

PD-174 Final
Approved

MURRAY CREEK

**PLANNED DEVELOPMENT GUIDELINES
JOHNS ISLAND | CHARLESTON COUNTY | SOUTH CAROLINA**

TMS 311-00-00-025 | 311-00-00-097

DATE: FINAL PD APPROVED 9/8/2020

APPLICANT:

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SECTION 1 | OVERVIEW



CONTEXT MAP | JOHNS ISLAND
NOT TO SCALE



1.1 STATEMENT OF OBJECTIVES

This proposed Planned Development (PD) is comprised of an approximately 11.861-acre parcel of land (the Site) on River Road in Charleston County to be known as **Murray Creek**. The PD is also referred to in this PD as the “Community” or the “Project” and is comprised of lands as depicted on the surveys included in the Appendix. Development surrounding the Community is a mix of rural and residential uses. The project will have a maximum of 3.9 units per highland acre

A Conceptual Master Plan (the “Conceptual Plan”) is included as part of this PD on Page 17. The Conceptual Master Plan provides a general depiction of the Land Use Areas. The final site layout will be determined by preliminary and final plats approved in accordance with the Land Development Regulations. The Planned Development is being proposed to meet the target density of R-4 while affording the opportunity for common open space and physical and visual access to the waterway. It is also an objective of this PD to provide residents with access to food grown on-site at the Micro Farm. This community is intended to provide a development that would not be possible under the strict application of the standards of this Ordinance that were designated primarily for development on individual lots by providing a density compatible with R-4 zoning but with the addition of dedicated open space and a Micro Farm. This is made possible by providing lots that are smaller than the current requirements of R-4. This planning approach provides access to nature through dedicated open space, with passive amenities, and access to locally grown produce through the Micro Farm. This planning approach also takes advantage of the waterfront setting by allowing access to the water by all residents. This community also provides a development pattern that is in harmony with the applicable goals and strategies of the Comprehensive Plan. The community will include common open space,

and passive recreation areas. This planning approach also results in a more economical networks of utilities and streets. This creative approach to the use of land and related physical facilities also results in better development and design and a development pattern that incorporates adequate public safety measures in its design and compliments the developed properties in the vicinity and the natural features of the site.

The objective of this PD is to establish a community with a maximum of 39 residential units, as defined in Section 3.1.1, which is a density of 3.9 units per highland acre and a minimum of 0.25 acres of Commercial Use (the Micro Farm), as defined in 3.1.2. A minimum of 25% (approximately 2.97 acres) of the Site shall be reserved as Protected Open Areas, as defined in Section 3.1.3.

1.2 INTENT AND RESULTS

The Community is intended to be redeveloped as a high-quality mixed-use development offering residential housing products varying in lot sizes and unit sizes with a commercial area consisting of a Micro Farm, as defined herein, which is intended to serve the Community. Prototypical Building Types are shown for illustrative purposes only on Page 16. The Community meets the intent and results of Article 4.23.4 of the ZLDR as follows:

- A. **A maximum choice in the types of environment available to the public by allowing a development that would not be possible under the strict application of the standards of this Ordinance that were designated primarily for development on individual lots.** The PD allows modifications in lot sizes and setbacks in order to provide useable community open space that will increase interaction and a sense of community. Also, a commercial use (the Micro Farm) allows sustainable local agriculture on the site, which is in keeping with the historic land uses of Johns Island. A commercial use would not be allowed within R-4.
- B. **A greater freedom in selecting the means to provide access, light, open space and design amenities.** The PD, by providing community open space and access (both visual and physical) to the waterfront creates a more intentional community than would be possible under R-4 zoning while still meeting the overall density of R-4.
- C. **Quality design and environmentally sensitive development by allowing development to take advantage of special site characteristics, locations and land use arrangements.** The project site abuts marshes and creeks. Under conventional R-4, typically only lots fronting the critical line would have water access and water views. By “clustering” the lots the entire community shares that water access. This further protects the marsh from possible encroachments over time. It also allows the design to be more responsive to higher quality Grand Trees.
- D. **A development pattern in harmony with the applicable goals and strategies of the Comprehensive Plan.** The Comprehensive Plan calls for this site as being single family detached residential. This PD is consistent with that development pattern.
- E. **The permanent preservation of common open space, recreation areas and facilities.** The project, by clustering lots, can set aside permanent open space for the enjoyment and betterment of the community.

- F. **An efficient use of the land resulting in more economical networks of utilities, streets, schools, public grounds and buildings, and other facilities.** The clustering of lots affords more efficient layout of streets and utilities as well as easy access to open space areas.
- G. **A creative approach to the use of land and related physical facilities that results in better development and design and the construction of amenities.** The PD, by allowing smaller lots and less restrictive setbacks, takes a more creative approach to site design that meets density targets consistent with R-4 while affording the opportunity for public open space, water access, and sustainable agriculture.
- H. **A development pattern that incorporates adequate public safety and transportation-related measures in its design and compliments the developed properties in the vicinity and the natural features of the site.** The PD provides for safe pedestrian circulation as well as appropriate vehicular access, including emergency access. The project is consistent with other recent projects in the area in density and scale and takes advantage of the natural features of the site, including existing Grand Trees and access to the waterfront.

The development guidelines set forth in this PD are established pursuant to CHAPTER 4 | BASE ZONING DISTRICTS, ARTICLE 4.23 PD, PLANNED DEVELOPMENT ZONING DISTRICT of the Zoning and Land Development Regulations Ordinance (ZLDR) of Charleston County, last updated December 27, 2018 (the “Zoning Ordinance”), governing Planned Developments. To the extent that any of the guidelines, terms, conditions, or regulations of this PD conflict with any of the guidelines, terms, conditions, or regulations of the Zoning Ordinance and the Land Development Regulations, the guidelines, terms, conditions, or regulations of this PD shall control development of the Site. Issues not addressed in this PD shall comply with the R-4 Zoning District requirements in effect at the time of subsequent development application submittal

1.3 SITE INFORMATION

The Site is currently shown on Charleston County Tax Map Nos. 311-00-00-025 and 311-00-00-097. The land included in the Site will be rezoned as a Planned Development (PD) in accordance with the guidelines set forth in these Planned Development Guidelines. Land use is broken down as follows:

Total Site:	11.861 AC
Highland Area:	09.914 AC
Land Below Critical Line:	01.947 AC
Micro-Farm:	00.250 AC
Open Space:	02.970 AC

Accessory Dwelling Units and Accessory Structures (such as carports, detached garages, sheds, etc.) are allowed if all setback and building height requirements are met. In this case, the lot is not required to meet a 1.5-time minimum lot size requirement.

SECTION 2 | LAND USE AREAS

2.1 ALLOWED LAND USES

The following are approved land uses within the Community:

USES ALLOWED BY RIGHT (see descriptions below in 2.1.1, 2.1.2, and 2.1.3)

- A. Single Family Residential
- B. Commercial Area (Micro Farm)
- C. Open Areas
- D. Community Dock (as defined in Section 5.3.3 of the ZLDR)
- E. Sanitary Sewer Pump Station (no landscaping required)
- F. Community Park Areas
- G. Stormwater Ponds, Bioswales, etc. for stormwater treatment and conveyance
- H. Mail Kiosks
- I. Oyster Sheds, or other non-habitable Open Space Structures for community use
- J. Roof-Mounted Solar Panels (see Section 4.6 Architecture)
- K. Accessory Dwelling
- L. Accessory Structures

The Community is divided into Primary Allowed Land Use Areas: Single Family Residential, Commercial Area (Micro Farm) and Open Areas. These Land Use Areas are generally depicted in the Conceptual Master Plan, subject to Preliminary and Final Plats as approved in accordance with the Land Development Regulations.

Over the life of the Community, the shape, size, and configuration of different Land Use Areas may undergo modifications. These modifications, as determined by the Developer, include changes to the location and configuration of various Land Use Areas and variations in the acreage of each Land Development Zone, if minimum requirements are met per this PD.

The on-going development of the Community needs to maintain flexibility in order to accommodate specific soil conditions, existing critical areas (marsh), physical constraints, final engineering requirements, and various design parameters. Due to this need for flexibility, the exact locations of boundary lines and acreage designations between various Land Use Areas, the locations and sizes of parcels for any specific Allowed Land Uses within the Land Use Areas, and the preliminary planning concepts for the Land Use Areas as indicated on the Conceptual Master Plan are preliminary and subject to minor modifications. Allowed Primary Land Uses are described in Sections 2.1.1 through 2.1.3.

2.1.1 SINGLE FAMILY RESIDENTIAL

Residential Lots shall accommodate single family detached structures. A maximum of 39 lots are allowed with a maximum gross density (not including marsh areas) of four (4) units per acre. The actual density is 3.9 units per acre per the Conceptual Plan. Accessory Dwelling Units, Detached Garages or Carports, and Storage Buildings are allowed uses if all setback, height, and lot coverage requirements are met. 1.5 times the minimum lot size is NOT required for Accessory Dwelling Units and/or structures. Short term rentals shall not be allowed. Lots shall be a minimum of 4,500 SF in size with a minimum lot width of 45', measured at the front setback. Setbacks shall be according to the Section 4.2.

