot to the west.

Figure 1 - Final Site Location

Funding Structure

PortMiami Contribution Non-Federal $ 10,032,410.00 17%
Private Partner and FDOT Contribution Non-Federal $ 13,500,000.00 24%
Port Infrastructure Development Grant Federal $ 33,500,000.00 59%
Total Project Cost: $ 57,032,410.00 100%

Questionnaire

The purpose of this section is to help PortMiami assess the fumigation and cold chain processing market conditions in Broward and Dade counties by providing observations to develop a competitive fumigation and cold chain processing facility at MIA.

a) Can you share insight or projections regarding current and/or future cargo volumes in South Florida?

a. Florida Freezer is actively seeking to expand its existing cold storage business base (current base is an owned cold storage facility in Lee County, FL, a leased cold storage facility in Miami-Dade County, FL and a leased dry facility in Polk County, FL), particularly in South Florida to be in position for the growth of the region AND for the growth of Miami as a port through which import and export goods flow.

b) What is the recommended lease structure for a fumigation and cold chain processing facility in Miami-Dade County/Broward County?

a. Depends on ownership and equity sharing of facility and improvements. For example, who owns and controls the refrigeration system(s) should in theory benefit from energy efficiencies directly. Knowing those conditions will help to determine whether a triple net or gross lease arrangement is more suitable. Otherwise, a long term lease, with CPI renewal periods is desirable for all parties.

c) What is the average price per square foot of a standard storage warehouse prepared for fumigation and/or cold chain processing?

a. $7.75-$.825 per Sqft at a triple net basis for a 15 year lease. Renewals on CPI. Operating Expenses TBD. This is NOT the revenue of the facility, simply the base occupancy expense.

d) What is the recommended minimum square feet for a fumigation and cold chain processing center in Miami-Dade County/Broward County?

a. Thinking in terms of cubic feet, the square footage ratio for fumigation and cold chain processing, is first determinable on the maximum height of the facility that may be achieved on this site. After that consideration, it will be optimal to have rooms that are convertible rather than static to the function of fumigation, or ripening, or any other specialized function. While some space is lost to walls, built in flexibility ought to provide long term adaptability to handle seasonality, changes to market conditions, and other unforeseen opportunities. Although larger may be achievable and desirable, the minimum effective size of a cold chain with fumigation in the South Florida market is 4,000,000 cubic feet (100,000 sqft at a 40’ clear height).

e) Assuming 150,000 structure is the minimum size to offset construction and begin generating revenue - What is your recommended ratio of fumigation space to cold chain processing for a space of up to 150,000 sf? The goal is to generate a minimum percentage of fumigation to cold chain processing space the future facility could provide to be competitive in the local and regional marketplace.

    a. Thinking in terms of cubic feet, the square footage ratio for fumigation and cold chain processing, is first determinable on the maximum height of the facility that may be achieved on this site. After that consideration, it will be optimal to have rooms that are convertible rather than static to the function of fumigation, or ripening, or any other specialized function. While some space is lost to walls, built in flexibility ought to provide long term adaptability to handle seasonality, changes to market conditions, and other unforeseen opportunities. At 150,000 sqft and a 40' clear height, the facility has an earning power in the market of 6 million cubic feet. If the cubic capacity of the building is high, then the ratio of fumigation is significantly lower, especially if space above may be utilized for storage. In whichever scenario (high cube or a more traditional lower cube facility), automation of handling and storage will be key to unlocking greater opportunities.

f) Are there any current or future emerging product lines that are anticipated to be market drivers/influencers (ie. Pharmaceuticals and MIA designating it the world's "pharma hub")?

    a. Pharma is certainly one potential driver of business and is less likely to exhibit the seasonality of goods like floral. Other goods that ought to be sought after are the food staples of growing populations, seafood, traditional animal proteins, plant based proteins, produce, and a wide assortment of prepared fresh and frozen foods, including ice cream. Beverages (alcoholic and specialties) should not be ruled out as product lines to pursue, nor should the entire realm of cold chain related e-commerce support. As previously stated, automation should be considered up front to maximize opportunities.

g) Does nationwide precedence exist for multi-tenant fumigation and/or cold chain processing center (ie. Multiple tenants under one shell structure)?

    a. Yes. There are various scenarios in which multiple parties are together under one roof, although they are not in that instance considered "tenants" but rather clients of the public warehouse operator. Florida Freezer has a large list of public warehouse clients, many of which compete against one another, that store goods within Florida Freezer's warehouses. Florida Freezer also has tenants to whom it leases space. In Florida Freezer's Miami warehouse, Florida Freezer is one of at least five (5) tenants that used a shared dock space. While it may be unusual to have multiple public warehouse operators under the same roof, it would not be novel to have a public warehouse operator, and specialty service providers, and even assembly or manufacturing under one roof as "tenants". The consolidated client concept also extends to the inbound and outbound transportation, where multiple owners of goods may have the products comingled in a container (truck, TEU, railcar, etc) for efficient and cost effective transport to/from a destination.

Fumigation

1. What is the standard lease (timeframe) for a fumigation facility in Miami-Dade County/Broward County?
    a. 10 to 15 years

2. What is the average price per square foot of fumigation space in Miami-Dade County/Broward County?
    a. Will follow industrial space market, but should be kept in the context of the cold chain facility as answered above in Question C.

3. What are the typical commodities being processed through the fumigation spaces in Miami-Dade County/Broward County?
    a. Assumption could be made that it is similar to other ports where imported fruits and vegetables are the mainstay of fumigation activity. The USDA maintains an online searchable database of importable goods (by country of export) and the pest control mitigation strategies acceptable for each. An example of broccoli from Mexico may be found at https://epermits.aphis.usda.gov/manual/index.cfm?action=cirReportP&PERMITTED_ID=10597237. Other commodities will included live plants and cut florals. When broadening out the definition of fumigation to include any gassing or ripening, the product line quickly includes bananas, some apple varieties, are certain types of exotic produce.

Cold Chain Processing

1. What is the standard lease (timeframe) for a fumigation facility in Miami-Dade County/Broward County?
    a. See above responses.

2. What is the average price per square foot of cold chain processing space in Miami-Dade County/Broward County?
    a. See above responses.

3. What are the typical commodities being processed through the fumigation spaces in Miami-Dade County/Broward County?
    a. See above responses.

Please provide any additional questions or criteria for a fumigation and cold chain processing center that we may not have covered.

Additional Notes:

APPENDIX M

Marty Koehler (Hellmann Logistics) – Questionnaire Response

APPENDIX M

2020.03.24

Fumigation and Cold Chain Processing Center – Marty Koehler, Hellmann Logistics - Criteria/Questionnaire

Project Description

Construction of an approximately 100,0000 square feet building to house a third-party operated, state-of-the-art fumigation and cold chain processing center able to further the phytosanitary treatment requirements of 7 CFR 305.5-305.8 and provide space for cold chain processing. Given the lack of land area at Port Miami, the facility will be built on a 14-acre Miami-Dade County-owned site and completed in a single phase.

Site Description

The selected site is owned by Miami-Dade County and located in Miami International Airport's (MIA) property and is bounded by NW 12th Street to the south, Milam Dairy Road to the west, a railroad to the north, and industrial and commercial lot to the west.

Figure 1 - Final Site Location

Funding Structure

Port Miami Contribution Non-Federal $ 10,032,410.00 17%
Private Partner and FDOT Contribution Non-Federal $ 13,500,000.00 24%
Port Infrastructure Development Grant Federal $ 33,500,000.00 59%
Total Project Cost: $ 57,032,410.00 100%

Questionnaire

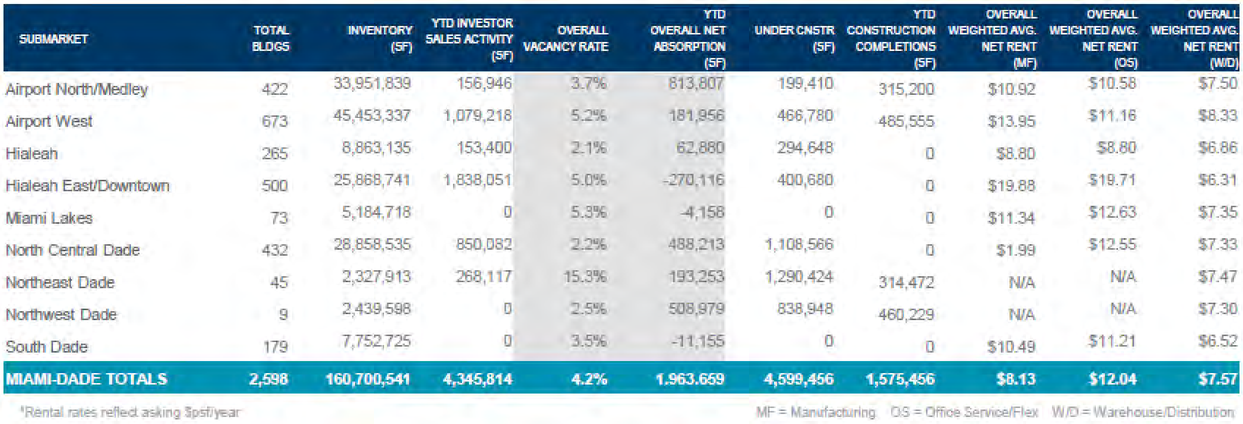
The purpose of this section is to help Port Miami assess the fumigation and cold chain processing market conditions in Broward and Dade counties by providing observations to develop a competitive fumigation and cold chain processing facility at MIA.

The answers provided are directional in nature and represent our first pass at researching the topics below. The financial numbers provided are estimates and should be considered as "+or-". As the project begins to take more shape Hellmann would recommend a deeper market analysis and demand planning excise be conducted. We would be willing to collaborate with the appropriate teams to facilitate that effort.

a) Can you share insight or projections regarding current and/or future cargo volumes in South Florida? Air freight volume touching MIA International Airport is expected to rise up to 2.7 million tons per annum by 2023 from approx. 2.3 million tons in 2019, according to a CBRE study. Port Miami experienced a record year in 2019, with over 1.1 million TEUs handled in the port, a 3.4% gain vs. the prior year. At the same time (in 2019), Port Everglades loaded over 766,000 TEUs while FLL Airport handled 115,000 tons of air freight. Another factor that should not be ignored is cross-border traffic coming from Mexico by truck. These traffic flows accounted for USD 429 billion of cargo, both US exports and imports.

b) What is the recommended lease structure for a fumigation and cold chain processing facility in Miami-Dade County/Broward County? Leases are typically "triple net" with a base rent figure – operating expenses (i.e. taxes, utilities, and maintenance). Tenant improvements are added and amortized as well. TIs are a big part of the commercial structure when modifying existing space to accommodate fumigation and cold store requirements.

c) What is the average price per square foot of a standard storage warehouse prepared for fumigation and/or cold chain processing?
The net rent square foot prices range depending on the region within MIA. In the category of Warehouse and Distribution (WD) the net rent is at $7,57 in average for MIA Dade.



SUBMARKET	TOTAL BLDGS	INVENTORY (SF)	YTD INVESTOR SALES ACTIVITY (SF)	OVERALL VACANCY RATE	YTD OVERALL NET ABSORPTION (SF)	UNDER CNSTR (SF)	YTD CONSTRUCTION COMPLETIONS (SF)	OVERALL WEIGHTED AVG. NET RENT (MF)	OVERALL WEIGHTED AVG. NET RENT (OS)	OVERALL WEIGHTED AVG. NET RENT (W/D)
Airport North/Medley	422	33,951,839	156,946	3.7%	813,807	199,410	315,200	$10.92	$10.58	$7.50
Airport West	673	45,453,337	1,079,218	5.2%	181,956	466,780	485,555	$13.95	$11.16	$8.33
Hialeah	265	8,863,135	153,400	2.1%	62,880	294,648	0	$8.80	$8.80	$6.86
Hialeah East/Downtown	500	25,868,741	1,838,051	5.0%	-270,116	400,680	0	$19.88	$19.71	$6.31
Miami Lakes	73	5,184,718	0	5.3%	-4,158	0	0	$11.34	$12.63	$7.35
North Central Dade	432	28,858,535	850,082	2.2%	488,213	1,108,566	0	$1.99	$12.55	$7.33
Northeast Dade	45	2,327,913	268,117	15.3%	193,253	1,290,424	314,472	N/A	N/A	$7.47
Northwest Dade	9	2,439,598	0	2.5%	508,979	838,948	460,229	N/A	N/A	$7.30
South Dade	179	7,752,725	0	3.5%	-11,155	0	0	$10.49	$11.21	$6.52
MIAMI-DADE TOTALS	**2,598**	**160,700,541**	**4,345,814**	**4.2%**	**1.963.659**	**4,599,456**	**1,575,456**	**$8.13**	**$12.04**	**$7.57**

*Rental rates reflect asking $psf/year

MF = Manufacturing OS = Office Service/Flex W/D = Warehouse/Distribution

To account for the investment costs of a cold storage/ fumigation setup the depreciation has to be considered. For illustrative purposes, the following example that would lead to additional $3,33 per sq. ft p.a.

Investment: $500k
Space: 15,000 sq. ft
Depreciation: 10 years

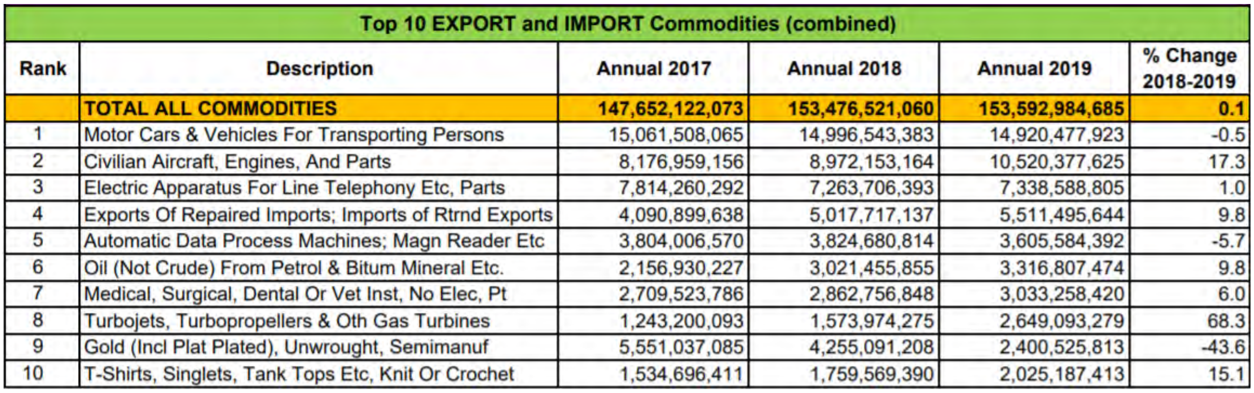
In addition to the net rent and the CAPEX depreciation costs there are further costs to be considered that vary greatly depending on each situation: OPEX, Electricity, Tax, etc.

d) What is the recommended minimum square feet for a fumigation and cold chain processing center in Miami-Dade County/Broward County? To leverage economies of scale as much as possible and at the same time have the highest possible fill rate within the warehouse a minimum footprint of 100-120k sq ft should be aimed at. While larger space still decreases the rent costs the cost for unutilized space impacts the cost scenario negatively. With that being said the demand and therefore the market potential to utilize the space determines where the optimum footprint lies.

e) Assuming 150,000 structure is the minimum size to offset construction and begin generating revenue - What is your recommended ratio of fumigation space to cold chain processing for a space of up to 150,000 sf? The goal is to generate a minimum percentage of fumigation to cold chain processing space the future facility could provide to be competitive in the local and regional marketplace. Deeper research would be required to determine exactly what the right ratio would be. Below is a link of the FDA approved fumigation facilities in the US and Florida specifically. Our high-level estimate would be an 80% cold storage to 20% fumigation ratio, but this would need to be further validated.
https://www.aphis.usda.gov/import_export/plants/manuals/ports/downloads/national_treatment_facility_list.pdf

f) Are there any current or future emerging product lines that are anticipated to be market drivers/influencers (ie. Pharmaceuticals and MIA designating it the world's "pharma hub")?

Out of Top 10 Merchandise Export Commodities in 2019, #5 was Human Blood, Animal Blood, Vaccines, etc. with a growth of 4.8% from 2018 to 2019 and #6 Medical, Surgical, Dental Devices, etc. with a growth of 3.1% in the same period. Out of Top 10 Merchandise Import Commodities, #7 Fish Fillets, etc. went slightly down by 1.7% from 2018 and 2019. Unlike other major USA healthcare / pharmaceutical companies' clusters (CA, NJ/NY, IL/OH/IN, TN/GA/NC, etc.), Miami is not a manufacturing hub but transfer (other US locations to Miami to Latin America) and gateway hub (foreign countries to Miami to Latin America) for major trading partners like Brazil, Colombia, Chile, etc. Therefore, medical device and pharmaceutical volumes will continue to climb if Miami remains competitive to other competing hubs like Panama, Uruguay, etc. in terms of cost, flight options, temperature-controlled storages, customs process, etc. Based on the top 10 combined (both export and import) commodities with the highest growth, aircraft parts, gas turbines, and t-shirts are with highest growths from 2018 to 2019. Hellmann also believes that consumer products are a large potential market in and out of LATAM. Further analysis would be needed to validate this.



Top 10 EXPORT and IMPORT Commodities (combined)

Rank	Description	Annual 2017	Annual 2018	Annual 2019	% Change 2018-2019
	TOTAL ALL COMMODITIES	**147,652,122,073**	**153,476,521,060**	**153,592,984,685**	**0.1**
1	Motor Cars & Vehicles For Transporting Persons	15,061,508,065	14,996,543,383	14,920,477,923	-0.5
2	Civilian Aircraft, Engines, And Parts	8,176,959,156	8,972,153,164	10,520,377,625	17.3
3	Electric Apparatus For Line Telephony Etc, Parts	7,814,260,292	7,263,706,393	7,338,588,805	1.0
4	Exports Of Repaired Imports; Imports of Rtrnd Exports	4,090,899,638	5,017,717,137	5,511,495,644	9.8
5	Automatic Data Process Machines; Magn Reader Etc	3,804,006,570	3,824,680,814	3,605,584,392	-5.7
6	Oil (Not Crude) From Petrol & Bitum Mineral Etc.	2,156,930,227	3,021,455,855	3,316,807,474	9.8
7	Medical, Surgical, Dental Or Vet Inst, No Elec, Pt	2,709,523,786	2,862,756,848	3,033,258,420	6.0
8	Turbojets, Turbopropellers & Oth Gas Turbines	1,243,200,093	1,573,974,275	2,649,093,279	68.3
9	Gold (Incl Plat Plated), Unwrought, Semimanuf	5,551,037,085	4,255,091,208	2,400,525,813	-43.6
10	T-Shirts, Singlets, Tank Tops Etc, Knit Or Crochet	1,534,696,411	1,759,569,390	2,025,187,413	15.1

Source: https://www.enterpriseflorida.com/wp-content/uploads/Florida-Trade-Summary.pdf

g) Does nationwide precedence exist for multi-tenant fumigation and/or cold chain processing center (ie. Multiple tenants under one shell structure)? In reviewing the US Department of Agriculture's (USDA) list of approved fumigation facilities, it does not appear multi-tenant fumigation facilities are commonplace in the continental USA. Multi-tenant cold chain facilities have gained popularity in recent years. Examples include FedEx Supply Chain's (formerly GENCO) multi-tenant facilities opened in 2016: http://www.supplychain247.com/article/fedex_genco_rolls_out_multi_tenant_healthcare_warehouse_offering/Healthcare

Fumigation

1. What is the standard lease (timeframe) for a fumigation facility in Miami-Dade County/Broward County? The standard lease timeframe for a fumigation facility, assuming such a facility is to be housed in a warehouse-type facility without extensive office space should be expected to be between seven (7) and twelve (12) years depending on the structure of the lease and any capital expenditures that need to be made and amortized into the rent per square foot. Shorter lease terms would likely not be accepted by a potential landlord given the specific nature of the facility, while potential tenants would likely be turned off by a lease longer than the customary five or ten years, particularly after the implementation of IFRS 16. *(IFRS 16 is an International Financial Reporting Standard promulgated by the International Accounting Standards Board providing guidance on accounting for leases. IFRS 16 was issued in January 2016)*

2. What is the average price per square foot of fumigation space in Miami-Dade County/Broward County? Per the second quarter of 2020, the average asking lease rate (gross lease rate, i.e. including property tax, common area maintenance, and property management) in Miami is USD 9.81 per square foot, per annum. The facility's intended location falls under the submarket Airport/Doral, where the average asking lease rate is significantly higher at USD 10.31 per square foot (SF), per annum. Both figures do not take into account any amortized investments made by the landlord. Rental rates for pure warehousing space in the Airport West/Doral submarket per Q2/2020 fall around USD 9.30-9.60/SF, per annum, assuming operating expenses of USD 1.25-1.50/SF per annum on a net rent of USD 8.06/SF.

   In Broward County, average asking rents for pure warehousing space as described above are at USD 10.60-10.85 per square foot, assuming operating expenses of USD 1.25-1.50/SF per annum on a net rent of USD 9.35/SF. Rents for mixed-use industrial property with office space are significantly higher than Miami-Dade county, reaching USD 15.80-16.05/SF per annum, considering the same amount(s) for operating expenses. Average rents are influenced by the North and Southwest Broward areas, as Central Broward (Fort Lauderdale incl. FLL Airport area) average rents are lower than the average, with a Q2/2020 average of USD 14.69-14.94/SF per annum for mixed use space and USD 9.92-10.17/SF per annum for pure warehousing space.

   Source: CBRE and Cushman & Wakefield Market Reports, Q2/2020

3. What are the typical commodities being processed through the fumigation spaces in Miami-Dade County/Broward County? The most common import commodities requiring fumigation in Miami-Dade and Broward Counties are flowers, fresh produce, and other perishables that are generally known to be in danger of containing pests.

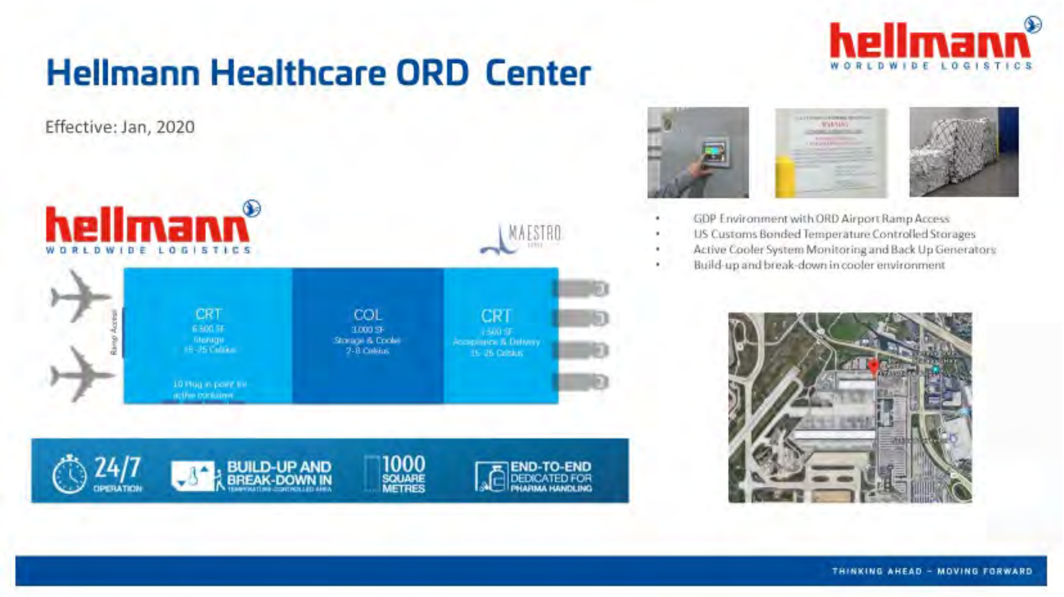
Cold Chain Processing

1. What is the standard lease (timeframe) for a cold chain facility in Miami-Dade County/Broward County?

A typical lease time frame for industrial facilities in Miami-Dade Country/Broward County are anywhere between 7 to 12 years. Since a large cold chain facility requires additional investment such as multiple temperature-controlled chambers (+2 to +8C, +15 to +25C, freezer, temperature controlled unloading/loading area, haz-mat cold chain chambers, etc.) and the fact that perishable (e.g. fish, flowers, etc.) cannot be mixed with pharmaceutical products, a longer lease is desired.

2. What is the average price per square foot of cold chain processing space in Miami-Dade County/Broward County?

   Generally, there are very few cold chain processing space in Miami-Dade County/Broward Country area. Some of those few (source: www.loopnet.com) are ranging anywhere between $12 to $20 / SF / Year. Usually, for pharmaceutical graded level (e.g. flooring, redundant power source, etc.) of cold chain processing space, premium of 35-50% increase (per SF/year) on top of the average price per square foot of regular cold chain processing space should be considered (See the below picture of an airport healthcare facility)



Hellmann Healthcare ORD Center

Effective: Jan, 2020

- GDP Environment with ORD Airport Ramp Access
- US Customs Bonded Temperature Controlled Storages
- Active Cooler System Monitoring and Back Up Generators
- Build-up and break-down in cooler environment

24/7 OPERATION

BUILD-UP AND BREAK-DOWN IN TEMPERATURE-CONTROLLED AREA

1000 SQUARE METRES

END-TO-END DEDICATED FOR PHARMA HANDLING

THINKING AHEAD – MOVING FORWARD

3. What are the typical commodities being processed through the cold chain spaces in Miami-Dade County/Broward County?

   Based on https://www.ustradenumbers.com/imports/, both Miami Airport and Port of Miami handle about 1.5% (by value) of the entire USA import value (Total 176B USD), the top commodities that need cold chain treatment are perishables like fish (Rank #4) and fresh-cut flowers (Rank #6). Pharma is also included in this group.

Please provide any additional questions or criteria for a fumigation and cold chain processing center that we may not have covered.

Additional Notes:

- Can you provide an overview of how this project would be commercialized? “Who does what role”
- What other parties/3PL providers is the port of Miami working with on this project?

APPENDIX N

Transwestern – Questionnaire Response

APPENDIX N

2020.03.24

Fumigation and Cold Chain Processing Center – Criteria/Questionnaire - Transwestern

Project Description

Construction of an approximately 100,0000 square feet building to house a third-party operated, state-of-the-art fumigation and cold chain processing center able to further the phytosanitary treatment requirements of 7 CFR 305.5-305.8 and provide space for cold chain processing. Given the lack of land area at PortMiami, the facility will be built on a 14-acre Miami-Dade County-owned site and completed in a single phase.

Site Description

The selected site is owned by Miami-Dade County and located in Miami International Airport's (MIA) property and is bounded by NW 12th Street to the south, Milam Dairy Road to the west, a railroad to the north, and industrial and commercial lot to the west.

Figure 1 - Final Site Location

Funding Structure

PortMiami Contribution Non-Federal $ 10,032,410.00 17%
Private Partner and FDOT Contribution Non-Federal $ 13,500,000.00 24%
Port Infrastructure Development Grant Federal $ 33,500,000.00 59%
Total Project Cost: $ 57,032,410.00 100%

Questionnaire

The purpose of this section is to help PortMiami assess the fumigation and cold chain processing market conditions in Broward and Dade counties by providing observations to develop a competitive fumigation and cold chain processing facility at MIA.

a) Can you share insight or projections regarding current and/or future cargo volumes in South Florida? See attached historical data. We do not have any projections currently as to future anticipated Port volumes.

b) What is the recommended lease structure for a fumigation and cold chain processing facility in Miami-Dade County/Broward County?

   - 10-15 Year Initial Lease Term with 3% annual escalations.

c) What is the average price per square foot of a standard storage warehouse prepared for fumigation and/or cold chain processing?
   - Varies depending if facility is built as freezer or cooler, along with the ceiling height.

d) What is the recommended minimum square feet for a fumigation and cold chain processing center in Miami-Dade County/Broward County?
   - 100,000 SF Minimum, however if possible, build 150-200,000 SF while allowing room for additional trailer drops on site this would be more ideal as we feel there is sufficient demand in the marketplace to justify building a larger facility from the outset.

e) Assuming 150,000 structure is the minimum size to offset construction and begin generating revenue - What is your recommended ratio of fumigation space to cold chain processing for a space of up to 150,000 sf? The goal is to generate a minimum percentage of fumigation to cold chain processing space the future facility could provide to be competitive in the local and regional marketplace.
   - No more than 5-10% of the total building square footage should be dedicated to fumigation. We recommend keeping the fumigation space as a separate unit, fully demised from the cold storage unit.

f) Are there any current or future emerging product lines that are anticipated to be market drivers/influencers (ie. Pharmaceuticals and MIA designating it the world's "pharma hub")?
   - The Pharma hub designation is expected to bring additional demand for cold storage. Additionally, general population growth, Food Distributors keeping higher levels of inventory on hand to avoid future disruptions in the supply chain, and grocers adopting e-commerce/delivery models are also expected to drive additional demand for cold storage in the future.

g) Does nationwide precedence exist for multi-tenant fumigation and/or cold chain processing center (ie. Multiple tenants under one shell structure)?
    - Varies and is in the process of evolving, however one trend we have seen is the demand for cold storage users who are asking for higher ceiling as they continue to value facilities based on cubic footage/total pallet positions. We are therefore seeing some cold storage facilities being built with ceiling heights of 50', 60' and higher across the country.

Fumigation

1. What is the standard lease (timeframe) for a fumigation facility in Miami-Dade County/Broward County?

2. What is the average price per square foot of fumigation space in Miami-Dade County/Broward County?

3. What are the typical commodities being processed through the fumigation spaces in Miami-Dade County/Broward County?

Cold Chain Processing

1. What is the standard lease (timeframe) for a fumigation facility in Miami-Dade County/Broward County? 5-15 Years. Wide variation because this will depend upon whether the space is a 2nd generation cold storage facility whether the improvements have already been amortized, or a dry facility which the landlord is building the cooler/freezer to suit, in which case a longer lease term will be required.

2. What is the average price per square foot of cold chain processing space in Miami-Dade County/Broward County? Varies depending on submarket

3. What are the typical commodities being processed through the fumigation spaces in Miami-Dade County/Broward County? Produce, Flowers, Meat/Fish/Poultry, Pharmaceuticals

Please provide any additional questions or criteria for a fumigation and cold chain processing center that we may not have covered.

Additional Notes:

APPENDIX O

Grupo Drago (Riccardo Drago) – Questionnaire Response

APPENDIX O

2020.03.24

Fumigation and Cold Chain Processing Center – Criteria/Questionnaire – Riccardo Drago

Project Description

Construction of an approximately 100,0000 square feet building to house a third-party operated, state-of-the-art fumigation and cold chain processing center able to further the phytosanitary treatment requirements of 7 CFR 305.5-305.8 and provide space for cold chain processing. Given the lack of land area at PortMiami, the facility will be built on a 14-acre Miami-Dade County-owned site and completed in a single phase.

Site Description

The selected site is owned by Miami-Dade County and located in Miami International Airport's (MIA) property and is bounded by NW 12th Street to the south, Milam Dairy Road to the west, a railroad to the north, and industrial and commercial lot to the west.

Figure 1 - Final Site Location

Funding Structure

PortMiami Contribution Non-Federal $ 10,032,410.00 17%

Private Partner and FDOT Contribution Non-Federal $ 13,500,000.00 24%

Port Infrastructure Development Grant Federal $ 33,500,000.00 59%

Total Project Cost: $ 57,032,410.00 100%

Questionnaire

The purpose of this section is to help PortMiami assess the fumigation and cold chain processing market conditions in Broward and Dade counties by providing observations to develop a competitive fumigation and cold chain processing facility at MIA.

a) Can you share insight or projections regarding current and/or future cargo volumes in South Florida?

This year with the pandemic (COVID-19) brought us some instability in our projections
Currently we are reduced to what is left of the market
We are trying to reestablish local trade in anticipation of the resumption of suppliers and demands for foreign trade.
But still without a stable scenario

b) What is the recommended lease structure for a fumigation and cold chain processing facility in Miami-Dade County/Broward County?

Our experience is more focused on the Latin American market.
Our suggestion would be to share in the income, so that we can generate a competitive rate that can proactively remunerate all partners

c) What is the average price per square foot of a standard storage warehouse prepared for fumigation and/or cold chain processing?

For general tariffs we have the general storage fee of US$ 2.00 (sqf / month)
As for the cold storage chain and with the advantage of fumigation, it would not have this reference until now.

d) What is the recommended minimum square feet for a fumigation and cold chain processing center in Miami-Dade County/Broward County?

I don't have the demand data, but for a short charge cycle in fumigation it has to be wide with a very fast input and output capacity

e) Assuming 150,000 structure is the minimum size to offset construction and begin generating revenue - What is your recommended ratio of fumigation space to cold chain processing for a space of up to 150,000 sf? The goal is to generate a minimum percentage of fumigation to cold chain processing space the future facility could provide to be competitive in the local and regional marketplace.

I understand that the cold chain does not mix with the fumigation process and must be treated separately, but I confess that I am not aware of the habilitation processes that regulate both

In the cold chain, I understand that volumes are transient and of high turnover, we had installations in the past but regressed due to high operating costs and low demand.

In the fumigation process, we are in demand but suppliers are restricted and procedures are confusing and expensive.

f) Are there any current or future emerging product lines that are anticipated to be market drivers/influencers (ie. Pharmaceuticals and MIA designating it the world's "pharma hub")?
Our expectations in 2019 were strongly focused on this analysis!
Currently we are unable to guide or create such a scenario of evolution or expectation

g) Does nationwide precedence exist for multi-tenant fumigation and/or cold chain processing center (ie. Multiple tenants under one shell structure)?
Our structure in Brazil and Miami works with general management serving all users in a centralized way, which generates conditions and centralizes volume and value capacity.

Fumigation

1. What is the standard lease (timeframe) for a fumigation facility in Miami-Dade County/Broward County?
   Between 10 to 30 years

2. What is the average price per square foot of fumigation space in Miami-Dade County/Broward County?

3. What are the typical commodities being processed through the fumigation spaces in Miami-Dade County/Broward County?
   Foodstuffs
   Cashew nut

Cold Chain Processing

1. What is the standard lease (timeframe) for a fumigation facility in Miami-Dade County/Broward County?
   Between 10 to 30 years

2. What is the average price per square foot of cold chain processing space in Miami-Dade County/Broward County?
   I don't have this information

3. What are the typical commodities being processed through the fumigation spaces in Miami-Dade County/Broward County?
   Foodstuffs

Cashew nut

Please provide any additional questions or criteria for a fumigation and cold chain processing center that we may not have covered.

Additional Notes:
In our experience, we have to say that the cold chain should start with a smaller capacity, with expansion capacity as demand is being absorbed and the market is getting better.

As for the fumigation chain, we believe that the space provided is good and can also be expanded according to the demand variation and consolidation.

Today we are using fumigation export goods from USA to South Africa, inside containers, under severe restrictions, on the supply of services linked to 3 single suppliers, in confusing and poorly operational processes.

Our Group has the capacity and interest to manage this process in partnership with the Port of Miami and Miami-Dade County/Broward County

APPENDIX P

Bridge Development Partners, Inc. – Questionnaire Response

APPENDIX P

PORTMIAMI

BRIDGE Cold

Fumigation and Cold Chain Processing Center

BRIDGE DEVELOPMENT PARTNERS, LLC

FUMIGATION AND COLD CHAIN PROCESSING CRITERIA / QUESTIONNAIRE

PREPARED FOR: PORTMIAMI

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NAME: Aaron Hirschl **COMPANY:** Bridge Development Partners, LLC **Date:** October 2nd, 2020

Fumigation and Cold Chain Processing Center – Criteria/Questionnaire

Project Description

Construction of an approximately 100,0000 square feet building to house a third-party operated, state-of-the-art fumigation and cold chain processing center able to further the phytosanitary treatment requirements of 7 CFR 305.5-305.8 and provide space for cold chain processing. Given the lack of land area at PortMiami, the facility will be built on a 14-acre Miami-Dade County-owned site and completed in a single phase.

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Total Project Cost: $ 57,032,410.00 100%

Questionnaire

The purpose of this section is to help PortMiami assess the fumigation and cold chain processing market conditions in Broward and Dade counties by providing observations to develop a competitive fumigation and cold chain processing facility at MIA.

a) Can you share insight or projections regarding current and/or future cargo volumes in South Florida?

Over the course of the next several years, BRIDGE expects the volume and value of cargo to continue to rise dramatically. As the Port enters a new age of specially-designed cruise terminals, post Panamax ships, and intermodal accessibility, PortMiami ("Port") will continue to have steady cargo growth that is only further propelled by the Port's ongoing multimodal interconnectivity improvements.

Market fundamentals remained healthy in Miami's industrial sector prior to the outbreak of COVID-19. PortMiami's record-shattering fiscal year 2019, with cargo operations posting 1.1 million twenty-foot equivalent units (TEUs) and cruise passengers totaling a world's best 6.8 million passenger total, correlated with the robust warehouse and distribution demand the market experienced throughout 2019. This demand led to a 9 percent uptick in South Florida industrial investment sales, and developers delivered 5.6 million square feet of product to Miami-Dade County. Industrial completions in 2019 exceeded the all-time high set in 2018, and the local inventory expanded by nearly 3 percent.

The impact of the COVID-19 crisis on the South Florida industrial market, of course, remains highly fluid and it is too early to tell what the long-term impacts will be. In first-quarter 2020, as the coronavirus pandemic began to unfold and cause widespread global challenges, the flow of cargo continued to meet essential needs from medical supplies to food, while all cruise lines voluntarily ceased sailings. In addition, after a strong start to the year, COVID-19 caused construction to pause and dimmed demand from space users that service hard-hit industries such as tourism and brick-and-mortar retail. In the short-term, a negative effect on South Florida's hospitality and tourism market could present some headwinds for Miami's industrial market as many hotel and cruise line operators require significant warehousing for their operations.

Having said that, the disruption of the consumer supply chains caused by Covid-19 is causing a new surge and demand for warehouse space, most notably an unprecedented boost in e-commerce, grocery, and medical supply distribution, which are all currently driving the Miami industrial sector despite COVID-19, turning steady demand for space into a growing demand by late 2020. Demand for cold storage, which was already high prior to the COVID-19 pandemic, continues to grow unabated – the e-commerce and online shopping sector will grow at a much faster pace due to the pandemic, meaning many more distribution centers, measuring in the hundreds of millions of square feet over the next 5-7 years.

According to an April report from commercial real estate firm CBRE, an additional 75 million to 100 million square feet of freezer and cooler space is needed to meet booming demand for direct-to-consumer and buy-online/pick-up-in-store services, a trend that has been

accelerated by the COVID-19 pandemic.[1] Locally, activity is picking up in the cold storage space thanks to a number of demand drivers including but not limited to new cruise ships, growing international trade, and Miami's increasing presence as a pharma hub. Miami has long been a key gateway; for instance, flowers (more than 90% of important flowers come through MIA) imported from Colombia, Ecuador, Mexico, and the Netherlands, salmon fillets from Chile, fruits and vegetables from Central America and other imports that require refrigeration in temperatures ranging from 15 degrees for frozen goods to 55 degrees for chilled items – all of these industries, and more, continue to grow, particularly in light of COVID-19:

- **Fresh cut flower imports at Miami International Airport are up 4.14% year to date over the 2018 total of $755.69 million; at Port Everglades, flower imports grew by 72.9% year to date over the 2018 total of $17.54 million.**
- **Imports of fresh and frozen fish fillets imported through Miami International — mostly salmon from Chile — have risen 6.78% year to date over last year; imports through PortMiami are up 2% year-to-date.**
- **Since Miami International Airport became the first U.S. airport designated in 2015 by the Geneva-based International Airport Association (IATA) as a "Pharma Hub," its pharmaceutical-products traffic has grown dramatically. Imports and exports of medicines and other pharma products at Miami International Airport increased by 49% in 2018, up from $3.7 billion in 2017 to $5.5 billion in 2018. Exports out of MIA were up by 22% and imports increased by 100%. This year to date, exports of vaccines and live blood at MIA are up 13.6% over last year.**
- **New cruise ships and terminals at PortMiami and Port Everglades are also helping the niche cold-storage industry grow. Between 2017 and 2018, passenger traffic at the two ports combined grew about 3% — adding another 300,000 to the 9 million passengers filling up at salad bars, multi-course gourmet meals and onboard steakhouses. All of those groceries need to be kept cold until they get loaded aboard.**
- **South Florida's bubbling restaurant scene is also a contributor. There's an increasing demand for food, as a result of the growing number of restaurants and cruise lines.**
- **Cold-storage warehouses are also a key for online grocery stores that deliver goods directly from warehouses. Online grocers are seeing a rush of demand for direct-to-consumer brands. Food deliveries will continue to grow significantly – approximately 75-100 million square feet of cold storage warehouse space will be needed to meet the demand generated by online grocery sales including produce, meat and other perishables. Grocery delivery app downloads hit record levels and worldwide online searched for "grocery delivery" increased 450% versus March 2019 due to Covid-19.**

Based on the above, along with supplemental research performed by Bridge in conjunction to Bridge's review/analysis of local and national research publications, cargo tonnage in South Florida is expected to increase 3% to 4% annually through 2035. PortMiami handled about

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[1] According to a recent survey conducted by the Global Cold Chain Alliance (GCCA), 74 percent of member respondents anticipate demand for e-commerce and direct-to-consumer delivery of chilled and/or frozen product to increase as a result of the pandemic, while 24 percent expect no change, and just 2 percent expect a decrease.

1,084,000 Twenty-foot Equivalency Units (TEUs) of containerized cargo in 2018. According to the Port's 2035 Master Plan, the demand for containerized cargo handling is projected to be nearly 2.7 million TEUs in international trade by the year 2035.[2]

b) What is the recommended lease structure for a fumigation and cold chain processing facility in Miami-Dade County/Broward County?

Given the large capital investment associated with a fumigation and cold chain processing facility, a ground lease need be "longer-term" in order to amortize costs across a longer horizon. Bridge's recommended ground lease structure would be a minimum of fifty (50) years with a 25-year renewal option.

c) What is the average price per square foot of a standard storage warehouse prepared for fumigation and/or cold chain processing?

Pricing will vary based on building's clear height, systems and specifications (including but not limited to variant temperatures, utility requirements, etc.), location, proposed use, number of users, etc. On average, a purpose-built cold storage facility will be anywhere from three (3) to five (5) times more expensive than a standard dry warehouse, or anywhere from $500 to $800 per building SF.

d) What is the recommended minimum square feet for a fumigation and cold chain processing center in Miami-Dade County/Broward County?

At minimum, Bridge would recommend 100,000 to 150,000 SF facility for a fumigation and cold chain processing center in Miami-Dade County/Broward County to accommodate demand in the next 3 to 5 years.

e) Assuming 150,000 structure is the minimum size to offset construction and begin generating revenue - What is your recommended ratio of fumigation space to cold chain processing for a space of up to 150,000 sf? The goal is to generate a minimum percentage of fumigation to cold chain processing space the future facility could provide to be competitive in the local and regional marketplace.

Bridge would work with the Port and its local and global partners and clients to best determine how space inside the facility be allocated. Having said that, Bridge would anticipate that fumigation comprise approximately 25% to 30% of a facility of up to 150,000 SF.

f) Are there any current or future emerging product lines that are anticipated to be market drivers/influencers (i.e. Pharmaceuticals and MIA designating it the world's "pharma hub")?

As detailed herein, the perishables market demand drivers dictate that a new fumigation and cold chain processing center be constructed – either with direct connectivity to the Port or at the Port itself – to provide an alternative to offload perishables at PortMiami that are presently diverted to Northeast US ports and trucked back to South Florida. With a population of 21.6 million and an annual growth rate of 1.6% and over 127 million visitors a year, the Florida market for fruits, vegetables, flowers and other perishables is substantial and ever-increasing.

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[2] Source: PortMiami

The key target perishable import markets for the Cold Chain Processing and Fumigation Center consists of perishable products originating in South and Central America, as well as Mexico and the Caribbean. This market includes dates, figs, blueberries, apples, mangoes, pears, seafood, pineapples, avocados, melons, papayas, grapes, and citrus fruit. In addition to these commodities, fresh flowers also represent a key target market, particularly for air cargo. Exports include Florida citrus, Florida seafood, and U.S. agricultural products such as frozen beef, pork, poultry, and soy.

One of the trends in the shipment of perishables is the change in mode of flower transport, from air to sea. The international flower market has historically transported flowers from the South American and Central America market by air. While in 2017 only 50,000 stems (approximately 1/3 of a 40 ft. container) was transported by ocean, in 2018 almost 27 million stems (approximately 400 TEUs) were transported. This represents an increase of 54,000%. This figure has increased further.3 Predominantly, these arrive from Colombia, Guatemala, Ecuador and Costa Rica, where the new routes by Seaboard Marine and Maersk have been initiated. The seaboard routes are relatively new routes and as time progresses, the traffic of perishables will increase including significant growth in the transport of flowers via sea.

Over the course of the next 10 years, the value of imports is anticipated to rise dramatically, with the highest growth commodity expected to be horticultural products, at almost 4% per year, largely composed of the sales of fresh fruit and vegetables. The U.S. Department of Agriculture Economic Research Service reports that fresh produce imports will rise 45% from 2016 to 2027, which implies that in the next decade over 3/4 of our fruits and half our veggies will be imported from outside of the U.S.[4]

g) Does nationwide precedence exist for multi-tenant fumigation and/or cold chain processing center (i.e. Multiple tenants under one shell structure)?
Absolutely. Given that the cold storage buildings are designed to withstand different temperature ranges, demising walls between tenant spaces allow for each unit to have a different temperature range in their space. This opens the possibility of attracting different types of end-users, whether in the pharmaceutical industry, food processing, floral, food distributions, etc. Accordingly, it is imperative to understand the different kind of end-user that will occupy the space because specifications such as sewage, water and refrigeration needs vary on the type of production on-site. Given the construction of cold storage facilities, much like the one Bridge is currently developing in Hialeah, developing a warehouse with a higher clear height allows for more racking, which in return aligns with the Port's mission to house increasing capacities to offload, store and ship refrigerated containers.

Fumigation

1. What is the standard lease (timeframe) for a fumigation facility in Miami-Dade County/Broward County?
Standard lease terms are contingent upon a number of factors including but not limited to the end-user and market conditions. Given the relatively high cost of Tenant buildout and unique specifications therein, lease terms tend to be longer-term, averaging between 10 and 15

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[3] Source: PortMiami

[4] Source: PortMiami

years. Further, given the increasing demand, Bridge would expect to pre-lease the entirety of the facility – either to a single tenant or multiple tenants – prior to the completion of construction.

2. What is the average price per square foot of fumigation space in Miami-Dade County/Broward County?

   On average, a purpose-built cold storage facility will be anywhere from three (3) to five (5) times more expensive than a standard dry warehouse, or anywhere from $500 to $800 per building SF. A fumigation space would likely be on the higher end of that quoted range from a cost of construction standpoint.

   In terms of the rental rate an end-user would pay the lease the space, it would be entirely contingent on the cost to build out the building shell, in addition to any tenant-specific improvements in the space. Further, a building's clear height – which of course drives the cubic feet of storage capability of a given space – is critical to identifying a potential rental rate. Base rental rates could range anywhere from $0.30 per cubic foot to $0.75 per cubic foot.

3. What are the typical commodities being processed through the fumigation spaces in Miami-Dade County/Broward County?

   Fruits, vegetables, flowers, pharmaceuticals, and other perishables.

Cold Chain Processing

1. What is the standard lease (timeframe) for a fumigation facility in Miami-Dade County/Broward County?

   Standard lease terms are contingent upon a number of factors including but not limited to the end-user and market conditions. Given the relatively high cost of Tenant buildout and unique specifications therein, lease terms tend to be longer-term, averaging between 10 and 15 years. Further, given the increasing demand, Bridge would expect to pre-lease the entirety of the facility – either to a single tenant or multiple tenants – prior to the completion of construction.

2. What is the average price per square foot of cold chain processing space in Miami-Dade County/Broward County?

   In recent years, the demand for cold storage facilities, both Freezer and Cooler, has pushed asking rental rates higher for all clear heights. Generally speaking, Freezer storage lease rates demand a 2-3x premium due to greater storage and handling fees generated at colder temperatures as well as clear heights and cost of infrastructure. Due to the limited availability of new cold storage product and the premium prices being paid for lower clear heights we are seeing the demand for higher cube facilities as users want to be more competitive in an already tight market.

3. What are the typical commodities being processed through the fumigation spaces in Miami-Dade County/Broward County?

   Fruits, vegetables, flowers, pharmaceuticals, and other perishables.

Please provide any additional questions or criteria for a fumigation and cold chain processing center that we may not have covered.

Additional Notes:

South Florida's Class A / B cold storage inventory is undersupplied with only +/- 1.3 million SF of product seen as competitive to Bridge's cold storage facility, Bridge Point Cold Logistics Center, that is under construction in Hialeah, FL. Of that 1.3 million SF of competitive product, only 70% is temperature-controlled space with the average building size of approximately 83,000 SF. Out of the 1.3 million SF there is no leasable space available.

Further, there are limited high clear height cold storage facilities leased in the South Florida today. Bridge's experience in the market dictates that the demand for new cold storage product and operators bring modern clear heights and efficiencies to South Florida in order to improve their operations. Today, the average cold storage facility in South Florida is 27' clear build in the 1970s and 80s. As a market, we are at the beginning of a paradigm shift related to SFL cold storage. For instance, Lineage introduced their newest facility to the market in Hialeah Gardens in early 2020 with rents of $27.65 PSF NNN at 60' clear. This lease rate will soon become the norm as older inefficient buildings become obsolete, land prices increase, and new product is constructed in South Florida.

While most of the country's core markets – including South Florida – have a healthy pipeline of dry warehouse development that will help meet demand from users, the same cannot be said for an increasingly essential part of our supply chain — cold storage facilities. Accordingly, in late 2019, Bridge and PGIM Real Estate, the global real estate investment management business of Prudential Financial, Inc., launched a $150 million national cold storage programmatic joint venture, targeting $400 million in assets nationally, through the development of Class A cold storage facilities as well as the acquisition and repositioning of Class A/Class B cold storage developments across the country. As we mentioned on the call, we recently announced our plans to construct Bridge Point Cold Logistics Center (see Exhibit A), a 312,103-square-foot facility in Hialeah, FL that will be South Florida's first-ever cold storage facility built on a speculative basis, and the first ground-up speculative development for the JV with PGIM. We closed on the site in July 2020 and expect to complete build out by end of 4Q2021. Bridge's commitment to developing state-of-the-art cold storage facilities long-preceded COVID-19; the pandemic, however, has only accelerated the pace of change for cold storage facilities and places even more stress on our supply chain of food and other perishables that require a controlled temperature environment. We look forward to the opportunity to partner with the Port in efforts to solve need / accommodate growing demand and best position PortMiami to capture increasing portions of the perishable market.

Exhibit A – Bridge Point Cold Logistics Center

BRIDGE POINT COLD LOGISTICS CENTER

BRIDGE Cold

NW 162nd St and NW 102 Ave (W 108th St and W 40th Ave) | Miami Dade County

COLD STORAGE/FREEZER WAREHOUSE
NW MIAMI-DADE SUBMARKET

HIGHLIGHTS

- State-of-the-art Cold Storage facility totaling 312,103 square feet.
- Irreplaceable multi-modal logistics location in one of Miami-Dade's premier submarkets, providing immediate access to Florida's Turnpike, I-75, and the Palmetto Expressway.
- Strategically situated to service the entire tri-county region with efficient access to the essential logistics hubs of Port Miami, Port Everglades, Miami International Airport and Ft Lauderdale International Airport.
- Building designed with flexibility in mind to accommodate plethora of users; specifically, each refrigerated room can achieve temperatures ranging from -10° to +55° Fahrenheit.
- 50' clear ceiling heights to maximize the number of pallet positions.
- Ample automotive and trailer parking.
- Divisible to 78,026 SF

AVAILABLE SPACE - UP TO

312,103 SF

LAND SIZE

20.08 Acres

DELIVERY DATE

Q4 2021

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305-351-2452

WAYNE RAMOSKI
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SKYLAR STEIN
Senior Associate
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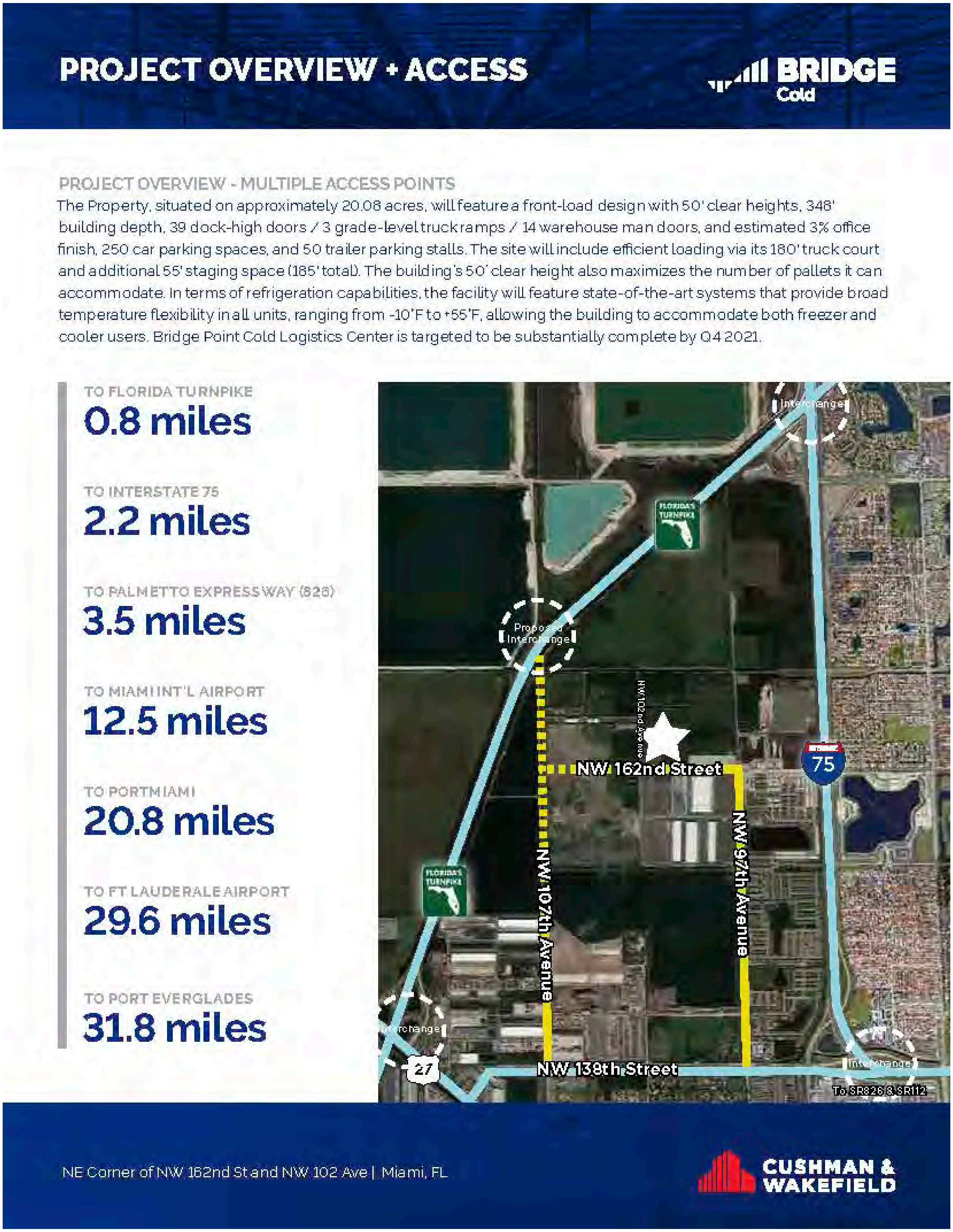
CUSHMAN & WAKEFIELD



PROJECT OVERVIEW + ACCESS

BRIDGE Cold

PROJECT OVERVIEW - MULTIPLE ACCESS POINTS

The Property, situated on approximately 20.08 acres, will feature a front-load design with 50' clear heights, 348' building depth, 39 dock-high doors / 3 grade-level truck ramps / 14 warehouse man doors, and estimated 3% office finish, 250 car parking spaces, and 50 trailer parking stalls. The site will include efficient loading via its 180' truck court and additional 55' staging space (185' total). The building's 50' clear height also maximizes the number of pallets it can accommodate. In terms of refrigeration capabilities, the facility will feature state-of-the-art systems that provide broad temperature flexibility in all units, ranging from -10°F to +55°F, allowing the building to accommodate both freezer and cooler users. Bridge Point Cold Logistics Center is targeted to be substantially complete by Q4 2021.

TO FLORIDA TURNPIKE
0.8 miles

TO INTERSTATE 75
2.2 miles

TO PALMETTO EXPRESSWAY (826)
3.5 miles

TO MIAMI INT'L AIRPORT
12.5 miles

TO PORTMIAMI
20.8 miles

TO FT LAUDERALE AIRPORT
29.6 miles

TO PORT EVERGLADES
31.8 miles

NE Corner of NW 162nd St and NW 102 Ave | Miami, FL

CUSHMAN & WAKEFIELD

BUILDING SPECIFICATIONS

BRIDGE Cold

Bridge Point Cold Logistics Center

312,103 SF
50'-0" CLR. HGT
185 PARKING SPACES
50 TRAILER SPACES

PROJECT DATA

Total Site	20.08 Acres
Total Building	312,103 SF
Divisible To	78,026 SF
Typical Bay Size	±18,360
Office Area	To Suit
Clear Height	±50'
Column Spacing	54' x 60'
Loading	39 OH Doors 10'x11'
Ramps	3-12'x14' Drive-in
Trailer Parking	50 Dedicated
Car Parking	185 Spaces
"IMP" Construction	6" Ins. Metal Panel
Warehouse Lighting	LED - 30 FC @ 36"
Utilities	16" W, 12" Gas, 10" S
ESFR System	Dry TYCO Quell
Floor Slab	8", Under Slab Glycol

- ONE OF THE MOST ACTIVE COLD STORAGE DEVELOPERS IN THE U.S
- ACQUIRED AND DEVELOPED 1.8 MILLION SF OF COLD STORAGE SINCE 2009

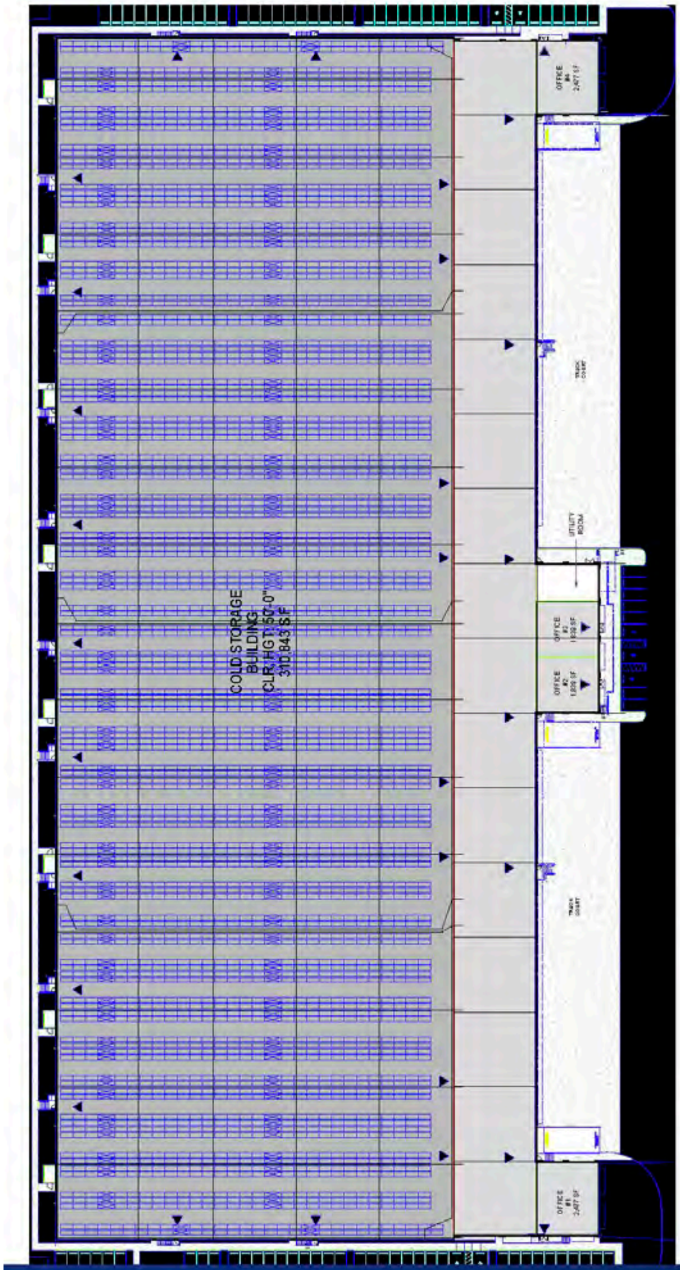
BPC'S 50' CLEAR HEIGHT MAXIMIZES PALLET CAPACITY, PROVIDING USER'S WITH WORLD-CLASS EFFICIENCY THAT RENDERS THE NEED TO LEASE LESS SQUARE FOOTAGE.

NE Corner of NW 162nd St and NW 102 Ave | Miami, FL

CUSHMAN & WAKEFIELD

BUILDING SYSTEMS • RACKING LAYOUT

BRIDGE Cold



Bridge Point Cold Logistics Center can accommodate ±48,280 pallet positions based on a 2-deep, back-to-back configuration, with 78" openings throughout.

RACKING DATA

Typical Building Bay	±18,360
Positions/Bay	±1,663
Pallet Height	@ 70" - 7 High
21' vs 50'	+60% more inventory
Racking Allowance*	TBD

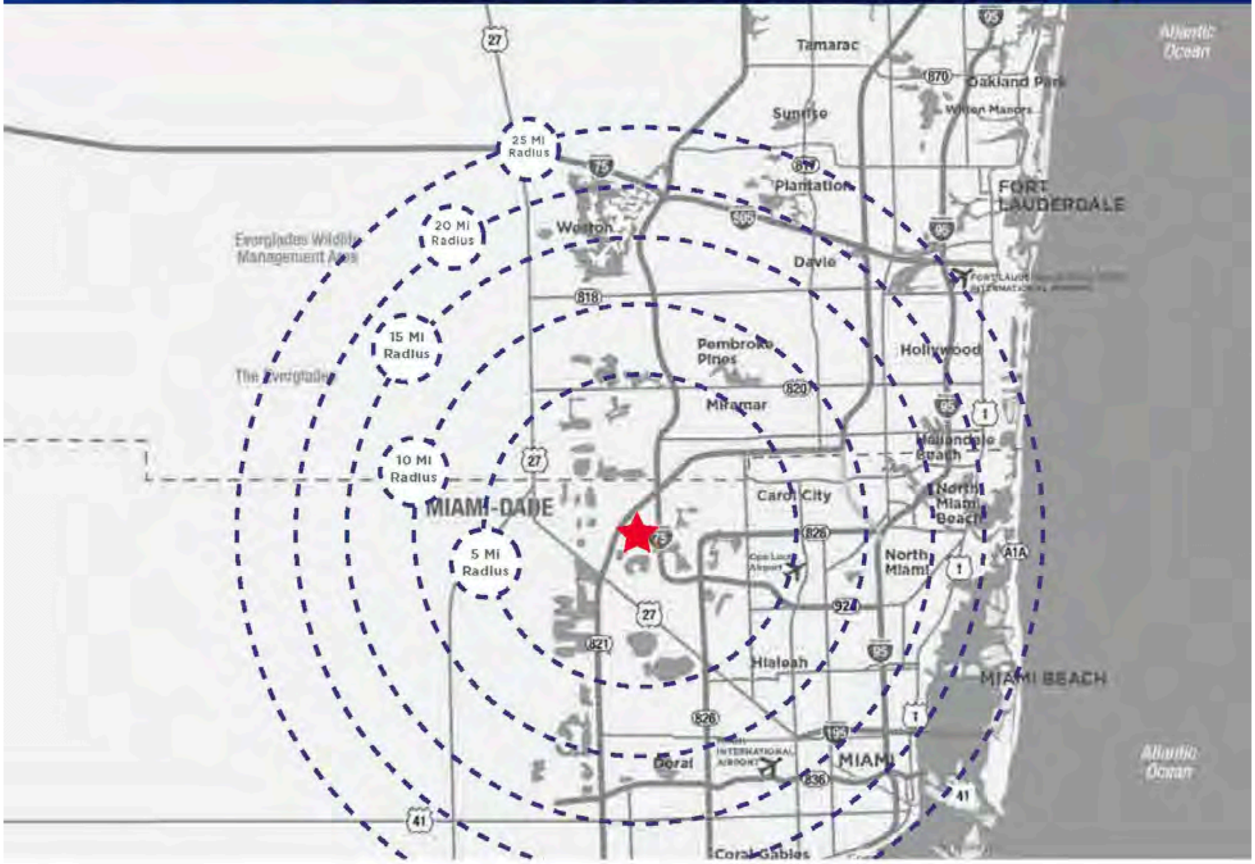
BUILDING SYSTEMS

Construction	6" insulated metal panel walls for the freezer perimeter & to separate the Freezer/Cold Dock areas. Tilt wall construction for cold dock & office.
Building Floor Slab	Under slab glycol heating system, 3" mud slab, 10-mil vapor barrier, 6" insulation, & 8" shrinkage compensating slab.
Refrigeration System	Industrial Split Freon System(s) designed for automatic operation. All Freon packages are industrial stainless steel evaporators with hot gas defrost. Design capacity is as low as -10°F.
Fire Protection System	ESFR dry TYCO Quell system
Electrical	277/480 volt, 3-phase, 4-wire system, 4,000-8,000 amp service.

**Landlord is willing to contribute towards tenant's racking allowance*

LOCATOR MAP • TRAVEL DISTANCES

BRIDGE Cold



Florida Turnpike (proposed entry)	0.80 miles	Miami International Airport	12.5 miles
Interstate 75 (via 138th Street)	2.20 miles	PortMiami	20.8 miles
Palmetto Exp. (826) (via 138th/75)	3.50 miles	Ft Lauderdale International Airport	29.6 miles
Tri-Rail Hialeah Market	12.0 miles	Port Everglades	31.8 miles

TRANSPORT ACCESS
FULL BUS SERVICE

FINANCIAL
INSTITUTIONS

HEALTHCARE
FACILITIES

DINING

PUBLIX
MAJOR RETAILERS
DRUG STORES

LODGING

NE Corner of NW 162nd St and NW 102 Ave | Miami, FL

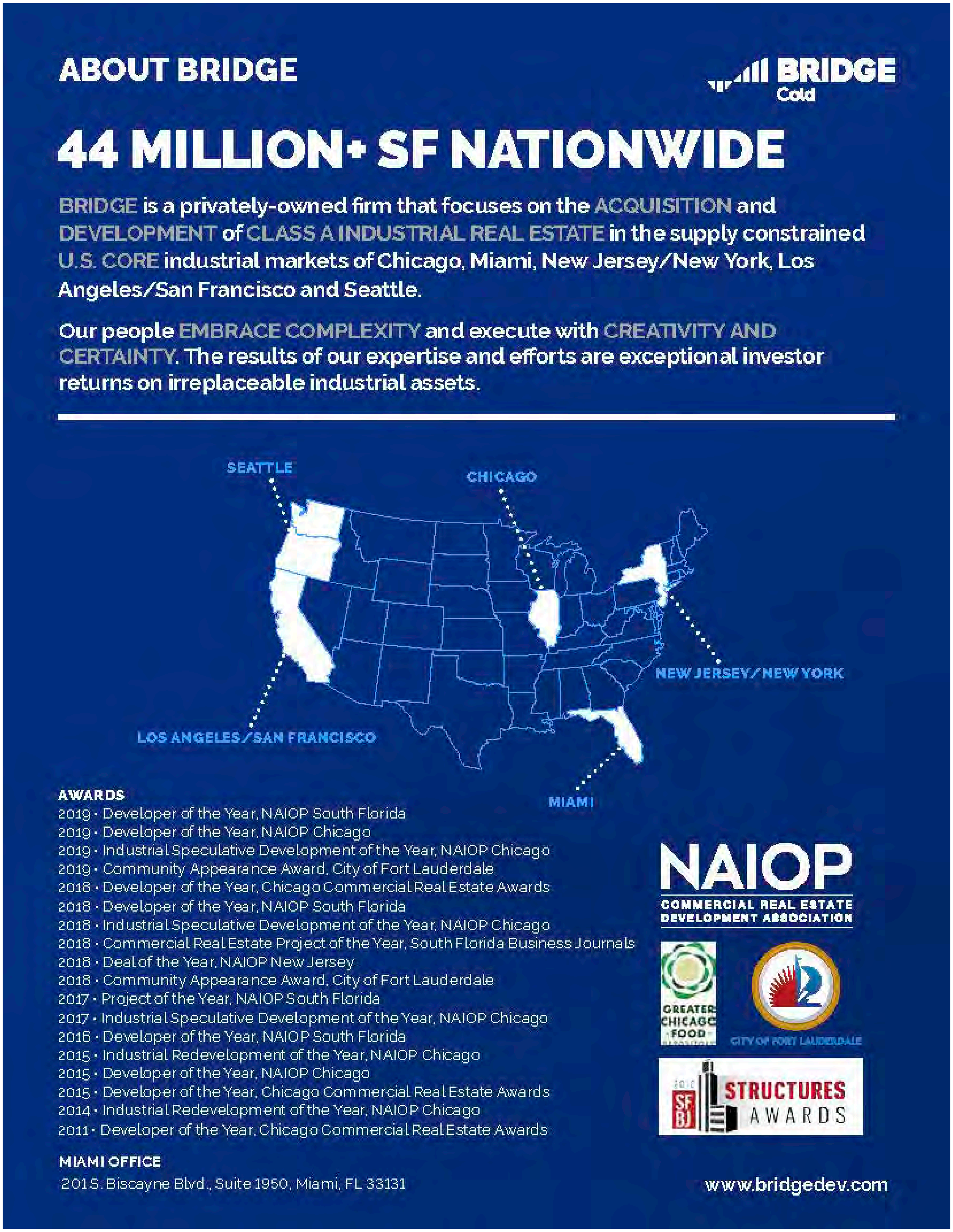
CUSHMAN & WAKEFIELD

CORPORATE NEIGHBORS

BRIDGE Cold

NE Corner of NW 162nd St and NW 102 Ave | Miami, FL

CUSHMAN & WAKEFIELD



ABOUT BRIDGE

BRIDGE Cold

44 MILLION+ SF NATIONWIDE

BRIDGE is a privately-owned firm that focuses on the ACQUISITION and DEVELOPMENT of CLASS A INDUSTRIAL REAL ESTATE in the supply constrained U.S. CORE industrial markets of Chicago, Miami, New Jersey/New York, Los Angeles/San Francisco and Seattle.

Our people EMBRACE COMPLEXITY and execute with CREATIVITY AND CERTAINTY. The results of our expertise and efforts are exceptional investor returns on irreplaceable industrial assets.

AWARDS

2019 · Developer of the Year, NAIOP South Florida
2019 · Developer of the Year, NAIOP Chicago
2019 · Industrial Speculative Development of the Year, NAIOP Chicago
2019 · Community Appearance Award, City of Fort Lauderdale
2018 · Developer of the Year, Chicago Commercial Real Estate Awards
2018 · Developer of the Year, NAIOP South Florida
2018 · Industrial Speculative Development of the Year, NAIOP Chicago
2018 · Commercial Real Estate Project of the Year, South Florida Business Journals
2018 · Deal of the Year, NAIOP New Jersey
2018 · Community Appearance Award, City of Fort Lauderdale
2017 · Project of the Year, NAIOP South Florida
2017 · Industrial Speculative Development of the Year, NAIOP Chicago
2016 · Developer of the Year, NAIOP South Florida
2015 · Industrial Redevelopment of the Year, NAIOP Chicago
2015 · Developer of the Year, NAIOP Chicago
2015 · Developer of the Year, Chicago Commercial Real Estate Awards
2014 · Industrial Redevelopment of the Year, NAIOP Chicago
2011 · Developer of the Year, Chicago Commercial Real Estate Awards

NAIOP
COMMERCIAL REAL ESTATE DEVELOPMENT ASSOCIATION

GREATER CHICAGO FOOD

CITY OF FORT LAUDERDALE

SFBJ STRUCTURES AWARDS

MIAMI OFFICE

201 S. Biscayne Blvd., Suite 1950, Miami, FL 33131

www.bridgedev.com

APPENDIX Q

Cargo Yard Resiliency Improvements + Fumigation & Cold Chain Processing Center PortMiami Grant Application

APPENDIX q

Confirmation

Thank you for submitting your grant application package via Grants.gov. Your application is currently being processed by the Grants.gov system. Once your submission has been processed, Grants.gov will send email messages to advise you of the progress of your application through the system. Over the next 24 to 48 hours, you should receive two emails. The first will confirm receipt of your application by the Grants.gov system, and the second will indicate that the application has either been successfully validated by the system prior to transmission to the grantor agency or has been rejected due to errors.

Please do not hit the back button on your browser.

If your application is successfully validated and subsequently retrieved by the grantor agency from the Grants.gov system, you will receive an additional email. This email may be delivered several days or weeks from the date of submission, depending on when the grantor agency retrieves it.

You may also monitor the processing status of your submission within the Grants.gov system by clicking on the “Track My Application” link listed at the end of this form.

Note: Once the grantor agency has retrieved your application from Grants.gov, you will need to contact them directly for any subsequent status updates. Grants.gov does not participate in making any award decisions.

IMPORTANT NOTICE: If you do not receive a receipt confirmation and either a validation confirmation or a rejection email message within 48 hours, please contact us. The Grants.gov Contact Center can be reached by email at support@grants.gov, or by telephone at 1-800-518-4726. Always include your Grants.gov tracking number in all correspondence. The tracking numbers issued by Grants.gov look like GRANTXXXXXXXX.

If you have questions please contact the Grants.gov Contact Center: support@grants.gov
1-800-518-4726 24 hours a day, 7 days a week. Closed on federal holidays.

The following application tracking information was generated by the system:

Grants.gov Tracking Number: GRANT12936605

Applicant DUNS: 13-191-0254

Submitter's Name: Wall T Dan

CFDA Number:

CFDA Description:

Funding Opportunity Number: 693JF7-19-BAA-0002

Funding Opportunity Description: Port Infrastructure Development Grants

Agency Name: Maritime Administration

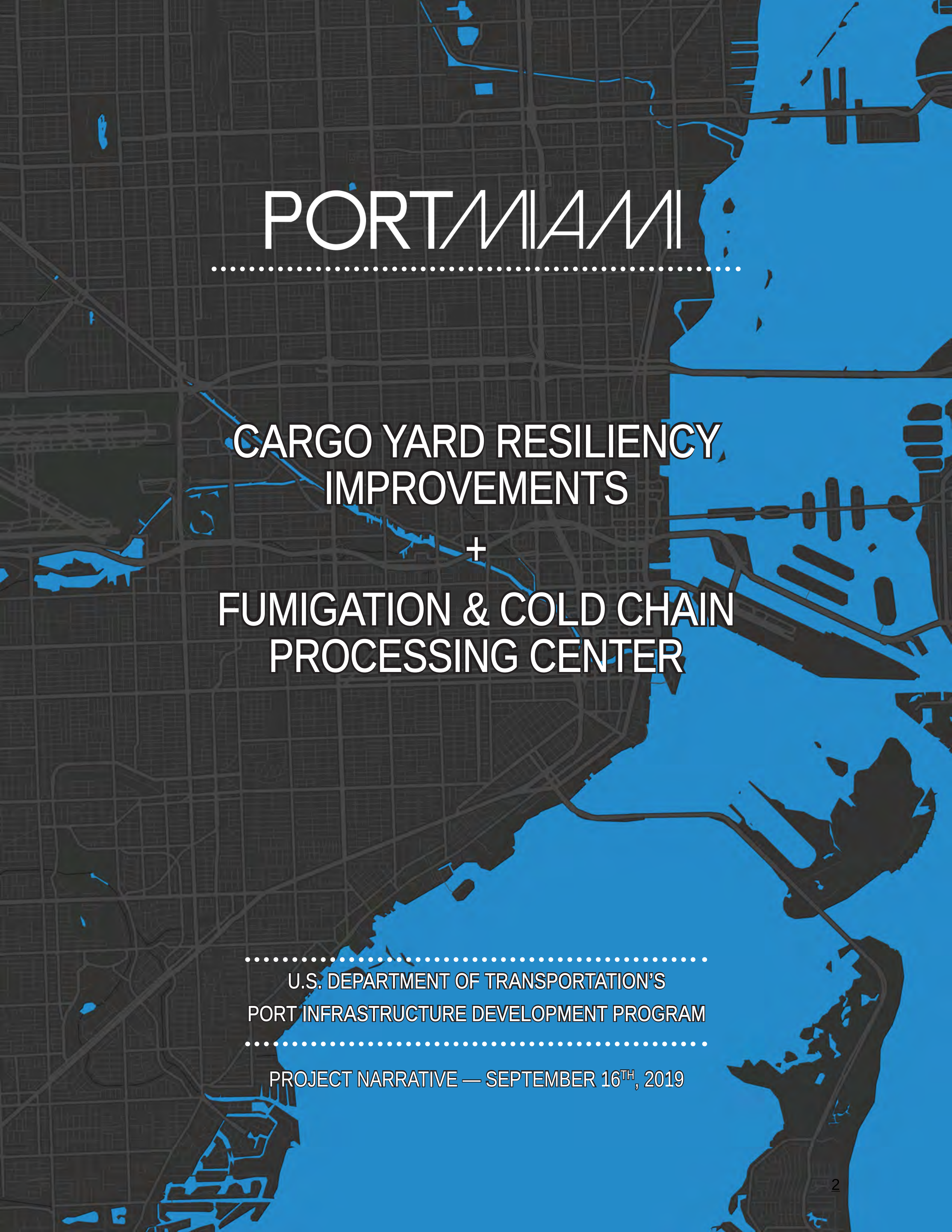
Application Name of this Submission: PortMiami Cargo Yard Resiliency Improvements and Fumigation and Cold Chain Processing Center Project

Date/Time of Receipt: Sep 16, 2019 06:02:46 PM EDT

TRACK MY APPLICATION – To check the status of this application, please click the link below:

https://apply07.grants.gov/apply/spoExit.jsp?p=web/grants/applicants/track-my-application.html&tracking_num=GRANT12936605

It is suggested you Save and/or Print this response for your records.



PORTMIAMI

CARGO YARD RESILIENCY IMPROVEMENTS

+

FUMIGATION & COLD CHAIN PROCESSING CENTER

U.S. DEPARTMENT OF TRANSPORTATION'S
PORT INFRASTRUCTURE DEVELOPMENT PROGRAM

PROJECT NARRATIVE — SEPTEMBER 16TH, 2019

2019 Port Infrastructure Development Program (PIDP) Project Information Form

Field Name	Response
Applicant Name	Miami-Dade County/PortMiami
Project Name	Cargo Yard Resiliency Improvements and Fumigation & Cold Chain Processing Center
Project Description	This application is seeking federal support through the Port Infrastructure Development Program Project that will allow the increase of international trade to PortMiami, which acts as the principal United States trade gateway to Central and South America and the Caribbean. The Project is composed of two primary components mentioned below and described in greater detail to follow. The two components demonstrate a connection by providing improved services along two parts of a sequence of services tailored specifically for perishable cargo entering PortMiami. The first component of this application is the Cargo Yard Resiliency Improvements and will supplement and bring to reality PortMiami infrastructure improvements to upgrade drainage and resiliency methods, along with the reorganization of cargo containers, which allow for the installation of additional refrigerated racks and an overall more efficient yard. These improvements will yield a higher capacity cargo yard, where land is currently at a premium. The second component of this application is for the construction of a Fumigation and Cold Chain Processing Center, on an off PortMiami site, to support the safe flow of agricultural and food products free of pests and diseases, domestically and internationally and further the treatment requirements of 7 CFR 305.5-305.8. The project proposes the construction of a state-of-the-art fumigation and cold chain processing facility within ten (10) miles of PortMiami on County-owned land. The new facility will serve to allow an alternative to offload perishables at PortMiami that are presently diverted to Northeast US ports and truck back to South Florida.
Project Outcomes	The Fumigation & Cold Chain Processing Center and Cargo Yard Resiliency Improvements will improve the safety, efficiency, reliability, and strengthen key points of service along the sequence of cargo processing that is vital to the continued growth for Florida and the nation. It will also improve the port's economic competitiveness by providing additional capacity for cargo phytosanitary treatment, cold chain processing, and value-added services.
Project Zip Code	33152-6624
Opportunity Zone	Yes
Does this project include purchase of any fully automated cargo handling equipment?	No
Anticipated Environmental Reviews (NEPA Status)	No NEPA environmental reviews are required.

Project previously Submitted?	No
Project previously received BUILD/TIGER/FASTLANE/INFRA funding?	No previous funding received
PIDP Grant Amount Requested	$ 43,928,393.00
Future Eligible Project costs	
Total Project Cost (Two Components)	$ 78,758,229.00
Total Federal Funding	$ 43,928,393.0
Total Non-Federal Funding	$ 34,829,836.00
Will RRIF or TIFIA funds be used as part of the project financing?	No

1. PROJECT DESCRIPTION

This application is seeking federal support through the Port Infrastructure Development Program Project that will allow the increase of international trade to and from PortMiami, a major seaport located in Miami-Dade County. The Port acts as the principal United States trade gateway to Central and South America and the Caribbean. The Project is composed of two primary components mentioned below and described in greater detail to follow. The two components demonstrate a connection by providing improved services along two parts of a sequence of services tailored for perishable cargo entering PortMiami.

1.1 Grant Recipient Information - PortMiami

PortMiami (the Port), as the lead/primary point of contact and award recipient, presents this application for the Cargo Yard Resiliency Improvements and Fumigation and Cold Chain Processing Center.

PortMiami is one of the top 15 coastal ports that handled the greatest number of loaded foreign and domestic twenty-foot equivalent units of containerized cargo in 2016, as by the U.S. Army Corps of Engineers.

PortMiami is a designated Department of Miami-Dade County government (Miami-Dade Seaport Department), and is owned by, and operated as an ‘enterprise fund’ of the County. An enterprise fund is used to account for activity in which the cost of providing goods and services is primarily recovered through the fees charged to the users. The Port is among the top 11 container ports in the United States. The Port is an island port and occupies approximately 520 acres of land. With an operating budget of nearly $73.2M and 410 employees, the POM has the resources and history of managing and controlling large grant awards for construction and other port investments.

PortMiami is a vital economic engine contributing $43 billion annual with 334,000 direct and indirect jobs.

The Port has achieved all previous performance goals and outcomes on federally funded initiatives; successfully designed, implemented and completed numerous capital projects, on time, and within budget; and has a professional support to implement and complete all aspects of supervision and contractual obligations of the Cargo Yard Resiliency Improvements and the Fumigation and Cold Chain Processing Center.

In the past, the Port has US$22,767,000 from the U.S. Department of Transportation for the Port of Miami Intermodal and Rail Reconnection project. Also, the Port was awarded INFRA Grants in 2017 for the PortMiami Truck Gate Expansion and Automation Project for US$7,000,000 and in 2019 for the PortMiami Bulkhead Rehabilitation and Capacity Expansion Project for US$8,046,741.

1.2 Cargo Yard Resiliency Improvements

Located in PortMiami the Cargo Yard Resiliency Improvements component of this Project will provide for investments to supplement and bring to reality PortMiami infrastructure improvements. It will upgrade paving, drainage and resiliency methods, along with the reorganization of cargo containers, which allow for the installation of additional refrigerated racks and an overall more yard. These improvements will yield a higher capacity cargo yard, where land is currently at a premium.

1.3 Fumigation and Cold Chain Processing Center

The second component of this application is for the construction of a Fumigation and Cold Chain Processing Center, to support the safe of agricultural and food products free of pests and diseases, domestically and internationally and further the treatment requirements of 7 CFR 305.5-305.8. The project proposes the construction of a state-of-the-art fumigation and cold chain processing center within ten (10) miles of PortMiami on County-owned land. The new facility will serve to allow an alternative to perishables at PortMiami that are presently diverted to Northeast US ports and trucked back to South Florida.

Together, the components of this Project will improve the safety, and reliability of the movement of goods into, and out of the Port, as well as the unloading, loading, and refrigerated capacity of cargo at port facilities that are currently at risk to weather-related and sea-level rise. In addition, for the increase in containers that arrive at the Port, this Project will allow the Port to reorganize to a more yard and improve the Port's economic competitiveness by providing additional capacity for cargo phytosanitary treatment, cold processing to help capture a portion of the perishable markets and bring them to a pivotal region that serves the southeast U.S., the Caribbean, and Latin America.

1.4 Project Challenges

The following port infrastructure, port-related transportation, and safe of agricultural product challenges addressed by the Project's individual components are:

1.4.1 Cargo Yard Resiliency Improvements

- **Improve PortMiami's Capacity to Handle the Increasing Demand for Containerized Cargo -** through infrastructure improvements to the present container yards;
- **Reduce Dwell and Comb Times -** That are the result of related to capacity issues;
- **Reduce Truck Vehicle Miles Traveled (VMT) -** By providing greater refrigerated capacity at PortMiami container yard thus reducing the need to go to storage areas;
- **Provide Resiliency to Cargo Yard Operations -** Through the investment in the surface infrastructure of the cargo yard, improving drainage, raising the level of the aprons to respond to sea level rise;
- **Provide The Cargo Yard Surface Improvements -** To allow for the installation of refrigerated container racks to meet the increasing demand for refrigerated container

1.4.2 Fumigation and Cold Chain Processing Center

- **Support the Safe Flow of Agricultural and Perishable Products -** by providing a fumigation and cold chain processing center to meet the increasing demand for processing of perishable and other commodities in Miami-Dade County and South Florida and in order to further phytosanitary treatment as required under 7 CFR 302.5-305.8:
    - **Construct a consolidated phytosanitary treatment facility** that meets all the requirements of 7 CFR 305.05-305.08;
    - **Build Resiliency to Natural Disasters** by responding to new building code standards for an inland coastal port and provide a state of the art facility in South Florida that can serve as a processing center in response natural or man made disasters other US east coast facilities;
    - **Reduce Truck Vehicle Miles Traveled (VMT)** on Interstate Roads that are the result of the absence of a state-of-the-art consolidated Fumigation and Cold Chain Processing Center in Miami-Dade County
    - **Offer an Alternative To Offload Perishables In PortMiami** to serve the needs of

South Florida residents and visitors;

- **Expand Shelf Life of Agricultural Products** by having a facility that will reduce land based and air borne travel time to South Florida market.
- **Handle Increased Demand for Phytosanitary Treatment of Agricultural Produce And Cold Chain Processing** to respond to cargo growth and new container cargo route development in PortMiami;
- **Reduce Transportation Costs and Emissions** associated with cargo diverted from the Northeast U.S.

1.5 Projects of Independent Utility

Each of the components that comprise the Project while linked, have independent utility. The Cargo Yard Resiliency Improvements are investments to the cargo yard to address drainage and sea level rise issues and provide for refrigerated container racks ("reefer racks") to expand PortMiami's capacity to store and ship refrigerated containers. Refrigerated container at PortMiami is increasing at an unprecedented rate with the opening of new refrigerated container service to various Central and South American destinations.

The new refrigerated container racks at PortMiami's cargo yard will provide additional "reefer" capacity to receive Cold Chain Processing containers to further support the Fumigation & Cold Chain Processing Center. The two components demonstrate a connection by providing improved services along two parts of a sequence of services tailored for perishable cargo. Each component supports one another, but will function independently. As such they have independent utility.

1.5.1 Preferred Project Priority

Both of the proposed project components are considered of equal priority to PortMiami.

1.6 Project Partnerships

The Port presents the following partnerships established for the development of this project should grant funds be awarded for the execution. The partnerships for each of the project components are described in further detail below:

1.6.1 Cargo Yard Resiliency Improvements

There are no project partnerships to note for this component of the project.

1.6.2 PortMiami Fumigation and Cold Chain Processing Center

1.6.2.1 PortMiami and Miami-Dade County

PortMiami is seeking funding assistance to construct a building shell to contain a new phytosanitary treatment facility on **Miami-Dade County (MDC)**-owned land. The grant funds will update an existing cargo yard facility to accommodate the growing demand of containerized cargo, and more that which requires cold processing and fumigation within Miami-Dade County.

1.6.2.2 PortMiami and To Be Determined Third-Party Operator

Port Miami will release a Request for Proposals (RFP) for submissions to operate a state-of-the-art Fumigation and Cold Chain Processing Center within the facility to be constructed by the Port on MDC-owned property. Proposers will be responsible for the purchase of all necessary equipment and furnishings required to operate, and for the operation of the facility.

In preparation of the release of this RFP, PortMiami hosted an Industry Workshop on Friday, August 30th, 2019[1]. The meeting was well-attended by local stakeholders, property-owners, and other representatives of the fumigation and cold chain processing industry of South Florida. Discussions included valuable insight regarding operations demands and facility requirements that would best situate this project component and gauge the temperature for responses to the future RFP. As a result of the meeting, PortMiami received a number of support letters from private industry.[2]

1.6.2.3 **PortMiami and Florida Department of Transportation**

The Florida Department of Transportation has committed $200,000.00 in non-federal funds towards the construction of the Fumigation and Cold Chain Processing Center component of the project.[3]

1.7 Detailed Project Components

The expansion of the Panama Canal, which was completed in June 2016, provides the capacity of the Canal's lock chambers to handle container ships up to about 14,000 TEUs, or post-Panamax ships. Prior to the expansion, the maximum size vessels that could transit the locks was about 4,500 TEUs. The impact of the larger Panama Canal is already impacting the size of the vessels moving through the Canal. Due to this shift in the cargo industry, the demand for U.S. ports to house the incoming cargo has been increasing at an remarkable rate. PortMiami ("Port"), handled about 1,084,000 Twenty-foot Equivalency Units (TEUs) of containerized cargo in 2018. According to the Port's 2035 Master Plan, the demand for containerized cargo handling is projected to be nearly 2.7 million TEUs in international trade by the year 2035[4].

However, PortMiami is an island port and the present lack of space to increase capacity will impact the Port's ability to meet the growing demand. Using the current of the Port, of TEUs/acre is required to provide the additional operating capacity needed. Achieving such an improved level of operational requires investments in infrastructure improvements. A major challenge is PortMiami's lack of space for expansion and the need to improve the Port's capacity to handle the increasing demand for containerized cargo.

The ocean total trade (exports and imports) of refrigerated goods products in South Florida has increased by 7.1% from 2014 to 2018[5]. PortMiami recorded a growth of 21.2% for this same period, which is explained by a increase in imports (26.9%) to reach 53,000 TEUs of refrigerated containers in 2018.

PortMiami is the closest US port to the regions that concentrate most of their perishable exports to South Florida. Central America and the west coast of South America together account for more than 80% of perishable imports to PortMiami. Seaboard Marine has been operating an express routes from Peru and Ecuador to Miami that in 2018 resulted in a 300% increase in Peruvian cargo and an 88% increase in cargo from Ecuador. In 2019, Seaboard has started an express route to Colombia and plans a new route to Chile in the next 6 monthes. This new service will provide increased international trade for perishables and other commodities. As time progresses the of perishables will increase including growth in the transport of via sea, as other ocean carriers like CMA-CGM are currently developing new routes linking Colombia to Miami.

International Flower Market From Air to Sea - One of the trends in the shipment of perishables is the change in mode of transport, from air to sea. The international market has historically transported from the South American and Central America market by air. Since 2017, there has been an exponential growth towards maritime transport. While in 2017 only 50,000 stems (approximately 1/3 of a 40 ft. container) was transported by ocean, in 2018

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[1] See Appendix K-2019-08-30 Industry Meeting Sign-In Sheet
[2] See Appendix E-Stakeholder Support Letters
[3] See Appendix C-PortMiami Commitment Letters
[4] See Appendix H-PortMiami 2035 Master Plan Executive Summary
[5] Source: PortMiami

almost 27 million stems (approximately 400 TEUs) were transported. This represents an increase of 54,000%. This has increased further, up to 50 million stems (approximately 740 TEUs) have already been received[6]. Predominantly, these arrive from Colombia, Guatemala, Ecuador and Costa Rica, where the new routes by Seaboard Marine and Maersk have been initiated. The seaboard routes are relatively new routes. As time progresses the of perishables will increase including growth in the transport of via sea.

1.7.1 PortMiami Cargo Yard Resiliency Improvements

The improvements to the cargo yard will greatly improve PortMiami's ability to respond to the growing demand for cargo containers entering the U.S. from Central and South America, especially those that require fumigation and cold chain processing. Given the Port's limited area to accommodate said demand, it becomes imperative that the available space is used and maintains the ability to accommodate any requirements for the cargo, such as temperature and the containment of pests within some perishables products entering the Port. Any interruption that hinders the Port's ability to accommodate this cargo, for instance, any event, where the Cargo Yard cannot be utilized to its fullest extent is a severe detriment to not only the businesses, but also trickles all the way down to the consumer's wallets. The Cargo Yard Resiliency Improvements are necessary due to the following circumstances:

Improvements And Expansion Of Reefer Racks

Part of the Cargo Yard Resiliency Improvements component is to improve the Reefer Racks at within the cargo yard to address the growing of refrigerated fruits, produce and handled by PortMiami. As mentioned, the reefer market has increased at Port Miami to 53,000 TEUs in 2018.

The investment created by the Cargo Yard Resiliency Improvements component will provide the needed infrastructure improvements to expand the number of reefer racks within the yard. Reefers can be stacked like regular containers at a dedicated area where electric plugs are available. Power outlets (poles) are provided for each row and up to 4 stacked reefers can be plugged. Stacking will be done with the available front loaders. This will allow the yard operator to more handle the increased in perishable commodities that move through PortMiami. To expand the reefer racks improvements to the electrical system will be required.

Climate Change and Sea-Level Rise

Regionally, sea levels are expected to be 14 to 26 inches higher than 1992 levels by 2060. The County relies upon the Sea Level Rise Projection for Southeast Florida created by the Southeast Florida Regional Climate Change Compact. The County's Internal Services Department created a 3D sea level rise viewer so planners and residents can view the impact of sea level rise. A Sea Level Rise Task Force provided direction for the County’s sea level rise adaptation resulting in guidance.

In 2014, per Resolution No. R-451-14, Miami-Dade County requires that all capital projects consider the impacts of sea level rise, Since then, the County has assessed the vulnerability of its facilities including utilities, surface water management, and other infrastructures in the Capital Project Overview, the Rapid Action Plan and the County's sustainability plan, GreenPrint. These documents have been developed to integrate with existing County plans, such as the Comprehensive Development Master Plan (CDMP), to ensure that any capital planning process incorporates changing risks due to sea level rise and heightened storm surge and evaluate their criticality to departmental operations.

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[6] Source: PortMiami

Port in the Eye of Major Storms and Hurricanes

South Florida is experiencing an increasing number of storms and hurricanes in recent years. South Florida is in the path of major hurricanes. Every hurricane season, from June to November, brings the specter of numerous Atlantic Ocean storms and hurricanes. The constant following of their path becomes the news of the day and the concern of all. The disastrous hurricane of August 1992, Hurricane Andrew, brought devastation to South Miami Dade County and substantial damage to other areas of the Miami Metropolitan Area. Hurricane Andrew and its destruction was an awakening to the inadequacy of the construction and storm water management codes in force at the time.

Since 1975, 146 tropical storms and hurricanes have hit Florida; of those, 47 have included fatalities. In 2005, Hurricane Wilma hit South Florida and caused damage to the Port. In this however, does not consider the true cost of the hurricane damage which includes the lost time and income for everyone from the individual dock worker, to those working for shipping companies, to the consumer who was unable to get the desired goods on time and/or was forced to pay more for the items because of the long delay moving goods through the Port while the reconstruction was taking place.

In addition to the storm water damage, Hurricane Wilma caused damage within the cargo yards. The cargo terminals closed for two full days following the storm and power was out for several days. One hundred empty containers were heavily damaged by the high winds, and more than a dozen fully stocked containers were knocked down. Inundation, was extensive and many of the sheds and smaller structures on the terminal were damaged. All this damage caused ships to be rerouted to other ports, which increased the cost for shippers and ultimately increased the cost of goods for the consumer.

Outdated Storm Water Management System

The current storm water management system was built in the early 1990s. At the time the system was built, prior to the changes to the storm-water code in the mid 1990's, the cargo yard was constructed to withstand a storm. The present Storm Water Management Code requires that the cargo yard withstands a storm.

PortMiami Cargo Yard Resiliency Improvements Project seeks to mitigate the damage such storms will cause by upgrading the storm water system. Potential damage due to storms and hurricanes is a critical issue facing the PortMiami. Sea level rise and climate change are making these improvements a more urgent necessity. The proposed Cargo Yard Resiliency Improvement Project will upgrade the storm water management system to withstand a storm. This brings the drainage system on the terminal up to current standards.

Upgrading this storm-water system will mitigate the number of repairs needed following the next storm, thus, reducing the potential downtime. Furthermore, the current drainage system will be brought into full compliance with updated local codes set to mitigate storm water drainage issues. The storm water upgrades will include pavement re-grading, the addition of drainage structures amongst other improvements to utilities.

This component shall be designed and constructed in accordance with expected sea level rise (SLR) projections during its anticipated useful life, using regionally consistent sea level rise projections.

Component Detail

The overall cost estimate for the Cargo Yard Resiliency Improvements is approximately $21,725,819, of which the Seaport Department is seeking $10,428,393, or a 48% match of federal funds.

1.7.2 Fumigation and Cold Chain Processing Center

The second of the major components included in this application is the construction of an approximately 100,0000 square feet building to house a third-party operated, state-of-the-art fumigation and cold chain processing center able to further the phytosanitary treatment requirements of 7 CFR 305.5-305.8. Given the lack of land area at PortMiami, the facility will be built on a 14-acre Miami-Dade County-owned site and completed in a single phase.

The US imported US$15.2 billion worth non-frozen of fruit in 2018, equal to a 32.4% increase from the value of America's imported fruits during 2014 and a 3.7% increase from 2017-2018[7]. Our appetite for fruits year-round and the growing and harvesting seasons of the north and south hemisphere has created a huge fruit import market from central and south America. Our winter grapes come from Chile, our asparagus comes from Peru. Once a net exporter of fruits, we are now a major importer of tropical fruits and other perishables.

Over the course of the next 10 years, the value of imports is anticipated to rise dramatically, with the highest growth commodity expected to be horticultural products, at almost 4% per year, largely composed of the sales of fresh fruit and vegetables. The U.S. Department of Agriculture Economic Research Service reports that fresh produce imports will rise 45% from 2016 to 2027, which implies that in the next decade over 3/4 of our fruits and half our veggies will be imported from outside of the U.S.[8]

The Fumigation and Cold Chain Processing Center is necessary due to the following circumstances:

South Florida Market

Florida is one of the most populated states in the Nation. With a population of 21.6 million and an annual growth rate of 1.6% and over 127 million visitors a year, the Florida market for fruits, vegetables, and other perishables is substantial. South Florida, comprised of Miami-Dade County, Broward County and Palm Beach County represent a population of over 6.7 million and a healthy growth rate of approximately 1%. Miami-Dade County has a population of 2.7 million add 16.5 million annual visitors, 6.7 million day-trippers and cruise passengers and there is a substantial annual population to consume fruits and vegetables.

Limited Industrial Land

This growth and population demand have also translated to the industrial/warehouse real estate market. Vacancy rates for industrial and warehouse space is between 3.8 and 4.0% which indicates a healthy real estate market for this type of use. Growth is constrained by the scarcity of industrial lands, and the supply of available sites are costly and limited. The availability of a Miami-Dade County owned site to include a Fumigation and Cold Chain Processing Center is a unique opportunity to create a multimodal hub that will service the local community.

Addressing All Potential Pest Threats

The phytosanitary treatments regulations in 7 CFR part 305 set out general requirements for certifying or approving treatment facilities and for performing treatments listed in the Plant Protection and Quarantine (PPQ) Treatment Manual [1] for fruits, vegetables, and other articles to prevent the introduction or dissemination of plant pests or noxious weeds into or through the United States. Regulations vary over time and by country of origin, and they are enforced by agencies. Fruit and vegetable imports are regulated by the U.S. Department of Agriculture's (USDA) Animal and Plant Health Inspection Service (APHIS) for pest risk. The United States Department of Agriculture (USDA) and the Animal Plant Health Inspection Services (APHIS) oversee protecting our citrus and other fruit producers from the arrival of pests. Most notably

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[7] See http://www.worldstopexports.com/top-imported-fruits-most-loved-by-americans/

[8] See https://www.nytimes.com/2018/03/13/dining/fruit-vegetables-imports.html

tropical fruit Department of Homeland Security (DHS) absorbed the inspection duties of APHIS in 2003, CBP has performed all inspections of fruits and vegetables for pests.

Fumigation

Phytosanitary inspections address all potential pest threats, including hitchhiking pests, goods, and contamination. Emphasis is paid to systemic pest threats known to commonly occur in the pathway. APHIS determines whether a pest is actionable, indicating that it poses a risk to U.S. agriculture, economy, or environment, and is neither established nor controlled within the United States. If the pest is actionable, the shipment is prohibited entry unless the risk is mitigated with an approved treatment. The two methods of approved treatment for perishables are fumigation (Methyl Bromide fumigant) and heat treatment.

AQI Treatment Fee

Until 2015, the USDA did not require any "treatment fee" for fresh agricultural products imported into the United States that after inspection were deemed as subject to possible treatment or mandatory treatment. In 2015, the USDA adjusted all fees and established the AQI Fee to reimburse treatment program costs. This fee was set at $47 per treatment and escalated every year for the next ultimately reaching $237 per treatment, December 28, 2019. However, the decision to adopt a fee "per treatment" has placed PortMiami at a disadvantage due to the fact that the commercial nature of enclosures varies drastically. In the Southeast (Florida), an "enclosure" is one 40-foot trailer that holds up to 20 pallets of commodity for fumigation (a treatment). On the contrary, an "enclosure" in the Northeast can be considered a warehouse that can hold up to 2,400 pallets at a time for fumigation (treatment). The discrepancy between these two represents a dramatic cost advantage to the Northeast U.S. Ports, which can ultimately be marketed and passed down as savings that cannot be done in the Southeast[9].

U.S. Industry Cost for Fumigation

The two largest agricultural commodities being imported into U.S. requiring fumigation as a condition of entry: Chilean fresh grapes and Peruvian fresh asparagus. In 2017, the Southeast (SE) represented only 24% of the Northeast (NE) volume requiring fumigation, but paid substantially more, even though SE volumes are less. Thus in 2018, the SE will pay over $778,586 more in AQI fees. In other words for 2018, if both import volumes were equal the SE would pay $3.27 Million compared to the NE paying only $21,868 for the same imported volume. Clearly this fee structure is inherently unfair and places a burden on trade.[10]

History of Cold Treatment North of The 39 Degree Latitude

In order to protect the U.S. mainland from the importation of fruit the USDA's phytosanitary regulations used to limit of cold treatment to facilities operated only in areas north of the 39 degree latitude and east of 104 degree longitude. In the past, fruits and vegetables were imported to the U.S. during winter months, because the areas north of 39th parallel have cold and snow, where the fruit and their larvae could not survive and become established.

Changing Method of Transport - Reefer Ships

When import of fruits from South America began, fruits were carried in the cargo hold of refrigerated ships as bulk cargo. This method of transport could not control the escape of pests from the ship during The process of unloading the fruit and the dangers of the propagation of devastating tropical fruit plagues required that the winter fruits be loaded in cold areas where the cold weather would naturally kill the pests and their larvae. The location restrictions served as an additional safeguard against the possibility that fruit could escape from imported

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[9] See Appendix F- The AQI Treatment Fee

[10] See Appendix F- The AQI Treatment Fee

articles prior to treatment and become established in the United States. In the case of Florida this has resulted in additional costs to consumers and truck vehicle- miles-traveled (VMT) to bring the fruit from the Northeast ports.

New Method of Fruit Transport - Reefer Containers

Today most fruit moves on refrigerated containers, “reefers”, that are airtight and sealed. The potential for escape of fruit or other pest is no longer a major risk. These refrigerated containers provide cold treatment en-route to meet the minimum 14-day cold treatment requirement. While cold treatment begins at the boarding port in the reefer containers, the travel time may not be enough to meet the 14-day requirement. from the ship, the refrigerated container continues cold treatment in an APHIS approved facility, or within the refrigerated container. Other situations such as malfunction of the reefer container may require the treatment to be recommenced from zero. If not possible restarting cold treatment is not possible, then the perishables must be exported from the US or destroyed at an approved USDA/APHIS facility. Today, there is USDA regulations forcing the processing of the perishables north of the 39th Parallel. Products can be brought to market directly without having to double back and traverse the East Coast to reach the Florida market. This will result in time saving, product freshness, reducing truck vehicle traveled miles, roadway congestion and safety.

Federal Government Recognition- Approval Of Southern And Western States

The Federal Government has recognized this condition that creates additional truck VMT and costs to the consumer and has approved cold treatment facilities to be In Southern and Western States under the “Federal Register 5871 Vol. 83, No. 29 Monday, February 12, 2018 DEPARTMENT OF AGRICULTURE Animal and Plant Health Inspection Service 7 CFR Part 305 [Docket No. APHIS–2013–0081] RIN 0579–AD90 Standardizing Phytosanitary Treatment Regulations: Approval of Cold Treatment and Irradiation Facilities; Cold Treatment Schedules; Establishment of Fumigation and Cold Treatment Compliance Agreements, A Rule by the Animal and Plant Health Inspection Service on 02/12/2018”. The Docket states:

“Although the regulations initially did not allow cold treatment facilities to be in Southern and Western States, APHIS periodically received requests for exemptions. In response to these requests, APHIS conducted site-specific evaluations for these locations and determined that regulated articles can be safely transported to, handled in, and treated by specific cold treatment facilities outside of the areas established by the regulations under special conditions to mitigate the possible escape of pests of concern. Over the years, APHIS has amended its regulations to allow cold treatment facilities to be located at the maritime ports of Wilmington, NC; Seattle, WA; Corpus Christi, TX; and Gulfport, MS; Seattle-Tacoma International Airport, Seattle, WA; Hartsfield-Atlanta International Airport, Atlanta, GA; and, most recently, MidAmerica St. Louis Airport, Mascoutah, IL. In addition to those requests, certain importers of fruits and vegetables have shown considerable interest in locating cold treatment facilities in places that are not currently allowed under the regulations (e.g., Miami and Port Everglades, FL, and Savannah, GA)”.

PortMiami Approval

Prior to 2019, cold treatment perishables could not enter ports south of the 39th latitude unless they have 15 days of cold treatment at 33 degree F. outside of the US (see USDA regulations (7 CFR 319.56-2d). For this reason, a wide array of fruit grown in Latin America and bound for Florida was shipped to out of state Northeastern ports like Philadelphia, PA and Wilmington, DE, thus a very number of containers arrive in Florida ports from the NE, expanding the carbon footprint associated with their transport and adding to the cost for consumers. Earlier this year, USDA updated their regulations regarding cold treatment to allow all southern US ports to request authorization by APHIS/USDA to bring in completed cold treatment produce as well as to continue cold treatment at the port of entry.

The USDA has determined that the cold treatment pilot in the Southeast was a complete success and based on risk analysis, they have determined that they will allow the the cold treatment of fruits either on and or near port, using protocols developed by USDA/APHIS that focus on safety. Business and consumer interests in Florida can by allowing cold treatment to in a safe and secure fashion in Florida, rather than the Northeast.

Perishables, such as fruits, vegetables, and degrade over a given period, or if exposed to extreme temperatures, humidity, or other environmental stressors such as fruit or other pests. Thus, it is critical to handle (including processes, such as fumigation), store and refrigerate these commodities properly through the entire logistics and value chain, from harvest to retail shelf. To minimize product deterioration and value loss, perishables must be delivered to the consumer without delay to maintain the highest quality possible in support of the safe of agricultural and food products, free of pests and disease, domestically and internationally. Importing via PortMiami provides Florida grocers and consumers with days more shelf-life, in which to sell and/or consume this fresh produce.

The key target perishable import markets for the Cold Chain Processing and Fumigation Center consists of perishable products originating in South and Central America, as well as Mexico and the Caribbean. This market includes dates, blueberries, apples, mangoes, pears, seafood, pineapples, avocados, melons, papayas, grapes, and citrus fruit. Bananas are not included in the target market since the major importers such as Dole and Chiquita have established proprietary facilities at several seaports, and tend to use third party cold storage processing centers to a lesser extent than the above noted commodities. In addition to these commodities, fresh also represent a key target market, particularly for air cargo. Exports include Florida citrus, Florida seafood, and U.S. agricultural products such as frozen beef, pork, poultry, and soy.

The perishable import market consisting of the commodities above move into the Southeastern U.S. through a select number of ports, as shown in Exhibit 1. This market is dominated by the Delaware River ports of Philadelphia (PA), Wilmington (DE), Chester (PA), and Gloucester City (NJ).

Key Ports Handling Perishable Cargo from South America and Central America

Ports	TEUS
Philadelphia/Delaware River	137,137
Port Everglades	43,965
Miami	12,195
Savannah	4,439

Source: Piers, 2018

Table 1— Key Ports Handling Perishable Cargo from South America and Central America

The of the development of the Cold Chain Processing and Fumigation Center is to capture the perishable cargo that now moves into Florida via non-Florida ports by truck, resulting in increased environmental, safety, infrastructure costs to the nation, as well as increasing the cost of perishable foods to the Florida consumers while reducing shelf life Using Piers data, Martin Associates estimated the share of imports from the West Coast of South America and Central America that are consumed in Florida and moving through various Atlantic Coast ports as well as the Florida ports. As shown in (Table 2), 40% of the Florida consumed imports from the West Coast of South America and Central America use ports other than Florida ports. As noted, the majority of these West Coast South American and Central American imports are perishable commodities, most likely moving into Florida from the Delaware River ports, as well as from

Savannah. In addition, in the recent months, the Port of Wilmington, NC has entered into the perishable goods import market, and is also likely to serve certain Florida Markets in the near future.

Imports from West Coast South America and Central America Consumed in Florida by Port of Import

Ports	TEUS	Share
Non-Florida Ports	136,408	40.1%
Port Everglades	83,666	24.6%
Tampa/Manatee	84,739	24.9%
Miami	34,052	10.0%
Jacksonville	1,609	0.5%
Total	340,473	100.0%

Source: Piers, 2018

Table 2— Imports from West Coast South America and Central America Consumed in Florida by Port of Import

It is important to emphasize that the TEUs in (Table 2) underestimate the volume of perishables that move into Florida from out of state ports, since the Piers data only cargo that moves from the port of entry to a destination under an international bill of lading and clears customs at the point of destination. A large share of the imported perishables clear customs at the port of entry, and then move to near-port cold processing centers, where they are re-loaded (transloaded) into domestic refrigerated trucks for the move to consumption. Therefore, the Piers data does not include these international shipments that are transloaded at the port of entry, for the further trip to consumption. As a result, the Piers data regarding consumption point, such as the state of Florida, underestimates the actual of perishable cargo that is discharged at the Delaware River ports and the other South Atlantic ports and ultimately consumed in Florida[11].

To develop a more comprehensive estimate of the volume of perishables that move from the port of import into the state of Florida, IHS Transearch data was used. This data base the perishable cargo that is trucked from each import port BEA (Business Economic Area) into each BEA in the state of Florida. Focus was on the volume of domestic trucked perishable cargo (consisting of the commodities above) that was moved from each non-Florida port BEA into each Florida BEA for consumption. (Table 3) shows the domestic tonnage that was trucked from each non-Florida port BEA into each Florida BEA.

Domestic Perishable Cargo Trucked Between non-Florida Port BEA and Florida BEA (Tons)

	Florida BEA								
Port BEA	**Fort Myers, FL**	**Jacksonville, FL**	**Miami, FL**	**Orlando, FL**	**Pensacola, FL**	**Sarasota, FL**	**Tallahassee, FL**	**Tampa, FL**	**Total**
Philadelphia, PA	7,540	12,554	90,178	41,415	2,850	7,953	2,781	15,822	181,093
Savannah, GA	4,769	11,533	37,314	42,874	5,040	5,812	3,007	13,095	123,443
Wilmington, NC	3,658	5,120	21,718	11,052	967	3,347	1,036	7,070	53,968
Total	**15,967**	**29,206**	**149,210**	**95,341**	**8,858**	**17,112**	**6,823**	**35,987**	**358,504**

Source: HIS Transearch 2017 (most recent year data is available)

Table 3— Domestic Perishable Cargo Trucked Between non-Florida Port BEA and Florida BEA (Tons)

This 358,504 tons (18,000 full truckload equivalents) of domestic cargo trucked into Florida is used as a proxy for the transloaded international perishable cargoes, and also as a proxy for the

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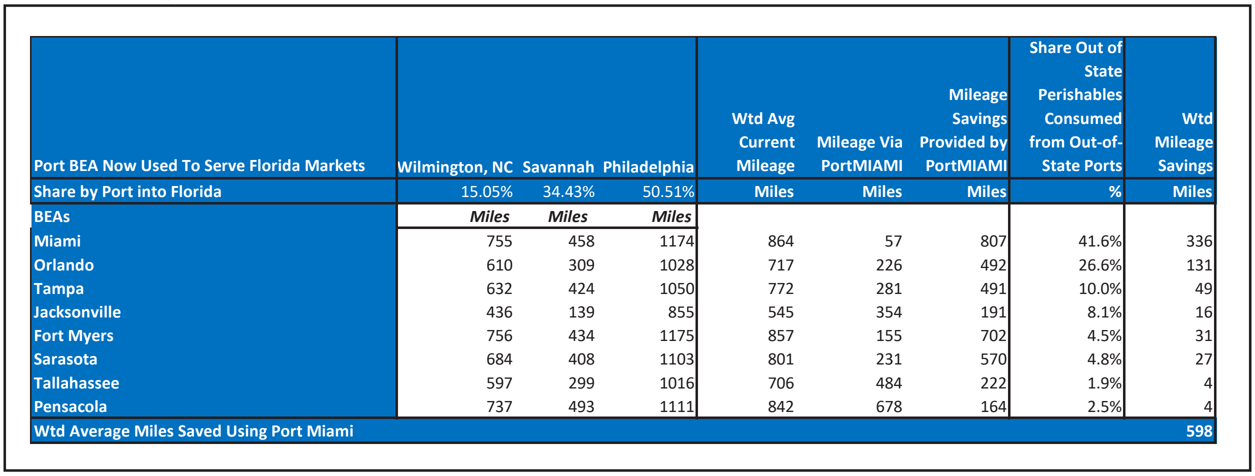
[11] In addition to not capturing the transloaded perishable cargo moving into Florida from out of state ports, the Piers data also under reports the geographic destination of imports by state since a large percentage of imports do not indicate a consignee, and its location, since the cargo is moved by freight forwarders, that don't the actual point of consumption; or in some cases the headquarters location of an importer is reported on the shipping bill of lading rather than the ultimate geographic destination.

ultimate destinations for perishables imported through non-Florida ports that are consumed in Florida. This is in addition to the TEUs trucked directly from each of the non-Florida ports into Florida.

The mileage cost savings of serving each Florida BEA through the proposed Fumigation and Cold Chain Processing Center (and using PortMiami) rather than using the current non-Florida ports were estimated by non-Florida port and Florida BEA of consumption. (Table 4) shows the mileage between each non-Florida port to each Florida BEA as well as the mileage to each Florida BEA should PortMiami and the Fumigation and Cold Chain Processing Center be used. A weighted mileage cost savings by using PortMiami was then computed (weights being perishables now consumed, by Florida BEA)



Port BEA Now Used To Serve Florida Markets	Wilmington, NC	Savannah	Philadelphia	Wtd Avg Current Mileage	Mileage Via PortMIAMI	Mileage Savings Provided by PortMIAMI	Share Out of State Perishables Consumed from Out-of-State Ports	Wtd Mileage Savings
Share by Port into Florida	15.05%	34.43%	50.51%	Miles	Miles	Miles	%	Miles
BEAs	*Miles*	*Miles*	*Miles*					
Miami	755	458	1174	864	57	807	41.6%	336
Orlando	610	309	1028	717	226	492	26.6%	131
Tampa	632	424	1050	772	281	491	10.0%	49
Jacksonville	436	139	855	545	354	191	8.1%	16
Fort Myers	756	434	1175	857	155	702	4.5%	31
Sarasota	684	408	1103	801	231	570	4.8%	27
Tallahassee	597	299	1016	706	484	222	1.9%	4
Pensacola	737	493	1111	842	678	164	2.5%	4
Wtd Average Miles Saved Using Port Miami								598

Table 4— Mileage Savings to Florida Consumers due to Fumigation and Cold Chain Processing Centers

As shown in (Table 4), the use of the Fumigation and Cold Chain Processing Center would result in a savings of 598 truck miles over the current without project situation in which the Florida perishable market is served by out of state ports, most notable the Delaware River ports, and to a lesser extent Savannah and Wilmington, NC.

This weighted average truck mileage savings will be critical in driving the savings in Vehicle Miles Traveled (VMT) and the resulting environmental, safety, infrastructure and economic competitiveness of the Fumigation and Cold Chain Processing Center and the Cargo Yard Resiliency Improvement components.

The proposed Fumigation and Cold Chain Processing Center will have 80 truck bays. Assuming about 2 trucks serviced per bay per day (based on interviews with current operators of similar Fumigation and Cold Chain Processing Centers), and 360 days of operation annually. It is further assumed that 40% of the facility utilization will be accounted for by perishables that under the without project case are moved into Florida consumption markets from out of state ports, as indicated previously in (Table 2). Under the without project case it is also assumed that the trucks now serving the Florida consumption markets will return to the out of state port regions.

As shown in (Table 5), the center will handle 23,040 trucks per year. This equates to 46,080 round-trip truck trips per year at full facility utilization that will be saved as the result of the opening of the new Fumigation and Cold Chain Processing Center. These containers will move through PortMiami and will utilize the additional processing capacity generated by the Cargo Yard Resiliency Improvements component. Assuming 1.7 TEUs per truck load, the 23,040 trucks per year equate to 39,168 TEUs at full facility utilization. This equates to approximately 23% of the about 167,008 TEUs of the perishable cargo now moving into Florida from non Florida ports.[12]

Truck Trips per Year Saved

Truck Trip Assumptions	
Number of Truck Bays	80
Truck Turns per Day per Bay	2
Days of Operation	360
Total Annual Throughput in Terms of Truck Trips	57,600
Share from Out of State Ports	40%
Trucks per Year from Out of State Ports (Containers)	**23,040**
Round Trip Truck Trips Saved Annually at Full Utilization	**46,080**

Table 5— Truck Trips per Year Saved

The reduced truck round trips multiplied by the average miles saved, 598 miles as shown in (Table 4), results in Vehicle Miles Traveled (VMT) savings due to the Fumigation and Cold Chain Processing Center and the Cargo Yard Resiliency Improvements projects. The VMT savings are the key drivers of the that are as the result of the Fumigation and Cold Chain Processing Center and the Cargo Yard Resiliency Improvements. It is further assumed that the project becomes operational in 2021, with a 75% facility utilization rate, growing to a 100% utilization rate in the year 2026. Based on these utilization assumptions, the VMT savings are estimated 20,682,513 VMT in 2021, growing to 27,576,683 VMT by 2026, and remaining at that level throughout the 30 year projection period.

Component Detail

The overall cost estimate for the PortMiami Fumigation and Cold Chain Processing Center is approximately $57,032,410 of which the Seaport Department is seeking $33,500,000, or a 58% match of federal funds.

2. PROJECT LOCATION

2.1 Location Description

Miami-Dade County is home to 2.751 million residents and hosts 15.7 million overnight visitors each year. It is a paradise of oceanfront cities, urban hubs, and charming villages, however most it is widely considered the North American gateway to serve Latin and South America. There is no other place in the world that can such a strategic geographic location, extensive infrastructure of airports and seaports, and the trade expertise to reach these markets.

PortMiami is a major seaport located in Biscayne Bay in Miami-Dade County, Florida. Today PortMiami is situated on Dodge Island with a land mass of 520-acres in central Biscayne Bay and

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[12] It is estimated that 136,408 TEUs of perishables from West Coast South America and Central America moved directly into Florida from non-Florida ports (Table 2), while another 30,472 TEUs of perishables (358,504 tons of trucked cargo divided by about 11.8 tons per TEU) moved into Florida after transloaded at the non-Florida port of entry, for a total 167,008 TEUs currently moving from out of state ports into Florida.

is under operational management of Miami-Dade County. It is bounded to the north by the Main Channel adjacent to MacArthur Causeway (I-395), to the west by Downtown Miami, to the east by Miami Beach/Fisher Island, and to the south by Fisherman's Channel and Biscayne Bay.

Miami International Airport is situated on approximately 3,230 acres of land near downtown Miami that is operated by the Miami-Dade Aviation Department on property controlled by Miami-Dade County. The Airport is bound to the north by NW 36th Street, to the west by NW 72nd Avenue, State Road 836 to the south and NW 42nd Avenue to the east.

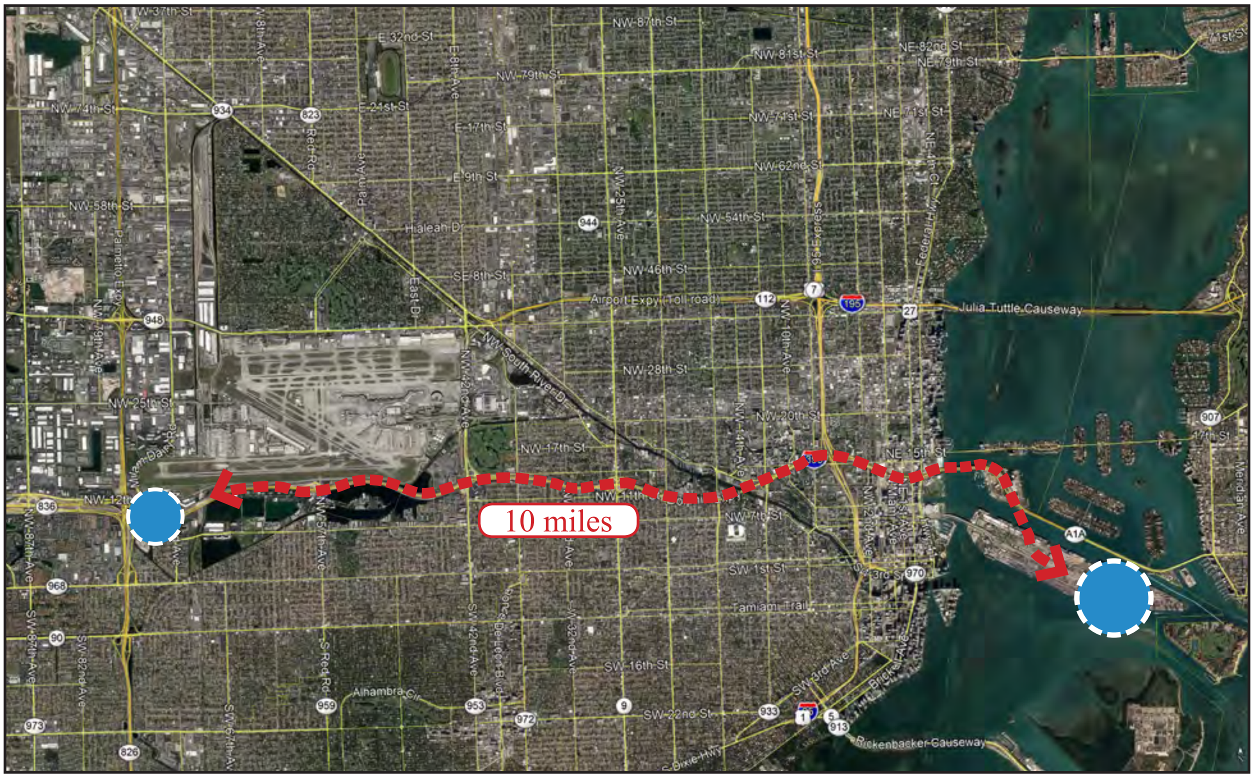

Figure 1— Access and Connectivity

2.1.1 Connections to Existing Transportation

PortMiami and the Fumigation and Cold Chain Processing Site (Figure 1) are within a ten-mile radius of each other. Miami's two main economic engines are linked multimodally by the SR 836 Dolphin Expressway that connects to the state and national expressway system, in addition to rail connectivity. By providing a more direct access to the national highway system, the tunnel allows for truck to bypass downtown streets, relieving unnecessary congestion and truck travel through the urban core street grid. With direct access from I-395 to I-95, truck and cargo travel maintains direct and convenient access to the airport via State Road 836 on the south side.

The primary roadway connection for cargo truck originating at the Port passes through the Port of Miami Tunnel to SR 836 where it is facilitated via an exit at Milam Dairy Road from State Road 836 at NW 11th Street, approximately 1/4 mile to the south east.

There is an existing rail line located on the northern boundary of the Fumigation and Cold Chain Processing Center site. This rail access to the site establishes an additional means of convenient multimodal connection to both PortMiami and the national rail system. Access via rail is conveniently located from PortMiami to the Hialeah Intermodal Rail Yard, directly northwest of Miami International Airport. Partnering with the Florida East Coast Railway (FEC), the U.S. Department of Transportation and the State, PortMiami invested $50 million to re-introduce on-port rail service and restore the tracks linking the Port and the rail yard, providing direct cargo access to the national rail system. This service re-connects the Port with national rail systems (CSX and Norfolk Southern) and further expedites the movement of goods throughout Florida and the continental U.S.

Detailed proposed project sites can be generally referred to as the Cargo Yard Resiliency Improvements Site, and the Fumigation and Cold Chain Processing Site depicted and described below:

2.2 Detailed Project Location: Cargo Yard Resiliency Improvements Site

Figure 2— Cargo Yard Resiliency Improvements Site Location Description

The Cargo Yard Resiliency Improvements Site (Figure 2), home to the Cargo Yard Resiliency Improvements component, is located within the State of Florida, City of Miami and Miami-Dade County. It is represented by Florida’s 27th Congressional District. The location of the Cargo Yard Resiliency Improvements is adjacent to PortMiami’s Truck Gate Innovation project that was awarded the Department of Transportation’s Nationally Freight and Highway (INFRA) Grant in 2018. Cargo is transported inland from the Port either by rail, or by truck. The Cargo Yard Resiliency Improvements compliments the Truck Gate Innovation Project and serves to continue infrastructure improvements necessary for the Port to capture and handle the expected future increase in cargo that requires cold processing and fumigation

Geospatial Data

The geographical coordinates are 25.7745° N 80.1709° W.

2.3 Detailed Project Location: Fumigation and Cold Chain Processing Site

Figure 3— Fumigation and Cold Chain Processing Site Location Description

The Fumigation and Cold Chain Processing Site (Figure 3) is located within the State of Florida, City of Miami and Miami-Dade County jurisdiction. It is represented by the Florida’s 25th Congressional District. , the Fumigation and Cold Chain Processing Site is located on the southwestern edge of Miami International Airport. The Fumigation and Cold Chain Processing Site occupies roughly 16 acres of land on the north east corner of the intersection at NW 12th Street and NW 72nd Avenue (Milam Dairy Road)

Geospatial Data

The geographical coordinates are 25.782950° N 80.317596° W.

2.4 Qualified Opportunity Zones

The term Opportunity Zone (QOZ)” means a population census tract that is a low-income community that is designated pursuant to 26 U.S.C. 1400Z–1.

The Fumigation and Cold Chain Processing Site is located within a QOZ Tract 12086009100. The site is Designated QOZ (Yes) and New Markets Tax Credit NMTC (Yes).

The Cargo Yard Resiliency Improvements Site is not located within a QOZ. The site is Designated QOZ (No) and New Markets Tax Credit NMTC (Yes).

3. GRANT FUNDS, SOURCES AND USES OF ALL PROJECT FUNDING

3.1 Cargo Yard Resiliency Improvements

The overall cost estimate for the Cargo Yard Resiliency Improvements is approximately $21,725,819, of which PortMiami is seeking $10,428,393.60, or a 48% match of federal funds.

Cargo Yard Resiliency Improvements			
Project Investments Contributions			
Funding Source		**Amount**	**% of Total**
PortMiami Contribution	Non-Federal*	$ 11,297,426.00	52%
Port Infrastructure Development Grant	Federal	$ 10,428,393.00	48%
	Total Project Cost:	$ 21,725,819.00	100%

* Documentation for funding commitments are referenced in Appendix C

Table 6— Project Investments Contributions (Cargo Yard Resiliency Improvements)

Cargo Yard Resiliency Improvements		
Budget		
Major Construction Activity	**Amount**	**% of Total**
Non-Federal Funds		
Civil/Site Improvements	$ 11,297,426.00	52%
Subtotal:	$ 11,297,426.00	52%
Ports Program Funds		
Civil/Site Improvements	$ 10,428,393.00	48%
Subtotal:	$ 10,428,393.00	48%
Other Federal Funds		
None		
Total Project Cost:	$ 21,725,819.00	100%

Table 7— Budget (Cargo Yard Resiliency Improvements)

3.2 Fumigation & Cold Chain Processing Center

The overall cost estimate for the PortMiami Fumigation & Cold Chain Processing Center is approximately $57,032,410 of which PortMiami is seeking $33,500,000, or a 59% match of federal funds.

Fumigation & Cold Chain Processing Center Project Investments Contributions			
Funding Source		**Amount**	**% of Total**
PortMiami Contribution	Non-Federal*	$ 10,032,410.00	17%
Private Partner and FDOT Contribution	Non-Federal	$ 13,500,000.00	24%
Port Infrastructure Development Grant	Federal	$ 33,500,000.00	59%
	Total Project Cost:	$ 57,032,410.00	100%

* Documentation for funding commitments are referenced in Appendix C

Table 8— Project Investments Contributions (Fumigation & Cold Chain Processing Center)

Fumigation & Cold Chain Processing Center Budget		
Major Construction Activity	**Amount**	**% of Total**
Non-Federal Funds		
General Site Conditions	$2,479,670.00	4.35%
Permitting/Approvals/NEPA	$2,000,000.00	3.51%
Fumigation and Cold Chain Equ.	$13,500,000.00	23.67%
Fumigation Gas Recovery System	$3,500,000.00	6.14%
Contingency	$2,052,740.00	3.60%
Subtotal:	$23,532,410.00	41%
Ports Program Funds		
Building Shell	$23,400,000.00	41.03%
Concrete Truck Bay Area	$788,400.00	1.38%
Landscape (Xeriscape)	$515,000.00	0.90%
Civil/Site Improvements	$5,755,000.00	10.09%
Contingency	$3,041,600.00	5.33%
Subtotal:	$33,500,000.00	59%
Other Federal Funds		
None		
Total Project Cost:	$ 57,032,410.00	100%

Table 9— Budget (Fumigation & Cold Chain Processing Facility)

4. LEVERAGING OF FEDERAL FUNDS

4.1 Cargo Yard Resiliency Improvements

4.1.1 Maximization of Non-Federal Share & Private Funding

PortMiami will provide the private share of investment for the required cargo yard improvements.

4.1.2 Fiscal Constraints

As described in Section (4.1.3) Non-Federal Investment for Related Projects, PortMiami has embarked on a substantial investment track for port and port transportation related improvements. The improvements required for the Cargo Yard Resiliency Improvements were not anticipated and as such are out of the investment stream of the project. Federal assistance will expedite the implementation of the improvements that will otherwise require a number of years for funds to be available.

4.1.3 Non-Federal Investment for Related Projects

In addition to the PortMiami Cargo Yard Resiliency Improvements, PortMiami has responded to growth demands by working to improve infrastructures that serve its cargo business. The Port completed the deepening of the Miami Harbor to a controlling depth of minus 50 feet to accommodate the increased size of the post-Panamax ships by the advancing the federal funds. The Port connected to the nation's highway system via a $1 billion tunnel and restored a direct freight rail connection that eliminates unnecessary truck traveling through downtown Miami. These projects assisted PortMiami in mitigating inevitable transportation congestion following record cargo of over 1 million TEUs for the past consecutive four years. During year 2019 – second quarter, the Port increased its cargo business by 9%; Accommodating the continuing cargo growth challenges the in the Port's cargo yards and surrounding areas.

In 2009, PortMiami contributed over $400 million to construct a tunnel joining the I-395 and Port. The construction of the tunnel has allowed for cargo trucks to avoid downtown streets when commuting to the Port. The location of the PortMiami Cargo Yard Resiliency Improvements is adjacent to PortMiami's Truck Gate Innovation project, that was awarded the Department of Transportation's Nationally Freight and Highway (INFRA) grant in 2018 (Figure 4).

With the assistance of the 2017 INFRA grant award ($7,000,000), PortMiami is undertaking a Truck Gate Innovation Project that will employ innovative and intelligent transportation systems, such as placing Radio- frequency (RFID) readers at critical ingress/egress points. RFID readers will provide advance of truck and cargo arrivals. Utilization of real-time gate data and advance systems for planned cargo moves will make the process more seamless, reduce unnecessary cargo movements, increase throughput, promote environmental sustainability, and lower shipping costs. This project improves and complements the Cargo Yard Resiliency Improvements by reducing the average truck gate processing time from approximately two hours to under one hour. Despite these on-going investments, there is more growth to come at PortMiami. Since the Port is located on an island in Biscayne Bay there are no opportunities to expand the physical site of the Port without excessive environmental impacts. Additional infrastructure improvements, such the PortMiami Cargo Yard Resiliency Improvements, are needed to remain competitive, and mitigate growth strains in an island port during such an unprecedented time in South Florida's cargo industry.

The location of the Cargo Yard Resiliency Improvements is adjacent to PortMiami's Truck Gate Innovation project, that was awarded the Department of Transportation's Nationally Freight and Highway (INFRA) grant in 2018. Cargo is transported inland from the Port either through rail or by trucks. The Cargo Yard Resiliency Improvements compliments the Truck Gate Innovation Project and serves to continue infrastructure improvements necessary for the Port to capture and handle the expected increase in cargo.

4.2 Fumigation & Cold Chain Processing Center

4.2.1 Maximization of Non-Federal Share & Private Funding

The Fumigation & Cold Chain Processing Center represents the collaboration of the two major economic engines of South Florida, the PortMiami and Miami-Dade County. The County will contribute the land for the construction of the facility. PortMiami will provide the 20% of additional leverage funds necessary to construct the facility to supplement the grant request.

A third-party private operator for the facility will be procured. This will represent an additional investment of private funds to provide the fumigation equipment system; the required equipment for the cold chain processing at the facility; and the operations and management.

4.2.2 Fiscal Constraints

PortMiami has planned for $1.5 billion in port projects programmed through 2024 which limits the port’s funding capabilities. The land is being made available by Miami-Dade County to the seaport now. As such, PortMiami cannot address the opportunity to expand this service until 2024 without the Federal assistance. The total combined investment for the component is $57,032,410. PortMiami ($10,032,410) and a Private Partner ($13,500,000) will contribute the non-federal share for the center. Given the magnitude of the investment, the POM is not in a position to invest the required total combined investment to develop the facility at the MDC external site. Without Federal assistance the project would be delayed . The availability of Federal funding will accelerate making the project reality.

4.2.3 Non-Federal Investment for Related Projects

Please reference Section (4.1.3) for a details regarding the Non-Federal investment of projects related to this component.

5. PROJECT COSTS AND BENEFITS

5.1 Cargo Yard Resiliency Improvements & Fumigation and Cold Chain Processing Center

5.1.1 Safety Benefits

Safety are in terms of reduced accidents and associated injuries as the result of the reduced vehicle truck miles traveled due to the Fumigation and Cold Chain Processing Center and Cargo Yard Resiliency Improvements. Accidents per 100 million vehicle miles traveled were developed from Surface Transportation, *A Comparison of the Costs of Road, Rail and Waterways*

Freight Shipments that are not Passed on to Consumers, GAO, Report to the Subcommittee on Select Revenue Measures, Committee on Ways and Means House of Representatives, January 2011. The value of an accident, a fatality, injury, or property damage only (PDO) was collected from *BTS Motor Vehicle Safety Data*, 2015 National Transportation Statistics, 2015. The values were from 2015 values to 2018 values based on the consumer price index published by the U.S. Bureau of Labor Statistics, May 2018.

Accidents per 100 Million VMT

	Accident Probability/ 100 million VMT	Value per Accident, 2018$
Fatal Accident Cost (K)	1.13369	$10,011,917
Severe Injury Accident Cost (A)	78.92426	$214,318
PDO Accident Cost (no injury)	203.40039	$3,337

Sources: *Surface Transportation, A Comparison of the Costs of Road, Rail and Waterways Freight Shipments that are not Passed on to Consumers*, GAO, Report to the Subcommittee on Select Revenue Measures, Committee on Ways and Means House of Representatives, January 2011.

Table 10— Accidents per 100 Million VMT

The accident rates per 100 million VMT by type of accident were multiplied by the 100 million vehicle miles traveled savings to estimate the number of accidents by type (due to the reduced VMT). The estimated number of accidents by type were then multiplied by the value accidents (by type) to estimate the total annual value of accidents that would be avoided under the Fumigation and Cold Chain Processing Center and Cargo Yard Resiliency Improvements due to savings in VMT. These safety savings were estimated through 2049, and then discounted under a 3% and 7% discount rate. The present value of the savings of the Fumigation and Cold Chain Processing Center and Cargo Yard Resiliency Improvements are (Table 11):

NPV of Safety @3%	**$142,945,073.50**
NPV of Safety@7%	**$86,544,142.08**

Table 11— Net Present Value of Safety

5.1.2 Environmental Benefits

Environmental are generated due to the reduced vehicle miles traveled with the Fumigation and Cold Chain Processing Center and Cargo Yard Resiliency Improvements. Emissions of air pollutants are generated per VMT, and the metrics used to estimate the volume of emissions per truck VMT are shown in (Table 12). These emission rates are measured in terms of short tons emitted per million VMT.

Short Tons of Emissions per Million VMT

Emissions	TONS EMITTED PER MILLION VMT
Nitrogen Oxides (Nox)	3.0193
Volatile Organic Compounds (VOC)	0.11
Fine Particule (PM)	0.1191
Sulfur Dioxide (SO2)	0.0055

Source: *Surface Transportation, A Comparison of the Costs of Road, Rail and Waterways Freight Shipments that are not Passed on to Consumers*, GAO, Report to the Subcommittee on Select Revenue Measures, Committee on Ways and Means House of Representatives, January 2011

Table 12— Short Tons of Emissions per Million VMT

The cost per short ton of the emissions by type of emission were developed from NHTSA, Final Regulatory Impact Analysis, CAFE for MY 2012-MY 2016 Passenger Cars and Light Trucks, March 2010. The cost of carbon dioxide has historically been based on the social costs of carbon and their costs per metric ton (converted to short ton) are prepared for future years by the IWGSCC, Social Cost of Carbon for Regulatory Impact Analysis Under Executive Order 12866, February 2011. As of June 2018, the cost of carbon dioxide emissions is no longer considered in the evaluation of emissions. These costs were updated using the May 2018 CPI and are shown in (Table 13).

Value per Short Ton of Emissions

Cost meterics	Cost/Short Ton Emitted
Nitrogen Oxides (Nox)	$7,693.53
Volatile Organic Compounds (VOC)	$1,952.32
Fine Particule (PM)	$351,938.69
Sulfur Dioxide (SO2)	$45,470.79

Source: Final Regulatory Impact Analysis, CAFE for MY 2012-MY 2016 Passenger Cars and Light Trucks, March 2010. And *IWGSCC, Social Cost of Carbon for Regulatory Impact Analysis* Under Executive Order 12866, February 2011.

Table 13— Value per Short Ton of Emissions

The net present value of the environmental cost savings of the Fumigation and Cold Chain Processing Center and Cargo Yard Resiliency Improvements project are (Table 14):

NPV of Emissions @3% with out co2	**$35,607,649.77**
NPV of Emissions @7% without co2	**$21,558,165.14**

Table 14— Net Present Value of Emissions

5.1.3 External Truck Cost Savings Benefits

External truck cost savings consist of reduced costs of highway/pavement repair, highway congestion, and noise pollution, due to reduced truck vehicle miles traveled resulting for the Fumigation and Cold Chain Processing Center and Cargo Yard Resiliency Improvements. Metrics that measure highway/pavement degradation costs per truck mile, noise pollution costs per truck mile and highway congestion per ton mile are published by the *1997 Federal Highway Cost Allocation Study*, Final Report, USDOT, Federal Highway Administration, May 2000, Table 13. These cost metrics are shown in (Table 15) and updated to 2018 dollars using the CPI for May 2018. These metrics are applied to the vehicle miles traveled saved under the Fumigation and Cold Chain Processing Center and Cargo Yard Resiliency Improvements project. With the I-95 corridor at or above capacity in many segments between Philadelphia and Miami, the removal of thousands of trucks from this corridor will provide relief in an order of National

External Truck Cost Savings

Combination Truck 4 Axel	Cost/VMT
Congestion	**$0.4730**
Noise	**$0.0232**
Pavement (Urban Interstate)	**$0.2623**

Source: *1997 Federal Highway Cost Allocation Study*, Final Report, USDOT, Federal Highway Administration, May 2000

Table 15— External Truck Cost Savings

The present value of the External Truck Cost is (Table 16):

NPV of External Truck Cost Savings @3%	**$374,613,226.19**
NPV of External Truck Cost Savings @7%	**$226,804,460.48**

Table 16— Net Present Value of External Truck Cost Savings

5.1.4 Economic Competitiveness Benefits

The economic competitiveness resulting from the Fumigation and Cold Chain Processing Center and Processing Facility and Cargo Yard Resiliency Improvements consists of the transportation cost savings to the nation's importers as the result of lower truck costs due to the savings in miles traveled to the key consumption destinations in Florida. After the project is completed, additional container volumes will move through PortMIAMI to the consumption markets at lower transportation costs. To estimate the transportation cost savings, the hourly trucking cost was estimated from interviews with key trucking companies engaged in port drainage, as well as information provided by American Transportation Research Institute (ATRI), An Analysis of the Operational Costs of Trucking, 2018. Based on these sources, it is estimated that the daily trucking costs are $950. Using the 11 hours of daily service that are capped under the current hours of service regulation and enforced through the electronic logging devices (ELD), the current hourly operating cost per truck is estimated at $86.36. The cost savings per container is presented in (Table 17).

Transportation Cost Savings Per Container Due to Cold Chain Processing and Fumigation Center and Cargo Yard Resiliency Improvements

Savings in Hours of Truck Driving Time by Using PortMiami Over Use of Out of State Ports to Serve Florida Perishable	Miles Saved	Hours Saved	Cost Savings per Container
	598	14.96	$1,292.11
Cost Savings per Container			$1,292.11

Table 17— Transportation Cost Savings per Container

The cost savings per truck trip multiplied by the number of containers utilizing the new Fumigation and Cold Chain Processing Center and the container yard was used to estimate the transportation cost savings to cargo owners that will be able to use PortMIAMI and the new Fumigation and Cold Chain Processing Center and the Cargo Yard Resiliency Improvements. It is to be emphasized that it is further assumed that the cost savings is applied to the number of containers that will be moved through PortMIAMI with the completed project. Under the without project, these containers would be moved into Florida from out of state ports. The present value of the transportation cost savings of the Fumigation and Cold Chain Processing Center and Cargo Yard Resiliency Improvements, or the Economic Competitiveness are (Table 18):

NPV of Economic Competitiveness @3%	**$533,150,866.75**
NPV of Economic Competitiveness @7%	**$322,788,909.30**

Table 18— Net Present Value of Economic Competitiveness

5.2 Summary of Benefits

The total projected to occur due to the Fumigation and Cold Chain Processing Center and Cargo Yard Resiliency Improvements are shown in (Table 19). Using a 3% discount rate over the period 2019 through 2049, the present value of the total of the Fumigation and Cold Chain Processing Center and Cargo Yard Resiliency Improvements is $1.1 billion. Under a 7% discount rate, the total present value of the of the project are $657.7 million. The annual calculations over the 30-year period are presented in the attached Excel Workbook.[13]

Summary of Benefits of the PortMIAMI Cold Chain Processing and Fumigation Center and Cargo Yard Resiliency Improvements

BENEFIT CATEGORIES	3% DISCOUNT	7% DISCOUNT
EMISSIONS	$35,607,649.77	$21,558,165.14
SAFETY	$142,945,073.50	$86,544,142.08
EXTERNAL TRUCK	$374,613,226.19	$226,804,460.48
ECONOMIC COMPETITIVENESS	$533,150,866.75	$322,788,909.30
TOTAL BENEFITS	$1,086,316,816.20	$657,695,677.00

Table 19— Summary of

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[13] See Appendix Cost Analysis Workbook

5.3 Costs

The total cost of the project is estimated at $78,758,229. The federal grant request is $43,928,393.

5.4 Benefit-Cost Calculation

The Fumigation and Cold Chain Processing Center and Cargo Yard Resiliency Improvements has a very ratio, the strong merits of the project due the reduction in truck on the nation's highways, in turn resulting in environmental safety external truck and economic competitive

Using a 3% discount rate over the 30-year time horizon, the project has a ratio of 13.79, and with a 7% discount rate the ratio is 8.35. The annual and costs are presented in the attached excel spreadsheet

Total Present Value of Benefits @ 3% over 30 Years	**$1,086,316,816.20**
Total Present Value of Benefits @ 7% over 30 Years	**$657,695,677.00**
Total Cost	**$78,758,229.00**
Benefit Cost Ratio with 3% Discount Rate	**13.79**
Benefit Cost Ratio with 7% Discount Rate	**8.35**

Table 20— Cost Ratio

6. PROJECT OUTCOMES

6.1 Cargo Yard Resiliency Improvements

The Cargo Yard Resiliency Improvements most directly advances two of the overall project outcomes described in Section A of the Notice of Funding Opportunity. The following outcomes are:

(2) Bring facilities to a state of good repair and improve resiliency by addressing current or projected vulnerabilities in the condition of port transportation facilities.

The project outcomes are addressed in greater detail to below:

6.1.1 Efficiency Improvements

Cargo Capacity Increases

By improving the surface and subsurface infrastructure in the cargo yard the project provides an opportunity to reorganize and make the yard more These investments in infrastructure will help meet the goal of shorter storage time and lower transportation costs. Additionally, the Cargo Yard Resiliency Improvements will allow for the installation of reefer racks to increase capacity to handle refrigerated containers to meet this increasing demand.

6.1.2 State of Good Repair - Improve Resiliency, Address Projected Vulnerabilities

Improving the resiliency of the cargo yard will require a amount of rehabilitation to the current storm water management system that is in dire need of repair as well as raising the above-sea-level elevation of the present yard.

State of Good Repair

The current storm water management system is outdated and obsolete, it was built in the early 1990s. At the time the system was built it was constructed to withstand a storm. The present drainage system does not meet the requirements of present Miami Dade County Code.

Improve Resiliency

South Florida is experiencing an increasing number of storms and hurricanes in recent years. The PortMiami Cargo Yard Resiliency Improvements seeks to mitigate the damage such storms will cause by upgrading the storm water system. Potential damage due to storms and hurricanes is a critical issue facing the PortMiami. Since 1975, 146 tropical storms and hurricanes have hit Florida; of those, 47 have included fatalities. In 2005, Hurricane Wilma hit South Florida and caused damage to the Port. One hundred empty containers were heavily damaged by the high winds, and more than a dozen fully stocked containers were knocked down. Many of the sheds and smaller structures on the terminal were damaged. All this damage caused ships to be rerouted to other ports, which increased the cost for shippers and ultimately increased the cost of goods for the consumer. As a result, PortMiami spent more than $1.2 million in 2014 dollars to redevelop forty-seven deep injection storm water wells and clear over 15,000 linear feet of storm water inlets and pipes.

This however, does not consider the true cost of the hurricane damage which includes the lost time and income for everyone from the individual dock worker, to those working for shipping companies, to the consumer who was unable to get the desired goods on time and/or was forced to pay more for the items because of the long delay moving goods through the Port while the reconstruction was taking place.

Address Projected Vulnerabilities

The proposed project will upgrade the storm water management system to withstand a year storm. This brings the drainage system on the terminal up to current standards. Upgrading this storm-water system will mitigate the number of repairs needed following the next storm, thus, reducing the potential downtime. Furthermore, the current drainage system will be brought into full compliance with updated local codes set to mitigate storm water drainage issues. The storm water upgrades will include pavement re-grading.

6.2 Fumigation & Cold Chain Processing Center

The Fumigation & Cold Chain Processing Center advances one of the overall project outcomes described in Section A of the Notice of Funding Opportunity. This project outcome is:

(5) For only the top 15 coastal ports, support the safe of agricultural and food products, free of pests and disease, domestically and internationally.

The project outcomes are addressed in greater detail to below:

6.2.1 Support Safe Flow of Agricultural and Food Products

The proposed Fumigation and Cold Chain Processing Center will support the safe of agricultural and food products safe of pests and disease by addressing and providing

Consolidated Phytosanitary Facility - that will house a state-of-the-art fumigation facility and cold chain processing center. At present the existing fumigation facilities are scattered in areas west of Miami International Airport. A new facility can consolidate the fumigation and cold chain processing in a single location providing for more modern and controlled phytosanitary processing.

Build Resiliency to Natural Disasters - by providing an alternative to cold treatment perishables in Miami and not be totally dependent on ports of the Northeast. An adequately constructed Cold Chain Processing Center will provide for an alternate port in case a natural or man-made disaster the existing facilities in the Northeast.

Reduce Truck Vehicle Miles Traveled (Truck VMT) - by cold treatment perishables at PortMiami thus reducing the need to truck the perishables from Northeast ports to South Florida. As indicated in the BCA this will reduce the Truck VMT. An additional will be the expansion of shelf life of agricultural products as they will reach the consumer market in less time.

Handle Increased Demand for Required Phytosanitary Treatment and Cold Chain Processing - that is a result of the increase in refrigerated container at POM; the increase in perishables including and the future authorization for Cold Chain Processing Center at PortMiami.

7. DEMONSTRATE PROJECT READINESS

7.1 Cargo Yard Resiliency Improvements

7.1.1 Technical Feasibility

There is a detailed statement of work breakdown. The scope of work proposed would meet the objectives discussed earlier in the application. Cargo Yard Program – Phase 1 is currently underway and scheduled to be complete by January 2021. Final engineering drawings, drainage design, geotechnical engineering, survey, pavement design, equipment requirements and utility and electrical designs are underway for Cargo Yard Resiliency Improvements. This design is expected to be completed the quarter 2020. Immediately upon a grant agreement being executed between the U.S. DOT and Miami-Dade County, the construction project will begin. The construction is expected to take up to 18 months.

7.1.2 Project Schedule

The Cargo Yard Resiliency Improvements component planning and design has begun and is expected to be completed in quarter 2020. The construction is expected to take up to 18 months, and will be completed in advance of September, 2023.[14]

7.1.3 Project Approvals

The following are the anticipated approvals for the successful completion of the project:

NEPA Status and Other Environmental Permits - There are no adverse impacts on minority populations. All construction and operations will occur within existing rights of way. There are no impacts on the endangered species, biological resources or the social environment from noise or contamination resources. The project will result in emissions reductions improving air quality within the Miami air-shed, which is an attainment area under the Clean Air Act.

Since the funding of this project through the grant program will be considered a federal action, a preliminary National Environmental Policy Act (NEPA) draft of the programmatic categorical exclusion will be provided.

7.1.4 Project Risk

There are no risks associated with this project. There is a clearly scope, schedule and cost estimate. PortMiami is highly that this project will proceed according

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[14] See Appendix G-Project Gantt Charts

to schedule and estimated costs. Additionally, Phase I is currently under construction and lessons learned are being applied to this component. If funding overruns are later in the project, local matches will be used to make up the if needed. However, funding overruns are not anticipated as evidenced by PortMiami experience in managing federal grants, and the fact that there has never been any audit in this area, which demonstrates the Port's ability to administer a federal grant.

7.2 Fumigation & Cold Chain Processing Center

7.2.1 Technical Feasibility

There are numerous precedents for the design of the Fumigation and Cold Chain Processing Center. The two components that make up the facility, Fumigation and Cold Chain Processing, will require sectors of the facility to carry out the process required.

Fumigation will be of containers and of palletized perishable cargo within the building. Fumigation will require the recovery and processing of the methyl bromide gas used. Although in the same structure, the fumigation area will be separate from the Cold Chain processing to insure safety. Special ventilated spaces will separate the two uses and still allow for the safe transfer of perishables to the cold chain areas when required.

The building structure will be of conventional construction for this type of facility, either a tilt-up concrete structure or a combination of tilt-up construction and insulated metal panel walls structure. The type of construction will be decided once a third-party operator has been selected and their preferences incorporated in the design of the facility. The building will have to meet the highest standards of sustainability and energy .

7.2.2 Project Schedule

The Fumigation and Cold Chain Processing Center can be under construction by January of 2023. Upon Award of the Grant for the construction of the Fumigation and Cold Chain Processing Center an RFP for the procurement of a private partner to operate and manage the proposed facility will be issued. The private partner will be required to provide contributions of the fumigation and cold chain processing equipment. This procurement process will be done within an eleven-month time-line.

The preparation of Design Documents will begin once an operator has been selected and his preferences are incorporated into the design process. The Port estimates a nine-month process for the preparation of design documents. Permitting will commence early and will be concluded by march of 2022. Bidding and negotiations with the selection of a contractor will be concluded by November of 2022. Construction of the facility will begin on December of 2022 which is in keeping with the Grant requirement of construction to begin before Sept 20, 2023. The time-line for construction is expected to take 18 months. The center will be completed by June 2024.[15]

7.2.3 Project Approvals

The following are the anticipated approvals for the successful completion of the project:

NEPA Status and Other Environmental Permits - There are no adverse impacts on minority populations. All construction and operations will occur within existing property. There are no impacts on the endangered species, biological resources or the social environment from noise or contamination resources. The project will result in emissions reductions improving air quality within the Miami air-shed, which is an attainment area under the Clean Air Act.

Since the funding of this project through the grant program will be considered a federal action, a preliminary National Environmental Policy Act (NEPA) draft of the programmatic categorical

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[15] See Appendix G-Project Gantt Charts

exclusion will be provided.

Permitting - Due to the location of the proposed fumigation facility, several airspace and runway safety areas need to be evaluated for penetrations. The proposed location may impact operations of Runway 9; therefore, a full airspace analysis should be performed before design is completed. A penetration to the Part 77 surface may be permissible as long as the object or structure is properly marked and lit.

Given that it is a previously developed urban site there is existing water and sewer infrastructure as well as electrical and telecommunications access. Both the land use and the site zoning are commercial/industrial. All required Health Department permits including storm water management permits will need to be obtained as well as a building permit. We do not anticipate any major risks in obtaining permits for the construction of the facility.

7.2.4 Project Risk

The following are the risks to successful completion of the project:

Environmental Risks - The site was previously occupied by a department store warehouse and is presently vacant. A Phase I Environmental Assessment as required by Miami-Dade County will have to be carried out. We do not foresee any major environmental issues with construction of the facility on site.

Applicant's Capacity to Manage Project - As previously mentioned in Section (1.1) PortMiami has managed numerous successful projects and grant awards. PortMiami has the capacity to manage the grant funds allocation, the construction of the facility and subsequent management of the property. There is no anticipated issues with the delivery of the project given the availability of

8. DOMESTIC PREFERENCE

Materials to be used in the construction of the Cargo Yard Resiliency Improvement Project and the building of the Fumigation and Cold Chain Processing Center will abide by the Buy American Act and as the Act indicates: "As expressed in Executive Order 13788 of April 18, 2017 (Buy American and Hire American), and in Executive Order 13858 of January 31, 2019 (Strengthening Buy American Preferences for Infrastructure Projects), it is the policy of the United States to buy American and to maximize, consistent with law, the use of goods, products, and materials produced in the United States."

The Act further states: "In Executive Order 10582 of December 17, 1954 (Prescribing Uniform Procedures for Certain Determinations Under the Buy-American Act), President Eisenhower established that materials shall be, for purposes of the Buy American Act, considered of foreign origin if the cost of the foreign products used in such materials constitutes 50 percent or more of the cost of all the products used in such materials." In particular the Act indicates that: "The policies described in section 1(b) of this order were adopted by the Federal Acquisition Regulatory Council (FAR Council) in the Federal Acquisition Regulation (FAR), title 48, Code of Federal Regulations." The FAR proposes rules that require:

"(A) for iron and steel end products, the cost of foreign iron and steel used in such iron and steel end products constitutes 5 percent or more of the cost of all the products used in such iron and steel end products; or

(B) for all other end products, the cost of the foreign products used in such end products constitutes 45 percent or more of the cost of all the products used in such end products; …"

PortMiami will ensure that contractors carrying out the work under the auspices of the US Department of Transportation ‘s Port Infrastructure Development Program will meet the requirements of the Buy American Act.

8.1 Cargo Yard Resiliency Improvements

All anticipated grant monies received will be used for infrastructure improvements to the Cargo Yard Resiliency Improvements component presented herein. The construction materials required for this component will meet the requirements under the Buy American Act to be produced and manufactured domestically.

At this time, it is not anticipated that any of the materials or manufactured products that compose this project component will require an exception or waiver of the Buy American provisions described in F.2 of the Notice of Funding Opportunity (NOFO).

8.2 Fumigation & Cold Chain Processing Center

All anticipated grant monies received will be used for the construction of the building shell to accommodate the third-party fumigation and cold chain processing center component presented herein. The construction materials required for this component will meet the requirements under the Buy American Act to be produced and manufactured domestically.

At this time, it is not anticipated that any of the materials or manufactured products that compose this project component will require an exception or waiver of the Buy American provisions described in F.2 of the NOFO.

List of Appendices	
A	Cost Analysis
B	Cost Analysis Workbook
C	PortMiami Commitment Letters
D	PortMiami Tenant Support Letters
E	Stakeholder Support Letters
F	The AQI Treatment Fee
G	Project Gantt Chart
H	PortMiami 2035 Master Plan Executive Summary
I	2018-19 Perishables Update
J	2017 Local & Regional Economic Impacts of PortMiami
K	2019-08-30 Industry Meeting Sign-In Sheet

Project: Cold Storage Fumigation and Processing Facility and Container Yard Densification

BENEFIT-COST SPREADSHEET MODEL FOR PORTMIAMI COLD CHAIN PROCESSING AND FUMIGATION CENTER AND CARGO YARD RESILIENCY IMPROVEMENTS

Prepared for:

Port*Miami*

1015 North America Way, 2nd Floor
Miami, FL 33132

Prepared by :

Martin Associates
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Lancaster, PA 17603

www.johncmartinassociates.com

September 11, 2019

Model Parameters

General

Discount Rate		3%
Base Year		2018
Conversion Factors		
Metric Ton to Grams	*grams / metric ton*	1,000,000
Long UK Ton to Metric Ton	*long UK ton / metric ton*	0.98420
Short US Ton to Metric Ton	*short US ton / metric ton*	1.10231
Pounds to Metric Ton	*pounds / metric ton*	2,204.62
Miles to Kilometer	*kilometers / mile*	1.60934
Miles to Feet	*feet / mile*	5,280
Short Ton to Grams	*grams / short ton*	1,000,000
long ton to Metric Ton	*metric Ton / long ton*	1.01605

CPI	Annual Average CPI
2000	173.6
2005	197.4
2010	218.6
2011	226.3
2012	230.3
2013	233.5
2014	237.1
2015	237.8
2016	241.2
2017	246.2
2018	251.6

US Bureau of Labor Statistics

Value of Time

		2015 dollars	2018 dollars			Adjusted	
Vehicle Operators							
Truck Drivers	*$2015 per person-hour*	$27.2	$28.8			2018	Benefit-Cost Analysis (BCA) Resource Guide (November 2016), Revised Departrmental Guidence on Vaulation of Travel Time in Economic Analysis, Revision 2 Corrected
Bus Drivers	*$2015 per person-hour*	$28.3	$29.9			2018	
Locomotive engineers	*$2015 per person-hour*	$41.6	$44.0			2018	
Airline pilots and engineers	*$2015 per person-hour*	$86.7	$91.7			2018	
Average Vehilcle Occupancy Rate							
Truck	*persons per vehicle*	1.00				2018	Martin Assumption
Locomotives	*engineers per train*	2.00				2018	Martin assumption

Operating Costs

Not Used

Auto Maintenance Cost (Med/Lg Automobile)				
Oil Price - Auto	*$ per quart*	$9.8	2012	HERS Technical Report, 2002, Updated from 1997$ to 2012$ using BLS Series CUUR0000SS47021
Truck Maintenance Costs (Avg. 4-5 Axle Combo)				
Oil Price - Truck	*per quart*	$3.9	2012	HERS Technical Report, 2002, Updated from 1997$ to 2012$ using BLS Series CUUR0000SS47021

Safety

Fatalities				
Trucking	*fatalities per billion ton-miles*	2.54	2011	Surface Transportation, A Comparison of the Costs of Road, Rail and Waterways Freight Shipments that are not Passed on to Conusmers, GAO, Report to the Subcommittee on Select Revenue Measures, Committee on Ways and Means House of Representatives, January 2011
Railroad	*fatalities per billion ton-miles*	0.39	2011	
Waterways	*fatalities per billion ton-miles*	0.01	2011	
All Non-Fatal Injuries				
Trucking	*injuries per billion ton-miles*	55.98	2011	
Railroad	*injuries per billion ton-miles*	3.32	2011	
Waterways	*injuries per billion ton-miles*	0.05	2011	

Accident Cost		2016 $	2018 $		Accident Probality/100 million VMT		
Fatal accident cost (K)	*$ per accident*	$9,600,000	$10,011,917		1.13369	2018	Traffic accidnt incident per 100 million miles from BTS Motor Vehicle Safety Data, 2015 National Transportation Statistics, 2015
Severe Injury Accident Cost (A)	*$ per accident*	$459,100	$478,799		78.92426	2018	
Moderate Injury Accident Cost (B)	*$ per accident*	$125,000	$130,364			2018	
Minor Injury Accident Cost (C)	*$ per accident*	$63,900	$66,642			2018	
Pers. Inj. Accident cost - (No KABCO data) - Severity Unknown	*$ per accident*	$174,000	$181,466			2018	

PDO accident cost (no injury)	*$ per accident*	$3,200	$3,337		203.40039	2018	
Annual increase in value of life	*percent per year*	1.07%					
Average Cost of non death injury	*avg per non death injury accident*	$205,500	$214,318				

Emissions

Particulare Matter		*TONS EMITTED BY MODE PER TON MILE OR VMT*					
Trucking	*tons per million ton-miles*	0.1191	.			2011	Surface Transportation, A Comparison of the Costs of Road, Rail and Waterways Freight Shipments that are not Passed on to Consumers, GAO, Report to the Subcommittee on Select Revenue Measures, Committee on Ways and Means House of Representatives, January 2011
Railroad	*tons per million ton-miles*	0.0179				2011	
Waterways	*tons per million ton-miles*	0.0116				2011	
Nitrogen Oxides (NOx)							
Trucking	*tons per million ton-miles*	3.0193				2011	Surface Transportation, A Comparison of the Costs of Road, Rail and Waterways Freight Shipments that are not Passed on to Consumers, GAO, Report to the Subcommittee on Select Revenue Measures, Committee on Ways and Means House of Representatives, January 2011
Railroad	*tons per million ton-miles*	0.6747				2011	
Waterways	*tons per million ton-miles*	0.4691				2011	
VOC	*tons per million ton-miles*	0.11					
Carbon Dioxide (CO2) Equivalents							
Trucking	*tons per million ton-miles*	229.8				2011	Surface Transportation, A Comparison of the Costs of Road, Rail and Waterways Freight Shipments that are not Passed on to Consumers, GAO, Report to the Subcommittee on Select Revenue Measures, Committee on Ways and Means House of Representatives, January 2011
Railroad	*tons per million ton-miles*	28.96				2011	
Waterways	*tons per million ton-miles*	17.48				2011	
Sulfur Dioxide (SO2) Truck Only	*tons per million ton-miles*	0.0055					
Emission Costs		2017	2018 $				
Nitrogen Oxides (Nox)	*$/short ton*	$8,300	$8,482.92			2017	The Safer Affordable Fuel-Efficienct Vehicles Rule for MY2021-MY2026 Passenger Cars and Light Trucks Preliminary Regulatory Impapct Analysis, October 2018, www.nhtsa.gov/sites/nhtsa.dot.gov/files/documents/ld café co2 nhtsa 2127-al76 epa ppria 18106.pdf
Volatile Organic Compounds (VOC)	*$/short ton*	$2,000	$2,044.08			2017	
Fine Particule (PM)	*$/short ton*	$377,800	$386,126.05			2017	
Sulfur Dioxide (SO2)	*$/short ton*	$48,900	$49,977.67			2017	
Carbon Monoxide (CO)	*$/short ton*	$1	$1.04			2017	
Carbon Dioxide (CO2) - Discount Rate	*percent*	3.0%	Not Used			2017	IBID

External Cost of Additional Truck Use

Single Unit Truck Use		2000 $	2018 $				
Congestion	*$ per VMT*	$0.1201	Not Used			2012	Federal Highway Administration, 1997 Federal Highway Cost Allocation Study, Final Report, USDOT, Federal Highway Administration, May 2000, Table 13
Accidents	*$ per VMT*	$0.0170	Not Used			2012	
Noise	*$ per VMT*	$0.0092	Not Used			2012	
Combination Truck 4 axel							
Congestion	*$ per VMT*	$0.3264	$0.47			2018	Federal Highway Administration, 1997 Federal Highway Cost Allocation Study, Final Report, USDOT, Federal Highway Administration, May 2000, Table 13
Accidents	*$ per VMT*	$0.0236	Not Used			2018	
Noise	*$ per VMT*	$0.0160	$0.02			2018	
Pavement (Urban Interstate)	*$ per VMT*	$0.18	$0.26			2018	

Freight Vehicles Capacity

Average Train Capacity							
Number of carloads per unit-train	*carloads per train*	100.00					HDR Assumption, based on US Industry Standards
Average carload size, all commodities	*tons per carload*	110.00	100		125		Based on U.S. Government Accountability Office (GAO)'s analysis of data from US DOT, EPA and the Texas Transportation Institute
Average length of a Train	*feet*	7,000					HDR Assumption, based on US Industry Strandards
Average Truck Load							
Cargo weight, all commodities	*tons per truck*	22.7	17.0		25.0		HDR average estimate based on freight truck capacities and legal weight limits on public roads (LOW); Texas Transortation Institute, A Modal Comparison of Domestic Freight Transportation Effects on the General Public, 2009 (HIGH); U.S. Government Accountability Office (MID)

Truck Trips per TEU	*Trucks Container Move*	1.0		Martin Associates based on one container per truck each way
Short tons per loaded TEU	*Tons per container*	14.0	2018	assumes 1 full and 50% empty return
Truck Cost Savings				
		2018 cost/hour		
Trucking costs	950 per 11 hours	$86.36	2018	Martin Associates Interviews with Trucking companies $950/day, average 40/MPH over the road, 30 mph local; American Transportation Research Institute (ATRI), An Analysis of the Operational Costs of Trucking, 2017.
Miles/hour within 50 miles	30			
Miles/hour greater than 50 miles	40			

Port BEA Now Used To Serve Florida Markets	Wilmington, NC	Savannah	Philadelphia	Wtd Avg Current Mileage	Mileage Via PortMIAMI	Mileage Savings Provided by PortMIAMI	Share Out of State Perishables Consumed from Out-of-State Ports	Wtd Mileage Savings
Share by Port into Florida	15.05%	34.43%	50.51%	Miles	Miles	Miles	%	Miles
BEAs	*Miles*	*Miles*	*Miles*					
Miami	755	458	1174	864	57	807	41.6%	336
Orlando	610	309	1028	717	226	492	26.6%	131
Tampa	632	424	1050	772	281	491	10.0%	49
Jacksonville	436	139	855	545	354	191	8.1%	16
Fort Myers	756	434	1175	857	155	702	4.5%	31
Sarasota	684	408	1103	801	231	570	4.8%	27
Tallahassee	597	299	1016	706	484	222	1.9%	4
Pensacola	737	493	1111	842	678	164	2.5%	4
Wtd Average Miles Saved Using Port Miami								598

Truck Trip Assumptions	
Number of Truck Bays	80
Truck Turns per Day per Bay	2
Days of Operation	360
Total Annual Throughput in Terms of Truck Trips	57,600
Share from Out of State Ports	40%
Trucks per Year from Out of State Ports (Containers)	**23,040**
Round Trip Truck Trips Saved Annually at Full Utilization	**46,080**

39,168 **TEUS equivalent of the 23,040 truck moves**

167,008 **Total TEUS into Flroida from non Florida ports**

23.45% **Share of out of state perishable market (from non-Florida Ports)**

PROJECTED TRUCK TRIPS SAVED BASED ON FACILITY UTILIZATION ASASUMPTIONS

PROJECTED TON MILE OR VEHICLE MILES TRAVELED SAVINGS

Port BEA Now Used To Serve Florida Markets	Wilmington, NC	Savannah	Philadelphia	Wtd Avg Current Mileage	Mileage Via PortMIAMI	Mileage Savings Provided by PortMIAMI	Share Out of State Perishables Consumed from Out-of-State Ports	Wtd Mileage Savings
Share by Port into Florida	15.05%	34.43%	50.51%	Miles	Miles	Miles	%	Miles
BEAs	*Miles*	*Miles*	*Miles*					
Miami	755	458	1174	864	57	807	41.6%	336
Orlando	610	309	1028	717	226	492	26.6%	131
Tampa	632	424	1050	772	281	491	10.0%	49
Jacksonville	436	139	855	545	354	191	8.1%	16
Fort Myers	756	434	1175	857	155	702	4.5%	31
Sarasota	684	408	1103	801	231	570	4.8%	27
Tallahassee	597	299	1016	706	484	222	1.9%	4
Pensacola	737	493	1111	842	678	164	2.5%	4
Wtd Average Miles Saved Using Port Miami								598

ENVIRONMENTAL SAVINGS

Emissions	TONS EMITTED PER MILLION VMT	
Nitrogen Oxides (Nox)	3.0193	
Volatile Organic Compounds (VOC)	0.11	
Fine Particule (PM)	0.1191	
Sulfur Dioxide (SO2)	0.0055	
Carbon Dioxide	229.8	Not Included as of July 2018

Cost meterics	Cost/Short Ton Emitted Truck
Nitrogen Oxides (Nox)	$8,482.92
Volatile Organic Compounds (VOC)	$2,044.08
Fine Particule (PM)	$386,126.05
Sulfur Dioxide (SO2)	$49,977.67
CO2	$1.00

mt/st conversion	1.10231136
Discount at 3%	

NPV @3% +80:83less co2
NPV @7% less co2
NPV Of CO2 @3%
NPV of Emissions @3% with ou
NPV of Emissions @7% withou

SAFETY

		Accident Probability/ 100 million VMT	Value per Accident, 2018$
Fatal Accident Cost (K)	$ per accident	1.13369	$10,011,917
Severe Injury Accident Cost (A)	$ per accident	78.92426	$214,318
PDO Accident Cost (no injury)	$ per accident	203.40039	$3,337

NPV of Safety @3%
NPV of Safety@7%

EXTERNAL TRUCK COST SAVINGS

Combination Truck 4 Axel	Cost/VMT
Congestion	**$0.4730**

Noise	$0.0232
Pavement (Urban Interstate)	$0.2623

NPV of External Truck Cost Sa
NPV of External Truck Cost Sa

TRANSPORTATION COST SAVINGS - ECONOMIC COMPETITIVENESS

Savings in Hours of Truck Driving Time by Using PortMiami Over Use of Out of State Ports to Serve Florida Perishable Markets	Miles Saved	Hours Saved	Cost Savings per Container
	598	14.96	$1,292.11
Cost Savings per Container			$1,292.11

Assumotion: Truck Cost Per Hour	$86.36
Assumption: Average Truck Speed in Miles Per Hour	40

NPV of Economic Competitive
NPV of Economic Competitive

TOTAL NET BENEFITS

BENEFIT CATEGORIES
EMISSIONS
SAFETY
EXTERNAL TRUCK
ECONOMIC COMPETITIVENES
TOTAL BENEFITS

NPV AT 7%
EMISSIONS
SAFETY
EXTERNAL TRUCK
ECONOMIC COMPETITIVENES
TOTAL BENEFITS

Facility Utilization	0	0	0.75	0.8	0.85	0.9	0.95	0.95	1	1	1	1
	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Out of State Truck Trips Saved By Cold Storage F	0	0	34,560	36,864	39,168	41,472	43,776	43,776	46,080	46,080	46,080	46,080

	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Truck Vehicle Miles Saved	0	0	20,682,513	22,061,347	23,440,181	24,819,015	26,197,849	26,197,849	27,576,683	27,576,683	27,576,683	27,576,683
Total Vehicle Miles Traveled Saved	0	0	20,682,513	22,061,347	23,440,181	24,819,015	26,197,849	26,197,849	27,576,683	27,576,683	27,576,683	27,576,683

Short Tons Emitted Savings	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Particulare	0.00	0.00	2.46	2.63	2.79	2.96	3.12	3.12	3.28	3.28	3.28	3.28
Nitrogen Oxides (NOx)	0.00	0.00	62.45	66.61	70.77	74.94	79.10	79.10	83.26	83.26	83.26	83.26
Sulfur Dioxide (SO2)	0.00	0.00	0.11	0.12	0.13	0.14	0.14	0.14	0.15	0.15	0.15	0.15
Carbon Dioxide CO2	0.00	0.00	4,752.84	5,069.70	5,386.55	5,703.41	6,020.27	6,020.27	6,337.12	6,337.12	6,337.12	6,337.12
VOC	0.00	0.00	2.28	2.43	2.58	2.73	2.88	2.88	3.03	3.03	3.03	3.03

Value of Emission Tons Savings due to Truck												
Particulare	$0.00	$0.00	$951,139.37	$1,014,548.66	$1,077,957.95	$1,141,367.24	$1,204,776.53	$1,204,776.53	$1,268,185.82	$1,268,185.82	$1,268,185.82	$1,268,185.82
Nitrogen Oxides (NOx)	$0.00	$0.00	$529,730.28	$565,045.64	$600,360.99	$635,676.34	$670,991.69	$670,991.69	$706,307.05	$706,307.05	$706,307.05	$706,307.05
Sulfur Dioxide (SO2)	$0.00	$0.00	$5,685.15	$6,064.16	$6,443.17	$6,822.18	$7,201.19	$7,201.19	$7,580.20	$7,580.20	$7,580.20	$7,580.20
CO2 Value/short ton	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Carbon Dioxide (CO2) Equivalents	$0.00	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**
VOC	$0.00	**$0.00**	**$4,650.43**	$4,960.46	$5,270.49	$5,580.52	$5,890.54	$5,890.54	$6,200.57	$6,200.57	$6,200.57	$6,200.57
Total Emission savings less CO2	$0.00	**$0.00**	**$1,491,205.23**	$1,590,618.92	$1,690,032.60	$1,789,446.28	$1,888,859.96	$1,888,859.96	$1,988,273.64	$1,988,273.64	$1,988,273.64	$1,988,273.64

$35,607,649.77
$21,558,165.14
$0.00

$35,607,649.77
$21,558,165.14

100,000,000 vehicle miles	0	0	0.206825125	0.220613467	0.234401809	0.24819015	0.261978492	0.261978492	0.275766834	0.275766834	0.275766834	0.275766834

	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Fatal accident cost (K)	$0.00	$0.00	$2,347,554.13	$2,504,057.74	$2,660,561.34	$2,817,064.95	$2,973,568.56	$2,973,568.56	$3,130,072.17	$3,130,072.17	$3,130,072.17	$3,130,072.17
Injury Cost	$0.00	$0.00	$3,498,417.56	$3,731,645.40	$3,964,873.24	$4,198,101.07	$4,431,328.91	$4,431,328.91	$4,664,556.75	$4,664,556.75	$4,664,556.75	$4,664,556.75
PDO accident cost (no injury)	$0.00	$0.00	$140,394.81	$149,754.46	$159,114.12	$168,473.77	$177,833.42	$177,833.42	$187,193.08	$187,193.08	$187,193.08	$187,193.08
Total Safety Cost	$0.00	$0.00	$5,986,366.50	$6,385,457.60	$6,784,548.70	$7,183,639.80	$7,582,730.90	$7,582,730.90	$7,981,822.00	$7,981,822.00	$7,981,822.00	$7,981,822.00

$142,945,073.50
$86,544,142.08

	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Vehicle miles	0	0	20,682,513	22,061,347	23,440,181	24,819,015	26,197,849	26,197,849	27,576,683	27,576,683	27,576,683	27,576,683
Congestion	$0.0000	$0.0000	$9,783,486.4480	$10,435,718.8778	$11,087,951.3077	$11,740,183.7376	$12,392,416.1674	$12,392,416.1674	$13,044,648.5973	$13,044,648.5973	$13,044,648.5973	$13,044,648.5973

Noise	$0.0000	$0.0000	$479,582.6690	$511,554.8470	$543,527.0249	$575,499.2028	$607,471.3808	$607,471.3808	$639,443.5587	$639,443.5587	$639,443.5587	$639,443.5587
Pavement	$0.0000	$0.0000	$5,425,278.9433	$5,786,964.2062	$6,148,649.4690	$6,510,334.7319	$6,872,019.9948	$6,872,019.9948	$7,233,705.2577	$7,233,705.2577	$7,233,705.2577	$7,233,705.2577
Total External Truck cost savings	$0.0000	$0.0000	$15,688,348.0603	$16,734,237.9310	$17,780,127.8016	$18,826,017.6723	$19,871,907.5430	$19,871,907.5430	$20,917,797.4137	$20,917,797.4137	$20,917,797.4137	$20,917,797.4137
$374,613,226.19	0	0	14787772.7	15314198.27	15797413.26	16239488.22	16642409.72	16157679.34	16512702.44	16031749.94	15564805.77	15111461.91
$226,804,460.48	374613226.2											

	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Containerized Truck Trip Savngs Assuming	0	0	17,280	18,432	19,584	20,736	21,888	21,888	23,040	23,040	23,040	23,040
Total Truck Savings to BCOs	$0	$0	$22,327,712	$23,816,227	$25,304,741	$26,793,255	$28,281,769	$28,281,769	$29,770,283	$29,770,283	$29,770,283	$29,770,283

$533,150,866.75
$322,788,909.30

3% DISCOUNT	**7% DISCOUNT**
$35,607,649.77	**$21,558,165.14**
$142,945,073.50	**$86,544,142.08**
$374,613,226.19	**$226,804,460.48**
$533,150,866.75	**$322,788,909.30**
$1,086,316,816.20	**$657,695,677.00**

BENEFITS
$21,558,165.14
$86,544,142.08
$226,804,460.48
$322,788,909.30
$657,695,677.00

1	1	1	1	1	1	1	1	1	1	1	1	1
2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043
46,080	46,080	46,080	46,080	46,080	46,080	46,080	46,080	46,080	46,080	46,080	46,080	46,080

2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043
27,576,683	27,576,683	27,576,683	27,576,683	27,576,683	27,576,683	27,576,683	27,576,683	27,576,683	27,576,683	27,576,683	27,576,683	27,576,683
27,576,683	27,576,683	27,576,683	27,576,683	27,576,683	27,576,683	27,576,683	27,576,683	27,576,683	27,576,683	27,576,683	27,576,683	27,576,683

2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043
3.28	3.28	3.28	3.28	3.28	3.28	3.28	3.28	3.28	3.28	3.28	3.28	3.28
83.26	83.26	83.26	83.26	83.26	83.26	83.26	83.26	83.26	83.26	83.26	83.26	83.26
0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
6,337.12	6,337.12	6,337.12	6,337.12	6,337.12	6,337.12	6,337.12	6,337.12	6,337.12	6,337.12	6,337.12	6,337.12	6,337.12
3.03	3.03	3.03	3.03	3.03	3.03	3.03	3.03	3.03	3.03	3.03	3.03	3.03
$1,268,185.82	$1,268,185.82	$1,268,185.82	$1,268,185.82	$1,268,185.82	$1,268,185.82	$1,268,185.82	$1,268,185.82	$1,268,185.82	$1,268,185.82	$1,268,185.82	$1,268,185.82	$1,268,185.82
$706,307.05	$706,307.05	$706,307.05	$706,307.05	$706,307.05	$706,307.05	$706,307.05	$706,307.05	$706,307.05	$706,307.05	$706,307.05	$706,307.05	$706,307.05
$7,580.20	$7,580.20	$7,580.20	$7,580.20	$7,580.20	$7,580.20	$7,580.20	$7,580.20	$7,580.20	$7,580.20	$7,580.20	$7,580.20	$7,580.20
$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	0
$0.00	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**
$6,200.57	$6,200.57	$6,200.57	$6,200.57	$6,200.57	$6,200.57	$6,200.57	$6,200.57	$6,200.57	$6,200.57	$6,200.57	$6,200.57	$6,200.57
$1,988,273.64	$1,988,273.64	$1,988,273.64	$1,988,273.64	$1,988,273.64	$1,988,273.64	$1,988,273.64	$1,988,273.64	$1,988,273.64	$1,988,273.64	$1,988,273.64	$1,988,273.64	$1,988,273.64

0.275766834	0.275766834	0.275766834	0.275766834	0.275766834	0.275766834	0.275766834	0.275766834	0.275766834	0.275766834	0.275766834	0.275766834	0.275766834

2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043
$3,130,072.17	$3,130,072.17	$3,130,072.17	$3,130,072.17	$3,130,072.17	$3,130,072.17	$3,130,072.17	$3,130,072.17	$3,130,072.17	$3,130,072.17	$3,130,072.17	$3,130,072.17	$3,130,072.17
$4,664,556.75	$4,664,556.75	$4,664,556.75	$4,664,556.75	$4,664,556.75	$4,664,556.75	$4,664,556.75	$4,664,556.75	$4,664,556.75	$4,664,556.75	$4,664,556.75	$4,664,556.75	$4,664,556.75
$187,193.08	$187,193.08	$187,193.08	$187,193.08	$187,193.08	$187,193.08	$187,193.08	$187,193.08	$187,193.08	$187,193.08	$187,193.08	$187,193.08	$187,193.08
$7,981,822.00	$7,981,822.00	$7,981,822.00	$7,981,822.00	$7,981,822.00	$7,981,822.00	$7,981,822.00	$7,981,822.00	$7,981,822.00	$7,981,822.00	$7,981,822.00	$7,981,822.00	$7,981,822.00

2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043
27,576,683	27,576,683	27,576,683	27,576,683	27,576,683	27,576,683	27,576,683	27,576,683	27,576,683	27,576,683	27,576,683	27,576,683	27,576,683
$13,044,648.5973	$13,044,648.5973	$13,044,648.5973	$13,044,648.5973	$13,044,648.5973	$13,044,648.5973	$13,044,648.5973	$13,044,648.5973	$13,044,648.5973	$13,044,648.5973	$13,044,648.5973	$13,044,648.5973	$13,044,648.5973

$639,443.5587	$639,443.5587	$639,443.5587	$639,443.5587	$639,443.5587	$639,443.5587	$639,443.5587	$639,443.5587	$639,443.5587	$639,443.5587	$639,443.5587	$639,443.5587	$639,443.5587
$7,233,705.2577	$7,233,705.2577	$7,233,705.2577	$7,233,705.2577	$7,233,705.2577	$7,233,705.2577	$7,233,705.2577	$7,233,705.2577	$7,233,705.2577	$7,233,705.2577	$7,233,705.2577	$7,233,705.2577	$7,233,705.2577
$20,917,797.4137	$20,917,797.4137	$20,917,797.4137	$20,917,797.4137	$20,917,797.4137	$20,917,797.4137	$20,917,797.4137	$20,917,797.4137	$20,917,797.4137	$20,917,797.4137	$20,917,797.4137	$20,917,797.4137	$20,917,797.4137
14671322.24	14244002.18	13829128.33	13426338.18	13035279.79	12655611.45	12287001.4	11929127.58	11581677.26	11244346.85	10916841.61	10598875.34	10290170.24

2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043
23,040	23,040	23,040	23,040	23,040	23,040	23,040	23,040	23,040	23,040	23,040	23,040	23,040
$29,770,283	$29,770,283	$29,770,283	$29,770,283	$29,770,283	$29,770,283	$29,770,283	$29,770,283	$29,770,283	$29,770,283	$29,770,283	$29,770,283	$29,770,283

1	1	1	1	1	1
2044	2045	2046	2047	2048	2049
46,080	46,080	46,080	46,080	46,080	46,080

2044	2045	2046	2047	2048	2049
27,576,683	27,576,683	27,576,683	27,576,683	27,576,683	27,576,683
27,576,683	27,576,683	27,576,683	27,576,683	27,576,683	27,576,683

2044	2045	2046	2047	2048	2049
3.28	3.28	3.28	3.28	3.28	3.28
83.26	83.26	83.26	83.26	83.26	83.26
0.15	0.15	0.15	0.15	0.15	0.15
6,337.12	6,337.12	6,337.12	6,337.12	6,337.12	6,337.12
3.03	3.03	3.03	3.03	3.03	3.03
$1,268,185.82	$1,268,185.82	$1,268,185.82	$1,268,185.82	$1,268,185.82	$1,268,185.82
$706,307.05	$706,307.05	$706,307.05	$706,307.05	$706,307.05	$706,307.05
$7,580.20	$7,580.20	$7,580.20	$7,580.20	$7,580.20	$7,580.20
0	0	0	0	0	0
$0.00	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**
$6,200.57	$6,200.57	$6,200.57	$6,200.57	$6,200.57	$6,200.57
$1,988,273.64	$1,988,273.64	$1,988,273.64	$1,988,273.64	$1,988,273.64	$1,988,273.64

0.275766834	0.275766834	0.275766834	0.275766834	0.275766834	0.275766834

2044	2045	2046	2047	2048	2049
$3,130,072.17	$3,130,072.17	$3,130,072.17	$3,130,072.17	$3,130,072.17	$3,130,072.17
$4,664,556.75	$4,664,556.75	$4,664,556.75	$4,664,556.75	$4,664,556.75	$4,664,556.75
$187,193.08	$187,193.08	$187,193.08	$187,193.08	$187,193.08	$187,193.08
$7,981,822.00	$7,981,822.00	$7,981,822.00	$7,981,822.00	$7,981,822.00	$7,981,822.00

2044	2045	2046	2047	2048	2049
27,576,683	27,576,683	27,576,683	27,576,683	27,576,683	27,576,683
$13,044,648.5973	$13,044,648.5973	$13,044,648.5973	$13,044,648.5973	$13,044,648.5973	$13,044,648.5973

$639,443.5587	$639,443.5587	$639,443.5587	$639,443.5587	$639,443.5587	$639,443.5587
$7,233,705.2577	$7,233,705.2577	$7,233,705.2577	$7,233,705.2577	$7,233,705.2577	$7,233,705.2577
$20,917,797.4137	$20,917,797.4137	$20,917,797.4137	$20,917,797.4137	$20,917,797.4137	$20,917,797.4137
9990456.541	9699472.37	9416963.466	9142682.977	8876391.24	8617855.573

2044	2045	2046	2047	2048	2049	
23,040	23,040	23,040	23,040	23,040	23,040	
$29,770,283	$29,770,283	$29,770,283	$29,770,283	$29,770,283	$29,770,283	$0

Fumigation & Cold Chain Processing Center - Opinion of Probable Construction Cost

Description	Units	Area	Unit Cost	Subtotal
General Site Conditions (5%)				$2,479,670
Contingency (10%)				$4,959,340
Building Shell	SF	104,000	$225	$23,400,000
Permitting/Approvals/NEPA	LS		$2,000,000	$2,000,000
Concrete truck bay area	SF	65,700	$12	$788,400
Fumigation & Cold Chain Equip.	LS		$15,000,000	$13,500,000
Fumigation Gas Recovery System	LS		$3,500,000	$3,500,000
Landscape (Xeriscape)	SF	51,500	$10	$515,000
Civil/Site Improvements	LS		$4,390,000	$5,890,000
Cost of Fumigation & Cold Chain Processing Center				$57,032,410

Cargo Yard Resiliency Improvements - Opinion of Probable Construction Cost

Description	Units	Area	Unit Cost	Subtotal
Civil/Site Improvements	LS	75 acres	$289,678	$21,725,819
Cost of Cargo Yard Resiliency				$21,725,819
Total Cost of Project				***$ 78,758,229***

Total Present Value of Benefits @ 3% over 30 Years	**$1,086,316,816.20**
Total Present Value of Benefits @ 7% over 30 Years	**$657,695,677.00**
Total Cost	**$78,758,229.00**
Benefit Cost Ratio with 3% Discount Rate	**13.79**
Benefit Cost Ratio with 7% Discount Rate	**8.35**

PORT*MIAMI* COLD CHAIN PROCESSING AND FUMIGATION CENTER AND CARGO YARD RESILIENCY IMPROVEMENTS - BENEFIT-COST ANALYSIS APPENDIX

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SEPTEMBER 11, 2019

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I. PROJECT DESCRIPTION

PortMIAMI is entering an application to apply for the DOT Port Infrastructure Development Program and is seeking funding assistance in constructing a Cold Chain Processing and Fumigation Center and investing in Cargo Yard Resiliency Improvements. PortMIAMI is the lead and primary point of contact and award recipient. The two components together will improve the safety, efficiency, and reliability of the movement of goods into, out of, around, and within the port, as well as the unloading, loading, and processing capacity of cargo at the port. It will also improve the port's economic competitiveness by providing more capacity for cargo phytosanitary treatment, cold processing, and processing to help capture a large portion of the perishable markets in a pivotal region that serves the southeast, Caribbean, and Latin American regions.

