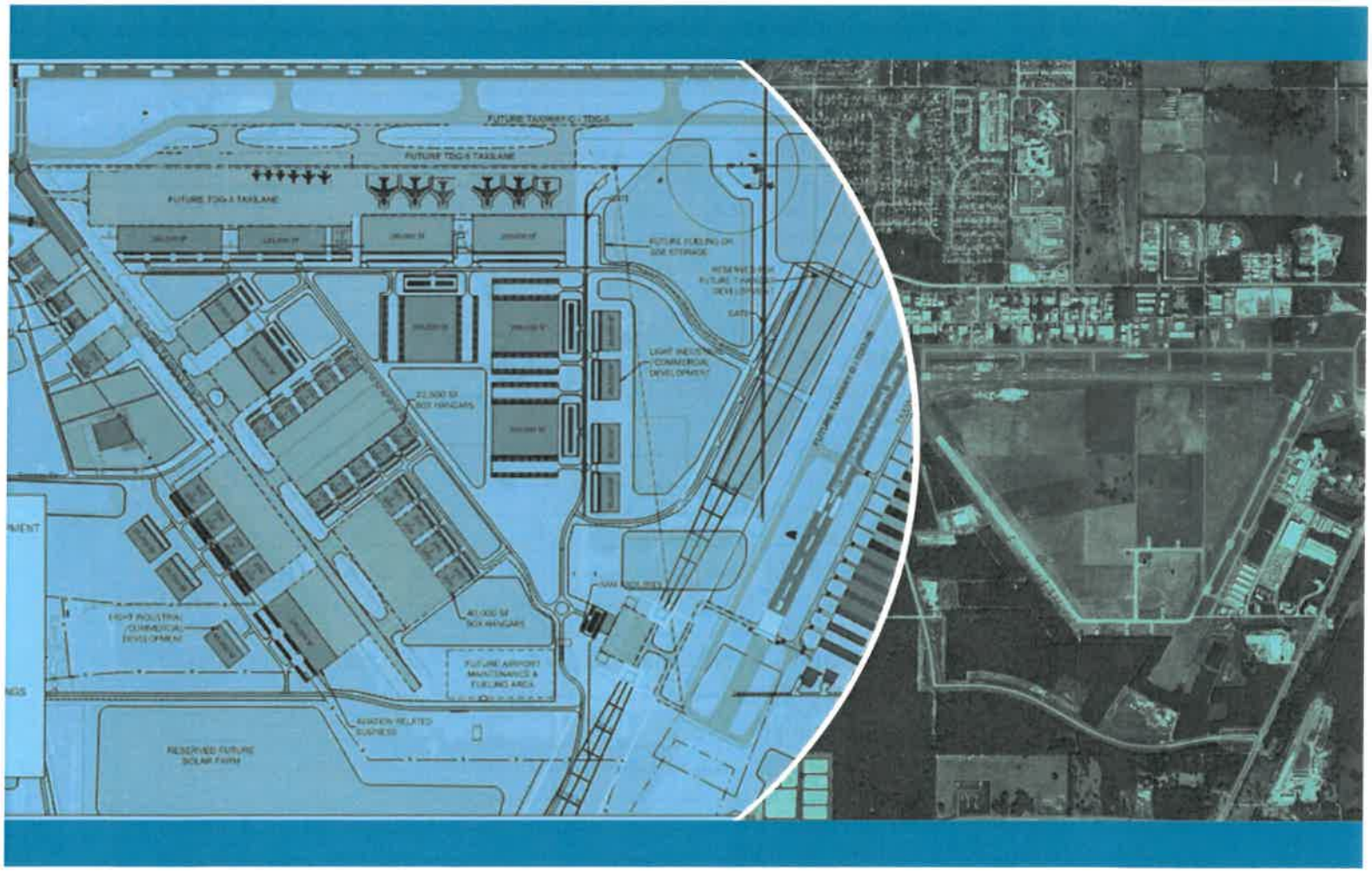
Brooksville-Tampa Bay
Regional Airport

Infield Infrastructure Development Plan

Final Technical Report
May 2025



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Acronyms

AAC	Aircraft Approach Category
AAM	Advanced Air Mobility
AC	Advisory Circular
ACIP	Airports Capital Improvement Plan
ACRP	Airport Cooperative Research Program [TRB]
ACTC	Airport Traffic Control Tower
AIP	Airport Improvement Program
ALP	Airport Layout Plan
BKV	Brooksville-Tampa Bay Regional Airport
CFR	Code of Federal Regulations
CIP	Capital Improvement Program
EA	Environmental Assessment
EB	Engineering Brief
eVTOL	Electric Vertical Takeoff and Landing
FAA	Federal Aviation Administration
FAR	Federal Aviation Regulation
FATO	Final Approach and Takeoff
FBO	Fixed Base Operator
FDOT	Florida Department of Transportation
GA	General Aviation
IDP	Infrastructure Development Plan
MPU	Master Plan Update
MRO	Maintenance, Repair and Overhaul
NAS	National Airspace System
NASA	National Aeronautics and Space Administration
NBAI	National Based Aircraft Inventory Program
NEPA	National Environmental Policy Act
NPIAS	National Plan of Integrated Airport Systems
RAM	Regional Air Mobility
TDG	Taxiway Design Group
TLOF	Touchdown and Lift-off Touchdown and Lift-off
TRB	Transportation Research Board
UAM	Urban Air Mobility

1 INTRODUCTION

1.1 Overview

Hernando County desires to assess existing and future infrastructure needs at Brooksville-Tampa Bay Regional Airport (BKV) to bring the airport's infrastructure within BKV's infield development area up to current standards. The last airport master plan for BKV was updated in 2016. The BKV Master Plan identified the potential of developing the airport's industrial park and infield areas to support new economic opportunities and sources of aeronautical and non-aeronautical revenue for the airport. As a result, in 2020, Hernando County began the development process by preparing an Airport Infrastructure Development Plan (IDP) for the industrial park areas of the airport. This initial phase of the IDP evaluated land use, roadways, drainage, utilities, and other infrastructure needed to prepare various sites for development over the next ten years.

This planning study is the second phase of the airport's infrastructure development planning process, with the premise of providing the infrastructure needed to maximize future development within the airport's infield area. In this phase, the study evaluates alternatives for landside developments (i.e., aeronautical, and non-aeronautical development), including new roadways and security improvements. The development alternatives are assessed based on their efficiency in meeting identified facility requirements, engineering factors, ease of implementation, costs, phasing, airside and landside accessibility, protection of existing facilities (i.e., Airport Traffic Control Tower, electrical vault, and stormwater facilities), and environmental/historical considerations leading to the selection of the option or combination of options which best satisfies the identified needs. The preferred alternative is refined to include drainage, stormwater, and the utilities needed to support the proposed expansion.

As part of the plan, the study recommends improvements and adjustments to the airport's infield infrastructure over a 10- to 20-year planning horizon. It also includes an Implementation Plan that prioritizes projects and associated costs of recommended improvements. Airport staff and other Hernando County Departments will use the information contained in the plan to maintain, plan for, and develop infrastructure within the airport's infield development area. For the purpose of this study, Runway 9-27, Runway 3-21, the airport's abandoned runway, and Sergeant Lea Mills Boulevard will serve as the limits of the project.

1.2 Goals for the Infield IDP Study

The general goal of this planning effort is to guide the airport in establishing future airport developments and supporting infrastructure requirements that accommodate future aviation demand while fully meeting current FAA airport design and safety standards. The study will provide a comprehensive Infield Infrastructure Development Plan aligned with the county's goals and expectations to maximize efficiency.

The specific goals of BKV and Hernando County regarding the Infield IDP are as follows:

- Provide an efficient layout for future development aligned with the county's land use and the airport demand.
- Evaluate the airport's vision to attract new business and create new demand.
- Coordinate the future development with existing facilities and short-term projects proposed at the airport by existing and potential future tenants.
- Identify the necessary drainage and utility improvements to provide a flexible and scalable system for a variety of different business needs.
- Generate an implementation plan that prioritizes development areas that could be fast growing, easier to implement, and tied to the airport's ongoing marketing efforts.
- Prioritize capital investment projects that create jobs.
- Review and identify landside facilities that are currently or anticipated to be needed to accommodate future aviation activity while fully meeting FAA design and safety standards.

1.3 Guidance and Requirements

The overall purpose of the Infield IDP is to provide reasonable guidelines for future airport development to satisfy future aviation demand in a cost-effective and timely manner. In support of the purpose and goals identified, the primary objective of this study is to create a 10- to 20-year airport development program for the infield area that will maintain a safe, efficient, economical, and environmentally sustainable airport facility that meets current FAA, state, and Hernando County requirements. **Figure 1-1** shows the key elements of the project process used for this study.

Figure 1-1: Infield Infrastructure Development Plan Process

Source: Michael Baker International, Inc., 2023.

The Infield IDP will follow guidance listed in the following FAA and industry documents as well as validate recommendations considered in previous planning studies at BKV:

- FAA Advisory Circulars (ACs)
  - AC 150/5070-6B, Airport Master Plans
  - AC 150/5300-13B, Airport Design
    - Standard Operating Procedures (SOP) Checklists 2.0 and 3.0
- Code of Federal Regulations (CFR)
  - Part 77, Safe, Efficient Use, and Preservation of the Navigable Airspace

- FAA Orders
  - Order 1050.1F, Environmental Impacts: Policies and Procedures
  - Order 5050.4B, National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions
  - Order 5090.5, Formulation of the National Plan of Integrated Airport Systems (NPIAS) and Airports Capital Improvement Plan (ACIP)
  - Order 5100.38D, AIP Handbook
  - Order 5200.8, Runway Safety Area Program
  - Order 8260.3D, United States Standard for Terminal Instrument Procedures (TERPS)
- Airport Cooperative Research Program (ACRP)
  - Report 113, Guidebook on General Aviation Facility Planning
- Hernando County
  - BKV Master Plan Update and ALP
  - BKV Infrastructure Development Plan - Phase I

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2 PROPOSED INFIELD DEVELOPMENT

2.1 Existing Conditions and Potential Development Areas

The land use analysis performed as part of the BKV MPU and the recently completed Brooksville-Tampa Bay Regional Airport Infrastructure Development Plan (Phase 1) for the Airport Industrial Park areas forms the basis of the infrastructure analyses performed in this study.

In an effort to maximize the efficiency of the infrastructure development in the infield area, this study will evaluate areas suitable for aeronautical use and other areas for non-aeronautical services that do not require direct access to the airfield but may be considered complementary to aeronautical activities.

During the initial project kick-off meeting, airport and Hernando County staff identified areas that are currently being reserved for development (i.e., Maintenance, Repair, and Overhaul (MRO), Airport Cargo, and Hangar facilities) due to existing agreements and ongoing negotiations. These areas will be considered during the alternatives analysis.

Some development constraints associated with the project include the ATCT line of sight, existing infrastructure leaseholds, and ground access. There are dashed red lines shown in **Figure 2-1** that project from the ATCT to project the line of sight to the airfield. Buildings constructed along the dashed line to the north and east of the dashed line could physically block the view of the airfield from the ATCT and/or create shadows that block the view of the airfield. Therefore, it would be necessary to conduct a thorough evaluation of any proposed developments that may obstruct the view of the airfield from the ATCT.

One premise used in the BKV MPU was to segregate the air traffic at the airport by aircraft classification. The development on the east side of the airport along Taxiway B is focused on providing facilities for small- and medium-sized general aviation aircraft. On the airport's west side, the development is focused on providing facilities for larger corporate and commercial aircraft.

Furthermore, the infield development maintains the future development of the airside approved in the airport's current Airport Layout Plan (ALP). **Figure 2-1** depicts the Infield Development Area evaluated in this study, the constraints, and the future improvements in the airside.

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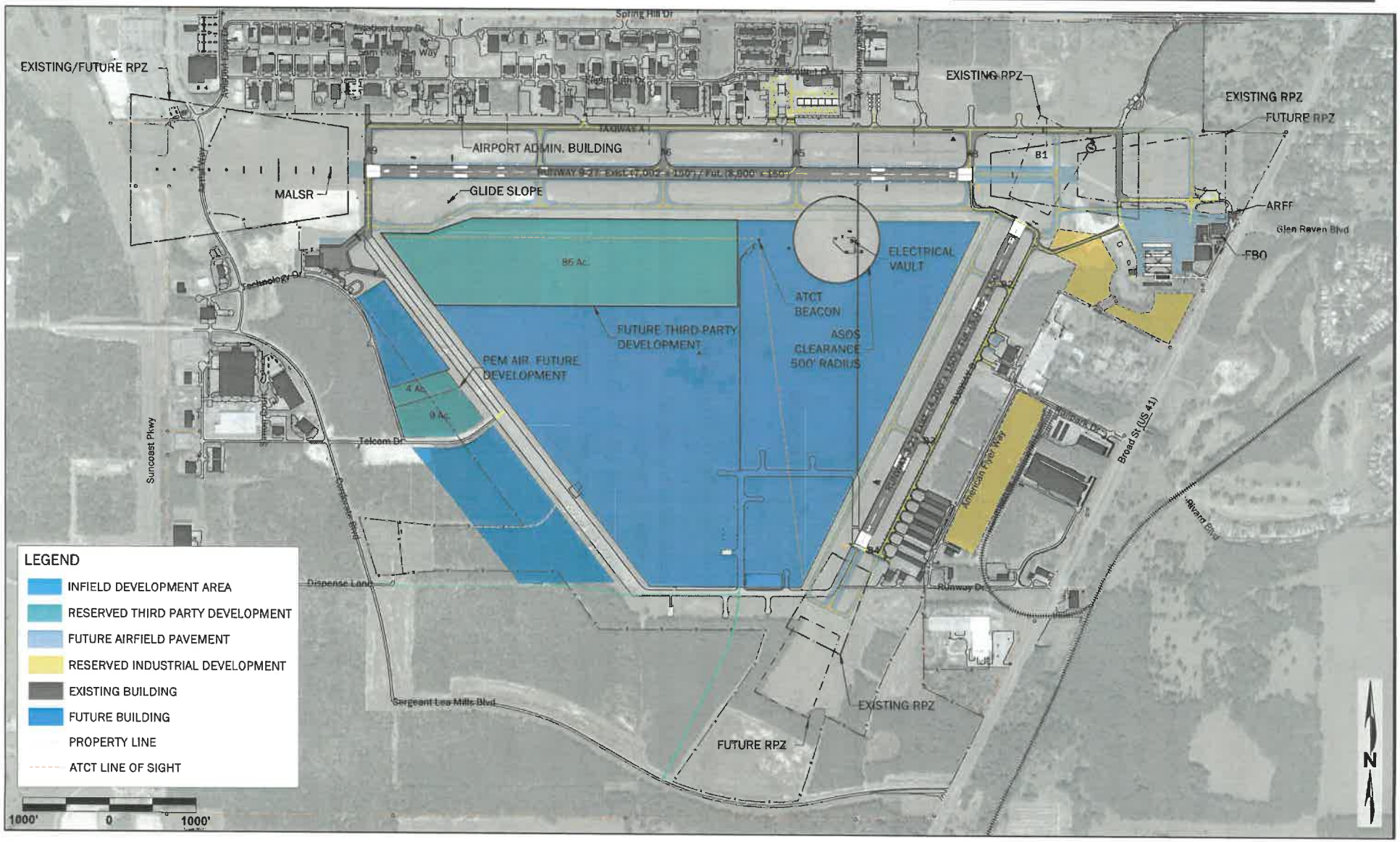

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Infield Development Area

Figure 2-1

2.2 IDP Alternatives

This section includes the development of graphical alternatives which depict methods to either resolve deficiencies or to construct new facilities needed to meet future demand expectations for the Study Area, including potential improvements to both airside and landside facilities.

The Infield IDP alternatives analysis focuses on both airside and landside developments to accommodate anticipated demand over a 10 to 20-year planning period.

As part of the alternatives analysis, the best use of airport property is considered to accommodate the future development of the study area. This task aims to support Hernando County's efforts to maximize growth to meet demand and support future airport operations. The following existing characteristics of landside facilities within the infield area were considered:

- Proximity of areas to existing facilities and compatible uses,
- Existing leaseholds,
- Overall site circulation and external access,
- On-site parking needs,
- Availability of utilities, and
- Site preparation and environmental/historical impacts.

The individual components of each preliminary alternative are evaluated to aid in the selection of a preferred development alternative that represents the desired development for the Infield Development Area over the 10- to 20-year planning period. For that reason, the preliminary alternatives should be viewed as flexible development plans that may be refined or combined to best satisfy the needs of BKV.

2.2.1 Alternative Analysis Process

The alternatives analysis process is based on guidance provided in Federal Aviation Administration (FAA) Advisory Circular (AC) 150/5070-6B, Airport Master Plans. The development and analysis of alternatives incorporate input from Hernando County and other key stakeholders. An organized approach to identifying and evaluating various options is essential to effective planning. This includes identifying a standard set of evaluation criteria based on the goals and objectives of the plan and existing constraints that will impact the development of alternatives.

In AC 150/5070-6B, the FAA recommends a standard set of criteria to evaluate development alternatives according to an airport's unique conditions. The evaluation process should feature "generally accepted planning principles, be replicable, consistently applied, and documented." As a result, a set of evaluation criteria were established for use in this alternatives analysis. The criteria are strategic, qualitative, and quantitative to ensure that the evaluation process remains at a planning level of detail. The evaluation criteria used in this planning effort are shown in **Table 2-1**.

Table 2-1: Evaluation Criteria	
Criteria	**Definition**
Achievement of Objective	This criterion is based on achieving the specific need identified. Alternatives are assessed based on the degree to which they satisfy the objective.
Airport Design Standards	The proposed development should satisfy applicable airport design standards and maintain or improve the safety and efficiency of the airport.
Flexibility	The alternative should support a reasonable level of flexibility to accommodate changes in demand and include the ability to expand in the future.
Collateral Impacts	This criterion evaluates the extent to which an alternative requires changes or improvements to existing airport facilities which otherwise would not require changes or improvements (e.g., Relocation of utilities that are impacted by an alternative is considered a collateral impact).
Probable Cost	The preferred alternative should be cost effective, within the means of Hernando County to secure funding, and minimize the long-term financial commitment by the airport or its tenants.
Efficiency of Construction Phasing	Construction of the proposed improvements should be implemented without undue interference to existing operations.
Environmental Compatibility	The preferred alternative should be consistent with environmental regulations and minimize impacts to the environmental impact categories identified in FAA Orders 1050.1F, Environmental Impacts: Policies and Procedures Desk Reference and 5050.4B, National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions. Future development should support growth while minimizing impacts to the environment.

Source: AC 150/5070-6B; Michael Baker International, 2023.

2.2.2 Airside Considerations

The National Plan of Integrated Airport Systems (NPIAS) 2023–2027 categorized BKV as a General Aviation airport with a National Role. "National airports are located in metropolitan areas near major business centers and support flying throughout the nation and the world. These airports provide pilots with attractive alternatives to the primary airports. National airports have very high levels of activity with many jets and multiengine propeller aircraft."[1]. It is essential to highlight that the NPIAS had categorized BKV as a Regional Airport in previous years. The upgrade of the airport's role in the NPIAS reflects the importance of BKV for the airport system and the region's fast growth.

BKV has two runways. The primary runway, Runway 9-27, is 7,002 feet long and 150 feet wide. The secondary or crosswind runway, Runway 3-21, currently has an overall length of 4,215 feet and is 150 feet wide.

Runway 9-27 has a Runway Design Code (RDC) C-IV, which means that it can fully accommodate aircraft having Aircraft Approach Category (AAC) speeds ranging from 121 or

[1] FAA NPIAS 2023-2027

more but less than 141 knots and Airplane Design Group (ADG) IV wingspans of 118 feet to less than 171 feet. The critical aircraft identified in the BKV MPU is the Challenger 600 / C130. However, it is expected that Runway 9-27 will be extended to 8,000 feet and have an RDC D-IV in the future. It is anticipated that the future critical aircraft will be the Boeing 757 or an aircraft with similar characteristics.

Runway 3-21 has an RDC classification of B-II. It can fully accommodate aircraft having Aircraft Approach Category (AAC) speeds ranging from 91 or more but less than 121 knots and Airplane Design Group (ADG) II wingspans of 49 feet to less than 79 feet. The existing and future critical aircraft identified in the BKV MPU is the King Air 350.

All future development should consider the primary runway's ability to accommodate certain types of aircraft as well as protect the safety areas to preserve the potential airside development as proposed by the master plan.

Most taxiways that run parallel to Runway 9-27 are designed to accommodate large aircraft such as the Lockheed C-130 Hercules, corporate jets, and even commercial-sized jets. Based on the undercarriage dimensions of the taxiways serving Runway 9-27, the pavement width and fillet geometry should be designed in accordance with Taxiway Design Group (TDG) 5 standards.

The airport has plans to convert the abandoned runway into a future taxiway to provide improved access to the Infield Development Area. Based on the airfield capabilities and the existing and future critical aircraft, it is recommended that the future taxiway be designed in accordance with TDG-5 standards.

2.2.3 Considerations

Three alternatives are presented to take advantage of several aeronautical and industrial development opportunities within the Infield Development Area. The recommended actions presented in this chapter, if followed, could result in new development, new facilities, and increased employment in Hernando County. It will also provide increased business opportunities for the airport and expand the services offered, including cargo and related logistics services. Over time, these actions will create a stronger logistics platform for global trade in Hernando County.

As part of the preliminary alternatives analysis, each option evaluates the development of the following types of facilities and businesses in the Infield Development Area and prioritizes the capital investments that will promote new jobs for the region.

2.2.3.1 Corporate Hangars

The BKV MPU reported 176 based aircraft in 2013 and forecasted 272 based aircraft by 2033. According to the 2023 National Based Aircraft Inventory (NBAI), BKV currently reports 185 based aircraft.

The BKV MPU established the need for approximately 137,925 square feet of conventional or corporate hangar space and 50 T-hangar units to accommodate the based aircraft growth by 2033. The BKV MPU's Preferred Development Plan proposed to segregate aircraft storage facilities by aircraft size, recommending the construction of T-hangars and small corporate hangars on the east side of Runway 3-21, and larger hangars on the west side of

the abandoned runway (future taxiway). Moreover, the alternatives examined in Infield IDP will consider the development of medium- to large-sized hangars in the Infield Development Area.

2.2.3.2 Advanced Air Mobility

The constant look for improvement and evolution of transportation solutions has resulted in various emerging trends led by efficiency and sustainability. Advanced Air Mobility (AAM) is one of the opportunities that is being evaluated worldwide. As defined in the AAM Coordination and Leadership Act (P.L. 117-203, 136 Stat. 2227), October 17, 2022, "AAM is a transportation system that moves people and property by air between two points using aircraft with advanced technologies, including electric aircraft, or electric vertical takeoff and landing (eVTOL) aircraft, in both controlled and uncontrolled airspace." AAM also expands the possibility of traditionally piloted vehicles to remotely piloted or autonomous ones.

The AAM concept is a collection of emerging technologies that could be applied to the transportation system and aircraft types. eVTOL aircraft may be powered by hybrid electric systems, batteries, or potentially hydrogen fuel cells. The potential applications include Urban Air Mobility (UAM), Regional Air Mobility (RAM), public services, large cargo delivery, and private or recreational vehicles.

AAM is considered an opportunity to boost the economic growth of the region and to provide efficient transportation solutions in a sustainable manner, moving people or cargo from places not easily served by traditional aviation. The FAA is responsible for regulating navigable airspace and will determine how AAM will be integrated into the National Airspace System (NAS). In July 2023, the FAA published the Advanced Air Mobility Implementation Plan to ensure the integration of this new technology of aircraft, maintaining the operational safety levels of aviation today. The FAA will establish the operating rules and training requirements and develop the regulation and infrastructure standards aligned with operation safety and security.

The FAA envisions that the initial AAM operation in 2025-2028 is expected to primarily use existing airports and heliports. Greenfield or infill (repurposed) development for new vertiports is also expected to connect operations to destinations near a city center or other preferred locations.

Regarding infrastructure, in September of 2022, the FAA released the Engineering Briefing (EB) No. 105, Vertiport Design Standards, to support the safe integration of Advanced Air Mobility Aircraft. "The design standards serve as the initial step to provide key information for airport owners, operators, and infrastructure developers to begin development of facilities that will support operations of AAM aircraft that are electrically powered and takeoff and land vertically"[2].

[2] https://www.faa.gov/newsroom/faa-releases-vertiport-design-standards-support-safe-integration-advanced-air-mobility

The Florida Department of Transportation (FDOT) also released the Florida Advance Air Mobility Roadmap focusing on commercial passenger-carrying electric eVTOL aircraft and their support. According to the FDOT's study, three main types of eVTOL systems can be expected in Florida:

- Multicopter – looks and flies much like a helicopter except with multiple rotors.
- Lift and cruise – uses rotors for vertical flight and transitions to propellers for horizontal flight.
- Vectored thrust – uses rotors or fans for both vertical and horizontal flight.

In addition, the Florida Roadmap identified three business use cases for AAM in the near future: medical, cargo transport, and air taxi services.

Medical: In this field, two companies are working with eVTOL manufacturers to improve organ transplant airlifts and cargo delivery. Also, the National Aeronautics and Space Administration (NASA) has evaluated their use in firefighting, public safety, search and rescue, disaster relief, and law enforcement.

Cargo: Currently, UPS has partnered with CVS to deliver medical prescriptions.

Air Taxi Services: according to the FDOT's vision, "In states like Florida, where there are numerous large cities within a relatively short distance, AAM could act as point-to-point transportation to get from city center to city center in minutes instead of hours, bypassing airports altogether."[3]

Several companies have established plans to develop AAM operations in various airports in the state of Florida. In central Florida, Lilium, in partnership with the City of Orlando, has announced the construction of a vertiport in Lake Nona to connect in less than an hour with Tampa, Jacksonville, Fort Myers, and Miami[4]. Additionally, Ferrovial has leased five acres to build two vertiports for the Lilium Jets at Palm Beach International Airport that would connect to Miami, the Florida Keys, Fort Myers, Florida's Suncoast, Tampa, and Melbourne.

Tampa International has already evaluated potential locations for AAM operations in their master plan update. The Hillsborough County Aviation Authority (HCAA) has created an Advance Aviation Technology Committee to begin planning for the implementation of AAM at their General Aviation (GA) airports. For example, the strategic location of the Tampa Executive Airport could make it become an AAM hub in the area[5].

It is essential to highlight that any sponsor of a federally obligated airport pursuing an eVTOL vertiport (or supporting infrastructure) must update their ALP with the FAA, conduct the

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[3] Federal Aviation Administration. Memorandum: Process for Submitting and Reviewing Proposed Landing Pads

and Supporting Equipment for Advanced Air Mobility and Electric Aircraft. Washington, D.C. : s.n., June 2021, 2021

[4] https://lilium.com/newsroom-detail/lilium-partners-with-tavistock-and-orlando

[5] https://news.tampaairport.com/get-ready-tpa-launches-committee-to-plan-ahead-and-prepare-for-air-taxis-at-local-airports/

applicable environmental review required by the National Environmental Protection Act (NEPA), and submit an FAA Form 7460, Notice of Proposed Construction or Alteration, for an airspace determination.

This study considers that the infrastructure development plan is an opportunity to evaluate the potential locations for AAM facilities at BKV in the future.

After evaluating the current trends and the State Roadmap, BKV could become an important asset for the AAM system in the state, providing connectivity with other hubs in Florida for passenger and cargo transportation and, potentially, air medical, firefighting, and public safety. In addition, BKV could also provide support services like training and eVTOL maintenance.

As mentioned before, design standards and recommended practices are constantly evolving due to the new aircraft's early stages and testing phases. In the meantime, the design standards for vertiports are determined by the FAA interim guidance for vertiports, EB 105, Vertiport Design, until a complete vertiport design Advisory Circular can be developed. Following the FAA's AAM Implementation Plan, the infrastructure requirements for a vertiport are listed as follows:

Required Infrastructure

- Adequate AAM aircraft parking zones for loading/unloading,
- Infrastructure sizing, dimensional geometry and load bearing requirements modified to comply with FAA EB 105, Vertiport Design (September 21, 2022),
- Charging stations, cooling stations and hazardous materials (HazMat) lockers/storage for batteries and fire suppression for battery fires,
- Weather station, and
- Fire management services.

Since most of the eVTOLs are in a preliminary stage of development and FAA certifications are ongoing. The design standards used during the alternative development process consider the operation of aircraft with a maximum wingspan of 50 feet. This is also the limitation identified in EB 105. **Table 2-2** lists some of the most renowned eVTOLs seeking certification.

Table 2-2: eVTOL Aircraft Characteristics			
Aircraft	**Manufacturer**	**Passengers**	**Wingspan (feet)**
Velocity	Volocopter	2	37
Wisk's 6th Generation	Wisk	4	<50
Lilium[6]	Lilium Jet	7	45.6
Archer	Midnight	4	47
VA-1X	Vertical Aerospace	4	49.2

Note: Holds EASA and FAA certification basis for a powered lift eVTOL aircraft
Compiled by Michael Baker International, Inc., 2023

Additional Requirements

The implementation of vertiports requires the availability of electricity to supply the demand for charging and servicing eVTOLs. NASA and Black & Veatch prepared a study to analyze the energy supply and charging infrastructure needed to implement AAM. During the study, it was recommended to use 600kW class chargers. "While eVTOLs currently in development are estimated to be able to charge at a maximum of 350kW, choosing to utilize 600kW chargers will futureproof the design of the infrastructure required. Renovation of a site to increase its individual charger capacity would effectively require full-site demolition and reconstruction."[7]

The typical airport electrical infrastructure requirements listed in the study indicate that "A new medium voltage feeder will be brought to the site by the utility company. The new feeder will be terminated at a transformer provided by the contractor. New ground infrastructure will be installed, including concrete pads, charging stations, switchboard, underground feeders to each charging station, waiting area building, fencing, and lighting. New landing zone lighting and ground markings will be installed"[7]. The ability of the design vehicle being capable of taxiing is crucial to site layout and design where charging areas are separate from take-off and landing areas.

2.2.3.3 Third-Party Development

By the time of the study, BKV had reserved 86 acres for a third-party developer. The company intends to develop box hangars and cargo facilities with cold storage and logistics components.

During the alternatives analysis, one of the alternatives will consider the proposed layout developed by the third-party developer and its integration with the Infield Development Plan; the second alternative will only reserve the area for the third-party developer's future development; finally, the third alternative will not incorporate or reserve any areas for specific third-party developers.

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[6] https://lilium.com/newsroom-detail/faa-issues-g-1-for-lilium-jet

[7] eVTOL Electrical Infrastructure Study for UAM Aircraft - Analysis to Determine Typical Infrastructure Upgrade Requirements for eVTOL- National Institute of Aerospace

Pem Air is another tenant that is currently expanding its facilities at BKV. As a result, 9 acres have been reserved for the construction of a parts-maintenance facility (currently under construction) located near the corner of Technology Drive and Telcom Drive. An additional 4 acres parcel is also reserved to expand those facilities during the short-term planning period. The preliminary alternatives will include and reserve those areas for Pem Air's expansion.

2.2.3.4 Industrial and Light Industrial Development

BKV has a vast area available to develop infrastructure related to aviation activity. The BKV MPU proposed development opportunities on the property to generate additional revenues without impacting future aviation development and expansion. The master plan reserved some areas on the east side of the airport for industrial development, as depicted in **Figure 2-1.**

The Infield IDP continues to reserve those areas and will evaluate additional locations suitable for industrial and light industrial development. Sites recommended for this use will not have airside access since those parcels should be prioritized for aeronautical use.

2.2.3.5 Maintenance, Repair and Overhaul Facilities

BKV has the opportunity to develop MRO facilities due to the available land, runway capacity, and the airport's location related to other large and medium hub airports. BKV has the potential to become a maintenance leader in Central Florida. The size and location of the MROs will be set by the runway's capabilities to accommodate a particular aircraft fleet. The airport currently provides services for the Boeing 767 and potentially the Boeing 777 on a less frequent basis in the future.

2.2.3.6 Solar Farm

Airports in the US are taking advantage of unused land, rooftops, and parking garages to create solar farms to take steps towards reducing their carbon footprint and exploring alternative energy sources. A recent study conducted at the University of Colorado revealed that 20 percent of public airports have already implemented solar power in the past decade.

Solar farms are not only a sustainable option but also add power to the grid and generate revenue for the airport. Some airports have decided to fund solar farms using municipal bonds or other funding types. Others entered into power purchase agreements with third-party energy providers to own and operate on-airport installed systems[8].

The FAA supports the implementation of solar farms at airports and, in May 2021, published a Final Policy to ensure that airport solar projects do not create hazardous glare. The policy requires airports to measure the visual impact of such projects on pilots and air traffic control personnel.

[8] https://www.nytimes.com/2021/12/07/business/airports-solar-farms.html

The Infield IDP will consider reserving areas to establish solar arrays where elevation restrictions, drainage, or access issues make it challenging to develop for other purposes.

Hernando County's priority is to incentivize businesses that create new job opportunities for the community, which is the reason why the majority of the proposed development will be focused on capital investment projects. However, due to the useful service life of current solar technology, some airports have decided to build solar farms in areas reserved for future airport expansion and obtain revenue in the near future while preserving parcels for long-term (30+ years) aeronautical development.

Moreover, solar farms can be part of a floating system over ponds or even be installed as part of other facilities. Solar energy could also play a part in future AAM development by providing additional electricity to the grid.

2.2.3.7 Other Potential Developments

The development alternatives will contemplate other facilities in the IDP, including the following.

- Future airport maintenance and fueling area
- Corporate Hangars
- Avionics
- A future aeronautical development near the flight school area – New FBO with additional hangar development

2.2.4 Roadways and Security Considerations

The Infield IDP incorporates access to the developable areas using two main entry points. The first alignment will extend east from Corporate Boulevard along the same or similar alignment as Dispense Lane. This roadway would be included to provide public access to future infield development toward the southern end of the closed runway. The second alignment will extend north from Sergeant Lea Mills Boulevard and lie west of Runway 3.

The roadway network inside the Infield IDP will provide access throughout the developable area, unlocking various locations while offering the most direct access possible for smooth traffic movements. The network will be planned to provide two-lane access throughout the site.

However, additional traffic studies may be required in the future to determine if turn lanes or improved intersections are needed to support the proposed development areas.

The alternatives will also include any airfield fence and gate improvements required to maintain the safe and secure operation of the airfield and facilitate the ingress/egress of tenants and users of the future facilities in the Infield Development Area.

2.2.4.1 Overall Roadway Design Considerations

The following guidelines and standards were used to layout the proposed roads for each development alternative. This includes previous geometry and curve radius guidance from previously successful road projects.

Roadway Geometry

- FDOT Manual of Uniform Minimum Standards for Design, Construction and Maintenance for Streets and Highways. 2018 Edition.
- FDOT Design Manual, (FDM 210, 215).
- A minimum horizontal curve of 150' was used for WB-50 Semi tractor trailer operation, while a minimum 50' curve radius was used for intersections for the WB-50.
- Minimum Curve Radius used was 30' for passenger cars and pickup truck operation.
- A curve Radius of 30' was used at all intersections where passenger cars and pickup trucks would operate.
- A curve Radius of 50' was used at all intersections where Semi Tractor Trailer operation was expected.
- Maximum Curve Radius ranges from 300' to 2,000' where possible.
- 12' wide lanes were used on all roadways.
- To avoid intersection deflection issues, all roadways were designed with 90-degree intersections.

Roadway Section

Following Hernando County Facility Design Guidelines, Sections I and III, the standard roadway section for a frontage road was used to develop the Infield IDP alternatives. The standard roadway section is displayed in **Figure 2-2.**

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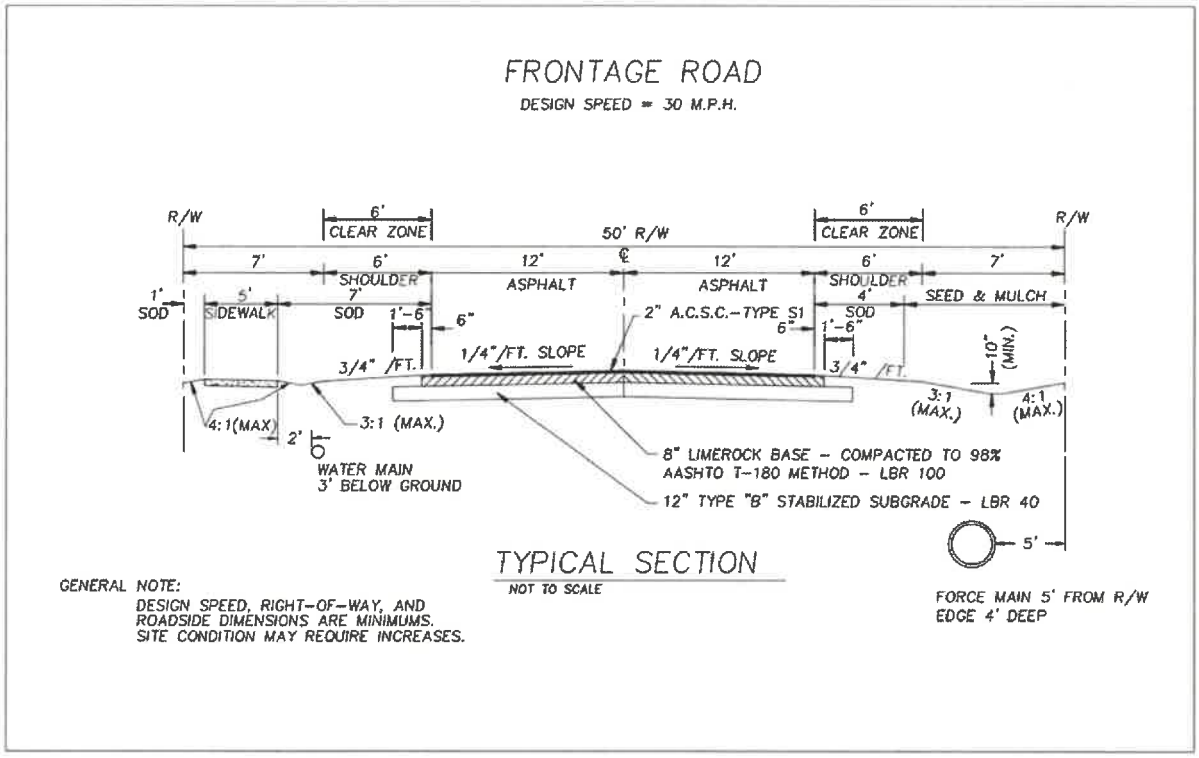
Figure 2-2: Standard Roadway Section



Source: Hernando County Facility Design Guidelines

A 50-foot roadway right-of-way associated with the frontage road section with a design speed of 30 MPH was used. All buildings and parking lots proposed in the alternatives should be placed outside the right-of-way.

The Hernando County Facility Design Guidelines, Section I, show the requirement of at least one sidewalk on either side of the road. The sidewalks are not shown in the preliminary alternatives and will be included in the refinement chapter.

Vehicle Parking Areas

The alternatives include schematic parking lot layouts in an effort to approximate locations and sizes. Parking lots should follow local design standards and regulations during the design phase.

2.3 Alternative 1

2.3.1 Third-Party Development

The first alternative reserves two areas for third-party development. One area is located at the northeast corner of the Infield Development Area. The alternative reserves 86 acres facing Runway 9-27 and connects with the airfield via future Taxiway C. This alternative considers the roadway connections needed to provide ground access to the future third-party facilities.

As shown in **Figure 2-4**, an additional 13 acres are reserved on the west side of the abandoned runway for Pem Air Turbine Engine Services. Pem Air already has plans in progress to expand its services at BKV. This alternative preserves the parcels for this expansion.

2.3.2 Aviation Related Development

Alternative 1 proposes the development of hangar clusters that could be constructed in phases as demand dictates. The alternative includes a small set of seven 150' x 150' hangars in the northwest corner of the Infrastructure Development Area, as proposed in the BKV MPU. This alternative also preserves the development of a box hangar near the end of Runway 9. Three additional hangar clusters of 150' x 150' hangars and 200' x 200' hangars are proposed along the new taxiway reconfigured from the abandoned runway. The hangars will have a shared taxilane to access the facilities and each hangar includes ramp space in front of the building with landside access and parking. In total, Alternative 1 provides twenty-six 150' x 150' hangars and nine 200' x 200' corporate hangars.

The layout also includes two 100,000 square feet facilities that could be used as MROs capable of accommodating two Boeing 767-300 aircraft.

An additional 250' x 250' hangar is proposed in the midfield portion of the infield area that can be used for other aeronautical business activities, like avionics, airframe, or aircraft painting.

2.3.3 Advanced Air Mobility

Alternative 1 incorporates an AAM facility with two designated Touchdown and Lift-off Areas (TLOF) and Final Approach and Takeoff Areas (FATOs) aligned with Runway 3-21.

A FATO approach/departure surface is centered on each approach/departure path. The approach/departure path starts at the outer edge of the FATO and extends upward at a slope of 8:1 for 4,000 feet, where the width is 500 feet at a height of 500 feet above the airport elevation as defined by the EB 105, Vertiport Design.

As depicted in **Figure 2-4**, the transitional surfaces start from the edges of the FATO parallel to the flight path centerline and from the outer edges of the 8:1 approach/departure surface and extend outwards at a slope of 2:1 for 250 feet from the centerline. The transitional surfaces extend longitudinally from the edge of the FATO to the far end of the approach/departure surface.

The AAM facilities include three parking positions for loading/unloading passengers or cargo as required, and a terminal building that is accessible by the proposed road from the south. The facility is proposed along the west side of the future Runway 3-21 expansion. It includes a taxiway connector to the runway, providing the opportunity to use the airfield for approaches and departures in lieu of dedicated landing and takeoff facilities.

The facilities include enough space to allocate support services like charging and cooling stations, HazMat, lockers/storage for batteries, fire suppression, and fire management services. This location also allows for future expansion as demand dictates.

2.3.4 Non-aeronautical Development

Not all infield areas are best suited for airside access. The proposed roadway development opens portions of the Infield Development Area to build facilities that take advantage of the closeness to the airfield, but not necessarily require airside access. Examples of these types of facilities may be used for logistics and light industrial uses. Alternative 1 proposes a logistics center consisting of two 200,000-square-foot buildings. The facility can be used by a single distribution operator or be divided into multiple operators. The facilities include truck access on both sides and a separate vehicle parking lot. An additional 100,000-square-foot building is proposed east of the future taxiway.

Two 45,000 square foot buildings are proposed south of the Infield Development Area. Those buildings can be used for flex light industrial or commercial business use.

2.3.5 Other Support Facilities

As discussed in previous sections, the development alternatives will recommend suitable areas to develop a solar farm that could generate additional airport revenue and support the electrification efforts required for AAM. Alternative 1 proposes to reserve approximately 28 acres for solar farm development on the southeast side of the ATCT. The location is beneficial due to the solar panels' minimum height, precluding intercepting the ATCT line of sight. The existing electric poles in the area will need to be removed.

2.3.6 Roadway System

Alternate 1 has some roadway design elements that are specific to this development option.

2.3.6.1 Parking Lot Access

Under Alternate 1, each parking lot has a separate road leading to each lot. This eliminates traffic from driving inside the parking area. A separate connection into each lot was provided to give a sense of private access to each hangar or building.

2.3.6.2 Logistics Center

- The logistics center access incorporates a 50-foot turn radius to accommodate WB-50 Semi tractor trailer operations.
- The parking area and loading/unloading docks have a lane spaced 80 feet wide to allow the WB-50 Semi to back into each loading dock or parking space.

2.3.6.3 Main Road

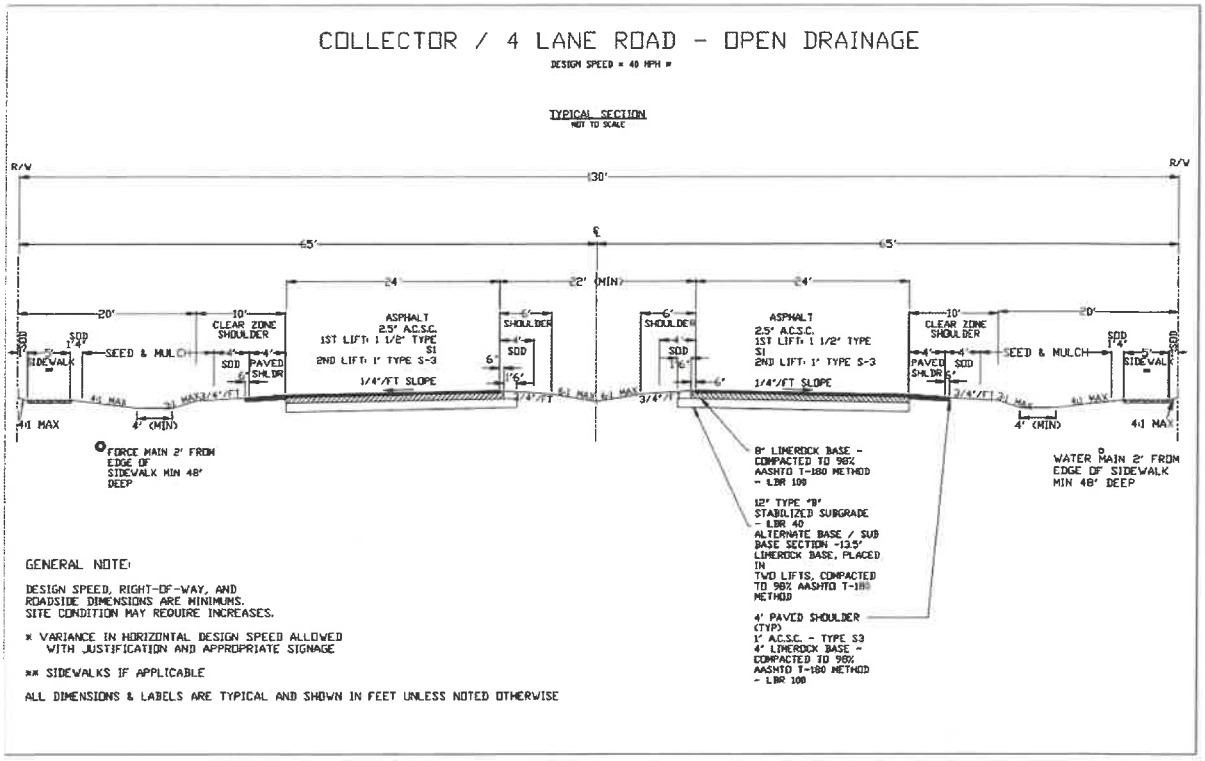
Alternative 1, incorporates a two-way 4-lane divided roadway with roundabout access to the midfield area and includes the following characteristics:

- Nestled in the middle of the logistics center and corporate hangars, a two-way 4-lane divided roadway is proposed with a roundabout at each intersection leading to vehicle parking areas.
- This design maintains smooth traffic flow without the need for traffic signals.
- The divided road allows for landscaping options to increase the scenic value of the road.

- The center of the roundabout also provides landscaping opportunities with scenic value.

The 4-lane design depicted in **Figure 2-3** follows the typical road section from the Hernando County, Facility Design Guidelines, Section III.

Figure 2-3: Typical Section - 4 Lane Road



Source: Hernando County, Facility Design Guidelines, Section III

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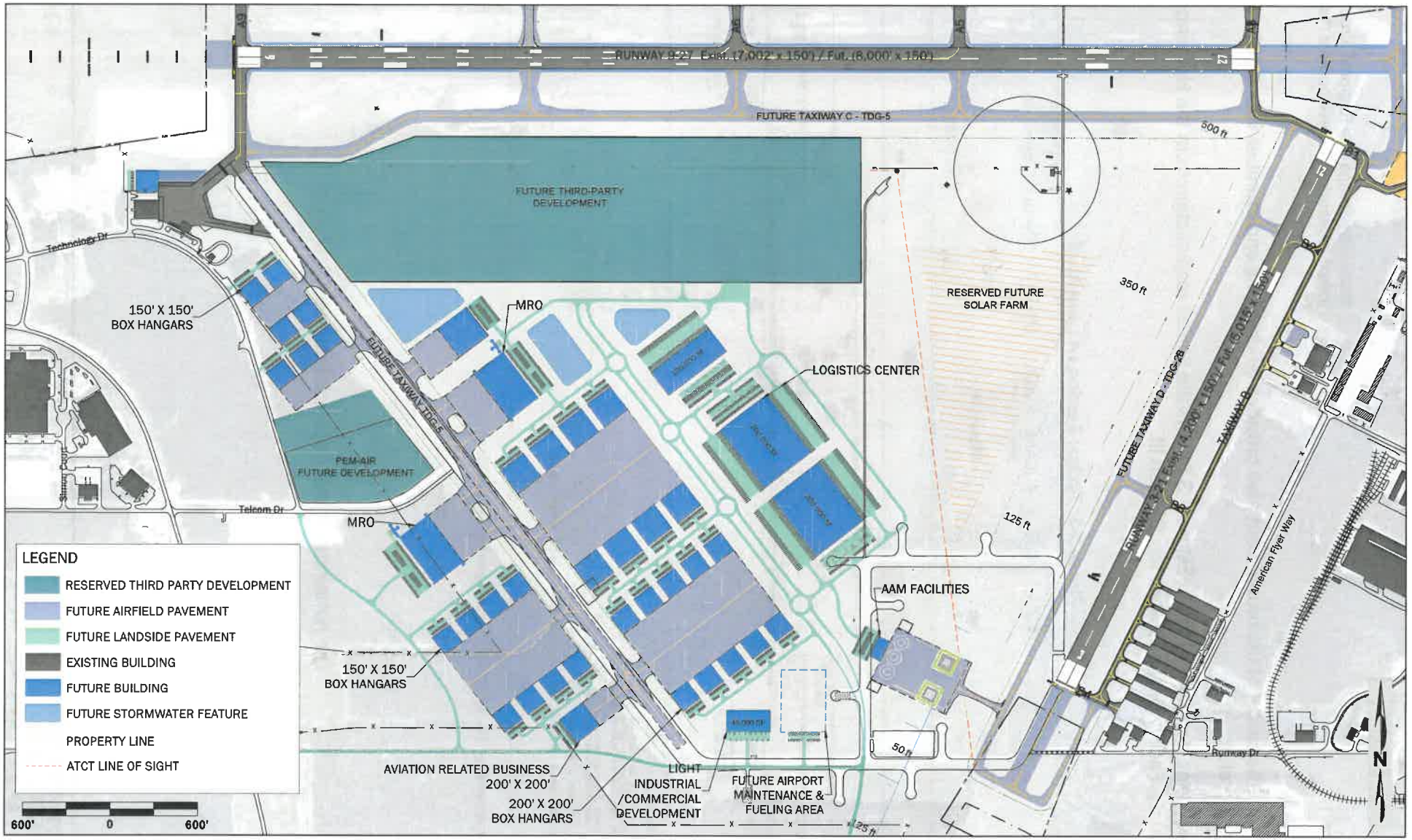

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Alternative 1

Figure 2-4

2.4 Alternative 2

2.4.1 Third-Party development

Alternative 2 incorporates an 86-acre parcel that includes 200,000 square feet of cargo and distribution facilities with ample truck loading and unloading area on the land side, and a cargo apron capable of accommodating six Boeing 757-200 aircraft parking positions, as shown in **Figure 2-5.**

The development also includes 4 MRO hangars next to each other that can accommodate up to an Airbus A320. The area provides adequate apron space in front of each hangar and is connected to Runway 9-27 via future Taxiway C.

In the infield's northwest corner, the third-party developer's proposed development includes a cluster of private hangars to accommodate aircraft like the Gulfstream G650. The proposed facilities also include a vehicular parking lot, truck loading and unloading area, and stormwater storage capacity.

The Pem Air development is proposed in the 9-acre parcel located at the intersection of Technology Drive and Telcom Drive. Pem Air is currently constructing an engine maintenance facility and expects to expand their operation towards the 4-acre parcel to the north.

The Pem Air facility includes a 50,000-square-foot building, paved areas for vehicular parking and equipment storage. The facilities do not have airside access, and landside access will be provided via Telcom Drive and Technology Drive.

2.4.2 Aviation Related Development

Alternative 2 proposes aviation business development on the west side of the future taxiway, including an MRO facility next to the Pem Air development. Two hangars are proposed south Telcom Drive, a 250' x 250' hangar, and a 250' x 400' hangar (capable of accommodating two Boeing 767 aircraft).

In the infield, Alternative 2 includes a cluster of ten 150' x 150' hangars, and four 200' x 200' hangars, each with aprons and taxilane access to the future taxiway. Alternative 2 offers in total 14 150' x 150' hangars, four 200' x 200' hangars, two 250' x 250' hangars and two 250' x 400' hangars. In addition, Alternative 2 recommends reserving an area next to the future Taxiway D to develop aircraft storage facilities for ADG-I aircraft. This future development should evaluate any impact the proposed hangars may have on the ATCT line of sight over Taxiway D and Runway 3-21.

This alternative incorporates the development of a 150' x 150' box hangar near the end of Runway 9 as proposed in the BKV MPU.

2.4.3 Advanced Air Mobility

Similar to the previous alternative, Alternative 2 proposes the development of an AAM facility in the southern portion of the Infield Development Area. In this case, the two FATOs are aligned with Runway 9-27, as described in Section 2.3.3. The FATOs should protect the approach and transitional surfaces.

The AAM facilities proposed in Alternative 2 include a potential terminal for passenger transportation and, on the other side of the TLOF, additional parking positions and buildings that could be used for AAM maintenance or training. Associated access and vehicular parking is provided.