2.1.2 COMMERCIAL AREA (MICRO FARM)

An area of not less than 0.25 acres (10,890 square feet) shall be set aside from residential development to serve as a Micro Farm. The Micro Farm may be used for the purposes of local and sustainable agricultural uses, including vegetable, fruit, and grain production, apiculture, pisciculture, and poultry (broilers and/or eggs) production. The Micro Farm may include structures and facilities directly related to farming operations including, but not limited to, raised garden beds, hoop houses, greenhouses, storage buildings, wash stations, a farm stand for the on-site sale of produce, fencing, irrigation, and other uses customary to farming operations. A minimum 4'-0" height fence (wire and/or wood materials) will enclose the farm, with appropriate gates for vehicular and pedestrian access. A minimum of one off-street parking space shall be provided for use by the farm. The farm area may be used to either support community agriculture (community gardens) or leased to a farmer, or both. Terms of leases and rules for the use of community garden space are subject to approval and enforcement by the POA. The Micro Farm shall be separated from residential lots by an open space area of not less than 10'-0". There are no planting requirements for this space. No special events will take place on this site unless specifically permitted by Charleston County according to ARTICLE 6.7 SPECIAL EVENTS USE.

2.1.3 OPEN AREAS

There is approximately 1.947 acres of marsh below the Critical Line that will be preserved within the Community. The development shall adhere to buffers and setbacks from the Critical Line, per Article 9.7 which calls for a 15' buffer and a 35' setback from the Critical Line. There is also a required S-5 (75') landscape buffer on River Road, as per Section 9.5.4 "Landscape Buffers". In addition, the Developer will establish additional Open Areas, all as described and defined hereinafter.

"Protected Open Space" is defined as Critical Areas (Marsh), Critical Line Buffers, and Required Landscape Buffers. The Protected Open Space is generally restricted from development under applicable Local, State, and Federal regulations. Additional open space, referred to as "Common Areas", and consisting of passive or active recreation areas, may be constructed for the betterment of the Community. Protected Open Space and Common Areas are collectively referred to as "Open Areas". All Open Areas, combined, shall be at least 25% of the gross acreage of the Site (2.96 acres).

Common Areas may be used for passive and active recreational uses, including related Open Space Structures and facilities that complement those uses. Allowed amenities within Common Areas may include, but are not limited to, one Community Dock, crabbing docks, pavilions, picnic areas, fire pits, mail kiosks, passive sitting areas, site furnishings, lighting, and landscaping. Stormwater management features such as ponds, bioswales, rain gardens, vegetated swales, and associated structures are allowed within Open Areas.

The Developer may, at their option, convey any portions of the Protected Open Space and Common Areas to one or more qualified organizations under 26 U.S.C Section 501(c)(3) in a form required by State or Federal law, and may subsequently transfer all or portions of such Protected Open Space, Common Areas, or other portions of the Site to the Property Owners Association for the Community (hereafter defined and described).

The Developer will reserve to itself, its successors, and assigns, easements and rights for access, construction, and maintenance of utility infrastructure purposes or other development purposes within these Open Areas that are necessary, convenient, or desirable for development of the Allowed Land Uses set forth in this document.

2.2 DIMENSIONAL AND LOT STANDARDS

Setbacks, Building Heights Maximum Impervious Coverage Requirements, and Minimum Lot Requirements for Principal and Accessory Structures shall be according to the following charts and accompanying notes.

NOTE: Minimum lot sizes and setback dimensions are less than those found in the standards for R-4 in the ZLDR. However, SECTION 6-29-740. "Planned development districts" of the South Carolina Code of Laws states:

*"In order to achieve the objectives of the comprehensive plan of the locality and to allow flexibility in development that will result in **improved design, character, and quality of new mixed use developments and preserve natural and scenic features of open spaces**, the local governing authority may provide for the establishment of planned development districts as amendments to a locally adopted zoning ordinance and official zoning map. The adopted planned development map is the zoning district map for the property. The planned development provisions must encourage innovative site planning for residential, commercial, institutional, and industrial developments within planned development districts. **Planned development districts may provide for variations from other ordinances and the regulations of other established zoning districts concerning use, setbacks, lot size, density, bulk, and other requirements** to accommodate flexibility in the arrangement of uses for the general purpose of promoting and protecting the public health, safety, and general welfare."*

Therefore, variations in setbacks as provided for within this PD and described below are consistent with the intent of the enabling legislation as the smaller lot sizes and decreased setback enable the project to achieve its target density, consistent with R-4, while also providing useable community open space and increased access to and views of the waterfront. These variations will provide a more innovative design and improved character over traditional R-4 zoning.

Should the project develop in a manner differently than depicted in the Conceptual Master Plan, the modified plan must conform with Section 4.22 (WATERFRONT DEVELOPMENT STANDARDS) of the ZLDR as they are required for R-4. In this case, for lots fronting the waterfront, they would be subject to a minimum size of 12,000 SF with a minimum lot width of 90' and an average lot width of 100'.

PRINCIPAL RESIDENTIAL | MINIMUM SETBACKS (FEET)

FRONT / SIDE STREET:	10
REAR:	15
SIDE:	5

ACCESSORY RESIDENTIAL | MINIMUM SETBACKS (FEET)

FRONT / SIDE STREET:	25
REAR:	5
SIDE:	5

MICRO FARM | MINIMUM SETBACKS (FEET)

FRONT / SIDE STREET:	10
REAR:	10
SIDE:	5

OPEN SPACE STRUCTURES | MINIMUM SETBACKS (FEET)

FRONT / SIDE STREET:	10
REAR:	10
SIDE:	5

Note: Open Space Structures are defined in 2.1.3

Note: Accessory Residential Structures includes sheds, playhouses, playground equipment, detached garages, detached carports, and other similar structures.

MINIMUM LOT SIZE: 4,500 Square Feet

MINIMUM LOT WIDTH: 45 Feet

LOT BUILDING COVERAGE

MAXIMUM: 40%

BUILDING HEIGHT (FEET)

MAXIMUM: 45 (Measured from the Base Flood Elevation)

OFF-STREET PARKING: 2 SPACES PER LOT

NOTES:

1. All building separations must meet applicable building codes and building Setbacks shall be measured to the exterior vertical wall.
2. Eaves of residential buildings may not extend beyond property lines. Uncovered steps, uncovered porches, eaves, cornices, chimneys, HVAC units, and other architectural elements may encroach into minimum building Setbacks a maximum of 5'-0" (if all applicable building codes are met) but may not encroach into rights of way, drainage easements, and/or utility easements.
3. Building height refers to the vertical distance between the base flood elevation and: (1) the average height level between the eaves and ridge line of a gable, hip or gambrel roof; (2) the highest point of a mansard roof; or (3) the highest point of the coping of a flat roof.

2.3 PROPOSED ROADWAY STANDARDS

Proposed street standards for the Community are set forth within this document. However, street sections may be modified as needed if streets meet the requirements of Charleston County. Streets are intended to be privately maintained. However, at some point streets may be publicly dedicated if requested by the POA and accepted by Charleston County. Streets may utilize either standing curb or roll curb sections.

A. Sidewalks

1. Sidewalks are required on both sides of all Streets.

2. Sidewalks shall be a minimum of five (5) ft in width but may be reduced to 4'-0" in short sections as allowed by applicable codes, laws, and regulations to avoid conflicts, such as existing trees, utilities, drainage features, etc.
 3. All sidewalks or paths inside the Right of Way must be hard surface and ADA compliant.
 4. Sidewalks are not required adjacent to a pedestrian green or park that includes a pedestrian or multi-use path or adjacent to a wetland buffer.
- B. Decorative Street signs and signposts are permitted but must meet all applicable SCDOT and/or County standards. The applicable Property Owner's Association will be responsible for maintaining any decorative Street signs and signposts.
- C. Street Trees shall be placed with a spacing not to exceed 50'-0" on center. Street trees shall be at least 80% indigenous species planted at a minimum size of 2.5" caliper. No more than 40% of all street trees may be the same species.
- D. Rights-of-way may vary to accommodate variations in verge, sidewalks, and lane widths. However, all elements of the Street shall be within the right-of-way.
- E. An improved two-way vehicular drive and associated pedestrian sidewalk shall be provided from the internal street network to the shared property line of the PD and the adjoining property TMS# 311-00-00-024 in order to allow for a future connection to occur at such time that the adjacent property is developed.

2.4 COMPLIANCE WITH THE CHARLESTON COUNTY ZONING AND LAND DEVELOPMENT REGULATIONS ORDINANCE (ZLDR)

The Murray Creek Community (PD) shall include and comply with processes included in the Charleston County Zoning and Land Development Regulations that are not specifically addressed in these Planned Development Guidelines. The Murray Creek Community (PD) agrees to proceed with proposed development in accordance with the provisions of the Charleston County Zoning and Land Development Regulations, applicable provisions of the Charleston County Comprehensive Plan, and with such conditions as may be attached to any rezoning to the PD. The provisions of Article 3.10, Variances, of this Ordinance shall not apply to the Murray Creek Community (PD). All major changes to the PD must be approved by County Council. Tree variances may be granted in accordance with this Article and all other sections of this Ordinance. The Murray Creek Community (PD) complies with the approval criteria contained in Section 4.23.9(E)(9) as follows:

- A. The Murray Creek PD Development Plan complies with the standards contained in Article 4.23 of the ZLDR, except for setbacks which vary from the current zoning; a variation addressed in the State of South Carolina enabling legislation for Planned Developments (see Section 2.2 of this PD).

- B. The development is consistent with the intent of the Comprehensive Plan and other adopted policy documents as the Comprehensive Plan identifies the site as single family detached housing and the project site is inside the Urban Growth Boundary.
- C. The County and other agencies will be able to provide necessary public services, facilities, and programs to serve the development proposed, at the time the property is developed as demonstrated by the coordination letters found in the Appendix.
- D. This Community shall obtain variances for tree removal or any encroachment into the protected area of Grand Trees. If needed, the Community shall seek approval from County Council for changes to the Planned Development.