The PortMIAMI Fumigation and Cold Chain Processing Center will be built on a 14-acre site. The facility will be completed in one phase, building a 104,000 SF facility. The proposed building and installed fumigation treatment and cold processing equipment will provide advance technology-supported safety and design efficiency improvements by providing several services into one facility with the latest technology and spatial programming to optimize space. The proposed Fumigation and Cold Chain Processing Center will improve resiliency by reducing roadway depletion via roadway transport. It will adapt to sea level rise by designing and constructing a facility in accordance with expected sea level rise projections during its anticipated useful life, using regionally consistent unified sea level rise projections.

The Fumigation and Cold Chain Processing and Fumigation Center will provide for South Florida's need to handle exports of manufacturing, agriculture, and other goods by creating higher capacity and current technology to treat, store, and process perishables near the port. This will result in vehicle miles traveled savings by sourcing the growing treatment and processing needs locally. The multipurpose center's proposed size, advance technology, and innovative flexible layout will improve Miami's position as a key point of treatment at the US Port closest to the growing regions of Latin America and the Caribbean, thus saving on transportation length and cost, storing, and/or processing goods. PortMiami's position as a nexus of both N-S and E-W trade will also provide a transshipment point for perishables that are currently transshipped via nearby foreign ports in the Caribbean and S. America to support the safe flow of agricultural and food products, free of pests and disease, domestically and internationally.

The overall cost estimate for the PortMIAMI Cold Chain Processing and Fumigation Center is approximately $57,032,410 of which the Seaport Department is seeking $33,500,000, or a 58% match of federal funds.

PortMIAMI's Cargo Yard Resiliency Improvements – will provide for investments to supplement and bring to reality PortMiami infrastructure improvements to upgrade paving and drainage, and resiliency methods, along with the reorganization of cargo containers, which allow for the installation of additional refrigerated racks and an overall more efficient yard. These improvements will yield a higher capacity cargo yard, where land is currently at a premium. The increased cargo capacity is required to support the additional container traffic at PortMIAMI that will be generated by the new Cold Chain Processing and Fumigation Center

The overall cost estimate for the PortMIAMI Cargo Yard Resiliency Improvements is approximately $21,725,820, of which the Seaport Department is seeking $10,428,393, or a 48% match of federal funds.

Strict guidelines for measuring the merits of projects applying for the grants are outlined in The Notice of Funding Opportunity for the Department of Transportation's National Infrastructure Investments Under the Consolidated Appropriations Act, 2018. Furthermore, the benefit-cost guide lines to be applied to the project are set forth in the "Benefit-cost Analysis Guidance for Discretionary Grant Programs, U.S." Department of Transportation, December 2018. Martin Associates has followed these guidelines to assess the benefits of the container yard expansion. These benefits are then combined with the costs of the project, as developed by PortMIAMI to estimate the benefit-cost ratio under a 3% and 7% discount rate.

The benefit criteria applied to the project are:

1. ***Determination of the Safety Benefits*** which result from the reduction in the truck travel distance and resulting vehicle miles traveled to serve the perishable products consumption markets in Florida, by attracting perishables that are currently moved into Florida from non-Florida ports. These new imports will be handled at PortMIAMI, which will require the additional yard storage capacity that will be provided under the Cargo Yard Resiliency Improvements.
2. ***Determination of Environmental Benefits*** by reducing the truck distance and corresponding vehicle miles traveled to serve the perishable products consumption markets in Florida, by attracting perishables that are currently moved into Florida from non-Florida ports. These new imports will be handled at PortMIAMI, which will require the additional yard storage capacity that will be provided under the Cargo Yard Resiliency Improvements.
3. ***Determination of External Trucking and National Infrastructure Benefits*** by reducing the truck distance and corresponding vehicle miles traveled to serve the perishable products consumption markets in Florida, by attracting perishables that are currently moved into Florida from non-Florida ports. These new imports will be handled at PortMIAMI, which will require the additional yard storage capacity that will be provided under the Cargo Yard Resiliency Improvements.
4. ***Determination of Economic Competitiveness Benefits*** to the perishable products consumers in Florida, by reducing the truck distance, and hence transportation costs over the without project case whereby these imports are moved via non-Florida ports.

These benefits are quantified over a 30-year period (2019 through 2049). It is assumed that the Projects will start with the award of the grant and will be completed by 2021, when the facility will begin handling perishables. The 30 year period is chosen as the useful life of the project. The detailed calculations are included in the attached Excel spreadsheet benefit-cost model.

II. KEY ASSUMPTIONS

The key target perishable import markets for the Cold Chain Processing and Fumigation Center consists of perishable products originating in Chile and Peru, as well as Central America. This market includes dates, figs, blueberries, apples, mangos, pears, seafood, pineapples, avocados, melons, papayas, grapes, and citrus fruit. Bananas are not included in the target market since the major importers such as Dole and Chiquita have established proprietary facilities at several seaports, and tend to use third party cold storage facilities to a lesser extent than the above noted commodities. In addition to these commodities, fresh flowers also represent a key target market, particularly for air cargo. Exports include Florida citrus, Florida seafood, and U.S. agricultural products such as beef, pork, poultry, soy and non-GMO wheat and corn.

The perishable import market consisting of the commodities identified above move into the Southeastern U.S. through a select number of ports, as shown in Exhibit 1. This market is dominated by the Delaware River ports of Philadelphia (PA), Wilmington (DE), Chester (PA), and Gloucester City (NJ).

Exhibit 1

Key Ports Handling Perishable Cargo from South America and Central America

Ports	TEUS
Philadelphia/Delaware River	137,137
Port Everglades	43,965
Miami	12,195
Savannah	4,439

Source: Piers, 2018

The benefits of the development of the Cold Chain Processing and Fumigation Center is to capture the perishable cargo that now moves into Florida via non-Florida ports by truck, resulting in increased environmental, safety, infrastructure costs to the nation, as well as increasing the cost of perishable foods to the Florida consumers while reducing shelf life Using Piers data, Martin Associates estimated the share of imports from the West Coast of South America and Central America that are consumed in Florida and moving through various Atlantic Coast ports as well as the Florida ports. As shown in Exhibit 2, 40% of the Florida consumed imports from the West Coast of South America and Central America use ports other than Florida ports. As noted, the majority of these West Coast South American and Central American imports are perishable commodities, most likely moving into Florida from the Delaware River ports, as well as from Savannah. In addition, in the recent months, the Port of Wilmington, NC has entered into the perishable goods import market, and is also likely to serve certain Florida Markets in the near future.

Exhibit 2

Imports from West Coast South America and Central America Consumed in Florida by Port of Import

Ports	TEUS	Share
Non-Florida Ports	136,408	40.1%
Port Everglades	83,666	24.6%
Tampa/Manatee	84,739	24.9%
Miami	34,052	10.0%
Jacksonville	1,609	0.5%
Total	340,473	100.0%

Source: Piers, 2018

It is important to emphasize that the TEUs identified in Exhibit 2 underestimate the volume of perishables that move into Florida from out of state ports, since the Piers data only identifies cargo that moves from the port of entry to a final destination under an international bill of lading and clears customs at the point of destination. A large share of the imported perishables clear customs at the port of entry, and then move to near-port cold storage warehouses where they are re-loaded (transloaded) into domestic refrigerated trucks for the move to final consumption. Therefore, the Piers data does not include these international shipments that are transloaded at the port of entry, for the further trip to final consumption. As a result, the Piers data regarding final consumption point, such as the state of Florida, underestimates the actual flow of perishable cargo that is discharged at the Delaware River ports and the other South Atlantic ports and ultimately consumed in Florida.[1]

To develop a more comprehensive estimate of the volume of perishables that move from the port of import into the state of Florida, IHS Transearch data was used. This data base identifies the perishable cargo that is trucked from each import port BEA (Business Economic Area) into each BEA in the state of Florida. Focus was on the volume of domestic trucked perishable cargo (consisting of the commodities identified above) that was moved from each non-Florida port BEA into each Florida BEA for consumption. Exhibit 3 shows the domestic tonnage that was trucked from each non-Florida port BEA into each Florida BEA.

Exhibit 3

Domestic Perishable Cargo Trucked Between non-Florida Port BEA and Florida BEA (Tons)

	Florida BEA								
Port BEA	**Fort Myers, FL**	**Jacksonville, FL**	**Miami, FL**	**Orlando, FL**	**Pensacola, FL**	**Sarasota, FL**	**Tallahassee, FL**	**Tampa, FL**	**Total**
Philadelphia, PA	7,540	12,554	90,178	41,415	2,850	7,953	2,781	15,822	181,093
Savannah, GA	4,769	11,533	37,314	42,874	5,040	5,812	3,007	13,095	123,443
Wilmington, NC	3,658	5,120	21,718	11,052	967	3,347	1,036	7,070	53,968
Total	**15,967**	**29,206**	**149,210**	**95,341**	**8,858**	**17,112**	**6,823**	**35,987**	**358,504**

Source: HIS Transearch 2017 (most recent year data is available)

This 358,504 tons (18,000 full truckload equivalents) of domestic cargo trucked into Florida is used as a proxy for the transloaded international perishable cargoes, and also as a proxy for the ultimate destinations for perishables imported through non-Florida ports that are consumed in Florida. This is in addition to the TEUs trucked directly from each of the non-Florida ports into Florida.

The mileage cost savings of serving each Florida BEA through the proposed Cold Chain Processing and Fumigation Center (and using PortMIAMI) rather than using the current non-Florida ports were estimated by non-Florida port and Florida BEA of consumption. Exhibit 4 shows the mileage between each non-Florida port to each Florida BEA as well as the mileage to each Florida BEA should PortMIAMI and the Cold Chain Processing and Fumigation Center be used. A weighted mileage cost savings by using PortMIAMI was then computed (weights being perishables now consumed, by Florida BEA)

[1] In addition to not capturing the transloaded perishable cargo moving into Florida from out of state ports, the Piers data also under reports the final geographic destination of imports by state since a large percentage of imports do not indicate a final consignee, and its location, since the cargo is moved by freight forwarders, that don't reflect the actual point of consumption; or in some cases the headquarters location of an importer is reported on the shipping bill of lading rather than the ultimate geographic destination.

Exhibit 4
Mileage Savings to Florida Consumers due to Cold Chain Processing and Fumigation Center

Port BEA Now Used To Serve Florida Markets	Wilmington, NC	Savannah	Philadelphia	Wtd Avg Current Mileage	Mileage Via PortMIAMI	Mileage Savings Provided by PortMIAMI	Share Out of State Perishables Consumed from Out-of-State Ports	Wtd Mileage Savings
Share by Port into Florida	15.05%	34.43%	50.51%	Miles	Miles	Miles	%	Miles
BEAs	*Miles*	*Miles*	*Miles*					
Miami	755	458	1174	864	57	807	41.6%	336
Orlando	610	309	1028	717	226	492	26.6%	131
Tampa	632	424	1050	772	281	491	10.0%	49
Jacksonville	436	139	855	545	354	191	8.1%	16
Fort Myers	756	434	1175	857	155	702	4.5%	31
Sarasota	684	408	1103	801	231	570	4.8%	27
Tallahassee	597	299	1016	706	484	222	1.9%	4
Pensacola	737	493	1111	842	678	164	2.5%	4
Wtd Average Miles Saved Using Port Miami								598

As shown in Exhibit 4, the use of the Cold Chain Processing and Fumigation would result in a savings of 598 truck miles over the current without project situation in which the Florida perishable market is served by out of state ports, most notable the Delaware River ports, and to a lesser extent Savannah and Wilmington, NC.

This weighted average truck mileage savings will be critical in driving the savings in Vehicle Miles Traveled (VMT) and the resulting environmental, safety, infrastructure and economic competitiveness benefits of the Cold Chain Processing and Fumigation Center and the Cargo Yard Resiliency Improvements.

The proposed Cold Chain Processing and Fumigation Center will have 80 truck bays. Assuming about 2 trucks serviced per bay per day (based on interviews with current operators of similar Cold Chain Processing and Fumigation Facilities), and 360 days of operation annually. It is further assumed that 40% of the facility utilization will be accounted for by perishables that under the without project case are moved into Florida consumption markets from out of state ports, as indicated previously in Exhibit 2. Under the without project case it is also assumed that the trucks now serving the Florida consumption markets will return to the out of state port regions.

Exhibit 5 shows that that the facility will handle 23,040 trucks per year. This equates to 46,080 roundtrip truck trips per year at full facility utilization that will be saved as the result of the opening of the new Cold Chain Processing and Fumigation Center. These containers will move through PortMIAMI, and will utilize the additional storage capacity generated by the Cargo Yard Resiliency Improvements project. Assuming 1.7 TEUs per truck load, the 23,040 trucks per year equate to 39,168 TEUs at full facility utilization. This is about 23% of the 167,008 TEUs of perishable cargo now moving into Florida from non-Florida ports.[2]

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[2] It is estimated that 136,408 TEUs of perishables from West Coast South America and Central America moved directly into Florida from non-Florida ports (see Exhibit 2), while another 30,472 TEUs of perishables (358,504 tons of trucked cargo divided by about 11.8 tons per TEU) moved into Florida after transloaded at the non-Florida port of entry, for a total 167,008 TEUs currently moving from out of state ports into Florida.

Exhibit 5
Truck Trips per Year Saved

Truck Trip Assumptions	
Number of Truck Bays	80
Truck Turns per Day per Bay	2
Days of Operation	360
Total Annual Throughput in Terms of Truck Trips	57,600
Share from Out of State Ports	40%
Trucks per Year from Out of State Ports (Containers)	**23,040**
Round Trip Truck Trips Saved Annually at Full Utilization	**46,080**

The reduced truck round trips multiplied by the average miles saved, 598 miles as shown in Exhibit 4, results in Vehicle Miles Traveled (VMT) savings due to the Cold Chain Processing and Fumigation Center and the Cargo Yard Resiliency Improvements projects. The VMT savings are the key drivers of the benefits that are quantified as the result of the Cold Chain Processing and Fumigation Center and the Cargo Yard Resiliency Improvements. It is further assumed that the project becomes operational in 2021, with a 75% facility utilization rate, growing to a 100% utilization rate in the year 2026. Based on these utilization assumptions, the VMT savings are estimated 20,682,513 VMT in 2021, growing to 27,576,683 VMT by 2026, and remaining at that level throughout the 30 year projection period.

III. BENEFITS ANALYSIS

1. Safety Benefits

Safety benefits are defined in terms of reduced accidents and associated injuries as the result of the reduced vehicle truck miles traveled due to the Cold Chain Processing and Fumigation Center and Cargo Yard Resiliency Improvements. Accidents per 100 million vehicle miles traveled were developed from *Surface Transportation, A Comparison of the Costs of Road, Rail and Waterways Freight Shipments that are not Passed on to Consumers*, GAO, Report to the Subcommittee on Select Revenue Measures, Committee on Ways and Means House of Representatives, January 2011. The value of an accident, a fatality, injury, or property damage only (PDO) was collected from *BTS Motor Vehicle Safety* Data, 2015 National Transportation Statistics, 2015. The values were inflated from 2015 values to 2018 values based on the consumer price index published by the U.S. Bureau of Labor Statistics, May 2018.

Exhibit 6
Accidents per 100 Million VMT

	Accident Probability/ 100 million VMT	Value per Accident, 2018$
Fatal Accident Cost (K)	1.13369	$10,011,917
Severe Injury Accident Cost (A)	78.92426	$214,318
PDO Accident Cost (no injury)	203.40039	$3,337

Sources: *Surface Transportation, A Comparison of the Costs of Road, Rail and Waterways Freight Shipments that are not Passed on to Consumers*, GAO, Report to the Subcommittee on Select Revenue Measures, Committee on Ways and Means House of Representatives, January 2011.

BTS Motor Vehicle Safety Data, 2015 National Transportation Statistics, 2015

The accident rates per 100 million VMT by type of accident were multiplied by the 100 million vehicle miles traveled savings to estimate the number of accidents by type (due to the reduced VMT). The estimated number of accidents by type were then multiplied by the value accidents (by type) to estimate the total annual value of accidents that would be avoided under the Cold Chain Processing and Fumigation Center and Cargo Yard Resiliency Improvements due to savings in VMT. These safety savings were estimated through 2049, and then discounted under a 3% and 7% discount rate. The present value of the savings benefits of the Cold Chain Processing and Fumigation Center and Cargo Yard Resiliency Improvements are:

NPV of Safety @3%	**$142,945,073.50**
NPV of Safety@7%	**$86,544,142.08**

2. Environmental Benefits

Environmental benefits are generated due to the reduced vehicle miles traveled with the Cold Chain Processing and Fumigation Center and Cargo Yard Resiliency Improvements. Emissions of air pollutants are generated per VMT, and the metrics used to estimate the volume of emissions per truck VMT are shown in Exhibit 7. These emission rates are measured in terms of short tons emitted per million VMT.

Exhibit 7
Short Tons of Emissions per Million VMT

Emissions	TONS EMITTED PER MILLION VMT
Nitrogen Oxides (Nox)	3.0193
Volatile Organic Compounds (VOC)	0.11
Fine Particule (PM)	0.1191
Sulfur Dioxide (SO2)	0.0055

Source: *Surface Transportation, A Comparison of the Costs of Road, Rail and Waterways Freight Shipments that are not Passed on to Consumers*, GAO, Report to the Subcommittee on Select Revenue Measures, Committee on Ways and Means House of Representatives, January 2011

The cost per short ton of the emissions by type of emission were developed from *NHTSA, Final Regulatory Impact Analysis, CAFE for MY 2012-MY 2016 Passenger Cars and Light Trucks*, March 2010. The cost of carbon dioxide has historically been based on the social costs of carbon and their costs per metric ton (converted to short ton) are prepared for future years by the *IWGSCC, Social Cost of Carbon for Regulatory Impact Analysis* Under Executive Order 12866, February 2011. As of June 2018, the cost of carbon dioxide emissions is no longer considered in the evaluation of emissions. These costs were updated using the May 2018 CPI and are shown in Exhibit 8.

Exhibit 8
Value per Short Ton of Emissions

Cost meterics	Cost/Short Ton Emitted
Nitrogen Oxides (Nox)	$7,693.53
Volatile Organic Compounds (VOC)	$1,952.32
Fine Particule (PM)	$351,938.69
Sulfur Dioxide (SO2)	$45,470.79

Source: Final Regulatory Impact Analysis, CAFE for MY 2012-MY 2016 Passenger Cars and Light Trucks, March 2010. And *IWGSCC, Social Cost of Carbon for Regulatory Impact Analysis* Under Executive Order 12866, February 2011.

The net present value of the environmental cost savings of the Cold Chain Processing and Fumigation Center and Cargo Yard Resiliency Improvements are:

NPV of Emissions @3% with out co2	**$35,607,649.77**
NPV of Emissions @7% without co2	**$21,558,165.14**

3. External Truck Cost Savings Benefits

External truck cost savings consist of reduced costs of highway/pavement repair, highway congestion, and noise pollution, due to reduced truck vehicle miles traveled resulting for the Cold Chain Processing and Fumigation Center and Cargo Yard Resiliency Improvements. Metrics that measure highway/pavement degradation costs per truck mile, noise pollution costs per truck mile and highway congestion per ton mile are published by the *1997 Federal Highway Cost Allocation Study*, Final Report, USDOT, Federal Highway Administration, May 2000, Table 13. These cost metrics are shown in Exhibit 9 and updated to 2018 dollars using the CPI for May 2018. These metrics are applied to the vehicle miles travelled saved under the Cold Chain Processing and Fumigation Center and Cargo Yard Resiliency Improvements project. With the I-95 corridor at or above capacity in many segments between Philadelphia and Miami, the removal of thousands of trucks from this corridor will provide relief in an order of National significance.

Exhibit 9
External Truck Cost Savings

Combination Truck 4 Axel	Cost/VMT
Congestion	**$0.4730**
Noise	**$0.0232**
Pavement (Urban Interstate)	**$0.2623**

Source: *1997 Federal Highway Cost Allocation Study*, Final Report, USDOT, Federal Highway Administration, May 2000

The present value of the External Truck Cost Savings benefits is:

NPV of External Truck Cost Savings @3%	**$374,613,226.19**
NPV of External Truck Cost Savings @7%	**$226,804,460.48**

4. Economic Competitiveness Benefits

The economic competitiveness benefits resulting from the Cold Chain Processing and Fumigation Center and Processing Facility and Cargo Yard Resiliency Improvements consists of the transportation cost savings to the nation's importers as the result of lower truck costs due to the savings in miles traveled to the key consumption destinations in in Florida. After the project is completed, additional container volumes will move through PortMIAMI to the consumption markets at lower transportation costs. To estimate the transportation cost savings, the hourly trucking cost was estimated from interviews with key trucking companies engaged in port drayage, as well as information provided by American Transportation Research Institute (ATRI), *An Analysis of the Operational Costs of Trucking, 2018*. Based on these sources, it is estimated that the daily trucking costs are $950. Using the 11 hours of daily service that are capped under the current hours of service regulation and enforced through the electronic logging devices (ELD), the current hourly operating cost per truck is estimated at $86.36. The cost savings per container is presented in Exhibit 10.

Exhibit 10

Transportation Cost Savings Per Container Due to Cold Chain Processing and Fumigation Center and Cargo Yard Resiliency Improvements

Savings in Hours of Truck Driving Time by Using PortMiami Over Use of Out of State Ports to Serve Florida Perishable	**Miles Saved**	**Hours Saved**	**Cost Savings per Container**
	598	14.96	$1,292.11
Cost Savings per Container			$1,292.11

The cost savings per truck trip multiplied by the number of containers utilizing the new Cold Chain Processing and Fumigation Center and the densified container yard was used to estimate the transportation cost savings to beneficial cargo owners that will be able to use PortMIAMI and the new Cold Chain Processing and Fumigation Center and the Cargo Yard Resiliency Improvements. It is to be emphasized that it is further assumed that the cost savings is applied to the number of containers that will be moved through PortMIAMI with the completed project. Under the without project, these containers would be moved into Florida from out of state ports. The present value of the transportation cost savings benefits of the Cold Chain Processing and Fumigation Center and Cargo Yard Resiliency Improvements, or the Economic Competitiveness Benefits are:

NPV of Economic Competitiveness @3%	**$533,150,866.75**
NPV of Economic Competitiveness @7%	**$322,788,909.30**

5. Summary of the Benefits

The total benefits projected to occur due to the Cold Chain Processing and Fumigation Center and Cargo Yard Resiliency Improvements are shown in Exhibit 11. Using a 3% discount rate over the period 2019 through 2049, the present value of the total benefits of the Cold Chain Processing and Fumigation Center and Cargo Yard Resiliency Improvements is $1.1 billion. Under a 7% discount rate, the total present value of the benefits of the project are $657.7 million. The annual benefits calculations over the 30-year period are presented in the attached benefit-cost Excel Workbook.

Exhibit 11

Summary of Benefits of the PortMIAMI Cold Chain Processing and Fumigation Center and Cargo Yard Resiliency Improvements

BENEFIT CATEGORIES	3% DISCOUNT	7% DISCOUNT
EMISSIONS	$35,607,649.77	$21,558,165.14
SAFETY	$142,945,073.50	$86,544,142.08
EXTERNAL TRUCK	$374,613,226.19	$226,804,460.48
ECONOMIC COMPETITIVENESS	$533,150,866.75	$322,788,909.30
TOTAL BENEFITS	$1,086,316,816.20	$657,695,677.00

IV. COSTS

The cost of the project is estimated at $78,758,229. The federal grant request is $43,928,393. The project costs are summarized in Exhibit 12.

Exhibit 12

Cost Summary of Cold Chain Processing and Fumigation Center and Cargo Yard Resiliency Improvements

Fumigation & Cold Chain Processing Center - Opinion of Probable Construction				
Description	**Units**	**Area**	**Unit Cost**	**Subtotal**
General Site Conditions (5%)				$2,479,670
Contingency (10%)				$4,959,340
Building Shell	SF	104,000	$225	$23,400,000
Permitting/Approvals/NEPA	LS		$2,000,000	$2,000,000
Concrete truck bay area	SF	65,700	$12	$788,400
Fumigation & Cold Chain Equip.	LS		$15,000,000	$13,500,000
Fumigation Gas Recovery Syster	LS		$3,500,000	$3,500,000
Landscape (Xeriscape)	SF	51,500	$10	$515,000
Civil/Site Improvements	LS		$4,390,000	$5,890,000
Cost of Fumigation & Cold Chain Processing Center				$57,032,410
Cargo Yard Resiliency Improvements - Opinion of Probable Construction Cost				
Description	**Units**	**Area**	**Unit Cost**	**Subtotal**
Civil/Site Improvements	LS	75 acres	$289,678	$21,725,819
Cost of Cargo Yard Resiliency				$21,725,819
Total Cost of Project				***$ 78,758,229***

The benefit-cost analysis in the next section is based on a $78,758,229 total project cost.

V. BENEFIT-COST CALCULATION

The Cold Chain Processing and Fumigation Center and Cargo Yard Resiliency Improvements has a very significant benefit-cost ratio, reflecting the strong merits of the project due the reduction in truck traffic on the nation's highways, in turn resulting in significant environmental benefits, safety benefits, external truck benefits, and economic competitive benefits.

Using a 3% discount rate over the 30-year time horizon, the project has a benefit-cost ratio of 13.79, and with a 7% discount rate the benefit-cost ratio is 8.35. The annual benefits and costs are presented in the attached Excel spreadsheet file.

Total Present Value of Benefits @ 3% over 30 Years	**$1,086,316,816.20**
Total Present Value of Benefits @ 7% over 30 Years	**$657,695,677.00**
Total Cost	**$78,758,229.00**
Benefit Cost Ratio with 3% Discount Rate	**13.79**
Benefit Cost Ratio with 7% Discount Rate	**8.35**

PORTMIAMI

September 16, 2019

The Honorable Elaine Chao
U.S. Secretary of Transportation
U.S. Department of Transportation
1200 New Jersey Ave. SE
Washington, DC 20590

RE: 2019 US DOT Port Infrastructure Development Program
PortMiami Cargo Yard Resiliency Improvements and
Fumigation and Cold-Chain Processing Center

Dear Secretary Chao:

This instrument serves as evidence of assurance by PortMimai that the matching funds for the "*PortMiami Fumigation and Cold Chain Processing Center*" and the *"Cargo Yard Resiliency Improvements* "components under the 2019 U.S. Department of Transportation Infrastructure Development Program for the fiscal year 2019 funding are committed and will be provided.

The total costs for the projects, as submitted, are $78,758,229 and we are committed to providing $21,129,836 or 27% percent, as matching funds.

Sincerely,

Andrew C. Hecker,
Chief Financial Officer
Assistant Port Director Finance

1015 N. America Way, 2nd Floor, Miami, Florida 33132
Phone: 305-347-4800

FDOT
Florida Department of Transportation

RON DESANTIS
GOVERNOR

1000 N.W. 111 Avenue
Miami, Florida 33172

KEVIN J. THIBAULT, P.E.
SECRETARY

September 12, 2019

Juan M. Kuryla, PPM
Port Director and CEO
PortMiami
1015 North America Way, 2nd Floor
Miami, Florida 33132

RE: Commitment Letter, U.S. Department of Transportation, Port Infrastructure Development Program, FY 2019 Appropriations Act

Dear Mr. Kuryla:

This letter serves to document the Florida Department of Transportation's investment in projects related to PortMiami's *Cargo Yard Resiliency Improvements* and *Fumigation and Cold Chain Processing Center* projects. Related projects have received the following Non-Federal funding investments from the State of Florida:

Financial #	Project	Previous Expenditures	Future Expenditures	Required Match	Expiration
431126-1	Ship to Shore Cranes	$7,964,572	$19,344,616	50%	06/30/2020
440616-1	Yard Densification & Truck Gates	$2,725,204	$10,724,795	50%	06/30/2022
440617-1	Cargo & Container Distribution Center	$0.00	$200,000.00	50%	06/30/2022

Once completed, these coastal seaport infrastructure projects will improve the safety, efficiency and reliability of the movement of goods and cargo at PortMiami.

Sincerely,

James Wolfe, P.E.
District Six Secretary

SFCT
South Florida
Container Terminal

September 6, 2019

The Honorable Elaine Chao
Secretary, United States Department of Transportation
1200 New Jersey Ave, S.E.
Washington, DC 20590

RE: 2019 US DOT Port Infrastructure Development Program
PortMiami Cargo Yard Resiliency Improvements and
Fumigation and Cold-Chain Processing Center

Dear Secretary Chao:

The South Florida Container Terminal (SFCT), a terminal operating cargo company that leases land from PortMiami, is writing to express our strong support for the 2019 U.S. Department of Transportation (DOT) Infrastructure Development Program grant application submitted by PortMiami for the "*PortMiami Cargo Yard Resiliency Improvements and Fumigation and Cold Chain Processing Center*" project.

The SFCT leased cargo yard is approximately 75 acres and there are no opportunities to expand the Terminal without significant environmental impacts involving physical expansion of the island port. The SFCT handles thirty-two percent of PortMiami's cargo and is a key contributor to PortMiami's job growth in South Florida and local economy.

The proposed infrastructure improvements include stormwater drainage upgrades, pavement improvements, barriers, milling and resurfacing, lighting, bypass lanes and roadways. The improvements will provide SFCT a much-needed opportunity to maximize the efficiency of cargo operations within the existing cargo yard. It will also bring SFCT's cargo yard to a state of good repair and increase resiliency, promote exports of manufacturing, agriculture, and other goods. These improvements will strengthen key points of service along the sequence of cargo processing that is vital to the continued growth for Florida and the nation.

The SFCT urges your support of PortMiami's grant application for this important infrastructure project.

Sincerely,

Mark J. Baker
President

SEABOARD
MARINE

8001 Northwest 79th Avenue
Miami, Florida 33166
P 305.863.4444
F 509.863.4400

September 10, 2019

The Honorable Elaine Chao
U.S. Secretary of Transportation
U.S. Department of Transportation
1200 New Jersey Ave. SE
Washington, DC 20590

Dear Secretary Chao:

As PortMiami's largest cargo tenant and a major employer in South Florida, we write to express our strong support for the 2019 U.S. Department of Transportation (DOT) Infrastructure Development Program grant application submitted by PortMiami for the "*PortMiami Fumigation and Cold Chain Processing Center*" (Center) project.

The Center's attributes will improve the safety, efficiency and reliability of the movement of perishables as well as the processing capacity of temperature-controlled cargo at PortMiami. It will also improve the region's economic competitiveness by providing additional capacity for cargo phytosanitary treatment, cold chain processing, and value-added services. The innovative multipurpose layout will enhance Miami's position as a key point of treatment and processing of perishables, particularly from Latin America, and will support the safe flow of agricultural/food products, free of pests and diseases, both domestically and internationally.

PortMiami supports 334,000 jobs in Florida and contributes $43 billion to the local economy and remains an indispensable partner in Seaboard Marine's efforts to support the creation of high-paying jobs and strengthened U.S. relations throughout the Americas. The market for fresh produce is growing in South Florida, and the proposed Center will create a needed synergy that is vital to continued economic growth for Florida and the nation.

We urge your support of PortMiami's grant application for this important infrastructure project.

Sincerely,

Bruce Brecheisen
Executive Vice President

greater
miami
chamber
of commerce

August 22, 2019

The Honorable Elaine Chao
U.S. Secretary of Transportation
U.S. Department of Transportation
1200 New Jersey Ave. SE
Washington, DC 20590

Dear Secretary Chao:

As members of the South Florida trade and logistics community, we write to express our strong support for the 2019 U.S. Department of Transportation (DOT) Infrastructure Development Program grant application submitted by PortMiami for the "*PortMiami Fumigation and Cold Processing Center*" (Center) project.

The components of the Center will improve the safety, efficiency and reliability of the movement of perishables as well as the processing capacity of temperature-controlled cargo at PortMiami. It will also improve the port's economic competitiveness by providing additional capacity for cargo phytosanitary treatment, cold chain processing, and value-added services.

The advance technology and innovative multipurpose layout will enhance Miami's position as a key point of treatment and processing of perishables and will support the safe flow of agricultural/food products, free of pests and diseases, both domestically and internationally. PortMiami supports 334,000 jobs in Florida and contributes $43 billion to the local economy and remains an indispensable partner in our efforts to support the creation of high-paying jobs for our constituents, growth for businesses, and strengthened U.S. relations throughout the world. The market for fresh produce is growing in South Florida, and the proposed Center will create a needed synergy that is vital to continued economic growth for Florida and the nation.

We urge your support of PortMiami's grant application for this important infrastructure project.

Sincerely,

Alfred Sanchez
President & CEO

Greater Miami Chamber of Commerce
1601 Biscayne Blvd. Ballroom Level · Miami, Florida 33132 · (305) 577-5445

September 10, 2019

The Honorable Secretary Elaine L. Chao
US Department of Transportation
1200 New Jersey Ave, SE
Washington, DC 20590

RE: U.S. Department of Transportation Maritime Administration (MARAD) Port Infrastructure Development Program 2019 Grant Application Support Letter for PortMiami Cargo Yard Resiliency Improvements and Fumigation and Cold Chain Processing Center

Dear Secretary Chao:

The Florida Ports Council is pleased to submit this letter of support for PortMiami's Cargo Yard Resiliency Improvements and Fumigation and Cold Chain Processing Center for the U.S. Department of Transportation Port Infrastructure Development Program 2019 Grant Application. The project will be divided into two interdependent components totaling $78.7 million, with a public-private partner share contribution of $13.5 million and PortMiami contributing $21.3 million. The request for the Port Infrastructure Development Program 2019 Grant Application is $43,928,393. This project will strengthen the infrastructure and capacity for the port, thus improving efficient freight flows for the State of Florida.

The Cargo Yard Resiliency Improvements and Fumigation and Cold Chain Processing Center Program will allow the increase of international trade to PortMiami, which acts as the principal United States trade gateway to Central and South America and the Caribbean. The two primary components of this program demonstrate a connection by providing improved services. The sequence of services will be tailored specifically for perishable cargo entering PortMiami. The Cargo Yard Resiliency Improvements are for infrastructure improvements to upgrade drainage and resiliency improvements for the reorganization of cargo containers; and the Fumigation and Cold Chain Processing Center consists of the construction of a state-of-the-art fumigation and cold chain processing facility.

It is critical that Florida's seaports are equipped to handle a growing volume of trade to meet consumer needs and to ensure our nation's surface transportation system is used most efficiently. PortMiami contributes more than $41 billion annually to the South Florida economy, and provides direct and indirect employment to more than 324,000 jobs.

South Florida is the 8th largest metropolitan area in the U.S. with more than six million residents. In addition, Florida is the 3rd largest state with over 21 million residents, and we welcomed 126 million seasonal visitors in 2018. It is critical that Florida's seaports are positioned and equipped to handle a growing volume of trade to meet consumer needs and to ensure our nation's surface transportation system is used most efficiently.

I appreciate the opportunity to express the Florida Ports Council's support for this project and encourage the U.S. Department of Transportation to consider its regional benefits. Thank you for your leadership in addressing the critical transportation challenges we face.

Sincerely,

Doug Wheeler
President & CEO
Florida Ports Council

Cc: Juan Kuryla, PortMiami, Port Director

PORT OF MIAMI CRANE MANAGEMENT, INC.

September 13, 2019

The Honorable Elaine Chao
U.S. Secretary of Transportation
U.S. Department of Transportation
1200 New Jersey Ave. SE
Washington, DC 20590

Re: Support for PortMiami Fumigation and Cold Chain Processing Center

Dear Secretary Chao:

As members of the South Florida trade and logistics community, we write to express our strong support for the 2019 U.S. Department of Transportation (DOT) Infrastructure Development Program grant application submitted by PortMiami for the *"PortMiami Fumigation and Cold Chain Processing Center"* (Center) project.

The components of the Center will improve the safety, efficiency and reliability of the movement of perishables as well as the processing capacity of temperature-controlled cargo at PortMiami. It will also improve the port's economic competitiveness by providing additional capacity for cargo phytosanitary treatment, cold chain processing, and value-added services. The advance technology and innovative multipurpose layout will enhance Miami's position as a key point of treatment and processing of perishables and will support the safe flow of agricultural/food products, free of pests and diseases, both domestically and internationally.

PortMiami supports 334,000 jobs in Florida and contributes $43 billion to the local economy and remains an indispensable partner in our efforts to support the creation of high-paying jobs for our constituents, growth for businesses, and strengthened U.S. relations throughout the world. The market for fresh produce is growing in South Florida, and the proposed Center will create a needed synergy that is vital to continued economic growth for Florida and the nation.

We at Port of Miami Crane Management, Inc., (PMCM) specifically value this project for our nation's economy which includes bringing more jobs to our company as we oversee the large gantry cranes that will unload the containers that would be processed thru this Center.

We urge your support of PortMiami's grant application for this important infrastructure project.

Sincerely,

Aguedo E. (Ed) Bello, PE
Chief Executive Officer

2886 PORT BOULEVARD • MIAMI, FL 33132 USA • TEL (305) 381-6250 • FAX: (305) 381-6537
www.cranemgt.com

CONSULATE GENERAL OF BRAZIL
MIAMI, FLORIDA

September 13, 2019

The Honorable Elaine Chao
U.S. Secretary of Transportation
U.S. Department of Transportation
1200 New Jersey Ave. SE
Washington, DC 20590

Dear Secretary Chao:

As a trade official from the Consulate General of Brazil in Miami representing the fruitful commercial partnership between Brazil and the state of Florida, we write to express our strong support for the 2019 U.S. Department of Transportation (DOT) Infrastructure Development Program grant application submitted by PortMiami for the "*PortMiami Fumigation and Cold Chain Processing Center*" (Center) project.

The components of the Center will improve the safety, efficiency and reliability of the movement of perishables as well as the processing capacity of temperature-controlled cargo at PortMiami. It will also improve the port's economic competitiveness by providing additional capacity for cargo phytosanitary treatment, cold chain processing, and value-added services. The advance technology and innovative multipurpose layout will enhance Miami's position as a key point of treatment and processing of perishables and will support the safe flow of agricultural/food products, free of pests and diseases, both domestically and internationally.

PortMiami supports 334,000 jobs in Florida and contributes $43 billion to the local economy and remains an indispensable partner in our efforts to support the creation of high-paying jobs for our constituents, growth for businesses, and strengthened U.S. relations throughout the world. The market for fresh produce is growing in South Florida, and the proposed Center will create a needed synergy that is vital to continued economic growth for Florida and the nation.

We urge your support of PortMiami's grant application for this important infrastructure project.

Sincerely,

Rodrigo Fonseca
Deputy Consul
Head of the Economic &
Commercial Affairs Office
Consulate General of Brazil in Miami

COMMERCIAL REAL ESTATE SERVICES

CBRE

Michael K. Silver, SIOR
First Vice President

CB Richard Ellis, Inc.
Brokerage Services
Industrial

777 Brickell Avenue
Suite 1100
Miami, FL 33131-2814

305 779 3124 Tel
305 381 6462 Fax
305 527 3612 Cell

michael.silver@cbre.com
www.cbre.com

September 4, 2019

The Honorable Elaine Chao
U.S. Secretary of Transportation
U.S. Department of Transportation
1200 New Jersey Ave. SE
Washington, DC 20590

Dear Secretary Chao:

As members of the South Florida trade and logistics community, we write to express our strong support for the 2019 U.S. Department of Transportation (DOT) Infrastructure Development Program grant application submitted by PortMiami for the "*PortMiami Fumigation and Cold Chain Processing Center*" (Center) project.
The components of the Center will improve the safety, efficiency and reliability of the movement of perishables as well as the processing capacity of temperature-controlled cargo at PortMiami. It will also improve the port's economic competitiveness by providing additional capacity for cargo phytosanitary treatment, cold chain processing, and value-added services. The advance technology and innovative multipurpose layout will enhance Miami's position as a key point of treatment and processing of perishables and will support the safe flow of agricultural/food products, free of pests and diseases, both domestically and internationally.
PortMiami supports 334,000 jobs in Florida and contributes $43 billion to the local economy and remains an indispensable partner in our efforts to support the creation of high-paying jobs for our constituents, growth for businesses, and strengthened U.S. relations throughout the world. The market for fresh produce is growing in South Florida, and the proposed Center will create a needed synergy that is vital to continued economic growth for Florida and the nation.
We urge your support of PortMiami's grant application for this important infrastructure project.

Sincerely,

Michael Silver

Michael Silver, SIOR

China Latin America Trade Center

CHINA LATIN AMERICAN TRADE CENTER
中国拉丁美洲贸易中心

2710 NW 24th street
Miami, Florida 33142 USA

Tel: 305-636-0902
Fax: 305-636-0910

www.chinalatam.com
joechi888yahoo.com

August 30, 2019

The Honorable Elaine Chao
U.S. Secretary of Transportation
U.S. Department of Transportation
1200 New Jersey Ave. SE
Washington, DC 20590

Dear Secretary Chao:

As members of the South Florida trade and logistics community, we write to express our strong support for the 2019 U.S. Department of Transportation (DOT) Infrastructure Development Program grant application submitted by PortMiami for the "*PortMiami Fumigation and Cold Chain Processing Center*" (Center) project.

The components of the Center will improve the safety, efficiency and reliability of the movement of perishables as well as the processing capacity of temperature-controlled cargo at PortMiami. It will also improve the port's economic competitiveness by providing additional capacity for cargo phytosanitary treatment, cold chain processing, and value-added services. The advance technology and innovative multipurpose layout will enhance Miami's position as a key point of treatment and processing of perishables and will support the safe flow of agricultural/food products, free of pests and diseases, both domestically and internationally.

PortMiami supports 334,000 jobs in Florida and contributes $43 billion to the local economy and remains an indispensable partner in our efforts to support the creation of high-paying jobs for our constituents, growth for businesses, and strengthened U.S. relations throughout the world. The market for fresh produce is growing in South Florida, and the proposed Center will create a needed synergy that is vital to continued economic growth for Florida and the nation.

We urge your support of Port Miami's grant application for this important infrastructure project.

Sincerely,

Joe Chi

Executive Director
China Latin American Trade Center 中国拉丁美洲贸易中心
www.chinalatam.com

CMA CGM

September 10th, 2019

To,
The Honorable Elaine Chao
U.S. Secretary of Transportation
U.S. Department of Transportation
1200 New Jersey Ave. SE
Washington, DC 20590

Dear Secretary Chao:

As members of the South Florida trade and logistics community, we write to express our strong support for the 2019 U.S. Department of Transportation (DOT) Infrastructure Development Program grant application submitted by PortMiami for the "*PortMiami Fumigation and Cold Chain Processing Center*" (Center) project.

The components of the Center will improve the safety, efficiency and reliability of the movement of perishables as well as the processing capacity of temperature-controlled cargo at PortMiami. It will also improve the port's economic competitiveness by providing additional capacity for cargo phytosanitary treatment, cold chain processing, and value-added services. The advance technology and innovative multipurpose layout will enhance Miami's position as a key point of treatment and processing of perishables and will support the safe flow of agricultural/food products, free of pests and diseases, both domestically and internationally.

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We urge your support of PortMiami's grant application for this important infrastructure project.

Sincerely,

Efrain Osorio
VP Regional, LATAM and Caribbean

CMA CGM (America) LLC
5701 Lake Wright Drive – Norfolk, VA – 23502-1868, USA – Tel: 1 (877) 556-6308
www.cma-cgm.com

ComReal
MIAMI - DORAL, LLC
www.comreal.com

September 10, 2019

The Honorable Elaine Chao
U.S. Secretary of Transportation
U.S. Department of Transportation
1200 New Jersey Ave. SE
Washington, DC 20590

Dear Secretary Chao:

As members of the South Florida trade and logistics community, we write to express our strong support for the 2019 U.S. Department of Transportation (DOT) Infrastructure Development Program grant application submitted by PortMiami for the "*PortMiami Fumigation and Cold Chain Processing Center*" (Center) project.

The components of the Center will improve the safety, efficiency and reliability of the movement of perishables as well as the processing capacity of temperature-controlled cargo at PortMiami. It will also improve the port's economic competitiveness by providing additional capacity for cargo phytosanitary treatment, cold chain processing, and value-added services. The advance technology and innovative multipurpose layout will enhance Miami's position as a key point of treatment and processing of perishables and will support the safe flow of agricultural/food products, free of pests and diseases, both domestically and internationally.

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We urge your support of PortMiami's grant application for this important infrastructure project.

Sincerely,

Edward J. Redlich

Edward J. Redlich, SIOR, CCIM
Managing Member
eredlich@comreal.com
T 305-710-5593 | O 786-433-2380

September 12, 2019

The Honorable Elaine Chao
U.S. Secretary of Transportation
U.S. Department of Transportation
1200 New Jersey Ave. SE
Washington, DC 20590

Dear Secretary Chao:

As members of the South Florida trade and logistics community, we write to express our strong support for the 2019 U.S. Department of Transportation (DOT) Infrastructure Development Program grant application submitted by PortMiami for the "PortMiami Fumigation and Cold Chain Processing Center" (Center) project.

The components of the Center will improve the safety, efficiency and reliability of the movement of perishables as well as the processing capacity of temperature-controlled cargo at PortMiami. It will also improve the port's economic competitiveness by providing additional capacity for cargo phytosanitary treatment, cold chain processing, and value-added services. The advance technology and innovative multipurpose layout will enhance Miami's position as a key point of treatment and processing of perishables and will support the safe flow of agricultural/food products, free of pests and diseases, both domestically and internationally.

PortMiami supports 334,000 jobs in Florida and contributes $43 billion to the local economy and remains an indispensable partner in our efforts to support the creation of high-paying jobs for our constituents, growth for businesses, and strengthened U.S. relations throughout the world. The market for fresh produce is growing in South Florida, and the proposed Center will create a needed synergy that is vital to continued economic growth for Florida and the nation.

We urge your support of PortMiami's grant application for this important infrastructure project.

Very truly yours,

Jennifer R. Diaz

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KSG TRADE CO.

P.O. Box 150357
Cape Coral, FL 33915-0357, USA
Tel: +1-239-810-3080
Fax: +1-239-573-0934
E-mail: ksgtrade@aol.com

August 30, 2019

The Honorable **Elaine Chao**
U.S. Secretary of Transportation
U.S. Department of Transportation
1200 New Jersey Ave. SE
Washington, DC 20590

Dear Secretary Chao:

As members of the South Florida trade and logistics community, we write to express our strong support for the 2019 U.S. Department of Transportation (DOT) Infrastructure Development Program grant application submitted by PortMiami for the "*PortMiami Fumigation and Cold Chain Processing Center*" (Center) project.

The components of the Center will improve the safety, efficiency and reliability of the movement of perishables as well as the processing capacity of temperature-controlled cargo at PortMiami. It will also improve the port's economic competitiveness by providing additional capacity for cargo phytosanitary treatment, cold chain processing, and value-added services. The advance technology and innovative multipurpose layout will enhance Miami's position as a key point of treatment and processing of perishables and will support the safe flow of agricultural/food products, free of pests and diseases, both domestically and internationally.

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We urge your support of PortMiami's grant application for this important infrastructure project.

Sincerely,

German Vite,
PRESIDENT & CEO

POMTOC

Port of Miami Terminal Operating Company, L.C.
635 Australia Way
Miami, Florida 33132

www.pomtoc.com

Telephone: (305) 533-8200
Fax: (305) 373-6916

September 10, 2019

The Honorable Elaine Chao
U.S. Secretary of Transportation
U.S. Department of Transportation
1200 New Jersey Ave. SE
Washington, DC 20590

Dear Secretary Chao:

As members of the South Florida trade and logistics community, we write to express our strong support for the 2019 U.S. Department of Transportation (DOT) Infrastructure Development Program grant application submitted by PortMiami for the "*PortMiami Fumigation and Cold Chain Processing Center*" (Center) project.

The components of the Center will improve the safety, efficiency and reliability of the movement of perishables as well as the processing capacity of temperature-controlled cargo at PortMiami. It will also improve the port's economic competitiveness by providing additional capacity for cargo phytosanitary treatment, cold chain processing, and value-added services. The advance technology and innovative multipurpose layout will enhance Miami's position as a key point of treatment and processing of perishables and will support the safe flow of agricultural/food products, free of pests and diseases, both domestically and internationally.

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We urge your support of PortMiami's grant application for this important infrastructure project.

Sincerely,

Charles O'Malley

Charles O'Malley
Chief Financial Officer
Port Of Miami Terminal Operating Co. L.C.

LATIN CHAMBER OF COMMERCE OF U.S.A.
CAMACOL
CAMARA DE COMERCIO LATINA EE.UU.

August 30, 2019

The Honorable Elaine Chao
U.S. Secretary of Transportation
U.S. Department of Transportation
1200 New Jersey Ave. SE
Washington, DC 20590

Dear Secretary Chao:

The Latin Chamber of Commerce of the United States, CAMACOL is a member of the South Florida's vibrant international business community. As such, we write to express our strong support for the 2019 U.S. Department of Transportation (DOT) Infrastructure Development Program grant application submitted by PortMiami for the "*PortMiami Fumigation and Cold Chain Processing Center*" (Center) project.

The components of the Center will improve the safety, efficiency and reliability of the movement of perishables as well as the processing capacity of temperature-controlled cargo at PortMiami. It will also improve the port's economic competitiveness by providing additional capacity for cargo phytosanitary treatment, cold chain processing, and value-added services. The advance technology and innovative multipurpose layout will enhance Miami's position as a key point of treatment and processing of perishables and will support the safe flow of agricultural/food products, free of pests and diseases, both domestically and internationally.

PortMiami supports 334,000 jobs in Florida and contributes $43 billion to the local economy and remains an indispensable partner in our efforts to support the creation of high-paying jobs for our constituents, growth for businesses, and strengthened U.S. relations throughout the world. The market for fresh produce is growing in South Florida, and the proposed Center will create a needed synergy that is vital to continued economic growth for Florida and the nation.

We urge your support of PortMiami's grant application for this important infrastructure project.

Sincerely,

Patricia Arias, Managing Director
CAMACOL

1401 W. Flagler Street Miami, Florida 33135
Phone: 305-642-3870

ELLER – ITO Stevedoring Company, L.L.C.

1007 North America Way # 501 Miami, Florida 33132
Telephone: (305) 379-3700 / Facsimile: (305) 371-9969

September 13, 2019

The Honorable Elaine Chao
U.S. Secretary of Transportation
U.S. Department of Transportation
1200 New Jersey Ave. SE
Washington, DC 20590

Dear Secretary Chao:

Eller-ITO Stevedoring Company, L.L.C., as part of the South Florida Maritime Industry wants to show our complete endorsement of the 2019 U.S. Department of Transportation (DOT) Infrastructure Development Program grant application submitted by PortMiami for the "*PortMiami Fumigation and Cold Chain Processing Center*" (Center) project.

This Center is essential to the continued improvement of temperature controlled perishables moving safely and efficiently through PortMiami. This Center will also improve the competitiveness of PortMiami as a hub for cold chain processing and increase its foothold as a destination for safe flow agricultural products, free of pest and diseases both domestically and internationally.

PortMiami is the second largest employer in Miami-Dade County and contributes $43 billion to the South Florida economy. The Center will help PortMiami to continue growing and become a destination for fresh produce as demand for such products continue to escalate worldwide.

Your support of PortMiami's grant application is vital for this essential infrastructure project.

Sincerely,

Christopher C. Arocha
Senior Vice President
Eller-ITO Stevedoring Company, L.L.C.

August 30, 2019

Classic Fruit Company
5480 West Spruce Ave.
Suite 101
Fresno, California 93722
Tel (559) 271-9200
Fax (559) 271-9211

The Honorable Elaine Chao
U.S. Secretary of Transportation
U.S. Department of Transportation
1200 New Jersey Ave. SE
Washington, DC 20590

Dear Secretary Chao:

As members of the South Florida trade and logistics community, we write to express our strong support for the 2019 U.S. Department of Transportation (DOT) Infrastructure Development Program grant application submitted by Port Miami for the "*PortMiami Fumigation and Cold Chain Processing Center*" (Center) project.

The components of the Center will improve the safety, efficiency and reliability of the movement of perishables as well as the processing capacity of temperature-controlled cargo at PortMiami. It will also improve the port's economic competitiveness by providing additional capacity for cargo phytosanitary treatment, cold chain processing, and value-added services. The advance technology and innovative multipurpose layout will enhance Miami's position as a key point of treatment and processing of perishables and will support the safe flow of agricultural/food products, free of pests and diseases, both domestically and internationally.

PortMiami supports 334,000 jobs in Florida and contributes $43 billion to the local economy and remains an indispensable partner in our efforts to support the creation of high-paying jobs for our constituents, growth for businesses, and strengthened U.S. relations throughout the world. The market for fresh produce is growing in South Florida, and the proposed Center will create a needed synergy that is vital to continued economic growth for Florida and the nation.
We urge your support of PortMiami's grant application for this important infrastructure project.

Sincerely,

Mark Woodham

Mark Woodham

September 12, 2019

The Honorable Elaine Chao
U.S. Secretary of Transportation
U.S. Department of Transportation
1200 New Jersey Ave. SE
Washington, DC 20590

Dear Secretary Chao:

As members of the South Florida trade and logistics community, we write to express our strong support for the 2019 U.S. Department of Transportation (DOT) Infrastructure Development Program grant application submitted by PortMiami for the "*PortMiami Fumigation and Cold Chain Processing Center*" (Center) project.

The components of the Center will improve the safety, efficiency and reliability of the movement of perishables as well as the processing capacity of temperature-controlled cargo at PortMiami. It will also improve the port's economic competitiveness by providing additional capacity for cargo phytosanitary treatment, cold chain processing, and value-added services. The advance technology and innovative multipurpose layout will enhance Miami's position as a key point of treatment and processing of perishables and will support the safe flow of agricultural/food products, free of pests and diseases, both domestically and internationally.

PortMiami supports 334,000 jobs in Florida and contributes $43 billion to the local economy and remains an indispensable partner in our efforts to support the creation of high-paying jobs for our constituents, growth for businesses, and strengthened U.S. relations throughout the world. The market for fresh produce is growing in South Florida, and the proposed Center will create a needed synergy that is vital to continued economic growth for Florida and the nation.

We urge your support of PortMiami's grant application for this important infrastructure project.

Sincerely,

Barbara Pimentel

Mrs. Barbara Pimentel
Director of Operations
SPR

The Perishable Specialist Inc.

9831 N.W. 58th Street, Unit 131
Doral, Florida 33178

T 305.477.9906
F 305.477.9975

August 30, 2019

The Honorable Elaine Chao
U.S. Secretary of Transportation
U.S. Department of Transportation
1200 New Jersey Ave. SE
Washington, DC 20590

Dear Secretary Chao:

As members of the South Florida trade and logistics community, we write to express our strong support for the 2019 U.S. Department of Transportation (DOT) Infrastructure Development Program grant application submitted by PortMiami for the "*PortMiami Fumigation and Cold Chain Processing Center*" (Center) project.

The components of the Center will improve the safety, efficiency and reliability of the movement of perishables as well as the processing capacity of temperature-controlled cargo at PortMiami. It will also improve the port's economic competitiveness by providing additional capacity for cargo phytosanitary treatment, cold chain processing, and value-added services. The advance technology and innovative multipurpose layout will enhance Miami's position as a key point of treatment and processing of perishables and will support the safe flow of agricultural/food products, free of pests and diseases, both domestically and internationally.

PortMiami supports 334,000 jobs in Florida and contributes $43 billion to the local economy and remains an indispensable partner in our efforts to support the creation of high-paying jobs for our constituents, growth for businesses, and strengthened U.S. relations throughout the world. The market for fresh produce is growing in South Florida, and the proposed Center will create a needed synergy that is vital to continued economic growth for Florida and the nation.

We urge your support of PortMiami's grant application for this important infrastructure project.

Sincerely,

Frank Ramos
President

www.theperishablespecialist.com

THE UNITED STATES-MEXICO
CHAMBER OF COMMERCE
INTER - AMERICAN CHAPTER

September 12, 2019

The Honorable Elaine Chao
U.S. Secretary of Transportation
U.S. Department of Transportation
1200 New Jersey Ave. SE
Washington, DC 20590

Dear Secretary Chao:

On behalf of the United States - Mexico Chamber of Commerce, Inter-American Chapter and as members of the South Florida trade and logistics community, we write to express our strong support for the 2019 U.S. Department of Transportation (DOT) Infrastructure Development Program grant application submitted by PortMiami for the "PortMiami Fumigation and Cold Chain Processing Center" (Center) project.

The components of the Center will improve the safety, efficiency and reliability of the movement of perishables as well as the processing capacity of temperature-controlled cargo at PortMiami. It will also improve the port's economic competitiveness by providing additional capacity for cargo phytosanitary treatment, cold chain processing, and value-added services. The advance technology and innovative multipurpose layout will enhance Miami's position as a key point of treatment and processing of perishables and will support the safe flow of agricultural/food products, free of pests and diseases, both domestically and internationally.

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We urge your support of PortMiami's grant application for this important infrastructure project.

Sincerely,

Antonio Peña
President of the Inter-American Chapter of the United States-Mexico Chamber of Commerce

September 10, 2019

The Honorable Elaine Chao
U.S. Secretary of Transportation
U.S. Department of Transportation
1200 New Jersey Ave. SE
Washington, DC 20590

Dear Secretary Chao:

As members of the South Florida trade and logistics community, I write to express my strong support for the 2019 U.S. Department of Transportation (DOT) Infrastructure Development Program grant application submitted by PortMiami for the "*PortMiami Fumigation and Cold Chain Processing Center*" (Center) project.

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I urge your support of PortMiami's grant application for this important infrastructure project.

Sincerely,

Carlos Gaviria
Vice President
Transwestern

Waterclerks, LLC

September 12, 2019

The Honorable Elaine Chao
U.S. Secretary of Transportation
U.S. Department of Transportation
1200 New Jersey Ave. SE
Washington, DC 20590

Dear Secretary Chao:

As members of the South Florida trade and logistics community, we write to express our strong support for the 2019 U.S. Department of Transportation (DOT) Infrastructure Development Program grant application submitted by PortMiami for the "*PortMiami Fumigation and Cold Chain Processing Center*" (Center) project.

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Sincerely,

T.Lykes

WORLD TRADE CENTER®
MIAMI

September 11, 2019

The Honorable Elaine Chao
U.S. Secretary of Transportation
U.S. Department of Transportation
1200 New Jersey Ave. SE
Washington, DC 20590

Dear Secretary Chao:

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We urge your support of PortMiami's grant application for this important infrastructure project.

Sincerely,

C Gallogly

Charlotte Gallogly
President

A CUSTOMS BROKERAGE
YOUR CARGO CONCIERGE®

2750 NW 84TH AVE
DORAL, FL 33122
T: 305.805.6797
F: 305.805.6798
WWW.ACB-US.COM

August 30, 2019

The Honorable Elaine Chao
U.S. Secretary of Transportation
U.S. Department of Transportation
1200 New Jersey Ave. SE
Washington, DC 20590

Dear Secretary Chao:

As members of the South Florida trade and logistics community, we write to express our strong support for the 2019 U.S. Department of Transportation (DOT) Infrastructure Development Program grant application submitted by PortMiami for the "*PortMiami Fumigation and Cold Chain Processing Center*" (Center) project.

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1200 New Jersey Ave. SE
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Sincerely,

Priscilla L. Bush

Priscilla Lleras-Bush
Executive Director of Peruvian Asparagus Importers Association

AFIF
AMERICA'S
FLOWER
CONNECTION

2500 NW 97th Ave
Suite 201
Doral, FL
33172
TEL: 305-593-2383
www.afifnet.org

September 12, 2019

The Honorable Elaine Chao
U.S. Secretary of Transportation
U.S. Department of Transportation
1200 New Jersey Ave. SE
Washington, DC 20590

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We urge your support of PortMiami's grant application for this important infrastructure project.

Sincerely,

Christine Boldt

Christine Boldt
Executive Vice President

FLORIDA STEVEDORING INC.
Miami - Port Everglades

September 12th, 2019

The Honorable Elaine Chao
U.S. Secretary of Transportation
U.S. Department of Transportation
1200 New Jersey Ave. SE
Washington, DC 20590

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We urge your support of PortMiami's grant application for this important infrastructure project.

Sincerely,

Jorge P. Rovirosa
President

JPR/emp

FAROVI SHIPPING CORPORATION
STEAMSHIP AGENTS & BROKERS, MIAMI – PORT EVERGLADES, FL
2541 S.W. 27th AVENUE, MIAMI, FL 33133 P.O. BOX 011254, MIAMI, FL 33101
E-MAIL: farovi@farovi.com – TEL.: 305-373-4765 FAX: 305-371-6874

September 12th, 2019

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U.S. Secretary of Transportation
U.S. Department of Transportation
1200 New Jersey Ave. SE
Washington, DC 20590

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Sincerely,

Jorge P. Rovirosa
President

JPR/emp

President Gerardo "Jerry" Becerra

Secretary/Treasurer Anthony Arrufat
Vice President Luis Gonzalez

Local 1922
1007 N. AMERICA WAY #407
Miami, Florida 33132
Telephone: 305-379-8694

International Longshoremen's
....Association....

Affiliated with the AFL-CIO and Canadian Labour Congress

The Honorable Elaine Chao
U.S. Secretary of Transportation
U.S. Department of Transportation
1200 New Jersey Ave. SE
Washington, DC 20590

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We urge your support of PortMiami's grant application for this important infrastructure project.

Sincerely,

1015 N. America Way, 2nd Floor, Miami, Florida 33132
Phone: 305-347-4800

MIAMI-DADE
BEACON
COUNCIL
The Official Economic
Development Partnership

September 13, 2019

The Honorable Elaine Chao
U.S. Secretary of Transportation
U.S. Department of Transportation
1200 New Jersey Ave. SE
Washington, DC 20590

Dear Secretary Chao:

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We urge your support of PortMiami's grant application for this important infrastructure project.

Sincerely,

James Kohnstamm
Executive Vice President
Miami-Dade Beacon Council

MIAMI-DADE
CHAMBER OF COMMERCE

September 16, 2019

The Honorable Elaine Chao
U.S. Secretary of Transportation
U.S. Department of Transportation
1200 New Jersey Ave. SE
Washington, DC 20590

Dear Secretary Chao:

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We urge your support of PortMiami's grant application for this important infrastructure project.

Sincerely,

Gordon Eric Knowles, President and CEO
Miami-Dade Chamber of Commerce, Inc.

100 S. BISCAYNE BLVD. | 3RD FLOOR SUITE 300 | MIAMI, FL 33131 P: 305.751.8648 | WWW.M-DCC.ORG

FDOT

Florida Department of Transportation

RON DESANTIS
GOVERNOR

1000 N.W. 111 Avenue
Miami, Florida 33172

KEVIN J. THIBAULT, P.E.
SECRETARY

September 12, 2019

Juan M. Kuryla, PPM
Port Director and CEO
PortMiami
1015 North America Way, 2nd Floor
Miami, Florida 33132

RE: Commitment Letter, U.S. Department of Transportation, Port Infrastructure Development Program, FY 2019 Appropriations Act

Dear Mr. Kuryla:

This letter serves to document the Florida Department of Transportation's investment in projects related to PortMiami's *Cargo Yard Resiliency Improvements* and *Fumigation and Cold Chain Processing Center* projects. Related projects have received the following Non-Federal funding investments from the State of Florida:

Financial #	Project	Previous Expenditures	Future Expenditures	Required Match	Expiration
431126-1	Ship to Shore Cranes	$7,964,572	$19,344,616	50%	06/30/2020
440616-1	Yard Densification & Truck Gates	$2,725,204	$10,724,795	50%	06/30/2022
440617-1	Cargo & Container Distribution Center	$0.00	$200,000.00	50%	06/30/2022

Once completed, these coastal seaport infrastructure projects will improve the safety, efficiency and reliability of the movement of goods and cargo at PortMiami.

Sincerely,

James Wolfe, P.E.
District Six Secretary

MAT Concessionaire LLC
860 MacArthur Causeway
Miami, Florida 33132

September 16, 2019

The Honorable Elaine Chao
U.S. Secretary of Transportation
U.S. Department of Transportation
1200 New Jersey Ave. SE
Washington, DC 20590

Dear Secretary Chao:

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We urge your support of PortMiami's grant application for this important infrastructure project.

Sincerely,

Christopher Hodgkins
MAT Concessionaire, LLC
Chief Executive Officer

September 16, 2019

The Honorable Elaine Chao
U.S. Secretary of Transportation
U.S. Department of Transportation
1200 New Jersey Ave. SE
Washington, DC 20590

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Sincerely,

Priscilla L. Bush

Priscilla Lleras-Bush
Executive Director – Peruvian Asparagus Importers Association

FLORIDA PORTS CAUCUS MEETING

Date: February 27, 2018 **Presented by:** Priscilla Lleras-Bush/PAIA

Eliminating the Discriminatory Impact of AQI Treatment Fees on Florida/SE Trade

Final Rule: Docket No. APHIS-2013-0021 Agency of the Department of Agriculture, Animal and Plant Health Inspection Service
User Fees for Agricultural Quarantine and Inspection Services
80 Federal Register No. 209, at 66748-66779 (October 29, 2015)

ISSUE:

- USDA treatment fee creates disproportions/inequities for fresh fruit and vegetable importers subject to APHIS agricultural quarantine and inspection (AQI).
- AQI Treatment Fees imposed by APHIS/USDA are a detriment to Florida's economy, trade position and jobs (that will be leaving Florida).
- USDA treatment fee acts as a new tax that hinders growth in the produce industry.

Creation of the New Treatment Fee:

APHIS/USDA set the following escalating fee amounts over a five year period. The AQI - Agricultural Quarantine and Inspection Service Fee was created by a flawed study performed in 2011. The fee addresses imported products to the U.S that are either subject to possible treatment after inspection or subject to mandatory treatment without initial inspection as a condition of entry into the U.S. APHIS states that the cost in overseeing the treatment, administration, research and general overhead is estimated to be $9 to $12 million per year. AQI Treatment Fee Background document is attached.

Year 1: $47 per treatment (effective Dec. 28, 2015)
Year 2: $95 per treatment (effective Dec. 28, 2016)
Year 3: $142 per treatment (effective Dec. 28, 2017)
Year 4: $190 per treatment (effective Dec. 28, 2018)
Year 5: $237 per treatment (effective Dec 28, 2019)

The inequities are inherent in the USDA decision to adopt a per-treatment fee based upon charging a fee "per-enclosure." The commercial nature of enclosures is dramatically different from region to region. For example: In Southeast (Florida), an "enclosure" is one 40-foot trailer that holds up to 20 pallets of commodity for fumigation (treatment); whereas in the Northeast, an "enclosure" is a warehouse that can hold up 2,400 pallets at a time for fumigation (treatment). Despite the differences, APHIS adopted the same fee for each type of treatment.

This clearly creates a dramatically unfair trade and cost advantage between regions, treatment methods, commodities, and ports of entry. This positioning will continue to place Florida at a significant disadvantage to welcoming in volumes of fresh fruits and vegetables that would require fumigation or need fumigation as a condition of entry.

U.S. Industry Cost:

The two largest agricultural commodities being imported into U.S. requiring fumigation as a condition of entry: Chilean fresh grapes and Peruvian fresh asparagus. In 2017, the Southeast (SE) represented only 24% of the Northeast (NE) volume requiring fumigation, but paid substantially more, even though SE volumes are less. Thus in 2018, the SE will pay over $778,586 more in AQI fees. In other words for 2018, if both import volumes were equal the SE would pay $3.27 Million compared to the NE paying only $21,868 for the same imported volume. Clearly this fee structure is inherently unfair and places a burden on trade. See below escalating AQI Fees chart by year.

2017 Region	Commodity	LBS Import	# of Pallets	Cost / pallet	# of Fumig.	AQI Fee	Total Cost
SE Fumig.	Asparagus	173,961,700	112,479	$4.75	5,637	$95	$535,515
NE Fumig.	Grapes	711,320,166	370,479	$0.04	154	$95	$14,630
2018 Region	**Commodity**	**LBS Import**	**# of Pallets**	**Cost / pallet**	**# of Fumig.**	**AQI Fee**	**Total Cost**
SE Fumig.	Asparagus	199,766,146	129,214	$7.10	6,461	$142	$917,419
NE Fumig.	Grapes	715,196,774	467,448	$0.06	194	$142	$27,657
2019 Region	**Commodity**	**LBS Import**	**# of Pallets**	**Cost / pallet**	**# of Fumig.**	**AQI Fee**	**Total Cost**
SE Fumig.	Asparagus	199,766,146	129,214	$9.50	6,461	$190	$1,227,590
NE Fumig.	Grapes	715,196,774	467,448	$0.07	194	$190	$36,860

2020 Region	**Commodity**	**LBS Import**	**# of Pallets**	**Cost / pallet**	**# of Fumig.**	**AQI Fee**	**Total Cost**
SE Fumig.	Asparagus	199,766,146	129,214	$11.85	6,461	$237	$1,531,257
NE Fumig.	Grapes	715,196,774	467,448	$0.12	194	$237	$56,169

Industries Affected:

The USDA AQI Treatment Fee is increasing year over year and jeopardizing Florida's commerce, economy and trade. Florida jobs and international market share is at stake. The affected include:

- U.S. Agricultural companies predominately based in Florida, which include shippers/importers, major U.S. Seaports (especially Miami, Port Everglades and Tampa).
- Ocean carriers, airlines, fumigators, freight forwarders and customhouse brokers, industry commodity associations (importing fresh fruits and vegetables for United States consumers' consumption to healthy food alternatives at retailer and food service levels across the United States), warehousing.
- Industry service provider companies such as logistics companies, and other industries that enable imports to work in conjunction with USDA, APHIS and PPQ to protect the U.S.
- Increased costs for fresh fruit will ultimately be passed on to consumers, making such produce substantially more expensive for the middle and lower class

Suggested solutions to eliminate the discriminatory impact.

We are aware of the importance and urgency of President Trump's January 30, 2017, "Presidential Executive Order Enforcing the Regulatory Reform",[1] which addresses the management of costs associated with the governmental imposition of private expenditures. We believe that this AQI Treatment Fee implemented on December 28, 2015 is a prime example of the type of regulatory scheme which

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[1] https://www.whitehouse.gov/presidential-actions/presidential-executive-order-reducing-regulation-controlling-regulatory-costs/

(d) Each Regulatory Reform Task Force shall evaluate existing regulations (as defined in section 4 of Executive Order 13771) and make recommendations to the agency head regarding their repeal, replacement, or modification, consistent with applicable law. At a minimum, each Regulatory Reform Task Force shall attempt to identify regulations that:

(i) eliminate jobs, or inhibit job creation;

(ii) are outdated, unnecessary, or ineffective;

(iii) impose costs that exceed benefits;

(iv) create a serious inconsistency or otherwise interfere with regulatory reform initiatives and policies;

imposes unnecessary costs and which the Executive Order is intended to address.

Request:

- Propose that the fee be eliminated while a new more equitable cost-capturing arrangement established to capture the costs of United States Department of Agriculture (USDA) treatment activities is developed.
- Request the USDA/APHIS and Office of OMB to cease collection of all treatment fees (AQI) until an overall analysis of the equality and impartiality of this fee has been accomplished and consequences have be weighed affecting Florida's economy.

I would be happy to share any additional information in support of this document.

Priscilla Lleras-Bush, International Trade Consultant
Email: priscillaprestige@outlook.com
Phone: 817-793-3133

The AQI Treatment fee. All fresh agricultural products imported into the United States are either subject to *possible treatment* after inspection, or are subject to *mandatory treatment* without initial inspection as a condition of admissibility into the United States. Agricultural products include the major fruit and vegetable commodities consumed by United States consumers, such as grapes and asparagus, and all horticultural products, including live plants and flowers. Fresh-cut flowers are an example of products "subject to possible treatment"; blueberries and asparagus from Peru are examples of products subject to mandatory treatment.

Treatment methods vary depending upon products and problems, and include processes such as fumigation, irradiation, and "cold treatment." The USDA oversees treatments, which are performed by approved private sector service providers and paid for by importers, carriers, et al. The cost to the USDA in administering the treatment process is estimated to be $9 to $12 million per year.

Until 2015, the USDA did not charge a "treatment fee," but attempted to collect its costs through the conveyance fees charged to carriers for bringing AQI-regulated products into the United States. In 2015, the USDA adjusted all of its fees, and created a separate, new fee to reimburse its treatment program costs. *See Docket No. APHIS-2013-0021 Agency of the Department of Agriculture, Animal and Plant Health Inspection Service – User Fees for Agricultural Quarantine and Inspection Services.*[1] The amount of the fee was debated in the regulatory process, but was finally set at the following escalating amounts over a five year-period.

Year 1: $47 per treatment (effective December 28, 2015)
Year 2: $95 per treatment (effective December 28, 2016)
Year 3: $142 per treatment (effective December 28, 2017)
Year 4: $190 per treatment (effective December 28, 2018)
Year 5: $237 per treatment (effective December 28, 2019)

The Inequitable and Discriminatory Nature of the Existing Fee. The new APHIS fee is highly discriminatory as applied to importers due to its disparate impact on types of products, size of imports, ports of entry, and types of treatments. It is particularly inequitable as seen by its drastic negative impact on Florida airports and seaports. Suggestions that the fee serves as a deterrent to importation of contaminated products is misplaced: there typically are no alternative sources for products subject to mandatory treatment. In any event, it is not the government's place to entitle or even allow that one or more ports of entry be at a disadvantage over others.

The inequities are inherent in the USDA decision to adopt a per-treatment fee based upon charging a fee "per-enclosure." The commercial nature of enclosures is dramatically different from port-to-port: in the Southeast (Florida), an "enclosure" is one 40-foot trailer that holds up to 20 pallets of commodity for fumigation (treatment), whereas in the Northeast, an "enclosure" is a warehouse that can hold up 2,400 pallets at a time for fumigation (treatment). This clearly creates a dramatically unfair trade and cost advantage between regions, commodities, and ports of entry

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[1] Web Link: https://www.aphis.usda.gov/newsroom/federal_register/aqi_fees.pdf

Southeast fumigation ($95/20 pallets) = $4.75 per pallet[2]
Northeast fumigation ($95/2400 pallets) = $0.04 per pallet

or

Southeast fumigation of 2400 pallets = $11,640.00
Northeast fumigation of 2400 pallets = $95.00

The inequities are also inherent in charging the same fee regardless of the type of treatment. Fumigation and irradiation typically involve AQI personnel continuously overseeing the treatment process during the hours of the treatment; cold treatment typically involves a short review of a written report submitted by the company responsible for the cold treatment process.

The discriminatory application of the treatment fee clearly violates the sound policies of the USDA and federal government regulatory agencies, and may very well violate the statutory authority to assess fees. Based on the disparate impact of the fees discussed above, the new APHIS fees are not "commensurate with the costs of agricultural quarantine and inspection services with respect to the class of persons or entities paying the fees," as required under the Food, Agriculture, Conservation and Trade Act of 1990, referred to as the "FACT Act" 21 U.S.C. § 136a.

Proposed Solution: We are working with Senators Rubio, Cong. Diaz-Balart and Cong. Rooney to include language in the Omnibus bill to freeze the collection of the fees at $95 per treatment until a new study can find a more equitable fee. Please contact your business contacts who do business with the ports of Mobile, Charleston, or New Orleans to call the below staff's or e-mail them to support the inclusion of the proposed language

Senator Shelby (Alabama) morgan_carter@shelby.senate.gov 202-224-5744

Senator Graham (South Carolina) Scott_Graber@graham.senate.gov 202-224-5972

Senator Kennedy (Louisiana) Marcie_smith@kennedy.senate.gov 202-224-4623

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[2] Furthermore, in situations where pallets to be treated are not consolidated, the per-treatment charge favors large-scale treatments and marginalizes smaller-scale treatments.

APHIS AQI treatment monitoring fee equity: Include report language: "The Committee notes that assessing AQI treatment monitoring fees on a per-enclosure basis imposes disproportionate impacts on industry and user groups at certain key ports of entry, including PortMiami, Port Everglades, and Port Tampa Bay. The Committee encourages USDA to conduct a new study that specifically outlines the actual costs of treatments, examines the disproportionate impact the fee has on airports and seaports in different regions of the U.S., and evaluates alternative and equitable funding mechanisms. Such report should also incorporate due consideration of the recommendations of the Treatment Fee Working Group's September 27, 2016 "Report to APHIS". Within 120 days after the enactment of this act, USDA shall brief the Committees of Appropriations of both Houses of Congress on the status of such study and other efforts to ensure equitable collection of revenues for vital AQI treatment monitoring efforts."

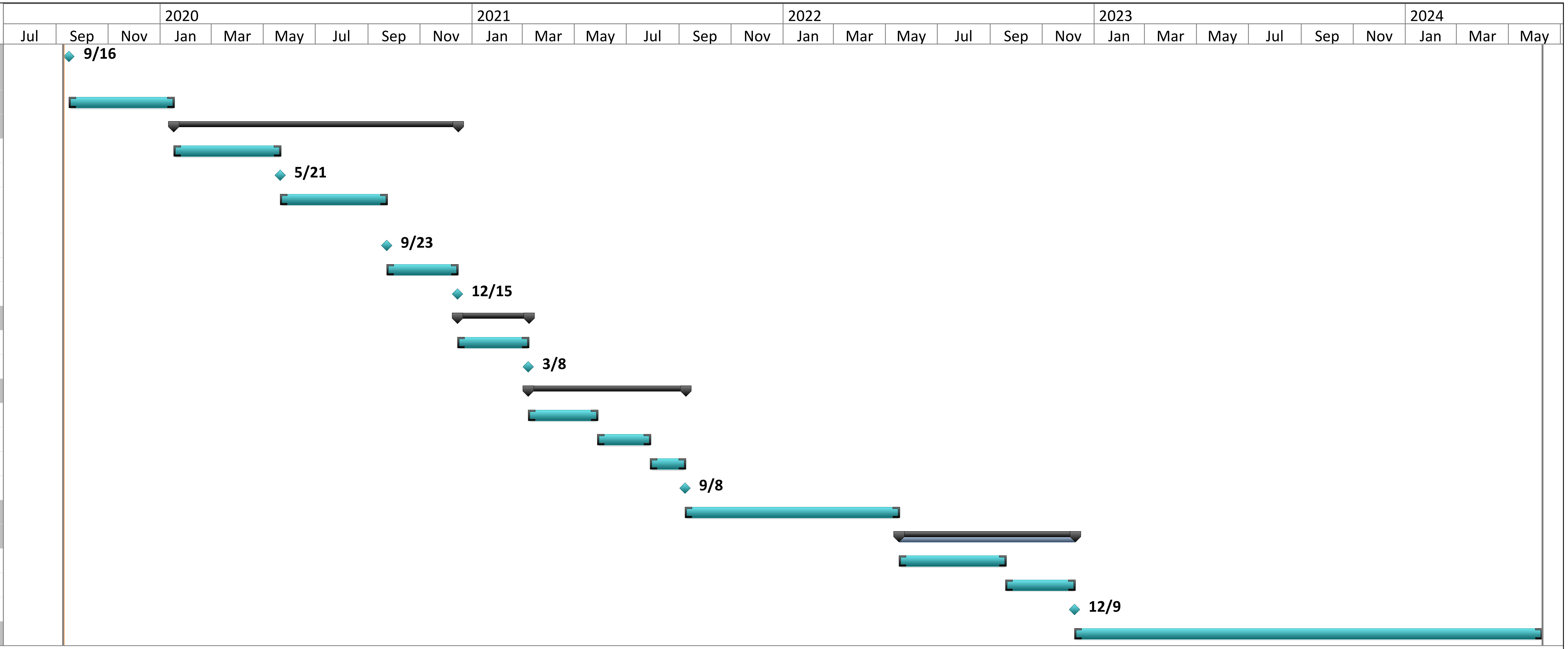
PROJECT SCHEDULE: CARGO YARD RESILIENCY IMPROVEMENTS

Project: Project Schedule-Cargo Y
Date: Wed 9/11/19

Task	▬	Project Summary	▬	Inactive Milestone	◇	Manual Summary Rollup	▬	Deadline	⬇
Split	┈	External Tasks	▬	Inactive Summary	▭	Manual Summary	▬	Progress	▬
Milestone	◆	External Milestone	◆	Manual Task	▬	Start-only	[		
Summary	▬	Inactive Task	▭	Duration-only	▬	Finish-only	]		

PROJECT SCHEDULE: FUMIGATION AND COLD CHAIN PROCESSING CENTER

ID	Task Name
1	**Federal Grant Application Submittal Date**
2	**Federal Grant Award Notice**
3	**RFP & Procurement Process**
4	RFP Preparation
5	RFP Release
6	RFP Applicant Preparation and Submittal
7	RFP Applicant Submittal Due Date
8	RFP Evaluation
9	Project Award
10	**Private Partnership**
11	Contract Negotiations
12	Sign Contract
13	**Design Documents**
14	30% Design Documents
15	60% Design Documents
16	100% Design Documents
17	100% Submittal
18	**Permitting**
19	**Contractor Procurement**
20	Bidding
21	Negotiations
22	Construction Contract Award
23	**Construction Contract Award**



Project: Project Schedule
Date: Tue 9/10/19

Task	Project Summary	Inactive Milestone ◇	Manual Summary Rollup	Deadline
Split	External Tasks	Inactive Summary	Manual Summary	Progress
Milestone ◆	External Milestone ◆	Manual Task	Start-only [	
Summary	Inactive Task	Duration-only	Finish-only]	

PORTMIAMI™

2035 MASTER PLAN

EXECUTIVE SUMMARY

EXECUTIVE SUMMARY FOREWORD

The Port of Miami's mission is to operate and further develop the world's leading cruise port and the largest container port in the State of Florida; to maximize its assets and strengthen its advantage for future growth; promote international trade and commerce as a vital link between North and South America and a growing global trade; support sustainability and operate in an environmentally responsible manner.

At the Port of Miami, with the support of the Mayor and County Commission, we are up for the challenge of the new global trade reality and we are positioning ourselves to compete well into 2035.

The POM 2035 Master Plan is a planning tool used to update the Port of Miami Master Plan Sub element of the County's Comprehensive Development Master Plan (CDMP). This document was prepared simultaneously with the County's Evaluation and Appraisal Report which analyzes if the Port is meeting its goals, policies and objectives.

By incorporating a market analysis for both cruise and cargo and a financial analysis of capital infrastructure, this master plan helps us better understand the direction in which we need to guide the Port. Cruise passenger projections take us from 4.1 million passengers to 5.9 million in 2035. And our cargo projections run from 847,249 TEUs in 2010 to 1.7 – 3.3 million in 2035. Increasing Port business ultimately increases the County's economy.

The 2020 Master Plan presented the need for a tunnel connecting Port traffic directly to the Interstate system and promoted dredging the South Channel to -50'/-52' in order for post-Panamax ships to berth at the Port. These projects are currently underway and their completion should coincide with the completion of the Panama Canal expansion.

The 2035 Master Plan continues to push the envelope and takes us into the future with projects that will help increase both cargo and passenger throughput by adding services, upgrading infrastructure, enhancing efficiency and increasing berthing capacity.

Projects presented in the 2035 Master Plan include a phased implementation plan allowing for development depending on additional changes in the global market. There are three main components to the Ports future progress: Cargo, Cruise and Commercial with an overarching theme of sustainability.

Sustainability:

The Port of Miami is located within the Biscayne Bay Aquatic Preserve, surrounded by the natural environment including sea grass and marine life, as well as the human environment with commercial and residential uses. Protecting both of these environments for future generations is a major concern in how the Port will grow. The Master Plan dedicates much thought to the surrounding areas and outlines projects that will help preserve it.

- **Shore Power**: Also known as cold ironing; allows ships that berth at the Port to plug-in to the electrical grid and turn off their engines, therefore reducing the emission of carbon dioxide.
- **Electrification of Cranes**: The Port of Miami is in the process of retrofitting all of its existing cranes to run on electricity instead of diesel fuel. This not only reduces carbon dioxide emissions but noise emissions as well.
- **LEED Buildings**: All new buildings constructed on the Port must meet the County's minimum requirement of LEED Certification.
- **Green Energy Initiatives**: There are several projects the Port plans to undertake to save energy. These include installing solar panels port-wide, electric generating wind turbines and water turbines.
- Additional sustainable projects outlined in the following sections include the Port of Miami Tunnel, rail service, consolidation of cargo gates, and a multimodal center. All are projects which will help integrate the Port with the community and reduce congestions and emissions.

Cargo:

In preparation to compete for cargo for the next 50 years, the Port of Miami is focusing on three major projects: the construction of the Port of Miami Tunnel which will connect Port traffic directly to the interstate system, dredging the main channel to accommodate post-Panamax ships, and the rehabilitation of rail on Port.

- **Dredge**: This Master Plan, as those prior to it, continues to encourage the dredging of the South Channel. Furthermore, this master plan bases all its calculations and market analysis past 2014 solely as if the dredge has occurred, as it obviously notes that, without the dredge, the Port cannot compete for trade.
- **Rail**: Reintroducing rail service at the Port and the development of an on-Port rail yard which will help decrease traffic congestion and reduce emissions.
- **Inland Distribution Center**: The development of an off-Port Inland Distribution Center in the warehousing district to handle increased container traffic.
- **Consolidation of accessory uses**: such as Customs and Border Protection, fumigation yard, sheds, etc., to one area in order to create continuous cargo area for tenants.
- **Cargo Gates**: Consolidation of the individual tenants' cargo gates to the Port's one Security Cargo Gate complex. This project also includes creating a fast-pass lane to increase efficiency and reduce processing time at the gates.
- **Cranes**: Breaks down the purchase of new cranes over the next 25 years, taking the Port to a total of 23 cranes by 2034.

Cruise:

The cruise industry supports one of the County's biggest economic engines: **tourism**. The Port of Miami, known worldwide as the Cruise Capital of the World, plans to remain number one by competing for the growing cruise industry. To accommodate for this growth in 2035, the Port must begin to invest in new larger terminal complexes and multimodal centers.

- **Berths**: Three new berthing spaces plus the extension of berth 6 to accommodate the new standard of larger cruise ships. This will allow for the berthing of nine of the world's largest class of ships.
- **Cruise Terminals**: The plan outlines several options for two to four new cruise terminals, including introducing the first of its kind twin linear terminals that will offer new efficiencies to cruise lines.

- **Multimodal Center**: A multimodal center allowing for the consolidation of ground transportation, decreasing the sprawled footprint of the Port, therefore allowing for increased efficiency and additional land to be dedicated to cruise or cargo business.

Commercial:

The Master Plan aligns the anticipation of an increase in cruise passengers visiting the Port with the need for providing commercial development onsite. This development is the anchor that will connect the Port and the tourism industry that it serves to the community. By working together we will create a unified waterfront global destination.

- **Cruise Ferry**: Design and development of a cruise ferry to service the Caribbean.
- **Marina**: A marina to berth mega yachts.
- **Hotel and commercial**: Development of a hotel, retail, restaurant, and office space to serve cruise passengers, port users, and the community.
- **Trans-shipment**: The creation of a transshipment area with additional cargo berths at the south channel.
- **Utilities**: Increasing capacity of utilities such as electricity, water, sewer, etc.

The capital improvement elements outlined in this master plan total $2 billion over the next 25 years. The Port, with the goal of creating jobs and building a stronger economy for the community, is aggressively moving forward to implement the projects outlined in this plan, laying the foundation for tomorrow's job and business opportunities.

Bill Johnson

Bill Johnson
Port Director

SECTION ES1

INTRODUCTION

ES1.1 HISTORY

Located in the heart of downtown Miami in Biscayne Bay, The Port of Miami is one of the most significant economic generators for South Florida. Through its cargo and cruise activities, the Port has determined that it contributes over $18 billion annually to the South Florida economy and helps provide direct and indirect employment for over 176,000 individuals. The Port is owned and operated by the Seaport Department of Miami-Dade County.

In 2010 the Port of Miami handled more than 4.1-million cruise passengers and 7.3-million tons of cargo providing a tremendous economic and social benefit to Miami-Dade County and the South Florida community. To meet the challenges of the future in Miami-Dade County and the South Florida region, the Port of Miami will continue its sustainable growth through the development of the cargo, cruise and commercial entities in order to create new jobs in the community. It is timely and relevant for Miami-Dade County to focus attention on this important community asset and plan accordingly for the future.

The Port of Miami is recognized as the "Cruise Capital of the World" – it has retained its status as the number one cruise passenger port in the world for well over four decades accommodating cruise vessels of major cruise lines such as Carnival Corporation, Royal Caribbean Cruises, Ltd. and Norwegian Cruise Line.

As the "Cargo Gateway of the Americas", the Port primarily handles containerized cargo and small amounts of break bulk, vehicles and industrial equipment. The Port of Miami is among an elite group of ports in the world which cater to both cruise ships and containerized cargo.

The port industry is in the middle of competitive changes which require ports to adjust if they are to continue to develop. The Port is geographically positioned for growth opportunities as the Panama Canal expansion project is completed in FY2014/15 allowing for post-Panamax vessels to transit the canal. The Port of Miami will be the closest US Port to the Canal. The Port of Miami is currently moving ahead with deepening the South Channel to -50-ft / -52-ft. to accommodate the new post-Panamax ships – a large container vessel providing for faster routes to Florida and the US East Coast. The development of the tunnel, on-port rail and off-site intermodal yard will accommodate this growth opportunity into the future.

ES1.2 BUSINESS APPROACH

This Master Plan is anchored by 5, 15 and 25-year forecasts for cruise and cargo traffic. These forecasts have been assembled through market assessments, the commitments that the Port has in current and planned User Agreements and the Port's recently completed Economic Impact Analysis. These last items are used to assist in the development of a sustainable strategic business plan and a framework for infrastructure planning to meet the projected demands to fulfill the Port's obligation to the community and to be fiscally sound.

The Master Plan also addresses the ancillary supportive tasks required to operate the port, inclusive of berth and mooring assessments, infrastructure improvements and others that are pertinent to the long-term development and success of the Port. The Plan has been prepared and presented so that it can serve several functions:

- Establish short and long-term capital programs;
- Achieve consensus, among the political leadership, on the long-term vision for the Port;
- Provide sound public need and justification to support future environmental permits;
- Allow for the incorporation into the County's Comprehensive Development Plan (CDMP) as its Port of Miami Master Plan sub element; and,
- Provide a potential planning vehicle for use in seeking grants.

ES1.3 PLANNING APPROACH

The Master Plan's main focus is to maximize the throughput and optimize its existing "footprint" to obtain sustainable growth. To achieve a plan based on this policy, the Master Plan was crafted in a way that would allow the decision-making logic to support that policy.

By defining the future cruise and cargo market demand for the Port through the market assessment process, the Plan can define the future physical and operational requirements of the Port for each of these main business units within the physical boundaries of the Port area. In the case of cargo, the Plan also explores the creation of off-port sustainable development to meet future demands and provide for increased market opportunities.

ES1.4 DIRECTION

From the outset there were several major policies that provided the directional framework for the study; these include:

- Port of Miami's mission statement and organization;
- The role of the Port of Miami in the community as an economic engine;
- Growth strategies for cruise, cargo and other commercial interests to strengthen and support the County;
- Priorities associated with trade, environment and community leadership; and,
- Successes and limitations of past master planning efforts of the Port of Miami.

During the course of the master planning process, several major strategies were contemplated that provided the overall direction for this report. These major strategies focused on the key components of the Port today (cruise and cargo) while also providing the platform for future commercial development opportunities. Major strategies linked specifically to the study included the following:

- **Cruise**
  - Development of new terminals; and,
  - Updating existing older terminals to meet the needs of larger modern vessels.
- **Cargo**
  - On-port development;
    - Creation of a flexible yard layout;
    - Increasing the dockside capacity;
    - Increase the number and size of cargo berths;
    - Dredging to meet the requirements of the next generation of cargo vessel; and,
    - Include the Tunnel in the development of the long-term port plan layout.
  - Off-port development;
    - Create port rail access to increase market opportunities; and,
    - Create distribution centers for rail and road movements.

- **Financial**
    - Increase revenues of the port;
    - Increase profitability; and,
    - Diversify revenue streams.

- **Management**
    - Manage to maximize profit through the development of business units.

ES1.5 OUTREACH

The approach for this plan included extensive outreach to Port users. Stakeholder outreach is an essential component of the Plan to provide the current tenants, facility users and other entities had a role in the assembly and implementation process.

ES1.6 COMPREHENSIVE PLAN COMPLIANCE

On July 1, 2011 the House of Representative passed Bill 399(FSTED) SS 311.14.3(a-e) which requires Ports to have a Board approved Strategic Plan which must include 5 components as outlined below:

Each port shall develop a strategic plan with a 10-year horizon. Each plan must include the following:

1. An economic development component that identifies targeted business opportunities for increasing business and attracting new business for which a particular facility has a strategic advantage over its competitors, identifies financial resources and other inducements to encourage growth of existing business and acquisition of new business, and provides a projected schedule for attainment of the plan's goals.

2. An infrastructure development and improvement component that identifies all projected infrastructure improvements within the plan area which require improvement, expansion, or development in order for a port to attain a strategic advantage for competition with national and international competitors.

3. A component that identifies all intermodal transportation facilities, including sea, air, rail, or road facilities, which are available or have potential, with improvements, to be available for necessary national and international commercial linkages and provides a plan for the integration of port, airport, and railroad activities with existing and planned transportation infrastructure.

4. A component that identifies physical, environmental, and regulatory barriers to achievement of the plan's goals and provides recommendations for overcoming those barriers.

5. An intergovernmental coordination component that specifies modes and methods to coordinate plan goals and missions with the missions of the Department of Transportation, other state agencies, and affected local, general-purpose governments.

To the extent feasible, the port strategic plan must be consistent with the local government comprehensive plans of the units of local government in which the port is located.

Additionally, Bill 7207 (Transportation Element of CDMP) – SS 613.3177.6(a)11.(b)2(b) and 3(b) adds the need for plans for ports, but does not address adoption of a master plan. While Bill 7207 (Coastal Management Element of CDMP) – SS 613.3178.2(k) stipulates that "A port master plan shall be prepared by or for each deep-water port for the purposes of coordinating the activities of the port with the plans of the appropriate local government." The plan is to be incorporated into the Transportation Element of the local government's comprehensive plan and be consistent with the goals, objectives, and policies of that element. Although the Port lies physically within the City of Miami limits, as a facility owned and operated by Miami-Dade County, it falls under the jurisdiction of the County.

An approved master plan must have a 10 year horizon. This plan has a 25 year horizon which is used yearly to update FSTED's Seaport Mission Plan. The Port of Miami Master Plan will need to be updated every 7 years to align with the CDMP.

This Master Plan provides information required for Comprehensive Plan Compliance. It provides discussions on existing and future land uses within the Port; infrastructure needs to support future market conditions, and environmental conditions resulting from any changes to the land uses. These representations are illustrated on aerial maps and other figures within the document.

To guide the Port of Miami through the 2035 Master Plan horizon, this document contains a series of proposed goals, objectives, and policies for implementation to allow for the long-term adoption of the Master Plan for the Port. As part of the 2010 Evaluation and Assessment Report (EAR), the Miami-Dade County Seaport Department and Miami-Dade County Department of Planning & Zoning will coordinate the adoption of the Port of Miami Master Plan sub element within the Comprehensive Development Master Plan.

SECTION ES2

EXISTING CONDITIONS

ES2.1 PORT OF MIAMI OVERVIEW

The Port of Miami is situated on an island with a land mass of 520-acres in central Biscayne Bay. It is bounded to the north by the Main Channel adjacent to MacArthur (I-395) Causeway, to the west by downtown Miami, to the east by Miami Beach and Fisher Island, and to the south by Fisherman's Channel and Biscayne Bay.

Though physically one island, it was created as part of a beneficial reuse plan out of three spoil islands: Dodge, Lummus and Sam's islands. In this 2035 Master Plan, the terminology "on-port" refers to facilities and activities located on these now joined islands (the Port of Miami) and "off-port" refers to locations, facilities or activities elsewhere and outside of the Port of Miami.

The Port of Miami acts as a transient point of entry or departure for cargo, and to meet its objectives, relies on its connections with other intermodal facilities such as the Miami International Airport (MIA), the FEC Hialeah Intermodal Facility, and the West Dade trade-related, freight forwarding and consolidation warehouses. The users of the Port of Miami also rely on the local, regional and inter-regional transportation network components consisting of roads, railway lines and channels to facilitate the efficient movement of goods and passengers including the Fort Lauderdale / Hollywood International Airport for a considerable amount of cruise passenger traffic departing to and from the Port of Miami.

ES2.2 PORT OF MIAMI ADMINISTRATION

The Port of Miami is a non-operating port, owned by Miami-Dade County, Florida, and managed by the Miami-Dade County Seaport Department. A "non-operating" port is one that provides, manages, maintains and leases the facilities for private entities to operate all shipping activities. The Port does not itself provide the services, shipping activities and/or manpower required to load and off-load vessels. The Port is under the leadership of the Port Director which is appointed by the Mayor.

Facilities are either leased or made available to Port users and operators. Tenants include shipping agents, cruise lines, freight forwarders, custom house brokers, stevedores, ship chandlers, federal, state and local agencies, and other port-related firms. The U. S. Coast Guard serves as Captain of the Port in matters relating to safety and inspection. Fire protection and Police services are provided by Miami-Dade County by contractual agreement with the Seaport Department. The Biscayne Bay Pilot's Association is responsible providing piloting services in the harbor.

ES2.3 LAND USES

Land uses are established by Miami-Dade County. They are all reflected in the County's Comprehensive Land Use Plan. The entire Port is classified as "Terminal" which allows for a broad range of uses and activities.

CHANNELS AND TURNING BASINS

Ships approaching from the Atlantic Ocean enter the Port of Miami through Outer Bar Cut and travel northwest to Government Cut and its 1,200-foot radius Fisher Island turning basin.

The Port is scheduled to undergo future deepening from its existing -42-foot depth to between -50 and -52 feet in order to accommodate the next generation of new post-Panamax cargo vessels capable of transiting the Panama Canal once that expansion project is completed in 2014. During the dredge other improvements to the channels will be made including widening the Fisher Island turning basin to 1,500-feet in diameter.

BERTHING INVENTORY

The Port of Miami accommodates cruise, cargo, military, barge, yacht, and numerous other miscellaneous vessels in support of commercial operations. At present, the Port has more than 28,739 feet of linear berth or buffer surrounding the Port. Approximately 8,474 feet of lineal berthing space are provided for cruise ships and 11,458 lineal feet for container ships. There is still a considerable amount of lineal water's edge of undeveloped berth space along the Main Channel (5,101 feet) from Bay 69 to 98 and additional space along the southwest corner adjacent to the RCCL headquarters building.

ES2.4 CARGO

The Port of Miami is a general cargo port with strict limitations on handling certain types of bulk products. Principal cargos passing through the port include fruits and vegetables, apparel and textiles, non-refrigerated food products / groceries, paper, electronic equipment, stone, clay and cement tiles, construction and industrial equipment, trucks, buses, and automobiles. Four types of cargo operations occur at the Port:

- Roll-on / roll-off (Ro / Ro) container operations;
- Lift-on / lift-off (Lo / Lo) container operations;
- Break- bulk cargo operations; and,
- Vehicle exports.

The Port allows container lines and or stevedores to operate at the port. At present there are three major terminal operators at the Port:

- **SEABOARD MARINE** - is an ocean transportation company that provides direct, regular service between the United States and the Caribbean Basin, Central America and South America.

- **SOUTH FLORIDA CONTAINER TERMINAL (SFCT)** is a joint venture terminal operator and stevedoring company between Terminal Link (CMA CGM) and APM Terminals.

- **PORT OF MIAMI TERMINAL OPERATING COMPANY (POMTOC)** has been operating at the Port for more than 10 years.

The Port is continuing to implement elements of the 2020 Cargo Master Plan through its Capital Improvements Program. This includes the continued expansion of berths and upland areas to assist in improving functionality and efficiencies of the operators. The main cargo projects to date include dredging deeper in order to meet the future new post-Panamax cargo vessels that can easily reach the Port following the expansion of the Panama Canal, new Tunnel providing for increased ingress and egress capacity for cargo with direct access to the main highway system, rail, cargo gate expansion with new inbound and outbound lanes, software modernization to increase throughput efficiencies, and a possible consolidation of gate functions to expedite processing times, replacing rip-rap with new bulkheads to accommodate additional vessels for cargo operations, stronger storm protection and cargo yard improvements to increase overall efficiencies.

ES2.5 CRUISE

The Port of Miami serves as a primary port of embarkation / debarkation (homeport) for the Caribbean region and is mostly used by the top three cruise lines in the world - Carnival Corporation (principal Miami brand – Carnival Cruise Line), Royal Caribbean Cruise Lines (Royal Caribbean International, Celebrity Cruises and Azamara Club Cruises) and Norwegian Cruise Line. Cruise operations occur on the north side of the island. Cruise facilities located in this area includes six cruise terminals with 744,784 square feet of interior operational space, cruise berths, cruise ship loading and support aprons, customs inspection and storage areas, provisioning spaces and parking areas. Additionally, Terminal J is located on the Southwest side of the Port and is able to accommodate cruise vessels up to 800 feet in length based upon current pilot standards. The landside portion of all cruise terminal operations, including parking, comprises approximately 52 acres.

The continued growth in the size of vessels affects the Port's ability to handle the mega-vessel passenger throughput. As discussed, and as shown as a major part of this 2035 Master Plan, some of these facilities will require renovations in the future to accommodate this increased demand.

One of the major issues for the Port of Miami, at present and over the long-term, is the ability to accommodate larger cruise vessels of 1,200 feet in length with larger passenger capacities. The current layout of the terminals does not provide for flexibility to accomplish this. This element is further discussed in the sections that follow.

SECTION ES3

PROPOSED GOALS, OBJECTIVES AND POLICIES

ES3.1 CURRENT STATUS

This Master Plan updates and replaces the Port's 2020 Master Plan previously adopted. This new Master Plan calls for sustainable growth in operations and expansion in cruise and cargo activities through enhancements of existing facilities, the development of a commercial business unit and the creation of a financial model whereby the Port maximizes profitability, prioritizes expenditures, diversifies revenues streams, protects our natural resources and allows for the Port to become self-sustaining.

The Port faces a number of challenges which require looking into the future to determine how to best position itself to meet its mission and role within the community. It must understand the issues and recognize the opportunities and limitations allowed for the creation of a realistic and sustainable Plan that can serve the Port beyond 2035.

Among the critical issues studied and evaluated as part of the Master Plan were the following:

- The location of the Port within the urban core of a major metropolitan area and its role in terms of the types of cargoes that move through it on a daily basis;
- The nature of an island port and its ability to expand (or not) within the Biscayne Bay Aquatic Preserve;
- The economic impact and role of the Port in terms of job creation within Miami-Dade County;
- The role that international trade will have on the future of the South Florida community;
- The realities of the inland transportation of freight from the Port and through the interstate highway system and beyond into the rest of the US hinterland, specifically, the use of rail to service the Port;
- The current economic condition of the Port and its ability to fund future capital programs;
- The Port is committed to achieving a sustainable balance between its customers, operations and development, while continually focused on its environmental responsibilities; and,
- The mobilization and diversification of cruise outside of the U.S. and Miami.

Cargo and cruise capacity throughputs have been consistent over the past few years. Therefore, increasing the level of competition and challenges in the traditional market share of cruise and cargo that the Port of Miami will need to meet over the next 25 years will be essential, not only to keep pace, but to strive to meet the demands of the markets it serves.

Moving forward, the Port will need to expand its physical footprint outside of the Port to remain competitive, diversify its financial capacity through the introduction of a commercial component to its cruise and cargo portfolio that is not tied to tariff income, increase its operational efficiencies in meeting the demands of the Port's key sectors through the application of technology to increase productivities for port users, and strengthen its marketing efforts to leverage these expansion efforts into additional customer successes.

The main goal for the Port of Miami is as follows:

THE PORT OF MIAMI SHALL CARRY OUT ITS DAY-TO-DAY OPERATIONS AND ITS LONG-TERM EXPANSION PROGRAM THROUGH COORDINATION WITH FEDERAL, STATE, AND LOCAL AGENCIES IN ORDER TO RETAIN AND EXPAND ITS SHARE OF THE MARKET AS THE TOP-RANKING CRUISE PORT IN THE WORLD AND AS ONE OF THE LEADING CONTAINER PORTS IN THE NATION WHILE CONSIDERING ITS EFFECT ON THE COMMUNITY AND THE ENVIRONMENT.

SECTION ES4

CRUISE AND FERRY

ES4.1 OVERVIEW

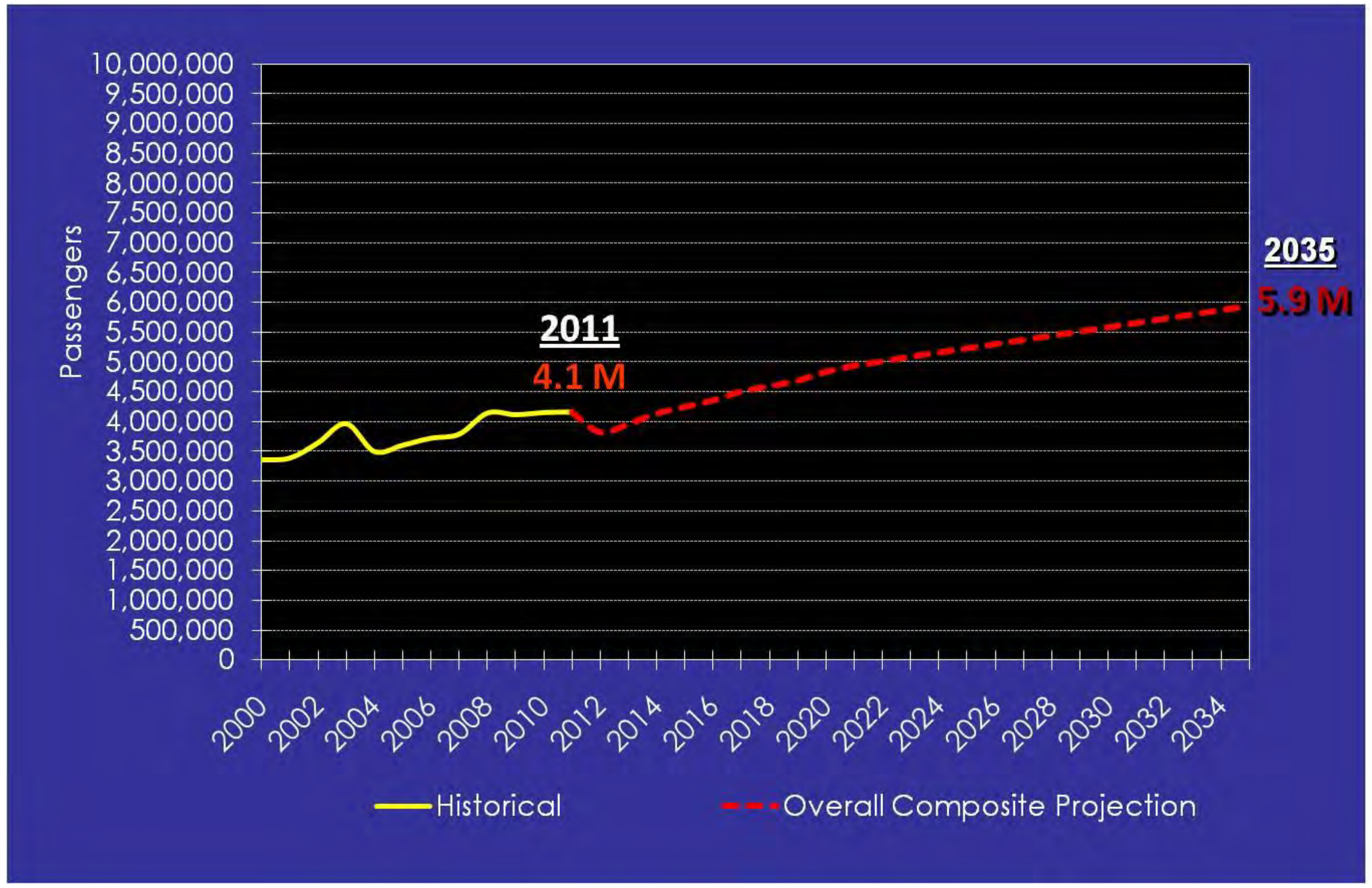
This section discusses the future of cruises at the Port of Miami and the facilities required to meet the needs. These forecasts are used as the baseline for the business plan and physical master plan efforts for the Port to determine future facility demand and financial performance.

The cruise forecasts assess the current industry trends impacting future cruise passenger and vessel throughput for the Port of Miami over the 25-year planning period (2010 - 2035). This assessment of the Port's main revenue drivers identifies global and regional market trends that impact potential levels of traffic.

ES4.2 PROJECTION OF CRUISE TRAFFIC

Figure ES4.1 shows the most likely passenger throughput scenario for the Port of Miami with a growth rate of 1.79% per annum.

FIGURE ES4.1: MOST LIKELY PASSENGER PROJECTION, 2011 - 2035



The passengers per sailing ranges from 2,733 to 3,074 based upon the type of vessels that will call at the Port of Miami.

Based upon the most likely revenue passenger projection and the passengers per sailing as illustrated on a per year basis, the overall number of anticipated calls grows from 760 in 2011 to 885 in 2020 and to 966 calls in 2035.

ES4.3 CRUISE BERTH DEMAND

CRUISE VESSEL GROWTH TRENDS

To forecast the facility requirements to meet the projections, it is important to take into account the anticipated trends in ship construction and deployment. This section illustrates the requirements of the industry relevant to the construction and deployment of cruise vessels in the worldwide cruise market and Caribbean region, in general. A summary of this section is presented below:

- In November 2009, Royal Caribbean International delivered the first new-build of the next generation of cruise vessel – *Oasis of the Seas*. It is approximately 43 percent larger than their other largest vessel delivered in spring 2006 – *Freedom of the Seas* - at 220,000 gross tons (GT). The sister ship - *Allure of the Seas* – was delivered in fall 2010. Also in summer 2010 the 150,000-GT, 325-meter LOA cruise vessel - *Norwegian Epic* - capable of accommodating more than 4,200 passengers and crew began seasonal sailings from the Port of Miami. NCL also ordered two additional vessels for delivery in 2013 and 2014 at 4,000 passengers each. RCCL has also begun a new shipbuilding program named *Project Sunshine* to deliver their next generation vessel.

- As of July 2011, 18 new cruise vessels with a total berth capacity of 56,215 are scheduled for delivery over the next six years (2010 through 2016). A total of 18 vessels have been delivered since December 2010 with a berth capacity of more than 36,000 berths. For comparison purposes, in December 2006, the forward cruise vessel order book contained 29 vessels with a berth capacity of approximately 85,000.

- The evolution of the cruise vessel has been one of the principal mechanisms propelling industry growth. Over the past ten years, the newest and most popular generation of vessels continues to offer greater passenger volumes, beams and lengths to accommodate the area needed for large-scale outside cabin development. These vessels range in length from 965 to 1,300 feet and have an average lower berth passenger complement of between 1,950 and 5,400.

For the Port of Miami to remain competitive in the regional marketplace and be able to fully accommodate the service requirements of the future generation of cruise vessels, current and future berth, terminal facilities and upland support areas will need to accommodate these large cruise vessels. This will include the ability to offer industry operators facilities and venues capable of accommodating a passenger complement upwards of 5,000 to 6,000 passengers per vessel into the mid to long-term. The core market will continue to reflect the predominant brands sailing from the Port of Miami including vessels ranging from 2,000 to 4,200-passengers per vessel.

Design vessel requirements for the Port of Miami homeport operations provide a heavy leaning toward the deployment of larger vessels into the Port and marketplace. Historically, the Port has catered to the mid-size to larger cruise vessels in the North American and, more recently, the worldwide fleet. This trend is likely to continue into the long-term. Albeit, the Port does serve some smaller vessels of the Oceania, Crystal, SeaDream, and World cruise fleets.

Using large vessel design parameters, consideration can be given to each of the primary infrastructure categories required to support the Port of Miami's cruise operations with specific emphasis on the primary infrastructure of entrance channels, turning basins, berths, passenger terminals, ground transportation areas, and other elements.

The Port of Miami presently has demand to serve post-Panamax and super post-Panamax vessels into the long-term. For the Port, the ability to accommodate ships of more than 120,000 to 150,000 GT and approximately 1,200 feet LOA, is a key factor in its ability to serve as a primary regional cruise homeport. The net result of the vessel development trend is that current and future facilities will need to accommodate large cruise vessels for the Port to remain competitive in the cruise marketplace.

DESIGN VESSELS

To facilitate the Port of Miami 2035 Master Plan, a recommended series of design vessels for the Port over time is presented. Based upon the plan layout for berthing it is envisioned that, to accommodate all classes of vessels that may utilize the Port, facilities that berth layout design must be in conjunction with the super post-Panamax vessels allowing for a 1,200-foot berth. Upland areas may be developed to provide for a wider range of facilities to then accommodate vessels ranging from post to super post-Panamax.

Table ES4.1 shows the recommended design vessels for the Port of Miami.

Table 4.1: Recommended Design Vessels for Port of Miami

TYPE	CURRENT	NEW BERTHS
	Design Vessel 2 (post-Panamax)	**Design Vessel 3 (super post-Panamax)**
Passengers	2,500 to 4,000	4,200 to 5,400
Crew	800 to 1,000	1,000 +
Gross Tons	90,000 to 130,000	140,000 to 225,000
Length Overall (feet)	985 to 1,100	1,100 to 1,300
Beam (feet)	130 to 165	140 to 185
Draft (feet)	28 to 32.8	28 to 32
Air Draft (feet)	Up to 210	210 +

TRAFFIC ANALYSIS

Part of the process in identifying long-term berth demand is to develop an understanding of the traffic patterns for the facility. For the Port of Miami a defined seasonal, monthly, and daily traffic pattern emerges through analysis of the historical traffic data. Traffic patterns for the Port of Miami were evaluated based upon an historical assessment. The following elements contributing to Port demand were identified:

- Seasonal and monthly traffic patterns are primarily driven by the winter Caribbean season with a focus on November through April. Redeployment to the Caribbean is shrinking each year as the Mediterranean and other competing destinations worldwide draw away cruise vessels from the Caribbean region;

- The Port of Miami is successful as a key regional homeport providing service to the Caribbean and Bahamas regions as the primary target;

- Over the five year period (2006 – 2011) the months of December, January and March provide the highest volume of cruise calls and passenger traffic with 10.7%, 11.1% and 10.8% respectively; and,

- The peak day for traffic over the period was Sunday. However, in 2009 there was a shift to more capacity sailings on Friday and Monday. That was somewhat offset in 2010.

MONTHLY TRAFFIC ANALYSIS AND SEASONALITY

For the Port of Miami the peak monthly traffic occurs in the winter months of November through April each year. During this 6-month period, 61.9% of the annual traffic moves through the Port (10.3% per month). This is in line with the typical Caribbean winter cruise season. Additionally, the Port has maintained a year-round presence in the region from May through October with some 7.9% traffic per month over this period. This pattern will continue into the long-term barring any unforeseen changes in the Caribbean region.

Should Cuba open for North American (US resident) travel and cruise line visits providing additional port options then it is likely this figure will increase to some degree. Seasonal cruise activities can also be attributed to outside influences, primarily Europe, Alaska, and Mediterranean market trends. See Figure 4.5 for the actual numbers of calls on a monthly basis over the 5-fiscal year period. The trend line is indicative of the Ports traffic pattern and used as the long-term baseline for monthly traffic throughput.

Based on the projection assumptions, growth is envisioned to occur in a consistent seasonal pattern for regional traffic on sailings of less than eight days. This is primarily due to the competition from other worldwide summer destinations whereby the revenues will continue to draw traffic out of the regional cruise market catchments over the 25-year planning period. Much of the long-term passenger growth (not cruise call growth) will be a reflection of the increased passenger capacity of the cruise vessels. This will be defined by the type of cruise sailing from the key regional homeports.

DAILY TRAFFIC ANALYSIS

From a passenger volume perspective, Saturday and Sunday consistently have shown the highest passenger throughputs.

However, in 2009, there was a considerable increase in the Monday and Friday traffic accompanied by a decrease in weekend cruise calls. This change was due in part to the addition of the *Jewel of the Seas* on Monday/Friday departures; *Norwegian Sky* on Monday/Friday departures; and the switch of the *Carnival Destiny* on Monday/Thursday for the *Carnival Fascination* on Monday/Friday, amongst others. The days from Friday through Monday will continue to be the busiest days for the Port of Miami as they are based upon the vacation patterns of the North American consumer.

If these change, and the European consumer becomes more prevalent in the market, these may be modified slightly into some additional mid-week sailings with a particular emphasis on Thursdays. These patterns are also indicative of a short-cruise duration market with an emphasis on 8-day; 5-, 5-, 4-day; and 3- and 4-day sailings that meet the demands of the North American consumer.

For the Port of Miami, a more consistent traffic pattern is shown with an average of 91.6% of its traffic placed on the peak weekend days (Fri, Sat, Sun, Mon) and the remaining 8.4% on the mid-week days. This is compared to approximately 80% of the traffic on peak weekend days and 20% on mid-week days for Port Everglades over the period. There has been a slight increase in the peak weekend day capacity over the past three years with most of that traffic attributed to larger vessels and the deployment of ships to slots on Monday and Friday.

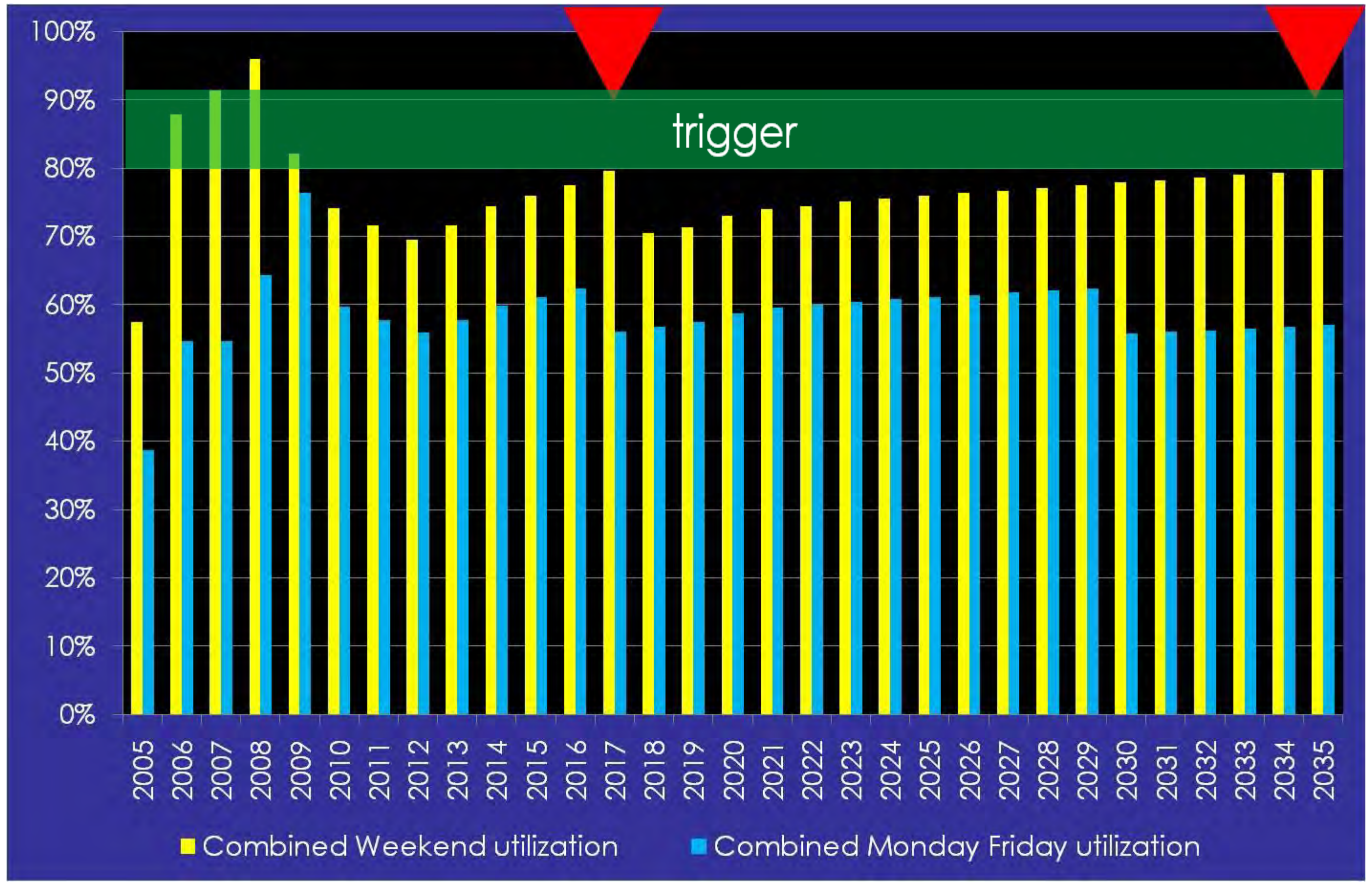
For cruise ports, the consistency of cruise traffic calling on a year-round basis is a positive attribute. This consistency allows the Port to manage the cruise facilities through revenue planning, personnel scheduling, and other defined areas of operations. If cruise traffic is inconsistent on an annual basis, it poses challenges in terms of apportioning reserves to maintenance during low cruise traffic periods and places more demands on other aspects of the cruise operation.

FACILITY DEMAND

For the purposes of this master planning study, we believe the majority of the berths should be able to accommodate the future design vessels of 1,100 feet LOA (berth size 1,260 feet). With this size berth, the facility can also accommodate vessels of less than these dimensions. Thus, the berth demand and projected requirements are based upon this berth length.

Figure ES4.2 illustrates the anticipated demand for berths in the upcoming years based upon the triggers. As shown there is a total demand for up to 9 berths during the projection period with an extension of berth 6 and a seventh now; an 8th berth in 2017; and, a 9th berth in approximately 2035. As presented in the Master Plan, vessels of more than 900-ft. would berth along the North Channel due to pilotage concerns with moving larger cruise vessels along the South Channel. The Southern Terminal "J" would act as the overflow facility until 8 to 9 berths are built along the North Channel.

FIGURE ES4.2: BERTH DEMAND, 2009 - 2035



ES4.4 FERRY

North American operators have had success in understanding how to market and develop cruise products that appeal to the tastes of many diverse consumer groups. These operators suggest there are still opportunities within the Caribbean cruising region; as such, this region will be one of the many focuses of their development in the mid- to long-term. For instance, the development of Cuba, offering a series of cruise ports and the continued development of new destinations throughout the region, will bolster mid- to long-term interest in the region by cruise lines, and more importantly, by consumers. Cruise line deployments will also continue to be based upon outside influences directly related to other potential markets in Europe and Asia as these begin to open and develop.

It is not believed, based upon cruise line interviews, that the introduction of Cuba at any point will have a dramatic effect on increased capacity from the South Florida market. However, this will assist the region in maintaining its dominance. Additionally, there are likely limited opportunities for passenger ferry service as the airline industry will capture much of the market to the dispersed cities of Cuba. There is an opportunity in the short-term for ferry Ro-Pax services and Ro-Ro services to move people, vehicles and construction supplies to the island community.

The development of shorter patterns sailings from South Florida on 3- to 5-day patterns to take advantage of the proximity of key Cuban ports may increase passenger throughput to some degree with the opening of Cuba to cruise tourism. However, many experts agree that the development of the infrastructure to support cruise tourism operations as seen in other Caribbean islands may take up to 2 to 3 years to develop once Cuba is open. This time period should also allow adequate development time for any U.S. ports to transition infrastructure, if necessary, to support new cruise operations.

From a competitive homeport standpoint, in the long-term Havana, Cuba may compete for international (particularly European) homeport traffic as the airline industry deploys to the island with direct flights. However, the major portion of the cruise consumer market will be North American and is much more likely to use Cuba as a port-of-call rather than a homeport operation.

ES4.5 CRUISE LAYOUT ALTERNATIVES

Historically, the Port of Miami has grown its cruise facilities organically as the need has arisen. This means that, as cruise vessel volumes (numbers of total vessels needing to be accommodated) as well as the vessel size (increases in vessel length, tonnage and passenger capacity) have increased, the Port has created the upland cruise terminal, ground transportation areas, and parking to accommodate the need. In many instances the Port had to respond to customer needs within months and resorted to building a terminal at a location that might not be the best from a planning perspective, but rather it was the only practical solution at the time. While this mode of growth appears to be appropriate from a financial perspective whereby the Port does not overly extend itself, this method does not work for long-term planning. What has occurred at the Port is that facilities built in the mid-1990's to serve that generation of cruise vessels are now out of place, creating conditions that impact operations and service for the Port and cruise line users.

The Port already has a major investment in the four westernmost terminals (F, G, D, and E) as well as Terminals B and C where an additional $21 million was recently spent to accommodate the *Norwegian Epic. T*he next question will arise when additional terminals are needed to the east. Therefore, for planning purposes, it is important to layout the optimum berth configuration and then decides upon the most appropriate location.

Flexibility is inherent in this plan, thus the final decision of when and where to place the terminal can and should be made at the time that the need arises, however this will allow the Port to proceed with items that are very long-term in nature such as the environmental permitting and financial planning.

BERTH CONFIGURATION

Based upon the cruise market assessment and berth demand analysis, there is a demand for up to 9 berths of 1,200-ft. over the projection period of 2035. As such an extension of berth 6 and a 7th berth is required now, followed by an 8th berth in 2020 and a 9th berth in approximately 2032. All of this cruise development would occur along the North Channel. This area would be separated from cargo operations to provide a passenger-friendly and sustainable cruise operations zone. In the short to mid-term, all cruise vessels over some 900-ft. would berth along the North Channel. Terminal "J" on the South Channel would continue to be used for smaller vessels until at least 8 berths are built. Cargo would utilize the South Channel only.

In order to accommodate the requirements for up to 9 – 1,200-ft. berths along the North Channel of the Port an analysis was done as to the most viable approach to add these berths to the channel.

To allow for the extension of berth 6 and add three more berths along the channel, the option was chosen to cut into the island based upon cost, marine elements and environmental balance.

Approximately 12.1-acres of cargo area would be needed in order to develop this new cruise berth area and uplands support areas. A 9th berth would require an additional approximate 6 acres of cargo space. To fully implement the plan additional cargo area of more than the acreage needed for the berths would be required for the terminals and upland support areas.

CRUISE TERMINAL LAYOUT

The Port has a fixed amount of land that can be used in various ways including cruise, cargo and commercial. From a cruise perspective, future development of upland facilities should maintain maximum flexibility and return on investment. However, from the Port's perspective, the allocation of land is a more complex evaluation which weighs the available solutions' impact on each user, the environment and the overall needs of the community.

The traditional approach of terminal development at the Port has been to build almost independent terminals for each ship. This now requires extensive infrastructure and the need for multiple Customs, Immigration, and security stations. As part of this plan, other options were considered to this approach. The concept of the sustainable development of twin or mega-terminals that can be positioned to service multiple vessels can align with different berth configurations, can be accessed via walkways, can be adjacent to Ground Transportation Area (GTA) and parking facilities, and can provide for mixed operations (such as security, Customs & Border Protection) to save on costs and perhaps even combining baggage and check-in long-term into the formula may apply.

RECOMMENDATION

Alternatives were evaluated through a process that looked at cost, implementation, areas impacted, and the theoretical **internal rate of return (IRR)** which compares the revenue generated per square foot of land for each competing land uses. Alternative A2 is preferred in the short-term for development at a total cost of approximately $241-million.

Providing for a continued linear berth pattern that works along the edge of the Main Channel and minimizes the impacts to the cargo yards adjacent to the cruise facilities will assist the Port in achieving its long-term goals. Based upon the recommended option A2, a mid-term and long-term master plan layout for the cruise terminal facilities has been developed as illustrated in Figure ES4.3 and the long-term Figure ES4.4, respectively. Based upon feedback from the cruise line users, the separation of cruise tourism and cargo activities is a positive impact on the Port.

Within the overall cruise zone of the Port, it is envisioned in the mid to long-term that a centralized multi-modal center could be developed to serve as a transportation hub for the Port, provide additional commercial (hotel, retail, entertainment) and allow for the opportunity to serve as a link to the Miami International Airport. The multi-modal center would also provide green spaces for activities such as tennis, jogging, swimming, and other outdoor activities that could accommodate port staff, crew, and other community activities. This site would primarily serve the cruise terminals from CB 1 to CB 4 with additional parking and support services.

The sustainable development in this central area of the Port can be done in conjunction with the development of the intermodal center. As shown, this area encompasses new buildings adjacent to the existing Port of Miami offices and Miami World Trade Center as well as development within the proposed multi-modal center and a replacement park on the roof.

A multi-modal center is approximately 230,000-SF per floor and a total of 3 to 7 stories. This dimension provides numerous internal uses and a rooftop green space. Uses may include parking, GTA, hotel, retail, entertainment, and others as required to support cruise functional operations and Port-specific needs. A second multi-modal center made up of parking, ground transportation area for bus, taxis, and private cars, potential baggage drop off, and other operational support elements would also be established to serve cruise terminals CB 5 to CB 8 (CB 9 long-term).

Additionally, to allow for financially viable cruise facilities growth of the Port, the next generation terminal complex at the Port would provide for the consolidation of services allowing for better management of operations and security (entryways to the terminal complex may be a shared security zone) where passengers would then move to individual halls from a series of main entryways and corridors for check-in processing.

FUTURE CRUISE OPERATIONS

With the development of the 2035 Port Master Plan there are significant operational issues related to the planned development approach that must be resolved through further review and specific master planning of the multi-modal centers, terminals, walkways, berths, and roadway systems servicing the cruise area. There are substantial operational challenges with the development of a terminal complex that may provide for up to five individual terminal spaces to service berths CB 5 through CB 9.

Cruise line users will need to be involved in the planning process to ensure that the adopted development pattern is consistent with how future cruise operations can be effectively and efficiently managed. Specific items of concern are the movement of baggage to and from cruise vessels berthed at a distance from the cruise terminal structure (such as CB 7 through CB 9). Alternative methods of moving baggage utilizing improved logistics and technologies will need to be explored. The current method of transporting baggage via forklift and cages to the individual vessels at this distance will certainly multiply substantially the total labor and equipment required. Thus, movement via green trolley trains or, more likely, via a beltway system linked to dispatch baggage from and to the terminals to each individual vessel would be used. This baggage system would be built as part of the walkway system that would provide access to the cruise vessel gangway systems for passengers moving to and from the cruise terminals.

The walkways, which may range from approximately 1,200 to 4,000-feet, would be equipped with an interior clearance space allowing for two-way travelators (moving walkways), shell door / gangway accessibility, movement via walking (if desired) and for trolley carts to provide transportation for disabled passengers along this core. The space would be air-conditioned and planning of the space should also consider the distance and time passengers will be in the space. Provisioning the individual vessels must also be considered. Pre-clearance of goods and service vehicles by CBP, stage areas for trucks, apron access, and an apron area wide enough to allow for these operations to function efficiently will need to be considered when master planning these sites.

The use of a terminal complex, instead of the traditional approach of one berth/one terminal, saves substantial real estate utilization at the Port and lessens the overall impact on cargo operations. However, this is a "visionary" master plan for the next 25-years and is meant to be utilized as a baseline for growth and improvement at the Port of Miami. Specific development will need to be driven by User need with a clear focus on operational costs, passenger services, and cost of the facilities. This set of factors may, over time, provide for a modified master plan development.

Working with the cruise line users and involving them in the decision-making process will not only improve the operational successes of the master plan development but also allow for enhanced relationship development between the Port and cruise line users. It is imperative that the Port continue to work with its cruise line partners as this master plan development moves forward through the sustainable planning of individual berth and terminal projects as well as upland support areas.

Additionally, it is noted within the mid and long-term master plan that Terminal "J", the small ship cruise terminal facility located on the southwest corner, would be demolished to provide for new cargo capacity and be replaced through the addition of a new berth and green terminal on the North Channel in coordination with future need overall. The decision on when to do this will not be necessary at this time as it is based upon the Port's business plan.

The southwest corner of the Port would also provide a future development area for mixed-use cargo, Ro/Ro and Ro-Pax ferry operations as may be dictated by future opportunities in the Caribbean, specifically Cuba.

FIGURE ES4.3: MID-TERM PREFERRED CRUISE PLAN ALTERNATIVE

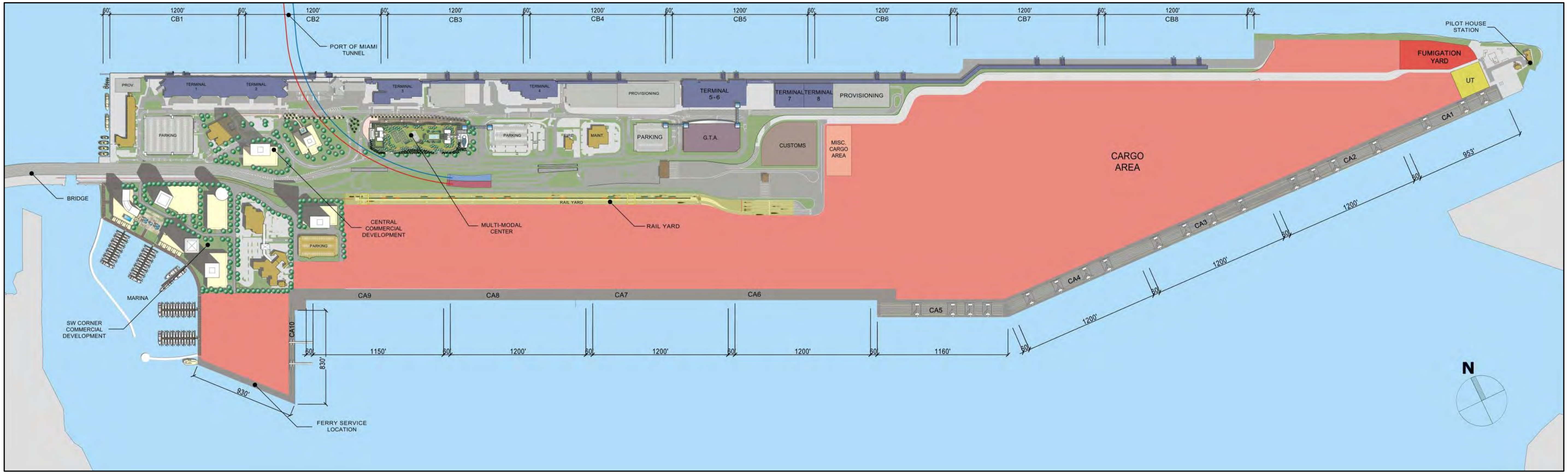
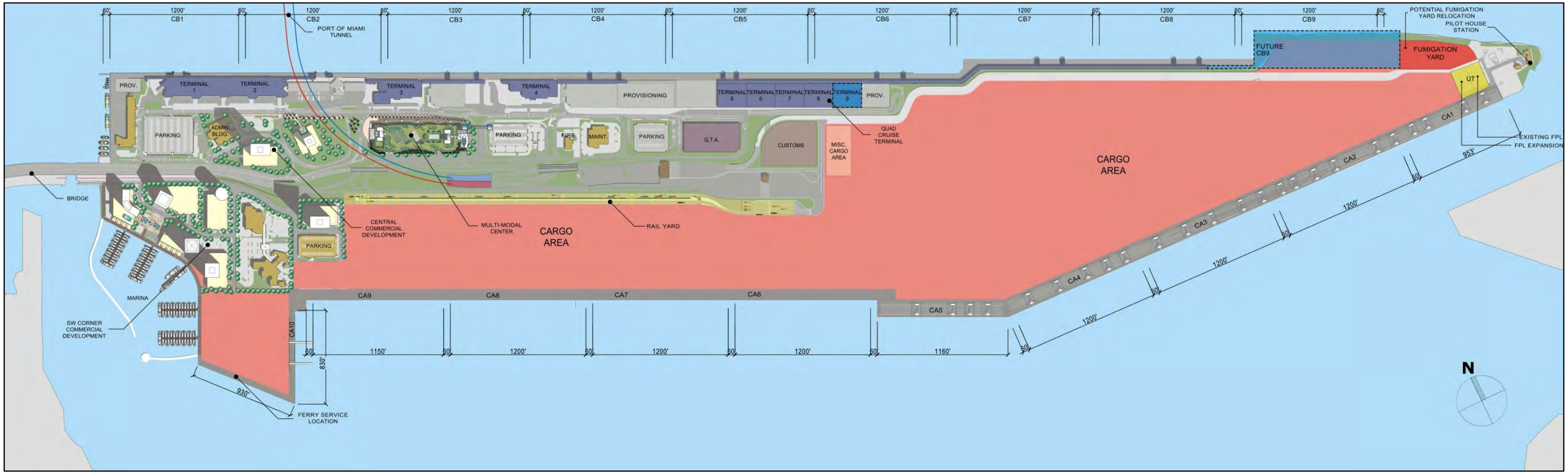


FIGURE ES4.4: LONG-TERM PREFERRED CRUISE PLAN ALTERNATIVE



SECTION ES5

CARGO

ES5.1 OVERVIEW

This section provides a summary of the projected containerized cargo throughput through 2035.

These forecasts are used as the baseline for the business plan and physical master plan efforts for the Port to determine future annual throughput capacities and facility demand.

The Port of Miami handles over seven million tons of waterborne containerized cargo annually. From 2000 through 2005, the Port's tonnage increased steadily, growing at an average rate of about 4% per annum.

The containerized cargo activity handled at the Port is handled by three individual terminals occupying approximately 268 acres: Seaboard Marine, South Florida Container Terminal/Terminal Link (formerly APM Terminals), and Port of Miami Terminal Operating Company, LLC (POMTOC).

Latin American cargoes have typically accounted for about 45-50% of the Port of Miami's total tonnage. Northern European cargoes have remained relatively constant at about 10-15% of the total, while Asian cargoes have increased from 15% in 2003 to nearly 30% in 2008. Conversely, Mediterranean, Middle East, and African cargoes share have been declining to less than 10%. It is anticipated that, as more direct, all-water services call the Port, the share of Asian cargoes will continue to grow.

Historically, growth at South Florida ports – Miami and Port Everglades – has averaged a modest 1.2% annually over the past ten years; however the 20-year containerized growth for these ports has been 5.4%. Specifically, since 1991, the Port of Miami has averaged 3.9% per annum.

Based on data from Moody's economy.com, US real Gross Domestic Product is likely to grow between 2-4 % annually over next 5 years. Based on the 1.5X future growth rate, this equates to a 3% to 6% baseline growth rate in TEUS at US ports. Some ports will experience greater growth as a result of shifting trade patterns while other ports are likely to grow at lower rates. Similarly, Florida GDP is expected to remain between 2% and 4% through 2020.

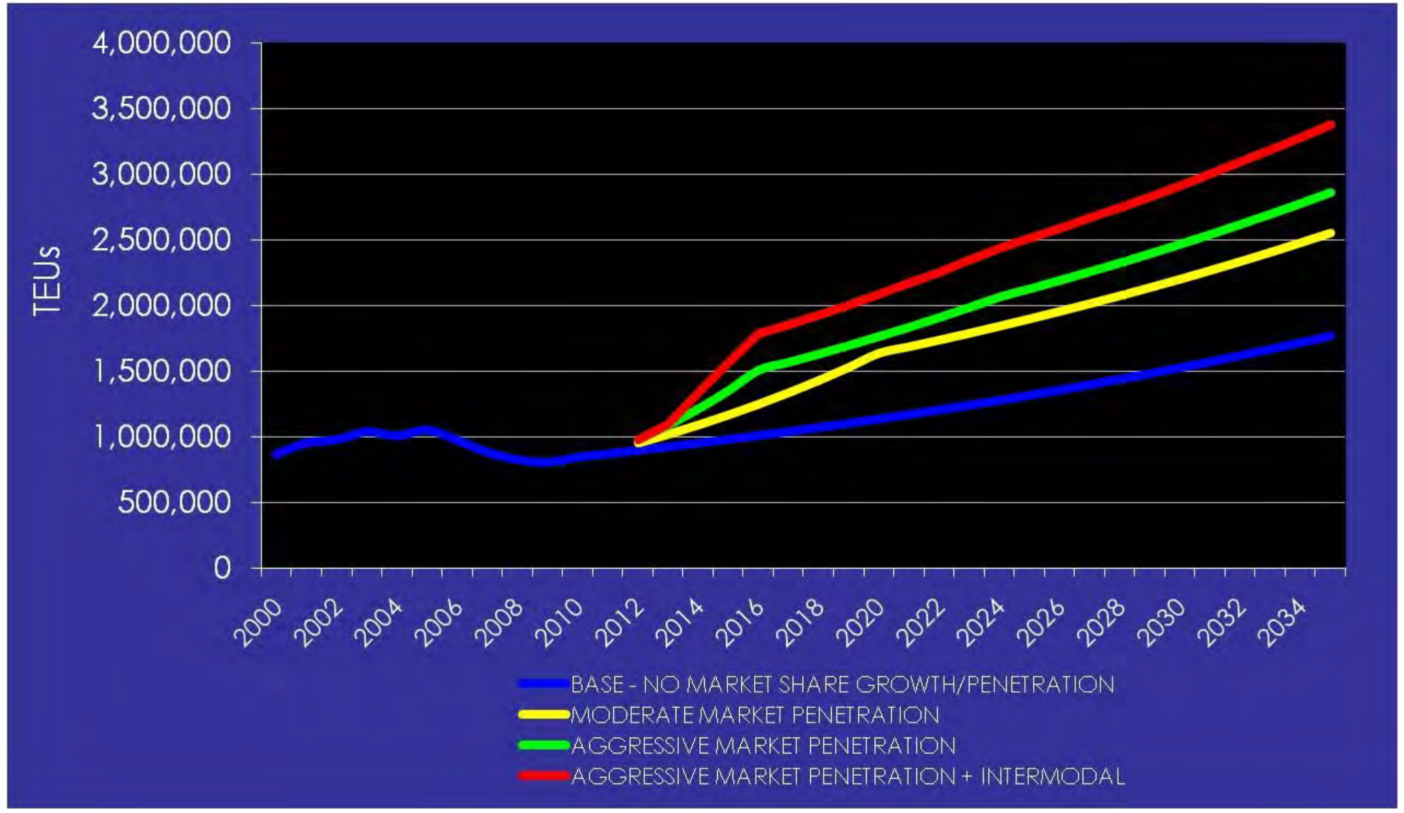
It is anticipated that, over time, more Asian service will be introduced on all-water Suez and Panama Canal routings however, the Port of Miami will still remain heavily vested in an export market that serves Latin American and Caribbean countries with consumer goods and supplies that replenish the cruise and tourism industries. Historical and projected near-term growth was also examined in terms of gross domestic product (GDP) in the Latin American and Caribbean countries. According to the International Monetary Fund (IMF)'s World Economic Outlook (April 2011) the Latin American and Caribbean region's GDP has experienced average annual growth rate of 3.4% over the past ten years. GDP growth rates for 2011 through 2016 are expected to average 4.1%.

Based on the estimated FY 2010 containerized volume handled at the Port of Miami, interviews of Port terminal operators and carriers and future growth factors, a range of containerized forecasts were developed:

- Low scenario container forecast, with no new market penetration, assumes a 3% growth of FY2010 base cargo.
- The moderate growth penetration scenario incorporates the estimated 500,000 potential TEU market that the Port of Miami can capture; 50% of the local truck hinterland market and 25% of the Central Florida market by 2020, with a 3% growth thereafter.
- The aggressive market penetration scenario assumes the same 500,000 potential TEU market is captured by 2016, with a 4.5% growth through 2025 and 3% thereafter.
- The aggressive market penetration plus intermodal scenario assumes the same rate of capture of the local truck hinterland and Central Florida market as described in the aggressive scenario as well as an 18% intermodal share, assuming the Port deepens the channel to -50', allowing for the ability to market to global carriers and handle a fully-laden first-inbound call.

By 2035, the unconstrained container throughput at Port of Miami is projected to range between 1.77 million and 3.38 million TEUs. The long-term growth rates of these scenarios range between 3% and 5.8%. The low/base, moderate, aggressive and aggressive plus intermodal container forecasts are graphically depicted in Figure ES5.1.

FIGURE ES5.1: PORT OF MIAMI LOW AND HIGH UNCONSTRAINED CONTAINER FORECASTS
Source: John Martin Associates



ES5.2 ON-PORT CARGO FACILITY DEMAND

In terms of current terminal capacity, the 828,349 TEUs handled over 268 terminal acres at the Port of Miami yielded about 3,200 TEUs per acre. This figure incorporates total gross acreage for all three cargo terminals. This TEU per acre figure is fairly consistent with the East Coast average of 3,257 TEU per acre. Other Florida ports of Port Everglades and JAXPORT reflect similar densities under current configurations.

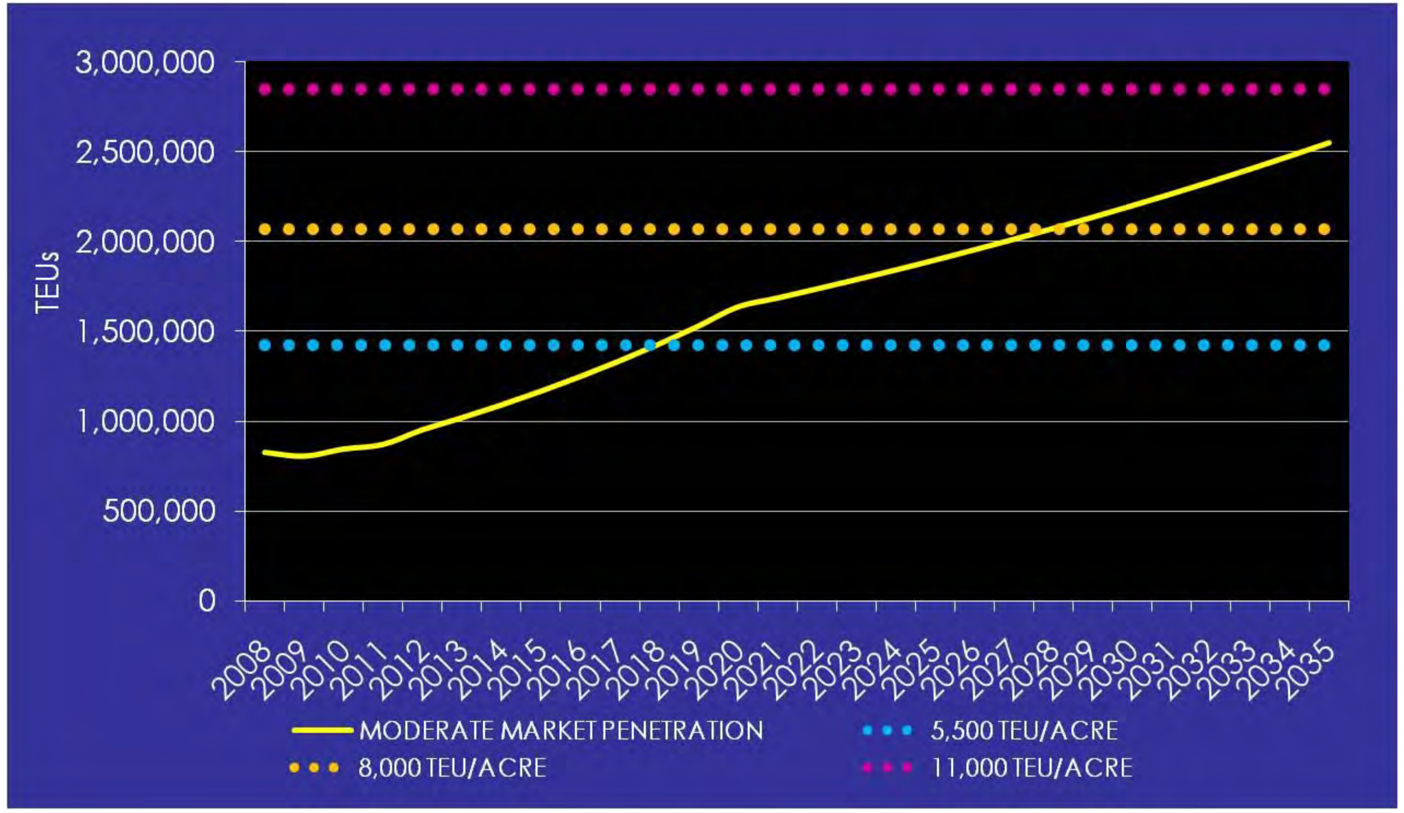
FUTURE ON-PORT CARGO TERMINAL CAPACITY

Based on the mid potential cargo projection scenario, the Port of Miami will be required to handle nearly 2.7 million TEUs in 2035. Using the current configuration of approximately 268 acres of gross cargo terminal area, this equates to about 10,350 TEUs per acre. Industry studies indicate that terminal density can increase to 11,000 TEU's / acre and eventually to 15,000 TEU's / acre without full terminal automation. However, to reach this level of densification, significant amounts of investment, including rail mounted gantry cranes (RMG) and other technology to minimize dwell times, will be required.

Figure ES5.2 illustrates the thresholds of capacity under various densification scenarios. This analysis suggests that, under the medium projection scenario, Port of Miami will approach densification of 8,000 TEU per acre in 2028. Assuming an 11,000 TEU per acre densification, the Port will not reach capacity in the planning period under the medium growth scenario.

FIGURE ES5.2: TEU PER ACRE PROJECTED CAPACITY THRESHOLDS

Source: John Martin Associates



Given these scenarios, the Port's terminals will need to densify in order to meet future long-term demand. This can be accomplished by:

- Reducing on-dock dwell times;
- Moving toward RTG and RMG operations;
- Improving gate efficiencies; and,
- Managing off-dock overflow yards, if necessary.

The levels of investment required to achieve this level of densification could result in higher operating costs per unit. It is imperative that there is a balance of maintaining reasonable cost per unit while gaining terminal efficiencies.

FUTURE BERTH CAPACITY

In addition to the landside constraints, future berth capacity must be taken into consideration. The average TEU per ship call has increased from about 350 to 510 since 2000. The average number of TEUs per call will most likely continue to increase. As larger vessel deployments occur on direct all-water routings, these vessels will discharge and load more units per call to ensure economies of scale of these larger ships. Currently the top 10 global carriers' fleets average about 3,600 TEU capacity per vessel. The order book for these same carriers reflects an increase in average vessel capacity to nearly 8,000 TEU per ship.

Based on industry standards, it is estimated that berth capacity can handle between 400,000 and 500,000 TEUs annually. The berth capacity analysis is based on 10,000 LF of berth – 6,700 of container crane and 3,300 of mobile crane berth operations. Assuming an average of 1,100 LF per berth, the analysis generates the need for 9 berths.

ES5.4 OFF-PORT CARGO FACILITY DEMAND

OFF-PORT DISTRIBUTION CENTER OPPORTUNITY

The potential for the Port of Miami to compete for distribution centers (DCs) to serve the Florida wholesale and retail markets is assessed in this section. This is due to the anticipated growth in Asian imports to the East Coast ports from increases in all-water direct services via the Panama and Suez Canals, and the accompanying growth in distribution centers near East Coast ports.

The Port of Miami finds itself in a unique situation by virtue of the fact that there is a significant parcel of land adjacent to the Hialeah intermodal yard that may be available for DC operations. The Flagler Property is approximately 400 acres and can be used for both intermodal and distribution opportunities. The following analysis focuses on this potential opportunity.

The Distribution Center (DC) and warehousing market in Florida has historically served not only retail and wholesale industries that serve the key consumption markets throughout the State with import and domestic shipments, but also the freight consolidators primarily located in South Florida and Jacksonville to serve the export Caribbean Island and Latin American trade as well as supply cruise vessels calling the Florida ports. The majority of DC growth in Florida has occurred in three regions:

- **MIAMI-DADE/BROWARD COUNTIES**: Serves the South Florida retail and wholesale markets; food wholesalers near the Port of Palm Beach, Port of Miami, and Port Everglades infrastructure serve cruise and island export markets; consolidators focus on near-airport facilities to also serve the air cargo market at Miami International Airport (MIA). There are also major highway and rail corridors linking the major cores of these areas.

- **I-4 CORRIDOR (TAMPA-LAKELAND-ORLANDO)**: Serve growing population and tourism in Central Florida. Also ability to serve South Florida retail and wholesale markets; excellent highway and rail access from hinterland.

- **GREATER JACKSONVILLE AREA**: Increasing market share; ability to serve into North/Central Florida as well as westbound; inexpensive land, low congestion; excellent highway and rail access that can also access South Florida; high interest by Asian steamship lines to develop container terminals in JAXPORT.

Historically, the South Florida markets of Palm Beach, Broward, and Miami-Dade Counties have been significantly more expensive in terms of lease rates and operating costs than Central and Northern Florida. Miami-Dade County's current industrial gross (IG) asking rate is $7.48 per square foot. Industrial gross differs from triple net (NNN) leases in that in a NNN agreement, the lease pays for rent and absorbs the costs of utilities, building insurance, and taxes. In an industrial gross arrangement, these costs are included in the rent. The differential from NNN to industrial gross is about $1.50 per square foot. Current NNN asking lease rates in Palm Beach and Broward Counties are $ 6.71 and $7.37, respectively. In contrast, NNN rates in Central Florida market of Tampa and Orlando range from $5.27 to $5.66 per foot. Furthermore, the Jacksonville area boasts a NNN asking rate of $3.86 per square foot.

PORT OF MIAMI DISTRIBUTION CENTER SITE ANALYSIS

The Port of Miami can compete with the Central and Northern Florida locations to serve the Florida consumption market with DC operations in Hialeah or Medley. The Flagler Property, which provides significant industrial acreage and intermodal access, exists and is available for development. The size of the parcel, coupled with the fact that smaller to mid-size DCs are becoming the trend, allows the site to pose as a potential multi-tenant complex. It is recommended that the Port continue to work in conjunction with Flagler and other involved parties including the Florida East Coast Railroad (FEC) to market this site to carriers, developers, and DC operators (shippers/consignees).

ES5.5 CARGO LAYOUT ALTERNATIVES

The options for providing for the cargo needs at the Port are affected by the cargo projections, input from the current leaseholders of the cargo terminals, and the longevity of the leases that the Port has over the current Port lands.

Since the cruise plan calls for the extension of cruise berths along the north shore of the container yard, the main component of the plan is to reroute the main access road to all of the container terminals on Lummus Island from that location. The plan proposes a new cargo access roadway allowing for the expansion of the cruise berths CB 7 to CB 9, and the access to each yard, fumigation yard, pilot station, and the utilities zone at the far eastern end of the Port.

To provide the Port and Users with future sustainable yard flexibility, the approach to flow cargo traffic from the main gate complexes to the north along the cargo/cruise boundary and into the cargo yards has been taken. The specific gates for each yard, configuration and acreage of each, layout of support facilities, and containers is then only dictated by the available space within the yard and not affected by outside issues. As noted in the cruise section above, the addition of the new cruise berths on the North Channel impacts the cargo yard acreage in that area. Access to the Seaboard cargo yard will continue to be organized in a similar fashion as today following the implementation of their master plan and gate complex.

ADDITIONAL LAND

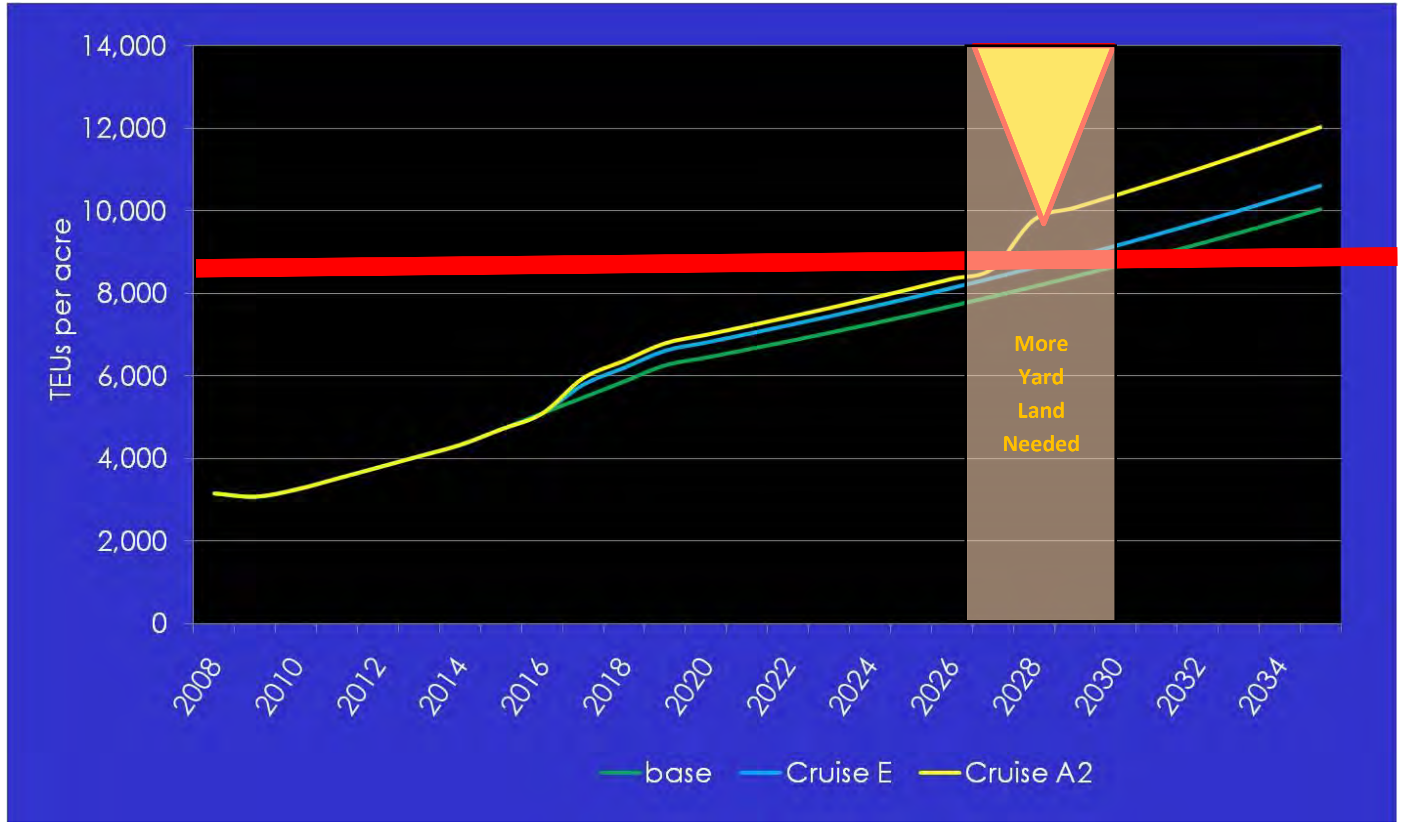
Based on the analysis shown in the previous section, the plan will be to optimize the use of the current land within the port for cargo operations. As such, in a range from 2027 to 2029 more space will be required. It is possible that some of this need may be offset by increases in overall yard efficiencies and new technologies related to the improved handling and movement of boxes to and from the Port and yards.