Facilities are planned based on the requirements and standards described in Section 2.2.3.2.

2.4.4 Non-aeronautical Development

Alternative 2 includes a logistics center located south of the proposed air cargo distribution facilities. Its proximity to the proposed cargo facilities supports the creation of approximately 400,000 square feet of distribution space that can be managed by a single company or subdivided into several businesses. Vehicular parking and truck docking facilities for loading and unloading are provided on both sides of the proposed facilities.

2.4.5 Other Support Facilities

Alternative 2 also reserves approximately 16 acres for a future solar farm between the proposed hangars and the logistics center. As an option, the location can also be used for stormwater management, and floating solar panels can be located on top of the retention pond, as described in Section 2.2.3.6.

This development option also preserves the BKV MPU recommendation to develop an airport maintenance and fueling facility in the southern portion of the infield area. The development of this facility should be carefully coordinated with the establishment of the proposed AAM facility to the west to avoid potential airspace impacts.

2.4.6 Roadway System

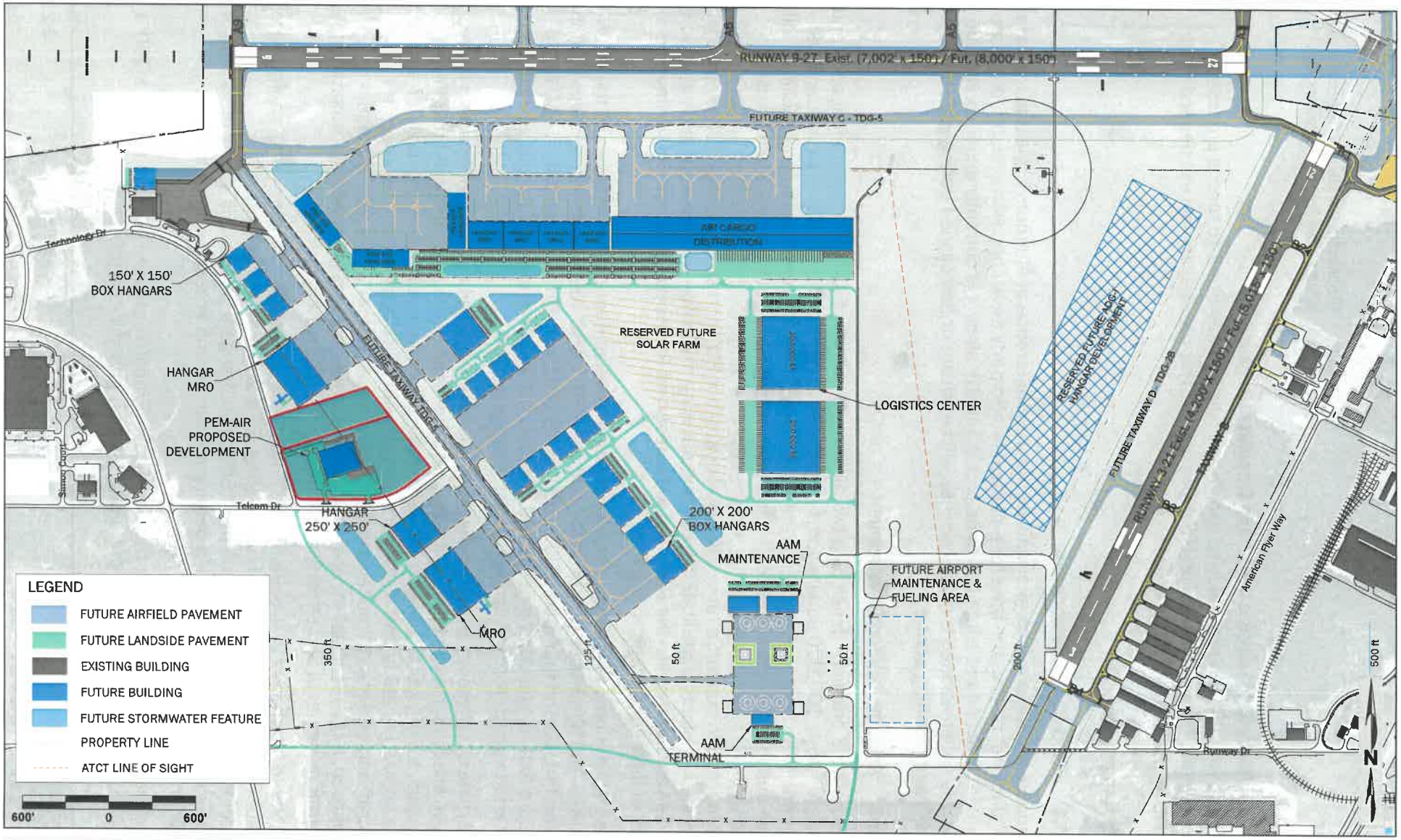
Alternate 2 differs from Alternate 1 as it is more compact and requires a smaller roadway network.

2.4.6.1 Parking Lot Access

For Alternate 2, each parking lot was created with a separate access road which reduces the potential for accidents by diverting through traffic outside the parking areas. The parking lots in this option are all connected with separate access points between each lot.

2.4.6.2 Logistics Center

- The logistics center access incorporates a 50-foot turn radius to accommodate WB-50 Semi tractor trailer operations.
- The parking area and loading/unloading docks have a lane spaced 80 feet wide to allow the WB-50 Semi to back into each loading dock or parking space.
- The logistics center is aligned with the existing ATCT access road running north and south.



Michael Baker INTERNATIONAL

Alternative 2

Figure 2-5

2.4.6.3 Roadway to Logistics Center and Corporate Hangars

To keep with the minimal roadway design, a single two-way frontage road is proposed between the hangar complex and logistics center. This provides the access needed while reducing the need for additional roads.

2.5 Alternative 3

2.5.1 Third-Party Development

Compared to the previous alternatives, the main difference of Alternative 3 is that the Infield IDP does not reserve the area for a particular third-party developer. However, the proposed Pem Air development continues to be part of the IDP since it is currently under construction, and it is not envisioned that the facilities will be vacant or demolished during this study's 10 to 20-year planning period.

2.5.2 Aviation Related Development

Alternative 3 proposes developing two air cargo buildings of 105,000 square feet each and approximately 100,000 square yards of apron to accommodate 6 ADG-IV aircraft and GSE storage in the northwest corner of the Infield Development Area. The air cargo facilities will have enough landside space to accommodate associated truck loading and unloading operations and vehicular parking. On the east side of the cargo facilities, an additional apron is proposed to support a future 60,000-square-foot FBO and six box hangars. The apron will include a taxilane to facilitate aircraft maneuvering and power in/power out parking of up to ADG-III aircraft. Next to the FBO, a space is reserved for support services like fueling and GSE equipment storage, if required.

Alternative 3 proposes accommodating hangar development on the west side of the future taxiway. The alternative proposed to build five 150' x 150' hangars on the northern portion of the taxiway and four more 200' x 200' south of Telcom Drive. In addition, a 130,000-square-foot hangar can be developed in support of aviation-related business activities or divided to accommodate various aircraft storage options.

Alternative 3 presents an opportunity to group aviation technical services around a shared apron space on the east side of the taxiway. The facilities can accommodate four large hangars; a 260' x 500' hangar/offices capable of accommodating two Boeing 777 aircraft. The second hangar is 250' x 400' in size, also with office space where two Boeing 767 aircraft can be served simultaneously. Finally, two additional 250' x 250' hangars are proposed in the technical service area. Additional apron space is provided to accommodate aircraft movements and parking of aircraft in front of the hangars.

Similar to Alternative 2, this alternative proposes a box hangar complex with a shared apron space for aircraft parking and maneuvering. Four 200' x 200' hangars can be accommodated on one side, and five 150' x 150' hangars can be built on the other side of the apron. All hangars will have a parking lot with ground access as described in Section 2.5.6.

Like the other two alternatives, this Alternative 3 incorporates the development of a 150' x 150' box hangar near the end of Runway 9 as proposed in the BKV MPU.

Alternative 3 also reserves a space to develop T-hangars on the east side of Runway 3-21. This hangar development is not envisioned to be required during the 20-year planning period of the Infield IDP; however, at the time the T-hangars are needed, the design should evaluate potential line of sight impacts to future Taxiway D and Runway 3-21. **Figure 2-6** also depicts the proposed access road to the future T-hangars.

2.5.3 Advanced Air Mobility

Alternative 3 differs from the other options by not providing a dedicated landing area for the AAM facilities. This alternative recommends constructing an apron west of the extended end of Runway 3 with three spaces for eVTOL parking, loading and unloading of passengers or cargo, and a terminal building. However, eVTOL takeoff and landing operations under this development option will be performed via Runway 3-21. The apron will be connected with the existing and future runway ends. **Figure 2-6** displays a taxiway connection to the existing runway end and a second connector will be incorporated once the runway shift is completed.

2.5.4 Non-aeronautical Development

Alternative 3 incorporates three potential buildings that can be used to support logistics or distribution activities. Each of the three 200,000-square-foot buildings provide a docking and waiting area for trucks and a separate vehicular parking lot. The buildings are located in the middle of the infield development area that does not provide airside access. Four additional buildings are proposed for industrial or light industrial use. Each building has an area of 45,000 square feet and vehicular parking is provided.

2.5.5 Other Support Facilities

The third alternative maintains a future airport maintenance and fueling area similar to the one proposed in the BKV MPU. However, the configuration is rotated in an east/west orientation to better accommodate the proposed AAM facilities. There is also space set aside near the proposed FBO for future fuel or GSE storage, as dictated by future demand. Additionally, a 28-acre solar farm development is proposed outside of the Infield Development Area. It is proposed south of the future access road that will extend east from Dispense Road into the Infield Development Area.

2.5.6 Roadway system

Alternate 3 differs from Alternate 2 by providing area for additional T-hangar development parallel to Runway 3-21 and additional light Industrial/commercial development opportunities.

2.5.6.1 Parking Lot Access

Similar to Alternative 2, each parking lot was created with a separate access road which reduces the potential for accidents by diverting through traffic outside the parking areas. The parking lots in this option are all connected with separate access points between each lot.

2.5.6.2 Logistics Center

- The logistics center access incorporates a 50-foot turn radius to accommodate WB-50 Semi tractor trailer operations.
- The parking area and loading/unloading docks have a lane spaced 80 feet wide to allow the WB-50 Semi to back into each loading dock or parking space.
- The logistics center is aligned with the existing ATCT access road running north and south.

2.5.6.3 Roadway to Logistics Center and Corporate Hangars

A north and south running road following the alignment of the existing ATCT access road was created to give full access to the corporate hangars and logistics center facilities. Also, a roundabout is included to better facilitate the flow of traffic between various sections of the infield development area.

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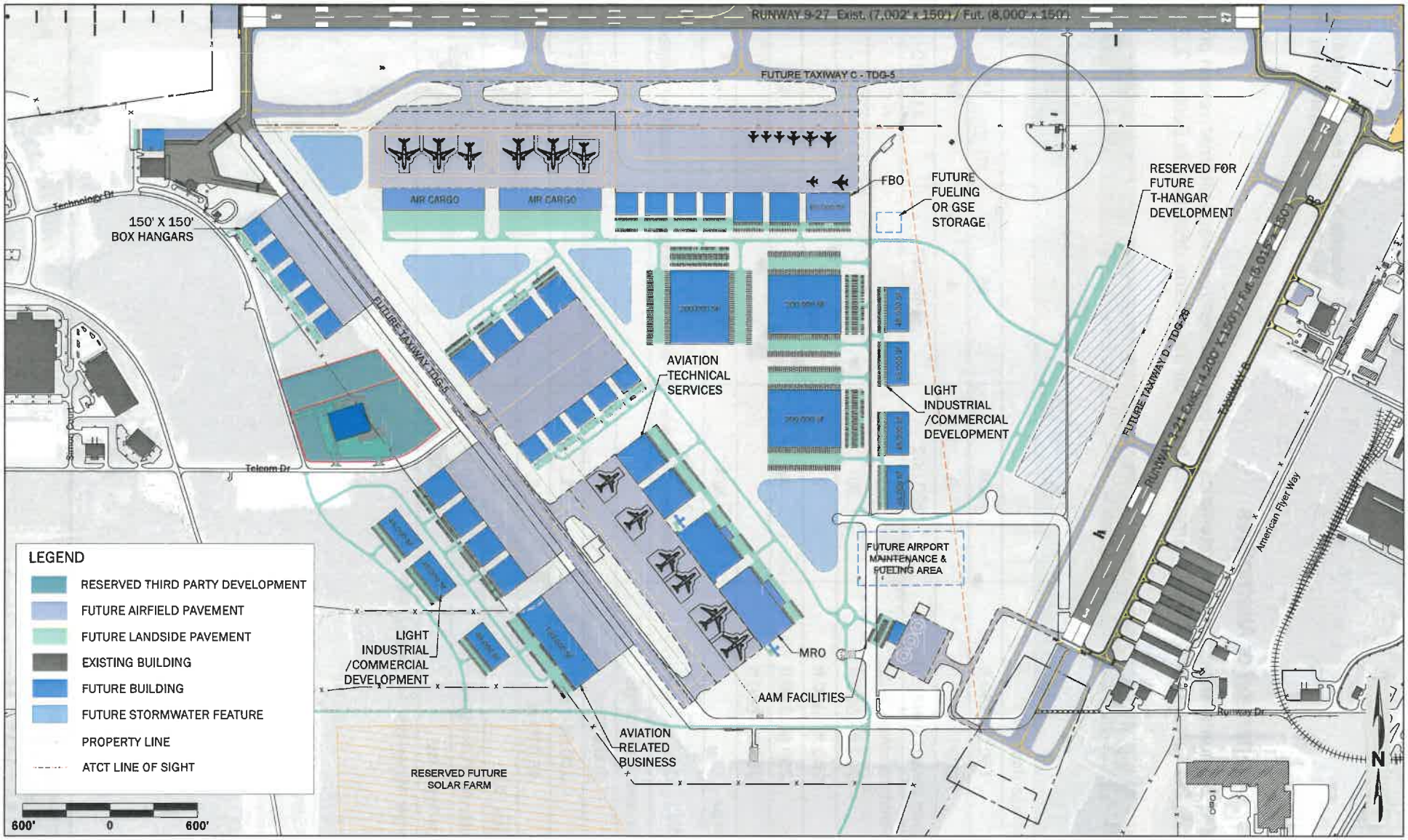
2.6 Comparison of Alternatives

Table 2-3 summarizes the characteristics and potential features each alternative can offer; **Table 2-4** compares the three alternatives based on the criteria described in Section 2.2.1

Table 2-3: Development Alternatives			
Facilities	**Alternative**		
	1	2	3
Storage Hangars			
150 ft x 150 ft	26	14	15
200 ft x 200 ft	8	4	10
Apron Development (sy)	220,502	140,847	414,410
Aviation Business Hangars			
260 ft x 500 ft	0		1
250 ft x 400 ft	2	2	1
250 ft x 250 ft	1	2	2
200 ft x 650 ft			
Cargo	N/A	Third party	Yes
AAM	2 FATOs 3 Parking Positions	2 FATOs 6 parking positions	3 parking positions
Non-aviation Facilities			
200,000 sf	2	2	3
100,000 sf	1	0	0
45,000 sf	2	0	7
Solar Farm	29	16	29
Vehicular Parking (sy)	151,644	89,942	189,115
Roadways (sy)	62,428	64,709	73,213

Source: Michael Baker International, 2023



Michael Baker INTERNATIONAL

Alternative 3

Figure 2-6

Table 2-4: Alternatives Evaluation Matrix			
Criteria	**Alternative**		
	1	**2**	**3**
Achievement of Objective	Yes	Yes	Yes
Airport Design Standards	Yes	Yes	Yes
Flexibility	Good	Good	Good
Collateral Impacts	Good	Good	Fair
Probable Cost	To be determined in conjunction with the preferred alternative.		
Efficiency of Construction Phasing	Good	Good	Fair
Environmental Compatibility	Good	Good	Good

Source: Michael Baker International, 2023

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3 REFINEMENT OF THE INFIELD DEVELOPMENT AREA

The three alternatives presented in Chapter 2 were presented in an alternatives workshop to evaluate and analyze the pros and cons of each alternative. A combination of the proposed infield development improvements results in the preferred development due to its capabilities, capacity, and implementation benefits. The preferred development option maximizes future landside development and airport revenue generating opportunities for the economic growth of Hernando County. The preferred development presented in this section incorporates the input from members of the Working Group.

The refinement process incorporated the recommendations and future airside development proposed in the 2018 BKV Master Plan Update. After the refinement process the potential environmental impacts and action plan is presented in this chapter, following the recommended drainage and utility improvements presented in Chapters 4 and 5. A more detailed list of capital improvement projects is summarized in Chapter 6. The refined infield development alternative will ultimately be utilized by the County as the foundation for updating the BKV Airport Layout Plan drawing set.

The preferred development includes:

- Third-party aeronautical development (MRO, air cargo, etc.)
- New corporate hangar development
- Reserved areas for future T-hangar development
- Future apron expansion
- Light industrial and commercial development
- New roadway access to the infield
- Security improvements
- Potential for Advanced Air Mobility facilities

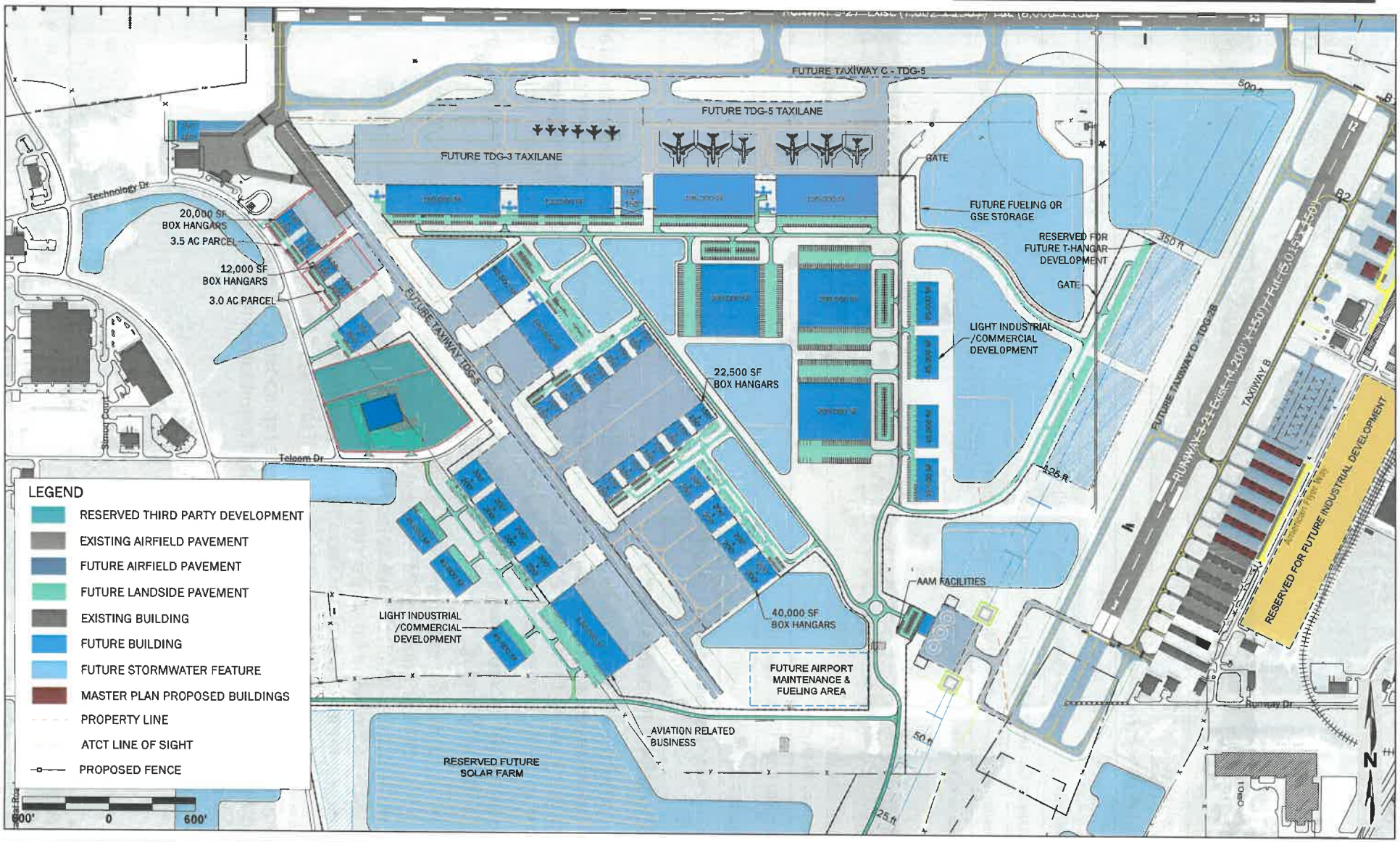
The preferred development is depicted in **Figure 3-1.**

3.1 Design Standards

The preferred development complies with the FAA runway design standards published in AC 150/5300-13B, Airport Design. The airport's primary runway, Runway 9-27, currently has a Runway Design Code (RDC) classification of C-IV; however, it is expected that Runway 9-27 will be extended to 8,000 feet in the future and have an RDC classification of D-IV capable of accommodating the Boeing 757 or a similar aircraft as its critical aircraft. Most of the existing taxiways serving Runway 9-27 follow the FAA taxiway design standards for Taxiway Design Group 5 (TDG-5).

Therefore, the preferred development considers the ability of the primary runway to accommodate the existing and future fleet mix and preserve safety areas for RDC (AAC and ADG) D-IV and TDG-5.

Tables 3-1 and **3-2** summarize the design standards associated with the preferred development proposed for BKV.



Michael Baker INTERNATIONAL

Preferred Development

Figure 3-1

Table 3-1: Taxiway Design Standard based on ADG IV	
Item	**Design Standard**
Taxiway Safety Area (TSA)	171 ft
Taxiway Object Free Area (TOFA)	243 ft
Taxilane Object Free Area (TLOFA)	224 ft
Taxiway Centerline to Parallel Taxiway/Taxilane Centerline	207 ft
Taxiway Centerline to Fixed or Movable Object	121.5 ft
Taxilane Centerline to Parallel Taxilane Centerline	197.5 ft

Source: FAA AC 150/5300-13B. Table 4-1

Table 3-2: Taxiway Design Standard based on TDG 5	
Item	**Design Standard**
Taxiway Width	75 ft
Taxiway Edge Safety Margin	14 ft
Taxiway Shoulder Width	30 ft

Source: FAA AC 150/5300-13B, Airport Design. Table 4-2

3.2 Airfield Improvements

The preferred infield development aligns with the master plan objective of separating traffic on the airport by aircraft classification, where the development on the east side of the airport and along Runway 3-21 will be focused on providing facilities for small and medium sized aircraft, and the west side will be focused on providing facilities for larger aircraft.

The Infield IDP incorporates the Master Plan's recommended airside improvements, including the following:

- Extension of Runway 9-27 to the east to a total runway length of 8,000 feet
- Shift of Runway 3-21 815 feet to the south
- Construction of paved blast pads and shoulders for Runway 9-27 and the associated taxiway system
- Construction of Taxiway C, parallel taxiway to Runway 9-27
- Construction of Taxiway D, parallel taxiway to Runway 3-21

The proposed infield development proposes repurposing the abandoned runway as a new TDG-5 taxiway to enable the development of aeronautical facilities with connecting access to Runway 9-27.

3.3 Aviation-Related Development

One of the premises for selecting the preferred development was creating a platform to boost new employment and increase airport business, generating economic growth for Hernando County and the region.

The preferred development concept is flexible in the type of facilities that could be offered for future development, including aircraft storage, maintenance, avionics, and other aviation-related businesses. In addition, the concept provides spaces for logistics, commerce, and light industrial business. The preferred development is an example of what the airport can develop in the infield area by prioritizing aviation-related businesses. However, the intent of the study is to identify the improvements the airport needs to implement in terms of airfield infrastructure, utilities, drainage, and roadways to unlock the area's airside and landside development potential. It is anticipated that the landside development shown will be driven by the market demand and developed by third-party interests.

As shown in the three alternatives presented in Chapter 2, the areas adjacent to the new taxiway will be reserved for aviation-related development uses due to convenient access to the airfield. These types of facilities include aircraft storage, corporate aviation, maintenance, avionics, medical, and flight training.

The layout depicted in **Figure 3-1** illustrates the potential aeronautical facilities that could be accommodated in the infield area.

The proposed layout encompasses a group of box hangars (each ranging from 12,000 to 20,000 square feet in size) located northeast on the new taxiway, each with adjacent apron space. Three additional clusters of hangars are proposed in the middle of the airfield. The first offers a shared apron capable of accommodating ten 150-foot by 150-foot box hangars. Landside access to these hangars will be provided from the south to the infield area via the new roadway development.

In addition, four 200-foot by 200-foot hangars are proposed east of the new taxiway. The hangars will be served by a shared taxilane with adjacent apron space in front of each hangar. Private vehicle access and parking will be provided. These facilities are best suited for developing aviation-related business opportunities due to their proximity and accessibility to airfield facilities.

On the west side of the taxiway, four additional 200-foot by 200-foot hangars are proposed. Compared to the previously mentioned hangar development, only individual apron areas are provided in front of each hangar, thus requiring aircraft maneuvering via the taxiway constructed on the abandoned runway.

The preferred infield development also proposes four hangars of varying sizes (40,000 square feet, 62,500 square feet, 100,000 square feet, and 130,000 square feet) along the new taxiway. The hangars include a similar sized apron area in front of each facility. Private vehicle access and parking will be provided. These hangars are best suited for a variety of aviation-related business activities, such as MROs, corporate aviation, and avionics.

On the north side of the Infield Area, the preferred development includes the construction of two aprons connecting with the future Taxiway C. One of the aprons has an area of 91,800

square feet and is best suited for corporate aviation activities, including aircraft storage and/or FBO services. This apron will be suitable for accommodating movements of ADG-III aircraft like the Gulf Stream G650. The apron will include TDG-3 taxilane and aircraft parking areas in the middle of the apron and in front of the hangar areas.

Three different sizes of hangars are proposed in this area to store jet aircraft of various sizes in the same hangar or the option to accommodate single box hangars.

The second apron, centrally located along future Taxiway C, has an area of 69,000 square feet and can accommodate ADG-IV aircraft. This layout includes two hangars that could be used for aircraft storage, cargo, or aircraft maintenance activities. Vehicular access will be provided via a proposed infield road and associated parking will be included.

The Preferred Development also recommends reserving approximately 13 acres east of future Taxiway D for the development of T-hangars. Airport control tower (ATCT) line of sight and a shadow analyses will be required to preclude potential impacts to future aircraft operations on Runway 3-21 and Taxiway D.

3.4 Advanced Air Mobility Facilities

The preferred alternative combines the Advanced Air Mobility (AAM) facility concepts proposed in Alternatives 1 and 3. AAM facilities will be located south of the infield area, connecting with the end of Runway 3. The AAM development includes a taxiway system to connect the AAM apron area with Runway 3-21. In addition, the apron has two designated Touchdown and Lift-off areas (TLOF) and FATOs aligned with Runway 3-21. This way, Electric Vertical Take-off and Landing Aircraft (EVTOL) can use the runway as required in the early stages of its development or if the Final Approach and Takeoff (FATO) areas are unavailable.

As detailed in Chapter 2, the FATO's approach/departure surface is centered on each approach/departure path. The approach/departure path starts at the outer edge of the FATO and extends upward at a slope of 8:1 for 4,000 feet, where the width is 500 feet at a height of 500 feet above the airport elevation as defined by FAA Engineering Brief (EB) No. 105, Vertiport Design.

As depicted in **Figure 3-1**, the transitional surfaces start from the edges of the FATO parallel to the flight path centerline and from the outer edges of the 8:1 approach/departure surface and extend outwards at a slope of 2:1 for 250 feet from the centerline. The transitional surfaces extend longitudinally from the edge of the FATO to the far end of the approach/departure surface.

The preferred layout for the AAM facilities incorporates three parking positions for loading/unloading passengers or cargo as required. Vehicular access to the terminal building will be provided via a new road south of the airfield, and associated parking will be included.

Future expansion of the facilities can be accommodated as demand dictates. The facilities should include charging and cooling stations, HazMat storage, lockers/storage for batteries, fire suppression for battery fires, and fire management services.

3.5 Non-Aeronautical Development

Portions of the Infield Development area that would not have direct access to the airfield are considered unsuitable for aeronautical use. Therefore, other non-aeronautic uses that are compatible with airport activities could be implemented to support economic development opportunities that would enhance the revenue generating potential of the airport. As evaluated by the most recent update of the BKV Airport Master Plan, it is anticipated that those areas will attract industrial and corporate businesses and industries incentivized by their proximity to the airport.

The Preferred Development incorporates three 200,000 square foot buildings that could be used by the same tenant or subdivided for different tenants/uses. These buildings have the ability to integrate truck loading docks, making them desirable for logistics or distribution centers. The facilities also include waiting areas for trucks and separate vehicular parking facilities.

Four additional 45,000 square foot buildings are proposed in the center of the infield area. These buildings could be used for corporate facilities, offices, and light industrial or commercial developments.

The areas identified outside the infield can also accommodate light industrial or commercial developments in line with the Master Plan proposal to develop industrial facilities west of the airfield.

3.6 Other Support Facilities

The Preferred Development also reserves approximately 7 acres south of the infield area to develop Airport Maintenance Facilities. As described in the BKV Master Plan, the future facility should have a fueling station capable of providing an on-site supply of unleaded and diesel fuel for airport vehicles and equipment versus traveling off-site to the Hernando County fueling facility.

The Preferred Development also reserves one acre north of the infield area adjacent to the ATCT Access Road to accommodate future fueling facilities and Ground Support Equipment (GSE) storage. A reserved area to develop a solar farm is also proposed in the southwest corner of the airfield, south of Dispense Lane. The 28-acre area could be used for anticipated drainage improvements while accommodating solar panels as part of a floating system over the drainage retention pond.

3.7 Roadway System and Security Considerations

The Preferred Development of the Infield Area includes the roadway access improvements considered in the three alternatives presented in Chapter 2. Access to/from the west of the airport will be provided by extending Airport Boulevard eastward from its intersection with Corporate Boulevard to the ATCT Access Road. In addition, a new road extending to the north from Sergeant Lea Mills Boulevard is proposed west of Runway 3. Both proposed alignments will intercept and create the main entrance to the Infield Development Area.

The main infield development road will extend north to a roundabout that will facilitate access to three roads leading to the different areas of the infield development.

The first exit to the east will connect with the AAM facilities. The second exit to the north will provide access to the west portion of the infield area where the future T-hangar development or continue north to connect with the proposed non-aeronautical development and onward to the ATCT. The third exit to the west will facilitate access to the different hangar clusters and aviation-related facilities. This road will also connect with a future road that runs parallel to Runway 9-27 and provides access to the aviation-related development proposed south of future Taxiway C.

The roadway network will be constructed in phases to access each development area as demand dictates. The road network will provide two-lane access throughout the site following the design considerations detailed in Section 3.7.1.1 and Hernando County Facility Design Guidelines. However, additional traffic studies may be required in the future to determine if turn lanes or improved intersections are needed to support the proposed development areas. The roadway right-of-way used was 50 feet per frontage road section with a design speed per section of 30 MPH. All buildings and parking lots proposed in the Preferred Development should be placed outside the right of way. The sidewalks are not shown in the Preferred Development. However, at least one sidewalk on either side of the road should be included during the design phase.

3.7.1 Vehicle Parking Areas

The Preferred Development considers that each facility should have a vehicle parking area adjacent to the building that follows local design standards and regulations. Each tenant will have their own designated vehicle parking area to be developed along with the building/hangar and in coordination with the airport's required standards.

The parking layout recommended for most of the parking lots provides separate access to each lot; except in cases where the space is constrained. In such cases, all parking lot sections have a common entry and are connected to each other by an internal road.

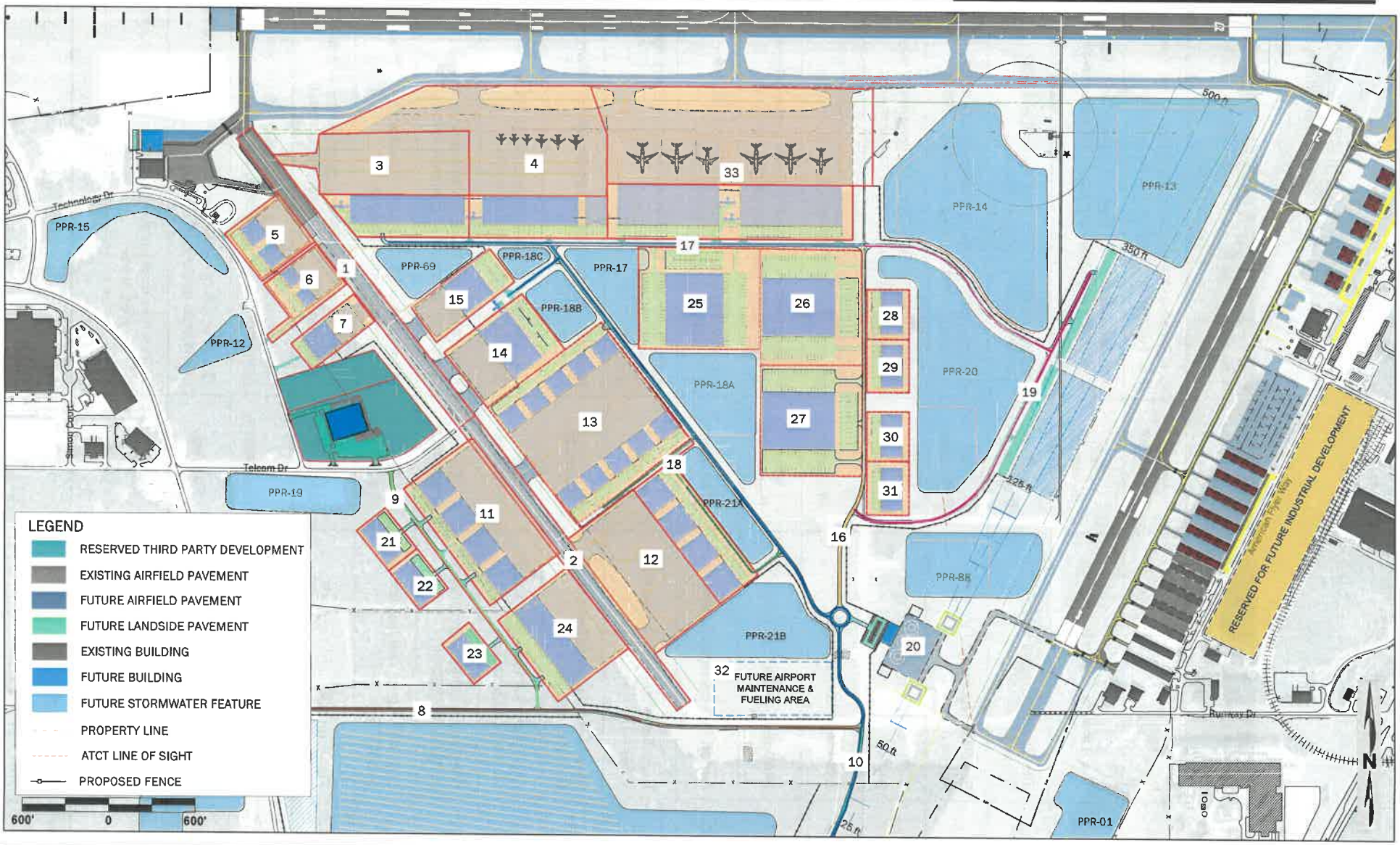
3.7.2 Fencing and Security

As the road network is developed and new facilities are built, each tenant will be required to implement a fencing project as part of its facilities to keep the airside secure and prevent incursions. In addition, the airport must implement secured gates to control the ingress/egress of authorized personnel to critical facilities like ATCT, electrical vault, aprons, fuel, and maintenance facilities. **Figure 3-1** shows the potential location of the future fence line to maintain safe operations at the airport.

3.8 Summary of Capital Improvement Projects

The Preferred Development has been divided into different capital improvement projects listed in **Table 3-3** and depicted in **Figure 3-2**. As mentioned previously, the Preferred Development concept is flexible in implementing landside developments, and the project list only includes the necessary improvements in support of pad-ready sites. The following list does not reflect any prioritization or year of implementation for each proposed project.

Chapter 7 will provide a more detailed implementation plan and the estimated cost of executing the BKV Infield Development Plan.



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Infield Development Plan Projects

Figure 3-2

Table 3-3: Projects List			
No	**Project Name**	**Type**	**Description**
1	New Taxiway Phase I	Airfield Pavement	Convert abandoned runway to taxiway from Taxiway C to Telcom Dr. Includes Paved Shoulders.
2	New Taxiway Phase II	Airfield Pavement	Convert abandoned runway to taxiway from Telcom Dr. to the infield southern point. Includes Paved Shoulders.
3	Site-Prep Northwest Infield - Phase I	Site Preparation	Prepare area for future development of apron, connectors, and hangars, Phase I
4	Site-Prep Northwest Infield - Phase II	Site Preparation	Prepare area for future development of apron, connectors, and hangars, Phase II.
5	Site-Prep Northwest (3.5 AC parcel)	Site Preparation	Prepare area for third-party development of two hangars on 20,000 SF apron and connector.
6	Site-Prep (3.0 AC parcel)	Site Preparation	Prepare area for third-party development of two hangars on 12,000 SF apron and connector.
7	Site-Prep (40,000 SF Hangar)	Site Preparation	Prepare area for third-party development of one hangar on 40,000 SF apron and connector.
8	Airport Service Road Extension	Roadway	Improve and extend Airport Service Road from Corporate Blvd. to the Infield area.
9	Road Development - South of Telcom Dr.	Roadway	Build roads west to the infield area to access light industrial and commercial development from Telcom Dr. to Airport Service Road.
10	Road from Sergeant Lea Mills Blvd to Infield Area	Roadway	Construct a Road from Sergeant Lea Mills Blvd. to the infield area.
11	Site-Prep southwest apron and hangars (40,000 SF)	Site Preparation	Prepare area for future development of four 200'x200' hangars and common apron.
12	Site-Prep southeast apron and hangars (40,000 SF)	Site Preparation	Prepare area for future development of four 200'x200' hangars and common apron.
13	Site-Prep Apron and hangars (22,500 SF)	Site Preparation	Prepare area for future development of ten 150'x150' hangars and common apron.
14	Site-Prep MRO (100,000 SF)	Site Preparation	Prepare area for third-party development of one hangar on 100,000 sf apron and connector.
15	Site-Prep MRO (62,500 SF)	Site Preparation	Prepare area for third-party development of one hangar on 62,500 sf apron and connector.
16	Road development south-north Infield Area	Roadway	Construction of a road from the southern point of the infield area to the ATCT.
17	Road development east-west Infield Area	Roadway	Build a new road parallel to Runway 9-27 to access future apron areas.

Table 3-3: Projects List			
No	**Project Name**	**Type**	**Description**
18	Road development parallel to the new taxiway	Roadway	New road parallel to the new taxiway to provide access to aeronautical use development (Hangar, MRO).
19	Road Development to enable future T-hangar developments	Roadway	Infield area road to connect with future T-hangar development.
20	AAM Facilities	Airfield Pavement	Include construction of TLOF, apron, and taxiway connectors. It does not include buildings.
21	Site-Prep Industrial Development West Side	Site Preparation	Prepare an area for third-party development of light industrial or commercial facilities and parking.
22	Site-Prep Industrial Development West Side	Site Preparation	Prepare an area for third-party development of light industrial or commercial facilities and parking.
23	Site-Prep Industrial Development West Side	Site Preparation	Prepare an area for third-party development of light industrial or commercial facilities and parking.
24	Site-Prep Southwest Hangar (130,000 SF)	Site Preparation	Prepare area for third-party development of one hangar on 130,000 sf apron and connector.
25	Site-Prep Industrial Development Infield	Site Preparation	Prepare an area for third-party logistics development, light industrial or commercial facilities, and parking.
26	Site-Prep Industrial Development Infield	Site Preparation	Prepare an area for third-party logistics development, light industrial or commercial facilities, and parking.
27	Site-Prep Industrial Development Infield	Site Preparation	Prepare an area for third-party logistics development, light industrial or commercial facilities, and parking.
28	Site-Prep Light industrial development West Side	Site Preparation	Prepare an area for third-party development of light industrial or commercial facilities and parking.
29	Site-Prep Light industrial development West Side	Site Preparation	Prepare an area for third-party development of light industrial or commercial facilities and parking.
30	Site-Prep Light industrial development West Side	Site Preparation	Prepare an area for third-party development of light industrial or commercial facilities and parking.
31	Site-Prep Light industrial development West Side	Site Preparation	Prepare an area for third-party development of light industrial or commercial facilities and parking.
32	Airport Maintenance & Fueling Facility	Others	New facility in the south of the airfield.
PPR	Stormwater Improvements	Drainage	Includes 16 new retention ponds.

3.9 Environmental Overview

This chapter provides general background information from an environmental perspective in the Infield Development Area. The environmental overview includes applicable categories outlined in accordance with FAA Order 1050.1F, Environmental Impacts: Policies and Procedures, as well as identifying any potential environmental impacts that could be expected.

3.9.1 Potential environmental impacts to natural resources

3.9.1.1 Air Quality

Based on the Clean Air Act, National Ambient Air Quality Standards (NAAQS) are applicable to all areas of the United States. Construction activities (e.g., demolition and excavation) will result in minor temporary air quality impacts (fugitive dust). No long-term deleterious air quality impacts are anticipated.

3.9.1.2 Threatened and Endangered Species

Under Section 7 of the Endangered Species Act of 1973, as amended, habitats at BKV were evaluated with respect to suitability for federal- and state-protected species. A list of federally protected species with potential to occur on or near BKV's Infield area was generated from the U.S. Fish and Wildlife Service (USFWS) Information for Planning and Consultation (IPaC) website on March 7, 2024. Species from the IPaC list and the Natural Heritage list were evaluated with respect to habitat requirements and those with potential to occur in the habitats on and near BKV are listed in **Table 3-4**, below.

Table 3-4: Potential Federal and State Protected Species in Vicinity of AEX

Scientific Name	Common Name	Federal Status	State Status
Laterallus jamaicensis ssp. jamaicensis	Eastern Black Rail	Threatened	Federally-designated Threatened (FT)
Rostrhamus sociabilis plumbeus	Everglade Snail Kite	Endangered	Federally-designated Endangered (FE)
Grus americana	Whooping Crane	EXPN	Federal Non-Essential Experimental Population (FXN)
Drymarchon couperi	Eastern Indigo Snake	Threatened	Federally-designated Threatened (FT)
Caretta caretta	Alligator Snapping Turtle	Threatened	State-designated Threatened (ST)
Margaritifera hembeli	Loggerhead Sea Turtle	Threatened	Federally-designated Threatened (FT)
Danaus plexippus	Monarch Butterfly	Candidate	

Sources: IPaC list generated for BKV property on March 7, 2024, and Florida's Official Endangered and Threatened Species List December 2022.

Note: EXPN - Experimental Population, Non-Essential

3.9.1.3 Historical, Architectural, Archaeological, and Cultural Resources

The National Historic Preservation Act of 1966 and the Archaeological and Historic Preservation Act of 1974 provide protection against development impacts that would impact the historical, architectural, archaeological, or cultural resources. The Florida Division of Historical Resources is crucial in reviewing projects and assessing their impact on historic, archaeological, and cultural resources within the state and federal laws and regulations. The National Park Service's National Register web-based map utility was used to review records of National Register of Historic Places (NRHP) listed properties that are not considered "sensitive or restricted" (such as archaeological sites) near BKV. This review indicated that there are no unrestricted NRHP-listed cultural, historical, or archaeological resources within or adjacent to AEX property. However, because the search does not include sensitive or restricted sites, sites that have yet to be discovered, or sites that may be eligible for listing but have not been officially listed to date, this review should only be preliminary.

Coordination with the Division of Historical Resources should occur to evaluate potential effects of proposed projects that are in previously undisturbed areas or that may impact buildings or landmarks that are more than 50 years of age have the potential to impact cultural resources prior to construction.

3.9.1.4 Farmland

The Farmland Protection Policy Act (FPPA) is overseen by the United States Department of Agriculture's (USDA's) Natural Resources Conservation Service (NRCS). This Act discourages Federal activities that would convert farmland to nonagricultural purposes. This includes properties with soils designated prime or unique farmland soils, soils of statewide or unique importance, and productive agricultural fields (fallow or active).

According to the NRCS Web Soil Survey farmland classification data for BKV's property (generated March 7, 2024), all the soils on BKV are classified as not prime farmland soils.[9]

3.9.1.5 Hazardous material and Solid Waste

The Resource Conservation and Recovery Act of 1976[10] (RCRA), Subtitle C, established the federal program to manage hazardous wastes from cradle to grave. Subtitle C contains guidance for hazardous waste handling entities regarding the generation, transportation, treatment, storage, or disposal of hazardous waste. The U.S. Environmental Protection Agency (USEPA) provides state and local agencies with information, guidance, policies, and regulations to help regulate community waste and enhance the environmental and economic benefits of source reduction and recycling of solid wastes. Notification of USEPA is necessary if treatment, storage, or disposal of hazardous waste is being conducted at a

[9] https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx

[10] 42 U.S.C. § 6901, "Resource Conservation and Recover Act," https://www.gpo.gov/fdsys/pkg/USCODE-2017-title42/pdf/USCODE-2017-title42-chap82-subchapI-sec6901.pdf, (March 13, 2019).

given facility to receive a USEPA Identification Number unless hazardous waste generated at the facility has been exempt.

The USEPA NEPAssist database[11] was used to obtain information regarding potential waste and hazardous material sites shown in **Figure 3-3.** According to NEPAssist, a total of 23 facilities that generate hazardous waste are located around the perimeter of BKV. All of them are very small-quantity generators or facilities for which no generator status is listed, which is likely because they either no longer generate waste or generate only a small amount. According to NEPAssist, no brownfields or Superfund sites are located at or near BKV. Only one facility is listed to generate Toxic Releases.

For planned development at the airport that may result in ground disturbance near existing facilities that handle or generate hazardous waste, it is recommended that a qualified hazardous material assessment firm be hired to investigate and determine if remediation is required before land acquisition or construction.

3.9.1.6 Environmental Justice

Project-level Environmental Justice analyses should be conducted in compliance with Executive. Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, and applicable current federal and state requirements for Federal aid transportation projects on behalf of the Federal Aviation Administration. However, it is anticipated that no Environmental Justice populations are present within the Infield Development Area. Therefore, no disproportionate impacts are anticipated for Minority Populations and Low-Income Populations.

3.9.1.7 Wetlands

Executive Order 11990[12], Protection of Wetlands, mandates that each federal agency take action to minimize the destruction, loss, or degradation of wetlands, and preserve and enhance their natural values. This Executive Order and the permitting requirements of Section 404[13] of the Clean Water Act requires a permit for impacts to Waters of the United States (including wetlands). Permit applications are submitted to the United States Army Corps of Engineers and the Florida Department of Environmental Protection Water Act Section 401 water quality certifications.

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[11] USEPA, "NEPAssist," https://nepassisttool.epa.gov/nepassist/nepamap.aspx, (March 7, 2024).

[12] National Archives, "Executive Orders: Executive Order 11990," https://www.archives.gov/federal-register/codification/executive-order/11990.html, May 24, 1977 (March 7, 2024).

[13] U.S. Environmental Protection Agency, "Section 404 of the Clean Water Act," https://www.epa.gov/cwa-404/clean-water-act-section-404 , October 6, 2016 (March 7, 2024).

The USFWS National Wetlands Inventory (NWI) Wetland Mapper[14] indicates that only one freshwater emergent wetland is present in the Infield Development Area. however, more detail information is described in the Storm Water Master Plan Update **(Appendix A)**

The locations of the mapped wetlands and surface waters are shown in **Figure 3-3.** There remains a possibility that other wetlands occur on the Infield Development Area that do not appear on the NWI mapping or that the actual extent of wetlands is less or different than depicted on the mapping. For future development, particularly in areas that have not been previously developed, it will be important to evaluate each site for the potential presence of wetlands before construction.

[14] U.S. Fish and Wildlife Service, "NWI Wetlands Mapper," https://www.fws.gov/wetlands/data/Mapper.html October 17, 2018, (March 14, 2019).

March 7, 2024

Water Dischargers (NPDES)
Water Dischargers (NPDES)
Hazardous Waste (RCRAInfo)
Hazardous Waste (RCRAInfo)
Toxic Releases (TRI)
Wetlands
Estuarine and Marine Deepwater
Estuarine and Marine Wetland
Freshwater Emergent Wetland
Freshwater Forested/Shrub Wetland
Freshwater Pond
Lake
Other
Riverine
Search Result (point)
Water Bodies

1:18,056

0 0.13 0.25 0.5 mi

0 0.2 0.4 0.8 km

U.S. Fish and Wildlife Service, National Standards and Support Team, wetlands_team@fws.gov, Map data © OpenStreetMap contributors,

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Environmental Features

Figure 3-3

3.9.2 Potential Environmental Documentation

FAA Order 1050.1F, Environmental Impacts: Policies and Procedures, provides the FAA policy and procedures to ensure compliance with the National Environmental Policy Act (NEPA) requirements for FAA-funded projects and lists the type of NEPA documentation required for each project type. Chapter 3 of FAA Order 1050.1F contains the levels of the National Environmental Policy Act review. The three levels of NEPA documents are Categorical Exclusion (CATEX), Environmental Assessment (EA) or Environmental Impact Statement (EIS). After the potential impacts on the human and natural environment are identified, the appropriate level of NEPA documentation can be identified.

CATEX refers to a category of actions that do not individually or cumulatively have a significant effect on the human environment and for which neither an EA nor an EIS is required.

An EA is used to determine whether a proposed action has the potential to significantly affect the human environment. An EA is a concise public document that briefly provides sufficient evidence and analysis for determining whether to prepare an EIS or a Finding Of No Significant Impact FONSI.

Chapter 3 of FAA Order 1050.1F indicates that an EA must be prepared at minimum when the proposed action does not normally require an EIS and does not fall within the scope of a CATEX or falls within the scope of a CATEX but there are one or more extraordinary circumstances.

An EIS must be prepared for actions that significantly affect the quality of the human environment when one or more environmental impacts are significant and mitigation measures cannot reduce the impacts below significant levels. The following examples provided in the FAA Order 1050.1F are actions normally requiring an EIS:

- Unconditional ALP approval or Federal financial participation in the following categories of airport actions:
  - Location of a new commercial service airport in a Metropolitan Statistical Area (MSA).
  - A new runway to accommodate air carrier aircraft at a commercial service.
  - airport in an MSA; and
  - Major runway extension.
- Issuance of a commercial space launch site operator license, launch license, or experimental permit to support activities requiring the construction of a new commercial space launch site on undeveloped land.

3.9.3 Potential Regulatory Permits

Permitting requirements for each project type are based on current federal, state, and local environmental regulations. The following criteria were used to determine the potential environmental permit that would be required for each project:

- **State Environmental Resource Permit (ERP)[15]:** The State Environmental Resource Permit (ERP) in Florida is a regulatory authorization that governs activities related to altering surface water flows. An ERP is required if the project meets one of the following criteria:

    a. The project proposes work in, on, or over wetlands and surface waters.
    b. The project proposes constructing more than 4,000 square feet of impervious or semi-pervious surface.
    c. The project proposed has an area that is greater than 1 acre.
    d. The project proposes impounding greater than 40-acre feet.
    e. The project has a dam that is greater than 10 feet in height.
    f. The project is part of a larger development plan.
    g. The project is a modification of an existing permit.

- **National Pollutant Discharge Elimination System (NPDES) Permit for Construction Activity[16]:** The NPDES program focuses on controlling and managing discharges from various sources, including industrial facilities, municipal wastewater treatment plants, and construction sites. Its primary goal is to protect water quality by limiting pollutant discharges and ensuring compliance with environmental standards.

  An NPDES for Construction permit is required if the project area is greater than 1 acre or less than 1 acre but part of a common Plan that ultimately disturbs 1 or more acres of land.

- **Gopher Tortoise Relocation Permit[17]:** The Florida Gopher Tortoise Relocation Permit is a regulatory authorization issued by the Florida Fish and Wildlife Conservation Commission (FWC).

  The gopher tortoise is a threatened species in Florida, and its burrows are protected by state law. Any project that disturbs gopher tortoise burrows or conducts construction activities within 25 feet of these burrows must obtain a Gopher Tortoise Relocation Permit from the FWC.

  The project has the potential to contain gopher tortoise habitat and gopher tortoise.

- **FDEP Industrial Wastewater Permit[18]:** The Florida Department of Environmental Protection (FDEP) issues Industrial Wastewater Permits to facilities and activities that discharge to surface waters and groundwaters within the state. The project has the potential to contaminate groundwater.

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[15] https://floridadep.gov/water/submerged-lands-environmental-resources-coordination/content/environmental-resource-permitting

[16] https://www.epa.gov/npdes/stormwater-discharges-construction-activities

[17] https://myfwc.com/license/wildlife/gopher-tortoise-permits/

[18] https://floridadep.gov/water/industrial-wastewater/content/industrial-wastewater-genericgeneral-permits

- **Section 404 Permit or Corps of Engineers Dredge and Fill Permit:** is a regulatory authorization required for activities involving the discharge of dredged or fill material into waters of the United States, including wetlands. A Section 404 Permit is required if the project proposes to fill or dredge wetlands.