2.5 CULTURAL RESOURCES DESKTOP REVIEW

There was a Cultural Resources Desktop Review prepared by prepared by Bland & Associates, Inc. dated 27 August 2019. The entire report is included in the Appendices. Currently, no cultural resources are currently recorded within the direct footprint of the project tract. But it must be noted that the absence of previously recorded cultural resources within a project tract such as this one is typically due to the lack of professional investigation and survey of that locale, rather than the actual absence of cultural resources. The project does not contain any previously recorded, historic bridges or historic engineering works (HABS/HAER listed properties).

No portion of the current project tract has been previously surveyed for cultural resources. However, numerous residential subdivisions in the area surrounding the current project tract have been required to undergo Phase I surveys due to Section 106 permitting requirements (Swygerts Landing, Rushland Plantation, Fenwick Plantation, etc.). In addition, several surveys associated with road projects, namely the Mark Clark Expressway, have also been conducted within the general area of the current project tract. More than ten, Phase I surveys have been required by various permitting agencies within a 1.0-mile radius of the current project tract. All these previous, residential subdivision, Phase I surveys encountered multiple cultural resources, as did all the various road project surveys. Research has also revealed that Charleston County has also executed three, historic structure surveys in 1989, 1992, and 2016 which examined the general vicinity surrounding the current project tract. Numerous historic structures were recorded around the current project tract during these three, historic structure surveys.

A review of the American Battlefield Protection Program (ABPP) database to check whether the project tract encompassed any listed historic (Civil and Revolutionary Wars, especially) battlefields indicated no historic military sites were within, or adjacent to, the current project tract. The Civil war Atlas also does not indicate any fortifications within the current project tract. A very cursory review of historic plats and maps does indicate extensive, Colonial and Antebellum, ownership of the current project tract (plantation lands). But no actual plantation

structures were noted within the current project tract, although a more thorough review of historic plats could revise that finding.

The results of this cultural resources site file review do indicate that there are numerous previously recorded, cultural resources within a 1.0+ mile radius of the current project tract. These historic resources consist of multiple archaeological sites, a NRHP Historic District (Fenwick Hall), and multiple historic structures. In addition, River Road itself is a historic road which borders the project tract. **However, there are no known cultural resources or historic sites on the National Register of Historic Places within 300 feet of the project site.**



EXISTING CONDITIONS | AERIAL PHOTOGRAPH

SECTION 3 | EXISTING CONDITIONS

3.1 EXISTING ZONING AND SITE CONDITIONS

The Site is bounded by River Road, Murray Creek and rural residential uses. The site is a combination of sparsely wooded areas and open fields. The Site is currently zoned R-4 in Charleston County.

3.2 IMPACT ASSESSMENT AND ANALYSIS

The Community currently has direct access to River Road, a two-lane paved road maintained by SCDOT. It is the intent of this PD that the street network within the PD be a connected street loop with one access point on River Road. Access points shall be subject to approval by SCDOT. Streets shall be built to Charleston County standards with the intent to be private roadways maintained by the Developer/POA. Streets may be offered for public ownership and maintenance pursuant to Charleston County requirements and processes.

Utilities will be provided by various entities including AT&T, Berkeley Electric Cooperative (electrical), Dominion Energy South Carolina (gas), Charleston Water Systems (sanitary sewer), and St. John's Water Company (water). Charleston County will provide essential services such as schools, waste disposal, fire protection, and police services.

3.4 PRELIMINARY THREATENED AND ENDANGERED SPECIES DETERMINATION

There was an Endangered and Threatened Species Determination Report prepared by ECS Southeast, LLP, dated July 29, 2019. The entire report is included in the Appendices. No known endangered or threatened species are known to exist on the subject parcel.

3.5 WETLANDS

According to the survey, prepared by Parker Land surveying LLC and included in the Appendix, there are no jurisdictional or non-jurisdictional freshwater wetlands located on the site. There are approximately 1.947 acres of marsh area below the Critical Line. The Approved Jurisdictional Determination (AJD) letter from the U.S. Army Corps of Engineers, dated November 28, 2018 is included in the Appendix.

3.6 TRAFFIC IMPACT ANALYSIS

A Traffic Impact Analysis was completed by Bihl Engineering. The report is dated July 2019. The entire report is included in the Appendix.

The development will be accessed via one full access site driveway located on River Road. The project is projected to generate 32 trips in the AM peak (8 trips in and 24 trips out) and 41 PM peak trips (26 in and 15 out).

Based on the analysis, the intersection of River Road at Site Driveway is projected to operate at LOS C during the AM peak hour and to experience elevated delay, operating at LOS E, during the PM peak hour in the 2022 Build conditions. It is not uncommon for stop-controlled side streets and driveways on major streets to experience longer delays during peak hours while most of the traffic moving through the corridor typically experiences little or no delay. The westbound queueing exiting the site is projected to be approximately one vehicle during the AM and PM peak hours in the Build conditions.

The intersection of River Road at Site Driveway was further reviewed for consideration of the installation of an exclusive northbound right-turn lane and an exclusive southbound left-turn lane on River Road

based on South Carolina Department of Transportation (SCDOT) Roadway Design Manual (2017) guidelines and projected intersection volumes. It was found that the AM and PM peak hour conditions did not meet the guidelines for installation of either turn lane on River Road at the intersection of River Road at Site Driveway.

3.7 STORMWATER

The planned development shall comply with all Charleston County Stormwater Ordinances and South Carolina Department of Health and Environmental Control (SCDHEC) Regulatory requirements. For site locations within sensitive drainage basins, additional stormwater design and construction requirements may be required by the Director of Public Works prior to Stormwater permit approval and issuance. Sensitive drainage basins may include but are not limited to areas which incur flooding conditions, are designated as Special Protection Areas, discharge to water bodies with restrictive Water Quality conditions, and/or are governed by other restrictive Water Quantity and Water Quality conditions. Where possible and allowed by permit, the proposed site may connect its stormwater system with existing conveyances. Best Management Practices (BMP's) shall be utilized, installed, and maintained in compliance with applicable approved permits throughout all phases including, but not limited to, site development, construction, and post construction.

Applicant shall comply with Charleston County Stormwater Ordinances and SCDHEC Regulatory requirements for pre and post construction water quality and quantity. Stormwater design, construction, and maintenance shall be in compliance with applicable approved Charleston County Stormwater Permits. Comprehensive Master Drainage Plan must be provided for proposed site and incorporate all development phasing, future development, existing drainage systems and conveyances, and proposed drainage systems and conveyances. The Comprehensive Stormwater Master Plan shall also include discharge management plans for specialized activities within the development including but not limited to micro farming and urban agriculture activities. Utilization of approved and permitted Low Impact Design elements is encouraged within a comprehensive site Master Drainage Plan.

The maintenance of all stormwater devices, structures, and facilities will be the responsibility of the Developer and/or Property Owner's Association. A Covenants For Permanent Maintenance of Stormwater Facilities shall be established by responsible party and recorded at the Registrar of Deeds office.

3.8 TREE PRESERVATION

The Grand Trees on the site have been evaluated by Natural Directions, a consulting arborist and graded from A to F. There are nineteen (19) Grand Trees. While one of the goals of the plan is to incorporate important Grand Trees some trees may have to be removed either for required infrastructure or because of health, safety, and welfare reasons base on their grade and/or species.

The Developer will follow all requirements of the Charleston County ZLDR Article 9.4

SECTION 4 | OTHER REQUIREMENTS

4.1 BUFFERYARDS

Required Buffers will not be disturbed except for signs, utilities, storm drainage connections, driveways, sidewalks, pedestrian or bicycle paths, screening walls, fences, required landscaping, landscaping maintenance and replacement, and perpendicular encroachments.

It is the intent of this PD that existing vegetation be preserved wherever practical to provide better buffers and improved tree canopy. Bufferyards shall be required as follows:

River Road Buffer: A 75' Type S5 landscaped buffer shall be required along River Road, inclusive of existing utility easements. A Conceptual Bufferyard Plan is included in the Appendix.

Critical Line Buffer: A 15' Buffer shall be retained along the OCRM Critical Line. There shall be an additional 20' Building setback line adjacent to the critical line buffer (35' from Critical Line). No additional planting shall be required.

Critical line buffers shall comply with ZLDR Article 9.7. Any disturbances or uses within the Critical Line Buffer shall be permitted in compliance with the ZLDR in effect at the time of development application submittal

No internal buffers are required.

4.2 SIGNAGE

All signage will follow regulations of the Charleston County at the time the PD is approved (Article 9.11 pursuant to Article 4.23 of the ZLDR).

4.3 PROPERTY OWNERS ASSOCIATION

A Property Owners Association will be established for the Community, pursuant to one or more recorded Declarations of Covenants, Conditions, and Restrictions, or the similar documents recorded by the Property Owner with respect to one or more Development Tracts ("CCRs"). Once established, membership in a POA will be mandatory for each property owner. Each POA will be funded by assessments to be established pursuant to its recorded CCRs. Additionally, the Commercial Area may be managed by the POA or a separate organization approved by the POA.

The POA shall be responsible for administering its recorded CCRs and for the maintenance and operation of the streets, sidewalks, and storm drainage infrastructure within the Community and those Common Areas, if any, which are designed to benefit the property owners subject to its jurisdiction. Common Areas may be exclusive or for joint use but shall not be dedicated for public use unless agreed to in writing by the POA of such Common Area and Charleston County.