Impacts on Port of Miami cargo operations will be seen in two specific upcoming projects: The Port of Miami tunnel project which has started construction as of May 2010 and is scheduled for completion in 2014, and the new deep dredge project on the South Channel that will allow for 50+ feet of draft for larger cargo vessels to enter and use the Port of Miami facilities. These projects together will assist in positioning the Port for the widening of the Panama Canal and the opportunity to service these large vessels capable of transiting from the Pacific to Atlantic once the canal project is completed in 2014. The development of these projects will serve as a new opportunity for the Port to expand its cargo operations to the outlying regions of the southern U.S.

Additionally, planning and design enhancements to the Port security cargo gate complex have also started and will provide for further efficiencies to cargo movements. Although this was not a key part of the master plan project, it is evident that this is a key barrier to the cargo yard efficiencies. The operations of each cargo operator are different and it is not an easy task to facilitate changes that impact each user. However, improvements to allow for faster movement in and out, box scanning capabilities, pre-clearance of trucks, and other related gate issues should be further explored as part of the overall tunnel and master plan.

See Figure ES5.3 for the TEU's per acre forecast for the Port of Miami.

FIGURE ES5.3: TEU'S PER ACRE FORECAST
Source: John Martin Associates and B&A



ES5.6 CARGO LAYOUT

Most of the cargo operations are consolidated in Lummus Island and the south side of Dodge Island. However, transit shed B is an isolated building still handling cargo while adjacent to cruise terminals. This creates operational issues and does not allow for efficient use of space; customs is in a tight space for access.

The recommended cargo master plan layout provides for consolidation of cargo yards and supporting functions and the ability for future expansion to coincide with projected TEU throughput demand and reconfiguration of the cruise area. In doing so, a separation of cruise and cargo will occur.

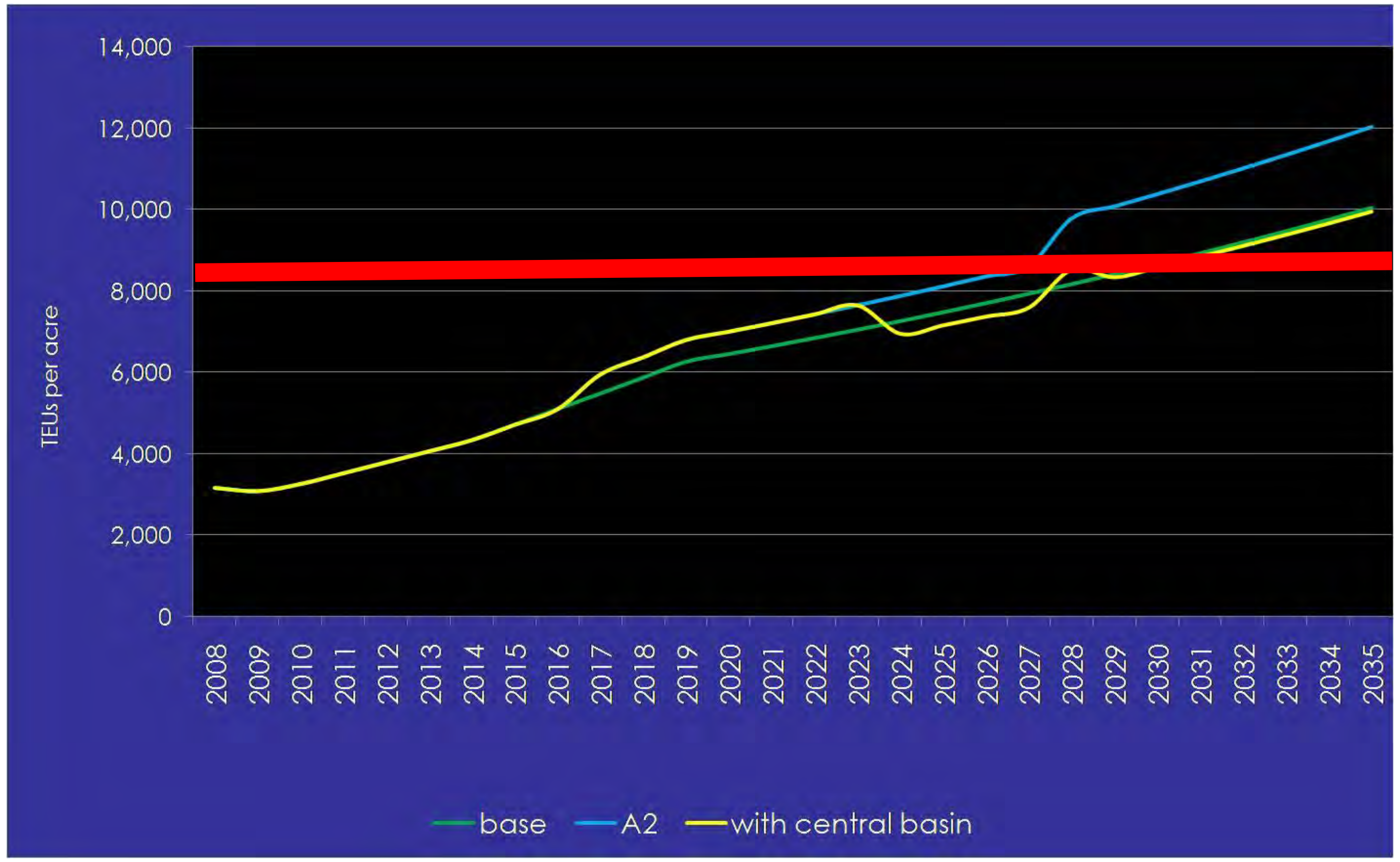
A new space for the transit shed B to allow for continued use of these facilities for bulk commodities will be provided. The Customs area will be expanded and moved to a location adjacent to the gate complexes that can also serve to support cruise operations functions as necessary and the present fumigation yard will be relocated to allow for the safe distance required for use, placing it in an area where it will not impact future cruise and cargo area development.

The master plan also takes into consideration current actions by Seaboard to develop their yard plan. South Florida Container Terminals is most impacted by the reconfiguration of the cruise and cargo areas due to the location of the yard gate complex. This will likely need to be relocated to provide for the completion of the master plan as presented.

To offset the potential loss of cargo yard as land is reallocated to cruise, it is recommended to expand the cargo area along the southwest corner edge by some 13.46 acres to provide a platform for future cargo operations. This expansion program would cost the Port an estimated $111,800,000 and would include the addition of two 830 to 927-linear foot berths with an area of 4.20 acres. This area would provide for potential river traffic interaction, Ro-Pax and Ro/Ro services.

Figure ES5.4 provides an overview of the projected requirements of TEU's per acre. This forecast was used as a baseline for the cargo master plan development. As shown, when levels reach approximately 8,000 TEU's per acre, there is a need for additional land area to meet the projection demands.

FIGURE ES5.4: TEU'S PER ACRE FORECAST WITH CENTRAL TERMINAL



The proposed long-term master plan provides for 13,252 linear feet of berth. Existing bulkheads along the channel will remain and current Port plans will further enhance these areas. These projects will be done in conjunction with the deepwater channel dredge project. Based upon the cargo market demand projections, the Port of Miami will require additional cargo land in:

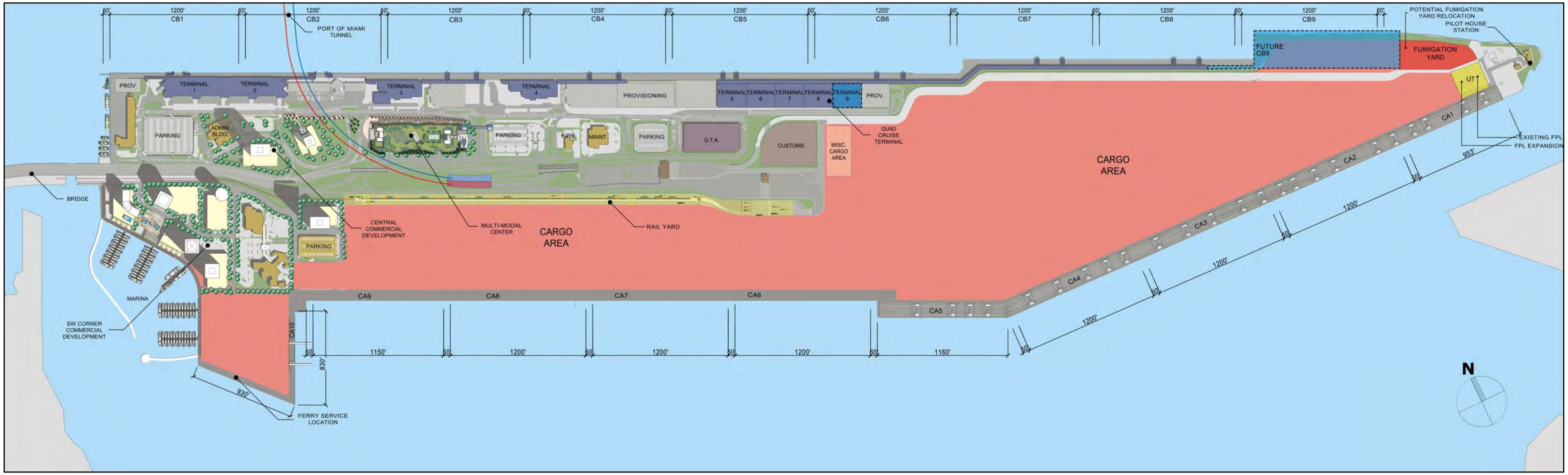
- 2023 with cruise Alternative A1; or,
- 2030 with cruise Alternative A2.

This assessment takes into consideration the acreage lost to cruise development and the addition of land with the new southwest infill. There will be a need for further detailed operational modeling prior to the sustainable development of any new cargo land areas to ensure there is adequate need based upon the TEU per acre metrics.

New berths for cargo will be required in 2029 with a total of 23 cranes by 2034 to meet the cargo market demand based upon the forecast. There are 16 operational cranes at present in the Port of Miami (including 5 operated by Seaboard). Four additional cranes are currently on order and will be placed at the Port as required to meet the operational needs of the Users with these additional cranes being planned for 2014 to coincide with the opening of the widening of the Panama Canal and new Port channel dredge efforts. Three existing gantry cranes (two of which are in use) will then be decommissioned. They have already been sold to another port in the region. Additional units would be added as the vessel sizes expand and new berth area is needed with the first of the master plan cranes being required in 2028 based upon projections. The projections include the entire cargo yard throughput inclusive of the Seaboard Marine facility that currently does not use the large mobile gantry container cranes for the movement of its cargo from ship to shore. See ES5.5 for the Cargo Long-Term Master Plan.

The additional cranes are projected based upon a productivity rate of 40 TEUS per hour and an overall maximum utilization rate of 2,000 hours per year per crane. The actual deployment of new gantry cranes may fluctuate based upon peaking factors, yard and gate efficiencies and other factors. As such the Port of Miami will need to monitor the overall yard effort to accurately time the purchase and deployment of new cranes, as is the case with the deployment of four new cranes to coincide with the completion of the widening of the Panama Canal and dredge project. Thus, actual implementation is a combination of operational needs, financial assessment and throughput over the next 25 years.

FIGURE ES5.5: PROPOSED LONG-TERM MASTER PLAN



ES5.7 ON-PORT RAIL AND OFF-PORT CARGO OPERATIONS

The Port of Miami currently has an existing rail spur of approximately .57 miles in the Port. To provide for the reduced cost benefits associated with an intermodal link, a new on-port rail yard is planned for better accessibility for container movements from and to the Port. The rail yard will be incorporated into the long-term master plan. The yard would use the existing corridor and linkages to the Hialeah FEC yard as its base. The layout of the off-site rail yard is a separate master plan element. It is envisioned that the yard would be accessed by container haulers via a security gate system, assigned a train unit, and then off-loaded by a picker system onto double-stacked trains. The rail reduces truck trips by several hundred thousand trips per year. This will improve road safety, while reducing fuel consumption, oil dependence green house gas emissions and road degradation.

The total yard area would be approximately 9.5 acres and reside adjacent to the tunnel access to the Port and Seaboard Marine yard. The total length of the intermodal rail yard is approximately 2,750-feet. The cost for the on-port rail portion and bascule bridge component of the project is approximately $22.7 million plus an additional $2.3 million for RTG equipment.

This rail yard would be used to stack and unload boxes from trains arriving and departing in the nighttime hours, thus not impacting downtown Miami traffic along Biscayne Boulevard. The train could either be used for direct service or interim service to a multi-modal transshipment yard close to the Miami International Airport. This provision provides another tool for marketing the Port and allowing the cargo yard users to compete in the Florida and Southeast U.S. market. It also establishes a sustainable cost effective direct rail service to and from the Port of Miami to lower transportation costs for shippers.

SECTION ES6

COMMERCIAL

ES6.1 OVERVIEW

One of the new strategic elements of the Port of Miami will be the introduction of commercial aspects to the business portfolio. The sustainable development will provide the Port with another avenue for generating revenues from the Port's land resource. In many ports throughout the U.S., commercial real estate income is one of the largest revenue figures for the business. Examples include the Port of San Diego and Port of Seattle, among others. The Port of Miami has spare land assets that allow for commercial development opportunities. The Port of Miami's weakness as a Central Business District "downtown" port can be exploited as a major strength in this regard. Furthermore, this allows the Port to develop a much needed "third leg" of the financial stool to provide additional strength to its portfolio of assets and earnings potential. The three "C's" include:

- Cargo;
- Cruise; and,
- Commercial.

Land and waterfront surrounding and adjacent to the existing southwest corner can be used to create a commercial complex for future port development opportunities.

The Master Plan focused on existing properties within the Port which could be developed or redeveloped without impacting the primary business of the Port or requiring land fill. The Port contains some parcels which have been isolated due to the roadway network, or which now have poor waterborne access and can no longer fulfill a maritime mission.

ES6.2 SOUTHWEST CORNER COMMERCIAL DEVELOPMENT

Lying adjacent to a newly created cargo expansion area, the introduction of new commercial opportunities for the Port will strengthen its financial position and provide growth options into the future. Development of this area will be further defined in the phasing and implementation sections of the master plan report.

The key element of the Southwest Corner is the introduction of a mega-yacht marina complex that would anchor the surrounding commercial development and provide for an active area. This would provide a mirror for Bayside and may enhance development opportunities on the mainland as well over the master plan period. Immediately adjacent to the marina would be a waterfront promenade with retail and restaurant areas. This development would ideally work in conjunction with the cruise area to provide early arriving passengers the opportunity to spend quality time in Miami prior to their cruise. Arrangements could be made to allow cruise passengers easy transportation options to and from the cruise terminals or intermodal facilities for this purpose via electric shuttle buses. See Figure ES6.1.

FIGURE ES6.1: SOUTHWEST CORNER COMMERCIAL DEVELOPMENT ZONE

ES6.3 ZONING AND ADVERTISING

To better address the needs of its tourist, the Port must develop a comprehensive Wayfinding and Advertising Signage Program. Both Wayfinding and Advertising are consistent with this Master Plan's concept to further explore commercial development on-port. By creating a comprehensive Signage Master Plan the Port will create a more efficient flow of traffic and people on the island while advertising will increase revenue with minimal costs.

The Port will need to develop a comprehensive signage master plan. It will also need to rezone to a designation which will allow commercial signage for advertising. The Port must do a thorough analysis of alternative types of signs that can be installed which will not compromise the aesthetic integrity of the surrounding community. In addition, the Port should look at designs which integrate architectural and artistic components. *As a component of this Master Plan a Way finding and Signage Analysis Report was assembled and included as part of the Appendix.*

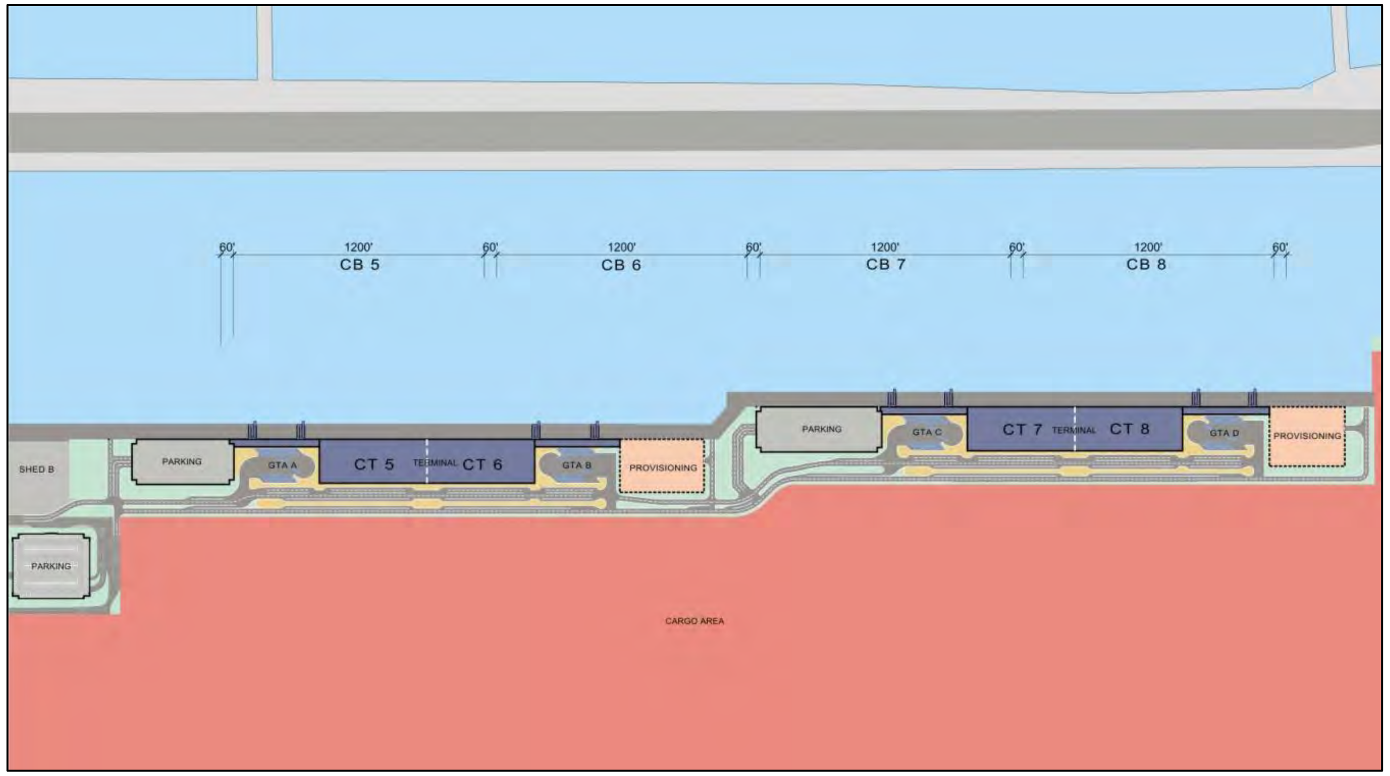
SECTION ES7

PREFERRED PLAN

7.1 OVERVIEW

As outlined in the previous sections, the preferred 2035 Plan for the Port of Miami encompasses elements of cruise, cargo, and commercial. The preferred plan is generated through the cruise and cargo 2035 projections, feedback from Port Users and Port of Miami staff, and a review of associated issues and sustainable opportunities over the long-term. The assembly of the plan followed a logical order in the development of cruise and cargo market assessments, definition and assembly of cruise and cargo design vessels and future berth demand requirements, financial and physical analysis of the Port properties, recognition of the role of future technological and operational advancements in the cruise and cargo sectors enhancing operations, needs of the surrounding communities and environment and the development of a third financial leg for the Port with the addition of a commercial component. The plan is shown in Figure ES4.3, ES4.4 and ES5.5 above. Figure ES7.1 shows an alternative layout for the cruise portion of the long-term plan.

FIGURE ES7.1: PREFERRED LONG-TERM MASTER PLAN ALTERNATIVE TERMINAL LAYOUT



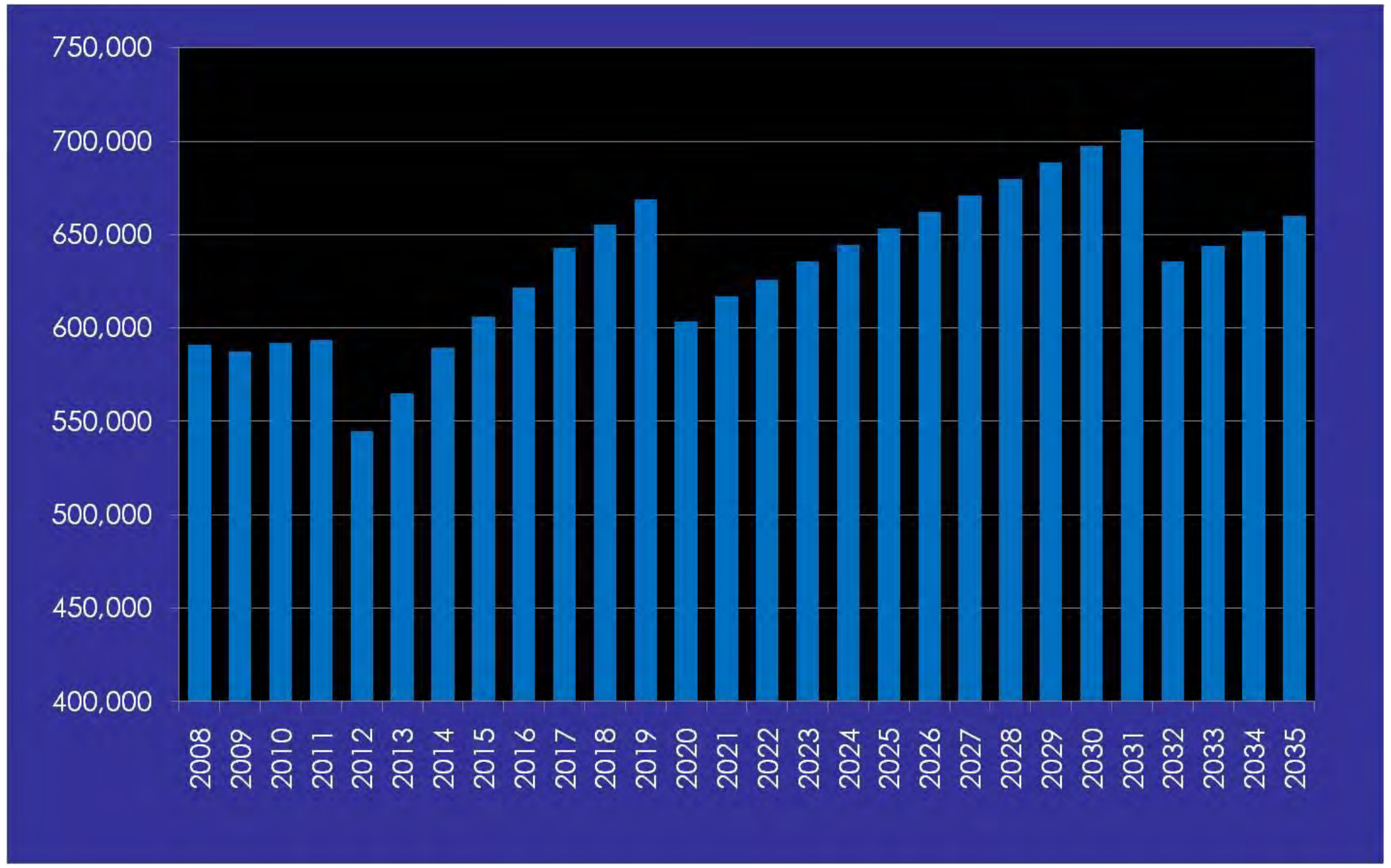
ES7.2 METRICS

To measure the effectiveness of the plan, a number of parameters were reviewed that allow continuous tracking to make sure that the plan is as efficient as possible. Subsequently, in the financial section of this Master Plan, the financial performance metrics are included that allow comparisons of the multiple uses within the Port. If implemented in concert with the anticipated traffic, the Plan will perform with the following operational performance metrics in cruise and cargo:

CRUISE

Since cruise is berth-intensive, the best metric is the cruise passengers per berth that is shown in Figure ES7.2. This metric is the best indicator of efficiency. Currently the Port is operating with less than 600,000 passengers per berth.

FIGURE ES7.2: CRUISE METRIC - PASSENGERS PER BERTH



Although this is at the top of the industry, as cruise ships increase in size, these numbers should go up. The chart reflects a stair step pattern which is due to the introduction of new berths on a particular year, and thus reducing the overall averages. Should the Port exceed the approximately 650,000 to 700,000 passenger per terminal mark, the facility should be generating sufficient revenues to support its costs.

CARGO

For cargo, being both berth and land-intensive, two metrics are the most indicative of efficiency: TEU's per acre as shown in Figure ES7.3 and TEU's per lineal feet of berth as illustrated in Figure ES7.4. The throughput of containers per berth fluctuates as the business evolves and new berths are constructed at the Port.

FIGURE ES7.3: CARGO METRIC - TEU'S PER ACRE

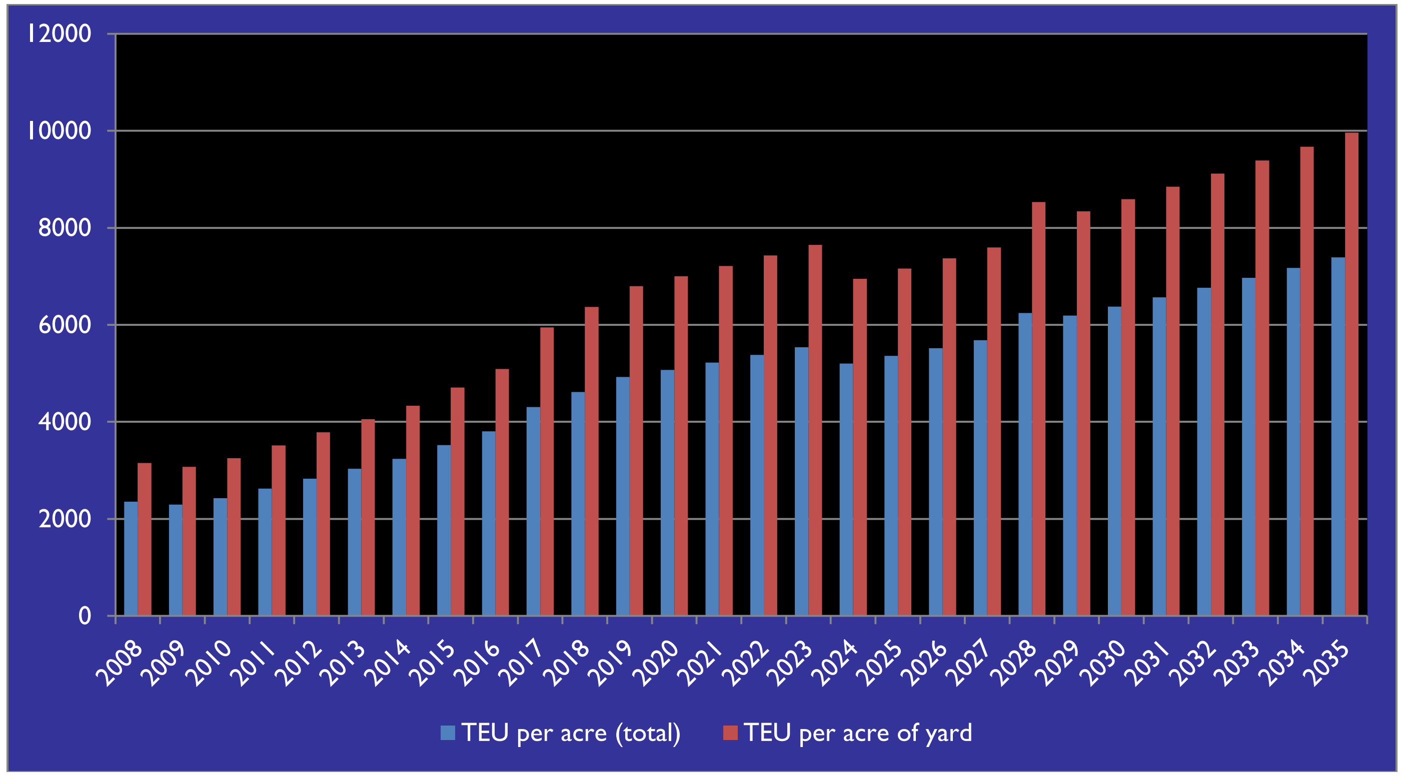
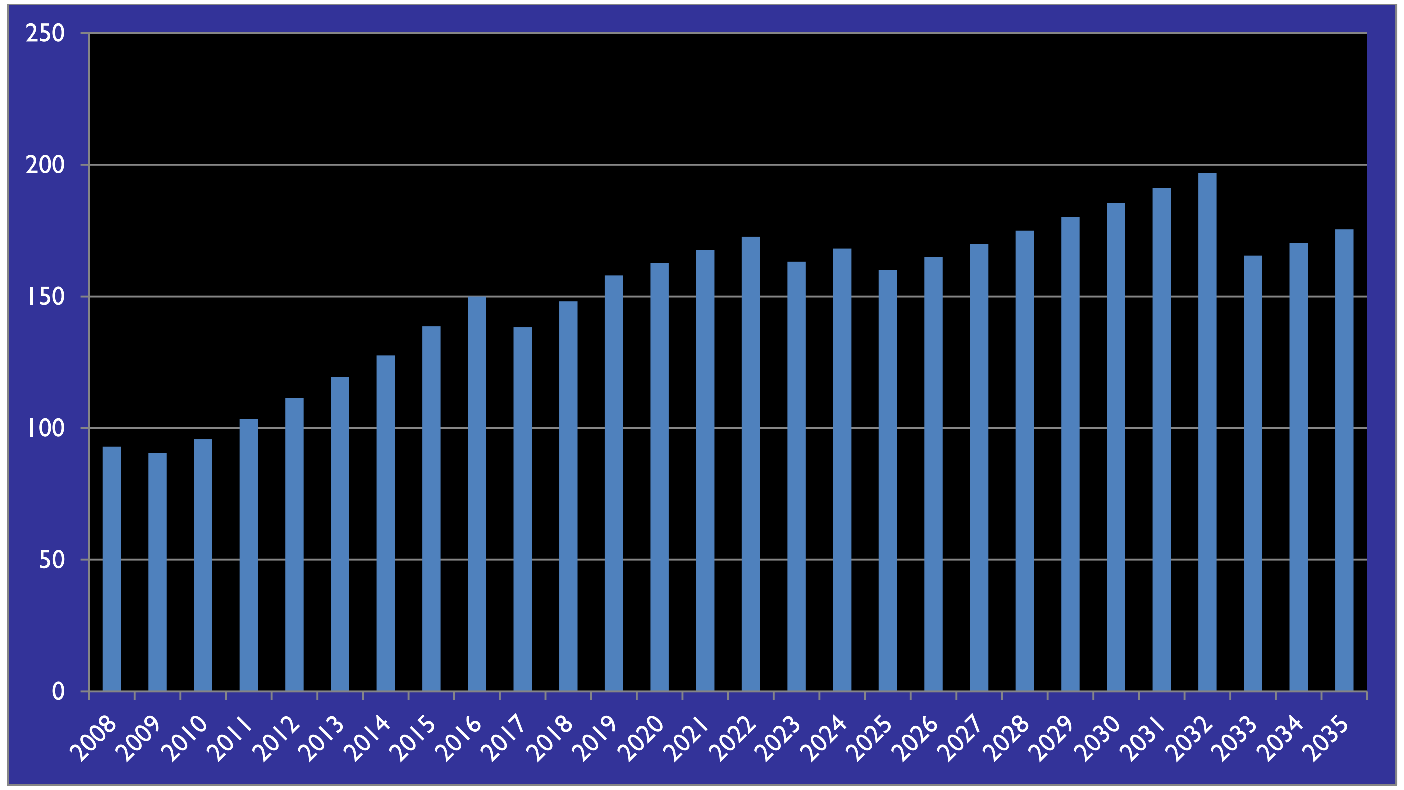


FIGURE ES7.4: CARGO METRIC - TEU'S PER LINEAL FEET OF BERTH



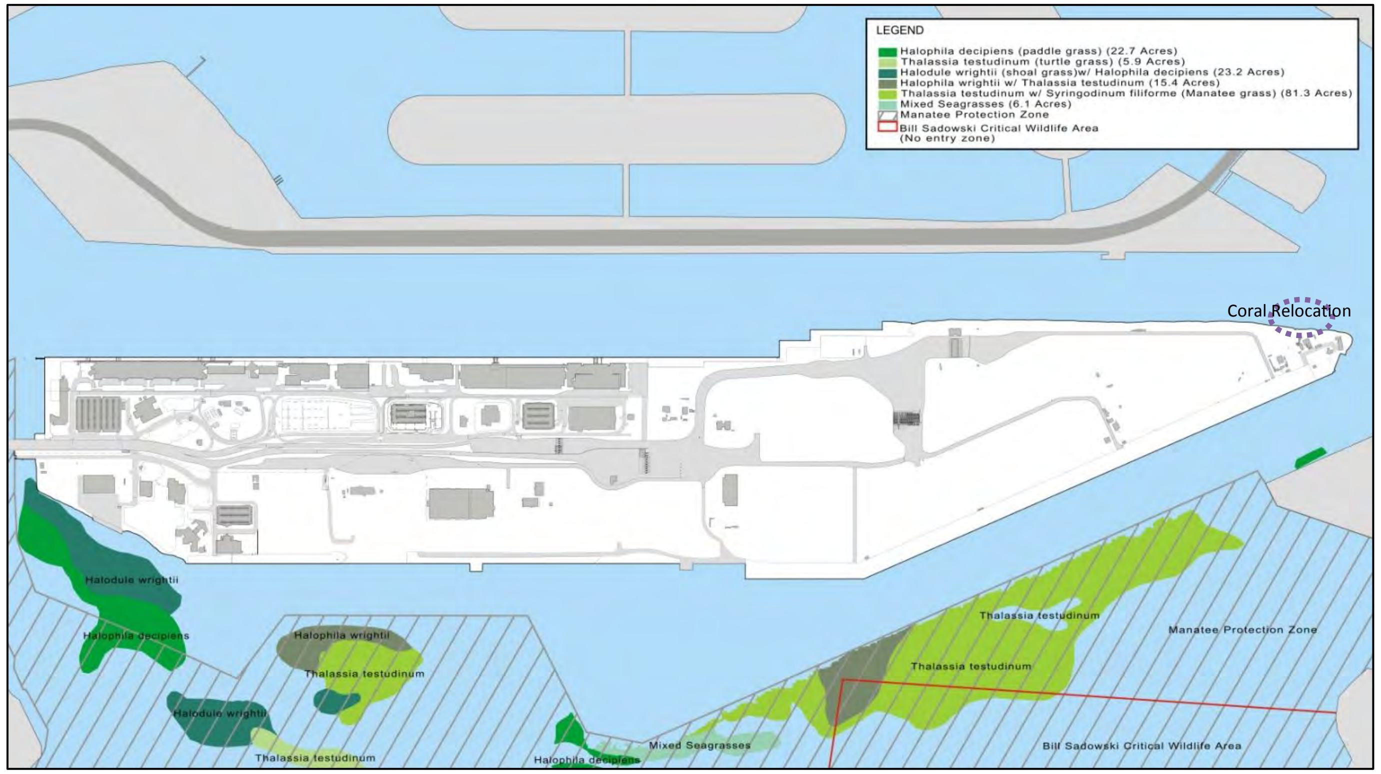
As with the cruise metric, the stair-step pattern shown in Figure ES7.4 reflects the justification for the addition of land to the cargo area when the program begins to near the 8,000 TEU's-per-acre thresholds. In the Plan, the Southwest corner land reclamation is scheduled for approximately 2023.

ES7.3 ENVIRONMENTAL

Located within the Biscayne Bay Aquatic Preserve, an area designated by the State of Florida for special environmental protection, the Port of Miami is a manmade land structure formed through beneficial land reuse of three spoil islands (see Figure ES7.5). The Port also provides for a coral relocation site along the northeast corner of the port boundary to assist in mitigation tied to port sustainable development projects.

FIGURE ES7.5: EXISTING ENVIRONMENTAL MAPPING, PORT OF MIAMI AND SURROUNDS

Source: Westhorp & Associates and B&A



Although estuarine conditions (i.e., water quality and movement) in the vicinity of the Port are generally good, human-influenced changes have resulted in increased overall turbidity and water quality awareness due to input from industrialized canals (e.g., the Miami River). The Port is well flushed by tidal action and Port-related activities are unlikely to impact natural environments outside the Port vicinity.

The proposed North Channel Cruise Terminal Expansion has been designed to accommodate more berthing area for cruise lines. The development of this expansion will involve new bulkhead construction along the seawall eastwardly adjacent to the current cruise line berthing area. Environmental impacts to the Port and its proximity are minimal for this project since it is located in an already much disturbed and altered area.

It is expected that the Port will conduct mitigation measures for this project type. The normal mitigation is to create one cubic yard of rip-rap for each linear foot of new berth or most likely the establishment of an artificial reef based upon this formula plus dredging of 1 cubic yard of rip rap for every 100 cubic yards of dredged bottom material. The Port will also relocate any existing corals to its established coral relocation site.

The North Channel is currently at a depth of 36 feet below sea level which does not provide the proper environment for sea grass to thrive due to the lack of sunlight. In the barren soft bottom communities that dominate the Port, wildlife is limited to a few burrowing animals and a few other burrowing invertebrates.

The Southwest expansion, located in the southwestern corner of the Port adjacent to the current Western Turning Basin, is designed to potentially accommodate a marina for vessels, a ferry, and a transshipment area. Although the exact layout of the expansion has not yet been determined, filling will be required and will consist of approximately 17.51 acres. The chief environmental concern associated with this project is the unavoidable removal of sea grass in the area. These sea grass beds provide low-to-moderate quality habitat for some juvenile fish and invertebrates and are also a staple to the endangered West Indian manatee. Due to the proposed marina on the southwestern side of Dodge Island, the Port will need to conduct mitigation activities for the sea grass that will be displaced. Providing for marina in an existing marine environment with the Port of Miami will mitigate other potential impacts into the future that may occur if such a marina facility would be placed in another location outside of the traditional port area.

GLOBAL CLIMATE CHANGE AND NATURAL DISASTER PLANNING

Southeast Florida has experienced 34 hurricanes between 1994 and 2007, nine of which were a Category 3 or above. During Hurricane Andrew in 1992, record high flooding occurred due to 17 feet of storm surge.[1] In addition, flooding due to torrential rainfall or a rise in sea level poses a serious threat to portions of Miami-Dade County, specifically in low lying areas such as Dodge Island (Port of Miami).

CLIMATE CHANGE AFFECTING THE PORT OF MIAMI

One of the biggest concerns involving the future of the Port of Miami is global climate change and the threat of sea level rise. Sea level rise, one of the likely effects of global warming, is a major threat to all coastal communities and infrastructure. Along much of the Florida coast, sea level has been rising at a rate of 7 to 9 inches per century.[2] In response to this matter, the Miami-Dade Board of County Commissioners passed an ordinance to establish the Miami-Dade Climate Change Advisory Task Force (CCATF) to provide technical assistance and advice on mitigation and adaptation with regard to global climate change. The scientists on the CCATF predict a rise in sea level of at least 1.5 feet in the next 50 years as reported in their Second Report and Initial Recommendations approved in March 2008. A 2-foot rise in sea level would result in spring tides at 4.5 to 5 feet higher than present mean sea level.[3] This would cause frequent flooding of barrier islands, fill islands, and low-lying mainland areas as the Port is classified. Areas along the coast are assigned a ranking from low to very high risk, and the Southeastern Coast of Florida is considered at high risk.

Of major concern is Dodge Island whose elevation is approximately 7.5 feet NGVD with a base flood elevation of 10 feet NGVD, while the elevation of Lummus Island is approximately 11.5 feet NGVD. During Hurricane Wilma in 2005, Dodge Island experienced severe flooding and minor damage while Lummus Island did not experience effects to the same degree. Dodge Island may be more susceptible to damage and flooding due to sea level rise and storm surge than Lummus Island. Dodge Island's elevation should be raised to a minimum of 10 feet NGVD, which is the FEMA base flood elevation. The Port must also consider future project modifications that may reduce or eliminate the adverse impacts from sea level rise and evaluate the structural integrity of structures near the ocean that are subject to potential hazards caused by sea level rise.

PERMITS

In the past 30 years, the Port has completed several expansion and improvement projects. All of these projects are examined on a project-by-project basis in reference to mitigation and permitting requirements.

An Ocean Dredged Material Disposal Site is already in place, its capacity may not be sufficient to contain the footprint of dredged material from future projects beyond the already approved – 50 ft. dredge. In keeping with the Port's Sustainability Committee's initiatives to reduce waste during construction, the Port should decant the water at a permitted location and coordinate possible beneficial uses of the remaining material for future projects that require fill, if possible.

SUSTAINABILITY

The Master Plan is underpinned by thoughtful consideration of future sustainable development in environmental, social and economic terms. This process considers the surrounding areas and outlines projects that will help preserve and improve conditions.

ES7.4 TRANSPORTATION

Port traffic is generated from cargo, cruise and other commercial operations within the Port. Determining traffic impacts that may occur to the adjacent roadways based upon the 2035 Master Plan projects shown within the preferred plan, and the anticipated Capital Improvements Projects (CIP) already planned for by the Port, is required to understand the overall impacts these future expansion efforts play for the Port of Miami and downtown core. Additionally, the creation of another access way to and from the Port of Miami via tunnel also provides for a different level of impacts to the surrounding roadway system. The traffic impacts were determined based on the following preferred plan program elements[4]:

- A composite projection of 3,911,204 total passengers in 2009 moving to 5,821,46 in 2035;
- Cargo terminal mid-level summary of twenty-foot equivalent units (TEU) projection of 828,349 TEUs in 2009 to 2,682,545 TEUs in 2035; and,
- Commercial development in the southwest corner of the Port of Miami with a potential of approximately 600,000 square feet (SF) of office and other space, as well as marina.

The Port of Miami Master Plan has an established build-out year of 2035. Future traffic is established as described below. An annual growth rate was determined to forecast traffic volumes from 2009 through to 2035. The intersection volumes are provided in Figure ES7.6.

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[1] Miami-Dade County, FL Comprehensive Emergency Management Plan. June 2008. Miami-Dade County Department of Emergency Management and Homeland Security Plan

[2] *Climate Change and Florida*, September 1997, EPA.

[3] *Second Report and Initial Recommendations*, April 2008, Miami-Dade County Climate Change Advisory Task Force.

[4] 2009 cruise and cargo projection figures provided and used for the transportation study were FY preliminary data. They do not accurately reflect the final projected numbers for 2009 to 2035 for the 2011 Master Plan Update.

FIGURE ES7.6: PROJECTED INTERSECTION VOLUMES, 2035

Source: Miami-Dade Public Works Department, FDOT and David Plummer & Associates

PORT TRAFFIC DISTRIBUTION

Traffic traveling to and from the Port is destined for one of three main areas inclusive of cruise terminal / parking facilities, cargo gates / terminals, or to the various offices / support facilities within the Port. The Port of Miami Tunnel Project is underway and will provide direct access between the Seaport, I-395 and I-95. This will relieve congested downtown Miami streets of Port passenger and cargo traffic, improving safety and circulation. The change in traffic patterns for vehicular access to the Port of Miami via the tunnel was considered for the traffic analysis. The amount of diverted traffic was based on the *POM 2020 Master Implementation Plan*. See Figure ES7.7.

MIAMI-DADE COUNTY FLORIDA

Carlos A. Gimenez
Mayor

BOARD OF COUNTY COMMISSIONERS

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Chairman

Audrey M. Edmonson
Vice Chairwoman

Barbara J. Jordan
District 1

Jean Monestime
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Audrey M. Edmonson
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Sally A. Heyman
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Bruno A. Barreiro
District 5

Rebeca Sosa
District 6

Xavier L. Suarez
District 7

Lynda Bell
District 8

Dennis C. Moss
District 9

Sen. Javier D Souto
District 10

Joe A. Martínez
District 11

José “Pepe” Díaz
District 12

Esteban Bovo, Jr.
District 13

Harvey Ruvin
Clerk of Courts

Pedro J. García
Property Appraiser

Alina T. Hudak
County Manager

Robert A. Cuevas, Jr.
County Attorney

Bill Johnson
Director Seaport Department

PORTMIAMI

2035 MASTER PLAN

EXECUTIVE SUMMARY

NOVEMBER 2011

Bermello Ajamil & Partners, Inc. DAVID PLUMMER & ASSOCIATES • FR ALEMAN & ASSOCIATES, INC. • JOHN MARTIN ASSOCIATES • LABOZAN ASSOCIATES, INC. • TRIANGLE ASSOCIATES, INC. • WESTHORP & ASSOCIATES, INC.

6 PORTMIAMI

Perishables Stats for the February – April Period between 2018 & 2019

The last USDA reports show a dramatic increase in fresh commodities arriving at PortMiami, when comparing the periods of February-April 2019 compared to the same period in 2018. In the 2019 period, total Kilograms of fresh commodities increased by 2.19% in comparison with the 2018 period. Below the detailed results:

- **Flowers**:
  - Comparing February '19 to February '18, we had the following increases:
    - From 90,720 stems in 2018 to 6,377,641 stems in 2019, an increase of 6,930%
    - From 1 shipment in 2018 to 68 shipments in 2019, an increase of 6,700%
  - Comparing March '19 to March '18, we had the following increases:
    - From 107,602 stems in 2018 to 4,418,230 stems in 2019, an increase of 4,006%
    - From 7 shipment in 2018 to 81 shipments in 2019, an increase of 1,057%
  - Comparing April '19 to April '18, we had the following increases:
    - From 2,407,624 stems in 2018 to 23,786,375 stems in 2019, an increase of 888%
    - From 20 shipment in 2018 to 392 shipments in 2019, an increase of 1,860%
  - Comparing the period February-April '19 to the period February-April '18, we had the following increases:
    - From 2,605,946 stems to 34,582,246 in 2019, an increase of 1,227%
    - From 28 shipments in 2018 to 541 shipments in 2019, an increase of 1,832%
- **All Fresh Commodities:**
  - When comparing the all fresh commodities during this period in 2019, to the one in 2018, we come to the following interesting pieces of information:
    - From 123,191,264 KGS for 2018 to 125,887,723 KGS in 2019, an increase of 2.19%
    - From 6,595 shipments in 2018, to 5,615 shipments in 2019, a decrease of 14,86%

Attached USDA's report on the top fresh perishables (Fruit/Vegetables and Flowers) imported via PortMiami during February and April 2019, as well as their country of origin and total quantity imported. Reports indicates the following:

- PortMiami received 35 varieties of cut flowers from 5 different countries totaling 34,582,246 stems.
- In terms of fruits & vegetables, PortMiami received 62 different products from 23 different countries, for a total of 91,074,203 kilograms.

Top Ranked Fresh Perishables
Commodity / Country Combinations
TOTAL IMPORT SUMMARY
Feb 1, 2019 to Apr 30, 2019
Top 10 Imports by Quantity
FL Miami Sea CBP

Location	Commodity Type Name	Propagative Material Type	Commodity/Country	Quantity	Units of Measure	Quantity Ranking	Number of Shipments	Shipment Ranking
FL Miami Sea CBP	Cut Flowers	NA	Rosa / Ecuador	4,744,453	Stems	1	73	11
			Rosa / Colombia	4,595,880	Stems	2	46	12
			Rosa / Guatemala	3,448,317	Stems	3	37	14
			Dianthus / Colombia	3,178,238	Stems	4	39	13
			Chrysanthemum (pom-pon) / Colombia	2,873,220	Stems	5	32	17
			Bouquet, Mixed / Colombia	1,900,177	Stems	6	16	18
			Chamaedorea / Guatemala	1,806,952	Stems	7	7	20
			Chamaedaphne / Guatemala	1,674,615	Stems	8	8	19
			Alstroemeria / Colombia	1,566,037	Stems	9	34	15
			Dianthus (mini) / Colombia	1,528,705	Stems	10	34	15
	Cut Flowers - Summary			**27,316,594**			**326**	
	Fruits Vegetables	NA	Cantaloupe / Guatemala	10,705,656	Kilogram	1	456	2
			Cucumber / Honduras	8,816,062	Kilogram	2	382	3
			Watermelon / Guatemala	5,781,442	Kilogram	3	226	5
			Honeydew Melon / Guatemala	5,317,277	Kilogram	4	227	4
			Green Bean / Guatemala	5,260,746	Kilogram	5	476	1
			Cantaloupe / Honduras	5,071,994	Kilogram	6	211	6
			Honeydew Melon / Honduras	3,735,884	Kilogram	7	156	8
			Plantain / Ecuador	3,451,121	Kilogram	8	143	9
			Avocado / Dominican Republic	3,175,394	Kilogram	9	170	7
			Squash / Honduras	2,651,070	Kilogram	10	126	10
	Fruits Vegetables - Summary			**53,966,646**			**2,573**	
	Lumber	NA	Swietenia Macrophylla, Dowel / Mexico	30	Cubic Meter	1	1	23
	Lumber -			**30**			**1**	

Shipment = The count of the number of commodities on a single BL/AW; the number of times a commodity appears on a BL/AW.

Note: This summary information is sourced from USDA databases and is being provided "as is" based on available data at the time of issuance, with no guarantee of completeness or accuracy.

Top Ranked Fresh Perishables
Commodity / Country Combinations
TOTAL IMPORT SUMMARY

Feb 1, 2019 to Apr 30, 2019

Top 10 Imports by Quantity

FL Miami Sea CBP

Location	Commodity Type Name	Propagative Material Type	Commodity/Country	Quantity	Units of Measure	Quantity Ranking	Number of Shipments	Shipment Ranking
FL Miami Sea CBP	**Summary**							
	Miscellaneous	NA	Rice / Thailand	99,301	Kilogram	1	5	21
			Rice / India	94,855	Kilogram	2	4	22
			Rice / Italy	15,010	Kilogram	3	1	23
			Bamboo / China	8,054	Kilogram	4	1	23
	Miscellaneous - Summary			**217,220**			**11**	
	Propagative Material	Nonpermit Seed	Panicum maximum var. Maximum / Mexico	9,000	Kilogram	1	1	1
			Brachiaria sp. / Mexico	5,024	Kilogram	2	1	1
	Propagative Material - Summary			**14,024**			**2**	
FL Miami Sea CBP - Summary				**81,514,514**			**2,913**	
Rankings Summary				**81,514,514**			**2,913**	

Overall Totals

Location	Commodity Type Name	Propagative Material Type	Commodities	Countries	Quantity	Units of Measure	Number of Shipments
FL Miami Sea CBP	Cut Flowers	NA	35	5	34,582,246	Stems	541
	Fruits Vegetables	NA	62	23	91,074,203	Kilogram	5,060
	Lumber	NA	1	1	30	Cubic Meter	1
	Miscellaneous	NA	2	4	217,220	Kilogram	11
	Propagative Material	Nonpermit Seed	2	1	14,024	Kilogram	2
Overall - Summary	**5**	**2**	**102**	**24**	**125,887,723**		**5,615**

Shipment = The count of the number of commodities on a single BL/AW; the number of times a commodity appears on a BL/AW.

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Shipment Volume Summary for Fresh Commodities Arriving at FL Miami Sea CBP During February, March, April 2018, 2019

Quantity and Shipments of Commodities Inspected by Month and Year (Commodities Sorted by Total Quantity)		April / 2019		April / 2018		March / 2019		March / 2018		February / 2019		February / 2018	
		Quantity	Number of Shipments	Quantity	Number of Shipments	Quantity	Number of Shipments	Quantity	Number of Shipments	Quantity	Number of Shipments	Quantity	Number of Shipments
Commodity - Type	**Unit of Measure**												
Cucumber - FV	Kilogram	56,444	3	161,510	11	2,923,930	131	5,409,767	244	6,269,057	269	6,812,490	305
Banana - FV	Kilogram	191,919	9	3,521,254	183	406,507	20	11,348,462	592	147,862	7	5,232,990	258
Cantaloupe - FV	Kilogram	4,269,017	176	3,635,493	186	7,251,709	310	307,650	14	4,256,924	181	272,180	12
Watermelon - FV	Kilogram	171,834	7	1,494,437	96	3,274,212	155	2,418,898	120	4,303,649	167	7,179,927	282
Rosa - CF	Stems	8,563,993	107	1,791,596	16	1,737,529	22	35,050	1	3,477,128	28	90,720	1
Plantain - FV	Kilogram	1,707,041	72	3,148,368	148	2,246,001	102	3,316,575	154	1,908,552	81	3,135,625	158
Honeydew Melon - FV	Kilogram	3,758,797	141	2,855,269	149	3,369,439	151	1,495,649	73	1,924,925	91	1,926,247	94
Mango - FV	Kilogram	869,541	38	5,964,650	259	535,707	21	1,452,544	63	1,901,800	76	4,134,118	174
Green Bean - FV	Kilogram	1,684,634	170	1,560,480	126	1,872,746	170	2,007,697	167	1,791,857	146	1,114,546	105
Squash - FV	Kilogram	310,658	19	1,338,210	82	1,328,629	71	1,716,980	95	1,190,286	61	812,217	53
Dasheen - FV	Kilogram	1,028,390	38	958,876	45	874,246	36	988,759	41	948,578	40	1,358,947	67
Avocado - FV	Kilogram	1,068,033	57	539,628	29	1,131,494	62	629,413	35	1,124,116	58	1,015,439	63
Snow Pea - FV	Kilogram	539,242	69	873,055	76	1,100,517	130	1,149,269	114	991,118	86	696,942	81
Pineapple - FV	Kilogram			1,455,151	64	21,164	1	1,745,659	84	21,885	1	1,668,328	73
Melon - FV	Kilogram	620,417	24	1,665,449	82	756,908	56	446,498	22	412,606	18	881,311	40
Pepper, Bell - FV	Kilogram	413,797	42	473,267	39	650,350	58	880,544	75	688,697	63	305,808	31
Garlic - FV	Kilogram	356,011	15	188,802	13	870,493	36	489,647	30	926,103	37	562,792	33
Okra - FV	Kilogram	540,774	30	622,741	36	711,371	53	536,618	31	470,473	26	348,157	24
Bouquet, Mixed - CF	Stems	2,148,393	56	615,828	3	34,512	1			418,425	4		
Dianthus - CF	Stems	2,549,129	33			488,720	10			173,489	3		
Asparagus - FV	Kilogram	1,547,389	101	1,281,894	103	125,821	8	83,022	8	62,539	3	62,159	4
Chamaedorea - CF	Stems	1,394,250	3			273,639	4			1,432,505	3		
Papaya - FV	Kilogram	621,134	43	290,916	17	805,574	73	340,408	19	730,265	42	254,850	14
Chrysanthemum (pom-pon) - CF	Stems	2,469,746	23			379,566	6	72,552	6	23,908	3		
Cassava - FV	Kilogram	209,352	11	891,317	43	127,745	7	679,986	32	124,534	8	785,253	41
Yam - FV	Kilogram	1,064,898	47	211,855	11	374,023	17	343,842	16	254,233	11	522,857	25
Pea - FV	Kilogram	242,490	23	853,769	81	398,375	36	271,817	28	695,599	56	122,155	10
Ginger, Root - FV	Kilogram	237,589	10	212,072	9	194,077	9	496,441	25	196,706	8	614,528	31
Pepper - FV	Kilogram	377,154	38	355,190	25	259,343	24	504,443	43	219,983	18	229,374	29
Onion - FV	Kilogram	20,520	2	135,865	6			801,167	39	295,689	11	478,454	20
Chamaedaphne - CF	Stems	1,466,115	7			208,500	1						
Alstroemeria - CF	Stems	917,903	21			641,429	11			9,248	3		
Dianthus (mini) - CF	Stems	1,262,501	24			187,314	7			78,890	3		
Carrot - FV	Kilogram	163,678	35	282,624	34	288,746	62	315,882	40	198,017	36	175,532	34
Pumpkin - FV	Kilogram	20,554	1	329,877	16	74,096	4	477,000	26	110,185	7	355,015	20
Chrysanthemum - CF	Stems	1,195,666	17			46,924	3			30,816	1		
Lime, Sour - FV	Kilogram	265,184	19	88,768	4	225,414	10	230,530	10	163,876	7	73,039	3
Tomato - FV	Kilogram	99,709	10	134,242	9	294,002	35	168,748	11	168,558	13	132,349	13
Chayote - FV	Kilogram			266,584	15	21,164	1	354,050	16	60,269	3	261,411	15
Blueberry - FV	Kilogram					77,114	5	68,788	4	612,349	47	183,304	10
Zucchini - FV	Kilogram	3,783	6	14,544	3	179,753	16	28,164	6	138,516	14	174,437	12
Bouquet, Rose - CF	Stems	323,169	12			18,320	1			150,960	2		
Coconut - FV	Kilogram	30,587	3	18,000	1	133,120	8	25,000	1	191,543	10	63,499	3
Shallot - FV	Kilogram	108,243	5	21,792	1	50,424	2	26,786	1	46,304	2	122,446	10
Bouquet, Pompon - CF	Stems	282,324	2			18,000	2			58,344	2		
Salix - CF	Stems									340,000	1		
Broccoli - FV	Kilogram	78,997	9	34,452	2	163,847	20	597	1	43,835	7	853	2
Hypericum - CF	Stems	307,260	13										
Bellis - CF	Stems	278,640	2										
Tomato, Red Or Pink - FV	Kilogram	62,957	10	113,252	11	23,160	3	5,987	2	30,839	4	23,346	2
Pitahaya - FV	Kilogram	32,999	2	15,436	2	86,399	5	46,225	4	64,062	4	9,720	1
Garlic Cloves, Peeled - FV	Kilogram	24,400	1	21,656	1	13,355	1			69,609	3	100,952	4
Eggplant - FV	Kilogram			42,655	4	59,035	5	32,146	4	60,895	5	27,571	3
Rice - MC	Kilogram	38,546	2			99,301	5			71,319	3		
Liatris - CF	Stems	7,560	1			200,176	1						
Asparagus, White - FV	Kilogram	26,485	2	33,600	2	17,637	1	13,252	2	67,277	5	41,780	3
Brussels Sprouts - FV	Kilogram			16,914	1	7,922	2	39,934	4	62,698	7	60,427	19

Note: This summary information is sourced from USDA databases and is being provided "as is", based on available data at the time of issuance, with no guarantee of completeness or accuracy.

Shipment Volume Summary for Fresh Commodities Arriving at FL Miami Sea CBP During February, March, April 2018, 2019

Quantity and Shipments of Commodities Inspected by Month and Year (Commodities Sorted by Total Quantity)		April / 2019		April / 2018		March / 2019		March / 2018		February / 2019		February / 2018	
		Quantity	Number of Shipments	Quantity	Number of Shipments	Quantity	Number of Shipments	Quantity	Number of Shipments	Quantity	Number of Shipments	Quantity	Number of Shipments
Gypsophila - CF	Stems	167,948	21			7,200	2			5,680	1		
Lemon - FV	Kilogram	31,225	1			23,855	1			100,669	4	24,080	1
Hydrangea - CF	Stems	47,104	8			34,646	3			47,698	3		
Tangelo - FV	Kilogram					20,160	1			101,910	5		
Chamelaucium - CF	Stems	115,620	1										
Ruscus - CF	Stems	37,800	2							75,150	3		
Grape - FV	Kilogram									111,605	7		
Pepper, Greenhouse - FV	Kilogram	17,218	3	24,000	2			53,840	4			13,343	1
Ranunculus - CF	Stems	98,688	1										
Tomato, Green - FV	Kilogram	13,768	1	3,280	1			42,428	4	32,495	4	4,832	1
Persian Lime - FV	Kilogram	43,793	2			52,469	2						
Corn - FV	Kilogram	4,752	8	3,373	9	73,026	14	212	2	1,194	3	1,691	2
Bouquet, Carnation (mini) - CF	Stems	6,400	1			65,255	2			3,520	1		
Bitter Melon - FV	Kilogram					8,022	1	6,573	1	37,414	2	11,865	2
Lilium - CF	Stems	37,850	4			10,900	3			14,398	3		
Sour Orange - FV	Kilogram	14,120	1	3,902	1			440	1	15,532	1	25,325	2
Dragon Fruit - FV	Kilogram	27,356	2	9,000	1			8,700	1			13,710	1
Aspidistra - CF	Stems	55,416	4										
Breadfruit - FV	Kilogram	26,758	2	25,698	3			997	1			1,650	1
Pepper, Chili - FV	Kilogram	11,000	1	9,516	1	16,161	2			15,792	3		
Gerbera - CF	Stems					51,410	1						
Mandarin - FV	Kilogram			21,840	1	23,861	1						
Tamarind - FV	Kilogram					45,263	2						
Radicchio - FV	Kilogram	13,599	6			19,204	10			3,086	1	6,715	3
Turmeric - FV	Kilogram	8,787	2	4,843	1	16,638	1	11,484	1				
Blackberry - FV	Kilogram	526	1	19,168	2	1,051	1	3,210	1				
Butternut - FV	Kilogram							23,600	1				
Yampi - FV	Kilogram											21,000	1
Abutilon - CF	Stems									20,000	1		
Coffee, Unroasted - MC	Kilogram							19,181	1				
Eryngium - CF	Stems	18,330	2										
Pitahaya, Yellow - FV	Kilogram	17,035	1										
Aralia - CF	Stems	16,500	1	200	1								
Cauliflower - FV	Kilogram	3,174	2			10,551	8			2,471	2		
Protea - CF	Stems					14,190	1						
Senecio - CF	Stems	13,954	18										
Rumohra - CF	Stems									10,722	1		
Panicum maximum var. Maximum - PM	Kilogram					9,000	1						
Bamboo - MC	Kilogram					8,054	1						
Chicory - FV	Kilogram	2,878	2			2,365	1			680	2	1,508	3
Lettuce - FV	Kilogram			2,369	1			4,486	2				
Leek - FV	Kilogram									5,652	2		
Brachiaria sp. - PM	Kilogram					5,024	1						
Bouquet, Carnation - CF	Stems									3,520	1		
Bouquet, Alstroemeria - CF	Stems									3,240	1		
Limonium - CF	Stems	2,820	6										
Pepper, Other - FV	Kilogram			2,092	1								
Canna sp. - PM	Plant Unit											1,766	1
Radish - FV	Kilogram							1,018	1				
Helianthus - CF	Stems	960	1										
Cacao Bean Pod - FV	Kilogram							450	1				
Aster - CF	Stems	336	1										
Swietenia Macrophylla, Dowel - LU	Cubic Meter	30	1										
Port Totals		**46,885,591**	**1,718**	**38,660,619**	**2,069**	**38,177,804**	**2,051**	**41,979,065**	**2,325**	**40,824,328**	**1,846**	**42,551,580**	**2,201**

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		2018-2017 TEU GAIN	2017-2018 TEU PERCENT GAIN
1	Peru	12,533	300%
2	Ecuador	7,078	88%
3	Indonesia	6,558	86%
4	India	5,716	48%
5	Italy	4,537	26%
6	El Salvador	4,422	20%
7	Trinidad And Tobago	4,324	49%
8	Guatemala	4,010	12%
9	Dominican Republic	3,679	9%
10	Spain	3,170	24%
11	Jamaica	2,808	14%
12	Malaysia	2,765	67%
13	Vietnam	2,698	18%
14	Haiti	2,594	20%
15	Honduras	2,270	4%
16	Nicaragua	1,900	11%
17	France	1,769	17%
18	Taiwan, Roc	1,336	14%
19	Singapore	1,323	33%
20	Netherlands Antilles	1,114	44%
21	Georgia	767	64%
22	Egypt	722	105%
23	Leeward And Windward	682	22%
24	Canada	666	NA
25	United Arab Emirates	643	22%

2017 Local and Regional Economic Impacts of Port*Miami*: Executive Summary

Conducted by Martin Associates
www.martinassoc.net

May 22,2018

Overview of Port*Miami*

Handling approximately 9.2 million tons of cargo and more than 5.2 million cruise passengers, Port*Miami* is a leading cargo and cruise port located in Miami, Florida. Port*Miami* operates as a landlord port and maintains lease agreements with its cargo terminal operators including Seaboard Marine, POMTOC, and South Florida Container Terminal. Of the 9.2 million cargo tons, 9.1 million of these tons are containerized cargo while the remaining tonnage is a combination of project cargo and break bulk cargo. Additionally, Port*Miami* serves as global headquarters for Carnival Cruise Lines, Norwegian Cruise Lines, Royal Caribbean Cruises, Oceania Cruises and Regent Seven Seas Cruises. In 2017, 1,185 cruises called Port*Miami*'s seven cruise terminals, carrying 5.2 million passengers to and from popular cruising destinations such as the Bahamas, Caribbean, and Mexico.

Port*Miami* recently completed a series of capital improvements totaling around $1 billion. These improvements included completion of projects such as a new tunnel that provides direct access between the terminals and I-395 and I-95, modernization of on dock rail, and new cranes that can handle the larger Post-Panamax ships, which can now sail into the Port because of the recently completed 50-foot dredging alongside the main terminal.

Economic Impact Analysis Methodology

Martin Associates used the 2016 Port*Miami* economic impact model with calendar year 2017 cargo and cruise passenger data to estimate the 2017 local and regional economic impacts generated by maritime activity at the marine cargo and cruise terminals at Port*Miami* for the calendar year. The 2016 study which was used to develop the 2016 baseline cruise and cargo model employs methodology and definitions that have been used by Martin Associates to measure the economic impacts of seaport activity at more than 500 ports in the United States and Canada, as well as at the leading airports in the United States. It is to be emphasized that only measurable impacts are included in this study. To ensure defensibility, the Martin Associates' approach to economic impact analysis is based on data developed through an extensive interview and telephone survey program of the Port's tenants and the firms providing cargo and cruise services at Port*Miami*. In addition, a survey of 1,300 cruise passengers and 300 cruise vessel crew was conducted to develop passenger spending profiles pre-and post-cruise as well as the spending characteristics of the vessel crew during each port call at Miami. Specific re-spending models have been developed for the Miami-Dade County area to reflect the unique economic and consumer profiles of the regional economy. The resulting impacts reflect the uniqueness of the individual Port operations, as well as the surrounding regional economy, and are based on detailed surveys of the Port's service providers to both cargo and cruise activity. The resulting economic models can be used to estimate annual updates, as well as to test the sensitivity of the impacts to changes in such factors as marine cargo tonnage or cruise passenger levels, labor productivity and work rules, and new marine facilities development and expansion.

2017 Economic Impact of Port*Miami* - Summary of Results

More than **334,500** jobs supported by Port activity

- Direct Jobs: 22,414
- Induced Jobs: 14,478
- Indirect Jobs: 9,297
- Related Jobs: 288,342

$43.0 billion of total economic activity - 4.4% of State GDP

- $6.2 billion of direct business revenue
- $1.7 billion of re-spending of direct income and local consumption purchases
- $35.1 billion of output supported with related port users

$1.6 billion of state and local taxes

- $299.2 million of direct, induced and indirect state and lcoal taxes
- $1.3 billion of state and local taxes with related exporters and importers supported by port activity

2016 Port*Miami* Economic Impact Results

In 2017, cargo and cruise activity at Port*Miami* supported 334,532 jobs in the state of Florida. Of these jobs, **22,414 jobs directly created**, of which about three-quarters reside in Miami-Dade County. As a result of local and regional purchases by those 22,414 individuals holding the direct jobs, **14,478 induced jobs** were supported in the regional economy. The **9,297 indirect jobs** were generated in the local economy because of the $627.5 million of local purchases made by companies directly dependent on the Port. The cargo moving via Port*Miami* **supported 288,342 jobs** throughout the state of Florida with importers and exporters located in the state. These jobs are classified as related*,* and are created because of the demand for the product, not the use of the Port. Should Port*Miami* not be available for use by these importers and exporters, other ports would be used and the related jobs would not be impacted in the short term. In contrast the direct, induced and indirect jobs would be dislocated should the cargo not move via Port*Miami*.

The **total economic activity in the state of Florida** resulting from the cargo and cruise cargo activity at PortMiami, is estimated at **$43.0 billion.** This consists of the direct business revenue of $6.2 billion, the re-spending and local consumption impact of $1.7 billion, and the related user output of $35.1 billion. The majority of these user impacts are associated with containerized cargo. This dollar value represents the sphere of influence of Port*Miami* in 2017 and accounts for 4.4 percent of the $984.1 billion Gross Domestic Product (GDP) for the state of Florida. (Fourth Quarter 2017)

The 22,414 direct jobs received $916.1 million of direct wage and salary income, for an average earnings of $40,873 per direct employee. As the result of local purchases with this $916.1 million of direct wages and salaries, an additional $1.7 billion of income and local consumption expenditures were created in the Miami-Dade County area. It is this re-spending impact that supported the 14,478 induced jobs[1]. The indirect jobs holders received $329.8 million. In total, $13.0 billion of personal income was created as the result of Port*Miami* operations, including the $10.1 billion of wages and salaries received by those employed with the users of the Port.

As a result of the cargo and cruise activity at Port*Miami*, a total of $1.6 billion of state and local tax revenue was supported in the State, of which $1.3 billion is attributed to the related users of the Port.

[1] The induced income impact also includes local consumption expenditures as well as induced wages, and should not be divided by induced jobs to estimate the average salary per induced job. This would overstate the average salary.

2016 PortMiami Economic Impact Results – Port*Miami* Cargo and Cruise Activity Comparison

Port*Miami* Cargo Activity

- **304,443 total jobs**
  - *Direct*: 7,585
  - *Induced*: 5,647
  - *Indirect*: 2,869
  - *Related*: 288,342
- **$298.3 million** in local purchases
- **$37.2 billion** Total Economic Value
- **$1.4 billion** of state and local taxes

Port*Miami* Cruise Activity

- **30,008 total jobs**
  - *Direct:* 14,829
  - *Induced:* 8,831
  - *Indirect* 6,428
  - *Related:* N/A
- **$329.2 million** in local purchases
- **$5.8 billion** Total Economic Value
- **$188.9 million** of state and local taxes

Growth of Economic Impacts at Port*Miami*: 2012-2016

126,728 new jobs supported by cargo and cruise activity

- 2,701 direct jobs
- 605 induced jobs
- 2,836 indirect jobs
- 120,586 related jobs

$14.4 billion increase in total economic activity in Florida

- $1.7 billion direct revenue
- $148.5 million re-spending of income/local consumption
- $12.6 billion related output increase

2012 vs. 2017
Impact Cargo and Cruise Comparison

Since the 2012 Martin Associates' economic impact study of Port*Miami*, the overall economic impact of the Port has increased significantly. The total jobs related to the cargo and cruise activity at Port*Miami* increased by approximately 126,728 jobs and the total value of the economic activity at the Port increased by $14.4 billion, from $28.6 billion in 2012 to $43.0 billion in 2016. This growth in economic impact is driven by the 19 percent increase since 2012 of nearly 100,000 containers handled at the Port in 2017, which reflects the investment in channel deepening to 50 ft., the completion of the new tunnel that provides direct access between the marine terminals and I-395 and I-95, modernization of on dock rail, and new cranes that can handle the larger Post-Panamax ships. In addition, passenger traffic grew by 1.4 million passengers since 2012.

Summary

Overall, Port*Miami* is an important economic force in the community, contributing $43.0 billion of total economic activity and supporting 334,532 jobs in the state of Florida. The $43.0 billion dollar value of economic activity of the Port represents 4.4 percent of the $984.1 billion state of Florida GDP in 2017 (4th Quarter). The importance of the $1 billion of investment in channel deepening to 50 ft., the completion of the new tunnel that provides direct access between the marine terminals and I-395 and I-95, modernization of on dock rail, and new cranes that can handle the larger Post-Panamax ships is reflected by the fact that over the past four years, the Port has increased its containerized cargo by nearly 100,000 containers and has grown its cruise passengers by 1.4 million passengers. In turn, this growth in cargo and cruise business at the Port has increased the economic importance of Port*Miami* to the south Florida region and to the State. In order to continue to grow the economic significance of the Port, continued investment in cargo and cruise terminal infrastructure will be required, ensuring that Port*Miami* continues as a world class cargo and cruise port, capable of handling the next generation of container and cruise vessels.

PORTMIAMI

MIAMI-DADE COUNTY

PORTMIAMI INDUSTRY MEETING
AUGUST 30, 2019

Name – [please print]	Organization	Email Address	Phone
KEN ROBERTS	WORLD CITY	Kroberts@worldcityweb.com	3/441-2244
Tiffany Martinez	STR | FDTC	tmartinez@strtrade.com	3/894-1015
Alex Napoles Jr	AL-FLEX	ANapolesJr@al-flex.com	305 345-9907
JOSHUA RAK	B&A	j.rak@bermello ajamil.com	305 484 3766
JOSE A. RAMOS	MDAD	JRAMOS@MIAMI-AIRPORT.com	305-876-8080
ERNIE RODRIGUEZ	MDAD	ERODRIGUEZ@MIAMI-AIRPORT.com	305-876-7705
Kevin Torres	CBP	kevin.torres@cbp.dhs.gov	(305) 808 9726
Ramón A. Dones	USDA	ramon.a.dones@usda.gov	(305) 423-1545
George Casey	TREC	georgewileycasey@gmail.com	954-592-1776
Jamil El-Srouji	TREC	SouthFl.Commercial@gmail.	(561) 542-4468

PORTMIAMI INDUSTRY MEETING
AUGUST 30, 2019

Name – [please print]	Organization	Email Address	Phone
Joe Pelayo. CCIM SIOR	TREC	TREC@JoePelayo.com	954. 341 3294 954.224 8773
Michael Silver	CBRE	Michael.Silver@cbre.com	305 527 3612
John Dohm	FlaTransatlantic	john@jdohm.com	(954)557-3646
Eshet Modi	CMA CGM	usa.emodi@cma-cgm.com	(305)398 4979
Eric Hasselmann	Seaboard	eric.hasselmann@seaboardmarine.com	305 608 9554
Bob Balaam	USDA APHIS PPQ	robert.J.balaam@usda.gov	305 453-5245
Doralyn Braithwaite	Seaport/PortMiami	dbraitt@miamidade.Gov	(305)577-6429
Carlos Cortina	Seaport	cortina@miamidade.gov	3/960 5704
Henry Ros	Seaport	eros@miamidade.gov	3/329-4030
Ronald Rojas	SEAPORT	ronr@miamidade.gov	3/347-4971

PORTMIAMI

MIAMI-DADE COUNTY

PORTMIAMI INDUSTRY MEETING
AUGUST 30, 2019

Name – [please print]	Organization	Email Address	Phone
Sebastian Tavar	Port Miami	sjavar@miamidade.gov	
Craig Rosenbaum	CBP - FIELD OFFICE	CRAIG.ROSENBAUM@CBP.DHS.GOV	305-810-5114
Carlos Gaviria	Transwestern	Carlos.gaviria@transwestern.com	305-808-7313
Alexander E. Napoles	Al-Flex Exterminators	ALFlex@bellsouth.net	305-552-0141
Lee Sandler	STR / FPTC	lsandler@strade.com	305-894-1000
Tiffany N. Comprés	Shutts + Bowen	tcompres@shutts.com	305·415·9415
Eric Borrazas	Synthesis	borrazas@bellsouth.net	3052974827
Raul Echevarrìa	TDR Fumigation	raul@termitedoctor.org	305-986-9454

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WORKSPACE FORM

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This Workspace form is one of the forms you need to complete prior to submitting your Application Package. This form can be completed in its entirety offline using Adobe Reader. You can save your form by clicking the "Save" button and see any errors by clicking the “Check For Errors” button. In-progress and completed forms can be uploaded at any time to Grants.gov using the Workspace feature.

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OPPORTUNITY & PACKAGE DETAILS:

Opportunity Number:	693JF7-19-BAA-0002
Opportunity Title:	Port Infrastructure Development Grants
Opportunity Package ID:	PKG00253007
CFDA Number:	
CFDA Description:	
Competition ID:	
Competition Title:	
Opening Date:	06/12/2019
Closing Date:	09/16/2019
Agency:	Maritime Administration
Contact Information:	Judy Bowers Contracting Officer E-mail: judy.bowers@dot.gov Phone: 202-366-1913

APPLICANT & WORKSPACE DETAILS:

Workspace ID:	WS00363191
Application Filing Name:	PortMiami Infrastructure Project
DUNS:	1319102540000
Organization:	MIAMI-DADE, COUNTY OF
Form Name:	Application for Federal Assistance (SF-424)
Form Version:	2.1
Requirement:	Mandatory
Download Date/Time:	Sep 10, 2019 04:07:26 PM EDT
Form State:	No Errors

FORM ACTIONS:

OMB Number: 4040-0004
Expiration Date: 12/31/2019

Application for Federal Assistance SF-424

* 1. Type of Submission:
☐ Preapplication
☒ Application
☐ Changed/Corrected Application

* 2. Type of Application:
☒ New
☐ Continuation
☐ Revision

* If Revision, select appropriate letter(s):

* Other (Specify):

* 3. Date Received: Completed by Grants.gov upon submission.

4. Applicant Identifier:

5a. Federal Entity Identifier:

5b. Federal Award Identifier:

State Use Only:

6. Date Received by State:

7. State Application Identifier:

8. APPLICANT INFORMATION:

* a. Legal Name: Miami-Dade County

* b. Employer/Taxpayer Identification Number (EIN/TIN): 59-6000573

* c. Organizational DUNS: 1319102540000

d. Address:

* Street1: Stephen P. Clark Center
Street2: 111 NW 1st Street, 22nd Floor
* City: Miami
County/Parish: Miami-Dade
* State: FL: Florida
Province:
* Country: USA: UNITED STATES
* Zip / Postal Code: 33128-1994

e. Organizational Unit:

Department Name: OMB Grants Division

Division Name: for Seaport Department

f. Name and contact information of person to be contacted on matters involving this application:

Prefix: Mr.
* First Name: Daniel
Middle Name: T.
* Last Name: Wall
Suffix:

Title: Assistant Director

Organizational Affiliation: County Government

* Telephone Number: 305 375-4742

Fax Number: 305 375-4049

* Email: Daniel.Wall@miamidade.gov

Application for Federal Assistance SF-424

*** 9. Type of Applicant 1: Select Applicant Type:**

B: County Government

Type of Applicant 2: Select Applicant Type:

Type of Applicant 3: Select Applicant Type:

* Other (specify):

*** 10. Name of Federal Agency:**

Maritime Administration

11. Catalog of Federal Domestic Assistance Number:

CFDA Title:

*** 12. Funding Opportunity Number:**

693JF7-19-BAA-0002

* Title:

Port Infrastructure Development Grants

13. Competition Identification Number:

Title:

14. Areas Affected by Project (Cities, Counties, States, etc.):

Add Attachment | Delete Attachment | View Attachment

*** 15. Descriptive Title of Applicant's Project:**

PortMiami Cargo Yard Resiliency Improvements and Fumigation and Cold Chain Processing Center Project

Attach supporting documents as specified in agency instructions.

Add Attachments | Delete Attachments | View Attachments

Application for Federal Assistance SF-424

16. Congressional Districts Of:

* a. Applicant FL-024

* b. Program/Project FL-024

Attach an additional list of Program/Project Congressional Districts if needed.

Add Attachment Delete Attachment View Attachment

17. Proposed Project:

* a. Start Date: 01/01/2020

* b. End Date: 05/31/2024

18. Estimated Funding ($):

* a. Federal	43,928,393.00
* b. Applicant	21,129,836.00
* c. State	200,000.00
* d. Local	13,500,000.00
* e. Other	0.00
* f. Program Income	0.00
* g. TOTAL	78,758,229.00

*** 19. Is Application Subject to Review By State Under Executive Order 12372 Process?**

☐ a. This application was made available to the State under the Executive Order 12372 Process for review on .

☒ b. Program is subject to E.O. 12372 but has not been selected by the State for review.

☐ c. Program is not covered by E.O. 12372.

*** 20. Is the Applicant Delinquent On Any Federal Debt? (If "Yes," provide explanation in attachment.)**

☐ Yes ☒ No

If "Yes", provide explanation and attach

Add Attachment Delete Attachment View Attachment

21. *By signing this application, I certify (1) to the statements contained in the list of certifications and (2) that the statements herein are true, complete and accurate to the best of my knowledge. I also provide the required assurances** and agree to comply with any resulting terms if I accept an award. I am aware that any false, fictitious, or fraudulent statements or claims may subject me to criminal, civil, or administrative penalties. (U.S. Code, Title 218, Section 1001)**

☒ ** I AGREE

** The list of certifications and assurances, or an internet site where you may obtain this list, is contained in the announcement or agency specific instructions.

Authorized Representative:

Prefix: Mr.

* First Name: Carlos

Middle Name: A.

* Last Name: Gimenez

Suffix:

* Title: Mayor

* Telephone Number: 305 375-5071

Fax Number: 305 375-1262

* Email: Carlos.Gimenez@miamidade.gov

* Signature of Authorized Representative: Completed by Grants.gov upon submission.

* Date Signed: Completed by Grants.gov upon submission.

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Competition ID:	
Competition Title:	
Opening Date:	06/12/2019
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Agency:	Maritime Administration
Contact Information:	Judy Bowers Contracting Officer E-mail: judy.bowers@dot.gov Phone: 202-366-1913

APPLICANT & WORKSPACE DETAILS:

Workspace ID:	WS00363191
Application Filing Name:	PortMiami Infrastructure Project
DUNS:	1319102540000
Organization:	MIAMI-DADE, COUNTY OF
Form Name:	Attachments
Form Version:	1.2
Requirement:	Mandatory
Download Date/Time:	Sep 10, 2019 04:07:53 PM EDT
Form State:	No Errors

FORM ACTIONS:

ATTACHMENTS FORM

Instructions: On this form, you will attach the various files that make up your grant application. Please consult with the appropriate Agency Guidelines for more information about each needed file. Please remember that any files you attach must be in the document format and named as specified in the Guidelines.

Important: Please attach your files in the proper sequence. See the appropriate Agency Guidelines for details.

1) Please attach Attachment 1	Attachment 1_Project Narrati	Add Attachment	Delete Attachment	View Attachment
2) Please attach Attachment 2	Attachment 2_BCA and BCA App	Add Attachment	Delete Attachment	View Attachment
3) Please attach Attachment 3	Attachment 3_Commitment Lett	Add Attachment	Delete Attachment	View Attachment
4) Please attach Attachment 4	Attachment 4_Tenant Support	Add Attachment	Delete Attachment	View Attachment
5) Please attach Attachment 5	Attachment 5_Stakeholder Sup	Add Attachment	Delete Attachment	View Attachment
6) Please attach Attachment 6	Attachment 6_AQI Summary & T	Add Attachment	Delete Attachment	View Attachment
7) Please attach Attachment 7	Attachment 7_Project Schedul	Add Attachment	Delete Attachment	View Attachment
8) Please attach Attachment 8	Attachment 8_PortMiami 2035	Add Attachment	Delete Attachment	View Attachment
9) Please attach Attachment 9	Attachment 9_Perishables Sta	Add Attachment	Delete Attachment	View Attachment
10) Please attach Attachment 10	Attachment 10_2017 Economic	Add Attachment	Delete Attachment	View Attachment
11) Please attach Attachment 11	Attachment 11_Sign In Sheet.	Add Attachment	Delete Attachment	View Attachment
12) Please attach Attachment 12		Add Attachment	Delete Attachment	View Attachment
13) Please attach Attachment 13		Add Attachment	Delete Attachment	View Attachment
14) Please attach Attachment 14		Add Attachment	Delete Attachment	View Attachment
15) Please attach Attachment 15		Add Attachment	Delete Attachment	View Attachment

APPENDIX R

Fumigation Facility Project Book - MDAD - by Ricondo

APPENDIX R

July 25, 2019 | Final

Miami International Airport

Fumigation Facility Project Book

Prepared for:

Miami-Dade Aviation Department

Prepared by:

RICONDO

In association with:

M.C. Harry and Associates, Inc.
Nova Consulting

Ricondo & Associates, Inc. (Ricondo) prepared this document for the stated purposes as expressly set forth herein and for the sole use of Miami-Dade Aviation Department and its intended recipients. The techniques and methodologies used in preparing this document are consistent with industry practices at the time of preparation and this Report should be read in its entirety for an understanding of the analysis, assumptions, and opinions presented. Ricondo & Associates, Inc. is not registered as a municipal advisor under Section 15B of the Securities Exchange Act of 1934 and does not provide financial advisory services within the meaning of such act.

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LIST OF APPENDICES

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LIST OF EXHIBITS

1. EXECUTIVE SUMMARY

Miami-Dade Aviation Department (MDAD) completed the initial planning stage(s) of the cargo facilities modernization program at Miami International Airport (MIA or the Airport). The program determined that the areas currently occupied by fumigation facilities will be necessary for cargo development and concluded all fumigation facilities within Airport property will be displaced from their current locations. Therefore, Miami-Dade Aviation Department engaged the Consultant Team to prepare this Project Book for a consolidated fumigation facility with the following objectives:

- Define current fumigation needs at MIA based on existing operators.
- Develop concepts for relocation and consolidation within the selected site.
- Provide general guidance to architectural and/or engineering consultants to facilitate and proceed with the design effort of these facilities.

As part of the preparation of this Project Book, the Consultant Team undertook an extensive data-collection effort and conducted an inventory of existing conditions of the fumigation facilities at the Airport. The Consultant Team conducted on-site visits and performed a benchmark analysis to understand the current operations and to identify key operational needs and deficiencies to meet existing and future service demand.

Following the completion of the inventory, the Consultant Team completed the future facility requirements analysis, which identified the need for one fumigation facility to accommodate 2025 demand, with expansion capability to accommodate the 2035 demand.

2. PROJECT OVERVIEW

2.1 STUDY BACKGROUND

The Miami International Airport (MIA or the Airport) Strategic Airport Master Plan 2015–2050 Study identified airfield, terminal, landside, and other Airport support facilities needed to accommodate 30 million annual enplaned passengers, 565,000 total aircraft operations, and 4.2 million tons of cargo over a planning horizon ending in fiscal year (FY) 2035.

The cargo facilities modernization program for MIA identified the need to relocate the existing fumigation operators from their current locations. However, the relocation of these operators requires significant study and programming, beyond what is typically conducted as part of a master planning study. Therefore, Miami-Dade Aviation Department (MDAD) engaged the Consultant Team to undertake an advanced planning study for a new fumigation facility to consolidate the current operators into one location. This advanced planning study utilizes existing and future fumigation demand levels.

Additionally, MDAD identified this future fumigation facility as a building that will boost the attractiveness of MIA as a cargo hub. MIA receives perishable freight cargo by air and by sea as part of the Ocean-to-Air Perishables Transshipment Program. Through this program, cargo shippers save time and money with expedited air transport of perishable products arriving by sea to international markets via MIA.

Perishables degrade over a given period, or if exposed to extreme temperatures, humidity, or other environmental stressors. Thus, it is critical to handle (including processes, such as fumigation), store, and refrigerate these commodities properly through the entire logistics and value chain, from harvest to retail shelf. To minimize product deterioration and value loss, perishables must be delivered to the consumer as quickly as possible with the highest quality possible.

2.2 OVERVIEW OF A FUMIGATION FACILITY

Fumigation is a method of pest control that diffuses gaseous pesticides in a sealed space to eliminate the pests that could live within.

Type of Fumigation Facilities

The two types of fumigation facilities discussed in this study are the following:

- **Outdoor:** open-air facilities that provide tarp or tarpless fumigation of entire tractor-trailers/containers and require a 200-foot buffer around the fumigation area
- **Enclosed:** indoor facilities, including fumigation chambers, that allow fumigation of palletized commodities or entire tractor-trailers/containers without the 200-foot buffer, provided the chambers are equipped with a gas recovery function

Fumigation Process

International cargo, both perishable and nonperishable goods, arriving in Miami by air or by sea and requiring fumigation to eliminate possible domestic infestation of exotic organisms will first clear U.S. Customs and Border Protection (CBP) before proceeding to a U.S. Department of Agriculture (USDA) sanctioned fumigation facility. Commodities are typically transported from the port of entry to the fumigation facility via tractor-trailer or via shipping container on a flatbed truck. Once the commodities are introduced into the sealed space, the fumigants are released into the space. The gas is then held within the sealed area, for a set period, until the pest is eliminated. USDA monitor each fumigation to ensure that effective fumigant concentration levels are maintained throughout the treatment. Once USDA confirms the commodities have been cleared, the space is aerated until the gas concentration levels are validated by USDA and the space is safe to enter.

Commodities Fumigated at Miami International Airport

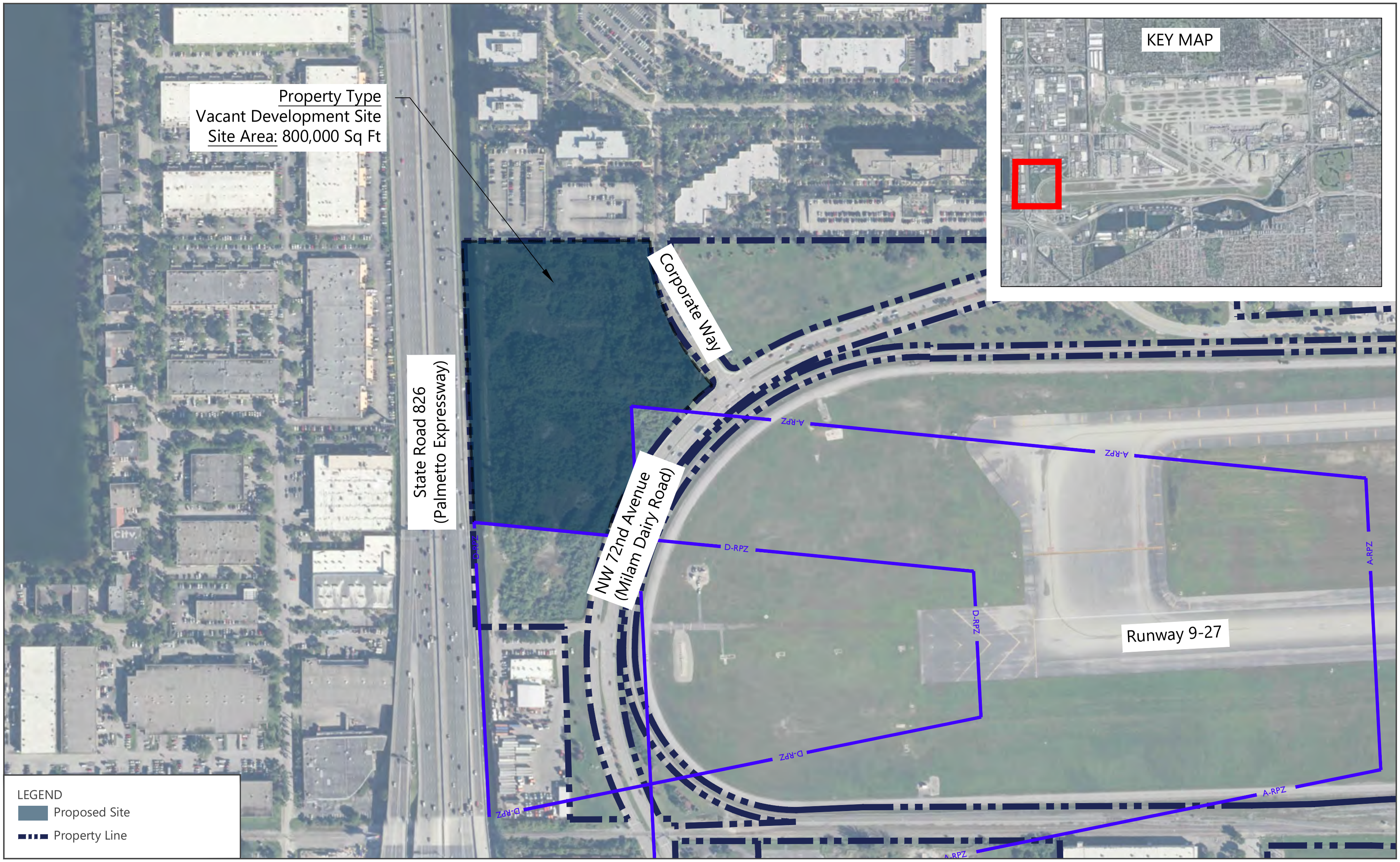
The most common commodities fumigated at MIA are fruits and vegetables (e.g., blueberries, asparagus), fish/seafood, and flowers. The procedures and treatment for such commodities are referenced in the USDA Treatment Manual shown in **Appendix A**.

2.3 STUDY OBJECTIVES

The purpose of this Project Book is to solidify a conceptual layout and to establish the design criteria necessary to accommodate a new fumigation facility within a vacant parcel generally located west of NW 72nd Avenue, between NW 14th Street and Corporate Way (see **Exhibit 2-1**). Specifically, this study covers the following:

- assessment of existing surface and subsurface site conditions, including grades/elevations, geotechnical, and available utilities (drainage, water, sewer, electrical, communications, pollution control, gas, and jet fuel)
- identification of existing and/or anticipated environmental concerns
- assessment of existing fumigation operations at MIA and establishment of requirements for the new facility
- study of the feasibility for accommodating a new facility within the noted parcel, including proposed vehicle circulation, access, and building requirements
- identification of building requirements, including structural systems, power, communications, fire suppression, life safety systems, and any other necessary operating systems
- identification of civil and infrastructure requirements
- identification and development of a conceptual layout for building(s) and necessary civil infrastructure
- identification of required permits and standards
- provision of rough-order-of-magnitude (ROM) cost estimates to support the evaluation of the preferred concept

This Project Book is intended to be utilized by the architectural and/or engineering consultant (A/E Consultant), selected by MDAD, to undertake the final design of the noted facility. It is intended to provide general information and guidance for the preparation of design/construction contract documents, as necessary for MDAD to procure a construction contract to perform such work. The selected A/E Consultant shall verify and satisfy itself of all MDAD, federal, local, state, and other applicable standards necessary for the preparation of its design/contract documents. Final compliance with all applicable requirements rests with the A/E of Record.



SOURCES: Quantum Spatial, *2017 MIA Aerial Image*, October 2017; Miami-Dade Aviation Department, *Fumigation Facility Relocation and Test Cell Facility*, May 2018.

NORTH

0 500 ft

EXHIBIT 2-1

FUMIGATION FACILITY RELOCATION
PROPOSED SITE

Drawing: P:\Project-Miami\MDAD\On-call 2017\SO6 - Test Cell and Fumigation Facility Project Books\CAD\Fumigation Exhibits_8.5x11.dwgLayout: 2-1 Plotted: Jul 25, 2019, 02:31PM

3. EXISTING CONDITIONS

3.1 OVERVIEW OF OPERATORS AT THE AIRPORT

MIA has two fumigation operators that provide service 24 hours a day, 7 days a week. The operators treat shipments originating from both air and sea routes:

- Termite Doctor: outdoor facility located at the east end of NW 25th Street
- Al-Flex: outdoor facility located north of NW 25th Street and west of 67th Avenue

3.2 INVENTORY OF EXISTING CONDITIONS

Exhibit 3-1 depicts the current fumigation operators' existing sites. Additionally, data regarding the current fumigation facilities and the existing demand were collected and documented for each fumigator. The data were sourced from the following:

- site visit of Termite Doctor, including photographic inventory from on-site visits (refer to **Appendix B**)
- FY 2017 activity at MIA provided by the USDA

Table 3-1 presents each fumigation operator's facility inventory.

TABLE 3-1 FUMIGATION FACILITIES – EXISTING CONDITIONS SUMMARY

FACILITY	TYPE OF FUMIGATION	TREATMENT USED	FUMIGATION SITE (SQ FT)	NUMBER OF TRACTOR-TRAILER / CONTAINERS POSITIONS	AVERAGE NUMBER OF TRACTOR-TRAILERS / CONTAINERS FUMIGATED PER DAY [2]	200-FOOT RADIUS BUFFER REQUIRED	ON-SITE MONITORING BY USDA
Termite Doctor	Tarpaulin/ Tarpless	Methyl Bromide	150,000	15	17	Yes	Yes
Al-Flex (NW 67th Ave)	Tarpaulin/ Tarpless	Methyl Bromide	100,000	20 [1]	40	Yes	Yes
Overall Airport	**Tarpaulin/ Tarpless**	**Methyl Bromide**	**250,000**	**35**	**57**	**Yes**	**Yes**

NOTES: USDA – U.S. Department of Agriculture

1 Al-Flex's number of tractor-trailer/containers positions was assumed based on the daily average of tractor-trailers/containers fumigated and based on 2 fumigations per day.

2 The annual and monthly fumigation operations (FY 2017) were provided by the USDA, and the average daily number of containers fumigated was calculated based on the number of working days in December 2016 (peak month).

SOURCES: Termite Doctor, May 2018 (site visit); U.S. Department of Agriculture, *MIA Fumigation Facility - Data Request* (*Monthly Summary of Containers Fumigated at MIA)*, July 2018.

SOURCE: Quantum Spatial, *2017 MIA Aerial Image*, October 2017.

EXHIBIT 3-1

FUMIGATION FACILITY RELOCATION EXISTING CONDITIONS

Drawing: P:\Project-Miami\MDAD\On-call 2017\SO6 - Test Cell and Fumigation Facility Project Books\CAD\Fumigation Exhibits_8.5x11.dwgLayout: 3-1 Plotted: Jul 25, 2019, 02:31PM

4. FACILITY REQUIREMENTS

4.1 BENCHMARKING ASSESSMENT

Given the limited real estate available at MIA for new facility development, a benchmarking assessment of on-airport and off-airport enclosed fumigation facilities in the United States was undertaken to explore the feasibility of an enclosed solution, as well as to determine the layout standards. A total of three facilities were reviewed as part of the benchmarking assessment:

- On-Airport:
  - Gulfport-Biloxi International Airport (Mississippi)
- Off-Airport:
  - City of Miami (American Consolidation and Logistics [ACL])
  - Port of Baltimore (Wallenius Wilhelmsen Solutions)

Appendix D presents the detailed benchmarking assessment.

Key Findings from the Benchmarking Assessment

Of the three facilities analyzed, ACL was chosen as the most relevant example of a state-of-the-art enclosed fumigation facility combined with refrigerated storage. It provides useful insight into the organization and size requirements of a modern fumigation facility.

The following recommendations for constructing and operating a fumigation facility are based on the findings from the benchmarking assessment:

- The facility's fumigation chamber shall include a gas recovery system that recaptures the fumigants during the ventilation phase.
- The facility shall combine palletized fumigation with full tractor-trailer/container fumigation.
- The facility shall include cold storage / refrigerated areas to store the commodities pre- and post-fumigation. In order to conduct cold treatments under USDA regulations, cold storage or refrigerated areas must be compliant with the certification requirements referenced in the latest version of the USDA Treatment Manual shown in Appendix A.

4.2 FACILITY REQUIREMENTS

4.2.1 BASELINE REQUIREMENTS

Based on the FY 2017 activity summary provided by the USDA, Al-Flex and Termite Doctor currently fumigate 9,054 tractor-trailers/containers a year. Of those tractor-trailers/containers, 12 percent originate from the seaport. Due to the seasonality of the perishable commodities, the corresponding peak month is December. MIA fumigates an average of 57 tractor-trailers/containers daily during the month of December (working days only).

4.2.2 FUTURE REQUIREMENTS

Based on the 2017 Supplemental Aviation Activity Forecasts Update's cargo projections presented in **Table 4-1**, the cargo tonnage is expected to increase at a 3.4 percent compound annual growth rate (CAGR) between 2017 and 2035. As a result, the monthly peak number of containers fumigated will reach 2,321 containers by 2035.

To determine the corresponding total facility area required, the following assumptions were used:

- 90 percent of the tractor-trailers/containers (40-foot containers) could fit a maximum of 20 pallets, and 10 percent of the tractor-trailers/containers (53-foot containers) could fit a maximum of 25 pallets.
- The demand was increased by 20 percent to protect for induced demand resulting from a more modern and more efficient fumigation facility.
- The facility can fumigate up to twice a day.
- Each pallet (including circulation) requires 25 square feet of space.
- Based on the June 5, 2018, meeting with the current fumigation operators, fumigation can be assumed as 30 percent of the total facility.

TABLE 4-1 FUMIGATION FACILITY REQUIREMENTS

	CARGO TONNAGE	NUMBER OF CONTAINERS FUMIGATED IN THE PEAK MONTH [1]	AVERAGE DAILY NUMBER OF CONTAINERS FUMIGATED IN THE PEAK MONTH [2]	NUMBER OF CORRESPONDING PALLETS	FUMIGATION AREA (SQ FT) [3]	OTHER AREAS (SQ FT) [3]	TOTAL FACILITY (SQ FT) [3]
Existing (2017)	2,284,148	1,262	57	1,197	15,000 – 30,000	34,900 – 69,800	**50,000 – 100,000**
PAL 1 (2025)	3,086,863	1,706	78	1,638	20,500 – 41,000	47,800 – 95,600	**68,000 – 137,000**
PAL 2 (2030)	3,630,905	2,006	91	1,911	23,900 – 47,800	55,700 – 111,500	**80,000 – 159,000**
PAL 3 (2035)	4,201,033	2,321	106	2,226	27,800 – 55,700	64,900 – 129,900	**93,000 – 186,000**
CAGR Existing – PAL 3	**3.40%**						

NOTES: PAL – Planning Activity Level CAGR – Compound Annual Growth Rate

1 The annual and monthly fumigation operations (FY 2017) were provided by the USDA.

2 The average daily number of containers fumigated was calculated based on the number of working days in December 2016 (peak month).

3 The ranges' bottom and top values respectively correspond to one and two fumigation cycles per day.

SOURCES: U.S. Department of Agriculture, *MIA Fumigation Facility - Data Request* (*Monthly Summary of Containers Fumigated at MIA)*, July 2018; Miami-Dade Aviation Department, *2017 Supplemental Aviation Activity Forecast Update*, November 2017.

The final recommendation is to build one fumigation facility in two phases. Phase 1 and Phase 2 will respectively accommodate the 2025 and 2035 demand. As the demand not evenly distributed over the month with some days accommodating higher volumes, the averages of the 2025 and 2035 Total Facility Area ranges was used to plan the facility. The following building areas will apply:

- Phase 1: 104,000 S.F. (average of the 2025 Total Facility Area)
- Phase 2: 149,000 S.F. (average of the 2035 Total Facility Area)

5. CONCEPTUAL SITE PLAN

5.1 CONCEPTUAL LAYOUT

As depicted on **Exhibit 5-1** and **Exhibit 5-2**, the proposed site includes Phase 1 and Phase 2 of the proposed fumigation facility. [1]

Phase 2 full-buildout facility is approximately 195 feet wide by 795 feet long, with the long dimension oriented north–south. Truck access to the site is via Milam Dairy Road to NW 14th Street. On-site traffic circulation is organized around one-way vehicle movements to tractor-trailer/container parking positions on both the east and west sides of the building. All traffic exits the site from the northeast corner onto Milam Dairy Road.

Exhibit 5-3 and **Exhibit 5-4** present renderings of the recommended fumigation facility.

5.2 BUILDING HEIGHT CONSIDERATIONS

The west side of the proposed building is largely used for staging areas; accordingly, the west side is the tallest part of the building. Based on the ACL drawings shown in **Appendix C**, the height of the building should be approximately 35 feet above finished floor (AFF), and the height of insulation ceiling panels within the building should be approximately 15 feet AFF in storage areas and 25 feet AFF in staging areas. The warehouse floor is raised to dock level (approximately 4 feet above grade). Therefore, the roof would be approximately 39 feet above grade (i.e., 35 feet + 4 feet = 39 feet; or approximately 46 feet above mean sea level [MSL]).

5.3 OPERATIONAL SCENARIOS

The proposed cargo processing model relies on a variety of operational scenarios.

5.3.1 SCENARIO 1: FUMIGATION OF NONPERISHABLE CARGO

Scenario 1.1: Pallet Fumigation

The tow vehicle and trailer back onto a westside elevated loading dock where the cargo is offloaded to a secure staging area and moved to a temperature- and humidity-controlled fumigation chamber suited to the cargo. Once the fumigation process is completed, the cargo is cleared by the USDA and returned to the staging area, reloaded into a tractor-trailer/container, and departs.

Scenario 1.2: Full Trailer Fumigation

Alternatively, to fumigate within the tractor-trailer/container, the tow vehicle and trailer back into an eastside at-grade enclosed and fully insulated parking bay; the tow vehicle is disengaged, and the fumigant is introduced, following placement of monitoring devices. Each parking bay will fit up to four tractor-trailer/container at a time Once the in-trailer/in-container fumigation process is completed and cleared by the USDA, the tow vehicle is reengaged and departs through the northeast exit onto Milam Dairy Road.

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[1] The designer will work with potential operators to determine the final layouts and space breakdown.

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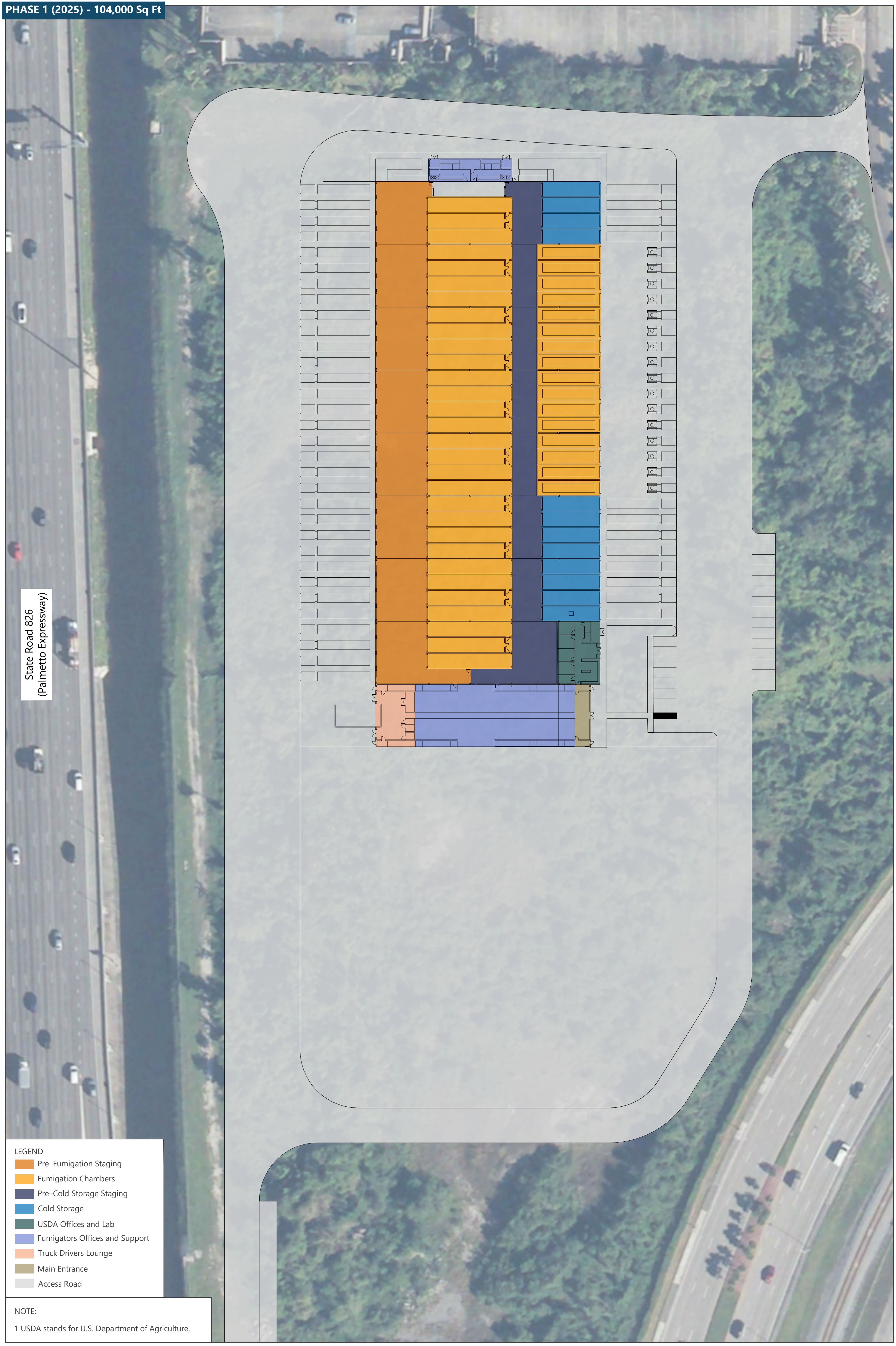


LEGEND

■ Pre–Fumigation Staging
■ Fumigation Chambers
■ Pre–Cold Storage Staging
■ Cold Storage
■ USDA Offices and Lab
■ Fumigators Offices and Support
■ Truck Drivers Lounge
■ Main Entrance
■ Access Road

NOTE:

1 USDA stands for U.S. Department of Agriculture.

SOURCE: Quantum Spatial, *2017 MIA Aerial Image*, October 2017; M C Harry Architects, *Fumigation Facility Concept*, November 2018.

NORTH 0 100 ft

EXHIBIT 5-1

FUMIGATION FACILITY RELOCATION
PROPOSED CONCEPT (PHASE 1)

Drawing: P:\Project-Miami\MDAD\On-call 2017\SO6 - Test Cell and Fumigation Facility Project Books\CAD\Fumigation Exhibits_8.5x11.dwgLayout: 5-1 - 11x17P Plotted: Jul 25, 2019, 02:36PM

FULL BUILDOUT (2035) - 149,000 Sq Ft

NOTE:

1 USDA stands for U.S. Department of Agriculture.

SOURCE: Quantum Spatial, *2017 MIA Aerial Image*, October 2017; M C Harry Architects, *Fumigation Facility Concept*, November 2018.

NORTH

0 100 ft

EXHIBIT 5-2

FUMIGATION FACILITY RELOCATION PROPOSED CONCEPT (OVERALL)

Drawing: P:\Project-Miami\MDAD\On-call 2017\SO6 - Test Cell and Fumigation Facility Project Books\CAD\Fumigation Exhibits_8.5x11.dwgLayout: 5-2 - 11x17P Plotted: Jul 25, 2019, 02:36PM

SOURCE: M C Harry Architects, *Fumigation Facility Massing Model*, December 2018.

NORTH 0 Not To Scale

EXHIBIT 5-3

PROPOSED FUMIGATION FACILITY MASSING MODEL VIEW FROM THE NORTHEAST

Drawing: P:\Project-Miami\MDAD\On-call 2017\SO6 - Test Cell and Fumigation Facility Project Books\CAD\Fumigation Exhibits_8.5x11.dwgLayout: 5-3 Plotted: Jul 25, 2019, 02:32PM

DRAFT

SOURCE: M C Harry Architects, *Fumigation Facility Massing Model*, December 2018.

NORTH 0 Not To Scale

EXHIBIT 5-4

PROPOSED FUMIGATION FACILITY MASSING MODEL
VIEW FROM THE NORTHWEST

Drawing: P:\Project-Miami\MDAD\On-call 2017\SO6 - Test Cell and Fumigation Facility Project Books\CAD\Fumigation Exhibits_8.5x11.dwgLayout: 5-4 Plotted: Jul 25, 2019, 02:32PM

5.3.2 SCENARIO 2: FUMIGATION OF PERISHABLE CARGO

The tow vehicle and trailer back onto a westside elevated loading dock where the cargo is offloaded to a secure staging area and moved to a temperature- and humidity-controlled fumigation chamber suited to the cargo. Once the fumigation process is completed, the cargo is cleared by the USDA, resorted as necessary, and moved to a secure refrigerated storage unit with temperature settings appropriate for the product being stored. From there it is loaded into a refrigerated tractor-trailer/container on the eastside of the facility; the tractor-trailer/container exits to Milam Dairy Road for domestic distribution.

5.3.3 SCENARIO 3: STORAGE OF PERISHABLE CARGO

Vehicles and trailers transporting perishable cargo previously cleared by the USDA elsewhere can off load the product into a secure eastside temperature- and humidity-controlled storage room and held for a prescribed duration to increase shelf life. The cargo can be sorted, if needed, and loaded onto one or more refrigerated transport vehicles for delivery off-site via the northeast exit onto Milam Dairy Road.

5.4 AIRSPACE AND SAFETY AREA CONSIDERATIONS

Due to the location of the proposed fumigation facility, several airspace and runway safety areas need to be evaluated for penetrations. The proposed location may impact operations of Runway 9; therefore, a full airspace analysis should be performed before final design is completed. The analysis included below references the Code of Federal Regulations (CFR) Title 14 Part 77, *Safe, Efficient Use, and Preservation of the Navigable Airspace*; FAA's Order 8260.3D, *United States Standard for Terminal Instrument Procedures (TERPS);* and Advisory Circular (AC) 150/5300-13A, Change 1, *Airport Design*.

Each of the referenced documents is used for different purposes by the FAA. The surfaces included in Part 77 are used to identify obstructions around the airport to ensure safe avigation of the surrounding airspace. A penetration to the Part 77 surface may be permissible as long as the object or structure is properly marked and lit. On the contrary, the surfaces included in the TERPS regulations are restrictive, and structure heights must not penetrate these surfaces to ensure there are no operational restrictions on the runway. If an object penetrates one of the TERPS surfaces, the instrument approach procedure for the runway will need to be changed to provide proper clearance to any obstacles. This is generally accomplished through lowing the visibility minimums for the runway.

Finally, AC 150/5300-13A provide guidance for Runway Protection Zone (RPZ) clearance, and the Threshold Siting Surface (TSS). In general, these are all expected to be kept free of obstructions but are not as restrictive as the TERPS surfaces.

5.4.1 TITLE 14 CODE OF FEDERAL REGULATIONS PART 77

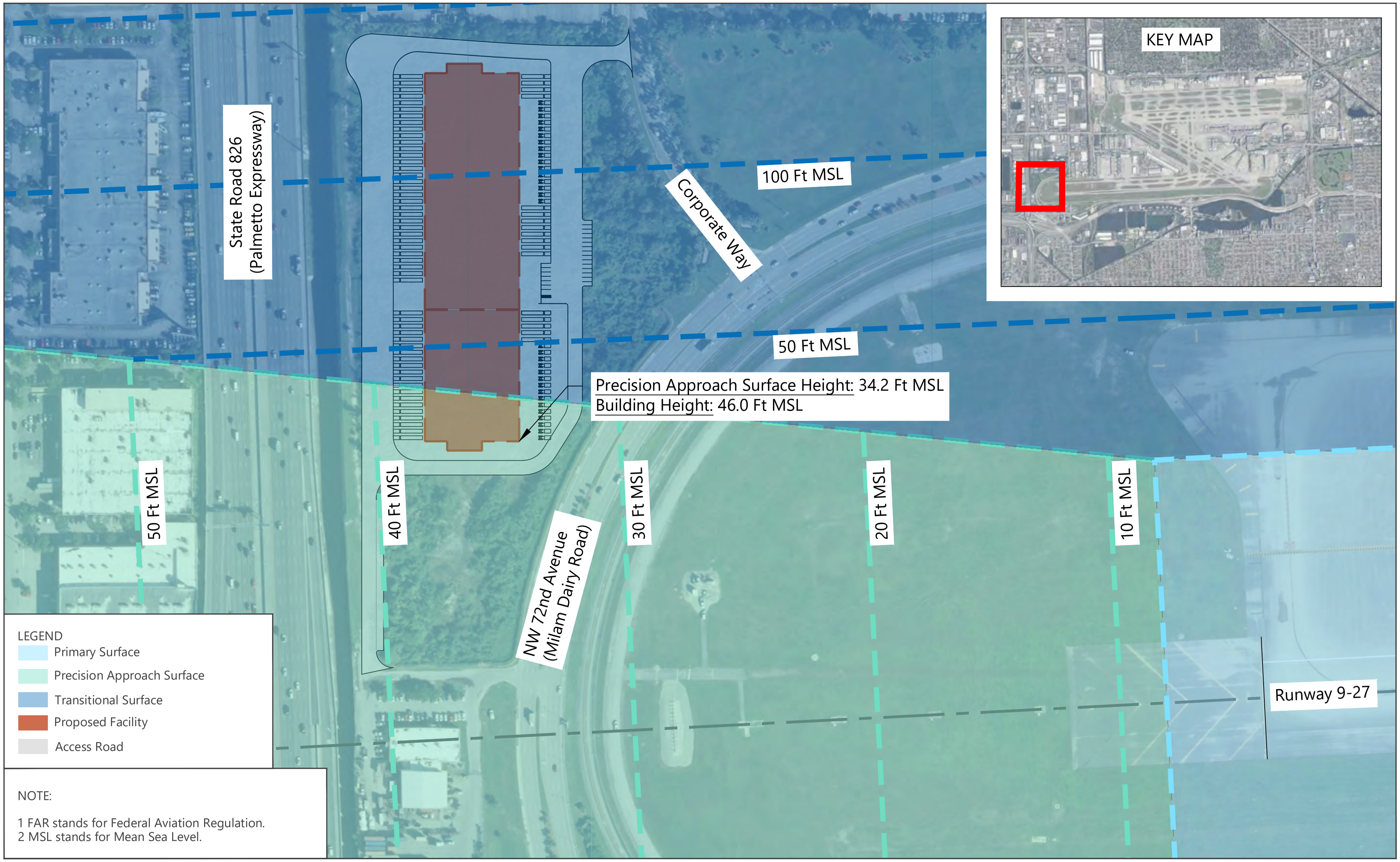
Exhibit 5-5 depicts Title 14 CFR Part 77 imaginary surfaces near the proposed fumigation facility location.

Primary Surface

The primary surface is longitudinally centered on the runway, extends 200 feet beyond the runway end and has the same elevation of the nearest point on the runway centerline. The primary surface is based on the Runway Safety Area and uniformly extends 500 feet from the runway centerline.

Precision Approach Surface

The precision Approach surface begins at the end of the primary surface and extends outward and upward at a slope of 50:1 for the first 10,000 feet and at a slope of 40:1 for the next 40,000 feet.



NOTE:

1 FAR stands for Federal Aviation Regulation.
2 MSL stands for Mean Sea Level.

SOURCES: Quantum Spatial, *2017 MIA Aerial Image*, October 2017; M C Harry Architects, *Fumigation Facility Concept*, November 2018.

NORTH
0 300 ft

EXHIBIT 5-5

FUMIGATION FACILITY RELOCATION
FAR PART 77 SURFACES

Drawing: P:\Project-Miami\MDAD\On-call 2017\SO6 - Test Cell and Fumigation Facility Project Books\CAD\Fumigation Exhibits_8.5x11.dwgLayout: 5-5 Plotted: Jul 25, 2019, 02:32PM

Transitional Surface

The transitional surface extends outward and upward, perpendicular to the runway centerline from the edge of the primary and approach surfaces with a 7:1 slope.

As noted in Section 5.2, the height of the new would be 46 feet MSL which would directly penetrate a portion of the precision approach and transitional surfaces. Per Title 14 CFR Part 77, the Airport is required to notify the FAA of any new construction within the Part 77 surfaces in order to evaluate if the proposed construction is a hazard to air navigation. The FAA will determine appropriate mitigating measures (marking and lighting recommendations) using FAA's AC 70/7460-1, *Obstruction Marking and Lighting,* to preserve safety of air navigation.

5.4.2 TERMINAL INSTRUMENT PROCEDURES

As described in FAA Order 8260.3B, TERPS approach and departure surfaces are applicable to Runway 9.

Instrument Landing System Approach Surfaces

Runway 9 is equipped with precision instrument approach capabilities and as such is subject to TERPS final approach "W", "X" and "Y" Obstacle Clearance Surfaces (OCS). The "W" surface begins 200 feet from the landing threshold point and extends outward and upward at a slope of 34:1. The "X" surface extends outward and upward at a slope of 4:1 perpendicularly to the "W" surface. Similarly, the "Y" surface extends outward and upward at a slope of 7:1 perpendicularly to the "X" surface.

Exhibit 5-6 shows that the proposed facility does not penetrate the TERPS approach surfaces.

Instrument Departure Surface

The departure surface is centered on the runway, begins at the runway end and extends outward and upward at a slope of 40:1. As shown in **Exhibit 5-7** the proposed facility penetrates the departure surface. The overall climb gradient caused by the fumigation facility penetration is 201.6 feet per nautical mile and the "climb-to" altitude would be 49.8 feet above the departure-end of runway (DER). Per, FAA's Order 8260.46G, *Departure Procedure (DP) Program*, as the climb gradient is over 200 feet per nautical mile (standard) and the climb-to altitude is not greater than 200 feet above the DER, the fumigation facility will likely be considered a "low close-in". The Airport will need to coordinate with the FAA to determine whether modification of the instrument departure procedures would be required.

5.4.3 RUNWAY PROTECTION ZONES

As defined in the FAA's AC 150/5300-13A, the RPZ is "an area at ground level prior to the threshold or beyond the runway end to enhance the safety and protection of people and property on the ground." Therefore, the RPZ should remain clear of all above-ground objects or at least be cleared of all facilities associated with incompatible land uses defined in FAA's *Interim Guidance on Land Uses within a Runway Protection Zone*. A D-V approach reference code for Runway 9-27 requires the following approach and departure RPZ:

- Approach RPZ – 78.9 acres
- Departure RPZ – 29.5 acres

Exhibit 5-8 shows that the proposed facility clears runway 9-27's approach and departure RPZs.

5.4.4 THRESHOLD SITTING SURFACE

The TSS begins at runway 9 displaced threshold and extends outward and upward at a slope of 34:1.

Exhibit 5-9 shows that there is no penetration to the TSS.

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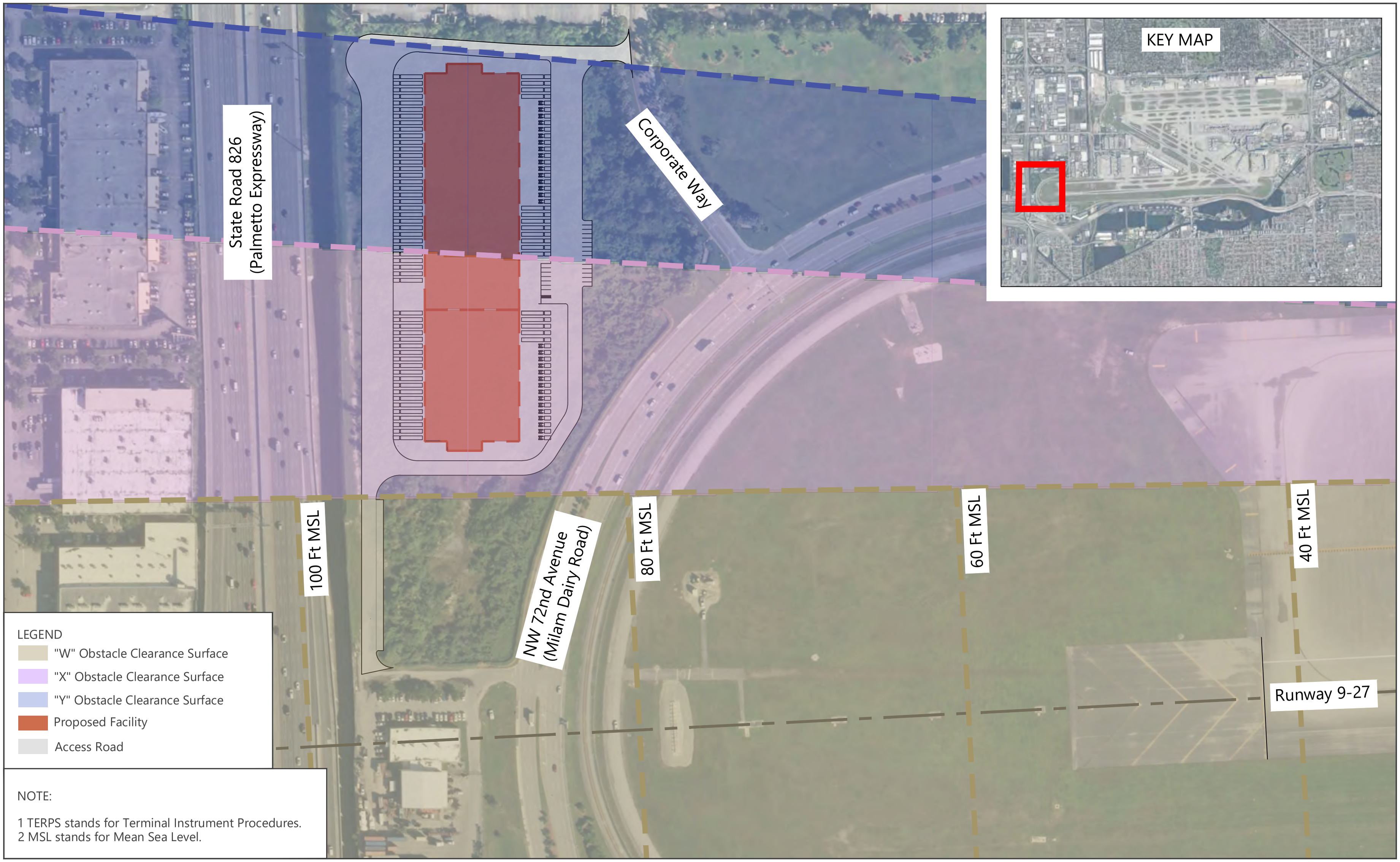


NOTE:

1 TERPS stands for Terminal Instrument Procedures.
2 MSL stands for Mean Sea Level.

SOURCES: Quantum Spatial, *2017 MIA Aerial Image*, October 2017; M C Harry Architects, *Fumigation Facility Concept*, November 2018.

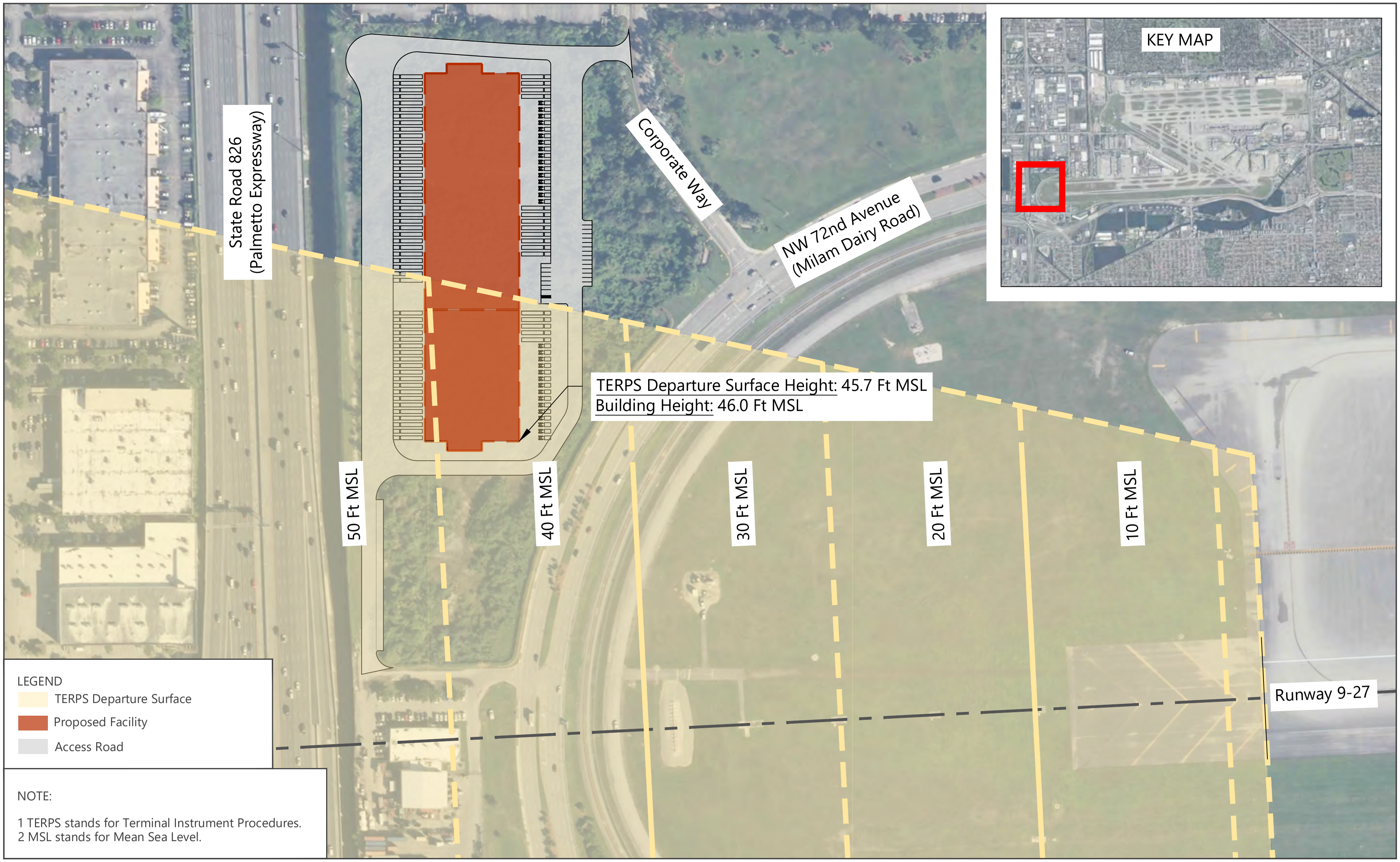
NORTH

0 300 ft

EXHIBIT 5-6

FUMIGATION FACILITY RELOCATION TERPS APPROACH SURFACES

Drawing: P:\Project-Miami\MDAD\On-call 2017\SO6 - Test Cell and Fumigation Facility Project Books\CAD\Fumigation Exhibits_8.5x11.dwgLayout: 5-6 Plotted: Jul 25, 2019, 02:34PM



NOTE:

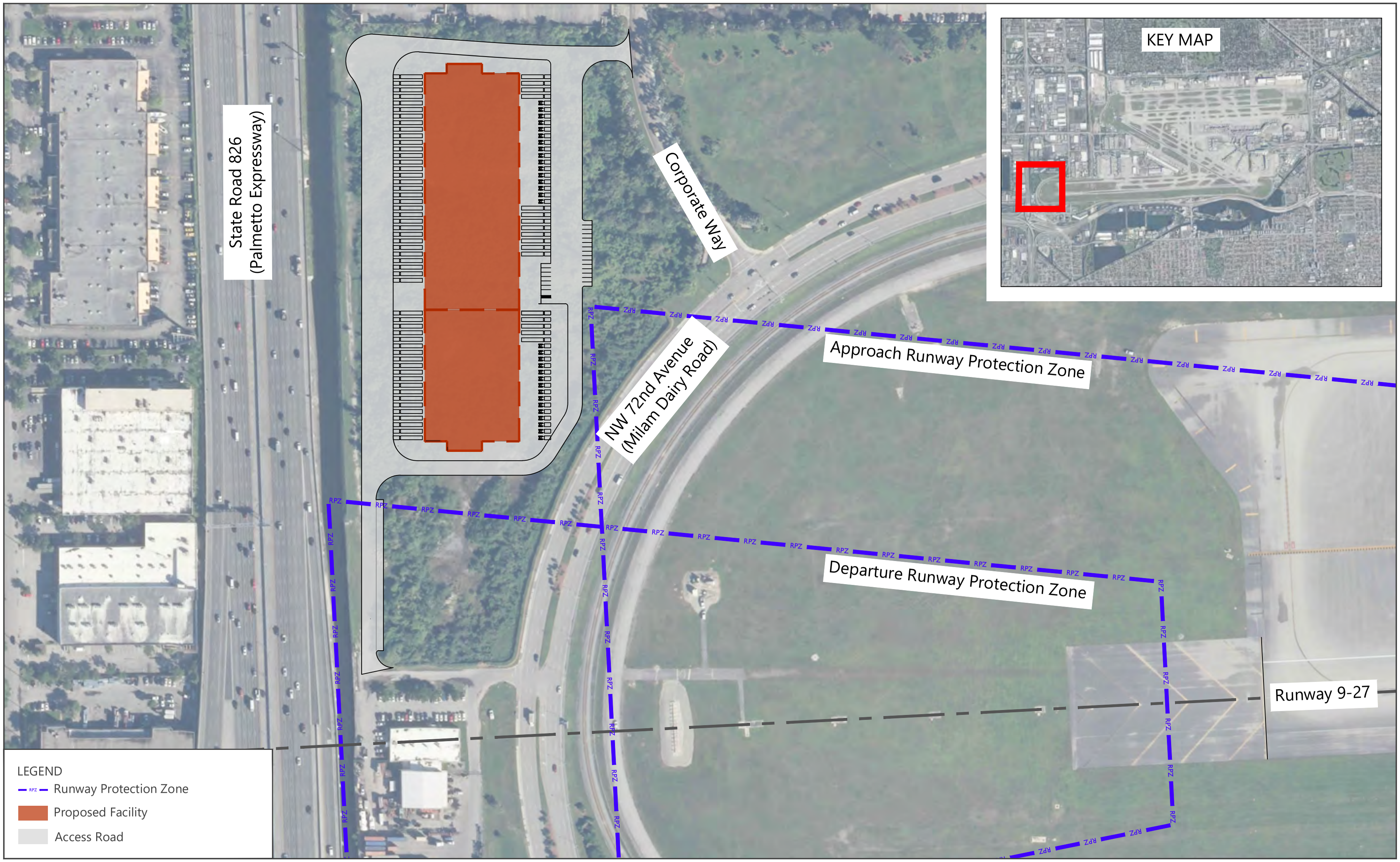
1 TERPS stands for Terminal Instrument Procedures.
2 MSL stands for Mean Sea Level.

SOURCES: Quantum Spatial, *2017 MIA Aerial Image*, October 2017; M C Harry Architects, *Fumigation Facility Concept*, November 2018.

EXHIBIT 5-7

FUMIGATION FACILITY RELOCATION TERPS DEPARTURE SURFACES

Drawing: P:\Project-Miami\MDAD\On-call 2017\SO6 - Test Cell and Fumigation Facility Project Books\CAD\Fumigation Exhibits_8.5x11.dwgLayout: 5-7 Plotted: Jul 25, 2019, 02:35PM



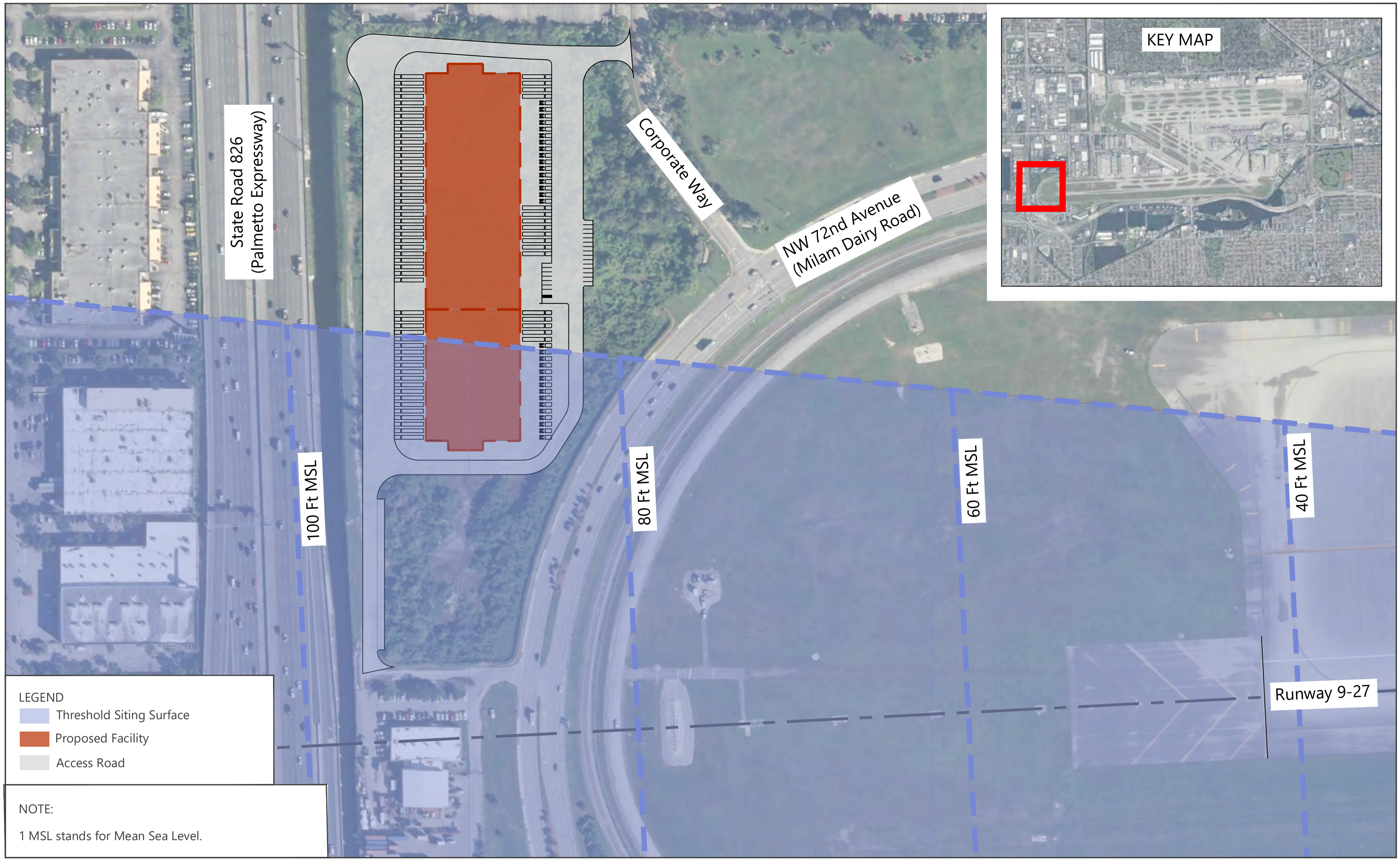
SOURCES: Quantum Spatial, *2017 MIA Aerial Image*, October 2017; M C Harry Architects, *Fumigation Facility Concept*, November 2018.

NORTH 0 300 ft

EXHIBIT 5-8

FUMIGATION FACILITY RELOCATION RUNWAY PROTECTION ZONES

Drawing: P:\Project-Miami\MDAD\On-call 2017\SO6 - Test Cell and Fumigation Facility Project Books\CAD\Fumigation Exhibits_8.5x11.dwgLayout: 5-8 Plotted: Jul 25, 2019, 02:35PM



NOTE:

1 MSL stands for Mean Sea Level.

SOURCES: Quantum Spatial, *2017 MIA Aerial Image*, October 2017; M C Harry Architects, *Fumigation Facility Concept*, November 2018.

NORTH 0 300 ft

EXHIBIT 5-9

FUMIGATION FACILITY RELOCATION THRESHOLD SITING SURFACE

Drawing: P:\Project-Miami\MDAD\On-call 2017\SO6 - Test Cell and Fumigation Facility Project Books\CAD\Fumigation Exhibits_8.5x11.dwgLayout: 5-9 Plotted: Jul 25, 2019, 02:35PM

6. ARCHITECTURAL BUILDING CONCEPT

6.1 OVERVIEW

The proposed fumigation facility would be located on the west side of the Airport on undeveloped property immediately west–northwest of the south of Runway 9-27 and north of Northwest 14th Street.

6.2 BUILDING CONFIGURATION

To meet 2035 demand, the building's square footage will be approximately 149,000 square feet. The building will accommodate a total of 100 truck bays, each 16-feet wide; 52 bays on the westside; and 48 bays on the eastside. Truck bays are grouped to accommodate the operational scenarios:

- All 52 westside truck bays can accommodate Operational Scenarios 1.1 and 2, which is approximately equivalent to 104 containers per day, assuming a utilization rate of 2 fumigation cycles per day.
- 28 of the 48 eastside truck bays can accommodate Operational Scenario 1.2.
- 20 of the 48 eastside truck bays can accommodate Operational Scenario 3.

The 149,000-square-foot building floor plan also incorporates space for centrally located tenant offices, a truck driver lounge, an employee entrance, restrooms, and accessible access/egress ramps. Supplemental restrooms and egress ramps are located at each end of the building.

General guidelines for ceiling height within warehouse facilities include the following:

- When freight is not stored on multitiered racks, a 16-foot ceiling height should be adequate. Assuming 6 feet for roof structure and suspended insulation ceiling panels and allowing a 4-foot height for elevated loading docks, the building height in warehouse areas will be approximately 26 feet above grade; building height in office and restroom areas can be lower.
- When freight is stored on multitiered racks to accommodate high-volume distribution, a ceiling height of approximately 25 feet may be necessary. For the purposes of this study, a ceiling height of 25 feet has been incorporated into the concept design. Assuming 6 feet for roof structure and suspended insulation ceiling panels and allowing a 4-foot height for elevated loading docks, the building height in warehouse areas will be approximately 35 feet above grade.

6.3 ZONING CONSIDERATIONS

Per Miami Dade Property Appraiser, the project site is located within two parcels (Folio 30-3035-000-0072 and Folio 30-3035-000-090). Both parcels are currently owned by Miami Dade Aviation Department and classified as "Governmental Property" (GP) while the zoning district classification for adjacent parcels is "Governmental Property" (GP) or "Industrial" (IU).

Additionally, due to its proximity to MIA, additional airport zoning requirements are applicable. However, such requirements are largely based on height of structures and possible encroachment into the airport airspace surfaces (Part 77 and approach surfaces) adjacent to runways as described in section 5.4.

6.4 CONSTRUCTION CONSIDERATIONS

6.4.1 CONSTRUCTION PHASING

The proposed building has been configured for implementation in two phases as demand requires. The Phase 1 building area is approximately 104,000 square feet. However, this layout has only 32 westside truck bays, and it appears 39 truck bays may be needed to fumigate 78 containers per day (assuming 2 fumigations per day). If additional capacity is needed on the west side, trucks could get unloaded and then be pulled away and parked on the east side to allow another truck in.

As currently configured, the space allocation is as follows: 60 percent palletized fumigation (approximately 1,170 pallets), 21 percent full trailer fumigation (approximately 330 pallets), and 19 percent cold storage (approximately 216 pallets). Total fumigation capacity for palletized fumigation and full-trailer fumigation is equal to approximately 1,500 pallets.

The Phase 2 full-buildout building area is approximately 149,000 square feet. This layout shows 52 westside truck bays, approximately equivalent to 104 containers per day (assuming 2 fumigations per day). The 2035 requirements include 106 containers per day. At full buildout, the space allocation is as follows: 63 percent palletized fumigation (approximately 1,872 pallets), 19 percent full trailer fumigation (approximately 640 pallets), and 18 percent cold storage (approximately 351 pallets). Total fumigation capacity for palletized fumigation and full-trailer fumigation is equal to approximately 2,500 pallets. The ratios are estimates only; full-trailer fumigation and cold storage areas can be adjusted as necessary.

6.4.2 OCCUPANCY AND USE CLASSIFICATION

Low-hazard storage Group S-2 occupancies include buildings used for the storage of noncombustible materials, such as products on wood pallets or in paper cartons with or without single thickness divisions; or products in paper wrappings. Such products are permitted to have a negligible amount of plastic trim, such as knobs, handles, or film wrapping. Group S-2 storage uses shall include storage of the following: dairy products in non–waxed coated paper containers; food products; foods in noncombustible containers; fresh fruits and vegetables in non–plastic trays or containers; frozen foods; and meats. For additional information, refer to Florida Building Code (FBC)-B §311.3.

6.4.3 TYPE OF CONSTRUCTION

The type of construction has been identified as Type II-B, noncombustible (no fire-resistance rating required for roof or exterior walls). For purposes of this analysis, the type of construction is based on Phase 1 development of a single-story building of less than 104,000 square feet in area, equipped throughout with an automatic fire-suppression sprinkler system:

- Maximum Allowable Building Height for Type II-B (based on Group S-2, one story in height, fully sprinklered): 75 feet (per FBC-B Table 504.3).
- Maximum Allowable Building Area for Type II-B (based on Group S-2, one story in height, fully sprinklered): 104,000 square feet (per FBC-B Table 506.2). [2]

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[2] If Phase 1 development is increased to more than 104,000 square feet, then it must comply with requirements for Type II-A or Type I-B construction (e.g., minimum 1-hour fire-resistance rating for primary structural frame, exterior walls, and roof construction). Also, if/when Phase 2 is constructed, the building area will exceed 104,000 square feet; therefore, a fire wall will be required for separation between Phase 1 and Phase 2.

7. STRUCTURAL BUILDING CONCEPT

7.1 MECHANICAL

The entire facility shall be provided with an energy-efficient heating, ventilation, and air conditioning (HVAC) system to provide individual control throughout all occupied areas using variable air volume (VAV) boxes or dedicated air-conditioning units. Office spaces shall be designed to maintain an indoor target temperature of 75-degrees Fahrenheit with a 50 percent (±5 percent) relative humidity. Specific bay area housing refrigerated goods shall be designed for interior temperatures in accordance with the type of goods that will be stored. Care should be taken when selecting the HVAC equipment, including a consideration for noise-generated characteristics. Outside air temperature shall be based on Miami-Dade County (MDC) typical summer and winter conditions. The following codes and standards shall be adhered to for the mechanical design of this project:

- Florida Building Code
- Florida Fire Prevention Code
- American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE): 60.1-2013, Ventilation for Acceptable Indoor Air Quality
- Sheet Metal and Air Conditioning Contractors' National Association: Ductwork Construction Standards
- National Fire Protection Association (NFPA)

Based on preliminary space planning and preliminary cooling load estimates, the following values are projected to accommodate the needs for the new fumigation facility:

- Office Space: 100 tons
- Refrigerated Space: 800 tons

Air-Handling Units

All air-handling units serving the office space should be installed on the roof (rooftop units) or in mechanical rooms located within the building. These air-handling units shall be the double wall type with enclosed motors and a variable frequency drive system. They shall modulate air flow to a system of pressure-independent VAV boxes. All boxes shall be thermostatically controlled. All boxes serving occupied areas shall be provided with electric heat capabilities.

Thermostats for localized control shall be wall mounted. To eliminate any possible indoor air quality problems (above and beyond constantly monitoring the amounts of pre-cooled outside air, carbon dioxide levels in the return air, and the indoor humidity levels, as directed by ASHRAE 62.1-2013, Guideline, and the ASHRAE-issued *Humidity Control Design Guide*), all ductwork shall be galvanized sheet metal with complete externally wrapped insulation. The insulation R-value will be specified to meet or exceed the requirements of the Florida Energy Efficiency Code for Building Construction. This should provide for a clean, smooth air flow track throughout the life of the system. Additionally, the ductwork system will be designed with provision for sound transmission dampening devices (sound attenuators) to eliminate noise carryover and transmission through ductwork pipes. The selection and location of sound attenuation devices will be based on preventing air noise impingement on occupied environments.

The air-conditioning system's return air will be completely ducted into respective air-handling units. This will allow for a better air control of the overall air-conditioning system, while reducing the chances of untreated outdoor air being introduced into the building through minuscule cracks in the perimeter walls at points above the ceiling line.

All ducts crossing over rated partitions will be provided with a damper matching the rating of the partition being crossed. If a partition is smoke rated, then a smoke damper will be provided. The same applies to fire-rated or fire/smoke–rated partitions.

The air-handling units will be provided with direct expansion cooling coils. In instances where the air-handling units are serving a VAV system, the compressors serving these specific units will be specified of the digital type with both hot-gas bypass and reheat coil capabilities. This will allow personnel to accurately control indoor air quality (temperature and relative humidity) at partial cooling load scenarios.

Ventilation

The building toilet rooms and janitorial closets will be provided with adequate ventilation. Toilet rooms and janitorial closets will be ventilated meeting or exceeding the volumetric rates required by the Florida Building Code. All related ductwork to this ventilation system will be made of sheet metal and will be externally insulated. In isolated cases, where single toilet rooms or janitorial closets are away from a main ventilation trunk duct, ceiling-cabinet fan types will be provided to properly ventilate these areas.

An exhaust ventilation system, capable of removing fumigation gases from the facility while replacing with uncontaminated fresh air, will be designed in accordance with the facility operating requirements.

Controls

A state-of-the-art direct-digital-control system will be provided to properly control and monitor all the mechanical devices to be controlled and/or monitored (e.g., condensing units, VAV boxes, air-handling units, exhaust fans, supply fans, fan coil units, refrigeration equipment).

This control system will be designed so it can be accessed from a central location (to be determined) and/or accessed remotely through a web-based system. All appropriate passwords will be provided to the appropriate personnel by the control equipment supplier. Additionally, the control program will be specified so all applicable, adjustable variables (e.g., individual space temperatures, time schedules) can be easily modified to custom-fit the user requirements. All control wires will be specified of the plenum-rated type and will be installed in a minimum of 0.5-inch conduits.

7.2 ELECTRICAL

Building Electrical Distribution

This new refrigerated fumigation facility will require an estimated 4,000 amps, 120/208 volts, three-phase, four-wire electrical service. This service will be served directly from a new Florida Power & Light (FPL) transformer in the northeast corner of the site. The service entrance equipment and corresponding panelboards serving the facility will be housed in a dedicated electrical room(s) located on the perimeter of the building.

This facility will be 100 percent backed up by a proposed backup diesel generator estimated at 1,250 kilowatts located inside the building in a new generator room. The generator will be provided with an 8,000-gallon (72 hours of fuel as requested by MDC) aboveground double-wall diesel fuel tank located on the exterior of the building.

The following is a list of equipment that will be connected to the emergency power distribution system:

- emergency lighting
- fire alarm system
- generator auxiliaries
- fire protection equipment
- security screening equipment
- telephone/security systems
- mechanical control systems
- building automation system
- uninterruptible power supply (UPS)
- air conditioning equipment for IT room
- other equipment or lighting designated by the MDC/users

This facility will be provided with a 100-kilovolt-ampere UPS system for the central IT / server room to maintain operational continuity of critical systems during the switchover period after a normal power failure to generator power. The proposed single-module UPS will have maintenance-free sealed batteries in cabinets, static switch, and a maintenance bypass cabinet. The UPS system will be connected to all control-room critical electronic loads, communications equipment, and select PC workstations to be defined by the user. It is assumed that noncritical electronic equipment will have standalone UPS units.

Lighting Systems

Lighting levels will be designed utilizing the FBC. All lighting fixtures will be energy-efficient LED lamp source. The proposed lighting system will be as follows:

- Office areas will generally have LED troffers with one fixture for every 80 square feet in large and open office areas and two fixtures minimum for smaller (8 feet by 10 feet) offices. All fixtures will have provisions for two lighting levels.
- Storage/Refrigeration/Fumigation areas will have LED troffers hung from the structure, with one fixture for every 100 square feet.
- All exterior lighting will be LED wall security packs to maintain the overall look of the exterior of the facility. Lighting in parking areas will be pole mounted LED fixtures. Exterior lighting and associated parking areas will be designed to be in conformance with Miami-Dade Code Section 8C-3 and all light poles will meet the applicable FAA regulations.
- Exit lights will be LED edge-lit type in all areas.

Lightning Protection System

The facility will be designed with an Underwriters Laboratories (UL) master-labeled lightning protection system per NFPA 780 and Lighting Protection Institute 175 Standards. Surge protection will be provided on the main electrical service equipment and all panelboards serving office areas, IT rooms, and communications equipment.

Fire Alarm

The building's life safety components will be monitored by a fire alarm detection and annunciation system. A microprocessor-based fully addressable intelligent system will be designed to provide an early warning network throughout the building in the event of a fire condition. This system will consist of smoke detectors, heat detectors, duct smoke detectors, and manual pull stations. Americans with Disabilities Act (ADA)–approved automatic audible and visual alarm signals will be provided to guarantee the notification to all building occupants. Fire alarm system functions will be as follows:

- alarm initiating and signaling
- Emergency Voice Communications (recorded message/speaker system)
- fire department communications (fireman's phone system)

The main fire alarm panel will be housed in the main office area with a graphic annunciator panel at the entrance lobby to the building.

Access control and Closed-Circuit Televison Systems

The facility will have access control and security systems to monitor the entrance and exit of all employees into the facility, as well as to control access to the more vital rooms within the building. Card readers and right-to-exit devices will be installed on all entrance/exit points and on all critical/vital room access points. The closed-circuit television (CCTV) will consist of IP cameras with a minimum of 1,080-pixel resolution. Cameras shall be installed at all exits and all exterior corners of the building, as well as in interior spaces deemed critical by the user.

7.3 PLUMBING

The facility will be provided with a complete plumbing system that will consist of a sanitary collection and disposal system, a storm drainage system, and a domestic water distribution system, including distribution of hot water.

Domestic Water Distribution

Domestic water service will be provided by connecting into the existing main water system serving the area. The main line feeding the building will be split for the fire protection component and for domestic water service, each with its own backflow preventer. Adequate isolation valves will be provided at each branch to facilitate building maintenance without having an overall building water shutdown. Hot water will be provided at all applicable fixtures within the building. All domestic water lines (hot and cold) will be of the copper type. Keyed wall hydrants will be provided throughout the perimeter of each building, spaced at no more than 100 feet from each other.

Sanitary Drainage System

The sanitary system will consist of a waste and vent collecting system, which will be discharging into the underground sanitary sewer mains. Adequate cleanouts will be provided, as required by the FBC, to facilitate the maintenance of the overall sanitary system. All sanitary waste and vent lines will be of the cast-iron type. Aboveground applications shall be installed using hub-less fittings, and underground application shall be installed using hub-and-spigot fittings. All toilet rooms shall be provided with low-flow tankless toilet fixtures and low-flow flushometer urinals to conserve water. These urinals could significantly reduce the water demand in the new building. All toilet rooms shall be provided with floor drains and keyed wall hydrants for cleaning purposes.

Storm Drainage System

The storm drainage system shall collect roof runoffs through drains that will have leaders down to a collection system surrounding the building. The collection system and subsequent disposal structures will be provided under the civil engineering component of this project. All storm drainage lines within the building will be of the insulated hub-less cast-iron type. Insulation on these lines is required for sound isolation purposes.

Plumbing Fixtures

Plumbing fixtures shall be commercial grade. Accessible fixtures shall be provided as specified by the Uniform Federal Accessibility Standards. Water closets shall be wall mounted, vitreous china with flush-valve operation designed for 1.280 gallons per flush. Urinals shall be wall mounted, vitreous china with flush-valve operation designed for 0.125 gallons per flush. Lavatories shall be vitreous china, countertop drop-in type or wall-hung fixture with ADA–approved trim and/or single-handle type faucet with 0.5 gallons per minute (gpm) discharge. Electric water coolers shall be hi-lo type, wall-mounted self-contained units. Water heaters, when supplied, will be of the instantaneous type. Mop sinks shall be floor-mounted cast stone units with stainless steel wall-mounted splashguards and a wall-mounted faucet set.

7.4 FIRE PROTECTION OVERVIEW

A properly zoned, supervised, hydraulically designed fire protection system consisting of an automatic fire sprinkler system and standpipes shall be provided utilizing the following MDAD design criteria:

Reference Standards

- NFPA 13 – 2013 Edition: Installation of Sprinkler Systems
- NFPA 14 – 2000 Edition: Installation of Standpipe, Private Hydrant, and Hose Systems
- NFPA 20 – 2013 Edition: Installation of Stationary Pumps for Fire Protection

All office and assembly areas will be designed as follows:

- Occupancy: Light Hazard Flow
- Density: 0.10 gpm/square feet over the hydraulically most-remote 1,500 square feet of area
- Area Coverage: 225 square feet maximum per sprinkler head
- Proposed Sprinkler Head Types: standard upright or pendant in exposed areas; semi-recessed in hard or acoustical ceilings; sidewall type where applicable

All warehouse areas (miscellaneous storage up to 12 feet in height) will be designed as follows:

- Occupancy: Ordinary Hazard Group 1
- Flow Density: 0.15 gpm/square feet over hydraulically most-remote 1,500 square feet of area
- Area Coverage: 225 square feet maximum per sprinkler head
- Proposed Sprinkler Head Types: standard upright or pendant in exposed areas

In warehouse areas subjected to freezing temperatures (i.e., coolers), a dry pipe system will be provided in accordance with NFPA 13 requirements.

All telecommunication rooms, including the main IT room, will be protected by a dry-gas type (Inergen) fire protection system, which does not require human evacuations of rooms and is environmentally friendly (i.e., not containing chlorofluorocarbons or hydrochlorofluorocarbons). This eliminates the presence of water in these vital rooms, thus preventing possible water damage to the telecommunication and IT equipment.

All materials and equipment, including piping (Schedule 40 black steel in sizes 2.0 inches and smaller; Schedule 10 in sizes 2.5 inches and larger) shall be UL-listed and FM-approved.

A hose allowance of 100 gpm for light hazard occupancies will be added to the sprinkler demand. It will be compared to data provided by a required fire-flow test to assure adequate flow and pressure are available to protect the building, its contents, and its occupants.

The fire protection system shall be provided with a driven fire pump sized to properly provide the amount of water required by the number of standpipes. It will also be sized to achieve a required pressure of 100 pounds per square inch at the highest roof manifold. The specification of the fire pump shall be made in strict accordance with Chapter 20 of the NFPA. This pump shall be sized per hydraulic calculations of the design using the water-flow test data from the area’s water source as a reference point.

7.5 STRUCTURAL ENGINEERING OVERVIEW

The structural framing for this one-story facility is a concrete tilt-up building with interior steel framing. Four bays are in the east–west direction, and in the north–south direction the columns are spaced to accommodate truck traffic. The exterior tilt-up walls have openings that span about 32 feet to provide two lanes of truck access. Steel roll-up doors are required to close the truck entrances during storm conditions.

The interior framing consists of steel columns and steel beams or open-web steel joists at 5 feet on center supporting a steel roof deck, with rigid insulation or light-weight insulating concrete.

At the elevated loading dock areas there is a 4-foot change in elevation to facilitate container unloading. The other areas, including offices and restrooms, are at a lower elevation closer to the existing grades.

A geotechnical investigation shall be required. However, it is anticipated that shallow foundations will be required.

7.6 SITE UTILITIES OVERVIEW

The Consultant Team coordinated with Sunshine State One Call of Florida, Inc., to open a design ticket to obtain pertinent information for the utilities present within the proposed facility area. These utilities include power, telecommunication, gas, water, sewer, and other identified facilities. Refer to **Appendix E** for additional information.

While utility coordination was performed within the area, the A/E Consultant must continue these efforts and must continue to communicate with the utility providers for the most up-to-date information.

7.6.1 SEWER SERVICE

7.6.1.1 EXISTING CONDITIONS

A 48-inch force main runs along NW 72nd Avenue (Milam Dairy Road) along the southeast boundary of the proposed facility site. North of the proposed site is a 10-inch gravity sewer along NW 19th Street, which ultimately connects to Pump Station 19 (PS-19), located east of NW 70th Avenue, via a 36-inch gravity sewer along NW 22nd

Street. Existing sewer lines and force mains can be found via the Miami-Dade Water and Sewer Department Sewer Atlas, as provided in **Appendix F**, Sheets N13 and N13.5.

7.6.1.2 DESIGN REQUIREMENTS

Sewer service for the new facility shall be provided through a connection to the existing sanitary sewer collection system located along NW 19th Street via existing Manhole 33 (MH-33) at the intersection of NW 75th Avenue and NW 19th Street. The A/E Consultant shall be responsible for designing the sanitary sewer conveyance for the proposed fumigation facility and for the connection to the existing sanitary sewer collection system, so it meets the requirements of all agencies having jurisdiction over the project. The A/E Consultant shall evaluate how to collect and convey all sanitary flows from the proposed facility to the point of connection to the existing system. The A/E Consultant shall be responsible for determining the capacity requirements for the service connection to the proposed facility, considering average, minimum, and peak flow. The new sanitary sewer collection system shall be adequately sized and routed and shall not adversely impact the existing receiving system under peak-flow conditions.

The concept for the proposed sanitary sewer collection system consists of a new gravity sewer serving the facility, which connects to a grinder pump package system, a force main, a double-check valve assembly, or any other means necessary to appropriately convey demand flows.

Anticipated sewer demand flows have been estimated per the MDC Code of Ordinances Section 24.43-1, Liquid Waste Disposal and Potable Water Supply Systems. **Table 7-1** lists the total anticipated sewage flow. Based on facility square footage, the estimated sewage demand flow of 3,315 gallons per day (gpd; 2.3 gpm) will need to be accommodated.

TABLE 7-1 ESTIMATED FLOW DISTRIBUTION PER MIAMI-DADE COUNTY ORDINANCE SECTION 24.43-1 BASED ON FACILITY SQUARE FOOTAGE

LAND USE PER MDC ORDINANCE SEC. 24.43-1	SEWAGE FLOW PER MDC ORDINANCE SEC. 24.43-1 (GPD/100 SQ FT)	PROPOSED FACILITY AREA (SQ FT)	ESTIMATED SEWAGE DEMAND FLOW (GPD)
Fumigation Facility (TOTAL = 149,000 square feet)			
Warehouse / Spec. Building	2	138,737	2,774.74
Office Building	5	10,800	540.00
		TOTAL	**3,314.74**

NOTE: GPD – Gallons Per Day
SOURCE: Miami-Dade County, Miami-Dade County Ordinance Section 24.43-1, 1992.

Due to the exclusivity of a fumigation/refrigeration facility, the facility land use was identified as part "Warehouse/Spec. Bldg.," and the bathrooms were identified as "Office Building," per the Ordinance to approximate potential sewage demand flows. It is anticipated that the existing 10-inch gravity sewer for the proposed connection can provide sufficient capacity for the anticipated sewage flows, given that connecting to the existing 10-inch gravity main at MH-33 along NW 19th Street will bring the sewage to PS-19, which currently has a nominal average pump operation time (NAPOT) of 1.97, with a projected NAPOT of 2.02.

7.6.1.3 RECOMMENDATION

A recommended solution is to provide a grinder pump to receive sewage flow from the eastern façade of the facility, near the proposed tenant offices and restrooms, which are located near the center of the facility, via a 4-inch service weight cast-iron gravity main. Supplemental restrooms located at the north and south ends of the facility will also generate sewage to be received by the same grinder pump via 4-inch cast-iron gravity mains. Sewage shall be pumped through a proposed 2-inch ductile iron (DI) force main via a grinder pump with appropriate specifications, as determined by the A/E Consultant. The main will be located on the east side of the facility. It is estimated that 0.5 horsepower will be sufficient for the proposed flow; however, the A/E Consultant shall be responsible for selecting an adequate grinder pump with sufficient power and pressure capacity for anticipated peak flow. It is worth noting that a Sewer Capacity Certification (Allocation Letter) will be required for connecting to an existing sewer system, in order to certify that the sewer system can handle the demands of the new facility.

The 2-inch DI force main is proposed for connection from the proposed grinder pump to the existing 10-inch gravity sewer main via MH-33, located north of the site, along NW 19th Street. At the property line, the proposed 2-inch DI force main shall be equipped with a double-check valve assembly.

Exhibit 7-1 provides a schematic of the proposed configuration.

7.6.2 WATER SUPPLY

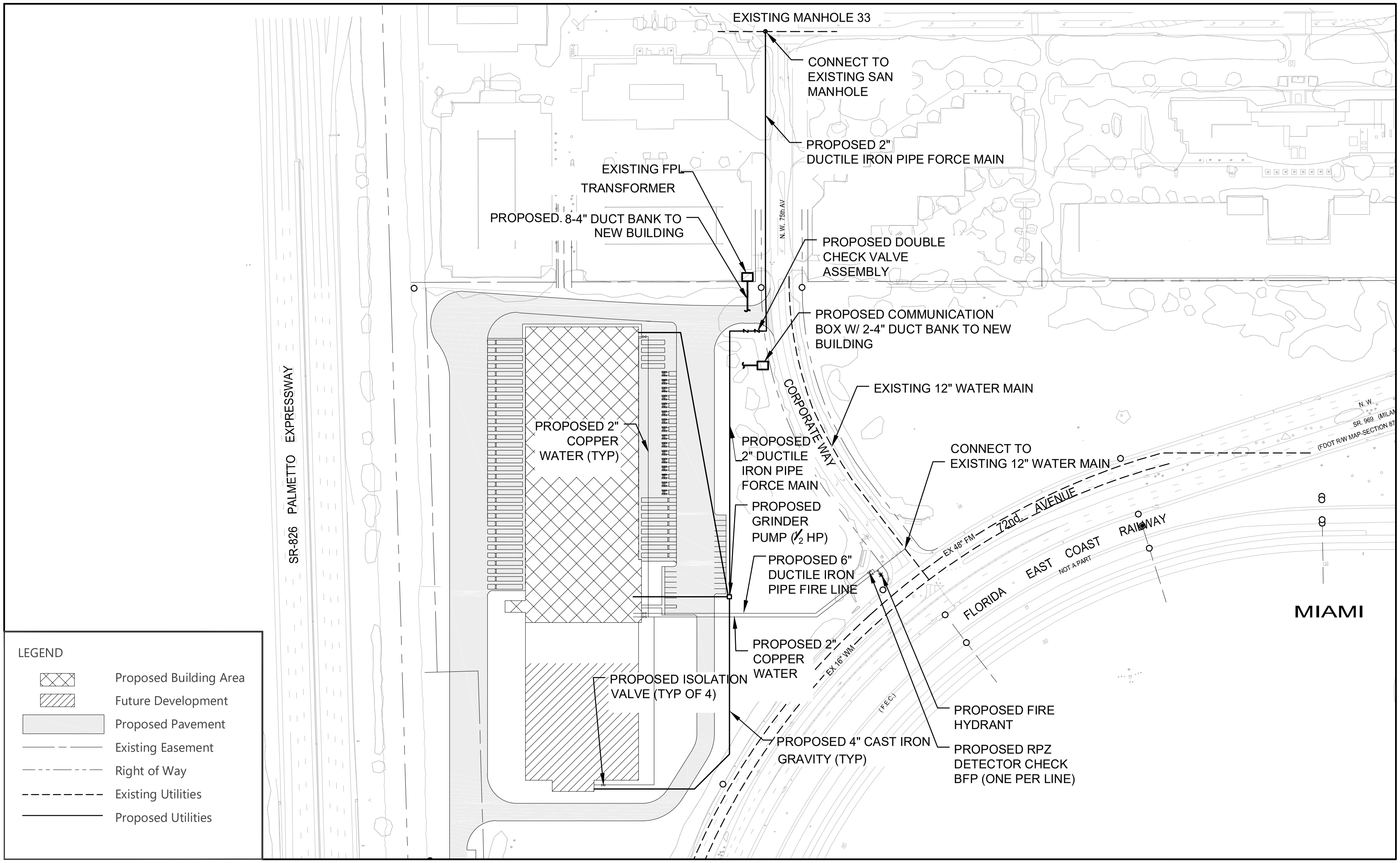
7.6.2.1 EXISTING CONDITIONS

Currently, a 12-inch ductile iron (DI) water main is in the general northeast direction of the proposed facility site, running along Corporate Way, and a 16-inch DI water main is in the general southeast direction of the proposed facility site, running along NW 72nd Avenue (Milam Dairy Road). Additionally, a plugged 12-inch water main that connects to the main 16-inch DI water main on Milam Dairy Road extends into NW 14th Street, approximately 74 feet from the 16-inch DI water main. Existing water distribution lines can be found via the Miami-Dade Water and Sewer Department Water Transmission Atlas, as provided in **Appendix G**, Sheets N13 and N13.5.

7.6.2.2 DESIGN REQUIREMENTS

Potable water service to the new facility will be provided through a connection to the existing water distribution system located along NW 75th Avenue (Corporate Way). The A/E Consultant shall be responsible for designing the new water mains and connections to the existing potable water distribution system to serve the potable water demands of the proposed fumigation facility, as well as determining flow requirements and the size of service connections, including fire flows and fire protection inside the structure. The on-site water distribution system will consist of new pressurized water mains, reduced pressure zone backflow preventers, isolation valves, or any other means necessary to convey water demand flows.

Sufficient flow is anticipated to be available in the existing 12-inch water main to meet the fire-flow demand and the requirements for the new facility; however, the A/E Consultant will be responsible for verifying the flow and pressures in the existing and new water main(s) are adequate and comply with Water and Sewer Department, local, and state requirements for new fire hydrants, new fire lines, and new water services, prior to finalizing a design for connecting to the existing water mains.



SOURCE: Nova Consulting, December 2018 (schematic drawings generated in CAD).

NORTH

0 250 ft

EXHIBIT 7-1

EXISTING AND PROPOSED UTILITIES CONCEPTUAL

Drawing: D:\Nova\Nova Consulting, Inc\MIAMI OFFICE - 02 - MIA CAD\30200 - Ricondo_Associates\02-02 - Fumigation Facility\01-D\FF_EXH-7_1 - EX-PROP-UT.dwgLayout: Layout1 Plotted: Jun 5, 2019, 05:31PM

Anticipated potable water consumption flows are expected to mirror those of the sewage flows. Table 7-1 lists the total estimated sewage flow per the MDC Code of Ordinances Section 24.43-1, Liquid Waste Disposal and Potable Water Supply Systems. Based on the proposed facility square footage, the water consumption flow estimated for the facility is 3,315 gpd (2.3 gpm).

Preliminary determination of fire flows has been conducted based on the MDC Code of Ordinances Section 2-103.21, Required Fire Flow, Consumption, Table 1. The proposed site falls within the GP zoning district per the Miami-Dade Zoning Map geographic information system (GIS) map application, which is not included in Table 1 of the MDC Code of Ordinances Section 2-103.21. However, based on the surrounding zonings (industrial districts), it is anticipated that the facility will adhere to the requirements for zonings IU-1, IU-2, IU-3, or IU-C (i.e., the system delivers not less than 3,000 gpm at 20 pounds per square inch residual on the system and that each fire hydrant delivers not less than 1,000 gpm). Water service and fire flow will be split near the property line; the flows will be delivered separately on-site, with backflow preventers and isolation valves in each line.

7.6.2.3 RECOMMENDATION (CONCEPTUAL PLAN FOR WATER SUPPLY)

An 8-inch DI water main is suggested for connection from the property to the existing 12-inch water main along NW 75th Avenue (Corporate Way). The 8-inch DI water main shall carry the water flow to the property line and into the site, immediately west of NW 75th Avenue. Near the property line, the 8-inch water main shall be split into a 2-inch copper potable water service line and a 6-inch DI fire supply line, each with an appropriately sized reduced-pressure zone detector check backflow preventer situated near the property line within the site. The 2-inch copper service lines shall split into two additional 2-inch copper service lines due to the layout of the facility's restrooms (one at each side). In addition, each water supply water main shall include an isolation valve.

The 6-inch fire line shall bring water supply into the facility near the tenant offices, while the 2-inch service lines will bring water supply to the tenant offices and the north and south supplemental restrooms. The reason for this is that it is anticipated that restrooms are to be located within the tenant office area in addition to the north and south supplemental restrooms.

One fire hydrant shall be provided on-site near the north property line, and additional fire hydrants will be located at the discretion of an MDC Fire Marshall. For purposes of this Conceptual Plan, one additional fire hydrant is proposed at the southwest corner of the property.

It is worth noting that a Water Supply Certification Letter will be required for connecting to an existing water supply system, in order to certify that adequate water supply is available following an increase in water consumption from the facility's water supply demands.

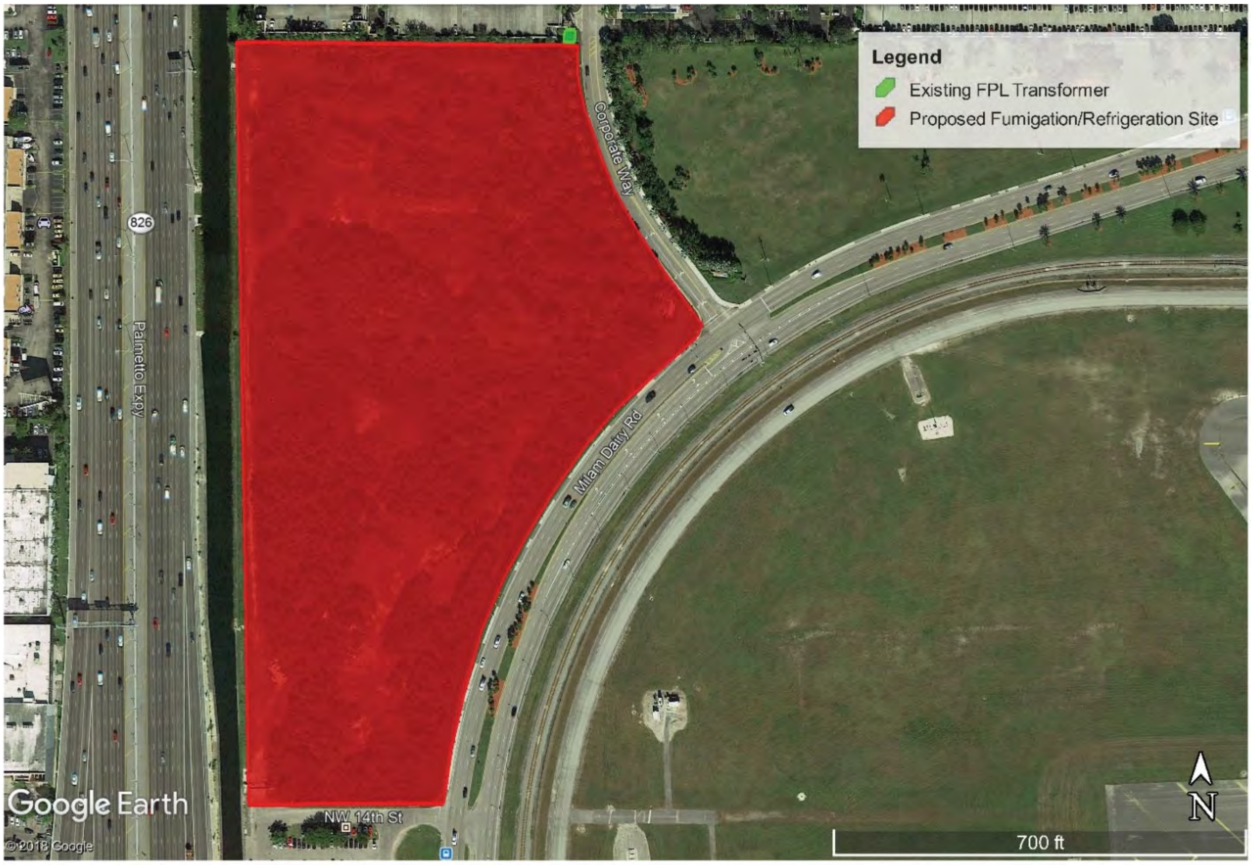
7.6.3 ELECTRICAL AND COMMUNICATIONS

7.6.3.1 EXISTING CONDITIONS

A FPL transformer is currently located near the southeast corner of an existing parking garage, north of the proposed facility site. It is anticipated that the power and telecommunications demand for the proposed facility will not be met by the existing transformer, potentially requiring the construction of a new transformer. **Exhibit 7-2** shows the location of the existing FPL transformer in relation to the proposed site.