3.9.4 Potential Environmental Impacts and Action Plan.

All projects involving a federal action or federal resources must undergo an environmental review process. The level of environmental documentation required depends on the project type and the potential impacts on the environment. The airport projects that qualify for federal funding will follow FAA Order 5050.4B, National Environmental Policy Act Implementing Instructions for Airport Actions and Order 1050.1F Environmental Impact: Policies and Procedures to ensure there are no adverse impacts to the environment.

Depending on funding and implementation, if a particular element of the Preferred Development Plan is deemed to have independent utility, is listed as a potentially categorically excluded action in Orders 1050.1F and 5050.4B, and has no extraordinary circumstances. Some of the projects may be assessed under NEPA utilizing a CATEX. For the Master Plan Project of Runway 9-27 extension, an EA would likely be required.

Depending on the individual projects, construction may impact various resources under the authority of various Federal and State agencies. These resources may include, but are not limited to, protected species, wetlands and other water bodies, archeological resources, and water quality. All elements of the IDP would need to be reviewed for the environmental impact categories as listed in the FAA Order 1050.1F Desk Reference.

Impacts to environmental resources would require a permit, a certification, a consistency determination, an approval, or a letter of record from the governing agency. In some cases, mitigation may be required. Mitigation may vary from using Best Management Practices (BMPs) during construction to costly restoration of an off-site location for an environmental resource. The application for the applicable permit should be completed and submitted as early as possible in the design development process to prevent a delayed construction start while waiting on final permit approval. However, design plans must be sufficiently developed so that the permit is reasonably representative of the actual project impacts.

Based upon the above considerations and to facilitate future individual actions at the airport, the following Environmental Action Plan is proposed:

- Wetlands and waters of the U.S. should be delineated within the airport property boundary and show where additional property may be purchased. The delineation should be submitted to the United States Army Corps Engineers (USACE) for jurisdictional determination.
- Surveys for potential protected species should be completed at the appropriate time of year for each individual species (i.e., flowering times for plants and nesting/breeding/overwintering times for animals).
- Appropriate historical, architectural, and archeological surveys for those resources should be undertaken in any areas of the airport not previously surveyed and on additional properties proposed to be purchased.

- The proposed design should be overlayed upon mapping of the above resource locations to determine potential impacts. The design team should attempt to avoid impacts to the resources to the greatest extent practicable. Unavoidable impacts should be minimized to the greatest extent practicable by reasonable means. The permitting required for the unavoidable and minimized impacts should be determined, and the application for the permit should be submitted as early in the design process as possible.
- If mitigation is required for the unavoidable impacts, a mitigation plan should be completed and submitted with the permit application.
- Once a permit (certification, approval, etc.) is obtained, all conditions to the permit should be noted and made available to anyone associated with the proposed project, including, but not limited to, airport staff, project management team, contractors, sub-contractors, inspectors, etc. so that violations to the permit may be prevented.
- If mitigation is required, it should be completed, and the appropriate agencies should be provided with proof of purchase, completion, or other action as required.
- Once the project is deemed complete, a notification of completion should be provided to the issuing agency.

Some of these actions, such as the first three listed above, could be completed as soon as sufficient funding is available. The remaining actions would likely need to wait until the NEPA process, and the design process have a design sufficiently developed for impact analysis.

The projects proposed for the preferred alternative were examined using existing GIS data and recent aerial photography to determine if the proposed project would potentially impact previously developed areas, waters of the U.S., or areas of known or suspected environmental concern. **Table 3-5** identifies the potential environmental impacts associated with the preferred Infield development, the anticipated level of NEPA documentation for each project, such as a CATEX, EA, or EIS, and the regulatory permits that may be needed for each project. Permitting approvals that are anticipated to be addressed by standard design measures, construction timing or best management practices (BMPs) are not included in the list.

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Table 3-5: Potential Environmental Impacts

No.	Projects	Acreage	Noise	Air Quality	Wetland	Upland Forested	Protected Species	Potential NEPA Documentation	1050.1F Reference	Permits	Comments	FLUCFCS Code Impacted
Master Plan Projects	Runway 3-21 Shift (Asphalt - Runway 3 End Only)	9.4	N	N	N	N	N	CatEx	5-6.4 e	ERP, NPDES		8100
	Runway 9-27 Extension (Asphalt)	30.7	Y	Y	N	N	Y	EA	3-1.3 b (c)	ERP, NPDES, GTRP	Requires updated noise contours or Part 150 Study	8100
	Parallel Taxiway C (Runway 9-27 - Asphalt)	49.2	N	N	N	N	Y	CatEx	5-6.4 e	ERP, NPDES, GTRP	May contain gopher tortoise	8100
	Parallel Taxiway D (Runway 3-21 - Asphalt)	32.2	N	N	N	N	Y	CatEx	5-6.4 e	ERP, NPDES, GTRP	May contain gopher tortoise	8100
1	New Taxiway Phase I	3.19	N	N	N	N	N	CatEx	5-6.4 e	ERP, NPDES		8100
2	New Taxiway Phase II	4.25	N	N	N	N	N	CatEx	5-6.4 e	ERP, NPDES		8100
3	Siter ready for Northwest Infield Development Phase I	45.54	N	N	N	N	N	CatEx	5-6.4 f	ERP, NPDES		8100
4	Siter ready for Northwest Infield Development Phase II	41.41	N	N	N	N	Y	CatEx	5-6.4 f	ERP, NPDES, GTRP	May contain gopher tortoise	8100
5	Site ready for 3.5 Ac parcel (2 - 20,000 SF Hangars)	4.4	N	N	N	Y	Y	CatEx	5-6.4 f	ERP, NPDES, GTRP	May contain gopher tortoise	4400;4120;8100
6	Site ready for 3.0 Ac parcel (2 - 12,000 SF Hangars)	3.9	N	N	N	Y	Y	CatEx	5-6.4 f	ERP, NPDES, GTRP	May contain gopher tortoise	4400;4120;8100
7	Site ready for 200 x 200 hangar	3.0	N	N	N	Y	Y	CatEx	5-6.4 f	ERP, NPDES, GTRP	May contain gopher tortoise	4400;4120;8100
8	Airport Service Road Extension	2.70	N	N	N	Y	Y	CatEx	5-6.4 a	ERP, NPDES, GTRP	May contain gopher tortoise	6530;4120;8100
9	Westside roads development south of Telcom Dr	2.7	N	N	N	Y	Y	CatEx	5-6.4 a	ERP, NPDES, GTRP	May contain gopher tortoise	4120
10	Road from Sergeant Mills Blvd to Infield Area	1.5	N	N	N	Y	Y	CatEx	5-6.4 a	ERP, NPDES, GTRP	May contain gopher tortoise	6530;4400;4120;1900;8100
11	Site ready future southwest hangars 200x200 and apron	13.69	N	N	N	Y	Y	CatEx	5-6.4 f	ERP, NPDES, GTRP	May contain gopher tortoise	4120;8100
12	Site ready future southeast hangars 200x200 and apron	20.85	N	N	Y	N	Y	CatEx	5-6.4 f	ERP, NPDES, GTRP, Section 404	May contain gopher tortoise	8100
13	Site ready common apron east of new taxiway for 150x150 hangars	22.94	N	N	N	N	Y	CatEx	5-6.4 f	ERP, NPDES, GTRP	May contain gopher tortoise	8100
14	Siter ready for MRO (100,000 sf)	7.51	N	N	N	N	Y	CatEx	5-6.4 f	ERP, NPDES, GTRP	May contain gopher tortoise	8100
15	Siter ready for MRO (62,500 sf)	4.55	N	N	N	N	Y	CatEx	5-6.4 f	ERP, NPDES, GTRP	May contain gopher tortoise	8100
16	Road development south-north Infield Area	2.40	N	N	N	N	Y	CatEx	5-6.4 a	ERP, NPDES, GTRP	May contain gopher tortoise	8100
17	Road development east-west Infield Area	2.1	N	N	N	N	Y	CatEx	5-6.4 a	ERP, NPDES, GTRP	May contain gopher tortoise	8100
18	Road development parallel to the new taxiway	3.7	N	N	Y	N	Y	CatEx	5-6.4 a	ERP, NPDES, GTRP, Section 404	May contain gopher tortoise	8100
19	Road Development to enable future T-hangar developments	2.70	N	N	N	N	Y	CatEx	5-6.4 a	ERP, NPDES, GTRP	May contain gopher tortoise	8100
20	AAM Facilities	48.03	N	N	N	N	Y	CatEx	5-6.4 t	ERP, NPDES, GTRP	May contain gopher tortoise	8100
21	Site ready for industrial and commercial development Westside.	2.07	N	N	N	Y	Y	CatEx	5-6.4 f	ERP, NPDES, GTRP	May contain gopher tortoise	4120
22	Site ready for industrial and commercial development Westside.	2.07	N	N	N	Y	Y	CatEx	5-6.4 f	ERP, NPDES, GTRP	May contain gopher tortoise	4120
23	Site ready for industrial and commercial development Westside.	2.07	N	N	N	Y	Y	CatEx	5-6.4 f	ERP, NPDES, GTRP	May contain gopher tortoise	4120
24	Site ready Southwest hangar 130,000 sf	9.76	N	N	N	Y	Y	CatEx	5-6.4 f	ERP, NPDES, GTRP	May contain gopher tortoise	4120;8100
25	Site Ready for Light Industrial Development West Side	12.63	N	N	N	N	Y	CatEx	5-6.4 f	ERP, NPDES, GTRP	May contain gopher tortoise	8100
26	Site Ready for Light Industrial Development West Side	12.63	N	N	N	N	Y	CatEx	5-6.4 f	ERP, NPDES, GTRP	May contain gopher tortoise	8100
27	Site Ready for Light Industrial Development West Side	12.63	N	N	N	N	Y	CatEx	5-6.4 f	ERP, NPDES, GTRP	May contain gopher tortoise	8100
28	Site Ready for Light Industrial Development West Side	2.41	N	N	N	N	Y	CatEx	5-6.4 f	ERP, NPDES, GTRP	May contain gopher tortoise	8100
29	Site Ready for Light Industrial Development West Side	2.41	N	N	N	N	Y	CatEx	5-6.4 f	ERP, NPDES, GTRP	May contain gopher tortoise	8100
30	Site Ready for Light Industrial Development West Side	2.41	N	N	N	N	Y	CatEx	5-6.4 f	ERP, NPDES, GTRP	May contain gopher tortoise	8100
31	Site Ready for Light Industrial Development West Side	2.41	N	N	N	N	Y	CatEx	5-6.4 f	ERP, NPDES, GTRP	May contain gopher tortoise	8100
32	Airport Maintenance & Fueling Facility - new location	6.78	N	N	N	N	Y	CatEx	3-1.2 f	ERP, NPDES, GTRP	May contain gopher tortoise	8100

Source: Michael Baker International Inc. 2024

4 DRAINAGE

The proposed stormwater pond recommendations were determined considering the preferred development plan defined in Chapter 3 of this Infield Infrastructure Development Plan Phase II, the Infrastructure Development Plan Phase I dated March 2021, and the Airport Layout Plan (ALP) updated in May 2020. The resulting future development assumptions, including the layout of future buildings, roads, and other impervious surfaces used for purposes of this study, are displayed in **Figure 4-1.** In addition, the Stormwater Master Plan was updated as part of this study and can be found in **Appendix A.**

The proposed development locations include both airside and landside. On the airside, notable improvements are within the northwest quadrant of the infield, as well as two new taxiways. Additional hangars are proposed along future Taxiway C on the east side, and significant new development is proposed landside on the southwest quadrant of the airport. Some of the proposed developments impact existing ponds or depressional areas, which are accounted for in this study.

For the airport's total property area of 2,300 ac, the proposed development has increased the overall percent impervious from 14% to 39% or 325 ac to 889 ac in terms of total impervious area.

4.1 Pond Siting Methodology

The airport has 32 existing ponds, including two wet detention ponds and 30 dry retention ponds. To accommodate the future development assumptions, a total of 55 ponds have been identified which is a combination of 30 existing ponds to remain and 25 proposed ponds. All of the proposed ponds are dry retention with no outfall, except for the two existing wet detention ponds at the northeast corner of the airport.

The factors considered in identifying the proposed pond locations include topography, groundwater levels, proposed development, and environmental considerations. The following sections describe the methodology used for determining the proposed pond locations.

4.1.1 Proposed Pond Design

The first step in the pond siting process was to evaluate the stormwater volume requirements for each basin with consideration of the proposed impervious layout presented in **Figure 4-1** based on the preferred development described in Chapter 3. For each basin, we determined the available storage for retention of the 100-yr / 24-hr storm event in comparison with the required storage for future development. For any basins with a storage deficit, either the existing pond was reconfigured to provide additional storage and/or a proposed pond was provided. For this study, we conservatively sized the ponds to provide storage for the 100-year post-development runoff volume plus floodplain compensation. For pond systems which do not provide the total 100-yr runoff volume, the peak stage was checked with consideration of infiltration during the storm to confirm it is below the top of berm elevation. Final design adjustments can be made to store the 100-year pre/post difference if an internal outfall can be maintained, which could reduce the required pond

sizes. The location of the proposed ponds is shown on the Post-Development Drainage map (**Figure 4-1**).

The proposed ponds' seasonal high groundwater level was assessed to establish the bottom elevation. Pond bottom elevations were set at least 2 feet above the seasonal high groundwater level. The top of berm elevations was set at or near existing ground or adjacent infrastructure such as runways, taxiways, or roadways. Additionally, vertical soil storage between the pond bottom and the seasonal high groundwater elevations was included in our pond routing calculations; however, horizontal seepage was not included. The assumed pond, seasonal high groundwater elevations, and soil storage approach will require review and confirmation during the final design stage for each planned development.

Volume recovery of the 100-year/24-hour storm is required for each no-discharge dry retention pond site. A preliminary review of the limited geotechnical investigation indicates there are highly permeable soils with horizontal conductivity rates greater than 20 feet per day, which can accommodate the required recovery requirements; however, additional investigation will be required during the final design and permitting phase. A table of seasonal high-water levels for each pond site is included in Appendix D of the Stormwater Master Plan.

4.1.2 Avoidance and Minimization of Wetland Impact

The development areas and proposed stormwater ponds depicted in the stormwater master plan avoid most of the wetlands identified in the approximation. The exceptions are two very small potential wetlands located just north of Sergeant Lea Mills Boulevard in the southern portion of the airport's property and the apparent sinkhole and the associated wetlands in the northeast corner of the airport's property. If it is determined that all these potential wetlands are isolated, which appears to be the case, they may not be subject to FDEP permitting under Section 404 of the Clean Water Act. For the two areas on the north side of Sergeant Lea Mills Boulevard, if they are determined to be subject to SWFWMD jurisdiction but are less than 0.1 acres in size, it is possible that SWFWMD would not require mitigation for impacts to these areas. Impacts to the sinkhole and associated potential wetland in the northeast corner of the Airport's property would likely require compensatory mitigation from the SWFWMD because this area appears to be greater than 0.1 acre in size.

4.1.3 Pond Design Considerations for Wildlife Hazard Management

Federal Aviation Administration (FAA) Advisory Circular (AC) 150/5200-33C establishes the recommended minimum general separation criteria between an airport's air operations area (AOA) and hazardous wildlife attractants. For airports that serve turbine-powered aircraft, such as BKV, AC 150/5200 specifies a recommended minimum separation distance of 10,000 feet between the AOA and hazardous wildlife attractants. If an attractant "could cause hazardous wildlife movement into or across the approach or departure airspace," AC 150/5200-33C recommends a separation distance of 5 miles between the AOA and the hazardous wildlife attractant.

Wet ponds, ditches, and swales holding water for extended periods can be attractants for wildlife that create hazards for aircraft operations. AC 150/5200-33C provides several recommendations regarding the design and functional characteristics of stormwater

treatment facilities that are located at a distance less than the recommended separation distance. Since the ponds incorporated into the SWMP will be located less than 10,000 feet from the AOA (either within the AOA or on airport property near the AOA), the ponds included in the SWMP should include these recommendations. The first of these recommendations is that the ponds should be "designed, engineered, constructed, and maintained to allow a maximum 48-hour detention period after the design storm and remain completely dry between storms." AC 150/5200-33C also recommends that detention basins be designed to incorporate steep side slopes, have banks that are lined with rip rap, and be narrow or linear in shape. These characteristics help to make the basin less attractive for foraging and nesting birds. Basins with these characteristics reduce visibility for birds that are foraging within a basin and make it more difficult for them to detect approaching predators. Rip-rap lined banks are also less attractive for foraging birds in comparison to natural vegetation.

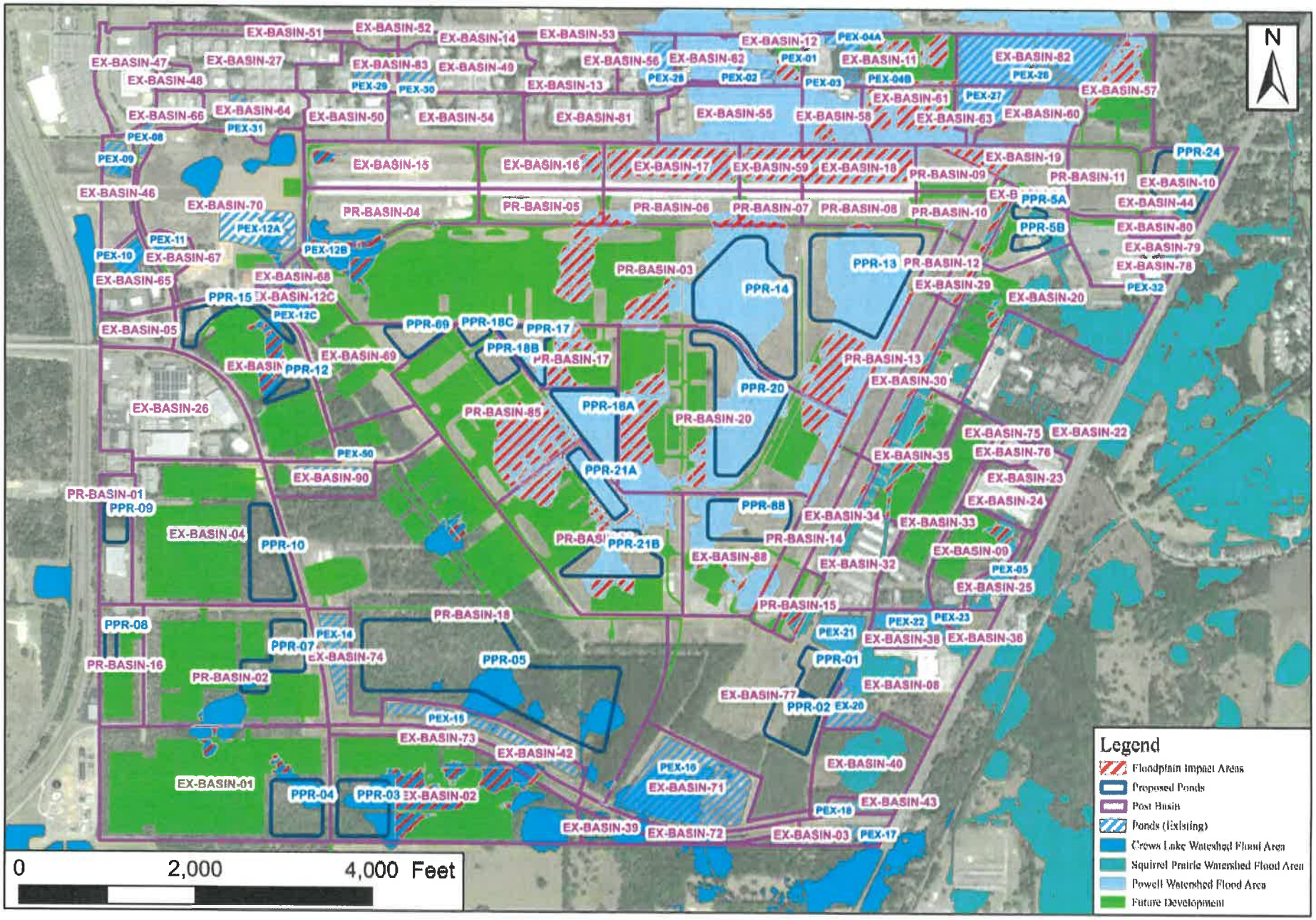
If it is not possible to design a basin to dry down within 48 hours of the design storm due to local characteristics such as a high-water table, the basin should be designed for wet retention. It is recommended that the basin be designed so that the bottom elevation is 2.5 feet or greater below the mean low water elevation so that the pond will not be suitable foraging habitat for wading birds. In such situations, every effort should be made to incorporate steeply sloping banks to limit the available foraging habitat for wading birds along the shoreline. If the wet pond still attracts hazardous wildlife, the airport should incorporate physical barriers such as bird balls, wire grids, pillows, or netting to prevent wildlife from using the pond.

All ponds should be designed to allow access to maintenance equipment to keep the area free of vegetation to the maximum extent possible. Banks and surrounding areas should be designed so that mowers can readily access the area around the pond and, for dry ponds, the center of the pond. For wet ponds, herbicide application may also be needed to control emergent vegetation.

Designers may also consider using green stormwater infrastructure best management practices, such as bioretention cells, where this can be accomplished without increasing wildlife hazards, particularly by avoiding exceeding the 48-hour maximum detention period and avoiding the creation of habitat that attracts wildlife. As with ponds, bioretention swales should be designed to allow easy access to maintenance equipment so that overgrowth of vegetation that would attract wildlife does not occur.

4.1.4 Drainage Conclusions

The results of the SWMP update indicate that there is sufficient onsite property to accommodate regulatory stormwater criteria for the proposed future development. The post-development drainage map (**Figure 4-1**) provide the locations and sizes of the ponds proposed for this concept-level study. Further investigation will be required to include additional geotechnical and a more detailed stormwater assessment during the final design phase to confirm the pond requirements.



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Stormwater Master Plan - Post-Development Map Infield Development Area

Figure 4-1

5 UTILITIES

5.1 Overview

The intent of the Utilities planning component of the project is to develop a comprehensive master planning tool for the analysis of existing utilities and to serve as a basis for modifying and expanding the wastewater collection and transmission system and potable water and fire protection transmission systems to serve the existing and future Brooksville-Tampa Bay Regional Airport Infield development. This Infield Infrastructure Development Plan (IDP) study is intended to be used as a "working document" by the County and airport staff to plan existing infrastructure capacity and future improvements within BKV's infield development area over the planning horizon.

The infield development area is shown in Figure 2-1. Existing calibrated hydraulic models (WaterGEMS and SewerGEMS) provided by Hernando County in 2020 and modified by Stantec for the IDP Final Report dated May 2021 were used to perform simulations for this analysis. Steady-state simulations were utilized for this work, as they are useful approximations of various network conditions and often used to solve infrastructure-related design problems (AWWA Manual M32, 2017). The Hernando County Utilities Department (HCUD) and Michael Baker have worked to develop a proposed development plan and a phasing plan, as previously mentioned. The water distribution network and wastewater collection system are proposed to be developed within the infield development area with the phasing plan, with certain portions added at the short-term, mid-term, and long-term phases.

Contour maps show some elevated areas towards the northern portion of the BKV infield area and slight sloping towards the site's southern end. The 1-foot contours sourced in 2020 were used to update elevations for the new junctions, hydrants, and manholes to maintain consistency within the model.

5.1.1 Available Information

At the time of starting these models, the following information was available:

- Phasing plan
- Preferred development refinement plan
- Building/hangar sizes, quantities, proposed uses, and fire foam suppression system requirements per NFPA 409 for each building/hangar.
- Permission to use the previous water and wastewater models for this work, as HCUD was planning to update their WaterGEMS and SewerGEMS models for their Water and Wastewater Master Plans.

Information unavailable for this analysis:

- Uses, pressure, and flow requirements for the water tanks and pumps shown next to some buildings/hangars.
- Design information or specific plans for the water tanks and pumps shown next to some buildings/hangars.

- Future flow conditions, including flows from the City of Brooksville that are in the process of being planned for future re-direction to HCUD's Airport Water Reclamation Facility.

5.1.2 Logistics Considerations

These preliminary plans avoid pipes passing beneath taxiways as conditions allow, but some areas need to be impacted for efficiency and cost considerations. The plans avoid pipes passing underneath runways, but include pipes passing beneath taxiways, as the BKV infield area is surrounded by runways and taxiways to the north, east, and west. This poses maintenance challenges for HCUD, which traditionally has the responsibility of maintaining water and wastewater infrastructure within the BKV infield area. Coordination efforts will be required to ensure that HCUD has access to the water and wastewater infrastructure, specifically within the BKV infield area and including mains that may lie on private properties.

5.2 Water Distribution Network

Developing the BKV infield area requires expanding the potable water system to include additional transmission components sized as needed to support the proposed facilities. The evaluation will include system conditions during an average daily demand, maximum daily demand plus fire flow, and peak hourly demand. As part of the potable water system evaluation, three potable water system deficiencies were documented:

1. Low flow fire hydrants (<1,000 gpm)
2. Pipes with high velocities (>7 feet per second) / headloss)
3. Low water pressure areas (<40 psi during peak hour demand, 20 psi minimum residual pressure for maximum day demand plus fire flow)

If deficiencies were recorded, recommendations were made for system improvements via system extensions, diameter increases, additional looping zones, pump improvements, pumping stations, etc., to meet system requirements.

5.2.1 Phasing Plan

The water distribution network is proposed to be developed within the infield development area with the phasing plan, with certain portions added at the short-term, mid-term, and long-term phases. Each development phase is considered as follows:

- Short-term: next five years (2025-2029)
- Mid-term: following five years (2030-2034)
- Long-term: following 10 years (2035-2044)

5.2.1.1 Short-Term

Water distribution system components to be added for short-term developments are summarized in **Table 5-1** and shown in **Figure 5-2.**

Table 5-1: Short-Term Water Distribution System Pipe Description		
Description	**Unit**	**Quantity**
12-inch PVC	LF	8,276
6-inch PVC	LF	80
Fire Hydrants	EA	4
6-inch Gate Valve	EA	4
12-inch Gate Valve	EA	15
Booster Pump Station	EA	2
Air Release Valve	EA	2

Source: Stantec, 2024

Two booster pump stations with variable frequency drives (VFDs) are recommended on three lines feeding the infield area, leaving two lines for outbound flow. The BKV area has a pressure below 40 psi during PHD conditions. Therefore, booster pumps are required to raise pressure to the 40 psi goal. Variable frequency drives (VFDs) are recommended for the booster pump stations so flow and pressure can be adjusted throughout the development phases. Existing pumps from the HCUD water distribution system were used for preliminary analysis in the BKV infield area: Southwest WP-2 was used for PMP-13, while the larger pump Southwest WP-5 was used for PMP-14. PMP-13 and PMP-14 should be included in the short-term development phase. The pump selections will have to be further refined in the design stage. Pressures upstream of the recommended booster pumps must also be reviewed, as the WaterGEMS model shows that booster pumps lower the upstream pressures. Upstream pressures in the immediate vicinity of the BKV infield area are as low as 18 psi in the PHD flow condition at the long-term development phase, specifically at the intersection of Technology Dr. and Aerial Way. This is critical to review, as it is lower than the 20 psi required by the Hernando County Fire Department.

Two additional air release valves (ARVs) are required for the 12-inch PVC water mains – one along the new road connecting Telecom Dr. and Airport Service Rd, and another along the new road running east to west across the BKV Infield area. ARVs are required to relieve pressure along pressurized mains where there are elevation gains. The approximate locations of the air release valves and elevation profiles from Google Earth Pro are shown in **Figure 5-2** and **Figure 5-3**.

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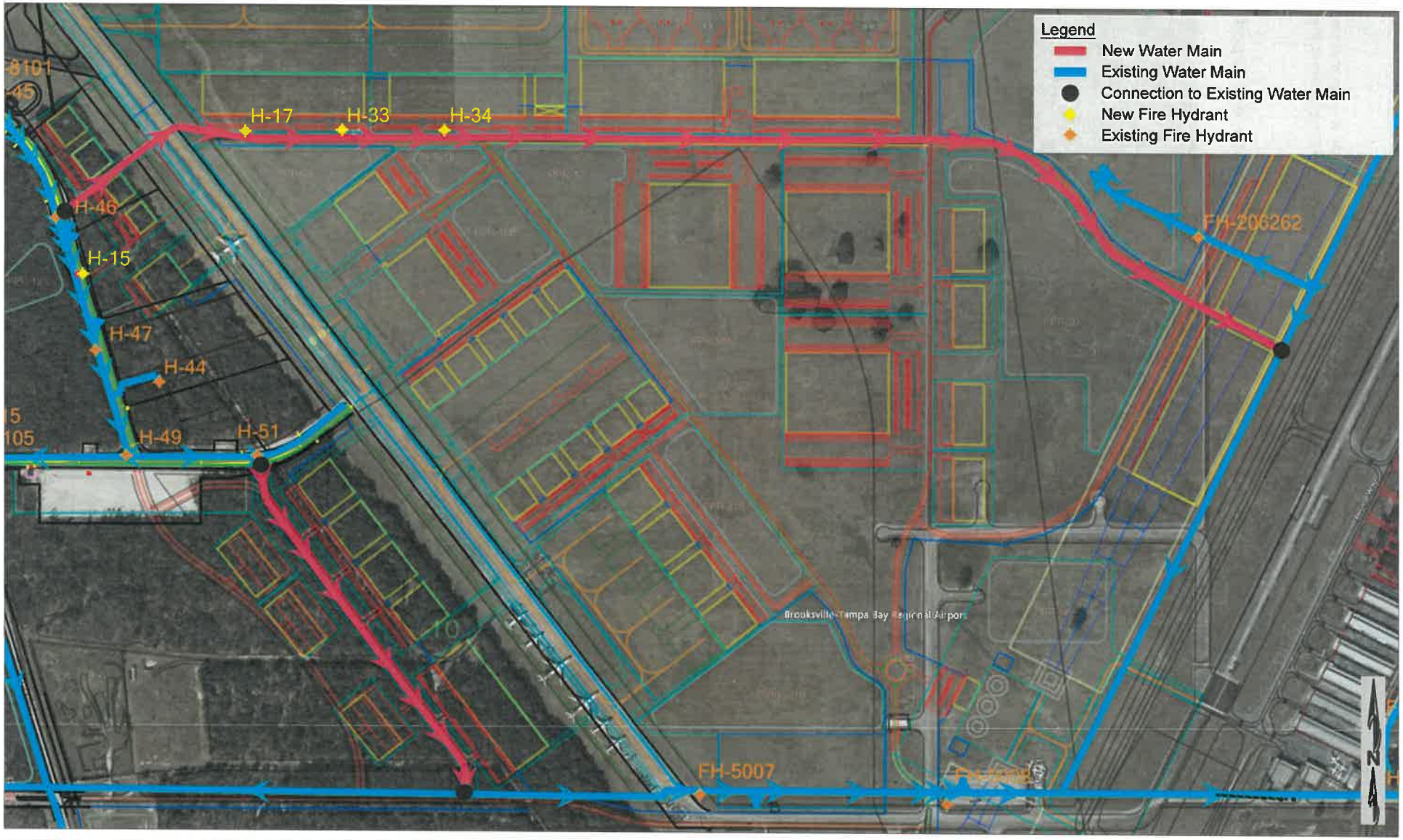

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Locations of Proposed Water Mains and Fire Hydrants for Short-Term Developments

Figure 5-1

Figure 5-2: Ground Elevation Profile along the New Road Connecting Telecom Dr. and Airport Service Rd and Approximate ARV Placement (Red Arrow)

Source: Stantec, 2024

Figure 5-3: Ground Elevation Profile along the New Road Going East to West across the BKV Infield area and Approximate ARV Placement (Red Arrow)

Source: Stantec, 2024

5.2.1.2 Mid-Term

Water distribution system components to be added for mid-term developments are summarized in **Table 5-2** and shown in **Figure 5-4.**

Table 5-2: Mid-Term Water Distribution System Pipe Description		
Description	**Unit**	**Quantity**
12-inch PVC	LF	6,531
6-inch PVC	LF	260
Fire Hydrants	EA	13
6-inch Gate Valve	EA	13
12-inch Gate Valve	EA	10
Booster Pump Station	EA	1

Source: Stantec, 2024

An additional booster pump with a VFD is recommended to support pressure requirements for the mid-term development phase. Existing pumps from the HCUD water distribution system were used for preliminary analysis in the BKV infield area: Southwest WP-2 was used for PMP-18, which should be added for the mid-term development phase. The pump selection will have to be further refined in the design stage.

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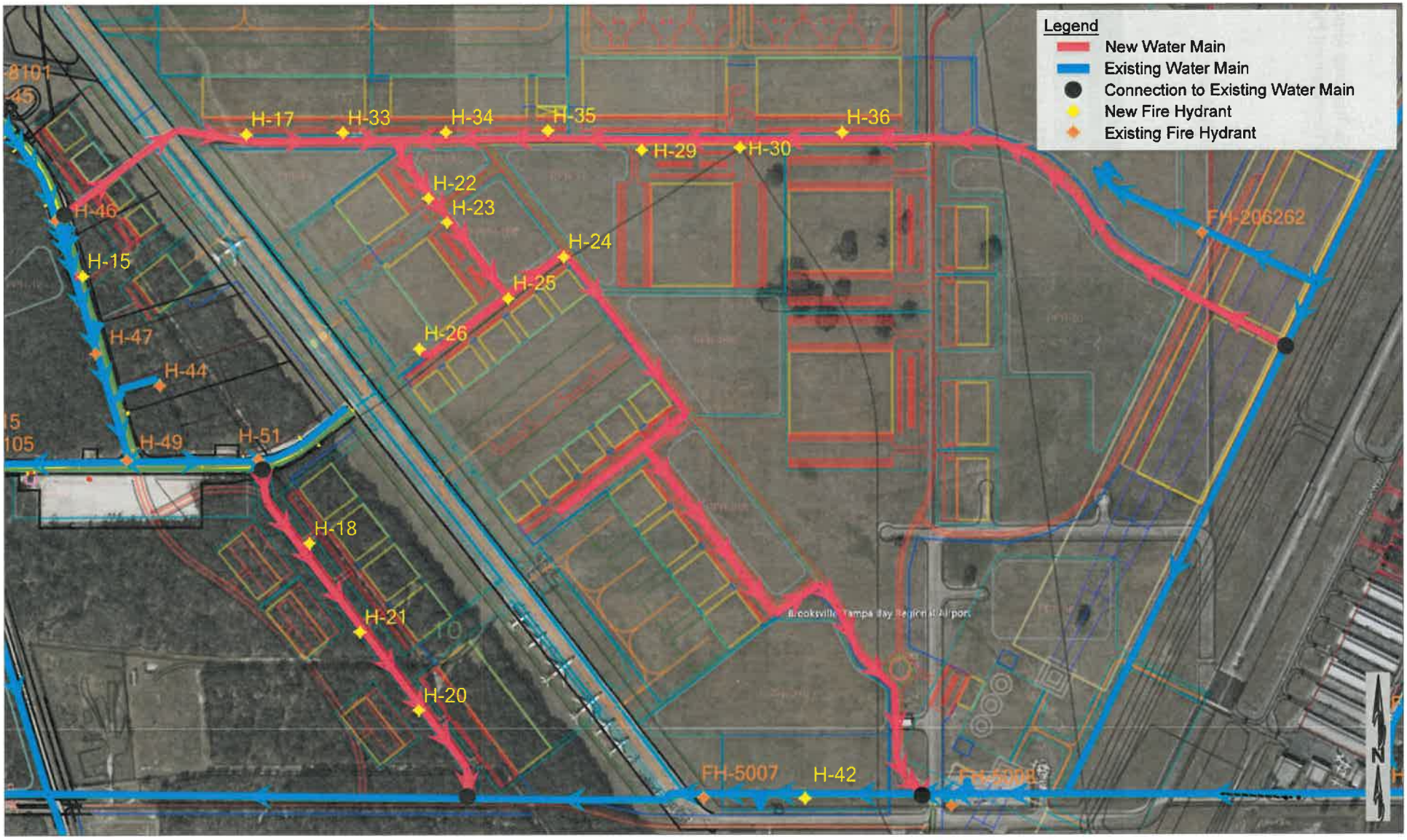

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Locations of Proposed Water Mains and Fire Hydrants for Mid-Term Developments

Figure 5-4

5.2.1.3 Long-Term

Water distribution system components to be added for long-term developments are summarized in **Table 5-3** and shown in **Figure 5-5.**

Table 5-3: Long-Term Water Distribution System Pipe Description		
Description	**Unit**	**Quantity**
12-inch PVC	LF	2,714
6-inch PVC	LF	200
Fire Hydrants	EA	10
6-inch Gate Valve	EA	10
12-inch Gate Valve	EA	3

Source: Stantec, 2024

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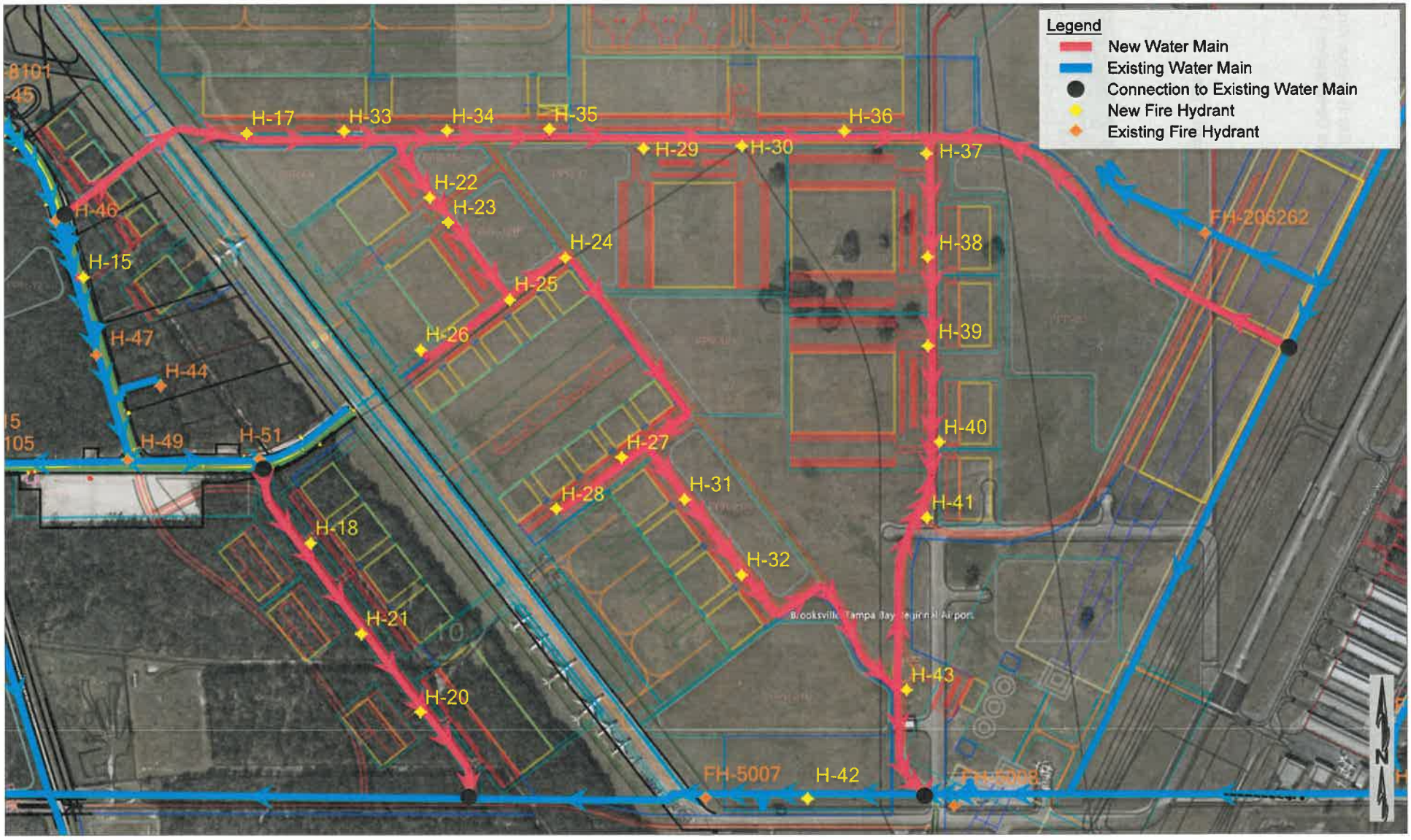

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Locations of Proposed Water Mains and Fire Hydrants for Long-Term Developments

Figure 5-5

5.2.2 Flow Requirements

Each building or hangar is estimated to have either two or three employee shifts, with 15-25 gallons of water used per employee per shift, in accordance with the USEPA (2024). While the USEPA mentions a range of 10-25 gal/employee/shift, the lower value represents only toilets, while the higher value represents toilets, showers, food preparation, and dish washing. A minimum value of 15 gal/employee/shift was used here as a conservative estimate to allow for water use during employee mealtimes.

The water use values are within the range of values shown in Methods for Estimating Commercial, Industrial and Institutional Water Use, Morales et al. (2009), with water uses in commercial/industrial aviation-related buildings in the same range as the paper's reported commercial buildings, and aircraft storage buildings intentionally lower. A Microsoft Excel spreadsheet showing flow and demand calculations is included as an attachment, and the associated junction map is included in **Appendix B.** Projected water demand data is also summarized in **Table 5-4.**

Buildings designated for aircraft or air cargo storage were assigned fixed demands instead diurnal variations or peaking factors for PDD and PHD, as minimal employees and water usage are expected. Other proposed building uses include aviation technical services; maintenance, repair, and overhaul, aviation related business, light industrial commercial, and logistic/distribution centers. These building types are not expected to have diurnal variations typical of residential areas but are predicted to have variations with shift changes.

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Table 5-4: Water Use Estimates for Proposed Developments								
Building/ Hangar Size (SF)	**Qty.**	**Proposed Usage**	**Number of Total Employees**	**Number of shifts**	**Sanitary water usage [1] (gal)**	**Sanitary water use [2] (gal)**	**Average Water Use [3] (gpm)**	**Foam Fire Suppression System Required [4]**
19,500	2	Aircraft Storage	3	1	15	45	50	No
12,000	2	Aircraft Storage	3	1	15	45	50	No
22,500	11	Aircraft Storage	3	1	15	45	50	No
40,000	1	Aviation Technical Services	100	2	25	1,250	1,389	Yes
40,000	8	Aircraft Storage	3	1	15	45	50	Yes
62,500	1	Aviation Technical Services	156	2	25	1,953	2,170	Yes
100,000	1	MRO	200	2	25	2,500	2,778	Yes
130,000	1	Aviation Related Business	325	1	25	8,125	9,028	Yes
133,500	1	Aircraft Storage	3	1	15	45	50	Yes
160,000	1	Aircraft Storage	3	1	15	45	50	Yes
196,000	2	Air Cargo	50	2	15	375	417	Yes
45,000	7	Light Industrial Commercial	113	1	25	2,813	3,125	N/A
200,000	3	Logistic/Distribution Centers	333	2	25	4,167	4,630	N/A
87,840	1	Maintenance & Fueling Area	25	2	25	313	347	N/A
12,150	1	AAM Terminal	27	2	25	338	375	N/A

Source: Stantec, 2024

Notes:

1.Gallons Per employee per shift

2. Gallons per building during an 8-hour shift

3. Not including Fire Flow per Building

4. NFPA 409 Foam Fire Suppression System Required

5.2.3 Average Daily Demand (ADD)

Junction pressure and pipe velocities within the BKV infield area meet system requirements in short-term, mid-term, and long-term development phases during ADD conditions. ADD demands for short-term, mid-term, and long-term development phases were estimated to be 3.41 gpm, 43.6 gpm, and 112.4 gpm, respectively. Deficiencies are not noted in the BKV infield area during AAD conditions.

5.2.4 Peak Daily Demand (PDD)

PDD was run with an overall peaking factor of 1.7 to be consistent with the existing model. Junction pressure and pipe velocities within the BKV infield area meet system requirements in short-term, mid-term, and long-term development phases during PDD conditions. Deficiencies are not noted in the BKV infield area during PDD conditions.

5.2.5 Peak Hourly Demand (PHD)

PHD was run with an overall peaking factor of 3.0 for residential and commercial developments in the general BKV area, and a 2.0 peaking factor for buildings within the BKV Infield area that are not designated for aircraft or cargo storage. The 2.0 peaking factor was selected to demonstrate a scenario where two sets of employee shifts overlap, doubling the water demand.

Pipe velocities within the BKV infield area meet system requirements in short-term, mid-term, and long-term development phases during PHD conditions. Junction pressures meet the 40-psi goal during PHD in short-term, mid-term, and long-term development phases with the additional booster pumps. Booster pumps are required due to a low system pressure (<40 psi) outside of the BKV infield area. The minimum Hernando County Fire Department pressure of 20 psi is met throughout the BKV infield area during the three development phases when five of the six high service pumps (SW HSPs 1-5) are running.

Table 5-5 shows the node pressures summary in the BKV area water distribution network (proposed) for ADD, PDD, PHD, and PDD+FF scenarios at the long-term development phase, which demonstrates the maximum pressure increase from this infield infrastructure development plan.

Table 5-5: Summary of Node Water Pressures (psi) in the BKV Area at the Long-Term Development Phase

	ADD	PDD	PHD [1]	PDD + FF
Minimum	53.0	46.0	40.0	46.0
Average	59.8	52.8	45.5	52.8
Maximum	88.0	81.0	57.0	81.0

Source: Stantec, 2024

Note: [1] PHD was run with an additional SW-HSP online (5 of the 6) and the three booster pump stations active

5.2.6 PDD with Fire Flow (FF)

Fire flow was tested at PDD conditions, requiring sufficient flow and pressure with a peaking factor of 1.7 and required fire flows. Fire hydrants were placed at least every 500 feet along streets where fire suppression needs are present, with at least one fire hydrant within 400 feet of each building or hangar per NFPA 1, 2021 edition, chapter 18.5.3. Each fire hydrant has a minimum and maximum flow of 1,000 gallons per minute (gpm) and 1,500 gpm, respectively, per NFPA 1, 2021, chapter 18.5 and consistent with the Hernando County Potable Water Master Plan, 2021. Assuming buildings and hangars with Type 1 construction per NFPA 220, each building and hangar's fire flow needs were determined based on their square footage in accordance with Table 18.4.5.2.1 within NFPA 1, 2021 edition, included in Appendix B.

Fire flow analysis parameters are shown in **Table 5-6.** Certain developments require fire foam suppression systems per NFPA 409, yet additional water needs are not expected. Fire suppression water needs are met for each building by the combined water contributed from fire hydrants within 1,000 feet of the building, which is allowed per NFPA 1, 2021 edition, chapter 18.5.4. Required hydrants are based on a single building fire, therefore hydrants can be shared between buildings, as confirmed with the Hernando County Fire Rescue (Smith, 2024). The branch pipes leading to fire hydrants were designed with six (6) inch diameters, in congruence with other fire hydrants in the BKV area.

Table 5-6: Fire Flow Analysis Parameters

Flow Constraint	Velocity Constraint	Residual Pressure Constraint @ PDD
1,000 – 1,500 gpm	None	20 psi minimum

Source: Stantec, 2024

To meet fire flow requirements of the proposed developments in the short, mid, and long-term there are twenty-seven (27) fire hydrants that are to be installed. The fire flow analysis was conducted utilizing the flow constraints at PDD conditions for the proposed system; the results are provided by short, mid, and long-term and included in **Table 5-7**, **Table 5-8**, and **Table 5-9**, respectively.

Table 5-7: Fire Flow Analysis Results for the Proposed Short-Term System

Fire Hydrant No.	Available Flow (gpm)	Residual Pressure @ PDD (psi)	Fire Hydrant No.	Available Flow (gpm)	Residual Pressure @ PDD (psi)
H-14	1,500	41	H-46	1,500	40
H-17	1,500	40	H-47	1,500	45
H-33	1,500	39	H-49	1,500	47
H-34	1,500	40	H-51	1,500	47
H-44	1,500	41	N/A	N/A	N/A

Source: Stantec, 2024

Table 5-8: Fire Flow Analysis Results for the Proposed Mid-Term System					
Fire Hydrant No.	Available Flow (gpm)	Residual Pressure @ PDD (psi)	Fire Hydrant No.	Available Flow (gpm)	Residual Pressure @ PDD (psi)
FH-5007	1,500	41	H-29	1,500	40
FH-5008	1,500	39	H-30	1,500	39
H-15	1,500	35	H-33	1,500	33
H-17	1,500	35	H-34	1,500	35
H-18	1,500	37	H-35	1,500	37
H-20	1,500	40	H-36	1,500	39
H-21	1,500	41	H-42	1,500	68
H-22	1,500	37	H-44	1,500	35
H-23	1,500	37	H-46	1,500	35
H-24	1,500	39	H-47	1,500	39
H-25	1,500	39	H-49	1,500	41
H-26	1,500	35	H-51	1,500	40

Source: Stantec, 2024

Table 5-9: Fire Flow Analysis Results for the Proposed Long-Term System					
Fire Hydrant No.	Available Flow (gpm)	Residual Pressure @ PDD (psi)	Fire Hydrant No.	Available Flow (gpm)	Residual Pressure @ PDD (psi)
FH-5007	1,500	40	H-32	1,500	39
FH-5008	1,500	38	H-33	1,500	32
H-15	1,500	34	H-34	1,500	34
H-17	1,500	34	H-35	1,500	36
H-18	1,500	36	H-36	1,500	38
H-20	1,500	39	H-37	1,500	39
H-21	1,500	40	H-38	1,500	38
H-22	1,500	35	H-39	1,500	38
H-23	1,500	35	H-40	1,500	37
H-24	1,500	38	H-41	1,500	37
H-25	1,500	38	H-42	1,500	67
H-26	1,500	34	H-43	1,500	66
H-27	1,500	38	H-44	1,500	34
H-28	1,500	37	H-46	1,500	33
H-29	1,500	40	H-47	1,500	38

Table 5-9: Fire Flow Analysis Results for the Proposed Long-Term System					
Fire Hydrant No.	Available Flow (gpm)	Residual Pressure @ PDD (psi)	Fire Hydrant No.	Available Flow (gpm)	Residual Pressure @ PDD (psi)
H-30	1,500	39	H-49	1,500	40
H-31	1,500	38	H-51	1,500	39

Source: Stantec, 2024

Table 5-10: Average Water Demands (gpm) Per Term (Cumulative)							
Junction	Short-Term	Mid-Term	Long-Term	Junction	Short-Term	Mid-Term	Long-Term
J1	0.21	0.21	0.21	J11	N/A	N/A	0.21
J2	0.21	0.21	0.21	J12	N/A	N/A	1.74
J3	2.89	2.89	2.89	J13	N/A	N/A	16.16
J4	N/A	13.02	13.44	J14	N/A	N/A	6.51
J5	N/A	6.51	25.32	J15	N/A	N/A	16.16
J6	0.10	0.10	0.10	J16	N/A	N/A	6.51
J7	N/A	4.52	4.52	J17	N/A	9.65	9.65
J8	N/A	5.79	5.79	J18	N/A	0.72	0.72
J9	N/A	N/A	1.04	J19	N/A	N/A	0.78
J10	N/A	N/A	0.42	N/A	N/A	N/A	N/A

Source: Stantec, 2024

5.3 Wastewater Collection System

Developing the BKV infield area requires expanding the wastewater collection system to include additional transmission components and sizes needed to support the proposed facilities. The evaluation will include system conditions during an average daily flow and maximum daily flow. As part of the wastewater system evaluation, four wastewater collection system deficiencies were documented within the BKV infield area:

1. Surcharged sewer gravity mains
2. Force mains with high velocities (> 7 feet per second) / headloss
3. Pump capacity limitations
4. Low velocity force mains and gravity mains

If deficiencies were recorded, recommendations were made for system improvements via system extensions, diameter increases, additional looping zones, pump improvements, pumping stations, etc., to meet system requirements.

Design guidelines were established by HCUD Water, Reclaimed Water and Wastewater Construction Specifications Manual (2017):

- Peaking factor 3 for commercial wastewater flows
- Minimum 4-foot cover depth, but at least 5-foot when possible.

- Gravity mains sized to accommodate peak flow when flowing ½ full, but never less than 8-inches in diameter
- Minimum slope 0.004 ft/ft (0.40%) for 8-inch gravity sewer mains
- Manholes spaced no more than 350 feet apart
- Manhole depths less than 12 feet, when possible, otherwise, less than 30 feet.
- Wet wells less than 30 feet in depth

The HCUD Water, Reclaimed Water, and Wastewater Construction Specifications Manual also requires a minimum velocity of 2 feet per second (fps) for gravity mains greater than 12-inches in diameter when flowing half full. Since gravity mains with 8-inch diameters were selected for the BKV infield area, this guideline does not apply. The Florida Department of Environmental Protection (FDEP) recommends a 2 feet per second minimum velocity for gravity mains when flowing full. This velocity is translated to a minimum slope of 0.004 ft/ft for 8-inch gravity sewer mains, which is reflected in the HCUD Manual.

5.3.1 Phasing Plan

Force mains, both wet wells, and a portion of the gravity system are required for the short-term implementation plan, and the gravity system should be extended for both mid-term and long-term developments. This section summarizes the wastewater collection system extensions to be built for the short-term, mid-term, and long-term developments.