Open Areas, including all Protected Open Space and Common Areas for the benefit of property owners and residents of the Community, may include both passive park space as well as areas for pool(s), playground(s), recreation buildings, docks, boat/kayak/paddle board launches, and other passive and/or active amenities. A Community Dock is allowed, by right, providing they comply with Article 5.3 of the ZLDR.

The recorded CCRs of each applicable POA will also establish an ARB for the review and approval of plans, prior to commencement of construction, for all new construction (residential and commercial) and any additions, modifications, or improvements. The review by the ARB will be for the purposes discussed in detail in Section 4.7 and aesthetic purposes only and does not replace the building permit or other required reviews by Charleston County. ARB approval is not required for issuance of a zoning permit.

4.4 PARKING

Parking shall be provided in accordance with the standards set forth in ARTICLE 9.3 of the ZLDR.

4.5 RESOURCE AREAS

This Community shall protect any resources determined significant by the Planning Director including, but not limited to: agricultural soils and active farmland, buffer areas between active farmland and existing/planned future non-farm development, wetlands, mature trees, land adjacent to preserved farmland on neighboring properties, scenic views, water access and shoreline buffers, and habitat of species designated as of federal, state and local concern. In addition, this Community shall comply with all provisions of ARTICLE 9.4, Tree Protection and Preservation, of the ZLDR. Water access and some grand trees will be protected. Some grand trees may be removed, as allowed by BZA.

4.6 ARCHITECTURE

The development shall follow the guidelines found in ARTICLE 9.6 ARCHITECTURAL AND LANDSCAPE DESIGN STANDARDS of the Charleston County ZLDR.

1. Roof-mounted solar panels shall be allowed providing they are not visible from the street. Owners may sell electricity back to Dominion Energy South Carolina, as allowed by law.
2. Single Family Residential Units shall be similar in architectural style and materiality to the following building elevations, which are provided for illustrative purposes only:



Ashley A



Ashley B



Sawgrass A



Sawgrass B



Avondale F



Avondale H



Ashley C



Avondale A



Virginia D



Virginia F

PROTOTYPICAL BUILDING TYPES (FOR ILLUSTRATIVE PURPOSES ONLY)





 NOTE: THIS PLAN IS CONCEPTUAL IN NATURE AND SUBJECT TO CHANGE.


 SEAMONWHITESIDE

MURRAY CREEK
 RIVER ROAD | JOHNS ISLAND
 CHARLESTON COUNTY | SOUTH CAROLINA
 8158 X | 30 SEPT 20

CONCEPTUAL MASTER PLAN

APPENDICES:

SURVEY BY PARKER LAND SURVEYING, LLC

CONCEPTUAL INFRASTRUCTURE PLAN

CONCEPTUAL LANDSCAPE PLAN

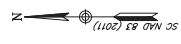
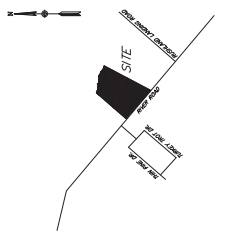
CULTURAL RESOURCES DESKTOP REVIEW

PRELIMINARY THREATENED AND ENDANGERED SPECIES DETERMINATION

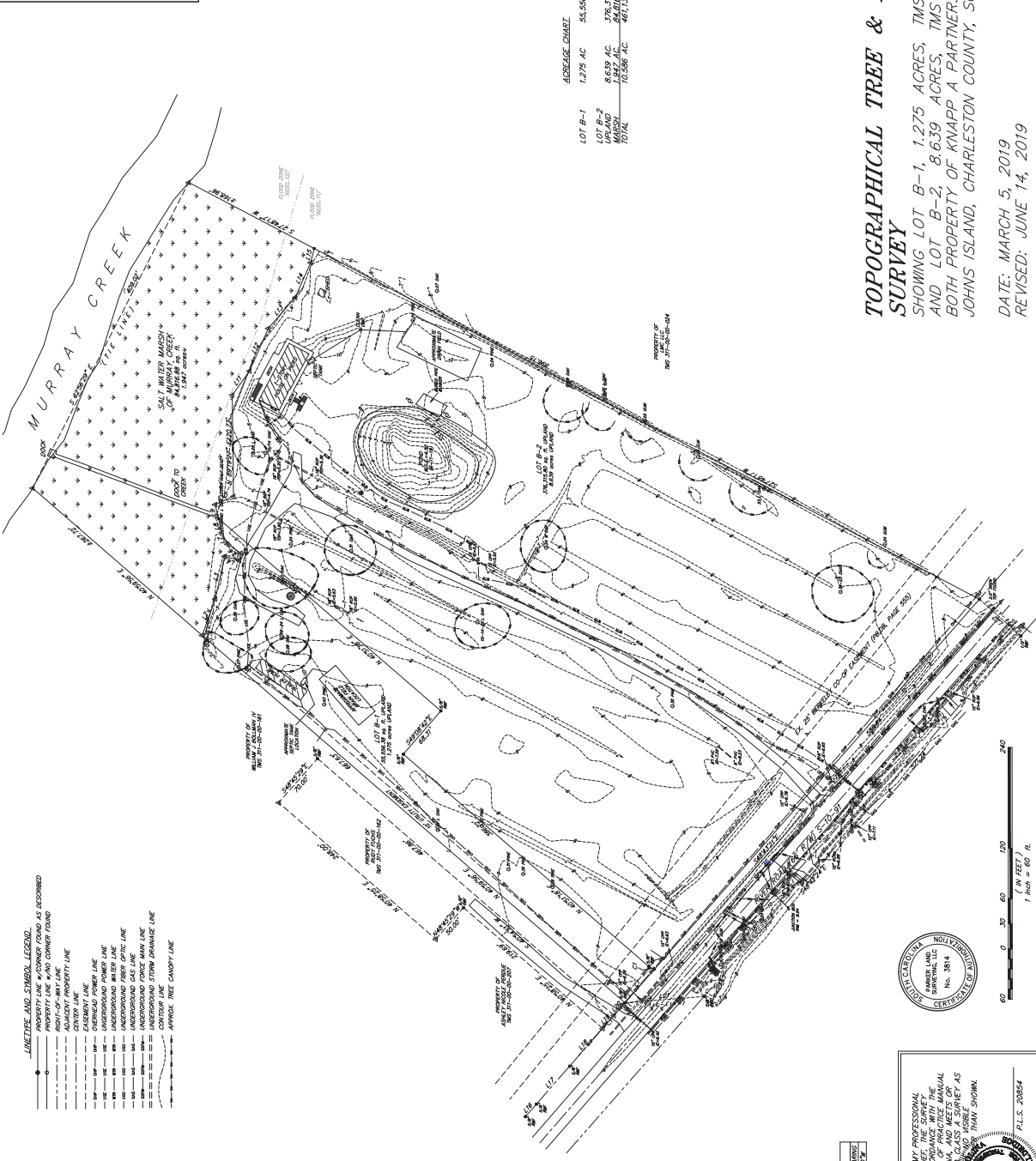
WETLANDS LETTER (NOVEMBER 28, 2018)

TRAFFIC IMPACT ANALYSIS

COORDINATION LETTERS



- LINE/TYPE AND SYMBOL LEGEND:**
- PROPERTY LINE # AND CORNER FOUND AS RECORDED
 - ADJACENT PROPERTY LINE
 - CENTER LINE
 - OVERHEAD POWER LINE
 - UNDERGROUND POWER LINE
 - UNDERGROUND GAS LINE
 - UNDERGROUND STORM DRAINAGE LINE
 - CONTOUR LINE
 - APPROX. TREE CANOPY LINE



ACRESAGE CHART

LOT B-1	1.275 AC	55,566.38 S.F.
LOT B-2	8.639 AC	376,916.60 S.F.
TOTAL	9.914 AC	432,482.98 S.F.

TOPOGRAPHICAL TREE & BOUNDARY SURVEY
 SHOWING LOT B-1, 1.275 ACRES, TMS 311-00-00-097,
 AND LOT B-2, 8.639 ACRES, TMS 311-00-00-025,
 BOTH PROPERTY OF KNAPP A PARTNERSHIP, LOCATED ON
 JOHNS ISLAND, CHARLESTON COUNTY, SOUTH CAROLINA

DATE: MARCH 5, 2019 SCALE: 1" = 60'
 REVISED: JUNE 14, 2019

- REFERENCES:**
1. PLAT SHOWING THE SUBDIVISION OF LOT B INTO LOT B-1 AND LOT B-2 LOCATED BY MASON, GARNETT, SHELBY AND TERRY, INC., REGISTERED PROFESSIONAL SURVEYORS, CHARLESTON COUNTY AND DISTRICT.
 2. PLAT SHOWING THE SUBDIVISION OF TRACT 1, BEING SUBTRACTS 1, 2, 3 AND 4 OF THE MARYLYN CORNERS TRACT, TMS 311-00-00-025, LOCATED ON JOHNS ISLAND, CHARLESTON COUNTY AND DISTRICT, REGISTERED PROFESSIONAL SURVEYORS, CHARLESTON COUNTY AND DISTRICT.
 3. A. SUBDIVISION PLAT OF TRACT A, BEING ROAD TRACTS A-1 THROUGH A-9 LOCATED IN SOUTH CAROLINA, WATED JANUARY 14, 2008, BY MARY, S. BLAKE, SHELBY AND TERRY, INC., REGISTERED PROFESSIONAL SURVEYORS, CHARLESTON COUNTY AND DISTRICT.
 4. A. SUBDIVISION PLAT OF TRACT A-3, A-8, A-9, A-10, AND A-11, BEING ROAD TRACTS A-3 THROUGH A-11, BEING ROAD TRACTS A-3 THROUGH A-11, LOCATED IN SOUTH CAROLINA, WATED FEBRUARY 11, 2008, BY MARY, S. BLAKE, SHELBY AND TERRY, INC., REGISTERED PROFESSIONAL SURVEYORS, CHARLESTON COUNTY AND DISTRICT.