Regarding communications service, attempts were made to contact AT&T to determine the location of the AT&T service, but no response was received.

EXHIBIT 7-2 EXISTING SUBSTATION NEAR PROPOSED FUMIGATION/REFRIGERATION FACILITY SITE



NOTE: FPL – Florida Power & Light
SOURCE: Nova Consulting, December 2018 (civil infrastructure improvements); Google Earth Pro, 2018.

7.6.3.2 DESIGN REQUIREMENTS

Coordination will be required between the A/E Consultant and FPL to connect to the existing transformer. Further coordination may potentially be required for the construction of a new transformer on-site to provide the required power, given that the refrigeration component of the facility is anticipated to require significant power.

Coordination with AT&T will also need to be conducted to bring the service to the east side of the property, along NW 75th Avenue. Power and telecommunications demand and requirements for the facility are discussed in the section 7.2 of this Project Book.

Power and communication lines shall be embedded in concrete encased conduits (duct banks) that follow MDAD requirements and specifications.

7.6.3.3 RECOMMENDATION

The A/E Consultant shall be responsible for designing the electrical and communication service connections, as well as conducting all necessary coordination with FPL and AT&T (communication provider) to bring all services to the north property line. This includes verifying new electrical infrastructure and equipment is sufficient to serve the electrical and power demands of the proposed Fumigation/Refrigeration facility, as well as determining the size of service connections or any other means necessary to supply electrical and communication demand, as required.

From the property line, an electrical duct bank is proposed consisting of eight 4-inch lines to bring power from the existing FPL transformer. The electrical duct bank shall be extended from the proposed transformer to a point of connection to the building, yet to be determined as of the time of this writing.

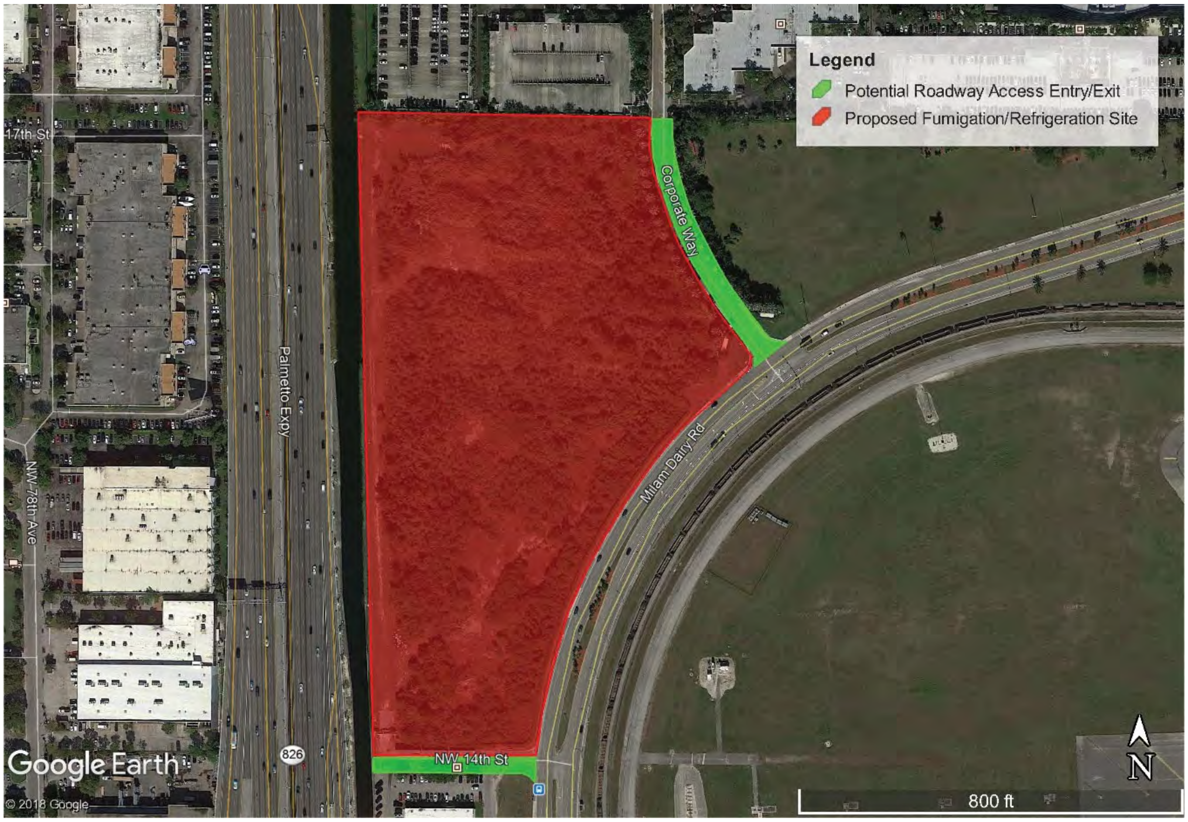
Additionally, also starting at the property line, a separate communication duct bank is proposed, consisting of two 4-inch lines to bring the communications to an on-site communications box. The communication duct bank should extend from the proposed communications box to a point of connection to the building, yet to be determined as of the time of this writing.

7.6.4 ACCESS ROADWAYS

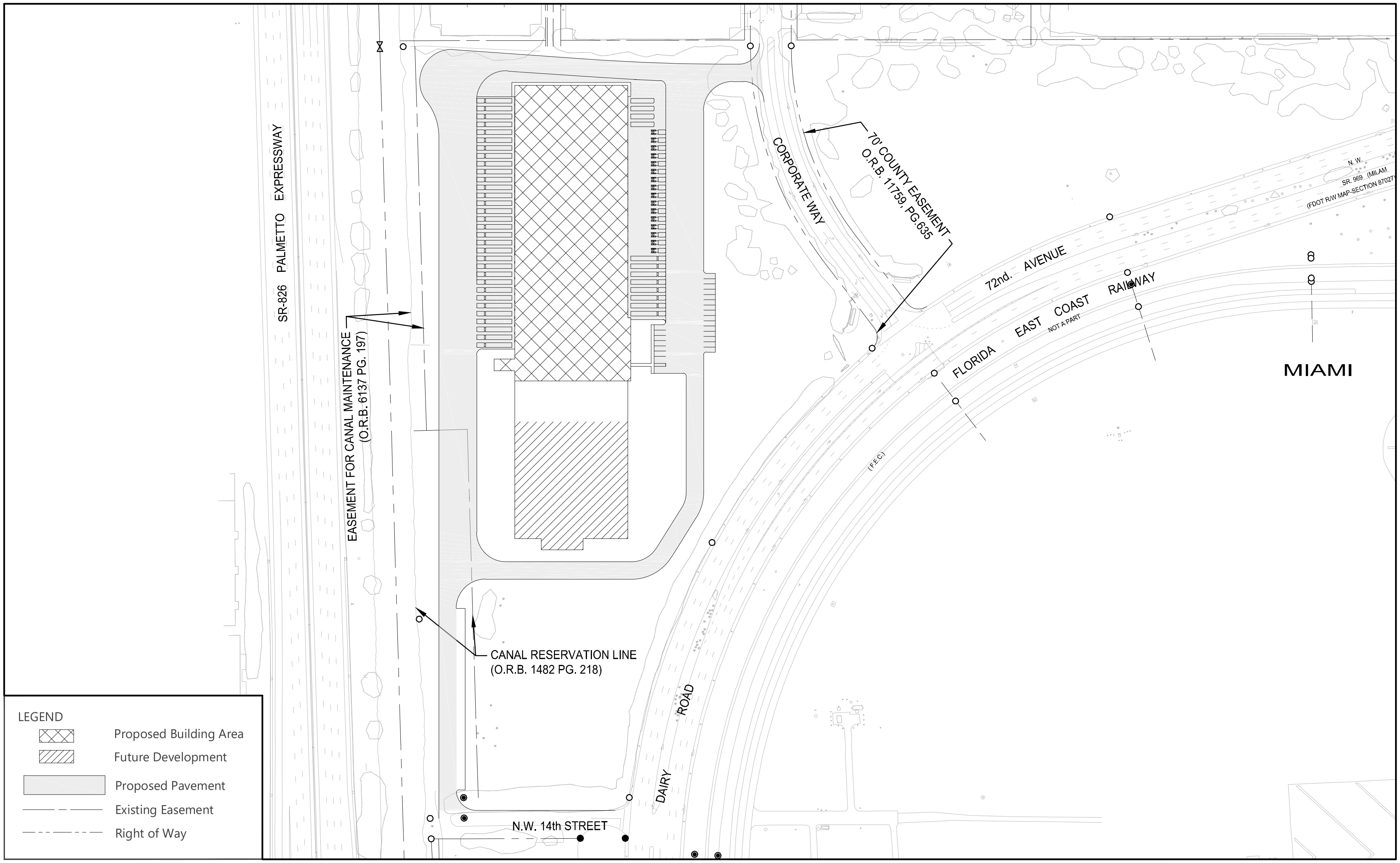
7.6.4.1 EXISTING CONDITIONS

The proposed project site is bound by two parking garages to the north, Corporate Way and Milam Dairy Road to the east, NW 14th Street to the south, and a canal east of Palmetto Expressway (SR 826) to the west. Access to the proposed facility site can be provided via Corporate Way and NW 14th Street. **Exhibit 7-3** illustrates the existing roadways that may be utilized for access into the proposed facility site. **Exhibit 7-4** depicts the proposed facility site, illustrating how the proposed internal roadway connects to the existing entry/exit roadways.

EXHIBIT 7-3 ENTRY/EXIT ACCESS ROADWAY TO PROPOSED FUMIGATION/REFRIGERATION SITE



SOURCE: Nova Consulting, December 2018 (civil infrastructure improvements); Google Earth Pro, 2018.



SOURCE: Nova Consulting, December 2018 (schematic drawings generated in CAD).

EXHIBIT 7-4

CONCEPTUAL SITE DEVELOPMENT

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7.6.4.2 DESIGN REQUIREMENTS

Based on the use of the facility, the largest expected vehicle to be accommodated by the access roadways into the proposed facility is a WB-50 Semi-Trailer (8.5 feet wide by 55.0 feet long). The turning radius on the access roadway and on internal roadways at the site were verified utilizing the Vehicle Tracking application on Civil 3D. **Exhibit 7-5** provides turning radius verification. In addition, operational requirements suggest the entry and exit points to be separated.

While vehicle maneuvering was considered, a traffic study to address existing and/or proposed traffic conditions/impacts resulting from additional loading generated by the new facility was not performed and is highly recommended to be performed as part of the design. The A/E Consultant shall verify the noted traffic conditions/impacts, including undertaking any traffic impact study necessary, and will provide further recommendations/solutions.

7.6.4.3 RECOMMENDATION

The A/E Consultant shall be responsible for verifying and designing the internal and external roadway system to serve the facility, including all necessary coordination with Miami-Dade County, MDAD and any other agencies involved. This includes verifying design vehicle requirements, access entry/exit routes, signalization, internal circulation, turning radius, parking, among others.

Based on adjacent roadways and operational requirements, it is recommended to use NW 14th Street as entry point at the southwest corner of the facility and NW 75th Avenue as exit point at the northeast corner of the facility. This proposed access route for trucks bringing products for fumigation and/or refrigeration on-site was deemed appropriate for accommodating the expected vehicle accessing the facility.

7.6.5 SITE DEVELOPMENT

7.6.5.1 FINISHED FLOOR ELEVATION

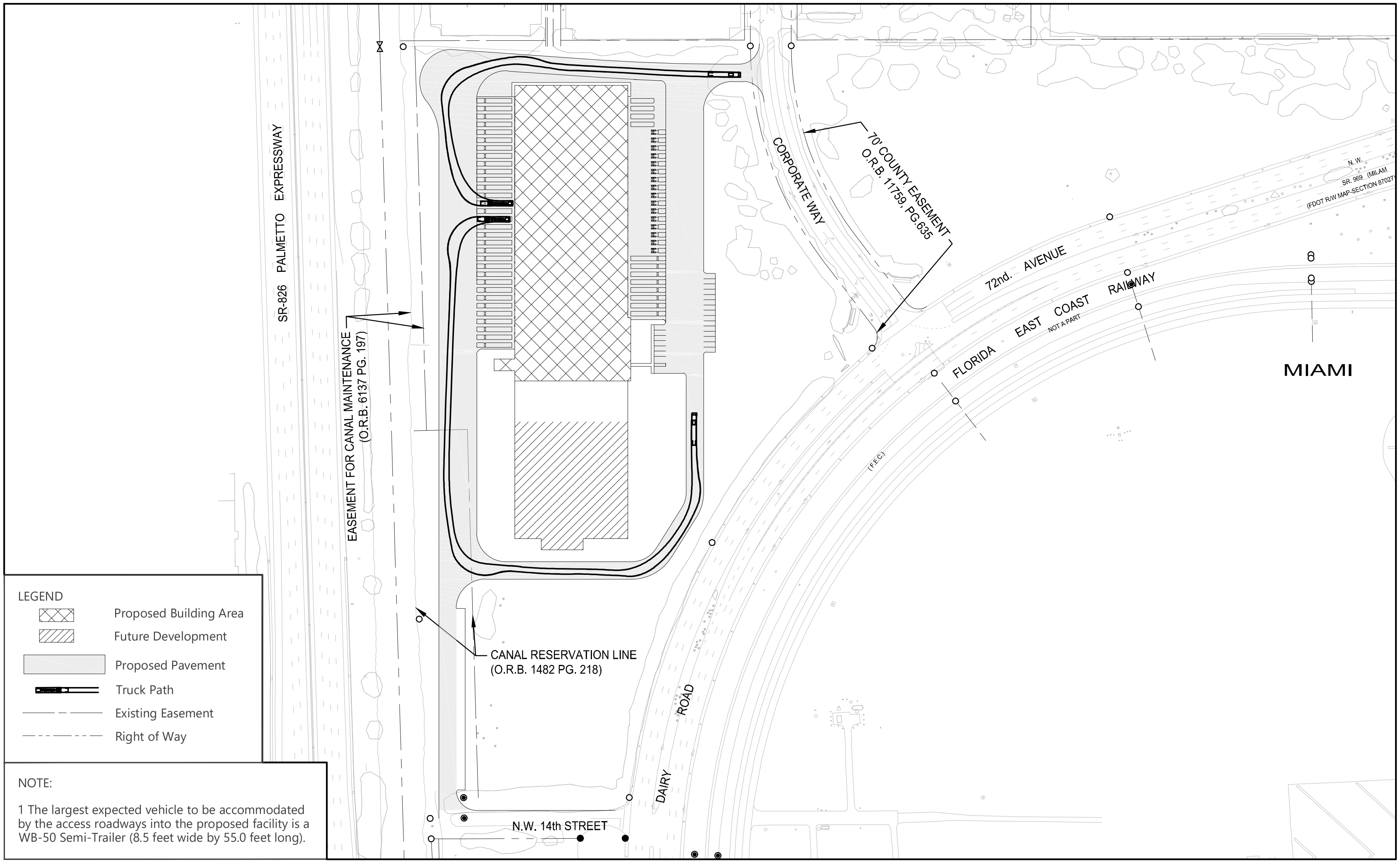
Existing Conditions

The current average site elevation, as obtained from the Miami-Dade County GIS 5-foot Digital Elevation Model using U.S. Geological Survey's light detection and ranging (LIDAR) data with elevations in the North American Vertical Datum of 1988 (NAVD88), ranges between 6 to 36 feet (NAVD88), with an approximate average site elevation of 15 feet (NAVD88). **Exhibit 7-6** shows the existing grading obtained with the LIDAR data.

Design Requirements

Building floors shall be above the 100-year flood elevation, as determined from the Federal Emergency Management Agency (FEMA) Flood Map Service Center's Flood Insurance Rate Map (FIRM). Based on the American Society of Civil Engineers 24-14, *Flood Resistant Design and Construction Standard*, and using a Flood Design Class 2, the minimum elevation of the lowest floor shall be the base flood elevation (BFE), as obtained from the FEMA FIRM, plus 1 foot. Based on mitigation measures applied for similar projects, an additional 6 inches is recommended to mitigate for sea-level rise.

The FEMA FIRM referenced is included in **Appendix H**, which depicts the zones applicable to the proposed site. The center and majority of the site falls within Zone X (area of minimal flood hazard), while the northeast boundary falls within Zone AH, and the west boundary falls within Zone AE. The BFE for Zones AE and AH per the FEMA FIRM is 7.00 feet, which translates to approximately 5.50 feet in the NAVD88.



NOTE:

1 The largest expected vehicle to be accommodated by the access roadways into the proposed facility is a WB-50 Semi-Trailer (8.5 feet wide by 55.0 feet long).

SOURCE: Nova Consulting, December 2018 (schematic drawings generated in CAD).

EXHIBIT 7-5

ACCESS ROAD MANEUVER VERIFICATION

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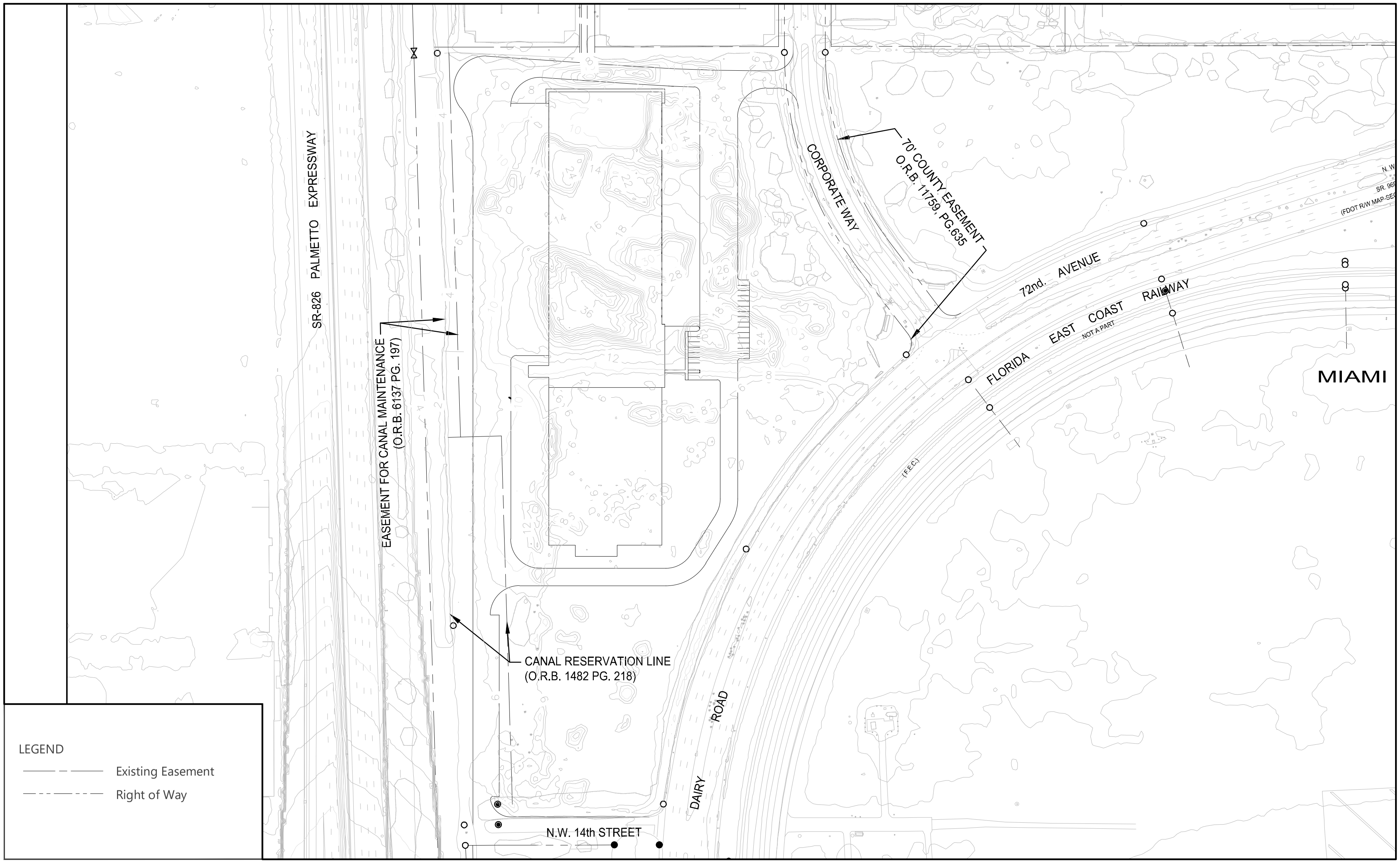

SOURCE: Nova Consulting, December 2018 (schematic drawings generated in CAD).

EXHIBIT 7-6

EXISTING GRADE ELEVATION

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Table 7-2 briefly describes the applicable flood zones.

TABLE 7-2 DESCRIPTION OF APPLICABLE PROPOSED SITE FLOOD ZONES

FLOOD ZONE	DESCRIPTION
AE	An area subject to inundation by 1.0% annual chance flooding, for which BFEs have been determined.
AH	An area subject to inundation by 1.0% annual chance shallow flooding (usually an area of ponding), for which BFEs have been determined; flood depths range from 1 to 3 feet.
X (unshaded)	Area of minimal flood hazard and higher than the elevation of the 0.2% annual chance flood.

NOTE: BFE – Base Flood Elevation
SOURCE: Nova Consulting, December 2018 (civil infrastructure improvements)

Recommendation

Using the BFE for Zones AE and AH of 5.50 feet (NAVD88) as the basis for determining the facility's finished floor elevation (FFE), this would yield a minimum required FFE of 7.00 feet (NAVD88), based on the design requirements for FFE described herein. However, given that the portions of the site that fall within Zones AE and/or AH are small compared to most of the site that falls within Zone X, it is recommended to provide an FFE of 10.0 feet (NAVD88) to maximize regrading efforts. Although the average existing grade elevation is approximately 15.0 feet (NAVD88), using an FFE of 10.0 feet (NAVD88) also mitigates an abrupt change in elevation from the neighboring entry/exit points to the site.

7.6.5.2 GRADING, PAVING, AND DRAINAGE

Existing Conditions

Based on MDC Public Records, the property is currently owned by MDAD Finance.

Upon search for existing permits associated with the property, no permits were identified that could confirm the existing grading and drainage conditions and/or any characteristics of the existing stormwater management system.

Exhibit 7-6 shows the existing grading within the project site. On-site elevations range from 6 to 36 feet (NAVD88), with the lower elevations between 6 to 8 feet (NAVD88), predominantly around the borders of the site. These conditions suggest a drainage flow direction from the center of the property towards the outer edges.

One existing water body may serve as an area that could receive overflow discharges from any proposed stormwater management system within the site—the North Line Canal that borders the entire west boundary of the site and is adjacent to State Road 826 (Palmetto Expressway). This canal is under jurisdiction of MDC, and it connects downstream to the South Florida Water Management District (SFWMD) C-4 Canal. Coordination with both agencies is anticipated to be required during design to confirm drainage conditions and requirements.

Design Requirements

For drainage assessment, based on the SFWMD Environmental Resource Permit (ERP) Applicant's Handbook: Volume II, a storm event of 3-day duration and 25-year return frequency was used for preliminary calculations. Per the handbook, for a 3-day rainfall and 25-year return period, the design storm for the project site amounts to 14 inches of rainfall in 3 days.

Per SFWMD guidelines, full on-site retention must be provided for the 3-day, 25-year storm event shall be used in sizing the elements of the proposed stormwater management system for the area. Off-site discharges are to be maintained to a minimum and are only allowed during exceptional extreme events. At a minimum, the first inch of rainfall that is not absorbed by the ground is required to be retained on site, prior to discharge. Eventual stormwater overflow discharge may be required in exceptional emergency situations, for which the North Line Canal may be utilized. Any overflow discharge water must be authorized by the Department of Environmental Resources Management (DERM) and SFWMD and pre-treated to an acceptable level of water quality. The discharge rate must never exceed the maximum allowable flow as defined by the SFWMD and DERM. Coordination with the SFWMD and DERM will be required at the time of preliminary design to confirm all permitting requirements, including the allowable rates for overflow discharge criteria.

Upon consultation with DERM for this Project Book, it was determined that the North Line Canal on the west side of the property may receive overflow discharges in case of an extreme event.

Design Storm

Unless otherwise specified by previous permits or criteria, full on-site retention of a storm event of 3-day duration and 25-year return frequency will be used in sizing the elements of the proposed stormwater management system. Off-site discharges are to be maintained to a minimum and are only allowed during exceptional extreme events. Coordination with the SFWMD and DERM will be required at the time of preliminary design to confirm all permitting requirements, including the allowable rates for overflow discharge criteria.

Upon consultation with DERM for this Project Book, it was determined that the North Line Canal located along the west boundary of the property may receive overflow discharges in case of an extreme event.

Water Quantity

The A/E Consultant shall submit flood routing calculations as part of the ERP submittal to identify combinations of site conditions (i.e., grading, drainage patterns, exfiltration rates) and rainfall frequencies, which should result in an acceptable impact to the site and/or surrounding properties.

Off-Site Discharge Rate

The off-site discharge rate is limited to exceptional extreme events, as well as limited to rates not causing adverse impacts to existing off-site properties:

- historic discharge rates
- rates determined in previous district permit actions
- rates specified in district criteria

Close coordination by the A/E Consultant with the governing environmental agencies (DERM and SFWMD) will be required during design to determine the allowable off-site discharge rates for storms exceeding the design storm event.

Water Quality

The water quality criteria set by SFWMD (ERP Applicant’s Handbook: Volume II) is a volumetric value that must be provided within retention, detention, or both retention and detention in the overall system, including swales, exfiltration trenches, lakes, canals, or greenways. The criteria will be provided for one of the three following criteria, or equivalent combinations thereof:

- Wet detention volume shall be provided for the first inch of runoff from the developed project, or the total runoff of 2.5 inches times the percentage of imperviousness, whichever is greater.
- Dry detention volume shall be provided equal to 75 percent of the amounts computed for wet detention.
- Retention volume shall be provided equal to 50 percent of the amounts computed for wet detention.

Wet retention ponds are not a suitable stormwater drainage design alternative per FAA Advisory Circular 150/5200-33B; therefore, the A/E Consultant shall use other methods of detention.

Since this facility may be considered industrial due to surrounding properties with industrial zoning, an additional 50 percent of the dry detention volume shall be provided, unless reasonable assurance can be offered during design that hazardous materials will not enter the surface water management system.

Dry detention areas shall be designed to have a minimum bottom elevation equal to a minimum 1 foot above the average ground water level.

Close coordination by the A/E Consultant with the environmental agencies (DERM and SFWMD) is required during design to determine the requirements for water quality, as well as to determine the stormwater management features to be utilized to meet the criteria.

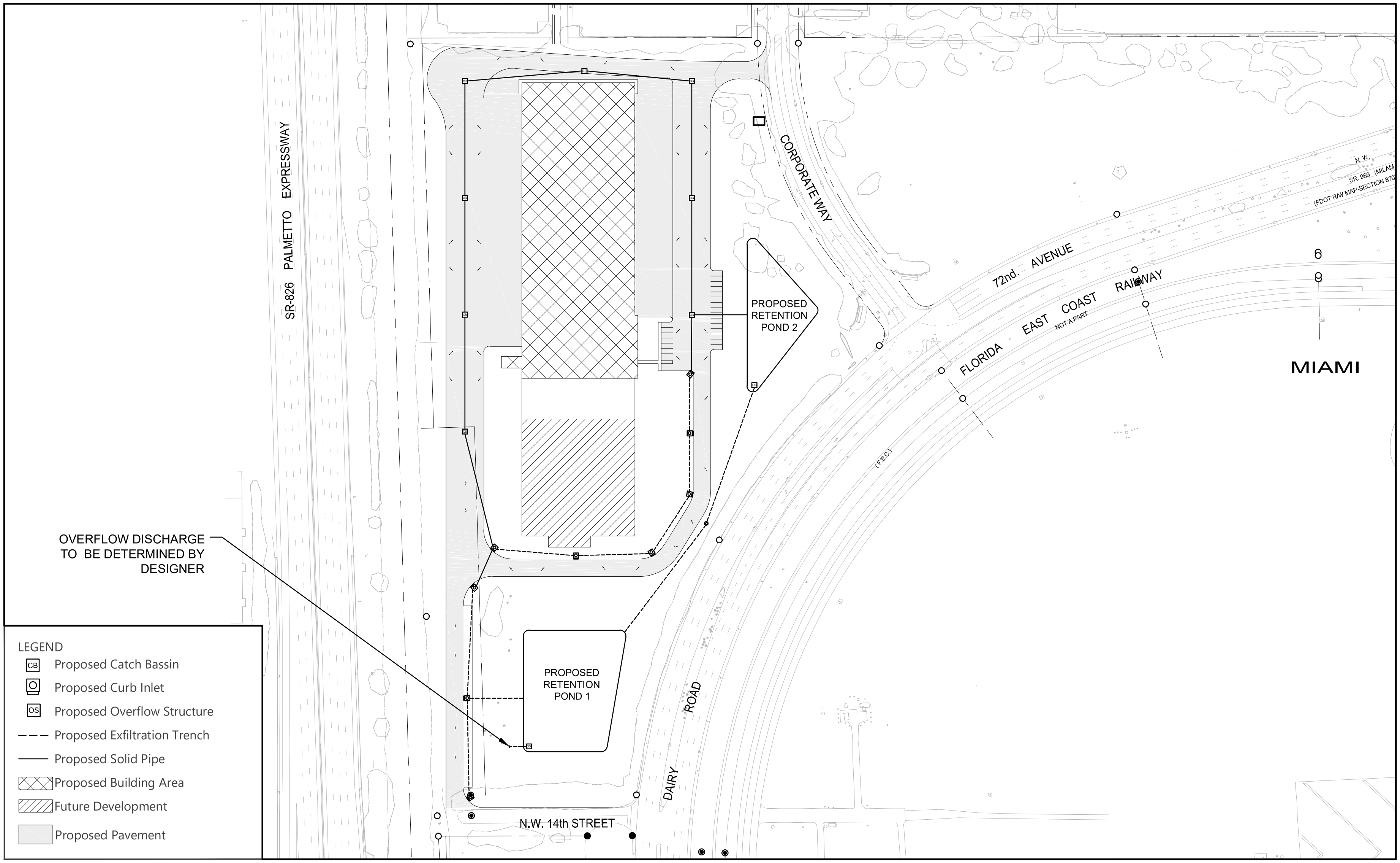
Recommendation

The drainage system shall consist of a combination of proposed catch basins, pipes, exfiltration trenches, and dry detention areas. The drainage design concept would consist of catch basins that would collect the entire runoff from the site and would convey the stormwater flows to the proposed exfiltration trenches located underneath swales and pervious areas for storage, treatment, and infiltration. Dry detention areas shall collect stormwater flows from saturated exfiltration trenches, which shall sit on a gravel filter bed to assist in the draining of the collected stormwater. The A/E Consultant shall ensure that the dry detention areas are designed with a 48-hour maximum detention period and will stay completely dry between storms per FAA Advisory Circular 150/5200-33B.

Based on preliminary drainage assessment, the linear feet of proposed exfiltration trenches that can be accommodated together with the storage provided by the proposed dry detention areas, appear to be sufficient to provide the required full on-site containment of the 3-day, 25-year design storm event. In the case of an extreme event, an overflow connection will be required. Adjacent to the proposed site on the west side is the North Line Canal. A DERM Class II permit is required for the construction of a drainage system with overflow on any water body.

The A/E Consultant shall verify the above recommendation, conduct all geotechnical and percolation testing to obtain site-specific parameters (i.e., hydraulic conductivity) and will coordinate with DERM and SFWMD to ensure the design calculations meet permit requirements.

Exhibit 7-7 illustrates the proposed elements for a conceptual stormwater management system for the project site. This preliminary concept considers the elements discussed in this section regarding the FFE, site grading, drainage structures and well, retention/detention areas, and exfiltration trenches.



SOURCE: Nova Consulting, December 2018 (schematic drawings generated in CAD).

EXHIBIT 7-7

SITE DRAINAGE CONCEPTUAL PLAN

Drawing: D:\Nova\Nova Consulting, Inc\MIAMI OFFICE - 02 - MIA CAD\30200 - Ricondo_Associates\02-02 - Fumigation Facility\01-D\FF_EXH-7_7 - PROPOSED-DRAINAGE.dwgLayout: Layout1 Plotted: Jun 6, 2019, 08:50AM

7.6.6 ENVIRONMENTAL CONSIDERATIONS

The subject property is located on the west side of Milam Dairy Road (NW 72nd Avenue), between NW 14th Street and Corporate Way. It is currently part of two folios, 30-3035-000-0072 and 30-3035-000-0090, both owned by the Miami-Dade County Aviation Department. Based on review of historical aerial imagery using Google Earth, the subject property seems to have been cleared between 1999 and 2002, and used for temporary storage of various items, including drainage structures and possibly storage trailers, and soil stockpiling from approximately 2002 to 2013. The subject property seems to have remained unused since 2013, and the majority of the original foliage has returned. A desktop historical file review was conducted for the subject property, utilizing the Miami-Dade County Department of Environmental Resource Management (DERM) online database and Environmental Considerations GIS (ECG) Tool, and the Florida Department of Environmental Protection (FDEP) online database tools, Oculus and Map Direct.

Although no files in regard to historical site use and environmental concerns were found, a DERM file number was provided by DERM for inclusion in this Project Book. As per DERM's file number ARP-162, the site has been historically used for contaminated soil staging. As such, stockpiled soil should be sampled and assessed for either disposal criteria or for soil reuse, in accordance with the DERM Soil Reuse Guidelines.

Due to the unknown nature of the stockpiled soil and temporary storage trailers noted in the aerial images, there is a possibility that these practices pose an environmental risk in which various chemicals may have leached into the soil and/or groundwater over time. As such, it is recommended that the underlying soil and groundwater be assessed as well. A sampling plan, based on site history and soil pile data, shall be submitted to DERM for review and approval prior to subsurface investigations. Based on the sample results for the site, the preparation of a soil management plan, dust control plan, and health and safety plan may be required to be submitted to DERM for review and approval prior to construction. Additionally, drainage design will be dependent on the results of the groundwater sampling. The A/E Consultant shall be responsible for implementing the appropriate drainage requirements if contamination is present, including but not limited to obtaining a Class VI drainage permit, as stormwater will not be allowed to percolate in areas where groundwater is determined to be contaminated.

8. ROUGH-ORDER-OF-MAGNITUDE COST ESTIMATE AND SCHEDULE

8.1 ROUGH-ORDER-OF-MAGNITUDE COST ESTIMATE AND PROJECT SCHEDULE

Preliminary cost estimates for the proposed fumigation facility are presented in **Appendix I**. The ROM cost estimates are tabulated in 2018 dollars and include provisions for site preparation, new construction, and soft costs. In summary, the total estimated ROM cost for the proposed fumigation facility is $63.1 million (in 2018 dollars).

8.1.1 COST ASSUMPTIONS – GENERAL

Site preparation, including building foundations, will be needed to clear the site. The existing site is currently served by active utilities, including fire water main, potable water, and sewer. Dry utilities include gas, electrical, and telecommunications. For the proposed location, a full environmental study is recommended prior to commencing work.

The cost estimates only include the construction of the building shell and utilities; the building interior/equipment is assumed to be added by the fumigation operators selected for the project.

The following assumptions were made as part of the soft-cost estimates:

- A/E Consultant services (including owner's allowance): 16.0 percent of total direct construction costs
- Construction Support (including owner's allowance and permitting): 26.5 percent of total direct construction costs
- Indirect Costs: 6.5 percent of total direct construction costs

8.1.2 PRELIMINARY PROJECT SCHEDULE

The proposed fumigation facility shall be constructed in accordance with MDAD's Master Capital Project List. Per MDAD's Master Project List, the proposed facility would commence in 2019. Inclusive of planning, design, procurement, bidding, and construction, it is estimated that it would take approximately 4 years to design and build the facility, with a target operational date set for May 2023 for Phase 1, assuming the planning for the project begins January 2019.

The new fumigation facility project does not have any predecessor, and it can be completed independently of other projects currently shown on MDAD's Master Project List.

8.2 OPEN/OUTSTANDING ISSUES

The proposed fumigation facility may affect the circulation on Milan Dairy Road. Therefore, a traffic study is recommended to assess the potential impacts on Milan Dairy Road during the construction phase of the proposed facility.

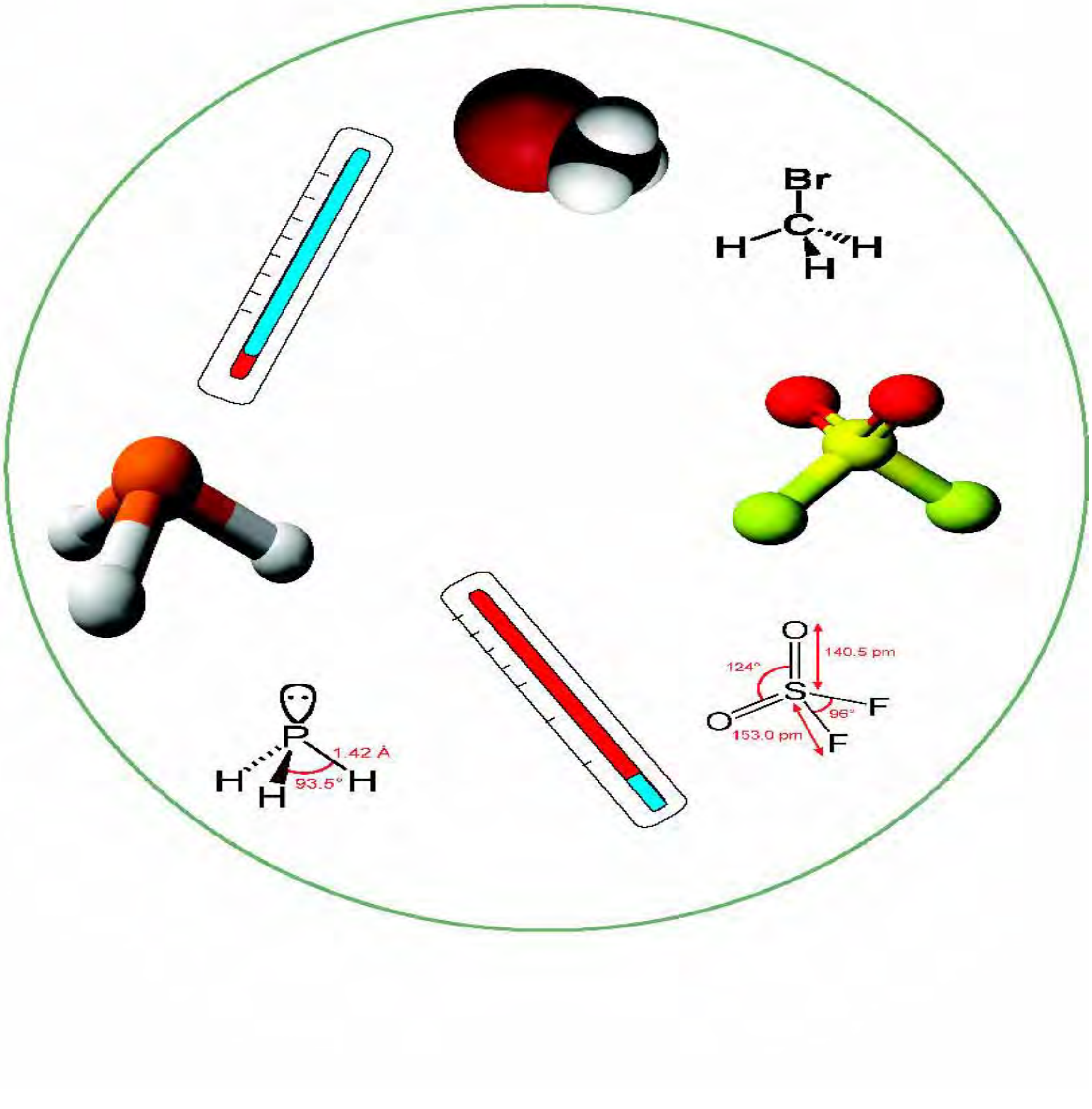
Furthermore, none of the two fumigation operators at MIA provided feedback on the final facility concepts. Thus, concurrence from Termite Doctor and Al-Flex on the final facility layout will be desirable, as MDAD could be accommodating multiple operators at the new facility.

APPENDIX A

United States Department of Agriculture Treatment Manual

United States Department of Agriculture

Treatment Manual



Some processes, equipment, and materials described in this manual may be patented. Inclusion in this manual does not constitute permission for use from the patent owner. The use of any patented invention in the performance of the processes described in this manual is solely the responsibility of the user. APHIS does not indemnify the user against liability for patent infringement and will not be liable to the user or to any third party for patent infringement.

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When using pesticides, read and follow all label instructions.

2

Treatment Manual

Chemical Treatments

Fumigants • Methyl Bromide

Contents

Properties and Use

Methyl bromide (MB) (CH_3Br) is a colorless, odorless, nonflammable fumigant. MB boils at 38.5 °F and has a very low solubility in water. As a gas, MB is three times heavier than air. As a liquid at 32 °F, 1 pound of MB is equivalent to 262 ml. For ease in transportation and handling, MB is compressed and stored in metal cylinders as a liquid.

MB is an effective fumigant for treating a wide variety of plant pests associated with a wide variety of commodities. MB is the most frequently used fumigant in quarantine fumigations. MB may also be used to devitalize plant material. MB is effective in treating the following pests:

- Insects (all life stages)
- Mites and ticks (all life stages)
- Nematodes (including cysts)
- Snails and slugs
- Fungi (such as oak wilt fungus)

MB is effective over a wide range of temperatures (40 °F and above). In general, living plant material tolerates the dosage rate specified, although the degree of tolerance varies with species, variety, stage of growth, and condition of the plant material. MB accelerates the decomposition of plants in poor condition.

Since MB is three times heavier than air, it diffuses outward and downward readily, but requires fans to ensure upward movement and equal gas distribution. Fan circulation also enhances penetration of MB into the commodity. A volatilizer is used to heat the liquid MB in order to speed up its conversion to a gas. Once the gas is evenly distributed, it maintains that condition for the duration of the treatment unless an outside event such as excessive leakage occurs.

Section 18 Exemption Treatment Schedules

Methyl bromide fumigants, except those with “Q” labels, may be subject to requirements of the FIFRA Section 18 Quarantine Exemption. When commodities intended for food or feed are fumigated with methyl bromide under the FIFRA Section 18 Quarantine Exemption, one additional EPA *requirement* must be met: PPQ must monitor aeration by sampling the gas concentration to determine when a commodity may be released.

The EPA defines a Federal quarantine exemption (40 CFR 166.2(b)) as “A quarantine exemption may be authorized in an emergency condition to control the introduction or spread of any pest new to or not theretofore known to be widely prevalent or distributed within and throughout the United States and its territories.”

The section 18 Crisis Exemption has been amended to permit treatment of commodities that are at risk for carrying Federal quarantine pests. This means that treatments are permitted not only for imported commodities, but also for domestic commodities growing in areas under quarantine for a regulated pest. This exemption does not authorize treatments of domestically grown commodities for export certification **unless** the treatment is necessary to move the commodity out of quarantine, i.e. the target pests must be Federally regulated pests.

In this manual, fumigation schedules under the FIFRA Section 18 Quarantine Exemption are followed by an “Important” note to help you determine the current exemption status. For example:

Example Treatment Schedule Table			

Important

Do **not** use this treatment schedule if its FIFRA Section 18 Exemption has expired. For the current exemption status, call your local State Plant Health Director (SPHD).

Table 2-3-1 is a list of commodities covered by the FIFRA Section 18 exemption. This list will expire on March 01, 2020.

Table 2-3-1 List of Commodities Covered by FIFRA Section 18 Exemption

Commodity	Minimum Temperature (F)	Maximum Dosage Range (lb/1000 ft^3)	Exposure Period (hours)
Avocado	70	4	4
Banana and Plantain (fruit)	40	4	2
Banana leaf	40	4	2
Blueberry and unlabeled commodities from the berry and small fruit crop group 13-07	40	4	4
Cacti, edible (includes Opuntia)	40	4	3.5
Coffee bean (green, unroasted)	40	9	12
Coconut (unprocessed, whole coconut without husk)	60	2.5	2
Cottonseed (for animal feed)	40	7	24
	40	5	48
Cucurbit seed (unprocessed)	40	9	12
Dasheen (root and tuber)	40	4	4
Figs, fresh	40	4	3
Flowers, squash and lorocco	40	4	2
Genip (Spanish Lime)	40	4	4
Herbs and spices, fresh (crop group 19)	40	4	4
Ivy gourd	40	4	2
Kaffir lime leaves	40	4	2
Kola nut (cola)	40	6	6
Longan	60	4	2
Lychee fruit	40	4	2
Mango	40	4	2
Mint, dried	40	3	24
Mint, fresh	40	4	2
Oilseed (crop group 20)	40	9	12
Persimmon	40	4	2
Pitahaya (pitaya or dragon fruit)[1]	40	4	2
Pomegranate, fresh	40	4	3
Pointed gourd	40	4	2
Rambutan	60	4	2
Seeds in the family Malvaceae for food use, including hibiscus and kenaf seed	40	3.5	2
Unlabeled commodities in the leaves of legume vegetable crop group 7[2]	40	4	2.5
Unlabeled commodities in the root and tuber crop group 1[2]	60	3	3.5
Unlabeled commodities in the stone fruit crop group (12-12)[2] (i.e. pluot, plumcot, aprium, cherrycot, peachcot)	40	4	3

Table 2-3-1 List of Commodities Covered by FIFRA Section 18 Exemption (continued)

Commodity	Minimum Temperature (F)	Maximum Dosage Range (lb/1000 ft^3)	Exposure Period (hours)
Unlabeled commodities in the Bulb Vegetable crop group (3-07) [2]	40	4	4
Unlabeled commodities in the stalk, stem, and leaf petiole crop group 22[2]	40	4	3.5
Unlabeled commodities in the following crop groups[2]: ◆ Brassica leafy vegetables (crop group 5) ◆ Curcurbit vegetables (crop group 9) ◆ Edible podded legume vegetables (crop group 6A) ◆ Fruiting vegetable (crop group 8-10) ◆ Leafy vegetables (except Brassica) (crop group 4) ◆ Leaves of roots and tubers (i.e. chicory) (crop group 2) ◆ Tropical and subtropical fruit, edible peel (crop group 23) ◆ Tropical and subtropical fruit, inedible peel (crop group 24)	40	4	2

1 Dragon fruit is also known as pitahaya or pitaya. Refer to the *List of Scientific Names of Admissible Dragon Fruit* for more information.

2 The EPA crop groups are listed in Appendix F on **page F-1** for quick reference. Refer to 40 CFR 180.41 Crop Group Tables for the official list of commodities within each crop group. **NOTE:** If you have questions regarding what commodities are covered by a particular crop group or whether or not a commodity is labeled or unlabeled, CONTACT Field Operations at 919-855-7336.

The EPA only authorizes fumigation of commodities if they are listed on the label of the gas being used for the fumigation. The fumigator is responsible for ensuring that the commodity, its dosage, and the treatment duration is listed either on the product label or within the Section 18 authorization letter, which the PPQ officer should have readily available for any fumigator who requests it. The methyl bromide products that fumigators are authorized to use for Section 18 treatments are identified within the Section 18 authorization letter. To comply with State requirements, the fumigator is responsible for ensuring that the fumigant is registered in the State where it is being used.

Fumigation schedules in this publication are more detailed than what is provided in commercial labels in order to ensure that the phytosanitary treatments of imported commodities are efficacious.

When the treatment schedule is marked “MB”, **any** methyl bromide fumigant may be used for the fumigation as long as the commodity, its dosage, and treatment duration are on the fumigant label.

Leak Detection and Gas Analysis

Require the fumigator to use an APHIS-approved gas detection device to measure gas concentration levels in tarpaulins. Require the fumigator to use an APHIS-approved leak detection device primarily to check for leaks around tarpaulins, chambers, application equipment, and as a safety device around the fumigation site. For a partial list of manufacturers of detection devices, refer to **Reference Guide to Commercial Suppliers of Treatment and Related Safety Equipment**. Colorimetric tubes, which are supplied by the fumigator, are used to measure gas concentration levels during aeration.

2016 Methyl Bromide Label Information

In 2015, the Environmental Protection Agency (EPA) directed all methyl bromide (MB) registrants to amend the use directions on the labels of all 100% MB products. EPA required the changes in order to reflect recommendations in an EPA report.[1]

These amendments modify the use directions for fumigation and aeration procedures, modify respiratory requirements and equipment and update gas monitoring equipment. EPA requires all labels on newly manufactured MB to reflect these recommendations effective **October 01, 2016**; however, EPA is allowing existing stocks of MB to be used in accordance with the use directions on the existing stock's (older) labels.

PPQ officials and fumigators **must** closely examine gas cylinder labels in order to validate that the dosage, exposure, and commodity are either on the cylinder label or covered by a FIFRA Section 18 exemption. If a label is **not** affixed to the cylinder, DO NOT allow the fumigator to use that cylinder.

New Buffer Zone Requirements

All 2016 MB labels now require both a treatment and an aeration buffer zone. Both the treatment and aeration buffer zones are specific to the enclosure being fumigated and **must** be determined by visiting a website link[2] provided in every MB label. The fumigators are responsible for using this website to determine the buffer zones and reporting both buffer zones to the PPQ official. If the treatment buffer zone is determined to be less than 30 feet, the PPQ official will maintain PPQ's standard 30 foot treatment buffer zone; otherwise, the new treatment buffer zone **must** be observed.

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[1] "Report of Food Quality Protection Act (FQPA) Tolerance Reassessment and Risk Management Decision (TRED) for methyl bromide, and Reregistration Eligibility Decision (RED) for Methyl Bromide's Commodity Uses", dated August 2006. (https://archive.epa.gov/pesticides/reregistration/web/pdf/methyl_bromide_tred.pdf)

[2] https://www.epa.gov/pesticide-registration/mbcommoditybuffer

If the aeration buffer zone is determined to be less than 200 feet, then PPQ's standard "200 feet for 10 minutes" aeration buffer zone **still** applies for the first 10 minutes of aeration. The fumigator **must** refer to EPA's website to determine the minimum aeration buffer zone to be maintained until the aeration period is complete and the fumigator has verified that gas concentration levels meet the conditions in the MB label.

Transiting through buffer zones

The label permits vehicles to transit through both treatment and aeration buffer zones under specific conditions found in the label; it is up to the fumigator determine how or whether vehicles may transit in accordance with the label.

When using the newer 2016 MB label, changes to certain procedures and equipment in this chapter are displayed in a NOTICE box with a heading titled "MB 2016 Label".

MB 2016 Label (example)

NOTICE

Use this information when the fumigator is using the 2016 MB label.

When using existing stocks, follow the equipment and procedural guidance that is displayed in the body of the text (outside of the NOTICE box).

If there is no "MB 2016 Label" NOTICE box, then the instructions apply to all MB labels, 2016 and older.

MB 2016 Label

NOTICE

The PPQ official and the fumigator must use the following leak detection and gas analysis equipment:

- An air purifying NIOSH certified half-mask or full face piece respirator when gas concentrations are between 1 and 5 ppm
- A self contained breathing apparatus (SCBA) NIOSH approved prefix TC-13F when gas concentrations are 5 ppm or above
- An APHIS-approved continuous real time gas monitoring device that is permanently mounted in PPQ owned facilities or a portable photoionization detector to monitor gas concentrations in the breathing space
- An APHIS-approved direct read gas detection device, such as colorimetric tubes, to determine gas concentrations when aerating and releasing the commodity

For a list of manufacturers and approved models refer to **Reference Guide to Commercial Suppliers of Treatment and Related Safety Equipment**.

PPQ policy is to wear appropriate respiratory protection when air concentrations are above 1 ppm. However, the new MB labels allow workers to be present without respiratory protection for specific time limits over a 24-hour period when air concentrations are:

- >3 to 5 ppm (90 minutes),
- >2 to 3 ppm (160 minutes),
- >1 to 2 ppm (4 hours), and
- >0 to 1 ppm (8 hours).

These permissible work-time allowances will give the PPQ official sufficient time to calmly locate and don the appropriate respiratory protection should their PID (alarm set to go off at 1 ppm) indicate the presence of MB in the air.

Effects of Temperature and Humidity

MB is effective at the same temperatures plants are generally handled (usually 40 °F and above). In general, increases in temperature give a corresponding increase in the effectiveness of MB. All treatment schedule temperatures are listed with the corresponding dosage rate. Follow the dosage rates listed. A Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Section 3 registration (the labeled rate of MB provided), or a Section 18 Exemption must be in effect at the time of treatment.

For live plant material which is actively growing or with leaves, maintain a high percentage of humidity (above 75 percent) in the chamber by placing wet sphagnum or excelsior in the chamber or by wetting the chamber walls and floor. Protect actively growing or delicate plants from the direct air flow of fans. Do **not** add any moisture to the chamber when fumigating seeds. Too much moisture on the material to be fumigated may prevent the fumigant from reaching some of the pests.

Penetration and Aeration of Boxes and Packages

Plastic wrappings such as cellophane, films, and shrink wrap, and papers that are waxed, laminated, or waterproofed are **not** readily permeable and **must** be perforated, removed, or opened before fumigation. Approved packaging materials may be layered as long as perforations allow adequate MB penetration.

Important

Inform prospective importers that all packaging used in USDA quarantine fumigations **must** comply with these Manual specifications or be approved by CPHST-TMT.

USDA-APHIS-PPQ-S&T-CPHST-TMT
1730 Varsity Drive, Suite 300
Raleigh, NC 27606
919-855-7450

The following is a partial list of approved packaging materials:

- Dry cloth
- Dry, non-waxed or non-painted cardboard
- Dry, non-waxed or non-painted non-glossy paper

- Dry, woven fabrics and plastics
    - Woven polypropylene bags that are **not** laminated with plastic or paper inside or out (these bags are typically used for holding seeds or grains)
    - Bags containing a large quantity of seeds or grains (>2,000 lbs.) are referred to as “super sacks” or “totes” and must have the top of the bag opened to aid in fumigant dispersal and aeration
- Dupont™ Tyvek® Air Cargo Covers (refer to Chapter 8—Equipment **Dupont™ Tyvec® Air Cargo Covers** for more information)
- Pac-Armor™ (Safeguard Global LLC)
- Perforated plastics with evenly distributed holes on all sides and 0.93 percent open area of surface, for example:
    - Holes that are 3/16-inch in diameter every 3 square inches
    - Holes that are 1/4-inch in diameter every 4 square inches
    - 49+ pinholes per square inch
- Plastic clamshells
    - Evenly distributed holes on all sides and 0.93 percent open area of surface
    - Holes on top and bottom must not be blocked when clamshells are stacked (i.e. clamshells must have recesses or ridges to prevent blockage)
- Seed packets (from Thompson & Morgan (UK) Ltd.)
- SmartPac liner with 0.3% vented area (Quimas S.A. Chile)
- Wooden boxes (lids removed if tightly sealed)

If a commodity is NOT undergoing fumigation, a consignment cannot be rejected because of packaging.

Important

Inform prospective importers that the wrappings on their shipments may have to be perforated according to PPQ specifications, removed, or opened if PPQ requires fumigation. PPQ is not responsible for opening or perforating the wrapping.

To expedite commodity movement, importers should send a complete bag/wrap sample to CPHST-TMT for inspection and approval.

USDA-APHIS-PPQ-S&T-CPHST-TMT
1730 Varsity Drive, Suite 300
Raleigh, NC 27606
919-855-7450

Sorption

Sorption is the process of chemically or physically binding free MB on or within the fumigated commodity. Sorption makes the fumigant unavailable to kill the plant pest. There are three types of sorption—absorption, adsorption, and chemisorption. Sorption rate is high at first, then gradually reduces to a slow rate. Sorption increases the time required for aeration.

Commodities known or believed to be highly sorptive should not be fumigated in chambers unless concentration readings can be taken to ensure the required minimum concentration is met. Additional readings may be necessary in order to properly monitor gas concentration sorptive commodities in chambers.

For tarpaulin fumigation, additional gas readings are necessary to monitor concentration of gas to determine the rate of sorption. The following is a partial list of commodities known to be highly sorptive:

- Burlap bales
- Carpet backing
- Cinnamon quills
- Cocoa mats
- Cotton
- Flour and finely milled products
- Gall nuts
- Hardboard (Masonite™)
- Incense
- Myrobalan
- Pistachio nuts
- Polyamide waste
- Polystyrene foam (Styrofoam)
- Potato starch
- Rubber (crepe or crude)
- Vermiculite
- Wood products (unfinished)
- Wool (raw, except pulled)

Contact CPHST-TMT if you are concerned about the sorptive properties of other commodities.

Residual Effect

MB may adversely affect the shelf life of fresh fruits and vegetables, the viability of dormant and actively growing plants, and the germination of seed. Although MB may adversely affect some commodities, it is a necessary risk in order to control pests. Some dosage rates are near the maximum tolerance of the commodity, so care must be exercised in choosing the proper treatment schedule and applying the treatment.

MB may also adversely affect nonplant products. In general, articles with a high sulfur content may develop “off-odors” on contact with MB. In some commodities the odors are difficult or impossible to remove by aeration. If possible or practical, remove from the area to be fumigated any items that are likely to develop an undesirable odor.

Ordinarily, the following items should **not** be fumigated:

- Any commodity **not** listed on the label or lacking a FIFRA Section 18 Exemption
- Any commodity lacking a treatment schedule
- Automobiles
- Baking powder
- Blueprints
- Bone meal
- Butter, lard, or fats, unless in airtight containers
- Charcoal (highly sorptive)
- Cinder blocks or mixed concrete and cinder blocks
- CO^{2} scrubbers (calcium hydroxide and calcium carbonate; MAXtend®)[3]
- EPDM rubber (ethylene propylene diene M-class; a type of synthetic rubber)
- Electronic equipment[4]
- Ethylene absorbers (potassium permanganate sachets used to remove ethylene from an enclosure, usually a container loaded with fruit)
- Feather pillows
- Felt

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[3] If the scrubbers are removed prior to fumigation, the consignment may be fumigated.

[4] Electronic equipment may be fumigated as long as it is properly sealed to protect against internal fluid contamination by the MB gas. Ensure that the liquid MB is completely volatilized before it is introduced into the area to be fumigated. Obtain a waiver from the importer agreeing to release the USDA from any damages.

- Furs
- High-protein flours (soybean, whole wheat, peanut)
- Horsehair articles
- Leather goods
- Machinery with milled surfaces
- Magazines and newspapers (made of wood pulp)
- Magnesium articles (subject to corrosion)
- Paper with high rag or sulfur content
- Photographic chemicals and prints (**not** camera film or X-rays)
- Polyurethane foam
- Natural rubber goods, particularly sponge rubber, foam rubber, and reclaimed rubber including pillows, mattresses, rubber stamps, and upholstered furniture
- Neoprene
- Rug pads
- Silver polishing papers
- Woolens (especially angora), soft yarns, and sweaters; viscose rayon fabrics
- Yak rugs

2

Treatment Manual

Chemical Treatments

Fumigants • Methyl Bromide • Chamber Fumigation

Contents

Methods and Procedures

The procedures covered in this section provide commercial fumigators and chamber owners with the methods, responsibilities, and precautions for normal atmospheric pressure (NAP) and vacuum chamber fumigations.

The chamber owner is responsible for hiring a state certified fumigator and for ensuring that the chamber is certified for conducting PPQ quarantine treatments.

2016 Methyl Bromide Label Information

In 2015, the Environmental Protection Agency (EPA) directed all methyl bromide (MB) registrants to amend the use directions on the labels of all 100% MB products. EPA required the changes in order to reflect recommendations in an EPA report.[1]

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[1] "Report of Food Quality Protection Act (FQPA) Tolerance Reassessment and Risk Management Decision (TRED) for methyl bromide, and Reregistration Eligibility Decision (RED) for Methyl Bromide's Commodity Uses", dated August 2006. (https://archive.epa.gov/pesticides/reregistration/web/pdf/methyl_bromide_tred.pdf)

These amendments modify the use directions for fumigation and aeration procedures, modify respiratory requirements and equipment and update gas monitoring equipment. EPA requires all labels on newly manufactured MB to reflect these recommendations effective **October 01, 2016**; however, EPA is allowing existing stocks of MB to be used in accordance with the use directions on the existing stock's (older) labels.

PPQ officials and fumigators **must** closely examine gas cylinder labels in order to validate that the dosage, exposure, and commodity are either on the cylinder label or covered by a FIFRA Section 18 exemption. If a label is **not** affixed to the cylinder, DO NOT allow the fumigator to use that cylinder.

New Buffer Zone Requirements

All 2016 MB labels now require both a treatment and an aeration buffer zone. Both the treatment and aeration buffer zones are specific to the enclosure being fumigated and must be determined by visiting a website link[2] provided in every MB label. The fumigators are responsible for using this website to determine the buffer zones and reporting both buffer zones to the PPQ official. If the treatment buffer zone is determined to be less than 30 feet, the PPQ official will maintain PPQ's standard 30 foot treatment buffer zone; otherwise, the new treatment buffer zone **must** be observed. If the aeration buffer zone is determined to be less than 200 feet, then PPQ's standard "200 feet for 10 minutes" aeration buffer zone **still** applies for the first 10 minutes of aeration.

NOTICE

USDA-APHIS granted the State of California a waiver from the 200' aeration buffer zone requirement provided the following criteria are met:

- The local CA Department of Pesticides or local Air Pollutions Department has issued a local permit allowing less than 200' aeration buffer zone.
- The permit applies **only** to a chamber with a vertical aeration stack.

USDA-APHIS may consider other waivers on a case-by-case basis.

The fumigator **must** refer to EPA's website to determine the minimum aeration buffer zone to be maintained until the aeration period is complete and the fumigator has verified that gas concentration levels meet the conditions in the MB label.

Transiting through buffer zones

The label permits vehicles to transit through both treatment and aeration buffer zones under specific conditions found in the label; it is up to the fumigator determine how or whether vehicles may transit in accordance with the label.

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[2] https://www.epa.gov/pesticide-registration/mbcommoditybuffer

When using the newer 2016 MB label, changes to certain procedures and equipment in this chapter are displayed in a NOTICE box with a heading titled "MB 2016 Label".

MB 2016 Label (example)

NOTICE

Use this information when the fumigator is using the 2016 MB label.

When using existing stocks, follow the equipment and procedural guidance that is displayed in the body of the text (outside of the NOTICE box).

If there is no "MB 2016 Label" NOTICE box, then the instructions apply to all MB labels, 2016 and older.

Materials Needed

PPQ Official Provides

- APHIS-approved leak detection device
- Calculator (optional)
- Forms (PPQ Form 429 and APHIS Form 2061 if necessary)
- Self-contained breathing apparatus (SCBA) or supplied air respirator

MB 2016 Label

NOTICE

In addition to the bulleted list on page 2-5-3, the PPQ official will provide:

- Air purifying respirator NIOSH certified half-mask or full face piece with a cartridge for concentrations between 1 and 4 ppm
- APHIS-approved continuous real time gas monitoring device
  - Permanently mounted in PPQ owned facilities only, PureAire Monitoring Systems, Inc. model Air check Advantage[1]
  - Portable Photoionization Detector (PID), RAE Systems, Inc. model MiniRAE 3000[2]
- Self contained breathing apparatus (SCBA) NIOSH approval prefix TC-13F or supplied air respirator NIOSH approval prefix TC-19C

[1] The Air Check Advantage can be calibrated either by the manufacturer or by the PPQ official. Calibrate according to the manufacturer's User Guide. Refer to Chapter 8: Equipment for more information.

[2] The MiniRae 3000 must be calibrated by the PPQ official according to the manufacturer's User's Guide. Refer to Chapter 8: Equipment for more information.

Fumigator Provides

- APHIS-approved gas detection device[3] (e.g. thermal conductivity device, infrared device, etc.)
- APHIS-approved leak detection device
- Auxiliary pump for purging long gas sample tubes
- Carbon dioxide filter (e.g., Ascarite®)
- Colorimetric tubes (Refer to *Gas Detector Tube (colorimetric) and Apparatus* ***on page E-1-32*** for a list of APHIS-approved product ranges)
- Desiccant (e.g., Drierite®)
- Electrical wiring (grounded, permanent type), three prong extension cords
- Gas introduction line
- Heat supply

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[3] The methyl bromide monitor must be calibrated annually. Refer to Chapter 8: Equipment for calibration information. If using a thermal conductivity (TC) analyzer, Drierite® and Ascarite® must be used.

- Methyl bromide
- Scale or graduated cylinder for volume (liquid measurements)[4]
- SCBA or supplied air respirator
- Temperature recorder and temperature sensors[5]
- Thermometer[6]
- Volatilizer
- Warning signs/Placarding

MB 2016 Label

NOTICE

In addition to the bulleted list on **page 2-5-4** and **page 2-5-5**, the fumigator will provide:

- Air purifying respirator NIOSH certified half-mask or full face piece with a cartridge for concentrations between 1 and 4 ppm
- APHIS-approved continuous real time gas monitoring device[1]
    - Permanently mounted in PPQ owned facilities only, PureAire Monitoring Systems, Inc. model Air check Advantage
    - Portable Photoionization Detector (PID), RAE Systems, Inc. model MiniRAE 3000
- APHIS-approved direct read gas detection device
    - Colorimetric tubes (e.g. Draeger, Sensidyne)
- Self contained breathing apparatus (SCBA) NIOSH approval prefix TC-13F or supplied air respirator NIOSH approval prefix TC-19C

[1] These devices must be calibrated according to the manufacturer's User Guide. Refer to Chapter 8: Equipment for more information.

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[4] All scales must be calibrated by the State, a company that is certified to conduct scale calibrations, or by the fumigator under the supervision of PPQ. The source and date of calibration must be posted in a visible location on or with the scale at all times. The scale must be calibrated a following every repair or minimum of every year.

[5] Temperature sensors must be calibrated annually by the manufacturer or National Institute of Standards and Technology (NIST) within the range of 40 °F to 80 °F (4.4 °C to 26.7 °C)

[6] The thermometer must be calibrated or replaced annually.

Refer to *Certification of Vacuum Fumigation Chambers* **on page 6-2-1** and *Certifying Atmospheric Fumigation Chambers* **on page 6-3-1** for guidelines on chamber certification.

Conducting the Fumigation

Step 1—Selecting a Treatment Schedule

The PPQ official will select an appropriate treatment schedule to effectively eliminate the plant pest without damaging the commodity to be fumigated.

Turn to the treatment schedule Index and look up by commodity or by pest the treatment schedule(s) available. Treatment schedules which are approved for chambers will be listed as either "NAP" (normal atmospheric pressure) or as "vacuum."

Step 2—Issuing a PPQ Form 523 (Emergency Action Notification)

When an intercepted pest is identified and confirmed by a PPQ Area Identifier as requiring action, the CBP or PPQ official will issue a Form 523 (Emergency Action Notification - EAN) to the owner, broker, or representative. The EAN will list all treatment options. Refer to Appendix A in the *Manual for Agricultural Clearance* for instructions on completing and distributing the EAN.

Step 3—Determining Section 18 Exemptions and Sampling Requirements

After selecting the treatment schedule, the PPQ official will determine which treatment schedules are FIFRA Section 18 Exemptions. The schedule will be followed by an "IMPORTANT" note to help you determine the current exemption status. Some treatment schedules are only FIFRA Section 18 Exemptions at specific temperature ranges. Check the treatment schedule and temperature to determine if the fumigation will be a FIFRA Section 18 Exemption.

Residue monitoring by taking samples of the commodity prior to the start of the fumigation and after aeration is no longer required.

Step 4—Setting up the Fumigation Site

MB 2016 Label

NOTICE

The PPQ official and the fumigator must select a secure area where traffic and people are restricted from entering and which is isolated from people working. A nonwork area is preferred to help prevent accidents.

The treatment and aeration buffer zones are determined by the fumigator in accordance with EPA’s fumigation buffer zone tables (https:www.epa.gov/pesticide-registration/mbcommoditybuffer).

The buffer zones surround the area where access is limited during treatment. If the fumigator determines that the buffer zone is less than 30’, then PPQ requires a 30’ buffer zone. If the fumigator determines that the buffer zone is greater than 30’, then PPQ must observe the prescribed buffer zone.

The treatment and aeration buffer zones extend from the perimeter of the enclosure to a distance determined by the fumigator in accordance with the label. Entry by any person except the PPQ official and the fumigator is **prohibited** except as provided in the “Exceptions to Buffer Zone Entry Restrictions” section of the label.

The treatment buffer zone begins when the fumigant is introduced into the enclosure and ends when aeration begins, at which point the aeration buffer zone requirements apply.

The fumigator must define the treatment and aeration buffer zone perimeters using physical barriers (such as walls, ropes, etc.) and placards to limit access to the buffer zone. Placards must meet all label requirements regarding specific warnings, information, and language.

The fumigator will permit transiting through buffer zones in accordance with the “Transit Exception” section of the label.

Buffer Zone Overlap for Multiple Enclosures

For multiple enclosures where buffer zones overlap, the fumigator must recalculate both the treatment and aeration buffer zones in accordance with the label and supply them to the PPQ official.

Step 5—Measuring the Temperature

The PPQ official must determine the temperature of the commodity in order to select the proper dosage rate. Depending on whether or not you are fumigating a pulpy fruit or vegetable, you may use **either** the commodity temperature **or** an average of the commodity and air temperatures. A pulpy fruit or vegetable can support internal feeding insects, is fleshy and moist, and can be probed with a temperature measuring device. Examples include, but are not limited to peppers, onions, and grapes.

Determine the temperature to use in selecting the proper dosage rate:

- For fruits, pulpy vegetables, or logs use only the commodity temperature.
- For all other commodities use both the commodity and air temperature.

To take the temperature readings, use a bimetallic, mercury, or digital long-stem thermometer that has been calibrated. Use **Table 2-5-1** to determine which temperature to use when selecting the proper dosage rate for commodities other than fresh fruits, vegetables, or logs. Record the temperatures in Block 22 of the PPQ Form 429.

If using the electronic 429 database, record the temperatures in the space and commodity fields in the Treatment form.

NOTICE

The presence of ice indicates temperatures below 40 °F. If ice is present anywhere in the box, pallet, or fumigation enclosure, DO **NOT** fumigate the commodity.

Important

Commodity and space temperatures must be 40 °F or above.

Table 2-5-1 Determine Whether to Use Commodity or Air Temperature for Determining Dosage Rate

If the air temperature is:	And:	Then, for commodities other than fresh fruits or vegetables or logs and lumber[1]:
Higher than the commodity temperature	→	Use the single lowest commodity temperature for determining the dosage rate (Do Not use the average commodity temperature).
Lower than the commodity temperature	By less than 10 degrees	
	By 10 degrees or more	Use the average of the single lowest air and commodity temperature for determining the dosage rate

1 Use commodity temperature for fresh fruits or vegetables or logs and lumber.

Step 6—Calculating the Dosage

In order to calculate dosage, the PPQ official must have the following information:

- Treatment schedule
- Volume of the fumigation chamber (ft^3)
- Temperatures of commodity and air (°F)

The PPQ official must refer to the specific treatment schedule to determine the dosage rate (pounds/ft^3).

Use the formula in **Figure 2-5-1** to calculate the dosage:

$$\begin{aligned}\text{dosage (lbs.)} &= \text{volume}(\text{ft}^3) \times \text{dosage rate (lbs./1,000 ft}^3) \\ &= \frac{\text{volume}(\text{ft}^3) \times \text{dosage rate (lbs.)}}{1{,}000\ \text{ft}^3}\end{aligned}$$

Figure 2-5-1 Formula for Calculating Dosage for Chamber Fumigations

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EXAMPLE: Using a fumigation chamber which has a volume of 500 ft^3, you determine the temperature of the commodity and space is 72 °F. The treatment schedule requires 2 lbs. MB/1,000 ft^3 at 70 °F or above. To calculate dosage multiply the volume (500 ft^3) by the dosage rate (2 lbs. MB/1,000 ft^3). This equals 1.0 lbs. of MB needed for the dosage.

Step 7—Conducting the Fumigation

Since fumigation chambers vary by manufacturer and model, refer to the manufacturer's operating manual to determine how to use the chamber. In NAP chambers, circulation fans **must** run for 15 minutes following introduction of the gas.

Taking concentration readings is **not** required when conducting chamber fumigations.

Step 8—Leak Detection

Turn on any leak detection devices prior to gas introduction and ensure that they run throughout the entire fumigation and aeration.

Aerating the Chamber

The fumigator must:

- Arrange for the aeration to proceed once the treatment is completed.

- Consider the direction of the wind when pointing the exhaust duct, and face the duct outlet toward an open area away from people.
- Ensure that, during the first 10 minutes of aeration, no one is present within 200 feet downwind of the exhaust duct outlet. (see California waiver details on **page 2-5-2**)
- Determine aeration buffer zones in accordance with EPA's fumigation buffer zone tables (https:www.epa.gov/pesticide-registration/mbcommoditybuffer).
- Ensure that no one is present within the perimeter of the aeration buffer zone unless they are wearing SCBA.
- **See "Buffer Zone Overlap for Multiple Enclosures" on page-2-5-7**.
- Follow all label instructions, state, county, and local regulations, in addition to the instructions in this manual.
- Inform people located in occupied structures and personnel in the immediate area within the buffer zone that release of MB is about to take place and give them the option of leaving the area or remaining inside the building.
- Restrict access to the area where the exhaust duct extends beyond the enclosure.
- Secure the fumigation area and allow only the chamber operator and the PPQ official monitoring the fumigation into the secure area.

WARNING

Do ***not*** allow motorized vehicles to operate within the secure area.

Responsibility for Aerating the Commodity

Responsibility for aerating the chamber and releasing the commodity depends on whether the treatment schedule used was a labeled use or FIFRA Section 18 Exemption. Use **Table 2-5-2** to determine responsibility for aerating the commodity

Table 2-5-2 Determine the Responsibility for Aerating the Commodity During Chamber Fumigations

If the fumigation chamber is:	And the treatment schedule is:	Then:
Privately or State owned	A labeled treatment	RELEASE the fumigation to the fumigator to aerate and release the commodity.
	A FIFRA Section 18 Exemption (noted in the treatment schedules)	1. PPQ official must be present at the initiation of aeration and to verify the final aeration readings 2. USE **Table 2-5-3** to determine which aeration procedures to follow.
PPQ owned	→	

Table 2-5-3 Determine the Aeration Procedure for Chamber Fumigations

If the chamber is:	Then:
NAP	Use the procedures on **page 2-5-12**
Vacuum	Use the procedures on **page 2-5-12**

Each chamber must be equipped with at least one permanent, metal gas sampling tube to allow the fumigator to take colorimetric tube readings during the aeration. Any extensions of the gas sampling tube or flexible connectors must be made of Teflon™ tubing or metal. The extensions of the sampling tube must run from an area in between the treated boxes and end outside the chamber to allow for colorimetric tube readings.

Wearing Respiratory Protection

The fumigator must wear approved respiratory protection (SCBA, supplied air respirator, or combination unit) when there is a risk of exposure to concentrations above 5 ppm; this includes any time the concentration is unknown.

MB 2016 Label

NOTICE

If MB concentration levels are between 1-4 ppm, the PPQ official and the fumigator may wear an air purifying respirator NIOSH certified half-mask or full face piece with a cartridge.

Normal Atmospheric Pressure Chamber—Aerating Noncontainerized Cargo

Advise the fumigator to:

1. While wearing SCBA, turn on the chamber fans.
2. Aerate a minimum of 3 hours for all commodities.
3. Stop the fans and take concentration readings with colorimetric tubes in the airspace around the box and, when feasible, within the carton or box.

Use Table 2-5-4 to determine when to release the commodity.

Table 2-5-4 Determine When to Release the Commodity After NAP Fumigation

If the gas concentration level is:	Then:
5 ppm or less	1. CONTINUE aeration for 30 minutes. 2. REQUIRE the fumigator to confirm that gas concentrations remain at 5 ppm or less. 3. RELEASE the commodity
6 ppm or more	1. REQUIRE the fumigator to conduct two additional air washes. 2. TAKE gas concentration readings. 3. If concentration readings are 5 ppm or less, CONTINUE aeration for 30 minutes. 4. REQUIRE the fumigator to confirm that gas concentrations remain at 5 ppm or less. 5. RELEASE the commodity.

For FIFRA Section 18 exemptions, record the concentration reading (in ppm), date, and time in Block 39 of PPQ Form 429. If using the electronic 429 database, record the date, time and detector reading (in ppm) in the “Detector Readings” form.

Vacuum Fumigation Chambers—Aerating Containerized and Noncontainerized Cargo

Advise the fumigator to:

1. Adjust any vacuum remaining at the end of the fumigation to zero by temporarily opening the air intake valve, then closing it.
2. Draw a 15 inch vacuum and adjust it to zero.
3. Repeat this process of drawing a 15 inch vacuum and releasing it a **minimum** of four times.

4. Take concentration readings using a colorimetric tube in the airspace around the box, and when feasible, **within the carton or box.**

For FIFRA Section 18 exemptions, record the concentration reading (in ppm), date, and time in Block 39 of PPQ Form 429. If using the electronic 429 database, record the date, time and detector reading (in ppm) in the "Detector Readings" form.

Use **Table 2-5-5** to determine when to release the commodity.

Table 2-5-5 Determine When to Release the Commodity After Vacuum Fumigation

If the gas concentration is:	Then:
5 ppm or less	1. CONTINUE aeration for 30 minutes. 2. REQUIRE the fumigator to confirm that gas concentrations remain at 5 ppm or less. 3. RELEASE the commodity
6 ppm or above	1. REQUIRE the fumigator to conduct two additional air washes. 2. TAKE gas concentration readings. 3. If concentration readings are 5 ppm or less, CONTINUE aeration for 30 minutes. 4. REQUIRE the fumigator to confirm that gas concentrations remain at 5 ppm or less. 5. RELEASE the commodity. 6.

6

Treatment Manual

Certifying Facilities

Certification of Cold Treatment

Contents

Introduction

Since the early 1900s, sustained cold temperature has been employed as an effective post-harvest method for the control of the Mediterranean and certain other tropical fruit flies. Exposing infested fruit to temperatures of 2.2 °C (36 °F) or below for specific periods of time results in the mortality of the various life stages of this group of notoriously injurious insects. Procedures were developed to effectively apply cold treatment (CT) to fruit while in transport in refrigerated holds of ships, in refrigerated containers, and in warehouses located in the country of origin or in the United States.

Self-refrigerated (Integral) containers, conventional vessels, and warehouses utilized for regulatory cold treatment are subject to approval by the USDA. Approval is needed only when treating fruit under USDA regulations and does **not** constitute an endorsement for the carrying or storage of refrigerated cargo.

Only officials authorized by APHIS have permission to conduct warehouse, vessel or container certification under the general guidance of CPHST-TMT. Refer to the following web site for a complete list of USDA-certified vessels and containers for intransit cold treatment:

https://treatments.cphst.org/vessels/

Standards for Temperature Recording Systems

Temperature recording systems may consist of various electronic components such as temperature sensors, computers, printers, and cables and are required for temperature recording installations in cold treatment vessels, refrigerated containers, or warehouses. Submit plans and specifications of the temperature recording system to **USDA-APHIS-PPQ-CPHST-TMT** for review and approval before installation.

Temperature Recording System

- **Accuracy**—The accuracy of the system must be within plus or minus 0.3 °C (0.5 °F) of the true temperature in the range of minus 3 °C (27 °F) to plus 3 °C (37 °F.)
    - Ensure the instrument is capable of repeatability in the range of minus 3 °C to plus 3 °C (27 °F to 37 °F.)
- **Automatic Operation**—The system must be capable of automatic operation whenever the treatment system is activated.
- **Long-Term Recording**—The system must be capable of continuous recording of date, time, sensor number, and temperature during all calibrations and for the duration of a voyage and/or treatment period.
- **Password Protection**—All approved temperature recording devices must be password protected and tamper-proof.
- **Recording Frequency**—The time interval between prints will be no less than **once every hour**. For each sensor, the temperature value, location/identification, time and date must print **once per hour.**
- **Repeatability**—When used under treatment conditions over an extended period of time, the system must be capable of repeatability in the range of minus 3 °C to plus 3 °C (27 °F to 37 °F.) The design, construction and materials must be such that the typical environmental conditions (including vibration) will **not** affect performance.

- **Range**—The recorder must be programmed to cover the entire range between minus 3 °C to plus 3 °C (27 °F to 37 °F), with a resolution of 0.1 (°C or °F.)
- **Visual Display**—The system must have a visual display so the temperature can be reviewed manually during the treatment and calibrations.

Temperature Sensors

- **Construction Standards**—Sensors should have an outer sheath diameter of 0.25 inches (6.4 millimeters) or less. The sensing unit must be in the first inch of the sensor.
- **Identification**—Identify all sensors to distinguish the sensors in one compartment from those in other compartments.
    - Place an identifying number on the box where the sensor originates and on a permanent tag where the cable joins the sensor.
    - Identify the sensors for each compartment so the air sensors are numbered first (e.g., A1, A2—air; A3, A4,..., etc.,—fruit pulp.)
- **Location**—Post a diagram next to the recording instrument that shows the location and identification of each sensor by compartment.
    - Air sensors—Place sensors on the center line of the vessel, fore and aft, approximately 30 centimeters from the ceiling and connected to cables at least 3 meters in length
    - Fruit sensors—Distribute fruit sensors throughout the compartment so all areas of the compartment can be reached (5- to 15-meter cable lengths are usually sufficient.) The number and location is dependent upon cubic capacity of the compartment. Refer to **Figure 6-4-1 on page-6-4-6** for guidance for vessels and **Figure 6-4-6 on page-6-4-15** for guidance for warehouses. Three temperature sensors are required for refrigerated containers. These are labeled USDA1, USDA2, and USDA3.

Contact **USDA-APHIS-PPQ-CPHST-TMT** for a complete list of approved temperature recording systems.

Certification of Warehouses Used for Cold Treatment

The local APHIS-PPQ inspector will certify refrigerated warehouses for use as cold treatment facilities before treating fruit under USDA regulations. In addition to the general requirements, warehouse approval is subject to specific geographical pest-risk considerations as outlined in Title 7, Section 305.6 of the Code of Federal Regulations.

USDA-APHIS-PPQ-CPHST-TMT will approve plans and specifications prior to the initial warehouse certification. Conduct a performance survey prior to the warehouse receiving approval to conduct cold treatments under USDA regulations.

Plan and Specification Approval

Prior to the start of warehouse construction, submit a completed Application for Warehouse Approval, detailed drawings of the physical characteristics, and a written description of the all the treatment related equipment to **USDA-APHIS-PPQ-CPHST-TMT**. All plans and supporting materials must be submitted in Standard English. An example of a completed Application is provided in **Figure 6-4-7 on page-6-4-18**.

Include the following information in the Application:

- Address of the warehouse location
- Drawings showing the dimensions, cubic capacity and door locations

Important

Drawings may be hand-drawn, but must clearly show location of refrigeration units, circulation fans, temperature recorder, and sensors.

- Make and model of the refrigeration equipment
- Name and address of the firm owning the warehouse chamber
- Number and location of sensors (**Figure 6-4-6 on page-6-4-15**)
- Method for segregating fruit under treatment and securing it from other foreign or domestic articles
- Specification of the air circulation system; must indicate the number of air changes and direction of air flow
- Specifications of the recording system

Certification Testing

When all documents and a completed Application have been submitted and approved by the **USDA-APHIS-PPQ-CPHST-TMT**, the warehouse owner should make the warehouse available for an on-site certification visit by a local PPQ official. To arrange warehouse certification, contact the State Plant Health Director or Officer-In-Charge for the port. Before requesting final inspection, the warehouse owner must complete all arrangements as directed by the PPQ officer. The PPQ official will conduct calibration and identification tests during the inspection.

Determining the Number of Temperature Sensors

The number and location of temperature sensors is based on the cubic capacity. Refer to **Figure 6-4-6** to determine the number and location of sensors. The minimum requirement is three sensors—one air sensor and two pulp sensors. Sensor cables must be long enough to reach all areas of the load.

Cubic Feet	Cubic Meters	Number of Pallets	Number of Air Sensors	Number of Pulp Sensors	Total Number of Sensors
0 to 10,000	0 to 283	1 - 100	1	2	3
10,001 to 20,000	284 to 566	101 - 200	1	3	4
20,001 to 30,000	567 to 849	201 - 300	1	4	5
30,001 to 40,000	850 to 1132	301 - 400	1	5	6
40,001 to 50,000	1133 to 1415	401 - 500	1	6	7
50,001 to 60,000	1416 to 1698	501 - 600	1	7	8
60,001 to 70,000	1699 to 1981	601 - 700	1	8	9
70,001 to 80,000	1982 to 2264	701 - 800	1	9	10
80,001 to 90,000	2265 to 2547	801 - 900	1	10	11
90,001 to 100,000	2548 to 2830	901 - 1000	1	11	12
Over 100,000	>2830	1000 +	Must be approved by CPHST-TMT		

Figure 6-4-6 Number of Sensors in a Warehouse

Important

If a refrigerated room is equipped according to the cubic capacity of the storage area (rather than of the load itself), the same criteria apply.

It is highly recommended that additional sensors beyond the required minimum be installed.

Calibration of Temperature Sensors

Calibrate all temperature sensors using a freshwater ice water slurry at 0 ºC (32 ºF).

NOTICE

It is APHIS policy to use the standard "rounding rule". In determining calibration factors, if the reading is .05 or higher, round to the next higher number in tenths. If it is .04 or lower, round to the lower number. For example: If the calibration factor was .15, round to .2. If it was .32, round to .3. Similar rounding can be used in actual treatment readings. If an actual reading was 34.04, round to 34.0, add or subtract the calibration factor, if necessary. If it was 34.07, round to 34.1, add or subtract the calibration factor, if necessary.

Use the following steps to make the ice water slurry:

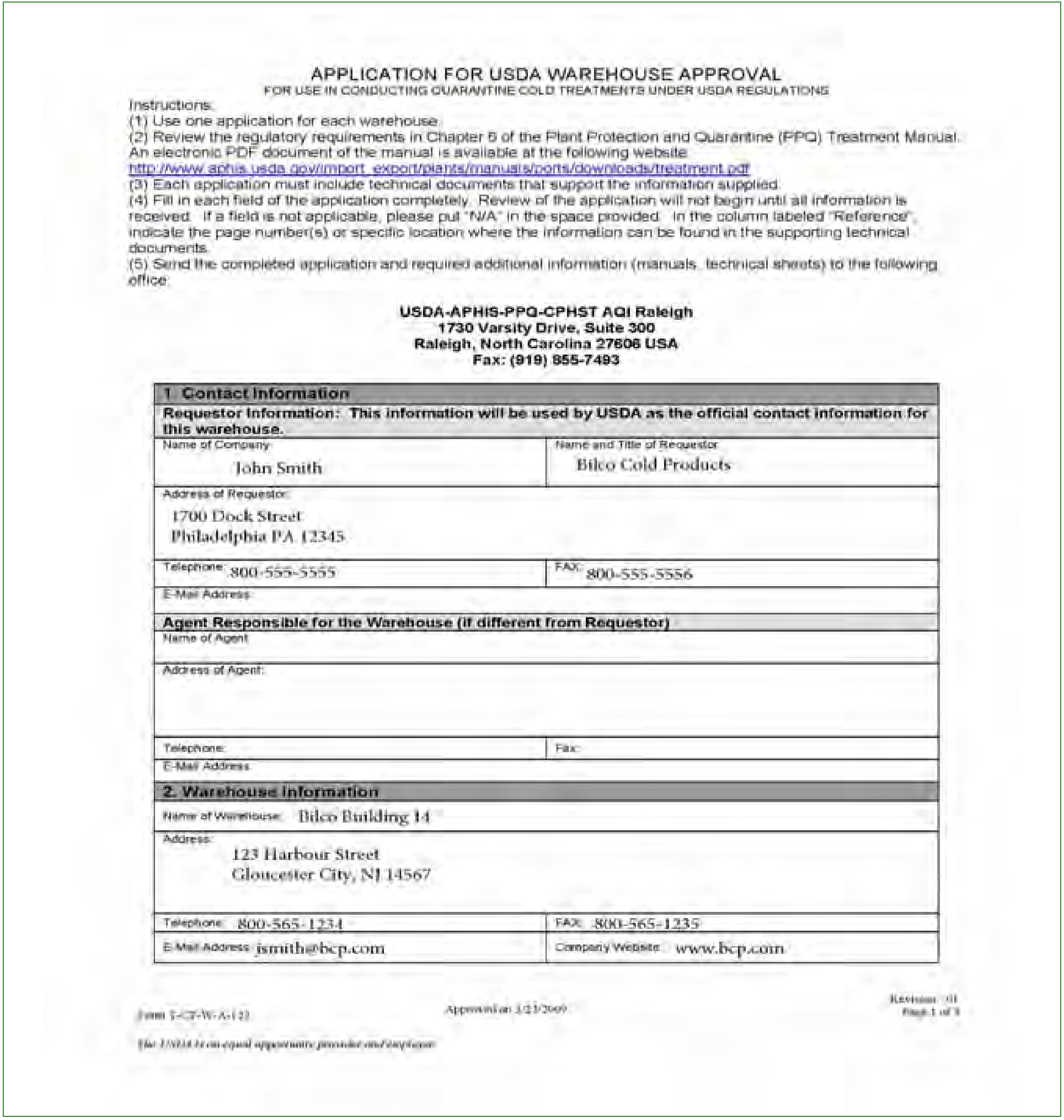
1. Prepare a mixture of clean ice and fresh water in a clean insulated container.
2. Crush or chip the ice and completely fill the container.
3. Add enough water to stir the mixture.
4. Stir the ice and water for a minimum of 2 minutes to ensure the water is completely cooled and good mixing has occurred.
    - ❖ The percentage of ice is estimated at 80 to 85 percent while the water fills the air voids (15 to 20 percent).
5. Add more ice as the ice melts.
6. Prepare and stir the ice water slurry to maintain a temperature of 32 °F. (0 °C)
7. Submerge the sensors in the ice water slurry without touching the sides or bottom of the container.
8. Stir the mixture.
9. Continue testing of each sensor in the ice water slurry until the temperature reading stabilizes.
10. Record two consecutive readings of the stabilized temperature on the temperature chart or logsheet.
    - ❖ The temperature recording device should be in manual mode to provide an instantaneous readout.
11. Allow at least a 1 minute interval between two consecutive readings for any one sensor; however, the interval should **not** exceed 5 minutes.
    - ❖ The variance between the two readings should **not** exceed 0.1°.
12. Contact an instrument company representative immediately if the time interval exceeds the normal amount of time required to verify the reading and accuracy of the sensor and recorder system
    - ❖ The recorder used with the sensors must be capable of printing or displaying on demand and **not** just at hourly intervals.
13. Correct any deficiencies in the equipment before certification.
14. Replace any sensor that reads more than plus or minus 0.3 °C (0.5 °F) from the standard 0 ºC (32 ºF).
15. Replace and recalibrate any sensors that malfunction.
16. Document the recalibration and replacement of the sensor(s) on the PPQ Form 449-R, Temperature Recording Calibration Report.
17. Determine the calibrations to the nearest tenth of one degree.

Frequency of Certification Testing

A certification test is required every year. Sumit requests for recertification to the local PPQ office at least 60 days before expiration. Certification testing is also required anytime a malfunction, breakdown or other failure occurs (excluding temperature sensors) that requires modifications to the recording and monitoring system(s).

Application for USDA Warehouse Approval

Visit the Commodity Treatment Information System web site or contact **USDA-APHIS-PPQ-CPHST-TMT** for a fillable, electronic Vessel Approval Application.



APPLICATION FOR USDA WAREHOUSE APPROVAL

FOR USE IN CONDUCTING QUARANTINE COLD TREATMENTS UNDER USDA REGULATIONS

Instructions:
(1) Use one application for each warehouse.
(2) Review the regulatory requirements in Chapter 6 of the Plant Protection and Quarantine (PPQ) Treatment Manual. An electronic PDF document of the manual is available at the following website:
http://www.aphis.usda.gov/import_export/plants/manuals/ports/downloads/treatment.pdf
(3) Each application must include technical documents that support the information supplied.
(4) Fill in each field of the application completely. Review of the application will not begin until all information is received. If a field is not applicable, please put "N/A" in the space provided. In the column labeled "Reference", indicate the page number(s) or specific location where the information can be found in the supporting technical documents.
(5) Send the completed application and required additional information (manuals, technical sheets) to the following office:

USDA-APHIS-PPQ-CPHST AQI Raleigh
1730 Varsity Drive, Suite 300
Raleigh, North Carolina 27606 USA
Fax: (919) 855-7493

1. Contact Information

Requestor Information: This information will be used by USDA as the official contact information for this warehouse.

Name of Company: John Smith

Name and Title of Requestor: Bilco Cold Products

Address of Requestor:
1700 Dock Street
Philadelphia PA 12345

Telephone: 800-555-5555

FAX: 800-555-5556

E-Mail Address:

Agent Responsible for the Warehouse (if different from Requestor)

Name of Agent:

Address of Agent:

Telephone:

Fax:

E-Mail Address:

2. Warehouse Information

Name of Warehouse: Bilco Building 14

Address:
123 Harbour Street
Gloucester City, NJ 14567

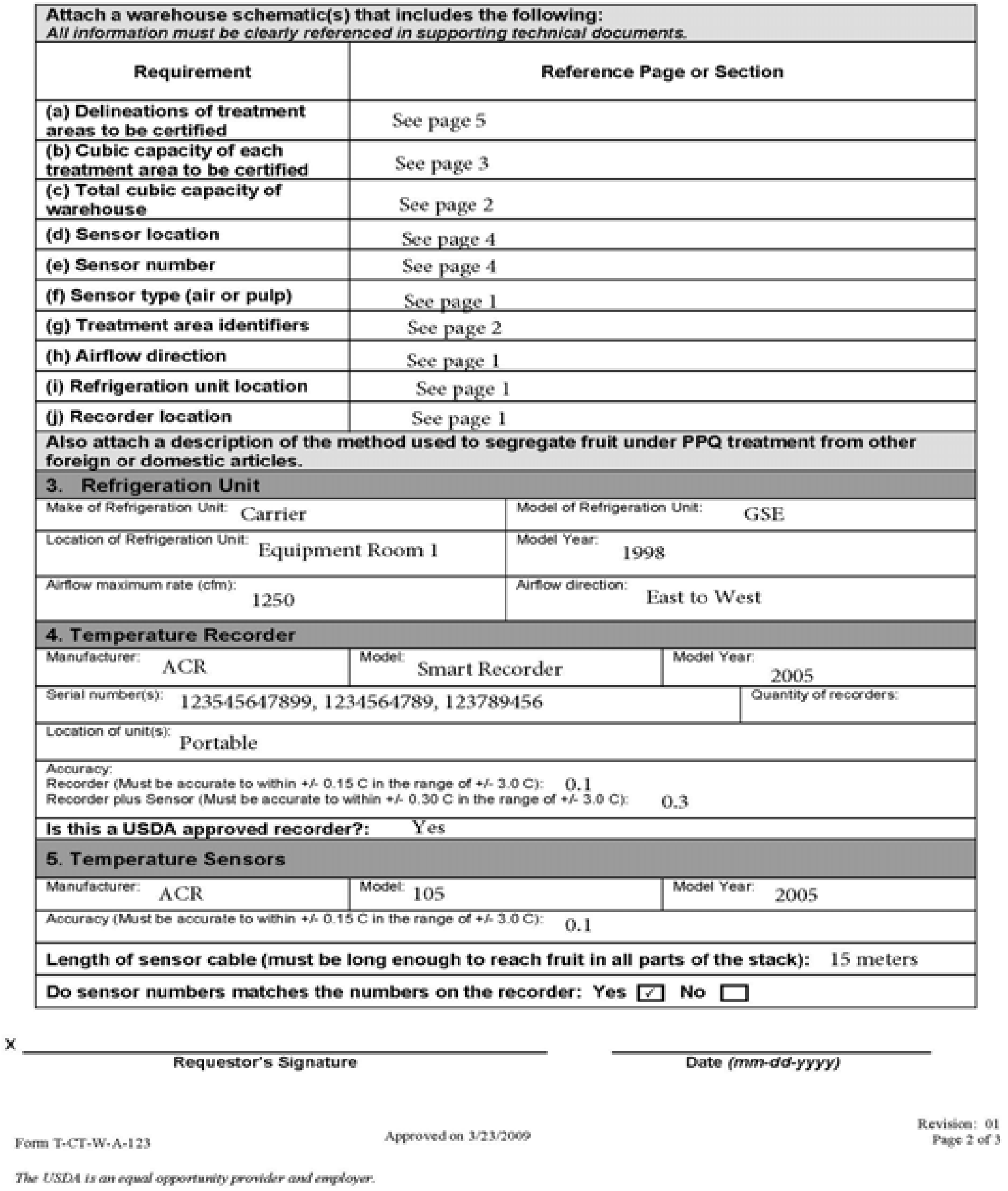
Telephone: 800-565-1234

FAX: 800-565-1235

E-Mail Address: jsmith@bcp.com

Company Website: www.bcp.com

Figure 6-4-7 Example of a Completed Application for USDA Warehouse Approval, page 1 of 3



Attach a warehouse schematic(s) that includes the following:
All information must be clearly referenced in supporting technical documents.

Requirement	**Reference Page or Section**
(a) Delineations of treatment areas to be certified	See page 5
(b) Cubic capacity of each treatment area to be certified	See page 3
(c) Total cubic capacity of warehouse	See page 2
(d) Sensor location	See page 4
(e) Sensor number	See page 4
(f) Sensor type (air or pulp)	See page 1
(g) Treatment area identifiers	See page 2
(h) Airflow direction	See page 1
(i) Refrigeration unit location	See page 1
(j) Recorder location	See page 1

Also attach a description of the method used to segregate fruit under PPQ treatment from other foreign or domestic articles.

3. Refrigeration Unit

Make of Refrigeration Unit: Carrier

Model of Refrigeration Unit: GSE

Location of Refrigeration Unit: Equipment Room 1

Model Year: 1998

Airflow maximum rate (cfm): 1250

Airflow direction: East to West

4. Temperature Recorder

Manufacturer: ACR

Model: Smart Recorder

Model Year: 2005

Serial number(s): 123545647899, 1234564789, 123789456

Quantity of recorders:

Location of unit(s): Portable

Accuracy:
Recorder (Must be accurate to within +/- 0.15 C in the range of +/- 3.0 C): 0.1
Recorder plus Sensor (Must be accurate to within +/- 0.30 C in the range of +/- 3.0 C): 0.3

Is this a USDA approved recorder?: Yes

5. Temperature Sensors

Manufacturer: ACR

Model: 105

Model Year: 2005

Accuracy (Must be accurate to within +/- 0.15 C in the range of +/- 3.0 C): 0.1

Length of sensor cable (must be long enough to reach fruit in all parts of the stack): 15 meters

Do sensor numbers matches the numbers on the recorder: Yes ☑ **No** ☐

X ______________________________
Requestor's Signature

____
Date *(mm-dd-yyyy)*

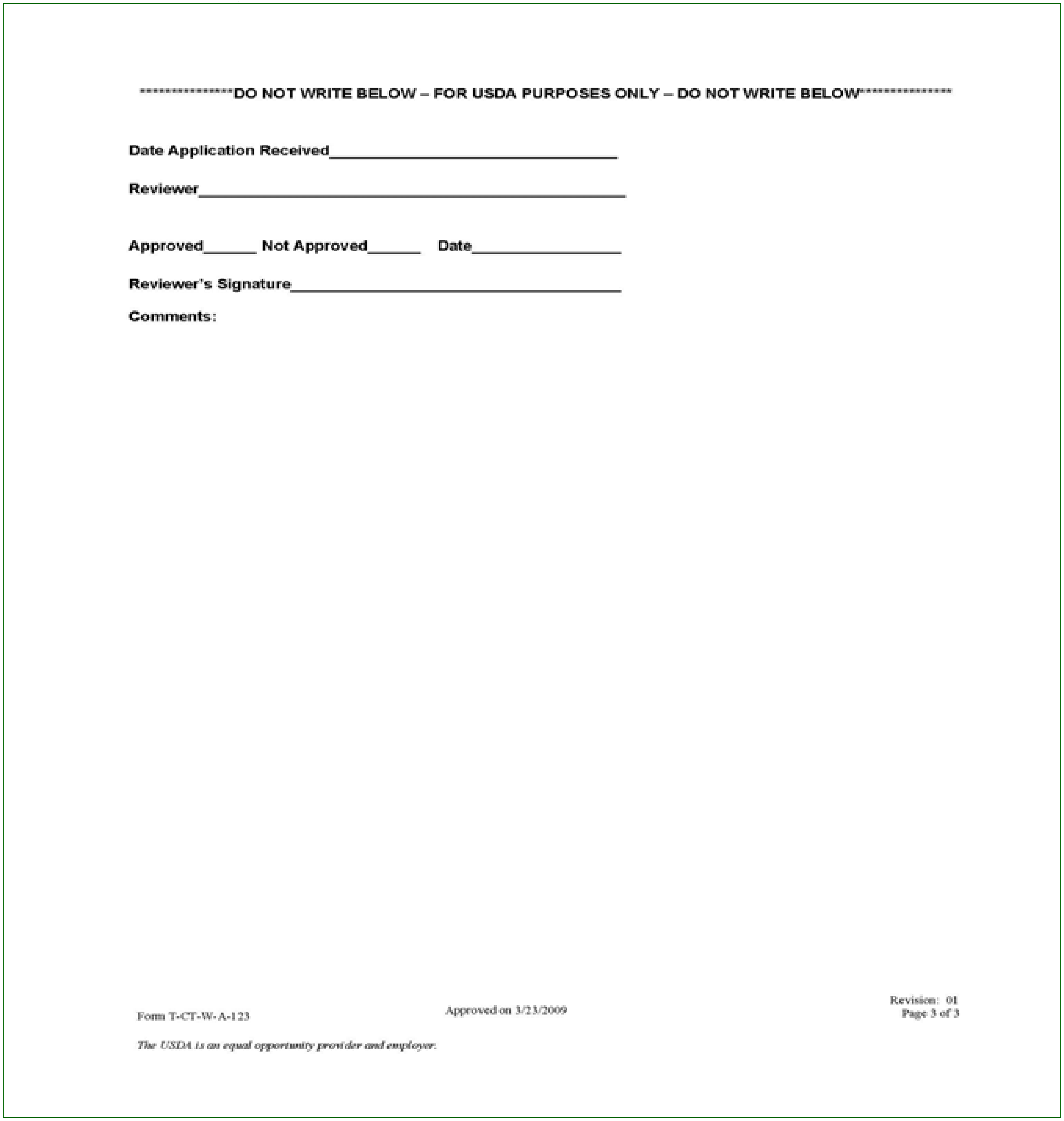
Form T-CT-W-A-123

Approved on 3/23/2009

Revision: 01
Page 2 of 3

The USDA is an equal opportunity provider and employer.

Figure 6-4-8 Example of a Completed Application for USDA Warehouse Approval, page 2 of 3



*****************DO NOT WRITE BELOW – FOR USDA PURPOSES ONLY – DO NOT WRITE BELOW*****************

Date Application Received______________________________

Reviewer____

Approved_____ **Not Approved**_____ **Date**_______________

Reviewer's Signature______________________________

Comments:

Form T-CT-W-A-123

Approved on 3/23/2009

Revision: 01
Page 3 of 3

The USDA is an equal opportunity provider and employer.

Figure 6-4-9 Example of a Completed Application for USDA Warehouse Approval, page 3 of 3

Contact Information

USDA-APHIS-PPQ-CPHST-TMT
1730 Varsity Drive
Suite 300
Raleigh, NC 27606
Phone: 919-855-7450
FAX: 919-855-7493
Email: cphst.tqau@aphis.usda.gov

APPENDIX B

MIA Fumigation Site Visit (Termite Doctor)

MDAD On-Call

Fumigation and Engine Test Cell Facilities – Site Visit

May 17, 2018

8:00 AM – 11:30 AM

17-04-1027 – Miami On-Call Services

On-Site

Facilitator: George Garcia **Note takers:** Estelle Boudassou

Attendees:	**Representing**	**Email**	**Phone Number**
Renee Bergeron	MDAD Planning	RBergeron@miami-airport.com	(305) 869-4849
Audwyn Francis	MDAD Planning	AFrancis@miami-airport.com	(305) 876-0367
Juan Prieto	Nova Consulting	jprieto@nova-consulting.com	-
Luis Lopez-Blazquez	Nova Consulting	llopez@nova-consulting.com	-
Cynthia Estivil	Nova Consulting	cestivil@nova-consulting.com	(305) 436-9200 x239
Thomas Carlson	M C Harry Architects	tcarlson@mcharry.com	-
Larry Arrington	M C Harry Architects	larrington@mcharry.com	(305) 445 3765 x127
Esther Monterrey	M C Harry Architects	emonterrey@mcharry.com	-
Ernie Aloma	SDM	erniea@sdmcorp.com	-
George Garcia	R&A	ggarcia@ricondo.com	(954) 494-4883
Estelle Boudassou	R&A	eboudassou@ricondo.com	(305) 260-2727 x257

Discussion Points

Fumigation and Test Cell Facilities - Proposed Site

The proposed site is located along the corner of Milan Dairy Road and Corporate Way, west of the end of Runway 9-27. The site is currently covered with dense vegetation (see **Exhibit 1**).

During the visit, the attendees mentioned their concern to have an engine test cell facility built at the end of a runway which would potentially impact and threaten approaches and landings on that specific runway.

Exhibit 1: Proposed Fumigation and Test Cell Site

SOURCE: Ricondo & Associates, Fumigation and Test Cell Facilities Site Visit, May 2017.

Fumigation Facility - Termite Doctor

Site Description

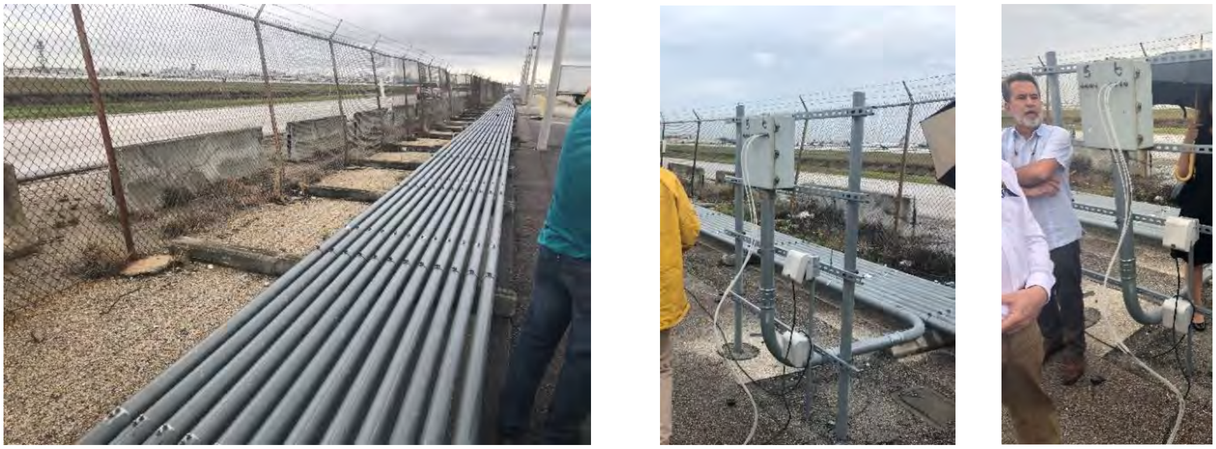
Termite Doctor's site is located at the east end of NW 25th St.. It includes 2 trailers, 12 fumigation stations and 1 transload station (see **Exhibits 2**, **3**, and **4** below).

The facility operates 24/7 but by appointment outside of the regular working hours (the gate closes at 9PM).

Exhibit 2: Employee and USDA Trailers

SOURCE: Ricondo & Associates, Fumigation and Test Cell Facilities Site Visit, May 2017.

Exhibit 3: Fumigation Stations



SOURCE: Ricondo & Associates, Fumigation and Test Cell Facilities Site Visit, May 2017.

Exhibit 4: Transload Station

SOURCE: Ricondo & Associates, Fumigation and Test Cell Facilities Site Visit, May 2017.

Fumigation Process

Each truck is assigned to one of the fumigation stations which includes a panel that is connected through a pipe to the USDA trailer (see **Exhibit 2**) and a gas inlet tube required for the fumigation itself. The panel combines a pair of 4 tubes directly plugged into the truck/container, thus collecting the information/results that are sent to the USDA trailer for analysis.

The fumigation process consists of the following:

- Check that the container can hold the gas pressure (it needs to hold the gas more than 15 seconds),
- Fumigate the truck for 2 to 4 hours depending of the type of load (200 pounds gas tanks are used (see **Exhibit 5**) and regular containers have a 10 to 15 pounds gas tank usage),
- Open the truck and aerate with a 200’ radius offset for the first 30 minutes,
- Once the truck is checked and cleared by USDA, it can be collected. When the fumigation is over and if a truck needs to be moved to free up one of the stations, the employees would be able to do so.

Exhibit 5: Gas Inlet

SOURCE: Ricondo & Associates, Fumigation and Test Cell Facilities Site Visit, May 2017.

Trucks can be fumigated side to side (with a 30' offset) but not simultaneously. The facility can perform fumigation on 7 to 8 trucks at once and can have up to 30 trucks a day. Overall a truck can stay up to 7 hours at the facility.

Regarding seaport containers, those are most likely stacked on top of each other in which case they would need to be transloaded. The transload operation is performed in a closed environment and fans are used to avoid overheating (see **Exhibit 6**).

Exhibit 6: Transload Station Interior

SOURCE: Ricondo & Associates, Fumigation and Test Cell Facilities Site Visit, May 2017.

Working Conditions

The facility operates with up to 3 or 5 USDA officers at the busiest times. Each officer can work on 5 trucks at once if required. They are reading and analyzing the data from their position using both visual and radio communication to coordinate with the employees fumigating (see **Exhibit 7**). Additionally, each officer keeps a log of all the gathered data.

The USDA trailer is equipped with offices, computers, one bathroom, and WIFI (often deficient).

The fumigation employees' trailer has one bathroom and extra equipment storage but lacks sitting, resting and sleeping areas.

Exhibit 7: USDA Officer Position

SOURCE: Ricondo & Associates, Fumigation and Test Cell Facilities Site Visit, May 2017.

APPENDIX C

American Consolidation and Logistics – Fumigation Facility Plan (Miami-Dade County Regulatory and Economic Resources Department Microfilm Section)

ELECTRICAL SYMBOL TABLE

SYMBOL	DESCRIPTION		SYMBOL	DESCRIPTION	
⏀	DUPLEX RECEPTACLE 20 AMP/125 VOLT	–MOUNT 18" A.F.F. UNLESS OTHERWISE NOTED	▽	TELEPHONE OUTLET	–MOUNT 18" A.F.F. UNLESS OTHERWISE NOTED –EMPTY 3/4" EMT STUBBED ABOVE CEILING W/ BUSHING
⏀	DUPLEX RECEPTACLE 20 AMP/125 VOLT	–SWITCHED RECEPTACLE AS PER PLANS	▽	DATA/PHONE OUTLET	–MOUNT 18" A.F.F. UNLESS OTHERWISE NOTED –EMPTY 3/4" EMT STUBBED ABOVE CEILING W/ BUSHING
⏀	DUPLEX RECEPTACLE 20 AMP/125 VOLT	–VERIFY MOUNTING HEIGHT	Ⓥ	TELEPHONE JUNCTION BOX WALL MOUNT	–EMPTY 1.25" EMT STUBBED ABOVE CEILING W/ BUSHING
⏀	GFCI DUPLEX RECEPTACLE 20 AMP/125 VOLT	–VERIFY MOUNTING HEIGHT	Ⓓ	DATA JUNCTION BOX WALL MOUNT	–EMPTY 1.25" EMT STUBBED ABOVE CEILING W/ BUSHING UNLESS OTHERWISE NOTED.
⏀ GFCI/WR/W.P.	WEATHER-RESISTANT GFCI DUPLEX RECEPTACLE 20 AMP/125 VOLT	–VERIFY MOUNTING HEIGHT PROVIDE WEATHERPROOF ENCLOSURE	Ⓟ	POWER JUNCTION BOX WALL MOUNT	–CONNECT TO ELECTRICAL PANEL AS PER PLANS
$⏀_D$	DUPLEX RECEPTACLE 20 AMP/125 VOLT	–DEDICATED CIRCUIT, SEPARATE NEUTRAL RUN #12 GROUND WIRE BACK TO PANEL	Ⓙ	JUNCTION BOX 4" X 4"	–VERIFY MOUNTING HEIGHT
$⏀_{I.G.}$	DUPLEX RECEPTACLE 20 AMP/125 VOLT	–ISOLATED CIRCUIT, LEVITON #5362–IG RUN #12 GROUND WIRE BACK TO PANEL	⍑	TELEVISION OUTLET	–MOUNT 18" A.F.F. UNLESS OTHERWISE NOTED –EMPTY 3/4" EMT STUBBED ABOVE CEILING W/ BUSHING
⏀	QUAD RECEPTACLE 20 AMP/125 VOLT	–MOUNT 18" A.F.F. UNLESS OTHERWISE NOTED	PP	POWER POLE	–SIZE AND HEIGHT TO MATCH CEILING REQUIREMENTS DUAL CHANNEL FOR POWER AND DATA
⏀	GFCI QUAD RECEPTACLE 20 AMP/125 VOLT	–VERIFY MOUNTING HEIGHT	☐	DISCONNECT	–SIZED AND FUSED AS PER EQUIPMENT NAMEPLATE RATING
⏀	SINGLE RECEPTACLE 20 AMP/125 VOLT	–MOUNT 18" A.F.F. UNLESS OTHERWISE NOTED VOLTAGE AND AMPACITY AS PER PLANS	☒	MOTOR STARTER	–VERIFY HEATER STRIP SIZE WITH EQUIPMENT
$⏀_C$	CLOCK HANGER RECEPTACLE 20 AMP/125 VOLT	–VERIFY MOUNTING HEIGHT	VFD	VARIABLE FREQUENCY DRIVE	–PROVIDED BY MECHANICAL CONTRACTOR
▼	EQUIPMENT RECEPTACLE 120/208/277/480 VOLT	–MOUNT 18" A.F.F. UNLESS OTHERWISE NOTED VOLTAGE AND AMPACITY AS PER PLANS	⊗	PIN–AND–SLEEVE RECEPTACLE	–VERIFY NUMBER OF POLES AND REQUIREMENTS WITH EQUIPMENT. PROVIDE PLUG FOR EQUIPMENT.
$	SWITCH, SINGLE POLE 20 AMP/120–277 VOLT	–MOUNT 44" A.F.F. UNLESS OTHERWISE NOTED	●	EXHAUST FAN/MOTOR	–SEE MECHANICAL DRAWINGS FOR DETAILS
$\$_{DP}$	SWITCH, DOUBLE POLE 20 AMP/120–277 VOLT	–MOUNT 44" A.F.F. UNLESS OTHERWISE NOTED	LC	LIGHTING CONTACTOR	–VERIFY NUMBER OF POLES
$\$_3$	SWITCH, THREE–WAY 20 AMP/120–277 VOLT	–MOUNT 44" A.F.F. UNLESS OTHERWISE NOTED	K	CARD READER / KEYPAD	–JUNCTION BOX AND EMPTY 3/4" EMT STUBBED ABOVE CEILING W/ BUSHING. VERIFY EXACT MOUNTING HEIGHT AND LOCATION WITH SECURITY CONSULTANT.
$\$_4$	SWITCH, FOUR–WAY 20 AMP/120–277 VOLT	–MOUNT 44" A.F.F. UNLESS OTHERWISE NOTED	I	INTERCOM	–JUNCTION BOX AND EMPTY 3/4" EMT STUBBED ABOVE CEILING W/ BUSHING. VERIFY EXACT MOUNTING HEIGHT AND LOCATION WITH SECURITY CONSULTANT.
$\$_D$	SWITCH, DIMMER 120–277 VOLT	–SIZE DIMMER WITH TOTAL LAMP WATTAGE	S	SECURITY DEVICE	–JUNCTION BOX AND EMPTY 3/4" EMT STUBBED ABOVE CEILING W/ BUSHING. VERIFY EXACT MOUNTING HEIGHT AND LOCATION WITH SECURITY CONSULTANT.
$\$_R$	SWITCH, FAN DIMMER 120 VOLT RHEOSTAT	–SIZE DIMMER WITH TOTAL MOTOR LOAD	▭◁	MONITOR CAMERA	–JUNCTION BOX AND EMPTY 1.0" EMT STUBBED ABOVE CEILING W/ BUSHING. VERIFY EXACT MOUNTING HEIGHT AND LOCATION WITH SECURITY CONSULTANT.
$\$_M$	SWITCH, MOTOR RATED 120–277 VOLT	–RATED FOR USE WITH TOTAL MOTOR LOADS AMPS RATING SHALL MATCH OVERCURRENT PROTECTION	◖◗	ALARM CONTACTS	
$\$_K$	SWITCH, KEY 20 AMP/120–277 VOLT	–AS MANUFACTURED BY "LEVITON" MODEL #1221–2L / 55500	⚲	DOOR BUZZER	
$\$_{TS}$	TIME SWITCH OVERRIDE MAXIMUM SETTING OF 4 HOURS	–SEE PANEL SCHEDULE FOR SPECIFICATION	▨	LOW VOLTAGE CEILING MOUNTED SPEAKERS	
$\$_*$	DIMMING PANEL OVERRIDE MAXIMUM SETTING OF 4 HOURS	–DEVICE MUST BE IDENTIFIED TO BE COMPATIBLE WITH DIMMING/LIGHTING CONTROL PANEL	⬚	DENOTES FLOOR OR ROOF MOUNT	
$\$_O$	SWITCH, OCCUPANCY SENSOR 20 AMP/120–277 VOLT	–AS MANUFACTURED BY "SENSOR SWITCH" MODEL #WSD–PDT, PIR/MICROPHONICS, U.N.O.	◌	DENOTES CEILING MOUNT	
$\$_{O/2P}$	SWITCH, OCC. SENSOR, 2–POLE 20 AMP/120–277 VOLT	–AS MANUFACTURED BY "SENSOR SWITCH" MODEL #WSD–PDT–2P, PIR/MICROPHONICS, U.N.O.	○	DENOTES CORD DROP DEVICE	–VERIFY MOUNTING HEIGHT
$\$_{O/2P/FAN}$	SWITCH, OCC. SENSOR, 2–POLE, FAN 20 AMP/120–277 VOLT	–AS MANUFACTURED BY "SENSOR SWITCH" MODEL #WSD–PDT–2P–FAN, PIR/MICROPHONICS, U.N.O.			
$\$_{O/SA}$	SWITCH, OCC. SENSOR, SEMI AUTO. 20 AMP/120–277 VOLT	–AS MANUFACTURED BY "SENSOR SWITCH" MODEL #WSD–PDT–SA, PIR/MICROPHONICS, U.N.O.			
$\$_{VA}$	SWITCH, VACANCY SENSOR 20 AMP/120–277 VOLT	–AS MANUFACTURED BY "SENSOR SWITCH" MODEL #WSD–PDT–VA, PIR/MICROPHONICS, U.N.O.			
⊼	OCCUPANCY SENSOR, CORRIDOR 20 AMP/120–277 VOLT	–AS MANUFACTURED BY "SENSOR SWITCH" MODEL #HWR–13, PIR, U.N.O.			
⊼ WV	OCC. SENSOR, WIDE VIEW, CORNER 20 AMP/120–277 VOLT	–AS MANUFACTURED BY "SENSOR SWITCH" MODEL #WVR–PDT–16, PIR, U.N.O.			
⊙	OCCUPANCY SENSOR, CEILING 20 AMP/120–277 VOLT	–AS MANUFACTURED BY "SENSOR SWITCH" MODEL #CMR–PDT–10, PIR/MICROPHONICS, U.N.O.			
⊙ O/2P	OCCUPANCY SENSOR, CEILING, 2–POLE, 20 AMP/120–277 VOLT	–AS MANUFACTURED BY "SENSOR SWITCH" MODEL #CMR–PDT–10–2P, PIR/MICROPHONICS, U.N.O.			
⊙ LV	OCCUPANCY SENSOR, CEILING LOW VOLTAGE	–AS MANUFACTURED BY "SENSOR SWITCH" MODEL #CM–PDT–10, PIR/MICROPHONICS, U.N.O.			
⊙ HB	OCCUPANCY SENSOR, HIGH BAY 20 AMP/120–277 VOLT	–AS MANUFACTURED BY "SENSOR SWITCH" MODEL #CMR–6, PIR, U.N.O.			
⊙ HB/LV	OCCUPANCY SENSOR, HIGH BAY LOW VOLTAGE	–AS MANUFACTURED BY "SENSOR SWITCH" MODEL #CM–6, PIR, U.N.O.			
OC–PP	POWER PACK 20 AMP/120–277 VOLT	–AS MANUFACTURED BY "SENSOR SWITCH" MODEL #PP–20, U.N.O.			
OC–2P	POWER PACK, 2–POLE 20 AMP/120–277 VOLT	–AS MANUFACTURED BY "SENSOR SWITCH" MODEL #PP–20–2P, U.N.O.			

U.N.O. – UNLESS OTHERWISE NOTED

LIGHTING FIXTURE SCHEDULE

TYPE	MANUFACTURER	NUMBER	MOUNT	VOLT	LAMPS	REMARKS
A	WILLIAMS	92–8–232–DR–EB4–UNV	SURFACE	277	4–F32T8	8' VAPOR TIGHT
A1	WILLIAMS	92–8–232–DR–EB4–EM1400T8–UNV	SURFACE	277	4–F32T8	8' VAPOR TIGHT W/ BATTERY BACK–UP
X	BEGHELLI	WLX–LR–1–W–SA–IH	UNIVERSAL	DUAL	LED	EXIT SIGN – W/ BATTERY BACK–UP

GENERAL ELECTRICAL NOTES

- ALL ELECTRICAL WORK PERFORMED UNDER THIS CONTRACT SHALL COMPLY WITH THE NATIONAL ELECTRICAL CODE (NEC) 2008, LOCAL CODES AND ORDINANCES (INCLUDING THE 2010 FLORIDA BUILDING CODE (F.B.C.) WITH LATEST SUPPLEMENTS & AMENDMENTS), AND ALL STANDARDS OF CONSTRUCTION ESTABLISHED BY THE LANDLORD.
- PRIOR TO BID OR COMMENCEMENT OF WORK, THE CONTRACTOR SHALL VISIT THE JOB SITE AND EVALUATE ALL EXISTING FIELD CONDITIONS. THE CONTRACTOR SHALL NOTIFY THE ARCHITECT OR ENGINEER OF ANY DISCREPANCIES. THE CONTRACTOR SHALL QUALIFY THE BID ACCORDINGLY.
- THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR ACCEPTANCE BY THE ARCHITECT AND/OR ENGINEER BEFORE PROCEEDING WITH THE PURCHASE OR INSTALLATION OF THE EQUIPMENT AND MATERIALS. NO FACSIMILES OR FACSIMILE COPIES SHALL BE ACCEPTED.
- THE CONTRACTOR SHALL OBTAIN APPROVAL FROM THE ENGINEER PRIOR TO CUTTING OR DRILLING ANY STRUCTURAL SUPPORT MEMBER.
- THE CONTRACTOR SHALL SATISFACTORILY REPAIR/REPLACE ANY EQUIPMENT OR PART OF STRUCTURE DAMAGED AS A RESULT OF WORK PERFORMED. SURFACES AND FINISHED AREAS SHALL BE RESTORED TO MATCH ADJACENT AREAS.
- ALL CONDUCTORS SHALL BE THWN OR THHN COPPER.
- METAL–CLAD (MC) CABLE SHALL NOT BE USED IN ANY PORTION OF THE INSTALLATION UNLESS PRIOR WRITTEN CONSENT IS OBTAINED FROM THE OWNER, ARCHITECT AND ENGINEER.
- ALL OPEN WIRING ABOVE A SUSPENDED CEILING SYSTEM USED AS A RETURN AIR PLENUM SHALL BE RATED FOR USE IN A RETURN AIR PLENUM. ALL CABLING SHALL COMPLY WITH N.F.P.A. STANDARDS.
- ALL EXPOSED CONDUITS SHALL BE RUN AS NEAT AS POSSIBLE. P.V.C. CONDUIT SHALL ONLY BE USED IN SLAB OR UNDERGROUND AT A MINIMUM DEPTH OF 24 INCHES.
- ALL UNDERGROUND CONDUIT INSTALLATIONS SHALL COMPLY WITH NEC SECTION 300.5.
- ALL UNDERGROUND CONDUITS SHALL BE CONVERTED TO E.M.T. CONDUIT ABOVE SLAB LEVEL. ALL UNDERGROUND ELBOWS SHALL BE R.G.S. CONDUIT.
- PROVIDE PULL STRINGS IN ALL EMPTY CONDUITS.
- ALLOW NO MORE THAN THE EQUIVALENT OF FOUR QUARTER BENDS (360 DEGREES TOTAL) BETWEEN ALL PULL POINTS, E.G., CONDUIT BODIES AND BOXES AS PER NEC 344.26.
- PROVIDE EXPANSION JOINTS WHERE REQUIRED AS PER NEC 300.7(B).
- FLEXIBLE CONDUIT SHALL BE USED FOR CONNECTION TO ALL VIBRATING EQUIPMENT SUCH AS MOTORS, ETC.
- ALL DEDICATED OUTLETS SERVING EQUIPMENT SUCH AS REFRIGERATORS, WATER COOLERS, COPIERS, FAXES, ETC. SHALL HAVE SEPARATE NEUTRAL CONDUCTORS TO EACH DEVICE OR APPLIANCE.
- ALL WIRING DEVICES SHALL BE LEVITON COMMERCIAL GRADE (WHITE DECORA) OR EQUAL AS APPROVED BY ARCHITECT OR ENGINEER.
- ALL RECEPTACLES SHALL BE INSTALLED AT 18" A.F.F. UNLESS OTHERWISE NOTED.
- MAINTAIN FIRE RATING IN ALL PENETRATIONS THRU DEMISING AND FIRE RATED WALLS. THIS INCLUDES MAINTAINING A MINIMUM 24" SEPARATION BETWEEN ELECTRICAL DEVICES MOUNTED ON OPPOSITE SIDES OF ALL FIRE RATED PARTITIONS AND WALLS.
- ELECTRICAL POWER AND CONTROL WIRING FOR H.V.A.C. AND MECHANICAL EQUIPMENT SHALL BE FURNISHED AND INSTALLED BY THE ELECTRICAL CONTRACTOR.
- ELECTRICAL CONTRACTOR SHALL COORDINATE WORK WITH THE ARCHITECTURAL PLANS BEFORE ROUGH INSTALLATION OF LIGHTS, RECEPTACLES, SWITCHES, AND EQUIPMENT FOR EXACT LOCATION.
- ELECTRICAL CONTRACTOR SHALL VERIFY EXACT DIMENSIONS AND LOCATIONS OF ALL EQUIPMENT WITH TENANT PRIOR TO ROUGH INSTALLATION.
- ELECTRICAL CONTRACTOR SHALL COORDINATE LOCATIONS OF ALL ELECTRICAL WIRING DEVICES (INCLUDING LUMINAIRES, RECEPTACLES, SWITCHES, CONDUITS, WIRING, ETC.) WITH OTHER TRADES TO AVOID CONFLICTS.
- ELECTRICAL CONTRACTOR SHALL VERIFY THE CEILING FINISHES AND SUSPENSION SYSTEMS FOR SELECTION OF THE PROPER TRIM AND SUPPORT ARRANGEMENTS OF ALL ELECTRICAL DEVICES.
- PROVIDE ACCESS PANELS AS REQUIRED TO SERVICE ALL ELECTRICAL EQUIPMENT ABOVE HARD CEILINGS. COORDINATE WITH ARCHITECT BEFORE ROUGH INSTALLATION.
- WHERE APPLICABLE, ALL LUMINAIRES SHALL BE PROPERLY SECURED TO CEILING GRID SYSTEM.
- LUMINAIRES THAT USE A METAL HALIDE LAMP OTHER THAN A THICK–GLASS PARABOLIC REFLECTOR LAMP (PAR) SHALL BE PROVIDED WITH A CONTAINMENT BARRIER THAT ENCLOSES THE LAMP, OR SHALL BE PROVIDED WITH A PHYSICAL MEANS THAT ONLY ALLOWS THE USE OF A LAMP THAT IS TYPE "O" IN ACCORDANCE WITH NEC 410.130(F)(5).
- FLUORESCENT LUMINAIRES THAT UTILIZE DOUBLE–ENDED LAMPS AND CONTAIN BALLAST(S) THAT CAN BE SERVICED IN PLACE OR BALLASTED LUMINAIRES THAT ARE SUPPLIED FROM MULTIWIRE BRANCH CIRCUITS AND CONTAIN BALLAST(S) THAT CAN BE SERVICED IN PLACE SHALL HAVE A DISCONNECTING MEANS IN ACCORDANCE WITH NEC 410.130(G), WHERE APPLICABLE.
- ALL LUMINARIES SHALL BE PROPERLY SUPPORTED IN ACCORDANCE WITH THE CEILING SYSTEM MANUFACTURER RECOMMENDATIONS AND LOCAL CODE REQUIREMENTS.
- ALL LIGHTING CIRCUITS WHICH CONTROL AND/OR OPERATE LIGHTING FIXTURES WITH AN ELECTRONIC BALLAST SHALL BE PROVIDED WITH A SEPARATE NEUTRAL WIRE PER EACH PHASE.
- ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR ALL LIGHT FIXTURE QUANTITIES AND MEASUREMENTS (LENGTHS) ON PLANS PRIOR TO SUBMITTAL OF SHOP DRAWINGS.
- EACH MULTIWIRE BRANCH CIRCUIT SHALL BE PROVIDED WITH A MEANS WHAT WILL SIMULTANEOUSLY DISCONNECT ALL UNGROUNDED CONDUCTORS AT THE POINT WHERE THE BRANCH CIRCUIT ORIGINATES AS PER NEC 210.4(B).
- ALL ELECTRICAL EQUIPMENT AND MATERIALS SHALL BE APPROVED AS SAFE FOR USE IN THE U.S. WORKPLACE FOR THE INTENDED APPLICATION, AS DETERMINED BY AN ORGANIZATION CURRENTLY RECOGNIZED BY OSHA (OCCUPATIONAL SAFETY AND HEALTH) AS A NRTL (NATIONALLY RECOGNIZED TEST LABORATORY). (E.G. – UL, CSA, ETC.)
- AS PER F.B.C. ENERGY CONSERVATION, CHAPTER 5, SECTION 505.7.3.1, FEEDER AND CUSTOMER–OWNED SERVICE CONDUCTORS SHALL BE SIZED FOR A MAXIMUM VOLTAGE DROP OF 2 PERCENT AT DESIGN LOAD REGARDLESS OF SIZES SHOWN ON PLANS OR PANEL SCHEDULES.
- ALL BRANCH CIRCUIT CONDUCTORS SHALL BE SIZED IN ACCORDANCE WITH N.E.C. 210.19 AND FOR A MAXIMUM VOLTAGE DROP OF 3 PERCENT AT DESIGN LOAD AS PER F.B.C. ENERGY CONSERVATION, CHAPTER 5, SECTION 505.7.3.2 REGARDLESS OF SIZES SHOWN ON PLANS OR PANEL SCHEDULES.
- AS PER F.B.C. ENERGY CONSERVATION, CHAPTER 5, SECTION 505.7.4.1, WITHIN 30 DAYS AFTER THE DATE OF SYSTEM ACCEPTANCE, RECORD DRAWINGS OF THE ACTUAL INSTALLATION SHALL BE PROVIDED BY THE GENERAL CONTRACTOR TO THE BUILDING OWNER, INCLUDING:
  1. A SINGLE–LINE DIAGRAM OF THE BUILDING ELECTRICAL DISTRIBUTION SYSTEM AND
  2. FLOOR PLANS INDICATING LOCATION AND AREA SERVED FOR ALL DISTRIBUTION.
- AS PER F.B.C. ENERGY CONSERVATION, CHAPTER 5, SECTION 505.7.4.2, THE GENERAL CONTRACTOR SHALL PROVIDE AN OPERATING MANUAL AND MAINTENANCE MANUAL TO THE BUILDING OWNER. THE MANUALS SHALL INCLUDE, AT A MINIMUM, THE FOLLOWING:
  1. SUBMITTAL DATA STATING EQUIPMENT RATING AND SELECTED OPTIONS FOR EACH PIECE OF EQUIPMENT REQUIRING MAINTENANCE.
  2. OPERATION MANUALS AND MAINTENANCE MANUALS FOR EACH PIECE OF EQUIPMENT REQUIRING MAINTENANCE. REQUIRED ROUTINE MAINTENANCE ACTIONS SHALL BE CLEARLY IDENTIFIED.
  3. NAMES AND ADDRESSES OF AT LEAST ONE QUALIFIED SERVICE AGENCY.
- IF ANY CONFLICT IS ENCOUNTERED WITHIN THE DESIGN DOCUMENTS, REGARDLESS OF TRADE OR RESPONSIBILITY, THE GREATER SCOPE OF WORK SHALL PREVAIL.
- CONTRACTOR SHALL WARRANT ALL WORK TO BE FREE OF DEFECT IN WORKMANSHIP AND MATERIALS FOR A PERIOD OF ONE YEAR AFTER ACCEPTANCE OF THE PROJECT.

REVISIONS	NUM.

Puga and Associates, Inc.
Engineers/Consultants
7339 S.W. 45th Street
Suite B
Miami, Florida 33155
(305) 661-7700

REFRIGERATION ENGINEERED
SYSTEMS, INC.
7215 NW 36 AVE.
MIAMI, FL 33147
TEL: (305) 836-6900

SLFC – BUILDING 1
REFRIGERATION FACILLITY
MIAMI, FLORIDA

DAVID PUGA
No 41163

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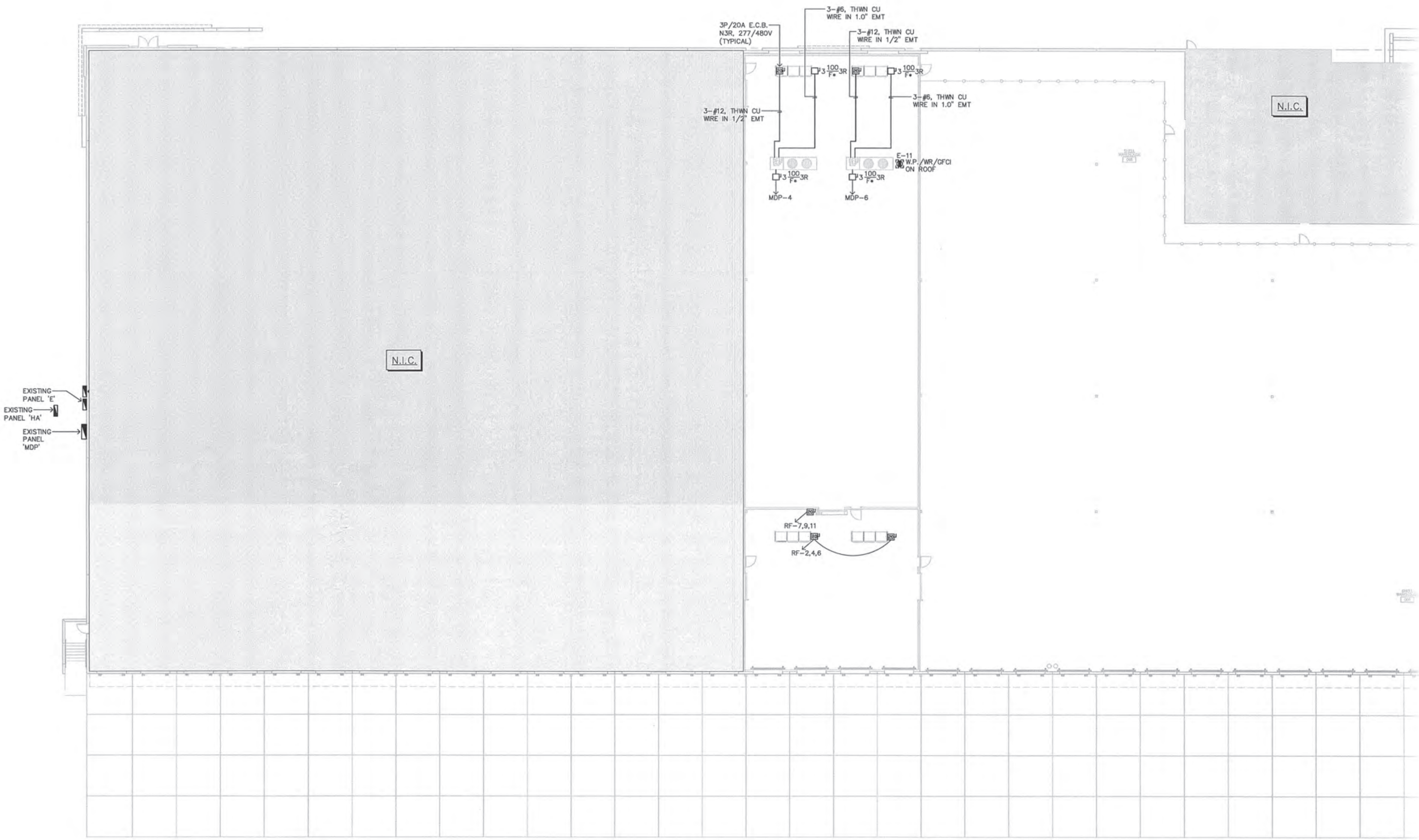
E-100
1 OF 4 SHEETS



1 ELECTRICAL POWER PLAN
E-200 SCALE: 1/16"=1'-0"

J. DAVID PUGA
No 41163

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Puga and Associates, Inc.
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E-200

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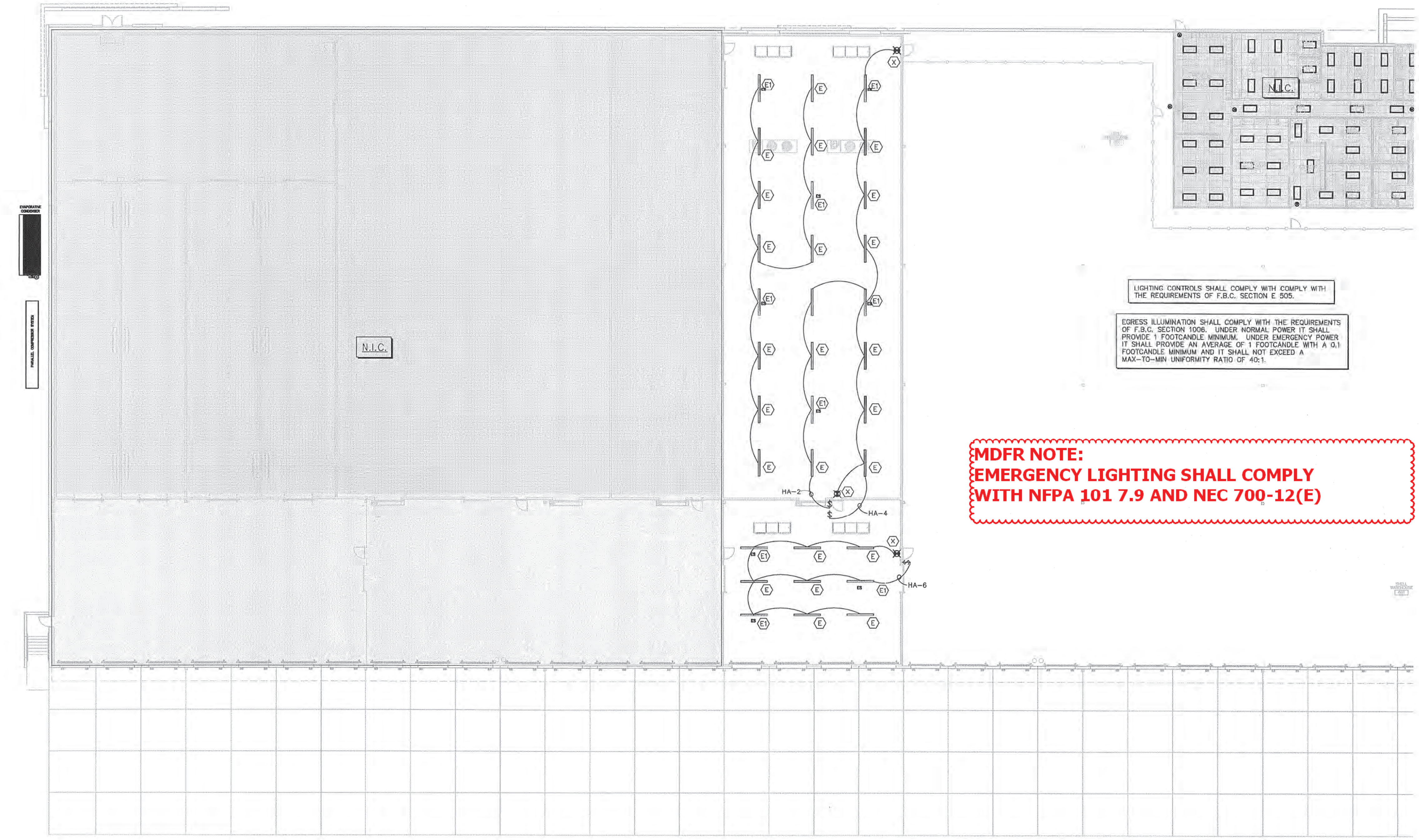

LIGHTING CONTROLS SHALL COMPLY WITH COMPLY WITH THE REQUIREMENTS OF F.B.C. SECTION E 505.

EGRESS ILLUMINATION SHALL COMPLY WITH THE REQUIREMENTS OF F.B.C. SECTION 1006. UNDER NORMAL POWER IT SHALL PROVIDE 1 FOOTCANDLE MINIMUM. UNDER EMERGENCY POWER IT SHALL PROVIDE AN AVERAGE OF 1 FOOTCANDLE WITH A 0.1 FOOTCANDLE MINIMUM AND IT SHALL NOT EXCEED A MAX-TO-MIN UNIFORMITY RATIO OF 40:1.

MDFR NOTE:
EMERGENCY LIGHTING SHALL COMPLY WITH NFPA 101 7.9 AND NEC 700-12(E)

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Examiner	Date Time Stamp	Disp.	Trade	Stamp Name
Victor Lombardi	12/23/2013 1:42:01 PM	A	ELEC	Approved
Ron Bennett	12/23/2013 7:42:42 AM	P	FIRE	Approved As Noted

1 ELECTRICAL LIGHTING PLAN
E-300 SCALE: 1/16"=1'-0"

J. DAVID PUGA
No 41163

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MIAMI, FLORIDA

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E-300
3 OF 4 SHEETS

PANEL E
(EXISTING)

TYPE : SQD–NQOD
MNT : SURFACE
LOC : REFRIGERATION EQUIPMENT ROOM
FEEDER : EXISTING
MAINS : M.L.O.
BUS : 225A
VOLTS : 120/208, 3PHS, 4W
A.I.C. : 10,000

	CKT	POLE	KVA	DESCRIPTION	WIRE, C	CKT	POLE	KVA	DESCRIPTION	WIRE, C	
(A)–	1	1/20	0.50	CONDENSATE PUMP	EXISTING	2	1/20	1.00	RECEPTACLES	EXISTING	–(A)
(A)–	3	1/20	1.00	COMPRESSOR CONT.	EXISTING	4	1/20	1.00	RECEPTACLES	EXISTING	–(A)
	5					6	1/20	1.00	RECEPTACLES	EXISTING	–(A)
(A)–	7	1/20	0.70	EF–4	EXISTING	8	1/20	1.00	RECEPTACLES	EXISTING	–(A)
(A)–	9	1/20	1.50	EF–3	EXISTING	10	1/20	1.00	RECEPTACLES	EXISTING	–(A)
(C)–	11	1/20	0.50	ROOFTOP GFI	3–#12, 1/2"	12	1/20	1.00	RECEPTACLES	EXISTING	–(A)
	13	.	.	SPACE	.	14	1/20	1.00	RECEPTACLES	EXISTING	–(A)
	15	.	.	SPACE	.	16	1/20	1.00	RECEPTACLES	EXISTING	–(A)
	17	.	.	SPACE	.	18	1/20	1.00	RECEPTACLES	EXISTING	–(A)
	19	.	.	SPACE	.	20	1/20	1.00	RECEPTACLES	EXISTING	–(A)
	21	.	.	SPACE	.	22	1/20	1.00	RECEPTACLES	EXISTING	–(A)
	23	.	.	SPACE	.	24	1/20	1.00	RECEPTACLES	EXISTING	–(A)
	25	.	.	SPACE	.	26	1/20	1.00	RECEPTACLES	EXISTING	–(A)
	27	.	.	SPACE	.	28	1/20	0.50	RECEPTACLES	EXISTING	–(A)
	29	.	.	SPACE	.	30	1/20	0.80	GEN. LIGHT	EXISTING	–(A)
	31	.	.	SPACE	.	32	1/20	0.50	RECEPTACLES	EXISTING	–(A)
	33	.	.	SPACE	.	34	.	.	SPACE	.	
	35	.	.	SPACE	.	36	.	.	SPACE	.	
	37	.	.	SPACE	.	38	.	.	SPACE	.	
	39	.	.	SPACE	.	40	.	.	SPACE	.	
	41	.	.	SPACE	.	42	.	.	SPACE	.	
	TOTAL		4.20	KVA		TOTAL		14.80	KVA		

19.00 KVA – TOTAL CONNECTED LOAD

19.00 KVA / 208 X $\sqrt{3}$ = 22.87 AMPS

(A)– EXISTING CKT TO REMAIN.

(B)– EXISTING CKT & BREAKER TO BE RE–USED. PROVIDE NEW BRANCH CONDUIT & WIRE.

(C)– NEW CIRCUIT FROM EXISTING PANEL. PROVIDE NEW BREAKER, CONDUIT AND WIRE.

(D)– REMOVE EXISTING BREAKER, BRANCH CIRCUIT, CONDUIT AND WIRE. INSTALL BLANK COVER(S) IN PANEL AND MARK AS SPACE.

(E)– REMOVE EXISTING BREAKER, BRANCH CIRCUIT, CONDUIT AND WIRE. PROVIDE NEW BREAKER, CONDUIT AND WIRE AS PER PANEL SCHEDULE..

(F)– EXISTING CIRCUIT FROM ORIGINAL PANEL TO BE RE–FED FROM NEW PANEL. PROVIDE NEW BREAKER, CONDUIT AND WIRE AS PER PANEL SCHEDULE..

PANEL RF

TYPE : SQD–NF
MNT : SURFACE
LOC : REGRIGERATION EQUIPMENT ROOM
FEEDER : 4–#6, 1.0"
MAINS : M.L.O.
BUS : 125A
VOLTS : 277/480, 3PHS, 4W
A.I.C. : 35,000

CKT	POLE	KVA	DESCRIPTION	WIRE, C	CKT	POLE	KVA	DESCRIPTION	WIRE, C
1			SPACE		2	3/20	12.96	EVAP SC 3	3–#10, 3/4"
3			SPACE		4				
5	1/20	1.00	SPARE		6				
7	3/20	5.65	NERGECO DOORS	3–#10, 3/4"	8	1/20	1.00	SPARE	
9					10	1/20	1.00	SPARE	
11					12			SPACE	
13			SPACE		14			SPACE	
15			SPACE		16			SPACE	
17			SPACE		18			SPACE	
19			SPACE		20			SPACE	
21			SPACE		22			SPACE	
23			SPACE		24			SPACE	
25			SPACE		26			SPACE	
27			SPACE		28			SPACE	
29			SPACE		30			SPACE	
TOTAL		6.65	KVA		TOTAL		14.96	KVA	

21.61 KVA – TOTAL CONNECTED LOAD
0.00 KVA – 25% OF CONTINUOUS LOAD
21.61 KVA – TOTAL DEMAND LOAD

21.61 KVA / 480 X $\sqrt{3}$ = 26.0 AMPS

(LC1)– CONNECT THRU LIGHTING SWITCHING PANEL. PROVIDE 8–CIRCUIT SWITCHING PANEL THAT PROVIDES A 7–DAY ASTRONOMICAL ELECTRONIC TIME SWITCH WITH 10–YEAR POWER FAILURE MEMORY. USE "LUTRON" SOFTSWITCH128 #XPS8–*A08–FT; *–ORDER WITH 2–POLE 480V CONTACTORS AS NEEDED, ONE FOR EACH 2–POLE BREAKER. OPERATING INSTRUCTIONS OF SYSTEM SHALL BE PROVIDED TO OWNER.

(*)– PROVIDE LOCK–ON BREAKER

PANEL MDP
(EXISTING)

TYPE : SQD – I–LINE
MNT : SURFACE
LOC : REFRIGERATION EQUIPMENT ROOM
FEEDER : EXISTING
MAINS : M.L.O.
BUS : 800 AMP
VOLTS : 277/480, 3PHS, 4W
A.I.C. : 65,000

	CKT	POLE	KVA	DESCRIPTION	WIRE, C	CKT	POLE	KVA	DESCRIPTION	WIRE, C	
(A)–	1	3/200	74.00	PANEL 'HA'	EXISTING	2	3/200	142.90	PANEL 'HC'	EXISTING	–(A)
(A)–	3	3/200	122.10	PANEL 'HE'	EXISTING	4	3/100	52.52	SYSTEM 7–1	3–#4, 1.25"	–(C)
	5			SPACE		6	3/100	54.76	SYSTEM 7–2	3–#4, 1.25"	–(C)
(C)–	9	3/60	26.21	PANEL 'RF'	4–#1, 1.0"	8			SPACE		
	TOTAL		222.31	KVA		TOTAL		252.42	KVA		

474.73 KVA – TOTAL CONNECTED LOAD

474.73 KVA / 480 X $\sqrt{3}$ = 571.3 AMPS

(A)– EXISTING CKT TO REMAIN.

(B)– EXISTING CKT & BREAKER TO BE RE–USED. PROVIDE NEW BRANCH CONDUIT & WIRE.

(C)– NEW CIRCUIT FROM EXISTING PANEL. PROVIDE NEW BREAKER, CONDUIT AND WIRE.

(D)– REMOVE EXISTING BREAKER, BRANCH CIRCUIT, CONDUIT AND WIRE. INSTALL BLANK COVER(S) IN PANEL AND MARK AS SPACE.

(E)– REMOVE EXISTING BREAKER, BRANCH CIRCUIT, CONDUIT AND WIRE. PROVIDE NEW BREAKER, CONDUIT AND WIRE AS PER PANEL SCHEDULE..

(F)– EXISTING CIRCUIT FROM ORIGINAL PANEL TO BE RE–FED FROM NEW PANEL. PROVIDE NEW BREAKER, CONDUIT AND WIRE AS PER PANEL SCHEDULE..

PANEL HA
(EXISTING)

TYPE : SQD–NQOD
MNT : SURFACE
LOC : REFRIGERATION EQUIPMENT ROOM
FEEDER : EXISTING
MAINS : M.L.O.
BUS : 225A
VOLTS : 277/480, 3PHS, 4W
A.I.C. : 35,000

	CKT	POLE	KVA	DESCRIPTION	WIRE, C	CKT	POLE	KVA	DESCRIPTION	WIRE, C	
	1	3/20	9.10	RECOVERY UNIT	EXISTING	2	1/20	2.80	COOLER LIGHTS	3–#12, 1/2"	–(C)
(A)–	3					4	1/20	2.80	COOLER LIGHTS	3–#12, 1/2"	–(C)
	5					6	1/20	2.10	COOLER LIGHTS	3–#12, 1/2"	–(C)
	7	3/20	9.10	RECOVERY UNIT	EXISTING	8			SPACE		
(A)–	9					10			SPACE		
	11					12			SPACE		
	13	3/20	9.10	RECOVERY UNIT	EXISTING	14			SPACE		
(A)–	15					16			SPACE		
	17					18			SPACE		
	19	3/20	9.10	RECOVERY UNIT	EXISTING	20			SPACE		
(A)–	21					22			SPACE		
	23					24			SPACE		
	25	3/30	20.00	HEATER FUMIG EQUIP.	EXISTING	26			SPACE		
(A)–	27					28			SPACE		
	29					30			SPACE		
	31			SPACE		32	1/20	1.30	GEN. LIGHT	EXISTING	–(A)
	33			SPACE		34	1/20	1.30	GEN. LIGHT	EXISTING	–(A)
	35			SPACE		36	1/20	1.30	GEN. LIGHT	EXISTING	–(A)
	37			SPACE		38	1/20	1.30	GEN. LIGHT	EXISTING	–(A)
	39			SPACE		40	1/20	1.90	GEN. LIGHT	EXISTING	–(A)
	41			SPACE		42	1/20	1.90	GEN. LIGHT	EXISTING	–(A)
	TOTAL		56.40	KVA		TOTAL		16.70	KVA		

73.10 KVA – TOTAL CONNECTED LOAD

73.10 KVA / 480 X $\sqrt{3}$ = 88.0 AMPS

(A)– EXISTING CKT TO REMAIN.

(B)– EXISTING CKT & BREAKER TO BE RE–USED. PROVIDE NEW BRANCH CONDUIT & WIRE.

(C)– NEW CIRCUIT FROM EXISTING PANEL. PROVIDE NEW BREAKER, CONDUIT AND WIRE.

(D)– REMOVE EXISTING BREAKER, BRANCH CIRCUIT, CONDUIT AND WIRE. INSTALL BLANK COVER(S) IN PANEL AND MARK AS SPACE.

(E)– REMOVE EXISTING BREAKER, BRANCH CIRCUIT, CONDUIT AND WIRE. PROVIDE NEW BREAKER, CONDUIT AND WIRE AS PER PANEL SCHEDULE..

(F)– EXISTING CIRCUIT FROM ORIGINAL PANEL TO BE RE–FED FROM NEW PANEL. PROVIDE NEW BREAKER, CONDUIT AND WIRE AS PER PANEL SCHEDULE..

J. DAVID PUGA
No 41163

REVISIONS	NUM.

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REFRIGERATION ENGINEERED
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MIAMI, FL 33147
TEL: (305) 836-6900

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MIAMI, FLORIDA

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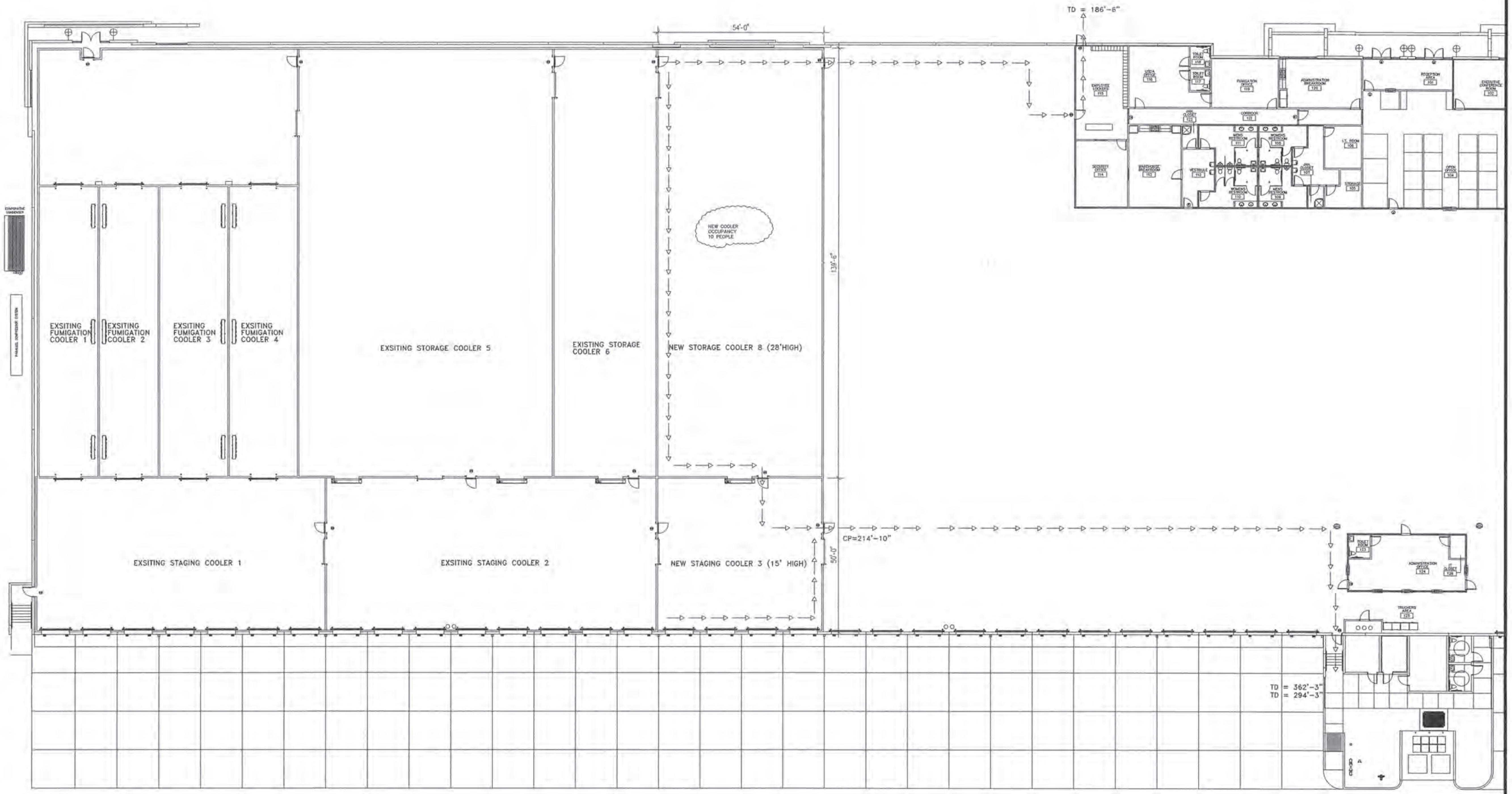

EXISTING COOLER PERMIT NO. 2013065568
EXISTING OFFICE PERMIT NO. 2013011216

LIFE SAFETY SCALE 1/16" : 1'

REVISIONS	NUM.

consulting enginee
analysis - planning - permit

2300 NW 94th Ave Doral, FL 33172
T: (786) 275 4376 F: (786) 332 3917
mep-miami.com

ENGINEER OF RECORD.
JORGE AROCHA
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3200 NW 67TH AVENUE
MIAMI, FLORIDA 33166

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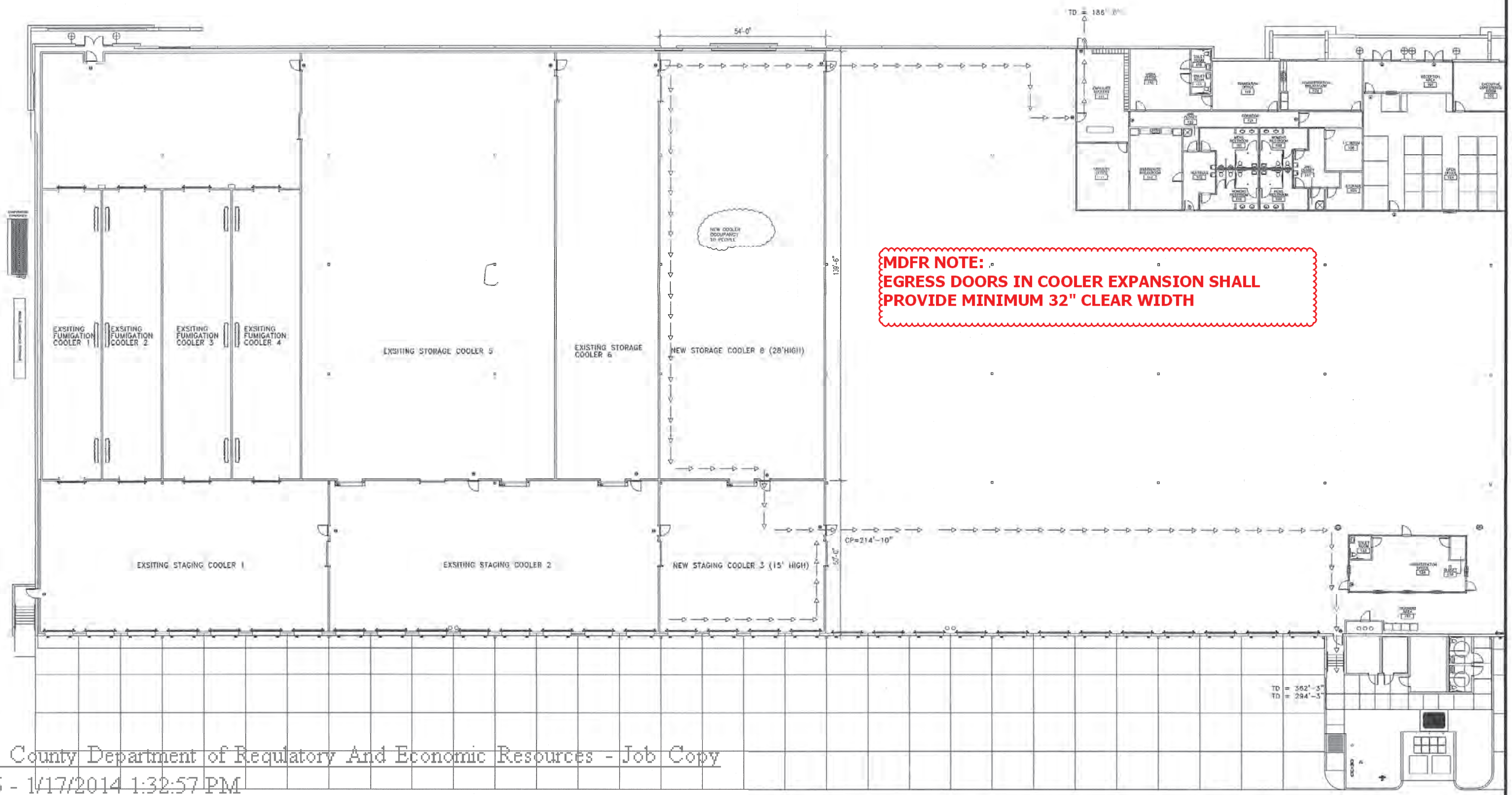
1/6/14



MDFR NOTE:
EGRESS DOORS IN COOLER EXPANSION SHALL PROVIDE MINIMUM 32" CLEAR WIDTH

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Examiner	Date Time Stamp	Disp.	Trade	Stamp Name
Ron Bennett	12/23/2013 7:41:08 AM	A	FIRE	Approved
JoAnn Pirrello	12/23/2013 12:58:30 PM	A	ZONE	Approved
Mario Soto	1/10/2014 2:00:26 PM	V	BLDG	Void
Mario Soto	12/26/2013 11:45:49 AM	R	BLDG	Reference only

EXISTING COOLER PERMIT NO. 2013011216 AND PROCESS NUMBER C2013155806

LIFE SAFETY SCALE 1/16" : 1'

REVISIONS	NUM.

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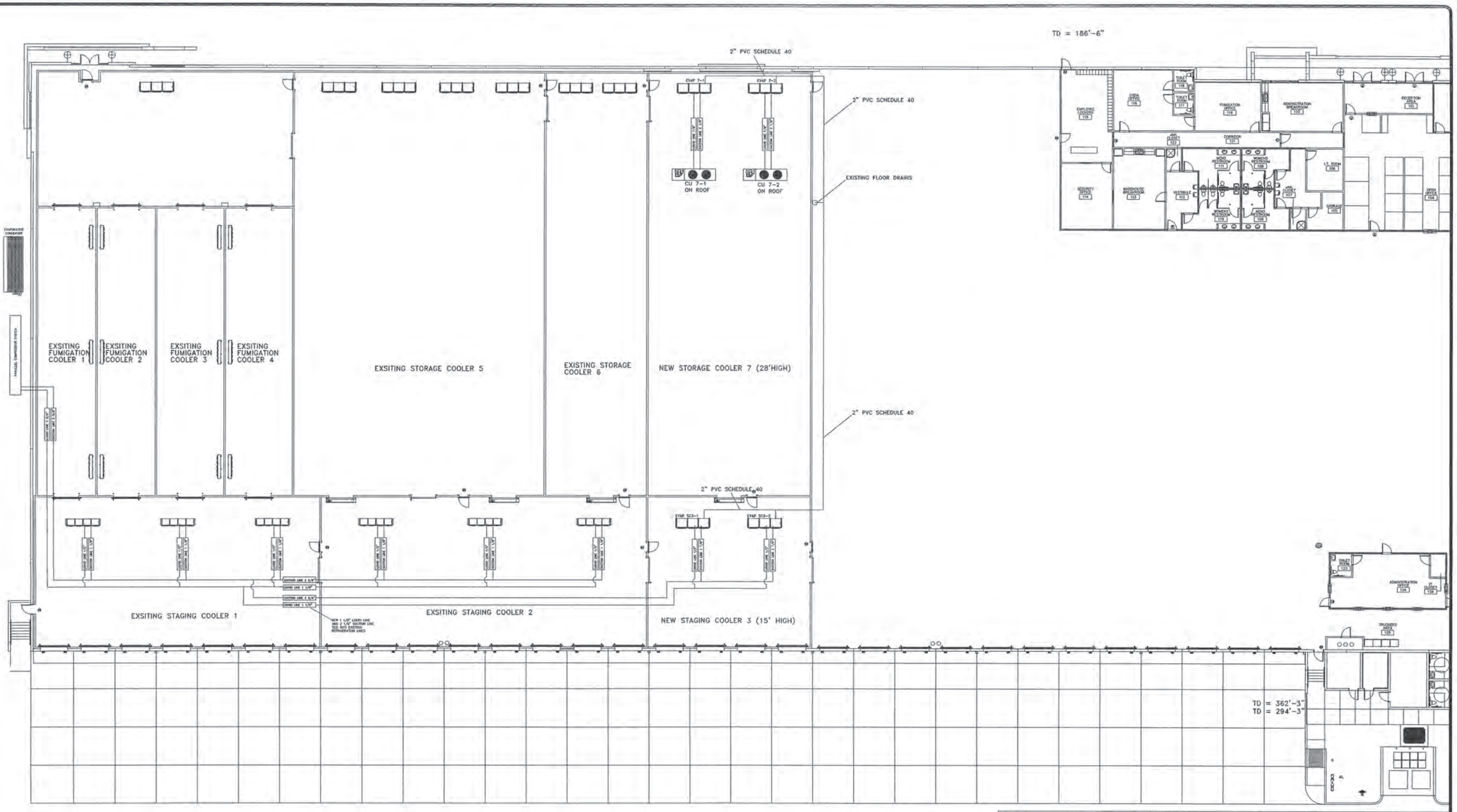
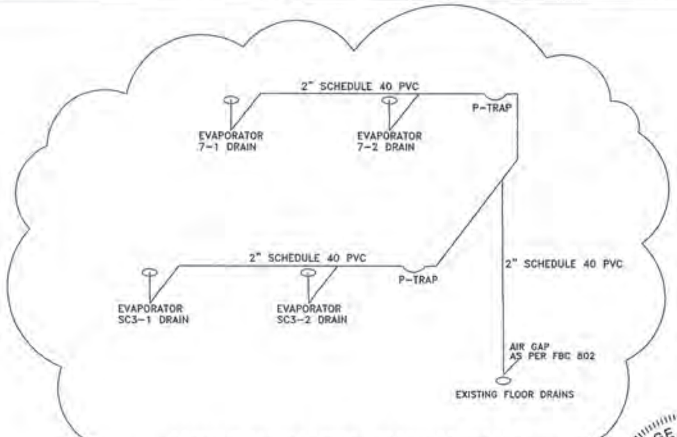
JORGE L. AROCHA
No. 61606





CONDENSATE ISOMETRIC

REFRIGERATION PIPING AND CONDENSATE DRAINS SCALE 1/8": 1'

REVISIONS	NUM.