5.3.1.1 Short-Term

A wet well was placed to (1) minimize incoming gravity mains' invert depth, limiting to 30 feet deep but keeping them below 12 feet deep when possible, and (2) facilitate gravity mains flowing towards the planned wet well on Telecom Dr. (WW-122), which is both in the general downhill direction and towards the Airport Water Reclamation Facility. One wet well is needed to direct flows from building 5 across the runway to existing MH-323, since gravity flow is limited by pipe cover and slope requirement. The wet well should contain two pumps. For preliminary modeling purposes, the same pumps as are currently shown in the lift station "BK-LS10" were used in the new wet well WW-123. This is an Ebara 50DGFU63.7S (5 hp) pump. This pump selection was based on peak flow at the long-term development phase. It is expected that float elevations will have to be modified after each development phase to adjust pump ON and OFF times as wastewater flows increase with each development phase. The wet well was set at an 8-foot diameter with a bottom elevation of 40 feet, giving it a total depth of 29.4 feet. Gravity main, force main, laterals, and manhole information is shown in **Table 5-11.**

Table 5-11: Short-Term Wastewater Collection System Pipe Description		
Description	**Unit**	**Quantity**
8" PVC – Gravity Main	LF	347
8" PVC – Force Main	LF	880
6" PVC Lateral	LF	200
48" Manholes	EA	1

Source: Stantec, 2024

Short-term wastewater collection system developments are displayed in **Figure 5-6**, with gravity mains shown in yellow, wet wells in cyan, and force mains in magenta. Flows in and out of the wet well are summarized in **Table 5-12.**

Table 5-12: Short-Term Wastewater Collection System Wet Well Flows			
Description	**Inflow at ADF (gpm)**	**Inflow at PDF (gpm)**	**Pump Rate (gpm)**
WW-123	0.09	0.47	119
WW–122	122	134	497[1]

Source: Stantec, 2024

Note: [1] WW-122 design pump rate is 450 gpm per Mead and Hunt drawings (July 2024) and PDR (Dec. 2023)

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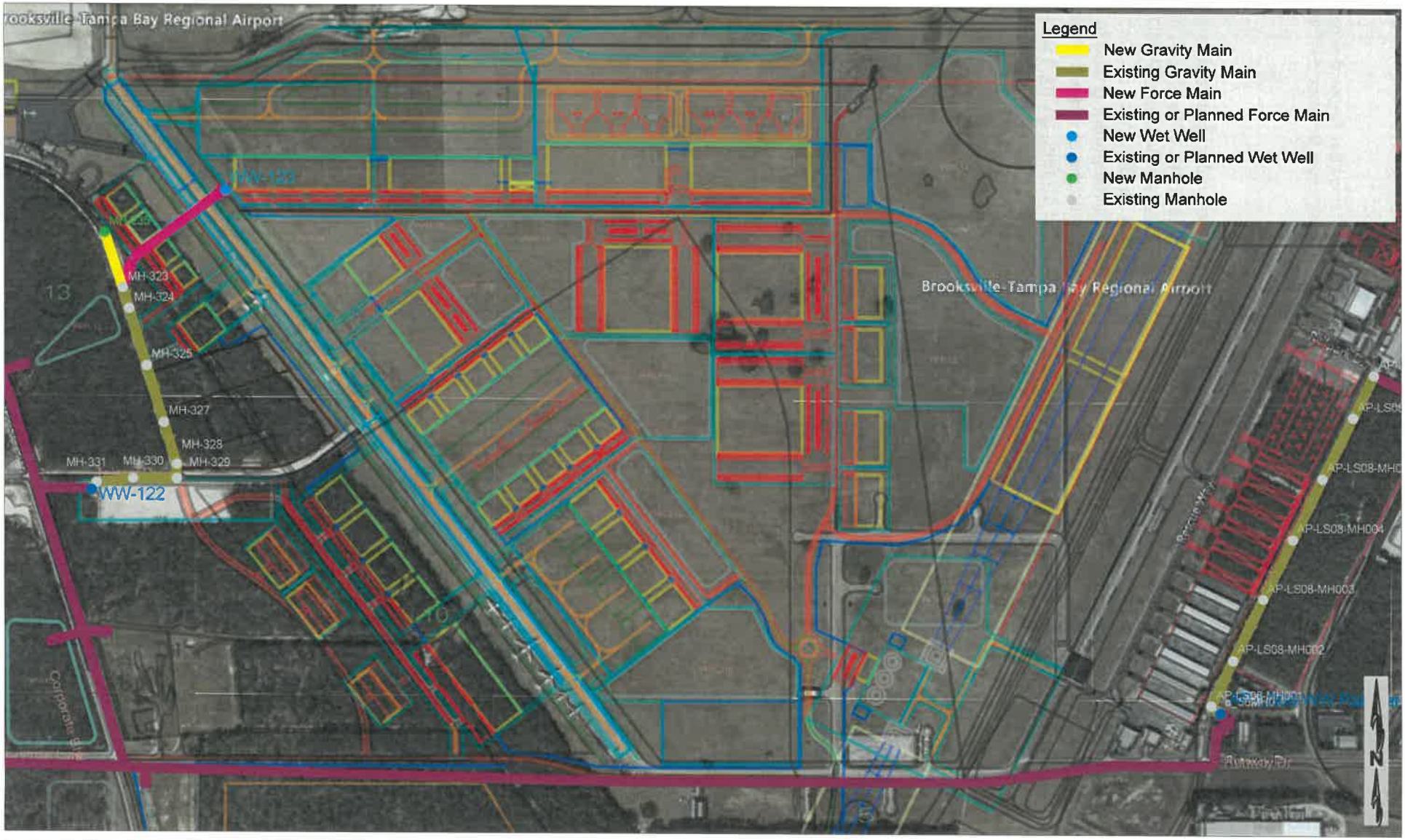

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Locations of Proposed Wastewater System for Short-Term Developments

Figure 5-6

5.3.1.2 Mid-Term

One additional wet well is needed for mid-term developments. The wet well should contain two pumps. For preliminary modeling purposes, the same pumps as are currently shown in the lift station "AP-LS06" were used in the new wet well WW-124. This is a Barnes 4SHMD (20hp) pump. This was selected based on peak flow at the long-term development phase. It is expected that float elevations will have to be modified after each development phase to adjust pump ON and OFF times as wastewater flows increase with each development phase. The wet well was set at an 8-foot diameter with a bottom elevation of 36 feet, giving it a total depth of 30 feet. Additional gravity mains, manholes, and laterals are recommended for the mid-term BKV Infield developments, as shown in **Table 5-13**. Proposed gravity mains are primarily 8-inches in diameter, with limited 10-inch diameter gravity mains included so the mains are less than ½ full during peak flow at the long-term development phase.

Table 5-13: Mid-Term Wastewater Collection System Pipe Description

Description	Unit	Quantity
8" PVC – Gravity Main	LF	7,124
10" PVC – Gravity Main	LF	106
8" PVC – Force Main	LF	257
6" PVC Lateral	LF	1,350
48" Manholes	EA	27
8" PVC – Gravity Main	LF	7,124

Source: Stantec, 2024

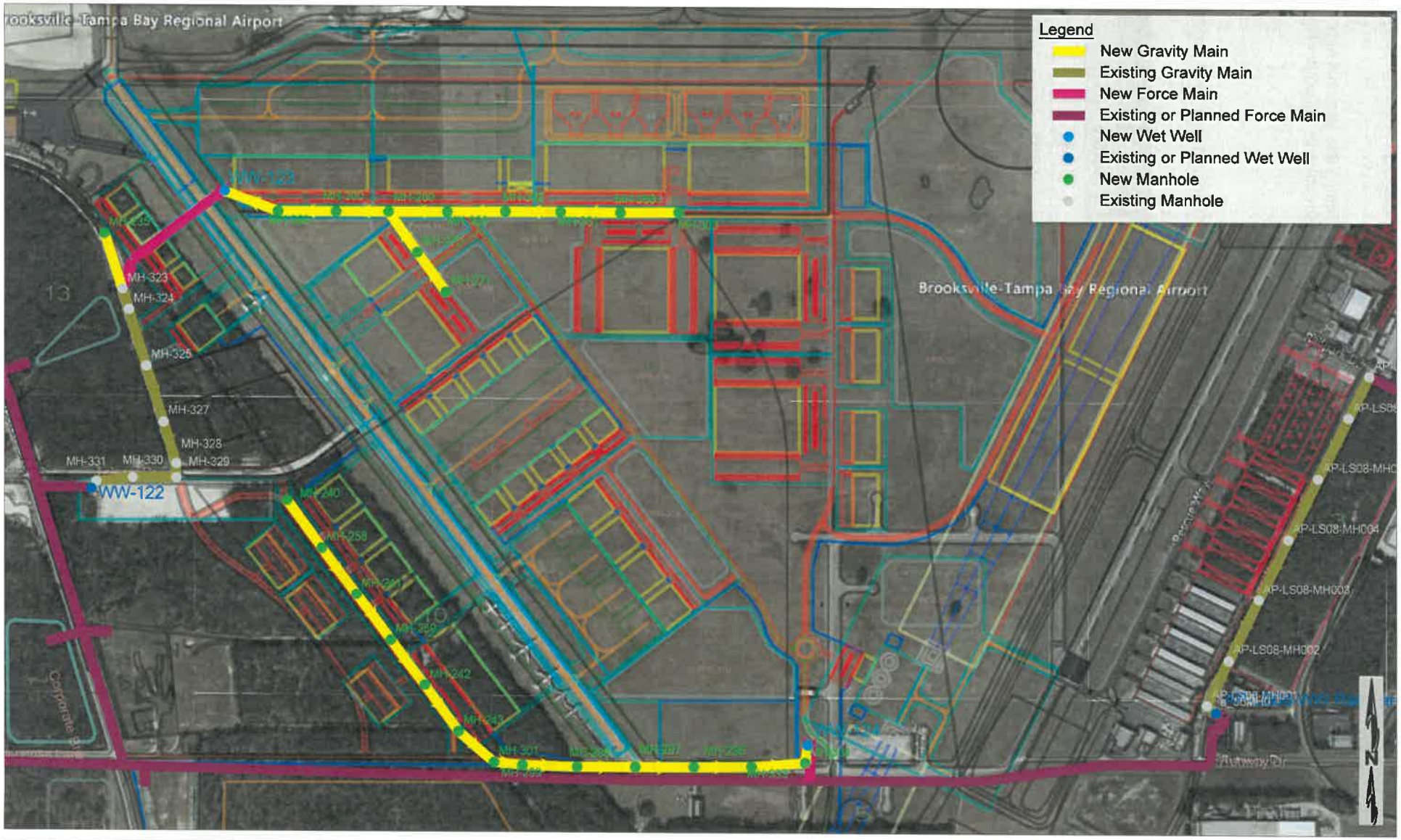
Mid-term wastewater collection system developments are displayed in **Figure 5-7**, with gravity mains shown in yellow, wet wells in cyan, and force mains in magenta. Flows in and out of the wet well are summarized in **Table 5-14**.

Table 5-14: Mid-Term Wastewater Collection System Wet Well Flows

Description	Inflow at ADF (gpm)	Inflow at PDF (gpm)	Pump Rate (gpm)
WW-123	18.1	54.2	119
WW-122	122	134	478[1]
WW-124	18.2	53.4	450

Source: Stantec, 2024

Note: [1] WW-122 design pump rate is 450 gpm per Mead and Hunt drawings (July 2024) and PDR (Dec. 2023)



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Locations of Proposed Wastewater System for Mid-Term Developments

Figure 5-7

5.3.1.3 Long-Term

Additional gravity mains, manholes, and laterals recommended for the long-term BKV Infield developments are summarized in **Table 5-15.**

Table 5-15: Long-Term Wastewater Collection System Pipe Description		
Description	**Unit**	**Quantity**
8" PVC – Gravity Main	LF	4,482
10" PVC – Gravity Main	LF	1,161
6" PVC Lateral	LF	650
48" Manholes	EA	13

Source: Stantec, 2024

Long-term wastewater collection system developments are displayed in **Figure 5-8,** with gravity mains shown in yellow, wet wells in cyan, and force mains in magenta. Flows in and out of the wet well are summarized in **Table 5-16.**

Table 5-16: Long-Term Wastewater Collection System Wet Well Flows			
Description	**Inflow at ADF (gpm)**	**Inflow at PDF (gpm)**	**Pump Rate (gpm)**
WW-123	19.8	59.4	119
WW-122	122	128	478[1]
WW-124	78.4	235	450

Source: Stantec, 2024

Note: [1] WW-122 design pump rate is 450 gpm per Mead and Hunt drawings (July 2024) and PDR (Dec. 2023)

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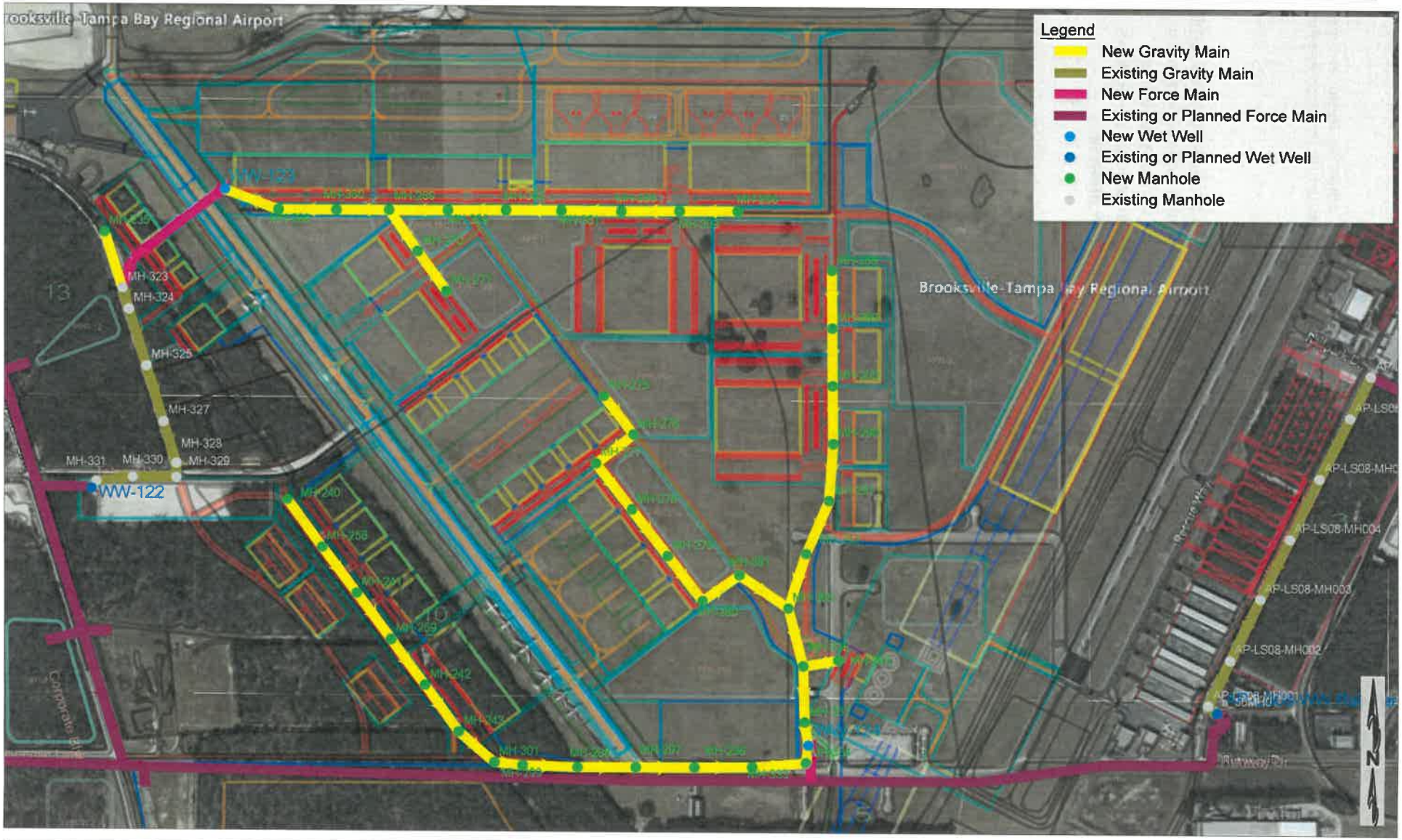

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Locations of Proposed Wastewater System for Long-Term Developments

Figure 5-8

5.3.2 Flow Requirements

Wastewater flows were based on water flows. Average daily flow was calculated by assuming that 90% of distributed water is ultimately introduced to the wastewater collection system. Peak daily demand was modeled in steady state. A peaking factor of 3 was applied, in accordance with the HCUD construction specifications manual. The additional peak flows were added to each respective manhole to allow for gravity main flow analysis.

5.3.3 Impact on Nearby Wet Wells

Pumps at nearby wet wells need to be re-evaluated during the design phase to account for the increased flows from the infield area developments and from the future diverted City of Brooksville Flows. AP-LS08-WW Rail Park pumps, which are located just southeast of the BKV infield area, need to be re-evaluated and sized up. Additional flows downstream from the infield IDP cause increased head on the AP-LS08 pumps, thus reducing flow compared to current conditions. Pump analysis should occur prior to short-term development construction and must include pumps at recommended wet wells within the BKV infield area and surrounding existing wet wells. Existing AP-LS08-WW Rail Park pumps and proposed WW-124 are of particular importance for pump analysis.

5.4 Electrical Utility Availability

Electrical utility availability was determined by contacting Sunshine 811 and Duke Energy. Sunshine 811 confirmed that Duke Energy, TECO People's Gas – Tampa, and AT&T exist in the BKV Infield area. Stantec also spoke with a Duke Energy representative and was informed that there is existing power in the area, with a control tower supported by underground wires. The Duke Energy representative also explained that high power needs would be discussed and planned at the development stage but is not expected to pose issues.

5.5 Utilities References

American Water Works Association (AWWA), M32 Computer Modeling of Water Distribution Systems, 4th Edition, 2017.

Barry Smith, Division Chief-Fire Prevention. Hernando County Fire Rescue, Email Correspondence. October 2024.

Congressional Budget Office; The Economic Outlook for 2023 to 2033 in 16 Charts; Webpage Last Updated February 2023. https://www.cbo.gov/publication/58957

Environmental Protection Agency (EPA), Lean & Water Toolkit: Appendix C, 2024.

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Florida Fire Prevention Code (FFPC), Florida's State Fire Marshal, 8th Edition, 2024.

Hernando County Utilities Department (HCUD); Water, Reclaimed Water and Wastewater Construction Specifications Manual; Jan. 2013, Updated 2017.

Hernando County Water Master Plan, March 2021.

Hernando County Wastewater Master Plan, Sept 2021.

Morales, Martin, & Heaney. Methods for Estimating Commercial, Industrial and Institutional Water Use, 2009.

NFPA 220 Standard on Types of Building Construction, 2021 Edition

NFPA 409 Standard on Aircraft Hangars, 2021 Edition.

6 IMPLEMENTATION PLAN

This section includes the phasing, quantities, refined costs, and funding opportunities for each proposed project shown on the Infield Infrastructure Development Plan. In addition, the proposed development is analyzed to demonstrate the potential funding opportunities associated with the Plan.

Based on the refined alternative presented in Chapter 3, a list of proposed projects is presented in Table 3-3. The IDP evaluated each proposed project to understand its future cost and funding availability to provide general financial guidance to Hernando County regarding the recommended development in the Infield area of BKV.

6.1 Proposed Phasing Plan

To provide realistic assumptions regarding the funding available for the proposed projects, each project was placed into one of three general project phasing periods based on the ease of implementation, cost, permitting, commercial development, and logic of project sequencing. The objective was to establish an efficient project development and implementation order that meets the airport expansion needs and demand. Below are the project phasing periods used for this purpose.

- Short-Term Development Period – Projects anticipated to be implemented within years 0 to 5 of the airport plan (2025-2029),
- Mid-Term Development Period – Projects anticipated to be implemented between years 6 to 10 of the plan (2030-2034).
- Long-Term Development Period – Projects anticipated to be implemented between years 11 to 20 of the plan (2035-2044).

Although this study charts a course for planned development, it must be emphasized that the planning and development of an airport is a continuous process. The rehabilitation of existing facilities and the development of new facilities must be predicated on sustained demand, which justifies the costs of improvements.

6.2 Analysis of Priority Sites

Based on the airport goals, the County's vision, and the comments received during the phasing workshop held on July 15, 2024, the priority is to convert the old runway into a taxiway to provide airside access to the northwest of the Infield. The airport awarded a contract to design phase I of the project in 2024. The construction of the first portion of the taxiway is expected to be ready in the short term. Even though the west side of the taxiway has roadway access, the east side will depend on the development of landside access and the availability of utilities.

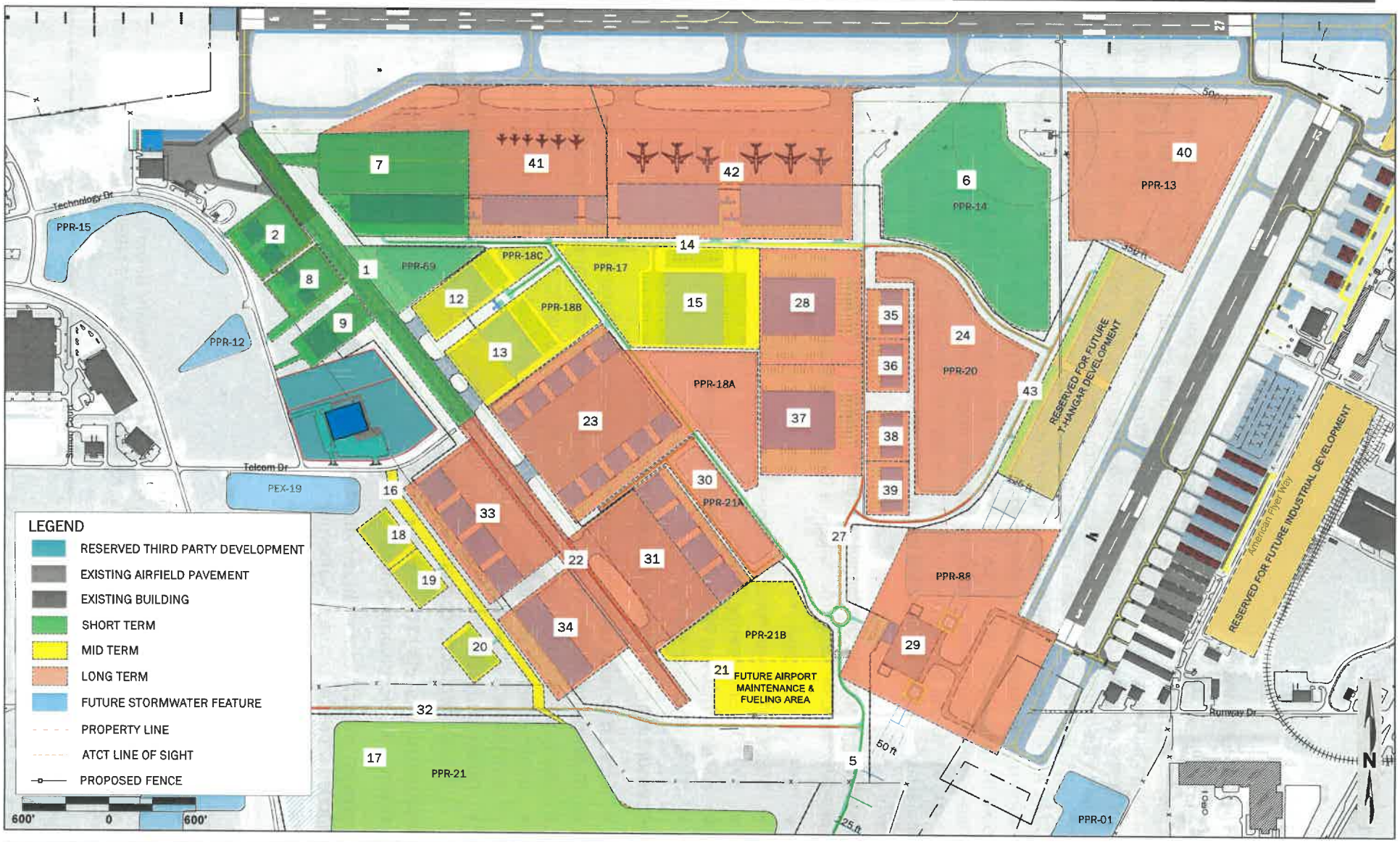
After evaluating the existing conditions, the actions required to unlock each development site, the availability of utilities, and the ease of implementation, a development priority was established.

The proposed projects have been prioritized and included in the development periods. The phasing plan is shown in **Table 6-1** and **Figure 6-1.**

Table 6-1: Phasing Plan		
Project Number	**Description**	**Implementation Year**
Short-Term Planning Period (2025-2029)		
1	New Taxiway-Phase I (PPR-69)	2026
2	Site-Prep Northwest (3.5 AC parcel)	2026
3	Water Distribution System-Phase I	2026
4	Wastewater Collection System - Phase I	2026
5	Road from Sergeant Mills Blvd to Infield Area	2026
6	Stormwater Improvements (PPR-14)	2028
7	Site-Prep Northwest Infield - Phase I	2028
8	Site-Prep (3.0 AC parcel)	2029
9	Site-Prep (40,000 SF Hangar)	2029
Mid-Term Planning Period (2030-2034)		
10	Water Distribution System-Phase II	2030
11	Wastewater Collection System - Phase II	2030
12	Site-Prep MRO (62,500 SF) (PPR-18C)	2030
13	Site-Prep MRO (100,000 SF) (PPR-18B)	2030
14	Road Development East-West Infield Area	2030
15	Site-Prep Industrial Development Infield (PPR-17)	2031
16	Roads Development - South of Telcom Dr	2032
17	Stormwater Improvements (PPR—21)	2032
18	Site-Prep Industrial Development West Side A	2033
19	Site-Prep Industrial Development West Side B	2033
20	Site-Prep Industrial Development West Side C	2033
21	Airport Maintenance & Fueling Facility (PPR-21B)	2034
Long-Term Planning Period (2035-2044)		
22	New Taxiway-Phase II	2035
23	Site-prep Apron and hangars (22,500 SF) (PPR-18A)	2035

Table 6-1: Phasing Plan		
Project Number	**Description**	**Implementation Year**
24	Stormwater Improvements (PPR-20)	2035
25	Water Distribution System-Phase III	2036
26	Wastewater Collection System - Phase III	2036
27	Road development south-north Infield Area	2037
28	Site-Prep Industrial Development Infield B	2038
29	AAM Facilities (PPR-88)	2039
30	Road development parallel to the new taxiway (PPR-21A)	2039
31	Site-Prep southeast apron and hangars (40,000 SF)	2039
32	Airport Service Road Extension	2040
33	Site-Prep southwest apron and hangars (40,000 SF)	2040
34	Site-Prep Southwest hangar (130,000 SF)	2041
35	Site-Prep Light industrial development West Side C	2042
36	Site-Prep for Light industrial development West Side D	2042
37	Site-Prep Industrial development Infield C	2043
38	Site-Prep for Light industrial development West Side F	2043
39	Site-Prep for Light industrial development West Side G	2043
40	Stormwater Improvements (PPR-13)	2044
41	Site-Prep Northwest - Phase II	2044
42	Site-Prep North-center	2044
43	Road Development to future T-hangar developments	2044

Source: Michael Baker International, Inc.



Michael Baker INTERNATIONAL

Infield Development Phasing Plan

Figure 6-1

6.3 Cost Estimates

Based on the selected development concept, probable construction costs are estimated for the proposed infield infrastructure development projects at BKV. The order of magnitude cost estimates associated with the proposed projects are presented in 2024 dollars and include estimated engineering fees and contingencies. The cost estimates are escalated base on Inflation rates estimated using sources from Statistical Research Department [19](2024), Congressional Budget Office (2023), and Federal Reserve Bank of Cleveland (2024). A 5.0 percent inflation rate is used for short-term projects and a 2.3 percent inflation rate is applied to escalate mid and long-term projects. As time goes by, the values should be reviewed to determine if any project cost adjustments have occurred. Although construction project costs are highly variable due to the fluctuating cost of materials (e.g., asphalt, steel, and energy production), a reasonable estimate of future costs can be calculated by adjusting the costs by the appropriate Consumer Price Index (CPI) inflation factor.

For planning purposes, the following fees are added to the base construction cost as applicable based on set percentages of construction cost.

- 15% Contingency
- 50% Contingency for utility projects
- 8%-10% Engineering Design
- 8% Construction Phase Professional Services
- 5% Utility Relocations

Other assumptions to be considered are as follows:

- Erosion Control assumed to be 30% of Safety and Security
- Mobilization is 10% of all items, excluding owners allowance, unspecified work
- Owner's Allowance, unspecified Work is 3% of all work, excluding mobilization
- Construction Quality Control Program (CQCP) is 2% of all work excluding mobilization and owner's allowance, unspecified work
- Safety and Security is 3% of all work, excluding mobilization, owner's allowance, unspecified work, contractor quality control program (CQCP), and erosion control

The proposed projects in the infield development plan are categorized as Roadways, Airfield Improvements, Development Areas (site-prep), Stormwater Features and Utilities.

Roadways: projects that include extending or constructing a new road enabling access to proposed areas for future developments.

[19] Statistica Research Department; Projected Annual Inflation Rate in the United States from 2010 to 2029, Webpage Last Updated August 2024. https://www.statista.com/statistics/244983/projected-inflation-rate-in-the-united-states

Airfield Improvements: projects that allow airfield access for future aeronautical use developments. This category includes the conversion of the former runway to a taxiway and the advanced air mobility facilities.

Development Areas (Site Prep): these projects consider the necessary action to obtain ready sites for third-party development, including drainage and utility improvements, grading, surveying, and earthwork. Even though the IDP recommends specific types of facilities, such as corporate hangars or MROs, the cost estimate for those projects does not include the construction cost of any facility or airfield pavement. Also, the cost will not include clearing activities. Stormwater features related to the impervious areas are included in the cost; however, it is expected that its cost will be included in the construction of the facilities, which will be third-party funded.

Stormwater Features: as described in Chapter 4, drainage improvements are required to accommodate the proposed impervious areas. Some of the proposed retention ponds serve more than one project. Since those projects are envisioned to be developed across the 20-year planning period, some retention ponds are considered a single project that will be required to enable the development of future areas. Even though the estimated cost reflects the maximum extension needed to serve the proposed impervious areas on a specific basin, the construction of the pond could be phased as the impervious areas are built.

Water/Wastewater Utilities: Additional demands and flows were added to the model based on envisioned developments in the short, mid, and long-term. The cost estimate is split into three phases for the water/wastewater utilities, respectively, for each term. Expanding the potable water system and wastewater collection system is necessary to meet water and fire flow demands and to handle wastewater flows from the new developments. **Table 6-2** presents the cost estimates per project.

Table 6-2: Cost Estimates

Project Number	Description	Implementation Year	Estimated Cost*
Short-Term Planning Period (2025-2029)			
1	New Taxiway-Phase I (PPR-69)	2026	$12,342,528
2	Site-Prep Northwest (3.5 AC parcel)	2026	$30,684
3	Water Distribution System - Phase I	2026	$10,175,365
4	Wastewater Collection System - Phase I	2026	$1,891,772
5	Road from Sergeant Mills Blvd to Infield Area	2026	$15,384,941
6	Stormwater Improvements (PPR-14)	2028	$16,020,504
7	Site-Prep Northwest Infield - Phase I	2028	$115,018

Table 6-2: Cost Estimates			
Project Number	**Description**	**Implementation Year**	**Estimated Cost***
8	Site-Prep (3.0 AC parcel)	2029	$35,520
9	Site-Prep (40,000 SF Hangar)	2029	$28,416
		Total Short-Term	$56,024,748
Mid-Term Planning Period (2030-2034)			
10	Water Distribution System - Phase II	2030	$6,560,962
11	Wastewater Collection System - Phase II	2030	$6,081,621
12	Site-Prep MRO (62,500 SF) (PPR-18C)	2030	$964,901
13	Site-Prep MRO (100,000 SF) (PPR-18B)	2030	$2,485,479
14	Road Development East-West Infield Area	2030	$2,536,242
15	Site-Prep Industrial Development Infield (PPR-17)	2031	$4,047,724
16	Roads Development - South of Telcom Dr	2032	$9,182,614
17	Stormwater Improvements (PPR-21)	2032	$38,611,824
18	Site-Prep Industrial Development West Side A	2033	$26,228
19	Site-Prep Industrial Development West Side B	2033	$26,228
20	Site-Prep Industrial Development West Side C	2033	$26,228
21	Airport Maintenance & Fueling Facility (PPR-21B)	2034	$8,080,122
		Total Mid-Term	$78,630,174
Long-Term Planning Period (2035-2044)			
22	New Taxiway-Phase II	2035	$10,635,621
23	Site-prep Apron and hangars (22,500 SF) (PPR-18A)	2035	$8,100,730
24	Stormwater Improvements (PPR-20)	2035	$15,072,770
25	Water Distribution System - Phase III	2036	$2,704,481
26	Wastewater Collection System - Phase III	2036	$3,507,600
27	Road development south-north Infield Area	2037	$5,038,498

Table 6-2: Cost Estimates			
Project Number	**Description**	**Implementation Year**	**Estimated Cost***
28	Site-Prep Industrial Development Infield B	2038	$92,981
29	AAM Facilities (PPR-88)	2039	$12,920,834
30	Road development parallel to the new taxiway (PPR-21A)	2039	$7,450,581
31	Site-Prep southeast apron and hangars (40,000 SF)	2039	$148,747
32	Airport Service Road Extension	2040	$6,997,785
33	Site-Prep southwest apron and hangars (40,000 SF)	2040	$128,141
34	Site-Prep Southwest hangar (130,000 SF)	2041	$122,896
35	Site-Prep Light industrial development West Side C	2042	$16,763
36	Site-Prep for Light Industrial Development West Side D	2042	$16,763
37	Site-Prep Industrial Development Infield C	2043	$104,177
38	Site-Prep for Light Industrial Development West Side F	2043	$17,149
39	Site-Prep for Light Industrial Development West Side G	2043	$17,149
40	Stormwater Improvements (PPR-13)	2044	$16,679,326
41	Site-Prep Northwest - Phase II	2044	$263,144
42	Site-Prep North-center	2044	$368,402
43	Road Development to future T-hangar developments	2044	$7,150,878
		Total Long-Term	$97,555,415
		TOTAL	$232,210,337

Source: Michael Baker International and Stantec 2024.
Note: *Escalation of short-term projects 5%. Mid and long-term projects 2.3%.

Table 6-3 summarizes the Capital Improvement Plan by type of project, including an escalation of a 5 percent inflation rate for short-term projects and a 2.3 percent inflation rate for mid- and long-term projects.

Table 6-3: Cost Estimate by Project Category				
Project Category	**Short Term**	**Mid Term**	**Long Term**	**Total**
Airfield	$12,342,528	$-	$23,556,455.14	$35,898,983
Roadways	$15,384,941	$11,718,856	$26,637,741.57	$53,741,538
Drainage	$16,020,504	$38,611,824	$31,752,096.60	$86,384,425
Development Areas	$209,638	$7,576,789	$9,397,040.85	$17,183,468
Other	$-	$8,080,122	$-	$8,080,122
Utilities	$12,067,137	$12,642,583	$6,212,081.20	$30,921,801
Total	$56,024,748	$78,630,174	$97,555,415	$232,210,337

Source: Michael Baker International, Inc.

6.4 Sources of Funding

Large-scale development projects at an airport are typically beyond the normal annual budget capacity and cannot be supported solely with self-generated funds. In these situations, it is not uncommon for an airport to seek funding from outside sources. These sources can either provide funding for projects outright or be combined with one another to reach the necessary funding level.

In some cases, funding sources are capped on an annual or lifetime basis, such as with FAA entitlement funds. Therefore, it is not uncommon for airports to phase projects to maximize grants to collect the necessary funding. Most sources do not guarantee funding, and applicable projects must compete against one another.

Funding sources for this Financial Plan were analyzed and summarized from various governing bodies, including: The Federal Government, State Government, and Local funds. These potential funding sources include:

- Federal Government:
  - FAA Airport Improvement Program (AIP)
  - Bipartisan Infrastructure Law (BIL)
- State Government:
  - FDOT Grant Funds
- Local Government- Hernando County
- Public-Private Partnerships / Third-Party Development

The listed possible funding sources are not all-encompassing, as grant programs tend to open and close due to government funding availability. Therefore, it is recommended that when BKV is prepared to begin the initial planning for any project listed, the grant entity should coordinate with it to discuss the project's justification and benefits.

6.4.1 Federal Funding

FAA Airport Improvement Program (AIP)

Federal funding for airports is coordinated through the FAA. AIP funding is generated through taxes levied on passenger tickets and aviation fuel and is typically prioritized to enhance safety, security, capacity, and noise mitigation.

The two major sources of funding managed by the FAA are a part of the Airport Improvement Program, which, according to the FAA, "provides grants to public agencies — and, in some cases, to private owners and entities — for the planning and development of public-use airports that are included in the National Plan of Integrated Airport Systems (NPIAS)."[20] The two categories of AIP funding are: entitlements grants and discretionary grants. It is estimated that about two-thirds of the AIP's annual funds are allocated to airports via entitlement grants based on a formula that considers airport activity, passengers, and/or cargo weight, depending on the airport. Discretionary funding is made up of the remaining one-third of the AIP's annual funds and is set aside for specific projects based on their overall importance and priority. AIP grants are to be used for specific eligible capital projects, equipment, and certain types of planning and environmental studies. The funds are programmed to cover no more than 90 percent of project costs, depending on statutory requirements, at airports the size of BKV. However, under the Reauthorization Act of 2024, it was established a special rule for the fiscal years 2025 and 2026 where "the government's share of allowable project cost for a grant made to a non-hub, or nonprimary airport in each of the fiscal year 2025 and 2026 shall be 95 percent"[21]. They cannot be used for airport operating expenses, debt financing, or interest costs.[22]

Accepting these grants from the FAA includes accepting certain obligations and conditions (Grant Assurances) required by the FAA. According to the FAA, these obligations generally include operating and maintaining the airport in a safe and serviceable condition, not granting exclusive rights, mitigating hazards to airspace, and charging, collecting, and using airport revenue properly[23].

As of the 2023-2027 NPIAS Report, the FAA classified BKV as a national general aviation airport. General aviation airports are public-use airports that do not have scheduled service or have less than 2,500 annual passenger boardings. As a National Airport, BKV supports the national and state systems by providing communities with access to national and international markets in multiple states and throughout the United States.

This category impacts the amount of funding BKV receives from the FAA AIP entitlement fund (general aviation entitlement) annually. On average, BKV receives $150.000 of

[20] FAA - https://www.faa.gov/airports/aip
[21] FAA Reauthorization Act of 2024 SEC. 708
[22] https://www.faa.gov/airports/aip/overview#grant
[23] https://www.faa.gov/sites/faa.gov/files/airports/aip/grantapportion_data/FY-2022-Primary-Entitlements.pdf

entitlement funds, depending on the level of appropriations from Congress, annually. It is expected that with the Reauthorization Act of 2024, this amount will increase consistently, with the overall AIP funding increased from 3.35 billion per year to 4.0 billion per year starting in Fiscal Year 2025

FAA Order 5100.38D, Airport Improvement Program (AIP) Handbook, sets forth the official policy and procedures to be used in the administration of AIP grants. **Table 6-4** lists typical examples of eligible and ineligible AIP projects.

Table 6-4: Examples of Eligible vs. Ineligible AIP Projects

Eligible Projects	Ineligible Projects
Runway construction/rehabilitation	Maintenance equipment and vehicles
Taxiway construction/rehabilitation	Office and office equipment
Apron construction/rehabilitation	Fuel farms*
Airfield lighting	Landscaping
Airfield signage	Artworks
Airfield drainage	Aircraft hangars*
Land acquisition	Industrial Park development
Weather observation stations (AWOS)	Marketing plans
NAVAIDs such as REILs and PAPIs	Training
Planning studies	Improvements for commercial enterprises
Environmental studies	Maintenance or repairs of buildings
Safety area improvements	
Airport layout plans (ALPs)	
Access roads only located on airport property	
Removing, lowering, moving, marking, and lighting hazards	
Glycol Recovery Trucks/Glycol Vacuum Trucks**	

Source: FAA AIP Overview, FAA website.
*May be eligible. Contact your local Airport District or Regional Office for more information.
**To be eligible, the vehicles must be owned and operated by the airport and meet the Buy American Preference specified in the AIP grant. Contact your local Airport District or Regional Office for more information.

In addition, the following must also apply for FAA to consider a project for AIP funding:
The project sponsorship requirements have been met.
The project is reasonably consistent with the plans of planning agencies for the development of the area in which the airport is located.
Sufficient funds are available for the portion of the project not paid for by the Federal Government.
The project will be completed without undue delay.
The airport location is included in the current version of the NPIAS.
The project involves more than $25,000 in AIP funds.
The project is depicted on a current airport layout plan approved by FAA. All safety issues have been addressed.

Bipartisan Infrastructure Law

The Bipartisan Infrastructure and Investment Jobs Act (Bipartisan Infrastructure Law or BIL) was enacted and signed into law November 15, 2021. The Bipartisan Infrastructure Law authorizes up to $108 billion for public transportation – the largest federal investment in public transportation in the nation's history. The purpose of the BIL legislation is to advance public transportation in America's communities through four key priorities: safety, modernization, climate, and equity. The BIL includes approximately $25 billion for the National Airspace System, and approximately $5 billion is for improvements to FAA-owned facilities and equipment. FAA's Office of Airports (ARP) will administer the remaining

approximately $20 billion in grant funds for airport infrastructure, terminal development, including multimodal terminal development, including on-airport rail access projects, and airport-owned airport traffic control towers.[24] However, the Bipartisan Infrastructure Law will distribute these funds over the five-year period FY 2022 through FY 2026.

To date, nearly $9 billion in Airport Infrastructure Grant (AIG) funding has been available to airports nationwide. For BKV Fiscal Year 2024 $851,000 were allocated[25].

Approximately $4.85 billion ($970 million annually) is distributed by the competitive Airport Terminal Program (ATP). Airports can compete for ATP grants under BIL. The grants can be used for justified terminal development projects as defined under 49 USC 7102(28), including multi-modal terminal development and on-airport rail access projects. The sponsor matches 20 percent for large- and medium-hub airports and five percent for small-hub, non-hub, and non-primary airports.

6.4.2 State Funding - Florida Aviation Grant Program

This program was established to fund projects relating to airport planning, capital improvement, land acquisition, and economic development. The funding assists in providing a safe, cost-effective, and efficient statewide aviation system. FDOT grant funds help airports build and maintain runways and taxiways, eliminate airport hazards, protect airspace, develop plans, acquire land, and build terminals and other facilities.

All publicly owned airports in Florida that are part of the Florida Aviation System Plan (FASP) are eligible for funding from the Florida Department of Transportation (FDOT). To qualify for the Florida Aviation Grant Program, airport projects must align with the airport's designated role in the FASP and with the approved comprehensive plan of the local government. Additionally, capital projects must be included in an FDOT-approved airport master plan and/or airport layout plan, have an airport sponsor (local government), and be entered into the Florida Aviation Database (FAD) through the Joint Automated Capital Improvement Program (JACIP).

BKV, located in District 7, is designated as a General Aviation Airport in the FASP. This means that when a BKV project is funded by the FAA, FDOT may provide up to 80 percent of the remaining (non-federal) share of project costs. FDOT may provide up to 80 percent of the total project costs when no federal funding is available.

The Florida Aviation Grant program encompasses eligible projects that promote airport growth and development to help airports become self-sustaining. Examples of Economic Development projects eligible for funding are:

- Any airport improvement and land purchase that will enhance economic impact.
- Buildings for lease
- Industrial Park infrastructure and buildings

[24] FAA - Bipartisan Infrastructure Law Frequently Asked Questions- February 2022

[25] https://www.faa.gov/bil/airport-infrastructure

- Terminals constructed for the purpose of generating revenue through leases.
- Industrial Park marketing programs

6.4.3 Local Funding

Local airport owners and sponsors, such as counties, cities, and/or airport authorities, are frequently responsible for costs associated with airport development projects that remain after federal and state shares have been applied. In cases where outside funding is not enough to cover the total project cost, or if a project does not apply to any funding sources, the airport sponsor may provide the local share from its annual cash flow or available cash reserves. Additionally, it is desired that general aviation airports generate enough revenue to cover their operating expenses and the local match for federal and state grants.

6.4.4 Public Private Partnerships / Third-Party Development

Public Private Partnerships are "arrangements, typically medium to long term, between the public and private sectors whereby some of the services that fall under the responsibilities of the public sector are provided by the private sector, with clear agreement on shared objectives for delivery of public infrastructure and/or public services." These arrangements provide airports an opportunity to develop projects crucial to growth, without absorbing the financial burden of the construction and operation costs.

However, these arrangements also require airports to work closely with outside operators and could potentially result in less airport involvement during certain capital development projects. Many airports use private or third-party investment when the planned improvements will be primarily used by a private business or other organization. Such projects are not ordinarily eligible for federal funding. Projects of this kind typically include hangars, fixed based operator facilities, fuel storage, exclusive aircraft parking aprons, industrial aviation use facilities, non-aviation office/commercial/industrial developments, and other similar projects. Private development proposals are considered on a case-by-case basis. Often, airport funds for infrastructure, preliminary site work, and site access are required to facilitate privately developed projects on airport property.

6.5 Funding Plan

As a part of the IDP Study, a comprehensive list of recommended development projects is proposed in Chapter 6. **Table 6-5** outlines a proposed funding strategy breaking down the projects into the three timelines previously detailed in section 6-1: Short-Term Funding (2025-2029), Mid-Term Funding (2030-2034), and Long-Term Funding (2035-2044). It is important to note that this strategy does not include a financial feasibility analysis, and the intent is to provide a roadmap for the airport and the County regarding potential sources of funding that can be used for the project development.

The projections should be used for planning purposes only and do not imply that funding will be available. Each year indicates the initiation of design and/or environmental efforts, and it is assumed that construction will be undertaken either in the same year or the following year.

It is recommended that the proposed strategy be utilized as the genesis of a more in-depth planning session when developing the airport's annual Airport Capital Improvement Plan (ACIP) submission to the FAA.

As described in section 6.3, some drainage improvements to accommodate the proposed development have been listed as single projects. Even though **Table 6-5** lists those projects in a specific year, their construction can be phased as the impervious areas are built. Its size should be reviewed once the final design of the third-party development is determined. In addition, the pond's construction cost should be refined with the final design, and its funding source may change in response to the negotiation with the tenant.

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Table 6-5: Funding Plan							
No.	**Description**	**Year**	**Estimated Cost***	**Federal**	**State**	**Local**	**Third-Party**
Short-Term Planning Period (2025-2029)							
1	New Taxiway-Phase I (PPR-69)	2026	$12,342,528	$11,108,275	$987,402	$246,851	$-
2	Site-Prep Northwest (3.5 AC parcel)	2026	$30,684	$-	$15,342	$15,342	$-
3	Water Distribution System - Phase I	2026	$10,175,365	$-	$5,087,682	$5,087,682	$-
4	Wastewater Collection System - Phase I	2026	$1,891,772	$-	$945,886	$945,886	$-
5	Road from Sergeant Mills Blvd to Infield Area	2026	$15,384,941	$-	$12,307,953	$3,076,988	$-
6	Stormwater Improvements (PPR-14)	2028	$16,020,504	$-	$12,816,403	$3,204,101	$-
7	Site-Prep Northwest Infield - Phase I	2028	$115,018	$-	$92,014	$23,004	$-
8	Site-Prep (3.0 AC parcel)	2029	$35,520	$-	$28,416	$7,104	$-
9	Site-Prep (40,000 SF Hangar)	2029	$28,416	$-	$22,733	$5,683	$-
Total Short-Term			$56,024,748	$11,108,275	$32,303,832	$12,612,641	$-
Mid-Term Planning Period (2030-2034)							
10	Water Distribution System - Phase II	2030	$6,560,962	$-	$3,280,481	$3,280,481	$-
11	Wastewater Collection System - Phase II	2030	$6,081,621	$-	$3,040,810	$3,040,810	$-
12	Site-Prep MRO (62,500 SF) (PPR-18C)	2030	$964,901	$-	$346,477	$86,619	$531,806
13	Site-Prep MRO (100,000 SF) (PPR-18B)	2030	$2,485,479	$-	$919,959	$229,990	$1,335,531
14	Road Development East-West Infield Area	2030	$2,536,242	$-	$2,028,993	$507,248	$-
15	Site-Prep Industrial Development Infield (PPR-17)	2031	$4,047,724	$-	$1,540,858	$385,215	$2,121,651

Table 6-5: Funding Plan							
No.	Description	Year	Estimated Cost*	Federal	State	Local	Third-Party
16	Roads Development - South of Telcom Dr	2032	$9,182,614	$-	$7,346,091	$1,836,523	$-
17	Stormwater Improvements (PPR-21)	2032	$38,611,824	$-	$30,889,460	$7,722,365	$-
18	Site-Prep Industrial Development West Side A	2033	$26,228	$-	$20,983	$5,246	$-
19	Site-Prep Industrial Development West Side B	2033	$26,228	$-	$20,983	$5,246	$-
20	Site-Prep Industrial Development West Side C	2033	$26,228	$-	$20,983	$5,246	$-
21	Airport Maintenance & Fueling Facility (PPR-21B)	2034	$8,080,122	$-	$6,464,097	$1,616,024	$-
Total Mid-Term			$78,630,174	$-	$55,920,175	$18,721,012	$3,988,987
Long-Term Planning Period (2035-2044)							
22	New Taxiway-Phase II	2035	$10,635,621	$9,572,059	$850,850	$212,712	$-
23	Site-prep Apron and hangars (22,500 SF) (PPR-18A)	2035	$8,100,730	$-	$6,297,995	$1,574,499	$228,237
24	Stormwater Improvements (PPR-20)	2035	$15,072,770	$-	$12,058,216	$3,014,554	$-
25	Water Distribution System-Phase III	2036	$2,704,481	$-	$1,352,241	$1,352,241	$-
26	Wastewater Collection System - Phase III	2036	$3,507,600	$-	$1,753,800	$1,753,800	$-
27	Road development south-north Infield Area	2037	$5,038,498	$-	$4,030,798	$1,007,700	$-
28	Site-Prep Industrial Development Infield B	2038	$92,981	$-	$74,385	$18,596	$-
29	AAM Facilities (PPR-88)	2039	$12,920,834	$-	$8,901,447	$2,225,362	$1,794,026
30	Road development parallel to the new taxiway (PPR-21A)	2039	$7,450,581	$-	$5,960,465	$1,490,116	$-

Table 6-5: Funding Plan							
No.	**Description**	**Year**	**Estimated Cost***	**Federal**	**State**	**Local**	**Third-Party**
31	Site-Prep southeast apron and hangars (40,000 SF)	2039	$148,747	$-	$118,997	$29,749	$-
32	Airport Service Road Extension	2040	$6,997,785	$-	$5,598,228	$1,399,557	$-
33	Site-Prep southwest apron and hangars (40,000 SF)	2040	$128,141	$-	$102,513	$25,628	$-
34	Site-Prep Southwest hangar (130,000 SF)	2041	$122,896	$-	$98,317	$24,579	$-
35	Site-Prep Light industrial development West Side C	2042	$16,763	$-	$13,410	$3,353	$-
36	Site-Prep for Light Industrial Development West Side D	2042	$16,763	$-	$13,410	$3,353	$-
37	Site-Prep Industrial development Infield C	2043	$104,177	$-	$83,342	$20,835	$-
38	Site-Prep for Light Industrial Development West Side F	2043	$17,149	$-	$13,719	$3,430	$-
39	Site-Prep for Light Industrial Development West Side G	2043	$17,149	$-	$13,719	$3,430	$-
40	Stormwater Improvements (PPR-13)	2044	$16,679,326	$-	$13,343,461	$3,335,865	$-
41	Site-Prep Northwest - Phase II	2044	$263,144	$-	$210,515	$52,629	$-
42	Site-Prep North-center	2044	$368,402	$-	$294,721	$73,680	$-
43	Road Development to future T-hangar developments	2044	$7,150,878	$-	$5,720,703	$1,430,176	$-
Total Long-Term			$97,555,415	$9,572,059	$66,905,250	$19,055,843	$2,022,263
TOTAL			$232,210,337	$20,680,334	$155,129,257	$50,389,496	$6,011,250

Source: Michael Baker International and Stantec 2024.

Note: *Escalation of short-term projects 5%. Mid and long-term projects 2.3%.

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INTERNATIONAL

In association with

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STORMWATER MASTER PLAN UPDATE

Prepared for:

Prepared by:

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REVISED JULY 2025

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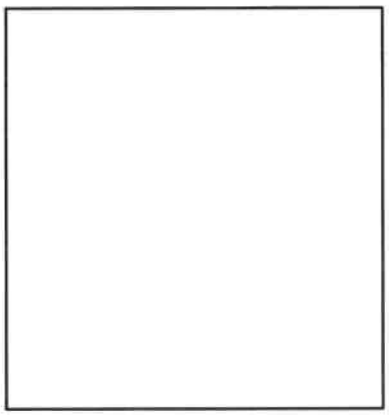
ELECTRONIC CERTIFICATION:



I, Paul Snead P.E., hereby state that this report, as listed in the above Table of Contents, is, to the best of my knowledge and belief, true and correct and represents the described work in accordance with current established engineering practices. I hereby certify that I am a Licensed Professional Engineer in the State of Florida practicing with Michael Baker International, and that I have supervised the preparation of and approve the evaluations, findings, opinions and conclusions hereby reported.