- NOTES:**
1. CORNER, BEING ONLY THIS PROPERTY, APPROXIMATE TO THE WITHIN ROAD CORNER, AS DETERMINED BY THE COORDINATE METHOD.
 2. THE AREA WAS DETERMINED BY THE COORDINATE METHOD.
 3. PROPERTY CORNERS FOUND AS LISTED.
 4. ALL DIMENSIONS SHOWN ARE PER RECORDS. PROPERTY MAY BE SUBJECT TO EASEMENTS, ENCUMBRANCES, AND OTHER INTERESTS NOT SHOWN HEREON.
 5. THE INSTRUMENTAL RECORD IS IN STATE FILE (SC MAG. 83 (2011)) AND THE INSTRUMENTAL RECORD IS IN STATE FILE (SC MAG. 83 (2011)) AND THE INSTRUMENTAL RECORD IS IN STATE FILE (SC MAG. 83 (2011)).
 6. THE PUBLIC RECORDS REFERENCED ON THIS PLAT ARE ONLY THOSE USED FOR THE PURPOSE OF THIS SURVEY. THEY ARE NOT TO BE CONSIDERED AS A PART OF THIS SURVEY.
 7. SUBSTANTIAL AND ENVIRONMENTAL CONDITIONS WERE NOT EXAMINED OR CONSIDERED IN THIS SURVEY. THE SURVEYOR HAS NOT CONDUCTED A VISUAL INSPECTION OF THE PROPERTY AND HAS NOT CONDUCTED A VISUAL INSPECTION OF THE PROPERTY.
 8. THE SURVEYOR HAS NOT CONDUCTED A VISUAL INSPECTION OF THE PROPERTY.
 9. THE SURVEYOR HAS NOT CONDUCTED A VISUAL INSPECTION OF THE PROPERTY.

CURVE TABLE

STATION	CHORD BEARING	CHORD	CHORD BEARING
121	345.00	584.2172	75.01
122	40.79	570.9429	75.01
123	51.29	558.6804	75.01
124	65.00	547.6602	75.01
125	81.29	537.8872	75.01
126	100.00	529.3672	75.01
127	120.79	522.1042	75.01
128	143.29	516.0942	75.01
129	167.29	511.2342	75.01
130	192.50	507.4172	75.01
131	218.79	504.5472	75.01
132	246.00	502.5272	75.01
133	274.00	501.2572	75.01
134	302.79	500.6372	75.01
135	332.29	500.5672	75.01
136	362.50	501.0472	75.01
137	393.29	502.0772	75.01
138	424.50	503.5572	75.01
139	456.29	505.4872	75.01
140	488.50	507.8672	75.01
141	521.29	510.6972	75.01
142	554.50	513.9772	75.01
143	588.29	517.7072	75.01
144	622.50	521.8872	75.01
145	657.29	526.5172	75.01
146	692.50	531.5972	75.01
147	728.29	537.1272	75.01
148	764.50	543.1072	75.01
149	801.29	549.5372	75.01
150	838.50	556.4172	75.01
151	876.29	563.7472	75.01
152	914.50	571.5272	75.01
153	953.29	579.7572	75.01
154	992.50	588.4372	75.01
155	1032.29	597.5672	75.01
156	1072.50	607.1472	75.01
157	1113.29	617.1772	75.01
158	1154.50	627.6572	75.01
159	1196.29	638.5872	75.01
160	1238.50	649.9672	75.01
161	1281.29	661.7972	75.01
162	1324.50	674.0772	75.01
163	1368.29	686.8072	75.01
164	1412.50	699.9872	75.01
165	1457.29	713.6172	75.01
166	1502.50	727.6972	75.01
167	1548.29	742.2272	75.01
168	1594.50	757.2072	75.01
169	1641.29	772.6372	75.01
170	1688.50	788.5172	75.01
171	1736.29	804.8472	75.01
172	1784.50	821.6272	75.01
173	1833.29	838.8572	75.01
174	1882.50	856.5372	75.01
175	1932.29	874.6672	75.01
176	1982.50	893.2472	75.01
177	2033.29	912.2772	75.01
178	2084.50	931.7572	75.01
179	2136.29	951.6872	75.01
180	2188.50	972.0672	75.01
181	2241.29	992.8972	75.01
182	2294.50	1014.1772	75.01
183	2348.29	1035.9072	75.01
184	2402.50	1058.0872	75.01
185	2457.29	1080.7172	75.01
186	2512.50	1103.7972	75.01
187	2568.29	1127.3272	75.01
188	2624.50	1151.3072	75.01
189	2681.29	1175.7372	75.01
190	2738.50	1200.6172	75.01
191	2796.29	1225.9472	75.01
192	2854.50	1251.7272	75.01
193	2913.29	1277.9572	75.01
194	2972.50	1304.6372	75.01
195	3032.29	1331.7672	75.01
196	3092.50	1359.3472	75.01
197	3153.29	1387.3772	75.01
198	3214.50	1415.8572	75.01
199	3276.29	1444.7872	75.01
200	3338.50	1474.1672	75.01
201	3401.29	1503.9972	75.01
202	3464.50	1534.2772	75.01
203	3528.29	1565.0072	75.01
204	3592.50	1596.1872	75.01
205	3657.29	1627.8172	75.01
206	3722.50	1659.8972	75.01
207	3788.29	1692.4272	75.01
208	3854.50	1725.4072	75.01
209	3921.29	1758.8372	75.01
210	3988.50	1792.7172	75.01
211	4056.29	1827.0472	75.01
212	4124.50	1861.8272	75.01
213	4193.29	1897.0572	75.01
214	4262.50	1932.7372	75.01
215	4332.29	1968.8672	75.01
216	4402.50	2005.4472	75.01
217	4473.29	2042.4772	75.01
218	4544.50	2079.9572	75.01
219	4616.29	2117.8872	75.01
220	4688.50	2156.2672	75.01
221	4761.29	2195.0972	75.01
222	4834.50	2234.3772	75.01
223	4908.29	2274.1072	75.01
224	4982.50	2314.2872	75.01
225	5057.29	2354.9172	75.01
226	5132.50	2395.9972	75.01
227	5208.29	2437.5272	75.01
228	5284.50	2479.5072	75.01
229	5361.29	2521.9372	75.01
230	5438.50	2564.8172	75.01
231	5516.29	2608.1472	75.01
232	5594.50	2651.9272	75.01
233	5673.29	2696.1572	75.01
234	5752.50	2740.8372	75.01
235	5832.29	2785.9672	75.01
236	5912.50	2831.5472	75.01
237	5993.29	2877.5772	75.01
238	6074.50	2924.0572	75.01
239	6156.29	2970.9872	75.01
240	6238.50	3018.3672	75.01
241	6321.29	3066.1972	75.01
242	6404.50	3114.4772	75.01
243	6488.29	3163.2072	75.01
244	6572.50	3212.3872	75.01
245	6657.29	3261.9172	75.01
246	6742.50	3311.8072	75.01
247	6828.29	3362.0472	75.01
248	6914.50	3412.6472	75.01
249	7001.29	3463.6072	75.01
250	7088.50	3514.9272	75.01
251	7176.29	3566.6072	75.01
252	7264.50	3618.6472	75.01
253	7353.29	3671.0472	75.01
254	7442.50	3723.8072	75.01
255	7532.29	3776.9272	75.01
256	7622.50	3830.3972	75.01
257	7713.29	3884.2172	75.01
258	7804.50	3938.3872	75.01
259	7896.29	3992.9072	75.01
260	7988.50	4047.7772	75.01
261	8081.29	4103.0072	75.01
262	8174.50	4158.5872	75.01
263	8268.29	4214.5172	75.01
264	8362.50	4270.8072	75.01
265	8457.29	4327.4572	75.01
266	8552.50	4384.4672	75.01
267	8648.29	4441.8372	75.01
268	8744.50	4500.5672	75.01
269	8841.29	4559.6572	75.01
270	8938.50	4619.1072	75.01
271	9036.29	4678.9172	75.01
272	9134.50	4739.0872	75.01
273	9233.29	4799.6172	75.01
274	9332.50	4860.5172	75.01
275	9432.29	4921.7872	75.01
276	9532.50	4983.4272	75.01
277	9633.29	5045.4372	75.01
278	9734.50	5107.8172	75.01
279	9836.29	5170.5672	75.01
280	9938.50	5233.6872	75.01
281	10041.29	5297.1772	75.01
282	10144.50	5361.0372	75.01
283	10248.29	5425.2672	75.01
284	10352.50	5490.8672	75.01
285	10457.29	5556.8372	75.01
286	10562.50	5623.1772	75.01
287	10668.29	5689.8872	75.01
288	10774.50	5756.9672	75.01
289	10881.29	5824.4172	75.01
290	10988.50	5892.2372	75.01
291	11096.29	5960.4272	75.01
292	11204.50	6028.9872	75.01
293	11313.29	6097.9172	75.01
294	11422.50	6167.2172	75.01
295	11532.29	6236.8872	75.01
296	11642.50	6306.9272	75.01
297	11753.29	6377.3372	75.01
298	11864.50	6448.1172	75.01
299	11976.29	6519.2672	75.01
300	12088.50	6590.7872	75.01
301	12201.29	6662.6772	75.01
302	12314.50	6734.9372	75.01
303	12428.29	6807.5672	75.01
304	12542.50	6880.5672	75.01
305	12657.29	6953.9372	75.01
306	12772.50	7027.6772	75.01
307	12888.29	7101.7872	75.01
308	13004.50	7176.2672	75.01
309	13121.29	7251.1172	75.01
310	13238.50	7326.3372	75.01
311	13356.29	7401.9272	75.01
312	13474.50	7477.8872	75.01
313	13593.29	7554.2172	75.01
314	13712.50	7630.9172	75.01
315	1		