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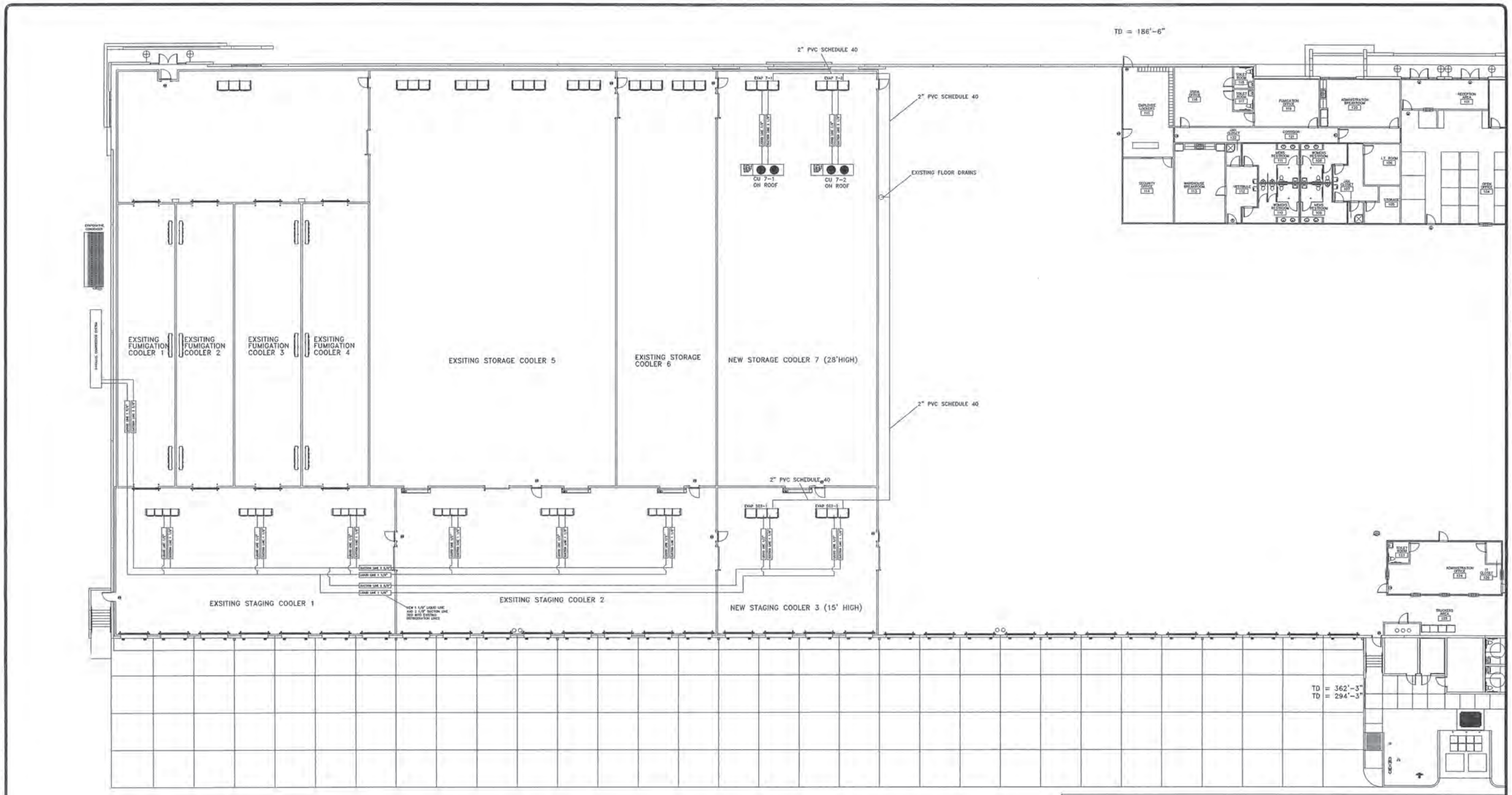
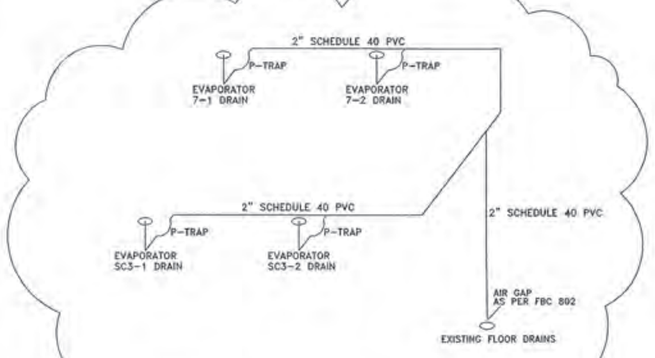
JORGE L. AROCHA
LICENSE
No. 61606
STATE OF FLORIDA
PROFESSIONAL ENGINEER

1/6/14

Examiner	Date Time Stamp	Disp.	Trade	Stamp Name
Wilfredo Urquiaga	1/9/2014 10:08:17 AM	D	PLUM	Disapproved



REFRIGERATION PIPING AND CONDENSATE DRAINS SCALE 1/8": 1'



CONDENSATE ISOMETRIC

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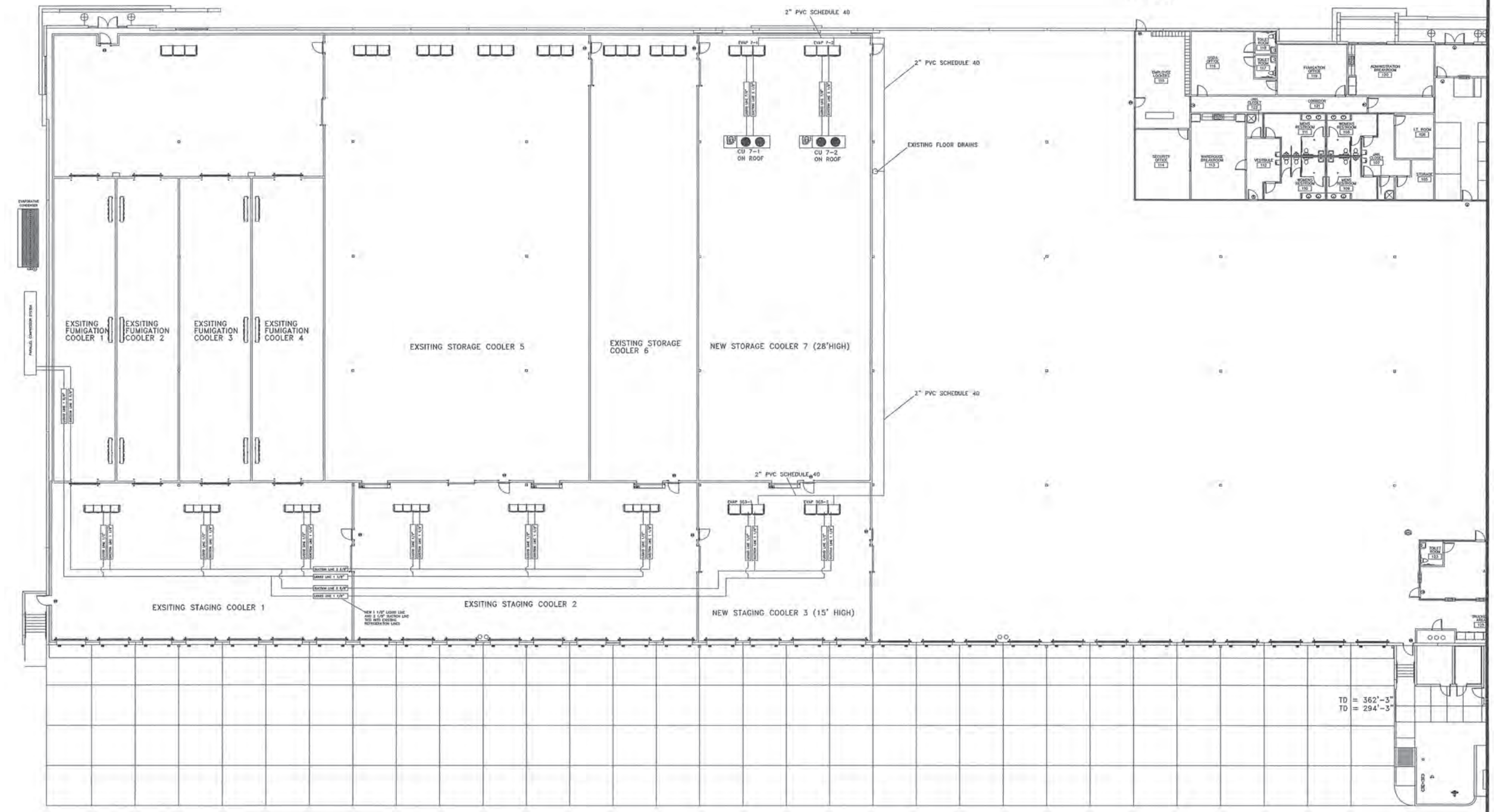
Examiner	Date Time Stamp	Disp.	Trade	Stamp Name
Wilfredo Urquiaga	1/16/2014 10:46:51 AM	A	PLUM	Approved



REFRIGERATION PIPING AND CONDENSATE DRAINS SCALE 1/8": 1'

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Examiner	Date Time Stamp	Disp.	Trade	Stamp Name
David Ferreira	12/20/2013 5:33:11 PM	A	MECH	Approved
Wilfredo Urquiaga	1/9/2014 10:08:31 AM	V	PLUM	Void

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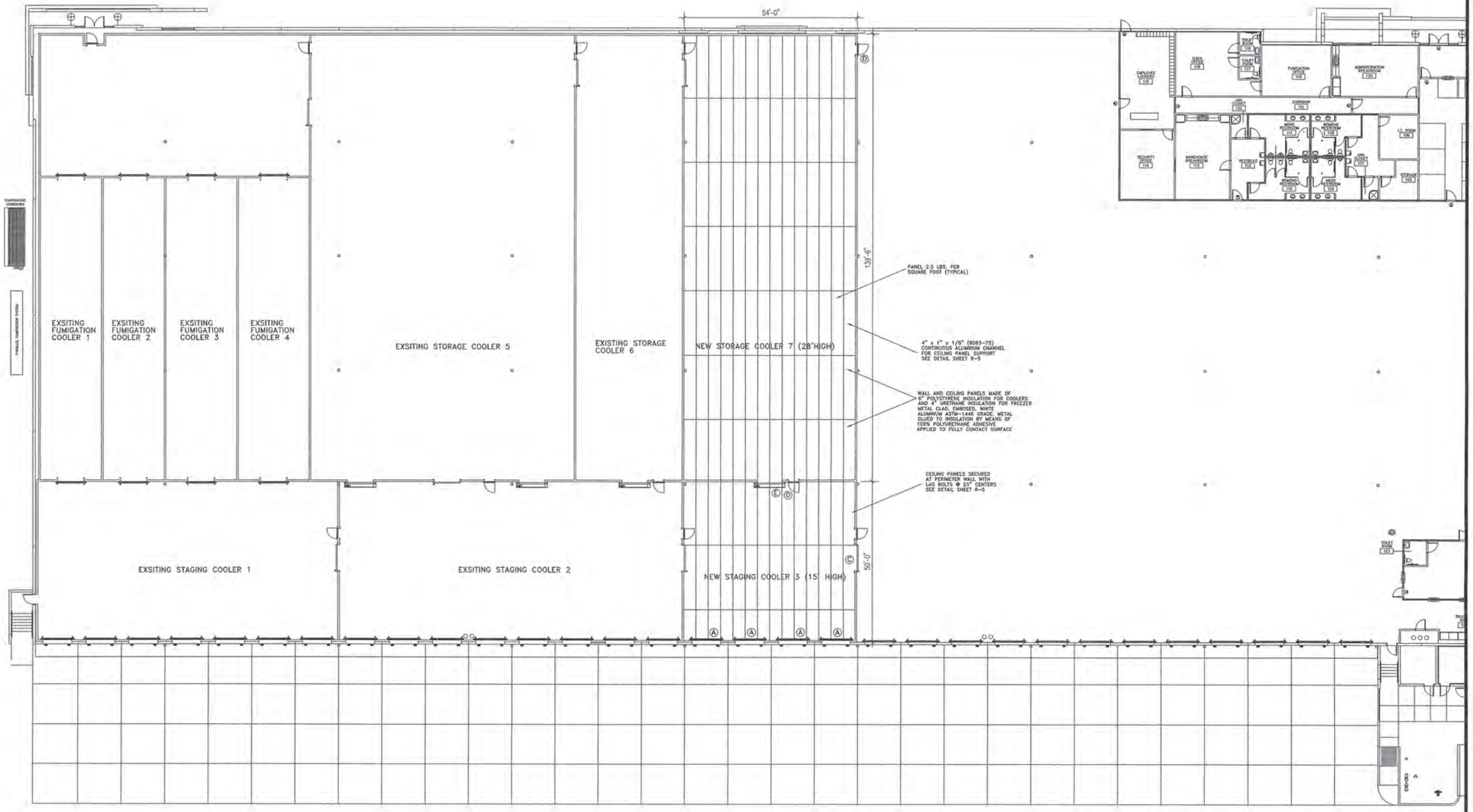

PANEL 2.5 LBS. PER SQUARE FOOT (TYPICAL)

4" x 1" x 1/8" (6063-75) CONTINUOUS ALUMINIUM CHANNEL FOR CEILING PANEL SUPPORT SEE DETAIL SHEET R-5

WALL AND CEILING PANELS MADE OF 6" POLYSTYRENE INSULATION FOR COOLERS AND 4" URETHANE INSULATION FOR FREEZER METAL CLAD, EMBOSED, WHITE ALUMINUM ASTM-1446 GRADE. METAL GLUED TO INSULATION BY MEANS OF 100% POLYURETHANE ADHESIVE APPLIED TO FULLY CONTACT SURFACE

CEILING PANELS SECURED AT PERIMETER WALL WITH LAG BOLTS @ 23" CENTERS SEE DETAIL SHEET R-5

COOLER PANEL LAYOUT SCALE 1/16" : 1'

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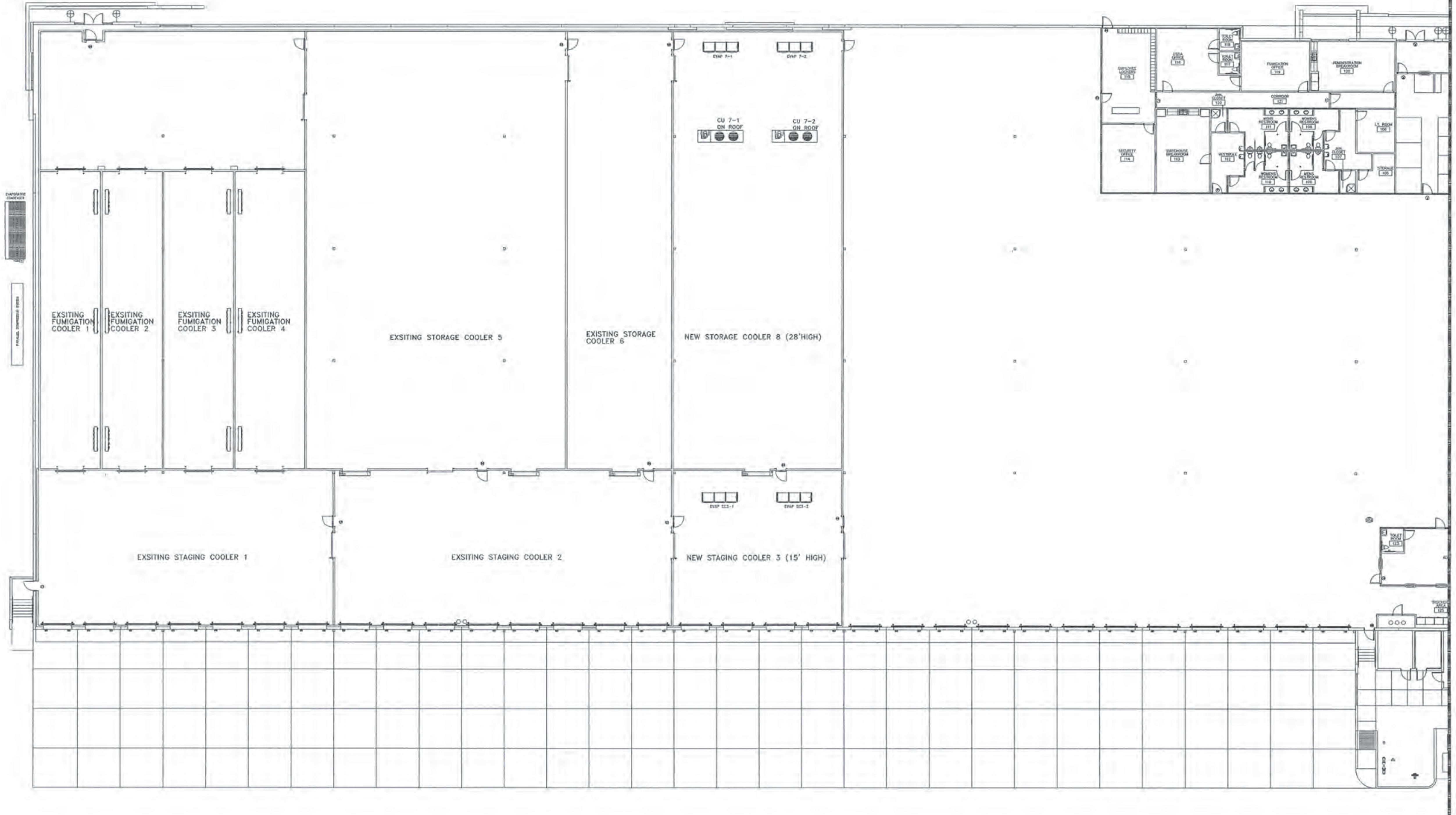
JORGE L. AROCHA
No. 61606



REFRIGERATION EQUIPMENT LOCATION SCALE 1/16" : 1'

REVISIONS	NUM.

consulting enginee
analysis - planning - permit
2300 NW 94th Ave Doral, FL 33172
T: (786) 275 4376 F: (786) 332 3917
mep-miami.com

ENGINEER OF RECORD.
JORGE AROCHA
P.E.#61606 C.A.#30186

REFRIGERATION ENGINEERED
SYSTEMS, INC.
7215 NW 36 AVE.
MIAMI, FL 33147
TEL: (305) 836-6900

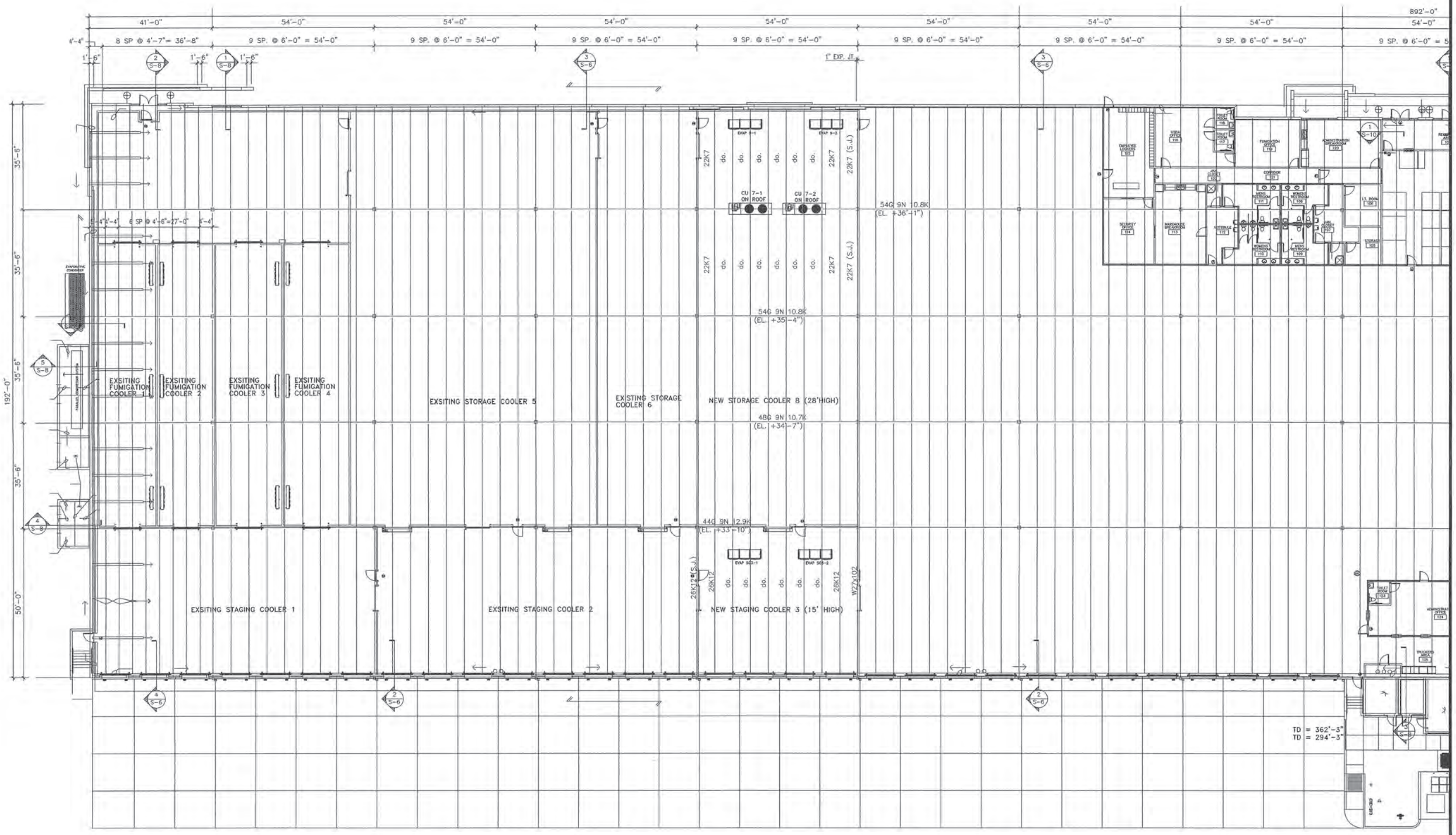
SLFC - BUILDING 1
3200 NW 67TH AVENUE
MIAMI, FLORIDA 33166

DRAWN
CHECKED
DATE
SCALE
JOB NO.
SHEET
S-2
OF SHEETS

No. 61606

Miami Dade County Department of Regulatory And Economic Resources - Job Copy
0000865375 - 1/17/2014 1:32:57 PM
S-2-12192013.PDF

Examiner	Date Time Stamp	Disp.	Trade	Stamp Name
David Ferreira	12/20/2013 5:34:15 PM	A	MECH	Approved



REFRIGERATION EQUIPMENT LOCATION SCALE 1/16" : 1'

REVISIONS | NUM.

mep
consulting enginee
analysis - planning - permit
2300 NW 94th Ave Doral, FL 33172
T: (786) 275 4376 F: (786) 332 3917
mep-miami.com

ENGINEER OF RECORD,
JORGE AROCHA
P.E.#61606 C.A.#30186

REFRIGERATION ENGINEERED
SYSTEMS, INC.
7215 NW 36 AVE.
MIAMI, FL 33147
TEL: (305) 836-6900

SLFC - BUILDING 1
3200 NW 67TH AVENUE
MIAMI, FLORIDA 33166

DRAWN
CHECKED
DATE
SCALE
JOB NO.
SHEET
S-2A
OF SHEETS

JORGE AROCHA
No. 61606
1/6/14

APPENDIX D

Benchmark Analysis

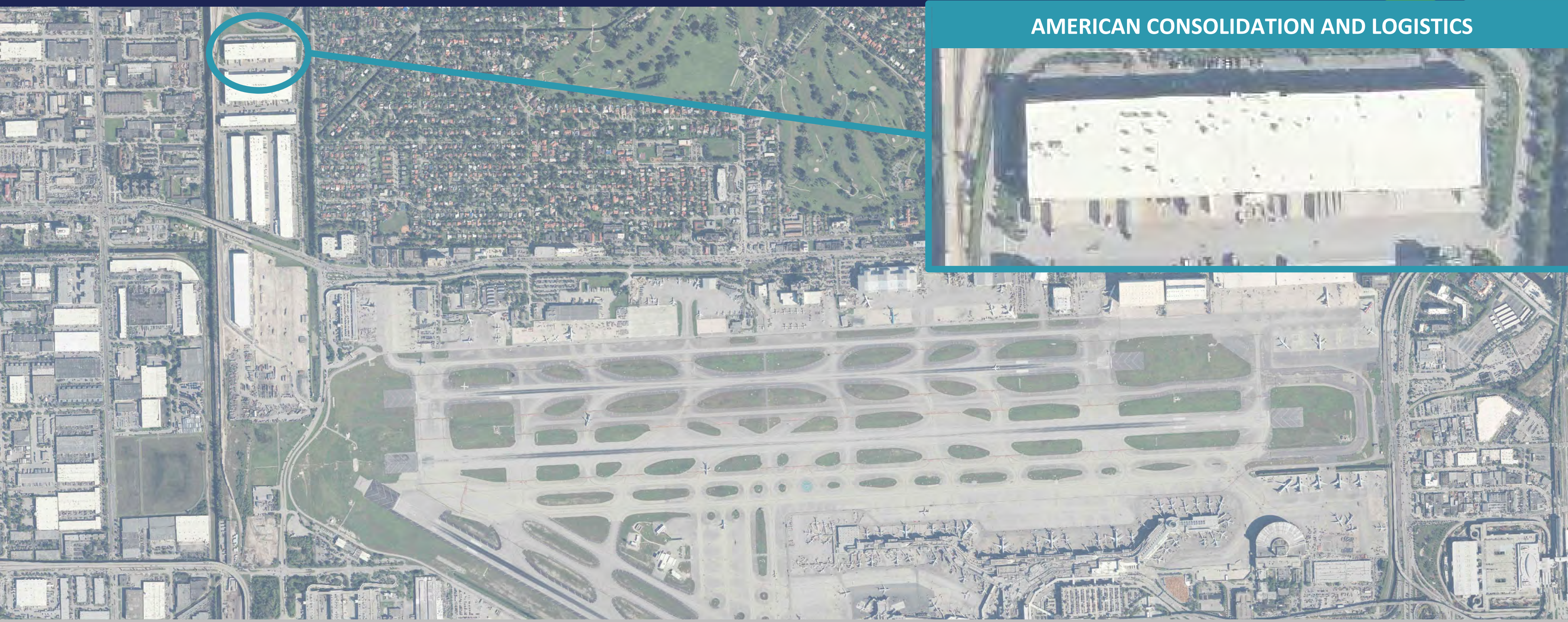
BENCHMARKED FACILITIES

Benchmarking Candidates

Airport	Fumigation Operator	Year Built	Facility Size (sq. ft.)
Gulfport-Biloxi International Airport (Mississippi)	Gateway America	2010	46,000
Off-Airport			
Miami	American Consolidation and Logistics (ACL)	2013	170,000
Port of Baltimore	Wallenius Wilhelmsen Solutions	2015	26,000

Miami (Off-Airport)

Operator: American Consolidation and Logistics (ACL)



Source: Quantum Spatial, 2017 MIA Aerial Image, October 2017.

Miami (Off-Airport)

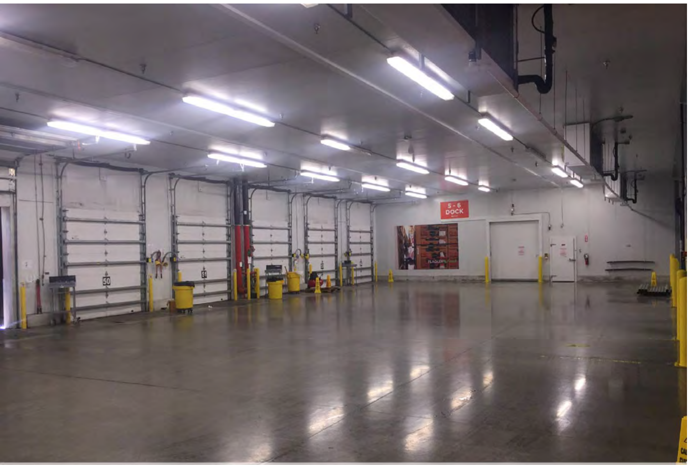
Operator: American Consolidation and Logistics (ACL)

- Facility Characteristics:
  - Building Size: 170,000 sq. ft.,
  - 4 fumigation chambers (360 pallets total), with a 95% emission free, recover system for the methyl bromide,
  - 31 bays under refrigeration,
  - 12 advanced forced air units (capacity for 120 pallets at a time),
  - Storage capacity of 3,500 pallets,
  - Controlled environment,
  - 1.4 miles from MIA cargo warehouses.

Source: ACL, http://www.amerconsolidated.com/airport.html, July 2018.

Miami (Off- Airport)

Operator: American Consolidation and Logistics (ACL)



LOADING DOCKS ENTRANCE

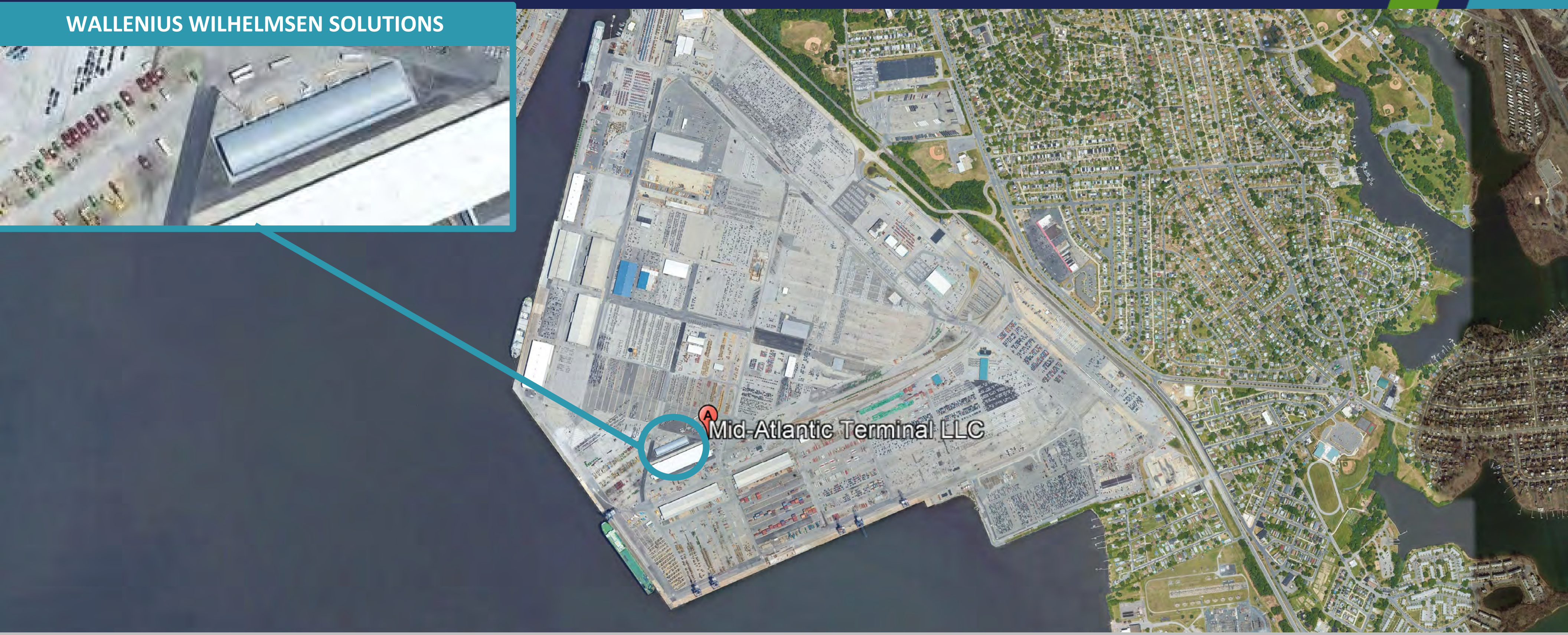
COLD STORAGE

FUMIGATION CHAMBERS

Source: ACL, http://www.amerconsolidated.com/airport.html, July 2018.

Port of Baltimore (Off-Airport)

Operator: Wallenius Wilhelmsen Solutions



Source: Google Earth Pro, 2018;

Port of Baltimore (Off-Airport)

Operator: Wallenius Wilhelmsen Solutions

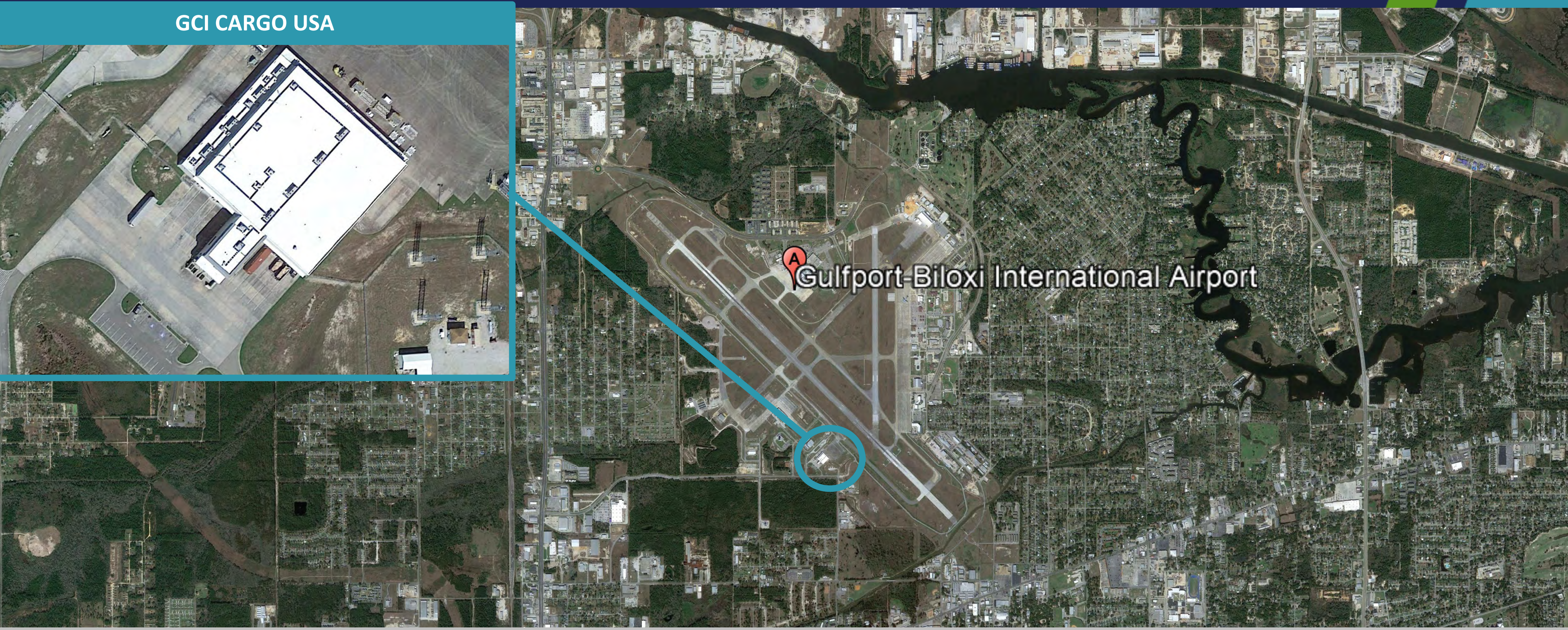
- Facility Characteristics:
  - Building Size: 26,000 sq. ft.,
  - 148,000 cubic meters of cargo fumigated in 2017,
  - 1 fumigation chamber,
  - State-of-the-art ventilation system,
  - Cargo fumigated for up to 12 hours, followed by up to 20 hours of ventilation,
  - Controlled environment.

FUMIGATION CHAMBER (CARS AND ROLLING EQUIPMENT)

Source: Wallenius Wilhelmsen Solutions, https://www.2wglobal.com/news-and-insights/articles/features/keeping-cargo-pest-free-in-baltimore/, June 2018.

Gulfport-Biloxi International Airport (Mississippi)

Operator: Gateway America



Source: Google Earth Pro, 2018;

Gulfport-Biloxi International Airport (Mississippi)

Operator: Gateway America

- Facility Characteristics:
  - Building Size: 46,000 sq. ft.,
  - 10 loading dock positions,
  - Cold and dry storage,
  - Airside access.

Source: Gulfport-Biloxi Airport, Fact Sheet, March 2017.

APPENDIX E

Design Ticket No. 130809513 and Log of Communications

Valeska L. Colmenares

From: irth_host@callsunshine.com
Sent: Thursday, May 10, 2018 2:23 PM
To: Valeska L. Colmenares
Subject: SSOCOF CONFRM 2018/05/10 #00000 130809513-000 NORM DSGN NEW

Categories: meeting

EXTERNAL EMAIL: Do not click unknown links/attachments. Never give out your user ID or password.

____
____

CONFRM 00000 CALL SUNSHINE 05/10/18 14:22:58ET 130809513-000 DESIGN GRID Ticket : 130809513 Rev:000 Taken: 05/10/18 14:04ET

State: FL Cnty: DADE GeoPlace: MIAMI
CallerPlace: MIAMI
Subdivision:

Address :
Street : NW 72ND AVE
Cross 1 : NW 14TH ST
Within 1/4 mile: Y

Locat: ***DESIGN*** THE PROPERTY BOUNDARIES ARE: NW 14TH ST TO THE SOUTH, NW 72ND AVE & CORPORATE WAY TO THE EAST, PALMETTO EXPY TO THE WEST AND W/IN 1200FT NORTH OF NW 14TH ST
:
Remarks : IN RESPONSE TO RECEIPT OF A DESIGN TICKET, SSOCOF PROVIDES THE ORIGINATOR OF THE DESIGN TICKET WITH A LIST OF SSOCOF MEMBERS IN THE VICINITY OF THE DESIGN PROJECT. SSOCOF DOES NOT NOTIFY SSOCOF MEMBERS OF THE RECEIPT BY SSOCOF OF A DESIGN TICKET. IT IS THE SOLE RESPONSIBILITY OF THE DESIGN ENGINEER TO CONTACT SSOCOF MEMBERS TO REQUEST INFORMATION ABOUT THE LOCATION OF SSOCOF MEMBERS' UNDERGROUND FACILITIES. SUBMISSION OF A DESIGN TICKET WILL NOT SATISFY THE REQUIREMENT OF CHAPTER 556, FLORIDA STATUTES, TO NOTIFY SSOCOF OF AN INTENT TO EXCAVATE OR DEMOLISH. THAT INTENT MUST BE MADE KNOWN SPECIFICALLY TO SSOCOF IN THE MANNER REQUIRED BY LAW. IN AN EFFORT TO SAVE TIME ON FUTURE CALLS, SAVE YOUR DESIGN TICKET NUMBER IF YOU INTEND TO BEGIN EXCAVATION WITHIN 90 DAYS OF YOUR DESIGN REQUEST. THE DESIGN TICKET CAN BE REFERENCED , AND THE INFORMATION ON IT CAN BE USED TO SAVE TIME WHEN YOU CALL IN THE EXCAVATION REQUEST.
*** LOOKUP BY MANUAL ***
:
Grids : 2547C8019C 2547C8019D 2547D8019C 2547D8019D

Work date: 05/10/18 Time: 14:05ET Hrs notc: 000 Category: 6 Duration: UNKNOWN Due Date : 05/14/18 Time: 23:59ET
Exp Date : 06/11/18 Time: 23:59ET Work type: DESIGN Boring: U White-lined: U
Ug/Oh/Both: U Machinery: N Depth: UNK Permits: U N/A Done for : DESIGN

Company : NOVA CONSULTING Type: CONT
Co addr : 10486 NW 31ST TER
City   : MIAMI State: FL Zip: 33172
Caller : VALESKA COLMENARES Phone: 305-436-9200 Ext: 240 Contact : DESIGN Phone:
BestTime: MORNING
Mobile : 786-449-8678
Fax   : 305-436-9265
Email   : VCOLMENARES@NOVA-CONSULTING.COM

Submitted: 05/10/18 14:04ET Oper: JES
Mbrs :
ATTF01 NANCY SPENCE 770-918-5424
ATT / T
2315 GEES MILL BUSINESS PKWY NE
CONYERS, GA 30013-1578
Level 1: NO
Level 2: NO
Level 3: YES, FEES WILL VARY
Level 4: NO
CC1280 LEONARD MAXWELL-NEWBOLD 954-447-8405
COMCAST CABLE
2601 SW 145TH AVE
MIRAMAR, FL 33027
Level 1: Member does not provide this service.
Level 2: Member does not provide this service.
Level 3: Member does not provide this service.
Level 4: Member does not provide this service.
CITYGS HARRY ROCHA 305-835-3612 Ext: 63612
FLORIDA CITY GAS
4045 NW 97TH AVE
DORAL, FL 33178
Level 1: SERVICES NOT PROVIDED BY MEMBER
Level 2: SERVICES NOT PROVIDED BY MEMBER
Level 3: SERVICES NOT PROVIDED BY MEMBER
Level 4: SERVICES NOT PROVIDED BY MEMBER
DCPWT OCTAVIO VIDAL 305-412-0891 Ext: 201
DADE COUNTY PUBLIC WORKS AND TRAFFIC
13284 SW 120TH ST
MIAMI, FL 33186
Level 1: $175.00 PER MILE OF PROJECT
Level 2: SERVICES NOT PROVIDED BY MEMBER
Level 3: $250.00 PER HOUR
Level 4: $500.00 PER TEST HOLE
FDOT06 THOMAS MILLER 305-470-5757
AECOM
1001 NW 111TH AVE
MIAMI, FL 33172
Level 1: SERVICES NOT PROVIDED BY MEMBER
Level 2: SERVICES NOT PROVIDED BY MEMBER
Level 3: SERVICES NOT PROVIDED BY MEMBER
Level 4: SERVICES NOT PROVIDED BY MEMBER
FGT01 JOSEPH E. SANCHEZ 407-838-7171

FLORIDA GAS TRANSMISSION COMPANY
2405 LUCIEN WAY, SUITE 200
MAITLAND, FL 32751
Level 1: ENGINEERING $70 / HR (2 HR MIN) CALL FOR ESTIMATE
Level 2: ENGINEERING $70/HR FIELD TECH $60/HR (2 HR MIN)
Level 3: FIELD TECH $60/HR (2 HR MIN)
Level 4: FIELD TECH $60/HR (2 HR MIN) SURVEY/VACUUM EXC NOT PROVIDED

FPLDAD EDGAR AGUILAR 386-586-6403
FLORIDA POWER & LIGHT
10705 QUAIL ROOST DR
MIAMI, FL 33157
Level 1: NO FEE
Level 2: SERVICES NOT PROVIDED BY MEMBER
Level 3: SERVICES NOT PROVIDED BY MEMBER
Level 4: SERVICES NOT PROVIDED BY MEMBER

FPLFOD DANNY HASKETT 786-610-7073
CROWN CASTLE FIBER
9250 W FLAGLER ST
MIAMI, FL 33174
Level 1: NO CHARGE
Level 2: SERVICES NOT PROVIDED BY MEMBER
Level 3: SERVICES NOT PROVIDED BY MEMBER
Level 4: SERVICES NOT PROVIDED BY MEMBER

FPLWEO EDGAR AGUILAR 386-586-6403
FLORIDA POWER & LIGHT
10705 QUAIL ROOST DR
MIAMI, FL 33157
Level 1: NO FEE
Level 2: SERVICES NOT PROVIDED BY MEMBER
Level 3: SERVICES NOT PROVIDED BY MEMBER
Level 4: SERVICES NOT PROVIDED BY MEMBER

L3C900 NETWORK RELATIONS 877-366-8344 Ext: 2
LEVEL 3 COMMUNICATIONS LLC
1025 ELDORADO BLVD
BROOMFIELD, CO 80021
Level 1: CONTACT MEMBER DIRECTLY FOR FEE SCALE
Level 2: CONTACT MEMBER DIRECTLY FOR FEE SCALE
Level 3: CONTACT MEMBER DIRECTLY FOR FEE SCALE
Level 4: CONTACT MEMBER DIRECTLY FOR FEE SCALE

MCIU01 DEAN BOYERS 469-886-4238
MCI
400 INTERNATIONAL PKWY
RICHARDSON , TX 75081
Level 1: $0
Level 2: SERVICES NOT PROVIDED BY MEMBER
Level 3: SERVICES NOT PROVIDED BY MEMBER
Level 4: SERVICES NOT PROVIDED BY MEMBER

MDWS LAZARO GUERRA 786-268-5273
MIAMI DADE WATER SEWER
3575 S LEJEUNE RD
MIAMI, FL 33146

Level 1: AS-BUILDS PROVIDED AT COST OF $5.00 PER SHEET
Level 2: SERVICES NOT PROVIDED BY MEMBER
Level 3: SERVICES NOT PROVIDED BY MEMBER
Level 4: SERVICES NOT PROVIDED BY MEMBER

QST885 GEORGE MCELVAIN 303-992-9931
CENTURYLINK (FORMERLY QWEST COMMUNICATI
700 W MINERAL AVE
NE J31.2
LITTLETON, CO 80120
Level 1: Call for fee.
Level 2: Call for fee.
Level 3: Call for fee.
Level 4: Call for fee.

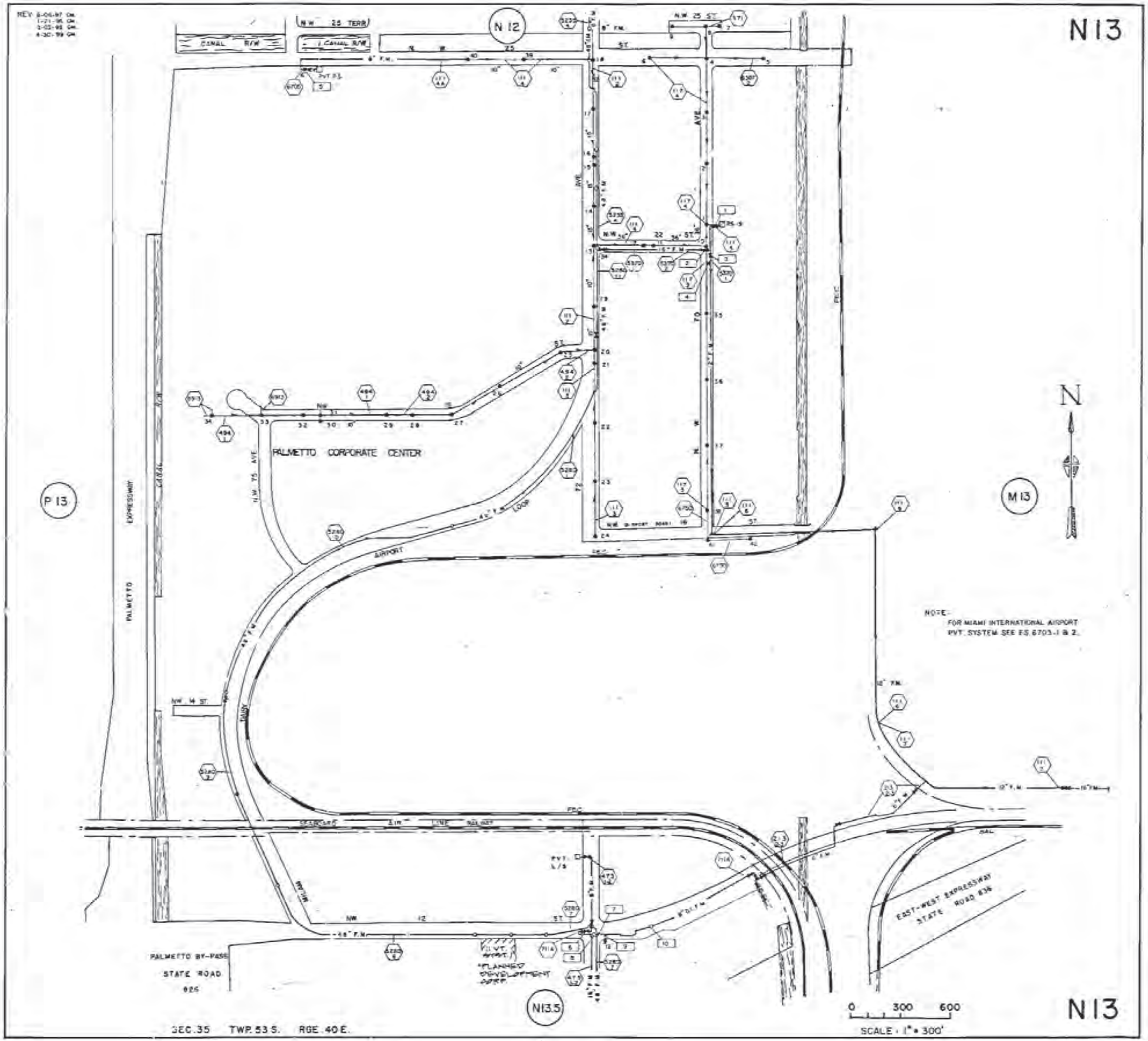
SB2186

SBF23 DINO FARRUGGIO 561-997-0240
AT & T/ DISTRIBUTION
1120 S ROGERS CIR
BOCA RATON, FL 33487
Level 1: FEE TO BE DETERMINED
Level 2: NOT PROVIDED BY MEMBER
Level 3: FEE TO BE DETERMINED
Level 4: NOT PROVIDED BY MEMBER

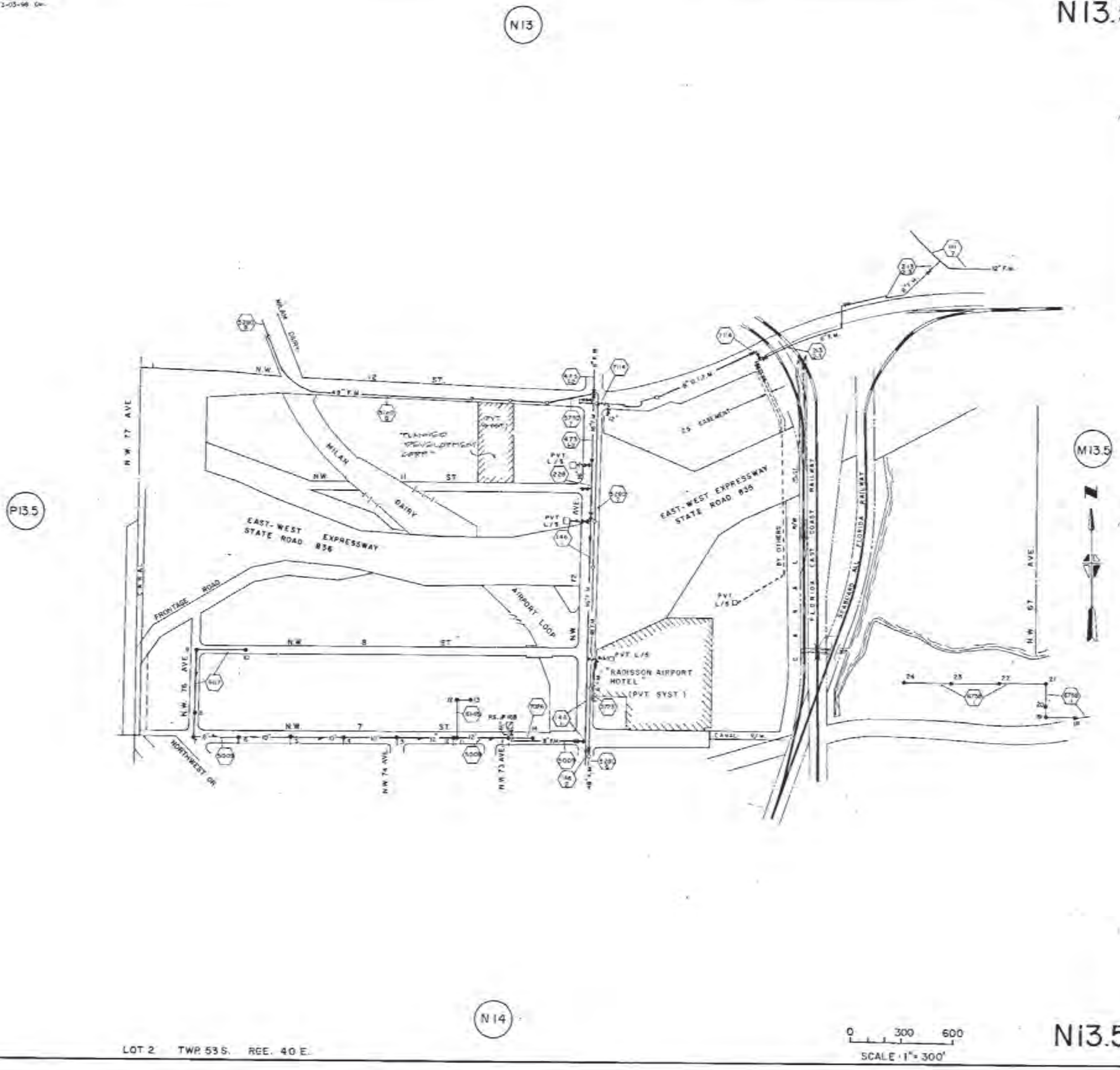
Utility Owner	Utility Type	Contact	Phone/Fax	Address	Email	Comments
COMCAST CABLE	Communications	LEONARD MAXWELL-NEWBOLD	954-447-8405	2601 SW 145TH AVE MIRAMAR, FL 33027	leonard_maxwell-newbold@cable.comcast.com	Sent email on 5/11 with the location
FLORIDA CITY GAS	Gas	HARRY ROCHA	305-835-3612 Ext: 63612	4045 NW 97TH AVE DORAL, FL 33178		Voice message left on 5/14/2018
DADE COUNTY PUBLIC WORKS AND TRAFFIC	Traffic Signalization, Stormwater	OCTAVIO VIDAL	305-412-0891 Ext: 201	13284 SW 120TH ST MIAMI, FL 33186	ovidal@htlocating.com	Sent email on 5/11 with the location
FLORIDA GAS TRANSMISSION COMPANY	Gas	JOSEPH E. SANCHEZ	407-838-7171	2405 LUCIEN WAY, SUITE 200 MAITLAND, FL 32751	joseph.e.sanchez@energytransfer.com	Sent email on 5/11 with the location
FLORIDA POWER & LIGHT	Electric	EDGAR AGUILAR	386-586-6403	10705 QUAIL ROOST DR MIAMI, FL 33157	edgar.aguilar@fpl.com	Sent email on 5/11 with the location
MIAMI DADE WATER SEWER	Water, Wastewater	LAZARO GUERRA	786-268-5273	3575 S LEJEUNE RD MIAMI, FL 33146		Water and Sewer As-Builts obtained via MDWASD GIS database
AT & T/ DISTRIBUTION	Communications	DINO FARRUGGIO	561-997-0240	1120 S ROGERS CIR BOCA RATON, FL 33487	df1979@att.com	Sent email on 5/14 with the location
ATT / T	Communications	NANCY SPENCE	770-918-5424	2315 GEES MILL BUSINESS PKWY NE CONYERS, GA 30013-1578		Voice message left on 5/14/2018
FDOT - AECOM		THOMAS MILLER	305-206-2600	1001 NW 111TH AVE MIAMI, FL 33172	Thomas.miller@sunguide.info	Sent email on 5/11 with the location
FPL - MDAD	Airport	ROBERT W GARDNER	305-345-3229	MIA	robert_w_gardner@fpl.com	Sent email on 5/15 with the location and MDAD sign off sheet
FAA - MDAD	Airport	JEFF COOPER	305-869-5349	MIA	jeff.b.cooper@faa.gov	Sent email on 5/15 with the location and MDAD sign off sheet
MDAD IRRIGATION	Airport	FRANK CONTRERAS	305-796-7746 Mobile 305-869-4760 Office	MIA	fcontreras@miami-airport.com	Sent email on 5/15 with the location and MDAD sign off sheet
MDAD UTILITIES	Airport	FRED HERBERT	305-876-7542	MIA	fherbert@miami-airport.com	Sent email on 5/15 with the location and MDAD sign off sheet
BLACK BOX - COMMUNICATIONS	Communications - Airport	CABLE FACILITIES DEPT	305-876-8416	MIA	bbns-miami-administration@blackbox.com	Sent email on 5/15 with the location and MDAD sign off sheet; Received sign off sheet signed MDAD has no underground utilities in this area; I do recommend G.P.R. and soft dig at this location
FPL - CROWN CASTLE FIBER		DANNY HASKETT	786-610-7073	9250 W FLAGLER ST MIAMI, FL 33174	danny.haskett@crowncastle.com fiber.dig@crowncastle.com	Sent email on 5/14 with the location Fibernet Direct Florida, LLC has underground fiber optic facilities within or near the limits of the above-referenced project
LEVEL 3 COMMUNICATIONS LLC	Communications	NETWORK RELATIONS	877-366-8344 Ext: 2	1025 ELDORADO BLVD BROOMFIELD, CO 80021	level3.networkrelocation@level3.com	Sent email on 5/14 with the location In response to your inquiry please find the enclosed drawings indicating the approximate location of the CenturyLink telecommunications facilities
CENTURYLINK (FORMERLY QWEST COMMUNICATI	Communications	GEORGE MCELVAIN	303-992-9931	700 W MINERAL AVE NE J31.2 LITTLETON, CO 80120		Voice message left on 5/14/2018
MCI		DEAN BOYERS	469-886-4238	400 INTERNATIONAL PKWY RICHARDSON , TX 75081	investigations@verizon.com	Sent email on 5/14 with the location Verizonbusiness (MCI) DOES Have Facilities in the area

APPENDIX F

Miami-Dade Water and Sewer Department Sewer Atlas


N13
REV: 6-06-97 GM.
1-21-96 GM.
3-03-98 GM.
4-30-99 GM.
N.W. 25 TERR.
CANAL R/W
CANAL R/W
N 12
N.W. 25 ST.
8" F.M.
6" F.M.
PVT. P.S.
6705
AVE.
N.W. 36 ST.
15" F.M.
10"
FEC
N
M 13
P 13
PALMETTO CORPORATE CENTER
N.W. 75 AVE.
AIRPORT
48" F.M.
LOOP
NOTE:
FOR MIAMI INTERNATIONAL AIRPORT
PVT. SYSTEM SEE F.S. 6703-1 & 2.
12" F.M.
16" F.M.
PALMETTO EXPRESSWAY
CANAL
NW 14 ST.
DAIRY
SEABOARD AIR LINE RAILWAY
FEC
SAL
EAST-WEST EXPRESSWAY
STATE ROAD 836
PVT. L/S
NW 12 ST.
MILAM
PLANNED DEVELOPMENT
PALMETTO BY-PASS
STATE ROAD
826
N13.5
SEC. 35 TWP. 53 S. RGE. 40 E.
0 300 600
SCALE: 1" = 300'
N13

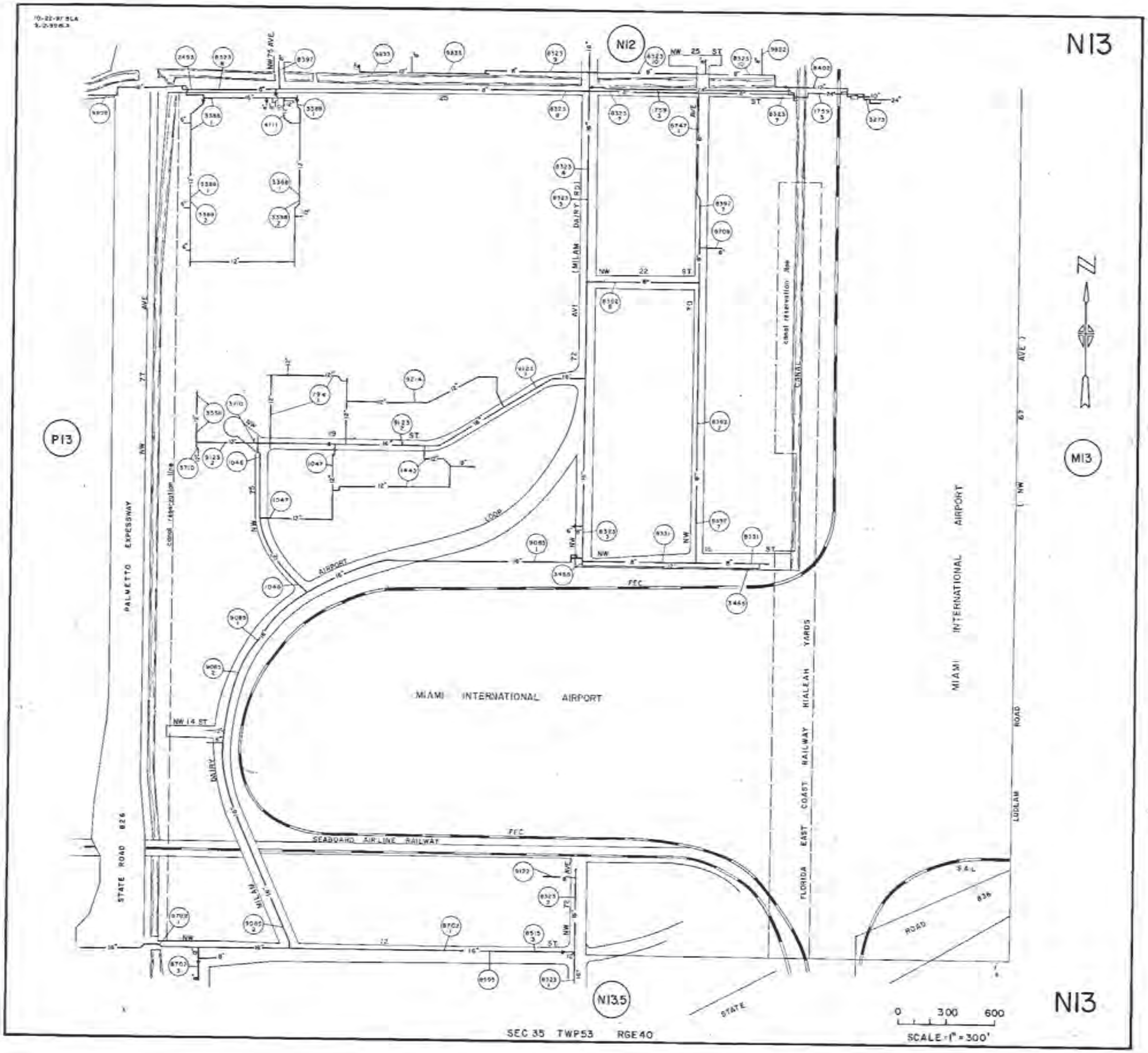
REV. 6-06-97 GW.
1-21-98 GW.
3-03-98 GW.

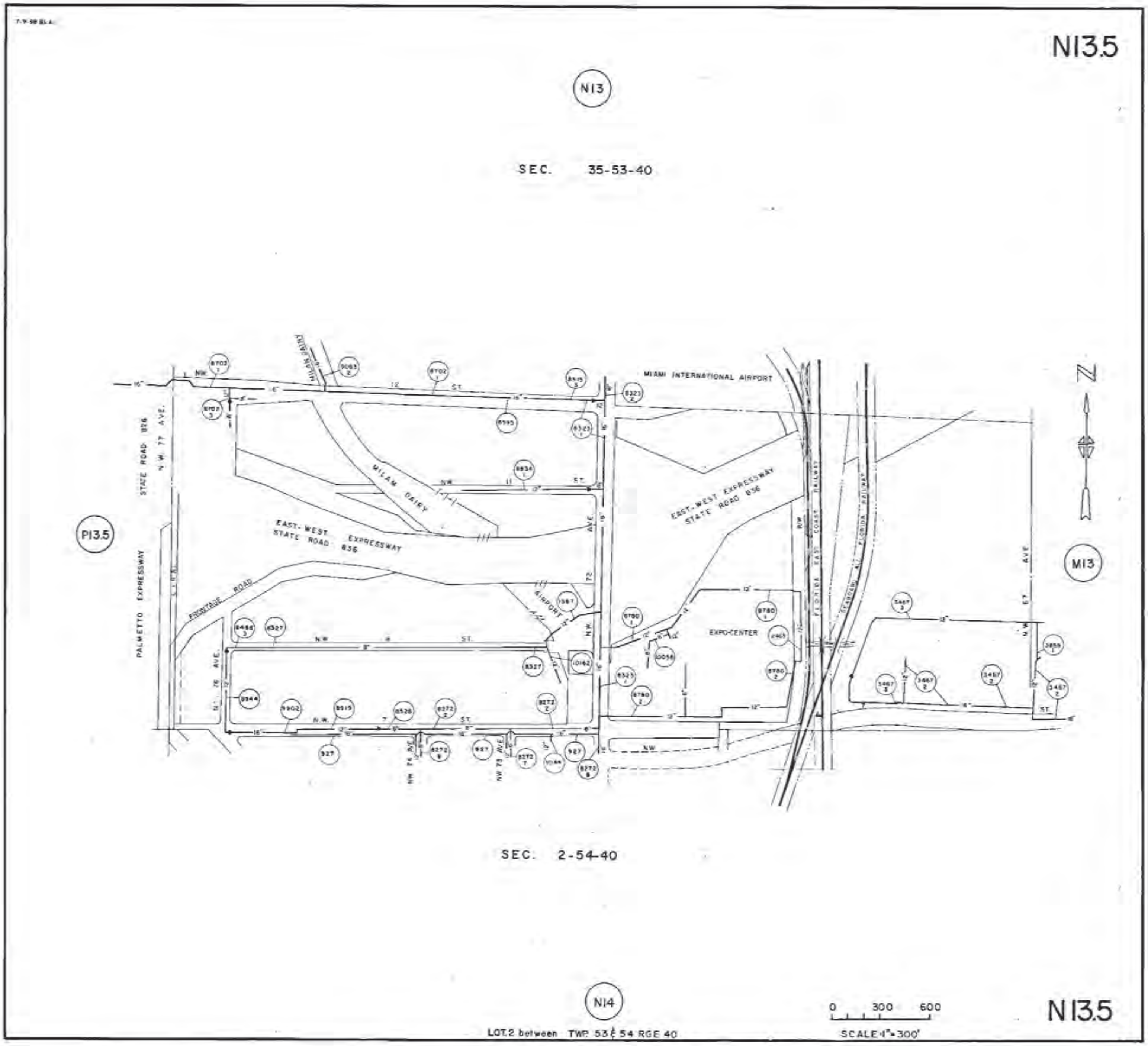


LOT 2 TWP. 53 S. RGE. 40 E.

APPENDIX G

Miami-Dade Water and Sewer Department Water Atlas


N13
N12
M13
P13
N13.5
NW 25 ST
NW 75 AVE
NW 22 ST
NW 72 AVE (MILAM DAIRY RD)
NW 19 ST
NW 25
NW 14 ST
NW 77 AVE
PALMETTO EXPRESSWAY
STATE ROAD 826
canal reservation line
CANAL
AIRPORT LOOP
DAIRY
MILAM
FEC
SEABOARD AIRLINE RAILWAY
FLORIDA EAST COAST RAILWAY HIALEAH YARDS
MIAMI INTERNATIONAL AIRPORT
NW 67 AVE (LUDLAM ROAD)
S.A.L.
836
ROAD
STATE
SEC 35 TWP53 RGE40
0 300 600
SCALE 1" = 300'
10-22-87 SLA

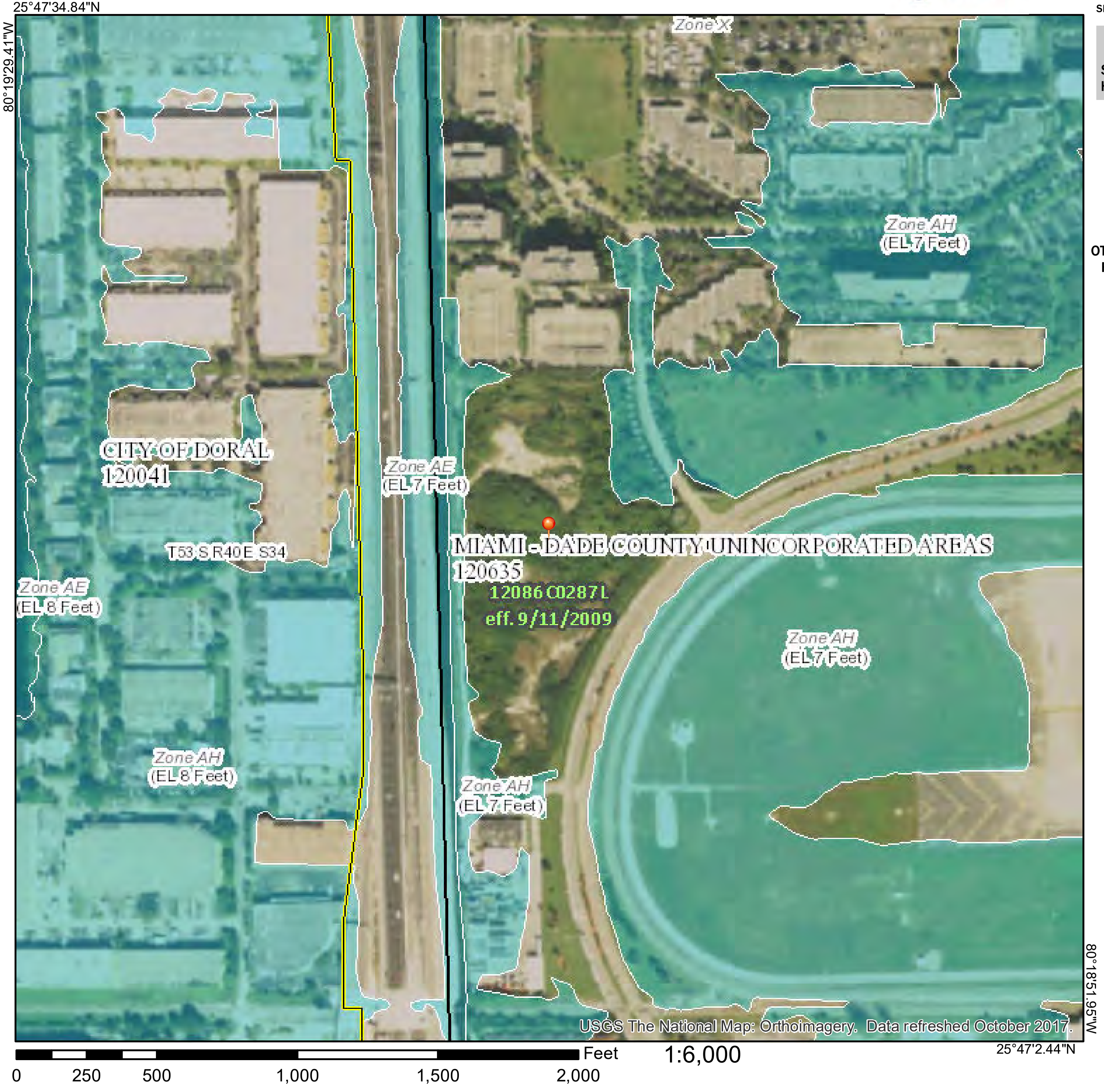

N13.5
N13
SEC. 35-53-40
MIAMI INTERNATIONAL AIRPORT
NW 12 ST.
MILAN DAIRY
MILAM DAIRY
NW 11 ST.
EAST-WEST EXPRESSWAY
STATE ROAD 836
FRONTAGE ROAD
AIRPORT
NW 8 ST.
N.W. 7 ST.
NW 74 AVE.
NW 73 AVE.
NW 76 AVE.
NW 72 AVE.
N.W. 77 AVE.
STATE ROAD 826
PALMETTO EXPRESSWAY
P13.5
EXPO-CENTER
R/W
FLORIDA EAST COAST RAILWAY
SEABOARD AIR FLORIDA RAILWAY
N.W. 67 AVE.
ST.
NW
M13
N
8702
9063
8515
8323
8595
8834
1387
8780
10056
2463
10162
8327
8488
9944
9902
8519
8528
8272
927
10144
3467
3859
SEC. 2-54-40
N14
LOT.2 between TWP. 53 & 54 RGE 40
0 300 600
SCALE 1"=300'
N13.5

APPENDIX H

Federal Emergency Management Agency – Flood Insurance Rate Map for Proposed Facility Site

National Flood Hazard Layer FIRMette

FEMA



USGS The National Map: Orthoimagery. Data refreshed October 2017.

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS	🟦	Without Base Flood Elevation (BFE) *Zone A, V, A99* With BFE or Depth *Zone AE, AO, AH, VE, AR*
	▨	Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD	🟧	0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
	▨	Future Conditions 1% Annual Chance Flood Hazard *Zone X*
	▨	Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
	▨	Area with Flood Risk due to Levee *Zone D*
OTHER AREAS	NO SCREEN	Area of Minimal Flood Hazard *Zone X*
	☐	Effective LOMRs
	🟧	Area of Undetermined Flood Hazard *Zone D*
GENERAL STRUCTURES	— — —	Channel, Culvert, or Storm Sewer
	ı ı ı ı ı ı ı	Levee, Dike, or Floodwall
OTHER FEATURES	B 20.2 17.5	Cross Sections with 1% Annual Chance Water Surface Elevation
	8 — —	Coastal Transect
	~~ 513 ~~~	Base Flood Elevation Line (BFE)
	—	Limit of Study
	—	Jurisdiction Boundary
	— - —	Coastal Transect Baseline
	—	Profile Baseline
	—	Hydrographic Feature
MAP PANELS	☐	Digital Data Available
	☐	No Digital Data Available
	☒	Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 11/9/2018 at 1:47:13 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

APPENDIX I

Preliminary Cost Estimates

TABLE I-1 (1 OF 5) ROUGH-ORDER-OF-MAGNITUDE COST ESTIMATE

Description	Estimated Quantity	Unit	Unit Price	Amount
General Conditions				
General Conditions	14%	-	-	$3,145,255
General Contractor Overhead and Profit	5%	-	-	$1,123,306
Bond and Fees	3%	-	-	$673,983
Subtotal - General Conditions				**$4,942,544**
Existing Conditions				
Demolition				$-
SUBTOTAL - Existing Conditions				**$-**
Concrete				
Underslab Vapor Barrier	96,000	sf	$0.30	$28,800
Concrete Forming	1	included in 033000		$-
Concrete Reinforcing	1	included in 033000		$-
Cast-in-Place Concrete	-	-	-	$3,400,800
Concrete Floor Finishing	96,000	sf	$2.50	$240,000
Tilt-up Concrete (walls)	60,000	sf	$18.00	$1,080,000
Subtotal - Concrete				**$4,749,600**
Masonry				
Concrete Unit Masonry	-	-	-	$1,220,000
Reinforced Unit Masonry	-	-	-	$72,800
Subtotal - Masonry				**$1,292,800**
Metals				
Structural Steel Framing	850	ton	$2,200.00	$1,870,000
Steel Joist Framing	350	ton	$1,750.00	$612,500
Steel Decking	100,000	sf	$5.00	$500,000
Metal Stairs	1	LS(allow)	$100,000.00	$100,000
Pipe and Tube Railings	1	LS(allow)	$49,500.00	$49,500
Subtotal - Metals				**$3,132,000**
Wood, Plastic and Composites				
Rough Carpentry	96,000	sf	$2.00	$192,000
Architectural Wood Casework	1	LS(allow)	$100,000.00	$100,000
Subtotal - Wood, Plastic and Composites				**$292,000**

TABLE I-1 (2 OF 5) ROUGH-ORDER-OF-MAGNITUDE COST ESTIMATE

Description	Estimated Quantity	Unit	Unit Price	Amount
Moisture and Thermal Protection				
Thermal Insulation				
Polyiso board insulation - roof assembly	96,000	sf	$2.50	$240,000
XPS board insulation - exterior walls	59,000	sf	$2.00	$118,000
Batt insulation - interior walls	17,500	sf	$0.55	$9,625
Insulated Wall Panels				
Fumigation Pallets Area	56000	sf	$8.50	$476,000
Cold Storage Area	30000	sf	$9.50	$285,000
Pre-Cold Staging	16500	sf	$8.50	$140,250
Thermoplastic Membrane Roofing	96,000	sf	$28.00	$2,688,000
Sheet Metal Flashing and Trim	3,600	lf	$3.00	$10,800
Roof Specialties	1	LS(allow)	89,300	$89,300
Firestopping	1	LS (allow)	$100,000.00	$100,000
Joint Sealants	1	LS (allow)	$100,000.00	$100,000
Subtotal - Moisture and Thermal Protection				**$4,256,975**
Openings				
Hollow Metal Doors and Frames	1	LS (allow)	$130,150.00	$130,150
Overhead Coiling Doors	1	LS (allow)	$842,800.00	$842,800
Aluminum-Framed Storefronts	250	sf	$150.00	$37,500
Aluminum Windows	250	sf	$80.00	$20,000
Fixed Wall Louvers	1,000	sf	$65.00	$65,000
Subtotal - Openings				**$1,095,450**
Finishes				
Gypsum Board Assemblies	17,440	sf	$12.50	$218,000
Cement Plastering	1	LS (allow)	$23,000.00	$23,000
Tiling				
Interior - Wall	2400	sf	$12.00	$28,800
Interior - Floor	3200	sf	$10.00	$32,000
Ceiling Panels				
Acoustical Ceiling Panels	12,000	sf	$4.00	$48,000
Insulated Ceiling Panels	60000	sf	$7.50	$450,000
Resilient Flooring	7500	sf	$5.20	$39,000
Painting and Coating				
Painting Interior Walls	75,000	sf	$3.00	$225,000
Painting Exterior Walls	65,600	sf	$3.50	$229,600
Painting Doors	65	ea	$150.00	$9,750
Paint Mech Equip	1	ls	$25,000.00	$25,000
Subtotal - Finishes				**$1,328,150**

TABLE I-1 (3 OF 5) ROUGH-ORDER-OF-MAGNITUDE COST ESTIMATE

Description	Estimated Quantity	Unit	Unit Price	Amount
Specialties				
Information Specialties	-	-	-	$19,000
Toilet Compartments	1	LS (allow)	$22,000.00	$22,000
Toilet Accessories	-	-	-	$43,735
Fire Protection Specialties	-	-	-	$15,000
Storage Specialties	-	-	-	$6,600
Exterior Specialties	-	-	-	$50,000
Subtotal - Specialties				**$156,335**
Equipment				
Subtotal - Equipment				**$-**
Furnishings				
Window Shades	1	ls	$25,000.00	$25,000
Entrance Floor Mats	12	ea	$2,000.00	$24,000
Subtotal - Furnishings				**$49,000**
Special Construction				
Subtotal - Special Construction				**$-**
Conveyance				
Subtotal - Conveyance				**$-**
Fire Supression				
NFPA 13 system	96,000	sf	$7.00	$672,000
Subtotal - Fire Supression				**$672,000**
Plumbing				
Subtotal - Plumbing				**$796,600**
HVAC				
Subtotal - HVAC				**$844,800**
Electrical				
Subtotal - Electrical				**$998,400**
Earth Work				
Site Clearing				
Site Clearing	22	ac	$8,500.00	$187,000
Tree Removal	100	ea	$750.00	$75,000
Grading	22	ac	$20,000.00	$440,000
Excavation				
Trenching and Rock Removal	1	LS (allow)	$250,000.00	$250,000
Underground Removal	1	LS (allow)	$250,000.00	$250,000
Fill - compacted building	64,000	cy	$28.00	$1,792,000
Termite Control	96,000	sf	$0.50	$48,000
Subtotal - Earth Work				**$3,042,000**

TABLE I-1 (4 OF 5) ROUGH-ORDER-OF-MAGNITUDE COST ESTIMATE

Description	Estimated Quantity	Unit	Unit Price	Amount
Exterior Improvements				
Subtotal - Exterior Improvements				**$-**
Utilities				
Excavation and Backfill for Water Main Connection 8" D.I.	1	LS	$2,400.00	**$2,400**
Excavation and Backfill for Fire Line - 6" D.I.	1	LS	$3,500.00	**$3,500**
Excavation and Backfill for Water Service - 2" Copper	1	LS	$8,800.00	**$8,800**
Excavation and Backfill for Grinder Pump Package System, 2" Ductile Iron Force Main, and 4" Cast Iron Gravity Main	1	LS	$15,300.00	**$15,300**
Excavation and Backfill for Power and Comm. Ductbank	1	LS	$2,200.00	**$2,200**
Installation of Water Main Connection 8" D.I.	66	LF	$307.58	**$20,300**
Installation one (1) fire hydrant	1	EA	$7,500.00	**$7,500**
Installation of Fire Line - 6" D.I.	443	LF	$138.37	**$61,300**
Installation of Water Service - 2" Copper	1332	LS	$40,200.00	**$40,200**
Installation Grinder Pump Package System, 2" Ductile Iron Force Main, and 4" Cast Iron Gravity Main	1	LS	$127,500.00	**$127,500**
Installation Power and Communication Ductbank (350 LF for Electrical Ductbank and 205 LF for Communication Ductbank. Cables not included)	1	LS	$37,500.00	**$37,500**
Parking Lot Appurtenances (assume 23 parking spaces. Cost does not include site lighting)	1	LS	$8,100.00	**$8,100**
Pavement Installation for Access Road and Parking Lot Area	211,784	SF	$3.00	**$636,100**
Drainage System (9 curb catch basins, 8 catch basin manholes)	1	LS	$192,700.00	**$192,700**
Retention Ponds	1	LS	$51,700.00	**$51,700**
Erosion and Sedimentation Controls	1	LS	$2,400.00	**$2,400**
Grading and Site Restoration	1	LS	$85,300.00	**$85,300**
Cleaning and Grubbing	8	Acre	$7,869.05	**$66,100**
Subtotal - Utilities				**$1,368,900**

TABLE I-1 (5 OF 5) ROUGH-ORDER-OF-MAGNITUDE COST ESTIMATE

Subtotal Trades				**$24,075,010**
General Conditions			-	$4,942,544
Construction Contingency for Level of Design			15.00%	$3,611,252
Design Development			20.00%	$4,815,002
Contractors Costs			19.50%	$4,694,627
Total Construction				**$42,138,434**
A/E Services Including Owner's Allowance			16.00%	$6,742,150
Construction Support Including Owner's Allowance			26.50%	$11,166,685
Potential Environmental Contamination Mitigation Allowance				$273,780
Indirect Costs			6.50%	$2,738,998
Total Project Cost (2018 Dollars)				**$63,060,047**

NOTE: Phase 1 is <100,000 sf OLF for Occupancy Group S (warehouse) or F (factory/industrial) is 500 sf per occupant, so total number of occupants is 200 (100 male + 100 female). Per FBC-B Table 2902.1, the minimum quantity of plumbing fixtures is: 1 WC + 1 LAV for 100 men, and 1 WC + 1 LAV for 100 women. However, plans assume separate facilities will be required for each tenant; supplemental facilities will be required at the opposite end of the building (due to travel distance).

SOURCES: M C Harry Architects, Jet Engine Test Cell - Rough Order of Magnitude (ROM) Estimate, December 2018; Nova Consulting, MIA Engine Test Cell Facility ROM Cost Estimate, June 2019; Aguirre Project Resources, LLC, Cost Estimate Soft Costs, December 2018.

TABLE I-2 ROUGH-ORDER-OF-MAGNITUDE COST ESTIMATE – DETAILED SOFT COSTS

DESCRIPTION	%	AMOUNT
Subtotal Trades		**$24,075,010**
General Conditions	-	$4,942,544
Construction Contingency for Level of Design	15.00%	$3,611,252
Design Development	20.00%	$4,815,002
Contractors Costs	19.50%	$4,694,627
Core General Conditions / Staff	10.00%	$2,407,501
Bond, Insurance and Builders Risk	3.00%	$722,250
Constructability Review	1.00%	$240,750
General Administration and Profit	5.50%	$1,324,126
Total Construction		**$42,138,434**
A/E Services Including Owner's Allowance	16.00%	$6,742,150
A/E Basic	6.00%	$2,528,306
Owner's Allowance Account - A/E Basic	10.00%	$4,213,843
Construction Support Including Owner's Allowance	26.50%	$11,166,685
A/E Additional	3.50%	$1,474,845
PM / CM Services	4.50%	$1,896,230
Construction and Inspection Services (CIS)	3.00%	$1,264,153
Estimating Services	0.75%	$316,038
Scheduling Services	0.75%	$316,038
Permitting Costs	0.50%	$210,692
Commissioning	1.00%	$421,384
Misc. Inspections Fee - Threshold, Fire Proofing	1.00%	$421,384
Testing Services	1.50%	$632,077
Owner's Allowance Account - A/E Additional	10.00%	$4,213,843
Potential Environmental Contamination Mitigation Allowance		$273,780
Indirect Costs	6.50%	$2,738,998
Consultant Costs	1.50%	$632,077
MDAD Costs	2.50%	$1,053,461
Authority Having Jurisdiction (AHJ)	1.50%	$632,077
AIPP	1.00%	$421,384
Total Project Cost (2018 Dollars)		**$63,060,047**

SOURCES: M C Harry Architects, Jet Engine Test Cell - Rough Order of Magnitude (ROM) Estimate, December 2018; Nova Consulting, MIA Engine Test Cell Facility ROM Cost Estimate, June 2019; Aguirre Project Resources, LLC, Cost Estimate Soft Costs, December 2018.

APPENDIX S

The Effects of Phytosanitary Regulations on U.S. Import of Fresh Fruits and Vegetables

United States Department of Agriculture

Economic
Research
Service

Economic
Research
Report
Number 168

July 2014

The Effects of Phytosanitary Regulations on U.S. Imports of Fresh Fruits and Vegetables

Peyton Ferrier

USDA

United States Department of Agriculture

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The Effects of Phytosanitary Regulations on U.S. Imports of Fresh Fruits and Vegetables

Peyton Ferrier

Abstract

Since the late 1980s, multilateral and bilateral trade agreements have reduced tariff rates and worked to restrain the arbitrary use of nontariff measures, including sanitary and phytosanitary regulations. U.S. imports of fruits and vegetables have risen steadily during this period as more pathways (specific country-commodity combinations) for legal importation to the United States have gained approval, regulations for gaining import access have been streamlined, and treatment options for phytosanitary issues have been expanded. This report compares 2011 tariff rates with phytosanitary treatments for 29 fruits and vegetables. In general, both tariffs and nontariff phytosanitary measures are relatively small across high-volume import pathways, and there is little evidence to suggest that phytosanitary regulations have a large effect on trade.

Keywords: phytosanitary, tariffs, nontariff measures, fruits and vegetables, imports

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United States Department of Agriculture

A report summary from the Economic Research Service

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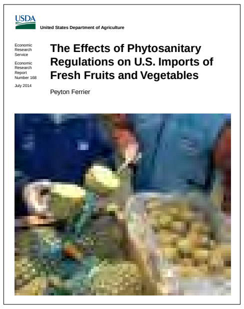

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Economic Research Service

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The Effects of Phytosanitary Regulations on U.S. Imports of Fresh Fruits and Vegetables

Peyton Ferrier

Find the full report at *www.ers.usda.gov/publications/err-economic-research-report/err168*

The Effects of Phytosanitary Regulations on U.S. Imports of Fresh Fruits and Vegetables

Peyton Ferrier

What Is the Issue?

Since fruits and vegetables are particularly susceptible to phytosanitary problems, their imports are often subject to a large number of regulatory requirements. While multilateral and bilateral trade liberalization agreements since the late 1980s have worked to restrain the arbitrary use of nontariff measures (including phytosanitary regulations), some argue that countries continue to use them to protect domestic producers because their complexity makes them difficult to challenge. While previous research has found examples where phytosanitary regulations reduce imports and protect domestic producers, relatively little work considers how these nontariff measures comprehensively affect the full range of fruit and vegetable imports.

This type of analysis is challenging because import regulations vary over time and by country of origin, and they are enforced by different agencies. For example, fruit and vegetable imports are regulated by the U.S. Department of Agriculture's (USDA) Animal and Plant Health Inspection Service (APHIS) for pest risk, USDA's Agricultural Marketing Service regulates for quality standards and marketing claims, and the U.S. Food and Drug Administration regulates for adulteration with pesticides and human pathogens. Moreover, enforcement data are typically not readily available, and imports and demand-substitution patterns are seasonal and diverse. Fruit and vegetable commodities are also regulated differently depending on the country of origin—each country-commodity combination (e.g., pineapples from Costa Rica) is considered a "pathway" by which pests may be introduced into the United States.

What Did the Study Find?

Using regulatory enforcement data, this study reports the rates at which fruit and vegetable imports receive discretionary phytosanitary treatments at the border as the result of an inspection (risk rates), and classifies these rates by the type of treatment ordered and the reason it was ordered. Combining this data with import data, this report has five main findings:

- For many imported commodities, the reported trade volume (as measured by the total weight) differs significantly between inspection data (collected by APHIS) and import data (collected by the U.S. Census Bureau) because of differences in the way these data are collected. This report compares the percentage difference between the quantity of a commodity recorded in imports data and the quantity of a commodity recorded in inspections data. Of the 29 goods considered, only 12 have differences (in absolute terms) of less than 10 percent and 6 have differences greater than 20 percent. These differences, however, are generally decreasing over time.

- U.S. imports of specific commodities are often dominated by a small number of countries, although a far larger number of pathways are permitted entry. Of the 29 goods considered, only 8 have more than 4 suppliers with import shares larger than 1 percent. Moreover, 18 of the 29 goods considered have a single country supplying more than 80 percent of U.S. imports of that good.

- About 8 percent of significant pathways (where a country ships more than 1 percent of all exports of a particular commodity to the United States) require a discretionary phytosanitary treatment more than 5 percent of the time, and about 30 percent of them require this type of treatment over 1 percent of the time. Of the 29 goods considered, 8 (apples, cassava, celery, corn, eggplant, papaya, peas, and pineapple) required discretionary phytosanitary treatments more than 1 percent of the time.

- Significant and nonsignificant pathways are about equally as likely to require a mandatory phytosanitary treatment. In 2012, 11 percent of significant pathways required a treatment as a condition of entry, compared with 13 percent of all pathways. Import requirements also vary across commodities—grapes, kiwi, peaches, and pears all have significant pathways that require mandatory treatments, while no significant pathways require treatments for bananas, tomatoes, and strawberries.

- Using the percentage of imports subject to discretionary treatments as an upper limit on the average cost of inspection, this report finds that both tariffs and nontariff measures are relatively small across significant pathways.

How Was the Study Conducted?

Four data sources—inspection enforcement data and regulatory data from APHIS, import data from the U.S. Census Bureau, and average tariff rates compiled by USDA's Economic Research Service—were used to develop a panel data set for month, commodity, and country of origin. These data include monthly import volumes, the volumes reported as being inspected, the inspection outcomes, and the average tariff rates. The inspection outcomes data were used to calculate the rates at which goods are ordered treatments, which were further classified by the specific type of risk (e.g., pests found, discrepancies in phytosanitary certificates, cargo contamination, prohibited products, or shipping material violations) and by the type of treatment ordered (e.g., whether the commodity was destroyed, returned, fumigated, cold treated, or given some other action). This report also includes the percentage of imports that entered under an APHIS pre-clearance program and the percentage of imports that entered the United States under the National Agricultural Release Program, a program where shipments of low-risk imports are inspected with less frequency than ordinary shipments.

The Effects of Phytosanitary Regulations on U.S. Imports of Fresh Fruits and Vegetables

Peyton Ferrier

Introduction

Since the late 1980s, multilateral and bilateral trade agreements (including the North American Free Trade Agreement, the Dominican Republic-Central American Free Trade Agreement, the Andean Free Trade Agreement, and the Chilean Free Trade Agreement) have incrementally reduced tariff rates for U.S. imports of fruits and vegetables. These agreements, along with comprehensive international agreements under the World Trade Organization, also created mechanisms to restrain the use of nontariff measures, such as technical barriers to trade (e.g., labeling requirements, minimum quality standards, restrictions on ingredients) and sanitary and phytosanitary (SPS) measures (e.g., treatment requirements for pests, quarantine restrictions). During roughly the same period, U.S. imports of fruits and vegetables have expanded steadily as the U.S. Department of Agriculture's (USDA) Animal and Plant Health Inspection Service (APHIS) has approved more pathways—specific country-commodity combinations—for legal importation into the United States.

As trade agreements have reduced tariff barriers to trade, some worry that industry groups will seek protection from import competition through regulatory (nontariff) measures. Underlying their argument is the suspicion that nontariff measures substantially inhibit trade in some or most cases by adding significant, unnecessary costs (Copeland, 1990; Lamb, 2006; Watson and James, 2013) (see box, "Theories of Nontariff Measures as Protectionism and Regulatory Capture," for discussion). While previous research has found examples where phytosanitary measures reduce imports and protect domestic producers (Orden et al., 2012; Peterson et al., 2013), relatively little work considers how these nontariff measures comprehensively affect the full range of fruit and vegetable imports. One reason for this may be the complexity of the issue—import regulations vary over time and by country of origin, and they are enforced by different agencies. For example, APHIS regulates fruits and vegetables for pest risk, USDA's Agricultural Marketing Service (AMS) regulates imports for quality standards and marketing claims, and the U.S. Food and Drug Administration (FDA) regulates imports for pesticide or pathogen adulteration. Moreover, enforcement data are typically not readily available, and imports and demand-substitution patterns are seasonal and diverse.

This report focuses on the regulation of imports for phytosanitary ("pest") concerns by APHIS. It describes the regulatory structure for 29 imported fruits and vegetables, particularly the import requirements for significant country-commodity pathways (e.g., Costa Rican pineapples, Chilean grapes) from 2006 to 2011. Most of the 1,072 permitted fruit and vegetable import pathways do not ship to the United States in large volumes. The rates at which imports in these low-volume pathways are ordered phytosanitary treatments are sensitive to the rejection of individual shipments and, as a

Theories of Nontariff Measures as Protectionism and Regulatory Capture

The "capture theory" of regulation argues that regulation largely serves the interests of rent-seeking industry groups; in contrast, the "public interest theory" emphasizes the role of regulation in addressing market failures (Viscusi et al., 2000). As a refinement to these theories, the "economic theory of regulation" notes that competition among interest groups checks each group's ability to influence regulation and that any group's influence is determined by its cohesion and organization relative to other competing interest groups (Becker, 1983; Tullock, 1975, 1967).

Within the context of this economic theory, industry groups may seek protection through mechanisms that are less transparent than tariffs because the harm to rival interest groups is more difficult to quantify or challenge on cost-benefit grounds. While the costs to consumers from tariff rates are fairly simple to estimate, similar costs of nontariff measures (as well as their potential environmental benefits) are more complex, which increases the difficulty in organizing political opposition. By this theory, a regulator will find it more difficult to eliminate an unjustified phytosanitary regulation that restricts imports of a commodity with a substantial, well-organized, domestic production interest group and weakly organized consumer or importer interests. For example, import access might be more easily secured for tropical or counter-seasonal fruits and vegetables that do not compete directly with domestic producer interests.

Several authors have examined the economic justification for and effect of nontariff measures without considering the role of inspections. Petersen et al. (2013) find that import requirements for 47 fruits and vegetables reduce trade, but that the effects of the treatment requirements diminish with market experience and when import levels from a country reach a certain threshold. Other authors (Livingston, 2007; Peterson and Orden, 2008; Yue and Beghin, 2009; Yue et al., 2006) have found mixed effects on the extent to which phytosanitary regulations affect trade, but because their conclusions typically consider the regulation of specific pathways, their findings are often difficult to extrapolate beyond the specific pathway in question. While researchers have developed various metrics (e.g., import notifications, regulatory heterogeneity indices) to proxy for the costs of nontariff measures (Beghin and Bureau, 2001; Disdier and Marette, 2010; Disdier et al., 2008; Li and Beghin, 2014) in estimating how these measures affect trade, it is difficult to develop a causal link between real regulatory actions that reduce nontariff barriers and trade. Other studies (Costello and McAusland, 2003; Mérel and Carter, 2008) have examined how risk-based tariffs may be used as adjuncts to nontariff measures in managing the risks associated with invasive species.

Authors have also considered why goods fail inspection at ports of entry and whether failed inspections may be explained by protectionist (i.e., capture) rather than risk-based reasons (Buzby et al., 2008). Baylis et al. (2009), for instance, find that Food and Drug Administration import refusals are correlated with domestic lobbying expenditures by industry groups in certain broad product categories. In general, however, most models of inspection of agricultural goods assume that inspection resources and import refusals represent the efficient allocation of resources under capacity constraints or limited information regarding risk (i.e., a public interest theory) (Moffitt et al., 2008; Springborn et al., 2010; Surkov et al., 2008; Surkov et al., 2009).

result, are highly variable across years. Consequently, this report focuses on the 118 "significant" pathways, where a country ships more than 1 percent of all exports of that commodity to the United States, and considers the other low-volume (nonsignificant) pathways in aggregate.

Unless addressed in a special import-inspection program, all U.S. fruit and vegetable imports are inspected for conformance to entry regulations, which may include a mandatory treatment for chronic pest problems. If a pest is found during an inspection, an action may be ordered that the shipment be treated, returned, or destroyed (among other actions). Based on USDA inspections data, this study calculates the risk and action rates for imported shipments. The risk rate describes the quantity share of inspected imports that carry some source of (untreated) pest risk, while the action rate describes the share of inspected imports that are ordered an action. In most cases (when a treatment is not mandatory), the aggregate values of these two rates are similar.[1] Additionally, because a good cannot be treated and must be destroyed in the worst case scenario, the risk rate is used to characterize the upper limit of the added unexpected cost (i.e., ordered treatments) resulting from inspections. The action rates are classified by treatments ordered (such as fumigation, cold treatment, or destruction), and the risk rates are classified by the specific sources (such as pest discovery, container contamination, or a documentation violation such as a "phyto discrepancy").

In addition to potentially requiring treatments, border inspections themselves add costs to importation. The National Agricultural Release Program (NARP) is a special import program that mandates fewer physical inspections for shipments in pathways designated as low risk by APHIS. While this program's primary purpose is to direct inspection resources to the highest risk shipments, it also reduces the costs of importation. Relatedly, APHIS allows agricultural inspections and treatments to occur at the country of disembarkation by creating producer-financed, pre-clearance programs. As both these programs affect the cost of inspections and phytosanitary regulations, this study also determines the percentages of imports that enter under NARP and APHIS pre-clearance programs.

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[1] In general, the action rate, but not the risk rate, includes treatments (fumigation, cold treatment, and returned or destroyed goods) ordered before a pest is conclusively identified and, in some cases, fumigations that are mandatory as a condition of entry. On the other hand, the risk rate, but not the action rate, includes discrepancies in the phytosanitary certificate that are resolved without a treatment being ordered.

Background

In 1995, the World Trade Organization ratified *The WTO Agreement on the Application of Sanitary and Phytosanitary Measures* (World Trade Organization, 1995) to establish a scientific framework for assessing their validity for imports. In general, the agreement requires that member countries only implement nontariff measures that are nondiscriminatory, scientifically based, and designed to have the smallest impact on trade possible. For instance, the agreement encouraged countries to regionalize their quarantine-zone restrictions if a trade partner can adequately ensure that a pest threat is limited to a specific area and under control. The agreement also created dispute resolution mechanisms and called for increased transparency in regulations.[2]

In the United States, APHIS regulates imports of fruits and vegetables by pathway (a specific combination of commodity and country—i.e., apples from South Africa). Generally, once import access is granted, the commodity can be imported from anywhere in the exporting country unless APHIS has additional entry conditions. To justify its decision and the entry conditions it implements, APHIS conducts a pest risk assessment that catalogues the good's potential pest risk and treatment options. The import regulatory process has historically differed between fruits and vegetables and other agricultural goods (see box, "The Regulation of Fruits and Vegetables Versus the Regulation of Propagative Material"). The manner in which APHIS classifies commodities and records inspection data also has not historically corresponded with the way U.S. Customs and Border Protection (CBP) (and its predecessor institutions in the U.S. Treasury Department) has collected data on imports for tariff purposes.

Phytosanitary inspections address all potential pest threats, including hitchhiking pests, misidentified goods, and contamination. Particular emphasis is paid to systemic pest threats known to commonly occur in the pathway. If warranted, APHIS may require one or more mandatory pest treatments as a condition of entry. In these cases, inspections may simply involve a verification that the treatment has occurred. For instance, Spanish citrus requires a cold treatment to address the Mediterranean fruit fly, *Ceratitis capitata*. Not all pests, however, have practicable treatments, in which case the good may be prohibited from entry. Because gaining import access requires the time and resources of the petitioning country, a country's lack of import access may simply reflect a decision not to pursue access to a market in which it may have no cost, niche, or quality advantage. Ferrier (2010), however, notes that APHIS has streamlined import access with several policy innovations (APHIS, 2008).[3]

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[2] Many contemporaneous bilateral agreements also contain similar, independent frameworks for disputes over sanitary and phytosanitary measures.

[3] Specifically, the Animal and Plant Health Inspection Service (APHIS) made import access a "notice-based process" rather than a "rule-based process," which removed the risk analysis requirements and reduced the time required for evaluating an import access petition. Furthermore, APHIS removed the requirement that treatments (i.e., irradiation or fumigation) necessarily be validated independently for every new pest-commodity combination.

The Regulation of Fruits and Vegetables Versus the Regulation of Propagative Material

Historically, fruit and vegetable imports and propagative material (plants for planting) imports have been treated differently from each other within Title 7, Section 319 of the Code of Federal Regulations (CFR), which addresses how USDA's Animal and Plant Health Inspection Service (APHIS) regulates imports. Specifically, fruit and vegetable imports are regulated under subsection 56 and are referred to as Q56 regulations, and propagative materials are regulated under subsection 37 and are referred to as Q37 regulations. As noted by Lehtonen and Tschanz (2008), several historical factors led to a divergence in the regulatory treatment of Q56 and Q37 goods. As the regulatory framework was being designed, most propagative material was imported as nursery stock rather than for direct sale in commerce, was derived from a small number of primarily European sources, and required fumigation. At that time, all taxa of propagative material were permitted entry by default, a risk assessment was not required unless the plant was imported in a growing media, few pre-export mitigation treatments were required, and monitoring of those pre-export mitigations was infrequent. Fruits and vegetables, on the other hand, were only enterable if a pest risk assessment had been performed specifically for that import pathway, and pre-export mitigations were often required and monitored.

In 2006 and 2009, APHIS proposed rules that liberalized Q56 regulations and tightened Q37 regulations. The Q56 regulatory changes facilitated the entry of new commodity pathways by making the approval of new commodities based on notifications (i.e., announcements of changes in the regulations) rather than subjecting them to the lengthy, formal rule-making process that required public participation (APHIS, 2007). It also allowed import pathways to be approved if they used established mitigation treatments that have been shown to address pest risk, rather than requiring a re-evaluation of the treatment specific to the commodity (Ferrier, 2010). The Q37 changes, on the other hand, created a new category of import treatment for propagative material called "Not Approved Pending Risk Assessment," or NAPPRA. The NAPPRA category included propagative material thought to bear an unacceptably high risk of introducing a harmful pest. The list of NAPPRA goods was created (in large part) based on the historical import record of these goods, but it was also open to public comment (APHIS, 2009). These rule changes were finalized in 2008 for Q56 goods and in 2011 for Q37 goods.

Data Sources

This report's data sets are derived from four primary sources – (1) regulatory data from APHIS, (2) inspections data from APHIS, (3) import data from the U.S. Census Bureau (Census), and (4) effective average tariff rates[4] from USDA's Economic Research Service (ERS). Regulatory data come from the APHIS Fruits and Vegetables Import Requirements (FAVIR) database, which organizes APHIS regulations on required conditions of entry for imported fruits and vegetables. Primarily, these data show whether goods are permitted access to the United States and what (if any) treatment or entry conditions are required. Nearly all agricultural goods require, at a minimum, an import permit and an inspection, which can only occur in U.S. or foreign ports in which CBP operates (table 1).[5] To enter the United States, the cargo may either be cleared during inspection or ordered some remedial action that allows it to meet entry requirements. A similar process is in place for clearing vessels themselves (cargo ships, cruise liners, aircraft, etc.), passengers, and returning military equipment.

Table 1
List of U.S. ports* by total imports of fruits and vegetables, 2006-11

Rank	Ports of entry	Total imports (mts)	Rank	Ports of entry	Total imports (mts)
1	Nogales, AZ	13,165,320	43	Eagle Pass, TX	109,492
2	Philadelphia, PA	8,909,834	44	Corpus Christi, TX	89,134
3	Wilmington, DE	7,784,100	45	West Palm Beach, FL	76,525
4	Pharr, TX	7,780,263	46	Los Angeles, CA	63,736
5	Port Hueneme, CA	4,595,435	47	Douglas, AZ	59,718
6	Otay Mesa, CA	4,247,160	48	Ft. Pierce, FL	44,742
7	Port Everglades, FL	4,100,076	49	Presidio, TX	42,521
8	Gulfport, MS	3,899,101	50	Brownsville, TX	37,122
9	Long Beach, CA	3,217,193	51	Chicago, IL	37,083
10	San Diego, CA	2,841,437	52	New Orleans, LA	34,795
11	Galveston, TX	2,017,574	53	Boston, MA	32,814
12	Port Manatee, FL	1,860,188	54	Charleston, SC	31,027
13	Brooklyn, NY	1,834,100	55	Sweetgrass, MT	30,339
14	Newark, Sea Cargo, NJ	1,825,222	56	Honolulu, HI	23,278
15	Newark, Air Cargo, NJ	1,747,958	57	Mayaguez, PR	19,037
16	Progreso, TX	1,684,515	58	Norfolk, VA	17,082
17	Laredo, Colombia, TX	1,495,490	59	Atlanta, GA	16,356
18	Miami Sea, FL	1,384,094	60	Blaine, Pacific Highway, WA	15,222

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[4] These rates account for exemptions from stated tariff rates due to quotas or other special programs.

[5] Canada is exempted from the general import-permit requirement for goods.

Table 1

List of U.S. ports* by total imports of fruits and vegetables, 2006-11—continued

Rank	Ports of entry	Total imports (mts)	Rank	Ports of entry	Total imports (mts)
19	Freeport, TX	1,303,924	61	Dulles, VA	13,891
20	Calexico, East, CA	1,232,904	62	Eastport, ID	12,300
21	JFK Air Cargo, NY	1,161,459	63	Champlain, NY	11,823
22	Laredo, TX	927,002	64	Houston Air, TX	10,084
23	Rio Grande City, TX	720,040	65	Buffalo, Peace Bridge, NY	9,744
24	Miami Air Cargo, FL	708,378	66	Pembina, ND	7,068
25	San Juan Sea, PR	681,034	67	Dallas/Ft. Worth, TX	6,975
26	Tampa, FL	648,523	68	Buffalo, Lewiston Bridge, NY	6,562
27	San Luis, AZ	623,262	69	Raymond, MT	6,144
28	Columbus, NM	553,451	70	St. Thomas, VI	5,947
29	New Haven, CT	457,042	71	Baltimore, MD	5,611
30	Port Huron, MI	357,557	72	Romulus, MI	4,257
31	Los Indios, TX	230,019	73	San Francisco, CA	4,113
32	Houston Sea, TX	182,894	74	St. Croix, VI	3,830
33	Cape Canaveral, FL	156,552	75	Portal, ND	3,729
34	Oakland, CA	154,087	76	Blaine, WA	3,619
35	Seattle Sea, WA	145,682	77	Oroville, WA	3,338
36	El Paso, Ysleta, TX	139,120	78	Sumas, WA	3,228
37	Providence, RI	136,439	79	Derby Line, VT	2,944
38	Savannah, GA	126,892	80	Jacksonville, FL	2,502
39	Panama City, FL	120,440	81	Dunseith, ND	2,115
40	El Paso, BOTA, TX	120,061	82	Phoenix, AZ	2,067
41	Santa Teresa, NM	119,410	83	Orlando, FL	1,770
42	Detroit, MI	113,468	84	Seattle, Sea Cargo, WA	1,363

*Ports listed only include ports that received over 1,000 metric tons (mts) of agricultural goods between 2006 and 2011.
Source: USDA, Animal and Plant Health Inspection Service, PPQ 280 inspections data.

The inspections data set comes from the APHIS PPQ 280 database, a name derived from the Form 280 that inspectors file as part of the Agricultural Quarantine Activity System (AQAS), which tracks imported commodities. For each shipment to the United States, the database records the commodity, its origin, its weight (in kgs), and its disposition code (see box, “Defining a Shipment Through the Cargo Manifest”). The disposition code is a four-letter code that describes the risk (if any) found on the shipment and the action ordered as a result of the assigned risk.[6]

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[6] The disposition code also distinguishes standard inspections from less frequent National Agricultural Release Program inspections.

Defining a Shipment Through the Cargo Manifest

Well-developed protocols have evolved for international trade. Consider a shipment of grapes moving by boat from Santiago, Chile, to Los Angeles, California. At the time of its departure, the shipment's cargo manifest details the contents of the shipment (the consignment), the names of the Chilean party sending the good (consignor), and the names of the U.S. party receiving the good (the consignee). By U.S. law, the cargo manifest must be forwarded to U.S. Customs and Border Protection (CBP) in advance of the cargo's arrival. The cargo manifest is then used to conduct a preliminary screening of the commodity, which might influence the rigor of the inspection.

The cargo manifest may detail separate commodities or separate consignees for goods arriving in the same vessel or cargo container. Similarly, the same vessel may contain several cargo manifests. The CBP uses the cargo manifest to assess whatever tariffs apply to the good at the time of its arrival. For the purposes of inspection, however, shipments must be broken out by commodity and destination. Therefore, within the inspection record, the number of shipments is a difficult figure to interpret because it does not necessarily refer to separate cargos (i.e., Chilean grapes on separate boats or Chilean grapes from different consignors) but can refer to a single cargo sent to different consignees. Depending on the sales arrangement within the United States, it may be more expeditious to ship the consignment to a single intermediary consignee who will divide it further among separate buyers, or to ship the consignment directly to several consignees. In the latter case, inspectors may be aware of this distinction but inspect the entire related cargo collectively, while reporting their work as separate inspections.

The import data set is collected by CBP and recorded by Census. This data set classifies imports with a 10-digit Harmonized Tariff Code (HTC), which is used to assign any relevant tariff that the Government has in place. At the time of entry, CBP determines the weight and value of the shipment entering the United States, as well as the appropriate tariff rate to be levied on the shipment (if any). In 2003, CBP absorbed inspections duties and staff from APHIS to perform pest inspections of fruits and vegetables, but the legacy of separate recording of products for tariff purposes in Census data and products for inspections purposes in USDA PPQ 280 data remains.[7]

The first six digits of HTC codes are uniformly assigned across countries by the General Agreement on Tariffs and Trade and can only be changed through a process of lengthy international agreement. The last four digits are determined by the importing country, often with the purpose of monitoring some policy component of trade, and can be unilaterally changed as the importing country sees fit. For instance, the six-digit tariff code 08.08.10 identifies a shipment as containing apples; in 2010, the U.S. HTC codes 08.08.10.00.30 identified apples valued at 22¢ per kg or less and 08.08.10.00.60 identified apples valued at over 22¢ per kg. In 2011, the United States further classified the 08.08.10.00.60 code into two separate codes: 08.08.10.00.45 identifying apples valued at over 22¢ per kg and certified organic, and 08.08.10.00.65 identifying apples valued at over 22¢ per kg and not certified organic.

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[7] While U.S. Customs and Border Protection now performs and records inspections and their outcomes, the USDA Animal and Plant Health Inspection Service performs all risk analysis and regulation utilizing that data.

The tariff data set contains the average tariff rates applied to commodities entering the United States at the six-digit level. Tariff rates may not be uniform over the course of a year and, in some cases, tariffs are not assessed until a certain volume of goods has entered the United States. For these reasons, average tariff rates are likely to be less than marginal tariff rates. For instance, producers may ship more asparagus to the United States from September to November when the tariff rate for asparagus is lower. This, in turn, lowers the average tariff rate paid over the course of the year for asparagus.

It is important to note that the APHIS PPQ 280 and Census data sets are recorded for very different purposes. In general, APHIS records the names of goods with the primary purpose of identifying invasive species risk. Census, on the other hand, records import shipments to track commerce and collect tariff revenue. For instance, the tariff code 07.04.10 includes both cauliflower and headed broccoli within a single product category while the APHIS data set distinguishes between the two goods. The APHIS data set also contains several hundred varieties of cut flowers and propagative material categories, while the Census data set contains less than 40. In many regards, APHIS data identify goods with greater specificity than Census data and may serve as an independent verification for the accuracy of trade data.

Both the APHIS inspection data set and Census import data set largely capture the same flow of imported fruits and vegetables across borders in terms of volume. While APHIS staff monitors the recorded import data from Census, there is no requirement or mechanism that ensures that the two trade volumes be equal. As of 2011, CBP agents entering data into the PPQ 280 system do so independently of the figures entered in the Census system. Although there are significant differences in reported volumes between the two data sets, these differences have decreased over the 6-year period studied.

Both the tariff and the Census import data sets identify goods by the same HTC code, allowing the two to be directly linked. Similarly, the PPQ 280 data can be linked to the APHIS regulatory data in FAVIR. To link the combined Census and APHIS data, however, separate concordances must be developed that assign a common commodity name and a common country name across the two data sets. Unfortunately, this creates some aggregation of the data that obscures its richness. Table 2 provides a sample concordance between the APHIS inspections and Census import data sets. The merged data set can relate import levels with inspections levels, as well as compare tariff rates with action and risk rates.

Table 2

Sample concordance between APHIS inspections and Census import data sets

Common name	APHIS* inspection name	Census import identifier (HTC Code)
Avocado		08.04.40.00.00
Avocado	Avocado	
Avocado	Avocado, Sliced	
Banana		08.03.00.20.00
Banana	Banana	
Cabbage, Brussels Sprouts and other Brassica	Brussels Sprouts	
Cabbage, Brussels Sprouts and other Brassica	Cabbage	
Cabbage, Brussels Sprouts and other Brassica	Chinese Cabbage	
Cabbage, Brussels Sprouts and other Brassica	Chinese Kale	
Cabbage, Brussels Sprouts and other Brassica	False Pak-Choi	
Cabbage, Brussels Sprouts and other Brassica	Kale	
Cabbage, Brussels Sprouts and other Brassica	Kohlrabi	
Cabbage, Brussels Sprouts and other Brassica	Mustard	
Cabbage, Brussels Sprouts and other Brassica	Mustard Greens	
Cabbage, Brussels Sprouts and other Brassica	Pak Choi	
Cabbage, Brussels Sprouts and other Brassica	Rape	
Cabbage, Brussels Sprouts and other Brassica	Rutabaga	
Cabbage, Brussels Sprouts and other Brassica	Savory	
Cabbage, Brussels Sprouts and other Brassica		07.04.20.00.00
Cabbage, Brussels Sprouts and other Brassica		07.04.90.20.00
Cabbage, Brussels Sprouts and other Brassica		07.04.90.40.40
Pineapple		08.04.30.20.00
Pineapple		08.04.30.40.00
Pineapple		08.04.30.60.00
Pineapple	Pineapple	
Plum	Plum	
Plum	Plumcot	
Plum		08.09.40.20.00
Plum		08.09.40.40.00

*APHIS refers to USDA's Animal and Plant Health Inspection Service and HTC refers to the Harmonized Tariff Code.
Source: USDA, Economic Research Service.

Trade and Phytosanitary Restrictions

Reduction in tariffs; improvements in shipping and preservation; an increasing preference for fresh, out-of-season produce; and the liberalization of SPS restrictions have all contributed to the increase in fresh fruit and vegetable imports since the late 1980s. In that period, the number of country-commodity pathways permitted entry into the United States (e.g., guavas from Mexico, mangoes from India) has risen substantially. However, imports are not necessarily diversified by source, and most U.S. fruit and vegetable imports arrive from only a handful of countries. Table 3 lists the share of imports for the top 10 exporters for the 29 fruits and vegetables discussed in this report. This report's metrics on inspection outcomes—the action and risk rates of commodities—are sensitive to the problem of small numbers. If the volume of imports from a specific source (the denominator in the action and risk rate) is small, the rate swings dramatically in response to the rejection of individual shipments. For this reason, only individual countries whose share of imports is greater than 1 percent are considered significant pathways in this analysis. The remaining imports are aggregated as "All Other Countries" (AOC).

Table 3
Market shares of top exporters of U.S. fruit and vegetable imports, 2006-11

	1 – Apple		2 – Apricot		3 – Artichoke	
1	Chile	58.7%	Chile	87.2%	Mexico	97.5%
2	New Zealand	23.1%	New Zealand	10.2%	Peru	1.0%
3	Canada	15.9%	Turkey	2.0%	Egypt	0.6%
4	Argentina	2.0%	China	0.2%	Spain	0.5%
5	Brazil	0.2%	Poland	0.2%	Canada	0.4%
6	Japan	0.1%	Pakistan	0.1%	France	0.0%
7	Mexico	0.0%	Netherlands	0.1%	Argentina	0.0%
8	China	0.0%	Afghanistan	0.0%	Chile	0.0%
9	Uruguay	0.0%	Argentina	0.0%	Colombia	0.0%
10	South Africa	0.0%	Canada	0.0%	Ecuador	0.0%
	Total (mts)+	1,023,677	Total (mts)	10,715	Total (mts)	7,392
	4 – Asparagus		5 – Avocado		6 – Banana	
1	Peru	54.0%	Mexico	70.7%	Guatemala	28.7%
2	Mexico	44.6%	Chile	24.3%	Ecuador	23.6%
3	Canada	0.8%	Dom. Rep.	4.3%	Costa Rica	21.5%
4	Ecuador	0.2%	Peru	0.5%	Honduras	11.3%
5	Chile	0.1%	New Zealand	0.2%	Colombia	10.9%
6	Colombia	0.1%	Haiti	0.0%	Mexico	2.3%
7	Argentina	0.1%	Dominica	0.0%	Nicaragua	0.8%
8	Guatemala	0.0%	Antigua/Barbuda	0.0%	Peru	0.5%
9	France	0.0%	Brazil	0.0%	Panama	0.3%
10	New Zealand	0.0%	Canada	0.0%	Dom. Rep.	0.0%
	Total (mts)	885,920	Total (mts)	2,048,533	Total (mts)	23,654,174
	7 – Carrot		8 – Cassava		9 – Celery	
1	Canada	62.3%	Costa Rica	89.3%	Mexico	79.6%
2	Mexico	32.9%	Ecuador	3.7%	Canada	20.1%
3	Costa Rica	2.2%	Ghana	2.3%	China	0.2%
4	Israel	2.1%	Nicaragua	2.0%	Dom. Rep.	0.0%
5	Guatemala	0.5%	Honduras	1.1%	India	0.0%
6	Peru	0.0%	Nigeria	0.4%	Netherlands	0.0%
7	Brazil	0.0%	Brazil	0.3%	El Salvador	0.0%
8	France	0.0%	Panama	0.3%	Belgium	0.0%
9	Belgium	0.0%	Colombia	0.2%	Costa Rica	0.0%
10	Germany	0.0%	Dom. Rep.	0.2%	Dominica	0.0%
	Total (mts)	809,901	Total (mts)	251,515	Total (mts)	186,529

—continued

Table 3

Market shares of top exporters of U.S. fruit and vegetable imports, 2006-11—continued

	10 – Cherries		11 – Corn		12 – Cucumber	
1	Chile	84.3%	Mexico	91.9%	Mexico	82.7%
2	Canada	12.8%	Canada	7.9%	Canada	11.7%
3	Argentina	2.0%	Guatemala	0.1%	Honduras	4.5%
4	Australia	0.5%	China	0.0%	Dom. Rep.	0.7%
5	New Zealand	0.4%	Vietnam	0.0%	Costa Rica	0.1%
6	Brazil	0.0%	Peru	0.0%	Netherlands	0.1%
7	Peru	0.0%	Honduras	0.0%	Spain	0.1%
8	China	0.0%	Thailand	0.0%	Guatemala	0.0%
9	Germany	0.0%	France	0.0%	Panama	0.0%
10	Mexico	0.0%	Costa Rica	0.0%	Nicaragua	0.0%
	Total (mts)	106,134	Total (mts)	234,846	Total (mts)	3,118,022
	13 – Eggplant		14 – Grapes		15 – Kiwi	
1	Mexico	81.8%	Chile	91.2%	Chile	40.5%
2	Honduras	12.9%	Peru	4.1%	New Zealand	36.6%
3	Canada	1.7%	Brazil	3.5%	Italy	22.1%
4	Dom. Rep.	1.3%	Mexico	0.7%	Greece	0.6%
5	Netherlands	1.2%	Italy	0.3%	France	0.1%
6	Guatemala	0.6%	South Africa	0.1%	Spain	0.0%
7	Spain	0.2%	South Korea	0.0%	Thailand	0.0%
8	Nicaragua	0.0%	Argentina	0.0%	Panama	0.0%
9	Italy	0.0%	Egypt	0.0%	Israel	0.0%
10	Portugal	0.0%	Spain	0.0%	Peru	0.0%
	Total (mts)	319,401	Total (mts)	2,436,388	Total (mts)	304,211
	16 – Olive		17 – Onion		18 – Papaya	
1	Mexico	99.6%	Mexico	57.1%	Mexico	72.2%
2	Greece	0.3%	Peru	18.7%	Belize	20.6%
3	Lebanon	0.0%	Canada	15.5%	Brazil	2.5%
4	France	0.0%	Chile	4.3%	Guatemala	2.2%
5	Italy	0.0%	New Zealand	1.0%	Dom. Rep.	1.7%
6	Bangladesh	0.0%	China	1.0%	Jamaica	0.7%
7	Belgium	0.0%	Guatemala	0.6%	Panama	0.1%
8	Peru	0.0%	Netherlands	0.4%	Nicaragua	0.0%
9	Jordan	0.0%	Brazil	0.3%	Costa Rica	0.0%
10	Morocco	0.0%	France	0.3%	Thailand	0.0%
	Total (mts)	48,427	Total (mts)	2,122,480	Total (mts)	844,684
	19 – Peaches		20 – Pears		21 – Peas	
1	Chile	97.4%	Argentina	47.0%	Guatemala	60.4%
2	Mexico	1.5%	Chile	26.2%	Mexico	24.8%
3	Canada	0.9%	China	11.3%	Peru	13.9%
4	Argentina	0.2%	South Korea	11.0%	Canada	0.7%
5	China	0.1%	New Zealand	3.3%	China	0.1%
6	Hong Kong	0.0%	South Africa	0.8%	Netherlands	0.0%
7	Peru	0.0%	Japan	0.2%	Costa Rica	0.0%
8	Cook Islands	0.0%	Canada	0.1%	Serbia	0.0%
9	Australia	0.0%	Brazil	0.0%	Honduras	0.0%
10	New Zealand	0.0%	Mexico	0.0%	Poland	0.0%
	Total (mts)	334,892	Total (mts)	505,244	Total (mts)	194,802
	22 – Peppers		23 – Pineapple		24 – Plum	
1	Mexico	83.9%	Costa Rica	83.0%	Chile	99.3%
2	Canada	11.4%	Mexico	5.1%	Argentina	0.3%
3	Netherlands	2.3%	Ecuador	3.9%	Guatemala	0.1%
4	Dom. Rep.	0.9%	Guatemala	3.0%	New Zealand	0.1%
5	Honduras	0.4%	Honduras	2.9%	St. Vincent	0.1%
6	Israel	0.3%	Panama	1.4%	China	0.0%
7	Spain	0.2%	Thailand	0.5%	Ecuador	0.0%
8	El Salvador	0.2%	Colombia	0.0%	El Salvador	0.0%
9	Nicaragua	0.1%	Dom. Rep.	0.0%	Iran	0.0%
10	Guatemala	0.1%	China	0.0%	Dominica	0.0%
	Total (mts)	3,948,293	Total (mts)	4,390,379	Total (mts)	181,738

—continued

Table 3

Market shares of top exporters of U.S. fruit and vegetable imports, 2006-11—continued

	25 – Potatoes		26 – Spinach		27 – Squash	
1	Canada	100.0%	Mexico	82.1%	Mexico	94.3%
2	Dom. Rep.	0.0%	Canada	17.6%	Honduras	1.6%
3	Ghana	0.0%	China	0.3%	Costa Rica	1.5%
4	China	0.0%	Jamaica	0.0%	Canada	1.2%
5	Cameroon	0.0%	Belgium	0.0%	Panama	0.6%
6	Peru	0.0%	Costa Rica	0.0%	New Zealand	0.2%
7	France	0.0%	Dominica	0.0%	Guatemala	0.2%
8	Mexico	0.0%	Dom. Rep.	0.0%	Dom. Rep.	0.1%
9	India	0.0%	Guatemala	0.0%	Chile	0.1%
10	Costa Rica	0.0%	Israel	0.0%	Nicaragua	0.1%
	Total (mts)	2,738,374	Total (mts)	42,016	Total (mts)	1,552,624
	28 – Strawberry		29 – Tomato			
1	Mexico	99.4%	Mexico	88.4%		
2	Canada	0.3%	Canada	10.6%		
3	China	0.1%	Guatemala	0.4%		
4	Peru	0.1%	Netherlands	0.3%		
5	Argentina	0.0%	Dom. Rep.	0.2%		
6	New Zealand	0.0%	Spain	0.1%		
7	Hong Kong	0.0%	Belgium	0.0%		
8	Egypt	0.0%	Costa Rica	0.0%		
9	Poland	0.0%	Israel	0.0%		
10	Chile	0.0%	New Zealand	0.0%		
	Total (mts)	491,279	Total (mts)	7,392,580		

+Mts refers to metric tons.

Source: U.S. Department of Commerce, U.S. Census Bureau, U.S. Imports of Merchandise: 2006-11.

The Inspection and Clearance of Imports

Since the U.S. Department of Homeland Security (DHS) absorbed the inspection duties of APHIS in 2003, CBP has performed all inspections of fruits and vegetables for pests. Several other agencies have an independent inspection authority with regard to issues surrounding food adulteration and safety and conservation (see box, “Authority of Different Agencies Over Import Inspection”). However, the regulatory authority for inspection (including rulemaking, import access, and risk analysis) remains with APHIS.

For example, APHIS performs the pest risk assessment and cost-benefit analysis for new country-commodity pathways and analyzes the risks in existing import pathways based on inspection data (along with existing science). APHIS can then direct the actions of inspectors at CBP on the conduct of inspections if it believes that a certain commodity poses a heightened, unaddressed risk. APHIS also determines whether a particular pest is *actionable*, indicating that it poses a risk to U.S. agriculture, economy, or environment, and is neither established nor controlled within the United States. In contrast, shipments carrying living, but non-actionable, organisms, such as common fungi or mealworms, are generally permitted entry by CBP.

If the pest is actionable, the shipment is prohibited entry unless the risk is mitigated with an approved treatment. In some cases, the pest cannot be identified immediately and is deemed actionable by default until a conclusive identification is made (see box, “Plant Inspection and Systematics”). APHIS trains agricultural inspectors within CBP on pest interception and the regulations, and it maintains the port identification stations for precisely identifying the pests on imports. APHIS also maintains its own staff for inspecting propagative materials and, when appropriate, quarantining plants for planting, as these inspection responsibilities are not assigned to DHS.

Authority of Different Agencies Over Import Inspection

In 2003, U.S. Customs and Border Protection (CBP) assumed inspection responsibilities for monitoring nonpropagative imports for invasive species threats and acquired all USDA Animal and Plant Health Inspection Service inspectors, as well as staff from the U.S. Department of Justice and other agencies. The commonly cited rationale for the consolidation of inspection authorities under a single agency was to facilitate the sharing of information and coordination regarding potential immediate security risks (Naim, 2005). Importantly, however, inspections for threats not deemed to be immediate were not incorporated into CBP. As outlined in Ferrier (2010), these inspections include those for food safety (performed by the U.S. Food and Drug Administration) and those for illegally harvested wildlife (performed by the U.S. Fish and Wildlife Service). In both cases, inspections are typically targeted based on historical risk criteria and do not necessarily occur immediately upon the good's arrival in the United States.

Plant Inspection and Systematics

When an inspector finds that a shipment contains an unknown pest, the shipment is placed on hold until it can be determined whether the pest is actionable (i.e., a risk to the United States and not already established in the import region). If the pest is actionable, it must be mitigated with an approved treatment before the shipment is released. If the pest is not actionable, the shipment is released immediately. In most cases, the pest is identified immediately by the inspector.

When the pest cannot be identified, it is sent to a USDA-maintained Plant Inspection Station, typically at a facility that inspects imported propagative material under Q37 regulations, and logged in an electronic tracking system. If the Plant Inspection Station cannot make a determination, then the pest will be sent to the Smithsonian Institution for formal classification. In this manner, USDA monitors the types of pests on imports and the spread of pests across countries (e.g., if a pest native to Australia is found in a shipment of South African grapes, it may be assumed that the pest has become established outside its native range), as well as potentially classifying new species. The fields of systematics (the process of classifying species according to their hierarchical structure to each other) and taxonomy (naming and organizing species) are essential to this process.

When identification is difficult and lengthy, shippers can treat the pest to avoid the costs of shipping delays if a treatment is available. While insect pests might be fumigated, bacterial or fungal pests cannot be destroyed in this manner, and these shipments must be destroyed or returned. One benefit of a strong and efficient systematic infrastructure among inspectors is its potential to reduce the frequency of unnecessary rejections.

Pests on a commodity may be distinguished as being *systemic* or *incidental*. Systemic risks are endemic to the commodity in the production regions where it is found. For example, Mediterranean fruit flies, which are found in Spanish citrus groves, require fruit to lay eggs and complete their life cycle, increasing the likelihood that these commodities carry this pest. For systemic risks, APHIS presumes that the pest will be present on the commodity upon its entry into the United States and requires the commodity to undergo a mandatory mitigation treatment,[8] regardless of whether the pest is actually observed. In recent years, APHIS has created regulatory systems approach protocols (RSAPs), which involve a set of actions undertaken both in the United States and at the point of origin, which collectively reduce systemic pest risks to levels equivalent to those ensured by single-step treatments (see box, "The Regulatory Systems Approach Protocol").

Incidental risks arise when actionable pests are found sporadically on a commodity (typically hitch-hiker insects, which attach themselves to a commodity and are found within a shipment). Producers can often reduce the likelihood of incidental pests by relatively simple biosafety measures, such as shaking or washing produce before shipment or maintaining clean processing facilities with physical barriers (such as screens in packing warehouses). Alternatively, a commodity may carry a fungus that is identified and found harmful to U.S. agriculture or simply cannot be identified in a speedy manner. When a good is found with an incidental pest, it must undergo a treatment to mitigate the pest threat. If no treatment is available or if the importer opts not to pay for the treatment, the commodity is prohibited entry and is returned to the importer or destroyed at the importer's request.

The Regulatory Systems Approach Protocol

In general, USDA's Animal and Plant Health Inspection Service (APHIS) evaluates the efficacy of a treatment at mitigating a pest threat at the probit-9 level, a standard indicating that the dose-response relationship in a treatment results in 99.9968 percent efficacy (Follett and Neven, 2005). In recent years, APHIS has expanded the range of potential treatment options to include regulatory systems approach protocols (RSAPs), a series of treatments that cumulatively address the pest threat at the probit-9 level. An RSAP might include pest surveys, trapping and sampling, field treatments, post-harvest safeguards, restrictions on crop maturity, and other measures. For example, an RSAP for Israeli bell peppers requires that they only be produced in greenhouses secure from the intrusion of Mediterranean fruit flies, located in regions where this pest is rare, and monitored via trapping. Follett and Neven note that implementing an RSAP requires coordination and agreement between governments because many of the required steps occur on foreign soil and are verified by that country's analogue agency to APHIS. Other examples of RSAPs include those developed for Mexican avocados (Peterson and Orden, 2008), South African stone fruit, and bananas from ECOWAS (West African) countries.[1]

[1] As of February 2013, the Animal and Plant Health Inspection Service was not issuing import permits for bananas from these countries because they had not met the import requirements.

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[8] If multiple pests are systemic, multiple treatments may be required.

If a commodity is frequently found with a hitchhiker pest, APHIS can unilaterally alter its inspection manual to make a pest treatment mandatory, which can be disruptive to importers. For example, eggs of the moth *Copitarsia delorosa* were chronically found on Peruvian asparagus in the late 1990s. After several years in which spot fumigation treatments were ordered on large shares of the imported product, APHIS made the treatment mandatory in 2001. In addition to its costs and the potential loss of organic asparagus sales, the fumigation treatment reduces the number of marketing days because it accelerates ripening by raising the temperature of the commodity during treatment.

By default, *all fruit and vegetable shipments* to the United States are inspected *at the border*, where an inspector examines approximately *2 percent of a randomly selected portion of the shipment* in search of pests. The emphasis added to the prior sentence highlights areas where significant deviation from this default rule may occur.

First, APHIS maintains NARP, where shipments of certain goods judged to be low risk are inspected only periodically. This risk assessment is based on historical records of inspections and the types of pests likely to be found on the good. When inspections occur, they are more rigorous than ordinary inspections and follow explicit protocols to ensure that sampling is random. NARP inspections are primarily designed to re-verify the low-risk status of the country-commodity pathway, rather than to detect and intercept pests in individual shipments. When a NARP inspection finds a pest, the affected good may be temporarily or permanently suspended from the program. While there is no firm rule regarding their frequency, NARP inspections occur for less than 10 percent of shipments.

NARP may be considered a systematic way of tailoring inspections to the pathway's specific risks to economize on port inspection resources. Differences in inspection protocols often exist informally at ports and are not typically recorded in inspection records, although they certainly affect costs. APHIS charges user fees per vehicle or vessel that is subject to inspection, but this fixed cost of entry is charged regardless of the actual inspection protocol applied.[9]

A less rigorous inspection of a shipment may lower importer costs in two ways. It can reduce the logistical delays of import entry and the costs associated with the inspections themselves. To understand these costs, one must first understand the different levels or intensities of inspection.[10] The least rigorous (and quickest) level of inspection is a check of the cargo manifest and, if required, the phytosanitary certificate. This type of inspection is relatively common when the risk is low. Certain commodities, such as cut flowers and certain tomatoes, are verified to have been grown in greenhouses and produced under conditions that make a pest infestation unlikely. A more rigorous container inspection, known as a tailgate inspection, samples the shipment from an easily accessed area so as not to require unpacking. Finally, a partial or total devanning unloads a part of (or the entire) commodity shipment from the container so that random sampling may occur easily. Unpacking a container in this manner is expensive, requires considerable time, and may harm the product to the extent it breaks the cold chain of refrigeration. While APHIS does not charge for the inspections, the importer bears the costs associated with unpacking and reloading shipments.

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[9] The Animal and Plant Health Inspection Service does not add any charge per inspected shipment even though a vehicle paying a user fee may have several shipments that might require inspection.

[10] While different inspection intensities are not recorded in the PPQ 280 inspections data, they are recorded in the more detailed Agricultural Quarantine Inspection Monitoring system, which the Animal and Plant Health Inspection Service maintains to monitor the efficacy of inspections.

Second, specific countries also maintain pre-clearance programs in which goods are inspected for import requirements and released for entry prior to their shipment to the United States. Typically, APHIS staff (either U.S. citizens or foreign nationals) provides the inspection service.[11] Pre-cleared goods do not necessarily represent a low-risk pathway—for example, Chilean grapes, which are often pre-cleared, must be fumigated as a condition of entry. The value of the pre-clearance program is to ease the logistics of entry into the United States and reduce the possibility of having to treat a good at the border. It is unclear whether the shipper of a good that fails an inspection under a pre-clearance program typically pays for a discretionary treatment (like fumigation), sells the good in the country of origin, or ships it to a third country.[12]

Figure 1 provides a flow chart of the import regulation and inspections process. If a country-commodity pathway has import conditions on the farm or a required treatment, the import requirement might be more extensive than that of a standard port inspection (even if having the regulation only results in checks of documents during inspections at the port). Alternatively, if the good is in a pre-clearance program or NARP, the actual inspection element at U.S. ports may be similarly minor. In each case, however, commodities may be re-inspected to verify that the import regulations are appropriate. If inspections provide information that the import inspections protocol or conditions of entry are not appropriate to the risk, APHIS can change the import requirements, including its inclusion in NARP, as it deems appropriate.

Finally, inspectors are not necessarily bound to inspect 2 percent of a randomly selected portion of the shipment. They have the discretion to adjust inspections according to the shipment's risk and logistical constraints associated with daily work flow. Moreover, certain commodities (e.g., apples, citrus, grapes, and stone fruit from South Africa) have inspection protocols that may specifically call for a larger inspection rate and devanning so that sampling may be random.

Required Treatments of Imports

Several possible treatments allow commodities with actionable pests to gain access to U.S. import markets, including fumigation, cold treatment, heat treatments (hot air, hot water, steam), and irradiation. For systemic risks, treatment options are typically evaluated within the pest risk assessment and established as a condition of entry at the time the commodity is permitted entry into the United States. For incidental risks, treatment options may or may not be available for the specific pest found. Most insect pests can be treated by fumigation or irradiation, but fungal, bacterial, or viral pests cannot. Additionally, irradiation cannot practically be applied as a spot treatment due to labeling and packaging requirements (Ferrier, 2010). Most, if not all, spot treatments involve fumigation.

A great deal of specificity also underlies how phytosanitary treatments can be applied effectively to different commodities. For example, heat treatments may not work for large commodities where the pest is deep beneath the skin of the good. Additionally, high doses of irradiation can cause spotting in avocados (Thomas and Bramlage, 1986) and damage nuts through its effects on fat (Gölge and Ova, 2008). Cold treatment works best on goods that store well, such as apples and citrus, but not on more delicate goods like asparagus. Pests themselves may be present in only certain regions of the

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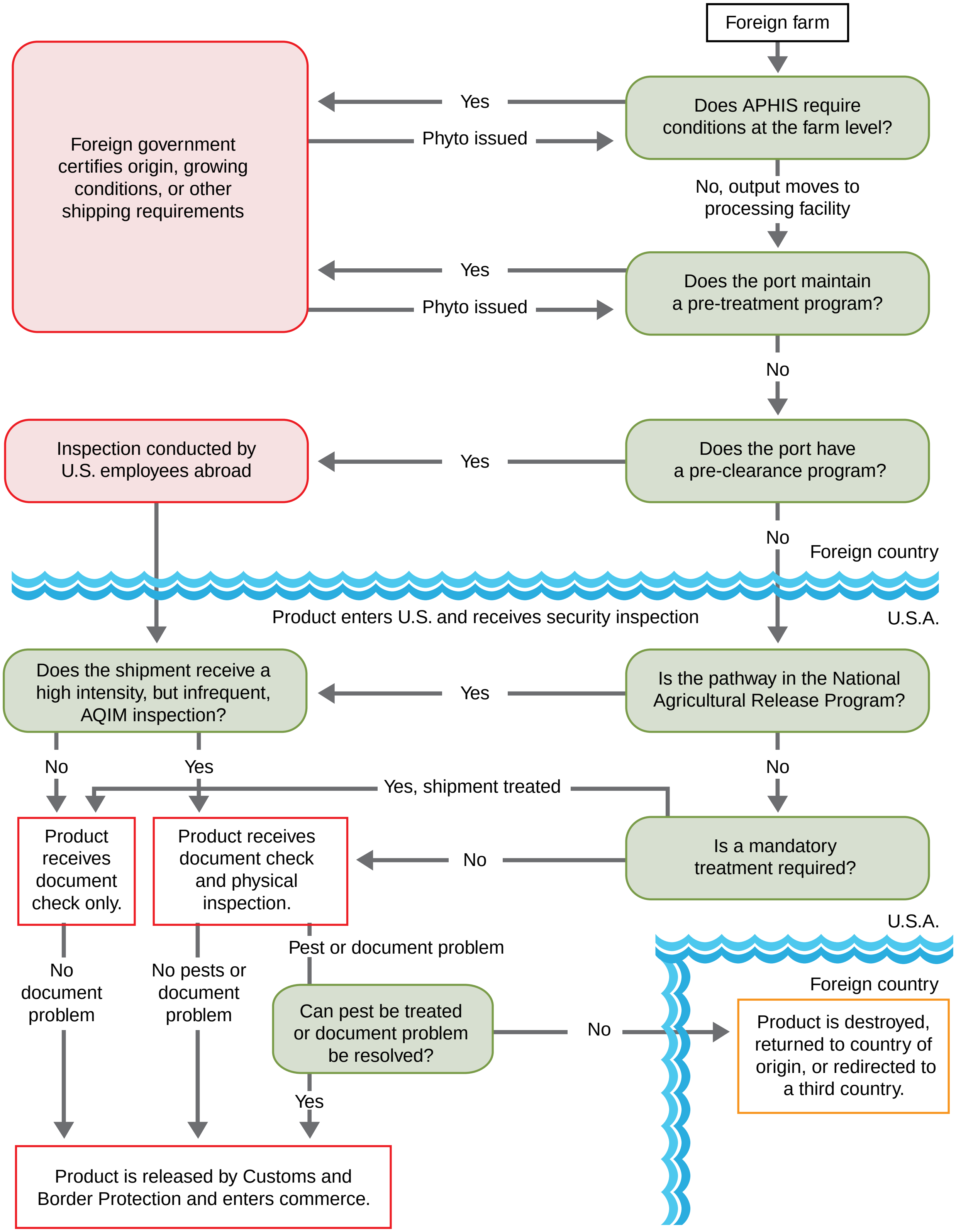
[11] Pre-clearance only pertains to the Animal and Plant Health Inspection Service's entry regulations, not to the more comprehensive security regulations conducted by Customs and Border Protection upon entry into the United States.

[12] Failure to meet U.S. import entry requirements does not necessarily ban a good from international markets. For example, Canadian quarantine restrictions are far more accommodating to insect pests because Canada produces a more limited variety of domestic crops and its cold winter kills many insects that might survive warmer climates.

Figure 1
Flow chart of import regulation and inspection



Source: USDA, Economic Research Service.
Notes: APHIS refers to the Animal and Plant Health Inspection Service, and AQIM refers to the Agricultural Quarantine Inspection Monitoring System.

country and may be a threat to only parts of the United States, in which case destination and origin restrictions can be incorporated into import regulations (see box, "Different Time Periods Required for Cold Treatments").

Different Time Periods Required for Cold Treatments

Different treatments have different impacts on certain commodities. For example, USDA's Animal and Plant Health Inspection Service's Fruits and Vegetables Import Requirements (FAVIR) database states that oranges (*citrus sinesis*) from Costa Rica may only be imported if they receive a cold treatment (specifically, treatment T107-b) to address the Mexican fruit fly (*Anastrepha ludens*), a treatment requiring a minimum of 20 days at 34º F. Treatment of Spanish oranges for the Mediterranean fruit fly (*Ceratitis capitata*) requires only 14 days at the same temperature. Treatment of oranges from the Republic of South Africa for three insects (False Codling Moth, *Thaumatotibia leucotreta*; Natal fruit fly, *Ceratitus rosa;* and *Bactrocera invadens*) requires 24 days at 31º F. Most cold treatments occur *en route* in cargo ships to reduce the delays associated with treatments. However, Mexican oranges can receive hot air, steam, irradiation, or fumigation treatments instead of the 20-day cold treatment, all of which require less than a day and potentially allow Mexican exporters to capitalize on short-run U.S. price fluctuations.

Inspection Regulation and Key Findings

To understand this report's key findings on inspections and trade, one must first understand how inspections for import pests occur and how paths are regulated. An inspection involves a CBP agent examining a shipment of a commodity to ensure that it meets its entry requirements. These requirements may involve (1) that the shipment have an import permit, (2) that the shipment carry a phytosanitary certificate,[13] (3) that only commercial shipments be permitted, (4) that goods only arrive from a certain region of the country (i.e., an origin restriction), (5) that goods only be shipped to certain destinations in the United States (i.e., a destination restriction), or (6) that goods receive a mandatory treatment that is verified by the inspector or certified by an agent at the shipment's origin point. If the shipment meets these inspection requirements, it is released for entry. All shipments must have a cargo manifest indicating the contents of the shipment, its value, origin, destination, consigner, and consignee.

At the time of inspection, the good is given a four-letter disposition code (table 4). Within the disposition code itself, two letters indicate the risk associated with the commodity and two letters indicate the action (if any) taken to deal with that risk. In the large majority of cases, the good is assigned the IRMR disposition code, indicating it was "Inspected and Released" (IR) because the shipment "Meets Requirements" (MR) for entry. However, other disposition codes can be assigned to characterize the rate at which goods bear some phytosanitary risk (the risk rate) out of all possible goods, and the rate at which these goods are ordered some action as a result of an inspection or as a pre-condition of entry (the action rate). The possible risks described by the disposition codes and their corresponding two-letter codes are as follows: Actionable Pest (AP), Container Contamination (CC), Product Contamination (PC), Phyto Discrepancy (PD) (a discrepancy between the phytosanitary certificate and what the inspector sees in the goods or cargo manifest), Prohibited Product (PP), and Wood Packing Material Violation (WP). Additionally, the two-letter code PQ indicates that an unknown organism has been found and is presumed to be actionable unless it is later identified and found to be innocuous. Each of these codes indicates that the shipment is out of compliance with the import regulations.

If a shipment is out of compliance upon its arrival, it can still be released for commerce if additional documentation (i.e., the correcting of a phytosanitary certificate) or a discretionary treatment brings the shipment into compliance. If the importer opts against treating the shipment or no treatment is available, then the product may be returned or destroyed. The first two letters of the disposition code indicate these corresponding actions: Fumigation (FU), Cold Treatment (CT), Destroyed (DE), Returned (RX), and Other Action Taken (OT). Additionally, cargo may arrive at the port pre-cleared or having undergone a previous treatment,[14] and it is still given a cursory inspection that may be oriented primarily to ensure that the inspection occurred abroad. Another set of codes, organized collectively as "Released," characterizes imports that do not require an action. The action rate is the percentage of the volume of goods that require an action. In most cases, the risk and action rates will be similar in aggregate, differing only due to the rare use of the "PQ" risk code (when actions occur at the behest of the importer before risks can conclusively be identified) or when a good arrives at a port still needing a treatment as a condition of entry (typically a fumigation). As it excludes treat-

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[13] In certain cases, the phytosanitary certificate may include information that verifies that several steps of a regulatory systems approach protocol have been performed.

[14] Cold treatment, for example, typically occurs in transit.

Table 4

PPQ 280 disposition codes and organization as treatment and risk rates

General category	Disposition code	Description	Risk category	Action category	Included as inspected	Included in import totals
Destroyed goods	DEAP	Destroyed, Actionable Pest	Actionable Pest	Destroyed	Yes	No
	DEAR	Destroyed, Actionable Pest (NARP*) - an actionable pest is detected during an AQIM+ inspection under NARP Program	Actionable Pest	Destroyed	Yes	No
	DECC	Destroyed, Container Contamination	Container Contamination	Destroyed	Yes	No
	DEPC	Destroyed, Product Contamination	Product Contamination	Destroyed	Yes	No
	DEPD	Destroyed, Phyto Discrepancy	Phyto Discrepancy	Destroyed	Yes	No
	DEPP	Destroyed, Prohibited Product	Prohibited Product	Destroyed	Yes	No
	DEPQ	Destroyed, Precautionary - the importer requests the shipment be destroyed because a pest is found that is presumed to be actionable	Unknown	Destroyed	Yes	No
Fumigated goods	FUAP	Fumigated, Actionable Pest	Actionable Pest	Fumigated	Yes	Yes
	FUAR	Fumigated, Actionable Pest - detected in AQIM inspection under NARP Program	Actionable Pest	Fumigated	Yes	Yes
	FUCC	Fumigation, Container Contamination	Container Contamination	Fumigated	Yes	Yes
	FUPC	Fumigation, Product Contamination	Product Contamination	Fumigated	Yes	Yes
	FUPQ	Fumigation, Precautionary - action taken at discretion of importer because the pest is presumed to be actionable	Unknown	Fumigated	Yes	Yes
	FUPT	Fumigation - this treatment is required to be performed as a condition of entry	NONE	Fumigated	No	Yes
Other action taken	OTAP	Other Action Taken - actionable pest	Actionable Pest	Other Action Taken	Yes	Yes
	OTAR	Other Action Taken, Actionable Pest Detected in AQIM Inspection Under NARP Program	Actionable Pest	Other Action Taken	Yes	Yes
	OTCC	Other Action Taken, Container Contamination	Container Contamination	Other Action Taken	Yes	Yes
	OTPC	Other Action Taken, Product Contamination	Product Contamination	Other Action Taken	Yes	Yes
	OTPD	Other Action Taken, Phyto Discrepancy	Phyto Discrepancy	Other Action Taken	Yes	Yes
	OTPP	Other Action Taken, Prohibited Product	Prohibited Product	Other Action Taken	Yes	Yes
	OTPQ	Other Action Taken, Precautionary - action taken at discretion of inspector because the pest is presumed to be actionable	Unknown	Other Action Taken	Yes	Yes
	OTPT	Other Action Taken - a mandatory (precautionary) treatment is required to be performed as a condition of entry	NONE	Other Action Taken	No	Yes

—continued

Table 4

PPQ 280 disposition codes and organization as treatment and risk rates—continued

General category	Disposition code	Description	Risk category	Action category	Included as inspected	Included in import totals
Returned goods	RXAP	Returned, Actionable Pest	Actionable Pest	Returned	Yes	No
	RXAR	Returned, Actionable Pest, NARP Inspection	Actionable Pest	Returned	Yes	No
	RXCC	Returned, Contained Contamination	Container Contamination	Returned	Yes	No
	RXPC	Returned, Product Contamination	Product Contamination	Returned	Yes	No
	RXPD	Returned, Phyto Discrepancy	Phyto Discrepancy	Returned	Yes	No
	RXPP	Returned, Prohibited Product	Prohibited Product	Returned	Yes	No
	RXPQ	Returned, Precautionary - action taken at discretion of importer because the pest is presumed to be actionable	NONE	Returned	Yes	No
	RXWP	Returned, Wood Packing Material Violation	Wood Packing Material Violation	Returned	Yes	No
Cold-treated goods	CTPT	Cold Treatment - this treatment is required to be performed as a condition of entry	NONE	NONE	No	Yes
Released goods	IRAR	Inspected and Released, Meets Requirements (NARP Inspection)	NONE	NONE	Yes	Yes
	IRMR	Inspected and Released, Meets Requirements	NONE	NONE	Yes	Yes
	IRPD	Inspected and Released, Phyto Discrepancy	Phyto Discrepancy	NONE	Yes	Yes
	CCNA	Cargo Clearance, Not Applicable – refers to good cleared with a review of documents or temperature logs in the case of cold treatment	NONE	NONE	Yes	Yes
Other codes	PCIR	Preclearance, Inspected and Released	NONE	NONE	No	Yes
	PCNA	Preclearance, No Action Taken	NONE	NONE	No	Yes
	REAR	Released Without Inspection Under NARP Program	NONE	NONE	No	Yes
	TEOC	Transit and Export, Other Country	NONE	NONE	No	No
	IEND	Immediate Export, No Diversions	NONE	NONE	No	No

*NARP refers to the National Agricultural Release Program.

+AQIM refers to the Agricultural Quarantine Inspection Monitoring System.

Source: USDA, Economic Research Service; USDA, Animal and Plant Health Inspection Service, PPQ 280 inspections data.

Data for Individual Commodities

The PPQ 280 data allow commodity pathways to be disaggregated by sources of risk (i.e., whether an actionable pest was found versus whether a prohibited product was found) and by the specific treatments ordered (i.e., fumigation versus cold treatment). This report includes only the data for 2006-11—the data for individual years is posted on the USDA's Economic Research Service website (www.ers.usda.gov).[1] On the website, each of the 29 individual commodities has a file containing 22 tables. The first table lists the volumes of the top 10 importers of the commodity from 2006 to 2011. The following 21 tables contain 3 tables for each of the following 7 periods: 2006, 2007, 2008, 2009, 2010, 2011, and 2006-11. For each period, the first table includes volume data (in metric tons) on imports, inspected goods (based on inspection data), pre-cleared goods and goods entering via the NARP program, rate data on tariffs, and the action and risk rates. The second table disaggregates the action rate for each period into whether the good was fumigated, destroyed, cold treated, returned, or ordered some other action. The third table disaggregates the risk rate for each year into whether the risk involved the finding of an actionable pest, a phyto discrepancy, contamination, whether the good was pre-treated, the finding of a prohibited product, a wood packing material violation, or the finding of an unidentified pest.

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[1] Related work from the Economic Research Service, titled "Phytosanitary Regulation of Fruits and Vegetables" (http://www.ers.usda.gov/data-products/phytosanitary-regulation.aspx), considers the extent to which 45 individual fruits and vegetables are imported by the United States. While not addressing either mandatory or incidental treatments, the data present the percentages of world production and world trade permitted entry into the United States under any condition. Owing to difficulties resolving the inspections data with trade data, this report addresses only 29 of the 45 fruits and vegetables covered in that earlier work. In particular, the Census trade data sets contain overly broad categories, including "Lemons and Limes," "Other Citrus," "Jicama and Breadfruit," "Guavas, Mangoes and Mangosteens," and "Roots and Tubers," that cannot easily be reconciled with inspections data. "Dates" and "Figs" are also excluded because they are often shipped in a preserved state (which the Animal and Plant Health Inspection Service regulates differently than fresh goods) that does not appear to be distinguished in Census trade data. Specifically, trade data suggest that large volumes of these goods arrive from prohibited origins.

ments as a condition of entry, the risk rate best represents the likelihood (on average) that a shipment will be ordered an unexpected treatment.

Findings

This report provides five main findings about the relationships among the inspections, trade, and regulatory data. The first two findings address the issue of data quality and the correspondence between inspections and import data. The last three findings address the relative role of inspections, regulations, and tariffs in explaining trade flows.

Volumes reported in inspections and imports data differ. Data on the volume of inspected goods and on the volume of imported goods represent overlapping records of the number of kilograms of fruits and vegetables entering the United States. Conceptually, these volumes should be identical, although that does not always prove to be the case. Moreover, some research questions may be better addressed using inspections data, which often contain more distinctions in variety and origin than imports data (despite their lack of price or value information).

Accounting for goods that port inspectors order to be destroyed or returned (and, consequently, do not appear in U.S. imports data), this report compares the percentage difference between the quantity of a commodity recorded in imports data and the quantity of a commodity recorded in inspections data. With regard to whether this difference is small or decreasing over time, no uniform finding is apparent across all goods. Table 5 provides a general description of the differences across goods, with more specific information provided in the online data. Of the 29 goods considered, only 12 have differences (in absolute value terms) less than 10 percent in the aggregate volume of inspected goods. Six of the goods have differences greater than 20 percent. The online data show that these differences are, in general, decreasing over time (but not in every case)—see appendix for further discussion of this topic.

This report does not consider the specific reasons why the two data sets differ. However, the differences may occur for innocuous reasons. For example, inspectors may place frozen or peeled carrots and potatoes in a processed goods category because they pose little pest risk, even when they are recorded in Customs as unprocessed. Shippers may also have leeway to have imported goods declared within multiple categories and have some discretion to have raw goods shipped to free trade zones (which may include processing facilities). In this last case, the good's entry status is suspended in Customs data until the good enters commerce, at which point it may enter commerce as a processed product following its treatment at the facility. Inspections data would not account for this change in processing status. Additionally, U.S.-produced raw commodities may "re-enter" the United States after they have been processed abroad, which may affect how they are recorded in either data set.

Import flows are dominated by a small number of significant pathways. Only a few countries export significant volumes of fruits and vegetables to the United States (relative to the number permitted to do so). Table 3 shows the shares of imports from the top 10 exporters of each commodity. While there are numerous ways to describe the concentration of imports across countries, a simple way is to count the number of countries with a share of imports larger than 1 percent. Of the 29 goods considered, only 8 (apples, bananas, cassava, eggplant, onion, papaya, pears, and pineapple) have more than 4 suppliers fitting this criterion. Moreover, 18 of the 29 goods considered have a single country supplying more than 80 percent of U.S. imports. In a few cases, this high concentration level can be explained entirely by sanitary and phytosanitary regulations. For example, fresh olives, potatoes, and corn are only permitted import from Mexico or Canada except under special circumstances.[15] Other high concentration levels may be attributed to limited trade access, as with apricots, plums, and peaches from Chile—only 15 or fewer countries can ship these products to the United States.

Moreover, these figures are likely to understate the concentration of imports along certain pathways owing to the seasonality of these imports. For instance, 98 percent of asparagus imports come from Mexico or Peru, but these two countries (which are in different hemispheres with reversed growing seasons) generally do not export goods at the same time. Similarly, while the arrival of imports is concentrated from certain origins, there are also many pathways for which little trade occurs, although it is permitted.

Risk rates are low, only exceeding 5 percent for about 8 percent of significant pathways. Inspection is costly and imperfect. Due to the nature of the sampling process, inspections will fail to intercept all hazardous materials at the border. Moreover, the costs of administering a treatment to

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[15] Exceptions may include specially permitted imports for breeding or research purposes or diplomatic reasons.

Table 5

Tariff, risk, and action rates* by significant pathway+, 2011

1 – Apple

Country	Treatment	Pre-clearance rate	NARP rate	Imports	Entered	Tariff rate	Action rate	Risk rate
AOC	N.A.**	14.87%	0.00%	424	381	0.00%	0.01%	0.01%
Argentina	Cold treat	100.00%	0.00%	4,551	6,806	0.00%	0.00%	0.00%
Canada		0.00%	0.00%	18,547	1,032	0.00%	0.00%	0.00%
Chile		99.78%	0.00%	91,141	107,569	0.00%	0.00%	0.00%
New Zealand		88.62%	0.00%	33,291	34,297	0.00%	10.98%	10.40%
Total				147,953	150,084	0.00%	2.47%	2.34%
Difference between imports and entered goods				1.43%	Number of approved pathways			19
Percent of pathways requiring treatments								52.63%

2 – Apricot

Country	Treatment	Pre-clearance rate	NARP rate	Imports	Entered	Tariff rate	Action rate	Risk rate
AOC	N.A.	0.00%	0.00%	5	0	0.04%	0.00%	0.00%
Chile		99.73%	0.00%	1,247	1,543	0.00%	0.00%	0.00%
New Zealand		24.05%	0.00%	73	92	0.06%	10.88%	10.88%
Turkey		0.00%	0.00%	97	0	0.06%	0.00%	0.00%
Total				1,422	1,636	0.01%	0.56%	0.56%
Difference between imports and entered goods				13.98%	Number of approved pathways			13
Percent of pathways requiring treatments								53.85%

3 – Artichoke

Country	Treatment	Pre-clearance rate	NARP rate	Imports	Entered	Tariff rate	Action rate	Risk rate
AOC	N.A.	0.00%	0.00%	22	20	11.30%	0.00%	0.00%
Egypt		0.00%	0.00%	-	-	0.00%	0.00%	0.00%
Mexico		0.00%	0.00%	1,977	2,078	0.00%	0.09%	0.09%
Peru		0.00%	0.00%	44	39	0.00%	0.00%	0.00%
Spain		0.00%	0.00%	18	-	11.30%	0.00%	0.00%
Total				2,061	2,137	0.22%	0.08%	0.08%
Difference between imports and entered goods				3.64%	Number of approved pathways			28
Percent of pathways requiring treatments								0.00%

4 – Asparagus

Country	Treatment	Pre-clearance rate	NARP rate	Imports	Entered	Tariff rate	Action rate	Risk rate
AOC	N.A.	3.21%	0.00%	354	415	6.45%	18.19%	5.74%
Canada		0.00%	0.00%	1,482	60	0.00%	0.00%	0.00%
Mexico		0.00%	96.35%	86,727	66,150	0.00%	0.09%	0.09%
Peru	Fumigation	0.03%	0.00%	86,085	94,938	0.01%	97.07%*	0.00%
Total				174,648	161,563	0.02%	47.93%	0.06%
Difference between imports and entered goods				-7.78%	Number of approved pathways			56
Percent of pathways requiring treatments								7.14%

5 – Avocado

Country	Treatment	Pre-clearance rate	NARP rate	Imports	Entered	Tariff rate	Action rate	Risk rate
AOC	N.A.	6.04%	0.00%	9,950	10,305	0.69%	1.96%	1.96%
Chile		98.57%	0.00%	69,834	67,723	1.88%	0.00%	0.00%
Dom. Rep		0.00%	0.00%	16,731	17,520	0.00%	0.73%	0.75%
Mexico		0.00%	1.00%	318,938	320,357	0.00%	0.03%	0.03%
Total				415,453	415,905	0.33%	0.10%	0.10%
Difference between imports and entered goods				0.11%	Number of approved pathways			24
Percent of pathways requiring treatments								4.17%

6 – Banana

Country	Treatment	Pre-clearance rate	NARP rate	Imports	Entered	Tariff rate	Action rate	Risk rate
AOC	N.A.	0.00%	0.00%	33,230	32,123	0.00%	0.26%	0.26%
Colombia		0.00%	0.00%	384,505	398,723	0.00%	0.06%	0.06%
Costa Rica		0.00%	0.00%	844,530	871,800	0.00%	0.04%	0.04%
Ecuador		0.00%	0.00%	879,414	908,983	0.00%	0.11%	0.11%
Guatemala		0.00%	0.00%	1,333,496	1,324,440	0.00%	0.05%	0.05%
Honduras		0.00%	0.00%	445,223	475,717	0.00%	0.02%	0.18%
Mexico		0.00%	83.96%	148,695	148,744	0.00%	0.05%	0.03%
Nicaragua		0.00%	0.50%	35,585	39,130	0.00%	0.00%	0.00%
Peru		0.00%	0.00%	23,266	27,616	0.00%	0.38%	0.38%
Total				2,141,680	2,211,629	0.00%	0.07%	0.07%
Difference between imports and entered goods				3.21%	Number of approved pathways			74
Percent of pathways requiring treatments								16.22%

—continued

Table 5

Tariff, risk, and action rates* by significant pathway+, 2011—continued

7 – Carrot

Country	Treatment	Pre-clearance rate	NARP rate	Imports	Entered	Tariff rate	Action rate	Risk rate
AOC	N.A.	0.00%	0.00%	1,657	1,787	0.00%	0.11%	0.11%
Canada		0.00%	0.00%	97,791	2,504	0.00%	0.00%	0.00%
Costa Rica		0.00%	0.00%	3,153	3,481	0.00%	1.98%	1.98%
Mexico		0.00%	91.75%	67,167	75,845	0.00%	0.14%	0.14%
Israel		0.00%	0.00%	8,854	7,801	0.02%	0.00%	0.00%
Total				178,621	91,418	0.00%	0.09%	0.09%
Difference between imports and entered goods				-64.6%	Number of approved pathways			38
Percent of pathways requiring treatments								0.00%

8 – Cassava

Country	Treatment	Pre-clearance rate	NARP rate	Imports	Entered	Tariff rate	Action rate	Risk rate
AOC	N.A.	0.45%	0.00%	521	445	0.00%	0.00%	0.00%
Brazil		0.00%	0.00%	47	20	7.02%	0.00%	0.00%
Costa Rica		0.00%	0.00%	35,791	36,759	0.00%	0.87%	0.87%
Dom. Rep.		0.00%	0.00%	30	29	0.00%	0.00%	0.00%
Ecuador		0.00%	0.00%	1,413	1,535	0.23%	0.00%	0.00%
El Salvador		0.00%	0.00%	111	111	0.00%	0.00%	0.00%
Ghana		0.00%	0.00%	962	0	0.00%	0.00%	0.00%
Honduras		0.00%	0.00%	762	880	1.40%	1.47%	1.47%
Mexico		0.00%	0.00%	437	480	0.00%	0.00%	0.00%
Nicaragua		0.00%	0.00%	1,549	1,075	0.15%	9.35%	9.35%
Total				41,623	41,333	0.05%	1.12%	1.12%
Difference between imports and entered goods				-0.70%	Number of approved pathways			46
Percent of pathways requiring treatments								0.00%

9 – Celery

Country	Treatment	Pre-clearance rate	NARP rate	Imports	Entered	Tariff rate	Action rate	Risk rate
AOC	N.A.	0.00%	0.00%	121	10	6.03%	0.00%	0.00%
Canada		0.00%	0.00%	6,029	78	0.01%	0.00%	0.00%
Dom. Rep.		0.00%	0.00%	408	634	0.00%	2.57%	2.57%
Mexico		0.00%	0.00%	40,048	40,475	0.00%	1.43%	1.40%
Netherlands		0.00%	0.00%	498	498	0.00%	0.00%	0.00%
Total				47,104	41,696	0.02%	1.24%	1.21%
Difference between imports and entered goods				-12.18%	Number of approved pathways			18
Percent of pathways requiring treatments								0.00%

10 – Cherries

Country	Treatment	Pre-clearance rate	NARP rate	Imports	Entered	Tariff rate	Action rate	Risk rate
AOC	N.A.	0.00%	0.00%	11	9	0.00%	0.00%	0.00%
Argentina	Cold Treat	99.17%	0.00%	508	450	0.00%	0.00%	0.00%
Canada		0.00%	0.00%	2,968	925	0.00%	0.00%	0.00%
Chile		99.02%	0.00%	16,909	22,782	0.00%	0.34%	0.00%
Total				20,396	24,166	0.00%	0.28%	0.00%
Difference between imports and entered goods				16.92%	Number of approved pathways			7
Percent of pathways requiring treatments								57.14%

11 – Corn

Country	Treatment	Pre-clearance rate	NARP rate	Imports	Entered	Tariff rate	Action rate	Risk rate
AOC	N.A.	0.00%	0.00%	163	189	5.79%	.23%	0.23%
Canada		0.00%	0.00%	3,038	256	0.00%	0.00%	0.00%
Mexico		0.00%	0.00%	44,970	50,658	0.00%	2.56%	2.46%
Total				48,171	51,103	0.02%	2.39%	2.30%
Difference between imports and entered goods				5.91%	Number of approved pathways			44
Percent of pathways requiring treatments								0.00%

12 – Cucumbers

Country	Treatment	Pre-clearance rate	NARP rate	Imports	Entered	Tariff rate	Action rate	Risk rate
AOC	N.A.	0.00%	0.00%	3,106	3,914	3.17%	0.00%	0.00%
Canada		100.00%	0.00%	76,112	2,383	0.00%	0.04%	0.04%
Dom Rep.		0.00%	0.00%	3,871	7,470	0.00%	1.57%	1.57%
Honduras		99.78%	0.00%	33,616	39,117	0.01%	0.31%	0.31%
Mexico		88.62%	0.00%	477,724	451,923	0.00%	0.05%	0.05%
Total				594,429	504,807	0.02%	0.07%	0.07%
Difference between imports and entered goods				-16.31%	Number of approved pathways			47
Percent of pathways requiring treatments								0.00%

—continued

Table 5

Tariff, risk, and action rates* by significant pathway+, 2011—continued

13 – Eggplant

Country	Treatment	Pre-clearance rate	NARP rate	Imports	Entered	Tariff rate	Action rate	Risk rate
AOC	N.A.	0.00%	0.00%	513	510	0.37%	4.67%	4.67%
Canada		0.00%	0.00%	1,198	23	0.00%	0.00%	0.00%
Dom. Rep.		0.00%	0.00%	3,041	5,013	0.00%	5.11%	5.10%
Guatemala		0.00%	0.00%	1,278	2,034	0.01%	5.97%	5.97%
Honduras		0.00%	0.00%	4,353	3,370	0.00%	6.49%	6.49%
Mexico		0.00%	92.42%	41,001	37,834	0.00%	0.13%	0.12%
Netherlands		0.00%	0.00%	1,085	1,616	0.66%	1.53%	1.53%
Total				52,469	50,402	0.02%	1.15%	1.15%
Difference between imports and entered goods				-4.02%	Number of approved pathways			38
Percent of pathways requiring treatments								0.00%

14 – Grapes

Country	Treatment	Pre-clearance rate	NARP rate	Imports	Entered	Tariff rate	Action rate	Risk rate
AOC	N.A.	1.81%	0.00%	2,049	2,049	0.28%	87.47%*	0.00%
Brazil	Fumigation	0.00%	0.00%	12,565	12,565	0.27%	87.18%*	0.28%
Chile	Fumigation	1.41%	0.00%	450,895	450,895	0.00%	98.58%*	0.00%
Mexico		0.00%	99.79%	3,161	113,438	0.00%	0.04%	0.01%
Peru	Cold Treat	0.04%	0.00%	39,053	39,053	0.00%	6.01%	2.07%
Total				507,722	617,999	0.01%	90.52%	0.17%
Difference between imports and entered goods				19.59%	Number of approved pathways			53
Percent of pathways requiring treatments								88.68%

15 – Kiwi

Country	Treatment	Pre-clearance rate	NARP rate	Imports	Entered	Tariff rate	Action rate	Risk rate
AOC	N.A.	0.00%	0.00%	527	322	0.00%	0.00%	0.00%
Chile	Fumigation	1.42%	0.00%	22,180	25,475	0.00%	98.3%*	0.00%
Italy	Vapor/Cold	0.00%	0.00%	14,691	15,761	0.00%	3.57%	0.14%
New Zealand		0.90%	0.00%	20,334	24,278	0.00%	3.12%	2.59%
Total				57,732	65,836	0.00%	39.76%	0.95%
Difference between imports and entered goods				13.12	Number of approved pathways			11
Percent of pathways requiring treatments								63.64%

16 – Olive

Country	Treatment	Pre-clearance rate	NARP rate	Imports	Entered	Tariff rate	Action rate	Risk rate
AOC	N.A.	0.00%	0.00%	27	-	2.86%	0.00%	0.00%
Mexico		0.00%	0.00%	2,511	2,360	0.00%	0.00%	0.00%
Total				2,537	2,360	0.03%	0.00%	0.00%
Difference between imports and entered goods				-7.26%	Number of approved pathways			1
Percent of pathways requiring treatments								0.00%

17 – Onion

Country	Treatment	Pre-clearance rate	NARP rate	Imports	Entered	Tariff rate	Action rate	Risk rate
AOC	N.A.	0.03%	0.00%	1,962	1,582	5.61%	5.96%	5.96%
Argentina		0.00%	0.00%	268	0	0.00%	0.00%	0.00%
Canada		0.00%	0.00%	29,631	4,261	0.00%	0.40%	0.40%
Chile		73.72%	0.00%	14,650	13,626	0.00%	0.00%	0.00%
China		0.00%	0.00%	4,101	3,915	4.93%	0.55%	0.55%
France		0.00%	0.00%	2,730	2,414	2.03%	1.27%	1.27%
Guatemala		0.00%	0.00%	1,600	2,333	0.00%	60.95%	60.95%
Mexico		0.00%	82.84%	251,968	294,742	0.00%	0.23%	0.20%
Total				311,061	326,748	0.16%	0.59%	0.57%
Difference between imports and entered goods				4.92%	Number of approved pathways			93
Percent of pathways requiring treatments								1.08%

18 – Papaya

Country	Treatment	Pre-clearance rate	NARP rate	Imports	Entered	Tariff rate	Action rate	Risk rate
AOC	N.A.	0.00%	0.00%	1,322	1,329	0.00%	0.00%	0.00%
Belize		0.00%	8.86%	26,372	24,482	0.02%	0.50%	0.50%
Brazil		0.27%	9.69%	3,582	5,508	0.05%	0.48%	0.48%
Dom. Rep.		0.00%	0.00%	2,165	3,078	0.00%	0.61%	0.61%
Guatemala		0.00%	0.00%	6,183	6,595	0.00%	0.40%	0.40%
Jamaica		96.84%	0.00%	547	554	0.00%	0.00%	0.00%

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Table 5

Tariff, risk, and action rates* by significant pathway+, 2011—continued

Mexico		0.00%	0.00%	100,875	101,797	0.00%	1.97%	1.78%
Total				141,046	143,341	0.00%	1.54%	1.41%
Difference between imports and entered goods				1.61%	Number of approved pathways			32
Percent of pathways requiring treatments								3.13%
19 – Peaches								
Country	Treatment	Pre-clearance rate	NARP rate	Imports	Entered	Tariff rate	Action rate	Risk rate
AOC	N.A.	98.65%	0.00%	75	175	0.00%	0.00%	0.00%
Canada		0.00%	0.00%	309	29	0.00%	0.00%	0.00%
Chile	Fumigation	99.15%	0.00%	46,537	54,757	0.00%	0.77%	0.00%
Mexico	Cold Treat***	0.00%	0.00%	86	96	0.00%	0.00%	0.00%
Total				47,007	55,057	0.00%	0.77%	0.00%
Difference between imports and entered goods				15.78%	Number of approved pathways			15
Percent of pathways requiring treatments								66.67%
20 – Pear								
Country	Treatment	Pre-clearance rate	NARP rate	Imports	Entered	Tariff rate	Action rate	Risk rate
AOC	N.A.	0.00%	0.00%	17	15	0.05%	0.00%	0.00%
Argentina	Cold Treat	100.00%	0.00%	38,962	45,539	0.15%	0.00%	0.00%
Chile		100.00%	0.00%	20,644	24,751	0.00%	0.00%	0.00%
China		0.00%	0.00%	6,241	6,631	0.22%	3.96%	3.96%
New Zealand		100.00%	0.00%	1,761	2,993	0.01%	0.00%	0.00%
S. Africa	Cold Treat	9.81%	0.00%	861	978	0.00%	0.00%	0.00%
S. Korea		92.53%	0.00%	9,302	8,828	0.11%	1.75%	1.75%
Total				77,788	89,735	0.11%	0.53%	0.53%
Difference between imports and entered goods				14.26%	Number of approved pathways			16
Percent of pathways requiring treatments								68.75%
21 – Peas								
Country	Treatment	Pre-clearance rate	NARP rate	Imports	Entered	Tariff rate	Action rate	Risk rate
AOC	N.A.	0.00%	0.00%	211	148	5.30%	3.63%	3.63%
Canada		0.00%	0.00%	514	740	0.00%	3.90%	3.90%
Guatemala		0.00%	0.00%	21,631	31,855	0.00%	0.95%	0.95%
Honduras		0.00%	0.00%	436	436	0.00%	0.00%	0.00%
Mexico		0.00%	54.43%	11,113	9,362	0.00%	0.08%	0.08%
Peru		0.00%	0.00%	3,905	4,260	0.00%	8.91%	8.91%
Total				37,809	46,801	0.03%	1.56%	1.56%
Difference between imports and entered goods				21.25%	Number of approved pathways			33
Percent of pathways requiring treatments								12.12%
22 – Peppers								
Country	Treatment	Pre-clearance rate	NARP rate	Imports	Entered	Tariff rate	Action rate	Risk rate
AOC	N.A.	1.38%	0.00%	6,785	6,549	0.80%	2.09%	1.92%
Canada		0.00%	0.37%	85,312	2,587	0.00%	5.02%	4.77%
Dom. Rep.		0.00%	0.00%	10,080	14,683	0.00%	5.23%	5.17%
Honduras		0.00%	0.00%	4,328	4,526	0.00%	0.74%	0.74%
Israel		0.00%	0.00%	1,013	964	0.19%	2.51%	2.51%
Mexico		0.04%	41.38%	651,372	639,486	0.00%	0.19%	0.18%
Netherlands		0.00%	0.00%	20,610	21,605	1.74%	2.62%	2.62%
Total				779,500	690,401	0.05%	0.87%	0.83%
Difference between imports and entered goods				-12.12%	Number of approved pathways			37
Percent of pathways requiring treatments								8.11%
23 – Pineapple								
Country	Treatment	Pre-clearance rate	NARP rate	Imports	Entered	Tariff rate	Action rate	Risk rate
AOC	N.A.	0.00%	0.00%	6,522	2,486	0.18%	0.14%	0.14%
Costa Rica		0.00%	0.00%	697,648	769,692	0.00%	4.01%	3.07%
Ecuador		0.00%	0.00%	21,557	25,276	1.45%	2.00%	2.00%
Guatemala		0.00%	0.00%	14,634	14,247	0.00%	2.45%	1.84%
Honduras		0.00%	0.00%	27,241	30,648	0.00%	3.21%	1.98%
Mexico		0.00%	10.79%	36,440	36,336	0.00%	1.11%	1.07%
Panama		0.00%	0.00%	14,113	13,029	0.00%	1.13%	1.13%
Total				818,154	891,713	0.04%	3.70%	2.84%
Difference between imports and entered goods				8.60%	Number of approved pathways			71
Percent of pathways requiring treatments								2.82%

—continued

Table 5

Tariff, risk, and action rates* by significant pathway+, 2011—continued

24 – Plum

Country	Treatment	Pre-clearance rate	NARP rate	Imports	Entered	Tariff rate	Action rate	Risk rate
AOC	N.A.	74.17%	0.00%	135	93	0.00%	0.00%	0.00%
Chile	Fumigation	96.21%	0.00%	29,383	33,140	0.00%	3.12%	0.00%
Total				29,517	33,233	0.00%	3.11%	0.00%
Difference between imports and entered goods				11.84%	Number of approved pathways			15
Percent of pathways requiring treatments								80.00%

25 – Potatoes

Country	Treatment	Pre-clearance rate	NARP rate	Imports	Entered	Tariff rate	Action rate	Risk rate
AOC	N.A.	0.00%	0.00%	49	5	0.26%	0.00%	0.00%
Canada		0.16%	0.01%	491,449	49,103	0.00%	0.36%	0.36%
Total				491,498	49,108	0.00%	0.36%	0.36%
Difference between imports and entered goods				-163.7%	Number of approved pathways			1
Percent of pathways requiring treatments								0.00%

26 – Spinach

Country	Treatment	Pre-clearance rate	NARP rate	Imports	Entered	Tariff rate	Action rate	Risk rate
AOC	N.A.	0.00%	0.00%	16	16	0.00%	10.14%	10.14%
Canada		0.00%	3.10%	1,168	38	0.00%	0.00%	0.00%
Mexico		0.00%	0.00%	5,025	6,350	0.00%	0.92%	0.87%
Total				6,209	6,403	0.00%	0.77%	0.73%
Difference between imports and entered goods				3.09%	Number of approved pathways			35
Percent of pathways requiring treatments								0.00%

27 – Squash

Country	Treatment	Pre-clearance rate	NARP rate	Imports	Entered	Tariff rate	Action rate	Risk rate
AOC	N.A.	6.98%	1.70%	2,910	4,738	0.21%	2.23%	2.23%
Canada		0.00%	0.00%	4,507	151	0.00%	0.00%	0.00%
Costa Rica		0.00%	0.00%	1,753	13,141	0.00%	0.19%	0.19%
Honduras		0.00%	0.00%	4,005	4,441	0.00%	2.97%	2.97%
Mexico		0.00%	85.17%	259,153	301,796	0.00%	0.09%	0.08%
Panama		0.00%	0.00%	872	941	0.00%	6.22%	6.22%
Total				273,200	325,207	0.00%	0.18%	0.17%
Difference between imports and entered goods				17.38%	Number of approved pathways			47
Percent of pathways requiring treatments								0.00%

28 – Strawberry

Country	Treatment	Pre-clearance rate	NARP rate	Imports	Entered	Tariff rate	Action rate	Risk rate
AOC	N.A.	7.89%	0.00%	443	229	0.07%	1.32%	1.32%
Mexico		0.00%	96.19%	110,162	91,393	0.00%	0.10%	0.08%
Total				110,605	91,622	0.00%	0.10%	0.08%
Difference between imports and entered goods				-18.77%	Number of approved pathways			94
Percent of pathways requiring treatments								1.06%

29 – Tomato

Country	Treatment	Pre-clearance rate	NARP rate	Imports	Entered	Tariff rate	Action rate	Risk rate
AOC	N.A.	0.00%	0.00%	5,499	6,468	0.33%	1.04%	1.13%
Canada		0.00%	0.16%	141,349	6,207	0.00%	3.00%	2.15%
Guatemala		0.00%	0.00%	17,351	19,094	0.00%	0.02%	0.02%
Mexico		0.00%	97.02%	1,327,312	1,164,916	0.00%	0.04%	0.04%
Total				1,491,511	1,196,685	0.00%	0.33%	0.24%
Difference between imports and entered goods				-21.93%	Number of approved pathways			66
Percent of pathways requiring treatments								4.55%

*High action rates associated with imports requiring mandatory fumigation likely reflect a small number of imports not being fumigated prior to port entry and not being assigned the precautionary treatment code.