THIS ITEM HAS BEEN DIGITALLYSIGNED AND SEALED BY

ON THE DATE ADJACENT TO THE SEAL. PRINTED COPIES OF THIS DOCUMENT ARE NOT CONSIDERED SIGNED AND SEALED AND THE SIGNATURE MUST BE VERIFIED ON ANY ELECTRONIC COPIES.

Michael Baker International
200 East Robinson Street, Suite 250
Orlando, FL 32801
Phone (407) 562-4118

Paul Snead P.E.
Florida P.E. No. 56982

1.0 INTRODUCTION

Brooksville-Tampa Bay Regional Airport (BKV) spans approximately 2,300 acres and is located in Hernando County, Florida. The airport location is shown on **Figure A.1** in **Appendix A**. BKV is owned and operated by Hernando County (County) who has contracted Michael Baker International, Inc. (Michael Baker) to update the Stormwater Master Plan (SWMP) based on existing conditions and proposed future development. This report includes stormwater management recommendations based on concept level design analysis in compliance with State and Hernando County regulatory requirements and Federal Aviation Administration (FAA) design criteria and wildlife hazard management guidelines. The stormwater management requirements for the proposed developments presented herein will require additional field investigation, design, and permitting at the final design stage.

BKV is in south-central Hernando County approximately 4 miles south of SR 50 (Cortez Boulevard) and is bordered to the west by SR 589 (Suncoast Parkway), to the east by US 41 (Broad Street), and to the north by Spring Hill Drive. There are commercial, residential, and undeveloped areas surrounding the airport. A land use map of the vicinity is included as **Figure A.6** in **Appendix A.**

The purpose of this report is to document existing conditions, minimize environmental impacts and provide preliminary stormwater management ponds based on our concept analysis for planned future development. Future development assumptions were based on the Airport Layout Plan (ALP) dated May 2020 and the Existing and Proposed Development Map, which are provided in **Appendix B and C.** The proposed pond locations identified in this report will be reviewed by the County and FAA and submitted to the Southwest Florida Water Management District (SWFWMD) for a Conceptual Environmental Resource Permit (ERP). The stormwater recommendations presented in this report will require further investigation, design, and permitting.

2.0 DATA COLLECTION

The data collection phase of this SWMP update included the following tasks:

- Review of existing plans and permits
- Review of the previous SWMP by Coastal Engineering Associates (October 2004)
- Field Reviews
- Limited on-site Survey and Geotechnical investigations
- Limited on-site Wetland Review
- Coordination with SWFWMD and Airport Staff

The following sections present additional information and the results of our data collection efforts.

2.1 Existing Plans & Permits

Michael Baker performed a thorough review of the existing permits on file at SWFWMD and as-built plans provided by the County as part of our research to develop an understanding of the existing drainage conditions on the airport. Michael Baker reviewed over 50 permits and permit modifications. A list of the permit numbers and names with relevant excerpts is included as **BKV ERP Summary Table** in **Appendix D.** These permits, design plans and calculations provided information that was utilized to evaluate existing drainage patterns for use in preparing the existing condition stormwater model.

2.2 Field Investigations

As part of our investigation of existing conditions, Michael Baker performed a site visit and collected limited survey and geotechnical information to confirm existing drainage patterns, site topography constraints, and develop concept level design parameters used to evaluate existing and proposed pond performance.

Michael Baker environmental staff visited the site on July 28, 2022 and August 16, 2022. Documentation of the environmental field visits is further detailed in *Section 3.3 Wetlands and Surface Waters* of this report.

A limited geotechnical investigation was performed by MC Squared, LLC to provide subsurface information including groundwater levels, hydraulic conductivity, soil types and other related information that our design team utilized in our concept level stormwater assessment. The geotechnical field investigation was performed in April 2022 and the Geotechnical Engineering Services Data Report (June 3, 2002) is included in **Appendix G.** Additional information regarding the geotechnical characteristics of the site is included in *Section 3.2 Soils and Groundwater.*

2.3 Previous Stormwater Master Plan

In response to changes from Michael Baker International's initial submission of the stormwater master plan, significant modifications have been implemented to ensure the plan's accuracy. Notably, the revised plan now incorporates updated hydrology to provide a more accurate representation of stormwater runoff within the project area. This includes a thorough reassessment of the basin areas, proposed ponds, and floodplain compensation.

The primary changes noted in this update to the SWMP as compared to the previous SWMP include:

- 2018 LiDAR is utilized
- Included new concept analysis for planned future development
- Included new developments constructed since the 2022 SWMP.

2.4 Coordination

The Michael Baker team coordinated with the BKV Airport and SWFWMD to develop the scope and design criteria for developing the proposed stormwater management concepts for this SWMP. On April 28, 2022, Michael Baker staff attended a virtual pre-application meeting with SWFWMD to discuss the stormwater management criteria, environmental criteria, and permitting approach. The minutes of the meeting are included in **Appendix H.**

On June 20, 2022, a Michael Baker representative had a discussion with BKV staff to discuss any known flooding or stormwater maintenance issues. The minutes of this discussion are included in **Appendix H.**

3.0 Existing Site Conditions

3.1 Topography

Aerial imagery was downloaded from the FDOT APLUS website and files dated 2020 were downloaded for the purposes of this study. USGS 2018 LiDAR and topographic data and limited on-site survey was used to evaluate existing site grades. Based on our review of this information existing site topography includes mild to moderate slopes with closed depressional areas and elevations ranging from +41 to +91 ft NAVD88. USGS topographic and contour maps of the project area are included on the **Pre-Development Maps** in **Appendix B.**

3.2 Soils and Groundwater

Subsurface conditions at existing and proposed pond locations was evaluated by geotechnical consultant MC Squared, LLC to provide information regarding soil types as well as groundwater levels and flow parameters. The findings of their field study are included in their report dated June 3, 2022 and included in **Appendix G.**

The results of the geotechnical investigation indicate the groundwater table fluctuates significantly between seasonal lows typically encountered in the late spring before the rainy season begins and the seasonal highs which are typically encountered near the end of September when the normal rainy season

ends. Most of the borings did not encounter groundwater to the 10-ft boring termination depths. Seasonal high groundwater levels are estimated to be in the range of 4 to 6 ft deep at the boring locations. Subsurface soil types are generally fine sands with silt, silty fine sands and clayey fine sands. Field testing results report a wide range of infiltration values ranging from greater than 20 ft per day for some of the fine sands to no infiltration for some of the clayey sands. For purposes of estimating aquifer parameters for pond recovery the clayey fine sands would be considered the bottom of the aquifer.

3.3 Wetlands and Surface Waters

The following references were used to approximate the limits of wetland and surface waters within the study area:

- Wetland information from previous studies at BKV
- U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) mapping
- Southwest Florida Water Management District Florida Land Use, Cover, and Forms Classification System (FLUCS) mapping
- Digital Elevation Model (DEM) mapping derived from light detection and ranging (LIDAR) data.

No flagged wetland delineation or field verification with permitting agencies was conducted, therefore this task results in the development of an approximation that identifies potential wetlands that may be subject to the jurisdiction and permitting authority of the Southwest Florida Water Management District (SWFMWD) under the Environmental Resource Permitting program and subject to jurisdiction and permitting authority of the Florida Department of Environmental Protection (FDEP) under the federal Clean Water Act Section 404 permit program.

Limited ground truthing was conducted within the study area limits in some areas. The focal areas for the ground truthing were areas where NWI or FLUCS data indicated the presence of wetlands as well as areas where the DEM indicated depression landforms that surface runoff would naturally drain towards and potentially accumulate, resulting in the potential presence of wetlands. These areas were evaluated in the field for evidence of the presence or absence of wetland soil, vegetation, or hydrological characteristics.

Based on the data review and the ground truthing effort, a small pond on the south side of the American Aviation general aviation development in the northeast portion of the Airport's property was the only natural non-wetland surface water identified in the study area. Other man-made ditches, swales, and stormwater ponds are classified as "other surface waters." No streams or creeks occur in the study area. While "other surface waters" are important for their stormwater treatment, floodplain storage, and conveyance functions, as long as those functions are adequately compensated for in association with modifications for new projects at the airport and as long as adequate treatment and storage is provided for new impervious surface, other mitigation is not typically required for changes to these features.

The wetland approximation is presented in **Figure A.5** in **Appendix A.** The largest area of wetland at BKV is in the northeastern portion of the study area, just south of the American Aviation general aviation development. This area includes the previously mentioned pond and adjacent forested and shrub wetlands that, together with the pond, comprise approximately 6.3 acres.

The remaining potential wetland areas on BKV property are predominantly isolated wetland depressions that range in size from approximately 0.2 to 2 acres. Some of these depressions are located within the mowed maintained airfield, where much of the area is used for production of hay. Other wetland depressions are scattered within wooded areas of the Airport.

Two of the potential wetlands, including one in the northeastern corner of the Airport's property and another that is approximately 2,500 feet northeast of the southwestern corner of the Airport's property appear to be centered on potential karst features (sinkholes) based on field review conducted at those sites. Future development at BKV will need to continue to take karst feature characteristics into

consideration as part of planning and pre-construction site evaluation.

3.4 Protected Species Potentially Occurring Within the Study Area

Available protected species data were reviewed to develop a list of species that are afforded special protection status due to federal or state regulations. Sources of data for this review included:

- Protected species information from previous studies conducted at BKV;
- USFWS list of species generated by the USFWS' Information for Planning and Consultation (IPaC) website;
- Florida Natural Areas Inventory's (FNAI) tracking list for Hernando County;
- FNAI's Biodiversity Matrix; and,
- Various sources for species accounts that include habitat descriptions for species thought to occur in Hernando County.

Based on these various species lists and taking into consideration the habitat requirements of the species listed and the habitats that occur within the study area, a list of species with the potential to occur in the study area was developed (**Table 1**).

Table 1. Protected Species Potentially Occurring within the SWMP Study Area

Scientific Name	Common Name	Federal Status	State Status	Likelihood of Occurence
Falco sparverius paulus	Southeastern American kestrel	None	State Threatened	Documented – foraging
Mycteria americana	Wood stork	Threatened	Federally Threatened	Documented – foraging
Egretta caerulea	Little blue heron	None	State Threatened	Documented – foraging
Haliaeetus leucocephalus	Bald eagle	BGEPA*	None	Documented – transient
Drymarchon corais couperi	Eastern indigo snake	Threatened	Federally Threatened	Potential
Gopherus polyphemus	Gopher tortoise	Candidate	State Threatened	Documented
Stilosoma extenuatum	Short-tailed snake	None	State Threatened	Potential
Pituophis melanoleucus	Pine snake	None	State Threatened	Potential
Danus plesippus	Monarch butterfly	Candidate	None	Potential
Antigone canadensis pratensis	Florida sandhill crane	None	State Threatened	Documented – foraging
Athene cunicularia floridana	Florida burrowing owl	None	State Threatened	Potential
Falco sparverius paulus	Southeastern American kestrel	None	State Threatened	Documented – foraging
Notophthalmus perstriatus	Striped newt	None	State Candidate	Low potential
Clitoria fragrans	Scrub pigeonwing	Threatened	State Endangered	Potential
*Federal Bald and Golden Eagle Protection Act.				

Of the species in **Table 1**, the species with the greatest potential to require special coordination and permitting for future developments and projects associated with the SWMP is the gopher tortoise. Gopher tortoises are common within BKVs property and are known to occur within open areas lacking tree cover, in areas along the edges of wooded areas, and, to a lesser extent, within more open woodlands on BKV property. A gopher tortoise survey conducted by a State of Florida-authorized gopher tortoise agent is likely to be required for any project involving new ground disturbance at BKV. If gopher tortoise burrows are found, a Gopher Tortoise Conservation Permit from the Florida Fish and Wildlife Conservation Commission (FWC) will be required if the gopher tortoise burrow will be impacted by proposed stormwater structures. Excavation of burrows and relocation of gopher tortoises to an approved recipient site may also be required.

Another species that is federally-listed, the eastern indigo snake, may also affect permitting for projects proposed in association with the SWMP. Although based on the information reviewed this species has not been documented to occur on BKV property, habitat in the study area is suitable for this species. Therefore, projects at BKV that require federal authorization may be conditioned with a requirement that the construction contractor implement the USFWS' *Standard Protection Measures for the Eastern Indigo Snake*. For projects impacting a large area with large numbers of gopher tortoise burrows (which can also be used by indigo snakes), Consultation with the USFWS may be required.

Although multiple federal and/or state-protected bird species have been observed at BKV, these observations have been of birds that are using habitats on-airport for foraging (little blue heron, wood stork, southeastern American kestrel) or are birds that are just flying over BKV property (bald eagle). No nesting of listed bird species has been documented at BKV. It should also be noted that BKV is not within the core foraging area of any documented wood stork colonies.

For any new project that involves ground disturbance at BKV, a general protected species survey should be conducted to determine whether suitable habitat for state or federally protected species is present at the site and to determine if any additional special coordination, special purpose surveys, or permitting needs to be initiated with the FWC or USFWS.

3.5 Floodplains

Existing floodplains have been delineated based on Federal Emergency Management Agency (FEMA) National Flood Insurance maps for Hernando County with effective date December 2021. In addition, administrative floodplains for the Squirrel Prairie, Powell and Pithlachascottee R./Bear creek Watersheds have also been obtain and delineated for purpose of this study. An excerpt of each floodplain overlain on an aerial of the study area is shown as **Figures A.7A, 7B, 7C and 7D** in **Appendix A.**

The existing FEMA floodplains include both Type AE and A, which have determined and undetermined flood elevations, respectively. The known floodplain elevations range from approximately +64 to +67 ft NAVD88 and are primarily located within the depressions in the grassed infield at the east end of Runway 9/27. However, there are several floodplains located in vicinity of the adjacent developments; most notably on the northeast area of the airport where the floodplain is shown to inundate portions of Taxiway A2, A4, and B1 (see ALP), the adjacent infield areas, as well as encroaching upon multiple buildings.

The County's administrative floodplains differ from the FEMA map. Squirrel Prairie watershed covers eastern portions of the airport, the Powell watershed covers northern and middle areas of the airport, and the Bear Creek cover south and western portions of the airport. The Base Flood Elevation for each of the watershed areas were determined and used to quantify required floodplain compensation per proposed impacted area. Based on the pre-app meeting held with SWFWMD, equivalent compensating storage for all 100-year, 24-hour riverine floodplain impacts must be provided. Cup-for-cup storage in dedicated areas of excavation is the preferred method of compensation

An impact floodplain map was created to determine what portions of the proposed development encroach on the existing floodplains. This map is included in **Appendix A, Figure A.8.** The impact volume was estimated by multiplying the encroachment/impact area by the difference in elevation between existing ground and base flood elevation. The required compensating volume will be provided by the proposed pond which is hydraulically connected to where the impact is proposed. A summary table for these calculations is provided in **Appendix D.**

4.0 EXISTING DRAINAGE PATTERNS

The project is primarily located within the Crews Lake Outlet basin (WBID 1392A1) with a small portion of the northwest corner of the airport located within an unnamed closed basin (WBID 1380). Neither of these basins are considered impaired by the Florida Department of Environmental Protection (FDEP). Surface drainage is primarily overland sheet flow along mild to moderate slopes to depressional areas with no outlets. These depressional areas drain primarily through groundwater infiltration and some overtop as a result of storms with high rainfall, intensity and/or duration. The following sections provide additional details about our assessment of the existing drainage basins and ponds.

4.1 Drainage Basins

Our assessment of the drainage patterns across the study area included the delineation of **88** existing drainage basins. The drainage divides were delineated based on review of contours produced from LiDAR survey data, and existing permits and as-built plans. The existing drainage basins are presented in Figures B.1 to B.19 in **Appendix B.**

4.2 Stormwater Ponds

Our evaluation of the existing ponds within the study area included review of existing permits and as-built plans. Based on this evaluation we have identified 54 stormwater ponds of which 2 are wet detention ponds (PEX-01 and PEX-02) and the remaining are dry retention. The pond names and associated SWFMD ERP permit numbers are listed on the Pond Summary Table in **Appendix D.**

4.3 Conveyances and Outfalls

Existing conveyances, including ditches and stormsewer, are located throughout the project area and serve the purpose to convey runoff across impoundments such as roads, taxiways, runways, and other infrastructure to an existing pond or depressional area. Our team has surveyed the significant stormsewer sections and these are shown on the Pre-Development Drainage Map figures in **Appendix B** and included in the Pre-Development ICPR reports in **Appendix E.**

5.0 STORMWATER MANAGEMENT CRITERIA

There are several regulatory agencies that have jurisdiction over the Airport's stormwater management systems including SWFWMD, FAA, and the County. Meeting these agencies' stormwater design requirements and obtaining the required permits will be a requirement of the planned developments discussed in this SWMP. Further investigation, design, and permitting will be required during the final design phase of each of the proposed improvements presented within this SWMP.

SWFWMD rules are the controlling criteria for a majority of the stormwater design elements for this SWMP; specifically water quality, water quantity, and floodplain compensation. The FAA provides guidance on dry pond recovery, acceptable flood levels and the locations of stormwater management facilities for the safety of airport airside elements. FAA stormwater criteria is documented in *FAA Advisory Circular (AC) 150-5320-5D – Airport Drainage.*

The following stormwater management design criteria were used in the development of the proposed stormwater management facilities for this SWMP:

Southwest Florida Water Management District

Water Quality

- On-line retention shall treat runoff from 1" of rainfall from contributing area; or as an alternative, ½" of runoff from contributing if basin area is less than 100 acres.
- Wet detention shall treat 1" of runoff from contributing area.
- Water Quality Treatment is required for entire project area and any contributing off-site flows.

- Treatment function of any filled ditches shall be replaced.
- Compensating treatment of existing untreated runway pavement to offset new construction which cannot be treated is acceptable.
- Net water quality improvement (pre/post nutrient loading) is not required.

Attenuation

- Post-development 25-year, 24-hour peak discharge rate shall be equal to or less than pre-development peak discharge rates. Pre-development discharge rates can only be exceeded if demonstrated it will not cause an adverse offsite impact.
- For closed basin outfalls, limit the post-development 100-year discharge volume to the pre-development 100-year, 24-hour volume.
- Demonstrate the project will not increase flood stages up- and down-stream of the project areas.

Floodplain Compensation

- Provide equivalent compensating storage for all 100-year, 24-hour riverine floodplain impacts. Tabulations of cup-for-cup impacts and compensation shall be provided at 0.5-foot increments to demonstrate impact and compensation occur at same levels. Storage modeling is otherwise required and will include modeling of the 10-, 25- and 100-year storm events for pre- and post-development conditions. The modeling may include reduced discharge to floodplain as applicable as part of the calculations.

Federal Aviation Administration

Surface Hydrology (AC 150/5320-5D)

- For the 5-year storm event there shall be no encroachment of runoff on taxiway and runway pavements (including paved shoulders). *Section 2-2.4.2*
- The center 50 percent of runways; the center 50 percent of taxiways serving these runways; and helipad surfaces along the centerline should be free from ponding resulting from storms of a 10-yr frequency and intensity. *Section 2-2.5*

Pond Recovery (AC 150/5200-33C)

- Airside ponds shall be designed for maximum 48-hour detention (recovery) period and are to remain completely dry between storm events. *Section 2.3.2* It is noted that volume recovery was not evaluated for the ponds for this study. Review of percolation rates and groundwater levels indicate the site is well drained with the potential to satisfy recovery criteria; however, this criterion should be further evaluated during final design and adjustments to the pond design made as necessary.

Hernando County

Per Section 26-50 of the County's land development code, drainage stormwater systems shall be designed in accordance with the requirements of the Southwest Florida Water Management District. Additional drainage requirements are provided in the County's Facility Design Guidelines, which include providing a minimum of 6" of freeboard between the design high water elevation and the lowest provided berm elevation surrounding the detention/retention area. This parameter shall be confirmed at final design as pond shape and grading can influence peak stages. Besides the freeboard requirement, based upon our review of these documents, there are no County criteria that are more restrictive then the applicable SWFWMD and FAA criteria previously mentioned.

Hernando County participates in the FEMA National Flood Insurance Program (NFIP) and subsequently impacts to a floodplain located within and along the airport boundary will require coordination with the County's Floodplain Manager to determine if a Floodplain Development Permit or Approval is required. We recommend this coordination during the final design and permitting stages of projects which may have runoff and/or fill impacts to the mapped floodplains.

6.0 FUTURE DEVELOPMENT CONSIDERATIONS

The proposed stormwater pond recommendations were determined with consideration of future development plans provided in the infield Infrastructure Development Plan finalized in 2025, and the Airport Layout Plan (ALP) updated in May 2020. The resulting future development assumptions including the layout of future buildings, roads and other impervious surface used for purposes of this SWMP are displayed on the Proposed Development exhibit in **Appendix C.**

The proposed development locations include both airside and landside. On the airside, notable improvement is within the northwest quadrant of the infield as well as two new taxiways. Additional hangars are proposed along future Taxiway C on the east side and significant new development is proposed landside on the southwest quadrant of the airport. Some of the proposed developments impact existing ponds or depressional areas which are accounted for in this study.

For the airport's total property area of **2,300** ac the proposed development has increased the overall percent impervious from **14% to 39% or 325 ac to 889 ac** in terms of total impervious area.

7.0 POND SITING METHODOLOGY

The airport has 32 existing ponds which include two wet detention ponds and 30 dry retention ponds. To accommodate the future development assumptions, we have identified **55** total ponds which is a combination of **30** existing ponds to remain and **25** proposed ponds. All of the proposed ponds are dry retention with no outfall with the exception of the two existing wet detention ponds at the northeast corner of the airport.

The factors considered in identifying the proposed pond locations include topography, groundwater levels, proposed development, and environmental considerations. The following sections describe our methodology for identifying the proposed pond locations:

7.1 Proposed Pond Design

The first step in the pond siting process was to evaluate the stormwater volume requirements for each basin with consideration of the proposed impervious layout that was presented in *Section 6.0 Future Development Considerations*. For each basin we determined the available storage for retention of the 100-yr / 24-hr storm event for comparison with the required storage for future development. For any basins with a storage deficit, either the existing pond was reconfigured to provide additional storage and/or a proposed pond was provided. For this study, we conservatively sized the ponds to provide storage for the 100-yr post-development runoff volume plus floodplain compensation. For pond systems which do not provide the total 100-yr runoff volume, the peak stage was checked with consideration of infiltration during the storm to confirm it is below the top of berm elevation. Final design adjustment can be made to store the 100-yr pre/post difference if an internal outfall can be maintained which could reduce the required pond sizes. The location of the proposed ponds is shown on the Post-Development Drainage maps in **Appendix C.**

For the proposed ponds we assessed the seasonal high groundwater level to establish the proposed pond bottom elevation. Pond bottom elevations were set at least 2 feet above the seasonal high groundwater level and top of berm elevations set at or near existing ground or adjacent existing infrastructure such as runways, taxiways, or roadways. Additionally, vertical soil storage between the pond bottom and the seasonal high groundwater elevations was included in our pond routing calculations, however, horizontal seepage was not included for most ponds, only selected ponds which did not satisfy the stage requirement are assigned with horizontal seepage in the model. The assumed pond and seasonal high groundwater elevations as well as the soil storage approach will require review and confirmation during the final design stage for each planned development.

Volume recovery of the 100-yr / 24-hr storm is required for each of the no-discharge dry retention pond sites. Preliminary review of the limited geotechnical investigation indicate there are highly permeable

soils with horizontal conductivity rates of greater than 20 feet per day which can accommodate the required recovery requirements; however, additional investigation will be required during the final design and permitting phase. A table of seasonal high-water levels for each of the pond sites is included in **Appendix D.**

7.2 Avoidance and Minimization of Wetland Impact

The development areas and proposed stormwater ponds depicted in the stormwater master plan avoid most of the wetlands identified in the approximation. The exceptions are two very small potential wetlands located just north of Sergeant Lea Mills Boulevard in the southern portion of the Airport's property, and the apparent sinkhole and the associated wetlands in the northeast corner of the Airport's property. If it is determined that all of these potential wetlands are isolated, which appears to be the case, they may not be subject to FDEP permitting under Section 404 of the Clean Water Act. For the two areas on the north side of Sergeant Lea Mills Boulevard, if they are determined to be subject to SWFWMD jurisdiction, but they are less than 0.1 acre in size, it is possible that SWFWMD would not require mitigation for impacts to these areas. Impacts to the sinkhole and associated potential wetland in the northeast corner of the Airport's property would likely require compensatory mitigation from the SWFWMD because this area appears to be greater than 0.1 acre in size.

7.3 Pond Design Considerations For Wildlife Hazard Management

Federal Aviation Administration (FAA) Advisory Circular (AC) 150/5200-33C establishes the recommended minimum general separation criteria between an airport's air operations area (AOA) and hazardous wildlife attractants. For airports that serve turbine powered aircraft, such as BKV, AC 150/5200 specifies a recommended minimum separation distance of 10,000 feet between the AOA and hazardous wildlife attractants. If an attractant "could cause hazardous wildlife movement into or across the approach or departure airspace," AC 150/5200-33C recommends a separation distance of 5 miles between the AOA and the hazardous wildlife attractant.

Wet ponds, ditches, and swales that hold water for extended periods of time can be attractants for wildlife that create hazards for aircraft operations. AC 150/5200-33C provides a number of recommendations regarding design and functional characteristics of stormwater treatment facilities that are located at a distance less than the recommended separation distance. Since the ponds that will be incorporated into the SWMP are going to be located less than 10,000 feet from the AOA (either within the AOA or on airport property very near the AOA), the ponds included in the SWMP should include these recommendations. The first of these recommendations is that the ponds should be "designed, engineered, constructed, and maintained to allow a maximum 48-hour detention period after the design storm and remain completely dry between storms."[1] AC 150/5200-33C also recommends that detention basins be designed to incorporate steep side slopes, have banks that are lined with rip rap, and be narrow or linear in shape.[2] These characteristics help to make the basin be less attractive for foraging and nesting birds. Basins with these characteristics reduce visibility for birds that are foraging within a basin and make it more difficult for them to detect approaching predators. Rip-rap lined banks are also less attractive for foraging birds in comparison to natural vegetation.

If it is not possible to design a basin to dry down within 48 hours of the design storm due to local characteristics such as a high water table, and the basin has to be designed for wet retention; it is recommended that the basin be designed so that the bottom elevation is 2.5 feet or greater below the mean low water elevation so that the pond will not be suitable foraging habitat for wading birds. In such situations every effort should also be made to incorporate steeply sloping banks to limit the available foraging habitat for wading birds along the shoreline. If the wet pond is still attracting hazardous wildlife, the airport should incorporate physical barriers such as bird balls, wire grids, pillows, or netting to prevent

[1] FAA, "AC 150/5200-33B Hazardous Wildlife Attractants on or Near Airports," https://www.faa.gov/documentLibrary/media/Advisory_Circular/AC_150_5200-33B.pdf, September 28, 2007.
[2] Ibid.

wildlife from using the pond.[3]

All ponds should be designed to allow access for maintenance equipment so that they can be maintained free of vegetation to the maximum extent possible. Banks and surrounding areas should be designed so that mowers can readily access the area around the pond and, for dry ponds, the center of the pond. For wet ponds herbicide application may also be needed to control emergent vegetation.

Designers may also consider the use of green stormwater infrastructure best management practices such as bioretention cells where this can be accomplished without increasing wildlife hazards, particularly avoiding exceeding of the 48-hour maximum detention period and avoiding the creation of habitat that attracts wildlife.[4] As with ponds bioretention swales should be designed to allow easy access of maintenance equipment so that overgrowth of vegetation that would attract wildlife does not occur.

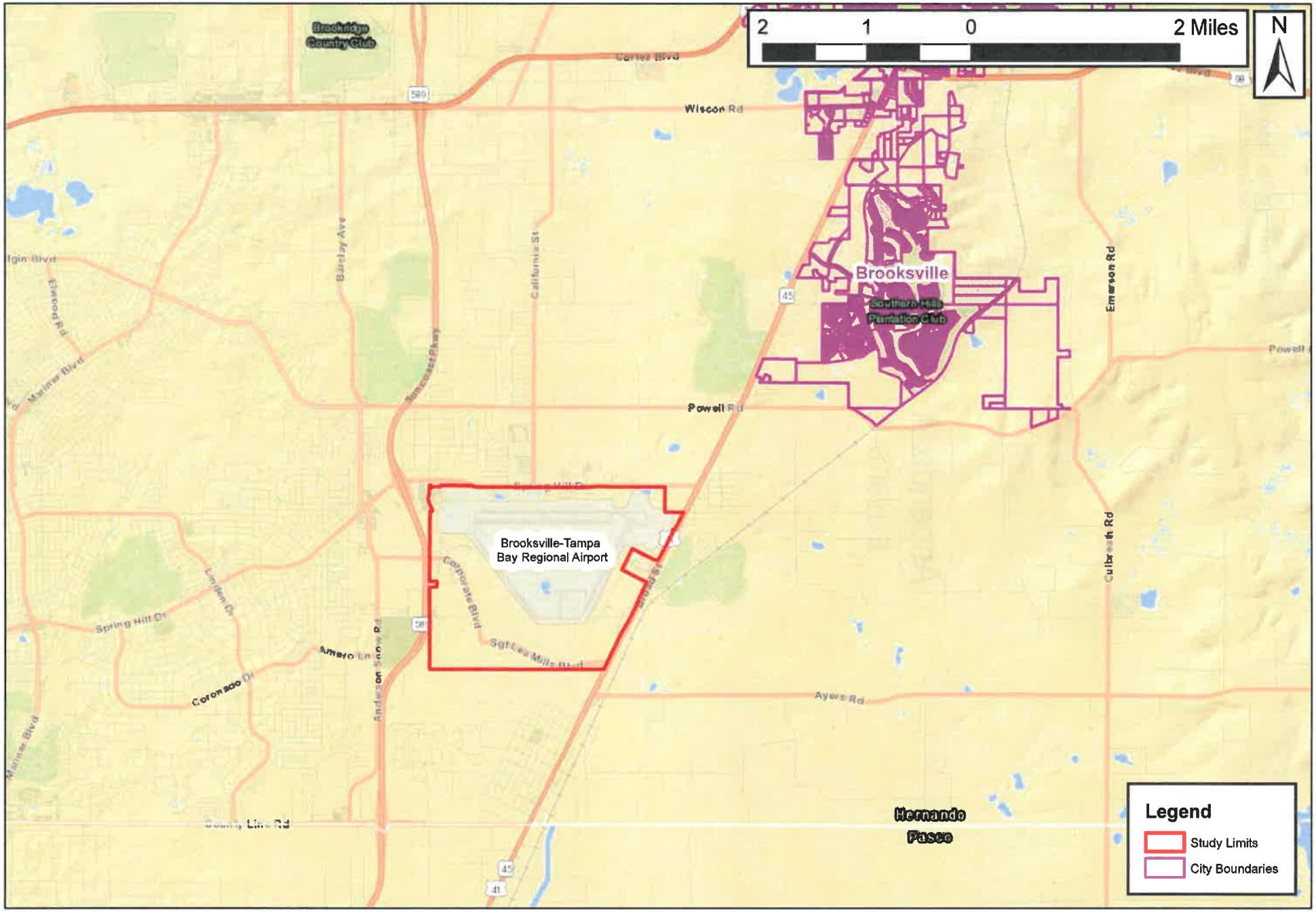
8.0 CONCLUSIONS

The results of this update to the BKV SWMP indicate there is sufficient onsite property to accommodate regulatory stormwater criteria for the proposed future development. The post-development drainage maps provided in **Appendix C** provide the locations and sizes of the ponds proposed for this concept level study. Further investigation to include additional geotechnical and a more detailed stormwater assessment will be required during the final design phase to confirm the pond requirements.

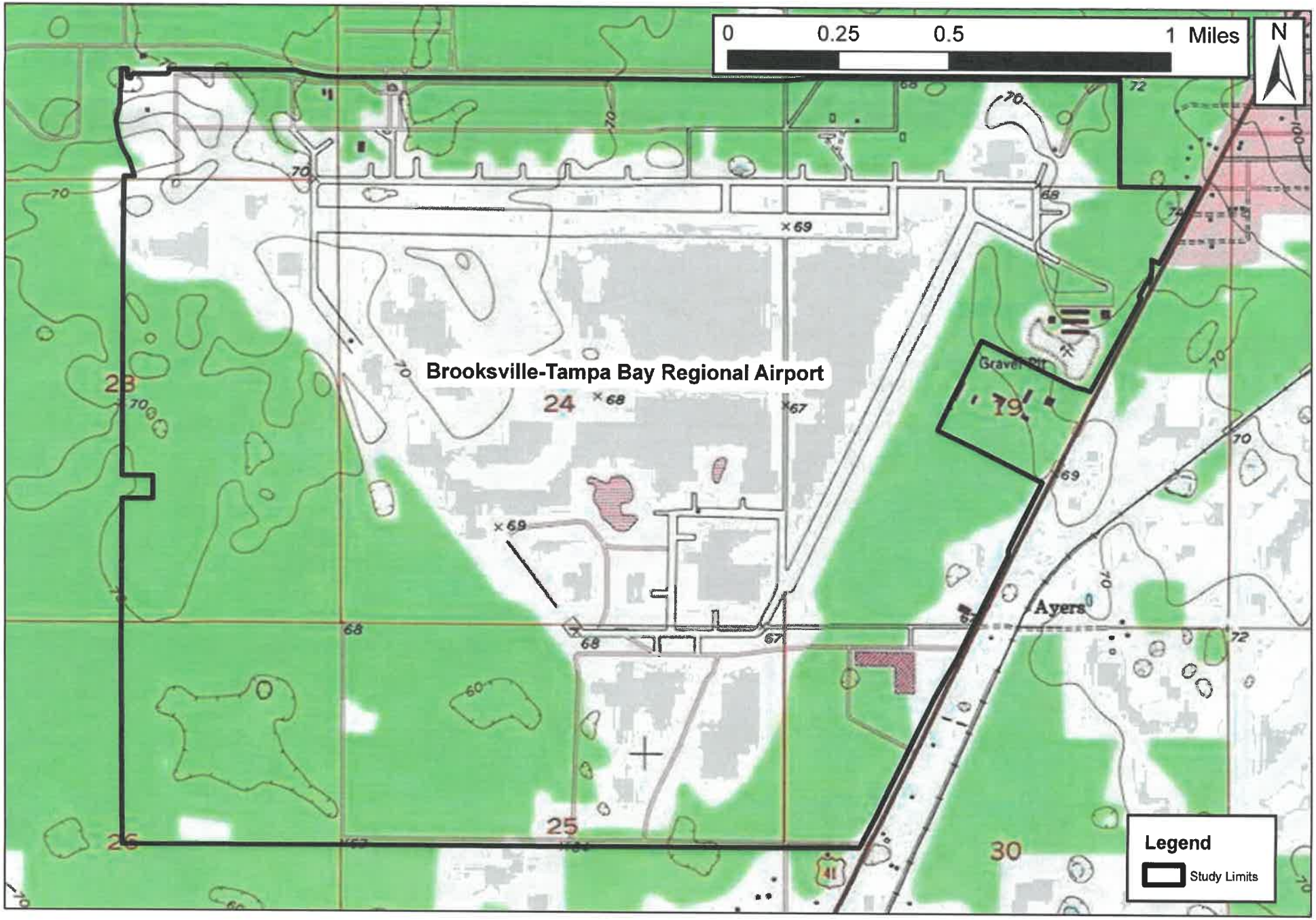
[3] Ibid.

[4] Airports Cooperative Research Program, "Research Report 174: Green Stormwater Infrastructure," http://nap.naptionalacademies.org/24817, 2017.

Appendix A
EXHIBITS



Stormwater Master Plan
Figure A.1 Project Location / Vicinity Map



Stormwater Master Plan
Figure A.2 USGS Quad Map

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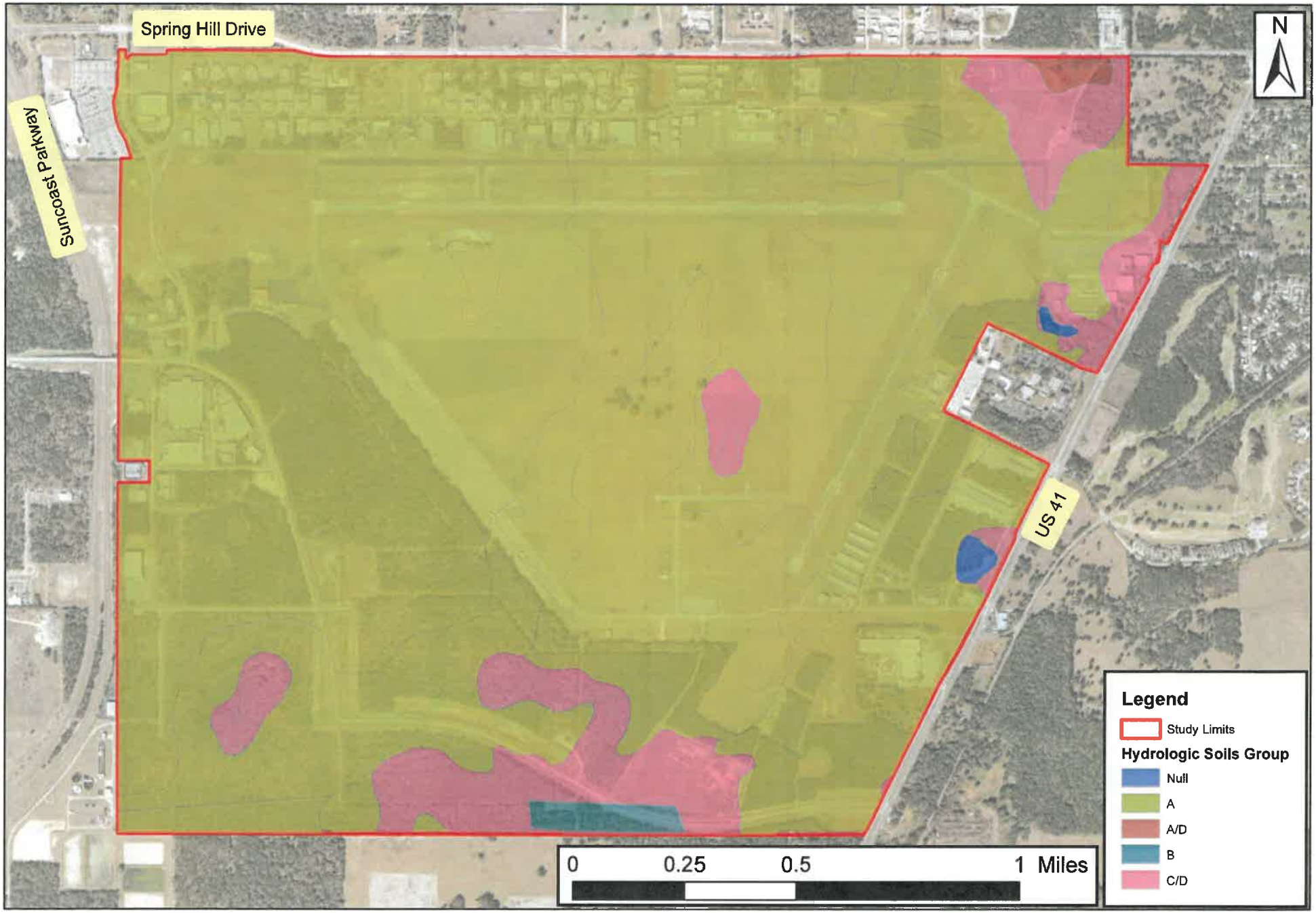
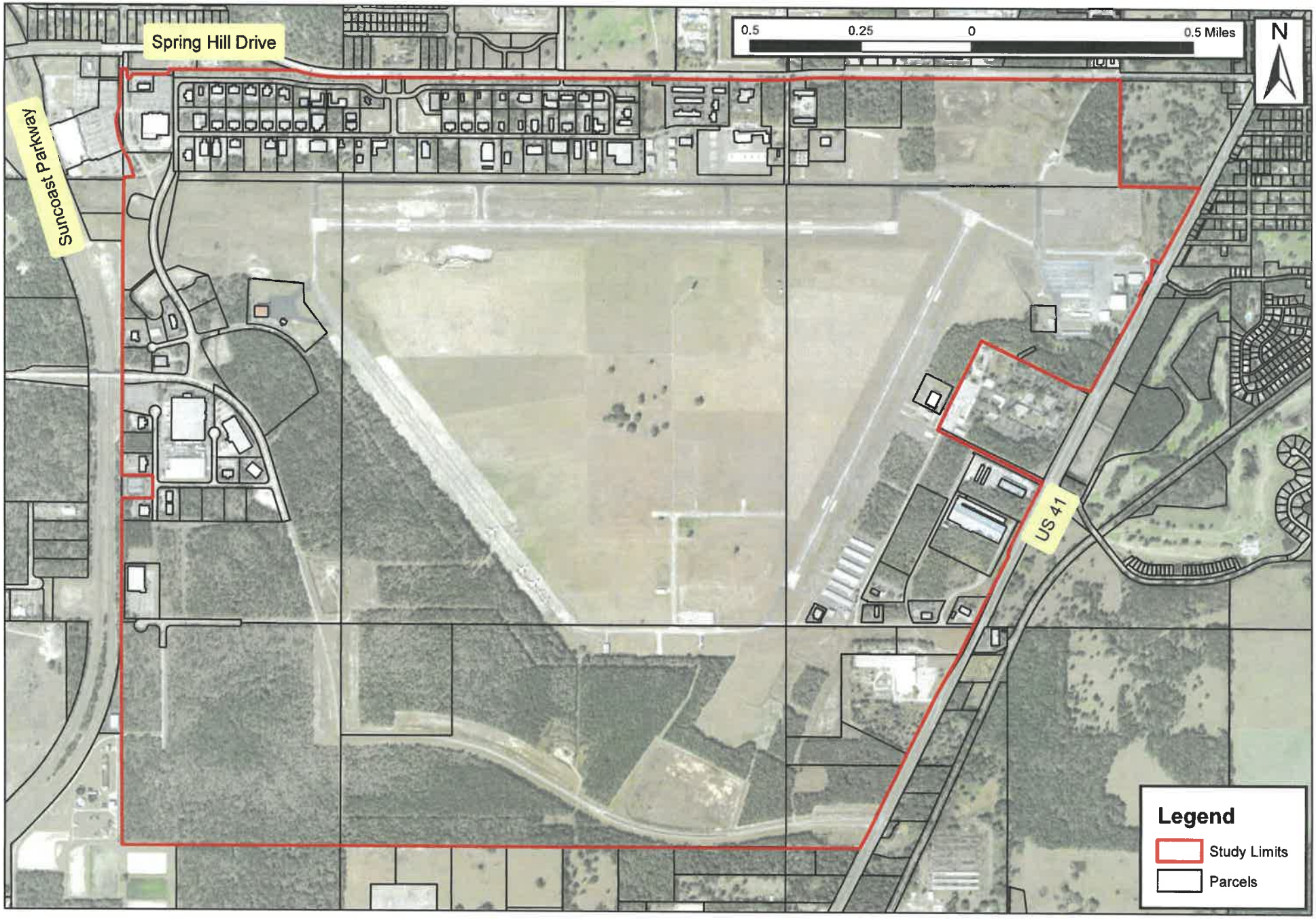


Stormwater Master Plan
Figure A.3 NRCS Soils Map

Michael Baker INTERNATIONAL



Stormwater Master Plan
Figure A.4 Parcels Map

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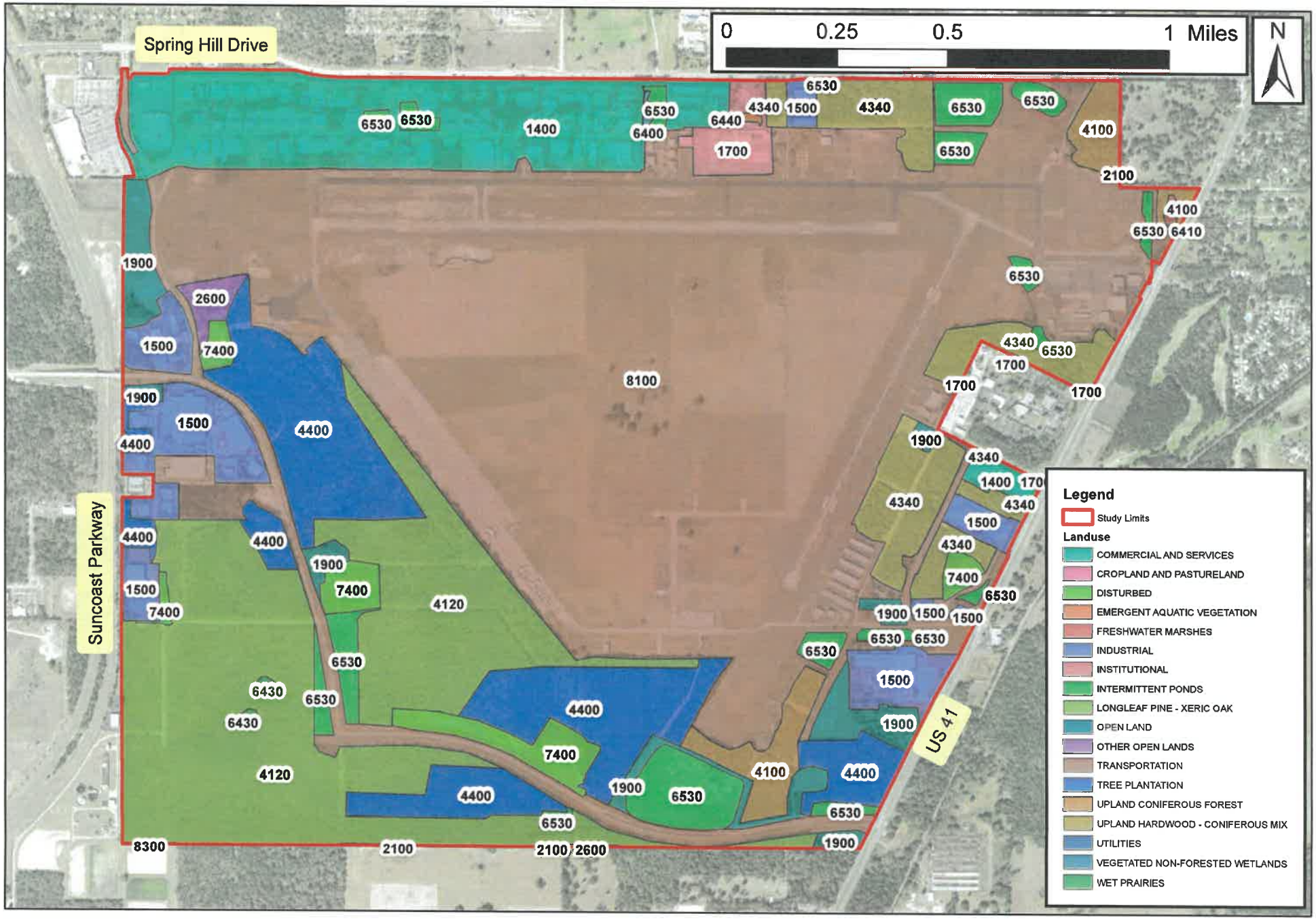
Stormwater Master Plan
Figure A.5 Wetland Map

Michael Baker INTERNATIONAL



Stormwater Master Plan
Figure A.6 Landuse Map

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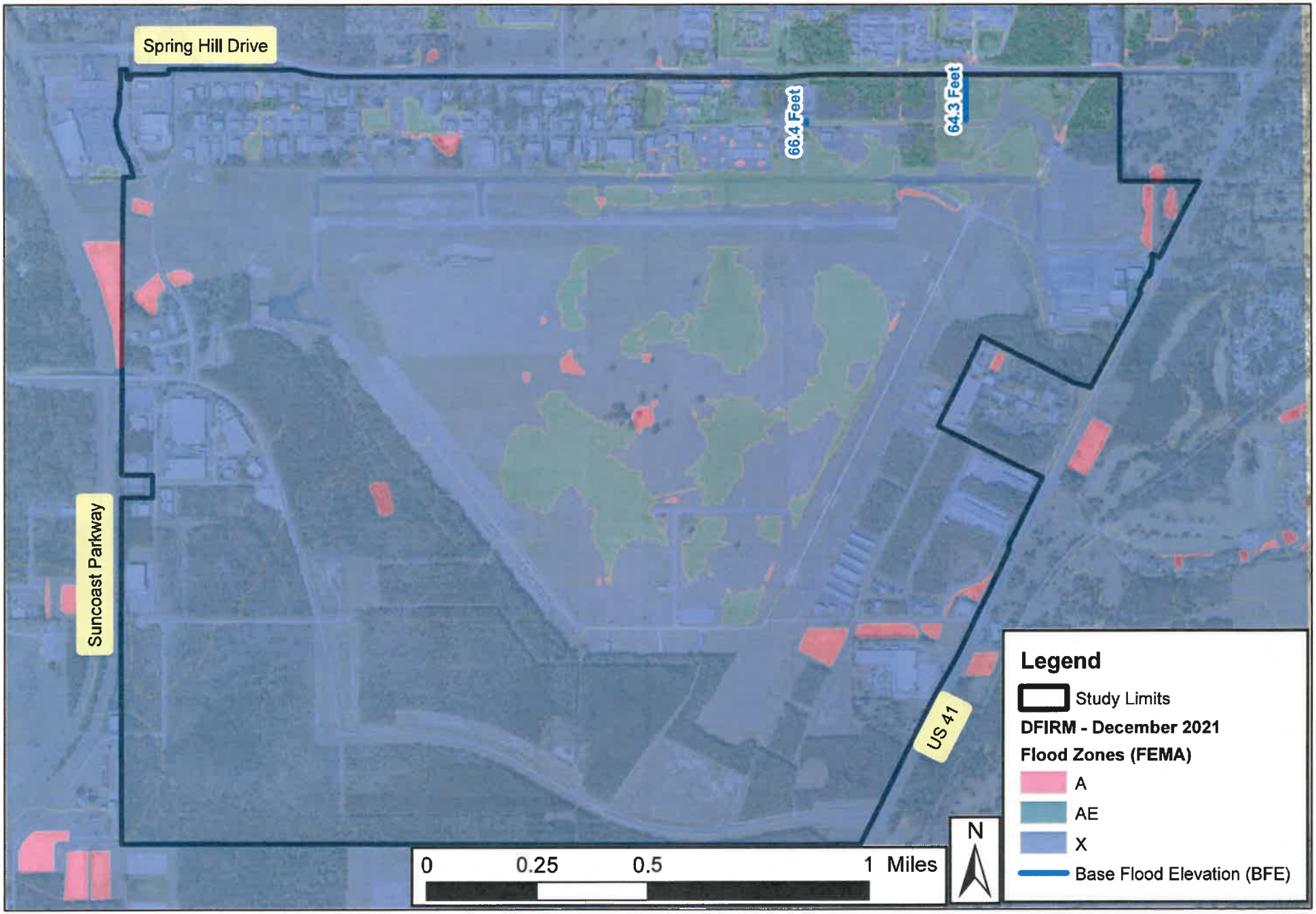

Stormwater Master Plan
Figure A.7A FEMA Floodplains Map

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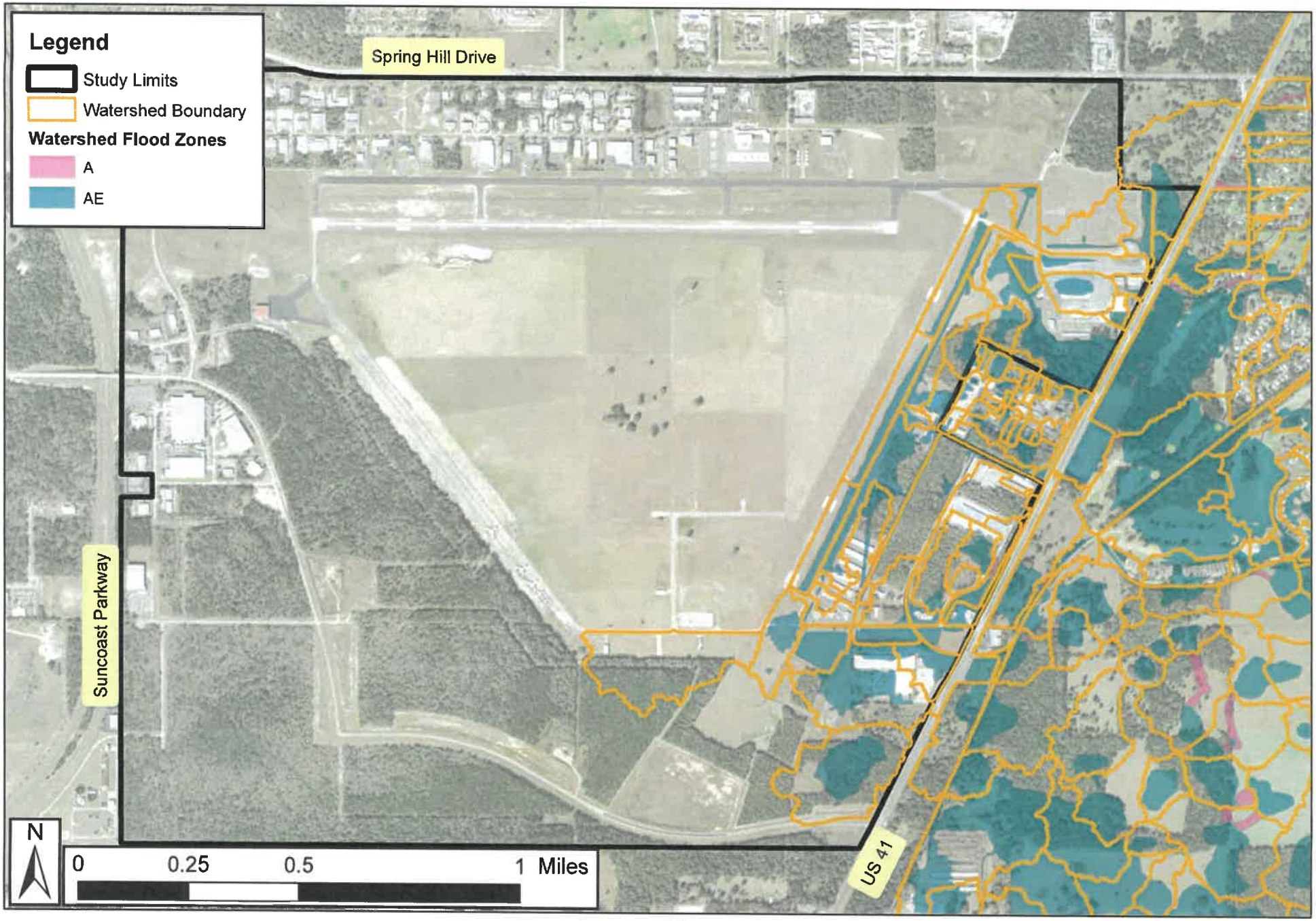