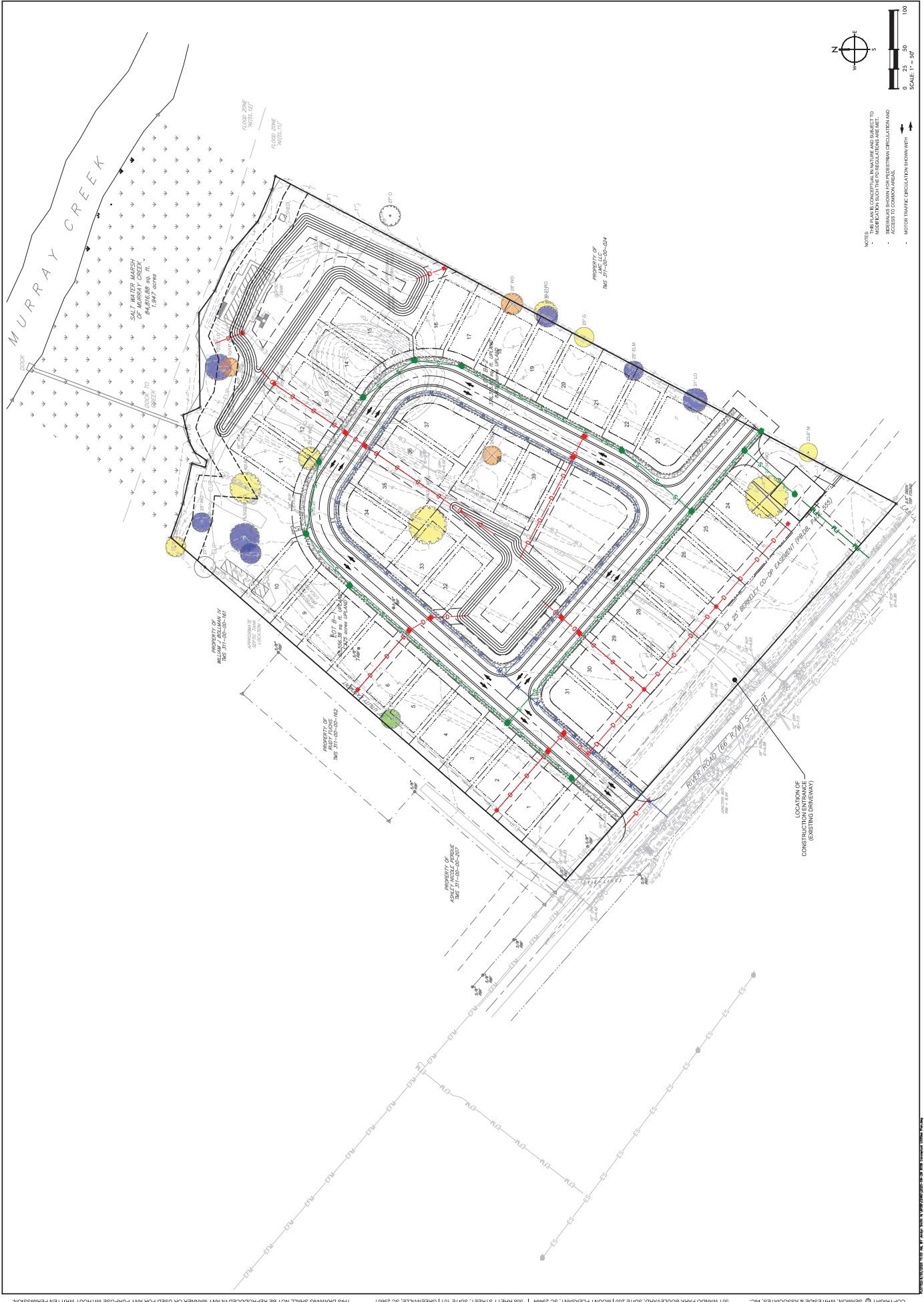


SWF PROJECT: 8158
 DATE: 11/07/19
 DRAWN BY: ECA
 CHECKED BY: ECA

REVISION HISTORY

NO.	DESCRIPTION

**OVERALL SITE
 PLAN**





SWW PROJECT:	8188
DATE:	11/07/19
DRAWN BY:	BEL
REVISION HISTORY:	1 03.20

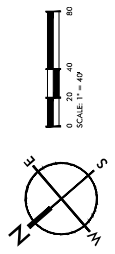
OVERALL LANDSCAPE PLAN

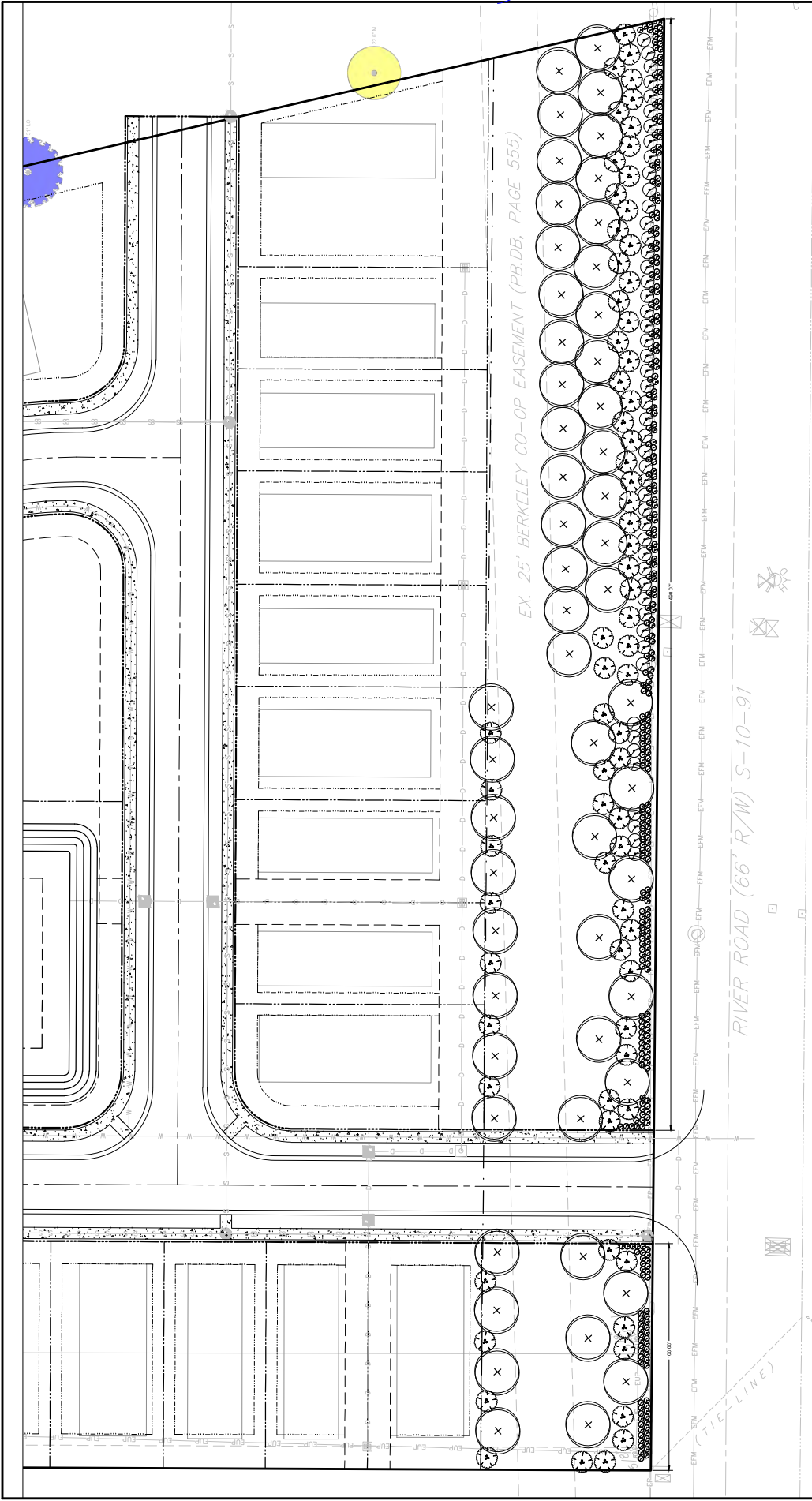
L1.0

- GENERAL NOTES:**
- SEE SWPPP PLANS (SHEETS CXX-CXX) FOR SILT FENCE LOCATIONS, TREE PROTECTION ZONES AND BARRIAGES, AND ADDITIONAL NOTES AND DETAILS.
 - SEE TREE SCHEDULE FOR TREE SPECIES, TREE SIZE, TREE CALIBER, AND FOR REQUIRED TREE MITIGATION AND DEVELOPMENT INCHES PER THE TOWN OF XXX ZONING ORDINANCE. PLEASE REFER TO SHEET L-200 FOR PLANT SCHEDULE QUANTITY AND SIZES.
 - SEE SITE PLAN (CXX & CXX) FOR SITE LABELS, INFORMATION AND DETAILS.
 - SEE TREE SCHEDULE FOR TREE SPECIES, TREE SIZE, TREE CALIBER, AND FOR REQUIRED TREE MITIGATION AND DEVELOPMENT INCHES PER THE TOWN OF XXX ZONING ORDINANCE. PLEASE REFER TO SHEET L-200 FOR PLANT SCHEDULE QUANTITY AND SIZES.
 - SEE TREE SCHEDULE FOR TREE SPECIES, TREE SIZE, TREE CALIBER, AND FOR REQUIRED TREE MITIGATION AND DEVELOPMENT INCHES PER THE TOWN OF XXX ZONING ORDINANCE. PLEASE REFER TO SHEET L-200 FOR PLANT SCHEDULE QUANTITY AND SIZES.
 - ANY SITEWORK MODIFICATIONS FROM THESE PLANS PRIOR TO CHANGES IN THE FIELD. CONTACT: 843-884-1667