+Significant pathways are those comprising more than 1 percent of 2006-11 aggregate imports.
**Not applicable.

***No treatment required from fruit-fly-free areas.

Note: NARP refers to the National Agricultural Release Program, and AOC refers to All Other Countries.

Source: USDA, Animal and Plant Health Inspection Service, PPQ 280 inspections data; U.S. Department of Commerce, U.S. Census Bureau, U.S. Imports of Merchandise.

remediate a pest problem found during an inspection are higher than the costs of that same treatment if it is planned. For example, a cold treatment can often be performed while the good is in transit, significantly reducing the storage and logistical disruptions of a treatment. Similarly, fumigations are performed more efficiently in large volumes, a circumstance easier to arrange prior to shipment.

APHIS is likely to make a treatment mandatory if the likelihood is high that a shipment requires a treatment. Moreover, as this likelihood rises, CBP is likely to order more rigorous inspections on the commodity, which raises the associated costs of unpacking and packing the shipment.[16] Subsequently, risk rates (capturing the likelihood of a discretionary treatment) rarely exceed some maximum threshold because APHIS is likely to make the treatment mandatory for a pathway that is frequently found to have pests. In most cases, the discretionary treatments associated with the finding of an actionable pest involve quickly fumigating the shipment for insect pests, and a large portion of the commodity's value is retained. A more harmful scenario occurs when goods must undergo a cold treatment or be returned, causing substantial logistical delays. At worst, no treatment is possible and returning the shipment is not feasible (perhaps because it is highly perishable), so the good is destroyed and all the value of the good is lost. Assuming that the costs of treatments are primarily the direct costs paid by the import, and the lost value of the commodity is primarily in terms of quality rather than reputation (including loss of consumer goodwill from supply chain disruptions), the risk rate acts as an upper limit on the costs of discretionary treatments.[17] If the rate is 3 percent, then suppliers as a group might lose a maximum of 3 percent of the value of imports if, in the most extreme case, all goods are ordered to be destroyed. This risk rate would be comparable to a 3-percent tariff that reduces the average value of shipments by that amount.

Of the 118 significant pathways, only 10 (about 8 percent) had risk rates exceeding 5 percent (table 5).[18] An additional 25 significant pathways had risk rates between 1 and 5 percent, so that about 30 percent of significant pathways have risk rates exceeding 1 percent. Of the 29 goods considered, 8 (apples, cassava, celery, corn, eggplant, papaya, peas, and pineapple) had average risk rates greater than 1 percent. Moreover, in most cases (with the exceptions of asparagus, onions, and spinach), average risk rates for nonsignificant ("AOC," or "All Other Countries") pathways are within 2 percentage points of either the average rate or the rate for a significant pathway.

Some significant commodity pathways have conditions of entry requiring treatments. In addition to listing treatment requirements for permitted pathways, table 5 provides the number of approved pathways for importation and the percentage of pathways requiring a treatment. In 2011, 13 of 118 (or 11 percent) significant commodity pathways required a mandatory treatment as a condition of entry, compared with 140 of 1,072 (or 13 percent) of all pathways.[19] Petersen et al. (2013) find that, while requirements to treat shipments reduce a country's exports to the United States, this effect becomes negligible once an exporter ships more than a certain threshold, and a large share of exporters (between 64 and 92 percent depending on the model specification) overcome this threshold. The slightly higher rate at which nonsignificant pathways have required treatments supports the general notion that required treatments inhibit trade, but that the effect seems limited. Additionally,

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[16] This may also lead to "port shopping" if certain ports target inspections more rigorously than others.

[17] High action rates (over 80 percent) are discounted in cases where a mandatory fumigation is required, as these high rates likely reflect the importer not undertaking a required treatment.

[18] Of these goods, only one pathway – onions from Guatemala – had a risk rate exceeding 11 percent.

[19] Table 5 provides the percentage of pathways requiring a mandatory treatment and the number of pathways for the 29 commodities. This figure is a weighted average of the individual percentages.

the expectation of an importer being required to perform a treatment may deter it from seeking trade access at all.

Import requirements vary across commodities. As table 5 indicates, grapes, kiwi, peaches, and pears all have multiple significant pathways that require mandatory treatments. On the other hand, tomatoes and strawberries have 66 and 94 pathways, respectively, approved for importation with no required treatments, and bananas have 74 pathways for which only 12 (nonsignificant) pathways require treatment. These three commodities also differ significantly in the concentration of their import shares. Bananas have eight significant pathways, tomatoes three, and strawberries one. For most commodities, the share of significant trade pathways requiring treatment is smaller than the share of nonsignificant pathways requiring treatment. Asparagus and peaches, however, are notable exceptions to this pattern.

A complete list of entry requirements for each commodity for 2012 is posted on the ERS website titled "Phytosanitary Regulation." [20] From these tables, several other observations emerge. First, importers often have multiple treatment options, with some treatments being more expensive than others.[21] Second, while RSAPs have been developed in recent years, they are not necessarily implemented. For instance, ECOWAS countries (i.e., West African countries) have had RSAPs for both bananas and peppers but have yet to implement the domestic conditions of these protocols. Third, regionalization, which limits regulation or quarantine restrictions to specific areas, is relatively common. For example, Tasmania can often export goods under less restrictive conditions than the rest of Australia because it is free from the Mediterranean fruit fly and the Queensland fruit fly. Similarly, the United States often restricts entry of imports to Puerto Rico and Hawaii that are not restricted entry to the mainland.[22] The United States also often restricts the ports at which goods can make entry. Importantly, these restrictions do not restrict the movement of goods once they enter the United States—instead, they represent early attempts at destination regionalization of goods originating from European countries and pre-date recent, more formal destination restrictions, such as those affecting Mexican avocados after 1997 (Peterson and Orden, 2008).

Both tariffs and nontariff measures are relatively small across significant trade pathways. In general, U.S. tariff rates on imports vary significantly across origin and commodity. The general tariff rate is typically the highest and affects the fewest countries. The most-favored-nation tariff rate is more generally applicable, being assessed for most nations in good diplomatic standing with the United States. Special lower tariff rates are levied or even eliminated for specific countries covered by bilateral or multilateral agreements including, most recently, the Korean, Colombian, and Dominican Republic-Central American Free Trade Agreements.

Tariff rates are generally low for goods with significant import pathways (table 5). Of the 118 significant pathways for the 29 commodities, only 2 (Spanish artichokes and Brazilian cassava) faced tariff rates greater than 5 percent. An additional seven significant pathways faced tariff rates between

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[20] www.ers.usda.gov/data-products/phytosanitary-regulation

[21] Reviewing the sparse systematic work of the costs of sanitary and phytosanitary treatments, Ferrier (2010) finds that the cost of irradiating produce ranges from 2 to 6 cents per pound, while the cost of methyl bromide fumigation ranges from 1 to 3 cents per pound (depending on the commodity). For grapes from Chile unloaded in Philadelphia, fumigation may cost $8 to $10 per 1,200-pound pallet or 0.67 to 0.83 cents per pound (Quinones, 2013). Relatedly, Calvin et al. (2008) find that the value of the quality reduction for apples (5 cents per pound) may be larger than the actual cost of the treatment.

[22] Only regulations for the mainland United States are included in entry conditions because import regulations for Hawaii, Puerto Rico, Guam, and the Commonwealth of the Northern Mariana Islands differ significantly.

1 and 5 percent, so that about 8 percent of these pathways face tariffs exceeding 1 percent. Of the nonsignificant pathways, 6 of the 29 groups of countries included within the AOC aggregate faced tariff rates over 5 percent, and an additional 2 groups faced rates between 1 and 5 percent—consequently, 28 percent of these pathways faced tariff rates over 1 percent.

While the risk rates are higher than the tariff rates for both significant and nonsignificant pathways in most cases, a treatment is likely to cost or reduce the quality-adjusted price of a commodity by only a fraction of its value. However, even in the worst-case scenario, where the finding of a pest destroys the entire value of the commodity, this loss represents less than 5 percent of the value of shipments in the majority of cases. In most cases, the treatment ordered (most commonly fumigation) results in far less than a total value loss and, as previously shown, mandatory treatments only applied to about 13 percent of trade pathways.

Conclusion

U.S. imports of fresh fruits and vegetables have grown dramatically since the early 1990s. In the same period, both tariffs and nontariff measures have been liberalized with the passage of several bilateral and multilateral trade agreements. Compared to tariffs, nontariff measures are more difficult to assess in terms of their relative effects on trade. In considering significant import pathways (i.e., countries that ship more than 1 percent of all U.S. imports of a particular commodity), the risk rate is greater than 5 percent for only 8 percent of these pathways, and treatments typically do not destroy the full value of the good—this rate represents the upper limit to the average tariff-equivalent cost to discretionary treatments resulting from inspections. Less significant trade partners do not face appreciably higher risk or action rates than significant trade partners.

Only 11 percent of significant commodity pathways require a mandatory treatment (compared with 13 percent for all pathways). Because both the types and effects of mandatory treatments differ across commodities, it is difficult to assign a dollar value to the cost of mandatory treatments. Between significant and nonsignificant pathways, the relative similarity in the rates at which pathways are subject to mandatory treatments or ordered discretionary treatments following an inspection suggests that large importers do not face substantially different regulations regarding treatments or inspections than small ones. While we cannot rule out all possibility of regulatory protectionism, there is no clear evidence that nonsignificant pathways face a different pattern of regulation than significant pathways (a pattern that would be apparent if compliance with phytosanitary regulations and inspections acted as a large fixed cost to trade). Instead, findings seem more consistent with the idea that mandatory and discretionary treatments are assigned based on risk. However, this study did not consider whether phytosanitary restrictions support regulatory protectionism where:

1. Regulatory costs (mandatory or discretionary treatments) deter trade generally without bias to significant or nonsignificant trading countries;
2. Countries do not seek import access because they expect prohibitively high ex-post regulatory costs; or
3. Countries facing very high regulatory costs do not ship goods at all.

This report comprehensively describes national measures to address phytosanitary concerns for various fruits and vegetables. By considering many commodities simultaneously, this study avoided only choosing import regulations for measures that appear too challenging or unjustified to importers. Importantly, this research addresses neither private standards implemented by large retailers nor food safety measures implemented by the FDA. While significant, these restrictions are more challenging to characterize because private standards are voluntary and do not apply to all producers in a pathway, while FDA's targeted inspections process is specific to importers rather than pathways. This research can provide a framework for future work addressing the impact of import regulations on trade.

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Appendix– Regression analysis of differences between imports recorded in trade data and inspections data

Table A provides the results of regression analysis considering the difference between imports recorded in trade data and inspections data. In five related models based on equation (1), the β coefficients of the dependent variables are estimated where *diff* is the percentage difference between imported and entered volumes (the import difference), *Commodity* is a dummy variable for each commodity, and *year, Imports*, and *Entered* are each control variables.

To allow for easy interpretation, the control variables of *year*, *Inspections*, and *Entered* are transformed to be their distances from their averages (2008.5, 343,835, and 338,680, respectively), the intercept term is omitted, and dummy variables are included for each commodity. This transformation allows the $\beta_{Commodity}$ term to be interpreted as the average difference for a specific commodity without further calculation regarding the controls.[23]

$$(1)\quad diff = \beta_{year}\, year + \beta_{Imports}\, Imports + \beta_{Entered}\, Entered + \beta_{Commodity}\, Commodity$$

In table A, variables are added sequentially to consider possible specification error. In model (1) (the base model), the three control variables—*year, Imports*, and *Entered*—are omitted from the estimation, thereby making the $\beta_{Commodity}$ estimate equivalent to the simple average import difference for each commodity. In model (2), the *year* and *Imports* variables are added, while in model (3), *year* and *Entered* are added. Because the close correlation between *Imports* and *Entered* creates multicollinearity, simultaneous inclusion of both variables will lead to inconsistent results. In each of these models, however, *Imports* and *Entered* goods are significant, suggesting that they have some explanatory power. Because, *diff* simultaneously includes positive and negative differences that can offset and attenuate the estimated effects of the control variables on *diff*, the *diff* is modified to be the square of the import difference in model (4) and absolute value of the import difference in model (5).

Based on 174 observations (29 goods in the 6 years from 2006 to 2011), the coefficient is significantly negative in each of the models (table A). This suggests that the import difference is shrinking over time. However, for many commodities, the coefficient on the commodity dummy variable ($\beta_{Commodity}$) is significantly different from zero,[24] indicating the average import difference is greater than zero even after controlling for other factors. Of the 29 commodities, 8 commodities have average import differences that are significantly different from zero in model (1), as do 16 in model (2). These differences may understate an estimate of the fall in the import differences because the import difference may be positive or negative, even as it falls in absolute value. To address this issue, models (4) and (5), which use the square and absolute values of the import difference as the dependent variable, still show that the β_{year} coefficient is significantly negative, so the difference between

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[23] This specification also makes the standard error of each of the commodity dummy parameters (not shown) equal.

[24] The p-value indicates the probability that the estimated coefficient is equal to zero if there was, in fact, no effect of the dummy variable on the percentage difference between inspection and entry rates and the observed data relationship was simply occurring by chance. If the p-value is less than 0.5, the probability is less than 5 percent that effect is due to chance alone and the coefficient is said to be statistically significant at the 5-percent level.

Table A

Regression of the percentage difference in quantities recorded as imported in trade data and entered in inspections data

Commodity		Base model (1) – diffs.	Model 2 – diffs.	Model 3 – diffs.	Model 4 - squared diffs.	Model 5 – absolute diffs.
	Parameter	*Est.*	*Est.*	*Est.*	*Est.*	*Est.*
	β year	--	-0.0251***	-0.0169**	-0.0158***	-0.0275***
	β Imported	--	5.26E-07***	--	4.11E-08	8.876E-08
	β Entered	--	--	-8.02E-08***	--	--
1	β Apple	0.1999***	0.2909***	0.184*	0.0726**	0.22***
2	β Apricots	-0.0477	0.1323	-0.0747*	0.1664***	0.3356***
3	β Artichoke	0.1135*	0.2938***	0.0864*	0.0426	0.156***
4	β Asparagus	-0.0057	0.0975	-0.021*	0.0108	0.0637
5	β Avocado	-0.0396	-0.0383	-0.0383*	0.0023	0.0398
6	β Banana	-0.0896	-1.9846***	0.2303	-0.1348	-0.2301
7	β Carrot	0.6805***	0.7903***	0.6586*	0.4738***	0.699***
8	β Cassava	0.0163	0.1749**	-0.0076*	0.0184	0.0878
9	β Celery	0.131**	0.2951***	0.106*	0.0358	0.1638***
10	β Cherry	0.0549	0.2265**	0.0292*	0.0986**	0.2495***
11	β Corn	-0.3496***	-0.1894**	-0.3723*	0.1683*	0.3766***
12	β Cucumber	0.0577	-0.0349	0.0699*	0.0149	0.123***
13	β Eggplant	0.0068	0.1594*	-0.0161*	0.0166	0.0783
14	β Grapes	-0.3012***	-0.334***	-0.2857*	0.1075***	0.2957***
15	β Kiwi	-0.0258	0.1284	-0.0487*	0.0202	0.102*
16	β Olive	0.0125	0.1892**	-0.014*	0.0148	0.0526
17	β Onions	-0.0229	0.0081	-0.0268*	0.0191	0.123***
18	β Papaya	-0.027	0.0796	-0.0425*	0.0126	0.0653
19	β Peaches	0.0131	0.1646**	-0.0095*	0.1107***	0.2991***
20	β Pear	0.0228	0.1593**	0.0022*	0.0377	0.1643***
21	β Peas	-0.13**	0.0334	-0.1542*	0.0326	0.1576***
22	β Pepper	0.0608	-0.1047	0.0832*	-0.0077	0.0361
23	β Pineapple	-0.1098*	-0.3143***	-0.0715*	-0.0026	0.0752
24	β Plum	0.0314	0.1963**	0.0066*	0.0447	0.1782***
25	β Potatoes	1.6038***	1.5445***	1.5806*	2.569***	1.5938***
26	β Spinach	-0.0281	0.1491*	-0.0547*	0.0203	0.0971*
27	β Squash	-0.1626**	-0.1181*	-0.1652*	0.0335	0.1701***
28	β Strawberry	0.2154***	0.3531***	0.1936*	0.0717**	0.2386***
29	β Tomato	0.2149***	-0.2526	0.2678	0.0143	0.1361
	d.f.	175	174	174	174	174
	R-squared	0.8495	0.8634	0.8566	0.9838	0.9188

The superscripts "*","**","***" indicate 90-percent, 95-percent, and 99-percent significance levels for the estimated β parameters, respectively.

Source: USDA, Economic Research Service.

measured imports and inspected goods is decreasing. The *Imports* and (closely correlated) *Entered* control variables are only found to be significant in model (2).[25]

While certain modeling assumptions would undoubtedly affect these specific results (for example, controlling for heteroskedasticity, weighting the regression results by import flows, or breaking out observations on a country and commodity level to increase the number of observations), this basic regression analysis of the data sets indicates systematic differences between the two.

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[25] A potential endogeneity problem may arise because the *Entered* and *Imports* variables are used to construct the *diff* terms ((*Imports* – *Entered*)/(*Imports* + *Entered*)/2) as independent variables on the right hand side of table A. There should be a correlation between *Imports* and *Entered* of 1 so that any nonzero value of difference is explained primarily through measurement error, rather than *Imports* or *Inspections* themselves. If the measurement error is not of direct interest, the significance of these parameters might easily be misinterpreted (see Borjas (1980) for an example with division bias), in which case the problem may be addressed with instrumental variables estimation.

APPENDIX T

USDA-APHIS-PPQ Phytosanitary Irradiation Program

USDA-APHIS-PPQ Phytosanitary Irradiation Program

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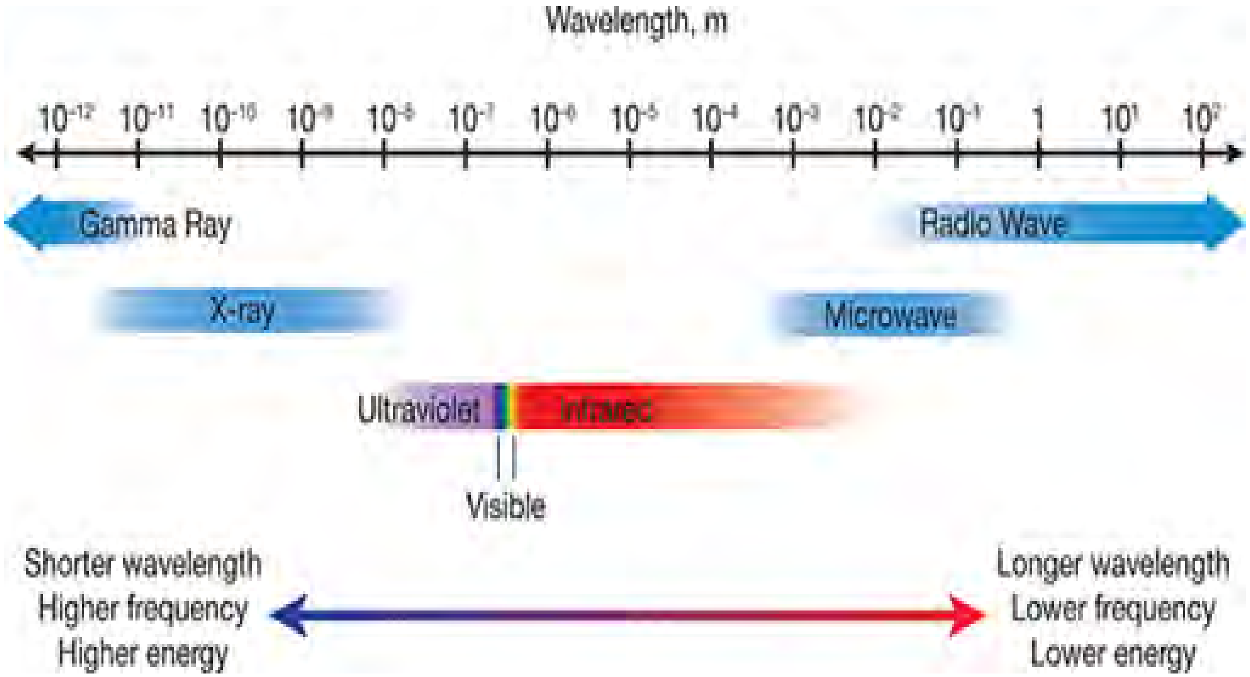
United States Department of Agriculture

Today’s Discussion

- General Background
- Regulatory Summary
- Program Types
- Data Capture

What is irradiation?

The exposure of a substance to high-energy ionizing radiation for the purpose of achieving some desired technical benefit.



Common Applications

- **Sterilization** – Medical products, instruments, food, etc.
- **Security** – Sterilize materials at high risk for bioterrorism, including mail
- **Materials modification** – Semiconductors, gemstone coloration, polymers
- **Food safety** – Kill micro-organisms, bacteria, viruses, and insects in food
- **Agriculture** – Create new strains of food crops and prevent sprouting or early ripening/maturation in harvested crops to extend shelf life
- **Sterile Insect Technique (SIT)** – Sterilize insects for mass rearing and release operations such as Medfly
- **Phytosanitary – Neutralize quarantine pests for safe trade**

Phytosanitary Irradiation

There are three approved source for phytosanitary irradiation treatments

- **Gamma**: ^{60}Cobalt or ^{137}Cesium emits photons during decay
- **E-beam**: High energy electrons propelled from an electron gun
- **X-ray**: High energy electrons are converted to X-rays (photons)

Phytosanitary Irradiation

- APHIS treatments require an absorbed doses between 60-400 Gy
- FDA limits fresh fruit and vegetable treatments to 1000 Gy
- Irradiated food products must bear the Radura

Phytosanitary Irradiation

Treatment response options:

- Mortality
- Sterilization
- Inactivity or Devitalization
- Inability to Emerge/Fly

Mortality is usually not the target response for APHIS treatments and live insects may remain after treatment

Pest Proof Packaging

As mortality is not the target response for APHIS treatments, live insects may remain after treatment

Generic and Pest-specific Doses

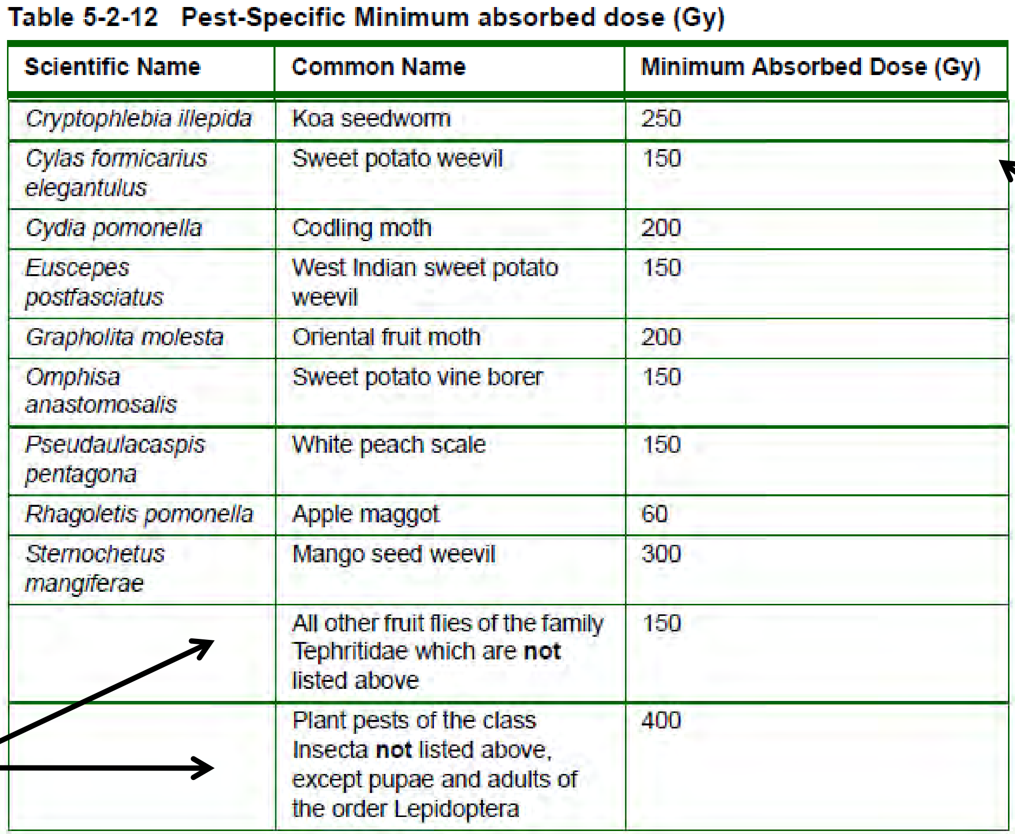


Table 5-2-12 Pest-Specific Minimum absorbed dose (Gy)

Scientific Name	Common Name	Minimum Absorbed Dose (Gy)
Cryptophlebia illepida	Koa seedworm	250
Cylas formicarius elegantulus	Sweet potato weevil	150
Cydia pomonella	Codling moth	200
Euscepes postfasciatus	West Indian sweet potato weevil	150
Grapholita molesta	Oriental fruit moth	200
Omphisa anastomosalis	Sweet potato vine borer	150
Pseudaulacaspis pentagona	White peach scale	150
Rhagoletis pomonella	Apple maggot	60
Sternochetus mangiferae	Mango seed weevil	300
	All other fruit flies of the family Tephritidae which are **not** listed above	150
	Plant pests of the class Insecta **not** listed above, except pupae and adults of the order Lepidoptera	400

Pest-Specific Absorbed Dose

Generic Absorbed Dose

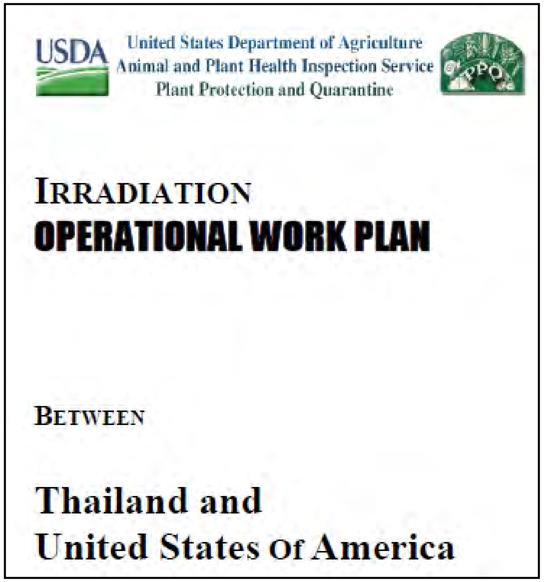
Trade Impacts

Generic Absorbed Doses Facilitate Trade

If a risk analysis of a new commodity demonstrates that no pupae or adult Lepidoptera follow a pathway, then export approval can happen without further research

Regulatory Summary

- Market Access Granted
- Framework Equivalency Work Plan Signed
- Trust Fund Established
- Operational Work Plan Signed
- Commodity-Specific Addendum Signed



United States Department of Agriculture
Animal and Plant Health Inspection Service
Plant Protection and Quarantine

IRRADIATION
OPERATIONAL WORK PLAN

BETWEEN

Thailand and
United States Of America

Regulatory Summary

- Facility Plan Approved
- Facility Certified
- Importer Compliance Agreement Signed
- Importer Permit Granted
- Packaging Approved
- Process Configuration Approved

Irradiation Program Types

Preclearance and Offshore
Irradiation of U.S. Imports in Country of Origin

Upon Arrival (Port of Entry)
Irradiation of U.S. Imports in United States

Domestic Quarantine
Treatment for Domestic Movement out of Federal Quarantines

Exports
Irradiation of U.S. Exports

Upon Arrival

Sadex Corporation

- Certified 2009
- Sioux City IA
- Pakistan Mangos
- E-beam

Southern Tier Rule

http://www.gpo.gov/fdsys/pkg/FR-2012-07-20/pdf/2012-17725.pdf

Southern Tier Rule

As of July 2012, establishment of port of entry phytosanitary irradiation facilities are allowed in the Southern U.S. states.

Additional Requirements:

- Approval by State Representative to the National Plant Board (State Plant Regulatory Official)
- Refrigerated Conveyance of Commodity
- Maps of Surrounding Agricultural Production Areas
- Pest Trapping or Monitoring
- Additional Facility Safeguarding

Southern States: Port of Entry

NCEBR
- Certified 2012
- College Station TX
- E-beam

Gateway America
- Certified 2013
- Gulfport MS
- ^{60}Co

Domestic Movement

Hawaii Pride

- 1st PPQ-certified facility
- X-ray

Pa’ina Hawaii

- Certified 2012
- ^{60}Co

Gateway America

- OFF quarantine

U.S. Exports

Gateway America

- Gulfport MS
- ^{60}Co

Benebión

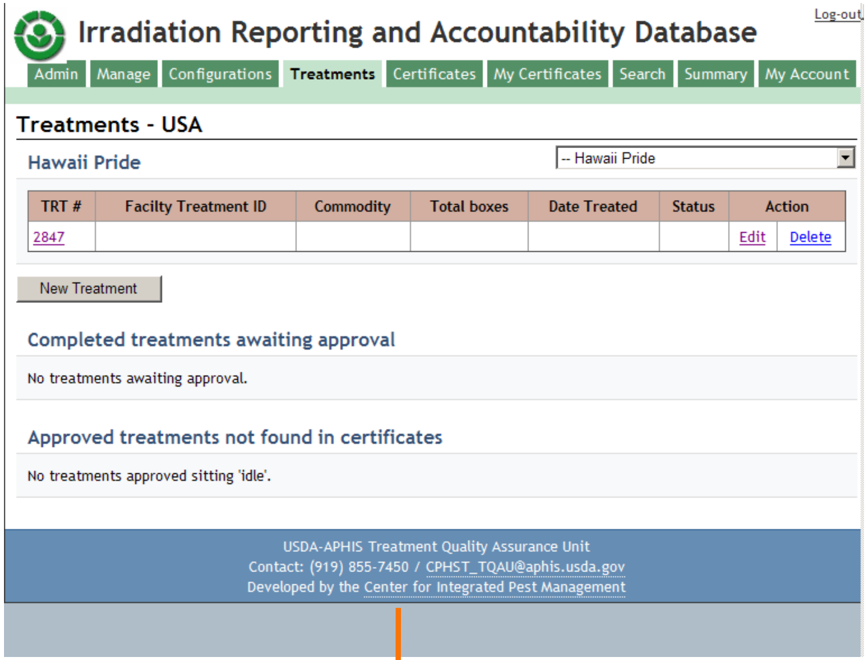
- Mexico
- ^{60}Co

IRADS

Foreign and domestic facilities enter treatment data

PPQ officer approves the report and generates 203/Treatment Certificate

Field Operations and POP staff enter information about packaging and treatment configurations



Irradiation Reporting and Accountability Database

Treatments - USA

Hawaii Pride

TRT #	Facilty Treatment ID	Commodity	Total boxes	Date Treated	Status	Action	
2847						Edit	Delete

Completed treatments awaiting approval

No treatments awaiting approval.

Approved treatments not found in certificates

No treatments approved sitting 'idle'.

USDA-APHIS Treatment Quality Assurance Unit
Contact: (919) 855-7450 / CPHST_TQAU@aphis.usda.gov
Developed by the Center for Integrated Pest Management

Database generates Form 203/ Treatment Certificate

Data can be searched and reports can be generated for USDA, Federal and State employees, other NPPOs, and FOIA requesters

APPENDIX U

2020 Piers Data Update – PortMiami

APPENDIX U

PORTMIAMI

PortMiami Executive Summary FY2020

FY2020 = Sixth consecutive year over 1 Million TEUs

2015	2016	2017	2018	2019	2020
1,007,782	1,028,156	1,024,335	1,083,614	1,120,913	1,066,738

Regional Performance

Latin America: -5.15% or -26,049 TEUs in FY2020 compared with FY2019. Market share decreased by -0.14%. Seaboard Marine represents 95.13% of this region's trade at PortMiami. In FY2020, Seaboard Marine's Miami – N. Central America service to Honduras & Guatemala remained PortMiami's #1 service by volume, moving 156,797 TEUs, down -12.36% or -22,123 TEUs from FY2019.

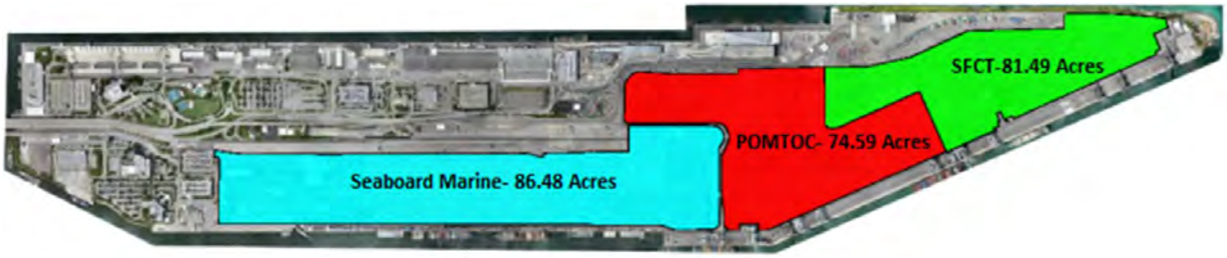
- Peru increased 1,906 TEUs +11%
- Guatemala increased 1,904 TEUs +6%
- Dominican Republic 517 TEUs +1%
- El Salvador decreased 6,826 TEUs -29%
- Colombia decreased 4,731 TEUs -22%
- Honduras decreased 3,597 TEUs -6%

Europe: +7.94% or +18,071 TEUs in FY2020 compared with FY2019. Market share increased by +2.72%. MSC, CMA & Maersk represent 74.19% of the trade with Europe in FY2020. In FY2020 the TA6 service to Italy, Spain and Portugal was PortMiami's #3 service by volume, moving 116,477 TEUs, up +32.83% or 28,790 TEUs over FY2019 when it was #6.

- Turkey increased 9,464 TEUs +83%
- Spain increased 2,999 TEUs +13%
- Italy decreased 2,980 TEUs -8%
- Georgia decreased 1,563 TEUs -38%
- France decreased 1,529 TEUs -13%

Asia: -11.95% or 46,331 TEUs in FY2020 compared with FY2019. Market share increased by +2.59%. Maersk, CMA, MSC & ZIM represent 82.35% of the trade with Asia in FY2020. In FY2020, the TP17 service to Malaysia, Hong Kong, Mainland China, Vietnam, Singapore and Saudi Arabia was PortMiami's #2 service by volume, with 126,979 TEUs, up 2.82% or 3,477 TEUs over FY2019 when it was #3.

- Taiwan increased 3,497 TEUs +29%
- Vietnam increased 2,175 TEUs +13%
- Malaysia increased 1,392 TEUs +17%
- China decreased 33,696 TEUs -25%
- India decreased 4,682 TEUs -22%
- Indonesia decreased 4,625 TEUs -37%



Terminal Performance

In FY2020 all Terminals were down -4.83% or -54,175 TEUs compared to the previous year, when all terminals were up by +3.44% or +37,328 TEUs.

TERMINALS	FY 2019	Var FY 19/20		FY 2020
		%	TEUs	
SEABOARD MARINE	484,430	-5.83%	-28,242	456,188
POMTOC	297,453	-3.39%	-10,074	287,379
SFCT	339,030	-4.68%	-15,859	323,171
Grand Total All Terminals	**1,120,913**	**-4.83%**	**-54,175**	**1,066,738**

Reefer

Miami Imports :

- **PortMiami rose to #8 nationwide for US reefer imports in FY2020, up from #9 in FY2019.**
- **In FY2020 Reefer increased by +4% or 7,232 TEUs at PortMiami.**
- **During the pandemic (March 2020 – September 2020) reefer imports at PortMiami grew +6.8% adding 2,490 TEUS while nearby PEV was down -2.7% or -1,545 TEUs during the same period.**

Pharma & Medical Equipment – March to September Imports by Value

During the COVID-19 pandemic (March 2020-September 2020), PortMiami has seen an increase for Pharma & Medical Equipment imports.

Pharma & Medical Equipment increased +225% at PortMiami over the same period in 2019.

Regional Performances

- **Lat. America & Caribbean increased $128,957,942 or +72%**
- **Asia increased $344,954,022 or +381%**
- **Europe increased $194,845,887 or +695%**

APPENDIX V
MDAD Limited Phase II Environmental Site Assessment – Land Parcel 3 (MIA)

APPENDIX V

LIMITED PHASE II
ENVIRONMENTAL SITE ASSESSMENT

LAND PARCEL 3
MIAMI INTERNATIONAL AIRPORT (MIA)

PREPARED FOR:

ENVIRONMENTAL ENGINEERING SYSTEM
FACILITIES DEVELOPMENT AND MANAGEMENT DIVISION
MIAMI-DADE AVIATION DEPARTMENT

PREPARED BY:

AMEC FOSTER WHEELER ENVIRONMENT & INFRASTRUCTURE, INC.
5845 N.W. 158th Street
Miami Lakes, Florida 33014

Amec Foster Wheeler Project Number 6783-17-2991.06

April 9, 2018

April 9, 2018

Mr. Rod Buenconsejo
Engineer III
ENVIRONMENTAL ENGINEERING SYSTEM
FACILITIES DEVELOPMENT AND MANAGEMENT DIVISION
MIAMI-DADE AVIATION DEPARTMENT
PO Box 025504, Building 5A
Miami, FL 33102-5504

Subject: **Limited PHASE II-ENVIRONMENTAL SITE ASSESSMENT**
LAND PARCEL 3, MIAMI INTERNATIONAL AIRPORT (MIA)
MIAMI DADE COUNTY, MIAMI, FLORIDA
Amec Foster Wheeler Project Number 6783-17-2991.06

Dear Mr. Buenconsejo:

Amec Foster Wheeler Environment & Infrastructure, Inc. (Amec Foster Wheeler) submits this Phase II Environmental Site Assessment (ESA) report to address the Recognized Environmental Concerns (RECs) observed in the Phase I ESA prepared by Amec Foster Wheeler dated November 6, 2015. The purpose of the Limited Phase II ESA is to evaluate soil and groundwater within the property boundaries that may have been impacted by historical site activities and the activities of the surrounding properties. The November 1, 2015 Phase I Environmental Site Assessment noted that although there were no observed sources of contamination at Land Parcel 3, there are known contaminated groundwater plumes in the southwest corner of MIA and that an evaluation of the groundwater would need to occur to better determine existing conditions at the site.

SITE DESCRIPTION

The parcel at the vicinity of NW 12th Street and Milam Dairy Road at MIA is comprised of four sections (A-D) totaling an approximate 14.61 acres. Parcel 3A is a parking lot containing some vegetation and trees. Parcel 3B is a vacant concreted lot with little vegetation (grass). Parcel 3C is a slightly vegetated vacant lot containing a concreted parking lot along the southern boundary; piles of concrete debris, gravel, and general debris in the northeast corner; and a saturated, wet-land type area in the southeast corner. Parcel 3 D is mostly a concreted vacant lot with small areas of vegetation (grass). Parcel 3A-D is bordered by Milam Dairy Road on the west side, by NW 12th Street on the south side, commercial properties on the east side, and by railroad tracks followed by Miami International Airport roadway on the north side. The site location map is included as **Figure 1**.

SOIL SAMPLING

On February 7 and 8, 2018, Amec Foster Wheeler personnel conducted soil assessment activities at the site. Prior to boring installation, the locations were marked out with white paint and the utilities were located utilizing the services of Amec Foster Wheeler's subcontractor, Ground Penetrating Radar Services (GPRS). Eight soil borings (SB-1 through SB-8) were advanced at the site. The soil boring locations are illustrated in **Figure 2**. Soils were characterized to the terminal depth of each soil boring. The soil borings were terminated at a maximum depth of 6 feet below land surface (bls) with the exception of SB-3 which was terminated at 8 feet bls. The soil boring logs for the February 7 and 8, 2018 field event are provided as **Attachment A**.

Soil samples were collected at a depth interval of 2 to 4 feet below surface at approximately one foot above the observed water table during drilling activities for laboratory analysis. The water table was observed at approximately 5 feet bls at each boring location. None of the PID readings were above 10 parts per million (ppm). Based on the visual observation and PID readings, the interval above the water table (2-4) was selected for laboratory analysis.

Soil samples were submitted to Pace Analytical Services LLC, a State of Florida certified laboratory for analysis of volatile organic compounds (VOC) by EPA Test Method 8260B, polynuclear aromatic hydrocarbons using EPA Test Method 8270, Total petroleum recoverable hydrocarbons (TRPH) by Florida Petroleum Range Organics (FL-PRO) method and 8 RCRA Metals using EPA Test Method 6010.

GROUNDWATER SAMPLING

Following the completion of soil borings, the following soil borings were converted into temporary monitoring wells:

Soil Boring ID	TM Well ID	Total Well Depth (ft)
SB-1	DP-1	9'
SB-2	DP-2	9'
SB-3	DP-3	9'
SB-6	DP-4	9'
SB-8	DP-5	54'

TM = temporary monitoring well

The monitoring wells were constructed of 1-inch diameter pre-packed mechanically slotted (0.010 inch) PVC screen and a solid riser. The monitoring well locations are illustrated in **Figure 2**. In addition to collecting groundwater samples from each of the 5 temporary monitoring wells, groundwater samples were collected from existing monitoring well, EMW-1. With exception of temporary monitoring well DP-5 (54’), groundwater samples were collected from within the top 2 feet. A discrete water sample was collected from a temporary monitoring well DP-5 (54’) at a depth of 54 feet below land surface (bls).

Groundwater sampling was performed pursuant to the FDEP Standard Operating Procedures (SOP) for Field Activities. Prior to sampling, the monitoring wells were purged with a low flow peristaltic pump until the required parameters (pH, temperature, specific conductance, turbidity and dissolved oxygen) had stabilized. Copies of the groundwater sampling logs are presented in **Attachment B**.

The samples were collected from the appropriate interval of the water column, transferred to the appropriate sample containers, sealed and immediately stored in an ice-filled cooler and delivered under chain-of-custody to Pace Analytical Services LLC, a State of Florida certified laboratory, for analysis of VOAs/VOHs by EPA Method 8260, PAHs by EPA Method 8270, TRPH by FL-PRO, and 8 RCRA Metals by EPA Method 6010B.

SOIL ANALYTICAL RESULTS

A summary of the soil analytical results is presented in **Tables 1A through 1D**. The February 7 and 8, 2018 soil analytical results indicate that no soil target analyte concentrations at soil boring locations were above the applicable Soil Cleanup Target Levels (SCTLs) for all targeted constituents with the exception of arsenic in soil sample SB-8. The arsenic concentration in SB-8 (2.2 mg/kg) exceeded SCTL for residential direct exposure of 2.1 mg/kg. The soil laboratory analytical results and chain of custody forms are included in **Attachment C**. The Benzo(a)pyrene Conversion Table for SB-1 and SB-7 is included in **Attachment D**.

GROUNDWATER ANALYTICAL RESULTS

A summary of the groundwater analytical results is presented in **Tables 2A through 2C**. Groundwater analytical results from the February 7 and 8, 2018 sampling event indicate no dissolved target analyte concentrations were above the applicable FDEP Groundwater Cleanup Target Levels (GCTLs) for all targeted constituents, with the exception of vinyl chloride at temporary monitoring well DP-5 (54’). Vinyl chloride was detected at a concentration of 1.4 µg/l slightly above the FDEP GCTL of 1.0 µg/l. The groundwater laboratory analytical results and chain of custody forms are included in **Attachment C**.

CONCLUSIONS

With the exception of the slight arsenic exceedance in soil sample SB-8, soil analytical results did not indicate concentrations for tested contaminants of concern to be above applicable SCTLs. The groundwater analytical results from the February 7 and 8, 2018 sampling event indicated no exceedances above the applicable GCTL with the exception of vinyl chloride concentrations in temporary monitoring well DP-5 (54’). Although the vinyl chloride concentration in DP-5 (54’) only slightly exceeded the standard, historically vinyl chloride has been detected in groundwater monitoring wells at MIA to depths in excess of 100 feet bls. West Cargo Area, Former Building 2129 (ARP-15/File 10428). According to Mactec Engineering and Consulting's May 13, 2010 Aquifer Test and Groundwater Sampling Report, vinyl chloride is the most commonly detected contaminant in the portion of the aquifer underlying MIA. A plume of vinyl chloride exists under the west side of MIA extending north to the Lower Miami Springs Well Field (LMSWF) and between 40 and 80 feet below ground surface. The former Building 2129 location has been determined to have been one of two primary sources of the VOCs in the West End Cargo Area (WECA). The Aerodex Pond area is the other primary source.

Based on the documented presence of vinyl chloride on the west side of MIA, it is recommended that the vinyl chloride exceedance be delineated both horizontally and vertically from DP-5 (54').

If you require additional information, please contact Ashok Aitharaju at (305) 818-8478.

Sincerely,

AMEC FOSTER WHEELER ENVIRONMENT & INFRASTRUCTURE, INC.

Jeremy Paris
Senior Biologist

Ricardo Fraxedas
Office Manager

Ashok Aitharaju
Project Manager

Distributions: Addressee (1 hard copy & 1 pdf copy CD)
File (1)

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TABLES

MIA Parcel 3
Phase II Environmental Site Assessment
Soil Analytical Results
Amec Foster Wheeler Project#6783-17-2991

TABLE 1A: SOIL ANALYTICAL SUMMARY - VOAs, TRPHs and Metals

Sample				**OVA**	**Laboratory Analyses**										**Comments**
Boring / Well No.	**Date Collected**	**Depth to Water (ft)**	**Sample Interval (fbls)**	**Net OVA Reading (ppm)**	**Benzene**	**Ethyl-benzene**	**Toluene**	**Tolal Xylenes**	**MTBE**	**TRPHs**	**Arsenic**	**Cadmium**	**Chro-mium**	**Lead**	
					(mg/kg)	**(mg/kg)**	**(mg/kg)**	**(mg/kg)**	**(mg/kg)**	**(mg/kg)**	**(mg/kg)**	**(mg/kg)**	**(mg/kg)**	**(mg/kg)**	
SB-1	02/07/2018	4	2-4'	<10	0.0024 U	0.0027 U	0.0025 U	0.0048 U	0.0023 U	**4.3**	**1.5**	0.027 U	**5.3**	**2.6**	
SB-2	02/07/2018	5	2-4'	<10	0.0029 U	0.0032 U	0.0031 U	0.0058 U	0.0028 U	**4.3 I**	**0.63 I**	0.034 U	**2.1**	**1.4**	
SB-3	02/07/2018	4.5	2-4'	<10	0.0023 U	0.0026 U	0.0025 U	0.0047 U	0.0023 U	**4.1 I**	**1.6**	**0.054 I**	**7.1**	**7.0**	
SB-4	02/08/2018	4.5	2-4'	<10	0.0028 U	0.0031 U	0.0029 U	0.0055 U	0.0027 U	**5.1**	**1.6**	0.025 U	**5.4**	**2.9**	
SB-5	02/08/2018	4.5	2-4'	<10	0.0026 U	0.0029 U	0.0028 U	0.0053 U	0.0026 U	2.6 U	**1.7**	0.031 U	**5.7**	**2.5**	
SB-6	02/07/2018	4.5	2-4'	<10	0.0025 U	0.0028 U	0.0027 U	0.0051 U	0.0025 U	**4.1 I**	**1.6**	0.029 U	**4.9**	**2.1**	
SB-7	02/08/2018	4.5	2-4'	<10	0.0024 U	0.0027 U	0.0026 U	0.0049 U	0.0024 U	**20.3**	**1.6**	0.030 U	**5.4**	**3.8**	
SB-8	02/08/2018	4.5	2-4'	<10	0.0025 U	0.0027 U	0.0026 U	0.0050 U	0.0024 U	**4.8**	🟥 **2.2**	**0.090**	**8.4**	**8.3**	
Leachability Based on Groundwater Criteria (mg/kg)					0.007	0.6	0.5	0.2	0.09	340	*	7.5	38	*	
Direct Exposure Residential (mg/kg)					1.2	1500	7500	130	4400	460	2.1	82	210	400	
Direct Exposure Commercial/Industrial (mg/kg)					1.7	9200	60000	700	24000	2700	12	1700	470	1400	

Notes:

NA = Not Available

NS = Not Sampled

* = Leachability value may be determined using TCLP.

🟨 **Exceeds Leachability Based on Groundwater Criteria Limits**

🟥 **Exceeds Direct Exposure Residential Limits**

🟦 **Exceeds Direct Exposure Commercial/Industrial Limits**

TABLE 1B: SOIL ANALYTICAL SUMMARY - Non-Carcinogenic PAHs

Sample				OVA	Laboratory Analyses											Comments
Boring / Well No.	Date Collected	Depth to Water (ft)	Sample Interval (fbls)	Net OVA Reading (ppm)	Naph-thalene	1-Methyl-naph-thalene	2-Methyl-naph-thalene	Acenaph-thene	Acenaph-thylene	Anthra-cene	Benzo (g,h,i) perylene	Fluoran-thene	Fluorene	Phenan-threne	Pyrene	
					(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	
SB-1	02/07/2018	4	2-4'	<10	0.0024 U	0.0012 U	0.0011 U	0.0016 U	0.0013 U	0.0015 U	**0.0040 I**	**0.015**	0.0017 U	**0.0066 I**	**0.012**	
SB-2	02/07/2018	5	2-4'	<10	0.0026 U	0.0013 U	0.0012 U	0.0017 U	0.0015 U	0.0016 U	0.0029 U	0.00093 U	0.0018 U	0.0017 U	0.0020 U	
SB-3	02/07/2018	4.5	2-4'	<10	0.012 U	0.0065 U	0.0059 U	0.0081 U	0.0070 U	0.0076 U	0.014 U	0.0045 U	0.0086 U	0.0081 U	0.0097 U	
SB-4	02/08/2018	4.5	2-4'	<10	0.0024 U	0.0012 U	0.0011 U	0.0016 U	0.0014 U	0.0015 U	0.0027 U	0.00086 U	0.0017 U	0.0016 U	0.0019 U	
SB-5	02/08/2018	4.5	2-4'	<10	0.0024 U	0.0013 U	**0.0019 I**	0.0016 U	0.0014 U	0.0015 U	0.0027 U	**0.0078 I**	0.0017 U	**0.0032 I**	**0.0061 I**	
SB-6	02/07/2018	4.5	2-4'	<10	0.0024 U	0.0013 U	0.0012 U	0.0016 U	0.0014 U	0.0015 U	0.0027 U	**0.0014 I**	0.0017 U	0.0016 U	0.0019 U	
SB-7	02/08/2018	4.5	2-4'	<10	0.0025 U	0.0013 U	0.0012 U	0.0017 U	0.0014 U	**0.0033 I**	**0.0098 I**	**0.047**	0.0018 U	**0.011**	**0.034**	
SB-8	02/08/2018	4.5	2-4'	<10	0.012 U	0.0064 U	0.0059 U	0.0080 U	0.0069 U	0.0075 U	0.014 U	**0.0047 I**	0.0085 U	0.0080 U	0.0096 U	
Leachability Based on Groundwater Criteria (mg/kg)					1.2	3.1	8.5	2.1	27	2500	32000	1200	160	250	880	
Direct Exposure Residential (mg/kg)					55	200	210	2400	1800	21000	2500	3200	2600	2200	2400	
Direct Exposure Commercial/Industrial (mg/kg)					300	1800	2100	20000	20000	300000	52000	59000	33000	36000	45000	

Notes:

NA = Not Available

NS = Not Sampled

Exceeds Leachability Based on Groundwater Criteria Limits

Exceeds Direct Exposure Residential Limits

Exceeds Direct Exposure Commercial/Industrial Limits

MIA Parcel 3
Phase II Environmental Site Assessment
Soil Analytical Results
Amec Foster Wheeler Project#6783-17-2991

TABLE 1C: SOIL ANALYTICAL SUMMARY - Carcinogenic PAHs

Sample				OVA	Laboratory Analyses								
Boring / Well No.	Date Collected	Depth to Water (ft)	Sample Interval (fbls)	Net OVA Reading (ppm)	Benzo (a) pyrene (mg/kg)	Benzo (a) anthra-cene (mg/kg)	Benzo (b) fluoran-thene (mg/kg)	Benzo (k) fluoran-thene (mg/kg)	Chrysene (mg/kg)	Dibenz (a,h) anthra-cene (mg/kg)	Indeno (1,2,3-cd) pyrene (mg/kg)	Benzo (a) pyrene equivalent (mg/kg)	Comments
SB-1	02/07/2018	4	2-4'	<10	**0.0058 I**	**0.0041 I**	**0.011**	**0.0033 I**	**0.0083 I**	0.0019 U	**0.0040 I**	**0.0087**	
SB-2	02/07/2018	5	2-4'	<10	0.0012 U	0.00080 U	0.00075 U	0.0017 U	0.0020 U	0.0020 U	0.0031 U	0.0018 U	
SB-3	02/07/2018	4.5	2-4'	<10	0.0059 U	**0.0040 I**	**0.0045 I**	0.0081 U	0.0097 U	0.0097 U	0.015 U	**0.0094**	
SB-4	02/08/2018	4.5	2-4'	<10	0.0011 U	0.00074 U	0.00070 U	0.0016 U	0.0019 U	0.0019 U	0.0029 U	0.0017 U	
SB-5	02/08/2018	4.5	2-4'	<10	**0.0039 I**	**0.0043 I**	**0.0060 I**	**0.0023 I**	**0.0045 I**	0.0019 U	0.0029 U	**0.0061**	
SB-6	02/07/2018	4.5	2-4'	<10	0.0012 U	**0.00093 I**	**0.00097 I**	0.0016 U	0.0019 U	0.0019 U	0.0030 U	**0.0019**	
SB-7	02/08/2018	4.5	2-4'	<10	**0.024**	**0.031**	**0.035**	**0.012**	**0.028**	**0.0040 I**	**0.011**	**0.036**	
SB-8	02/08/2018	4.5	2-4'	<10	0.0059 U	0.0038 U	**0.0037 I**	0.0080 U	0.0096 U	0.0096 U	0.015 U	**0.0091**	
Leachability Based on Groundwater Criteria (mg/kg)					8	0.8	2.4	24	77	0.7	6.6	**	
Direct Exposure Residential (mg/kg)					0.1	#	#	#	#	#	#	0.1	
Direct Exposure Commercial/Industrial (mg/kg)					0.7	#	#	#	#	#	#	0.7	

Notes:

NA= Not Available

NS = Not Sampled

** = Leachability value not applicable

= Direct Exposure value not applicable except as part of the Benzo(a)pyrene equivalent.

Exceeds Leachability Based on Groundwater Criteria Limits

Exceeds Direct Exposure Residential Limits

Exceeds Direct Exposure Commercial/Industrial Limits

MIA Parcel 3
Phase II Environmental Site Assessment
Soil Analytical Results
Amec Foster Wheeler Project#6783-17-2991

TABLE 1D: SOIL ANALYTICAL SUMMARY - Other Contaminants not listed in Chapter 62-770, F.A.C.

Sample				**OVA**																
Boring / Well No.	**Date Collected**	**Depth to Water (ft)**	**Sample Interval (fbls)**	**Net OVA Reading (ppm)**	**1,1,1,2-Tetrachloroethane**	**1,1,1-Trichloroethane**	**1,1,2,2-Tetrachloroethane**	**1,1,2-Trichloroethane**	**1,1-Dichloroethane**	**1,1-Dichloroethene**	**1,1-Dichloropropene**	**1,2,3-Trichlorobenzene**	**1,2,3-Trichloropropane**	**1,2,3-Trimethylbenzene**	**1,2,4-Trichlorobenzene**	**1,2,4-Trimethylbenzene**	**1,2-Dichlorobenzene**	**1,2-Dichloroethane**	**1,2-Dichloropropane**	**1,3,5-Trimethylbenzene**
					(mg/kg)	**(mg/kg)**	**(mg/kg)**	**(mg/kg)**	**(mg/kg)**	**(mg/kg)**	**(mg/kg)**	**(mg/kg)**	**(mg/kg)**	**(mg/kg)**	**(mg/kg)**	**(mg/kg)**	**(mg/kg)**	**(mg/kg)**	**(mg/kg)**	**(mg/kg)**
SB-1	02/07/2018	4	2-4'	<10	0.0023 U	0.0026 U	0.0023 U	0.0023 U	0.0026 U	0.0023 U	0.0024 U	0.0023 U	0.0023 U	0.0023 U	0.0023 U	0.0026 U	0.0023 U	0.0023 U	0.0023 U	0.0027 U
SB-2	02/07/2018	5	2-4'	<10	0.0028 U	0.0031 U	0.0028 U	0.0028 U	0.0031 U	0.0028 U	0.0029 U	0.0028 U	0.0028 U	0.0028 U	0.0028 U	0.0032 U	0.0028 U	0.0028 U	0.0028 U	0.0033 U
SB-3	02/07/2018	4.5	2-4'	<10	0.0023 U	0.0025 U	0.0023 U	0.0023 U	0.0025 U	0.0023 U	0.0023 U	0.0023 U	0.0023 U	0.0023 U	0.0023 U	0.0026 U	0.0023 U	0.0023 U	0.0023 U	0.0026 U
SB-4	02/08/2018	4.5	2-4'	<10	0.0027 U	0.0030 U	0.0027 U	0.0027 U	0.0029 U	0.0027 U	0.0028 U	0.0027 U	0.0027 U	0.0027 U	0.0027 U	0.0030 U	0.0027 U	0.0027 U	0.0027 U	0.0031 U
SB-5	02/08/2018	4.5	2-4'	<10	0.0026 U	0.0028 U	0.0026 U	0.0026 U	0.0028 U	0.0026 U	0.0026 U	0.0026 U	0.0026 U	0.0026 U	0.0026 U	0.0029 U	0.0026 U	0.0026 U	0.0026 U	0.0030 U
SB-6	02/07/2018	4.5	2-4'	<10	0.0025 U	0.0027 U	0.0025 U	0.0025 U	0.0027 U	0.0025 U	0.0025 U	0.0025 U	0.0025 U	0.0025 U	0.0025 U	0.0028 U	0.0025 U	0.0025 U	0.0025 U	0.0028 U
SB-7	02/08/2018	4.5	2-4'	<10	0.0024 U	0.0026 U	0.0024 U	0.0024 U	0.0026 U	0.0024 U	0.0024 U	0.0024 U	0.0024 U	0.0024 U	0.0024 U	0.0027 U	0.0024 U	0.0024 U	0.0024 U	0.0027 U
SB-8	02/08/2018	4.5	2-4'	<10	0.0024 U	0.0027 U	0.0024 U	0.0024 U	0.0027 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0024 U	0.0024 U	0.0027 U	0.0024 U	0.0024 U	0.0024 U	0.0028 U
Leachability Based on Groundwater Criteria (mg/kg)					NA	1.9	0.001	0.03	NA	0.06	NA	4.6	0.0001	NA	5.3	0.3	17	0.01	0.03	0.3
Direct Exposure Residential (mg/kg)					2.9	730	0.7	1.4	390	95	NA	650	0.06	18	660	18	880	0.5	0.6	15
Direct Exposure Commercial/Industrial (mg/kg)					4.3	3900	1.2	2	2100	510	NA	8200	0.1	96	8500	95	5000	0.7	0.9	80

Notes:

NA= Not Available

** = Leachability value not applicable

= Direct Exposure value not applicable except as part of the Benzo(a)pyrene equivalent.

Exceeds Leachability Based on Groundwater Criteria Limits

Exceeds Direct Exposure Residential Limits

Exceeds Direct Exposure Commercial/Industrial Limits

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Amec Foster Wheeler Project#6783-17-2991

TABLE 1D: SOIL ANALYTICAL SUMMARY - Other Contaminants not listed in Chapter 62-770, F.A.C.

Sample																				
Boring / Well No.	**Date Collected**	**Depth to Water (ft)**	**Sample Interval (fbls)**	**1,3-Dichlorobenzene**	**1,3-Dichloropropane**	**1,4-Dichlorobenzene**	**2,2-Dichloropropane**	**2-Butanone (MEK)**	**2-Chlorotoluene**	**2-Hexanone**	**4-Chlorotoluene**	**4-Methyl-2-pentanone (MIBK)**	**Acetone**	**Acetonitrile**	**Barium**	**Bromobenzene**	**Bromochloromethane**	**Bromodichloromethane**	**Bromoform**	**Bromomethane**
				(mg/kg)	**(mg/kg)**	**(mg/kg)**	**(mg/kg)**	**(mg/kg)**	**(mg/kg)**	**(mg/kg)**	**(mg/kg)**	**(mg/kg)**	**(mg/kg)**	**(mg/kg)**	**(mg/kg)**	**(mg/kg)**	**(mg/kg)**	**(mg/kg)**	**(mg/kg)**	**(mg/kg)**
SB-1	02/07/2018	4	2-4'	0.0023 U	0.0023 U	0.0023 U	0.0024 U	0.0023 U	0.0024 U	0.0023 U	0.0023 U	0.0023 U	**1.1**	0.023 U	**5.2**	0.0023 U	0.0023 U	0.0023 U	0.0023 U	0.0023 U
SB-2	02/07/2018	5	2-4'	0.0028 U	0.0028 U	0.0028 U	0.0029 U	0.0028 U	0.0029 U	0.0028 U	0.0028 U	0.0028 U	**0.63**	0.028 U	**2.0**	0.0028 U	0.0028 U	0.0028 U	0.0028 U	0.0028 U
SB-3	02/07/2018	4.5	2-4'	0.0023 U	0.0023 U	0.0023 U	0.0024 U	0.0023 U	0.0023 U	0.0023 U	0.0023 U	0.0023 U	**0.73**	0.023 U	**7.2**	0.0023 U	0.0023 U	0.0023 U	0.0023 U	0.0023 U
SB-4	02/08/2018	4.5	2-4'	0.0027 U	0.0027 U	0.0027 U	0.0028 U	**0.0029 I**	0.0027 U	0.0027 U	0.0027 U	0.0027 U	**1.1**	0.027 U	**4.1**	0.0027 U	0.0027 U	0.0027 U	0.0027 U	0.0027 U
SB-5	02/08/2018	4.5	2-4'	0.0026 U	0.0026 U	0.0026 U	0.0027 U	0.0026 U	0.0026 U	0.0026 U	0.0026 U	0.0026 U	**0.96**	0.026 U	**3.9**	0.0026 U	0.0026 U	0.0026 U	0.0026 U	0.0026 U
SB-6	02/07/2018	4.5	2-4'	0.0025 U	0.0025 U	0.0025 U	0.0025 U	0.0025 U	0.0025 U	0.0025 U	0.0025 U	0.0025 U	**0.61**	0.025 U	**3.7**	0.0025 U	0.0025 U	0.0025 U	0.0025 U	0.0025 U
SB-7	02/08/2018	4.5	2-4'	0.0024 U	0.0024 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0024 U	0.0024 U	0.0024 U	**0.87**	0.024 U	**10.0**	0.0024 U	0.0024 U	0.0024 U	0.0024 U	0.0024 U
SB-8	02/08/2018	4.5	2-4'	0.0024 U	0.0024 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0024 U	0.0024 U	0.0024 U	**0.60**	0.024 U	**4.0**	0.0024 U	0.0024 U	0.0024 U	0.0024 U	0.0024 U
Leachability Based on Groundwater Criteria (mg/				7	NA	2.2	NA	17	2.8	NA	NA	2.6	25	NA	1600	NA	NA	0.004	0.03	0.05
Direct Exposure Residential (mg/kg)				380	NA	6.4	NA	16000	200	24	170	4300	11000	NA	120	NA	95	1.5	48	3.1
Direct Exposure Commercial/Industrial (mg/kg)				2200	NA	9.9	NA	110000	1200	130	990	44000	68000	NA	130000	NA	530	2.2	93	16

Notes:

NA= Not Available

** = Leachability value not applicable

= Direct Exposure value not applicable except as part of

Exceeds Leachability Based on Groundwater Criteria L

Exceeds Direct Exposure Residential Limits

Exceeds Direct Exposure Commercial/Industrial Limits

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TABLE 1D: SOIL ANALYTICAL SUMMARY - Other Contaminants not listed in Chapter 62-770, F.A.C.

Sample																			
Boring / Well No.	**Date Collected**	**Depth to Water (ft)**	**Sample Interval (fbls)**	**Carbon disulfide**	**Carbon tetrachloride**	**Chlorobenzene**	**Chloroethane**	**Chloroform**	**Chloromethane**	**Dibromochloromethane**	**Dibromomethane**	**Dichlorodifluoromethane**	**Iodomethane**	**Isopropylbenzene (Cumene)**	**Mercury**	**Methylene Chloride**	**Percent Moisture**	**Selenium**	**Silver**
				(mg/kg)	**(mg/kg)**	**(mg/kg)**	**(mg/kg)**	**(mg/kg)**	**(mg/kg)**	**(mg/kg)**	**(mg/kg)**	**(mg/kg)**	**(mg/kg)**	**(mg/kg)**	**(mg/kg)**	**(mg/kg)**	**%**	**(mg/kg)**	**(mg/kg)**
SB-1	02/07/2018	4	2-4'	0.0023 U	0.0023 U	0.0023 U	0.0034 U	0.0028 U	0.0026 U	0.0023 U	0.0023 U	0.0025 U	0.0023 U	0.0027 U	0.0049 U	0.0023 U	**3.5**	0.41 U	0.14 U
SB-2	02/07/2018	5	2-4'	0.0028 U	0.0028 U	0.0028 U	0.0041 U	0.0034 U	0.0032 U	0.0028 U	0.0028 U	0.0030 U	0.0028 U	0.0033 U	0.0055 U	0.0028 U	**11.0**	0.51 U	0.17 U
SB-3	02/07/2018	4.5	2-4'	0.0023 U	0.0023 U	0.0023 U	0.0033 U	0.0027 U	0.0026 U	0.0023 U	0.0023 U	0.0024 U	0.0023 U	0.0027 U	**0.056**	0.0023 U	**6.1**	0.48 U	0.16 U
SB-4	02/08/2018	4.5	2-4'	0.0027 U	0.0027 U	0.0027 U	0.0039 U	0.0032 U	0.0030 U	0.0027 U	0.0027 U	0.0029 U	0.0027 U	0.0031 U	**0.0062 I**	0.0027 U	**4.0**	0.37 U	0.12 U
SB-5	02/08/2018	4.5	2-4'	0.0026 U	0.0026 U	0.0026 U	0.0037 U	0.0031 U	0.0029 U	0.0026 U	0.0026 U	0.0027 U	0.0026 U	0.0030 U	**0.0070 I**	0.0026 U	**3.2**	0.46 U	0.15 U
SB-6	02/07/2018	4.5	2-4'	0.0025 U	0.0025 U	0.0025 U	0.0035 U	0.0029 U	0.0028 U	0.0025 U	0.0025 U	0.0026 U	0.0025 U	0.0029 U	**0.0060 I**	0.0025 U	**4.5**	0.44 U	0.15 U
SB-7	02/08/2018	4.5	2-4'	0.0024 U	0.0024 U	0.0024 U	0.0034 U	0.0028 U	0.0027 U	0.0024 U	0.0024 U	0.0025 U	0.0024 U	0.0027 U	0.0049 U	0.0024 U	**9.6**	0.44 U	0.15 U
SB-8	02/08/2018	4.5	2-4'	0.0024 U	0.0024 U	0.0024 U	0.0035 U	0.0029 U	0.0027 U	0.0024 U	0.0024 U	0.0026 U	0.0024 U	0.0028 U	**0.014**	0.0024 U	**6.7**	0.42 U	0.14 U
Leachability Based on Groundwater Criteria (mg/				5.6	0.04	1.3	NA	0.4	0.02	0.003	NA	NA	NA	0.2	2.1	0.02	NA	5.2	17
Direct Exposure Residential (mg/kg)				270	0.5	120	3.9	0.4	4	1.5	96	77	NA	220	3	17	NA	440	410
Direct Exposure Commercial/Industrial (mg/kg)				1500	0.7	650	5.4	0.6	5.7	2.3	550	410	NA	1200	17	26	NA	11000	8200

Notes:

NA= Not Available

** = Leachability value not applicable

= Direct Exposure value not applicable except as part of

Exceeds Leachability Based on Groundwater Criteria I

Exceeds Direct Exposure Residential Limits

Exceeds Direct Exposure Commercial/Industrial Limit

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TABLE 1D: SOIL ANALYTICAL SUMMARY - Other Contaminants not listed in Chapter 62-770, F.A.C.

Sample																				
Boring / Well No.	**Date Collected**	**Depth to Water (ft)**	**Sample Interval (fbls)**	**Styrene**	**Tetrachloroethene**	**Trichloroethene**	**Trichlorofluoromethane**	**Vinyl acetate**	**Vinyl chloride**	**cis-1,2-Dichloroethene**	**cis-1,3-Dichloropropene**	**m&p-Xylene**	**n-Butylbenzene**	**n-Propylbenzene**	**o-Xylene**	**p-Isopropyltoluene**	**sec-Butylbenzene**	**tert-Butylbenzene**	**trans-1,2-Dichloroethene**	**trans-1,3-Dichloropropene**
				(mg/kg)	**(mg/kg)**	**(mg/kg)**	**(mg/kg)**	**(mg/kg)**	**(mg/kg)**	**(mg/kg)**	**(mg/kg)**	**(mg/kg)**	**(mg/kg)**	**(mg/kg)**	**(mg/kg)**	**(mg/kg)**	**(mg/kg)**	**(mg/kg)**	**(mg/kg)**	**(mg/kg)**
SB-1	02/07/2018	4	2-4'	0.0023 U	0.0023 U	0.0026 U	0.0026 U	0.0024 U	0.0025 U	0.0023 U	0.0023 U	0.0048 U	0.0028 U	0.0025 U	0.0024 U	0.0028 U	0.0027 U	0.0027 U	0.0029 U	0.0023 U
SB-2	02/07/2018	5	2-4'	0.0028 U	0.0028 U	0.0032 U	0.0031 U	0.0029 U	0.0031 U	0.0028 U	0.0028 U	0.0058 U	0.0034 U	0.0030 U	0.0029 U	0.0034 U	0.0033 U	0.0033 U	0.0035 U	0.0028 U
SB-3	02/07/2018	4.5	2-4'	0.0023 U	0.0023 U	0.0026 U	0.0025 U	0.0023 U	0.0025 U	0.0023 U	0.0023 U	0.0047 U	0.0028 U	0.0024 U	0.0024 U	0.0028 U	0.0026 U	0.0026 U	0.0028 U	0.0023 U
SB-4	02/08/2018	4.5	2-4'	0.0027 U	0.0027 U	0.0030 U	0.0029 U	0.0027 U	0.0029 U	0.0027 U	0.0027 U	0.0055 U	0.0032 U	0.0028 U	0.0028 U	0.0032 U	0.0031 U	0.0031 U	0.0033 U	0.0027 U
SB-5	02/08/2018	4.5	2-4'	0.0026 U	0.0026 U	0.0029 U	0.0028 U	0.0026 U	0.0028 U	0.0026 U	0.0026 U	0.0053 U	0.0031 U	0.0027 U	0.0027 U	0.0031 U	0.0030 U	0.0030 U	0.0032 U	0.0026 U
SB-6	02/07/2018	4.5	2-4'	0.0025 U	0.0025 U	0.0028 U	0.0027 U	0.0025 U	0.0026 U	0.0025 U	0.0025 U	0.0051 U	0.0030 U	0.0026 U	0.0025 U	0.0030 U	0.0028 U	0.0028 U	0.0030 U	0.0025 U
SB-7	02/08/2018	4.5	2-4'	0.0024 U	0.0024 U	0.0027 U	0.0026 U	0.0024 U	0.0025 U	0.0024 U	0.0024 U	0.0049 U	0.0029 U	0.0025 U	0.0024 U	0.0029 U	0.0027 U	0.0027 U	0.0029 U	0.0024 U
SB-8	02/08/2018	4.5	2-4'	0.0024 U	0.0024 U	0.0027 U	0.0026 U	0.0024 U	0.0026 U	0.0024 U	0.0024 U	0.0050 U	0.0029 U	0.0026 U	0.0025 U	0.0029 U	0.0028 U	0.0028 U	0.0030 U	0.0024 U
Leachability Based on Groundwater Criteria (mg/				3.6	0.03	0.03	NA	0.4	0.007	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.7	NA
Direct Exposure Residential (mg/kg)				3600	8.8	6.4	270	320	0.2	33	NA	NA	NA	NA	NA	960	NA	NA	53	NA
Direct Exposure Commercial/Industrial (mg/kg)				23000	18	9.3	1500	1700	0.8	180	NA	NA	NA	NA	NA	5600	NA	NA	290	NA

Notes:

NA= Not Available

** = Leachability value not applicable

= Direct Exposure value not applicable except as part of

Exceeds Leachability Based on Groundwater Criteria

Exceeds Direct Exposure Residential Limits

Exceeds Direct Exposure Commercial/Industrial Limit

TABLE 2A: GROUNDWATER MONITORING WELL ANALYTICAL SUMMARY - VOCs and Metals

Sample		Benzene	Toluene	Ethyl-benzene	Total Xylenes	Total VOAs	MTBE	EDB	1,2-Di-chloro-ethane	Total Arsenic	Cadmium	Total Chro-mium	Total Lead
Location	**Date**	**(ug/L)**	**(ug/L)**	**(ug/L)**	**(ug/L)**	**(ug/L)**	**(ug/L)**	**(ug/L)**	**(ug/L)**	**(ug/L)**	**(ug/L)**	**(ug/L)**	**(ug/L)**
DP-1	02/07/2018	0.10 U	0.50 U	0.50 U	1.0 U	1.0 U	0.50 U	NS	0.50 U	5.0 U	0.50 U	2.5 U	5.0 U
DP-2	02/07/2018	0.10 U	0.50 U	0.50 U	1.0 U	1.0 U	0.50 U	NS	0.50 U	**7.4 I**	0.50 U	2.5 U	5.0 U
DP-3	02/07/2018	0.10 U	0.50 U	0.50 U	1.0 U	1.0 U	0.50 U	NS	0.50 U	**6.5 I**	0.50 U	2.5 U	5.0 U
DP-4	02/08/2018	0.10 U	0.50 U	0.50 U	1.0 U	1.0 U	0.50 U	NS	0.50 U	5.0 U	0.50 U	2.5 U	5.0 U
DP-5 (54')	02/08/2018	0.10 U	0.50 U	0.50 U	1.5 U	1.5 U	0.50 U	NS	0.50 U	NS	NS	NS	NS
EMW-1	02/07/2018	0.10 U	0.50 U	0.50 U	1.0 U	1.0 U	0.50 U	NS	0.50 U	**8.4 I**	0.50 U	2.5 U	5.0 U
Trip Blank	02/08/2018	0.10 U	0.50 U	0.50 U	1.0 U	1.0 U	0.50 U	NS	0.50 U	NS	NS	NS	NS
GCTLs		1	40	30	20	NA	20	0.02	3	10	5	100	15
NADCs		100	400	300	200	NA	200	2	300	100	50	1000	150

Notes:

NA = Not Available

NS = Not Sampled

GCTLs = Groundwater Cleanup Target Levels specified in Table I of Chapter 62-777, F.A.C.

NADCs = Natural Attenuation Default Source Concentrations specified in Table V of Chapter 62-777, F.A.C.

Exceeds GCTL Limit

Exceeds NADC Limit

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TABLE 2B: GROUNDWATER MONITORING WELL ANALYTICAL SUMMARY - PAHs and TRPHs

Sample		TRPHs	Naph-thalene	1-Methyl-naph-thalene	2-Methyl-naph-thalene	Acenaph-thene	Acenaph-thylene	Anthra-cene	Benzo (g,h,i) perylene	Fluoran-thene	Fluorene	Phenan-threne	Pyrene	Benzo (a) pyrene	Benzo (a) anthra-cene	Benzo (b) fluoran-thene	Benzo (k) fluoran-thene	Chrysene	Dibenz (a,h) anthra-cene	Indeno (1,2,3-cd) pyrene
Location	**Date**	**(ug/L)**	**(ug/L)**	**(ug/L)**	**(ug/L)**	**(ug/L)**	**(ug/L)**	**(ug/L)**	**(ug/L)**	**(ug/L)**	**(ug/L)**	**(ug/L)**	**(ug/L)**	**(ug/L)**	**(ug/L)**	**(ug/L)**	**(ug/L)**	**(ug/L)**	**(ug/L)**	**(ug/L)**
DP-1	02/07/2018	**880 I**	0.048 U	0.032 U	0.11 U	0.013 U	0.012 U	0.012 U	0.042 U	**0.035 I**	0.016 U	**0.037 I**	**0.025 I**	0.020 U	0.055 U	0.027 U	0.023 U	0.026 U	0.13 U	0.12 U
DP-2	02/07/2018	770 U	0.048 U	0.032 U	0.11 U	0.013 U	0.012 U	0.012 U	0.042 U	0.018 U	0.016 U	0.018 U	0.019 U	0.020 U	0.055 U	0.027 U	0.023 U	0.026 U	0.13 U	0.12 U
DP-3	02/07/2018	**820 I**	0.048 U	0.032 U	0.11 U	0.013 U	0.012 U	0.012 U	0.042 U	0.018 U	0.016 U	**0.026 I**	0.019 U	0.020 U	0.055 U	0.027 U	0.023 U	0.026 U	0.13 U	0.12 U
DP-4	02/08/2018	790 U	0.048 U	0.032 U	0.11 U	0.013 U	0.012 U	0.012 U	0.042 U	0.018 U	0.016 U	**0.025 I**	0.019 U	0.020 U	0.055 U	0.027 U	0.023 U	0.026 U	0.13 U	0.12 U
DP-5 (54')	02/08/2018	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
EMW-1	02/07/2018	**890 I**	0.048 U	0.032 U	0.11 U	0.013 U	0.012 U	0.012 U	0.042 U	0.018 U	0.016 U	0.018 U	0.019 U	0.020 U	0.055 U	0.027 U	0.023 U	0.026 U	0.13 U	0.12 U
Trip Blank	02/08/2018	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
GCTLs		5000	14	28	28	20	210	2100	210	280	280	210	210	0.2**	0.05a	0.05a	0.5	4.8	0.005a	0.05a
NADCs		50000	140	280	280	200	2100	21000	2100	2800	2800	2100	2100	20	5	5	50	480	0.5	5

Notes:

NA = Not Available

NS = Not Sampled

GCTLs = Groundwater Cleanup Target Levels specified in Table I of Chapter 62-777, F.A.C.

NADCs = Natural Attenuation Default Source Concentrations specified in Table V of Chapter 62-777, F.A.C.

** = As provided in Chapter 62-550, F.A.C.

a = See the October 12, 2004 "Guidance for the Selection of Analytical Methods and for the Evaluation of Practical Quantitation Limits" to determine how to evaluate data when the CTL is lower than the PQL.

Exceeds GCTL Limit

Exceeds NADC Limit

TABLE 2C: GROUNDWATER MONITORING WELL ANALYTICAL SUMMARY - Other Contaminants not listed in Chapter 62-770, F.A.C.

Sample		**1,2,4-Tri-methyl-benzene**	**1,3,5-Tri-methyl-benzene**	**tert-Butyl alcohol**	**ETBE**	**TAME**	**DIPE**	**Ethanol**	**Cumene (Isopropyl benzene)**	**1,1,1,2-Tetrachloroethane**	**1,1,1-Trichloroethane**	**1,1,2,2-Tetrachloroethane**	**1,1,2-Trichloroethane**	**1,1-Dichloroethane**	**1,1-Dichloroethene**	**1,1-Dichloropropene**	**1,2,3-Trichlorobenzene**	**1,2,3-Trichloropropane**	**1,2,3-Trimethylbenzene**	**1,2,4-Trichlorobenzene**
Location	**Date**	**(ug/L)**	**(ug/L)**	**(ug/L)**	**(ug/L)**	**(ug/L)**	**(ug/L)**	**(ug/L)**	**(ug/L)**	**(ug/L)**	**(ug/L)**	**(ug/L)**	**(ug/L)**	**(ug/L)**	**(ug/L)**	**(ug/L)**	**(ug/L)**	**(ug/L)**	**(ug/L)**	**(ug/L)**
DP-1	02/07/2018	0.50 U	0.50 U	NS	NS	NS	NS	NS	0.50 U	0.50 U	0.50 U	0.12 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.59 U	1.0 U	0.50 U
DP-2	02/07/2018	0.50 U	0.50 U	NS	NS	NS	NS	NS	0.50 U	0.50 U	0.50 U	0.12 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.59 U	1.0 U	0.50 U
DP-3	02/07/2018	0.50 U	0.50 U	NS	NS	NS	NS	NS	0.50 U	0.50 U	0.50 U	0.12 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.59 U	1.0 U	0.50 U
DP-4	02/08/2018	0.50 U	0.50 U	NS	NS	NS	NS	NS	0.50 U	0.50 U	0.50 U	0.12 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.59 U	1.0 U	0.50 U
DP-5 (54')	02/08/2018	0.50 U	0.50 U	NS	NS	NS	NS	NS	0.50 U	0.50 U	0.50 U	0.12 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.59 U	1.0 U	0.50 U
EMW-1	02/07/2018	0.50 U	0.50 U	NS	NS	NS	NS	NS	0.50 U	0.50 U	0.50 U	0.12 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.59 U	1.0 U	0.50 U
Trip Blank	02/08/2018	0.50 U	0.50 U	NS	NS	NS	NS	NS	0.50 U	0.50 U	0.50 U	0.12 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.59 U	1.0 U	0.50 U
GCTLs		10	10	1400	NA	NA	NA	10000	0.8	1.3	200	0.2	5	70	7	NA	70	0.02	10	70
NADCs		100	100	14000	10000	5000	10000	100000	8	130	2000	20	500	700	70	NA	700	2	100	700

Notes:

NA= Not Available

GCTLs = Groundwater Cleanup Target Levels specified in Table I of Chapter 62-777, F.A.C.

NADCs = Natural Attenuation Default Source Concentrations specified in Table V of Chapter 62-777, F.A.C.

Exceeds GCTL Limit

Exceeds NADC Limit

MIA Parcel 3
Phase II Environmental Site Assessment
Groundwater Analytical Results
Amec Foster Wheeler Project#6783-17-2991

TABLE 2C: GROUNDWATER MONITORING WELL ANALYTICAL SUMMARY - Other Contaminants not listed in Chapter 62-770, F.A.C.

Sample		**1,2-Dichlorobenzene**	**1,2-Dichloropropane**	**1,3-Dichlorobenzene**	**1,3-Dichloropropane**	**1,4-Dichlorobenzene**	**2,2-Dichloropropane**	**2-Butanone (MEK)**	**2-Chlorotoluene**	**2-Hexanone**	**4-Chlorotoluene**	**4-Methyl-2-pentanone (MIBK)**	**Acetone**	**Acetonitrile**	**Barium**	**Bromobenzene**	**Bromochloromethane**	**Bromodichloromethane**	**Bromoform**	**Bromomethane**
Location	**Date**	**(ug/L)**	**(ug/L)**	**(ug/L)**	**(ug/L)**	**(ug/L)**	**(ug/L)**	**(ug/L)**	**(ug/L)**	**(ug/L)**	**(ug/L)**	**(ug/L)**	**(ug/L)**	**(ug/L)**	**(ug/L)**	**(ug/L)**	**(ug/L)**	**(ug/L)**	**(ug/L)**	**(ug/L)**
DP-1	02/07/2018	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	5.0 U	0.50 U	5.0 U	0.50 U	5.0 U	10.0 U	5.0 U	**11.1**	0.50 U	0.50 U	0.27 U	0.50 U	0.50 U
DP-2	02/07/2018	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	5.0 U	0.50 U	5.0 U	0.50 U	5.0 U	10.0 U	5.0 U	**11.2**	0.50 U	0.50 U	0.27 U	0.50 U	0.50 U
DP-3	02/07/2018	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	5.0 U	0.50 U	5.0 U	0.50 U	5.0 U	10.0 U	5.0 U	**12.6**	0.50 U	0.50 U	0.27 U	0.50 U	0.50 U
DP-4	02/08/2018	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	5.0 U	0.50 U	5.0 U	0.50 U	5.0 U	10.0 U	5.0 U	**10.8**	0.50 U	0.50 U	0.27 U	0.50 U	0.50 U
DP-5 (54')	02/08/2018	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	5.0 U	0.50 U	5.0 U	0.50 U	5.0 U	10.0 U	5.0 U		0.50 U	0.50 U	0.27 U	0.50 U	0.50 U
EMW-1	02/07/2018	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	5.0 U	0.50 U	5.0 U	0.50 U	5.0 U	10.0 U	5.0 U	**10.9**	0.50 U	0.50 U	0.27 U	0.50 U	0.50 U
Trip Blank	02/08/2018	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	5.0 U	0.50 U	5.0 U	0.50 U	5.0 U	**17.1 I**	5.0 U		0.50 U	0.50 U	0.27 U	0.50 U	0.50 U
GCTLs		600	5	210	NA	75	NA	4200	140	280	140	560	6300	42	2000	NA	91	0.6	4.4	9.8
NADCs		6000	500	2100	NA	7500	NA	42000	1400	2800	1400	5600	63000	NA	20000	NA	910	60	440	98

Notes:

NA= Not Available

GCTLs = Groundwater Cleanup Target

NADCs = Natural Attenuation Default S

🟨 **Exceeds GCTL Limit**

🟥 **Exceeds NADC Limit**

TABLE 2C: GROUNDWATER MONITORING WELL ANALYTICAL SUMMARY - Other Contaminants not listed in Chapter 62-770, F.A.C.

Sample		Carbon disulfide	Carbon tetrachloride	Chlorobenzene	Chloroethane	Chloroform	Chloromethane	Dibromochloromethane	Dibromomethane	Dichlorodifluoromethane	Iodomethane	Mercury	Methylene Chloride	Selenium	Silver	Styrene	Tetrachloroethene	Trichloroethene	Trichlorofluoromethane
Location	**Date**	**(ug/L)**	**(ug/L)**	**(ug/L)**	**(ug/L)**	**(ug/L)**	**(ug/L)**	**(ug/L)**	**(ug/L)**	**(ug/L)**	**(ug/L)**	**(ug/L)**	**(ug/L)**	**(ug/L)**	**(ug/L)**	**(ug/L)**	**(ug/L)**	**(ug/L)**	**(ug/L)**
DP-1	02/07/2018	5.0 U	0.50 U	0.50 U	0.50 U	0.50 U	0.62 U	0.26 U	0.50 U	0.50 U	0.50 U	0.10 U	2.5 U	7.5 U	2.5 U	0.50 U	0.50 U	0.50 U	0.50 U
DP-2	02/07/2018	5.0 U	0.50 U	0.50 U	0.50 U	0.50 U	0.62 U	0.26 U	0.50 U	0.50 U	0.50 U	0.10 U	2.5 U	7.5 U	2.5 U	0.50 U	0.50 U	0.50 U	0.50 U
DP-3	02/07/2018	5.0 U	0.50 U	0.50 U	0.50 U	0.50 U	0.62 U	0.26 U	0.50 U	0.50 U	0.50 U	0.10 U	2.5 U	7.5 U	2.5 U	0.50 U	0.50 U	0.50 U	0.50 U
DP-4	02/08/2018	5.0 U	0.50 U	0.50 U	0.50 U	0.50 U	0.62 U	0.26 U	0.50 U	0.50 U	0.50 U	0.10 U	2.5 U	7.5 U	2.5 U	0.50 U	0.50 U	0.50 U	0.50 U
DP-5 (54')	02/08/2018	5.0 U	0.50 U	0.50 U	0.50 U	0.50 U	0.62 U	0.26 U	0.50 U	0.50 U	0.50 U		2.5 U			0.50 U	0.50 U	0.50 U	0.50 U
EMW-1	02/07/2018	5.0 U	0.50 U	0.50 U	0.50 U	0.50 U	0.62 U	0.26 U	0.50 U	0.50 U	0.50 U	0.10 U	2.5 U	7.5 U	2.5 U	0.50 U	0.50 U	0.50 U	0.50 U
Trip Blank	02/08/2018	5.0 U	0.50 U	0.50 U	0.50 U	0.50 U	0.62 U	0.26 U	0.50 U	0.50 U	0.50 U		2.5 U			0.50 U	0.50 U	0.50 U	0.50 U
GCTLs		700	3	100	12	70	2.7	0.4	70	1400	NA	2	5	50	100	100	3	3	2100
NADCs		7000	300	1000	1200	700	270	40	NA	14000	NA	20	500	500	1000	1000	300	300	21000

Notes:

NA= Not Available

GCTLs = Groundwater Cleanup Target

NADCs = Natural Attenuation Default S

Exceeds GCTL Limit

Exceeds NADC Limit

TABLE 2C: GROUNDWATER MONITORING WELL ANALYTICAL SUMMARY - Other Contaminants not listed in Chapter 62-770, F.A.C.

Sample		**Vinyl acetate**	**Vinyl chloride**	**cis-1,2-Dichloroethene**	**cis-1,3-Dichloropropene**	**m&p-Xylene**	**n-Butylbenzene**	**n-Propylbenzene**	**o-Xylene**	**p-Isopropyltoluene**	**sec-Butylbenzene**	**tert-Butylbenzene**	**trans-1,2-Dichloroethene**	**trans-1,3-Dichloropropene**
Location	**Date**	**(ug/L)**	**(ug/L)**	**(ug/L)**	**(ug/L)**	**(ug/L)**	**(ug/L)**	**(ug/L)**	**(ug/L)**	**(ug/L)**	**(ug/L)**	**(ug/L)**	**(ug/L)**	**(ug/L)**
DP-1	02/07/2018	1.0 U	0.50 U	0.50 U	0.25 U	1.0 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.25 U
DP-2	02/07/2018	1.0 U	0.50 U	0.50 U	0.25 U	1.0 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.25 U
DP-3	02/07/2018	1.0 U	0.50 U	0.50 U	0.25 U	1.0 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.25 U
DP-4	02/08/2018	1.0 U	0.50 U	0.50 U	0.25 U	1.0 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.25 U
DP-5 (54')	02/08/2018	1.0 U	**1.4**	0.50 U	0.25 U	1.0 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.25 U
EMW-1	02/07/2018	1.0 U	0.50 U	0.50 U	0.25 U	1.0 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.25 U
Trip Blank	02/08/2018	1.0 U	0.50 U	0.50 U	0.25 U	1.0 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.25 U
GCTLs		88	1	70	0.4	NA	NA	NA	NA	NA	280	NA	100	0.4
NADCs		880	100	700	40	NA	NA	NA	NA	NA	2800	NA	1000	40

Notes:

NA= Not Available

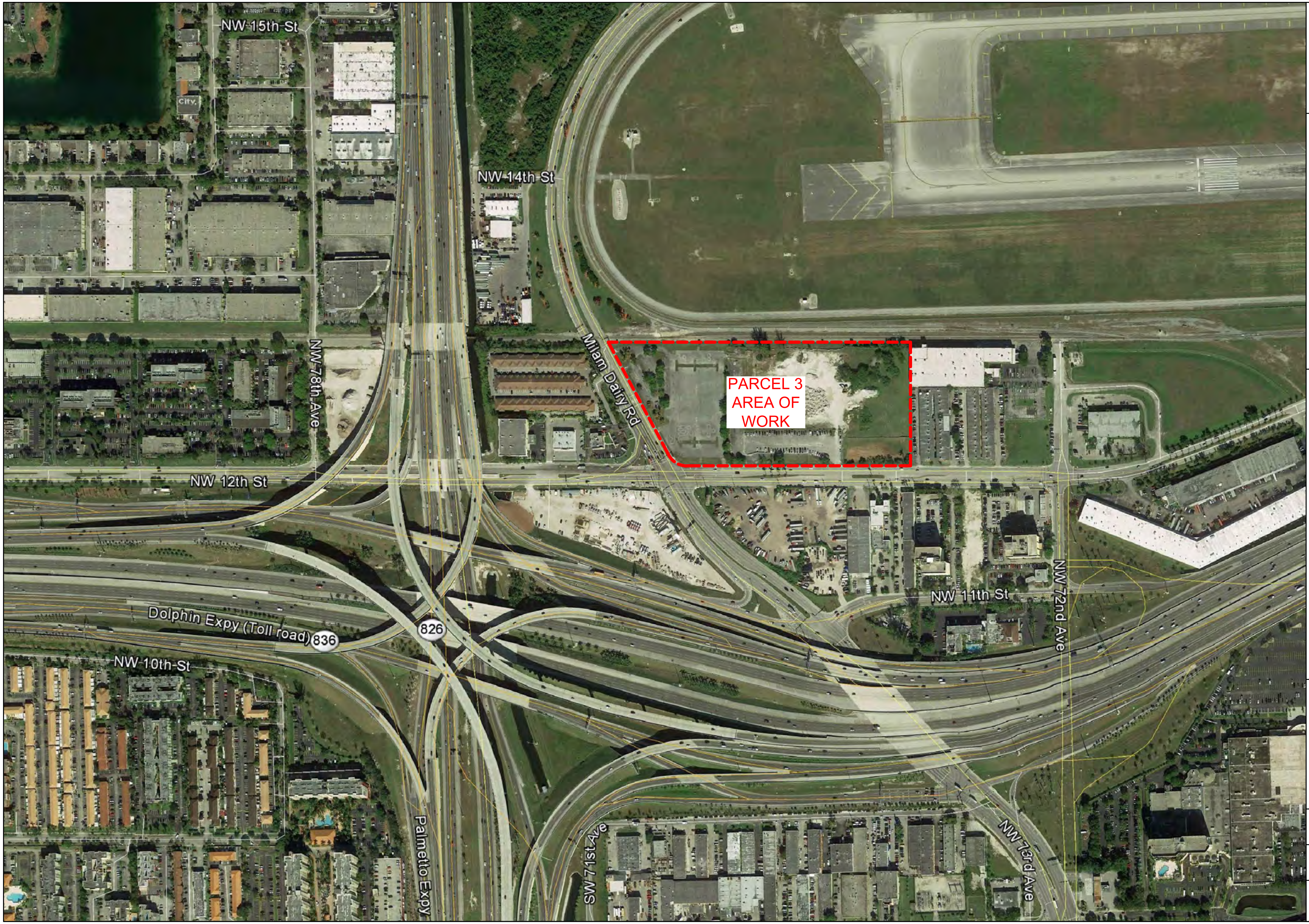
GCTLs = Groundwater Cleanup Target

NADCs = Natural Attenuation Default S

Exceeds GCTL Limit

Exceeds NADC Limit

FIGURES



amec foster wheeler

AMEC FOSTER WHEELER
5845 N.W. 158th Street
Miami, Florida 33014
Tel: (305) 826-5588 / Fax: (305) 826-1799

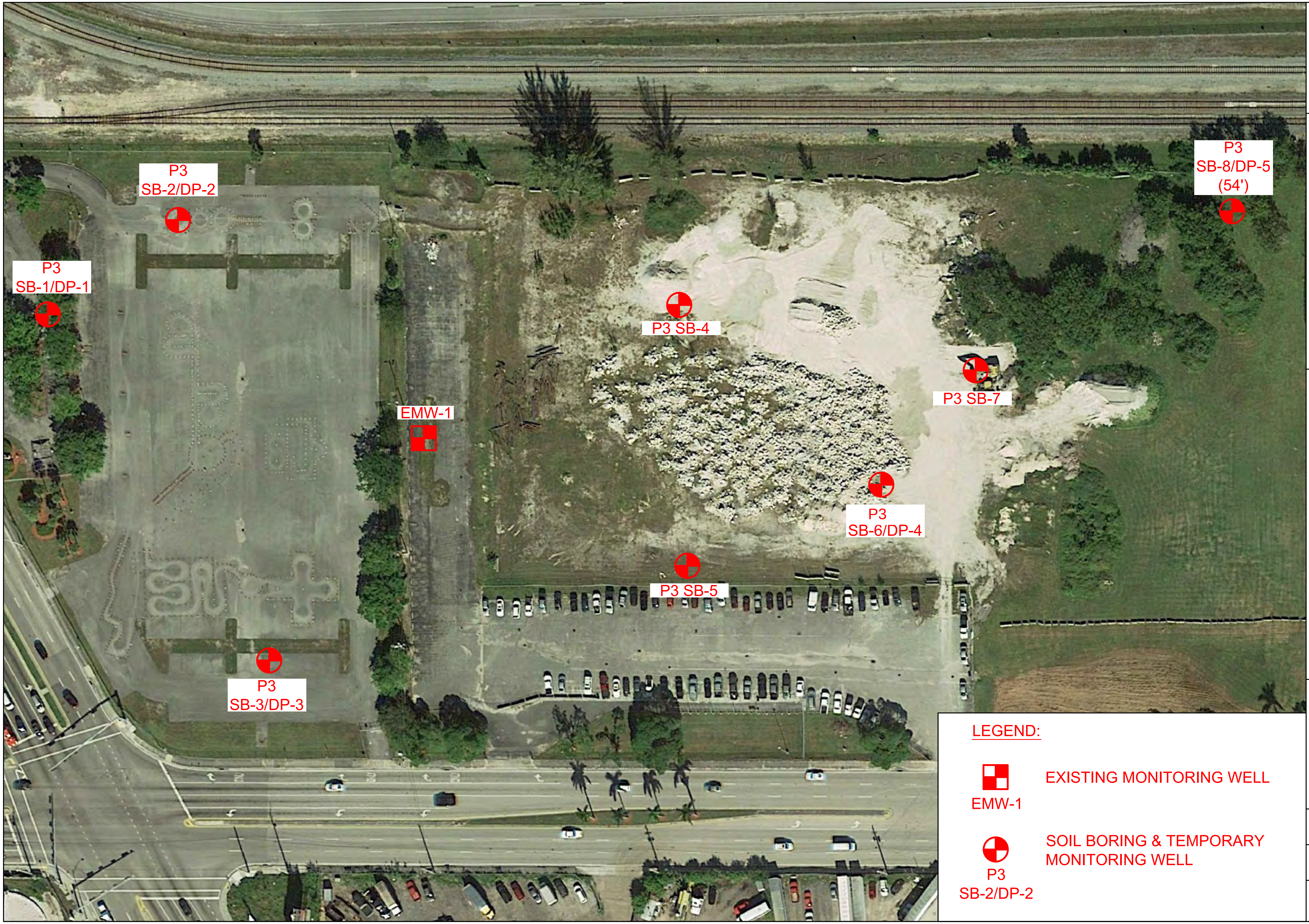
CLIENT
MIAMI INTERNATIONAL AIRPORT

PROJECT
MIA PARCEL 3
MIAMI INTERNATIONAL AIRPORT
MIAMI, FLORIDA

TITLE
SITE LOCATION MAP

DRAWN BY J. MILIAN	REVISED BY	APPROVED BY 6783-17-2991.06
CHECKED BY A.A.	APPROVED BY	SHEET NAME FIGURE 1
DATE 4/7/18	SCALE 1" = 400'	

REV. NO.	DATE	BY	DESCRIPTION



LEGEND:

🟥 EMW-1 EXISTING MONITORING WELL

● P3 SB-2/DP-2 SOIL BORING & TEMPORARY MONITORING WELL

amec foster wheeler

APPROVED BY 6783-17-2991.06

SHEET NAME FIGURE 2

AMEC FOSTER WHEELER
5845 N.W. 158th Street
Miami, Florida 33014
Tel: (305) 826-5588 / Fax: (305) 826-1799

DRAWN BY J. MILIAN

REVISED BY

CHECKED BY A.A.

APPROVED BY

DATE 4/7/18

SCALE 1" = 80'

CLIENT MIAMI INTERNATIONAL AIRPORT

PROJECT MIA PARCEL 3
MIAMI INTERNATIONAL AIRPORT
MIAMI, FLORIDA

TITLE SAMPLE LOCATION MAP

REV. NO.	DATE	BY	DESCRIPTION

ATTACHMENT A

SOIL BORING LOGS

Boring Log

Page 1 of 1

Boring/Well ID: P3-SB-1 / DP-1	Project Name: MIA PARCELS 3 & 5	Project Number: 6783-17-2991.06
Logged By: MARCELO PICHARDO	Borehole Start Date: 2/7/18 End Date: 2/7/18	Borehole Start Time: 950 ☒ AM ☐ PM ☐ 24hr End Time: 1030 ☒ AM ☐ PM ☐ 24hr
Operator: AUSTIN	Permit Number:	FDEP Facility Identification Number:

Drilling Company: JAEG	Pavement Thickness (inches): 3" ASPHALT	Borehole Diameter (inches): 3.25	Borehole Depth (feet): 6
Drilling Method(s): DIRECT PUSH	Apparent Borehole DTW (feet) (from soil moisture content): 4'	Measured Well DTW (in feet after water recharges in well):	OVA (list model and check type): PID ☐ FID ☒ PID

Disposition of Drill Cuttings [check method(s)]: ☐ Drum ☐ Spread ☒ Backfill ☐ Stockpile ☐ Other

(describe if other or multiple items are checked):

Borehole Completion (check one): ☒ Well ☐ Grout ☐ Bentonite ☐ Backfill ☐ Other (describe)

TEMP WELL

SAMPLE COLLECTED @ 2-4' 1020

Sample Type	Sample Recovery (inches)	Unfiltered OVA (ppm)	Filtered OVA (ppm)	Net OVA (ppm)	Depth (feet)	Lab Sample ID	Sample Description - include grain size based on USCS, odors, staining, and other remarks	USCS Symbol	Moisture Content
DP		<10	NA	<10	1		WHITE CRUSHED LIMESTONE ROCK (FILL)		D
DP					2				
DP		<10	NA	<10	3				M
DP					4		LIGHT GREY MED COARSE SAND		M
DP		<10	NA	<10	5		GREY FINE TO MED SAND ORANGE SANDY SILT W/CRUSHED LIMESTONE		W
DP					6		CRUSHED LIMESTONE ROCK (ORANGE)		S
					7				
					8				
					9				
					10				
					11				
					12				

Sample Type Codes: **PH** = Post Hole; **HA** = Hand Auger; **SS** = Split Spoon; **ST** = Shelby Tube; **DP** = Direct Push; **SC** = Sonic Core; **DC** = Drill Cuttings

Moisture Content Codes: **D** = Dry; **M** = Moist; **W** = Wet; **S** = Saturated

Checked By: ______

amec
foster
wheeler

Boring Log

Page 1 of 1

Boring/Well ID: P3-SB-2 / DP-2	Project Name: MIA PARCELS 335	Project Number: 6783-17-2991.06
Logged By: MARCELO PICHARDO	Borehole Start Date: 2/7/18 End Date: 2/7/18	Borehole Start Time: 1400 ☐ AM ☐ PM ☐ 24hr End Time: 1510 ☐ AM ☐ PM ☐ 24hr
Operator: AUSTIN	Permit Number:	FDEP Facility Identification Number:
Drilling Company: JAEE	Pavement Thickness (inches): 3" ASPHALT	Borehole Diameter (inches): 3.25
		Borehole Depth (feet): 6
Drilling Method(s): DIRECT PUSH	Apparent Borehole DTW (feet) (from soil moisture content): 5'	Measured Well DTW (in feet after water recharges in well): 5.5
		OVA (list model and check type): ☐ FID ☐ PID

Disposition of Drill Cuttings [check method(s)]: ☐ Drum ☐ Spread ☑ Backfill ☐ Stockpile ☐ Other

(describe if other or multiple items are checked):

Borehole Completion (check one): ☒ Well ☐ Grout ☐ Bentonite ☐ Backfill ☐ Other (describe)

Temp. WELL

SAMPLE COLLECTED @2'-4' @1500

Sample Type	Sample Recovery (inches)	Unfiltered OVA (ppm)	Filtered OVA (ppm)	Net OVA (ppm)	Depth (feet)	Lab Sample ID	Sample Description - include grain size based on USCS, odors, staining, and other remarks	USCS Symbol	Moisture Content
DP		<10	NA	<10	1		WHITE CRUSHED LIMESTONE ROCK (FILL)		D
DP					2				
DP		<10	NA	<10	3		FINE TO MED WHITE SAND		M
DP					4		BROWN FINE SAND		M
DP		<10	NA	<10	5		TAN FINE TO MED SAND		M
DP					6		TAN MED COARSE SAND		W
					7				
					8				
					9				
					10				
					11				
					12				

Sample Type Codes: **PH** = Post Hole; **HA** = Hand Auger; **SS** = Split Spoon; **ST** = Shelby Tube; **DP** = Direct Push; **SC** = Sonic Core; **DC** = Drill Cuttings

Moisture Content Codes: **D** = Dry; **M** = Moist; **W** = Wet; **S** = Saturated

Checked By: ______

Boring Log

Page 1 of 1

Boring/Well ID: P3-SB3 / DP-3
Project Name: MIA PARCELS 3 & 5
Project Number: 6783-17-2991.06
Logged By: MARCELO PICHARDO
Borehole Start Date: 2/7/18
End Date: 2/7/18
Borehole Start Time: ☐ AM ☐ PM ☐ 24hr
End Time: ☐ AM ☐ PM ☐ 24hr
Operator: AUSTIN
Permit Number:
FDEP Facility Identification Number:
Drilling Company: JAEE
Pavement Thickness (inches): 3" ASPHALT
Borehole Diameter (inches): 3.25
Borehole Depth (feet): 8
Drilling Method(s): DIRECT PUSH
Apparent Borehole DTW (feet) (from soil moisture content): 4.5
Measured Well DTW (in feet after water recharges in well): 5.0
OVA (list model and check type): PID ☐ FID ☒ PID
Disposition of Drill Cuttings [check method(s)]: ☐ Drum ☐ Spread ☒ Backfill ☐ Stockpile ☐ Other
(describe if other or multiple items are checked):
Borehole Completion (check one): ☒ Well ☐ Grout ☐ Bentonite ☐ Backfill ☐ Other (describe)
TEMP WELL

SAMPLE COLLECTED @ 2-4' @ 1415

Sample Type	Sample Recovery (inches)	Unfiltered OVA (ppm)	Filtered OVA (ppm)	Net OVA (ppm)	Depth (feet)	Lab Sample ID	Sample Description - include grain size based on USCS, odors, staining, and other remarks	USCS Symbol	Moisture Content
DP		<10	NA	<10	1		CRUSHED WHITE LIMESTONE ROCK (FILL)		D
DP					2		TAN FINE TO MED SAND w/ SOME ROCKS		M
DP		<10	NA	<10	3				
DP					4		WOOD DEBRIS (≈1")		
DP		<10	NA	<10	5		DARK BROWN/BLACK FINE SAND w/ SOME SILT		M
DP					6		ORANGE SANDY SILT w/ LITTLE CRUSHED LIMESTONE		W
DP		<10	NA	<10	7		ORANGE SANDY SILT w/ CRUSHED LIMESTONE		W
DP					8				S
					9				
					10				
					11				
					12				

Sample Type Codes: **PH** = Post Hole; **HA** = Hand Auger; **SS** = Split Spoon; **ST** = Shelby Tube; **DP** = Direct Push; **SC** = Sonic Core; **DC** = Drill Cuttings
Moisture Content Codes: **D** = Dry; **M** = Moist; **W** = Wet; **S** = Saturated
Checked By: ______

amec
foster
wheeler

Boring Log

Page 1 of 1

Boring/Well ID: P3-SB-4	Project Name: MIA PARCELS J & 5		Project Number: 6783-17-2991.06
Logged By: MARCELO PICHARDO	Borehole Start Date: 2-8-18 End Date: 2-8-18	Borehole Start Time: 1020 ☐ AM ☐ PM ☐ 24hr End Time: ☐ AM ☐ PM ☐ 24hr	
Operator: AUSTIN	Permit Number:	FDEP Facility Identification Number:	
Drilling Company: JAEE	Pavement Thickness (inches): NA	Borehole Diameter (inches): 3.25	Borehole Depth (feet): 6
Drilling Method(s): DIRECT PUSH	Apparent Borehole DTW (feet) (from soil moisture content): 4.5	Measured Well DTW (in feet after water recharges in well): NA	OVA (list model and check type): PID ☐ FID ☑ PID

Disposition of Drill Cuttings [check method(s)]: ☐ Drum ☐ Spread ☒ Backfill ☐ Stockpile ☐ Other

(describe if other or multiple items are checked):

Borehole Completion (check one): ☐ Well ☐ Grout ☐ Bentonite ☒ Backfill ☐ Other (describe)

SAMPLE COLLECTED 2'-4' @1030

Sample Type	Sample Recovery (inches)	Unfiltered OVA (ppm)	Filtered OVA (ppm)	Net OVA (ppm)	Depth (feet)	Lab Sample ID	Sample Description - include grain size based on USCS, odors, staining, and other remarks	USCS Symbol	Moisture Content
Dp		<10	NA	<10	1		WHITE CRUSHED LIMESTONE ROCK (FILL) TAN FINE SAND		D
Dp					2				
Dp		<10	NA	<10	3				
Dp					4		DARK BROWN FINE TO MED SAND		M
Dp		<10	NA	<10	5		GREY FINE SAND		M
Dp					6		CRUSHED LIMESTONE ROCK		S
					7				
					8				
					9				
					10				
					11				
					12				

Sample Type Codes: **PH** = Post Hole; **HA** = Hand Auger; **SS** = Split Spoon; **ST** = Shelby Tube; **DP** = Direct Push; **SC** = Sonic Core; **DC** = Drill Cuttings

Moisture Content Codes: **D** = Dry; **M** = Moist; **W** = Wet; **S** = Saturated

Checked By: ______

amec
foster
wheeler

Boring Log

Page 1 of 1

Boring/Well ID: P3-SB-5	Project Name: MIA PARCELS 3 & 5	Project Number: 6783-17-2991.06

Logged By: MARCELO PICHARDO

Borehole Start Date: 2-8-18

End Date: 2-8-18

Borehole Start Time: 1035 ☐ AM ☐ PM ☐ 24hr

End Time: ☐ AM ☐ PM ☐ 24hr

Operator: WAYNE

Permit Number: ———

FDEP Facility Identification Number: ———

Drilling Company: JAEE

Pavement Thickness (inches): NA

Borehole Diameter (inches): 3.25

Borehole Depth (feet): 6

Drilling Method(s): DIRECT PUSH

Apparent Borehole DTW (feet) (from soil moisture content): 4.5

Measured Well DTW (in feet after water recharges in well): NA

OVA (list model and check type): PID ☐ FID ☒ PID

Disposition of Drill Cuttings [check method(s)]: ☐ Drum ☐ Spread ☒ Backfill ☐ Stockpile ☐ Other

(describe if other or multiple items are checked):

Borehole Completion (check one): ☐ Well ☐ Grout ☐ Bentonite ☒ Backfill ☐ Other (describe)

Sample Type	Sample Recovery (inches)	Unfiltered OVA (ppm)	Filtered OVA (ppm)	Net OVA (ppm)	Depth (feet)	Lab Sample ID	Sample Description - include grain size based on USCS, odors, staining, and other remarks	USCS Symbol	Moisture Content
DP							WHITE CRUSHED LIMESTONE ROCK (FILL)		D
		<10	NA	<10	1				
DP							TAN/BROWN FINE TO MED SAND W/ ROCKS		D
					2				
DP									
		<10	NA	<10	3				
DP									
					4		DARK BROWN FINE TO MED SAND		M
DP									
		<10	NA	<10	5		LIGHT GREY MED COARSE SAND		W
DP									
					6		CRUSHED LIMESTONE ROCK		S
					7				
					8				
					9				
					10				
					11				
					12				

SAMPLE COLLECTED @2-4 @1100

Sample Type Codes: **PH** = Post Hole; **HA** = Hand Auger; **SS** = Split Spoon; **ST** = Shelby Tube; **DP** = Direct Push; **SC** = Sonic Core; **DC** = Drill Cuttings

Moisture Content Codes: **D** = Dry; **M** = Moist; **W** = Wet; **S** = Saturated

Checked By: ______

amec
foster
wheeler

Boring Log

Page 1 of 1

Boring/Well ID: B3-SB-6 / DP-4	Project Name: MIA PARCELS 3 & 5		Project Number: 6783-17-2991.06
Logged By: MARCELO PICHARDO	Borehole Start Date: 2-7-18 End Date: 2-8-18	Borehole Start Time: 15 ☐ AM ☒ PM ☐ 24hr End Time: ☐ AM ☐ PM ☐ 24hr	
Operator: AUSTIN	Permit Number:	FDEP Facility Identification Number:	
Drilling Company: JAEE	Pavement Thickness (inches): NA	Borehole Diameter (inches): 3.25	Borehole Depth (feet): 6
Drilling Method(s): DIRECT PUSH	Apparent Borehole DTW (feet) (from soil moisture content): 4.5	Measured Well DTW (in feet after water recharges in well): 4.45	OVA (list model and check type): PID ☐ FID ☒ PID

Disposition of Drill Cuttings [check method(s)]: ☐ Drum ☐ Spread ☒ Backfill ☐ Stockpile ☐ Other

(describe if other or multiple items are checked):

Borehole Completion (check one): ☒ Well ☐ Grout ☐ Bentonite ☐ Backfill ☐ Other (describe)

TEMP WELL

SAMPLE COLLECTED @2'4' @1600

Sample Type	Sample Recovery (inches)	Unfiltered OVA (ppm)	Filtered OVA (ppm)	Net OVA (ppm)	Depth (feet)	Lab Sample ID	Sample Description - include grain size based on USCS, odors, staining, and other remarks	USCS Symbol	Moisture Content
DP		<10	NA	<10	1		WHITE CRUSHED LIMESTONE ROCK (FILL)		D
DP					2				
DP		<10	NA	<10	3		LIGHT GREY FINE TO MED. SAND		M
DP					4				
DP		<10	NA	<10	5				W
DP					6		WHITE CRUSHED LIMESTONE ROCK		S
					7				
					8				
					9				
					10				
					11				
					12				

Sample Type Codes: **PH** = Post Hole; **HA** = Hand Auger; **SS** = Split Spoon; **ST** = Shelby Tube; **DP** = Direct Push; **SC** = Sonic Core; **DC** = Drill Cuttings

Moisture Content Codes: **D** = Dry; **M** = Moist; **W** = Wet; **S** = Saturated

Checked By: ______

amec foster wheeler

Boring Log

Page 1 of 1

Boring/Well ID: P3-SB-7

Project Name: MIA PARCELS 3 & 5

Project Number: 6783-17-2991.06

Logged By: MARCELO PICHARDO

Borehole Start Date: 2-8-18

End Date: 2-8-18

Borehole Start Time: ☐ AM ☐ PM ☐ 24hr

End Time: ☐ AM ☐ PM ☐ 24hr

Operator: WAYNE

Permit Number: ——

FDEP Facility Identification Number: ——

Drilling Company: JAEE

Pavement Thickness (inches): NA

Borehole Diameter (inches): 3.25

Borehole Depth (feet): 6

Drilling Method(s): DIRECT PUSH

Apparent Borehole DTW (feet) (from soil moisture content): 4.5'

Measured Well DTW (in feet after water recharges in well): NA

OVA (list model and check type): PID ☐ FID ☒ PID

Disposition of Drill Cuttings [check method(s)]: ☐ Drum ☐ Spread ☒ Backfill ☐ Stockpile ☐ Other

(describe if other or multiple items are checked):

Borehole Completion (check one): ☐ Well ☐ Grout ☐ Bentonite ☒ Backfill ☐ Other (describe)

SAMPLE COLLECTED 2'-4' @1140

Sample Type	Sample Recovery (inches)	Unfiltered OVA (ppm)	Filtered OVA (ppm)	Net OVA (ppm)	Depth (feet)	Lab Sample ID	Sample Description - include grain size based on USCS, odors, staining, and other remarks	USCS Symbol	Moisture Content
DP		<10	NA	<10	1		WHITE CRUSHED LIMESTONE ROCK (FILL)		D
DP					2				
DP		<10	NA	<10	3		LIGHT GREY FINE TO MED SAND		M
DP					4		BROWN FINE SAND		W
DP		<10	NA	<10	5		WHITE CRUSHED LIMESTONE ROCK		S
DP					6				
					7				
					8				
					9				
					10				
					11				
					12				

Sample Type Codes: **PH** = Post Hole; **HA** = Hand Auger; **SS** = Split Spoon; **ST** = Shelby Tube; **DP** = Direct Push; **SC** = Sonic Core; **DC** = Drill Cuttings

Moisture Content Codes: **D** = Dry; **M** = Moist; **W** = Wet; **S** = Saturated

Checked By: ______

Boring Log

Page 1 of 1

Boring/Well ID: P3-SB-8 / DP-5 (54')

Project Name: MIA PARCELS 3 & 5

Project Number: 6783-17-2991.06

Logged By: MARCELO PICHARDO

Borehole Start Date: 2-8-18

End Date: 2-8-18

Borehole Start Time: 930 ☐ AM ☐ PM ☐ 24hr

End Time: ☐ AM ☐ PM ☐ 24hr

Operator: AUSTIN

Permit Number: ——

FDEP Facility Identification Number: ——

Drilling Company: JAEE

Pavement Thickness (inches): NA

Borehole Diameter (inches): 3.25

Borehole Depth (feet): 6'

Drilling Method(s): DIRECT PUSH

Apparent Borehole DTW (feet) (from soil moisture content): 4.5

Measured Well DTW (in feet after water recharges in well): 4.50

OVA (list model and check type): PID ☐ FID ☒ PID

Disposition of Drill Cuttings [check method(s)]: ☐ Drum ☐ Spread ☒ Backfill ☐ Stockpile ☐ Other

(describe if other or multiple items are checked):

Borehole Completion (check one): ☒ Well ☐ Grout ☐ Bentonite ☐ Backfill ☐ Other (describe)

GEOPROBE WELL

SAMPLE COLLECTED 2'-4' @1000

Sample Type	Sample Recovery (inches)	Unfiltered OVA (ppm)	Filtered OVA (ppm)	Net OVA (ppm)	Depth (feet)	Lab Sample ID	Sample Description - include grain size based on USCS, odors, staining, and other remarks	USCS Symbol	Moisture Content
DP DP		<10	NA	<10	1		BLACK TOP SOIL W/ GRASS + ROOTS DARK BROWN FINE SAND W/ SOME ROOTS		D
					2				
DP DP		<10	NA	<10	3				
					4		TAN FINE TO MED SAND		M
DP DP		<10	NA	<10	5		CRUSHED LIMESTONE ROCK WHITE		S
					6				
					7				
					8				
					9				
					10				
					11				
					12				

Sample Type Codes: **PH** = Post Hole; **HA** = Hand Auger; **SS** = Split Spoon; **ST** = Shelby Tube; **DP** = Direct Push; **SC** = Sonic Core; **DC** = Drill Cuttings

Moisture Content Codes: **D** = Dry; **M** = Moist; **W** = Wet; **S** = Saturated

Checked By: ______

ATTACHMENT B

GROUNDWATER SAMPLING LOGS

DEP Form FD 9000-24: GROUNDWATER SAMPLING LOG

SITE NAME: MIA PARCELS 385

SITE LOCATION: MIAMI, FL

WELL NO: EMW-1 P3

SAMPLE ID: EMW-1 P3

DATE: 2-7-18

PURGING DATA

WELL DIAMETER (inches): 2

TUBING DIAMETER (inches): 3/8

WELL SCREEN INTERVAL DEPTH: – feet to – feet

STATIC DEPTH TO WATER (feet): 4.10

PURGE PUMP TYPE OR BAILER: PP

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable)
= (12.9 feet – 4.10 feet) X 0.16 gallons/foot = 1.40 gallons

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)
= gallons + (gallons/foot X feet) + gallons = gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 5

FINAL PUMP OR TUBING DEPTH IN WELL (feet): 5

PURGING INITIATED AT: 1200

PURGING ENDED AT: 1214

TOTAL VOLUME PURGED (gallons): 2.10

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (circle units) µmhos/cm ~~or~~ [✓ µS/cm]	DISSOLVED OXYGEN (circle units) mg/L or % saturation	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
1210	1.50	1.50	0.15	4.13	7.25	26.90	486	10.2	3.10	CLEAR	NONE
1212	.30	1.80	0.15	4.14	7.25	26.85	485	10.4	1.08	CLEAR	NONE
1214	.30	2.10	0.15	4.14	7.24	26.95	485	9.9	0.85	CLEAR	NONE

WELL CAPACITY (Gallons Per Foot): **0.75"** = 0.02; **1"** = 0.04; **1.25"** = 0.06; **2"** = 0.16; **3"** = 0.37; **4"** = 0.65; **5"** = 1.02; **6"** = 1.47; **12"** = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): **1/8"** = 0.0006; **3/16"** = 0.0014; **1/4"** = 0.0026; **5/16"** = 0.004; **3/8"** = 0.006; **1/2"** = 0.010; **5/8"** = 0.016

PURGING EQUIPMENT CODES: **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **PP** = Peristaltic Pump; **O** = Other (Specify)

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: MARCELO PICHARDO / AMECFW

SAMPLER(S) SIGNATURE(S):

SAMPLING INITIATED AT: 1215

SAMPLING ENDED AT: 1225

PUMP OR TUBING DEPTH IN WELL (feet): 5

TUBING MATERIAL CODE: HDPE

FIELD-FILTERED: Y [✓ N] Filtration Equipment Type:

FILTER SIZE: ____ µm

FIELD DECONTAMINATION: PUMP Y [✓ N] TUBING Y [✓ N (replaced)]

DUPLICATE: Y [✓ N]

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION (including wet ice)			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE	SAMPLE PUMP FLOW RATE (mL per minute)
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH			
EMW-1	3	CG	40ml	HCL	—	—	8260	APP	100
EMW-1	2	AG	100ml	H_2SO_4	—	—	TRPH FL-PRO	APP	100
EMW-1	1	AG	250ml	NONE	—	—	PAH 8270	APP	100
EMW-1	1	PE	250ml	HNO_3	—	—	RCRA METALS	APP	100

REMARKS:

MATERIAL CODES: **AG** = Amber Glass; **CG** = Clear Glass; **HDPE** = High Density Polyethylene; **LDPE** = Low Density Polyethylene; **PP** = Polypropylene; **S** = Silicone; **T** = Teflon; **O** = Other (Specify)

SAMPLING EQUIPMENT CODES: **APP** = After (Through) Peristaltic Pump; **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **RFPP** = Reverse Flow Peristaltic Pump; **SM** = Straw Method (Tubing Gravity Drain); **O** = Other (Specify)

NOTES: 1. The above do not constitute all of the information required by Chapter 62-160, F.A.C.

2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)

pH: ± 0.2 units **Temperature:** ± 0.2 °C **Specific Conductance:** ± 5% **Dissolved Oxygen:** all readings ≤ 20% saturation (see Table FS 2200-2); optionally, ± 0.2 mg/L or ± 10% (whichever is greater) **Turbidity:** all readings ≤ 20 NTU; optionally ± 5 NTU or ± 10% (whichever is greater)

DEP Form FD 9000-24: GROUNDWATER SAMPLING LOG

SITE NAME: MIA PARCELS 3 AND 5

SITE LOCATION: NE CORNER OF MILAM DAIRY RD + NW 12th ST

WELL NO: P3-DP1

SAMPLE ID: P3-DP-1

DATE: 2-7-18

PURGING DATA

WELL DIAMETER (inches): 1"

TUBING DIAMETER (inches): 3/8

WELL SCREEN INTERVAL DEPTH: 4.0 feet to 9.0 feet

STATIC DEPTH TO WATER (feet): 4.65

PURGE PUMP TYPE OR BAILER: PP

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable)
= (9.0 feet – 4.65 feet) X 0.04 gallons/foot = .17 gallons

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)
= gallons + (gallons/foot X feet) + gallons = gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 5.5

FINAL PUMP OR TUBING DEPTH IN WELL (feet): 5.5

PURGING INITIATED AT: 1310

PURGING ENDED AT: 1329

TOTAL VOLUME PURGED (gallons): .70

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (circle units) µmhos/cm or [✓ µS/cm]	DISSOLVED OXYGEN (circle units) ~~mg/L or~~ [✓ % saturation]	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
1325	.50	.50	.03	NA	7.46	25.46	422	10.4	8.4	CLEAR	NONE
1327	.10	.60	.05	NA	7.46	25.45	421	9.8	7.6	CLEAR	NONE
1329	.10	.70	.05	NA	7.46	25.47	421	9.4	5.1	CLEAR	NONE

WELL CAPACITY (Gallons Per Foot): **0.75"** = 0.02; **1"** = 0.04; **1.25"** = 0.06; **2"** = 0.16; **3"** = 0.37; **4"** = 0.65; **5"** = 1.02; **6"** = 1.47; **12"** = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): **1/8"** = 0.0006; **3/16"** = 0.0014; **1/4"** = 0.0026; **5/16"** = 0.004; **3/8"** = 0.006; **1/2"** = 0.010; **5/8"** = 0.016

PURGING EQUIPMENT CODES: **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **PP** = Peristaltic Pump; **O** = Other (Specify)

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: MARCELO PICHARDO / AMECFW

SAMPLER(S) SIGNATURE(S):

SAMPLING INITIATED AT: 1330

SAMPLING ENDED AT: 1340

PUMP OR TUBING DEPTH IN WELL (feet): 5.5

TUBING MATERIAL CODE: HDPE

FIELD-FILTERED: Y [✓ N]
Filtration Equipment Type:

FILTER SIZE: ____ µm

FIELD DECONTAMINATION: PUMP Y [✓ N] TUBING Y [✓ N (replaced)]

DUPLICATE: Y [✓ N]

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION (including wet ice)			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE	SAMPLE PUMP FLOW RATE (mL per minute)
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH			
P3-DP-1	3	CG	40ml	HCL	—	—	8260	APP	100
P3-DP-1	2	AG	100ml	H_2SO_4	—	—	TRPH FL-PRO	APP	100
P3-DP-1	1	AG	250ml	NONE	—	—	PAH 8270	APP	100
P3-DP-1	1	PE	250ml	HNO_3	—	—	RCRA METALS	APP	100

REMARKS:

MATERIAL CODES: **AG** = Amber Glass; **CG** = Clear Glass; **HDPE** = High Density Polyethylene; **LDPE** = Low Density Polyethylene; **PP** = Polypropylene; **S** = Silicone; **T** = Teflon; **O** = Other (Specify)

SAMPLING EQUIPMENT CODES: **APP** = After (Through) Peristaltic Pump; **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **RFPP** = Reverse Flow Peristaltic Pump; **SM** = Straw Method (Tubing Gravity Drain); **O** = Other (Specify)

NOTES: 1. The above do not constitute all of the information required by Chapter 62-160, F.A.C.

2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)

pH: ± 0.2 units **Temperature:** ± 0.2 °C **Specific Conductance:** ± 5% **Dissolved Oxygen:** all readings ≤ 20% saturation (see Table FS 2200-2); optionally, ± 0.2 mg/L or ± 10% (whichever is greater) **Turbidity:** all readings ≤ 20 NTU; optionally ± 5 NTU or ± 10% (whichever is greater)

DEP Form FD 9000-24: GROUNDWATER SAMPLING LOG

SITE NAME: MIA PARCELS 3 & 5
SITE LOCATION: MIAMI, FL
WELL NO: P3-DP-2
SAMPLE ID: P3-DP-2
DATE: 2-7-18

PURGING DATA

WELL DIAMETER (inches): 1
TUBING DIAMETER (inches): 3/8
WELL SCREEN INTERVAL DEPTH: 4.5 feet to 9.5 feet
STATIC DEPTH TO WATER (feet): 5.5
PURGE PUMP TYPE OR BAILER: PP

WELL VOLUME PURGE: **1 WELL VOLUME** = (TOTAL WELL DEPTH − STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable)
= (9.5 feet − 5.5 feet) X 0.04 gallons/foot = .16 gallons

EQUIPMENT VOLUME PURGE: **1 EQUIPMENT VOL.** = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)
= gallons + (gallons/foot X feet) + gallons = gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 6
FINAL PUMP OR TUBING DEPTH IN WELL (feet): 6
PURGING INITIATED AT: 1510
PURGING ENDED AT: 1524
TOTAL VOLUME PURGED (gallons): .70

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (circle units) µmhos/cm or [✓ µS/cm]	DISSOLVED OXYGEN (circle units) mg/L or [✓ % saturation]	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
1520	.50	.50	.05	NA	7.48	27.60	517	16.0	2.85	CLEAR	NONE
1522	.10	.60	.05	NA	7.48	27.55	517	15.3	1.40	CLEAR	NONE
1524	.10	.70	.05	NA	7.48	27.58	517	14.6	1.10	CLEAR	NONE

WELL CAPACITY (Gallons Per Foot): **0.75"** = 0.02; **1"** = 0.04; **1.25"** = 0.06; **2"** = 0.16; **3"** = 0.37; **4"** = 0.65; **5"** = 1.02; **6"** = 1.47; **12"** = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): **1/8"** = 0.0006; **3/16"** = 0.0014; **1/4"** = 0.0026; **5/16"** = 0.004; **3/8"** = 0.006; **1/2"** = 0.010; **5/8"** = 0.016

PURGING EQUIPMENT CODES: **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **PP** = Peristaltic Pump; **O** = Other (Specify)

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: MARCELO PICHARDO / AMECFW
SAMPLER(S) SIGNATURE(S):
SAMPLING INITIATED AT: 1525
SAMPLING ENDED AT: 1535
PUMP OR TUBING DEPTH IN WELL (feet): 6
TUBING MATERIAL CODE: HDPE
FIELD-FILTERED: Y [✓ N]
Filtration Equipment Type:
FILTER SIZE: ____ µm
FIELD DECONTAMINATION: PUMP Y [✓ N] TUBING Y [✓ N (replaced)]
DUPLICATE: Y [✓ N]

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION (including wet ice)			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE	SAMPLE PUMP FLOW RATE (mL per minute)
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH			
P3-DP-2	3	CG	40ml	HCL	—	—	VOCs 8260	APP	100
P3-DP-2	2	AG	100ml	H_2SO_4	—	—	TRPH FL-PRO	APP	100
P3-DP-2	1	AG	250ml	NONE	—	—	PAH 8270	APP	100
P3-DP-2	1	PE	250ml	HNO_3	—	—	RCRA METALS	APP	100

REMARKS:

MATERIAL CODES: **AG** = Amber Glass; **CG** = Clear Glass; **HDPE** = High Density Polyethylene; **LDPE** = Low Density Polyethylene; **PP** = Polypropylene; **S** = Silicone; **T** = Teflon; **O** = Other (Specify)

SAMPLING EQUIPMENT CODES: **APP** = After (Through) Peristaltic Pump; **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **RFPP** = Reverse Flow Peristaltic Pump; **SM** = Straw Method (Tubing Gravity Drain); **O** = Other (Specify)

NOTES: 1. The above do not constitute all of the information required by Chapter 62-160, F.A.C.

2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)

pH: ± 0.2 units **Temperature:** ± 0.2 °C **Specific Conductance:** ± 5% **Dissolved Oxygen:** all readings ≤ 20% saturation (see Table FS 2200-2); optionally, ± 0.2 mg/L or ± 10% (whichever is greater) **Turbidity:** all readings ≤ 20 NTU; optionally ± 5 NTU or ± 10% (whichever is greater)

DEP Form FD 9000-24: GROUNDWATER SAMPLING LOG

SITE NAME: MIA PARCELS 3&5
SITE LOCATION: MIAMI, FL

WELL NO: P3-DP-3
SAMPLE ID: P3-DP-3
DATE: 2-7-18

PURGING DATA

WELL DIAMETER (inches): 1
TUBING DIAMETER (inches): 3/8
WELL SCREEN INTERVAL DEPTH: 4.0 feet to 9.0 feet
STATIC DEPTH TO WATER (feet):
PURGE PUMP TYPE OR BAILER: PP

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable)
= (9.0 feet – 5.0 feet) X 0.04 gallons/foot = .16 gallons

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)
= gallons + (gallons/foot X feet) + gallons = gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 6
FINAL PUMP OR TUBING DEPTH IN WELL (feet): 6
PURGING INITIATED AT: 1438
PURGING ENDED AT: 1449
TOTAL VOLUME PURGED (gallons): .80

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (circle units) μmhos/cm [✓ or μS/cm]	DISSOLVED OXYGEN (circle units) mg/L or [✓ % saturation]	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
1445	.50	.50	.07	NA	7.48	26.82	429	13.0	8.1	CLEAR	NONE
1447	.15	.65	.07	NA	7.48	26.85	429	12.2	7.8	CLEAR	NONE
1449	.15	.80	.07	NA	7.47	26.88	428	11.8	7.5	CLEAR	NONE

WELL CAPACITY (Gallons Per Foot): **0.75"** = 0.02; **1"** = 0.04; **1.25"** = 0.06; **2"** = 0.16; **3"** = 0.37; **4"** = 0.65; **5"** = 1.02; **6"** = 1.47; **12"** = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): **1/8"** = 0.0006; **3/16"** = 0.0014; **1/4"** = 0.0026; **5/16"** = 0.004; **3/8"** = 0.006; **1/2"** = 0.010; **5/8"** = 0.016

PURGING EQUIPMENT CODES: **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **PP** = Peristaltic Pump; **O** = Other (Specify)

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: MARCELO PICHARDO / AMECFW
SAMPLER(S) SIGNATURE(S):
SAMPLING INITIATED AT: 1450
SAMPLING ENDED AT: 1500

PUMP OR TUBING DEPTH IN WELL (feet): 6
TUBING MATERIAL CODE: HDPE
FIELD-FILTERED: Y [✓ N] Filtration Equipment Type:
FILTER SIZE: ____ μm

FIELD DECONTAMINATION: PUMP Y [✓ N] TUBING Y [✓ N (replaced)]
DUPLICATE: Y [✓ N]

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION (including wet ice)			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE	SAMPLE PUMP FLOW RATE (mL per minute)
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH			
P3-DP-3	3	CG	40ml	HCL	—	—	VOCs 8260	APP	100
P3-DP-3	2	AG	100ml	H_2SO_4	—	—	TRPH FL-PRO	APP	100
P3-DP-3	1	AG	250ml	NONE	—	—	PAHs 8270	APP	100
P3-DP-3	1	PE	250ml	HNO_3	—	—	RCRA METALS	APP	100

REMARKS:

MATERIAL CODES: **AG** = Amber Glass; **CG** = Clear Glass; **HDPE** = High Density Polyethylene; **LDPE** = Low Density Polyethylene; **PP** = Polypropylene; **S** = Silicone; **T** = Teflon; **O** = Other (Specify)

SAMPLING EQUIPMENT CODES: **APP** = After (Through) Peristaltic Pump; **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **RFPP** = Reverse Flow Peristaltic Pump; **SM** = Straw Method (Tubing Gravity Drain); **O** = Other (Specify)

NOTES: 1. The above do not constitute all of the information required by Chapter 62-160, F.A.C.

2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)

pH: ± 0.2 units **Temperature:** ± 0.2 °C **Specific Conductance:** ± 5% **Dissolved Oxygen:** all readings ≤ 20% saturation (see Table FS 2200-2); optionally, ± 0.2 mg/L or ± 10% (whichever is greater) **Turbidity:** all readings ≤ 20 NTU; optionally ± 5 NTU or ± 10% (whichever is greater)

DEP Form FD 9000-24: GROUNDWATER SAMPLING LOG

SITE NAME: M/A PARCELS 3 & 5
SITE LOCATION: MIAMI, FL

WELL NO: P3-DP-4
SAMPLE ID: P3-DP-4
DATE: 2-8-18

PURGING DATA

WELL DIAMETER (inches): 1
TUBING DIAMETER (inches): 3/8
WELL SCREEN INTERVAL DEPTH: 4.0 feet to 9.0 feet
STATIC DEPTH TO WATER (feet): 4.45
PURGE PUMP TYPE OR BAILER: PP

WELL VOLUME PURGE: **1 WELL VOLUME** = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable)
= (9.0 feet – 4.45 feet) X 0.04 gallons/foot = 0.18 gallons

EQUIPMENT VOLUME PURGE: **1 EQUIPMENT VOL.** = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)
= gallons + (gallons/foot X feet) + gallons = gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 5.0
FINAL PUMP OR TUBING DEPTH IN WELL (feet): 5.0
PURGING INITIATED AT: 1210
PURGING ENDED AT: 1229
TOTAL VOLUME PURGED (gallons): .70

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (circle units) μmhos/cm or [✓ μS/cm]	DISSOLVED OXYGEN (circle units) mg/L or [✓ % saturation]	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
1225	.50	.50	.03	—	8.54	24.70	308	13.1	8.40	CLEAR	NONE
1227	.10	.60	.05	—	8.55	24.78	307	12.6	3.55	CLEAR	NONE
1229	.10	.70	.05	—	8.55	24.83	306	11.8	3.10	CLEAR	NONE

WELL CAPACITY (Gallons Per Foot): **0.75"** = 0.02; **1"** = 0.04; **1.25"** = 0.06; **2"** = 0.16; **3"** = 0.37; **4"** = 0.65; **5"** = 1.02; **6"** = 1.47; **12"** = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): **1/8"** = 0.0006; **3/16"** = 0.0014; **1/4"** = 0.0026; **5/16"** = 0.004; **3/8"** = 0.006; **1/2"** = 0.010; **5/8"** = 0.016

PURGING EQUIPMENT CODES: **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **PP** = Peristaltic Pump; **O** = Other (Specify)

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: MARCELO PICCHARDO / AMECFW
SAMPLER(S) SIGNATURE(S): MV
SAMPLING INITIATED AT: 1230
SAMPLING ENDED AT: 1240

PUMP OR TUBING DEPTH IN WELL (feet): 5.0
TUBING MATERIAL CODE: HDPE
FIELD-FILTERED: Y [✓ N] Filtration Equipment Type:
FILTER SIZE: ____ μm

FIELD DECONTAMINATION: PUMP Y [✓ N] TUBING Y [✓ N (replaced)]
DUPLICATE: Y [✓ N]

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION (including wet ice)			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE	SAMPLE PUMP FLOW RATE (mL per minute)
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH			
P3-DP-4	3	CG	40ml	HCL	—	—	VOCs 8260	APP	100
P3-DP-4	2	AG	100ml	H_2SO_4	—	—	TRPH FL-PRO	APP	100
P3-DP-4	1	AG	250ml	NONE	—		PAHs 8270	APP	100
P3-DP-4	1	PE	250ml	HNO_3	—	—	RCRA METALS	APP	100

REMARKS:

MATERIAL CODES: **AG** = Amber Glass; **CG** = Clear Glass; **HDPE** = High Density Polyethylene; **LDPE** = Low Density Polyethylene; **PP** = Polypropylene; **S** = Silicone; **T** = Teflon; **O** = Other (Specify)

SAMPLING EQUIPMENT CODES: **APP** = After (Through) Peristaltic Pump; **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **RFPP** = Reverse Flow Peristaltic Pump; **SM** = Straw Method (Tubing Gravity Drain); **O** = Other (Specify)

NOTES: 1. The above do not constitute all of the information required by Chapter 62-160, F.A.C.

2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)

pH: ± 0.2 units **Temperature:** ± 0.2 °C **Specific Conductance:** ± 5% **Dissolved Oxygen:** all readings ≤ 20% saturation (see Table FS 2200-2); optionally, ± 0.2 mg/L or ± 10% (whichever is greater) **Turbidity:** all readings ≤ 20 NTU; optionally ± 5 NTU or ± 10% (whichever is greater)

DEP Form FD 9000-24: GROUNDWATER SAMPLING LOG

SITE NAME: MIA PARCELS 3 & 5

SITE LOCATION: MIAMI, FL

WELL NO: P3-DP-5 (54)

SAMPLE ID: P3-DP-5 (54)

DATE: 2-8-18

PURGING DATA

WELL DIAMETER (inches): 1

TUBING DIAMETER (inches): 3/8

WELL SCREEN INTERVAL DEPTH: 50 feet to 54 feet

STATIC DEPTH TO WATER (feet): 4.50

PURGE PUMP TYPE OR BAILER: PP

WELL VOLUME PURGE: **1 WELL VOLUME =** (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable)
= (54 feet – 4.50 feet) X 0.04 gallons/foot = 1.98 gallons

EQUIPMENT VOLUME PURGE: **1 EQUIPMENT VOL.** = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)
= gallons + (gallons/foot X feet) + gallons = gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 52.5

FINAL PUMP OR TUBING DEPTH IN WELL (feet): 52.5

PURGING INITIATED AT: 1238

PURGING ENDED AT: 1254

TOTAL VOLUME PURGED (gallons): 2.60

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (circle units) µmhos/cm [✓ or µS/cm]	DISSOLVED OXYGEN (circle units) mg/L or [✓ % saturation]	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
1250	2.00	2.00	.16	NA	7.33	27.79	458	12.3	20.0	CLEAR	NONE
1252	.30	2.30	.15	NA	7.33	27.91	459	10.8	19.4	CLEAR	NONE
1254	.30	2.60	.15	NA	7.33	27.99	460	10.2	18.6	CLEAR	NONE

WELL CAPACITY (Gallons Per Foot): **0.75"** = 0.02; **1"** = 0.04; **1.25"** = 0.06; **2"** = 0.16; **3"** = 0.37; **4"** = 0.65; **5"** = 1.02; **6"** = 1.47; **12"** = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): **1/8"** = 0.0006; **3/16"** = 0.0014; **1/4"** = 0.0026; **5/16"** = 0.004; **3/8"** = 0.006; **1/2"** = 0.010; **5/8"** = 0.016

PURGING EQUIPMENT CODES: **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **PP** = Peristaltic Pump; **O** = Other (Specify)

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: MARCELO PICHARDO / AMECFW

SAMPLER(S) SIGNATURE(S):

SAMPLING INITIATED AT: 1255

SAMPLING ENDED AT: 1300

PUMP OR TUBING DEPTH IN WELL (feet): 52.5

TUBING MATERIAL CODE: HDPE

FIELD-FILTERED: Y [✓ N] FILTER SIZE: ____ µm
Filtration Equipment Type:

FIELD DECONTAMINATION: PUMP Y [✓ N] TUBING Y [✓ N (replaced)]

DUPLICATE: Y [✓ N]

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION (including wet ice)			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE	SAMPLE PUMP FLOW RATE (mL per minute)
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH			
P3-DP-5	3	CG	40ml	HCL	—	—	VINYL CHLORIDE	APP	100

REMARKS:

MATERIAL CODES: **AG** = Amber Glass; **CG** = Clear Glass; **HDPE** = High Density Polyethylene; **LDPE** = Low Density Polyethylene; **PP** = Polypropylene; **S** = Silicone; **T** = Teflon; **O** = Other (Specify)

SAMPLING EQUIPMENT CODES: **APP** = After (Through) Peristaltic Pump; **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **RFPP** = Reverse Flow Peristaltic Pump; **SM** = Straw Method (Tubing Gravity Drain); **O** = Other (Specify)

NOTES: 1. The above do not constitute all of the information required by Chapter 62-160, F.A.C.

2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)

pH: ± 0.2 units **Temperature:** ± 0.2 °C **Specific Conductance:** ± 5% **Dissolved Oxygen:** all readings ≤ 20% saturation (see Table FS 2200-2); optionally, ± 0.2 mg/L or ± 10% (whichever is greater) **Turbidity:** all readings ≤ 20 NTU; optionally ± 5 NTU or ± 10% (whichever is greater)

Form FD 9000-8: FIELD INSTRUMENT CALIBRATION RECORDS

INSTRUMENT (MAKE/MODEL#) YSI 556 MPS **INSTRUMENT #** 2

PARAMETER: *[check only one]*

☐ TEMPERATURE ☑ CONDUCTIVITY ☐ SALINITY ☑ pH ☐ ORP

☐ TURBIDITY ☐ RESIDUAL Cl ☐ DO ☐ OTHER

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A PH 7.0 EXP: 2/28/19, LOT# 7GB792

Standard B PH 10.0 EXP: OCT/2108, LOT # 6GJ351

Standard C 1.413 mS/cm EXP: 04/18, LOT # 7GD052

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
18/2/7	7:50	A	7.0	7.05		YES	INIT	MAP
18/2/7	7:53	B	10.0	9.98		YES	INIT	MAP
18/2/7	7:58	C	1.413	1.411		YES	INIT	MAP
18/2/8	820	A	7.0	6.99		YES	CONT	MAP
18/2/8	825	B	10.0	10.02		YES	CONT	MAP
18/2/8	830	C	1.413	1.410		YES	CONT	MAP

Form FD 9000-8: FIELD INSTRUMENT CALIBRATION RECORDS

INSTRUMENT (MAKE/MODEL#) YSI 556 MPS **INSTRUMENT #** 2

PARAMETER: *[check only one]*

☐ TEMPERATURE ☐ CONDUCTIVITY ☐ SALINITY ☐ pH ☐ ORP

☐ TURBIDITY ☐ RESIDUAL Cl ☒ DO ☐ OTHER

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A

Standard B

Standard C

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
18/02/7	7:38	—	100 %	100%		Y	INIT	MAP
18/02/7	1245	—	100%	100%		Y	INIT	MAP
18/02/8	800	—	100 %	100%		Y	INT	MAP
18/02/8	1300	—	100%	100 %		Y	INT	MAP

Form FD 9000-8: FIELD INSTRUMENT CALIBRATION RECORDS

INSTRUMENT (MAKE/MODEL#) LAMOTTE 2020We **INSTRUMENT #** 04

PARAMETER: *[check only one]*

☐ TEMPERATURE ☐ CONDUCTIVITY ☐ SALINITY ☐ pH ☐ ORP
☒ TURBIDITY ☐ RESIDUAL Cl ☐ DO ☐ OTHER ____________

STANDARDS: *[Specify the type(s) of standards used for calibration, the origin of the standards, the standard values, and the date the standards were prepared or purchased]*

Standard A 1.0 NTU LOT # C582717 EXP 01/18
Standard B 10.0 NTU LOT # C693333 EXP 07/18
Standard C ____________

DATE (yy/mm/dd)	TIME (hr:min)	STD (A, B, C)	STD VALUE	INSTRUMENT RESPONSE	% DEV	CALIBRATED (YES, NO)	TYPE (INIT, CONT)	SAMPLER INITIALS
18/02/07	7.40	A	1.0	1.03		Y	INIT	MAP
18/02/07	7.41	B	10.0	10.1		Y	INIT	MAP
18/02/07	12:30	A	1.0	1.07		Y	INIT	MAP
18/02/07	12:40	B	10.0	9.8		Y	INIT	MAP
18/02/08	810	A	1.0	1.01		Y	INIT	MAP
18/02/08	815	B	10.0	9.9		Y	INIT	MAP
18/02/08	1310	A	1.0	1.03		Y	INIT	MAP
18/02/08	1315	B	10.0	10.1		Y	INIT	MAP

ATTACHMENT C

SOIL AND GROUNDWATER LABORATORY ANALYTICAL RESULTS & CHAIN OF CUSTODY FORM

Pace Analytical Services, LLC
3610 Park Central Blvd N
Pompano Beach, FL 33064
954-582-4300

February 26, 2018

Ash Aitharaju
AMEC Foster Wheeler Environment & Infrastructure
5845 NW 158th Street
Miami Lakes, FL 33014

RE: Project: 6783-17-2991.04/MIA Parcel 3
Pace Project No.: 35373365

Dear Ash Aitharaju:

Enclosed are the analytical results for sample(s) received by the laboratory on February 10, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Christina Raschke

Christina Raschke
christina.raschke@pacelabs.com
(954)582-4300
Project Manager

Enclosures

NELAP ACCREDITED TNI LABORATORY

CERTIFICATIONS

Project:	6783-17-2991.04/MIA Parcel 3
Pace Project No.:	35373365

Ormond Beach Certification IDs

8 East Tower Circle, Ormond Beach, FL 32174
Alabama Certification #: 41320
Connecticut Certification #: PH-0216
Delaware Certification: FL NELAC Reciprocity
Florida Certification #: E83079
Georgia Certification #: 955
Guam Certification: FL NELAC Reciprocity
Hawaii Certification: FL NELAC Reciprocity
Illinois Certification #: 200068
Indiana Certification: FL NELAC Reciprocity
Kansas Certification #: E-10383
Louisiana Certification #: FL NELAC Reciprocity
Louisiana Environmental Certificate #: 05007
Maryland Certification: #346
Michigan Certification #: 9911
Mississippi Certification: FL NELAC Reciprocity
Missouri Certification #: 236
Montana Certification #: Cert 0074
Nebraska Certification: NE-OS-28-14
Nevada Certification: FL NELAC Reciprocity
New Jersey Certification #: FL022
New York Certification #: 11608
North Carolina Environmental Certificate #: 667
North Carolina Certification #: 12710
Oklahoma Certification #: D9947
Pennsylvania Certification #: 68-00547
Puerto Rico Certification #: FL01264
South Carolina Certification: #96042001
Tennessee Certification #: TN02974
Texas Certification: FL NELAC Reciprocity
US Virgin Islands Certification: FL NELAC Reciprocity
Virginia Environmental Certification #: 460165
Wyoming Certification: FL NELAC Reciprocity
West Virginia Certification #: 9962C
Wisconsin Certification #: 399079670
Wyoming (EPA Region 8): FL NELAC Reciprocity

Charlotte Certification IDs

9800 Kincey Ave. Ste 100, Huntersville, NC 28078
Louisiana/NELAP Certification # LA170028
North Carolina Drinking Water Certification #: 37706
North Carolina Field Services Certification #: 5342
North Carolina Wastewater Certification #: 12
South Carolina Certification #: 99006001
Florida/NELAP Certification #: E87627
Kentucky UST Certification #: 84
Virginia/VELAP Certification #: 460221

SAMPLE SUMMARY

Project: 6783-17-2991.04/MIA Parcel 3
Pace Project No.: 35373365

Lab ID	Sample ID	Matrix	Date Collected	Date Received
35373365001	**DP-1**	Water	02/07/18 13:30	02/10/18 01:00
35373365002	**DP-2**	Water	02/07/18 15:25	02/10/18 01:00
35373365003	**DP-3**	Water	02/07/18 14:50	02/10/18 01:00
35373365004	**DP-4**	Water	02/08/18 12:30	02/10/18 01:00
35373365005	**DP-5 (54')**	Water	02/08/18 12:55	02/10/18 01:00
35373365006	**Trip Blank**	Water	02/08/18 00:00	02/10/18 01:00
35373365007	**EMW-1**	Water	02/07/18 12:15	02/10/18 01:00
35373365008	**SB-1**	Solid	02/07/18 10:20	02/10/18 01:00
35373365009	**SB-2**	Solid	02/07/18 15:00	02/10/18 01:00
35373365010	**SB-3**	Solid	02/07/18 14:15	02/10/18 01:00
35373365011	**SB-6**	Solid	02/07/18 16:00	02/10/18 01:00
35373365012	**SB-5**	Solid	02/08/18 11:00	02/10/18 01:00
35373365013	**SB-4**	Solid	02/08/18 10:30	02/10/18 01:00
35373365014	**SB-7**	Solid	02/08/18 11:40	02/10/18 01:00
35373365015	**SB-8**	Solid	02/08/18 13:00	02/10/18 01:00

SAMPLE ANALYTE COUNT

Project:	6783-17-2991.04/MIA Parcel 3
Pace Project No.:	35373365

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
35373365001	**DP-1**	FL-PRO	BP2	3	PASI-O
		EPA 6010	SC1	7	PASI-O
		EPA 7470	MLO	1	PASI-O
		EPA 8270 by SIM	TWB	20	PASI-O
		EPA 8260	SK1	69	PASI-O
35373365002	**DP-2**	FL-PRO	BP2	3	PASI-O
		EPA 6010	SC1	7	PASI-O
		EPA 7470	MLO	1	PASI-O
		EPA 8270 by SIM	TWB	20	PASI-O
		EPA 8260	SK1	69	PASI-O
35373365003	**DP-3**	FL-PRO	BP2	3	PASI-O
		EPA 6010	SC1	7	PASI-O
		EPA 7470	MLO	1	PASI-O
		EPA 8270 by SIM	CB1	20	PASI-O
		EPA 8260	SK1	69	PASI-O
35373365004	**DP-4**	FL-PRO	BP2	3	PASI-O
		EPA 6010	SC1	7	PASI-O
		EPA 7470	MLO	1	PASI-O
		EPA 8270 by SIM	CB1	20	PASI-O
		EPA 8260	SK1	69	PASI-O
35373365005	**DP-5 (54')**	EPA 8260	SK1	69	PASI-O
35373365006	**Trip Blank**	EPA 8260	SK1	69	PASI-O
35373365007	**EMW-1**	FL-PRO	BP2	3	PASI-O
		EPA 6010	SC1	7	PASI-O
		EPA 7470	MLO	1	PASI-O
		EPA 8270 by SIM	CB1	20	PASI-O
		EPA 8260	SK1	69	PASI-O
35373365008	**SB-1**	FL-PRO	SMB	3	PASI-O
		EPA 6010	SC1	7	PASI-O
		EPA 7471	MLO	1	PASI-O
		EPA 8270 by SIM	PKS	21	PASI-C
		EPA 8260	QMC	69	PASI-O
		ASTM D2974-87	CS2	1	PASI-O
35373365009	**SB-2**	FL-PRO	SMB	3	PASI-O
		EPA 6010	SC1	7	PASI-O
		EPA 7471	MLO	1	PASI-O
		EPA 8270 by SIM	PKS	21	PASI-C

SAMPLE ANALYTE COUNT

Project: 6783-17-2991.04/MIA Parcel 3
Pace Project No.: 35373365

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
35373365010	**SB-3**	EPA 8260	QMC	69	PASI-O
		ASTM D2974-87	CS2	1	PASI-O
		FL-PRO	SMB	3	PASI-O
		EPA 6010	SC1	7	PASI-O
		EPA 7471	MLO	1	PASI-O
		EPA 8270 by SIM	PKS	21	PASI-C
35373365011	**SB-6**	EPA 8260	QMC	69	PASI-O
		ASTM D2974-87	CS2	1	PASI-O
		FL-PRO	SMB	3	PASI-O
		EPA 6010	SC1	7	PASI-O
		EPA 7471	MLO	1	PASI-O
		EPA 8270 by SIM	PKS	21	PASI-C
35373365012	**SB-5**	EPA 8260	QMC	69	PASI-O
		ASTM D2974-87	CS2	1	PASI-O
		FL-PRO	SMB	3	PASI-O
		EPA 6010	SC1	7	PASI-O
		EPA 7471	MLO	1	PASI-O
		EPA 8270 by SIM	PKS	21	PASI-C
35373365013	**SB-4**	EPA 8260	QMC	69	PASI-O
		ASTM D2974-87	CS2	1	PASI-O
		FL-PRO	SMB	3	PASI-O
		EPA 6010	SC1	7	PASI-O
		EPA 7471	MLO	1	PASI-O
		EPA 8270 by SIM	PKS	21	PASI-C
35373365014	**SB-7**	EPA 8260	QMC	69	PASI-O
		ASTM D2974-87	CS2	1	PASI-O
		FL-PRO	SMB	3	PASI-O
		EPA 6010	SC1	7	PASI-O
		EPA 7471	MLO	1	PASI-O
		EPA 8270 by SIM	PKS	21	PASI-C
35373365015	**SB-8**	EPA 8260	QMC	69	PASI-O
		ASTM D2974-87	CS2	1	PASI-O
		FL-PRO	SMB	3	PASI-O
		EPA 6010	SC1	7	PASI-O
		EPA 7471	MLO	1	PASI-O
		EPA 8270 by SIM	PKS	21	PASI-C
		EPA 8260	QMC	69	PASI-O

SAMPLE ANALYTE COUNT

Project: 6783-17-2991.04/MIA Parcel 3
Pace Project No.: 35373365

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		ASTM D2974-87	CS2	1	PASI-O

SUMMARY OF DETECTION

Project: 6783-17-2991.04/MIA Parcel 3
Pace Project No.: 35373365

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
35373365001	**DP-1**					
FL-PRO	Petroleum Range Organics	0.88 I	mg/L	0.98	02/16/18 06:34	
EPA 6010	Barium	11.1	ug/L	10.0	02/15/18 00:31	
EPA 8270 by SIM	Fluoranthene	0.035 I	ug/L	0.50	02/21/18 15:56	
EPA 8270 by SIM	Phenanthrene	0.037 I	ug/L	0.50	02/21/18 15:56	
EPA 8270 by SIM	Pyrene	0.025 I	ug/L	0.50	02/21/18 15:56	
35373365002	**DP-2**					
EPA 6010	Arsenic	7.4 I	ug/L	10.0	02/15/18 00:36	
EPA 6010	Barium	11.2	ug/L	10.0	02/15/18 00:36	
35373365003	**DP-3**					
FL-PRO	Petroleum Range Organics	0.82 I	mg/L	0.96	02/16/18 07:05	
EPA 6010	Arsenic	6.5 I	ug/L	10.0	02/15/18 00:39	
EPA 6010	Barium	12.6	ug/L	10.0	02/15/18 00:39	
EPA 8270 by SIM	Phenanthrene	0.026 I	ug/L	0.50	02/21/18 16:50	
35373365004	**DP-4**					
EPA 6010	Barium	10.8	ug/L	10.0	02/15/18 00:43	
EPA 8270 by SIM	Phenanthrene	0.025 I	ug/L	0.50	02/21/18 17:17	
35373365005	**DP-5 (54')**					
EPA 8260	Vinyl chloride	1.4	ug/L	1.0	02/16/18 06:08	
35373365006	**Trip Blank**					
EPA 8260	Acetone	17.1 I	ug/L	20.0	02/16/18 01:31	
35373365007	**EMW-1**					
FL-PRO	Petroleum Range Organics	0.89 I	mg/L	1.0	02/16/18 07:36	
EPA 6010	Arsenic	8.4 I	ug/L	10.0	02/15/18 00:47	
EPA 6010	Barium	10.9	ug/L	10.0	02/15/18 00:47	
35373365008	**SB-1**					
FL-PRO	Petroleum Range Organics	4.3	mg/kg	4.1	02/14/18 20:57	
EPA 6010	Arsenic	1.5	mg/kg	0.55	02/17/18 02:40	
EPA 6010	Barium	5.2	mg/kg	0.55	02/17/18 02:40	
EPA 6010	Chromium	5.3	mg/kg	0.27	02/17/18 02:40	
EPA 6010	Lead	2.6	mg/kg	0.55	02/17/18 02:40	
EPA 8270 by SIM	Benzo(a)anthracene	0.0041 I	mg/kg	0.010	02/15/18 14:12	
EPA 8270 by SIM	Benzo(a)pyrene	0.0058 I	mg/kg	0.010	02/15/18 14:12	
EPA 8270 by SIM	Benzo(b)fluoranthene	0.011	mg/kg	0.010	02/15/18 14:12	
EPA 8270 by SIM	Benzo(g,h,i)perylene	0.0040 I	mg/kg	0.010	02/15/18 14:12	
EPA 8270 by SIM	Benzo(k)fluoranthene	0.0033 I	mg/kg	0.010	02/15/18 14:12	
EPA 8270 by SIM	Chrysene	0.0083 I	mg/kg	0.010	02/15/18 14:12	
EPA 8270 by SIM	Fluoranthene	0.015	mg/kg	0.010	02/15/18 14:12	
EPA 8270 by SIM	Indeno(1,2,3-cd)pyrene	0.0040 I	mg/kg	0.010	02/15/18 14:12	
EPA 8270 by SIM	Phenanthrene	0.0066 I	mg/kg	0.010	02/15/18 14:12	
EPA 8270 by SIM	Pyrene	0.012	mg/kg	0.010	02/15/18 14:12	
EPA 8260	Acetone	1.1	mg/kg	0.019	02/14/18 21:08	L
ASTM D2974-87	Percent Moisture	3.5	%	0.10	02/15/18 12:53	

SUMMARY OF DETECTION

Project: 6783-17-2991.04/MIA Parcel 3
Pace Project No.: 35373365

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
35373365009	**SB-2**					
FL-PRO	Petroleum Range Organics	4.3 I	mg/kg	4.5	02/14/18 20:57	
EPA 6010	Arsenic	0.63 I	mg/kg	0.68	02/17/18 03:05	
EPA 6010	Barium	2.0	mg/kg	0.68	02/17/18 03:05	
EPA 6010	Chromium	2.1	mg/kg	0.34	02/17/18 03:05	
EPA 6010	Lead	1.4	mg/kg	0.68	02/17/18 03:05	
EPA 8260	Acetone	0.63	mg/kg	0.023	02/14/18 21:31	L
ASTM D2974-87	Percent Moisture	11.0	%	0.10	02/15/18 12:53	
35373365010	**SB-3**					
FL-PRO	Petroleum Range Organics	4.1 I	mg/kg	4.3	02/14/18 21:21	
EPA 6010	Arsenic	1.6	mg/kg	0.64	02/17/18 03:09	
EPA 6010	Barium	7.2	mg/kg	0.64	02/17/18 03:09	
EPA 6010	Cadmium	0.054 I	mg/kg	0.064	02/17/18 03:09	
EPA 6010	Chromium	7.1	mg/kg	0.32	02/17/18 03:09	
EPA 6010	Lead	7.0	mg/kg	0.64	02/17/18 03:09	
EPA 7471	Mercury	0.056	mg/kg	0.0089	02/19/18 10:57	
EPA 8270 by SIM	Benzo(a)anthracene	0.0040 I	mg/kg	0.054	02/15/18 14:59	J(M1)
EPA 8270 by SIM	Benzo(b)fluoranthene	0.0045 I	mg/kg	0.054	02/15/18 14:59	
EPA 8260	Acetone	0.73	mg/kg	0.018	02/14/18 21:54	L
ASTM D2974-87	Percent Moisture	6.1	%	0.10	02/15/18 12:53	
35373365011	**SB-6**					
FL-PRO	Petroleum Range Organics	4.1 I	mg/kg	4.2	02/14/18 21:21	
EPA 6010	Arsenic	1.6	mg/kg	0.58	02/17/18 03:13	
EPA 6010	Barium	3.7	mg/kg	0.58	02/17/18 03:13	
EPA 6010	Chromium	4.9	mg/kg	0.29	02/17/18 03:13	
EPA 6010	Lead	2.1	mg/kg	0.58	02/17/18 03:13	
EPA 7471	Mercury	0.0060 I	mg/kg	0.010	02/19/18 10:59	
EPA 8270 by SIM	Benzo(a)anthracene	0.00093 I	mg/kg	0.011	02/15/18 15:45	
EPA 8270 by SIM	Benzo(b)fluoranthene	0.00097 I	mg/kg	0.011	02/15/18 15:45	
EPA 8270 by SIM	Fluoranthene	0.0014 I	mg/kg	0.011	02/15/18 15:45	
EPA 8260	Acetone	0.61	mg/kg	0.020	02/15/18 03:43	L
ASTM D2974-87	Percent Moisture	4.5	%	0.10	02/15/18 12:53	
35373365012	**SB-5**					
EPA 6010	Arsenic	1.7	mg/kg	0.61	02/17/18 03:17	
EPA 6010	Barium	3.9	mg/kg	0.61	02/17/18 03:17	
EPA 6010	Chromium	5.7	mg/kg	0.31	02/17/18 03:17	
EPA 6010	Lead	2.5	mg/kg	0.61	02/17/18 03:17	
EPA 7471	Mercury	0.0070 I	mg/kg	0.0082	02/19/18 11:06	
EPA 8270 by SIM	Benzo(a)anthracene	0.0043 I	mg/kg	0.010	02/15/18 16:08	
EPA 8270 by SIM	Benzo(a)pyrene	0.0039 I	mg/kg	0.010	02/15/18 16:08	
EPA 8270 by SIM	Benzo(b)fluoranthene	0.0060 I	mg/kg	0.010	02/15/18 16:08	
EPA 8270 by SIM	Benzo(k)fluoranthene	0.0023 I	mg/kg	0.010	02/15/18 16:08	
EPA 8270 by SIM	Chrysene	0.0045 I	mg/kg	0.010	02/15/18 16:08	
EPA 8270 by SIM	Fluoranthene	0.0078 I	mg/kg	0.010	02/15/18 16:08	
EPA 8270 by SIM	2-Methylnaphthalene	0.0019 I	mg/kg	0.010	02/15/18 16:08	
EPA 8270 by SIM	Phenanthrene	0.0032 I	mg/kg	0.010	02/15/18 16:08	
EPA 8270 by SIM	Pyrene	0.0061 I	mg/kg	0.010	02/15/18 16:08	

SUMMARY OF DETECTION

Project: 6783-17-2991.04/MIA Parcel 3
Pace Project No.: 35373365

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
35373365012	**SB-5**					
EPA 8260	Acetone	0.96	mg/kg	0.021	02/15/18 04:07	L
ASTM D2974-87	Percent Moisture	3.2	%	0.10	02/15/18 12:53	J(D6)
35373365013	**SB-4**					
FL-PRO	Petroleum Range Organics	5.1	mg/kg	4.1	02/14/18 21:45	
EPA 6010	Arsenic	1.6	mg/kg	0.49	02/17/18 03:21	
EPA 6010	Barium	4.1	mg/kg	0.49	02/17/18 03:21	
EPA 6010	Chromium	5.4	mg/kg	0.25	02/17/18 03:21	
EPA 6010	Lead	2.9	mg/kg	0.49	02/17/18 03:21	
EPA 7471	Mercury	0.0062 I	mg/kg	0.0096	02/19/18 11:08	
EPA 8260	Acetone	1.1	mg/kg	0.022	02/15/18 04:30	L
EPA 8260	2-Butanone (MEK)	0.0029 I	mg/kg	0.0054	02/15/18 04:30	
ASTM D2974-87	Percent Moisture	4.0	%	0.10	02/15/18 12:53	
35373365014	**SB-7**					
FL-PRO	Petroleum Range Organics	20.3	mg/kg	4.4	02/14/18 22:09	
EPA 6010	Arsenic	1.6	mg/kg	0.59	02/17/18 03:25	
EPA 6010	Barium	10	mg/kg	0.59	02/17/18 03:25	
EPA 6010	Chromium	5.4	mg/kg	0.30	02/17/18 03:25	
EPA 6010	Lead	3.8	mg/kg	0.59	02/17/18 03:25	
EPA 8270 by SIM	Anthracene	0.0033 I	mg/kg	0.011	02/15/18 17:18	
EPA 8270 by SIM	Benzo(a)anthracene	0.031	mg/kg	0.011	02/15/18 17:18	
EPA 8270 by SIM	Benzo(a)pyrene	0.024	mg/kg	0.011	02/15/18 17:18	
EPA 8270 by SIM	Benzo(b)fluoranthene	0.035	mg/kg	0.011	02/15/18 17:18	
EPA 8270 by SIM	Benzo(g,h,i)perylene	0.0098 I	mg/kg	0.011	02/15/18 17:18	
EPA 8270 by SIM	Benzo(k)fluoranthene	0.012	mg/kg	0.011	02/15/18 17:18	
EPA 8270 by SIM	Chrysene	0.028	mg/kg	0.011	02/15/18 17:18	
EPA 8270 by SIM	Dibenz(a,h)anthracene	0.0040 I	mg/kg	0.011	02/15/18 17:18	
EPA 8270 by SIM	Fluoranthene	0.047	mg/kg	0.011	02/15/18 17:18	
EPA 8270 by SIM	Indeno(1,2,3-cd)pyrene	0.011	mg/kg	0.011	02/15/18 17:18	
EPA 8270 by SIM	Phenanthrene	0.011	mg/kg	0.011	02/15/18 17:18	
EPA 8270 by SIM	Pyrene	0.034	mg/kg	0.011	02/15/18 17:18	
EPA 8260	Acetone	0.87	mg/kg	0.019	02/15/18 04:53	L
ASTM D2974-87	Percent Moisture	9.6	%	0.10	02/15/18 12:53	
35373365015	**SB-8**					
FL-PRO	Petroleum Range Organics	4.8	mg/kg	4.3	02/14/18 22:09	
EPA 6010	Arsenic	2.2	mg/kg	0.56	02/17/18 03:30	
EPA 6010	Barium	4.0	mg/kg	0.56	02/17/18 03:30	
EPA 6010	Cadmium	0.090	mg/kg	0.056	02/17/18 03:30	
EPA 6010	Chromium	8.4	mg/kg	0.28	02/17/18 03:30	
EPA 6010	Lead	8.3	mg/kg	0.56	02/17/18 03:30	
EPA 7471	Mercury	0.014	mg/kg	0.0096	02/19/18 11:12	
EPA 8270 by SIM	Benzo(b)fluoranthene	0.0037 I	mg/kg	0.053	02/15/18 17:41	
EPA 8270 by SIM	Fluoranthene	0.0047 I	mg/kg	0.053	02/15/18 17:41	
EPA 8260	Acetone	0.60	mg/kg	0.019	02/15/18 05:16	L
ASTM D2974-87	Percent Moisture	6.7	%	0.10	02/15/18 12:53	

ANALYTICAL RESULTS

Project: 6783-17-2991.04/MIA Parcel 3
Pace Project No.: 35373365

Sample: DP-1 **Lab ID: 35373365001** Collected: 02/07/18 13:30 Received: 02/10/18 01:00 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
FL-PRO Water, Low Volume	Analytical Method: FL-PRO Preparation Method: EPA 3510								
Petroleum Range Organics	**0.88 I**	mg/L	0.98	0.78	1	02/12/18 23:59	02/16/18 06:34		
Surrogates									
o-Terphenyl (S)	96	%	82-142		1	02/12/18 23:59	02/16/18 06:34	84-15-1	
N-Pentatriacontane (S)	98	%	42-159		1	02/12/18 23:59	02/16/18 06:34	630-07-09	
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010								
Arsenic	**5.0 U**	ug/L	10.0	5.0	1	02/14/18 06:21	02/15/18 00:31	7440-38-2	
Barium	**11.1**	ug/L	10.0	5.0	1	02/14/18 06:21	02/15/18 00:31	7440-39-3	
Cadmium	**0.50 U**	ug/L	1.0	0.50	1	02/14/18 06:21	02/15/18 00:31	7440-43-9	
Chromium	**2.5 U**	ug/L	5.0	2.5	1	02/14/18 06:21	02/15/18 00:31	7440-47-3	
Lead	**5.0 U**	ug/L	10.0	5.0	1	02/14/18 06:21	02/15/18 00:31	7439-92-1	
Selenium	**7.5 U**	ug/L	15.0	7.5	1	02/14/18 06:21	02/15/18 00:31	7782-49-2	
Silver	**2.5 U**	ug/L	5.0	2.5	1	02/14/18 06:21	02/15/18 00:31	7440-22-4	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**0.10 U**	ug/L	0.20	0.10	1	02/16/18 15:51	02/19/18 10:04	7439-97-6	
8270 MSSV PAHLV by SIM	Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3510								
Acenaphthene	**0.013 U**	ug/L	0.50	0.013	1	02/13/18 11:14	02/21/18 15:56	83-32-9	
Acenaphthylene	**0.012 U**	ug/L	0.50	0.012	1	02/13/18 11:14	02/21/18 15:56	208-96-8	
Anthracene	**0.012 U**	ug/L	0.50	0.012	1	02/13/18 11:14	02/21/18 15:56	120-12-7	
Benzo(a)anthracene	**0.055 U**	ug/L	0.10	0.055	1	02/13/18 11:14	02/21/18 15:56	56-55-3	
Benzo(a)pyrene	**0.020 U**	ug/L	0.10	0.020	1	02/13/18 11:14	02/21/18 15:56	50-32-8	
Benzo(b)fluoranthene	**0.027 U**	ug/L	0.10	0.027	1	02/13/18 11:14	02/21/18 15:56	205-99-2	
Benzo(g,h,i)perylene	**0.042 U**	ug/L	0.50	0.042	1	02/13/18 11:14	02/21/18 15:56	191-24-2	
Benzo(k)fluoranthene	**0.023 U**	ug/L	0.50	0.023	1	02/13/18 11:14	02/21/18 15:56	207-08-9	
Chrysene	**0.026 U**	ug/L	0.50	0.026	1	02/13/18 11:14	02/21/18 15:56	218-01-9	
Dibenz(a,h)anthracene	**0.13 U**	ug/L	0.15	0.13	1	02/13/18 11:14	02/21/18 15:56	53-70-3	
Fluoranthene	**0.035 I**	ug/L	0.50	0.018	1	02/13/18 11:14	02/21/18 15:56	206-44-0	
Fluorene	**0.016 U**	ug/L	0.50	0.016	1	02/13/18 11:14	02/21/18 15:56	86-73-7	
Indeno(1,2,3-cd)pyrene	**0.12 U**	ug/L	0.15	0.12	1	02/13/18 11:14	02/21/18 15:56	193-39-5	
1-Methylnaphthalene	**0.032 U**	ug/L	2.0	0.032	1	02/13/18 11:14	02/21/18 15:56	90-12-0	
2-Methylnaphthalene	**0.11 U**	ug/L	2.0	0.11	1	02/13/18 11:14	02/21/18 15:56	91-57-6	
Naphthalene	**0.048 U**	ug/L	2.0	0.048	1	02/13/18 11:14	02/21/18 15:56	91-20-3	
Phenanthrene	**0.037 I**	ug/L	0.50	0.018	1	02/13/18 11:14	02/21/18 15:56	85-01-8	
Pyrene	**0.025 I**	ug/L	0.50	0.019	1	02/13/18 11:14	02/21/18 15:56	129-00-0	
Surrogates									
2-Fluorobiphenyl (S)	72	%	33-101		1	02/13/18 11:14	02/21/18 15:56	321-60-8	
p-Terphenyl-d14 (S)	76	%	38-115		1	02/13/18 11:14	02/21/18 15:56	1718-51-0	
8260 MSV	Analytical Method: EPA 8260								
1,1,1,2-Tetrachloroethane	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 05:51	630-20-6	
1,1,1-Trichloroethane	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 05:51	71-55-6	
1,1,2,2-Tetrachloroethane	**0.12 U**	ug/L	0.50	0.12	1		02/16/18 05:51	79-34-5	
1,1,2-Trichloroethane	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 05:51	79-00-5	
1,1-Dichloroethane	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 05:51	75-34-3	