Stormwater Master Plan
Figure A.7B Squirrel Prairie Watershed Floodplains Map

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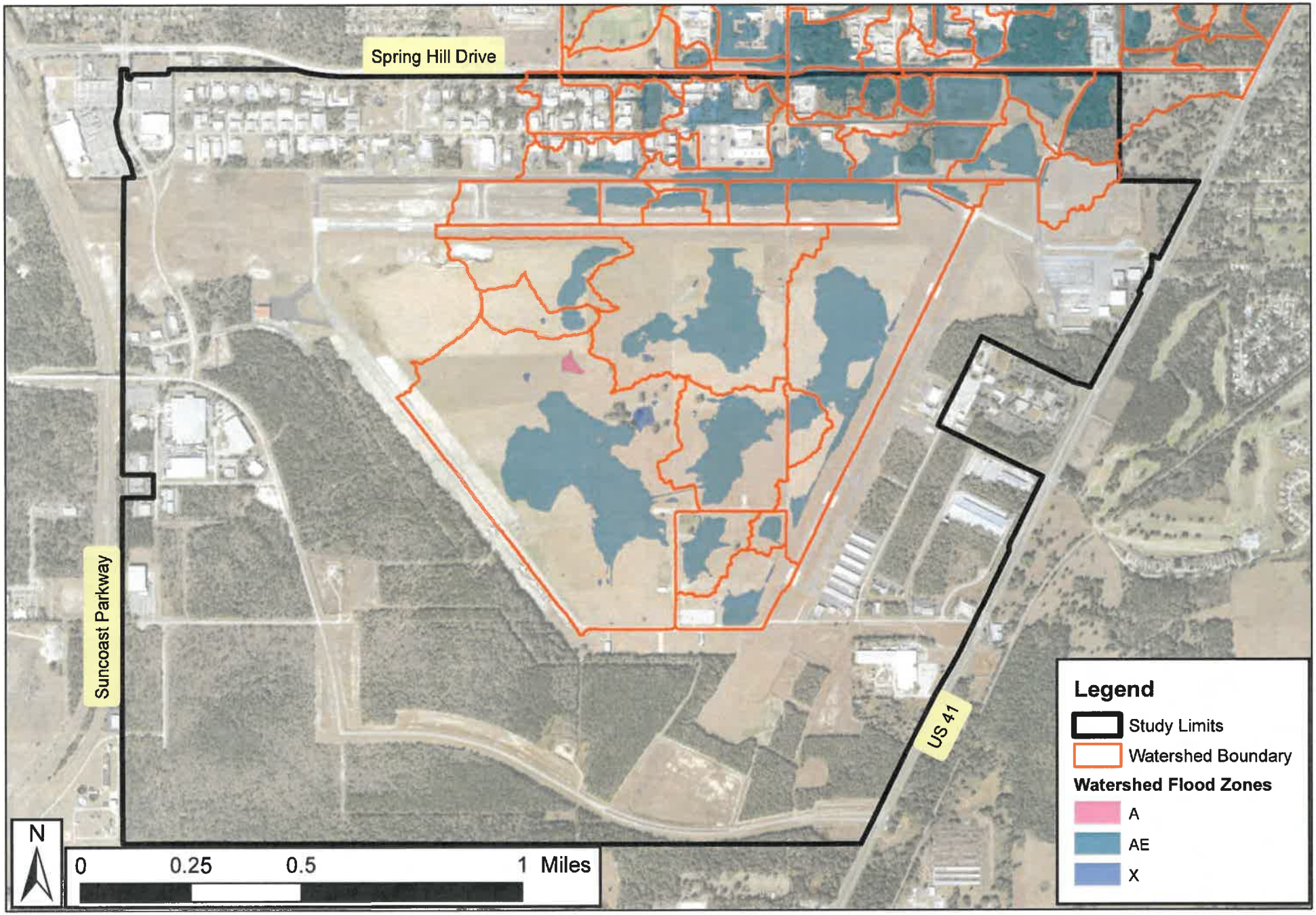

Stormwater Master Plan
Figure A.7C Powell Watershed Floodplains Map

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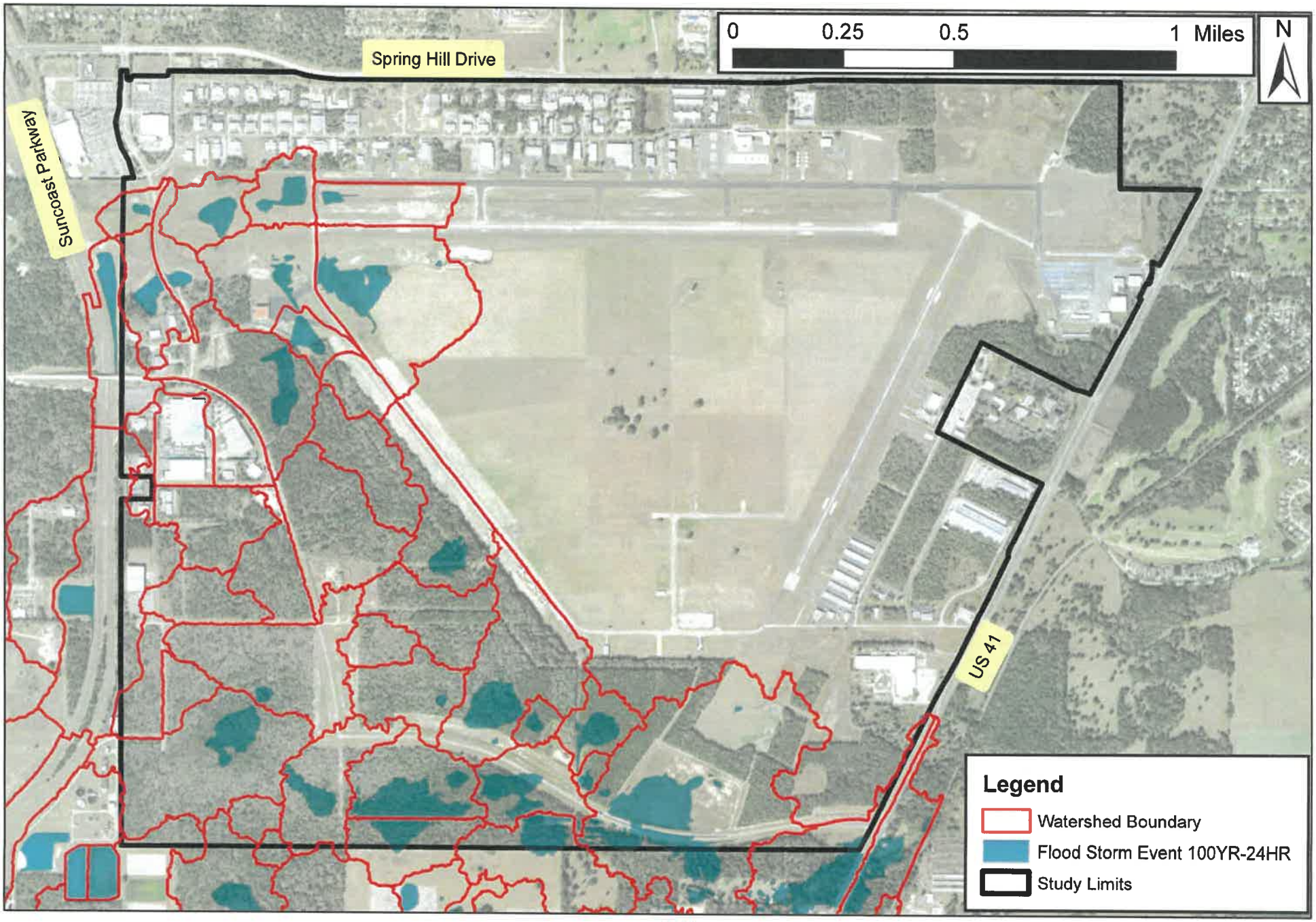
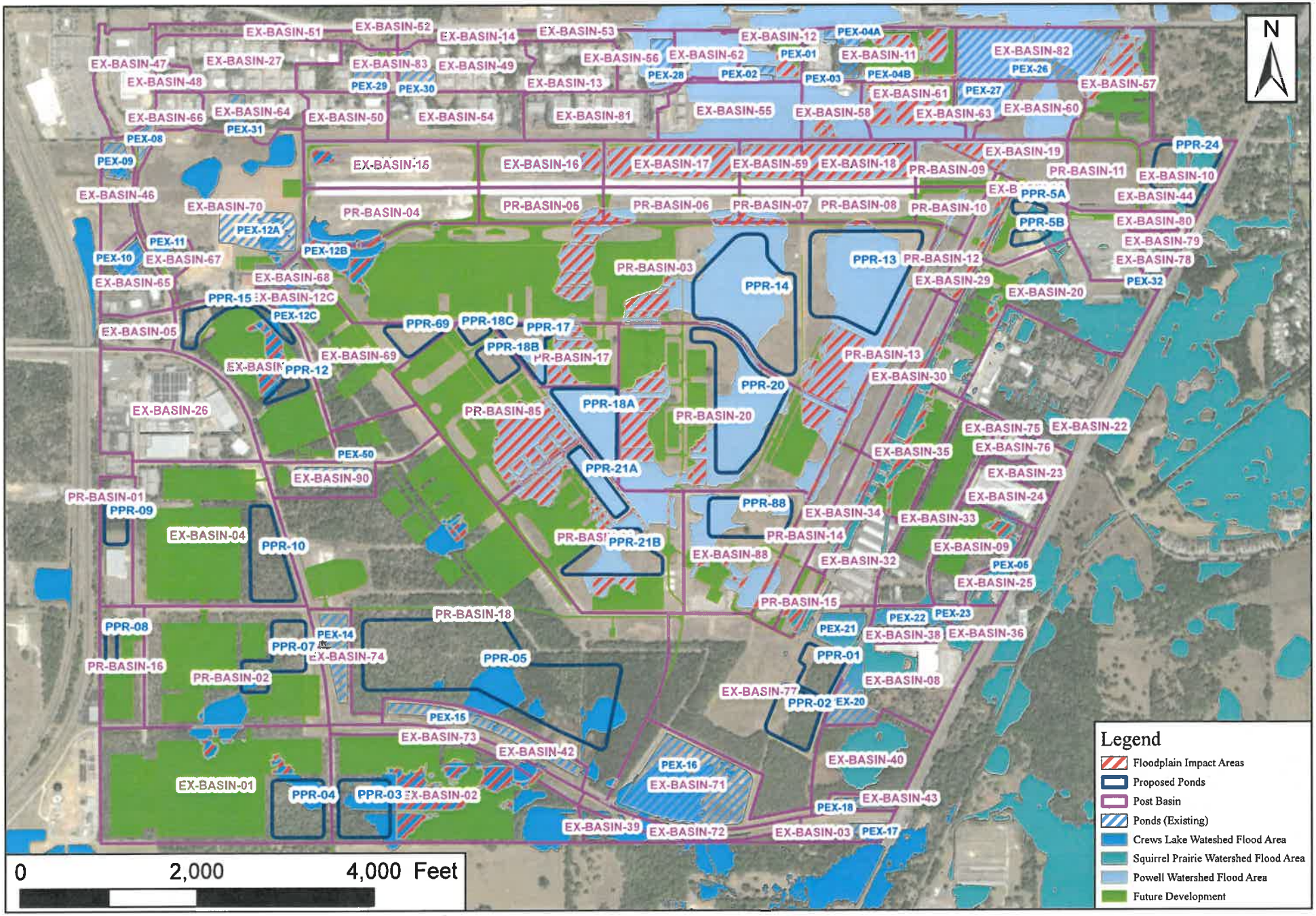


Stormwater Master Plan
Figure A.7D Bear Creek Watershed Floodplains Map

Michael Baker INTERNATIONAL



Stormwater Master Plan
Figure A.8 Floodplain Impacts Map

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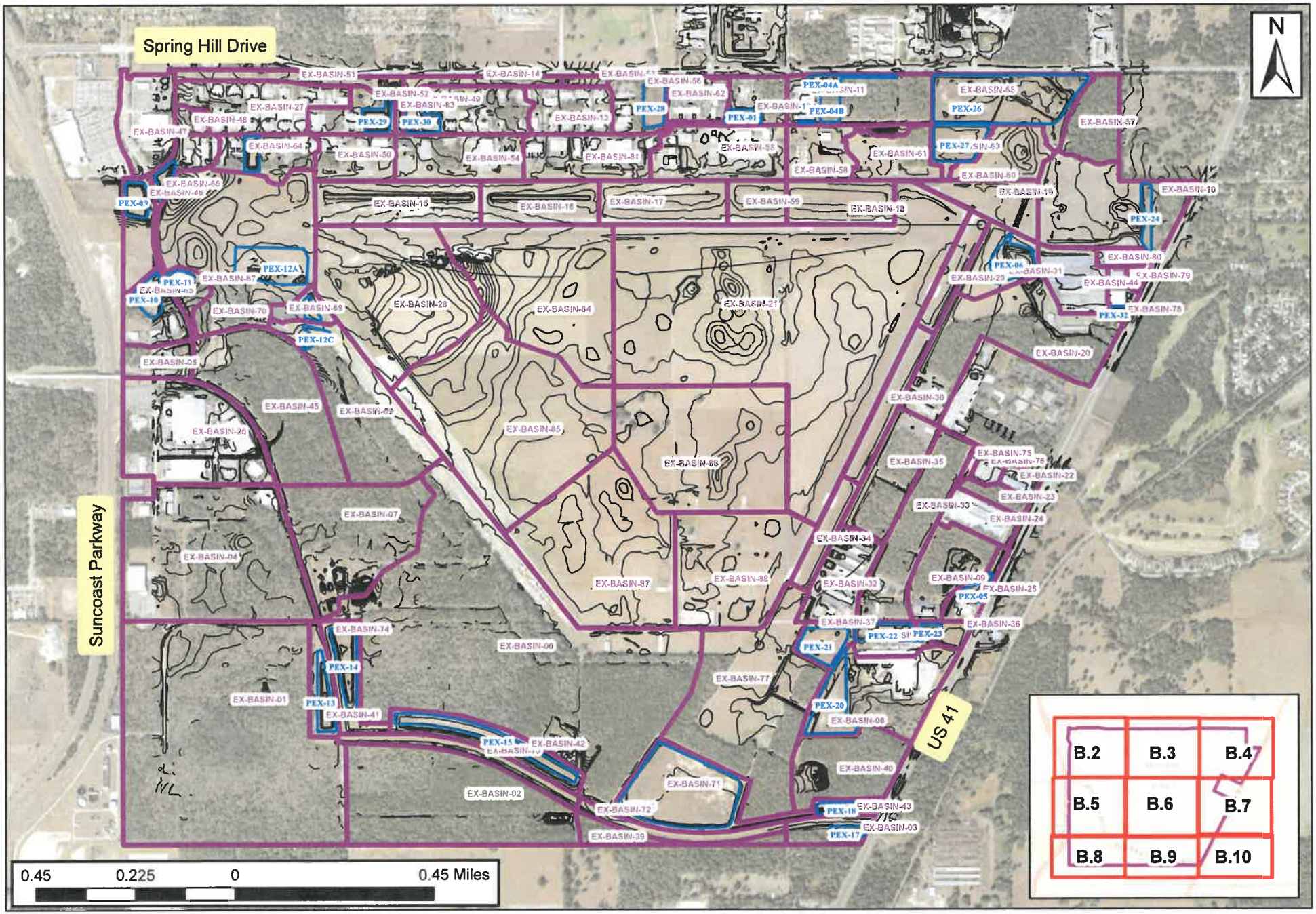
Appendix B

PRE-DEVELOPMENT DRAINAGE AND ICPR SCHEMATIC MAPS



Stormwater Master Plan
Figure B.1 Pre-Development Map

Legend

Ponds (Existing) —— Contours

Basins (Existing)

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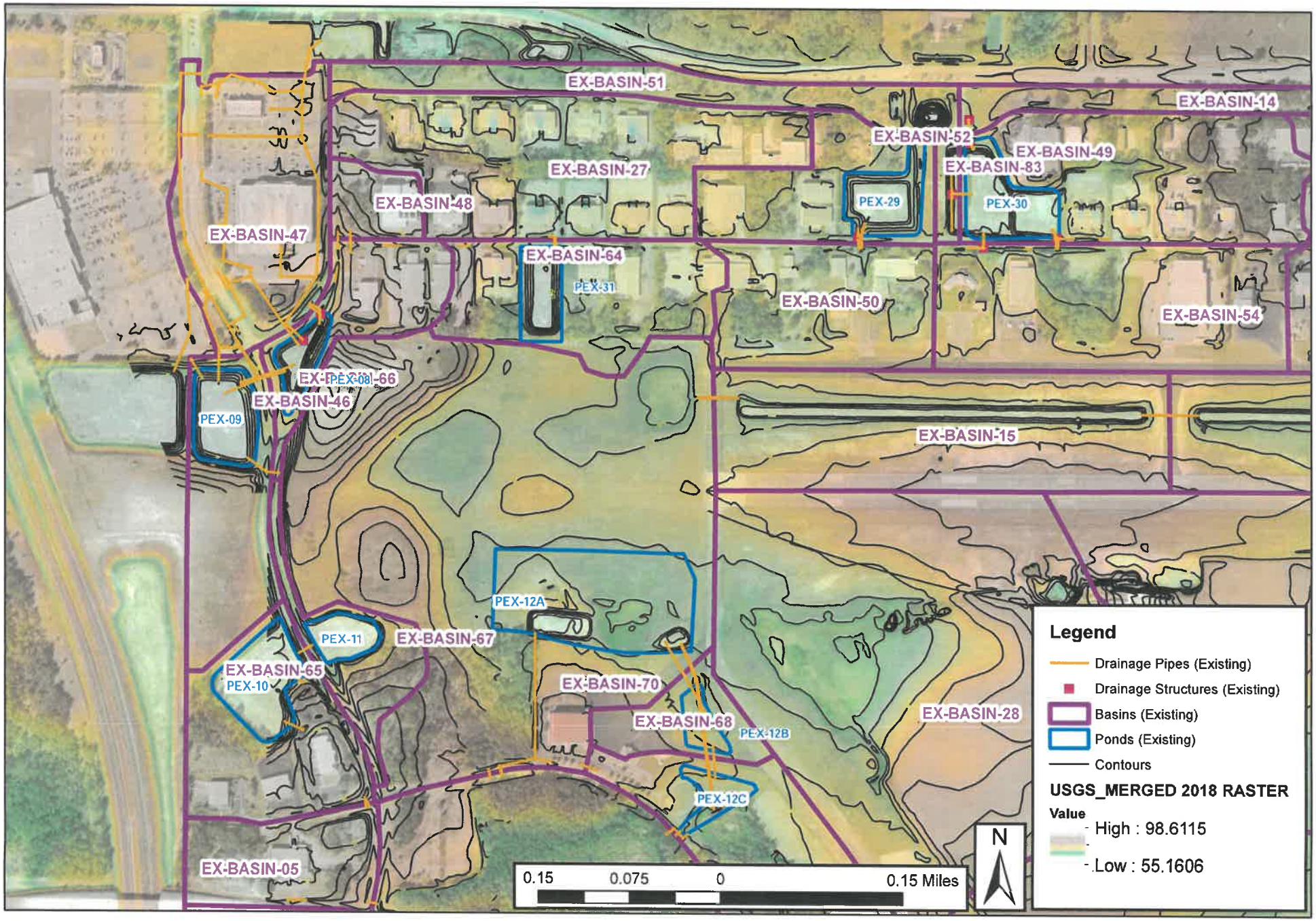
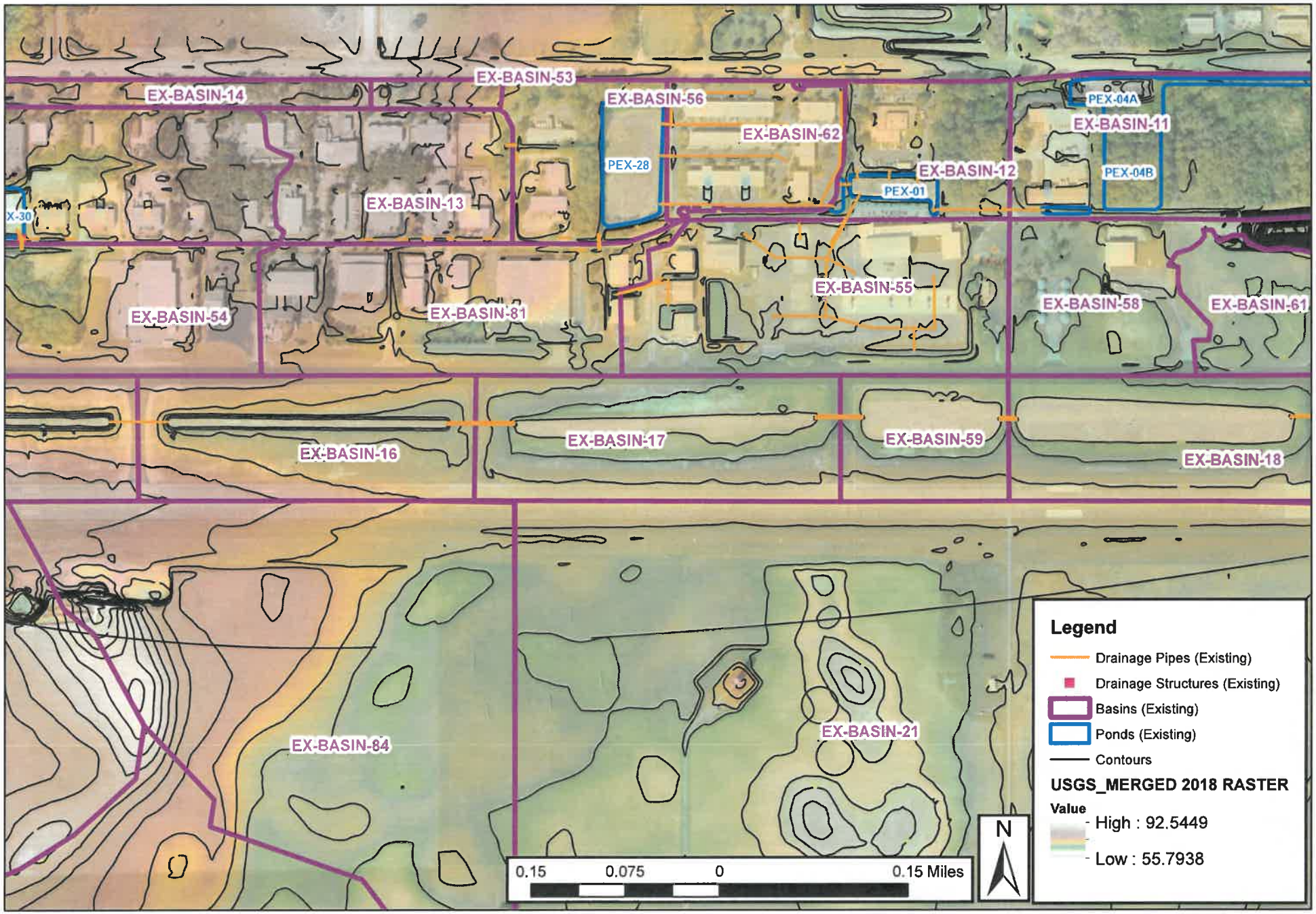


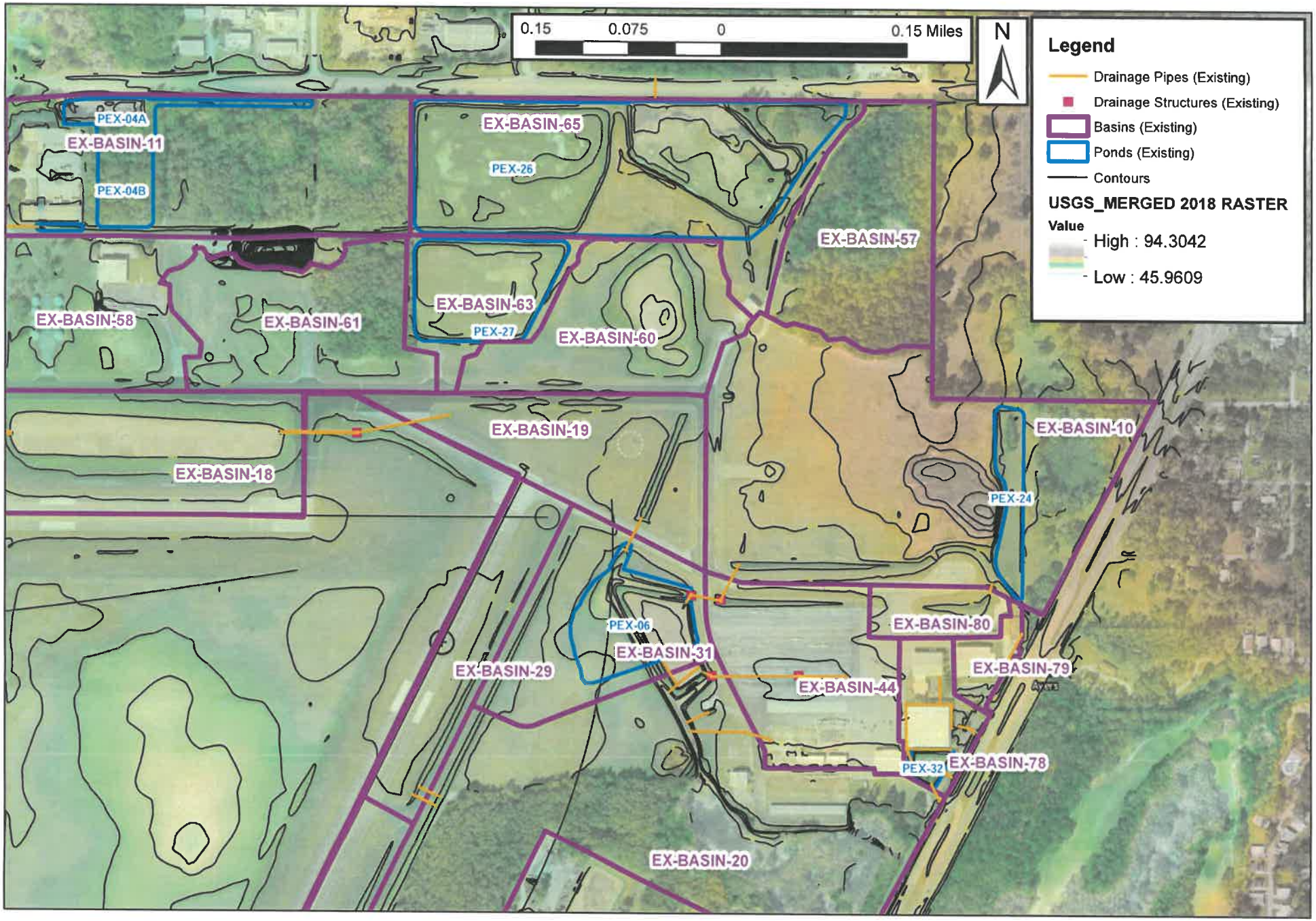
Stormwater Master Plan
Figure B.2 Pre-Development Map

Michael Baker INTERNATIONAL



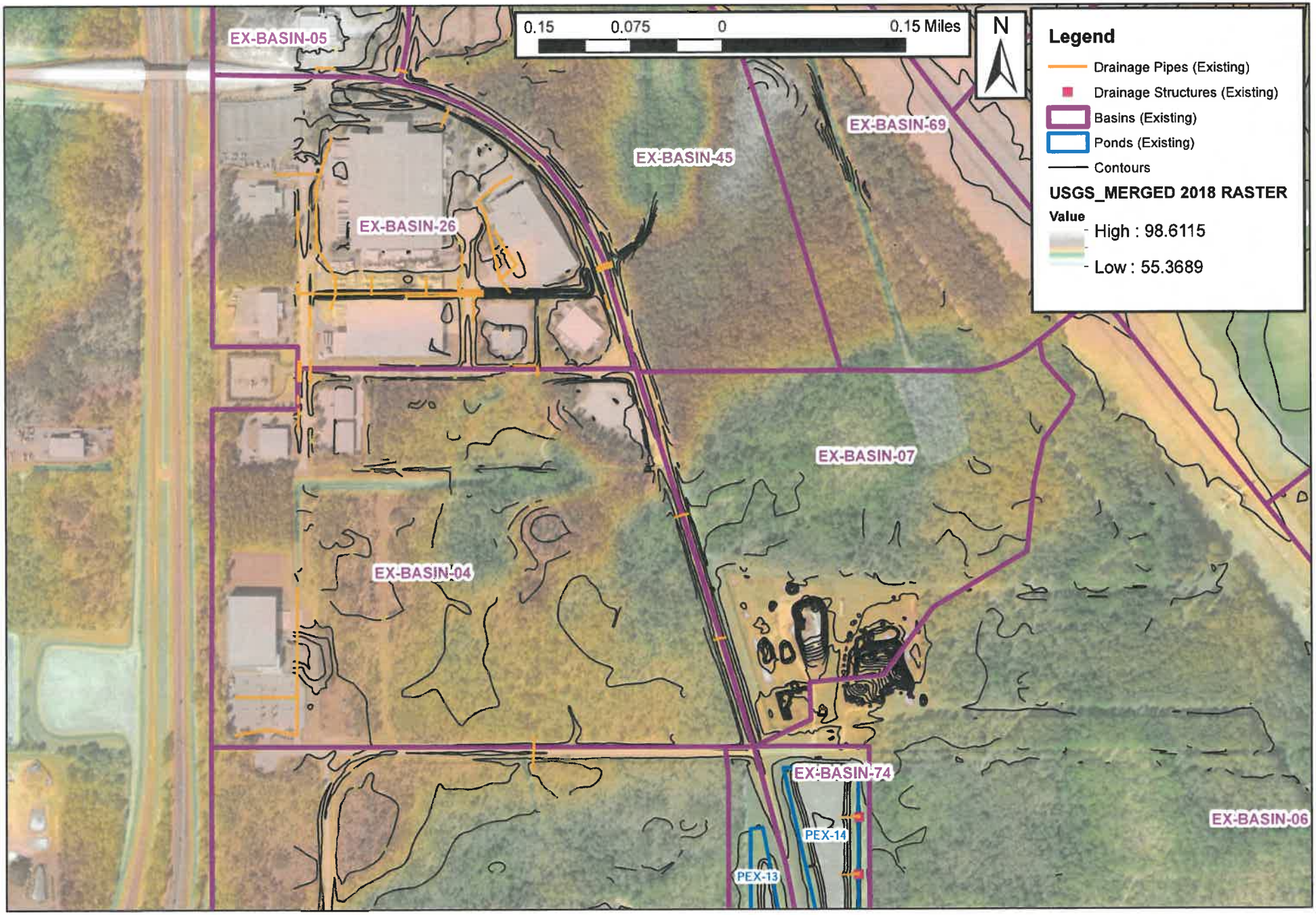
Stormwater Master Plan
Figure B.3 Pre-Development Map

Michael Baker INTERNATIONAL



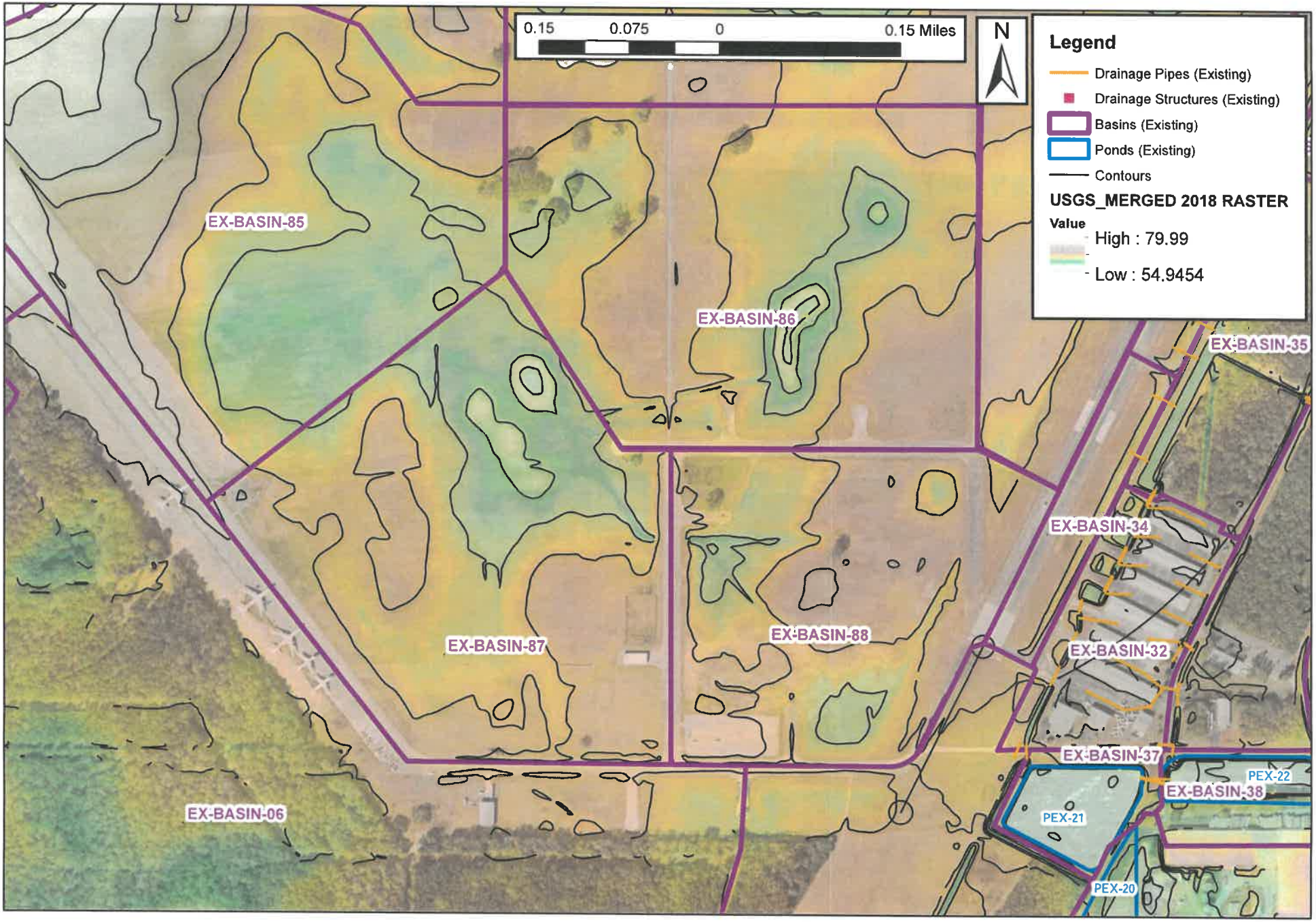
Stormwater Master Plan
Figure B.4 Pre-Development Map

Michael Baker INTERNATIONAL



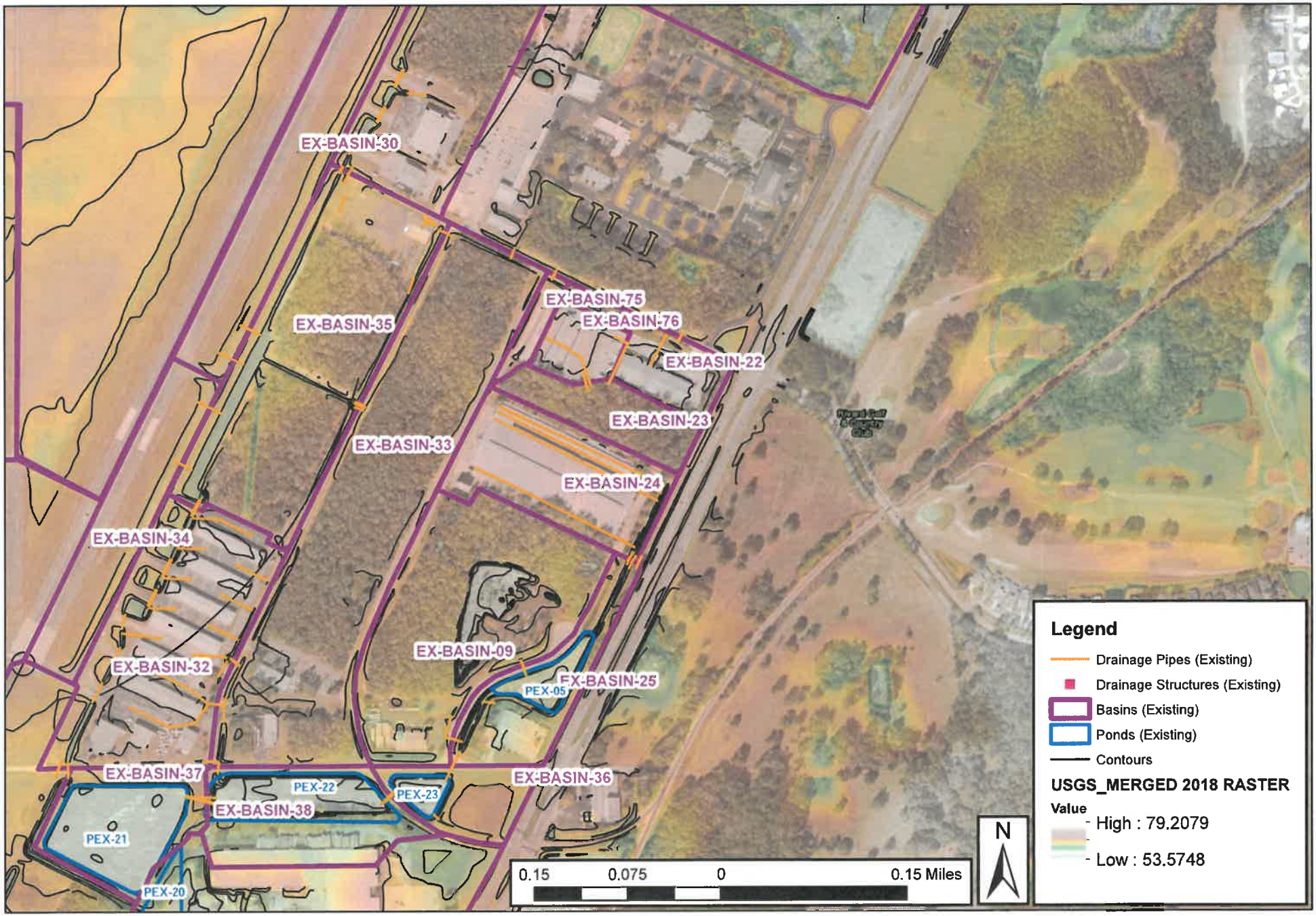
Stormwater Master Plan
Figure B.5 Pre-Development Map

Michael Baker INTERNATIONAL



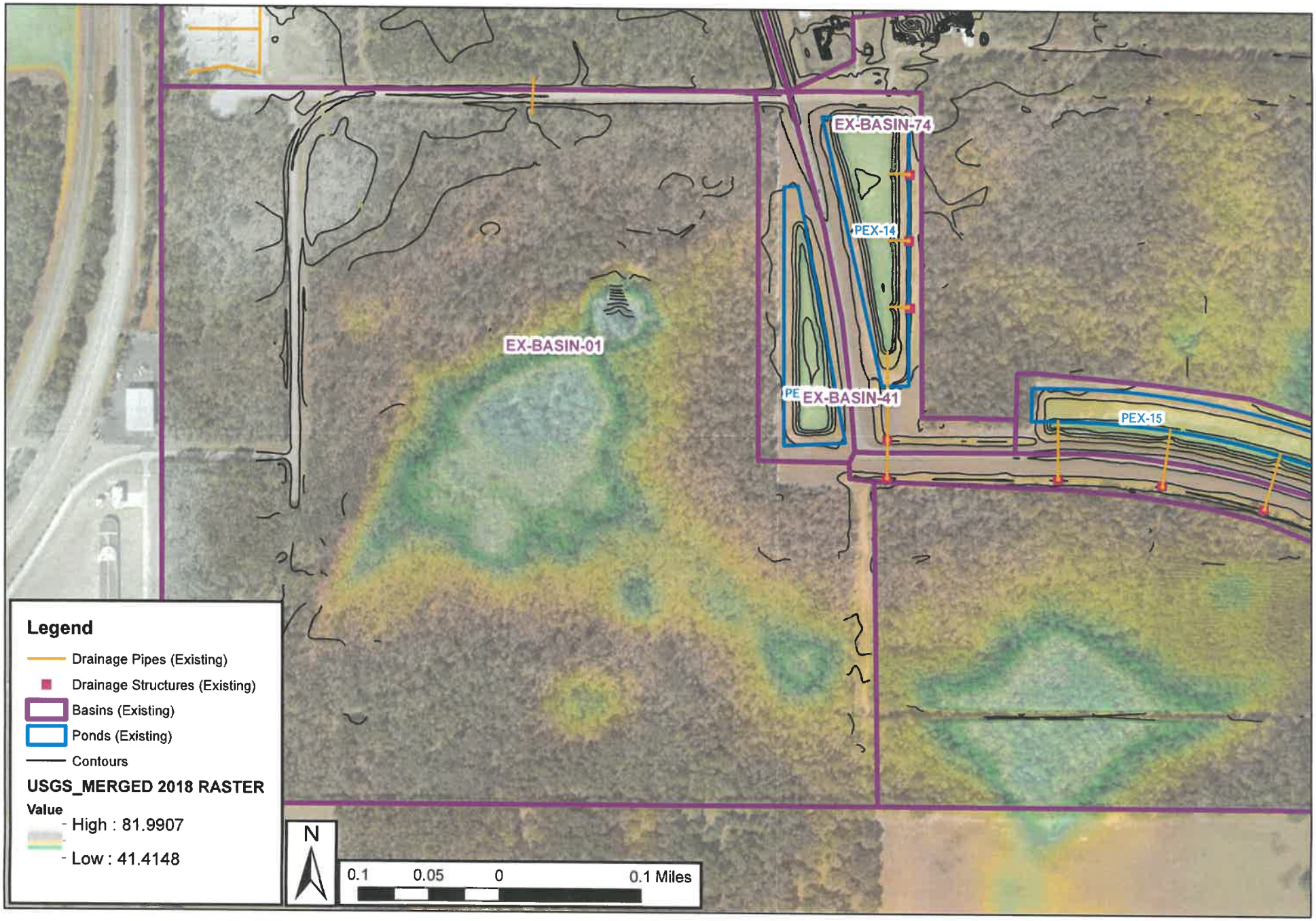
Stormwater Master Plan
Figure B.6 Pre-Development Map

Michael Baker INTERNATIONAL



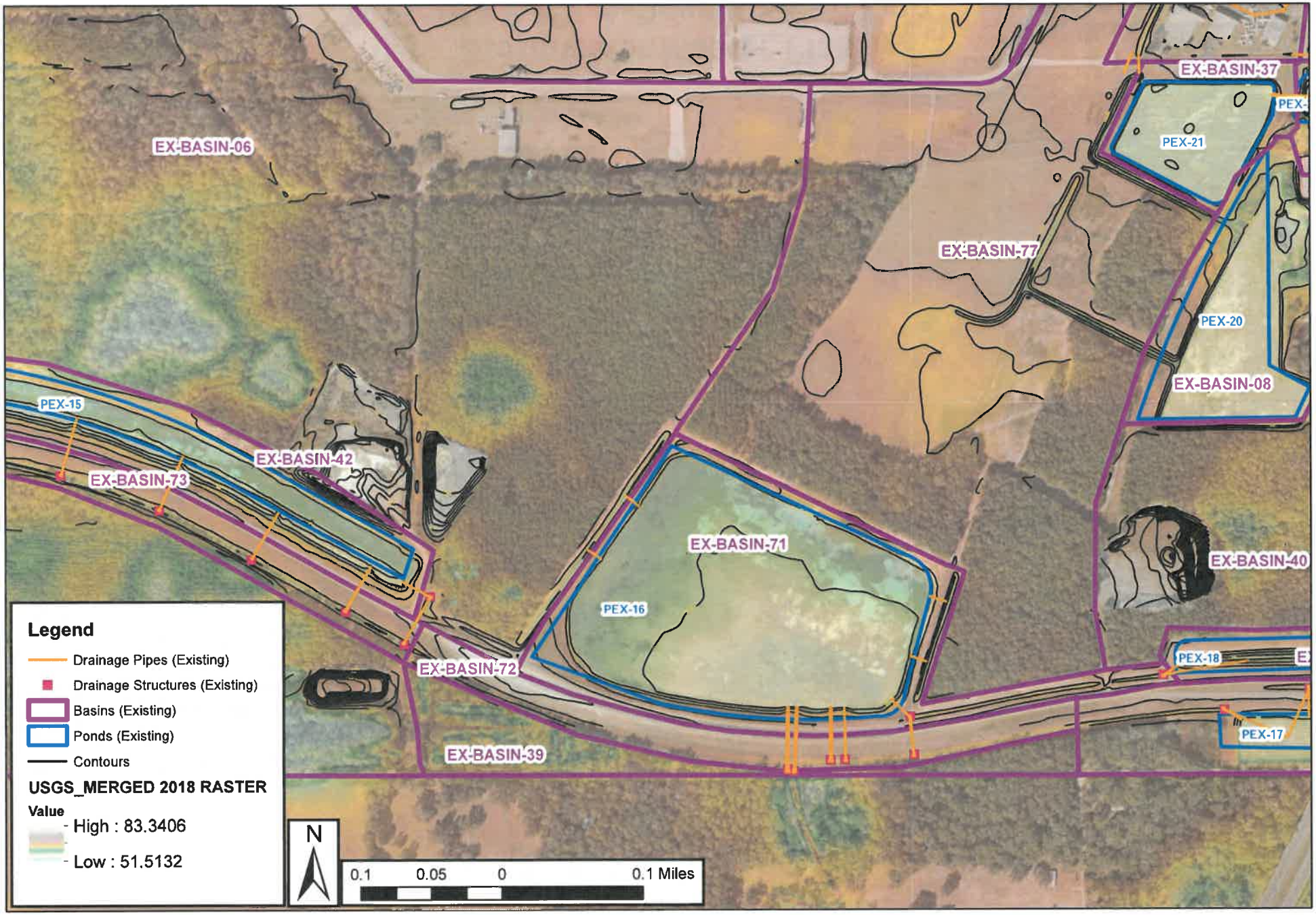
Stormwater Master Plan
Figure B.7 Pre-Development Map

Michael Baker INTERNATIONAL



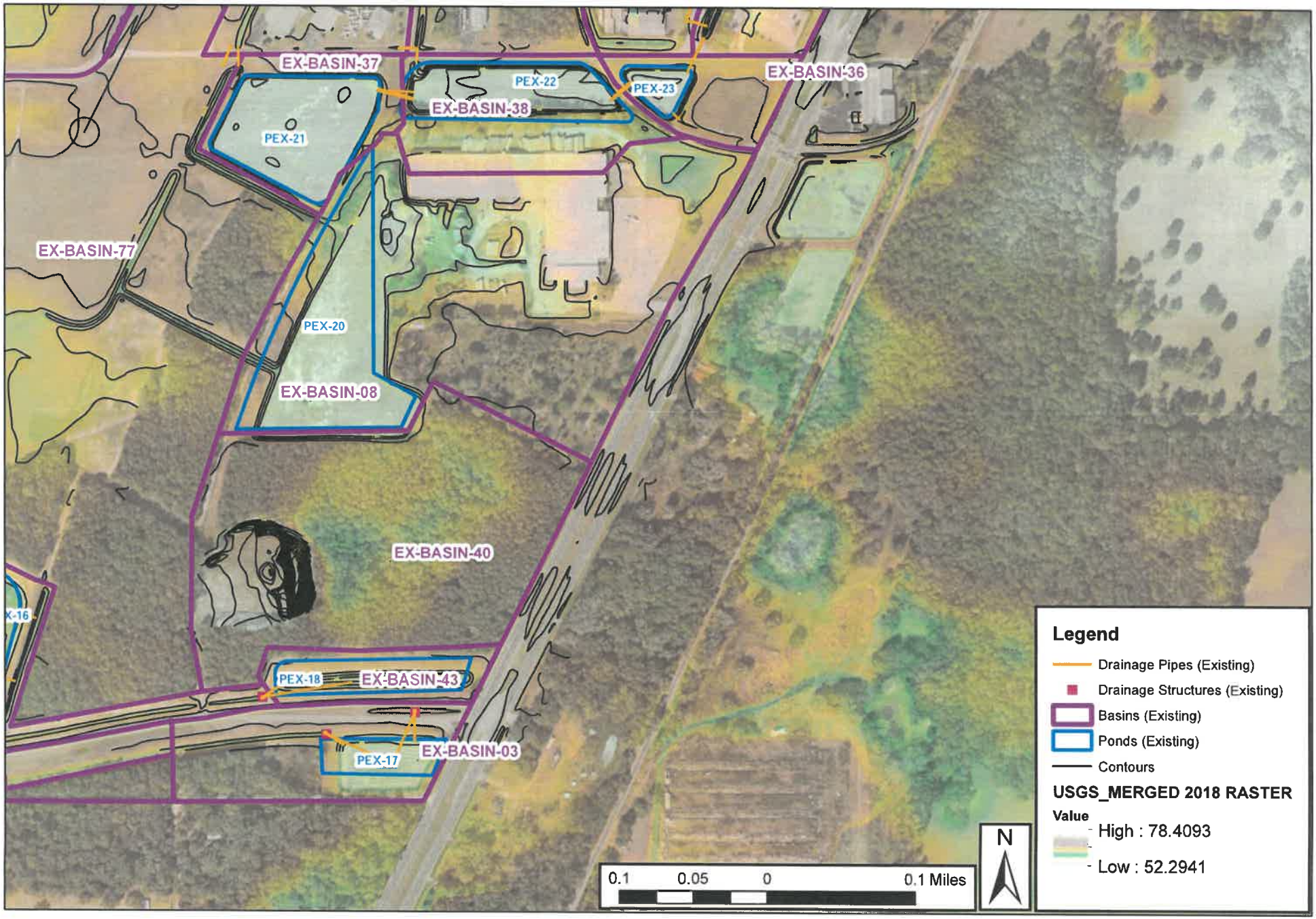
Stormwater Master Plan
Figure B.8 Pre-Development Map