PLANT SCHEDULE FOR SHEET L1.0

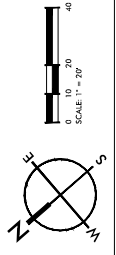
TREES	SYMBOL	CODE	QTY	BOTANICAL	COMMON NAME	SIZE
(+)		Q24V	84	Quercus agrifolia / Southern Live Oak		2 1/2" CAL
(*)		MAGL	72	Magnolia grandiflora / Little Gem / Dwarf Southern Magnolia		1 1/2" CAL
(D)		PRDM	310	Photinia macrophylla / Southern Yew		1 CAL
(V)		VRSD	50	Viburnum odoratissimum / Sweet Viburnum		1 CAL





PLANT SCHEDULE FOR SHEET L2.0

TREES	CODE	QTY	BOTANICAL / COMMON NAME	SIZE
+	04EV	54	Quercus virginiana / Southern Live Oak	2.5" CAL
*	04GL	72	Halepalm grandiflora / Little Gem / Dwarf Southern Magnolia	1.5" CAL
①	0310	310	Persea microphylla / Southern Yew	1 CAL
②	0350	50	Viburnum acerolobatum / Sweet Viburnum	1 CAL



- GENERAL NOTES:**
1. ALL SHEETS CXX-XI FOR LOT FENCE LOCATIONS, TREE PROTECTION ZONES AND BARRIAGES AND ADDITIONAL NOTES AND DETAILS.
 2. FOR TREE REMOVALS, PLEASE REFER TO SHEETS CXX-CXXI.
 3. FOR REQUIRED TREE MITIGATION AND DEVELOPMENT INCHES PER THE TOWN OF XXX, PLEASE REFER TO SHEET L2.00 FOR PLANT SCHEDULE QUANTITY AND SIZES.
 4. THE OVERALL PLANT QUANTITY FOR THE ENTIRE SITE CAN BE FOUND ON THE MASTER PLAN SHEET CXX-CXXI FOR SITE LABELS, INFORMATION AND DETAILS.
 5. SEE SITE PLANT CXX-CXXI FOR SITE LABELS, INFORMATION AND DETAILS.
 6. SEE LANDSCAPE SHEETS (CXX-CXXI) FOR LANDSCAPE LABELS AND DETAILS.
 7. CONTRACTOR TO CONTACT CIVIL ENGINEER OR LANDSCAPE ARCHITECT REGARDING ANY CHANGES FROM THESE PLANS PRIOR TO CHANGES IN THE FIELD. CONTACT: 843-884-6167.



July 29, 2019

Ms. Susan Bahr
Land Development
Crescent Homes
572 Savannah Highway
Charleston, South Carolina 29407

Re: **Preliminary Threatened and Endangered Species Determination**
River Road Site
1389 River Road
Johns Island, Charleston County, South Carolina
ECS Project No: 49: 9588-A

Dear Ms. Bahr:

ECS Southeast, LLP (ECS) is pleased to provide our results of the Preliminary Threatened and Endangered Species Determination conducted for the above-referenced site. The services were provided in accordance with ECS Proposal Numbers 49: 14407 & 14408-P.

Background Information

The site is located at 1389 River Road in Johns Island, Charleston County, South Carolina (Figure 1). The site consists of two parcels totaling approximately 12 acres. According to the Charleston County Online GIS Database website, the Tax Map Sequence Numbers (TMS#s) are: 3110000097 (1.28 acres) and 3110000025 (10.94 acres). The site consists of wooded land, fields, and access roads. Surrounding properties consist of wooded land, fields, commercial properties, and single-family residences. Based on the United States Geological Survey (USGS) Topographic Map, Pennys Creek and wetlands are depicted on site (Figure 2). The site is proposed for residential development.

ECS reviewed the South Carolina Department of Natural Resources (SCDNR) Heritage Trust Program's (HTP) Google Earth layer for State Listed Current & Historic Rare/Threatened/Endangered Species. Based on the information reviewed, known listings for Southern Twayblade (*Listera australis*), Pondspice (*Litsea aestivalis*) and Bald Eagle (*Haliaeetus leucocephalus*) are within a 1.5 mile radius of the site.

Site Reconnaissance

ECS conducted the field reconnaissance on June 27, 2019. The site consists of wooded land, fields, and single-family residences. The majority of the site consists of grassed areas and fields that are routinely mowed and maintained through clearing and landscaping practices. Dirt and gravel access roads transect the site and are associated with the single-family residence on the northern portion of the site. The wooded land consists of a mix of pine and hardwood species, ranging from approximately 5 to 80 years in age. Moderately dense understory vegetation was observed within the wooded land. Saltwater and tidal marsh, wetland areas, and other low-lying drainage areas were observed during the site reconnaissance.

Preliminary Threatened and Endangered Species Determination

Congress passed the Endangered Species Act (ESA) in 1973. The purpose of the ESA is to protect and recover imperiled species and the ecosystems upon which they depend. It is administered by the United States Fish and Wildlife Service (USFWS) and the Commerce Department's National Marine Fisheries Service (NMFS). The USFWS has primary responsibility for terrestrial and freshwater organisms, while the responsibilities of NMFS are mainly marine wildlife.

Under the ESA, species may be listed as either endangered or threatened. "Endangered" means a species is in danger of extinction throughout all or a significant portion of its range. "Threatened" means a species is likely to become endangered within the foreseeable future. All species of plants and animals, except pest insects, are eligible for listing as endangered or threatened. For the purposes of the ESA, Congress defined species to include subspecies, varieties, and, for vertebrates, distinct population segments.

ECS reviewed the USFWS Endangered Species Database to identify federally protected threatened and endangered species in Charleston County, South Carolina. The following federally protected Threatened and Endangered Amphibian, Birds, Mammals, Plants, and Reptiles were listed in Charleston County, South Carolina:

Common Name	Scientific name	Federal Status	Survey Window
Amphibian			
Frosted Flatwoods Salamander	<i>Ambystoma cingulatum</i>	T, CH	January 1 – April 30
Bird			
American Wood Stork	<i>Mycteria americana</i>	T	February 15 – September 1
Bachman's Warbler	<i>Vermivora bachmanii</i>	E	May 1 – June 15
Bald Eagle	<i>Haliaeetus leucocephalus</i>	BGPA	October 1 – May 15
Kirtland's Warbler	<i>Setophaga kirtlandii</i>	E	May 1 – June 15
Red-cockaded Woodpecker	<i>Picoides borealis</i>	E	April 1 – July 31
Piping Plover	<i>Charadrius melodus</i>	T, CH	July 15 – May 1
Red Knot	<i>Calidris canutus rufa</i>	T	August 1 – May 31
Eastern Black Rail	<i>Laterallus jamaicensis</i>	P	April – June
Mammal			
Northern Long-eared Bat	<i>Myotis septentrionalis</i>	T	Year-round
West Indian Manatee	<i>Trichechus manatus</i>	T, CH	May 15 – October 15
Plant			
American Chaffseed	<i>Schwalbea americana</i>	E	May – August
Canby's Dropwort	<i>Oxypolis canbyi</i>	E	February – March
Pondberry	<i>Lindera melissifolia</i>	E	Mid-July – September

Seabeach Amaranth	<i>Amaranthus pumilus</i>	T	July – October
Reptile			
Green Sea Turtle	<i>Chelonia mydas</i>	T, CH	May 1 – October 31
Kemp's Ridley Sea Turtle	<i>Lepidochelys kempii</i>	E	May 1 – October 31
Leatherback Sea Turtle	<i>Dermochelys coriacea</i>	E, CH	May 1 – October 31
Loggerhead Sea Turtle	<i>Caretta caretta</i>	T, CH	May 1 – October 31

BGPA = Bald and Golden Eagle Protection Act

E = Endangered

T = Threatened

CH = Critical Habitat

P = Proposed

Species/Habitat Description

Frosted Flatwoods Salamander

Description: The flatwoods salamander is medium-sized, reaching an adult length of 5 inches (13 centimeters). Body color ranges from silvery gray to black, with the back heavily mottled with a variable gray cross-band pattern. The underside is plain gray with faint creamy blotches. The head is small and equal to the neck in diameter.

Habitat: Flatwoods salamanders are endemic to the lower Gulf and Atlantic coastal plains where they occur in what were historically longleaf pine-wiregrass flatwoods and savannas. Their habitat has been reduced to less than 20 percent of its original extent. Surviving populations of flatwoods salamanders are small, localized, and highly vulnerable to habitat destruction, deterioration, and fragmentation.

Conclusions: The site consists of wooded land, fields, and single-family residences. The majority of the site consists of grassed areas and fields that are routinely mowed and maintained through clearing and landscaping practices. Dirt and gravel access roads transect the site and are associated with the single-family residence on the northern portion of the site. The wooded land consists of a mix of pine and hardwood species, ranging from approximately 5 to 80 years in age. Moderately dense understory vegetation was observed within the wooded land. Saltwater and tidal marsh, wetland areas, and other low-lying drainage areas were observed during the site reconnaissance. Longleaf pine-wiregrass flatwoods and savannas are not located on site.