ANALYTICAL RESULTS

Project: 6783-17-2991.04/MIA Parcel 3
Pace Project No.: 35373365

Sample: DP-1 **Lab ID: 35373365001** Collected: 02/07/18 13:30 Received: 02/10/18 01:00 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260								
1,1-Dichloroethene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 05:51	75-35-4	
1,1-Dichloropropene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 05:51	563-58-6	
1,2,3-Trichlorobenzene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 05:51	87-61-6	
1,2,3-Trichloropropane	**0.59 U**	ug/L	2.0	0.59	1		02/16/18 05:51	96-18-4	
1,2,3-Trimethylbenzene	**1.0 U**	ug/L	1.0	1.0	1		02/16/18 05:51	526-73-8	
1,2,4-Trichlorobenzene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 05:51	120-82-1	
1,2,4-Trimethylbenzene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 05:51	95-63-6	
1,2-Dichlorobenzene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 05:51	95-50-1	
1,2-Dichloroethane	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 05:51	107-06-2	
1,2-Dichloropropane	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 05:51	78-87-5	
1,3,5-Trimethylbenzene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 05:51	108-67-8	
1,3-Dichlorobenzene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 05:51	541-73-1	
1,3-Dichloropropane	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 05:51	142-28-9	
1,4-Dichlorobenzene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 05:51	106-46-7	
2,2-Dichloropropane	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 05:51	594-20-7	
2-Butanone (MEK)	**5.0 U**	ug/L	10.0	5.0	1		02/16/18 05:51	78-93-3	
2-Chlorotoluene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 05:51	95-49-8	
2-Hexanone	**5.0 U**	ug/L	10.0	5.0	1		02/16/18 05:51	591-78-6	
4-Chlorotoluene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 05:51	106-43-4	
4-Methyl-2-pentanone (MIBK)	**5.0 U**	ug/L	10.0	5.0	1		02/16/18 05:51	108-10-1	
Acetone	**10.0 U**	ug/L	20.0	10.0	1		02/16/18 05:51	67-64-1	
Acetonitrile	**5.0 U**	ug/L	40.0	5.0	1		02/16/18 05:51	75-05-8	
Benzene	**0.10 U**	ug/L	1.0	0.10	1		02/16/18 05:51	71-43-2	
Bromobenzene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 05:51	108-86-1	
Bromochloromethane	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 05:51	74-97-5	
Bromodichloromethane	**0.27 U**	ug/L	0.60	0.27	1		02/16/18 05:51	75-27-4	
Bromoform	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 05:51	75-25-2	
Bromomethane	**0.50 U**	ug/L	5.0	0.50	1		02/16/18 05:51	74-83-9	
Carbon disulfide	**5.0 U**	ug/L	10.0	5.0	1		02/16/18 05:51	75-15-0	
Carbon tetrachloride	**0.50 U**	ug/L	3.0	0.50	1		02/16/18 05:51	56-23-5	
Chlorobenzene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 05:51	108-90-7	
Chloroethane	**0.50 U**	ug/L	10.0	0.50	1		02/16/18 05:51	75-00-3	
Chloroform	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 05:51	67-66-3	
Chloromethane	**0.62 U**	ug/L	1.0	0.62	1		02/16/18 05:51	74-87-3	
Dibromochloromethane	**0.26 U**	ug/L	2.0	0.26	1		02/16/18 05:51	124-48-1	
Dibromomethane	**0.50 U**	ug/L	2.0	0.50	1		02/16/18 05:51	74-95-3	
Dichlorodifluoromethane	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 05:51	75-71-8	
Ethylbenzene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 05:51	100-41-4	
Iodomethane	**0.50 U**	ug/L	10.0	0.50	1		02/16/18 05:51	74-88-4	
Isopropylbenzene (Cumene)	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 05:51	98-82-8	
Methyl-tert-butyl ether	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 05:51	1634-04-4	
Methylene Chloride	**2.5 U**	ug/L	5.0	2.5	1		02/16/18 05:51	75-09-2	
Styrene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 05:51	100-42-5	
Tetrachloroethene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 05:51	127-18-4	
Toluene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 05:51	108-88-3	
Trichloroethene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 05:51	79-01-6	

ANALYTICAL RESULTS

Project: 6783-17-2991.04/MIA Parcel 3
Pace Project No.: 35373365

Sample: DP-1 **Lab ID: 35373365001** Collected: 02/07/18 13:30 Received: 02/10/18 01:00 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260								
Trichlorofluoromethane	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 05:51	75-69-4	
Vinyl acetate	**1.0 U**	ug/L	10.0	1.0	1		02/16/18 05:51	108-05-4	
Vinyl chloride	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 05:51	75-01-4	
Xylene (Total)	**1.0 U**	ug/L	3.0	1.0	1		02/16/18 05:51	1330-20-7	
cis-1,2-Dichloroethene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 05:51	156-59-2	
cis-1,3-Dichloropropene	**0.25 U**	ug/L	0.50	0.25	1		02/16/18 05:51	10061-01-5	
m&p-Xylene	**1.0 U**	ug/L	2.0	1.0	1		02/16/18 05:51	179601-23-1	
n-Butylbenzene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 05:51	104-51-8	
n-Propylbenzene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 05:51	103-65-1	
o-Xylene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 05:51	95-47-6	
p-Isopropyltoluene	**0.50 U**	ug/L	5.0	0.50	1		02/16/18 05:51	99-87-6	
sec-Butylbenzene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 05:51	135-98-8	
tert-Butylbenzene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 05:51	98-06-6	
trans-1,2-Dichloroethene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 05:51	156-60-5	
trans-1,3-Dichloropropene	**0.25 U**	ug/L	0.50	0.25	1		02/16/18 05:51	10061-02-6	
Surrogates									
4-Bromofluorobenzene (S)	107	%	89-111		1		02/16/18 05:51	460-00-4	
1,2-Dichloroethane-d4 (S)	102	%	75-135		1		02/16/18 05:51	17060-07-0	
Toluene-d8 (S)	101	%	89-112		1		02/16/18 05:51	2037-26-5	

ANALYTICAL RESULTS

Project: 6783-17-2991.04/MIA Parcel 3
Pace Project No.: 35373365

Sample: DP-2 **Lab ID: 35373365002** Collected: 02/07/18 15:25 Received: 02/10/18 01:00 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
FL-PRO Water, Low Volume	Analytical Method: FL-PRO Preparation Method: EPA 3510								
Petroleum Range Organics	**0.77 U**	mg/L	0.97	0.77	1	02/12/18 23:59	02/16/18 07:05		
Surrogates									
o-Terphenyl (S)	114	%	82-142		1	02/12/18 23:59	02/16/18 07:05	84-15-1	
N-Pentatriacontane (S)	118	%	42-159		1	02/12/18 23:59	02/16/18 07:05	630-07-09	
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010								
Arsenic	**7.4 I**	ug/L	10.0	5.0	1	02/14/18 06:21	02/15/18 00:36	7440-38-2	
Barium	**11.2**	ug/L	10.0	5.0	1	02/14/18 06:21	02/15/18 00:36	7440-39-3	
Cadmium	**0.50 U**	ug/L	1.0	0.50	1	02/14/18 06:21	02/15/18 00:36	7440-43-9	
Chromium	**2.5 U**	ug/L	5.0	2.5	1	02/14/18 06:21	02/15/18 00:36	7440-47-3	
Lead	**5.0 U**	ug/L	10.0	5.0	1	02/14/18 06:21	02/15/18 00:36	7439-92-1	
Selenium	**7.5 U**	ug/L	15.0	7.5	1	02/14/18 06:21	02/15/18 00:36	7782-49-2	
Silver	**2.5 U**	ug/L	5.0	2.5	1	02/14/18 06:21	02/15/18 00:36	7440-22-4	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**0.10 U**	ug/L	0.20	0.10	1	02/16/18 15:51	02/19/18 10:06	7439-97-6	
8270 MSSV PAHLV by SIM	Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3510								
Acenaphthene	**0.013 U**	ug/L	0.50	0.013	1	02/13/18 11:14	02/21/18 16:23	83-32-9	
Acenaphthylene	**0.012 U**	ug/L	0.50	0.012	1	02/13/18 11:14	02/21/18 16:23	208-96-8	
Anthracene	**0.012 U**	ug/L	0.50	0.012	1	02/13/18 11:14	02/21/18 16:23	120-12-7	
Benzo(a)anthracene	**0.055 U**	ug/L	0.10	0.055	1	02/13/18 11:14	02/21/18 16:23	56-55-3	
Benzo(a)pyrene	**0.020 U**	ug/L	0.10	0.020	1	02/13/18 11:14	02/21/18 16:23	50-32-8	
Benzo(b)fluoranthene	**0.027 U**	ug/L	0.10	0.027	1	02/13/18 11:14	02/21/18 16:23	205-99-2	
Benzo(g,h,i)perylene	**0.042 U**	ug/L	0.50	0.042	1	02/13/18 11:14	02/21/18 16:23	191-24-2	
Benzo(k)fluoranthene	**0.023 U**	ug/L	0.50	0.023	1	02/13/18 11:14	02/21/18 16:23	207-08-9	
Chrysene	**0.026 U**	ug/L	0.50	0.026	1	02/13/18 11:14	02/21/18 16:23	218-01-9	
Dibenz(a,h)anthracene	**0.13 U**	ug/L	0.15	0.13	1	02/13/18 11:14	02/21/18 16:23	53-70-3	
Fluoranthene	**0.018 U**	ug/L	0.50	0.018	1	02/13/18 11:14	02/21/18 16:23	206-44-0	
Fluorene	**0.016 U**	ug/L	0.50	0.016	1	02/13/18 11:14	02/21/18 16:23	86-73-7	
Indeno(1,2,3-cd)pyrene	**0.12 U**	ug/L	0.15	0.12	1	02/13/18 11:14	02/21/18 16:23	193-39-5	
1-Methylnaphthalene	**0.032 U**	ug/L	2.0	0.032	1	02/13/18 11:14	02/21/18 16:23	90-12-0	
2-Methylnaphthalene	**0.11 U**	ug/L	2.0	0.11	1	02/13/18 11:14	02/21/18 16:23	91-57-6	
Naphthalene	**0.048 U**	ug/L	2.0	0.048	1	02/13/18 11:14	02/21/18 16:23	91-20-3	
Phenanthrene	**0.018 U**	ug/L	0.50	0.018	1	02/13/18 11:14	02/21/18 16:23	85-01-8	
Pyrene	**0.019 U**	ug/L	0.50	0.019	1	02/13/18 11:14	02/21/18 16:23	129-00-0	
Surrogates									
2-Fluorobiphenyl (S)	72	%	33-101		1	02/13/18 11:14	02/21/18 16:23	321-60-8	
p-Terphenyl-d14 (S)	76	%	38-115		1	02/13/18 11:14	02/21/18 16:23	1718-51-0	
8260 MSV	Analytical Method: EPA 8260								
1,1,1,2-Tetrachloroethane	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:17	630-20-6	
1,1,1-Trichloroethane	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:17	71-55-6	
1,1,2,2-Tetrachloroethane	**0.12 U**	ug/L	0.50	0.12	1		02/16/18 06:17	79-34-5	
1,1,2-Trichloroethane	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:17	79-00-5	
1,1-Dichloroethane	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:17	75-34-3	

ANALYTICAL RESULTS

Project: 6783-17-2991.04/MIA Parcel 3
Pace Project No.: 35373365

Sample: DP-2 **Lab ID: 35373365002** Collected: 02/07/18 15:25 Received: 02/10/18 01:00 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260								
1,1-Dichloroethene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:17	75-35-4	
1,1-Dichloropropene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:17	563-58-6	
1,2,3-Trichlorobenzene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:17	87-61-6	
1,2,3-Trichloropropane	**0.59 U**	ug/L	2.0	0.59	1		02/16/18 06:17	96-18-4	
1,2,3-Trimethylbenzene	**1.0 U**	ug/L	1.0	1.0	1		02/16/18 06:17	526-73-8	
1,2,4-Trichlorobenzene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:17	120-82-1	
1,2,4-Trimethylbenzene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:17	95-63-6	
1,2-Dichlorobenzene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:17	95-50-1	
1,2-Dichloroethane	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:17	107-06-2	
1,2-Dichloropropane	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:17	78-87-5	
1,3,5-Trimethylbenzene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:17	108-67-8	
1,3-Dichlorobenzene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:17	541-73-1	
1,3-Dichloropropane	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:17	142-28-9	
1,4-Dichlorobenzene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:17	106-46-7	
2,2-Dichloropropane	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:17	594-20-7	
2-Butanone (MEK)	**5.0 U**	ug/L	10.0	5.0	1		02/16/18 06:17	78-93-3	
2-Chlorotoluene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:17	95-49-8	
2-Hexanone	**5.0 U**	ug/L	10.0	5.0	1		02/16/18 06:17	591-78-6	
4-Chlorotoluene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:17	106-43-4	
4-Methyl-2-pentanone (MIBK)	**5.0 U**	ug/L	10.0	5.0	1		02/16/18 06:17	108-10-1	
Acetone	**10.0 U**	ug/L	20.0	10.0	1		02/16/18 06:17	67-64-1	
Acetonitrile	**5.0 U**	ug/L	40.0	5.0	1		02/16/18 06:17	75-05-8	
Benzene	**0.10 U**	ug/L	1.0	0.10	1		02/16/18 06:17	71-43-2	
Bromobenzene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:17	108-86-1	
Bromochloromethane	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:17	74-97-5	
Bromodichloromethane	**0.27 U**	ug/L	0.60	0.27	1		02/16/18 06:17	75-27-4	
Bromoform	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:17	75-25-2	
Bromomethane	**0.50 U**	ug/L	5.0	0.50	1		02/16/18 06:17	74-83-9	
Carbon disulfide	**5.0 U**	ug/L	10.0	5.0	1		02/16/18 06:17	75-15-0	
Carbon tetrachloride	**0.50 U**	ug/L	3.0	0.50	1		02/16/18 06:17	56-23-5	
Chlorobenzene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:17	108-90-7	
Chloroethane	**0.50 U**	ug/L	10.0	0.50	1		02/16/18 06:17	75-00-3	
Chloroform	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:17	67-66-3	
Chloromethane	**0.62 U**	ug/L	1.0	0.62	1		02/16/18 06:17	74-87-3	
Dibromochloromethane	**0.26 U**	ug/L	2.0	0.26	1		02/16/18 06:17	124-48-1	
Dibromomethane	**0.50 U**	ug/L	2.0	0.50	1		02/16/18 06:17	74-95-3	
Dichlorodifluoromethane	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:17	75-71-8	
Ethylbenzene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:17	100-41-4	
Iodomethane	**0.50 U**	ug/L	10.0	0.50	1		02/16/18 06:17	74-88-4	
Isopropylbenzene (Cumene)	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:17	98-82-8	
Methyl-tert-butyl ether	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:17	1634-04-4	
Methylene Chloride	**2.5 U**	ug/L	5.0	2.5	1		02/16/18 06:17	75-09-2	
Styrene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:17	100-42-5	
Tetrachloroethene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:17	127-18-4	
Toluene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:17	108-88-3	
Trichloroethene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:17	79-01-6	

ANALYTICAL RESULTS

Project: 6783-17-2991.04/MIA Parcel 3
Pace Project No.: 35373365

Sample: DP-2 **Lab ID: 35373365002** Collected: 02/07/18 15:25 Received: 02/10/18 01:00 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260								
Trichlorofluoromethane	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:17	75-69-4	
Vinyl acetate	**1.0 U**	ug/L	10.0	1.0	1		02/16/18 06:17	108-05-4	
Vinyl chloride	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:17	75-01-4	
Xylene (Total)	**1.0 U**	ug/L	3.0	1.0	1		02/16/18 06:17	1330-20-7	
cis-1,2-Dichloroethene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:17	156-59-2	
cis-1,3-Dichloropropene	**0.25 U**	ug/L	0.50	0.25	1		02/16/18 06:17	10061-01-5	
m&p-Xylene	**1.0 U**	ug/L	2.0	1.0	1		02/16/18 06:17	179601-23-1	
n-Butylbenzene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:17	104-51-8	
n-Propylbenzene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:17	103-65-1	
o-Xylene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:17	95-47-6	
p-Isopropyltoluene	**0.50 U**	ug/L	5.0	0.50	1		02/16/18 06:17	99-87-6	
sec-Butylbenzene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:17	135-98-8	
tert-Butylbenzene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:17	98-06-6	
trans-1,2-Dichloroethene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:17	156-60-5	
trans-1,3-Dichloropropene	**0.25 U**	ug/L	0.50	0.25	1		02/16/18 06:17	10061-02-6	
Surrogates									
4-Bromofluorobenzene (S)	107	%	89-111		1		02/16/18 06:17	460-00-4	
1,2-Dichloroethane-d4 (S)	104	%	75-135		1		02/16/18 06:17	17060-07-0	
Toluene-d8 (S)	99	%	89-112		1		02/16/18 06:17	2037-26-5	

ANALYTICAL RESULTS

Project: 6783-17-2991.04/MIA Parcel 3
Pace Project No.: 35373365

Sample: DP-3 **Lab ID: 35373365003** Collected: 02/07/18 14:50 Received: 02/10/18 01:00 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
FL-PRO Water, Low Volume	Analytical Method: FL-PRO Preparation Method: EPA 3510								
Petroleum Range Organics	**0.82 I**	mg/L	0.96	0.77	1	02/12/18 23:59	02/16/18 07:05		
Surrogates									
o-Terphenyl (S)	91	%	82-142		1	02/12/18 23:59	02/16/18 07:05	84-15-1	
N-Pentatriacontane (S)	101	%	42-159		1	02/12/18 23:59	02/16/18 07:05	630-07-09	
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010								
Arsenic	**6.5 I**	ug/L	10.0	5.0	1	02/14/18 06:21	02/15/18 00:39	7440-38-2	
Barium	**12.6**	ug/L	10.0	5.0	1	02/14/18 06:21	02/15/18 00:39	7440-39-3	
Cadmium	**0.50 U**	ug/L	1.0	0.50	1	02/14/18 06:21	02/15/18 00:39	7440-43-9	
Chromium	**2.5 U**	ug/L	5.0	2.5	1	02/14/18 06:21	02/15/18 00:39	7440-47-3	
Lead	**5.0 U**	ug/L	10.0	5.0	1	02/14/18 06:21	02/15/18 00:39	7439-92-1	
Selenium	**7.5 U**	ug/L	15.0	7.5	1	02/14/18 06:21	02/15/18 00:39	7782-49-2	
Silver	**2.5 U**	ug/L	5.0	2.5	1	02/14/18 06:21	02/15/18 00:39	7440-22-4	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**0.10 U**	ug/L	0.20	0.10	1	02/16/18 15:51	02/19/18 10:08	7439-97-6	
8270 MSSV PAHLV by SIM	Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3510								
Acenaphthene	**0.013 U**	ug/L	0.50	0.013	1	02/13/18 11:14	02/21/18 16:50	83-32-9	
Acenaphthylene	**0.012 U**	ug/L	0.50	0.012	1	02/13/18 11:14	02/21/18 16:50	208-96-8	
Anthracene	**0.012 U**	ug/L	0.50	0.012	1	02/13/18 11:14	02/21/18 16:50	120-12-7	
Benzo(a)anthracene	**0.055 U**	ug/L	0.10	0.055	1	02/13/18 11:14	02/21/18 16:50	56-55-3	
Benzo(a)pyrene	**0.020 U**	ug/L	0.10	0.020	1	02/13/18 11:14	02/21/18 16:50	50-32-8	
Benzo(b)fluoranthene	**0.027 U**	ug/L	0.10	0.027	1	02/13/18 11:14	02/21/18 16:50	205-99-2	
Benzo(g,h,i)perylene	**0.042 U**	ug/L	0.50	0.042	1	02/13/18 11:14	02/21/18 16:50	191-24-2	
Benzo(k)fluoranthene	**0.023 U**	ug/L	0.50	0.023	1	02/13/18 11:14	02/21/18 16:50	207-08-9	
Chrysene	**0.026 U**	ug/L	0.50	0.026	1	02/13/18 11:14	02/21/18 16:50	218-01-9	
Dibenz(a,h)anthracene	**0.13 U**	ug/L	0.15	0.13	1	02/13/18 11:14	02/21/18 16:50	53-70-3	
Fluoranthene	**0.018 U**	ug/L	0.50	0.018	1	02/13/18 11:14	02/21/18 16:50	206-44-0	
Fluorene	**0.016 U**	ug/L	0.50	0.016	1	02/13/18 11:14	02/21/18 16:50	86-73-7	
Indeno(1,2,3-cd)pyrene	**0.12 U**	ug/L	0.15	0.12	1	02/13/18 11:14	02/21/18 16:50	193-39-5	
1-Methylnaphthalene	**0.032 U**	ug/L	2.0	0.032	1	02/13/18 11:14	02/21/18 16:50	90-12-0	
2-Methylnaphthalene	**0.11 U**	ug/L	2.0	0.11	1	02/13/18 11:14	02/21/18 16:50	91-57-6	
Naphthalene	**0.048 U**	ug/L	2.0	0.048	1	02/13/18 11:14	02/21/18 16:50	91-20-3	
Phenanthrene	**0.026 I**	ug/L	0.50	0.018	1	02/13/18 11:14	02/21/18 16:50	85-01-8	
Pyrene	**0.019 U**	ug/L	0.50	0.019	1	02/13/18 11:14	02/21/18 16:50	129-00-0	
Surrogates									
2-Fluorobiphenyl (S)	76	%	33-101		1	02/13/18 11:14	02/21/18 16:50	321-60-8	
p-Terphenyl-d14 (S)	81	%	38-115		1	02/13/18 11:14	02/21/18 16:50	1718-51-0	
8260 MSV	Analytical Method: EPA 8260								
1,1,1,2-Tetrachloroethane	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:42	630-20-6	
1,1,1-Trichloroethane	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:42	71-55-6	
1,1,2,2-Tetrachloroethane	**0.12 U**	ug/L	0.50	0.12	1		02/16/18 06:42	79-34-5	
1,1,2-Trichloroethane	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:42	79-00-5	
1,1-Dichloroethane	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:42	75-34-3	

ANALYTICAL RESULTS

Project: 6783-17-2991.04/MIA Parcel 3
Pace Project No.: 35373365

Sample: DP-3 **Lab ID: 35373365003** Collected: 02/07/18 14:50 Received: 02/10/18 01:00 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260								
1,1-Dichloroethene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:42	75-35-4	
1,1-Dichloropropene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:42	563-58-6	
1,2,3-Trichlorobenzene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:42	87-61-6	
1,2,3-Trichloropropane	**0.59 U**	ug/L	2.0	0.59	1		02/16/18 06:42	96-18-4	
1,2,3-Trimethylbenzene	**1.0 U**	ug/L	1.0	1.0	1		02/16/18 06:42	526-73-8	
1,2,4-Trichlorobenzene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:42	120-82-1	
1,2,4-Trimethylbenzene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:42	95-63-6	
1,2-Dichlorobenzene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:42	95-50-1	
1,2-Dichloroethane	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:42	107-06-2	
1,2-Dichloropropane	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:42	78-87-5	
1,3,5-Trimethylbenzene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:42	108-67-8	
1,3-Dichlorobenzene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:42	541-73-1	
1,3-Dichloropropane	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:42	142-28-9	
1,4-Dichlorobenzene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:42	106-46-7	
2,2-Dichloropropane	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:42	594-20-7	
2-Butanone (MEK)	**5.0 U**	ug/L	10.0	5.0	1		02/16/18 06:42	78-93-3	
2-Chlorotoluene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:42	95-49-8	
2-Hexanone	**5.0 U**	ug/L	10.0	5.0	1		02/16/18 06:42	591-78-6	
4-Chlorotoluene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:42	106-43-4	
4-Methyl-2-pentanone (MIBK)	**5.0 U**	ug/L	10.0	5.0	1		02/16/18 06:42	108-10-1	
Acetone	**10.0 U**	ug/L	20.0	10.0	1		02/16/18 06:42	67-64-1	
Acetonitrile	**5.0 U**	ug/L	40.0	5.0	1		02/16/18 06:42	75-05-8	
Benzene	**0.10 U**	ug/L	1.0	0.10	1		02/16/18 06:42	71-43-2	
Bromobenzene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:42	108-86-1	
Bromochloromethane	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:42	74-97-5	
Bromodichloromethane	**0.27 U**	ug/L	0.60	0.27	1		02/16/18 06:42	75-27-4	
Bromoform	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:42	75-25-2	
Bromomethane	**0.50 U**	ug/L	5.0	0.50	1		02/16/18 06:42	74-83-9	
Carbon disulfide	**5.0 U**	ug/L	10.0	5.0	1		02/16/18 06:42	75-15-0	
Carbon tetrachloride	**0.50 U**	ug/L	3.0	0.50	1		02/16/18 06:42	56-23-5	
Chlorobenzene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:42	108-90-7	
Chloroethane	**0.50 U**	ug/L	10.0	0.50	1		02/16/18 06:42	75-00-3	
Chloroform	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:42	67-66-3	
Chloromethane	**0.62 U**	ug/L	1.0	0.62	1		02/16/18 06:42	74-87-3	
Dibromochloromethane	**0.26 U**	ug/L	2.0	0.26	1		02/16/18 06:42	124-48-1	
Dibromomethane	**0.50 U**	ug/L	2.0	0.50	1		02/16/18 06:42	74-95-3	
Dichlorodifluoromethane	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:42	75-71-8	
Ethylbenzene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:42	100-41-4	
Iodomethane	**0.50 U**	ug/L	10.0	0.50	1		02/16/18 06:42	74-88-4	
Isopropylbenzene (Cumene)	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:42	98-82-8	
Methyl-tert-butyl ether	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:42	1634-04-4	
Methylene Chloride	**2.5 U**	ug/L	5.0	2.5	1		02/16/18 06:42	75-09-2	
Styrene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:42	100-42-5	
Tetrachloroethene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:42	127-18-4	
Toluene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:42	108-88-3	
Trichloroethene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:42	79-01-6	

ANALYTICAL RESULTS

Project: 6783-17-2991.04/MIA Parcel 3
Pace Project No.: 35373365

Sample: DP-3 **Lab ID: 35373365003** Collected: 02/07/18 14:50 Received: 02/10/18 01:00 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260								
Trichlorofluoromethane	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:42	75-69-4	
Vinyl acetate	**1.0 U**	ug/L	10.0	1.0	1		02/16/18 06:42	108-05-4	
Vinyl chloride	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:42	75-01-4	
Xylene (Total)	**1.0 U**	ug/L	3.0	1.0	1		02/16/18 06:42	1330-20-7	
cis-1,2-Dichloroethene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:42	156-59-2	
cis-1,3-Dichloropropene	**0.25 U**	ug/L	0.50	0.25	1		02/16/18 06:42	10061-01-5	
m&p-Xylene	**1.0 U**	ug/L	2.0	1.0	1		02/16/18 06:42	179601-23-1	
n-Butylbenzene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:42	104-51-8	
n-Propylbenzene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:42	103-65-1	
o-Xylene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:42	95-47-6	
p-Isopropyltoluene	**0.50 U**	ug/L	5.0	0.50	1		02/16/18 06:42	99-87-6	
sec-Butylbenzene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:42	135-98-8	
tert-Butylbenzene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:42	98-06-6	
trans-1,2-Dichloroethene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:42	156-60-5	
trans-1,3-Dichloropropene	**0.25 U**	ug/L	0.50	0.25	1		02/16/18 06:42	10061-02-6	
Surrogates									
4-Bromofluorobenzene (S)	105	%	89-111		1		02/16/18 06:42	460-00-4	
1,2-Dichloroethane-d4 (S)	103	%	75-135		1		02/16/18 06:42	17060-07-0	
Toluene-d8 (S)	99	%	89-112		1		02/16/18 06:42	2037-26-5	

ANALYTICAL RESULTS

Project: 6783-17-2991.04/MIA Parcel 3
Pace Project No.: 35373365

Sample: DP-4 **Lab ID: 35373365004** Collected: 02/08/18 12:30 Received: 02/10/18 01:00 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
FL-PRO Water, Low Volume	Analytical Method: FL-PRO Preparation Method: EPA 3510								
Petroleum Range Organics	**0.79 U**	mg/L	0.99	0.79	1	02/12/18 23:59	02/16/18 07:36		
Surrogates									
o-Terphenyl (S)	90	%	82-142		1	02/12/18 23:59	02/16/18 07:36	84-15-1	
N-Pentatriacontane (S)	83	%	42-159		1	02/12/18 23:59	02/16/18 07:36	630-07-09	
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010								
Arsenic	**5.0 U**	ug/L	10.0	5.0	1	02/14/18 06:21	02/15/18 00:43	7440-38-2	
Barium	**10.8**	ug/L	10.0	5.0	1	02/14/18 06:21	02/15/18 00:43	7440-39-3	
Cadmium	**0.50 U**	ug/L	1.0	0.50	1	02/14/18 06:21	02/15/18 00:43	7440-43-9	
Chromium	**2.5 U**	ug/L	5.0	2.5	1	02/14/18 06:21	02/15/18 00:43	7440-47-3	
Lead	**5.0 U**	ug/L	10.0	5.0	1	02/14/18 06:21	02/15/18 00:43	7439-92-1	
Selenium	**7.5 U**	ug/L	15.0	7.5	1	02/14/18 06:21	02/15/18 00:43	7782-49-2	
Silver	**2.5 U**	ug/L	5.0	2.5	1	02/14/18 06:21	02/15/18 00:43	7440-22-4	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**0.10 U**	ug/L	0.20	0.10	1	02/16/18 15:51	02/19/18 10:15	7439-97-6	
8270 MSSV PAHLV by SIM	Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3510								
Acenaphthene	**0.013 U**	ug/L	0.50	0.013	1	02/13/18 11:14	02/21/18 17:17	83-32-9	
Acenaphthylene	**0.012 U**	ug/L	0.50	0.012	1	02/13/18 11:14	02/21/18 17:17	208-96-8	
Anthracene	**0.012 U**	ug/L	0.50	0.012	1	02/13/18 11:14	02/21/18 17:17	120-12-7	
Benzo(a)anthracene	**0.055 U**	ug/L	0.10	0.055	1	02/13/18 11:14	02/21/18 17:17	56-55-3	
Benzo(a)pyrene	**0.020 U**	ug/L	0.10	0.020	1	02/13/18 11:14	02/21/18 17:17	50-32-8	
Benzo(b)fluoranthene	**0.027 U**	ug/L	0.10	0.027	1	02/13/18 11:14	02/21/18 17:17	205-99-2	
Benzo(g,h,i)perylene	**0.042 U**	ug/L	0.50	0.042	1	02/13/18 11:14	02/21/18 17:17	191-24-2	
Benzo(k)fluoranthene	**0.023 U**	ug/L	0.50	0.023	1	02/13/18 11:14	02/21/18 17:17	207-08-9	
Chrysene	**0.026 U**	ug/L	0.50	0.026	1	02/13/18 11:14	02/21/18 17:17	218-01-9	
Dibenz(a,h)anthracene	**0.13 U**	ug/L	0.15	0.13	1	02/13/18 11:14	02/21/18 17:17	53-70-3	
Fluoranthene	**0.018 U**	ug/L	0.50	0.018	1	02/13/18 11:14	02/21/18 17:17	206-44-0	
Fluorene	**0.016 U**	ug/L	0.50	0.016	1	02/13/18 11:14	02/21/18 17:17	86-73-7	
Indeno(1,2,3-cd)pyrene	**0.12 U**	ug/L	0.15	0.12	1	02/13/18 11:14	02/21/18 17:17	193-39-5	
1-Methylnaphthalene	**0.032 U**	ug/L	2.0	0.032	1	02/13/18 11:14	02/21/18 17:17	90-12-0	
2-Methylnaphthalene	**0.11 U**	ug/L	2.0	0.11	1	02/13/18 11:14	02/21/18 17:17	91-57-6	
Naphthalene	**0.048 U**	ug/L	2.0	0.048	1	02/13/18 11:14	02/21/18 17:17	91-20-3	
Phenanthrene	**0.025 I**	ug/L	0.50	0.018	1	02/13/18 11:14	02/21/18 17:17	85-01-8	
Pyrene	**0.019 U**	ug/L	0.50	0.019	1	02/13/18 11:14	02/21/18 17:17	129-00-0	
Surrogates									
2-Fluorobiphenyl (S)	59	%	33-101		1	02/13/18 11:14	02/21/18 17:17	321-60-8	
p-Terphenyl-d14 (S)	72	%	38-115		1	02/13/18 11:14	02/21/18 17:17	1718-51-0	
8260 MSV	Analytical Method: EPA 8260								
1,1,1,2-Tetrachloroethane	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 07:09	630-20-6	
1,1,1-Trichloroethane	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 07:09	71-55-6	
1,1,2,2-Tetrachloroethane	**0.12 U**	ug/L	0.50	0.12	1		02/16/18 07:09	79-34-5	
1,1,2-Trichloroethane	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 07:09	79-00-5	
1,1-Dichloroethane	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 07:09	75-34-3	

ANALYTICAL RESULTS

Project: 6783-17-2991.04/MIA Parcel 3
Pace Project No.: 35373365

Sample: DP-4 **Lab ID: 35373365004** Collected: 02/08/18 12:30 Received: 02/10/18 01:00 Matrix: Water

8260 MSV Analytical Method: EPA 8260

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
1,1-Dichloroethene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 07:09	75-35-4	
1,1-Dichloropropene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 07:09	563-58-6	
1,2,3-Trichlorobenzene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 07:09	87-61-6	
1,2,3-Trichloropropane	**0.59 U**	ug/L	2.0	0.59	1		02/16/18 07:09	96-18-4	
1,2,3-Trimethylbenzene	**1.0 U**	ug/L	1.0	1.0	1		02/16/18 07:09	526-73-8	
1,2,4-Trichlorobenzene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 07:09	120-82-1	
1,2,4-Trimethylbenzene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 07:09	95-63-6	
1,2-Dichlorobenzene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 07:09	95-50-1	
1,2-Dichloroethane	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 07:09	107-06-2	
1,2-Dichloropropane	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 07:09	78-87-5	
1,3,5-Trimethylbenzene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 07:09	108-67-8	
1,3-Dichlorobenzene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 07:09	541-73-1	
1,3-Dichloropropane	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 07:09	142-28-9	
1,4-Dichlorobenzene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 07:09	106-46-7	
2,2-Dichloropropane	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 07:09	594-20-7	
2-Butanone (MEK)	**5.0 U**	ug/L	10.0	5.0	1		02/16/18 07:09	78-93-3	
2-Chlorotoluene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 07:09	95-49-8	
2-Hexanone	**5.0 U**	ug/L	10.0	5.0	1		02/16/18 07:09	591-78-6	
4-Chlorotoluene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 07:09	106-43-4	
4-Methyl-2-pentanone (MIBK)	**5.0 U**	ug/L	10.0	5.0	1		02/16/18 07:09	108-10-1	
Acetone	**10.0 U**	ug/L	20.0	10.0	1		02/16/18 07:09	67-64-1	
Acetonitrile	**5.0 U**	ug/L	40.0	5.0	1		02/16/18 07:09	75-05-8	
Benzene	**0.10 U**	ug/L	1.0	0.10	1		02/16/18 07:09	71-43-2	
Bromobenzene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 07:09	108-86-1	
Bromochloromethane	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 07:09	74-97-5	
Bromodichloromethane	**0.27 U**	ug/L	0.60	0.27	1		02/16/18 07:09	75-27-4	
Bromoform	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 07:09	75-25-2	
Bromomethane	**0.50 U**	ug/L	5.0	0.50	1		02/16/18 07:09	74-83-9	
Carbon disulfide	**5.0 U**	ug/L	10.0	5.0	1		02/16/18 07:09	75-15-0	
Carbon tetrachloride	**0.50 U**	ug/L	3.0	0.50	1		02/16/18 07:09	56-23-5	
Chlorobenzene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 07:09	108-90-7	
Chloroethane	**0.50 U**	ug/L	10.0	0.50	1		02/16/18 07:09	75-00-3	
Chloroform	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 07:09	67-66-3	
Chloromethane	**0.62 U**	ug/L	1.0	0.62	1		02/16/18 07:09	74-87-3	
Dibromochloromethane	**0.26 U**	ug/L	2.0	0.26	1		02/16/18 07:09	124-48-1	
Dibromomethane	**0.50 U**	ug/L	2.0	0.50	1		02/16/18 07:09	74-95-3	
Dichlorodifluoromethane	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 07:09	75-71-8	
Ethylbenzene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 07:09	100-41-4	
Iodomethane	**0.50 U**	ug/L	10.0	0.50	1		02/16/18 07:09	74-88-4	
Isopropylbenzene (Cumene)	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 07:09	98-82-8	
Methyl-tert-butyl ether	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 07:09	1634-04-4	
Methylene Chloride	**2.5 U**	ug/L	5.0	2.5	1		02/16/18 07:09	75-09-2	
Styrene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 07:09	100-42-5	
Tetrachloroethene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 07:09	127-18-4	
Toluene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 07:09	108-88-3	
Trichloroethene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 07:09	79-01-6	

ANALYTICAL RESULTS

Project: 6783-17-2991.04/MIA Parcel 3
Pace Project No.: 35373365

Sample: DP-4 **Lab ID: 35373365004** Collected: 02/08/18 12:30 Received: 02/10/18 01:00 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260								
Trichlorofluoromethane	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 07:09	75-69-4	
Vinyl acetate	**1.0 U**	ug/L	10.0	1.0	1		02/16/18 07:09	108-05-4	
Vinyl chloride	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 07:09	75-01-4	
Xylene (Total)	**1.0 U**	ug/L	3.0	1.0	1		02/16/18 07:09	1330-20-7	
cis-1,2-Dichloroethene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 07:09	156-59-2	
cis-1,3-Dichloropropene	**0.25 U**	ug/L	0.50	0.25	1		02/16/18 07:09	10061-01-5	
m&p-Xylene	**1.0 U**	ug/L	2.0	1.0	1		02/16/18 07:09	179601-23-1	
n-Butylbenzene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 07:09	104-51-8	
n-Propylbenzene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 07:09	103-65-1	
o-Xylene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 07:09	95-47-6	
p-Isopropyltoluene	**0.50 U**	ug/L	5.0	0.50	1		02/16/18 07:09	99-87-6	
sec-Butylbenzene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 07:09	135-98-8	
tert-Butylbenzene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 07:09	98-06-6	
trans-1,2-Dichloroethene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 07:09	156-60-5	
trans-1,3-Dichloropropene	**0.25 U**	ug/L	0.50	0.25	1		02/16/18 07:09	10061-02-6	
Surrogates									
4-Bromofluorobenzene (S)	105	%	89-111		1		02/16/18 07:09	460-00-4	
1,2-Dichloroethane-d4 (S)	104	%	75-135		1		02/16/18 07:09	17060-07-0	
Toluene-d8 (S)	98	%	89-112		1		02/16/18 07:09	2037-26-5	

ANALYTICAL RESULTS

Project: 6783-17-2991.04/MIA Parcel 3
Pace Project No.: 35373365

Sample: DP-5 (54') **Lab ID: 35373365005** Collected: 02/08/18 12:55 Received: 02/10/18 01:00 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260								
1,1,1,2-Tetrachloroethane	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:08	630-20-6	
1,1,1-Trichloroethane	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:08	71-55-6	
1,1,2,2-Tetrachloroethane	**0.12 U**	ug/L	0.50	0.12	1		02/16/18 06:08	79-34-5	
1,1,2-Trichloroethane	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:08	79-00-5	
1,1-Dichloroethane	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:08	75-34-3	
1,1-Dichloroethene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:08	75-35-4	
1,1-Dichloropropene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:08	563-58-6	
1,2,3-Trichlorobenzene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:08	87-61-6	
1,2,3-Trichloropropane	**0.59 U**	ug/L	2.0	0.59	1		02/16/18 06:08	96-18-4	
1,2,3-Trimethylbenzene	**1.0 U**	ug/L	1.0	1.0	1		02/16/18 06:08	526-73-8	
1,2,4-Trichlorobenzene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:08	120-82-1	
1,2,4-Trimethylbenzene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:08	95-63-6	
1,2-Dichlorobenzene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:08	95-50-1	
1,2-Dichloroethane	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:08	107-06-2	
1,2-Dichloropropane	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:08	78-87-5	
1,3,5-Trimethylbenzene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:08	108-67-8	
1,3-Dichlorobenzene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:08	541-73-1	
1,3-Dichloropropane	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:08	142-28-9	
1,4-Dichlorobenzene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:08	106-46-7	
2,2-Dichloropropane	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:08	594-20-7	
2-Butanone (MEK)	**5.0 U**	ug/L	10.0	5.0	1		02/16/18 06:08	78-93-3	
2-Chlorotoluene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:08	95-49-8	
2-Hexanone	**5.0 U**	ug/L	10.0	5.0	1		02/16/18 06:08	591-78-6	
4-Chlorotoluene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:08	106-43-4	
4-Methyl-2-pentanone (MIBK)	**5.0 U**	ug/L	10.0	5.0	1		02/16/18 06:08	108-10-1	
Acetone	**10.0 U**	ug/L	20.0	10.0	1		02/16/18 06:08	67-64-1	
Acetonitrile	**5.0 U**	ug/L	40.0	5.0	1		02/16/18 06:08	75-05-8	
Benzene	**0.10 U**	ug/L	1.0	0.10	1		02/16/18 06:08	71-43-2	
Bromobenzene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:08	108-86-1	
Bromochloromethane	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:08	74-97-5	
Bromodichloromethane	**0.27 U**	ug/L	0.60	0.27	1		02/16/18 06:08	75-27-4	
Bromoform	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:08	75-25-2	
Bromomethane	**0.50 U**	ug/L	5.0	0.50	1		02/16/18 06:08	74-83-9	
Carbon disulfide	**5.0 U**	ug/L	10.0	5.0	1		02/16/18 06:08	75-15-0	
Carbon tetrachloride	**0.50 U**	ug/L	3.0	0.50	1		02/16/18 06:08	56-23-5	
Chlorobenzene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:08	108-90-7	
Chloroethane	**0.50 U**	ug/L	10.0	0.50	1		02/16/18 06:08	75-00-3	
Chloroform	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:08	67-66-3	
Chloromethane	**0.62 U**	ug/L	1.0	0.62	1		02/16/18 06:08	74-87-3	
Dibromochloromethane	**0.26 U**	ug/L	2.0	0.26	1		02/16/18 06:08	124-48-1	
Dibromomethane	**0.50 U**	ug/L	2.0	0.50	1		02/16/18 06:08	74-95-3	
Dichlorodifluoromethane	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:08	75-71-8	
Ethylbenzene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:08	100-41-4	
Iodomethane	**0.50 U**	ug/L	10.0	0.50	1		02/16/18 06:08	74-88-4	
Isopropylbenzene (Cumene)	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:08	98-82-8	
Methyl-tert-butyl ether	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:08	1634-04-4	

ANALYTICAL RESULTS

Project: 6783-17-2991.04/MIA Parcel 3
Pace Project No.: 35373365

Sample: DP-5 (54') **Lab ID: 35373365005** Collected: 02/08/18 12:55 Received: 02/10/18 01:00 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260								
Methylene Chloride	**2.5 U**	ug/L	5.0	2.5	1		02/16/18 06:08	75-09-2	
Styrene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:08	100-42-5	
Tetrachloroethene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:08	127-18-4	
Toluene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:08	108-88-3	
Trichloroethene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:08	79-01-6	
Trichlorofluoromethane	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:08	75-69-4	
Vinyl acetate	**1.0 U**	ug/L	10.0	1.0	1		02/16/18 06:08	108-05-4	
Vinyl chloride	**1.4**	ug/L	1.0	0.50	1		02/16/18 06:08	75-01-4	
Xylene (Total)	**1.5 U**	ug/L	3.0	1.5	1		02/16/18 06:08	1330-20-7	
cis-1,2-Dichloroethene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:08	156-59-2	
cis-1,3-Dichloropropene	**0.25 U**	ug/L	0.50	0.25	1		02/16/18 06:08	10061-01-5	
m&p-Xylene	**1.0 U**	ug/L	2.0	1.0	1		02/16/18 06:08	179601-23-1	
n-Butylbenzene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:08	104-51-8	
n-Propylbenzene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:08	103-65-1	
o-Xylene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:08	95-47-6	
p-Isopropyltoluene	**0.50 U**	ug/L	5.0	0.50	1		02/16/18 06:08	99-87-6	
sec-Butylbenzene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:08	135-98-8	
tert-Butylbenzene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:08	98-06-6	
trans-1,2-Dichloroethene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 06:08	156-60-5	
trans-1,3-Dichloropropene	**0.25 U**	ug/L	0.50	0.25	1		02/16/18 06:08	10061-02-6	
Surrogates									
4-Bromofluorobenzene (S)	94	%	89-111		1		02/16/18 06:08	460-00-4	
1,2-Dichloroethane-d4 (S)	109	%	75-135		1		02/16/18 06:08	17060-07-0	
Toluene-d8 (S)	104	%	89-112		1		02/16/18 06:08	2037-26-5	

ANALYTICAL RESULTS

Project: 6783-17-2991.04/MIA Parcel 3
Pace Project No.: 35373365

Sample: Trip Blank **Lab ID: 35373365006** Collected: 02/08/18 00:00 Received: 02/10/18 01:00 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260								
1,1,1,2-Tetrachloroethane	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 01:31	630-20-6	
1,1,1-Trichloroethane	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 01:31	71-55-6	
1,1,2,2-Tetrachloroethane	**0.12 U**	ug/L	0.50	0.12	1		02/16/18 01:31	79-34-5	
1,1,2-Trichloroethane	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 01:31	79-00-5	
1,1-Dichloroethane	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 01:31	75-34-3	
1,1-Dichloroethene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 01:31	75-35-4	
1,1-Dichloropropene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 01:31	563-58-6	
1,2,3-Trichlorobenzene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 01:31	87-61-6	
1,2,3-Trichloropropane	**0.59 U**	ug/L	2.0	0.59	1		02/16/18 01:31	96-18-4	
1,2,3-Trimethylbenzene	**1.0 U**	ug/L	1.0	1.0	1		02/16/18 01:31	526-73-8	
1,2,4-Trichlorobenzene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 01:31	120-82-1	
1,2,4-Trimethylbenzene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 01:31	95-63-6	
1,2-Dichlorobenzene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 01:31	95-50-1	
1,2-Dichloroethane	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 01:31	107-06-2	
1,2-Dichloropropane	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 01:31	78-87-5	
1,3,5-Trimethylbenzene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 01:31	108-67-8	
1,3-Dichlorobenzene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 01:31	541-73-1	
1,3-Dichloropropane	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 01:31	142-28-9	
1,4-Dichlorobenzene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 01:31	106-46-7	
2,2-Dichloropropane	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 01:31	594-20-7	
2-Butanone (MEK)	**5.0 U**	ug/L	10.0	5.0	1		02/16/18 01:31	78-93-3	
2-Chlorotoluene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 01:31	95-49-8	
2-Hexanone	**5.0 U**	ug/L	10.0	5.0	1		02/16/18 01:31	591-78-6	
4-Chlorotoluene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 01:31	106-43-4	
4-Methyl-2-pentanone (MIBK)	**5.0 U**	ug/L	10.0	5.0	1		02/16/18 01:31	108-10-1	
Acetone	**17.1 I**	ug/L	20.0	10.0	1		02/16/18 01:31	67-64-1	
Acetonitrile	**5.0 U**	ug/L	40.0	5.0	1		02/16/18 01:31	75-05-8	
Benzene	**0.10 U**	ug/L	1.0	0.10	1		02/16/18 01:31	71-43-2	
Bromobenzene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 01:31	108-86-1	
Bromochloromethane	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 01:31	74-97-5	
Bromodichloromethane	**0.27 U**	ug/L	0.60	0.27	1		02/16/18 01:31	75-27-4	
Bromoform	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 01:31	75-25-2	
Bromomethane	**0.50 U**	ug/L	5.0	0.50	1		02/16/18 01:31	74-83-9	
Carbon disulfide	**5.0 U**	ug/L	10.0	5.0	1		02/16/18 01:31	75-15-0	
Carbon tetrachloride	**0.50 U**	ug/L	3.0	0.50	1		02/16/18 01:31	56-23-5	
Chlorobenzene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 01:31	108-90-7	
Chloroethane	**0.50 U**	ug/L	10.0	0.50	1		02/16/18 01:31	75-00-3	
Chloroform	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 01:31	67-66-3	
Chloromethane	**0.62 U**	ug/L	1.0	0.62	1		02/16/18 01:31	74-87-3	
Dibromochloromethane	**0.26 U**	ug/L	2.0	0.26	1		02/16/18 01:31	124-48-1	
Dibromomethane	**0.50 U**	ug/L	2.0	0.50	1		02/16/18 01:31	74-95-3	
Dichlorodifluoromethane	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 01:31	75-71-8	
Ethylbenzene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 01:31	100-41-4	
Iodomethane	**0.50 U**	ug/L	10.0	0.50	1		02/16/18 01:31	74-88-4	
Isopropylbenzene (Cumene)	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 01:31	98-82-8	
Methyl-tert-butyl ether	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 01:31	1634-04-4	

ANALYTICAL RESULTS

Project: 6783-17-2991.04/MIA Parcel 3
Pace Project No.: 35373365

Sample: Trip Blank **Lab ID: 35373365006** Collected: 02/08/18 00:00 Received: 02/10/18 01:00 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260								
Methylene Chloride	**2.5 U**	ug/L	5.0	2.5	1		02/16/18 01:31	75-09-2	
Styrene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 01:31	100-42-5	
Tetrachloroethene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 01:31	127-18-4	
Toluene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 01:31	108-88-3	
Trichloroethene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 01:31	79-01-6	
Trichlorofluoromethane	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 01:31	75-69-4	
Vinyl acetate	**1.0 U**	ug/L	10.0	1.0	1		02/16/18 01:31	108-05-4	
Vinyl chloride	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 01:31	75-01-4	
Xylene (Total)	**1.0 U**	ug/L	3.0	1.0	1		02/16/18 01:31	1330-20-7	
cis-1,2-Dichloroethene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 01:31	156-59-2	
cis-1,3-Dichloropropene	**0.25 U**	ug/L	0.50	0.25	1		02/16/18 01:31	10061-01-5	
m&p-Xylene	**1.0 U**	ug/L	2.0	1.0	1		02/16/18 01:31	179601-23-1	
n-Butylbenzene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 01:31	104-51-8	
n-Propylbenzene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 01:31	103-65-1	
o-Xylene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 01:31	95-47-6	
p-Isopropyltoluene	**0.50 U**	ug/L	5.0	0.50	1		02/16/18 01:31	99-87-6	
sec-Butylbenzene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 01:31	135-98-8	
tert-Butylbenzene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 01:31	98-06-6	
trans-1,2-Dichloroethene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 01:31	156-60-5	
trans-1,3-Dichloropropene	**0.25 U**	ug/L	0.50	0.25	1		02/16/18 01:31	10061-02-6	
Surrogates									
4-Bromofluorobenzene (S)	106	%	89-111		1		02/16/18 01:31	460-00-4	
1,2-Dichloroethane-d4 (S)	106	%	75-135		1		02/16/18 01:31	17060-07-0	
Toluene-d8 (S)	99	%	89-112		1		02/16/18 01:31	2037-26-5	

ANALYTICAL RESULTS

Project: 6783-17-2991.04/MIA Parcel 3
Pace Project No.: 35373365

Sample: EMW-1 **Lab ID: 35373365007** Collected: 02/07/18 12:15 Received: 02/10/18 01:00 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
FL-PRO Water, Low Volume	Analytical Method: FL-PRO Preparation Method: EPA 3510								
Petroleum Range Organics	**0.89 I**	mg/L	1.0	0.80	1	02/12/18 23:59	02/16/18 07:36		
Surrogates									
o-Terphenyl (S)	107	%	82-142		1	02/12/18 23:59	02/16/18 07:36	84-15-1	
N-Pentatriacontane (S)	112	%	42-159		1	02/12/18 23:59	02/16/18 07:36	630-07-09	
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010								
Arsenic	**8.4 I**	ug/L	10.0	5.0	1	02/14/18 06:21	02/15/18 00:47	7440-38-2	
Barium	**10.9**	ug/L	10.0	5.0	1	02/14/18 06:21	02/15/18 00:47	7440-39-3	
Cadmium	**0.50 U**	ug/L	1.0	0.50	1	02/14/18 06:21	02/15/18 00:47	7440-43-9	
Chromium	**2.5 U**	ug/L	5.0	2.5	1	02/14/18 06:21	02/15/18 00:47	7440-47-3	
Lead	**5.0 U**	ug/L	10.0	5.0	1	02/14/18 06:21	02/15/18 00:47	7439-92-1	
Selenium	**7.5 U**	ug/L	15.0	7.5	1	02/14/18 06:21	02/15/18 00:47	7782-49-2	
Silver	**2.5 U**	ug/L	5.0	2.5	1	02/14/18 06:21	02/15/18 00:47	7440-22-4	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**0.10 U**	ug/L	0.20	0.10	1	02/16/18 15:51	02/19/18 10:17	7439-97-6	
8270 MSSV PAHLV by SIM	Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3510								
Acenaphthene	**0.013 U**	ug/L	0.50	0.013	1	02/13/18 11:14	02/22/18 09:59	83-32-9	
Acenaphthylene	**0.012 U**	ug/L	0.50	0.012	1	02/13/18 11:14	02/22/18 09:59	208-96-8	
Anthracene	**0.012 U**	ug/L	0.50	0.012	1	02/13/18 11:14	02/22/18 09:59	120-12-7	
Benzo(a)anthracene	**0.055 U**	ug/L	0.10	0.055	1	02/13/18 11:14	02/22/18 09:59	56-55-3	
Benzo(a)pyrene	**0.020 U**	ug/L	0.10	0.020	1	02/13/18 11:14	02/22/18 09:59	50-32-8	
Benzo(b)fluoranthene	**0.027 U**	ug/L	0.10	0.027	1	02/13/18 11:14	02/22/18 09:59	205-99-2	
Benzo(g,h,i)perylene	**0.042 U**	ug/L	0.50	0.042	1	02/13/18 11:14	02/22/18 09:59	191-24-2	
Benzo(k)fluoranthene	**0.023 U**	ug/L	0.50	0.023	1	02/13/18 11:14	02/22/18 09:59	207-08-9	
Chrysene	**0.026 U**	ug/L	0.50	0.026	1	02/13/18 11:14	02/22/18 09:59	218-01-9	
Dibenz(a,h)anthracene	**0.13 U**	ug/L	0.15	0.13	1	02/13/18 11:14	02/22/18 09:59	53-70-3	
Fluoranthene	**0.018 U**	ug/L	0.50	0.018	1	02/13/18 11:14	02/22/18 09:59	206-44-0	
Fluorene	**0.016 U**	ug/L	0.50	0.016	1	02/13/18 11:14	02/22/18 09:59	86-73-7	
Indeno(1,2,3-cd)pyrene	**0.12 U**	ug/L	0.15	0.12	1	02/13/18 11:14	02/22/18 09:59	193-39-5	
1-Methylnaphthalene	**0.032 U**	ug/L	2.0	0.032	1	02/13/18 11:14	02/22/18 09:59	90-12-0	
2-Methylnaphthalene	**0.11 U**	ug/L	2.0	0.11	1	02/13/18 11:14	02/22/18 09:59	91-57-6	
Naphthalene	**0.048 U**	ug/L	2.0	0.048	1	02/13/18 11:14	02/22/18 09:59	91-20-3	
Phenanthrene	**0.018 U**	ug/L	0.50	0.018	1	02/13/18 11:14	02/22/18 09:59	85-01-8	
Pyrene	**0.019 U**	ug/L	0.50	0.019	1	02/13/18 11:14	02/22/18 09:59	129-00-0	
Surrogates									
2-Fluorobiphenyl (S)	64	%	33-101		1	02/13/18 11:14	02/22/18 09:59	321-60-8	
p-Terphenyl-d14 (S)	74	%	38-115		1	02/13/18 11:14	02/22/18 09:59	1718-51-0	
8260 MSV	Analytical Method: EPA 8260								
1,1,1,2-Tetrachloroethane	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 07:34	630-20-6	
1,1,1-Trichloroethane	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 07:34	71-55-6	
1,1,2,2-Tetrachloroethane	**0.12 U**	ug/L	0.50	0.12	1		02/16/18 07:34	79-34-5	
1,1,2-Trichloroethane	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 07:34	79-00-5	
1,1-Dichloroethane	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 07:34	75-34-3	

ANALYTICAL RESULTS

Project: 6783-17-2991.04/MIA Parcel 3
Pace Project No.: 35373365

Sample: EMW-1 **Lab ID: 35373365007** Collected: 02/07/18 12:15 Received: 02/10/18 01:00 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260								
1,1-Dichloroethene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 07:34	75-35-4	
1,1-Dichloropropene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 07:34	563-58-6	
1,2,3-Trichlorobenzene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 07:34	87-61-6	
1,2,3-Trichloropropane	**0.59 U**	ug/L	2.0	0.59	1		02/16/18 07:34	96-18-4	
1,2,3-Trimethylbenzene	**1.0 U**	ug/L	1.0	1.0	1		02/16/18 07:34	526-73-8	
1,2,4-Trichlorobenzene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 07:34	120-82-1	
1,2,4-Trimethylbenzene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 07:34	95-63-6	
1,2-Dichlorobenzene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 07:34	95-50-1	
1,2-Dichloroethane	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 07:34	107-06-2	
1,2-Dichloropropane	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 07:34	78-87-5	
1,3,5-Trimethylbenzene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 07:34	108-67-8	
1,3-Dichlorobenzene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 07:34	541-73-1	
1,3-Dichloropropane	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 07:34	142-28-9	
1,4-Dichlorobenzene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 07:34	106-46-7	
2,2-Dichloropropane	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 07:34	594-20-7	
2-Butanone (MEK)	**5.0 U**	ug/L	10.0	5.0	1		02/16/18 07:34	78-93-3	
2-Chlorotoluene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 07:34	95-49-8	
2-Hexanone	**5.0 U**	ug/L	10.0	5.0	1		02/16/18 07:34	591-78-6	
4-Chlorotoluene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 07:34	106-43-4	
4-Methyl-2-pentanone (MIBK)	**5.0 U**	ug/L	10.0	5.0	1		02/16/18 07:34	108-10-1	
Acetone	**10.0 U**	ug/L	20.0	10.0	1		02/16/18 07:34	67-64-1	
Acetonitrile	**5.0 U**	ug/L	40.0	5.0	1		02/16/18 07:34	75-05-8	
Benzene	**0.10 U**	ug/L	1.0	0.10	1		02/16/18 07:34	71-43-2	
Bromobenzene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 07:34	108-86-1	
Bromochloromethane	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 07:34	74-97-5	
Bromodichloromethane	**0.27 U**	ug/L	0.60	0.27	1		02/16/18 07:34	75-27-4	
Bromoform	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 07:34	75-25-2	
Bromomethane	**0.50 U**	ug/L	5.0	0.50	1		02/16/18 07:34	74-83-9	
Carbon disulfide	**5.0 U**	ug/L	10.0	5.0	1		02/16/18 07:34	75-15-0	
Carbon tetrachloride	**0.50 U**	ug/L	3.0	0.50	1		02/16/18 07:34	56-23-5	
Chlorobenzene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 07:34	108-90-7	
Chloroethane	**0.50 U**	ug/L	10.0	0.50	1		02/16/18 07:34	75-00-3	
Chloroform	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 07:34	67-66-3	
Chloromethane	**0.62 U**	ug/L	1.0	0.62	1		02/16/18 07:34	74-87-3	
Dibromochloromethane	**0.26 U**	ug/L	2.0	0.26	1		02/16/18 07:34	124-48-1	
Dibromomethane	**0.50 U**	ug/L	2.0	0.50	1		02/16/18 07:34	74-95-3	
Dichlorodifluoromethane	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 07:34	75-71-8	
Ethylbenzene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 07:34	100-41-4	
Iodomethane	**0.50 U**	ug/L	10.0	0.50	1		02/16/18 07:34	74-88-4	
Isopropylbenzene (Cumene)	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 07:34	98-82-8	
Methyl-tert-butyl ether	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 07:34	1634-04-4	
Methylene Chloride	**2.5 U**	ug/L	5.0	2.5	1		02/16/18 07:34	75-09-2	
Styrene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 07:34	100-42-5	
Tetrachloroethene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 07:34	127-18-4	
Toluene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 07:34	108-88-3	
Trichloroethene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 07:34	79-01-6	

ANALYTICAL RESULTS

Project: 6783-17-2991.04/MIA Parcel 3
Pace Project No.: 35373365

Sample: EMW-1 **Lab ID: 35373365007** Collected: 02/07/18 12:15 Received: 02/10/18 01:00 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260								
Trichlorofluoromethane	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 07:34	75-69-4	
Vinyl acetate	**1.0 U**	ug/L	10.0	1.0	1		02/16/18 07:34	108-05-4	
Vinyl chloride	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 07:34	75-01-4	
Xylene (Total)	**1.0 U**	ug/L	3.0	1.0	1		02/16/18 07:34	1330-20-7	
cis-1,2-Dichloroethene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 07:34	156-59-2	
cis-1,3-Dichloropropene	**0.25 U**	ug/L	0.50	0.25	1		02/16/18 07:34	10061-01-5	
m&p-Xylene	**1.0 U**	ug/L	2.0	1.0	1		02/16/18 07:34	179601-23-1	
n-Butylbenzene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 07:34	104-51-8	
n-Propylbenzene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 07:34	103-65-1	
o-Xylene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 07:34	95-47-6	
p-Isopropyltoluene	**0.50 U**	ug/L	5.0	0.50	1		02/16/18 07:34	99-87-6	
sec-Butylbenzene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 07:34	135-98-8	
tert-Butylbenzene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 07:34	98-06-6	
trans-1,2-Dichloroethene	**0.50 U**	ug/L	1.0	0.50	1		02/16/18 07:34	156-60-5	
trans-1,3-Dichloropropene	**0.25 U**	ug/L	0.50	0.25	1		02/16/18 07:34	10061-02-6	
Surrogates									
4-Bromofluorobenzene (S)	106	%	89-111		1		02/16/18 07:34	460-00-4	
1,2-Dichloroethane-d4 (S)	104	%	75-135		1		02/16/18 07:34	17060-07-0	
Toluene-d8 (S)	99	%	89-112		1		02/16/18 07:34	2037-26-5	

ANALYTICAL RESULTS

Project:	6783-17-2991.04/MIA Parcel 3
Pace Project No.:	35373365

Sample: SB-1 **Lab ID: 35373365008** Collected: 02/07/18 10:20 Received: 02/10/18 01:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
FL-PRO Soil Microwave	Analytical Method: FL-PRO Preparation Method: EPA 3546								
Petroleum Range Organics	**4.3**	mg/kg	4.1	2.6	1	02/13/18 14:53	02/14/18 20:57		
Surrogates									
o-Terphenyl (S)	84	%	62-109		1	02/13/18 14:53	02/14/18 20:57	84-15-1	
N-Pentatriacontane (S)	93	%	42-159		1	02/13/18 14:53	02/14/18 20:57	630-07-09	
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**1.5**	mg/kg	0.55	0.27	1	02/15/18 03:15	02/17/18 02:40	7440-38-2	
Barium	**5.2**	mg/kg	0.55	0.27	1	02/15/18 03:15	02/17/18 02:40	7440-39-3	
Cadmium	**0.027 U**	mg/kg	0.055	0.027	1	02/15/18 03:15	02/17/18 02:40	7440-43-9	
Chromium	**5.3**	mg/kg	0.27	0.14	1	02/15/18 03:15	02/17/18 02:40	7440-47-3	
Lead	**2.6**	mg/kg	0.55	0.27	1	02/15/18 03:15	02/17/18 02:40	7439-92-1	
Selenium	**0.41 U**	mg/kg	0.82	0.41	1	02/15/18 03:15	02/17/18 02:40	7782-49-2	
Silver	**0.14 U**	mg/kg	0.27	0.14	1	02/15/18 03:15	02/17/18 02:40	7440-22-4	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	**0.0049 U**	mg/kg	0.0097	0.0049	1	02/16/18 10:56	02/19/18 10:46	7439-97-6	J(M1)
8270 MSSV MW PAH by SIM	Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546								
Acenaphthene	**0.0016 U**	mg/kg	0.010	0.0016	1	02/13/18 13:15	02/15/18 14:12	83-32-9	
Acenaphthylene	**0.0013 U**	mg/kg	0.010	0.0013	1	02/13/18 13:15	02/15/18 14:12	208-96-8	
Anthracene	**0.0015 U**	mg/kg	0.010	0.0015	1	02/13/18 13:15	02/15/18 14:12	120-12-7	
Benzo(a)anthracene	**0.0041 I**	mg/kg	0.010	0.00074	1	02/13/18 13:15	02/15/18 14:12	56-55-3	
Benzo(a)pyrene	**0.0058 I**	mg/kg	0.010	0.0011	1	02/13/18 13:15	02/15/18 14:12	50-32-8	
Benzo(b)fluoranthene	**0.011**	mg/kg	0.010	0.00069	1	02/13/18 13:15	02/15/18 14:12	205-99-2	
Benzo(g,h,i)perylene	**0.0040 I**	mg/kg	0.010	0.0027	1	02/13/18 13:15	02/15/18 14:12	191-24-2	
Benzo(k)fluoranthene	**0.0033 I**	mg/kg	0.010	0.0016	1	02/13/18 13:15	02/15/18 14:12	207-08-9	
Chrysene	**0.0083 I**	mg/kg	0.010	0.0019	1	02/13/18 13:15	02/15/18 14:12	218-01-9	
Dibenz(a,h)anthracene	**0.0019 U**	mg/kg	0.010	0.0019	1	02/13/18 13:15	02/15/18 14:12	53-70-3	
Fluoranthene	**0.015**	mg/kg	0.010	0.00086	1	02/13/18 13:15	02/15/18 14:12	206-44-0	
Fluorene	**0.0017 U**	mg/kg	0.010	0.0017	1	02/13/18 13:15	02/15/18 14:12	86-73-7	
Indeno(1,2,3-cd)pyrene	**0.0040 I**	mg/kg	0.010	0.0029	1	02/13/18 13:15	02/15/18 14:12	193-39-5	
1-Methylnaphthalene	**0.0012 U**	mg/kg	0.010	0.0012	1	02/13/18 13:15	02/15/18 14:12	90-12-0	
2-Methylnaphthalene	**0.0011 U**	mg/kg	0.010	0.0011	1	02/13/18 13:15	02/15/18 14:12	91-57-6	
Naphthalene	**0.0024 U**	mg/kg	0.010	0.0024	1	02/13/18 13:15	02/15/18 14:12	91-20-3	
Phenanthrene	**0.0066 I**	mg/kg	0.010	0.0016	1	02/13/18 13:15	02/15/18 14:12	85-01-8	
Pyrene	**0.012**	mg/kg	0.010	0.0019	1	02/13/18 13:15	02/15/18 14:12	129-00-0	
Surrogates									
Nitrobenzene-d5 (S)	49	%	10-128		1	02/13/18 13:15	02/15/18 14:12	4165-60-0	
2-Fluorobiphenyl (S)	53	%	10-110		1	02/13/18 13:15	02/15/18 14:12	321-60-8	
Terphenyl-d14 (S)	61	%	39-119		1	02/13/18 13:15	02/15/18 14:12	1718-51-0	
8260 MSV 5035	Analytical Method: EPA 8260 Preparation Method: EPA 5035								
Acetone	**1.1**	mg/kg	0.019	0.0094	1	02/14/18 09:00	02/14/18 21:08	67-64-1	L
Acetonitrile	**0.023 U**	mg/kg	0.047	0.023	1	02/14/18 09:00	02/14/18 21:08	75-05-8	
Benzene	**0.0024 U**	mg/kg	0.0047	0.0024	1	02/14/18 09:00	02/14/18 21:08	71-43-2	

ANALYTICAL RESULTS

Project: 6783-17-2991.04/MIA Parcel 3
Pace Project No.: 35373365

Sample: SB-1 **Lab ID: 35373365008** Collected: 02/07/18 10:20 Received: 02/10/18 01:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV 5035	Analytical Method: EPA 8260 Preparation Method: EPA 5035								
Bromobenzene	**0.0023 U**	mg/kg	0.0047	0.0023	1	02/14/18 09:00	02/14/18 21:08	108-86-1	
Bromochloromethane	**0.0023 U**	mg/kg	0.0047	0.0023	1	02/14/18 09:00	02/14/18 21:08	74-97-5	
Bromodichloromethane	**0.0023 U**	mg/kg	0.0047	0.0023	1	02/14/18 09:00	02/14/18 21:08	75-27-4	
Bromoform	**0.0023 U**	mg/kg	0.0047	0.0023	1	02/14/18 09:00	02/14/18 21:08	75-25-2	
Bromomethane	**0.0023 U**	mg/kg	0.0047	0.0023	1	02/14/18 09:00	02/14/18 21:08	74-83-9	
2-Butanone (MEK)	**0.0023 U**	mg/kg	0.0047	0.0023	1	02/14/18 09:00	02/14/18 21:08	78-93-3	
n-Butylbenzene	**0.0028 U**	mg/kg	0.0047	0.0028	1	02/14/18 09:00	02/14/18 21:08	104-51-8	
sec-Butylbenzene	**0.0027 U**	mg/kg	0.0047	0.0027	1	02/14/18 09:00	02/14/18 21:08	135-98-8	
tert-Butylbenzene	**0.0027 U**	mg/kg	0.0047	0.0027	1	02/14/18 09:00	02/14/18 21:08	98-06-6	
Carbon disulfide	**0.0023 U**	mg/kg	0.0047	0.0023	1	02/14/18 09:00	02/14/18 21:08	75-15-0	
Carbon tetrachloride	**0.0023 U**	mg/kg	0.0047	0.0023	1	02/14/18 09:00	02/14/18 21:08	56-23-5	
Chlorobenzene	**0.0023 U**	mg/kg	0.0047	0.0023	1	02/14/18 09:00	02/14/18 21:08	108-90-7	
Chloroethane	**0.0034 U**	mg/kg	0.0047	0.0034	1	02/14/18 09:00	02/14/18 21:08	75-00-3	
Chloroform	**0.0028 U**	mg/kg	0.0047	0.0028	1	02/14/18 09:00	02/14/18 21:08	67-66-3	
Chloromethane	**0.0026 U**	mg/kg	0.0047	0.0026	1	02/14/18 09:00	02/14/18 21:08	74-87-3	
2-Chlorotoluene	**0.0024 U**	mg/kg	0.0047	0.0024	1	02/14/18 09:00	02/14/18 21:08	95-49-8	
4-Chlorotoluene	**0.0023 U**	mg/kg	0.0047	0.0023	1	02/14/18 09:00	02/14/18 21:08	106-43-4	
Dibromochloromethane	**0.0023 U**	mg/kg	0.0047	0.0023	1	02/14/18 09:00	02/14/18 21:08	124-48-1	
Dibromomethane	**0.0023 U**	mg/kg	0.0047	0.0023	1	02/14/18 09:00	02/14/18 21:08	74-95-3	
1,2-Dichlorobenzene	**0.0023 U**	mg/kg	0.0047	0.0023	1	02/14/18 09:00	02/14/18 21:08	95-50-1	
1,3-Dichlorobenzene	**0.0023 U**	mg/kg	0.0047	0.0023	1	02/14/18 09:00	02/14/18 21:08	541-73-1	
1,4-Dichlorobenzene	**0.0023 U**	mg/kg	0.0047	0.0023	1	02/14/18 09:00	02/14/18 21:08	106-46-7	
Dichlorodifluoromethane	**0.0025 U**	mg/kg	0.0047	0.0025	1	02/14/18 09:00	02/14/18 21:08	75-71-8	
1,1-Dichloroethane	**0.0026 U**	mg/kg	0.0047	0.0026	1	02/14/18 09:00	02/14/18 21:08	75-34-3	
1,2-Dichloroethane	**0.0023 U**	mg/kg	0.0047	0.0023	1	02/14/18 09:00	02/14/18 21:08	107-06-2	
1,1-Dichloroethene	**0.0023 U**	mg/kg	0.0047	0.0023	1	02/14/18 09:00	02/14/18 21:08	75-35-4	
cis-1,2-Dichloroethene	**0.0023 U**	mg/kg	0.0047	0.0023	1	02/14/18 09:00	02/14/18 21:08	156-59-2	
trans-1,2-Dichloroethene	**0.0029 U**	mg/kg	0.0047	0.0029	1	02/14/18 09:00	02/14/18 21:08	156-60-5	
1,2-Dichloropropane	**0.0023 U**	mg/kg	0.0047	0.0023	1	02/14/18 09:00	02/14/18 21:08	78-87-5	
1,3-Dichloropropane	**0.0023 U**	mg/kg	0.0047	0.0023	1	02/14/18 09:00	02/14/18 21:08	142-28-9	
2,2-Dichloropropane	**0.0024 U**	mg/kg	0.0047	0.0024	1	02/14/18 09:00	02/14/18 21:08	594-20-7	
1,1-Dichloropropene	**0.0024 U**	mg/kg	0.0047	0.0024	1	02/14/18 09:00	02/14/18 21:08	563-58-6	
cis-1,3-Dichloropropene	**0.0023 U**	mg/kg	0.0047	0.0023	1	02/14/18 09:00	02/14/18 21:08	10061-01-5	
trans-1,3-Dichloropropene	**0.0023 U**	mg/kg	0.0047	0.0023	1	02/14/18 09:00	02/14/18 21:08	10061-02-6	
Ethylbenzene	**0.0027 U**	mg/kg	0.0047	0.0027	1	02/14/18 09:00	02/14/18 21:08	100-41-4	
2-Hexanone	**0.0023 U**	mg/kg	0.0047	0.0023	1	02/14/18 09:00	02/14/18 21:08	591-78-6	
Iodomethane	**0.0023 U**	mg/kg	0.0047	0.0023	1	02/14/18 09:00	02/14/18 21:08	74-88-4	
Isopropylbenzene (Cumene)	**0.0027 U**	mg/kg	0.0047	0.0027	1	02/14/18 09:00	02/14/18 21:08	98-82-8	
p-Isopropyltoluene	**0.0028 U**	mg/kg	0.0047	0.0028	1	02/14/18 09:00	02/14/18 21:08	99-87-6	
Methylene Chloride	**0.0023 U**	mg/kg	0.0047	0.0023	1	02/14/18 09:00	02/14/18 21:08	75-09-2	
4-Methyl-2-pentanone (MIBK)	**0.0023 U**	mg/kg	0.0047	0.0023	1	02/14/18 09:00	02/14/18 21:08	108-10-1	
Methyl-tert-butyl ether	**0.0023 U**	mg/kg	0.0047	0.0023	1	02/14/18 09:00	02/14/18 21:08	1634-04-4	
n-Propylbenzene	**0.0025 U**	mg/kg	0.0047	0.0025	1	02/14/18 09:00	02/14/18 21:08	103-65-1	
Styrene	**0.0023 U**	mg/kg	0.0047	0.0023	1	02/14/18 09:00	02/14/18 21:08	100-42-5	
1,1,1,2-Tetrachloroethane	**0.0023 U**	mg/kg	0.0047	0.0023	1	02/14/18 09:00	02/14/18 21:08	630-20-6	

ANALYTICAL RESULTS

Project: 6783-17-2991.04/MIA Parcel 3
Pace Project No.: 35373365

Sample: SB-1 **Lab ID: 35373365008** Collected: 02/07/18 10:20 Received: 02/10/18 01:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV 5035	Analytical Method: EPA 8260 Preparation Method: EPA 5035								
1,1,2,2-Tetrachloroethane	**0.0023 U**	mg/kg	0.0047	0.0023	1	02/14/18 09:00	02/14/18 21:08	79-34-5	
Tetrachloroethene	**0.0023 U**	mg/kg	0.0047	0.0023	1	02/14/18 09:00	02/14/18 21:08	127-18-4	
Toluene	**0.0025 U**	mg/kg	0.0047	0.0025	1	02/14/18 09:00	02/14/18 21:08	108-88-3	
1,2,3-Trichlorobenzene	**0.0023 U**	mg/kg	0.0047	0.0023	1	02/14/18 09:00	02/14/18 21:08	87-61-6	
1,2,4-Trichlorobenzene	**0.0023 U**	mg/kg	0.0047	0.0023	1	02/14/18 09:00	02/14/18 21:08	120-82-1	
1,1,1-Trichloroethane	**0.0026 U**	mg/kg	0.0047	0.0026	1	02/14/18 09:00	02/14/18 21:08	71-55-6	
1,1,2-Trichloroethane	**0.0023 U**	mg/kg	0.0047	0.0023	1	02/14/18 09:00	02/14/18 21:08	79-00-5	
Trichloroethene	**0.0026 U**	mg/kg	0.0047	0.0026	1	02/14/18 09:00	02/14/18 21:08	79-01-6	
Trichlorofluoromethane	**0.0026 U**	mg/kg	0.0047	0.0026	1	02/14/18 09:00	02/14/18 21:08	75-69-4	
1,2,3-Trichloropropane	**0.0023 U**	mg/kg	0.0047	0.0023	1	02/14/18 09:00	02/14/18 21:08	96-18-4	
1,2,3-Trimethylbenzene	**0.0023 U**	mg/kg	0.0047	0.0023	1	02/14/18 09:00	02/14/18 21:08	526-73-8	N2
1,2,4-Trimethylbenzene	**0.0026 U**	mg/kg	0.0047	0.0026	1	02/14/18 09:00	02/14/18 21:08	95-63-6	
1,3,5-Trimethylbenzene	**0.0027 U**	mg/kg	0.0047	0.0027	1	02/14/18 09:00	02/14/18 21:08	108-67-8	
Vinyl acetate	**0.0024 U**	mg/kg	0.0047	0.0024	1	02/14/18 09:00	02/14/18 21:08	108-05-4	
Vinyl chloride	**0.0025 U**	mg/kg	0.0047	0.0025	1	02/14/18 09:00	02/14/18 21:08	75-01-4	
Xylene (Total)	**0.0048 U**	mg/kg	0.014	0.0048	1	02/14/18 09:00	02/14/18 21:08	1330-20-7	
m&p-Xylene	**0.0048 U**	mg/kg	0.0094	0.0048	1	02/14/18 09:00	02/14/18 21:08	179601-23-1	
o-Xylene	**0.0024 U**	mg/kg	0.0047	0.0024	1	02/14/18 09:00	02/14/18 21:08	95-47-6	
Surrogates									
4-Bromofluorobenzene (S)	100	%	55-148		1	02/14/18 09:00	02/14/18 21:08	460-00-4	
1,2-Dichloroethane-d4 (S)	106	%	80-131		1	02/14/18 09:00	02/14/18 21:08	17060-07-0	
Toluene-d8 (S)	99	%	84-117		1	02/14/18 09:00	02/14/18 21:08	2037-26-5	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**3.5**	%	0.10	0.10	1		02/15/18 12:53		

ANALYTICAL RESULTS

Project: 6783-17-2991.04/MIA Parcel 3
Pace Project No.: 35373365

Sample: SB-2 **Lab ID: 35373365009** Collected: 02/07/18 15:00 Received: 02/10/18 01:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
FL-PRO Soil Microwave	Analytical Method: FL-PRO Preparation Method: EPA 3546								
Petroleum Range Organics	**4.3 I**	mg/kg	4.5	2.8	1	02/13/18 14:53	02/14/18 20:57		
Surrogates									
o-Terphenyl (S)	73	%	62-109		1	02/13/18 14:53	02/14/18 20:57	84-15-1	
N-Pentatriacontane (S)	90	%	42-159		1	02/13/18 14:53	02/14/18 20:57	630-07-09	
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**0.63 I**	mg/kg	0.68	0.34	1	02/15/18 03:15	02/17/18 03:05	7440-38-2	
Barium	**2.0**	mg/kg	0.68	0.34	1	02/15/18 03:15	02/17/18 03:05	7440-39-3	
Cadmium	**0.034 U**	mg/kg	0.068	0.034	1	02/15/18 03:15	02/17/18 03:05	7440-43-9	
Chromium	**2.1**	mg/kg	0.34	0.17	1	02/15/18 03:15	02/17/18 03:05	7440-47-3	
Lead	**1.4**	mg/kg	0.68	0.34	1	02/15/18 03:15	02/17/18 03:05	7439-92-1	
Selenium	**0.51 U**	mg/kg	1.0	0.51	1	02/15/18 03:15	02/17/18 03:05	7782-49-2	
Silver	**0.17 U**	mg/kg	0.34	0.17	1	02/15/18 03:15	02/17/18 03:05	7440-22-4	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	**0.0055 U**	mg/kg	0.011	0.0055	1	02/16/18 10:56	02/19/18 10:53	7439-97-6	
8270 MSSV MW PAH by SIM	Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546								
Acenaphthene	**0.0017 U**	mg/kg	0.011	0.0017	1	02/13/18 13:15	02/15/18 14:36	83-32-9	
Acenaphthylene	**0.0015 U**	mg/kg	0.011	0.0015	1	02/13/18 13:15	02/15/18 14:36	208-96-8	
Anthracene	**0.0016 U**	mg/kg	0.011	0.0016	1	02/13/18 13:15	02/15/18 14:36	120-12-7	
Benzo(a)anthracene	**0.00080 U**	mg/kg	0.011	0.00080	1	02/13/18 13:15	02/15/18 14:36	56-55-3	
Benzo(a)pyrene	**0.0012 U**	mg/kg	0.011	0.0012	1	02/13/18 13:15	02/15/18 14:36	50-32-8	
Benzo(b)fluoranthene	**0.00075 U**	mg/kg	0.011	0.00075	1	02/13/18 13:15	02/15/18 14:36	205-99-2	
Benzo(g,h,i)perylene	**0.0029 U**	mg/kg	0.011	0.0029	1	02/13/18 13:15	02/15/18 14:36	191-24-2	
Benzo(k)fluoranthene	**0.0017 U**	mg/kg	0.011	0.0017	1	02/13/18 13:15	02/15/18 14:36	207-08-9	
Chrysene	**0.0020 U**	mg/kg	0.011	0.0020	1	02/13/18 13:15	02/15/18 14:36	218-01-9	
Dibenz(a,h)anthracene	**0.0020 U**	mg/kg	0.011	0.0020	1	02/13/18 13:15	02/15/18 14:36	53-70-3	
Fluoranthene	**0.00093 U**	mg/kg	0.011	0.00093	1	02/13/18 13:15	02/15/18 14:36	206-44-0	
Fluorene	**0.0018 U**	mg/kg	0.011	0.0018	1	02/13/18 13:15	02/15/18 14:36	86-73-7	
Indeno(1,2,3-cd)pyrene	**0.0031 U**	mg/kg	0.011	0.0031	1	02/13/18 13:15	02/15/18 14:36	193-39-5	
1-Methylnaphthalene	**0.0013 U**	mg/kg	0.011	0.0013	1	02/13/18 13:15	02/15/18 14:36	90-12-0	
2-Methylnaphthalene	**0.0012 U**	mg/kg	0.011	0.0012	1	02/13/18 13:15	02/15/18 14:36	91-57-6	
Naphthalene	**0.0026 U**	mg/kg	0.011	0.0026	1	02/13/18 13:15	02/15/18 14:36	91-20-3	
Phenanthrene	**0.0017 U**	mg/kg	0.011	0.0017	1	02/13/18 13:15	02/15/18 14:36	85-01-8	
Pyrene	**0.0020 U**	mg/kg	0.011	0.0020	1	02/13/18 13:15	02/15/18 14:36	129-00-0	
Surrogates									
Nitrobenzene-d5 (S)	81	%	10-128		1	02/13/18 13:15	02/15/18 14:36	4165-60-0	
2-Fluorobiphenyl (S)	76	%	10-110		1	02/13/18 13:15	02/15/18 14:36	321-60-8	
Terphenyl-d14 (S)	77	%	39-119		1	02/13/18 13:15	02/15/18 14:36	1718-51-0	
8260 MSV 5035	Analytical Method: EPA 8260 Preparation Method: EPA 5035								
Acetone	**0.63**	mg/kg	0.023	0.011	1	02/14/18 09:00	02/14/18 21:31	67-64-1	L
Acetonitrile	**0.028 U**	mg/kg	0.057	0.028	1	02/14/18 09:00	02/14/18 21:31	75-05-8	
Benzene	**0.0029 U**	mg/kg	0.0057	0.0029	1	02/14/18 09:00	02/14/18 21:31	71-43-2	

ANALYTICAL RESULTS

Project: 6783-17-2991.04/MIA Parcel 3
Pace Project No.: 35373365

Sample: SB-2 **Lab ID: 35373365009** Collected: 02/07/18 15:00 Received: 02/10/18 01:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV 5035	Analytical Method: EPA 8260 Preparation Method: EPA 5035								
Bromobenzene	**0.0028 U**	mg/kg	0.0057	0.0028	1	02/14/18 09:00	02/14/18 21:31	108-86-1	
Bromochloromethane	**0.0028 U**	mg/kg	0.0057	0.0028	1	02/14/18 09:00	02/14/18 21:31	74-97-5	
Bromodichloromethane	**0.0028 U**	mg/kg	0.0057	0.0028	1	02/14/18 09:00	02/14/18 21:31	75-27-4	
Bromoform	**0.0028 U**	mg/kg	0.0057	0.0028	1	02/14/18 09:00	02/14/18 21:31	75-25-2	
Bromomethane	**0.0028 U**	mg/kg	0.0057	0.0028	1	02/14/18 09:00	02/14/18 21:31	74-83-9	
2-Butanone (MEK)	**0.0028 U**	mg/kg	0.0057	0.0028	1	02/14/18 09:00	02/14/18 21:31	78-93-3	
n-Butylbenzene	**0.0034 U**	mg/kg	0.0057	0.0034	1	02/14/18 09:00	02/14/18 21:31	104-51-8	
sec-Butylbenzene	**0.0033 U**	mg/kg	0.0057	0.0033	1	02/14/18 09:00	02/14/18 21:31	135-98-8	
tert-Butylbenzene	**0.0033 U**	mg/kg	0.0057	0.0033	1	02/14/18 09:00	02/14/18 21:31	98-06-6	
Carbon disulfide	**0.0028 U**	mg/kg	0.0057	0.0028	1	02/14/18 09:00	02/14/18 21:31	75-15-0	
Carbon tetrachloride	**0.0028 U**	mg/kg	0.0057	0.0028	1	02/14/18 09:00	02/14/18 21:31	56-23-5	
Chlorobenzene	**0.0028 U**	mg/kg	0.0057	0.0028	1	02/14/18 09:00	02/14/18 21:31	108-90-7	
Chloroethane	**0.0041 U**	mg/kg	0.0057	0.0041	1	02/14/18 09:00	02/14/18 21:31	75-00-3	
Chloroform	**0.0034 U**	mg/kg	0.0057	0.0034	1	02/14/18 09:00	02/14/18 21:31	67-66-3	
Chloromethane	**0.0032 U**	mg/kg	0.0057	0.0032	1	02/14/18 09:00	02/14/18 21:31	74-87-3	
2-Chlorotoluene	**0.0029 U**	mg/kg	0.0057	0.0029	1	02/14/18 09:00	02/14/18 21:31	95-49-8	
4-Chlorotoluene	**0.0028 U**	mg/kg	0.0057	0.0028	1	02/14/18 09:00	02/14/18 21:31	106-43-4	
Dibromochloromethane	**0.0028 U**	mg/kg	0.0057	0.0028	1	02/14/18 09:00	02/14/18 21:31	124-48-1	
Dibromomethane	**0.0028 U**	mg/kg	0.0057	0.0028	1	02/14/18 09:00	02/14/18 21:31	74-95-3	
1,2-Dichlorobenzene	**0.0028 U**	mg/kg	0.0057	0.0028	1	02/14/18 09:00	02/14/18 21:31	95-50-1	
1,3-Dichlorobenzene	**0.0028 U**	mg/kg	0.0057	0.0028	1	02/14/18 09:00	02/14/18 21:31	541-73-1	
1,4-Dichlorobenzene	**0.0028 U**	mg/kg	0.0057	0.0028	1	02/14/18 09:00	02/14/18 21:31	106-46-7	
Dichlorodifluoromethane	**0.0030 U**	mg/kg	0.0057	0.0030	1	02/14/18 09:00	02/14/18 21:31	75-71-8	
1,1-Dichloroethane	**0.0031 U**	mg/kg	0.0057	0.0031	1	02/14/18 09:00	02/14/18 21:31	75-34-3	
1,2-Dichloroethane	**0.0028 U**	mg/kg	0.0057	0.0028	1	02/14/18 09:00	02/14/18 21:31	107-06-2	
1,1-Dichloroethene	**0.0028 U**	mg/kg	0.0057	0.0028	1	02/14/18 09:00	02/14/18 21:31	75-35-4	
cis-1,2-Dichloroethene	**0.0028 U**	mg/kg	0.0057	0.0028	1	02/14/18 09:00	02/14/18 21:31	156-59-2	
trans-1,2-Dichloroethene	**0.0035 U**	mg/kg	0.0057	0.0035	1	02/14/18 09:00	02/14/18 21:31	156-60-5	
1,2-Dichloropropane	**0.0028 U**	mg/kg	0.0057	0.0028	1	02/14/18 09:00	02/14/18 21:31	78-87-5	
1,3-Dichloropropane	**0.0028 U**	mg/kg	0.0057	0.0028	1	02/14/18 09:00	02/14/18 21:31	142-28-9	
2,2-Dichloropropane	**0.0029 U**	mg/kg	0.0057	0.0029	1	02/14/18 09:00	02/14/18 21:31	594-20-7	
1,1-Dichloropropene	**0.0029 U**	mg/kg	0.0057	0.0029	1	02/14/18 09:00	02/14/18 21:31	563-58-6	
cis-1,3-Dichloropropene	**0.0028 U**	mg/kg	0.0057	0.0028	1	02/14/18 09:00	02/14/18 21:31	10061-01-5	
trans-1,3-Dichloropropene	**0.0028 U**	mg/kg	0.0057	0.0028	1	02/14/18 09:00	02/14/18 21:31	10061-02-6	
Ethylbenzene	**0.0032 U**	mg/kg	0.0057	0.0032	1	02/14/18 09:00	02/14/18 21:31	100-41-4	
2-Hexanone	**0.0028 U**	mg/kg	0.0057	0.0028	1	02/14/18 09:00	02/14/18 21:31	591-78-6	
Iodomethane	**0.0028 U**	mg/kg	0.0057	0.0028	1	02/14/18 09:00	02/14/18 21:31	74-88-4	
Isopropylbenzene (Cumene)	**0.0033 U**	mg/kg	0.0057	0.0033	1	02/14/18 09:00	02/14/18 21:31	98-82-8	
p-Isopropyltoluene	**0.0034 U**	mg/kg	0.0057	0.0034	1	02/14/18 09:00	02/14/18 21:31	99-87-6	
Methylene Chloride	**0.0028 U**	mg/kg	0.0057	0.0028	1	02/14/18 09:00	02/14/18 21:31	75-09-2	
4-Methyl-2-pentanone (MIBK)	**0.0028 U**	mg/kg	0.0057	0.0028	1	02/14/18 09:00	02/14/18 21:31	108-10-1	
Methyl-tert-butyl ether	**0.0028 U**	mg/kg	0.0057	0.0028	1	02/14/18 09:00	02/14/18 21:31	1634-04-4	
n-Propylbenzene	**0.0030 U**	mg/kg	0.0057	0.0030	1	02/14/18 09:00	02/14/18 21:31	103-65-1	
Styrene	**0.0028 U**	mg/kg	0.0057	0.0028	1	02/14/18 09:00	02/14/18 21:31	100-42-5	
1,1,1,2-Tetrachloroethane	**0.0028 U**	mg/kg	0.0057	0.0028	1	02/14/18 09:00	02/14/18 21:31	630-20-6	

ANALYTICAL RESULTS

Project: 6783-17-2991.04/MIA Parcel 3
Pace Project No.: 35373365

Sample: SB-2 **Lab ID: 35373365009** Collected: 02/07/18 15:00 Received: 02/10/18 01:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV 5035	Analytical Method: EPA 8260 Preparation Method: EPA 5035								
1,1,2,2-Tetrachloroethane	**0.0028 U**	mg/kg	0.0057	0.0028	1	02/14/18 09:00	02/14/18 21:31	79-34-5	
Tetrachloroethene	**0.0028 U**	mg/kg	0.0057	0.0028	1	02/14/18 09:00	02/14/18 21:31	127-18-4	
Toluene	**0.0031 U**	mg/kg	0.0057	0.0031	1	02/14/18 09:00	02/14/18 21:31	108-88-3	
1,2,3-Trichlorobenzene	**0.0028 U**	mg/kg	0.0057	0.0028	1	02/14/18 09:00	02/14/18 21:31	87-61-6	
1,2,4-Trichlorobenzene	**0.0028 U**	mg/kg	0.0057	0.0028	1	02/14/18 09:00	02/14/18 21:31	120-82-1	
1,1,1-Trichloroethane	**0.0031 U**	mg/kg	0.0057	0.0031	1	02/14/18 09:00	02/14/18 21:31	71-55-6	
1,1,2-Trichloroethane	**0.0028 U**	mg/kg	0.0057	0.0028	1	02/14/18 09:00	02/14/18 21:31	79-00-5	
Trichloroethene	**0.0032 U**	mg/kg	0.0057	0.0032	1	02/14/18 09:00	02/14/18 21:31	79-01-6	
Trichlorofluoromethane	**0.0031 U**	mg/kg	0.0057	0.0031	1	02/14/18 09:00	02/14/18 21:31	75-69-4	
1,2,3-Trichloropropane	**0.0028 U**	mg/kg	0.0057	0.0028	1	02/14/18 09:00	02/14/18 21:31	96-18-4	
1,2,3-Trimethylbenzene	**0.0028 U**	mg/kg	0.0057	0.0028	1	02/14/18 09:00	02/14/18 21:31	526-73-8	N2
1,2,4-Trimethylbenzene	**0.0032 U**	mg/kg	0.0057	0.0032	1	02/14/18 09:00	02/14/18 21:31	95-63-6	
1,3,5-Trimethylbenzene	**0.0033 U**	mg/kg	0.0057	0.0033	1	02/14/18 09:00	02/14/18 21:31	108-67-8	
Vinyl acetate	**0.0029 U**	mg/kg	0.0057	0.0029	1	02/14/18 09:00	02/14/18 21:31	108-05-4	
Vinyl chloride	**0.0031 U**	mg/kg	0.0057	0.0031	1	02/14/18 09:00	02/14/18 21:31	75-01-4	
Xylene (Total)	**0.0058 U**	mg/kg	0.017	0.0058	1	02/14/18 09:00	02/14/18 21:31	1330-20-7	
m&p-Xylene	**0.0058 U**	mg/kg	0.011	0.0058	1	02/14/18 09:00	02/14/18 21:31	179601-23-1	
o-Xylene	**0.0029 U**	mg/kg	0.0057	0.0029	1	02/14/18 09:00	02/14/18 21:31	95-47-6	
Surrogates									
4-Bromofluorobenzene (S)	103	%	55-148		1	02/14/18 09:00	02/14/18 21:31	460-00-4	
1,2-Dichloroethane-d4 (S)	124	%	80-131		1	02/14/18 09:00	02/14/18 21:31	17060-07-0	
Toluene-d8 (S)	99	%	84-117		1	02/14/18 09:00	02/14/18 21:31	2037-26-5	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**11.0**	%	0.10	0.10	1		02/15/18 12:53		

ANALYTICAL RESULTS

Project: 6783-17-2991.04/MIA Parcel 3
Pace Project No.: 35373365

Sample: SB-3 **Lab ID: 35373365010** Collected: 02/07/18 14:15 Received: 02/10/18 01:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
FL-PRO Soil Microwave	Analytical Method: FL-PRO Preparation Method: EPA 3546								
Petroleum Range Organics	**4.1 I**	mg/kg	4.3	2.7	1	02/13/18 14:53	02/14/18 21:21		
Surrogates									
o-Terphenyl (S)	92	%	62-109		1	02/13/18 14:53	02/14/18 21:21	84-15-1	
N-Pentatriacontane (S)	111	%	42-159		1	02/13/18 14:53	02/14/18 21:21	630-07-09	
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**1.6**	mg/kg	0.64	0.32	1	02/15/18 03:15	02/17/18 03:09	7440-38-2	
Barium	**7.2**	mg/kg	0.64	0.32	1	02/15/18 03:15	02/17/18 03:09	7440-39-3	
Cadmium	**0.054 I**	mg/kg	0.064	0.032	1	02/15/18 03:15	02/17/18 03:09	7440-43-9	
Chromium	**7.1**	mg/kg	0.32	0.16	1	02/15/18 03:15	02/17/18 03:09	7440-47-3	
Lead	**7.0**	mg/kg	0.64	0.32	1	02/15/18 03:15	02/17/18 03:09	7439-92-1	
Selenium	**0.48 U**	mg/kg	0.97	0.48	1	02/15/18 03:15	02/17/18 03:09	7782-49-2	
Silver	**0.16 U**	mg/kg	0.32	0.16	1	02/15/18 03:15	02/17/18 03:09	7440-22-4	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	**0.056**	mg/kg	0.0089	0.0044	1	02/16/18 10:56	02/19/18 10:57	7439-97-6	
8270 MSSV MW PAH by SIM	Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546								
Acenaphthene	**0.0081 U**	mg/kg	0.054	0.0081	5	02/13/18 13:15	02/15/18 14:59	83-32-9	J(M1)
Acenaphthylene	**0.0070 U**	mg/kg	0.054	0.0070	5	02/13/18 13:15	02/15/18 14:59	208-96-8	
Anthracene	**0.0076 U**	mg/kg	0.054	0.0076	5	02/13/18 13:15	02/15/18 14:59	120-12-7	J(M1)
Benzo(a)anthracene	**0.0040 I**	mg/kg	0.054	0.0038	5	02/13/18 13:15	02/15/18 14:59	56-55-3	J(M1)
Benzo(a)pyrene	**0.0059 U**	mg/kg	0.054	0.0059	5	02/13/18 13:15	02/15/18 14:59	50-32-8	
Benzo(b)fluoranthene	**0.0045 I**	mg/kg	0.054	0.0036	5	02/13/18 13:15	02/15/18 14:59	205-99-2	
Benzo(g,h,i)perylene	**0.014 U**	mg/kg	0.054	0.014	5	02/13/18 13:15	02/15/18 14:59	191-24-2	J(M1)
Benzo(k)fluoranthene	**0.0081 U**	mg/kg	0.054	0.0081	5	02/13/18 13:15	02/15/18 14:59	207-08-9	J(M1)
Chrysene	**0.0097 U**	mg/kg	0.054	0.0097	5	02/13/18 13:15	02/15/18 14:59	218-01-9	
Dibenz(a,h)anthracene	**0.0097 U**	mg/kg	0.054	0.0097	5	02/13/18 13:15	02/15/18 14:59	53-70-3	J(M1)
Fluoranthene	**0.0045 U**	mg/kg	0.054	0.0045	5	02/13/18 13:15	02/15/18 14:59	206-44-0	
Fluorene	**0.0086 U**	mg/kg	0.054	0.0086	5	02/13/18 13:15	02/15/18 14:59	86-73-7	J(M1)
Indeno(1,2,3-cd)pyrene	**0.015 U**	mg/kg	0.054	0.015	5	02/13/18 13:15	02/15/18 14:59	193-39-5	J(M1)
1-Methylnaphthalene	**0.0065 U**	mg/kg	0.054	0.0065	5	02/13/18 13:15	02/15/18 14:59	90-12-0	J(M1)
2-Methylnaphthalene	**0.0059 U**	mg/kg	0.054	0.0059	5	02/13/18 13:15	02/15/18 14:59	91-57-6	
Naphthalene	**0.012 U**	mg/kg	0.054	0.012	5	02/13/18 13:15	02/15/18 14:59	91-20-3	
Phenanthrene	**0.0081 U**	mg/kg	0.054	0.0081	5	02/13/18 13:15	02/15/18 14:59	85-01-8	J(M1)
Pyrene	**0.0097 U**	mg/kg	0.054	0.0097	5	02/13/18 13:15	02/15/18 14:59	129-00-0	
Surrogates									
Nitrobenzene-d5 (S)	78	%	10-128		5	02/13/18 13:15	02/15/18 14:59	4165-60-0	D3
2-Fluorobiphenyl (S)	72	%	10-110		5	02/13/18 13:15	02/15/18 14:59	321-60-8	
Terphenyl-d14 (S)	78	%	39-119		5	02/13/18 13:15	02/15/18 14:59	1718-51-0	
8260 MSV 5035	Analytical Method: EPA 8260 Preparation Method: EPA 5035								
Acetone	**0.73**	mg/kg	0.018	0.0091	1	02/14/18 09:00	02/14/18 21:54	67-64-1	L
Acetonitrile	**0.023 U**	mg/kg	0.046	0.023	1	02/14/18 09:00	02/14/18 21:54	75-05-8	
Benzene	**0.0023 U**	mg/kg	0.0046	0.0023	1	02/14/18 09:00	02/14/18 21:54	71-43-2	

ANALYTICAL RESULTS

Project: 6783-17-2991.04/MIA Parcel 3
Pace Project No.: 35373365

Sample: SB-3 **Lab ID: 35373365010** Collected: 02/07/18 14:15 Received: 02/10/18 01:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV 5035	Analytical Method: EPA 8260 Preparation Method: EPA 5035								
Bromobenzene	**0.0023 U**	mg/kg	0.0046	0.0023	1	02/14/18 09:00	02/14/18 21:54	108-86-1	
Bromochloromethane	**0.0023 U**	mg/kg	0.0046	0.0023	1	02/14/18 09:00	02/14/18 21:54	74-97-5	
Bromodichloromethane	**0.0023 U**	mg/kg	0.0046	0.0023	1	02/14/18 09:00	02/14/18 21:54	75-27-4	
Bromoform	**0.0023 U**	mg/kg	0.0046	0.0023	1	02/14/18 09:00	02/14/18 21:54	75-25-2	
Bromomethane	**0.0023 U**	mg/kg	0.0046	0.0023	1	02/14/18 09:00	02/14/18 21:54	74-83-9	
2-Butanone (MEK)	**0.0023 U**	mg/kg	0.0046	0.0023	1	02/14/18 09:00	02/14/18 21:54	78-93-3	
n-Butylbenzene	**0.0028 U**	mg/kg	0.0046	0.0028	1	02/14/18 09:00	02/14/18 21:54	104-51-8	
sec-Butylbenzene	**0.0026 U**	mg/kg	0.0046	0.0026	1	02/14/18 09:00	02/14/18 21:54	135-98-8	
tert-Butylbenzene	**0.0026 U**	mg/kg	0.0046	0.0026	1	02/14/18 09:00	02/14/18 21:54	98-06-6	
Carbon disulfide	**0.0023 U**	mg/kg	0.0046	0.0023	1	02/14/18 09:00	02/14/18 21:54	75-15-0	
Carbon tetrachloride	**0.0023 U**	mg/kg	0.0046	0.0023	1	02/14/18 09:00	02/14/18 21:54	56-23-5	
Chlorobenzene	**0.0023 U**	mg/kg	0.0046	0.0023	1	02/14/18 09:00	02/14/18 21:54	108-90-7	
Chloroethane	**0.0033 U**	mg/kg	0.0046	0.0033	1	02/14/18 09:00	02/14/18 21:54	75-00-3	
Chloroform	**0.0027 U**	mg/kg	0.0046	0.0027	1	02/14/18 09:00	02/14/18 21:54	67-66-3	
Chloromethane	**0.0026 U**	mg/kg	0.0046	0.0026	1	02/14/18 09:00	02/14/18 21:54	74-87-3	
2-Chlorotoluene	**0.0023 U**	mg/kg	0.0046	0.0023	1	02/14/18 09:00	02/14/18 21:54	95-49-8	
4-Chlorotoluene	**0.0023 U**	mg/kg	0.0046	0.0023	1	02/14/18 09:00	02/14/18 21:54	106-43-4	
Dibromochloromethane	**0.0023 U**	mg/kg	0.0046	0.0023	1	02/14/18 09:00	02/14/18 21:54	124-48-1	
Dibromomethane	**0.0023 U**	mg/kg	0.0046	0.0023	1	02/14/18 09:00	02/14/18 21:54	74-95-3	
1,2-Dichlorobenzene	**0.0023 U**	mg/kg	0.0046	0.0023	1	02/14/18 09:00	02/14/18 21:54	95-50-1	
1,3-Dichlorobenzene	**0.0023 U**	mg/kg	0.0046	0.0023	1	02/14/18 09:00	02/14/18 21:54	541-73-1	
1,4-Dichlorobenzene	**0.0023 U**	mg/kg	0.0046	0.0023	1	02/14/18 09:00	02/14/18 21:54	106-46-7	
Dichlorodifluoromethane	**0.0024 U**	mg/kg	0.0046	0.0024	1	02/14/18 09:00	02/14/18 21:54	75-71-8	
1,1-Dichloroethane	**0.0025 U**	mg/kg	0.0046	0.0025	1	02/14/18 09:00	02/14/18 21:54	75-34-3	
1,2-Dichloroethane	**0.0023 U**	mg/kg	0.0046	0.0023	1	02/14/18 09:00	02/14/18 21:54	107-06-2	
1,1-Dichloroethene	**0.0023 U**	mg/kg	0.0046	0.0023	1	02/14/18 09:00	02/14/18 21:54	75-35-4	
cis-1,2-Dichloroethene	**0.0023 U**	mg/kg	0.0046	0.0023	1	02/14/18 09:00	02/14/18 21:54	156-59-2	
trans-1,2-Dichloroethene	**0.0028 U**	mg/kg	0.0046	0.0028	1	02/14/18 09:00	02/14/18 21:54	156-60-5	
1,2-Dichloropropane	**0.0023 U**	mg/kg	0.0046	0.0023	1	02/14/18 09:00	02/14/18 21:54	78-87-5	
1,3-Dichloropropane	**0.0023 U**	mg/kg	0.0046	0.0023	1	02/14/18 09:00	02/14/18 21:54	142-28-9	
2,2-Dichloropropane	**0.0024 U**	mg/kg	0.0046	0.0024	1	02/14/18 09:00	02/14/18 21:54	594-20-7	
1,1-Dichloropropene	**0.0023 U**	mg/kg	0.0046	0.0023	1	02/14/18 09:00	02/14/18 21:54	563-58-6	
cis-1,3-Dichloropropene	**0.0023 U**	mg/kg	0.0046	0.0023	1	02/14/18 09:00	02/14/18 21:54	10061-01-5	
trans-1,3-Dichloropropene	**0.0023 U**	mg/kg	0.0046	0.0023	1	02/14/18 09:00	02/14/18 21:54	10061-02-6	
Ethylbenzene	**0.0026 U**	mg/kg	0.0046	0.0026	1	02/14/18 09:00	02/14/18 21:54	100-41-4	
2-Hexanone	**0.0023 U**	mg/kg	0.0046	0.0023	1	02/14/18 09:00	02/14/18 21:54	591-78-6	
Iodomethane	**0.0023 U**	mg/kg	0.0046	0.0023	1	02/14/18 09:00	02/14/18 21:54	74-88-4	
Isopropylbenzene (Cumene)	**0.0027 U**	mg/kg	0.0046	0.0027	1	02/14/18 09:00	02/14/18 21:54	98-82-8	
p-Isopropyltoluene	**0.0028 U**	mg/kg	0.0046	0.0028	1	02/14/18 09:00	02/14/18 21:54	99-87-6	
Methylene Chloride	**0.0023 U**	mg/kg	0.0046	0.0023	1	02/14/18 09:00	02/14/18 21:54	75-09-2	
4-Methyl-2-pentanone (MIBK)	**0.0023 U**	mg/kg	0.0046	0.0023	1	02/14/18 09:00	02/14/18 21:54	108-10-1	
Methyl-tert-butyl ether	**0.0023 U**	mg/kg	0.0046	0.0023	1	02/14/18 09:00	02/14/18 21:54	1634-04-4	
n-Propylbenzene	**0.0024 U**	mg/kg	0.0046	0.0024	1	02/14/18 09:00	02/14/18 21:54	103-65-1	
Styrene	**0.0023 U**	mg/kg	0.0046	0.0023	1	02/14/18 09:00	02/14/18 21:54	100-42-5	
1,1,1,2-Tetrachloroethane	**0.0023 U**	mg/kg	0.0046	0.0023	1	02/14/18 09:00	02/14/18 21:54	630-20-6	

ANALYTICAL RESULTS

Project: 6783-17-2991.04/MIA Parcel 3
Pace Project No.: 35373365

Sample: SB-3 **Lab ID: 35373365010** Collected: 02/07/18 14:15 Received: 02/10/18 01:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV 5035	Analytical Method: EPA 8260 Preparation Method: EPA 5035								
1,1,2,2-Tetrachloroethane	**0.0023 U**	mg/kg	0.0046	0.0023	1	02/14/18 09:00	02/14/18 21:54	79-34-5	
Tetrachloroethene	**0.0023 U**	mg/kg	0.0046	0.0023	1	02/14/18 09:00	02/14/18 21:54	127-18-4	
Toluene	**0.0025 U**	mg/kg	0.0046	0.0025	1	02/14/18 09:00	02/14/18 21:54	108-88-3	
1,2,3-Trichlorobenzene	**0.0023 U**	mg/kg	0.0046	0.0023	1	02/14/18 09:00	02/14/18 21:54	87-61-6	
1,2,4-Trichlorobenzene	**0.0023 U**	mg/kg	0.0046	0.0023	1	02/14/18 09:00	02/14/18 21:54	120-82-1	
1,1,1-Trichloroethane	**0.0025 U**	mg/kg	0.0046	0.0025	1	02/14/18 09:00	02/14/18 21:54	71-55-6	
1,1,2-Trichloroethane	**0.0023 U**	mg/kg	0.0046	0.0023	1	02/14/18 09:00	02/14/18 21:54	79-00-5	
Trichloroethene	**0.0026 U**	mg/kg	0.0046	0.0026	1	02/14/18 09:00	02/14/18 21:54	79-01-6	
Trichlorofluoromethane	**0.0025 U**	mg/kg	0.0046	0.0025	1	02/14/18 09:00	02/14/18 21:54	75-69-4	
1,2,3-Trichloropropane	**0.0023 U**	mg/kg	0.0046	0.0023	1	02/14/18 09:00	02/14/18 21:54	96-18-4	
1,2,3-Trimethylbenzene	**0.0023 U**	mg/kg	0.0046	0.0023	1	02/14/18 09:00	02/14/18 21:54	526-73-8	N2
1,2,4-Trimethylbenzene	**0.0026 U**	mg/kg	0.0046	0.0026	1	02/14/18 09:00	02/14/18 21:54	95-63-6	
1,3,5-Trimethylbenzene	**0.0026 U**	mg/kg	0.0046	0.0026	1	02/14/18 09:00	02/14/18 21:54	108-67-8	
Vinyl acetate	**0.0023 U**	mg/kg	0.0046	0.0023	1	02/14/18 09:00	02/14/18 21:54	108-05-4	
Vinyl chloride	**0.0025 U**	mg/kg	0.0046	0.0025	1	02/14/18 09:00	02/14/18 21:54	75-01-4	
Xylene (Total)	**0.0047 U**	mg/kg	0.014	0.0047	1	02/14/18 09:00	02/14/18 21:54	1330-20-7	
m&p-Xylene	**0.0047 U**	mg/kg	0.0091	0.0047	1	02/14/18 09:00	02/14/18 21:54	179601-23-1	
o-Xylene	**0.0024 U**	mg/kg	0.0046	0.0024	1	02/14/18 09:00	02/14/18 21:54	95-47-6	
Surrogates									
4-Bromofluorobenzene (S)	99	%	55-148		1	02/14/18 09:00	02/14/18 21:54	460-00-4	
1,2-Dichloroethane-d4 (S)	121	%	80-131		1	02/14/18 09:00	02/14/18 21:54	17060-07-0	
Toluene-d8 (S)	97	%	84-117		1	02/14/18 09:00	02/14/18 21:54	2037-26-5	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**6.1**	%	0.10	0.10	1		02/15/18 12:53		

ANALYTICAL RESULTS

Project: 6783-17-2991.04/MIA Parcel 3
Pace Project No.: 35373365

Sample: SB-6 **Lab ID: 35373365011** Collected: 02/07/18 16:00 Received: 02/10/18 01:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
FL-PRO Soil Microwave	Analytical Method: FL-PRO Preparation Method: EPA 3546								
Petroleum Range Organics	**4.1 I**	mg/kg	4.2	2.7	1	02/13/18 14:53	02/14/18 21:21		
Surrogates									
o-Terphenyl (S)	101	%	62-109		1	02/13/18 14:53	02/14/18 21:21	84-15-1	
N-Pentatriacontane (S)	125	%	42-159		1	02/13/18 14:53	02/14/18 21:21	630-07-09	
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**1.6**	mg/kg	0.58	0.29	1	02/15/18 03:15	02/17/18 03:13	7440-38-2	
Barium	**3.7**	mg/kg	0.58	0.29	1	02/15/18 03:15	02/17/18 03:13	7440-39-3	
Cadmium	**0.029 U**	mg/kg	0.058	0.029	1	02/15/18 03:15	02/17/18 03:13	7440-43-9	
Chromium	**4.9**	mg/kg	0.29	0.15	1	02/15/18 03:15	02/17/18 03:13	7440-47-3	
Lead	**2.1**	mg/kg	0.58	0.29	1	02/15/18 03:15	02/17/18 03:13	7439-92-1	
Selenium	**0.44 U**	mg/kg	0.87	0.44	1	02/15/18 03:15	02/17/18 03:13	7782-49-2	
Silver	**0.15 U**	mg/kg	0.29	0.15	1	02/15/18 03:15	02/17/18 03:13	7440-22-4	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	**0.0060 I**	mg/kg	0.010	0.0050	1	02/16/18 10:56	02/19/18 10:59	7439-97-6	
8270 MSSV MW PAH by SIM	Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546								
Acenaphthene	**0.0016 U**	mg/kg	0.011	0.0016	1	02/13/18 13:15	02/15/18 15:45	83-32-9	
Acenaphthylene	**0.0014 U**	mg/kg	0.011	0.0014	1	02/13/18 13:15	02/15/18 15:45	208-96-8	
Anthracene	**0.0015 U**	mg/kg	0.011	0.0015	1	02/13/18 13:15	02/15/18 15:45	120-12-7	
Benzo(a)anthracene	**0.00093 I**	mg/kg	0.011	0.00075	1	02/13/18 13:15	02/15/18 15:45	56-55-3	
Benzo(a)pyrene	**0.0012 U**	mg/kg	0.011	0.0012	1	02/13/18 13:15	02/15/18 15:45	50-32-8	
Benzo(b)fluoranthene	**0.00097 I**	mg/kg	0.011	0.00071	1	02/13/18 13:15	02/15/18 15:45	205-99-2	
Benzo(g,h,i)perylene	**0.0027 U**	mg/kg	0.011	0.0027	1	02/13/18 13:15	02/15/18 15:45	191-24-2	
Benzo(k)fluoranthene	**0.0016 U**	mg/kg	0.011	0.0016	1	02/13/18 13:15	02/15/18 15:45	207-08-9	
Chrysene	**0.0019 U**	mg/kg	0.011	0.0019	1	02/13/18 13:15	02/15/18 15:45	218-01-9	
Dibenz(a,h)anthracene	**0.0019 U**	mg/kg	0.011	0.0019	1	02/13/18 13:15	02/15/18 15:45	53-70-3	
Fluoranthene	**0.0014 I**	mg/kg	0.011	0.00088	1	02/13/18 13:15	02/15/18 15:45	206-44-0	
Fluorene	**0.0017 U**	mg/kg	0.011	0.0017	1	02/13/18 13:15	02/15/18 15:45	86-73-7	
Indeno(1,2,3-cd)pyrene	**0.0030 U**	mg/kg	0.011	0.0030	1	02/13/18 13:15	02/15/18 15:45	193-39-5	
1-Methylnaphthalene	**0.0013 U**	mg/kg	0.011	0.0013	1	02/13/18 13:15	02/15/18 15:45	90-12-0	
2-Methylnaphthalene	**0.0012 U**	mg/kg	0.011	0.0012	1	02/13/18 13:15	02/15/18 15:45	91-57-6	
Naphthalene	**0.0024 U**	mg/kg	0.011	0.0024	1	02/13/18 13:15	02/15/18 15:45	91-20-3	
Phenanthrene	**0.0016 U**	mg/kg	0.011	0.0016	1	02/13/18 13:15	02/15/18 15:45	85-01-8	
Pyrene	**0.0019 U**	mg/kg	0.011	0.0019	1	02/13/18 13:15	02/15/18 15:45	129-00-0	
Surrogates									
Nitrobenzene-d5 (S)	66	%	10-128		1	02/13/18 13:15	02/15/18 15:45	4165-60-0	
2-Fluorobiphenyl (S)	67	%	10-110		1	02/13/18 13:15	02/15/18 15:45	321-60-8	
Terphenyl-d14 (S)	66	%	39-119		1	02/13/18 13:15	02/15/18 15:45	1718-51-0	
8260 MSV 5035	Analytical Method: EPA 8260 Preparation Method: EPA 5035								
Acetone	**0.61**	mg/kg	0.020	0.0098	1	02/14/18 19:01	02/15/18 03:43	67-64-1	L
Acetonitrile	**0.025 U**	mg/kg	0.049	0.025	1	02/14/18 19:01	02/15/18 03:43	75-05-8	
Benzene	**0.0025 U**	mg/kg	0.0049	0.0025	1	02/14/18 19:01	02/15/18 03:43	71-43-2	

ANALYTICAL RESULTS

Project: 6783-17-2991.04/MIA Parcel 3
Pace Project No.: 35373365

Sample: SB-6 **Lab ID: 35373365011** Collected: 02/07/18 16:00 Received: 02/10/18 01:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV 5035	Analytical Method: EPA 8260 Preparation Method: EPA 5035								
Bromobenzene	**0.0025 U**	mg/kg	0.0049	0.0025	1	02/14/18 19:01	02/15/18 03:43	108-86-1	
Bromochloromethane	**0.0025 U**	mg/kg	0.0049	0.0025	1	02/14/18 19:01	02/15/18 03:43	74-97-5	
Bromodichloromethane	**0.0025 U**	mg/kg	0.0049	0.0025	1	02/14/18 19:01	02/15/18 03:43	75-27-4	
Bromoform	**0.0025 U**	mg/kg	0.0049	0.0025	1	02/14/18 19:01	02/15/18 03:43	75-25-2	
Bromomethane	**0.0025 U**	mg/kg	0.0049	0.0025	1	02/14/18 19:01	02/15/18 03:43	74-83-9	
2-Butanone (MEK)	**0.0025 U**	mg/kg	0.0049	0.0025	1	02/14/18 19:01	02/15/18 03:43	78-93-3	
n-Butylbenzene	**0.0030 U**	mg/kg	0.0049	0.0030	1	02/14/18 19:01	02/15/18 03:43	104-51-8	
sec-Butylbenzene	**0.0028 U**	mg/kg	0.0049	0.0028	1	02/14/18 19:01	02/15/18 03:43	135-98-8	
tert-Butylbenzene	**0.0028 U**	mg/kg	0.0049	0.0028	1	02/14/18 19:01	02/15/18 03:43	98-06-6	
Carbon disulfide	**0.0025 U**	mg/kg	0.0049	0.0025	1	02/14/18 19:01	02/15/18 03:43	75-15-0	
Carbon tetrachloride	**0.0025 U**	mg/kg	0.0049	0.0025	1	02/14/18 19:01	02/15/18 03:43	56-23-5	
Chlorobenzene	**0.0025 U**	mg/kg	0.0049	0.0025	1	02/14/18 19:01	02/15/18 03:43	108-90-7	
Chloroethane	**0.0035 U**	mg/kg	0.0049	0.0035	1	02/14/18 19:01	02/15/18 03:43	75-00-3	
Chloroform	**0.0029 U**	mg/kg	0.0049	0.0029	1	02/14/18 19:01	02/15/18 03:43	67-66-3	
Chloromethane	**0.0028 U**	mg/kg	0.0049	0.0028	1	02/14/18 19:01	02/15/18 03:43	74-87-3	
2-Chlorotoluene	**0.0025 U**	mg/kg	0.0049	0.0025	1	02/14/18 19:01	02/15/18 03:43	95-49-8	
4-Chlorotoluene	**0.0025 U**	mg/kg	0.0049	0.0025	1	02/14/18 19:01	02/15/18 03:43	106-43-4	
Dibromochloromethane	**0.0025 U**	mg/kg	0.0049	0.0025	1	02/14/18 19:01	02/15/18 03:43	124-48-1	
Dibromomethane	**0.0025 U**	mg/kg	0.0049	0.0025	1	02/14/18 19:01	02/15/18 03:43	74-95-3	
1,2-Dichlorobenzene	**0.0025 U**	mg/kg	0.0049	0.0025	1	02/14/18 19:01	02/15/18 03:43	95-50-1	
1,3-Dichlorobenzene	**0.0025 U**	mg/kg	0.0049	0.0025	1	02/14/18 19:01	02/15/18 03:43	541-73-1	
1,4-Dichlorobenzene	**0.0025 U**	mg/kg	0.0049	0.0025	1	02/14/18 19:01	02/15/18 03:43	106-46-7	
Dichlorodifluoromethane	**0.0026 U**	mg/kg	0.0049	0.0026	1	02/14/18 19:01	02/15/18 03:43	75-71-8	
1,1-Dichloroethane	**0.0027 U**	mg/kg	0.0049	0.0027	1	02/14/18 19:01	02/15/18 03:43	75-34-3	
1,2-Dichloroethane	**0.0025 U**	mg/kg	0.0049	0.0025	1	02/14/18 19:01	02/15/18 03:43	107-06-2	
1,1-Dichloroethene	**0.0025 U**	mg/kg	0.0049	0.0025	1	02/14/18 19:01	02/15/18 03:43	75-35-4	
cis-1,2-Dichloroethene	**0.0025 U**	mg/kg	0.0049	0.0025	1	02/14/18 19:01	02/15/18 03:43	156-59-2	
trans-1,2-Dichloroethene	**0.0030 U**	mg/kg	0.0049	0.0030	1	02/14/18 19:01	02/15/18 03:43	156-60-5	
1,2-Dichloropropane	**0.0025 U**	mg/kg	0.0049	0.0025	1	02/14/18 19:01	02/15/18 03:43	78-87-5	
1,3-Dichloropropane	**0.0025 U**	mg/kg	0.0049	0.0025	1	02/14/18 19:01	02/15/18 03:43	142-28-9	
2,2-Dichloropropane	**0.0025 U**	mg/kg	0.0049	0.0025	1	02/14/18 19:01	02/15/18 03:43	594-20-7	
1,1-Dichloropropene	**0.0025 U**	mg/kg	0.0049	0.0025	1	02/14/18 19:01	02/15/18 03:43	563-58-6	
cis-1,3-Dichloropropene	**0.0025 U**	mg/kg	0.0049	0.0025	1	02/14/18 19:01	02/15/18 03:43	10061-01-5	
trans-1,3-Dichloropropene	**0.0025 U**	mg/kg	0.0049	0.0025	1	02/14/18 19:01	02/15/18 03:43	10061-02-6	
Ethylbenzene	**0.0028 U**	mg/kg	0.0049	0.0028	1	02/14/18 19:01	02/15/18 03:43	100-41-4	
2-Hexanone	**0.0025 U**	mg/kg	0.0049	0.0025	1	02/14/18 19:01	02/15/18 03:43	591-78-6	
Iodomethane	**0.0025 U**	mg/kg	0.0049	0.0025	1	02/14/18 19:01	02/15/18 03:43	74-88-4	
Isopropylbenzene (Cumene)	**0.0029 U**	mg/kg	0.0049	0.0029	1	02/14/18 19:01	02/15/18 03:43	98-82-8	
p-Isopropyltoluene	**0.0030 U**	mg/kg	0.0049	0.0030	1	02/14/18 19:01	02/15/18 03:43	99-87-6	
Methylene Chloride	**0.0025 U**	mg/kg	0.0049	0.0025	1	02/14/18 19:01	02/15/18 03:43	75-09-2	
4-Methyl-2-pentanone (MIBK)	**0.0025 U**	mg/kg	0.0049	0.0025	1	02/14/18 19:01	02/15/18 03:43	108-10-1	
Methyl-tert-butyl ether	**0.0025 U**	mg/kg	0.0049	0.0025	1	02/14/18 19:01	02/15/18 03:43	1634-04-4	
n-Propylbenzene	**0.0026 U**	mg/kg	0.0049	0.0026	1	02/14/18 19:01	02/15/18 03:43	103-65-1	
Styrene	**0.0025 U**	mg/kg	0.0049	0.0025	1	02/14/18 19:01	02/15/18 03:43	100-42-5	
1,1,1,2-Tetrachloroethane	**0.0025 U**	mg/kg	0.0049	0.0025	1	02/14/18 19:01	02/15/18 03:43	630-20-6	

ANALYTICAL RESULTS

Project: 6783-17-2991.04/MIA Parcel 3
Pace Project No.: 35373365

Sample: SB-6 **Lab ID: 35373365011** Collected: 02/07/18 16:00 Received: 02/10/18 01:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV 5035	Analytical Method: EPA 8260 Preparation Method: EPA 5035								
1,1,2,2-Tetrachloroethane	**0.0025 U**	mg/kg	0.0049	0.0025	1	02/14/18 19:01	02/15/18 03:43	79-34-5	
Tetrachloroethene	**0.0025 U**	mg/kg	0.0049	0.0025	1	02/14/18 19:01	02/15/18 03:43	127-18-4	
Toluene	**0.0027 U**	mg/kg	0.0049	0.0027	1	02/14/18 19:01	02/15/18 03:43	108-88-3	
1,2,3-Trichlorobenzene	**0.0025 U**	mg/kg	0.0049	0.0025	1	02/14/18 19:01	02/15/18 03:43	87-61-6	
1,2,4-Trichlorobenzene	**0.0025 U**	mg/kg	0.0049	0.0025	1	02/14/18 19:01	02/15/18 03:43	120-82-1	
1,1,1-Trichloroethane	**0.0027 U**	mg/kg	0.0049	0.0027	1	02/14/18 19:01	02/15/18 03:43	71-55-6	
1,1,2-Trichloroethane	**0.0025 U**	mg/kg	0.0049	0.0025	1	02/14/18 19:01	02/15/18 03:43	79-00-5	
Trichloroethene	**0.0028 U**	mg/kg	0.0049	0.0028	1	02/14/18 19:01	02/15/18 03:43	79-01-6	
Trichlorofluoromethane	**0.0027 U**	mg/kg	0.0049	0.0027	1	02/14/18 19:01	02/15/18 03:43	75-69-4	
1,2,3-Trichloropropane	**0.0025 U**	mg/kg	0.0049	0.0025	1	02/14/18 19:01	02/15/18 03:43	96-18-4	
1,2,3-Trimethylbenzene	**0.0025 U**	mg/kg	0.0049	0.0025	1	02/14/18 19:01	02/15/18 03:43	526-73-8	N2
1,2,4-Trimethylbenzene	**0.0028 U**	mg/kg	0.0049	0.0028	1	02/14/18 19:01	02/15/18 03:43	95-63-6	
1,3,5-Trimethylbenzene	**0.0028 U**	mg/kg	0.0049	0.0028	1	02/14/18 19:01	02/15/18 03:43	108-67-8	
Vinyl acetate	**0.0025 U**	mg/kg	0.0049	0.0025	1	02/14/18 19:01	02/15/18 03:43	108-05-4	
Vinyl chloride	**0.0026 U**	mg/kg	0.0049	0.0026	1	02/14/18 19:01	02/15/18 03:43	75-01-4	
Xylene (Total)	**0.0051 U**	mg/kg	0.015	0.0051	1	02/14/18 19:01	02/15/18 03:43	1330-20-7	
m&p-Xylene	**0.0051 U**	mg/kg	0.0098	0.0051	1	02/14/18 19:01	02/15/18 03:43	179601-23-1	
o-Xylene	**0.0025 U**	mg/kg	0.0049	0.0025	1	02/14/18 19:01	02/15/18 03:43	95-47-6	
Surrogates									
4-Bromofluorobenzene (S)	99	%	55-148		1	02/14/18 19:01	02/15/18 03:43	460-00-4	
1,2-Dichloroethane-d4 (S)	116	%	80-131		1	02/14/18 19:01	02/15/18 03:43	17060-07-0	
Toluene-d8 (S)	98	%	84-117		1	02/14/18 19:01	02/15/18 03:43	2037-26-5	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**4.5**	%	0.10	0.10	1		02/15/18 12:53		

ANALYTICAL RESULTS

Project:	6783-17-2991.04/MIA Parcel 3
Pace Project No.:	35373365

Sample: SB-5 **Lab ID: 35373365012** Collected: 02/08/18 11:00 Received: 02/10/18 01:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
FL-PRO Soil Microwave	Analytical Method: FL-PRO Preparation Method: EPA 3546								
Petroleum Range Organics	**2.6 U**	mg/kg	4.1	2.6	1	02/13/18 14:53	02/14/18 21:45		
Surrogates									
o-Terphenyl (S)	100	%	62-109		1	02/13/18 14:53	02/14/18 21:45	84-15-1	
N-Pentatriacontane (S)	106	%	42-159		1	02/13/18 14:53	02/14/18 21:45	630-07-09	
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**1.7**	mg/kg	0.61	0.31	1	02/15/18 03:15	02/17/18 03:17	7440-38-2	
Barium	**3.9**	mg/kg	0.61	0.31	1	02/15/18 03:15	02/17/18 03:17	7440-39-3	
Cadmium	**0.031 U**	mg/kg	0.061	0.031	1	02/15/18 03:15	02/17/18 03:17	7440-43-9	
Chromium	**5.7**	mg/kg	0.31	0.15	1	02/15/18 03:15	02/17/18 03:17	7440-47-3	
Lead	**2.5**	mg/kg	0.61	0.31	1	02/15/18 03:15	02/17/18 03:17	7439-92-1	
Selenium	**0.46 U**	mg/kg	0.92	0.46	1	02/15/18 03:15	02/17/18 03:17	7782-49-2	
Silver	**0.15 U**	mg/kg	0.31	0.15	1	02/15/18 03:15	02/17/18 03:17	7440-22-4	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	**0.0070 I**	mg/kg	0.0082	0.0041	1	02/16/18 10:56	02/19/18 11:06	7439-97-6	
8270 MSSV MW PAH by SIM	Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546								
Acenaphthene	**0.0016 U**	mg/kg	0.010	0.0016	1	02/13/18 13:15	02/15/18 16:08	83-32-9	
Acenaphthylene	**0.0014 U**	mg/kg	0.010	0.0014	1	02/13/18 13:15	02/15/18 16:08	208-96-8	
Anthracene	**0.0015 U**	mg/kg	0.010	0.0015	1	02/13/18 13:15	02/15/18 16:08	120-12-7	
Benzo(a)anthracene	**0.0043 I**	mg/kg	0.010	0.00074	1	02/13/18 13:15	02/15/18 16:08	56-55-3	
Benzo(a)pyrene	**0.0039 I**	mg/kg	0.010	0.0012	1	02/13/18 13:15	02/15/18 16:08	50-32-8	
Benzo(b)fluoranthene	**0.0060 I**	mg/kg	0.010	0.00070	1	02/13/18 13:15	02/15/18 16:08	205-99-2	
Benzo(g,h,i)perylene	**0.0027 U**	mg/kg	0.010	0.0027	1	02/13/18 13:15	02/15/18 16:08	191-24-2	
Benzo(k)fluoranthene	**0.0023 I**	mg/kg	0.010	0.0016	1	02/13/18 13:15	02/15/18 16:08	207-08-9	
Chrysene	**0.0045 I**	mg/kg	0.010	0.0019	1	02/13/18 13:15	02/15/18 16:08	218-01-9	
Dibenz(a,h)anthracene	**0.0019 U**	mg/kg	0.010	0.0019	1	02/13/18 13:15	02/15/18 16:08	53-70-3	
Fluoranthene	**0.0078 I**	mg/kg	0.010	0.00087	1	02/13/18 13:15	02/15/18 16:08	206-44-0	
Fluorene	**0.0017 U**	mg/kg	0.010	0.0017	1	02/13/18 13:15	02/15/18 16:08	86-73-7	
Indeno(1,2,3-cd)pyrene	**0.0029 U**	mg/kg	0.010	0.0029	1	02/13/18 13:15	02/15/18 16:08	193-39-5	
1-Methylnaphthalene	**0.0013 U**	mg/kg	0.010	0.0013	1	02/13/18 13:15	02/15/18 16:08	90-12-0	
2-Methylnaphthalene	**0.0019 I**	mg/kg	0.010	0.0012	1	02/13/18 13:15	02/15/18 16:08	91-57-6	
Naphthalene	**0.0024 U**	mg/kg	0.010	0.0024	1	02/13/18 13:15	02/15/18 16:08	91-20-3	
Phenanthrene	**0.0032 I**	mg/kg	0.010	0.0016	1	02/13/18 13:15	02/15/18 16:08	85-01-8	
Pyrene	**0.0061 I**	mg/kg	0.010	0.0019	1	02/13/18 13:15	02/15/18 16:08	129-00-0	
Surrogates									
Nitrobenzene-d5 (S)	70	%	10-128		1	02/13/18 13:15	02/15/18 16:08	4165-60-0	
2-Fluorobiphenyl (S)	66	%	10-110		1	02/13/18 13:15	02/15/18 16:08	321-60-8	
Terphenyl-d14 (S)	60	%	39-119		1	02/13/18 13:15	02/15/18 16:08	1718-51-0	
8260 MSV 5035	Analytical Method: EPA 8260 Preparation Method: EPA 5035								
Acetone	**0.96**	mg/kg	0.021	0.010	1	02/14/18 19:01	02/15/18 04:07	67-64-1	L
Acetonitrile	**0.026 U**	mg/kg	0.052	0.026	1	02/14/18 19:01	02/15/18 04:07	75-05-8	
Benzene	**0.0026 U**	mg/kg	0.0052	0.0026	1	02/14/18 19:01	02/15/18 04:07	71-43-2	

ANALYTICAL RESULTS

Project: 6783-17-2991.04/MIA Parcel 3
Pace Project No.: 35373365

Sample: SB-5 **Lab ID: 35373365012** Collected: 02/08/18 11:00 Received: 02/10/18 01:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV 5035	Analytical Method: EPA 8260 Preparation Method: EPA 5035								
Bromobenzene	**0.0026 U**	mg/kg	0.0052	0.0026	1	02/14/18 19:01	02/15/18 04:07	108-86-1	
Bromochloromethane	**0.0026 U**	mg/kg	0.0052	0.0026	1	02/14/18 19:01	02/15/18 04:07	74-97-5	
Bromodichloromethane	**0.0026 U**	mg/kg	0.0052	0.0026	1	02/14/18 19:01	02/15/18 04:07	75-27-4	
Bromoform	**0.0026 U**	mg/kg	0.0052	0.0026	1	02/14/18 19:01	02/15/18 04:07	75-25-2	
Bromomethane	**0.0026 U**	mg/kg	0.0052	0.0026	1	02/14/18 19:01	02/15/18 04:07	74-83-9	
2-Butanone (MEK)	**0.0026 U**	mg/kg	0.0052	0.0026	1	02/14/18 19:01	02/15/18 04:07	78-93-3	
n-Butylbenzene	**0.0031 U**	mg/kg	0.0052	0.0031	1	02/14/18 19:01	02/15/18 04:07	104-51-8	
sec-Butylbenzene	**0.0030 U**	mg/kg	0.0052	0.0030	1	02/14/18 19:01	02/15/18 04:07	135-98-8	
tert-Butylbenzene	**0.0030 U**	mg/kg	0.0052	0.0030	1	02/14/18 19:01	02/15/18 04:07	98-06-6	
Carbon disulfide	**0.0026 U**	mg/kg	0.0052	0.0026	1	02/14/18 19:01	02/15/18 04:07	75-15-0	
Carbon tetrachloride	**0.0026 U**	mg/kg	0.0052	0.0026	1	02/14/18 19:01	02/15/18 04:07	56-23-5	
Chlorobenzene	**0.0026 U**	mg/kg	0.0052	0.0026	1	02/14/18 19:01	02/15/18 04:07	108-90-7	
Chloroethane	**0.0037 U**	mg/kg	0.0052	0.0037	1	02/14/18 19:01	02/15/18 04:07	75-00-3	
Chloroform	**0.0031 U**	mg/kg	0.0052	0.0031	1	02/14/18 19:01	02/15/18 04:07	67-66-3	
Chloromethane	**0.0029 U**	mg/kg	0.0052	0.0029	1	02/14/18 19:01	02/15/18 04:07	74-87-3	
2-Chlorotoluene	**0.0026 U**	mg/kg	0.0052	0.0026	1	02/14/18 19:01	02/15/18 04:07	95-49-8	
4-Chlorotoluene	**0.0026 U**	mg/kg	0.0052	0.0026	1	02/14/18 19:01	02/15/18 04:07	106-43-4	
Dibromochloromethane	**0.0026 U**	mg/kg	0.0052	0.0026	1	02/14/18 19:01	02/15/18 04:07	124-48-1	
Dibromomethane	**0.0026 U**	mg/kg	0.0052	0.0026	1	02/14/18 19:01	02/15/18 04:07	74-95-3	
1,2-Dichlorobenzene	**0.0026 U**	mg/kg	0.0052	0.0026	1	02/14/18 19:01	02/15/18 04:07	95-50-1	
1,3-Dichlorobenzene	**0.0026 U**	mg/kg	0.0052	0.0026	1	02/14/18 19:01	02/15/18 04:07	541-73-1	
1,4-Dichlorobenzene	**0.0026 U**	mg/kg	0.0052	0.0026	1	02/14/18 19:01	02/15/18 04:07	106-46-7	
Dichlorodifluoromethane	**0.0027 U**	mg/kg	0.0052	0.0027	1	02/14/18 19:01	02/15/18 04:07	75-71-8	
1,1-Dichloroethane	**0.0028 U**	mg/kg	0.0052	0.0028	1	02/14/18 19:01	02/15/18 04:07	75-34-3	
1,2-Dichloroethane	**0.0026 U**	mg/kg	0.0052	0.0026	1	02/14/18 19:01	02/15/18 04:07	107-06-2	
1,1-Dichloroethene	**0.0026 U**	mg/kg	0.0052	0.0026	1	02/14/18 19:01	02/15/18 04:07	75-35-4	
cis-1,2-Dichloroethene	**0.0026 U**	mg/kg	0.0052	0.0026	1	02/14/18 19:01	02/15/18 04:07	156-59-2	
trans-1,2-Dichloroethene	**0.0032 U**	mg/kg	0.0052	0.0032	1	02/14/18 19:01	02/15/18 04:07	156-60-5	
1,2-Dichloropropane	**0.0026 U**	mg/kg	0.0052	0.0026	1	02/14/18 19:01	02/15/18 04:07	78-87-5	
1,3-Dichloropropane	**0.0026 U**	mg/kg	0.0052	0.0026	1	02/14/18 19:01	02/15/18 04:07	142-28-9	
2,2-Dichloropropane	**0.0027 U**	mg/kg	0.0052	0.0027	1	02/14/18 19:01	02/15/18 04:07	594-20-7	
1,1-Dichloropropene	**0.0026 U**	mg/kg	0.0052	0.0026	1	02/14/18 19:01	02/15/18 04:07	563-58-6	
cis-1,3-Dichloropropene	**0.0026 U**	mg/kg	0.0052	0.0026	1	02/14/18 19:01	02/15/18 04:07	10061-01-5	
trans-1,3-Dichloropropene	**0.0026 U**	mg/kg	0.0052	0.0026	1	02/14/18 19:01	02/15/18 04:07	10061-02-6	
Ethylbenzene	**0.0029 U**	mg/kg	0.0052	0.0029	1	02/14/18 19:01	02/15/18 04:07	100-41-4	
2-Hexanone	**0.0026 U**	mg/kg	0.0052	0.0026	1	02/14/18 19:01	02/15/18 04:07	591-78-6	
Iodomethane	**0.0026 U**	mg/kg	0.0052	0.0026	1	02/14/18 19:01	02/15/18 04:07	74-88-4	
Isopropylbenzene (Cumene)	**0.0030 U**	mg/kg	0.0052	0.0030	1	02/14/18 19:01	02/15/18 04:07	98-82-8	
p-Isopropyltoluene	**0.0031 U**	mg/kg	0.0052	0.0031	1	02/14/18 19:01	02/15/18 04:07	99-87-6	
Methylene Chloride	**0.0026 U**	mg/kg	0.0052	0.0026	1	02/14/18 19:01	02/15/18 04:07	75-09-2	
4-Methyl-2-pentanone (MIBK)	**0.0026 U**	mg/kg	0.0052	0.0026	1	02/14/18 19:01	02/15/18 04:07	108-10-1	
Methyl-tert-butyl ether	**0.0026 U**	mg/kg	0.0052	0.0026	1	02/14/18 19:01	02/15/18 04:07	1634-04-4	
n-Propylbenzene	**0.0027 U**	mg/kg	0.0052	0.0027	1	02/14/18 19:01	02/15/18 04:07	103-65-1	
Styrene	**0.0026 U**	mg/kg	0.0052	0.0026	1	02/14/18 19:01	02/15/18 04:07	100-42-5	
1,1,1,2-Tetrachloroethane	**0.0026 U**	mg/kg	0.0052	0.0026	1	02/14/18 19:01	02/15/18 04:07	630-20-6	

ANALYTICAL RESULTS

Project: 6783-17-2991.04/MIA Parcel 3
Pace Project No.: 35373365

Sample: SB-5 **Lab ID: 35373365012** Collected: 02/08/18 11:00 Received: 02/10/18 01:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV 5035	Analytical Method: EPA 8260 Preparation Method: EPA 5035								
1,1,2,2-Tetrachloroethane	**0.0026 U**	mg/kg	0.0052	0.0026	1	02/14/18 19:01	02/15/18 04:07	79-34-5	
Tetrachloroethene	**0.0026 U**	mg/kg	0.0052	0.0026	1	02/14/18 19:01	02/15/18 04:07	127-18-4	
Toluene	**0.0028 U**	mg/kg	0.0052	0.0028	1	02/14/18 19:01	02/15/18 04:07	108-88-3	
1,2,3-Trichlorobenzene	**0.0026 U**	mg/kg	0.0052	0.0026	1	02/14/18 19:01	02/15/18 04:07	87-61-6	
1,2,4-Trichlorobenzene	**0.0026 U**	mg/kg	0.0052	0.0026	1	02/14/18 19:01	02/15/18 04:07	120-82-1	
1,1,1-Trichloroethane	**0.0028 U**	mg/kg	0.0052	0.0028	1	02/14/18 19:01	02/15/18 04:07	71-55-6	
1,1,2-Trichloroethane	**0.0026 U**	mg/kg	0.0052	0.0026	1	02/14/18 19:01	02/15/18 04:07	79-00-5	
Trichloroethene	**0.0029 U**	mg/kg	0.0052	0.0029	1	02/14/18 19:01	02/15/18 04:07	79-01-6	
Trichlorofluoromethane	**0.0028 U**	mg/kg	0.0052	0.0028	1	02/14/18 19:01	02/15/18 04:07	75-69-4	
1,2,3-Trichloropropane	**0.0026 U**	mg/kg	0.0052	0.0026	1	02/14/18 19:01	02/15/18 04:07	96-18-4	
1,2,3-Trimethylbenzene	**0.0026 U**	mg/kg	0.0052	0.0026	1	02/14/18 19:01	02/15/18 04:07	526-73-8	N2
1,2,4-Trimethylbenzene	**0.0029 U**	mg/kg	0.0052	0.0029	1	02/14/18 19:01	02/15/18 04:07	95-63-6	
1,3,5-Trimethylbenzene	**0.0030 U**	mg/kg	0.0052	0.0030	1	02/14/18 19:01	02/15/18 04:07	108-67-8	
Vinyl acetate	**0.0026 U**	mg/kg	0.0052	0.0026	1	02/14/18 19:01	02/15/18 04:07	108-05-4	
Vinyl chloride	**0.0028 U**	mg/kg	0.0052	0.0028	1	02/14/18 19:01	02/15/18 04:07	75-01-4	
Xylene (Total)	**0.0053 U**	mg/kg	0.015	0.0053	1	02/14/18 19:01	02/15/18 04:07	1330-20-7	
m&p-Xylene	**0.0053 U**	mg/kg	0.010	0.0053	1	02/14/18 19:01	02/15/18 04:07	179601-23-1	
o-Xylene	**0.0027 U**	mg/kg	0.0052	0.0027	1	02/14/18 19:01	02/15/18 04:07	95-47-6	
Surrogates									
4-Bromofluorobenzene (S)	100	%	55-148		1	02/14/18 19:01	02/15/18 04:07	460-00-4	
1,2-Dichloroethane-d4 (S)	127	%	80-131		1	02/14/18 19:01	02/15/18 04:07	17060-07-0	
Toluene-d8 (S)	100	%	84-117		1	02/14/18 19:01	02/15/18 04:07	2037-26-5	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**3.2**	%	0.10	0.10	1		02/15/18 12:53		J(D6)

ANALYTICAL RESULTS

Project: 6783-17-2991.04/MIA Parcel 3
Pace Project No.: 35373365

Sample: SB-4 **Lab ID: 35373365013** Collected: 02/08/18 10:30 Received: 02/10/18 01:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
FL-PRO Soil Microwave	Analytical Method: FL-PRO Preparation Method: EPA 3546								
Petroleum Range Organics	**5.1**	mg/kg	4.1	2.6	1	02/13/18 14:53	02/14/18 21:45		
Surrogates									
o-Terphenyl (S)	109	%	62-109		1	02/13/18 14:53	02/14/18 21:45	84-15-1	
N-Pentatriacontane (S)	129	%	42-159		1	02/13/18 14:53	02/14/18 21:45	630-07-09	
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**1.6**	mg/kg	0.49	0.25	1	02/15/18 03:15	02/17/18 03:21	7440-38-2	
Barium	**4.1**	mg/kg	0.49	0.25	1	02/15/18 03:15	02/17/18 03:21	7440-39-3	
Cadmium	**0.025 U**	mg/kg	0.049	0.025	1	02/15/18 03:15	02/17/18 03:21	7440-43-9	
Chromium	**5.4**	mg/kg	0.25	0.12	1	02/15/18 03:15	02/17/18 03:21	7440-47-3	
Lead	**2.9**	mg/kg	0.49	0.25	1	02/15/18 03:15	02/17/18 03:21	7439-92-1	
Selenium	**0.37 U**	mg/kg	0.74	0.37	1	02/15/18 03:15	02/17/18 03:21	7782-49-2	
Silver	**0.12 U**	mg/kg	0.25	0.12	1	02/15/18 03:15	02/17/18 03:21	7440-22-4	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	**0.0062 I**	mg/kg	0.0096	0.0048	1	02/16/18 10:56	02/19/18 11:08	7439-97-6	
8270 MSSV MW PAH by SIM	Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546								
Acenaphthene	**0.0016 U**	mg/kg	0.010	0.0016	1	02/13/18 13:15	02/15/18 16:55	83-32-9	
Acenaphthylene	**0.0014 U**	mg/kg	0.010	0.0014	1	02/13/18 13:15	02/15/18 16:55	208-96-8	
Anthracene	**0.0015 U**	mg/kg	0.010	0.0015	1	02/13/18 13:15	02/15/18 16:55	120-12-7	
Benzo(a)anthracene	**0.00074 U**	mg/kg	0.010	0.00074	1	02/13/18 13:15	02/15/18 16:55	56-55-3	
Benzo(a)pyrene	**0.0011 U**	mg/kg	0.010	0.0011	1	02/13/18 13:15	02/15/18 16:55	50-32-8	
Benzo(b)fluoranthene	**0.00070 U**	mg/kg	0.010	0.00070	1	02/13/18 13:15	02/15/18 16:55	205-99-2	
Benzo(g,h,i)perylene	**0.0027 U**	mg/kg	0.010	0.0027	1	02/13/18 13:15	02/15/18 16:55	191-24-2	
Benzo(k)fluoranthene	**0.0016 U**	mg/kg	0.010	0.0016	1	02/13/18 13:15	02/15/18 16:55	207-08-9	
Chrysene	**0.0019 U**	mg/kg	0.010	0.0019	1	02/13/18 13:15	02/15/18 16:55	218-01-9	
Dibenz(a,h)anthracene	**0.0019 U**	mg/kg	0.010	0.0019	1	02/13/18 13:15	02/15/18 16:55	53-70-3	
Fluoranthene	**0.00086 U**	mg/kg	0.010	0.00086	1	02/13/18 13:15	02/15/18 16:55	206-44-0	
Fluorene	**0.0017 U**	mg/kg	0.010	0.0017	1	02/13/18 13:15	02/15/18 16:55	86-73-7	
Indeno(1,2,3-cd)pyrene	**0.0029 U**	mg/kg	0.010	0.0029	1	02/13/18 13:15	02/15/18 16:55	193-39-5	
1-Methylnaphthalene	**0.0012 U**	mg/kg	0.010	0.0012	1	02/13/18 13:15	02/15/18 16:55	90-12-0	
2-Methylnaphthalene	**0.0011 U**	mg/kg	0.010	0.0011	1	02/13/18 13:15	02/15/18 16:55	91-57-6	
Naphthalene	**0.0024 U**	mg/kg	0.010	0.0024	1	02/13/18 13:15	02/15/18 16:55	91-20-3	
Phenanthrene	**0.0016 U**	mg/kg	0.010	0.0016	1	02/13/18 13:15	02/15/18 16:55	85-01-8	
Pyrene	**0.0019 U**	mg/kg	0.010	0.0019	1	02/13/18 13:15	02/15/18 16:55	129-00-0	
Surrogates									
Nitrobenzene-d5 (S)	77	%	10-128		1	02/13/18 13:15	02/15/18 16:55	4165-60-0	
2-Fluorobiphenyl (S)	75	%	10-110		1	02/13/18 13:15	02/15/18 16:55	321-60-8	
Terphenyl-d14 (S)	81	%	39-119		1	02/13/18 13:15	02/15/18 16:55	1718-51-0	
8260 MSV 5035	Analytical Method: EPA 8260 Preparation Method: EPA 5035								
Acetone	**1.1**	mg/kg	0.022	0.011	1	02/14/18 19:01	02/15/18 04:30	67-64-1	L
Acetonitrile	**0.027 U**	mg/kg	0.054	0.027	1	02/14/18 19:01	02/15/18 04:30	75-05-8	
Benzene	**0.0028 U**	mg/kg	0.0054	0.0028	1	02/14/18 19:01	02/15/18 04:30	71-43-2	

ANALYTICAL RESULTS

Project:	6783-17-2991.04/MIA Parcel 3
Pace Project No.:	35373365

Sample: SB-4 **Lab ID: 35373365013** Collected: 02/08/18 10:30 Received: 02/10/18 01:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV 5035	Analytical Method: EPA 8260 Preparation Method: EPA 5035								
Bromobenzene	**0.0027 U**	mg/kg	0.0054	0.0027	1	02/14/18 19:01	02/15/18 04:30	108-86-1	
Bromochloromethane	**0.0027 U**	mg/kg	0.0054	0.0027	1	02/14/18 19:01	02/15/18 04:30	74-97-5	
Bromodichloromethane	**0.0027 U**	mg/kg	0.0054	0.0027	1	02/14/18 19:01	02/15/18 04:30	75-27-4	
Bromoform	**0.0027 U**	mg/kg	0.0054	0.0027	1	02/14/18 19:01	02/15/18 04:30	75-25-2	
Bromomethane	**0.0027 U**	mg/kg	0.0054	0.0027	1	02/14/18 19:01	02/15/18 04:30	74-83-9	
2-Butanone (MEK)	**0.0029 I**	mg/kg	0.0054	0.0027	1	02/14/18 19:01	02/15/18 04:30	78-93-3	
n-Butylbenzene	**0.0032 U**	mg/kg	0.0054	0.0032	1	02/14/18 19:01	02/15/18 04:30	104-51-8	
sec-Butylbenzene	**0.0031 U**	mg/kg	0.0054	0.0031	1	02/14/18 19:01	02/15/18 04:30	135-98-8	
tert-Butylbenzene	**0.0031 U**	mg/kg	0.0054	0.0031	1	02/14/18 19:01	02/15/18 04:30	98-06-6	
Carbon disulfide	**0.0027 U**	mg/kg	0.0054	0.0027	1	02/14/18 19:01	02/15/18 04:30	75-15-0	
Carbon tetrachloride	**0.0027 U**	mg/kg	0.0054	0.0027	1	02/14/18 19:01	02/15/18 04:30	56-23-5	
Chlorobenzene	**0.0027 U**	mg/kg	0.0054	0.0027	1	02/14/18 19:01	02/15/18 04:30	108-90-7	
Chloroethane	**0.0039 U**	mg/kg	0.0054	0.0039	1	02/14/18 19:01	02/15/18 04:30	75-00-3	
Chloroform	**0.0032 U**	mg/kg	0.0054	0.0032	1	02/14/18 19:01	02/15/18 04:30	67-66-3	
Chloromethane	**0.0030 U**	mg/kg	0.0054	0.0030	1	02/14/18 19:01	02/15/18 04:30	74-87-3	
2-Chlorotoluene	**0.0027 U**	mg/kg	0.0054	0.0027	1	02/14/18 19:01	02/15/18 04:30	95-49-8	
4-Chlorotoluene	**0.0027 U**	mg/kg	0.0054	0.0027	1	02/14/18 19:01	02/15/18 04:30	106-43-4	
Dibromochloromethane	**0.0027 U**	mg/kg	0.0054	0.0027	1	02/14/18 19:01	02/15/18 04:30	124-48-1	
Dibromomethane	**0.0027 U**	mg/kg	0.0054	0.0027	1	02/14/18 19:01	02/15/18 04:30	74-95-3	
1,2-Dichlorobenzene	**0.0027 U**	mg/kg	0.0054	0.0027	1	02/14/18 19:01	02/15/18 04:30	95-50-1	
1,3-Dichlorobenzene	**0.0027 U**	mg/kg	0.0054	0.0027	1	02/14/18 19:01	02/15/18 04:30	541-73-1	
1,4-Dichlorobenzene	**0.0027 U**	mg/kg	0.0054	0.0027	1	02/14/18 19:01	02/15/18 04:30	106-46-7	
Dichlorodifluoromethane	**0.0029 U**	mg/kg	0.0054	0.0029	1	02/14/18 19:01	02/15/18 04:30	75-71-8	
1,1-Dichloroethane	**0.0029 U**	mg/kg	0.0054	0.0029	1	02/14/18 19:01	02/15/18 04:30	75-34-3	
1,2-Dichloroethane	**0.0027 U**	mg/kg	0.0054	0.0027	1	02/14/18 19:01	02/15/18 04:30	107-06-2	
1,1-Dichloroethene	**0.0027 U**	mg/kg	0.0054	0.0027	1	02/14/18 19:01	02/15/18 04:30	75-35-4	
cis-1,2-Dichloroethene	**0.0027 U**	mg/kg	0.0054	0.0027	1	02/14/18 19:01	02/15/18 04:30	156-59-2	
trans-1,2-Dichloroethene	**0.0033 U**	mg/kg	0.0054	0.0033	1	02/14/18 19:01	02/15/18 04:30	156-60-5	
1,2-Dichloropropane	**0.0027 U**	mg/kg	0.0054	0.0027	1	02/14/18 19:01	02/15/18 04:30	78-87-5	
1,3-Dichloropropane	**0.0027 U**	mg/kg	0.0054	0.0027	1	02/14/18 19:01	02/15/18 04:30	142-28-9	
2,2-Dichloropropane	**0.0028 U**	mg/kg	0.0054	0.0028	1	02/14/18 19:01	02/15/18 04:30	594-20-7	
1,1-Dichloropropene	**0.0028 U**	mg/kg	0.0054	0.0028	1	02/14/18 19:01	02/15/18 04:30	563-58-6	
cis-1,3-Dichloropropene	**0.0027 U**	mg/kg	0.0054	0.0027	1	02/14/18 19:01	02/15/18 04:30	10061-01-5	
trans-1,3-Dichloropropene	**0.0027 U**	mg/kg	0.0054	0.0027	1	02/14/18 19:01	02/15/18 04:30	10061-02-6	
Ethylbenzene	**0.0031 U**	mg/kg	0.0054	0.0031	1	02/14/18 19:01	02/15/18 04:30	100-41-4	
2-Hexanone	**0.0027 U**	mg/kg	0.0054	0.0027	1	02/14/18 19:01	02/15/18 04:30	591-78-6	
Iodomethane	**0.0027 U**	mg/kg	0.0054	0.0027	1	02/14/18 19:01	02/15/18 04:30	74-88-4	
Isopropylbenzene (Cumene)	**0.0031 U**	mg/kg	0.0054	0.0031	1	02/14/18 19:01	02/15/18 04:30	98-82-8	
p-Isopropyltoluene	**0.0032 U**	mg/kg	0.0054	0.0032	1	02/14/18 19:01	02/15/18 04:30	99-87-6	
Methylene Chloride	**0.0027 U**	mg/kg	0.0054	0.0027	1	02/14/18 19:01	02/15/18 04:30	75-09-2	
4-Methyl-2-pentanone (MIBK)	**0.0027 U**	mg/kg	0.0054	0.0027	1	02/14/18 19:01	02/15/18 04:30	108-10-1	
Methyl-tert-butyl ether	**0.0027 U**	mg/kg	0.0054	0.0027	1	02/14/18 19:01	02/15/18 04:30	1634-04-4	
n-Propylbenzene	**0.0028 U**	mg/kg	0.0054	0.0028	1	02/14/18 19:01	02/15/18 04:30	103-65-1	
Styrene	**0.0027 U**	mg/kg	0.0054	0.0027	1	02/14/18 19:01	02/15/18 04:30	100-42-5	
1,1,1,2-Tetrachloroethane	**0.0027 U**	mg/kg	0.0054	0.0027	1	02/14/18 19:01	02/15/18 04:30	630-20-6	

ANALYTICAL RESULTS

Project: 6783-17-2991.04/MIA Parcel 3
Pace Project No.: 35373365

Sample: SB-4 **Lab ID: 35373365013** Collected: 02/08/18 10:30 Received: 02/10/18 01:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV 5035	Analytical Method: EPA 8260 Preparation Method: EPA 5035								
1,1,2,2-Tetrachloroethane	**0.0027 U**	mg/kg	0.0054	0.0027	1	02/14/18 19:01	02/15/18 04:30	79-34-5	
Tetrachloroethene	**0.0027 U**	mg/kg	0.0054	0.0027	1	02/14/18 19:01	02/15/18 04:30	127-18-4	
Toluene	**0.0029 U**	mg/kg	0.0054	0.0029	1	02/14/18 19:01	02/15/18 04:30	108-88-3	
1,2,3-Trichlorobenzene	**0.0027 U**	mg/kg	0.0054	0.0027	1	02/14/18 19:01	02/15/18 04:30	87-61-6	
1,2,4-Trichlorobenzene	**0.0027 U**	mg/kg	0.0054	0.0027	1	02/14/18 19:01	02/15/18 04:30	120-82-1	
1,1,1-Trichloroethane	**0.0030 U**	mg/kg	0.0054	0.0030	1	02/14/18 19:01	02/15/18 04:30	71-55-6	
1,1,2-Trichloroethane	**0.0027 U**	mg/kg	0.0054	0.0027	1	02/14/18 19:01	02/15/18 04:30	79-00-5	
Trichloroethene	**0.0030 U**	mg/kg	0.0054	0.0030	1	02/14/18 19:01	02/15/18 04:30	79-01-6	
Trichlorofluoromethane	**0.0029 U**	mg/kg	0.0054	0.0029	1	02/14/18 19:01	02/15/18 04:30	75-69-4	
1,2,3-Trichloropropane	**0.0027 U**	mg/kg	0.0054	0.0027	1	02/14/18 19:01	02/15/18 04:30	96-18-4	
1,2,3-Trimethylbenzene	**0.0027 U**	mg/kg	0.0054	0.0027	1	02/14/18 19:01	02/15/18 04:30	526-73-8	N2
1,2,4-Trimethylbenzene	**0.0030 U**	mg/kg	0.0054	0.0030	1	02/14/18 19:01	02/15/18 04:30	95-63-6	
1,3,5-Trimethylbenzene	**0.0031 U**	mg/kg	0.0054	0.0031	1	02/14/18 19:01	02/15/18 04:30	108-67-8	
Vinyl acetate	**0.0027 U**	mg/kg	0.0054	0.0027	1	02/14/18 19:01	02/15/18 04:30	108-05-4	
Vinyl chloride	**0.0029 U**	mg/kg	0.0054	0.0029	1	02/14/18 19:01	02/15/18 04:30	75-01-4	
Xylene (Total)	**0.0055 U**	mg/kg	0.016	0.0055	1	02/14/18 19:01	02/15/18 04:30	1330-20-7	
m&p-Xylene	**0.0055 U**	mg/kg	0.011	0.0055	1	02/14/18 19:01	02/15/18 04:30	179601-23-1	
o-Xylene	**0.0028 U**	mg/kg	0.0054	0.0028	1	02/14/18 19:01	02/15/18 04:30	95-47-6	
Surrogates									
4-Bromofluorobenzene (S)	104	%	55-148		1	02/14/18 19:01	02/15/18 04:30	460-00-4	
1,2-Dichloroethane-d4 (S)	129	%	80-131		1	02/14/18 19:01	02/15/18 04:30	17060-07-0	
Toluene-d8 (S)	102	%	84-117		1	02/14/18 19:01	02/15/18 04:30	2037-26-5	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**4.0**	%	0.10	0.10	1		02/15/18 12:53		

ANALYTICAL RESULTS

Project: 6783-17-2991.04/MIA Parcel 3
Pace Project No.: 35373365

Sample: SB-7 **Lab ID: 35373365014** Collected: 02/08/18 11:40 Received: 02/10/18 01:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
FL-PRO Soil Microwave	Analytical Method: FL-PRO Preparation Method: EPA 3546								
Petroleum Range Organics	**20.3**	mg/kg	4.4	2.8	1	02/13/18 14:53	02/14/18 22:09		
Surrogates									
o-Terphenyl (S)	110	%	62-109		1	02/13/18 14:53	02/14/18 22:09	84-15-1	J(S0)
N-Pentatriacontane (S)	109	%	42-159		1	02/13/18 14:53	02/14/18 22:09	630-07-09	
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**1.6**	mg/kg	0.59	0.30	1	02/15/18 03:15	02/17/18 03:25	7440-38-2	
Barium	**10**	mg/kg	0.59	0.30	1	02/15/18 03:15	02/17/18 03:25	7440-39-3	
Cadmium	**0.030 U**	mg/kg	0.059	0.030	1	02/15/18 03:15	02/17/18 03:25	7440-43-9	
Chromium	**5.4**	mg/kg	0.30	0.15	1	02/15/18 03:15	02/17/18 03:25	7440-47-3	
Lead	**3.8**	mg/kg	0.59	0.30	1	02/15/18 03:15	02/17/18 03:25	7439-92-1	
Selenium	**0.44 U**	mg/kg	0.89	0.44	1	02/15/18 03:15	02/17/18 03:25	7782-49-2	
Silver	**0.15 U**	mg/kg	0.30	0.15	1	02/15/18 03:15	02/17/18 03:25	7440-22-4	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	**0.0049 U**	mg/kg	0.0098	0.0049	1	02/16/18 10:56	02/19/18 11:10	7439-97-6	
8270 MSSV MW PAH by SIM	Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546								
Acenaphthene	**0.0017 U**	mg/kg	0.011	0.0017	1	02/13/18 13:15	02/15/18 17:18	83-32-9	
Acenaphthylene	**0.0014 U**	mg/kg	0.011	0.0014	1	02/13/18 13:15	02/15/18 17:18	208-96-8	
Anthracene	**0.0033 I**	mg/kg	0.011	0.0015	1	02/13/18 13:15	02/15/18 17:18	120-12-7	
Benzo(a)anthracene	**0.031**	mg/kg	0.011	0.00079	1	02/13/18 13:15	02/15/18 17:18	56-55-3	
Benzo(a)pyrene	**0.024**	mg/kg	0.011	0.0012	1	02/13/18 13:15	02/15/18 17:18	50-32-8	
Benzo(b)fluoranthene	**0.035**	mg/kg	0.011	0.00074	1	02/13/18 13:15	02/15/18 17:18	205-99-2	
Benzo(g,h,i)perylene	**0.0098 I**	mg/kg	0.011	0.0029	1	02/13/18 13:15	02/15/18 17:18	191-24-2	
Benzo(k)fluoranthene	**0.012**	mg/kg	0.011	0.0017	1	02/13/18 13:15	02/15/18 17:18	207-08-9	
Chrysene	**0.028**	mg/kg	0.011	0.0020	1	02/13/18 13:15	02/15/18 17:18	218-01-9	
Dibenz(a,h)anthracene	**0.0040 I**	mg/kg	0.011	0.0020	1	02/13/18 13:15	02/15/18 17:18	53-70-3	
Fluoranthene	**0.047**	mg/kg	0.011	0.00092	1	02/13/18 13:15	02/15/18 17:18	206-44-0	
Fluorene	**0.0018 U**	mg/kg	0.011	0.0018	1	02/13/18 13:15	02/15/18 17:18	86-73-7	
Indeno(1,2,3-cd)pyrene	**0.011**	mg/kg	0.011	0.0031	1	02/13/18 13:15	02/15/18 17:18	193-39-5	
1-Methylnaphthalene	**0.0013 U**	mg/kg	0.011	0.0013	1	02/13/18 13:15	02/15/18 17:18	90-12-0	
2-Methylnaphthalene	**0.0012 U**	mg/kg	0.011	0.0012	1	02/13/18 13:15	02/15/18 17:18	91-57-6	
Naphthalene	**0.0025 U**	mg/kg	0.011	0.0025	1	02/13/18 13:15	02/15/18 17:18	91-20-3	
Phenanthrene	**0.011**	mg/kg	0.011	0.0017	1	02/13/18 13:15	02/15/18 17:18	85-01-8	
Pyrene	**0.034**	mg/kg	0.011	0.0020	1	02/13/18 13:15	02/15/18 17:18	129-00-0	
Surrogates									
Nitrobenzene-d5 (S)	73	%	10-128		1	02/13/18 13:15	02/15/18 17:18	4165-60-0	
2-Fluorobiphenyl (S)	73	%	10-110		1	02/13/18 13:15	02/15/18 17:18	321-60-8	
Terphenyl-d14 (S)	75	%	39-119		1	02/13/18 13:15	02/15/18 17:18	1718-51-0	
8260 MSV 5035	Analytical Method: EPA 8260 Preparation Method: EPA 5035								
Acetone	**0.87**	mg/kg	0.019	0.0095	1	02/14/18 19:01	02/15/18 04:53	67-64-1	L
Acetonitrile	**0.024 U**	mg/kg	0.047	0.024	1	02/14/18 19:01	02/15/18 04:53	75-05-8	
Benzene	**0.0024 U**	mg/kg	0.0047	0.0024	1	02/14/18 19:01	02/15/18 04:53	71-43-2	

ANALYTICAL RESULTS

Project: 6783-17-2991.04/MIA Parcel 3
Pace Project No.: 35373365

Sample: SB-7 **Lab ID: 35373365014** Collected: 02/08/18 11:40 Received: 02/10/18 01:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV 5035	Analytical Method: EPA 8260 Preparation Method: EPA 5035								
Bromobenzene	**0.0024 U**	mg/kg	0.0047	0.0024	1	02/14/18 19:01	02/15/18 04:53	108-86-1	
Bromochloromethane	**0.0024 U**	mg/kg	0.0047	0.0024	1	02/14/18 19:01	02/15/18 04:53	74-97-5	
Bromodichloromethane	**0.0024 U**	mg/kg	0.0047	0.0024	1	02/14/18 19:01	02/15/18 04:53	75-27-4	
Bromoform	**0.0024 U**	mg/kg	0.0047	0.0024	1	02/14/18 19:01	02/15/18 04:53	75-25-2	
Bromomethane	**0.0024 U**	mg/kg	0.0047	0.0024	1	02/14/18 19:01	02/15/18 04:53	74-83-9	
2-Butanone (MEK)	**0.0024 U**	mg/kg	0.0047	0.0024	1	02/14/18 19:01	02/15/18 04:53	78-93-3	
n-Butylbenzene	**0.0029 U**	mg/kg	0.0047	0.0029	1	02/14/18 19:01	02/15/18 04:53	104-51-8	
sec-Butylbenzene	**0.0027 U**	mg/kg	0.0047	0.0027	1	02/14/18 19:01	02/15/18 04:53	135-98-8	
tert-Butylbenzene	**0.0027 U**	mg/kg	0.0047	0.0027	1	02/14/18 19:01	02/15/18 04:53	98-06-6	
Carbon disulfide	**0.0024 U**	mg/kg	0.0047	0.0024	1	02/14/18 19:01	02/15/18 04:53	75-15-0	
Carbon tetrachloride	**0.0024 U**	mg/kg	0.0047	0.0024	1	02/14/18 19:01	02/15/18 04:53	56-23-5	
Chlorobenzene	**0.0024 U**	mg/kg	0.0047	0.0024	1	02/14/18 19:01	02/15/18 04:53	108-90-7	
Chloroethane	**0.0034 U**	mg/kg	0.0047	0.0034	1	02/14/18 19:01	02/15/18 04:53	75-00-3	
Chloroform	**0.0028 U**	mg/kg	0.0047	0.0028	1	02/14/18 19:01	02/15/18 04:53	67-66-3	
Chloromethane	**0.0027 U**	mg/kg	0.0047	0.0027	1	02/14/18 19:01	02/15/18 04:53	74-87-3	
2-Chlorotoluene	**0.0024 U**	mg/kg	0.0047	0.0024	1	02/14/18 19:01	02/15/18 04:53	95-49-8	
4-Chlorotoluene	**0.0024 U**	mg/kg	0.0047	0.0024	1	02/14/18 19:01	02/15/18 04:53	106-43-4	
Dibromochloromethane	**0.0024 U**	mg/kg	0.0047	0.0024	1	02/14/18 19:01	02/15/18 04:53	124-48-1	
Dibromomethane	**0.0024 U**	mg/kg	0.0047	0.0024	1	02/14/18 19:01	02/15/18 04:53	74-95-3	
1,2-Dichlorobenzene	**0.0024 U**	mg/kg	0.0047	0.0024	1	02/14/18 19:01	02/15/18 04:53	95-50-1	
1,3-Dichlorobenzene	**0.0024 U**	mg/kg	0.0047	0.0024	1	02/14/18 19:01	02/15/18 04:53	541-73-1	
1,4-Dichlorobenzene	**0.0024 U**	mg/kg	0.0047	0.0024	1	02/14/18 19:01	02/15/18 04:53	106-46-7	
Dichlorodifluoromethane	**0.0025 U**	mg/kg	0.0047	0.0025	1	02/14/18 19:01	02/15/18 04:53	75-71-8	
1,1-Dichloroethane	**0.0026 U**	mg/kg	0.0047	0.0026	1	02/14/18 19:01	02/15/18 04:53	75-34-3	
1,2-Dichloroethane	**0.0024 U**	mg/kg	0.0047	0.0024	1	02/14/18 19:01	02/15/18 04:53	107-06-2	
1,1-Dichloroethene	**0.0024 U**	mg/kg	0.0047	0.0024	1	02/14/18 19:01	02/15/18 04:53	75-35-4	
cis-1,2-Dichloroethene	**0.0024 U**	mg/kg	0.0047	0.0024	1	02/14/18 19:01	02/15/18 04:53	156-59-2	
trans-1,2-Dichloroethene	**0.0029 U**	mg/kg	0.0047	0.0029	1	02/14/18 19:01	02/15/18 04:53	156-60-5	
1,2-Dichloropropane	**0.0024 U**	mg/kg	0.0047	0.0024	1	02/14/18 19:01	02/15/18 04:53	78-87-5	
1,3-Dichloropropane	**0.0024 U**	mg/kg	0.0047	0.0024	1	02/14/18 19:01	02/15/18 04:53	142-28-9	
2,2-Dichloropropane	**0.0025 U**	mg/kg	0.0047	0.0025	1	02/14/18 19:01	02/15/18 04:53	594-20-7	
1,1-Dichloropropene	**0.0024 U**	mg/kg	0.0047	0.0024	1	02/14/18 19:01	02/15/18 04:53	563-58-6	
cis-1,3-Dichloropropene	**0.0024 U**	mg/kg	0.0047	0.0024	1	02/14/18 19:01	02/15/18 04:53	10061-01-5	
trans-1,3-Dichloropropene	**0.0024 U**	mg/kg	0.0047	0.0024	1	02/14/18 19:01	02/15/18 04:53	10061-02-6	
Ethylbenzene	**0.0027 U**	mg/kg	0.0047	0.0027	1	02/14/18 19:01	02/15/18 04:53	100-41-4	
2-Hexanone	**0.0024 U**	mg/kg	0.0047	0.0024	1	02/14/18 19:01	02/15/18 04:53	591-78-6	
Iodomethane	**0.0024 U**	mg/kg	0.0047	0.0024	1	02/14/18 19:01	02/15/18 04:53	74-88-4	
Isopropylbenzene (Cumene)	**0.0027 U**	mg/kg	0.0047	0.0027	1	02/14/18 19:01	02/15/18 04:53	98-82-8	
p-Isopropyltoluene	**0.0029 U**	mg/kg	0.0047	0.0029	1	02/14/18 19:01	02/15/18 04:53	99-87-6	
Methylene Chloride	**0.0024 U**	mg/kg	0.0047	0.0024	1	02/14/18 19:01	02/15/18 04:53	75-09-2	
4-Methyl-2-pentanone (MIBK)	**0.0024 U**	mg/kg	0.0047	0.0024	1	02/14/18 19:01	02/15/18 04:53	108-10-1	
Methyl-tert-butyl ether	**0.0024 U**	mg/kg	0.0047	0.0024	1	02/14/18 19:01	02/15/18 04:53	1634-04-4	
n-Propylbenzene	**0.0025 U**	mg/kg	0.0047	0.0025	1	02/14/18 19:01	02/15/18 04:53	103-65-1	
Styrene	**0.0024 U**	mg/kg	0.0047	0.0024	1	02/14/18 19:01	02/15/18 04:53	100-42-5	
1,1,1,2-Tetrachloroethane	**0.0024 U**	mg/kg	0.0047	0.0024	1	02/14/18 19:01	02/15/18 04:53	630-20-6	