Michael Baker INTERNATIONAL



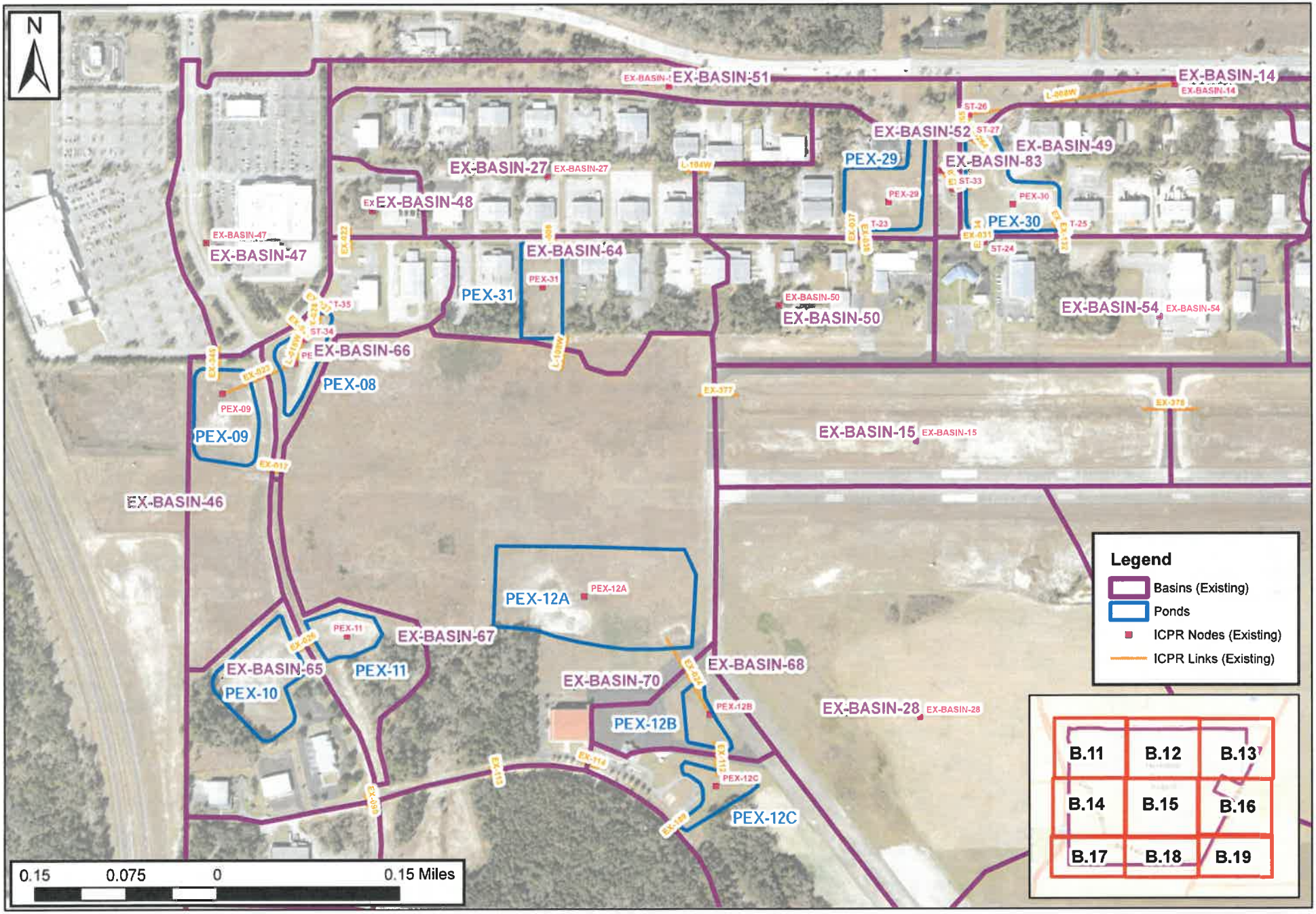
Stormwater Master Plan
Figure B.9 Pre-Development Map

Michael Baker INTERNATIONAL



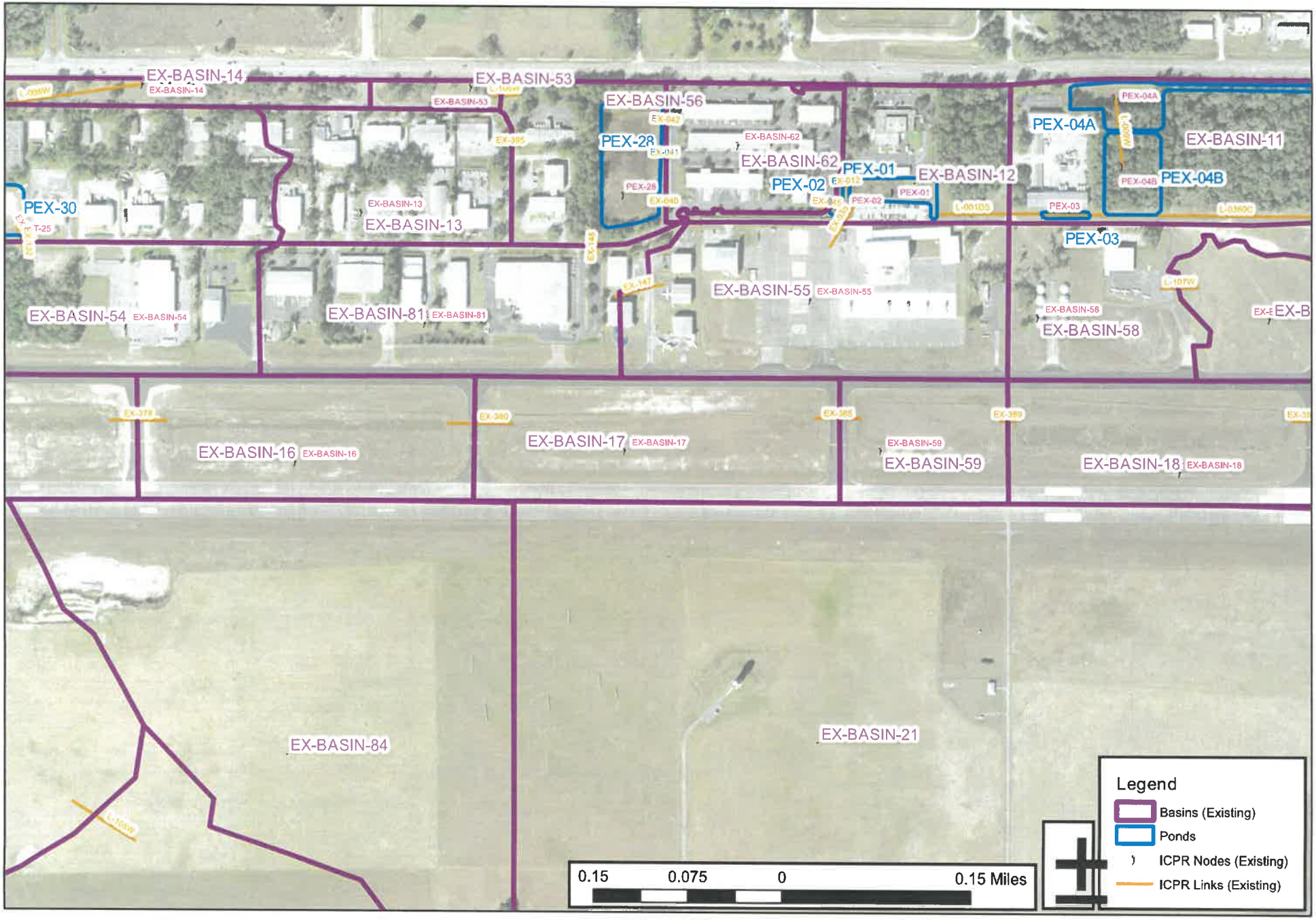
Stormwater Master Plan
Figure B.10 Pre-Development Map

Michael Baker INTERNATIONAL



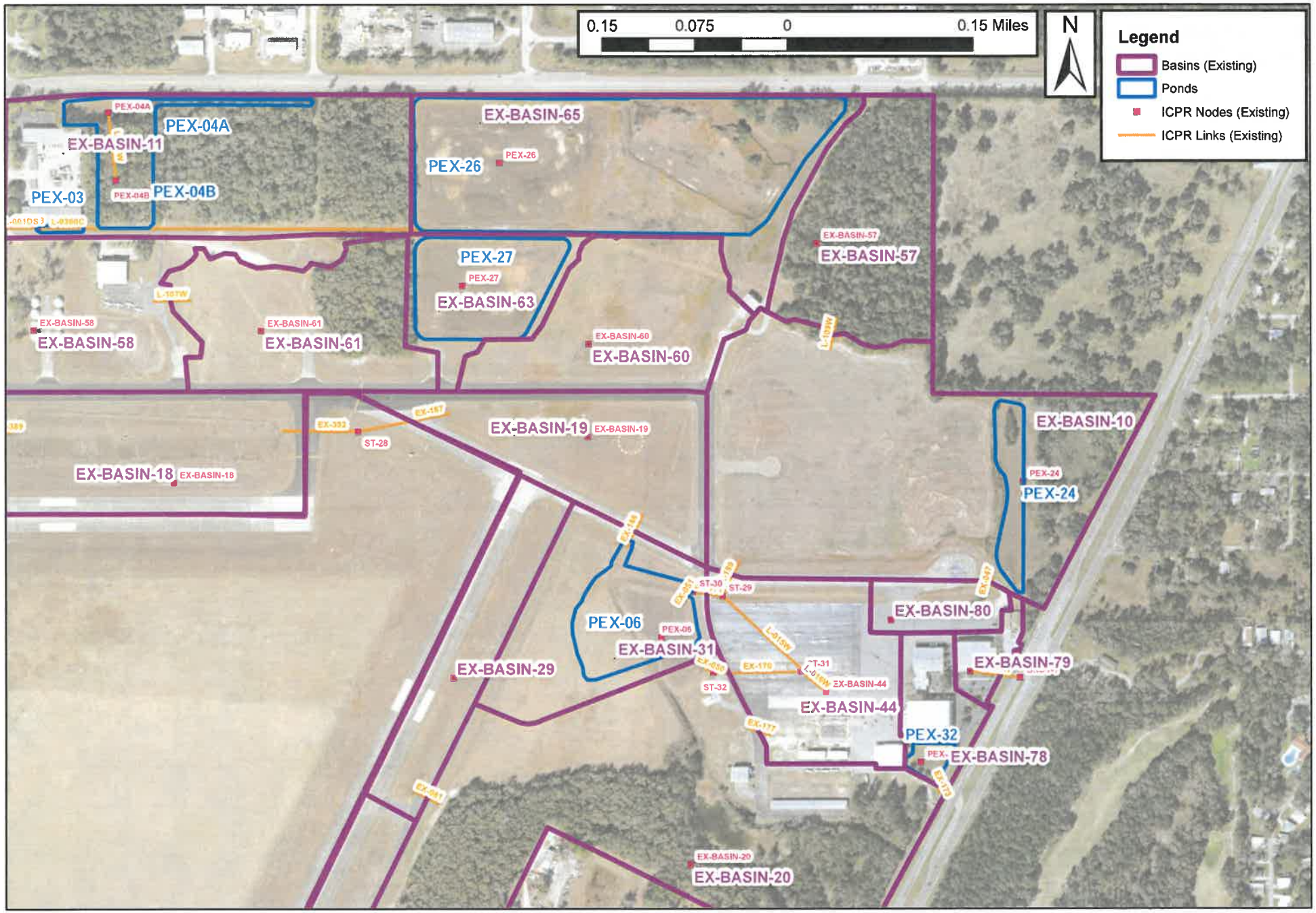
Stormwater Master Plan
Figure B.11 ICPR Pre-Schematic Map

Michael Baker INTERNATIONAL



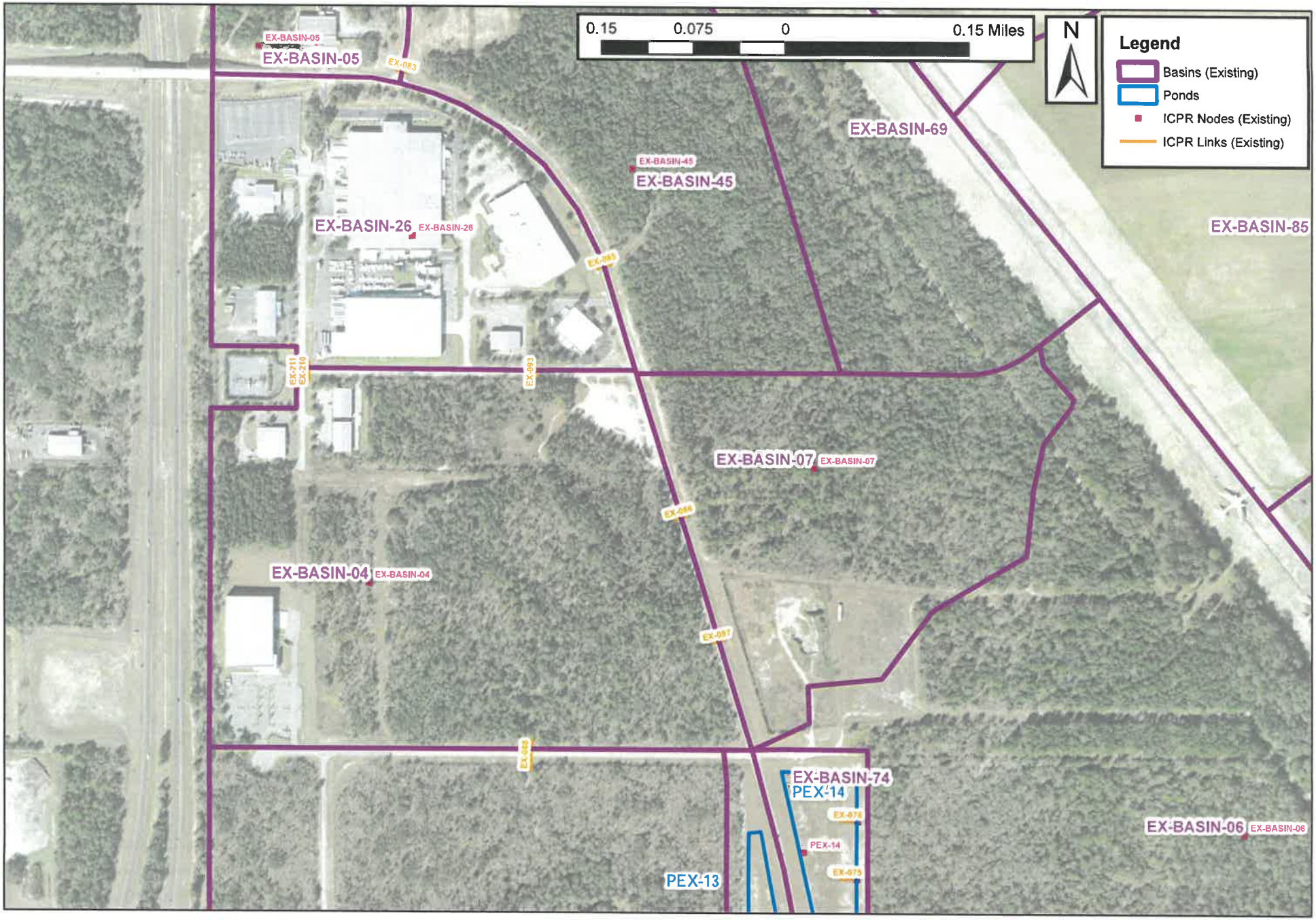
Stormwater Master Plan
Figure B.12 ICPR Pre-Schematic Map

Michael Baker INTERNATIONAL



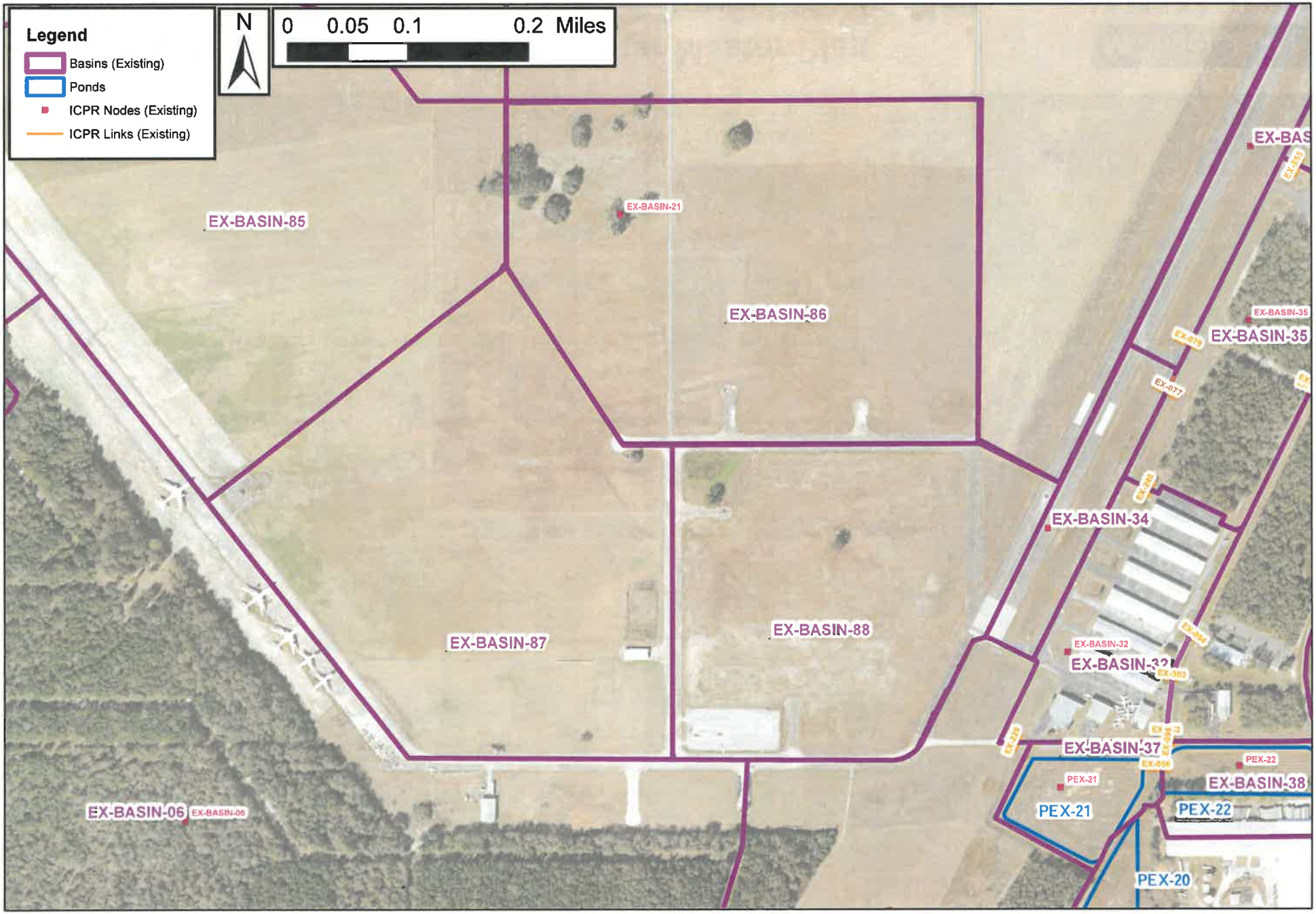
Stormwater Master Plan
Figure B.13 ICPR Pre-Schematic Map

Michael Baker INTERNATIONAL



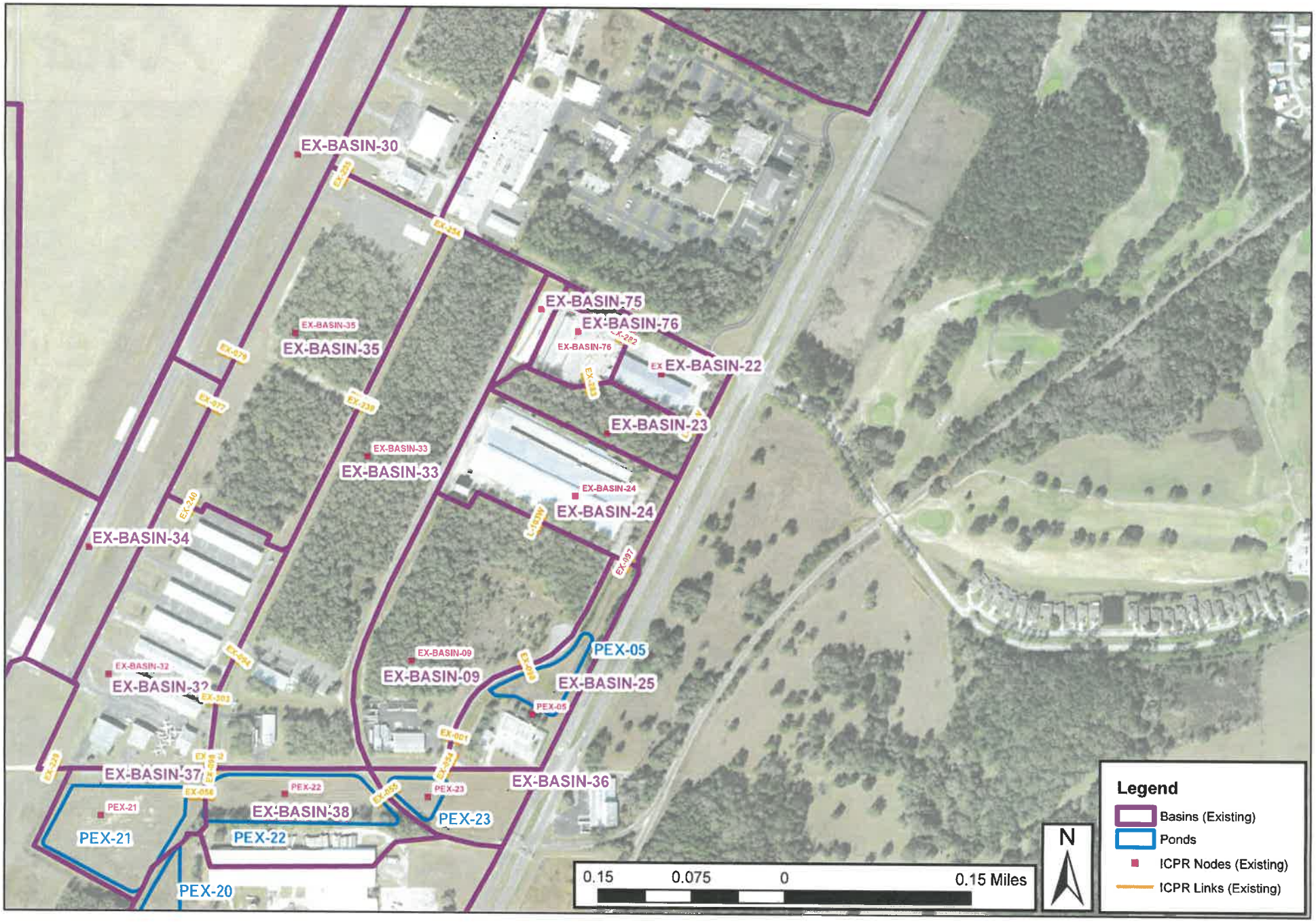
Stormwater Master Plan
Figure B.14 ICPR Pre-Schematic Map

Michael Baker
INTERNATIONAL



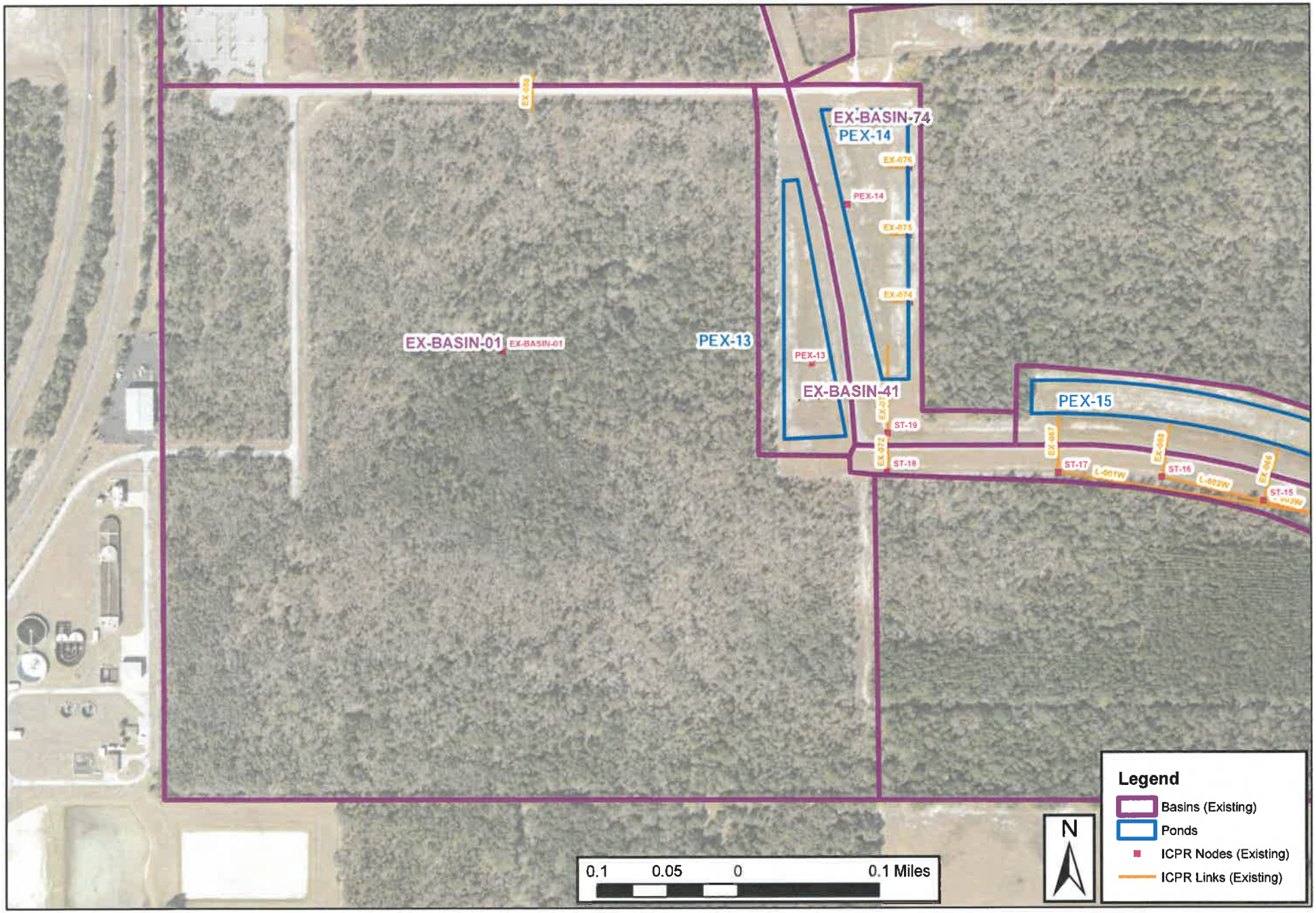
Stormwater Master Plan
Figure B.15 ICPR Pre-Schematic Map

Michael Baker INTERNATIONAL



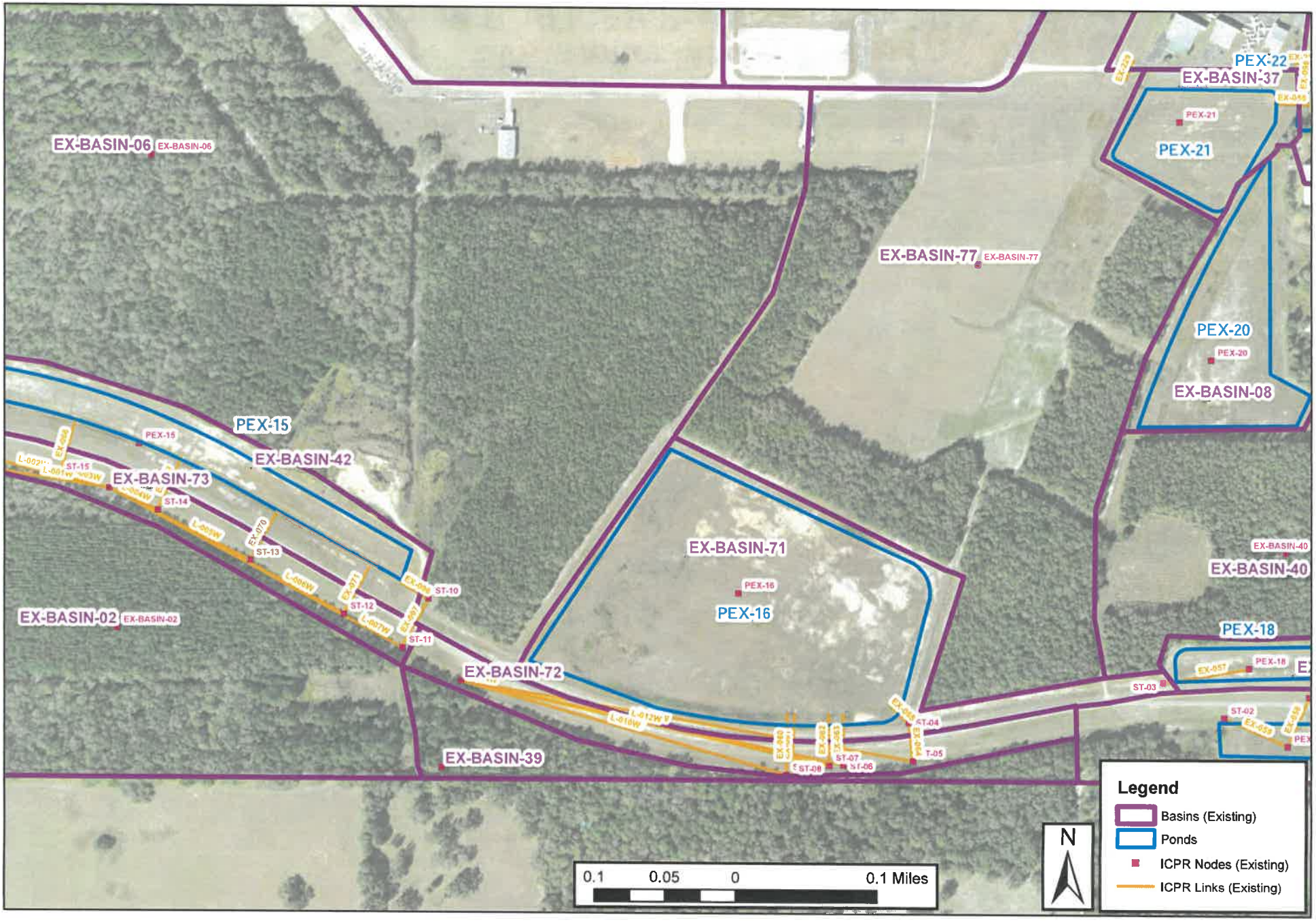
Stormwater Master Plan
Figure B.16 ICPR Pre-Schematic Map

Michael Baker INTERNATIONAL



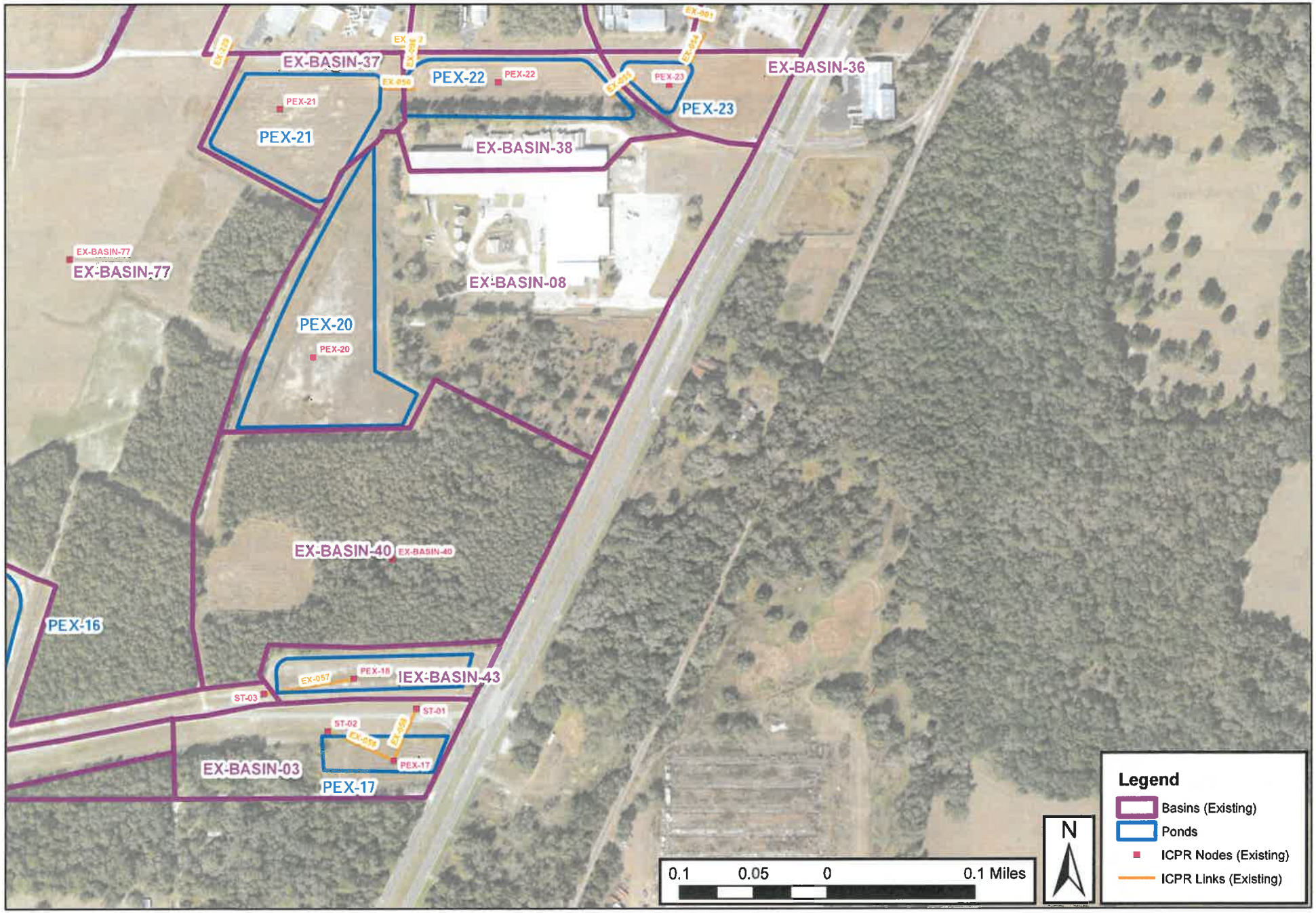
Stormwater Master Plan
Figure B.17 ICPR Pre-Schematic Map

Michael Baker INTERNATIONAL



Stormwater Master Plan
Figure B.18 ICPR Pre-Schematic Map

Michael Baker INTERNATIONAL

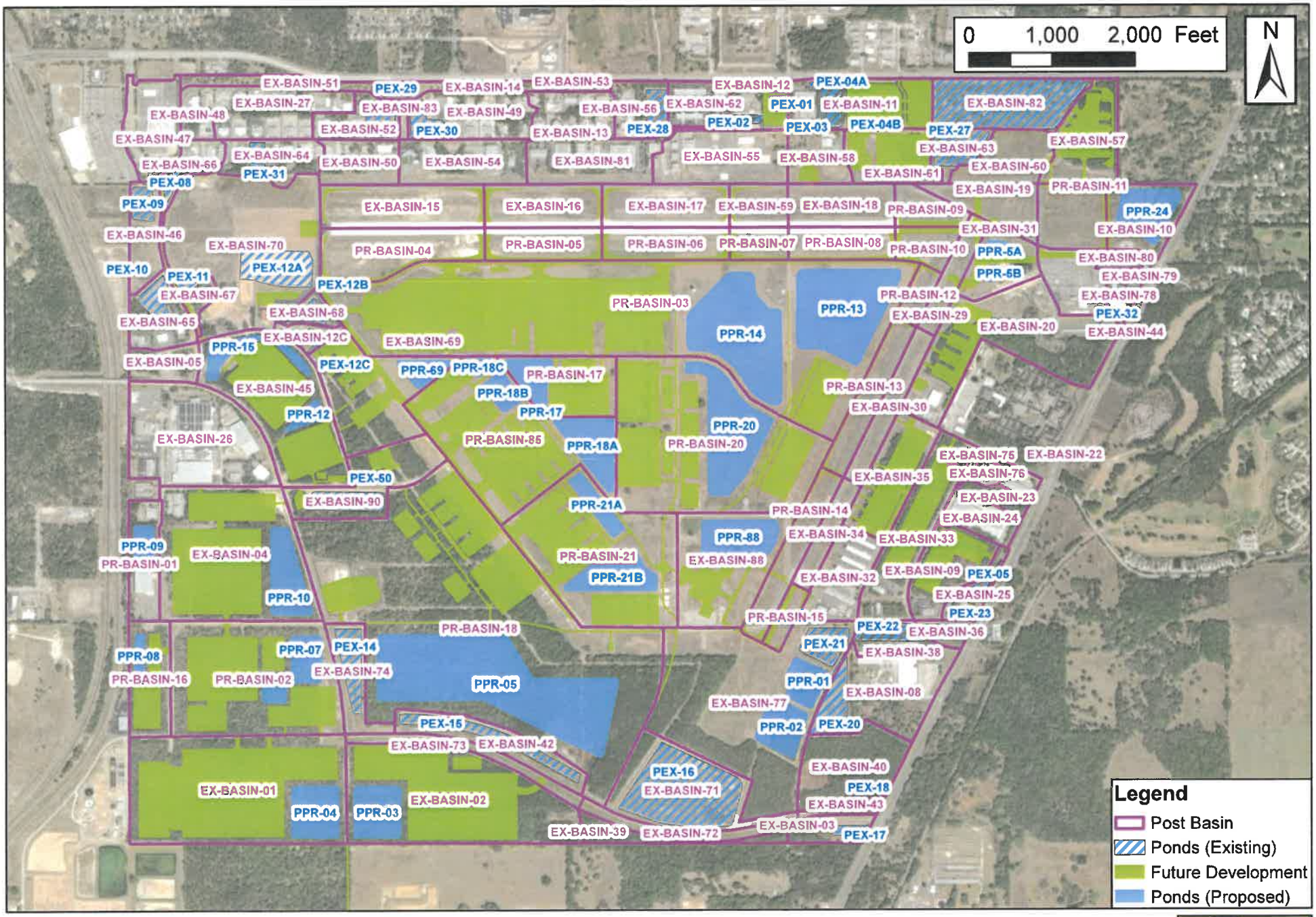


Stormwater Master Plan
Figure B.19 ICPR Pre-Schematic Map

Michael Baker INTERNATIONAL

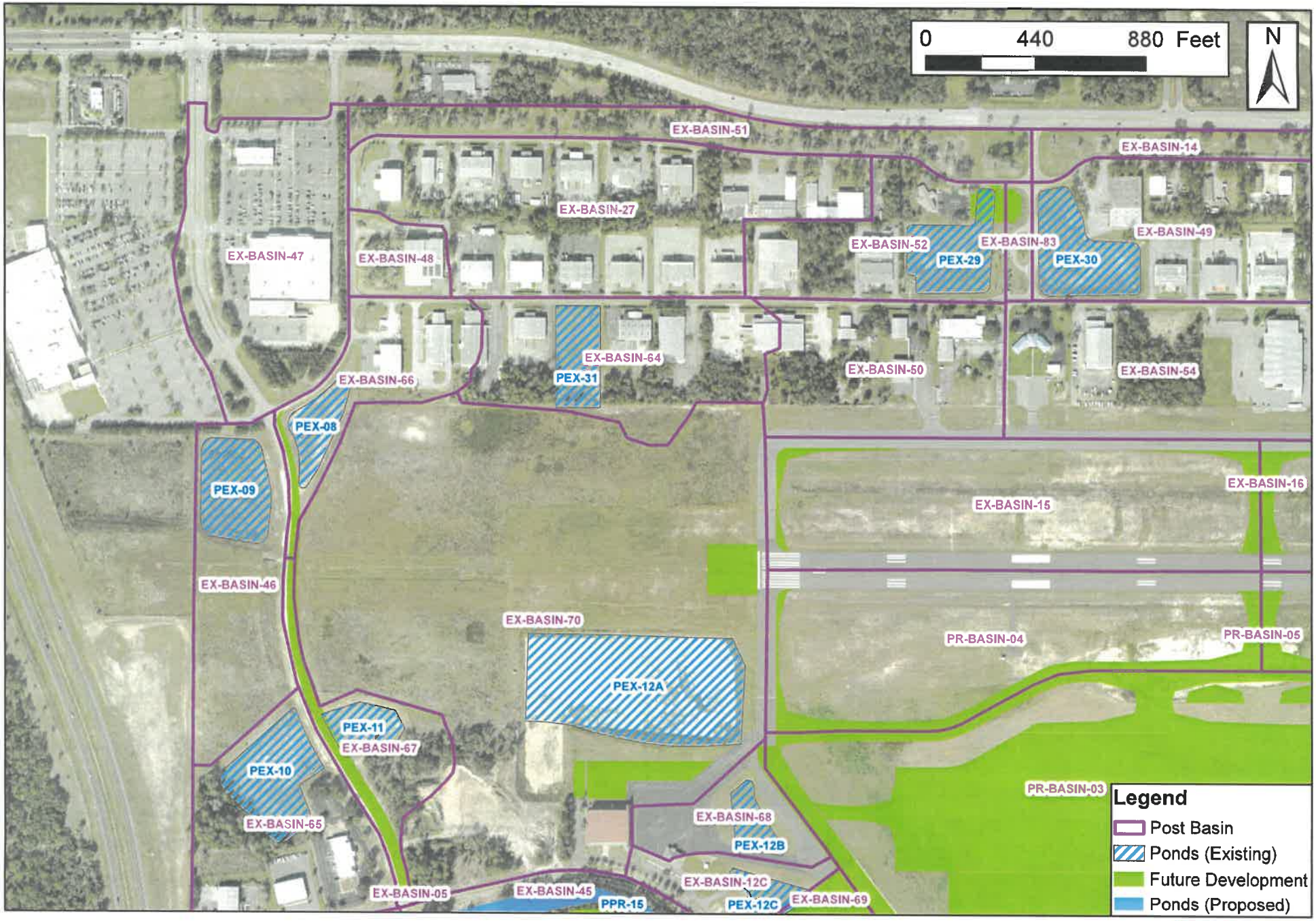
Appendix C

POST-DEVELOPMENT DRAINAGE AND ICPR SCHEMATIC MAPS



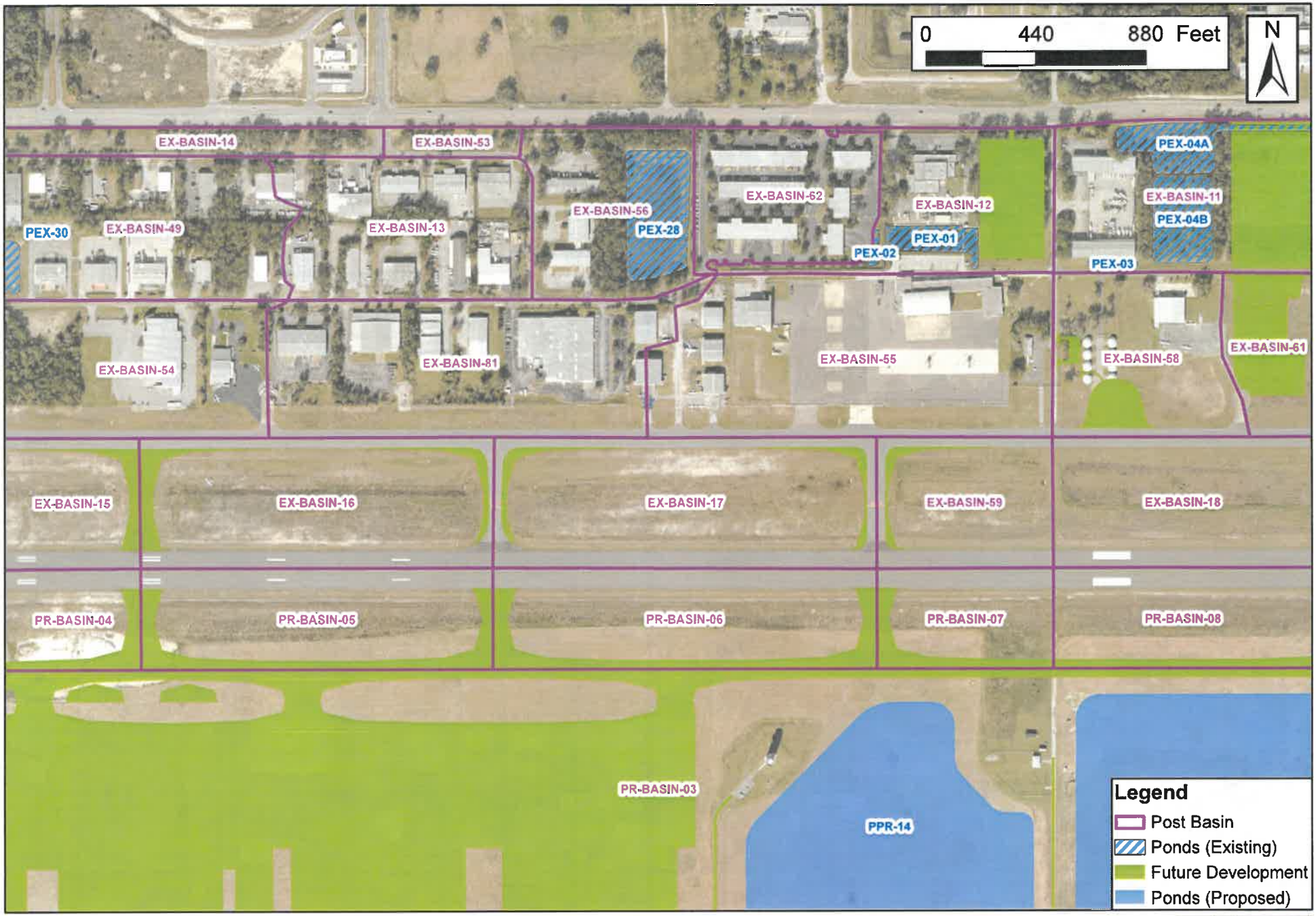
Stormwater Master Plan
Figure C.1 Post Development Map

Michael Baker INTERNATIONAL



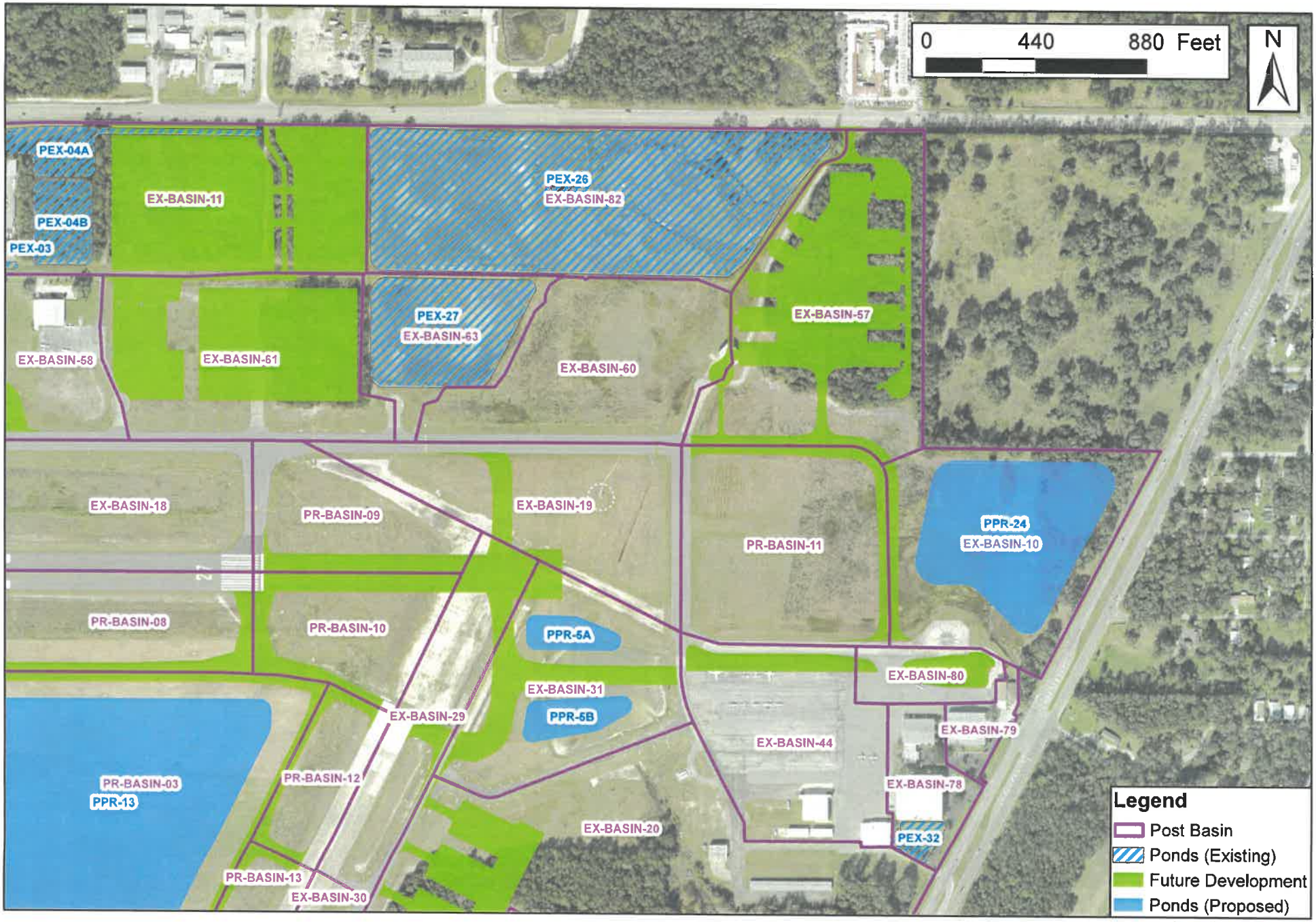
Stormwater Master Plan
Figure C.2 Post Development Map

Michael Baker INTERNATIONAL



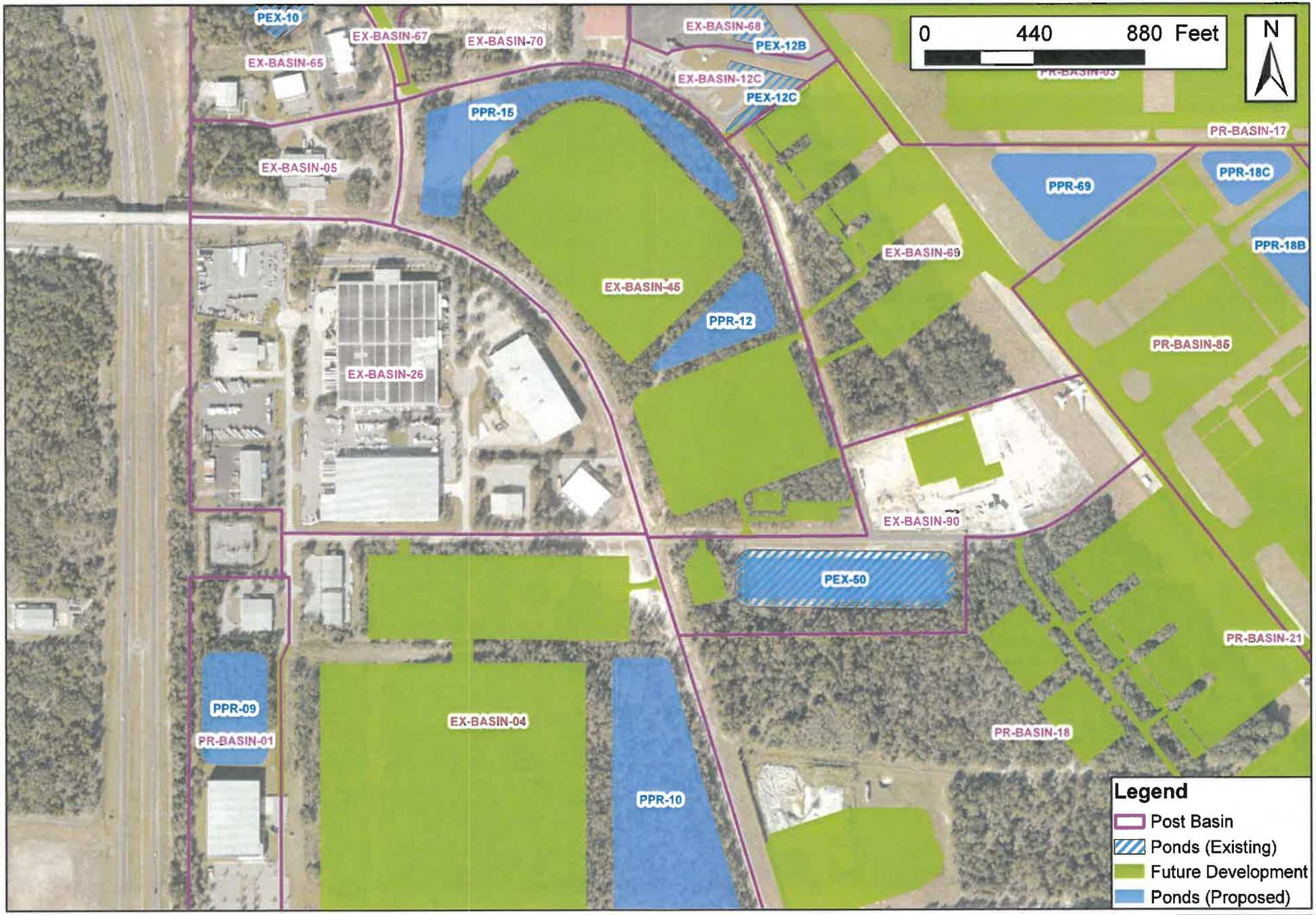
Stormwater Master Plan
Figure C.3 Post Development Map

Michael Baker INTERNATIONAL



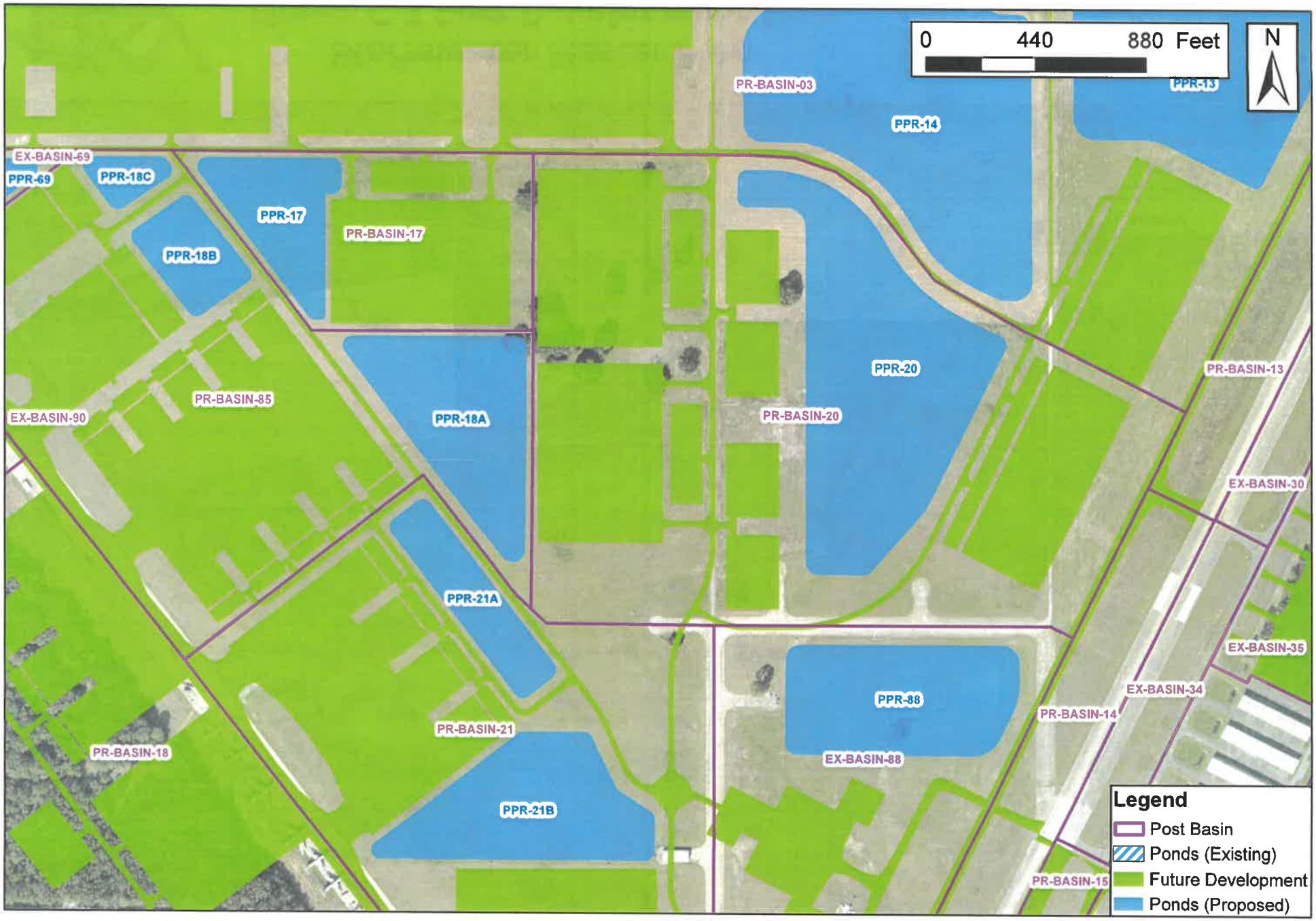
Stormwater Master Plan
Figure C.4 Post Development Map

Michael Baker INTERNATIONAL



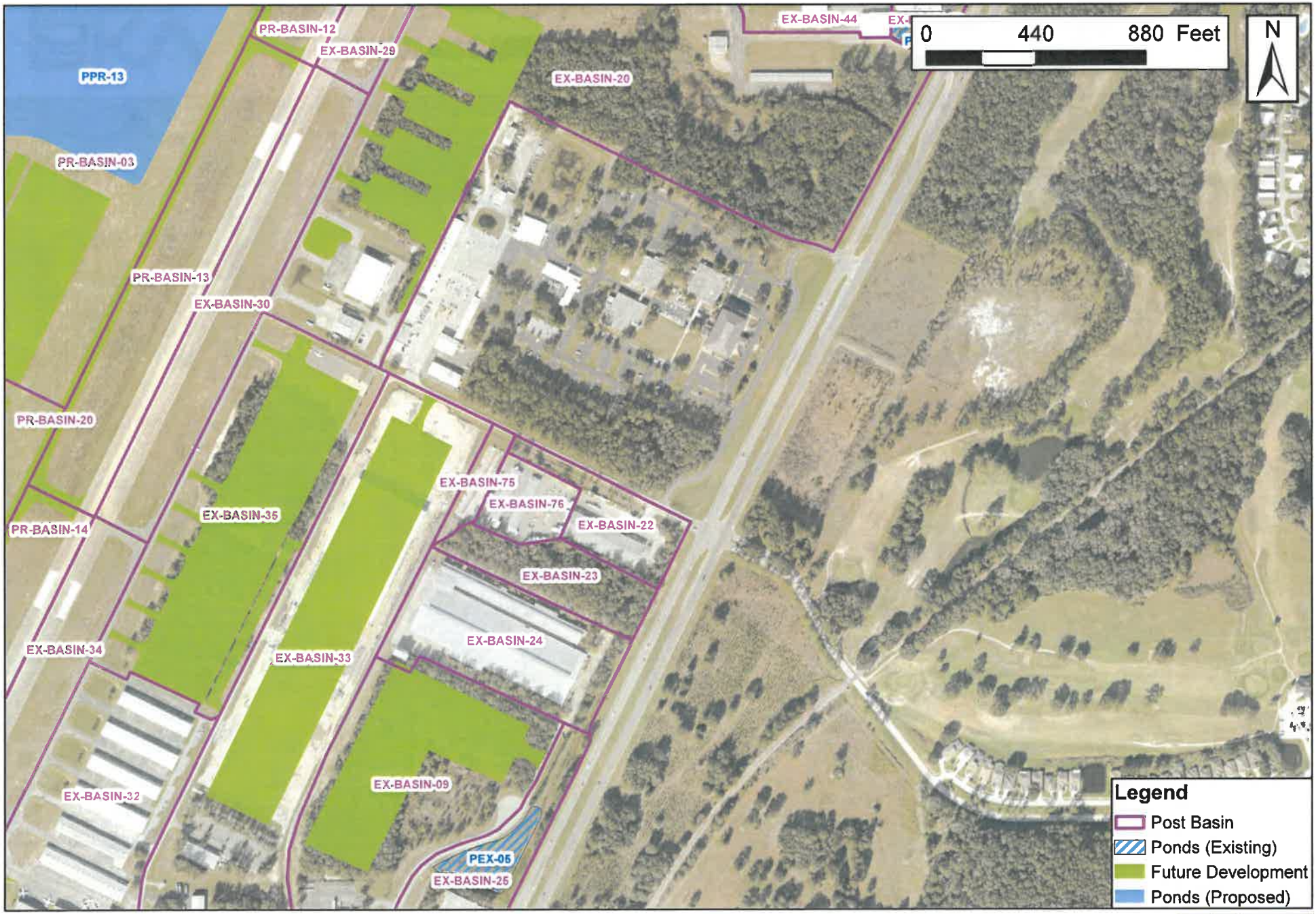
Stormwater Master Plan
Figure C.5 Post Development Map

Michael Baker INTERNATIONAL



Stormwater Master Plan
Figure C.6 Post Development Map

Michael Baker INTERNATIONAL

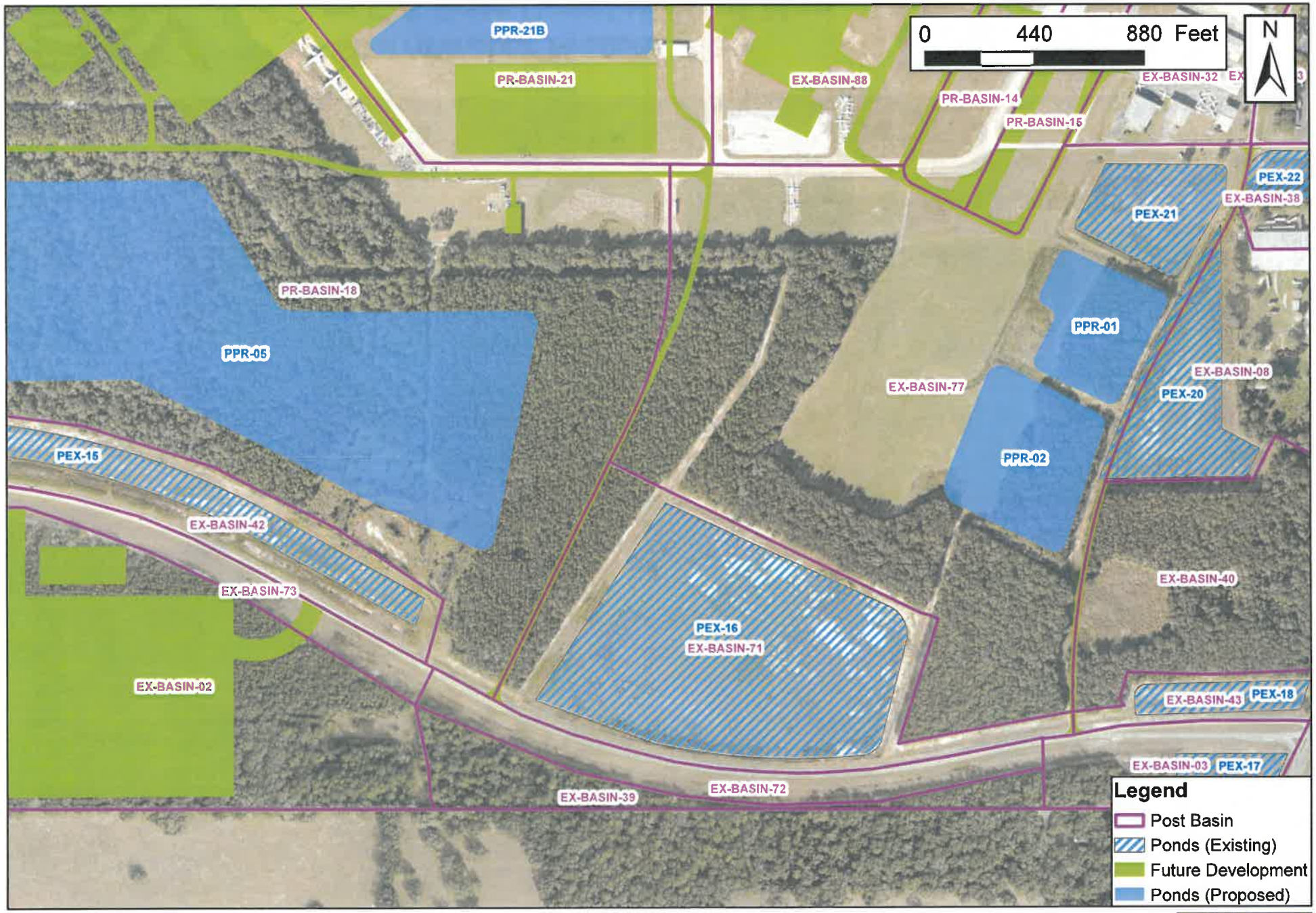


Stormwater Master Plan
Figure C.7 Post Development Map

Michael Baker INTERNATIONAL

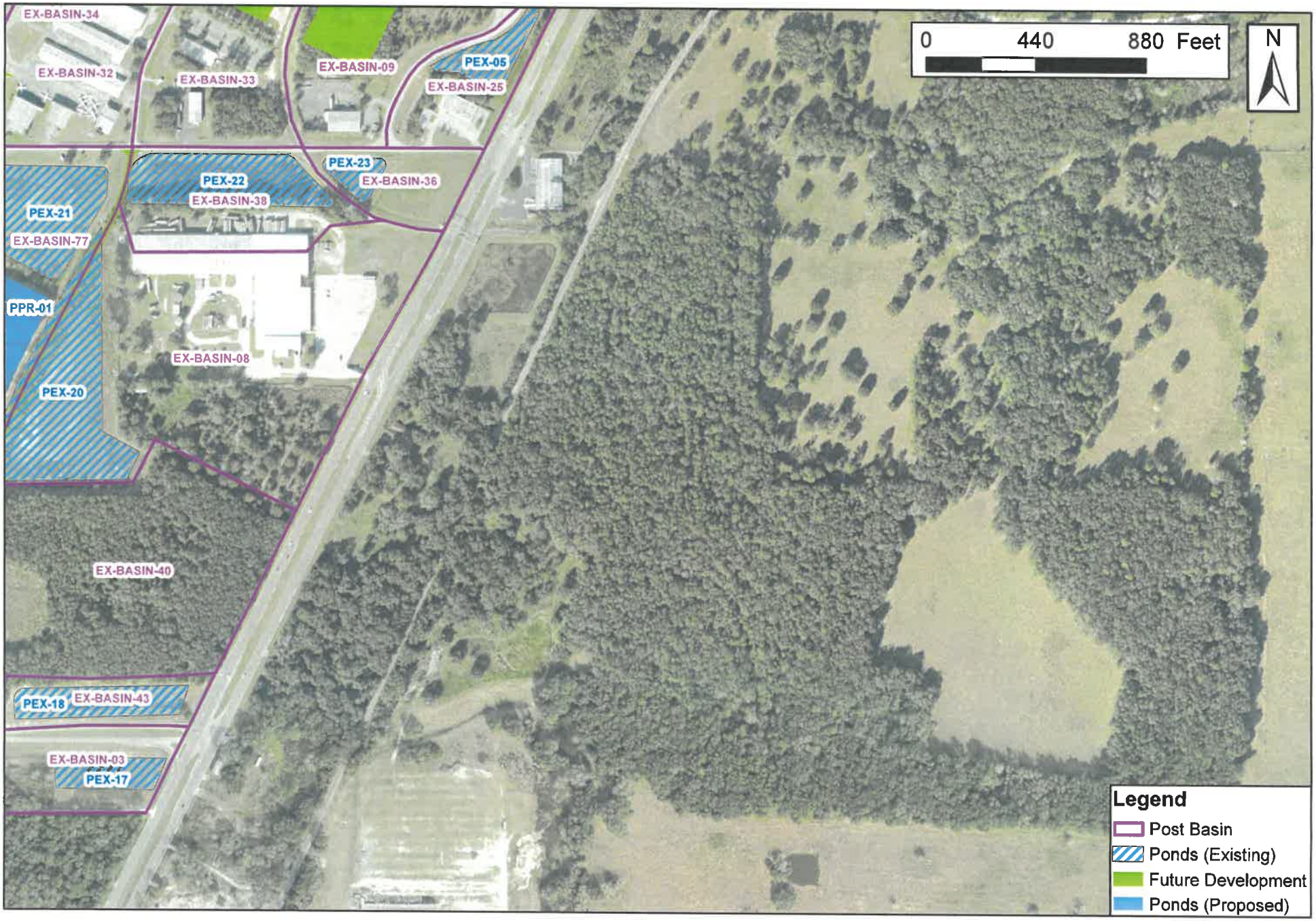
Stormwater Master Plan
Figure C.8 Post Development Map

Michael Baker INTERNATIONAL



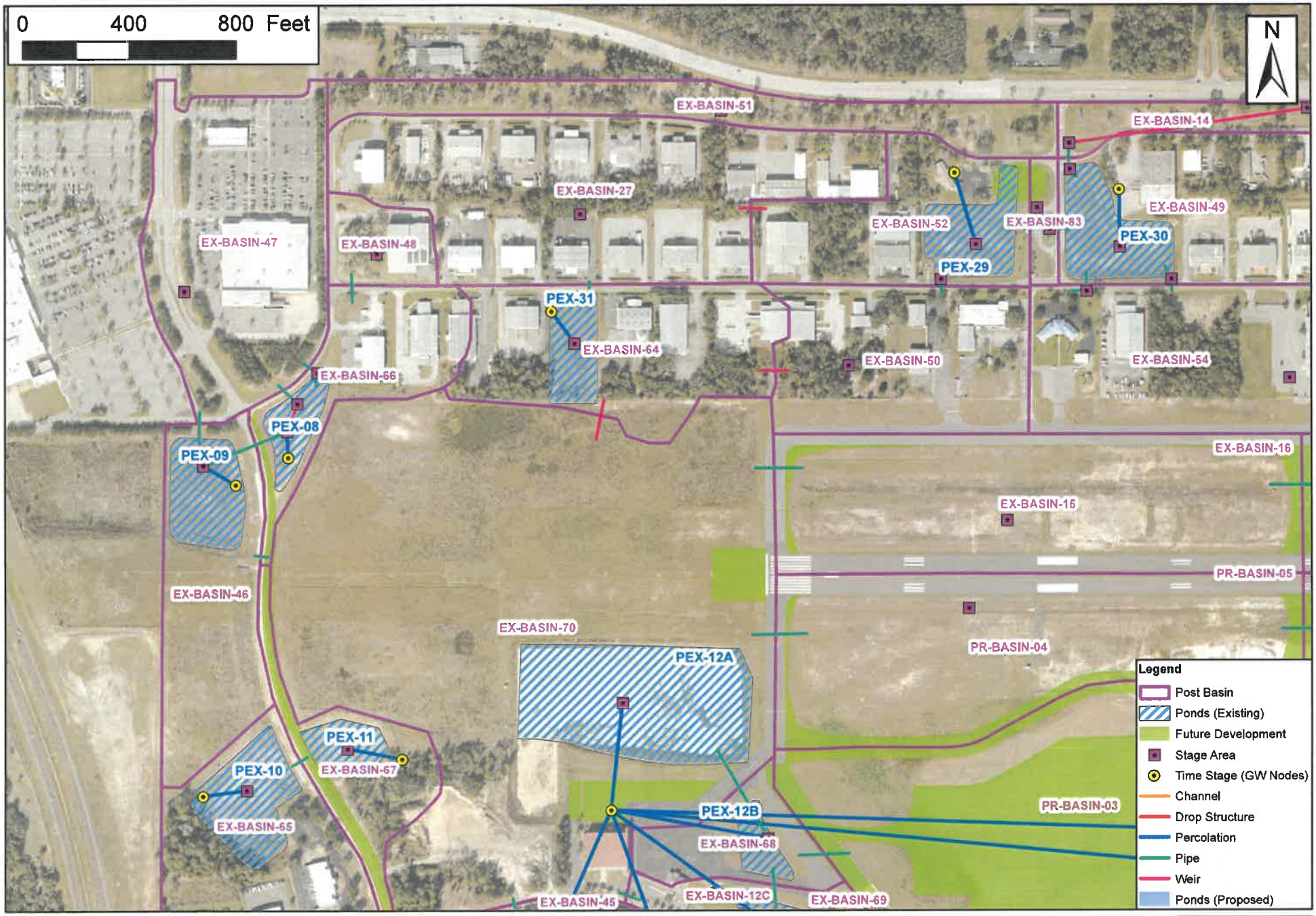
Stormwater Master Plan
Figure C.9 Post Development Map

Michael Baker INTERNATIONAL



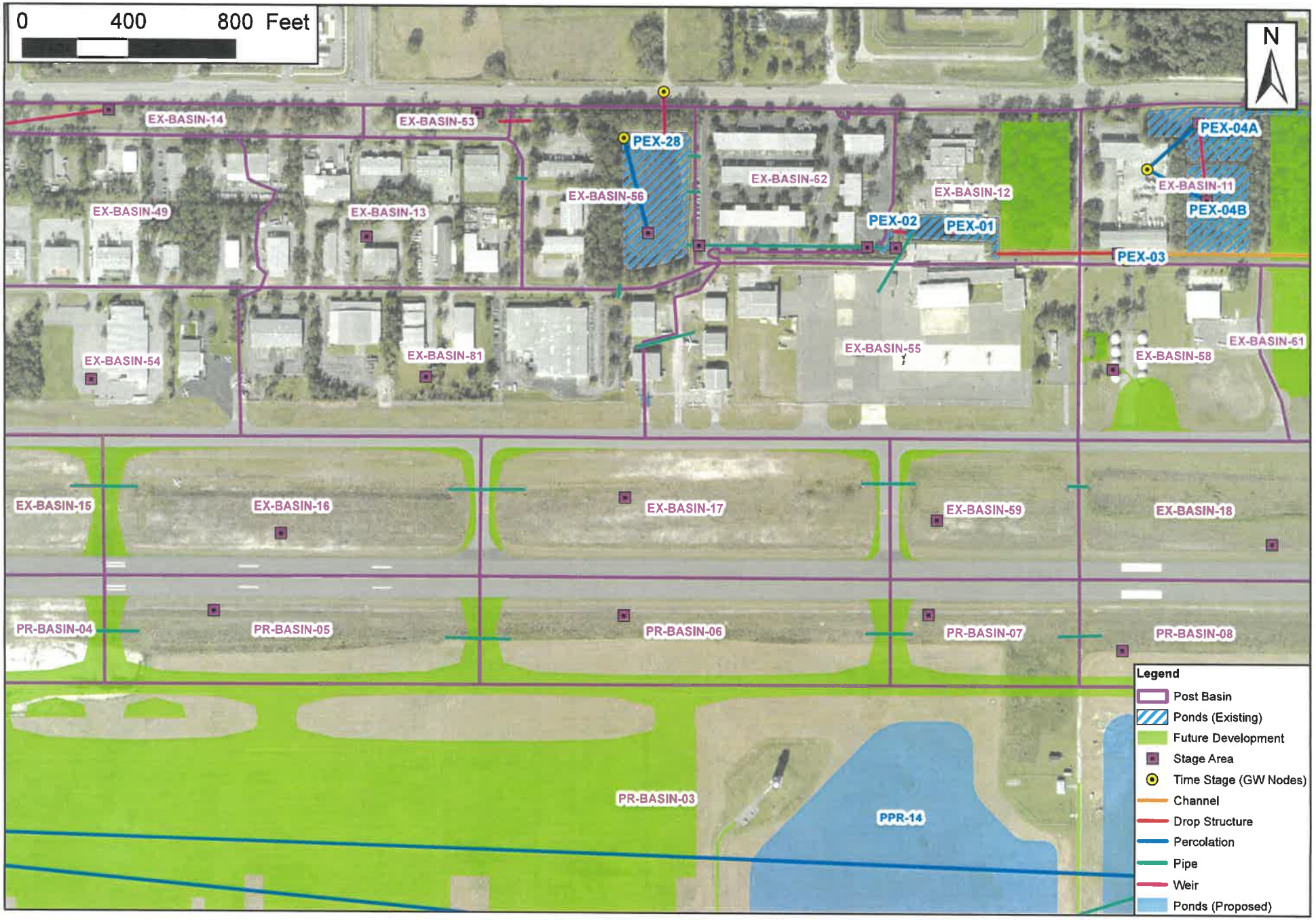
Stormwater Master Plan
Figure C.10 Post Development Map

Michael Baker INTERNATIONAL



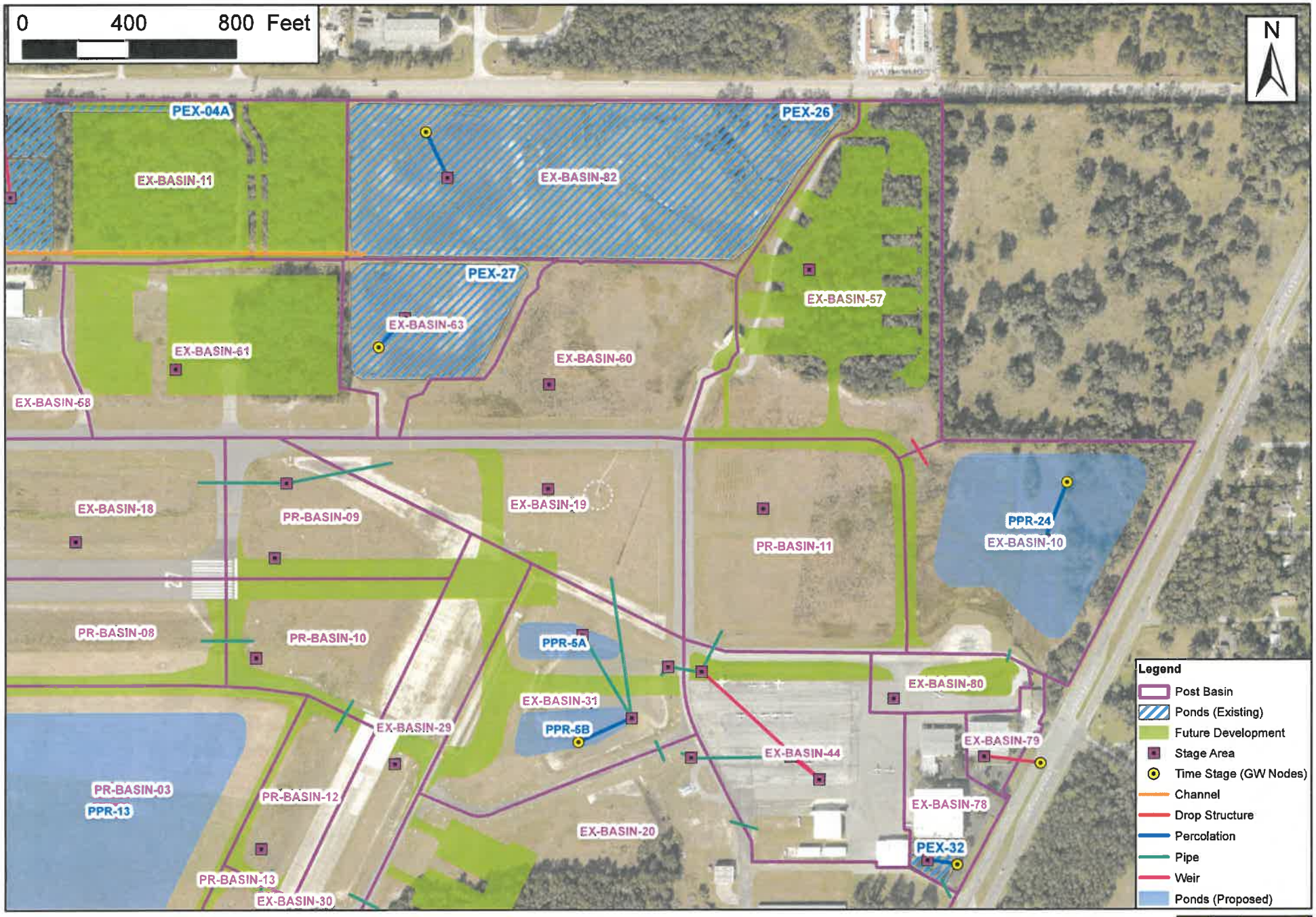
Stormwater Master Plan
Figure C.11 ICPR Post Schematic Map

Michael Baker INTERNATIONAL



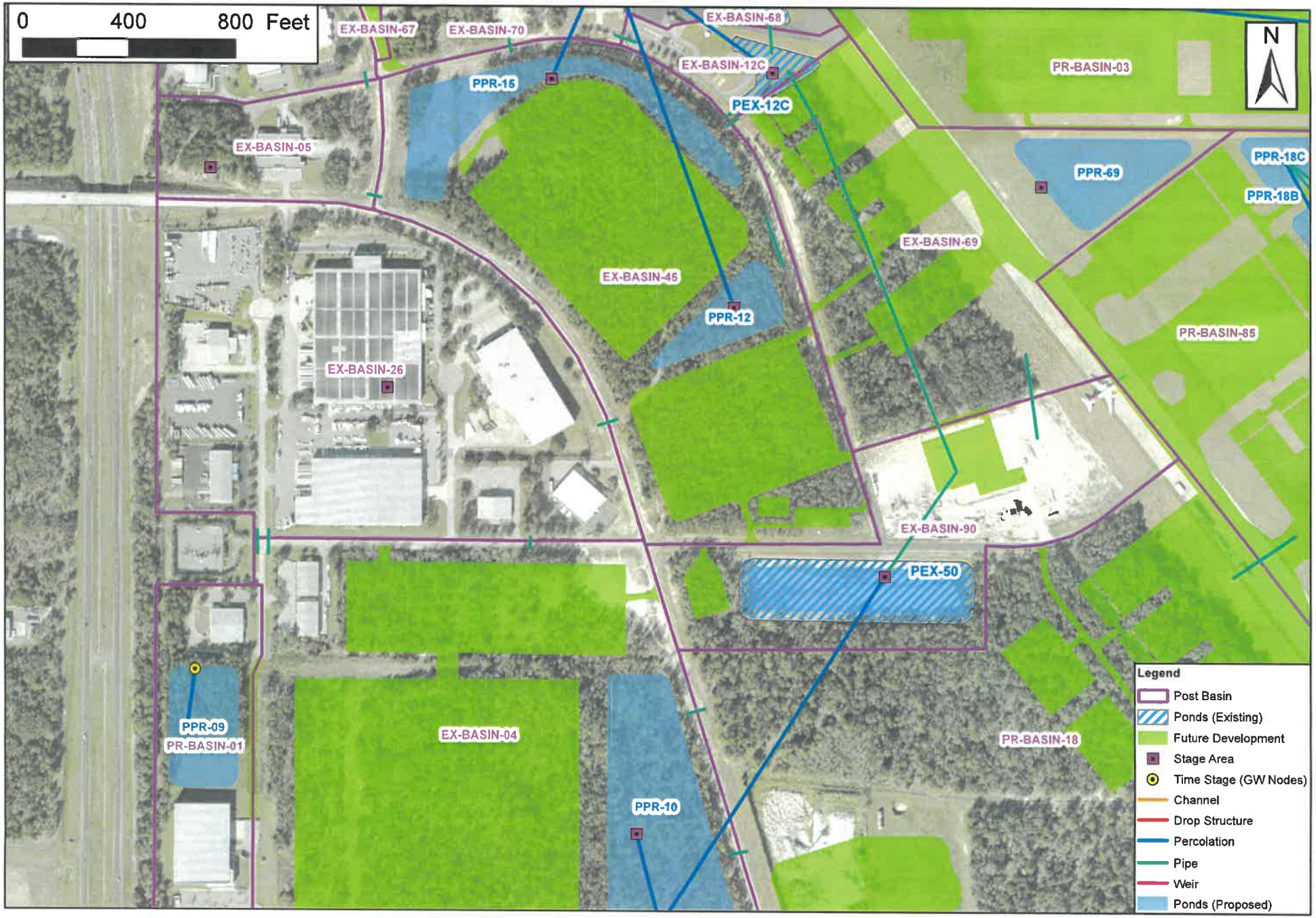
Stormwater Master Plan
Figure C.12 ICPR Post Schematic Map

Michael Baker INTERNATIONAL



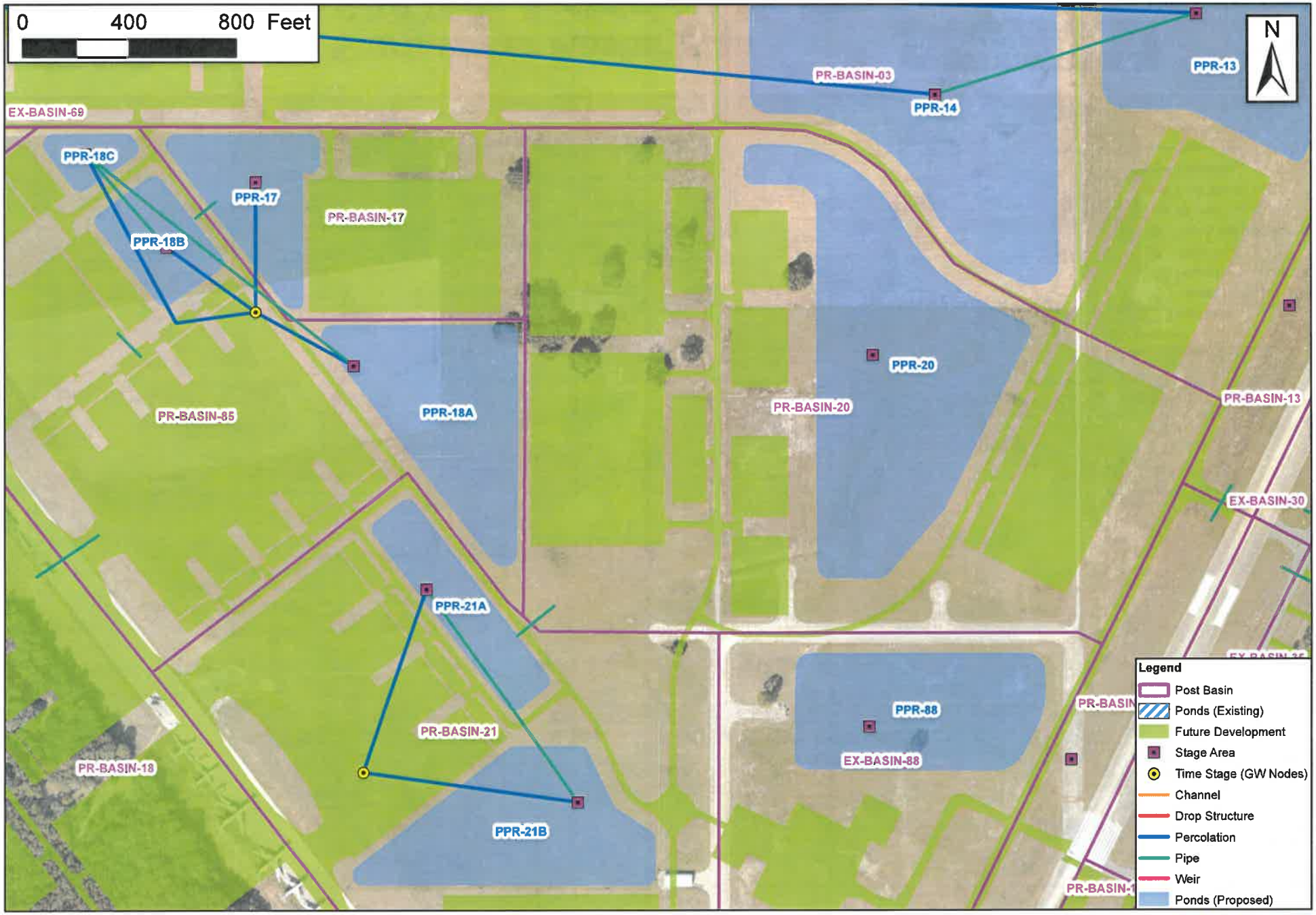
Stormwater Master Plan
Figure C.13 ICPR Post Schematic Map

Michael Baker INTERNATIONAL



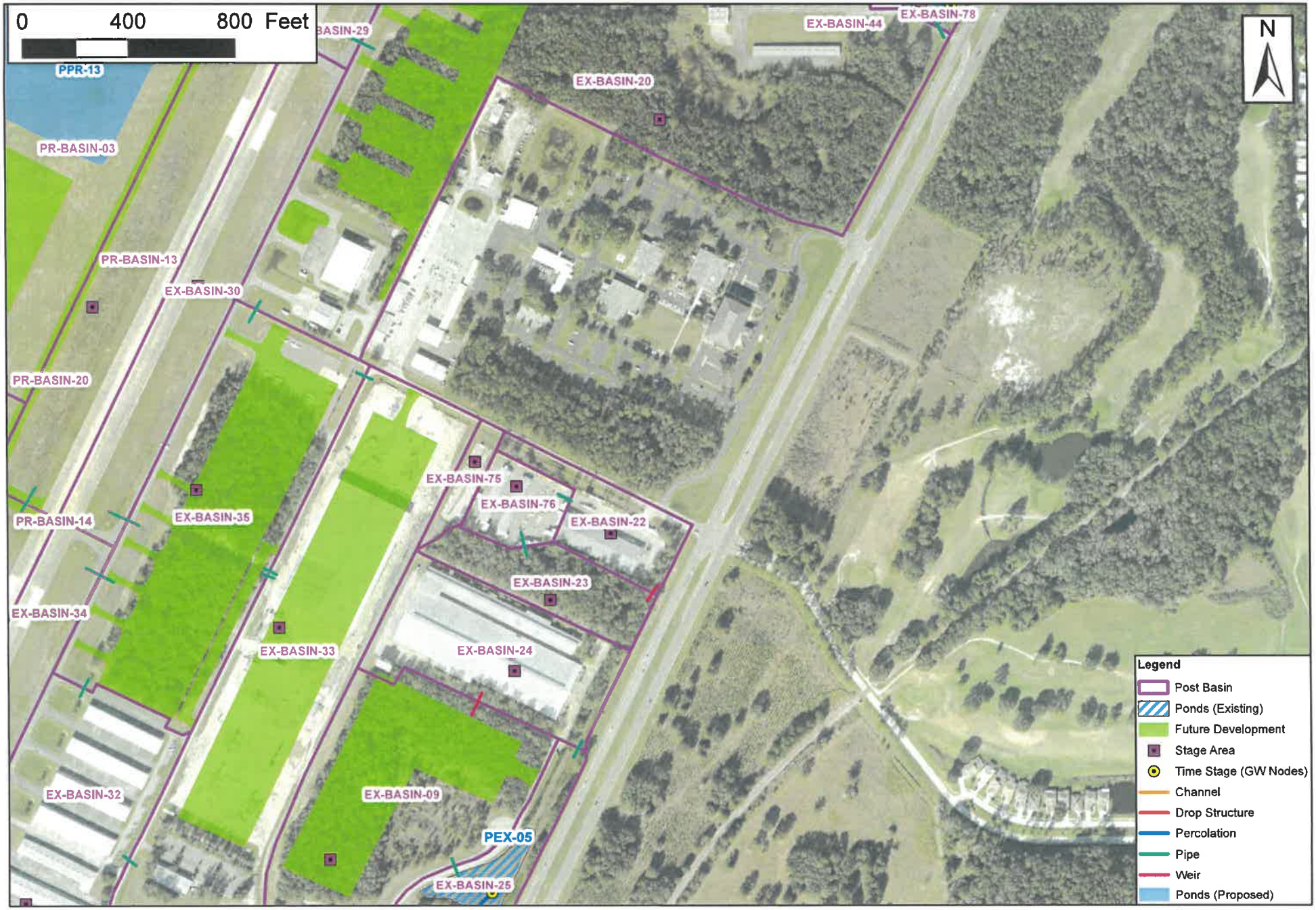
Stormwater Master Plan
Figure C.14 ICPR Post Schematic Map

Michael Baker INTERNATIONAL



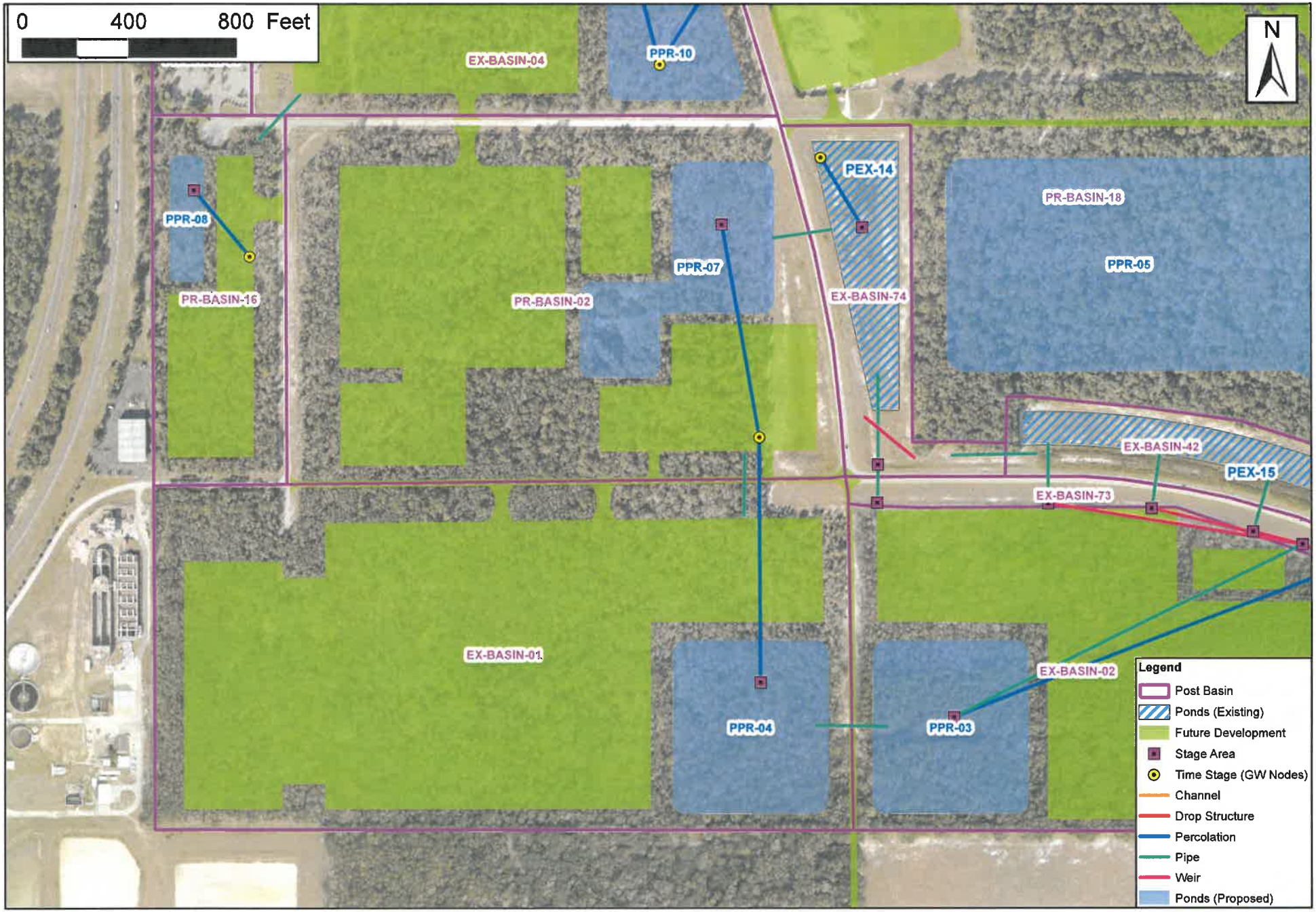
Stormwater Master Plan
Figure C.15 ICPR Post Schematic Map

Michael Baker INTERNATIONAL



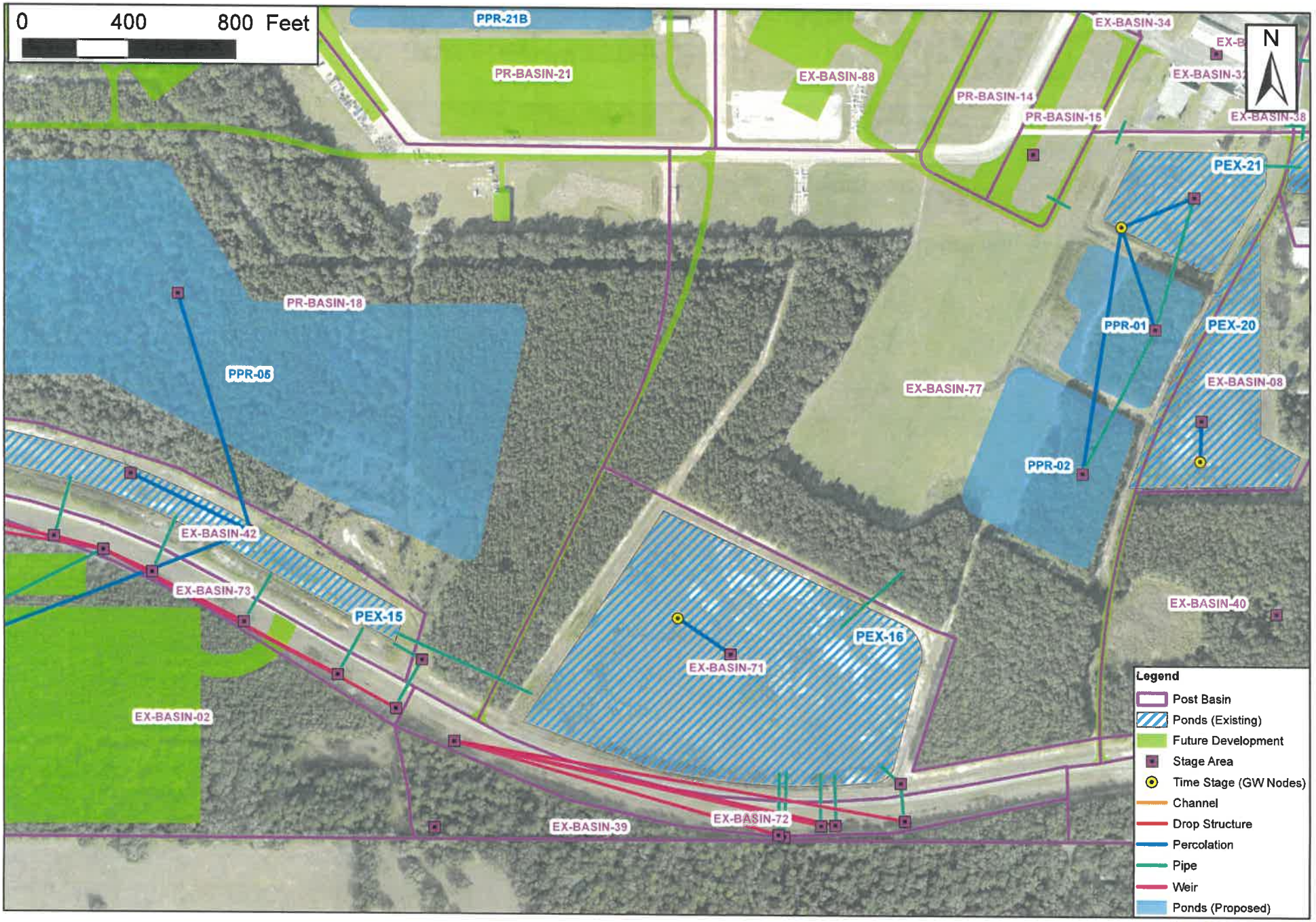
Stormwater Master Plan
Figure C.16 ICPR Post Schematic Map

Michael Baker INTERNATIONAL



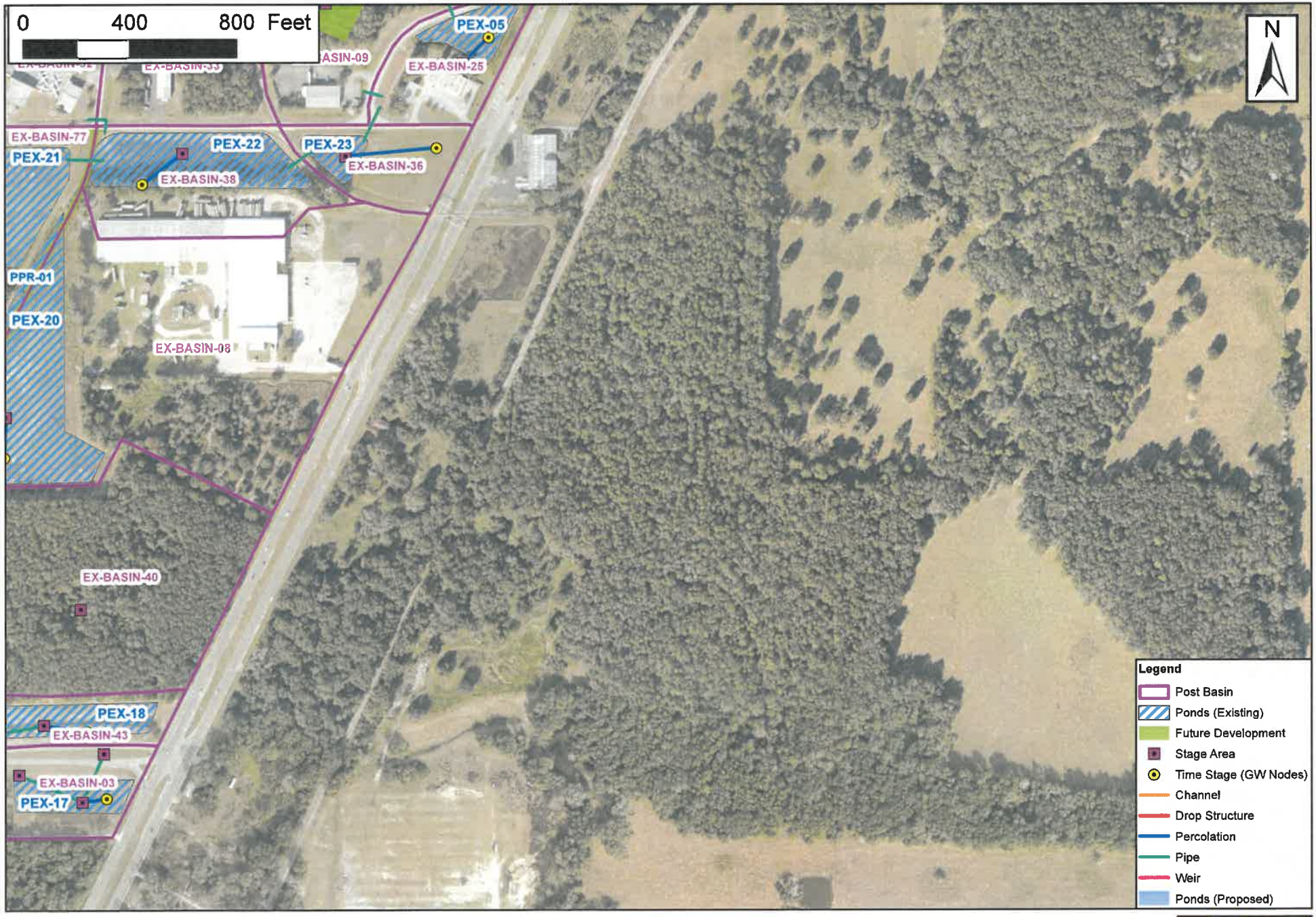
Stormwater Master Plan
Figure C.17 ICPR Post Schematic Map

Michael Baker INTERNATIONAL



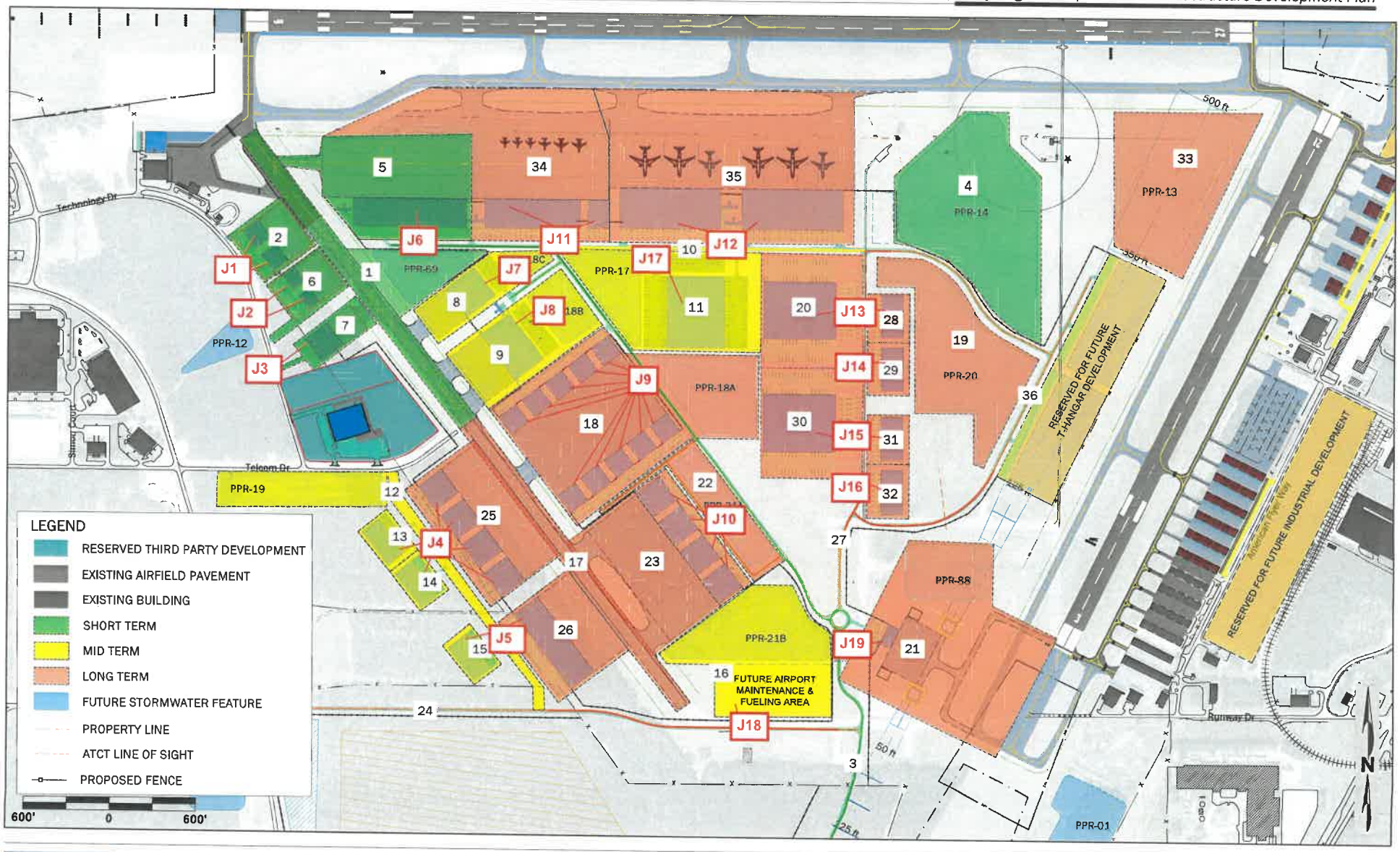
Stormwater Master Plan
Figure C.18 ICPR Post Schematic Map

Michael Baker INTERNATIONAL



Stormwater Master Plan
Figure C.19 ICPR Post Schematic Map

Michael Baker INTERNATIONAL



Michael Baker INTERNATIONAL

Infield Development Phasing Plan with Junctions

Appendix B