ANALYTICAL RESULTS

Project: 6783-17-2991.04/MIA Parcel 3
Pace Project No.: 35373365

Sample: SB-7 **Lab ID: 35373365014** Collected: 02/08/18 11:40 Received: 02/10/18 01:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV 5035	Analytical Method: EPA 8260 Preparation Method: EPA 5035								
1,1,2,2-Tetrachloroethane	**0.0024 U**	mg/kg	0.0047	0.0024	1	02/14/18 19:01	02/15/18 04:53	79-34-5	
Tetrachloroethene	**0.0024 U**	mg/kg	0.0047	0.0024	1	02/14/18 19:01	02/15/18 04:53	127-18-4	
Toluene	**0.0026 U**	mg/kg	0.0047	0.0026	1	02/14/18 19:01	02/15/18 04:53	108-88-3	
1,2,3-Trichlorobenzene	**0.0024 U**	mg/kg	0.0047	0.0024	1	02/14/18 19:01	02/15/18 04:53	87-61-6	
1,2,4-Trichlorobenzene	**0.0024 U**	mg/kg	0.0047	0.0024	1	02/14/18 19:01	02/15/18 04:53	120-82-1	
1,1,1-Trichloroethane	**0.0026 U**	mg/kg	0.0047	0.0026	1	02/14/18 19:01	02/15/18 04:53	71-55-6	
1,1,2-Trichloroethane	**0.0024 U**	mg/kg	0.0047	0.0024	1	02/14/18 19:01	02/15/18 04:53	79-00-5	
Trichloroethene	**0.0027 U**	mg/kg	0.0047	0.0027	1	02/14/18 19:01	02/15/18 04:53	79-01-6	
Trichlorofluoromethane	**0.0026 U**	mg/kg	0.0047	0.0026	1	02/14/18 19:01	02/15/18 04:53	75-69-4	
1,2,3-Trichloropropane	**0.0024 U**	mg/kg	0.0047	0.0024	1	02/14/18 19:01	02/15/18 04:53	96-18-4	
1,2,3-Trimethylbenzene	**0.0024 U**	mg/kg	0.0047	0.0024	1	02/14/18 19:01	02/15/18 04:53	526-73-8	N2
1,2,4-Trimethylbenzene	**0.0027 U**	mg/kg	0.0047	0.0027	1	02/14/18 19:01	02/15/18 04:53	95-63-6	
1,3,5-Trimethylbenzene	**0.0027 U**	mg/kg	0.0047	0.0027	1	02/14/18 19:01	02/15/18 04:53	108-67-8	
Vinyl acetate	**0.0024 U**	mg/kg	0.0047	0.0024	1	02/14/18 19:01	02/15/18 04:53	108-05-4	
Vinyl chloride	**0.0025 U**	mg/kg	0.0047	0.0025	1	02/14/18 19:01	02/15/18 04:53	75-01-4	
Xylene (Total)	**0.0049 U**	mg/kg	0.014	0.0049	1	02/14/18 19:01	02/15/18 04:53	1330-20-7	
m&p-Xylene	**0.0049 U**	mg/kg	0.0095	0.0049	1	02/14/18 19:01	02/15/18 04:53	179601-23-1	
o-Xylene	**0.0024 U**	mg/kg	0.0047	0.0024	1	02/14/18 19:01	02/15/18 04:53	95-47-6	
Surrogates									
4-Bromofluorobenzene (S)	104	%	55-148		1	02/14/18 19:01	02/15/18 04:53	460-00-4	
1,2-Dichloroethane-d4 (S)	125	%	80-131		1	02/14/18 19:01	02/15/18 04:53	17060-07-0	
Toluene-d8 (S)	102	%	84-117		1	02/14/18 19:01	02/15/18 04:53	2037-26-5	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**9.6**	%	0.10	0.10	1		02/15/18 12:53		

ANALYTICAL RESULTS

Project: 6783-17-2991.04/MIA Parcel 3
Pace Project No.: 35373365

Sample: SB-8 **Lab ID: 35373365015** Collected: 02/08/18 13:00 Received: 02/10/18 01:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
FL-PRO Soil Microwave	Analytical Method: FL-PRO Preparation Method: EPA 3546								
Petroleum Range Organics	**4.8**	mg/kg	4.3	2.7	1	02/13/18 14:53	02/14/18 22:09		
Surrogates									
o-Terphenyl (S)	94	%	62-109		1	02/13/18 14:53	02/14/18 22:09	84-15-1	
N-Pentatriacontane (S)	131	%	42-159		1	02/13/18 14:53	02/14/18 22:09	630-07-09	
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Arsenic	**2.2**	mg/kg	0.56	0.28	1	02/15/18 03:15	02/17/18 03:30	7440-38-2	
Barium	**4.0**	mg/kg	0.56	0.28	1	02/15/18 03:15	02/17/18 03:30	7440-39-3	
Cadmium	**0.090**	mg/kg	0.056	0.028	1	02/15/18 03:15	02/17/18 03:30	7440-43-9	
Chromium	**8.4**	mg/kg	0.28	0.14	1	02/15/18 03:15	02/17/18 03:30	7440-47-3	
Lead	**8.3**	mg/kg	0.56	0.28	1	02/15/18 03:15	02/17/18 03:30	7439-92-1	
Selenium	**0.42 U**	mg/kg	0.84	0.42	1	02/15/18 03:15	02/17/18 03:30	7782-49-2	
Silver	**0.14 U**	mg/kg	0.28	0.14	1	02/15/18 03:15	02/17/18 03:30	7440-22-4	
7471 Mercury	Analytical Method: EPA 7471 Preparation Method: EPA 7471								
Mercury	**0.014**	mg/kg	0.0096	0.0048	1	02/16/18 10:56	02/19/18 11:12	7439-97-6	
8270 MSSV MW PAH by SIM	Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3546								
Acenaphthene	**0.0080 U**	mg/kg	0.053	0.0080	5	02/13/18 13:15	02/15/18 17:41	83-32-9	
Acenaphthylene	**0.0069 U**	mg/kg	0.053	0.0069	5	02/13/18 13:15	02/15/18 17:41	208-96-8	
Anthracene	**0.0075 U**	mg/kg	0.053	0.0075	5	02/13/18 13:15	02/15/18 17:41	120-12-7	
Benzo(a)anthracene	**0.0038 U**	mg/kg	0.053	0.0038	5	02/13/18 13:15	02/15/18 17:41	56-55-3	
Benzo(a)pyrene	**0.0059 U**	mg/kg	0.053	0.0059	5	02/13/18 13:15	02/15/18 17:41	50-32-8	
Benzo(b)fluoranthene	**0.0037 I**	mg/kg	0.053	0.0036	5	02/13/18 13:15	02/15/18 17:41	205-99-2	
Benzo(g,h,i)perylene	**0.014 U**	mg/kg	0.053	0.014	5	02/13/18 13:15	02/15/18 17:41	191-24-2	
Benzo(k)fluoranthene	**0.0080 U**	mg/kg	0.053	0.0080	5	02/13/18 13:15	02/15/18 17:41	207-08-9	
Chrysene	**0.0096 U**	mg/kg	0.053	0.0096	5	02/13/18 13:15	02/15/18 17:41	218-01-9	
Dibenz(a,h)anthracene	**0.0096 U**	mg/kg	0.053	0.0096	5	02/13/18 13:15	02/15/18 17:41	53-70-3	
Fluoranthene	**0.0047 I**	mg/kg	0.053	0.0044	5	02/13/18 13:15	02/15/18 17:41	206-44-0	
Fluorene	**0.0085 U**	mg/kg	0.053	0.0085	5	02/13/18 13:15	02/15/18 17:41	86-73-7	
Indeno(1,2,3-cd)pyrene	**0.015 U**	mg/kg	0.053	0.015	5	02/13/18 13:15	02/15/18 17:41	193-39-5	
1-Methylnaphthalene	**0.0064 U**	mg/kg	0.053	0.0064	5	02/13/18 13:15	02/15/18 17:41	90-12-0	
2-Methylnaphthalene	**0.0059 U**	mg/kg	0.053	0.0059	5	02/13/18 13:15	02/15/18 17:41	91-57-6	
Naphthalene	**0.012 U**	mg/kg	0.053	0.012	5	02/13/18 13:15	02/15/18 17:41	91-20-3	
Phenanthrene	**0.0080 U**	mg/kg	0.053	0.0080	5	02/13/18 13:15	02/15/18 17:41	85-01-8	
Pyrene	**0.0096 U**	mg/kg	0.053	0.0096	5	02/13/18 13:15	02/15/18 17:41	129-00-0	
Surrogates									
Nitrobenzene-d5 (S)	66	%	10-128		5	02/13/18 13:15	02/15/18 17:41	4165-60-0	D3
2-Fluorobiphenyl (S)	68	%	10-110		5	02/13/18 13:15	02/15/18 17:41	321-60-8	
Terphenyl-d14 (S)	73	%	39-119		5	02/13/18 13:15	02/15/18 17:41	1718-51-0	
8260 MSV 5035	Analytical Method: EPA 8260 Preparation Method: EPA 5035								
Acetone	**0.60**	mg/kg	0.019	0.0097	1	02/14/18 19:01	02/15/18 05:16	67-64-1	L
Acetonitrile	**0.024 U**	mg/kg	0.049	0.024	1	02/14/18 19:01	02/15/18 05:16	75-05-8	
Benzene	**0.0025 U**	mg/kg	0.0049	0.0025	1	02/14/18 19:01	02/15/18 05:16	71-43-2	

ANALYTICAL RESULTS

Project:	6783-17-2991.04/MIA Parcel 3
Pace Project No.:	35373365

Sample: SB-8 **Lab ID: 35373365015** Collected: 02/08/18 13:00 Received: 02/10/18 01:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV 5035	Analytical Method: EPA 8260 Preparation Method: EPA 5035								
Bromobenzene	**0.0024 U**	mg/kg	0.0049	0.0024	1	02/14/18 19:01	02/15/18 05:16	108-86-1	
Bromochloromethane	**0.0024 U**	mg/kg	0.0049	0.0024	1	02/14/18 19:01	02/15/18 05:16	74-97-5	
Bromodichloromethane	**0.0024 U**	mg/kg	0.0049	0.0024	1	02/14/18 19:01	02/15/18 05:16	75-27-4	
Bromoform	**0.0024 U**	mg/kg	0.0049	0.0024	1	02/14/18 19:01	02/15/18 05:16	75-25-2	
Bromomethane	**0.0024 U**	mg/kg	0.0049	0.0024	1	02/14/18 19:01	02/15/18 05:16	74-83-9	
2-Butanone (MEK)	**0.0024 U**	mg/kg	0.0049	0.0024	1	02/14/18 19:01	02/15/18 05:16	78-93-3	
n-Butylbenzene	**0.0029 U**	mg/kg	0.0049	0.0029	1	02/14/18 19:01	02/15/18 05:16	104-51-8	
sec-Butylbenzene	**0.0028 U**	mg/kg	0.0049	0.0028	1	02/14/18 19:01	02/15/18 05:16	135-98-8	
tert-Butylbenzene	**0.0028 U**	mg/kg	0.0049	0.0028	1	02/14/18 19:01	02/15/18 05:16	98-06-6	
Carbon disulfide	**0.0024 U**	mg/kg	0.0049	0.0024	1	02/14/18 19:01	02/15/18 05:16	75-15-0	
Carbon tetrachloride	**0.0024 U**	mg/kg	0.0049	0.0024	1	02/14/18 19:01	02/15/18 05:16	56-23-5	
Chlorobenzene	**0.0024 U**	mg/kg	0.0049	0.0024	1	02/14/18 19:01	02/15/18 05:16	108-90-7	
Chloroethane	**0.0035 U**	mg/kg	0.0049	0.0035	1	02/14/18 19:01	02/15/18 05:16	75-00-3	
Chloroform	**0.0029 U**	mg/kg	0.0049	0.0029	1	02/14/18 19:01	02/15/18 05:16	67-66-3	
Chloromethane	**0.0027 U**	mg/kg	0.0049	0.0027	1	02/14/18 19:01	02/15/18 05:16	74-87-3	
2-Chlorotoluene	**0.0024 U**	mg/kg	0.0049	0.0024	1	02/14/18 19:01	02/15/18 05:16	95-49-8	
4-Chlorotoluene	**0.0024 U**	mg/kg	0.0049	0.0024	1	02/14/18 19:01	02/15/18 05:16	106-43-4	
Dibromochloromethane	**0.0024 U**	mg/kg	0.0049	0.0024	1	02/14/18 19:01	02/15/18 05:16	124-48-1	
Dibromomethane	**0.0024 U**	mg/kg	0.0049	0.0024	1	02/14/18 19:01	02/15/18 05:16	74-95-3	
1,2-Dichlorobenzene	**0.0024 U**	mg/kg	0.0049	0.0024	1	02/14/18 19:01	02/15/18 05:16	95-50-1	
1,3-Dichlorobenzene	**0.0024 U**	mg/kg	0.0049	0.0024	1	02/14/18 19:01	02/15/18 05:16	541-73-1	
1,4-Dichlorobenzene	**0.0024 U**	mg/kg	0.0049	0.0024	1	02/14/18 19:01	02/15/18 05:16	106-46-7	
Dichlorodifluoromethane	**0.0026 U**	mg/kg	0.0049	0.0026	1	02/14/18 19:01	02/15/18 05:16	75-71-8	
1,1-Dichloroethane	**0.0027 U**	mg/kg	0.0049	0.0027	1	02/14/18 19:01	02/15/18 05:16	75-34-3	
1,2-Dichloroethane	**0.0024 U**	mg/kg	0.0049	0.0024	1	02/14/18 19:01	02/15/18 05:16	107-06-2	
1,1-Dichloroethene	**0.0024 U**	mg/kg	0.0049	0.0024	1	02/14/18 19:01	02/15/18 05:16	75-35-4	
cis-1,2-Dichloroethene	**0.0024 U**	mg/kg	0.0049	0.0024	1	02/14/18 19:01	02/15/18 05:16	156-59-2	
trans-1,2-Dichloroethene	**0.0030 U**	mg/kg	0.0049	0.0030	1	02/14/18 19:01	02/15/18 05:16	156-60-5	
1,2-Dichloropropane	**0.0024 U**	mg/kg	0.0049	0.0024	1	02/14/18 19:01	02/15/18 05:16	78-87-5	
1,3-Dichloropropane	**0.0024 U**	mg/kg	0.0049	0.0024	1	02/14/18 19:01	02/15/18 05:16	142-28-9	
2,2-Dichloropropane	**0.0025 U**	mg/kg	0.0049	0.0025	1	02/14/18 19:01	02/15/18 05:16	594-20-7	
1,1-Dichloropropene	**0.0025 U**	mg/kg	0.0049	0.0025	1	02/14/18 19:01	02/15/18 05:16	563-58-6	
cis-1,3-Dichloropropene	**0.0024 U**	mg/kg	0.0049	0.0024	1	02/14/18 19:01	02/15/18 05:16	10061-01-5	
trans-1,3-Dichloropropene	**0.0024 U**	mg/kg	0.0049	0.0024	1	02/14/18 19:01	02/15/18 05:16	10061-02-6	
Ethylbenzene	**0.0027 U**	mg/kg	0.0049	0.0027	1	02/14/18 19:01	02/15/18 05:16	100-41-4	
2-Hexanone	**0.0024 U**	mg/kg	0.0049	0.0024	1	02/14/18 19:01	02/15/18 05:16	591-78-6	
Iodomethane	**0.0024 U**	mg/kg	0.0049	0.0024	1	02/14/18 19:01	02/15/18 05:16	74-88-4	
Isopropylbenzene (Cumene)	**0.0028 U**	mg/kg	0.0049	0.0028	1	02/14/18 19:01	02/15/18 05:16	98-82-8	
p-Isopropyltoluene	**0.0029 U**	mg/kg	0.0049	0.0029	1	02/14/18 19:01	02/15/18 05:16	99-87-6	
Methylene Chloride	**0.0024 U**	mg/kg	0.0049	0.0024	1	02/14/18 19:01	02/15/18 05:16	75-09-2	
4-Methyl-2-pentanone (MIBK)	**0.0024 U**	mg/kg	0.0049	0.0024	1	02/14/18 19:01	02/15/18 05:16	108-10-1	
Methyl-tert-butyl ether	**0.0024 U**	mg/kg	0.0049	0.0024	1	02/14/18 19:01	02/15/18 05:16	1634-04-4	
n-Propylbenzene	**0.0026 U**	mg/kg	0.0049	0.0026	1	02/14/18 19:01	02/15/18 05:16	103-65-1	
Styrene	**0.0024 U**	mg/kg	0.0049	0.0024	1	02/14/18 19:01	02/15/18 05:16	100-42-5	
1,1,1,2-Tetrachloroethane	**0.0024 U**	mg/kg	0.0049	0.0024	1	02/14/18 19:01	02/15/18 05:16	630-20-6	

ANALYTICAL RESULTS

Project: 6783-17-2991.04/MIA Parcel 3
Pace Project No.: 35373365

Sample: SB-8 **Lab ID: 35373365015** Collected: 02/08/18 13:00 Received: 02/10/18 01:00 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV 5035	Analytical Method: EPA 8260 Preparation Method: EPA 5035								
1,1,2,2-Tetrachloroethane	**0.0024 U**	mg/kg	0.0049	0.0024	1	02/14/18 19:01	02/15/18 05:16	79-34-5	
Tetrachloroethene	**0.0024 U**	mg/kg	0.0049	0.0024	1	02/14/18 19:01	02/15/18 05:16	127-18-4	
Toluene	**0.0026 U**	mg/kg	0.0049	0.0026	1	02/14/18 19:01	02/15/18 05:16	108-88-3	
1,2,3-Trichlorobenzene	**0.0024 U**	mg/kg	0.0049	0.0024	1	02/14/18 19:01	02/15/18 05:16	87-61-6	
1,2,4-Trichlorobenzene	**0.0024 U**	mg/kg	0.0049	0.0024	1	02/14/18 19:01	02/15/18 05:16	120-82-1	
1,1,1-Trichloroethane	**0.0027 U**	mg/kg	0.0049	0.0027	1	02/14/18 19:01	02/15/18 05:16	71-55-6	
1,1,2-Trichloroethane	**0.0024 U**	mg/kg	0.0049	0.0024	1	02/14/18 19:01	02/15/18 05:16	79-00-5	
Trichloroethene	**0.0027 U**	mg/kg	0.0049	0.0027	1	02/14/18 19:01	02/15/18 05:16	79-01-6	
Trichlorofluoromethane	**0.0026 U**	mg/kg	0.0049	0.0026	1	02/14/18 19:01	02/15/18 05:16	75-69-4	
1,2,3-Trichloropropane	**0.0024 U**	mg/kg	0.0049	0.0024	1	02/14/18 19:01	02/15/18 05:16	96-18-4	
1,2,3-Trimethylbenzene	**0.0024 U**	mg/kg	0.0049	0.0024	1	02/14/18 19:01	02/15/18 05:16	526-73-8	N2
1,2,4-Trimethylbenzene	**0.0027 U**	mg/kg	0.0049	0.0027	1	02/14/18 19:01	02/15/18 05:16	95-63-6	
1,3,5-Trimethylbenzene	**0.0028 U**	mg/kg	0.0049	0.0028	1	02/14/18 19:01	02/15/18 05:16	108-67-8	
Vinyl acetate	**0.0024 U**	mg/kg	0.0049	0.0024	1	02/14/18 19:01	02/15/18 05:16	108-05-4	
Vinyl chloride	**0.0026 U**	mg/kg	0.0049	0.0026	1	02/14/18 19:01	02/15/18 05:16	75-01-4	
Xylene (Total)	**0.0050 U**	mg/kg	0.015	0.0050	1	02/14/18 19:01	02/15/18 05:16	1330-20-7	
m&p-Xylene	**0.0050 U**	mg/kg	0.0097	0.0050	1	02/14/18 19:01	02/15/18 05:16	179601-23-1	
o-Xylene	**0.0025 U**	mg/kg	0.0049	0.0025	1	02/14/18 19:01	02/15/18 05:16	95-47-6	
Surrogates									
4-Bromofluorobenzene (S)	103	%	55-148		1	02/14/18 19:01	02/15/18 05:16	460-00-4	
1,2-Dichloroethane-d4 (S)	121	%	80-131		1	02/14/18 19:01	02/15/18 05:16	17060-07-0	
Toluene-d8 (S)	101	%	84-117		1	02/14/18 19:01	02/15/18 05:16	2037-26-5	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**6.7**	%	0.10	0.10	1		02/15/18 12:53		

QUALITY CONTROL DATA

Project: 6783-17-2991.04/MIA Parcel 3
Pace Project No.: 35373365

QC Batch: 426449 Analysis Method: EPA 7470
QC Batch Method: EPA 7470 Analysis Description: 7470 Mercury
Associated Lab Samples: 35373365001, 35373365002, 35373365003, 35373365004, 35373365007

METHOD BLANK: 2320935 Matrix: Water
Associated Lab Samples: 35373365001, 35373365002, 35373365003, 35373365004, 35373365007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	ug/L	0.10 U	0.20	0.10	02/19/18 09:36	

LABORATORY CONTROL SAMPLE: 2320936

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	2	1.9	96	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2320937 2320938

Parameter	Units	35372884001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	ug/L	<0.10	2	2	2.1	2.0	104	102	75-125	3	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

QUALITY CONTROL DATA

Project: 6783-17-2991.04/MIA Parcel 3
Pace Project No.: 35373365

QC Batch: 426337
QC Batch Method: EPA 7471
Analysis Method: EPA 7471
Analysis Description: 7471 Mercury
Associated Lab Samples: 35373365008, 35373365009, 35373365010, 35373365011, 35373365012, 35373365013, 35373365014, 35373365015

METHOD BLANK: 2320585 Matrix: Solid
Associated Lab Samples: 35373365008, 35373365009, 35373365010, 35373365011, 35373365012, 35373365013, 35373365014, 35373365015

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	mg/kg	0.0043 U	0.0086	0.0043	02/19/18 10:42	

LABORATORY CONTROL SAMPLE: 2320586

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	.089	0.089	100	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2320587 2320588

Parameter	Units	35373365008 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/kg	0.0049 U	.067	.1	0.071	0.0051 U	100	-3	80-120		20	J(M1)

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

QUALITY CONTROL DATA

Project: 6783-17-2991.04/MIA Parcel 3
Pace Project No.: 35373365

QC Batch: 425942
Analysis Method: EPA 6010
QC Batch Method: EPA 3050
Analysis Description: 6010 MET Solid
Associated Lab Samples: 35373365008, 35373365009, 35373365010, 35373365011, 35373365012, 35373365013, 35373365014, 35373365015

METHOD BLANK: 2318716
Matrix: Solid
Associated Lab Samples: 35373365008, 35373365009, 35373365010, 35373365011, 35373365012, 35373365013, 35373365014, 35373365015

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Arsenic	mg/kg	0.27 U	0.54	0.27	02/17/18 02:32	
Barium	mg/kg	0.27 U	0.54	0.27	02/17/18 02:32	
Cadmium	mg/kg	0.027 U	0.054	0.027	02/17/18 02:32	
Chromium	mg/kg	0.13 U	0.27	0.13	02/17/18 02:32	
Lead	mg/kg	0.27 U	0.54	0.27	02/17/18 02:32	
Selenium	mg/kg	0.40 U	0.81	0.40	02/17/18 02:32	
Silver	mg/kg	0.13 U	0.27	0.13	02/17/18 02:32	

LABORATORY CONTROL SAMPLE: 2318717

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic	mg/kg	15	14.2	95	80-120	
Barium	mg/kg	15	15.6	104	80-120	
Cadmium	mg/kg	1.5	1.5	99	80-120	
Chromium	mg/kg	15	15.9	106	80-120	
Lead	mg/kg	15	15.5	103	80-120	
Selenium	mg/kg	15	13.6	91	80-120	
Silver	mg/kg	1.5	1.5	100	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2318718 2318719

Parameter	Units	35373365008 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Arsenic	mg/kg	1.5	14.6	15.2	17.6	18.3	110	110	75-125	4	20	
Barium	mg/kg	5.2	14.6	15.2	19.8	21.5	100	108	75-125	8	20	
Cadmium	mg/kg	0.027 U	1.5	1.6	1.3	1.4	86	90	75-125	8	20	
Chromium	mg/kg	5.3	14.6	15.2	18.4	19.5	89	93	75-125	6	20	
Lead	mg/kg	2.6	14.6	15.2	15.5	16.6	88	92	75-125	7	20	
Selenium	mg/kg	0.41 U	14.6	15.2	13.8	15.6	94	103	75-125	13	20	
Silver	mg/kg	0.14 U	1.5	1.6	1.6	1.7	109	113	75-125	7	20	

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QUALITY CONTROL DATA

Project: 6783-17-2991.04/MIA Parcel 3
Pace Project No.: 35373365

QC Batch: 425635 Analysis Method: EPA 6010
QC Batch Method: EPA 3010 Analysis Description: 6010 MET
Associated Lab Samples: 35373365001, 35373365002, 35373365003, 35373365004, 35373365007

METHOD BLANK: 2316827 Matrix: Water
Associated Lab Samples: 35373365001, 35373365002, 35373365003, 35373365004, 35373365007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Arsenic	ug/L	5.0 U	10.0	5.0	02/14/18 22:56	
Barium	ug/L	5.0 U	10.0	5.0	02/14/18 22:56	
Cadmium	ug/L	0.50 U	1.0	0.50	02/14/18 22:56	
Chromium	ug/L	2.5 U	5.0	2.5	02/14/18 22:56	
Lead	ug/L	5.0 U	10.0	5.0	02/14/18 22:56	
Selenium	ug/L	7.5 U	15.0	7.5	02/14/18 22:56	
Silver	ug/L	2.5 U	5.0	2.5	02/14/18 22:56	

LABORATORY CONTROL SAMPLE: 2316828

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic	ug/L	250	260	104	80-120	
Barium	ug/L	250	252	101	80-120	
Cadmium	ug/L	25	25.5	102	80-120	
Chromium	ug/L	250	257	103	80-120	
Lead	ug/L	250	261	104	80-120	
Selenium	ug/L	250	264	106	80-120	
Silver	ug/L	25	25.2	101	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2316829 2316830

Parameter	Units	35372675005 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Arsenic	ug/L	13.6	250	250	278	273	106	104	75-125	2	20	
Barium	ug/L	28.9	250	250	289	288	104	104	75-125	0	20	
Cadmium	ug/L	0.50 U	25	25	25.9	25.7	103	103	75-125	0	20	
Chromium	ug/L	2.5 U	250	250	265	263	105	105	75-125	1	20	
Lead	ug/L	5.0 U	250	250	265	264	106	105	75-125	0	20	
Selenium	ug/L	7.5 U	250	250	250	252	100	101	75-125	1	20	
Silver	ug/L	2.5 U	25	25	25.7	25.7	103	103	75-125	0	20	

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QUALITY CONTROL DATA

Project: 6783-17-2991.04/MIA Parcel 3
Pace Project No.: 35373365

QC Batch: 425781 Analysis Method: EPA 8260
QC Batch Method: EPA 5035 Analysis Description: 8260 MSV 5035
Associated Lab Samples: 35373365008, 35373365009, 35373365010

METHOD BLANK: 2317557 Matrix: Solid
Associated Lab Samples: 35373365008, 35373365009, 35373365010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	mg/kg	0.0025 U	0.0050	0.0025	02/14/18 11:54	
1,1,1-Trichloroethane	mg/kg	0.0027 U	0.0050	0.0027	02/14/18 11:54	
1,1,2,2-Tetrachloroethane	mg/kg	0.0025 U	0.0050	0.0025	02/14/18 11:54	
1,1,2-Trichloroethane	mg/kg	0.0025 U	0.0050	0.0025	02/14/18 11:54	
1,1-Dichloroethane	mg/kg	0.0027 U	0.0050	0.0027	02/14/18 11:54	
1,1-Dichloroethene	mg/kg	0.0025 U	0.0050	0.0025	02/14/18 11:54	
1,1-Dichloropropene	mg/kg	0.0026 U	0.0050	0.0026	02/14/18 11:54	
1,2,3-Trichlorobenzene	mg/kg	0.0025 U	0.0050	0.0025	02/14/18 11:54	
1,2,3-Trichloropropane	mg/kg	0.0025 U	0.0050	0.0025	02/14/18 11:54	
1,2,3-Trimethylbenzene	mg/kg	0.0025 U	0.0050	0.0025	02/14/18 11:54	N2
1,2,4-Trichlorobenzene	mg/kg	0.0025 U	0.0050	0.0025	02/14/18 11:54	
1,2,4-Trimethylbenzene	mg/kg	0.0028 U	0.0050	0.0028	02/14/18 11:54	
1,2-Dichlorobenzene	mg/kg	0.0025 U	0.0050	0.0025	02/14/18 11:54	
1,2-Dichloroethane	mg/kg	0.0025 U	0.0050	0.0025	02/14/18 11:54	
1,2-Dichloropropane	mg/kg	0.0025 U	0.0050	0.0025	02/14/18 11:54	
1,3,5-Trimethylbenzene	mg/kg	0.0029 U	0.0050	0.0029	02/14/18 11:54	
1,3-Dichlorobenzene	mg/kg	0.0025 U	0.0050	0.0025	02/14/18 11:54	
1,3-Dichloropropane	mg/kg	0.0025 U	0.0050	0.0025	02/14/18 11:54	
1,4-Dichlorobenzene	mg/kg	0.0025 U	0.0050	0.0025	02/14/18 11:54	
2,2-Dichloropropane	mg/kg	0.0026 U	0.0050	0.0026	02/14/18 11:54	
2-Butanone (MEK)	mg/kg	0.0025 U	0.0050	0.0025	02/14/18 11:54	
2-Chlorotoluene	mg/kg	0.0025 U	0.0050	0.0025	02/14/18 11:54	
2-Hexanone	mg/kg	0.0025 U	0.0050	0.0025	02/14/18 11:54	
4-Chlorotoluene	mg/kg	0.0025 U	0.0050	0.0025	02/14/18 11:54	
4-Methyl-2-pentanone (MIBK)	mg/kg	0.0025 U	0.0050	0.0025	02/14/18 11:54	
Acetone	mg/kg	0.010 U	0.020	0.010	02/14/18 11:54	
Acetonitrile	mg/kg	0.025 U	0.050	0.025	02/14/18 11:54	
Benzene	mg/kg	0.0026 U	0.0050	0.0026	02/14/18 11:54	
Bromobenzene	mg/kg	0.0025 U	0.0050	0.0025	02/14/18 11:54	
Bromochloromethane	mg/kg	0.0025 U	0.0050	0.0025	02/14/18 11:54	
Bromodichloromethane	mg/kg	0.0025 U	0.0050	0.0025	02/14/18 11:54	
Bromoform	mg/kg	0.0025 U	0.0050	0.0025	02/14/18 11:54	
Bromomethane	mg/kg	0.0025 U	0.0050	0.0025	02/14/18 11:54	
Carbon disulfide	mg/kg	0.0025 U	0.0050	0.0025	02/14/18 11:54	
Carbon tetrachloride	mg/kg	0.0025 U	0.0050	0.0025	02/14/18 11:54	
Chlorobenzene	mg/kg	0.0025 U	0.0050	0.0025	02/14/18 11:54	
Chloroethane	mg/kg	0.0036 U	0.0050	0.0036	02/14/18 11:54	
Chloroform	mg/kg	0.0030 U	0.0050	0.0030	02/14/18 11:54	
Chloromethane	mg/kg	0.0028 U	0.0050	0.0028	02/14/18 11:54	
cis-1,2-Dichloroethene	mg/kg	0.0025 U	0.0050	0.0025	02/14/18 11:54	
cis-1,3-Dichloropropene	mg/kg	0.0025 U	0.0050	0.0025	02/14/18 11:54	

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QUALITY CONTROL DATA

Project: 6783-17-2991.04/MIA Parcel 3
Pace Project No.: 35373365

METHOD BLANK: 2317557 Matrix: Solid
Associated Lab Samples: 35373365008, 35373365009, 35373365010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Dibromochloromethane	mg/kg	0.0025 U	0.0050	0.0025	02/14/18 11:54	
Dibromomethane	mg/kg	0.0025 U	0.0050	0.0025	02/14/18 11:54	
Dichlorodifluoromethane	mg/kg	0.0027 U	0.0050	0.0027	02/14/18 11:54	
Ethylbenzene	mg/kg	0.0028 U	0.0050	0.0028	02/14/18 11:54	
Iodomethane	mg/kg	0.0025 U	0.0050	0.0025	02/14/18 11:54	
Isopropylbenzene (Cumene)	mg/kg	0.0029 U	0.0050	0.0029	02/14/18 11:54	
m&p-Xylene	mg/kg	0.0051 U	0.010	0.0051	02/14/18 11:54	
Methyl-tert-butyl ether	mg/kg	0.0025 U	0.0050	0.0025	02/14/18 11:54	
Methylene Chloride	mg/kg	0.0025 U	0.0050	0.0025	02/14/18 11:54	
n-Butylbenzene	mg/kg	0.0030 U	0.0050	0.0030	02/14/18 11:54	
n-Propylbenzene	mg/kg	0.0026 U	0.0050	0.0026	02/14/18 11:54	
o-Xylene	mg/kg	0.0026 U	0.0050	0.0026	02/14/18 11:54	
p-Isopropyltoluene	mg/kg	0.0030 U	0.0050	0.0030	02/14/18 11:54	
sec-Butylbenzene	mg/kg	0.0029 U	0.0050	0.0029	02/14/18 11:54	
Styrene	mg/kg	0.0025 U	0.0050	0.0025	02/14/18 11:54	
tert-Butylbenzene	mg/kg	0.0029 U	0.0050	0.0029	02/14/18 11:54	
Tetrachloroethene	mg/kg	0.0025 U	0.0050	0.0025	02/14/18 11:54	
Toluene	mg/kg	0.0027 U	0.0050	0.0027	02/14/18 11:54	
trans-1,2-Dichloroethene	mg/kg	0.0030 U	0.0050	0.0030	02/14/18 11:54	
trans-1,3-Dichloropropene	mg/kg	0.0025 U	0.0050	0.0025	02/14/18 11:54	
Trichloroethene	mg/kg	0.0028 U	0.0050	0.0028	02/14/18 11:54	
Trichlorofluoromethane	mg/kg	0.0027 U	0.0050	0.0027	02/14/18 11:54	
Vinyl acetate	mg/kg	0.0025 U	0.0050	0.0025	02/14/18 11:54	
Vinyl chloride	mg/kg	0.0027 U	0.0050	0.0027	02/14/18 11:54	
Xylene (Total)	mg/kg	0.0051 U	0.015	0.0051	02/14/18 11:54	
1,2-Dichloroethane-d4 (S)	%	109	80-131		02/14/18 11:54	
4-Bromofluorobenzene (S)	%	115	55-148		02/14/18 11:54	
Toluene-d8 (S)	%	100	84-117		02/14/18 11:54	

LABORATORY CONTROL SAMPLE: 2317558

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	mg/kg	.02	0.022	111	70-130	
1,1,1-Trichloroethane	mg/kg	.02	0.021	103	68-130	
1,1,2,2-Tetrachloroethane	mg/kg	.02	0.017	85	70-130	
1,1,2-Trichloroethane	mg/kg	.02	0.020	99	70-130	
1,1-Dichloroethane	mg/kg	.02	0.018	89	69-130	
1,1-Dichloroethene	mg/kg	.02	0.018	90	67-130	
1,1-Dichloropropene	mg/kg	.02	0.019	97	70-130	
1,2,3-Trichlorobenzene	mg/kg	.02	0.019	97	70-130	
1,2,3-Trichloropropane	mg/kg	.02	0.017	84	70-130	
1,2,3-Trimethylbenzene	mg/kg	.02	0.018	91	67-130	N2
1,2,4-Trichlorobenzene	mg/kg	.02	0.020	98	70-130	
1,2,4-Trimethylbenzene	mg/kg	.02	0.019	95	70-130	

QUALITY CONTROL DATA

Project: 6783-17-2991.04/MIA Parcel 3
Pace Project No.: 35373365

LABORATORY CONTROL SAMPLE: 2317558

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2-Dichlorobenzene	mg/kg	.02	0.019	94	70-130	
1,2-Dichloroethane	mg/kg	.02	0.019	96	70-130	
1,2-Dichloropropane	mg/kg	.02	0.018	88	70-130	
1,3,5-Trimethylbenzene	mg/kg	.02	0.018	92	70-130	
1,3-Dichlorobenzene	mg/kg	.02	0.019	93	70-130	
1,3-Dichloropropane	mg/kg	.02	0.019	94	70-130	
1,4-Dichlorobenzene	mg/kg	.02	0.018	91	70-130	
2,2-Dichloropropane	mg/kg	.02	0.020	102	70-130	
2-Butanone (MEK)	mg/kg	.04	0.033	81	51-161	
2-Chlorotoluene	mg/kg	.02	0.018	89	70-130	
2-Hexanone	mg/kg	.04	0.038	94	59-137	
4-Chlorotoluene	mg/kg	.02	0.019	93	70-130	
4-Methyl-2-pentanone (MIBK)	mg/kg	.04	0.036	89	64-143	
Acetone	mg/kg	.04	0.042	105	32-175	
Acetonitrile	mg/kg	.2	0.18	92	68-131	
Benzene	mg/kg	.02	0.020	99	70-130	
Bromobenzene	mg/kg	.02	0.018	88	70-130	
Bromochloromethane	mg/kg	.02	0.020	98	70-130	
Bromodichloromethane	mg/kg	.02	0.019	94	70-130	
Bromoform	mg/kg	.02	0.020	98	70-130	
Bromomethane	mg/kg	.02	0.023	113	42-156	
Carbon disulfide	mg/kg	.02	0.015	74	49-152	
Carbon tetrachloride	mg/kg	.02	0.021	105	65-132	
Chlorobenzene	mg/kg	.02	0.019	95	70-130	
Chloroethane	mg/kg	.02	0.018	88	56-146	
Chloroform	mg/kg	.02	0.020	98	69-130	
Chloromethane	mg/kg	.02	0.022	111	50-145	
cis-1,2-Dichloroethene	mg/kg	.02	0.018	92	70-130	
cis-1,3-Dichloropropene	mg/kg	.02	0.017	85	70-130	
Dibromochloromethane	mg/kg	.02	0.022	112	70-130	
Dibromomethane	mg/kg	.02	0.020	100	68-133	
Dichlorodifluoromethane	mg/kg	.02	0.027	133	58-138	
Ethylbenzene	mg/kg	.02	0.019	97	70-130	
Iodomethane	mg/kg	.04	0.034	86	59-142	
Isopropylbenzene (Cumene)	mg/kg	.02	0.020	101	70-130	
m&p-Xylene	mg/kg	.04	0.040	101	70-130	
Methyl-tert-butyl ether	mg/kg	.02	0.019	93	70-130	
Methylene Chloride	mg/kg	.02	0.013	66	40-159	
n-Butylbenzene	mg/kg	.02	0.017	86	70-130	
n-Propylbenzene	mg/kg	.02	0.018	92	70-130	
o-Xylene	mg/kg	.02	0.019	97	70-130	
p-Isopropyltoluene	mg/kg	.02	0.018	91	70-130	
sec-Butylbenzene	mg/kg	.02	0.019	97	70-130	
Styrene	mg/kg	.02	0.018	92	70-130	
tert-Butylbenzene	mg/kg	.02	0.019	96	70-130	
Tetrachloroethene	mg/kg	.02	0.022	109	63-130	
Toluene	mg/kg	.02	0.020	100	70-130	

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QUALITY CONTROL DATA

Project: 6783-17-2991.04/MIA Parcel 3
Pace Project No.: 35373365

LABORATORY CONTROL SAMPLE: 2317558

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
trans-1,2-Dichloroethene	mg/kg	.02	0.019	96	70-130	
trans-1,3-Dichloropropene	mg/kg	.02	0.021	103	70-130	
Trichloroethene	mg/kg	.02	0.020	100	69-130	
Trichlorofluoromethane	mg/kg	.02	0.020	100	67-130	
Vinyl acetate	mg/kg	.02	0.020	100	53-146	
Vinyl chloride	mg/kg	.02	0.020	99	67-130	
Xylene (Total)	mg/kg	.06	0.060	100	70-130	
1,2-Dichloroethane-d4 (S)	%			107	80-131	
4-Bromofluorobenzene (S)	%			116	55-148	
Toluene-d8 (S)	%			88	84-117	

MATRIX SPIKE SAMPLE: 2317607

Parameter	Units	35373089001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	mg/kg	0.0023 U	.021	0.029	137	42-130	J(M1)
1,1,1-Trichloroethane	mg/kg	0.0025 U	.021	0.035	163	42-131	J(M1)
1,1,2,2-Tetrachloroethane	mg/kg	0.0023 U	.021	0.026	120	50-130	
1,1,2-Trichloroethane	mg/kg	0.0023 U	.021	0.027	127	59-130	
1,1-Dichloroethane	mg/kg	0.0025 U	.021	0.029	134	50-130	J(M1)
1,1-Dichloroethene	mg/kg	0.0023 U	.021	0.031	144	51-130	J(M1)
1,1-Dichloropropene	mg/kg	0.0023 U	.021	0.031	144	41-130	J(M1)
1,2,3-Trichlorobenzene	mg/kg	0.0023 U	.021	0.023	109	20-143	
1,2,3-Trichloropropane	mg/kg	0.0023 U	.021	0.025	117	49-130	
1,2,3-Trimethylbenzene	mg/kg	0.0023 U	.021	0.022	102	20-130	N2
1,2,4-Trichlorobenzene	mg/kg	0.0023 U	.021	0.023	105	20-142	
1,2,4-Trimethylbenzene	mg/kg	0.0026 U	.021	0.022	101	20-133	
1,2-Dichlorobenzene	mg/kg	0.0023 U	.021	0.023	107	20-134	
1,2-Dichloroethane	mg/kg	0.0023 U	.021	0.031	144	57-130	J(M1)
1,2-Dichloropropane	mg/kg	0.0023 U	.021	0.027	126	52-130	
1,3,5-Trimethylbenzene	mg/kg	0.0026 U	.021	0.022	101	26-130	
1,3-Dichlorobenzene	mg/kg	0.0023 U	.021	0.021	100	20-133	
1,3-Dichloropropane	mg/kg	0.0023 U	.021	0.027	126	57-130	
1,4-Dichlorobenzene	mg/kg	0.0023 U	.021	0.021	97	20-134	
2,2-Dichloropropane	mg/kg	0.0024 U	.021	0.036	168	35-130	J(M1)
2-Butanone (MEK)	mg/kg	0.0023 U	.043	0.047	109	20-217	
2-Chlorotoluene	mg/kg	0.0023 U	.021	0.021	100	26-130	
2-Hexanone	mg/kg	0.0023 U	.043	0.056	131	20-136	
4-Chlorotoluene	mg/kg	0.0023 U	.021	0.023	106	21-132	
4-Methyl-2-pentanone (MIBK)	mg/kg	0.0023 U	.043	0.050	116	21-151	
Acetone	mg/kg	0.076	.043	0.18	231	20-219	J(M1)
Acetonitrile	mg/kg	0.023 U	.21	0.24	112	32-150	
Benzene	mg/kg	0.0023 U	.021	0.030	138	24-141	
Bromobenzene	mg/kg	0.0023 U	.021	0.024	109	20-138	
Bromochloromethane	mg/kg	0.0023 U	.021	0.031	142	53-141	J(M1)
Bromodichloromethane	mg/kg	0.0023 U	.021	0.031	145	20-155	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

QUALITY CONTROL DATA

Project: 6783-17-2991.04/MIA Parcel 3
Pace Project No.: 35373365

MATRIX SPIKE SAMPLE: 2317607

Parameter	Units	35373089001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Bromoform	mg/kg	0.0023 U	.021	0.027	127	30-130	
Bromomethane	mg/kg	0.0023 U	.021	0.034	157	22-152	J(M1)
Carbon disulfide	mg/kg	0.0023 U	.021	0.025	116	20-160	
Carbon tetrachloride	mg/kg	0.0023 U	.021	0.037	172	23-141	J(M1)
Chlorobenzene	mg/kg	0.0023 U	.021	0.025	114	34-130	
Chloroethane	mg/kg	0.0033 U	.021	0.031	143	43-146	
Chloroform	mg/kg	0.0027 U	.021	0.032	149	42-132	J(M1)
Chloromethane	mg/kg	0.0026 U	.021	0.035	163	31-144	J(M1)
cis-1,2-Dichloroethene	mg/kg	0.0023 U	.021	0.029	133	45-131	J(M1)
cis-1,3-Dichloropropene	mg/kg	0.0023 U	.021	0.027	127	33-132	
Dibromochloromethane	mg/kg	0.0023 U	.021	0.030	140	20-151	
Dibromomethane	mg/kg	0.0023 U	.021	0.032	150	49-137	J(M1)
Dichlorodifluoromethane	mg/kg	0.0024 U	.021	0.047	218	39-130	J(M1)
Ethylbenzene	mg/kg	0.0026 U	.021	0.024	114	30-130	
Iodomethane	mg/kg	0.0023 U	.043	0.057	132	20-155	
Isopropylbenzene (Cumene)	mg/kg	0.0026 U	.021	0.024	110	28-130	
m&p-Xylene	mg/kg	0.0047 U	.043	0.050	116	27-150	
Methyl-tert-butyl ether	mg/kg	0.0023 U	.021	0.027	125	31-156	
Methylene Chloride	mg/kg	0.0023 U	.021	0.019	87	20-150	
n-Butylbenzene	mg/kg	0.0027 U	.021	0.018	83	20-132	
n-Propylbenzene	mg/kg	0.0024 U	.021	0.022	100	24-130	
o-Xylene	mg/kg	0.0024 U	.021	0.026	120	27-150	
p-Isopropyltoluene	mg/kg	0.0027 U	.021	0.019	89	20-133	
sec-Butylbenzene	mg/kg	0.0026 U	.021	0.021	96	20-131	
Styrene	mg/kg	0.0023 U	.021	0.024	110	20-137	
tert-Butylbenzene	mg/kg	0.0026 U	.021	0.023	106	20-131	
Tetrachloroethene	mg/kg	0.0023 U	.021	0.028	128	23-144	
Toluene	mg/kg	0.0025 U	.021	0.027	124	24-137	
trans-1,2-Dichloroethene	mg/kg	0.0028 U	.021	0.031	142	50-130	J(M1)
trans-1,3-Dichloropropene	mg/kg	0.0023 U	.021	0.028	129	33-130	
Trichloroethene	mg/kg	0.0026 U	.021	0.031	143	42-130	J(M1)
Trichlorofluoromethane	mg/kg	0.0025 U	.021	0.034	158	40-130	J(M1)
Vinyl acetate	mg/kg	0.0023 U	.021	0.027	125	20-156	
Vinyl chloride	mg/kg	0.0025 U	.021	0.033	155	47-130	J(M1)
Xylene (Total)	mg/kg	0.0047 U	.064	0.076	117	26-130	
1,2-Dichloroethane-d4 (S)	%				110	80-131	
4-Bromofluorobenzene (S)	%				113	55-148	
Toluene-d8 (S)	%				99	84-117	

SAMPLE DUPLICATE: 2317608

Parameter	Units	35373089002 Result	Dup Result	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	mg/kg	0.0029 U	0.0028 U		40	
1,1,1-Trichloroethane	mg/kg	0.0032 U	0.0030 U		40	
1,1,2,2-Tetrachloroethane	mg/kg	0.0029 U	0.0028 U		40	

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QUALITY CONTROL DATA

Project: 6783-17-2991.04/MIA Parcel 3
Pace Project No.: 35373365

SAMPLE DUPLICATE: 2317608

Parameter	Units	35373089002 Result	Dup Result	RPD	Max RPD	Qualifiers
1,1,2-Trichloroethane	mg/kg	0.0029 U	0.0028 U		40	
1,1-Dichloroethane	mg/kg	0.0032 U	0.0030 U		40	
1,1-Dichloroethene	mg/kg	0.0029 U	0.0028 U		40	
1,1-Dichloropropene	mg/kg	0.0030 U	0.0028 U		40	
1,2,3-Trichlorobenzene	mg/kg	0.0029 U	0.0028 U		40	
1,2,3-Trichloropropane	mg/kg	0.0029 U	0.0028 U		40	
1,2,3-Trimethylbenzene	mg/kg	0.0029 U	0.0028 U		40	N2
1,2,4-Trichlorobenzene	mg/kg	0.0029 U	0.0028 U		40	
1,2,4-Trimethylbenzene	mg/kg	0.0033 U	0.0031 U		40	
1,2-Dichlorobenzene	mg/kg	0.0029 U	0.0028 U		40	
1,2-Dichloroethane	mg/kg	0.0029 U	0.0028 U		40	
1,2-Dichloropropane	mg/kg	0.0029 U	0.0028 U		40	
1,3,5-Trimethylbenzene	mg/kg	0.0034 U	0.0032 U		40	
1,3-Dichlorobenzene	mg/kg	0.0029 U	0.0028 U		40	
1,3-Dichloropropane	mg/kg	0.0029 U	0.0028 U		40	
1,4-Dichlorobenzene	mg/kg	0.0029 U	0.0028 U		40	
2,2-Dichloropropane	mg/kg	0.0030 U	0.0029 U		40	
2-Butanone (MEK)	mg/kg	0.0029 U	0.0028 U		40	
2-Chlorotoluene	mg/kg	0.0029 U	0.0028 U		40	
2-Hexanone	mg/kg	0.0029 U	0.0028 U		40	
4-Chlorotoluene	mg/kg	0.0029 U	0.0028 U		40	
4-Methyl-2-pentanone (MIBK)	mg/kg	0.0029 U	0.0028 U		40	
Acetone	mg/kg	0.11	0.14	26	40	
Acetonitrile	mg/kg	0.029 U	0.028 U		40	
Benzene	mg/kg	0.0030 U	0.0028 U		40	
Bromobenzene	mg/kg	0.0029 U	0.0028 U		40	
Bromochloromethane	mg/kg	0.0029 U	0.0028 U		40	
Bromodichloromethane	mg/kg	0.0029 U	0.0028 U		40	
Bromoform	mg/kg	0.0029 U	0.0028 U		40	
Bromomethane	mg/kg	0.0029 U	0.0028 U		40	
Carbon disulfide	mg/kg	0.0029 U	0.0028 U		40	
Carbon tetrachloride	mg/kg	0.0029 U	0.0028 U		40	
Chlorobenzene	mg/kg	0.0029 U	0.0028 U		40	
Chloroethane	mg/kg	0.0042 U	0.0040 U		40	
Chloroform	mg/kg	0.0034 U	0.0033 U		40	
Chloromethane	mg/kg	0.0033 U	0.0031 U		40	
cis-1,2-Dichloroethene	mg/kg	0.0029 U	0.0028 U		40	
cis-1,3-Dichloropropene	mg/kg	0.0029 U	0.0028 U		40	
Dibromochloromethane	mg/kg	0.0029 U	0.0028 U		40	
Dibromomethane	mg/kg	0.0029 U	0.0028 U		40	
Dichlorodifluoromethane	mg/kg	0.0031 U	0.0029 U		40	
Ethylbenzene	mg/kg	0.0033 U	0.0031 U		40	
Iodomethane	mg/kg	0.0029 U	0.0028 U		40	
Isopropylbenzene (Cumene)	mg/kg	0.0034 U	0.0032 U		40	
m&p-Xylene	mg/kg	0.0060 U	0.0057 U		40	
Methyl-tert-butyl ether	mg/kg	0.0029 U	0.0028 U		40	
Methylene Chloride	mg/kg	0.0029 U	0.0028 U		40	

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QUALITY CONTROL DATA

Project: 6783-17-2991.04/MIA Parcel 3
Pace Project No.: 35373365

SAMPLE DUPLICATE: 2317608

Parameter	Units	35373089002 Result	Dup Result	RPD	Max RPD	Qualifiers
n-Butylbenzene	mg/kg	0.0035 U	0.0033 U		40	
n-Propylbenzene	mg/kg	0.0031 U	0.0029 U		40	
o-Xylene	mg/kg	0.0030 U	0.0028 U		40	
p-Isopropyltoluene	mg/kg	0.0035 U	0.0033 U		40	
sec-Butylbenzene	mg/kg	0.0034 U	0.0032 U		40	
Styrene	mg/kg	0.0029 U	0.0028 U		40	
tert-Butylbenzene	mg/kg	0.0034 U	0.0032 U		40	
Tetrachloroethene	mg/kg	0.0029 U	0.0028 U		40	
Toluene	mg/kg	0.0031 U	0.0030 U		40	
trans-1,2-Dichloroethene	mg/kg	0.0036 U	0.0034 U		40	
trans-1,3-Dichloropropene	mg/kg	0.0029 U	0.0028 U		40	
Trichloroethene	mg/kg	0.0033 U	0.0031 U		40	
Trichlorofluoromethane	mg/kg	0.0032 U	0.0030 U		40	
Vinyl acetate	mg/kg	0.0029 U	0.0028 U		40	
Vinyl chloride	mg/kg	0.0031 U	0.0030 U		40	
Xylene (Total)	mg/kg	0.0060 U	0.0057 U		40	
1,2-Dichloroethane-d4 (S)	%	105	109	1	40	
4-Bromofluorobenzene (S)	%	114	110	9	40	
Toluene-d8 (S)	%	99	100	5	40	

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QUALITY CONTROL DATA

Project: 6783-17-2991.04/MIA Parcel 3
Pace Project No.: 35373365

QC Batch: 425844 Analysis Method: EPA 8260
QC Batch Method: EPA 5035 Analysis Description: 8260 MSV 5035
Associated Lab Samples: 35373365011, 35373365012, 35373365013, 35373365014, 35373365015

METHOD BLANK: 2317947 Matrix: Solid
Associated Lab Samples: 35373365011, 35373365012, 35373365013, 35373365014, 35373365015

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	mg/kg	0.0025 U	0.0050	0.0025	02/15/18 01:48	
1,1,1-Trichloroethane	mg/kg	0.0027 U	0.0050	0.0027	02/15/18 01:48	
1,1,2,2-Tetrachloroethane	mg/kg	0.0025 U	0.0050	0.0025	02/15/18 01:48	
1,1,2-Trichloroethane	mg/kg	0.0025 U	0.0050	0.0025	02/15/18 01:48	
1,1-Dichloroethane	mg/kg	0.0027 U	0.0050	0.0027	02/15/18 01:48	
1,1-Dichloroethene	mg/kg	0.0025 U	0.0050	0.0025	02/15/18 01:48	
1,1-Dichloropropene	mg/kg	0.0026 U	0.0050	0.0026	02/15/18 01:48	
1,2,3-Trichlorobenzene	mg/kg	0.0025 U	0.0050	0.0025	02/15/18 01:48	
1,2,3-Trichloropropane	mg/kg	0.0025 U	0.0050	0.0025	02/15/18 01:48	
1,2,3-Trimethylbenzene	mg/kg	0.0025 U	0.0050	0.0025	02/15/18 01:48	N2
1,2,4-Trichlorobenzene	mg/kg	0.0025 U	0.0050	0.0025	02/15/18 01:48	
1,2,4-Trimethylbenzene	mg/kg	0.0028 U	0.0050	0.0028	02/15/18 01:48	
1,2-Dichlorobenzene	mg/kg	0.0025 U	0.0050	0.0025	02/15/18 01:48	
1,2-Dichloroethane	mg/kg	0.0025 U	0.0050	0.0025	02/15/18 01:48	
1,2-Dichloropropane	mg/kg	0.0025 U	0.0050	0.0025	02/15/18 01:48	
1,3,5-Trimethylbenzene	mg/kg	0.0029 U	0.0050	0.0029	02/15/18 01:48	
1,3-Dichlorobenzene	mg/kg	0.0025 U	0.0050	0.0025	02/15/18 01:48	
1,3-Dichloropropane	mg/kg	0.0025 U	0.0050	0.0025	02/15/18 01:48	
1,4-Dichlorobenzene	mg/kg	0.0025 U	0.0050	0.0025	02/15/18 01:48	
2,2-Dichloropropane	mg/kg	0.0026 U	0.0050	0.0026	02/15/18 01:48	
2-Butanone (MEK)	mg/kg	0.0025 U	0.0050	0.0025	02/15/18 01:48	
2-Chlorotoluene	mg/kg	0.0025 U	0.0050	0.0025	02/15/18 01:48	
2-Hexanone	mg/kg	0.0025 U	0.0050	0.0025	02/15/18 01:48	
4-Chlorotoluene	mg/kg	0.0025 U	0.0050	0.0025	02/15/18 01:48	
4-Methyl-2-pentanone (MIBK)	mg/kg	0.0025 U	0.0050	0.0025	02/15/18 01:48	
Acetone	mg/kg	0.010 U	0.020	0.010	02/15/18 01:48	
Acetonitrile	mg/kg	0.025 U	0.050	0.025	02/15/18 01:48	
Benzene	mg/kg	0.0026 U	0.0050	0.0026	02/15/18 01:48	
Bromobenzene	mg/kg	0.0025 U	0.0050	0.0025	02/15/18 01:48	
Bromochloromethane	mg/kg	0.0025 U	0.0050	0.0025	02/15/18 01:48	
Bromodichloromethane	mg/kg	0.0025 U	0.0050	0.0025	02/15/18 01:48	
Bromoform	mg/kg	0.0025 U	0.0050	0.0025	02/15/18 01:48	
Bromomethane	mg/kg	0.0025 U	0.0050	0.0025	02/15/18 01:48	
Carbon disulfide	mg/kg	0.0025 U	0.0050	0.0025	02/15/18 01:48	
Carbon tetrachloride	mg/kg	0.0025 U	0.0050	0.0025	02/15/18 01:48	
Chlorobenzene	mg/kg	0.0025 U	0.0050	0.0025	02/15/18 01:48	
Chloroethane	mg/kg	0.0036 U	0.0050	0.0036	02/15/18 01:48	
Chloroform	mg/kg	0.0030 U	0.0050	0.0030	02/15/18 01:48	
Chloromethane	mg/kg	0.0028 U	0.0050	0.0028	02/15/18 01:48	
cis-1,2-Dichloroethene	mg/kg	0.0025 U	0.0050	0.0025	02/15/18 01:48	
cis-1,3-Dichloropropene	mg/kg	0.0025 U	0.0050	0.0025	02/15/18 01:48	

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QUALITY CONTROL DATA

Project: 6783-17-2991.04/MIA Parcel 3
Pace Project No.: 35373365

METHOD BLANK: 2317947 Matrix: Solid

Associated Lab Samples: 35373365011, 35373365012, 35373365013, 35373365014, 35373365015

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Dibromochloromethane	mg/kg	0.0025 U	0.0050	0.0025	02/15/18 01:48	
Dibromomethane	mg/kg	0.0025 U	0.0050	0.0025	02/15/18 01:48	
Dichlorodifluoromethane	mg/kg	0.0027 U	0.0050	0.0027	02/15/18 01:48	
Ethylbenzene	mg/kg	0.0028 U	0.0050	0.0028	02/15/18 01:48	
Iodomethane	mg/kg	0.0025 U	0.0050	0.0025	02/15/18 01:48	
Isopropylbenzene (Cumene)	mg/kg	0.0029 U	0.0050	0.0029	02/15/18 01:48	
m&p-Xylene	mg/kg	0.0051 U	0.010	0.0051	02/15/18 01:48	
Methyl-tert-butyl ether	mg/kg	0.0025 U	0.0050	0.0025	02/15/18 01:48	
Methylene Chloride	mg/kg	0.0025 U	0.0050	0.0025	02/15/18 01:48	
n-Butylbenzene	mg/kg	0.0030 U	0.0050	0.0030	02/15/18 01:48	
n-Propylbenzene	mg/kg	0.0026 U	0.0050	0.0026	02/15/18 01:48	
o-Xylene	mg/kg	0.0026 U	0.0050	0.0026	02/15/18 01:48	
p-Isopropyltoluene	mg/kg	0.0030 U	0.0050	0.0030	02/15/18 01:48	
sec-Butylbenzene	mg/kg	0.0029 U	0.0050	0.0029	02/15/18 01:48	
Styrene	mg/kg	0.0025 U	0.0050	0.0025	02/15/18 01:48	
tert-Butylbenzene	mg/kg	0.0029 U	0.0050	0.0029	02/15/18 01:48	
Tetrachloroethene	mg/kg	0.0025 U	0.0050	0.0025	02/15/18 01:48	
Toluene	mg/kg	0.0027 U	0.0050	0.0027	02/15/18 01:48	
trans-1,2-Dichloroethene	mg/kg	0.0030 U	0.0050	0.0030	02/15/18 01:48	
trans-1,3-Dichloropropene	mg/kg	0.0025 U	0.0050	0.0025	02/15/18 01:48	
Trichloroethene	mg/kg	0.0028 U	0.0050	0.0028	02/15/18 01:48	
Trichlorofluoromethane	mg/kg	0.0027 U	0.0050	0.0027	02/15/18 01:48	
Vinyl acetate	mg/kg	0.0025 U	0.0050	0.0025	02/15/18 01:48	
Vinyl chloride	mg/kg	0.0027 U	0.0050	0.0027	02/15/18 01:48	
Xylene (Total)	mg/kg	0.0051 U	0.015	0.0051	02/15/18 01:48	
1,2-Dichloroethane-d4 (S)	%	126	80-131		02/15/18 01:48	
4-Bromofluorobenzene (S)	%	106	55-148		02/15/18 01:48	
Toluene-d8 (S)	%	102	84-117		02/15/18 01:48	

LABORATORY CONTROL SAMPLE: 2317948

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	mg/kg	.02	0.021	105	70-130	
1,1,1-Trichloroethane	mg/kg	.02	0.021	103	68-130	
1,1,2,2-Tetrachloroethane	mg/kg	.02	0.017	86	70-130	
1,1,2-Trichloroethane	mg/kg	.02	0.019	97	70-130	
1,1-Dichloroethane	mg/kg	.02	0.019	94	69-130	
1,1-Dichloroethene	mg/kg	.02	0.018	90	67-130	
1,1-Dichloropropene	mg/kg	.02	0.020	98	70-130	
1,2,3-Trichlorobenzene	mg/kg	.02	0.020	100	70-130	
1,2,3-Trichloropropane	mg/kg	.02	0.017	86	70-130	
1,2,3-Trimethylbenzene	mg/kg	.02	0.018	88	67-130	N2
1,2,4-Trichlorobenzene	mg/kg	.02	0.020	98	70-130	
1,2,4-Trimethylbenzene	mg/kg	.02	0.019	93	70-130	

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QUALITY CONTROL DATA

Project: 6783-17-2991.04/MIA Parcel 3
Pace Project No.: 35373365

LABORATORY CONTROL SAMPLE: 2317948

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2-Dichlorobenzene	mg/kg	.02	0.018	91	70-130	
1,2-Dichloroethane	mg/kg	.02	0.022	112	70-130	
1,2-Dichloropropane	mg/kg	.02	0.018	92	70-130	
1,3,5-Trimethylbenzene	mg/kg	.02	0.019	93	70-130	
1,3-Dichlorobenzene	mg/kg	.02	0.019	93	70-130	
1,3-Dichloropropane	mg/kg	.02	0.019	93	70-130	
1,4-Dichlorobenzene	mg/kg	.02	0.018	89	70-130	
2,2-Dichloropropane	mg/kg	.02	0.018	90	70-130	
2-Butanone (MEK)	mg/kg	.04	0.033	82	51-161	
2-Chlorotoluene	mg/kg	.02	0.018	88	70-130	
2-Hexanone	mg/kg	.04	0.034	84	59-137	
4-Chlorotoluene	mg/kg	.02	0.019	94	70-130	
4-Methyl-2-pentanone (MIBK)	mg/kg	.04	0.035	87	64-143	
Acetone	mg/kg	.04	0.041	103	32-175	
Acetonitrile	mg/kg	.2	0.19	96	68-131	
Benzene	mg/kg	.02	0.020	99	70-130	
Bromobenzene	mg/kg	.02	0.018	91	70-130	
Bromochloromethane	mg/kg	.02	0.020	100	70-130	
Bromodichloromethane	mg/kg	.02	0.021	107	70-130	
Bromoform	mg/kg	.02	0.019	95	70-130	
Bromomethane	mg/kg	.02	0.020	102	42-156	
Carbon disulfide	mg/kg	.02	0.015	73	49-152	
Carbon tetrachloride	mg/kg	.02	0.021	106	65-132	
Chlorobenzene	mg/kg	.02	0.018	89	70-130	
Chloroethane	mg/kg	.02	0.017	83	56-146	
Chloroform	mg/kg	.02	0.021	106	69-130	
Chloromethane	mg/kg	.02	0.019	93	50-145	
cis-1,2-Dichloroethene	mg/kg	.02	0.019	97	70-130	
cis-1,3-Dichloropropene	mg/kg	.02	0.019	96	70-130	
Dibromochloromethane	mg/kg	.02	0.021	106	70-130	
Dibromomethane	mg/kg	.02	0.022	108	68-133	
Dichlorodifluoromethane	mg/kg	.02	0.023	113	58-138	
Ethylbenzene	mg/kg	.02	0.018	91	70-130	
Iodomethane	mg/kg	.04	0.031	79	59-142	
Isopropylbenzene (Cumene)	mg/kg	.02	0.018	92	70-130	
m&p-Xylene	mg/kg	.04	0.038	95	70-130	
Methyl-tert-butyl ether	mg/kg	.02	0.018	89	70-130	
Methylene Chloride	mg/kg	.02	0.017	87	40-159	
n-Butylbenzene	mg/kg	.02	0.017	87	70-130	
n-Propylbenzene	mg/kg	.02	0.018	91	70-130	
o-Xylene	mg/kg	.02	0.019	97	70-130	
p-Isopropyltoluene	mg/kg	.02	0.018	88	70-130	
sec-Butylbenzene	mg/kg	.02	0.018	92	70-130	
Styrene	mg/kg	.02	0.017	87	70-130	
tert-Butylbenzene	mg/kg	.02	0.018	90	70-130	
Tetrachloroethene	mg/kg	.02	0.018	92	63-130	
Toluene	mg/kg	.02	0.019	95	70-130	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

QUALITY CONTROL DATA

Project:	6783-17-2991.04/MIA Parcel 3
Pace Project No.:	35373365

LABORATORY CONTROL SAMPLE: 2317948

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
trans-1,2-Dichloroethene	mg/kg	.02	0.019	93	70-130	
trans-1,3-Dichloropropene	mg/kg	.02	0.019	94	70-130	
Trichloroethene	mg/kg	.02	0.019	95	69-130	
Trichlorofluoromethane	mg/kg	.02	0.020	98	67-130	
Vinyl acetate	mg/kg	.02	0.020	101	53-146	
Vinyl chloride	mg/kg	.02	0.017	85	67-130	
Xylene (Total)	mg/kg	.06	0.057	95	70-130	
1,2-Dichloroethane-d4 (S)	%			114	80-131	
4-Bromofluorobenzene (S)	%			107	55-148	
Toluene-d8 (S)	%			97	84-117	

MATRIX SPIKE SAMPLE: 2318412

Parameter	Units	35373655001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	mg/kg	0.0022 U	.022	0.021	93	42-130	
1,1,1-Trichloroethane	mg/kg	0.0024 U	.022	0.031	136	42-131	J(M1)
1,1,2,2-Tetrachloroethane	mg/kg	0.0022 U	.022	0.022	96	50-130	
1,1,2-Trichloroethane	mg/kg	0.0022 U	.022	0.024	107	59-130	
1,1-Dichloroethane	mg/kg	0.0024 U	.022	0.026	113	50-130	
1,1-Dichloroethene	mg/kg	0.0022 U	.022	0.029	127	51-130	
1,1-Dichloropropene	mg/kg	0.0022 U	.022	0.022	97	41-130	
1,2,3-Trichlorobenzene	mg/kg	0.0022 U	.022	0.011	46	20-143	
1,2,3-Trichloropropane	mg/kg	0.0022 U	.022	0.023	100	49-130	
1,2,3-Trimethylbenzene	mg/kg	0.0022 U	.022	0.0098	43	20-130	N2
1,2,4-Trichlorobenzene	mg/kg	0.0022 U	.022	0.0090	40	20-142	
1,2,4-Trimethylbenzene	mg/kg	0.0025 U	.022	0.0099	43	20-133	
1,2-Dichlorobenzene	mg/kg	0.0022 U	.022	0.012	51	20-134	
1,2-Dichloroethane	mg/kg	0.0022 U	.022	0.031	135	57-130	J(M1)
1,2-Dichloropropane	mg/kg	0.0022 U	.022	0.022	98	52-130	
1,3,5-Trimethylbenzene	mg/kg	0.0025 U	.022	0.0089	39	26-130	
1,3-Dichlorobenzene	mg/kg	0.0022 U	.022	0.010	45	20-133	
1,3-Dichloropropane	mg/kg	0.0022 U	.022	0.022	96	57-130	
1,4-Dichlorobenzene	mg/kg	0.0022 U	.022	0.010	45	20-134	
2,2-Dichloropropane	mg/kg	0.0023 U	.022	0.031	135	35-130	J(M1)
2-Butanone (MEK)	mg/kg	0.0039 I	.046	0.047	94	20-217	
2-Chlorotoluene	mg/kg	0.0022 U	.022	0.010	44	26-130	
2-Hexanone	mg/kg	0.0022 U	.046	0.048	105	20-136	
4-Chlorotoluene	mg/kg	0.0022 U	.022	0.010	45	21-132	
4-Methyl-2-pentanone (MIBK)	mg/kg	0.0022 U	.046	0.045	99	21-151	
Acetone	mg/kg	0.15	.046	0.38	504	20-219	J(M1)
Acetonitrile	mg/kg	0.022 U	.22	0.23	100	32-150	
Benzene	mg/kg	0.0022 U	.022	0.023	101	24-141	
Bromobenzene	mg/kg	0.0022 U	.022	0.014	60	20-138	
Bromochloromethane	mg/kg	0.0022 U	.022	0.026	114	53-141	
Bromodichloromethane	mg/kg	0.0022 U	.022	0.027	120	20-155	

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QUALITY CONTROL DATA

Project: 6783-17-2991.04/MIA Parcel 3
Pace Project No.: 35373365

MATRIX SPIKE SAMPLE: 2318412

Parameter	Units	35373655001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Bromoform	mg/kg	0.0022 U	.022	0.022	97	30-130	
Bromomethane	mg/kg	0.0022 U	.022	0.031	136	22-152	
Carbon disulfide	mg/kg	0.0022 U	.022	0.019	83	20-160	
Carbon tetrachloride	mg/kg	0.0022 U	.022	0.029	129	23-141	
Chlorobenzene	mg/kg	0.0022 U	.022	0.014	60	34-130	
Chloroethane	mg/kg	0.0031 U	.022	0.029	126	43-146	
Chloroform	mg/kg	0.0026 U	.022	0.029	128	42-132	
Chloromethane	mg/kg	0.0025 U	.022	0.032	140	31-144	
cis-1,2-Dichloroethene	mg/kg	0.0022 U	.022	0.024	106	45-131	
cis-1,3-Dichloropropene	mg/kg	0.0022 U	.022	0.021	92	33-132	
Dibromochloromethane	mg/kg	0.0022 U	.022	0.026	113	20-151	
Dibromomethane	mg/kg	0.0022 U	.022	0.027	117	49-137	
Dichlorodifluoromethane	mg/kg	0.0023 U	.022	0.048	209	39-130	J(M1)
Ethylbenzene	mg/kg	0.0025 U	.022	0.012	53	30-130	
Iodomethane	mg/kg	0.0022 U	.046	0.044	97	20-155	
Isopropylbenzene (Cumene)	mg/kg	0.0025 U	.022	0.0096	42	28-130	
m&p-Xylene	mg/kg	0.0045 U	.046	0.024	52	27-150	
Methyl-tert-butyl ether	mg/kg	0.0022 U	.022	0.026	115	31-156	
Methylene Chloride	mg/kg	0.0022 U	.022	0.019	86	20-150	
n-Butylbenzene	mg/kg	0.0026 U	.022	0.0050 I	22	20-132	
n-Propylbenzene	mg/kg	0.0023 U	.022	0.0083	37	24-130	
o-Xylene	mg/kg	0.0023 U	.022	0.012	53	27-150	
p-Isopropyltoluene	mg/kg	0.0026 U	.022	0.0062	27	20-133	
sec-Butylbenzene	mg/kg	0.0025 U	.022	0.0065	29	20-131	
Styrene	mg/kg	0.0022 U	.022	0.012	53	20-137	
tert-Butylbenzene	mg/kg	0.0025 U	.022	0.0077	34	20-131	
Tetrachloroethene	mg/kg	0.0022 U	.022	0.021	93	23-144	
Toluene	mg/kg	0.0024 U	.022	0.016	72	24-137	
trans-1,2-Dichloroethene	mg/kg	0.0027 U	.022	0.024	107	50-130	
trans-1,3-Dichloropropene	mg/kg	0.0022 U	.022	0.022	98	33-130	
Trichloroethene	mg/kg	0.0025 U	.022	0.020	89	42-130	
Trichlorofluoromethane	mg/kg	0.0024 U	.022	0.036	158	40-130	J(M1)
Vinyl acetate	mg/kg	0.0022 U	.022	0.0099	43	20-156	
Vinyl chloride	mg/kg	0.0024 U	.022	0.029	129	47-130	
Xylene (Total)	mg/kg	0.0045 U	.068	0.036	52	26-130	
1,2-Dichloroethane-d4 (S)	%				120	80-131	
4-Bromofluorobenzene (S)	%				102	55-148	
Toluene-d8 (S)	%				100	84-117	

SAMPLE DUPLICATE: 2318413

Parameter	Units	35373655002 Result	Dup Result	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	mg/kg	0.0031 U	0.0031 U		40	
1,1,1-Trichloroethane	mg/kg	0.0034 U	0.0034 U		40	
1,1,2,2-Tetrachloroethane	mg/kg	0.0031 U	0.0031 U		40	

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QUALITY CONTROL DATA

Project: 6783-17-2991.04/MIA Parcel 3
Pace Project No.: 35373365

SAMPLE DUPLICATE: 2318413

Parameter	Units	35373655002 Result	Dup Result	RPD	Max RPD	Qualifiers
1,1,2-Trichloroethane	mg/kg	0.0031 U	0.0031 U		40	
1,1-Dichloroethane	mg/kg	0.0034 U	0.0034 U		40	
1,1-Dichloroethene	mg/kg	0.0031 U	0.0031 U		40	
1,1-Dichloropropene	mg/kg	0.0031 U	0.0031 U		40	
1,2,3-Trichlorobenzene	mg/kg	0.0031 U	0.0031 U		40	
1,2,3-Trichloropropane	mg/kg	0.0031 U	0.0031 U		40	
1,2,3-Trimethylbenzene	mg/kg	0.0031 U	0.0031 U		40	N2
1,2,4-Trichlorobenzene	mg/kg	0.0031 U	0.0031 U		40	
1,2,4-Trimethylbenzene	mg/kg	0.0034 U	0.0034 U		40	
1,2-Dichlorobenzene	mg/kg	0.0031 U	0.0031 U		40	
1,2-Dichloroethane	mg/kg	0.0031 U	0.0031 U		40	
1,2-Dichloropropane	mg/kg	0.0031 U	0.0031 U		40	
1,3,5-Trimethylbenzene	mg/kg	0.0035 U	0.0035 U		40	
1,3-Dichlorobenzene	mg/kg	0.0031 U	0.0031 U		40	
1,3-Dichloropropane	mg/kg	0.0031 U	0.0031 U		40	
1,4-Dichlorobenzene	mg/kg	0.0031 U	0.0031 U		40	
2,2-Dichloropropane	mg/kg	0.0032 U	0.0032 U		40	
2-Butanone (MEK)	mg/kg	0.0031 U	0.0031 U		40	
2-Chlorotoluene	mg/kg	0.0031 U	0.0031 U		40	
2-Hexanone	mg/kg	0.0031 U	0.0031 U		40	
4-Chlorotoluene	mg/kg	0.0031 U	0.0031 U		40	
4-Methyl-2-pentanone (MIBK)	mg/kg	0.0031 U	0.0031 U		40	
Acetone	mg/kg	0.66	0.44	40	40	
Acetonitrile	mg/kg	0.031 U	0.031 U		40	
Benzene	mg/kg	0.0031 U	0.0031 U		40	
Bromobenzene	mg/kg	0.0031 U	0.0031 U		40	
Bromochloromethane	mg/kg	0.0031 U	0.0031 U		40	
Bromodichloromethane	mg/kg	0.0031 U	0.0031 U		40	
Bromoform	mg/kg	0.0031 U	0.0031 U		40	
Bromomethane	mg/kg	0.0031 U	0.0031 U		40	
Carbon disulfide	mg/kg	0.0031 U	0.0031 U		40	
Carbon tetrachloride	mg/kg	0.0031 U	0.0031 U		40	
Chlorobenzene	mg/kg	0.0031 U	0.0031 U		40	
Chloroethane	mg/kg	0.0044 U	0.0044 U		40	
Chloroform	mg/kg	0.0036 U	0.0036 U		40	
Chloromethane	mg/kg	0.0034 U	0.0034 U		40	
cis-1,2-Dichloroethene	mg/kg	0.0031 U	0.0031 U		40	
cis-1,3-Dichloropropene	mg/kg	0.0031 U	0.0031 U		40	
Dibromochloromethane	mg/kg	0.0031 U	0.0031 U		40	
Dibromomethane	mg/kg	0.0031 U	0.0031 U		40	
Dichlorodifluoromethane	mg/kg	0.0033 U	0.0033 U		40	
Ethylbenzene	mg/kg	0.0035 U	0.0035 U		40	
Iodomethane	mg/kg	0.0031 U	0.0031 U		40	
Isopropylbenzene (Cumene)	mg/kg	0.0036 U	0.0036 U		40	
m&p-Xylene	mg/kg	0.0063 U	0.0063 U		40	
Methyl-tert-butyl ether	mg/kg	0.0031 U	0.0031 U		40	
Methylene Chloride	mg/kg	0.0031 U	0.0031 U		40	

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QUALITY CONTROL DATA

Project: 6783-17-2991.04/MIA Parcel 3
Pace Project No.: 35373365

SAMPLE DUPLICATE: 2318413

Parameter	Units	35373655002 Result	Dup Result	RPD	Max RPD	Qualifiers
n-Butylbenzene	mg/kg	0.0037 U	0.0037 U		40	
n-Propylbenzene	mg/kg	0.0032 U	0.0032 U		40	
o-Xylene	mg/kg	0.0032 U	0.0032 U		40	
p-Isopropyltoluene	mg/kg	0.0037 U	0.0037 U		40	
sec-Butylbenzene	mg/kg	0.0036 U	0.0036 U		40	
Styrene	mg/kg	0.0031 U	0.0031 U		40	
tert-Butylbenzene	mg/kg	0.0035 U	0.0035 U		40	
Tetrachloroethene	mg/kg	0.0031 U	0.0031 U		40	
Toluene	mg/kg	0.0033 U	0.0033 U		40	
trans-1,2-Dichloroethene	mg/kg	0.0037 U	0.0037 U		40	
trans-1,3-Dichloropropene	mg/kg	0.0031 U	0.0031 U		40	
Trichloroethene	mg/kg	0.0035 U	0.0035 U		40	
Trichlorofluoromethane	mg/kg	0.0033 U	0.0033 U		40	
Vinyl acetate	mg/kg	0.0031 U	0.0031 U		40	
Vinyl chloride	mg/kg	0.0033 U	0.0033 U		40	
Xylene (Total)	mg/kg	0.0063 U	0.0063 U		40	
1,2-Dichloroethane-d4 (S)	%	124	114	8	40	
4-Bromofluorobenzene (S)	%	105	95	10	40	
Toluene-d8 (S)	%	99	101	2	40	

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QUALITY CONTROL DATA

Project: 6783-17-2991.04/MIA Parcel 3
Pace Project No.: 35373365

QC Batch: 426274
Analysis Method: EPA 8260
QC Batch Method: EPA 8260
Analysis Description: 8260 MSV
Associated Lab Samples: 35373365001, 35373365002, 35373365003, 35373365004, 35373365006, 35373365007

METHOD BLANK: 2320236
Matrix: Water
Associated Lab Samples: 35373365001, 35373365002, 35373365003, 35373365004, 35373365006, 35373365007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	0.50 U	1.0	0.50	02/15/18 23:53	
1,1,1-Trichloroethane	ug/L	0.50 U	1.0	0.50	02/15/18 23:53	
1,1,2,2-Tetrachloroethane	ug/L	0.12 U	0.50	0.12	02/15/18 23:53	
1,1,2-Trichloroethane	ug/L	0.50 U	1.0	0.50	02/15/18 23:53	
1,1-Dichloroethane	ug/L	0.50 U	1.0	0.50	02/15/18 23:53	
1,1-Dichloroethene	ug/L	0.50 U	1.0	0.50	02/15/18 23:53	
1,1-Dichloropropene	ug/L	0.50 U	1.0	0.50	02/15/18 23:53	
1,2,3-Trichlorobenzene	ug/L	0.50 U	1.0	0.50	02/15/18 23:53	
1,2,3-Trichloropropane	ug/L	0.59 U	2.0	0.59	02/15/18 23:53	
1,2,3-Trimethylbenzene	ug/L	1.0 U	1.0	1.0	02/15/18 23:53	
1,2,4-Trichlorobenzene	ug/L	0.50 U	1.0	0.50	02/15/18 23:53	
1,2,4-Trimethylbenzene	ug/L	0.50 U	1.0	0.50	02/15/18 23:53	
1,2-Dichlorobenzene	ug/L	0.50 U	1.0	0.50	02/15/18 23:53	
1,2-Dichloroethane	ug/L	0.50 U	1.0	0.50	02/15/18 23:53	
1,2-Dichloropropane	ug/L	0.50 U	1.0	0.50	02/15/18 23:53	
1,3,5-Trimethylbenzene	ug/L	0.50 U	1.0	0.50	02/15/18 23:53	
1,3-Dichlorobenzene	ug/L	0.50 U	1.0	0.50	02/15/18 23:53	
1,3-Dichloropropane	ug/L	0.50 U	1.0	0.50	02/15/18 23:53	
1,4-Dichlorobenzene	ug/L	0.50 U	1.0	0.50	02/15/18 23:53	
2,2-Dichloropropane	ug/L	0.50 U	1.0	0.50	02/15/18 23:53	
2-Butanone (MEK)	ug/L	5.0 U	10.0	5.0	02/15/18 23:53	
2-Chlorotoluene	ug/L	0.50 U	1.0	0.50	02/15/18 23:53	
2-Hexanone	ug/L	5.0 U	10.0	5.0	02/15/18 23:53	
4-Chlorotoluene	ug/L	0.50 U	1.0	0.50	02/15/18 23:53	
4-Methyl-2-pentanone (MIBK)	ug/L	5.0 U	10.0	5.0	02/15/18 23:53	
Acetone	ug/L	10.0 U	20.0	10.0	02/15/18 23:53	
Acetonitrile	ug/L	5.0 U	40.0	5.0	02/15/18 23:53	
Benzene	ug/L	0.10 U	1.0	0.10	02/15/18 23:53	
Bromobenzene	ug/L	0.50 U	1.0	0.50	02/15/18 23:53	
Bromochloromethane	ug/L	0.50 U	1.0	0.50	02/15/18 23:53	
Bromodichloromethane	ug/L	0.27 U	0.60	0.27	02/15/18 23:53	
Bromoform	ug/L	0.50 U	1.0	0.50	02/15/18 23:53	
Bromomethane	ug/L	0.50 U	5.0	0.50	02/15/18 23:53	
Carbon disulfide	ug/L	5.0 U	10.0	5.0	02/15/18 23:53	
Carbon tetrachloride	ug/L	0.50 U	3.0	0.50	02/15/18 23:53	
Chlorobenzene	ug/L	0.50 U	1.0	0.50	02/15/18 23:53	
Chloroethane	ug/L	0.50 U	10.0	0.50	02/15/18 23:53	
Chloroform	ug/L	0.50 U	1.0	0.50	02/15/18 23:53	
Chloromethane	ug/L	0.62 U	1.0	0.62	02/15/18 23:53	
cis-1,2-Dichloroethene	ug/L	0.50 U	1.0	0.50	02/15/18 23:53	
cis-1,3-Dichloropropene	ug/L	0.25 U	0.50	0.25	02/15/18 23:53	

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QUALITY CONTROL DATA

Project: 6783-17-2991.04/MIA Parcel 3
Pace Project No.: 35373365

METHOD BLANK: 2320236 Matrix: Water
Associated Lab Samples: 35373365001, 35373365002, 35373365003, 35373365004, 35373365006, 35373365007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Dibromochloromethane	ug/L	0.26 U	2.0	0.26	02/15/18 23:53	
Dibromomethane	ug/L	0.50 U	2.0	0.50	02/15/18 23:53	
Dichlorodifluoromethane	ug/L	0.50 U	1.0	0.50	02/15/18 23:53	
Ethylbenzene	ug/L	0.50 U	1.0	0.50	02/15/18 23:53	
Iodomethane	ug/L	0.50 U	10.0	0.50	02/15/18 23:53	
Isopropylbenzene (Cumene)	ug/L	0.50 U	1.0	0.50	02/15/18 23:53	
m&p-Xylene	ug/L	1.0 U	2.0	1.0	02/15/18 23:53	
Methyl-tert-butyl ether	ug/L	0.50 U	1.0	0.50	02/15/18 23:53	
Methylene Chloride	ug/L	2.5 U	5.0	2.5	02/15/18 23:53	
n-Butylbenzene	ug/L	0.50 U	1.0	0.50	02/15/18 23:53	
n-Propylbenzene	ug/L	0.50 U	1.0	0.50	02/15/18 23:53	
o-Xylene	ug/L	0.50 U	1.0	0.50	02/15/18 23:53	
p-Isopropyltoluene	ug/L	0.50 U	5.0	0.50	02/15/18 23:53	
sec-Butylbenzene	ug/L	0.50 U	1.0	0.50	02/15/18 23:53	
Styrene	ug/L	0.50 U	1.0	0.50	02/15/18 23:53	
tert-Butylbenzene	ug/L	0.50 U	1.0	0.50	02/15/18 23:53	
Tetrachloroethene	ug/L	0.50 U	1.0	0.50	02/15/18 23:53	
Toluene	ug/L	0.50 U	1.0	0.50	02/15/18 23:53	
trans-1,2-Dichloroethene	ug/L	0.50 U	1.0	0.50	02/15/18 23:53	
trans-1,3-Dichloropropene	ug/L	0.25 U	0.50	0.25	02/15/18 23:53	
Trichloroethene	ug/L	0.50 U	1.0	0.50	02/15/18 23:53	
Trichlorofluoromethane	ug/L	0.50 U	1.0	0.50	02/15/18 23:53	
Vinyl acetate	ug/L	1.0 U	10.0	1.0	02/15/18 23:53	
Vinyl chloride	ug/L	0.50 U	1.0	0.50	02/15/18 23:53	
Xylene (Total)	ug/L	1.0 U	3.0	1.0	02/15/18 23:53	
1,2-Dichloroethane-d4 (S)	%	101	75-135		02/15/18 23:53	
4-Bromofluorobenzene (S)	%	104	89-111		02/15/18 23:53	
Toluene-d8 (S)	%	102	89-112		02/15/18 23:53	

LABORATORY CONTROL SAMPLE: 2320237

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	20	20.4	102	70-130	
1,1,1-Trichloroethane	ug/L	20	20.3	101	70-130	
1,1,2,2-Tetrachloroethane	ug/L	20	19.5	97	70-130	
1,1,2-Trichloroethane	ug/L	20	20.1	100	70-130	
1,1-Dichloroethane	ug/L	20	20.8	104	70-130	
1,1-Dichloroethene	ug/L	20	16.5	83	65-134	
1,1-Dichloropropene	ug/L	20	20.1	100	70-130	
1,2,3-Trichlorobenzene	ug/L	20	21.6	108	70-130	
1,2,3-Trichloropropane	ug/L	20	17.5	88	65-135	
1,2,3-Trimethylbenzene	ug/L	20	21.5	108	70-130	
1,2,4-Trichlorobenzene	ug/L	20	19.9	100	70-130	
1,2,4-Trimethylbenzene	ug/L	20	20.9	105	70-130	

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QUALITY CONTROL DATA

Project: 6783-17-2991.04/MIA Parcel 3
Pace Project No.: 35373365

LABORATORY CONTROL SAMPLE: 2320237

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2-Dichlorobenzene	ug/L	20	20.2	101	70-130	
1,2-Dichloroethane	ug/L	20	18.4	92	70-130	
1,2-Dichloropropane	ug/L	20	20.2	101	70-130	
1,3,5-Trimethylbenzene	ug/L	20	21.5	108	70-130	
1,3-Dichlorobenzene	ug/L	20	20.9	105	70-130	
1,3-Dichloropropane	ug/L	20	20.1	100	70-130	
1,4-Dichlorobenzene	ug/L	20	19.3	97	70-130	
2,2-Dichloropropane	ug/L	20	19.4	97	55-143	
2-Butanone (MEK)	ug/L	40	40.3	101	61-129	
2-Chlorotoluene	ug/L	20	22.1	111	70-130	
2-Hexanone	ug/L	40	40.7	102	68-131	
4-Chlorotoluene	ug/L	20	21.3	107	70-130	
4-Methyl-2-pentanone (MIBK)	ug/L	40	38.7	97	70-130	
Acetone	ug/L	40	44.3	111	44-155	
Acetonitrile	ug/L	200	243	121	46-153	
Benzene	ug/L	20	20.1	101	70-130	
Bromobenzene	ug/L	20	19.2	96	70-130	
Bromochloromethane	ug/L	20	19.5	97	70-130	
Bromodichloromethane	ug/L	20	19.7	99	70-130	
Bromoform	ug/L	20	20.2	101	62-129	
Bromomethane	ug/L	20	13.9	69	10-179	
Carbon disulfide	ug/L	20	18.6	93	40-156	
Carbon tetrachloride	ug/L	20	19.2	96	66-127	
Chlorobenzene	ug/L	20	20.5	103	70-130	
Chloroethane	ug/L	20	20.6	103	57-142	
Chloroform	ug/L	20	19.5	97	70-130	
Chloromethane	ug/L	20	20.4	102	45-150	
cis-1,2-Dichloroethene	ug/L	20	19.9	100	70-130	
cis-1,3-Dichloropropene	ug/L	20	19.5	98	70-130	
Dibromochloromethane	ug/L	20	18.9	95	70-130	
Dibromomethane	ug/L	20	20.4	102	70-130	
Dichlorodifluoromethane	ug/L	20	18.7	94	44-149	
Ethylbenzene	ug/L	20	20.8	104	70-130	
Iodomethane	ug/L	40	39.5	99	21-150	
Isopropylbenzene (Cumene)	ug/L	20	22.1	111	70-130	
m&p-Xylene	ug/L	40	46.3	116	70-130	
Methyl-tert-butyl ether	ug/L	20	21.8	109	64-133	
Methylene Chloride	ug/L	20	21.5	107	65-127	
n-Butylbenzene	ug/L	20	21.4	107	70-130	
n-Propylbenzene	ug/L	20	21.6	108	70-130	
o-Xylene	ug/L	20	21.6	108	70-130	
p-Isopropyltoluene	ug/L	20	22.2	111	70-130	
sec-Butylbenzene	ug/L	20	21.7	109	70-130	
Styrene	ug/L	20	21.3	106	70-130	
tert-Butylbenzene	ug/L	20	21.5	107	70-130	
Tetrachloroethene	ug/L	20	21.5	107	48-155	
Toluene	ug/L	20	19.5	97	70-130	

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QUALITY CONTROL DATA

Project: 6783-17-2991.04/MIA Parcel 3
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LABORATORY CONTROL SAMPLE: 2320237

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
trans-1,2-Dichloroethene	ug/L	20	18.9	95	68-126	
trans-1,3-Dichloropropene	ug/L	20	18.9	95	70-130	
Trichloroethene	ug/L	20	19.3	97	69-129	
Trichlorofluoromethane	ug/L	20	18.3	91	60-144	
Vinyl acetate	ug/L	20	20.3	101	70-130	
Vinyl chloride	ug/L	20	18.8	94	67-136	
Xylene (Total)	ug/L	60	67.9	113	70-130	
1,2-Dichloroethane-d4 (S)	%			101	75-135	
4-Bromofluorobenzene (S)	%			108	89-111	
Toluene-d8 (S)	%			103	89-112	

MATRIX SPIKE SAMPLE: 2321178

Parameter	Units	35373209006 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	0.50 U	20	19.4	97	70-130	
1,1,1-Trichloroethane	ug/L	0.50 U	20	21.0	105	70-130	
1,1,2,2-Tetrachloroethane	ug/L	0.12 U	20	17.9	89	70-130	
1,1,2-Trichloroethane	ug/L	0.50 U	20	19.2	96	70-130	
1,1-Dichloroethane	ug/L	0.50 U	20	21.0	105	70-130	
1,1-Dichloroethene	ug/L	0.50 U	20	17.5	88	65-134	
1,1-Dichloropropene	ug/L	0.50 U	20	21.3	106	70-130	
1,2,3-Trichlorobenzene	ug/L	0.50 U	20	21.7	109	70-130	
1,2,3-Trichloropropane	ug/L	0.59 U	20	17.7	89	65-135	
1,2,3-Trimethylbenzene	ug/L	1.0 U	20	21.1	105	70-130	
1,2,4-Trichlorobenzene	ug/L	0.50 U	20	19.7	99	70-130	
1,2,4-Trimethylbenzene	ug/L	0.50 U	20	20.6	103	70-130	
1,2-Dichlorobenzene	ug/L	0.50 U	20	20.3	101	70-130	
1,2-Dichloroethane	ug/L	0.50 U	20	18.1	90	70-130	
1,2-Dichloropropane	ug/L	0.50 U	20	19.2	96	70-130	
1,3,5-Trimethylbenzene	ug/L	0.50 U	20	21.4	107	70-130	
1,3-Dichlorobenzene	ug/L	0.50 U	20	20.7	103	70-130	
1,3-Dichloropropane	ug/L	0.50 U	20	19.0	95	70-130	
1,4-Dichlorobenzene	ug/L	0.50 U	20	19.4	97	70-130	
2,2-Dichloropropane	ug/L	0.50 U	20	21.3	107	55-143	
2-Butanone (MEK)	ug/L	5.0 U	40	32.7	82	61-129	
2-Chlorotoluene	ug/L	0.50 U	20	21.6	108	70-130	
2-Hexanone	ug/L	5.0 U	40	32.5	81	68-131	
4-Chlorotoluene	ug/L	0.50 U	20	20.8	104	70-130	
4-Methyl-2-pentanone (MIBK)	ug/L	5.0 U	40	34.6	87	70-130	
Acetone	ug/L	10.0 U	40	34.1	85	44-155	
Acetonitrile	ug/L	5.0 U	200	166	83	46-153	
Benzene	ug/L	0.10 U	20	19.9	100	70-130	
Bromobenzene	ug/L	0.50 U	20	18.8	94	70-130	
Bromochloromethane	ug/L	0.50 U	20	20.3	101	70-130	
Bromodichloromethane	ug/L	0.27 U	20	19.3	97	70-130	

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QUALITY CONTROL DATA

Project: 6783-17-2991.04/MIA Parcel 3
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MATRIX SPIKE SAMPLE: 2321178

Parameter	Units	35373209006 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Bromoform	ug/L	0.50 U	20	19.2	96	62-129	
Bromomethane	ug/L	0.50 U	20	15.2	76	10-179	
Carbon disulfide	ug/L	5.0 U	20	19.7	98	40-156	
Carbon tetrachloride	ug/L	0.50 U	20	20.2	101	66-127	
Chlorobenzene	ug/L	0.50 U	20	20.0	99	70-130	
Chloroethane	ug/L	0.50 U	20	18.5	93	57-142	
Chloroform	ug/L	0.50 U	20	19.3	97	70-130	
Chloromethane	ug/L	0.62 U	20	18.3	91	45-150	
cis-1,2-Dichloroethene	ug/L	0.50 U	20	19.7	99	70-130	
cis-1,3-Dichloropropene	ug/L	0.25 U	20	17.9	89	70-130	
Dibromochloromethane	ug/L	0.26 U	20	18.3	91	70-130	
Dibromomethane	ug/L	0.50 U	20	19.3	96	70-130	
Dichlorodifluoromethane	ug/L	0.50 U	20	18.8	94	44-149	
Ethylbenzene	ug/L	0.50 U	20	20.9	105	70-130	
Iodomethane	ug/L	0.50 U	40	21.1	53	21-150	
Isopropylbenzene (Cumene)	ug/L	0.50 U	20	22.0	110	70-130	
m&p-Xylene	ug/L	1.0 U	40	46.0	115	70-130	
Methyl-tert-butyl ether	ug/L	0.50 U	20	19.7	98	64-133	
Methylene Chloride	ug/L	2.5 U	20	19.4	96	65-127	
n-Butylbenzene	ug/L	0.50 U	20	22.1	110	70-130	
n-Propylbenzene	ug/L	0.50 U	20	21.6	108	70-130	
o-Xylene	ug/L	0.50 U	20	20.9	104	70-130	
p-Isopropyltoluene	ug/L	0.50 U	20	22.2	111	70-130	
sec-Butylbenzene	ug/L	0.50 U	20	22.0	110	70-130	
Styrene	ug/L	0.50 U	20	20.6	103	70-130	
tert-Butylbenzene	ug/L	0.50 U	20	21.1	105	70-130	
Tetrachloroethene	ug/L	0.50 U	20	22.2	111	48-155	
Toluene	ug/L	0.50 U	20	19.1	95	70-130	
trans-1,2-Dichloroethene	ug/L	0.50 U	20	18.4	92	68-126	
trans-1,3-Dichloropropene	ug/L	0.25 U	20	18.3	92	70-130	
Trichloroethene	ug/L	0.50 U	20	19.5	98	69-129	
Trichlorofluoromethane	ug/L	0.50 U	20	18.7	93	60-144	
Vinyl acetate	ug/L	1.0 U	20	18.6	93	70-130	
Vinyl chloride	ug/L	0.50 U	20	17.0	85	67-136	
Xylene (Total)	ug/L	1.0 U	60	66.9	112	70-130	
1,2-Dichloroethane-d4 (S)	%				102	75-135	
4-Bromofluorobenzene (S)	%				108	89-111	
Toluene-d8 (S)	%				100	89-112	

SAMPLE DUPLICATE: 2321226

Parameter	Units	35373209005 Result	Dup Result	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	0.50 U	0.50 U		40	
1,1,1-Trichloroethane	ug/L	0.50 U	0.50 U		40	
1,1,2,2-Tetrachloroethane	ug/L	0.12 U	0.12 U		40	

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QUALITY CONTROL DATA

Project: 6783-17-2991.04/MIA Parcel 3
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SAMPLE DUPLICATE: 2321226

Parameter	Units	35373209005 Result	Dup Result	RPD	Max RPD	Qualifiers
1,1,2-Trichloroethane	ug/L	0.50 U	0.50 U		40	
1,1-Dichloroethane	ug/L	0.50 U	0.50 U		40	
1,1-Dichloroethene	ug/L	0.50 U	0.50 U		40	
1,1-Dichloropropene	ug/L	0.50 U	0.50 U		40	
1,2,3-Trichlorobenzene	ug/L	0.50 U	0.50 U		40	
1,2,3-Trichloropropane	ug/L	0.59 U	0.59 U		40	
1,2,3-Trimethylbenzene	ug/L	1.0 U	1.0 U		40	
1,2,4-Trichlorobenzene	ug/L	0.50 U	0.50 U		40	
1,2,4-Trimethylbenzene	ug/L	0.50 U	3.8		40	C8
1,2-Dichlorobenzene	ug/L	0.50 U	0.50 U		40	
1,2-Dichloroethane	ug/L	0.50 U	0.50 U		40	
1,2-Dichloropropane	ug/L	0.50 U	0.50 U		40	
1,3,5-Trimethylbenzene	ug/L	0.50 U	3.1		40	C8
1,3-Dichlorobenzene	ug/L	0.50 U	0.50 U		40	
1,3-Dichloropropane	ug/L	0.50 U	0.50 U		40	
1,4-Dichlorobenzene	ug/L	0.50 U	0.50 U		40	
2,2-Dichloropropane	ug/L	0.50 U	0.50 U		40	
2-Butanone (MEK)	ug/L	5.0 U	5.0 U		40	
2-Chlorotoluene	ug/L	0.50 U	0.50 U		40	
2-Hexanone	ug/L	5.0 U	5.0 U		40	
4-Chlorotoluene	ug/L	0.50 U	0.50 U		40	
4-Methyl-2-pentanone (MIBK)	ug/L	5.0 U	5.0 U		40	
Acetone	ug/L	10.0 U	10.0 U		40	
Acetonitrile	ug/L	5.0 U	5.0 U		40	
Benzene	ug/L	0.10 U	0.10 U		40	
Bromobenzene	ug/L	0.50 U	0.50 U		40	
Bromochloromethane	ug/L	0.50 U	0.50 U		40	
Bromodichloromethane	ug/L	0.27 U	0.27 U		40	
Bromoform	ug/L	0.50 U	0.50 U		40	
Bromomethane	ug/L	0.50 U	0.50 U		40	
Carbon disulfide	ug/L	5.0 U	5.0 U		40	
Carbon tetrachloride	ug/L	0.50 U	0.50 U		40	
Chlorobenzene	ug/L	0.50 U	0.50 U		40	
Chloroethane	ug/L	0.50 U	0.50 U		40	
Chloroform	ug/L	0.50 U	0.50 U		40	
Chloromethane	ug/L	0.62 U	0.62 U		40	
cis-1,2-Dichloroethene	ug/L	0.50 U	0.50 U		40	
cis-1,3-Dichloropropene	ug/L	0.25 U	0.25 U		40	
Dibromochloromethane	ug/L	0.26 U	0.26 U		40	
Dibromomethane	ug/L	0.50 U	0.50 U		40	
Dichlorodifluoromethane	ug/L	0.50 U	0.50 U		40	
Ethylbenzene	ug/L	0.50 U	0.50 U		40	
Iodomethane	ug/L	0.50 U	0.50 U		40	
Isopropylbenzene (Cumene)	ug/L	0.50 U	0.50 U		40	
m&p-Xylene	ug/L	1.0 U	1.0 U		40	
Methyl-tert-butyl ether	ug/L	0.50 U	0.50 U		40	
Methylene Chloride	ug/L	2.5 U	2.5 U		40	

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QUALITY CONTROL DATA

Project: 6783-17-2991.04/MIA Parcel 3
Pace Project No.: 35373365

SAMPLE DUPLICATE: 2321226

Parameter	Units	35373209005 Result	Dup Result	RPD	Max RPD	Qualifiers
n-Butylbenzene	ug/L	0.50 U	0.50 U		40	
n-Propylbenzene	ug/L	0.50 U	0.50 U		40	
o-Xylene	ug/L	0.50 U	0.50 U		40	
p-Isopropyltoluene	ug/L	0.50 U	0.50 U		40	
sec-Butylbenzene	ug/L	0.50 U	0.50 U		40	
Styrene	ug/L	0.50 U	0.50 U		40	
tert-Butylbenzene	ug/L	0.50 U	0.50 U		40	
Tetrachloroethene	ug/L	0.50 U	0.50 U		40	
Toluene	ug/L	0.50 U	0.50 U		40	
trans-1,2-Dichloroethene	ug/L	0.50 U	0.50 U		40	
trans-1,3-Dichloropropene	ug/L	0.25 U	0.25 U		40	
Trichloroethene	ug/L	0.50 U	0.50 U		40	
Trichlorofluoromethane	ug/L	0.50 U	0.50 U		40	
Vinyl acetate	ug/L	1.0 U	1.0 U		40	
Vinyl chloride	ug/L	0.50 U	0.50 U		40	
Xylene (Total)	ug/L	1.0 U	1.0 U		40	
1,2-Dichloroethane-d4 (S)	%	99	99	0	40	
4-Bromofluorobenzene (S)	%	107	107	0	40	
Toluene-d8 (S)	%	100	100	1	40	

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QUALITY CONTROL DATA

Project: 6783-17-2991.04/MIA Parcel 3
Pace Project No.: 35373365

QC Batch: 426277 Analysis Method: EPA 8260
QC Batch Method: EPA 8260 Analysis Description: 8260 MSV
Associated Lab Samples: 35373365005

METHOD BLANK: 2320266 Matrix: Water
Associated Lab Samples: 35373365005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	0.50 U	1.0	0.50	02/16/18 00:55	
1,1,1-Trichloroethane	ug/L	0.50 U	1.0	0.50	02/16/18 00:55	
1,1,2,2-Tetrachloroethane	ug/L	0.12 U	0.50	0.12	02/16/18 00:55	
1,1,2-Trichloroethane	ug/L	0.50 U	1.0	0.50	02/16/18 00:55	
1,1-Dichloroethane	ug/L	0.50 U	1.0	0.50	02/16/18 00:55	
1,1-Dichloroethene	ug/L	0.50 U	1.0	0.50	02/16/18 00:55	
1,1-Dichloropropene	ug/L	0.50 U	1.0	0.50	02/16/18 00:55	
1,2,3-Trichlorobenzene	ug/L	0.50 U	1.0	0.50	02/16/18 00:55	
1,2,3-Trichloropropane	ug/L	0.59 U	2.0	0.59	02/16/18 00:55	
1,2,3-Trimethylbenzene	ug/L	1.0 U	1.0	1.0	02/16/18 00:55	
1,2,4-Trichlorobenzene	ug/L	0.50 U	1.0	0.50	02/16/18 00:55	
1,2,4-Trimethylbenzene	ug/L	0.50 U	1.0	0.50	02/16/18 00:55	
1,2-Dichlorobenzene	ug/L	0.50 U	1.0	0.50	02/16/18 00:55	
1,2-Dichloroethane	ug/L	0.50 U	1.0	0.50	02/16/18 00:55	
1,2-Dichloropropane	ug/L	0.50 U	1.0	0.50	02/16/18 00:55	
1,3,5-Trimethylbenzene	ug/L	0.50 U	1.0	0.50	02/16/18 00:55	
1,3-Dichlorobenzene	ug/L	0.50 U	1.0	0.50	02/16/18 00:55	
1,3-Dichloropropane	ug/L	0.50 U	1.0	0.50	02/16/18 00:55	
1,4-Dichlorobenzene	ug/L	0.50 U	1.0	0.50	02/16/18 00:55	
2,2-Dichloropropane	ug/L	0.50 U	1.0	0.50	02/16/18 00:55	
2-Butanone (MEK)	ug/L	5.0 U	10.0	5.0	02/16/18 00:55	
2-Chlorotoluene	ug/L	0.50 U	1.0	0.50	02/16/18 00:55	
2-Hexanone	ug/L	5.0 U	10.0	5.0	02/16/18 00:55	
4-Chlorotoluene	ug/L	0.50 U	1.0	0.50	02/16/18 00:55	
4-Methyl-2-pentanone (MIBK)	ug/L	5.0 U	10.0	5.0	02/16/18 00:55	
Acetone	ug/L	10.0 U	20.0	10.0	02/16/18 00:55	
Acetonitrile	ug/L	5.0 U	40.0	5.0	02/16/18 00:55	
Benzene	ug/L	0.10 U	1.0	0.10	02/16/18 00:55	
Bromobenzene	ug/L	0.50 U	1.0	0.50	02/16/18 00:55	
Bromochloromethane	ug/L	0.50 U	1.0	0.50	02/16/18 00:55	
Bromodichloromethane	ug/L	0.27 U	0.60	0.27	02/16/18 00:55	
Bromoform	ug/L	0.50 U	1.0	0.50	02/16/18 00:55	
Bromomethane	ug/L	0.50 U	5.0	0.50	02/16/18 00:55	
Carbon disulfide	ug/L	5.0 U	10.0	5.0	02/16/18 00:55	
Carbon tetrachloride	ug/L	0.50 U	3.0	0.50	02/16/18 00:55	
Chlorobenzene	ug/L	0.50 U	1.0	0.50	02/16/18 00:55	
Chloroethane	ug/L	0.50 U	10.0	0.50	02/16/18 00:55	
Chloroform	ug/L	0.50 U	1.0	0.50	02/16/18 00:55	
Chloromethane	ug/L	0.62 U	1.0	0.62	02/16/18 00:55	
cis-1,2-Dichloroethene	ug/L	0.50 U	1.0	0.50	02/16/18 00:55	
cis-1,3-Dichloropropene	ug/L	0.25 U	0.50	0.25	02/16/18 00:55	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

QUALITY CONTROL DATA

Project: 6783-17-2991.04/MIA Parcel 3
Pace Project No.: 35373365

METHOD BLANK: 2320266 Matrix: Water

Associated Lab Samples: 35373365005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Dibromochloromethane	ug/L	0.26 U	2.0	0.26	02/16/18 00:55	
Dibromomethane	ug/L	0.50 U	2.0	0.50	02/16/18 00:55	
Dichlorodifluoromethane	ug/L	0.50 U	1.0	0.50	02/16/18 00:55	
Ethylbenzene	ug/L	0.50 U	1.0	0.50	02/16/18 00:55	
Iodomethane	ug/L	0.50 U	10.0	0.50	02/16/18 00:55	
Isopropylbenzene (Cumene)	ug/L	0.50 U	1.0	0.50	02/16/18 00:55	
m&p-Xylene	ug/L	1.0 U	2.0	1.0	02/16/18 00:55	
Methyl-tert-butyl ether	ug/L	0.50 U	1.0	0.50	02/16/18 00:55	
Methylene Chloride	ug/L	2.5 U	5.0	2.5	02/16/18 00:55	
n-Butylbenzene	ug/L	0.50 U	1.0	0.50	02/16/18 00:55	
n-Propylbenzene	ug/L	0.50 U	1.0	0.50	02/16/18 00:55	
o-Xylene	ug/L	0.50 U	1.0	0.50	02/16/18 00:55	
p-Isopropyltoluene	ug/L	0.50 U	5.0	0.50	02/16/18 00:55	
sec-Butylbenzene	ug/L	0.50 U	1.0	0.50	02/16/18 00:55	
Styrene	ug/L	0.50 U	1.0	0.50	02/16/18 00:55	
tert-Butylbenzene	ug/L	0.50 U	1.0	0.50	02/16/18 00:55	
Tetrachloroethene	ug/L	0.50 U	1.0	0.50	02/16/18 00:55	
Toluene	ug/L	0.50 U	1.0	0.50	02/16/18 00:55	
trans-1,2-Dichloroethene	ug/L	0.50 U	1.0	0.50	02/16/18 00:55	
trans-1,3-Dichloropropene	ug/L	0.25 U	0.50	0.25	02/16/18 00:55	
Trichloroethene	ug/L	0.50 U	1.0	0.50	02/16/18 00:55	
Trichlorofluoromethane	ug/L	0.50 U	1.0	0.50	02/16/18 00:55	
Vinyl acetate	ug/L	1.0 U	10.0	1.0	02/16/18 00:55	
Vinyl chloride	ug/L	0.50 U	1.0	0.50	02/16/18 00:55	
Xylene (Total)	ug/L	1.5 U	3.0	1.5	02/16/18 00:55	
1,2-Dichloroethane-d4 (S)	%	106	75-135		02/16/18 00:55	
4-Bromofluorobenzene (S)	%	95	89-111		02/16/18 00:55	
Toluene-d8 (S)	%	100	89-112		02/16/18 00:55	

LABORATORY CONTROL SAMPLE: 2320267

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	20	18.7	94	70-130	
1,1,1-Trichloroethane	ug/L	20	18.7	93	70-130	
1,1,2,2-Tetrachloroethane	ug/L	20	21.6	108	70-130	
1,1,2-Trichloroethane	ug/L	20	19.5	97	70-130	
1,1-Dichloroethane	ug/L	20	19.3	97	70-130	
1,1-Dichloroethene	ug/L	20	18.0	90	65-134	
1,1-Dichloropropene	ug/L	20	18.1	91	70-130	
1,2,3-Trichlorobenzene	ug/L	20	21.5	108	70-130	
1,2,3-Trichloropropane	ug/L	20	22.2	111	65-135	
1,2,3-Trimethylbenzene	ug/L	20	19.2	96	70-130	
1,2,4-Trichlorobenzene	ug/L	20	21.0	105	70-130	
1,2,4-Trimethylbenzene	ug/L	20	19.2	96	70-130	

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QUALITY CONTROL DATA

Project: 6783-17-2991.04/MIA Parcel 3
Pace Project No.: 35373365

LABORATORY CONTROL SAMPLE: 2320267

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,2-Dichlorobenzene	ug/L	20	20.4	102	70-130	
1,2-Dichloroethane	ug/L	20	18.3	91	70-130	
1,2-Dichloropropane	ug/L	20	18.3	91	70-130	
1,3,5-Trimethylbenzene	ug/L	20	20.2	101	70-130	
1,3-Dichlorobenzene	ug/L	20	20.5	102	70-130	
1,3-Dichloropropane	ug/L	20	19.6	98	70-130	
1,4-Dichlorobenzene	ug/L	20	20.7	103	70-130	
2,2-Dichloropropane	ug/L	20	19.0	95	55-143	
2-Butanone (MEK)	ug/L	40	38.1	95	61-129	
2-Chlorotoluene	ug/L	20	21.0	105	70-130	
2-Hexanone	ug/L	40	39.6	99	68-131	
4-Chlorotoluene	ug/L	20	20.4	102	70-130	
4-Methyl-2-pentanone (MIBK)	ug/L	40	39.0	98	70-130	
Acetone	ug/L	40	43.2	108	44-155	
Acetonitrile	ug/L	200	174	87	46-153	
Benzene	ug/L	20	18.0	90	70-130	
Bromobenzene	ug/L	20	21.1	106	70-130	
Bromochloromethane	ug/L	20	17.8	89	70-130	
Bromodichloromethane	ug/L	20	17.9	89	70-130	
Bromoform	ug/L	20	20.0	100	62-129	
Bromomethane	ug/L	20	20.9	105	10-179	
Carbon disulfide	ug/L	20	20.5	103	40-156	
Carbon tetrachloride	ug/L	20	17.0	85	66-127	
Chlorobenzene	ug/L	20	19.0	95	70-130	
Chloroethane	ug/L	20	20.5	102	57-142	
Chloroform	ug/L	20	17.7	88	70-130	
Chloromethane	ug/L	20	19.9	100	45-150	
cis-1,2-Dichloroethene	ug/L	20	18.4	92	70-130	
cis-1,3-Dichloropropene	ug/L	20	18.9	95	70-130	
Dibromochloromethane	ug/L	20	19.0	95	70-130	
Dibromomethane	ug/L	20	17.5	87	70-130	
Dichlorodifluoromethane	ug/L	20	19.4	97	44-149	
Ethylbenzene	ug/L	20	18.6	93	70-130	
Iodomethane	ug/L	40	37.5	94	21-150	
Isopropylbenzene (Cumene)	ug/L	20	19.3	96	70-130	
m&p-Xylene	ug/L	40	38.5	96	70-130	
Methyl-tert-butyl ether	ug/L	20	19.6	98	64-133	
Methylene Chloride	ug/L	20	19.7	99	65-127	
n-Butylbenzene	ug/L	20	20.9	105	70-130	
n-Propylbenzene	ug/L	20	19.8	99	70-130	
o-Xylene	ug/L	20	19.1	95	70-130	
p-Isopropyltoluene	ug/L	20	20.9	104	70-130	
sec-Butylbenzene	ug/L	20	20.2	101	70-130	
Styrene	ug/L	20	20.6	103	70-130	
tert-Butylbenzene	ug/L	20	19.9	100	70-130	
Tetrachloroethene	ug/L	20	18.7	93	48-155	
Toluene	ug/L	20	18.2	91	70-130	

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QUALITY CONTROL DATA

Project: 6783-17-2991.04/MIA Parcel 3
Pace Project No.: 35373365

LABORATORY CONTROL SAMPLE: 2320267

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
trans-1,2-Dichloroethene	ug/L	20	17.7	88	68-126	
trans-1,3-Dichloropropene	ug/L	20	20.0	100	70-130	
Trichloroethene	ug/L	20	17.4	87	69-129	
Trichlorofluoromethane	ug/L	20	20.2	101	60-144	
Vinyl acetate	ug/L	20	17.5	87	70-130	
Vinyl chloride	ug/L	20	19.5	97	67-136	
Xylene (Total)	ug/L	60	57.6	96	70-130	
1,2-Dichloroethane-d4 (S)	%			105	75-135	
4-Bromofluorobenzene (S)	%			95	89-111	
Toluene-d8 (S)	%			96	89-112	

MATRIX SPIKE SAMPLE: 2322429

Parameter	Units	35373040003 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	0.50 U	20	16.6	83	70-130	
1,1,1-Trichloroethane	ug/L	0.50 U	20	18.8	94	70-130	
1,1,2,2-Tetrachloroethane	ug/L	0.12 U	20	17.0	85	70-130	
1,1,2-Trichloroethane	ug/L	0.50 U	20	17.1	86	70-130	
1,1-Dichloroethane	ug/L	0.50 U	20	19.2	96	70-130	
1,1-Dichloroethene	ug/L	0.50 U	20	19.1	95	65-134	
1,1-Dichloropropene	ug/L	0.50 U	20	18.2	91	70-130	
1,2,3-Trichlorobenzene	ug/L	0.50 U	20	14.6	73	70-130	
1,2,3-Trichloropropane	ug/L	0.59 U	20	17.3	87	65-135	
1,2,3-Trimethylbenzene	ug/L	1.0 U	20	18.0	90	70-130	
1,2,4-Trichlorobenzene	ug/L	0.50 U	20	16.5	83	70-130	
1,2,4-Trimethylbenzene	ug/L	0.50 U	20	17.9	89	70-130	
1,2-Dichlorobenzene	ug/L	0.50 U	20	18.0	90	70-130	
1,2-Dichloroethane	ug/L	0.50 U	20	16.4	82	70-130	
1,2-Dichloropropane	ug/L	0.50 U	20	17.4	87	70-130	
1,3,5-Trimethylbenzene	ug/L	0.50 U	20	18.9	95	70-130	
1,3-Dichlorobenzene	ug/L	0.50 U	20	18.4	92	70-130	
1,3-Dichloropropane	ug/L	0.50 U	20	16.6	83	70-130	
1,4-Dichlorobenzene	ug/L	0.50 U	20	17.8	89	70-130	
2,2-Dichloropropane	ug/L	0.50 U	20	19.3	96	55-143	
2-Butanone (MEK)	ug/L	5.0 U	40	28.9	72	61-129	
2-Chlorotoluene	ug/L	0.50 U	20	19.4	97	70-130	
2-Hexanone	ug/L	5.0 U	40	30.0	75	68-131	
4-Chlorotoluene	ug/L	0.50 U	20	18.7	93	70-130	
4-Methyl-2-pentanone (MIBK)	ug/L	5.0 U	40	30.2	75	70-130	
Acetone	ug/L	10.0 U	40	34.1	77	44-155	
Acetonitrile	ug/L	5.0 U	200	140	70	46-153	
Benzene	ug/L	0.10 U	20	17.7	88	70-130	
Bromobenzene	ug/L	0.50 U	20	18.3	91	70-130	
Bromochloromethane	ug/L	0.50 U	20	16.4	82	70-130	
Bromodichloromethane	ug/L	0.27 U	20	17.2	86	70-130	

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QUALITY CONTROL DATA

Project: 6783-17-2991.04/MIA Parcel 3
Pace Project No.: 35373365

MATRIX SPIKE SAMPLE: 2322429

Parameter	Units	35373040003 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Bromoform	ug/L	0.50 U	20	16.0	80	62-129	
Bromomethane	ug/L	0.50 U	20	10.4	52	10-179	
Carbon disulfide	ug/L	5.0 U	20	21.6	108	40-156	
Carbon tetrachloride	ug/L	0.50 U	20	17.5	88	66-127	
Chlorobenzene	ug/L	0.50 U	20	17.5	87	70-130	
Chloroethane	ug/L	0.50 U	20	23.3	116	57-142	
Chloroform	ug/L	0.50 U	20	17.3	87	70-130	
Chloromethane	ug/L	0.62 U	20	20.0	100	45-150	
cis-1,2-Dichloroethene	ug/L	0.50 U	20	17.7	88	70-130	
cis-1,3-Dichloropropene	ug/L	0.25 U	20	16.5	83	70-130	
Dibromochloromethane	ug/L	0.26 U	20	16.2	81	70-130	
Dibromomethane	ug/L	0.50 U	20	15.5	78	70-130	
Dichlorodifluoromethane	ug/L	0.50 U	20	21.4	107	44-149	
Ethylbenzene	ug/L	0.50 U	20	17.8	89	70-130	
Iodomethane	ug/L	0.50 U	40	19.0	48	21-150	
Isopropylbenzene (Cumene)	ug/L	0.50 U	20	19.0	95	70-130	
m&p-Xylene	ug/L	1.0 U	40	37.4	93	70-130	
Methyl-tert-butyl ether	ug/L	0.50 U	20	17.0	85	64-133	
Methylene Chloride	ug/L	2.5 U	20	16.8	82	65-127	
n-Butylbenzene	ug/L	0.50 U	20	19.9	99	70-130	
n-Propylbenzene	ug/L	0.50 U	20	19.0	95	70-130	
o-Xylene	ug/L	0.50 U	20	18.2	91	70-130	
p-Isopropyltoluene	ug/L	0.50 U	20	20.0	100	70-130	
sec-Butylbenzene	ug/L	0.50 U	20	19.6	98	70-130	
Styrene	ug/L	0.50 U	20	19.1	95	70-130	
tert-Butylbenzene	ug/L	0.50 U	20	18.8	94	70-130	
Tetrachloroethene	ug/L	0.50 U	20	18.1	90	48-155	
Toluene	ug/L	0.50 U	20	16.9	85	70-130	
trans-1,2-Dichloroethene	ug/L	0.50 U	20	18.0	90	68-126	
trans-1,3-Dichloropropene	ug/L	0.25 U	20	16.8	84	70-130	
Trichloroethene	ug/L	0.50 U	20	17.7	88	69-129	
Trichlorofluoromethane	ug/L	0.50 U	20	22.7	114	60-144	
Vinyl acetate	ug/L	1.0 U	20	18.1	90	70-130	
Vinyl chloride	ug/L	0.50 U	20	20.7	104	67-136	
Xylene (Total)	ug/L	1.5 U	60	55.6	93	70-130	
1,2-Dichloroethane-d4 (S)	%				106	75-135	
4-Bromofluorobenzene (S)	%				98	89-111	
Toluene-d8 (S)	%				96	89-112	

SAMPLE DUPLICATE: 2322428

Parameter	Units	35373040002 Result	Dup Result	RPD	Max RPD	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	0.50 U	0.50 U		40	
1,1,1-Trichloroethane	ug/L	0.50 U	0.50 U		40	
1,1,2,2-Tetrachloroethane	ug/L	0.12 U	0.12 U		40	

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QUALITY CONTROL DATA

Project: 6783-17-2991.04/MIA Parcel 3
Pace Project No.: 35373365

SAMPLE DUPLICATE: 2322428

Parameter	Units	35373040002 Result	Dup Result	RPD	Max RPD	Qualifiers
1,1,2-Trichloroethane	ug/L	0.50 U	0.50 U		40	
1,1-Dichloroethane	ug/L	0.50 U	0.50 U		40	
1,1-Dichloroethene	ug/L	0.50 U	0.50 U		40	
1,1-Dichloropropene	ug/L	0.50 U	0.50 U		40	
1,2,3-Trichlorobenzene	ug/L	0.50 U	0.50 U		40	
1,2,3-Trichloropropane	ug/L	0.59 U	0.59 U		40	
1,2,3-Trimethylbenzene	ug/L	1.0 U	1.0 U		40	
1,2,4-Trichlorobenzene	ug/L	0.50 U	0.50 U		40	
1,2,4-Trimethylbenzene	ug/L	0.50 U	0.50 U		40	
1,2-Dichlorobenzene	ug/L	0.50 U	0.50 U		40	
1,2-Dichloroethane	ug/L	0.50 U	0.50 U		40	
1,2-Dichloropropane	ug/L	0.50 U	0.50 U		40	
1,3,5-Trimethylbenzene	ug/L	0.50 U	0.50 U		40	
1,3-Dichlorobenzene	ug/L	0.50 U	0.50 U		40	
1,3-Dichloropropane	ug/L	0.50 U	0.50 U		40	
1,4-Dichlorobenzene	ug/L	0.50 U	0.50 U		40	
2,2-Dichloropropane	ug/L	0.50 U	0.50 U		40	
2-Butanone (MEK)	ug/L	5.0 U	5.0 U		40	
2-Chlorotoluene	ug/L	0.50 U	0.50 U		40	
2-Hexanone	ug/L	5.0 U	5.0 U		40	
4-Chlorotoluene	ug/L	0.50 U	0.50 U		40	
4-Methyl-2-pentanone (MIBK)	ug/L	5.0 U	5.0 U		40	
Acetone	ug/L	10.0 U	10.0 U		40	
Acetonitrile	ug/L	5.0 U	5.0 U		40	
Benzene	ug/L	0.10 U	0.10 U		40	
Bromobenzene	ug/L	0.50 U	0.50 U		40	
Bromochloromethane	ug/L	0.50 U	0.50 U		40	
Bromodichloromethane	ug/L	0.27 U	0.27 U		40	
Bromoform	ug/L	0.50 U	0.50 U		40	
Bromomethane	ug/L	0.50 U	0.50 U		40	
Carbon disulfide	ug/L	5.0 U	5.0 U		40	
Carbon tetrachloride	ug/L	0.50 U	0.50 U		40	
Chlorobenzene	ug/L	0.50 U	0.50 U		40	
Chloroethane	ug/L	0.50 U	0.50 U		40	
Chloroform	ug/L	0.50 U	0.50 U		40	
Chloromethane	ug/L	0.62 U	0.62 U		40	
cis-1,2-Dichloroethene	ug/L	0.50 U	0.50 U		40	
cis-1,3-Dichloropropene	ug/L	0.25 U	0.25 U		40	
Dibromochloromethane	ug/L	0.26 U	0.26 U		40	
Dibromomethane	ug/L	0.50 U	0.50 U		40	
Dichlorodifluoromethane	ug/L	0.50 U	0.50 U		40	
Ethylbenzene	ug/L	0.50 U	0.50 U		40	
Iodomethane	ug/L	0.50 U	0.50 U		40	
Isopropylbenzene (Cumene)	ug/L	0.50 U	0.50 U		40	
m&p-Xylene	ug/L	1.0 U	1.0 U		40	
Methyl-tert-butyl ether	ug/L	0.50 U	0.50 U		40	
Methylene Chloride	ug/L	2.5 U	2.5 U		40	

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QUALITY CONTROL DATA

Project: 6783-17-2991.04/MIA Parcel 3
Pace Project No.: 35373365

SAMPLE DUPLICATE: 2322428

Parameter	Units	35373040002 Result	Dup Result	RPD	Max RPD	Qualifiers
n-Butylbenzene	ug/L	0.50 U	0.50 U		40	
n-Propylbenzene	ug/L	0.50 U	0.50 U		40	
o-Xylene	ug/L	0.50 U	0.50 U		40	
p-Isopropyltoluene	ug/L	0.50 U	0.50 U		40	
sec-Butylbenzene	ug/L	0.50 U	0.50 U		40	
Styrene	ug/L	0.50 U	0.50 U		40	
tert-Butylbenzene	ug/L	0.50 U	0.50 U		40	
Tetrachloroethene	ug/L	0.50 U	0.50 U		40	
Toluene	ug/L	0.50 U	0.50 U		40	
trans-1,2-Dichloroethene	ug/L	0.50 U	0.50 U		40	
trans-1,3-Dichloropropene	ug/L	0.25 U	0.25 U		40	
Trichloroethene	ug/L	0.50 U	0.50 U		40	
Trichlorofluoromethane	ug/L	0.50 U	0.50 U		40	
Vinyl acetate	ug/L	1.0 U	1.0 U		40	
Vinyl chloride	ug/L	0.50 U	0.50 U		40	
Xylene (Total)	ug/L	1.5 U	1.5 U		40	
1,2-Dichloroethane-d4 (S)	%	107	105	2	40	
4-Bromofluorobenzene (S)	%	95	95	0	40	
Toluene-d8 (S)	%	100	100	1	40	

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QUALITY CONTROL DATA

Project: 6783-17-2991.04/MIA Parcel 3
Pace Project No.: 35373365

QC Batch: 425235
QC Batch Method: EPA 3510
Analysis Method: EPA 8270 by SIM
Analysis Description: 8270 Water PAHLV by SIM MSSV
Associated Lab Samples: 35373365001, 35373365002, 35373365003, 35373365004, 35373365007

METHOD BLANK: 2314549
Matrix: Water
Associated Lab Samples: 35373365001, 35373365002, 35373365003, 35373365004, 35373365007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1-Methylnaphthalene	ug/L	0.032 U	2.0	0.032	02/20/18 19:24	
2-Methylnaphthalene	ug/L	0.11 U	2.0	0.11	02/20/18 19:24	
Acenaphthene	ug/L	0.013 U	0.50	0.013	02/20/18 19:24	
Acenaphthylene	ug/L	0.012 U	0.50	0.012	02/20/18 19:24	
Anthracene	ug/L	0.012 U	0.50	0.012	02/20/18 19:24	
Benzo(a)anthracene	ug/L	0.055 U	0.10	0.055	02/20/18 19:24	
Benzo(a)pyrene	ug/L	0.020 U	0.10	0.020	02/20/18 19:24	
Benzo(b)fluoranthene	ug/L	0.027 U	0.10	0.027	02/20/18 19:24	
Benzo(g,h,i)perylene	ug/L	0.042 U	0.50	0.042	02/20/18 19:24	
Benzo(k)fluoranthene	ug/L	0.023 U	0.50	0.023	02/20/18 19:24	
Chrysene	ug/L	0.026 U	0.50	0.026	02/20/18 19:24	
Dibenz(a,h)anthracene	ug/L	0.13 U	0.15	0.13	02/20/18 19:24	
Fluoranthene	ug/L	0.018 U	0.50	0.018	02/20/18 19:24	
Fluorene	ug/L	0.016 U	0.50	0.016	02/20/18 19:24	
Indeno(1,2,3-cd)pyrene	ug/L	0.12 U	0.15	0.12	02/20/18 19:24	
Naphthalene	ug/L	0.048 U	2.0	0.048	02/20/18 19:24	
Phenanthrene	ug/L	0.018 U	0.50	0.018	02/20/18 19:24	
Pyrene	ug/L	0.019 U	0.50	0.019	02/20/18 19:24	
2-Fluorobiphenyl (S)	%	68	33-101		02/20/18 19:24	
p-Terphenyl-d14 (S)	%	75	38-115		02/20/18 19:24	

LABORATORY CONTROL SAMPLE: 2314550

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1-Methylnaphthalene	ug/L	5	3.3	67	33-118	
2-Methylnaphthalene	ug/L	5	3.4	68	34-104	
Acenaphthene	ug/L	5	3.5	71	38-109	
Acenaphthylene	ug/L	5	3.4	67	31-115	
Anthracene	ug/L	5	4.1	81	38-111	
Benzo(a)anthracene	ug/L	5	4.2	84	36-110	
Benzo(a)pyrene	ug/L	5	3.5	70	27-107	
Benzo(b)fluoranthene	ug/L	5	4.5	90	32-119	
Benzo(g,h,i)perylene	ug/L	5	4.0	79	10-109	
Benzo(k)fluoranthene	ug/L	5	4.5	89	28-118	
Chrysene	ug/L	5	4.6	92	33-130	
Dibenz(a,h)anthracene	ug/L	5	3.2	65	10-104	
Fluoranthene	ug/L	5	4.5	90	45-115	
Fluorene	ug/L	5	3.7	74	41-114	
Indeno(1,2,3-cd)pyrene	ug/L	5	3.3	66	10-104	
Naphthalene	ug/L	5	3.3	66	38-100	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

QUALITY CONTROL DATA

Project: 6783-17-2991.04/MIA Parcel 3
Pace Project No.: 35373365

LABORATORY CONTROL SAMPLE: 2314550

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Phenanthrene	ug/L	5	4.1	82	41-106	
Pyrene	ug/L	5	4.5	89	45-115	
2-Fluorobiphenyl (S)	%			67	33-101	
p-Terphenyl-d14 (S)	%			81	38-115	

MATRIX SPIKE SAMPLE: 2315044

Parameter	Units	35373202005 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
1-Methylnaphthalene	ug/L	0.032 U	5	3.2	64	33-118	
2-Methylnaphthalene	ug/L	0.11 U	5	3.2	64	34-104	
Acenaphthene	ug/L	0.013 U	5	3.5	69	38-109	
Acenaphthylene	ug/L	0.012 U	5	3.2	63	31-115	
Anthracene	ug/L	0.012 U	5	3.6	72	38-111	
Benzo(a)anthracene	ug/L	0.055 U	5	3.8	76	36-110	
Benzo(a)pyrene	ug/L	0.020 U	5	3.4	67	27-107	
Benzo(b)fluoranthene	ug/L	0.027 U	5	4.3	86	32-119	
Benzo(g,h,i)perylene	ug/L	0.042 U	5	4.1	81	10-109	
Benzo(k)fluoranthene	ug/L	0.023 U	5	4.3	85	28-118	
Chrysene	ug/L	0.026 U	5	4.2	84	33-130	
Dibenz(a,h)anthracene	ug/L	0.13 U	5	3.2	64	10-104	
Fluoranthene	ug/L	0.018 U	5	4.0	80	45-115	
Fluorene	ug/L	0.016 U	5	3.7	73	41-114	
Indeno(1,2,3-cd)pyrene	ug/L	0.12 U	5	3.2	64	10-104	
Naphthalene	ug/L	0.12 I	5	3.2	61	38-100	
Phenanthrene	ug/L	0.018 U	5	3.7	75	41-106	
Pyrene	ug/L	0.019 U	5	4.0	80	45-115	
2-Fluorobiphenyl (S)	%				63	33-101	
p-Terphenyl-d14 (S)	%				71	38-115	

SAMPLE DUPLICATE: 2315046

Parameter	Units	35373336001 Result	Dup Result	RPD	Max RPD	Qualifiers
1-Methylnaphthalene	ug/L	0.032 U	0.048 I		40	
2-Methylnaphthalene	ug/L	0.11 U	0.12 I		40	
Acenaphthene	ug/L	0.013 U	0.013 U		40	
Acenaphthylene	ug/L	0.012 U	0.012 U		40	
Anthracene	ug/L	0.012 U	0.012 U		40	
Benzo(a)anthracene	ug/L	0.055 U	0.055 U		40	
Benzo(a)pyrene	ug/L	0.020 U	0.020 U		40	
Benzo(b)fluoranthene	ug/L	0.027 U	0.027 U		40	
Benzo(g,h,i)perylene	ug/L	0.042 U	0.042 U		40	
Benzo(k)fluoranthene	ug/L	0.023 U	0.023 U		40	
Chrysene	ug/L	0.026 U	0.026 U		40	
Dibenz(a,h)anthracene	ug/L	0.13 U	0.13 U		40	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

QUALITY CONTROL DATA

Project: 6783-17-2991.04/MIA Parcel 3
Pace Project No.: 35373365

SAMPLE DUPLICATE: 2315046

Parameter	Units	35373336001 Result	Dup Result	RPD	Max RPD	Qualifiers
Fluoranthene	ug/L	0.018 U	0.018 U		40	
Fluorene	ug/L	0.016 U	0.016 U		40	
Indeno(1,2,3-cd)pyrene	ug/L	0.12 U	0.12 U		40	
Naphthalene	ug/L	0.048 U	0.059 I		40	
Phenanthrene	ug/L	0.018 U	0.018 U		40	
Pyrene	ug/L	0.019 U	0.019 U		40	
2-Fluorobiphenyl (S)	%	67	66	1		
p-Terphenyl-d14 (S)	%	74	73	1		

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

QUALITY CONTROL DATA

Project: 6783-17-2991.04/MIA Parcel 3
Pace Project No.: 35373365

QC Batch: 397802 Analysis Method: EPA 8270 by SIM
QC Batch Method: EPA 3546 Analysis Description: 8270 MSSV PAH by SIM
Associated Lab Samples: 35373365008, 35373365009, 35373365010, 35373365011, 35373365012, 35373365013, 35373365014, 35373365015

METHOD BLANK: 2206382 Matrix: Solid
Associated Lab Samples: 35373365008, 35373365009, 35373365010, 35373365011, 35373365012, 35373365013, 35373365014, 35373365015

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1-Methylnaphthalene	mg/kg	0.0012 U	0.010	0.0012	02/14/18 13:40	
2-Methylnaphthalene	mg/kg	0.0011 U	0.010	0.0011	02/14/18 13:40	
Acenaphthene	mg/kg	0.0015 U	0.010	0.0015	02/14/18 13:40	
Acenaphthylene	mg/kg	0.0013 U	0.010	0.0013	02/14/18 13:40	
Anthracene	mg/kg	0.0014 U	0.010	0.0014	02/14/18 13:40	
Benzo(a)anthracene	mg/kg	0.00071 U	0.010	0.00071	02/14/18 13:40	
Benzo(a)pyrene	mg/kg	0.0011 U	0.010	0.0011	02/14/18 13:40	
Benzo(b)fluoranthene	mg/kg	0.00067 U	0.010	0.00067	02/14/18 13:40	
Benzo(g,h,i)perylene	mg/kg	0.0026 U	0.010	0.0026	02/14/18 13:40	
Benzo(k)fluoranthene	mg/kg	0.0015 U	0.010	0.0015	02/14/18 13:40	
Chrysene	mg/kg	0.0018 U	0.010	0.0018	02/14/18 13:40	
Dibenz(a,h)anthracene	mg/kg	0.0018 U	0.010	0.0018	02/14/18 13:40	
Fluoranthene	mg/kg	0.00083 U	0.010	0.00083	02/14/18 13:40	
Fluorene	mg/kg	0.0016 U	0.010	0.0016	02/14/18 13:40	
Indeno(1,2,3-cd)pyrene	mg/kg	0.0028 U	0.010	0.0028	02/14/18 13:40	
Naphthalene	mg/kg	0.0023 U	0.010	0.0023	02/14/18 13:40	
Phenanthrene	mg/kg	0.0015 U	0.010	0.0015	02/14/18 13:40	
Pyrene	mg/kg	0.0018 U	0.010	0.0018	02/14/18 13:40	
2-Fluorobiphenyl (S)	%	74	10-110		02/14/18 13:40	
Nitrobenzene-d5 (S)	%	75	10-128		02/14/18 13:40	
Terphenyl-d14 (S)	%	90	39-119		02/14/18 13:40	

LABORATORY CONTROL SAMPLE: 2206383

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1-Methylnaphthalene	mg/kg	.033	0.023	68	44-130	
2-Methylnaphthalene	mg/kg	.033	0.024	73	41-134	
Acenaphthene	mg/kg	.033	0.023	71	52-123	
Acenaphthylene	mg/kg	.033	0.023	69	49-116	
Anthracene	mg/kg	.033	0.023	70	41-133	
Benzo(a)anthracene	mg/kg	.033	0.023	68	56-130	
Benzo(a)pyrene	mg/kg	.033	0.022	65	51-136	
Benzo(b)fluoranthene	mg/kg	.033	0.023	68	37-149	
Benzo(g,h,i)perylene	mg/kg	.033	0.020	62	39-127	
Benzo(k)fluoranthene	mg/kg	.033	0.022	66	45-139	
Chrysene	mg/kg	.033	0.023	70	59-127	
Dibenz(a,h)anthracene	mg/kg	.033	0.022	66	37-139	
Fluoranthene	mg/kg	.033	0.022	66	53-132	

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QUALITY CONTROL DATA

Project: 6783-17-2991.04/MIA Parcel 3
Pace Project No.: 35373365

LABORATORY CONTROL SAMPLE: 2206383

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Fluorene	mg/kg	.033	0.023	70	45-127	
Indeno(1,2,3-cd)pyrene	mg/kg	.033	0.023	68	35-145	
Naphthalene	mg/kg	.033	0.023	70	45-123	
Phenanthrene	mg/kg	.033	0.022	67	50-125	
Pyrene	mg/kg	.033	0.022	66	52-132	
2-Fluorobiphenyl (S)	%			87	10-110	
Nitrobenzene-d5 (S)	%			88	10-128	
Terphenyl-d14 (S)	%			96	39-119	

MATRIX SPIKE SAMPLE: 2206384

Parameter	Units	35373365010 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
1-Methylnaphthalene	mg/kg	0.0065 U	.0362	0.017 I	48	50-150	J(M1)
2-Methylnaphthalene	mg/kg	0.0059 U	.0362	0.019 I	52	50-150	
Acenaphthene	mg/kg	0.0081 U	.0362	0.017 I	48	50-150	J(M1)
Acenaphthylene	mg/kg	0.0070 U	.0362	0.018 I	50	50-150	
Anthracene	mg/kg	0.0076 U	.0362	0.016 I	45	50-150	J(M1)
Benzo(a)anthracene	mg/kg	0.0040 I	.0362	0.021 I	46	50-150	J(M1)
Benzo(a)pyrene	mg/kg	0.0059 U	.0362	0.021 I	50	50-150	
Benzo(b)fluoranthene	mg/kg	0.0045 I	.0362	0.022 I	50	50-150	
Benzo(g,h,i)perylene	mg/kg	0.014 U	.0362	0.014 U	32	50-150	J(M1)
Benzo(k)fluoranthene	mg/kg	0.0081 U	.0362	0.018 I	45	50-150	J(M1)
Chrysene	mg/kg	0.0097 U	.0362	0.021 I	50	50-150	
Dibenz(a,h)anthracene	mg/kg	0.0097 U	.0362	0.012 I	33	50-150	J(M1)
Fluoranthene	mg/kg	0.0045 U	.0362	0.024 I	55	50-150	
Fluorene	mg/kg	0.0086 U	.0362	0.017 I	46	50-150	J(M1)
Indeno(1,2,3-cd)pyrene	mg/kg	0.015 U	.0362	0.015 U	35	50-150	J(M1)
Naphthalene	mg/kg	0.012 U	.0362	0.019 I	53	50-150	
Phenanthrene	mg/kg	0.0081 U	.0362	0.017 I	49	50-150	J(M1)
Pyrene	mg/kg	0.0097 U	.0362	0.024 I	55	50-150	
2-Fluorobiphenyl (S)	%				71	10-110	
Nitrobenzene-d5 (S)	%				71	10-128	D3
Terphenyl-d14 (S)	%				73	39-119	

SAMPLE DUPLICATE: 2206385

Parameter	Units	35373365012 Result	Dup Result	RPD	Max RPD	Qualifiers
1-Methylnaphthalene	mg/kg	0.0013 U	0.0012 U		30	
2-Methylnaphthalene	mg/kg	0.0019 I	0.0011 U		30	
Acenaphthene	mg/kg	0.0016 U	0.0015 U		30	
Acenaphthylene	mg/kg	0.0014 U	0.0013 U		30	
Anthracene	mg/kg	0.0015 U	0.0014 U		30	
Benzo(a)anthracene	mg/kg	0.0043 I	0.0019 I		30	
Benzo(a)pyrene	mg/kg	0.0039 I	0.0016 I		30	

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QUALITY CONTROL DATA

Project: 6783-17-2991.04/MIA Parcel 3
Pace Project No.: 35373365

SAMPLE DUPLICATE: 2206385

Parameter	Units	35373365012 Result	Dup Result	RPD	Max RPD	Qualifiers
Benzo(b)fluoranthene	mg/kg	0.0060 I	0.0024 I		30	
Benzo(g,h,i)perylene	mg/kg	0.0027 U	0.0027 U		30	
Benzo(k)fluoranthene	mg/kg	0.0023 I	0.0015 U		30	
Chrysene	mg/kg	0.0045 I	0.0018 U		30	
Dibenz(a,h)anthracene	mg/kg	0.0019 U	0.0018 U		30	
Fluoranthene	mg/kg	0.0078 I	0.0031 I		30	
Fluorene	mg/kg	0.0017 U	0.0016 U		30	
Indeno(1,2,3-cd)pyrene	mg/kg	0.0029 U	0.0029 U		30	
Naphthalene	mg/kg	0.0024 U	0.0024 U		30	
Phenanthrene	mg/kg	0.0032 I	0.0015 U		30	
Pyrene	mg/kg	0.0061 I	0.0025 I		30	
2-Fluorobiphenyl (S)	%	66	61	10		
Nitrobenzene-d5 (S)	%	70	63	12		
Terphenyl-d14 (S)	%	60	47	27		

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QUALITY CONTROL DATA

Project: 6783-17-2991.04/MIA Parcel 3
Pace Project No.: 35373365

QC Batch: 425239
Analysis Method: FL-PRO
QC Batch Method: EPA 3546
Analysis Description: FL-PRO Soil
Associated Lab Samples: 35373365008, 35373365009, 35373365010, 35373365011, 35373365012, 35373365013, 35373365014, 35373365015

METHOD BLANK: 2314574
Matrix: Solid
Associated Lab Samples: 35373365008, 35373365009, 35373365010, 35373365011, 35373365012, 35373365013, 35373365014, 35373365015

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Petroleum Range Organics	mg/kg	2.5 U	4.0	2.5	02/14/18 13:56	
N-Pentatriacontane (S)	%	126	42-159		02/14/18 13:56	
o-Terphenyl (S)	%	93	62-109		02/14/18 13:56	

LABORATORY CONTROL SAMPLE: 2314575

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Petroleum Range Organics	mg/kg	201	175	87	63-153	
N-Pentatriacontane (S)	%			112	42-159	
o-Terphenyl (S)	%			94	62-109	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2314576 2314577

Parameter	Units	35372621001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Petroleum Range Organics	mg/kg	22.4	217	217	168	179	67	72	51-215	6	25	
N-Pentatriacontane (S)	%						102	104	42-159			
o-Terphenyl (S)	%						81	87	62-109			

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QUALITY CONTROL DATA

Project: 6783-17-2991.04/MIA Parcel 3
Pace Project No.: 35373365

QC Batch: 425228
Analysis Method: FL-PRO
QC Batch Method: EPA 3510
Analysis Description: FL-PRO Water Low Volume
Associated Lab Samples: 35373365001, 35373365002, 35373365003, 35373365004, 35373365007

METHOD BLANK: 2314437
Matrix: Water
Associated Lab Samples: 35373365001, 35373365002, 35373365003, 35373365004, 35373365007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Petroleum Range Organics	mg/L	0.80 U	1.0	0.80	02/16/18 21:25	
N-Pentatriacontane (S)	%	113	42-159		02/16/18 21:25	
o-Terphenyl (S)	%	101	82-142		02/16/18 21:25	

LABORATORY CONTROL SAMPLE: 2314438

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Petroleum Range Organics	mg/L	5	5.2	103	55-118	
N-Pentatriacontane (S)	%			111	42-159	
o-Terphenyl (S)	%			96	82-142	

MATRIX SPIKE SAMPLE: 2314733

Parameter	Units	35373040002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Petroleum Range Organics	mg/L	2.0	4.7	5.6	75	41-101	
N-Pentatriacontane (S)	%				112	42-159	
o-Terphenyl (S)	%				106	82-142	

SAMPLE DUPLICATE: 2314734

Parameter	Units	35373040003 Result	Dup Result	RPD	Max RPD	Qualifiers
Petroleum Range Organics	mg/L	2.2	2.0	11	20	
N-Pentatriacontane (S)	%	95	111	12		
o-Terphenyl (S)	%	93	107	11		

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

QUALITY CONTROL DATA

Project: 6783-17-2991.04/MIA Parcel 3
Pace Project No.: 35373365

QC Batch: 425864
Analysis Method: ASTM D2974-87
QC Batch Method: ASTM D2974-87
Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 35373365008, 35373365009, 35373365010, 35373365011, 35373365012, 35373365013, 35373365014, 35373365015

SAMPLE DUPLICATE: 2318088

Parameter	Units	35371533001 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	98.5	99.2	1	5	

SAMPLE DUPLICATE: 2318108

Parameter	Units	35373279006 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	6.2	6.9	11	5	J(D6)

SAMPLE DUPLICATE: 2318109

Parameter	Units	35373365012 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	3.2	3.4	7	5	J(D6)

SAMPLE DUPLICATE: 2318112

Parameter	Units	35373228004 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	2.7	2.8	4	5	

SAMPLE DUPLICATE: 2318113

Parameter	Units	35371712009 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	7.8	9.5	19	5	J(D6)

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QUALIFIERS

Project: 6783-17-2991.04/MIA Parcel 3
Pace Project No.: 35373365

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.
ND - Not Detected at or above adjusted reporting limit.
TNTC - Too Numerous To Count
MDL - Adjusted Method Detection Limit.
PQL - Practical Quantitation Limit.
RL - Reporting Limit.
S - Surrogate
1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.
Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.
LCS(D) - Laboratory Control Sample (Duplicate)
MS(D) - Matrix Spike (Duplicate)
DUP - Sample Duplicate
RPD - Relative Percent Difference
NC - Not Calculable.
SG - Silica Gel - Clean-Up
U - Indicates the compound was analyzed for, but not detected.
N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.
Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.
TNI - The NELAC Institute.

LABORATORIES

PASI-C	Pace Analytical Services - Charlotte
PASI-O	Pace Analytical Services - Ormond Beach

ANALYTE QUALIFIERS

I	The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
U	Compound was analyzed for but not detected.
C8	Result may be biased high due to carryover from previously analyzed sample.
D3	Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.
J(D6)	Estimated Value. The relative percent difference (RPD) between the sample and sample duplicate exceeded laboratory control limits.
J(M1)	Estimated Value. Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
J(S0)	Estimated Value. Surrogate recovery outside laboratory control limits.
L	Off-scale high. Actual value is known to be greater than value given.
N2	The lab does not hold NELAC/TNI accreditation for this parameter.

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 6783-17-2991.04/MIA Parcel 3
Pace Project No.: 35373365

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
35373365008	**SB-1**	EPA 3546	425239	FL-PRO	425803
35373365009	**SB-2**	EPA 3546	425239	FL-PRO	425803
35373365010	**SB-3**	EPA 3546	425239	FL-PRO	425803
35373365011	**SB-6**	EPA 3546	425239	FL-PRO	425803
35373365012	**SB-5**	EPA 3546	425239	FL-PRO	425803
35373365013	**SB-4**	EPA 3546	425239	FL-PRO	425803
35373365014	**SB-7**	EPA 3546	425239	FL-PRO	425803
35373365015	**SB-8**	EPA 3546	425239	FL-PRO	425803
35373365001	**DP-1**	EPA 3510	425228	FL-PRO	425340
35373365002	**DP-2**	EPA 3510	425228	FL-PRO	425340
35373365003	**DP-3**	EPA 3510	425228	FL-PRO	425340
35373365004	**DP-4**	EPA 3510	425228	FL-PRO	425340
35373365007	**EMW-1**	EPA 3510	425228	FL-PRO	425340
35373365008	**SB-1**	EPA 3050	425942	EPA 6010	425968
35373365009	**SB-2**	EPA 3050	425942	EPA 6010	425968
35373365010	**SB-3**	EPA 3050	425942	EPA 6010	425968
35373365011	**SB-6**	EPA 3050	425942	EPA 6010	425968
35373365012	**SB-5**	EPA 3050	425942	EPA 6010	425968
35373365013	**SB-4**	EPA 3050	425942	EPA 6010	425968
35373365014	**SB-7**	EPA 3050	425942	EPA 6010	425968
35373365015	**SB-8**	EPA 3050	425942	EPA 6010	425968
35373365001	**DP-1**	EPA 3010	425635	EPA 6010	425722
35373365002	**DP-2**	EPA 3010	425635	EPA 6010	425722
35373365003	**DP-3**	EPA 3010	425635	EPA 6010	425722
35373365004	**DP-4**	EPA 3010	425635	EPA 6010	425722
35373365007	**EMW-1**	EPA 3010	425635	EPA 6010	425722
35373365001	**DP-1**	EPA 7470	426449	EPA 7470	426589
35373365002	**DP-2**	EPA 7470	426449	EPA 7470	426589
35373365003	**DP-3**	EPA 7470	426449	EPA 7470	426589
35373365004	**DP-4**	EPA 7470	426449	EPA 7470	426589
35373365007	**EMW-1**	EPA 7470	426449	EPA 7470	426589
35373365008	**SB-1**	EPA 7471	426337	EPA 7471	426435
35373365009	**SB-2**	EPA 7471	426337	EPA 7471	426435
35373365010	**SB-3**	EPA 7471	426337	EPA 7471	426435
35373365011	**SB-6**	EPA 7471	426337	EPA 7471	426435
35373365012	**SB-5**	EPA 7471	426337	EPA 7471	426435
35373365013	**SB-4**	EPA 7471	426337	EPA 7471	426435
35373365014	**SB-7**	EPA 7471	426337	EPA 7471	426435
35373365015	**SB-8**	EPA 7471	426337	EPA 7471	426435
35373365001	**DP-1**	EPA 3510	425235	EPA 8270 by SIM	427030
35373365002	**DP-2**	EPA 3510	425235	EPA 8270 by SIM	427030
35373365003	**DP-3**	EPA 3510	425235	EPA 8270 by SIM	427030
35373365004	**DP-4**	EPA 3510	425235	EPA 8270 by SIM	427030
35373365007	**EMW-1**	EPA 3510	425235	EPA 8270 by SIM	427030
35373365008	**SB-1**	EPA 3546	397802	EPA 8270 by SIM	397950

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project:	6783-17-2991.04/MIA Parcel 3
Pace Project No.:	35373365

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
35373365009	**SB-2**	EPA 3546	397802	EPA 8270 by SIM	397950
35373365010	**SB-3**	EPA 3546	397802	EPA 8270 by SIM	397950
35373365011	**SB-6**	EPA 3546	397802	EPA 8270 by SIM	397950
35373365012	**SB-5**	EPA 3546	397802	EPA 8270 by SIM	397950
35373365013	**SB-4**	EPA 3546	397802	EPA 8270 by SIM	397950
35373365014	**SB-7**	EPA 3546	397802	EPA 8270 by SIM	397950
35373365015	**SB-8**	EPA 3546	397802	EPA 8270 by SIM	397950
35373365008	**SB-1**	EPA 5035	425781	EPA 8260	426003
35373365009	**SB-2**	EPA 5035	425781	EPA 8260	426003
35373365010	**SB-3**	EPA 5035	425781	EPA 8260	426003
35373365011	**SB-6**	EPA 5035	425844	EPA 8260	425914
35373365012	**SB-5**	EPA 5035	425844	EPA 8260	425914
35373365013	**SB-4**	EPA 5035	425844	EPA 8260	425914
35373365014	**SB-7**	EPA 5035	425844	EPA 8260	425914
35373365015	**SB-8**	EPA 5035	425844	EPA 8260	425914
35373365001	**DP-1**	EPA 8260	426274		
35373365002	**DP-2**	EPA 8260	426274		
35373365003	**DP-3**	EPA 8260	426274		
35373365004	**DP-4**	EPA 8260	426274		
35373365005	**DP-5 (54')**	EPA 8260	426277		
35373365006	**Trip Blank**	EPA 8260	426274		
35373365007	**EMW-1**	EPA 8260	426274		
35373365008	**SB-1**	ASTM D2974-87	425864		
35373365009	**SB-2**	ASTM D2974-87	425864		
35373365010	**SB-3**	ASTM D2974-87	425864		
35373365011	**SB-6**	ASTM D2974-87	425864		
35373365012	**SB-5**	ASTM D2974-87	425864		
35373365013	**SB-4**	ASTM D2974-87	425864		
35373365014	**SB-7**	ASTM D2974-87	425864		
35373365015	**SB-8**	ASTM D2974-87	425864		

Pace Analytical

CHAIN-OF-CUSTODY / Analytical Request Docum

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be co

WO#: 35373365

35373365

Section A
Required Client Information:

Company:	Amec Foster Wheeler E&I, Inc.
Address:	5845 NW 158th Street, Miami Lakes, FL 33014
Email:	ashok.aitharaju@amecfw.com
Phone:	305-818-8478
Fax:	
Requested Due Date:	

Section B
Required Project Information:

Report To:	Ashok Aitharaju
Copy To:	Rod Buenconsejo
Purchase Order #:	AVIAT-0000037812
Project Name:	MIA Parcel 3
Project #:	6783-17-2991.04

Section C
Invoice Information:

Attention:	Rod Buenconsejo
Company Name:	Miami-Dade Aviation Department
Address:	P.O. Box 025504, Miami, Florida 33102-5504
Pace Quote:	
Pace Project Manager:	christina.raschke@pacelabs.com,
Pace Profile #:	4323

Regulatory Agency
State / Location
FL

SAMPLE ID
One Character per box.
(A-Z, 0-9 / , -)
Sample Ids must be unique

MATRIX	CODE
Drinking Water	DW
Water	WT
Waste Water	WW
Product	P
Soil/Solid	SL
Oil	OL
Wipe	WP
Air	AR
Other	OT
Tissue	TS

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED START DATE	COLLECTED START TIME	COLLECTED END DATE	COLLECTED END TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other	Analyses Test Y/N	Requested Analysis Filtered (Y/N): VOCs	PAHs	TRPH	8 RCRA metals	Vinyl chloride	Residual Chlorine (Y/N)	
1	DP-1	WT	G	2/7/18	1330				7										x	x	x	x			PARCEL 3
2	DP-2	WT		2/7/18	1525				7										x	x	x	x			
3	DP-3	WT		2/7/18	1450				7										x	x	x	x			
4	DP-4	WT		2/8/18	1230				7										x	x	x	x			
5	DP-5 (54')	WT		2/8/18	1255				3										~~x~~	~~x~~	~~x~~	~~x~~	X		
6	Trip Blank	WT																	x						
7	EMW-1	WT		2/7/18	1215				7										X	X	X	X			
8	SB-1 (2'-4')	SL		2/7/18	1020				4										X	X	X	X			
9	SB-2 (2'-4')	SL		2/7/18	1500				4										X	X	X	X			
10	SB-3 (2'-4')	SL		2/7/18	1415				4										X	X	X	X			
11	~~SB-[illegible]~~ SB-6 (2'-4')	SL		2/7/18	1600				4										X	X	X	X			
12	SB-5 (2'-4')	SL		2/8/18	1100				4										X	X	X	X			

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: TEMP in C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
	/ AMECFO	2/8/18	1615	PACE	2/8/18	1615				
	PACE	2/9/18	1040		[illegible]	1635	315			
	PBL	2/9	1635	K. Baloro / Pace	2/10/18	0100	2.8	Y	N	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: MARCELO PICHARDO

SIGNATURE of SAMPLER:

DATE Signed: 2-8-18

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page : 2 **Of** 2

Section A
Required Client Information:

Company:	AMEC Foster Wheeler Environment & Infrastructur
Address:	5845 NW 158th Street
	Miami Lakes, FL 33014
Email:	ashok.aitharaju@woodplc.com
Phone:	(954)695-6796 Fax:
Requested Due Date:	

Section B
Required Project Information:

Report To:	Ash Aitharaju
Copy To:	
Purchase Order #:	
Project Name:	MIA Parcel 3
Project #:	

Section C
Invoice Information:

Attention:	
Company Name:	
Address:	
Pace Quote:	
Pace Project Manager:	christina.raschke@pacelabs.com,
Pace Profile #:	4323

Regulatory Agency	
State / Location	FL

SAMPLE ID
One Character per box.
(A-Z, 0-9 / , -)
Sample Ids must be unique

MATRIX	CODE
Drinking Water	DW
Water	WT
Waste Water	WW
Product	P
Soil/Solid	SL
Oil	OL
Wipe	WP
Air	AR
Other	OT
Tissue	TS

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED START DATE	COLLECTED START TIME	COLLECTED END DATE	COLLECTED END TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other	Y/N Analyses Test	8260 VOC	PAH SIM	TRPH FL-PRO	RCRA Metals	Trip BLANK	PAH, FLPRO, RCRA	8260 VOC						Residual Chlorine (Y/N)	
13	DP-7 (→ SB-4 (2'-4')	SL	G	2/8/18	1030				4															X	X							PARCEL 3
14	~~DP-8 ( )~~ SB-7 (2'-4')	SL	G	2/8/18	1140				4															X	X							↓
15	~~DP-9 ( )~~ SB-8 (2'-4')	SL	G	2/8/18	100				4															X	X							↓
16	~~DP-10 ( )~~	SL	G																					X	X							↓
17																																
18																																
19																																
20																																
21																																
22																																
23																																
24																																

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: TEMP in C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
	/AMECFW	2/8/18	1615	PACE	2/8/18	1615				
	PACE	2/9/18	1040		2/9	1635	T315			
		2/9	1635	D. Brooks / Pace	2/10/18	0100	2.8	Y	N	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: MARCELO PICHARDO

SIGNATURE of SAMPLER:

DATE Signed: 2-8-18

Pace Analytical Florida Laboratory	Document Name: Sample Condition Upon Receipt Form	Document Revised: August 2, 2017
	Document No.: F-FL-C-007 rev. 12	Issuing Authority: Pace Florida Quality Office

Sample Condition Upon Receipt Form (SCUR)

WO#: 35373365
PM: CTR Due Date: 02/16/18
CLIENT: 36-MACTEC

Project #
Project Manager:
Client:

Date and Initials of person:
Examining contents:
Label: KB
Deliver:
pH:

Thermometer Used: T-315 Date: 2/10/18 Time: 0100 Initials: AB

State of Origin:

Cooler #1 Temp.°C 2.9 **(Visual)** -0.1 **(Correction Factor)** 2.8 **(Actual)** ☐ Samples on ice, cooling process has begun
Cooler #2 Temp.°C____ **(Visual)** ____ **(Correction Factor)** ____ **(Actual)** ☐ Samples on ice, cooling process has begun
Cooler #3 Temp.°C____ **(Visual)** ____ **(Correction Factor)** ____ **(Actual)** ☐ Samples on ice, cooling process has begun
Cooler #4 Temp.°C____ **(Visual)** ____ **(Correction Factor)** ____ **(Actual)** ☐ Samples on ice, cooling process has begun
Cooler #5 Temp.°C____ **(Visual)** ____ **(Correction Factor)** ____ **(Actual)** ☐ Samples on ice, cooling process has begun
Cooler #6 Temp.°C____ **(Visual)** ____ **(Correction Factor)** ____ **(Actual)** ☐ Samples on ice, cooling process has begun

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☐ Client ☑ Commercial SF ☐ Pace ☐ Other

Shipping Method: ☐ First Overnight ☐ Priority Overnight ☐ Standard Overnight ☐ Ground ☐ International Priority ☐ Other

Billing: ☐ Recipient ☐ Sender ☐ Third Party ☐ Credit Card ☐ Unknown

Tracking #

Custody Seal on Cooler/Box Present: ☐ Yes ☑ No **Seals intact:** ☐ Yes ☐ No **Ice:** [✓ Wet] Blue Dry None

Packing Material: ☐ Bubble Wrap ☑ Bubble Bags ☐ None ☐ Other 8 sets of 3

Samples shorted to lab (If Yes, complete) Shorted Date: 2/10/18 Shorted Time: 0249 Qty:

		Comments:
Chain of Custody Present	☑ Yes ☐ No ☐ N/A	
Chain of Custody Filled Out	☑ Yes ☐ No ☐ N/A	
Relinquished Signature & Sampler Name COC	☑ Yes ☐ No ☐ N/A	
Samples Arrived within Hold Time	☑ Yes ☐ No ☐ N/A	
Rush TAT requested on COC	☐ Yes ☑ No ☐ N/A	
Sufficient Volume	☑ Yes ☐ No ☐ N/A	
Correct Containers Used	☑ Yes ☐ No ☐ N/A	
Containers Intact	☑ Yes ☐ No ☐ N/A	
Sample Labels match COC (sample IDs & date/time of collection)	☑ Yes ☐ No ☐ N/A	
All containers needing acid/base preservation have been checked.	☑ Yes ☐ No ☐ N/A	Preservation Information: Preservative: Lot #/Trace #: Date: Time: Initials:
All Containers needing preservation are found to be in compliance with EPA recommendation: Exceptions: VOA, Coliform, TOC, O&G, Carbamates	☑ Yes ☐ No ☐ N/A	
Headspace in VOA Vials? (>6mm):	☑ Yes ☐ No ☐ N/A	Sample "DP-2" 1/3 vials have headspace
Trip Blank Present:	☑ Yes ☐ No ☐ N/A	

Client Notification/ Resolution:
Person Contacted: Date/Time:

Comments/ Resolution (use back for additional comments): Sample "DP-5" was logged on "HOLD" - there was not an acode for "vinyl chloride" in the profile.

Project Manager Review: Date:

ATTACHMENT D

BENZO(A)PYRENE EQUIVALENT CALCULATIONS

Benzo(a)pyrene Conversion Table

For Direct Exposure Soil Cleanup Target Levels

Facility/Site Name: MIA Parcel 3
Location: Miami International Airport
Facility/Site ID No.:

Soil Sample No. SB-1
Sample Date 02/07/2018 00:00
Location:
Depth (ft): 2-4'

INSTRUCTIONS: Calculate Total Benzo(a)pyrene Equivalents if at least one of the carcinogenic PAHs is detected in the sample at a concentration equal to or higher than the Method Detection Limit (MDL), whether quantified with certainty (the concentration reported has no qualifier) or estimated (the concentration reported has a “J”, “T” or “I” qualifier). Enter the contaminant concentrations (in mg/kg) for all seven carcinogenic PAHs in the yellow boxes using the following criteria (and see table below):

1. If quantified with certainty, or estimated and has the “J” qualifier, enter the reported value;
2. If not detected at the MDL (the concentration reported is the MDL followed by the “U” qualifier) enter 1/2 of the reported value;
3. If detected at a concentration lower than the MDL and the concentration is estimated (has the “T” qualifier) enter the estimated value;
4. If detected at a concentration equal to or higher than the MDL but lower than the Practical Quantitation Limit (PQL) and the concentration is estimated (has the “I” qualifier) enter the estimated value;
5. If detected at a concentration equal to or higher than the MDL but lower than the PQL and it is not estimated (the concentration reported is the PQL followed by the “M” qualifier) enter 1/2 of the reported value.

Contaminant	Concentration (mg/kg)	Toxic Equivalency Factor	Benzo(a)pyrene Equivalents
Benzo(a)pyrene	0.006	1.0	0.0058
Benzo(a)anthracene	0.004	0.1	0.0004
Benzo(b)fluoranthene	0.011	0.1	0.0011
Benzo(k)fluoranthene	0.003	0.01	0.0000
Chrysene	0.008	0.001	0.0000
Dibenz(a,h)anthracene	0.001	1.0	0.0009
Indeno(1,2,3-cd)pyrene	0.004	0.1	0.0004

DE Residential = 0.1 mg/kg; DE Industrial = 0.7 mg/kg

Total Benzo(a)pyrene Equivalents = 0.0

The concentration shown does not exceed the Residential Direct Exposure SCTL of 0.1 mg/kg.

The concentration shown does not exceed the Industrial Direct Exposure SCTL of 0.7 mg/kg.

Summary Criteria for Table Entries

Detection	Concentration Reported	Data Qualifier	Enter
Various	Quantified with certainty	None	reported value
Various	Estimated	J	reported (estimated) value
ND at MDL	MDL	U	1/2 reported value
< MDL	Estimated	T	reported (estimated) value
e MDL but < PQL	Estimated	I	reported (estimated) value
e MDL but < PQL	PQL	M	1/2 reported value

Benzo(a)pyrene Conversion Table

For Direct Exposure Soil Cleanup Target Levels

Facility/Site Name: MIA Parcel 3
Location: Miami International Airport
Facility/Site ID No.:

Soil Sample No. SB-5
Sample Date 02/08/2018 00:00
Location:
Depth (ft): 2-4'

INSTRUCTIONS: Calculate Total Benzo(a)pyrene Equivalents if at least one of the carcinogenic PAHs is detected in the sample at a concentration equal to or higher than the Method Detection Limit (MDL), whether quantified with certainty (the concentration reported has no qualifier) or estimated (the concentration reported has a “J”, “T” or “I” qualifier). Enter the contaminant concentrations (in mg/kg) for all seven carcinogenic PAHs in the yellow boxes using the following criteria (and see table below):

1. If quantified with certainty, or estimated and has the “J” qualifier, enter the reported value;
2. If not detected at the MDL (the concentration reported is the MDL followed by the “U” qualifier) enter 1/2 of the reported value;
3. If detected at a concentration lower than the MDL and the concentration is estimated (has the “T” qualifier) enter the estimated value;
4. If detected at a concentration equal to or higher than the MDL but lower than the Practical Quantitation Limit (PQL) and the concentration is estimated (has the “I” qualifier) enter the estimated value;
5. If detected at a concentration equal to or higher than the MDL but lower than the PQL and it is not estimated (the concentration reported is the PQL followed by the “M” qualifier) enter 1/2 of the reported value.

Contaminant	**Concentration (mg/kg)**	**Toxic Equivalency Factor**	**Benzo(a)pyrene Equivalents**
Benzo(a)pyrene	0.004	1.0	0.0039
Benzo(a)anthracene	0.004	0.1	0.0004
Benzo(b)fluoranthene	0.006	0.1	0.0006
Benzo(k)fluoranthene	0.002	0.01	0.0000
Chrysene	0.005	0.001	0.0000
Dibenz(a,h)anthracene	0.010	1.0	0.0095
Indeno(1,2,3-cd)pyrene	0.002	0.1	0.0002

DE Residential = 0.1 mg/kg; DE Industrial = 0.7 mg/kg

Total Benzo(a)pyrene Equivalents = 0.0

The concentration shown does not exceed the Residential Direct Exposure SCTL of 0.1 mg/kg.

The concentration shown does not exceed the Industrial Direct Exposure SCTL of 0.7 mg/kg.

Summary Criteria for Table Entries

Detection	**Concentration Reported**	**Data Qualifier**	**Enter**
Various	Quantified with certainty	None	reported value
Various	Estimated	J	reported (estimated) value
ND at MDL	MDL	U	1/2 reported value
< MDL	Estimated	T	reported (estimated) value
e MDL but < PQL	Estimated	I	reported (estimated) value
e MDL but < PQL	PQL	M	1/2 reported value

Benzo(a)pyrene Conversion Table

For Direct Exposure Soil Cleanup Target Levels

Facility/Site Name:	MIA Parcel 3
Location:	Miami International Airport
Facility/Site ID No.:	
Soil Sample No.	SB-7
Sample Date	02/08/2018 00:00
Location:	
Depth (ft):	2-4'

INSTRUCTIONS: Calculate Total Benzo(a)pyrene Equivalents if at least one of the carcinogenic PAHs is detected in the sample at a concentration equal to or higher than the Method Detection Limit (MDL), whether quantified with certainty (the concentration reported has no qualifier) or estimated (the concentration reported has a “J”, “T” or “I” qualifier). Enter the contaminant concentrations (in mg/kg) for all seven carcinogenic PAHs in the yellow boxes using the following criteria (and see table below):

1. If quantified with certainty, or estimated and has the “J” qualifier, enter the reported value;
2. If not detected at the MDL (the concentration reported is the MDL followed by the “U” qualifier) enter 1/2 of the reported value;
3. If detected at a concentration lower than the MDL and the concentration is estimated (has the “T” qualifier) enter the estimated value;
4. If detected at a concentration equal to or higher than the MDL but lower than the Practical Quantitation Limit (PQL) and the concentration is estimated (has the “I” qualifier) enter the estimated value;
5. If detected at a concentration equal to or higher than the MDL but lower than the PQL and it is not estimated (the concentration reported is the PQL followed by the “M” qualifier) enter 1/2 of the reported value.

Contaminant	**Concentration (mg/kg)**	**Toxic Equivalency Factor**	**Benzo(a)pyrene Equivalents**
Benzo(a)pyrene	0.024	1.0	0.0240
Benzo(a)anthracene	0.031	0.1	0.0031
Benzo(b)fluoranthene	0.035	0.1	0.0035
Benzo(k)fluoranthene	0.012	0.01	0.0001
Chrysene	0.028	0.001	0.0000
Dibenz(a,h)anthracene	0.004	1.0	0.0040
Indeno(1,2,3-cd)pyrene	0.011	0.1	0.0011

DE Residential = 0.1 mg/kg; DE Industrial = 0.7 mg/kg

Total Benzo(a)pyrene Equivalents = 0.0

The concentration shown does not exceed the Residential Direct Exposure SCTL of 0.1 mg/kg.

The concentration shown does not exceed the Industrial Direct Exposure SCTL of 0.7 mg/kg.

Summary Criteria for Table Entries

Detection	**Concentration Reported**	**Data Qualifier**	**Enter**
Various	Quantified with certainty	None	reported value
Various	Estimated	J	reported (estimated) value
ND at MDL	MDL	U	1/2 reported value
< MDL	Estimated	T	reported (estimated) value
e MDL but < PQL	Estimated	I	reported (estimated) value
e MDL but < PQL	PQL	M	1/2 reported value