Based on our knowledge and site observations, suitable habitat for the frosted flatwoods salamander is not located on the site.

American Wood Stork

Description: Wood storks are large, long-legged wading birds, about 45 inches tall, with a wingspan of 60 to 65 inches. The plumage is white except for black primaries and secondaries and a short black tail. The head and neck are largely unfeathered and dark gray in color. The bill is black, thick at the base, and slightly decurved. Immature birds have dingy gray feathers on their head and a yellowish bill.

Habitat: Storks are birds of freshwater and estuarine wetlands, primarily nesting in cypress or mangrove swamps. They feed in freshwater marshes, narrow tidal creeks, or flooded tidal pools. Particularly attractive feeding sites are depressions in marshes or swamps where fish become concentrated during periods of falling water levels.

Conclusions: The site consists of wooded land, fields, and single-family residences. The majority of the site consists of grassed areas and fields that are routinely mowed and maintained through clearing and landscaping practices. Dirt and gravel access roads transect the site and are associated with the single-family residence on the northern portion of the site. The wooded land consists of a mix of pine and hardwood species, ranging from approximately 5 to 80 years in age. Moderately dense understory vegetation was observed within the wooded land. Saltwater and tidal marsh, wetland areas, and other low-lying drainage areas were observed during the site reconnaissance. Large, open estuarine wetlands are present on site; however, Wood Storks were not observed during the site reconnaissance.

Based on our knowledge and site observations, suitable habitat for the American Wood Stork is located on site; however, Wood Storks were not observed during the site reconnaissance and ECS does not anticipate impacts to the saltwater and tidal marsh on site. If confirmation or a development plan is needed to confirm for the agencies review, ECS will work with the client to provide.

Bachman's Warbler

Description: Delicate warbler with slender, decurved bill. Adult males have a black forecrown, grey hind-crown and nape, yellow forehead, eye-ring, lores, supercilium and throat. Yellow underparts with black patch on upper breast and white undertail. Olive-green upperparts, grey wings with olive fringes and yellow lesser coverts, grey tail with white spots on inner webs of all but central rectrices. First-year males are duller with indistinct black breast patch and no black forecrown. Adult females are duller with whitish eye-ring, no black and less well marked head. First year females are even duller and paler below. Juveniles are brownish, buffy-yellow below, whiter on throat, two buffy wing-bars.

Habitat: Breeding habitat is described as palustrine forested wetlands (bottomland hardwoods) with a dense understory of palmetto (*Sabal minor*) or cane (*Arundanaria gigantea*). However, one of the most photographed and filmed Bachman's warbler was on territory in a predominantly longleaf pine (*Pinus palustris*) forest near brackish marsh just outside of Charleston, South Carolina. Nests were typically found low to the ground from late March through June, and average known clutch size is three to four eggs. Loss of breeding and wintering habitat is thought to be a major factor in the presumed extinction of the Bachman's warbler.

Conclusion: The site consists of wooded land, fields, and single-family residences. The majority of the site consists of grassed areas and fields that are routinely mowed and maintained through clearing and landscaping practices. Dirt and gravel access roads transect the site and are associated with the single-family residence on the northern portion of the site. The wooded land consists of a mix of pine and hardwood species, ranging from approximately 5 to 80 years in age. Moderately dense understory vegetation was observed within the wooded land. Saltwater and tidal marsh, wetland areas, and other low-lying drainage areas were observed during the site reconnaissance. Although the site has forested wetlands, they do not

contain dense areas of dwarf palmetto and cane species, as present in cane breaks. Longleaf pine forests near brackish marsh are also not located on site.

Based on our knowledge and site observations, suitable habitat for Bachman's warbler is not located on site.

Bald Eagle

Description: Distinguished by a white head and white tail feathers, bald eagles are powerful, brown birds that may weigh 14 pounds and have a wingspan of 8 feet. Male eagles are smaller, weighing as much as 10 pounds and have a wingspan of 6 feet. Sometimes confused with Golden Eagles, Bald Eagles are mostly dark brown until they are four to five years old and acquire their characteristic coloring.

Habitat: Bald Eagles live near rivers, lakes, and marshes where they can find fish, their staple food. Bald Eagles will also feed on waterfowl, turtles, rabbits, snakes, and other small animals and carrion. Bald Eagles require a good food base, perching areas, and nesting sites. Their habitat includes estuaries, large lakes, reservoirs, rivers, and some seacoasts. In winter, the birds congregate near open water in tall trees for spotting prey and night roosts for sheltering.

Conclusions: The site consists of wooded land, fields, and single-family residences. The majority of the site consists of grassed areas and fields that are routinely mowed and maintained through clearing and landscaping practices. Dirt and gravel access roads transect the site and are associated with the single-family residence on the northern portion of the site. The wooded land consists of a mix of pine and hardwood species, ranging from approximately 5 to 80 years in age. Moderately dense understory vegetation was observed within the wooded land. Saltwater and tidal marsh, wetland areas, and other low-lying drainage areas were observed during the site reconnaissance. Large bodies of water and a steady food support base are present on the site or in surrounding areas. However, bald eagles, eagles, or eagle nests were not observed during the site reconnaissance.

Based on our knowledge and site observations, suitable habitat for the Bald Eagle is located on site; however, Bald Eagles and/or Bald Eagle nests were not observed during the site reconnaissance and ECS does not anticipate impacts to the saltwater, tidal marsh, or wetlands on site. If confirmation or a development plan is needed to confirm for the agencies review, ECS will work with the client to provide.

Kirtland's Warbler

Description: The Kirtland's warbler, an endangered species, is a songbird that nests in young jack pine stands. Until 1995 Kirtland's warblers had only been known to nest in the northern part of Michigan's Lower Peninsula. Today, they also nest in the Upper Peninsula, and since 2007, have nested in Wisconsin and Canada. They migrate from their nesting grounds to the southeastern coast of the United States on their way to wintering grounds in the Bahamas. The male Kirtland's warblers' summer plumage is composed of a distinctive bright yellow colored breast streaked in black and bluish gray back feathers, a dark mask over its face with white eye rings, and bobbing tail. The female's plumage coloration is less bright; her facial area is devoid of a mask. Overall length of the bird is less than six inches.

Habitat: The Kirtland's warbler nests only in young jack pine forests growing on a special type of sandy soil. The warblers prefer to nest in forests that are about 80 acres (roughly 60 football

fields) or larger with numerous small, grassy openings. Kirtland's warblers prefer to nest in groups. They build their nests only on the ground among grass or other plants like blueberry bushes. The jack pine trees in its nesting area must be just the right height (about 5 to 16 feet tall) and the trees must be spaced to let sunlight through to the ground. The sunlight helps keep the lower branches alive and bushy, hiding the Kirtland's warbler nest beneath them. When the trees grow larger their upper branches block the sun, causing the lower branches to die. Grasses and other plants also become less dense. The warblers then must find another nesting area. When a stand of jack pines reaches about 5 feet high (around 8 years old), Kirtland's warblers begin nesting in the area. They will continue to use the area until the needles on the lower branches start dying. This usually happens when the trees are about 16 feet high (around 20 years old).

Conclusion: The site consists of wooded land, fields, and single-family residences. The majority of the site consists of grassed areas and fields that are routinely mowed and maintained through clearing and landscaping practices. Dirt and gravel access roads transect the site and are associated with the single-family residence on the northern portion of the site. The wooded land consists of a mix of pine and hardwood species, ranging from approximately 5 to 80 years in age. Moderately dense understory vegetation was observed within the wooded land. Saltwater and tidal marsh, wetland areas, and other low-lying drainage areas were observed during the site reconnaissance. Although the site is forested with pine tree species, none of the species observed were Jack Pine (*Pinus banksiana*). Additionally, the site is less than 80 acres in size.

Based on our knowledge and site observations, suitable habitat for Kirtland's warbler is not located on site.

Red-cockaded Woodpecker

Description: The Red-Cockaded Woodpecker (RCW) is a small bird measuring about seven inches in length. Identifiable by its white cheek patch and black and white barred back, the males have a few red feathers, or "cockade." These red feathers usually remain hidden underneath black feathers between the black crown and white cheek patch unless the male is disturbed or excited. Female RCWs lack the red cockade. Juvenile males have a red 'patch' in the center of their black crown. This patch disappears during the fall of their first year at which time their 'red-cockades' appear.

Habitat: RCW habitat includes forests with trees old enough for roosting, generally at least 30-120 years old, or greater than 10 inches diameter at breast height, depending on species of pine. The most prominent adaptation of RCWs is their use of living pines for cavity excavation. For nesting and roosting habitat, RCWs prefer open stands of pine containing trees greater than 30 years old. RCWs need live, large older pines to excavate their cavities. Longleaf pines (*Pinus palustris*) are preferred, but other species of southern pine are also acceptable. Dense stands with a thick hardwood under story are avoided. Foraging habitat is provided in pine and pine hardwood stands 30 years old or older with foraging preference for pine trees 10 inches or larger in diameter. An open under story with "meadow-like" characteristic is preferred by the RCW. In good, moderately-stocked, pine habitat, sufficient foraging substrate can be provided on 75 to 125 acres. Prescribed burning is the most efficient and ecologically beneficial method to accomplish hardwood mid-story control.

Conclusion: The site consists of wooded land, fields, and single-family residences. The majority of the site consists of grassed areas and fields that are routinely mowed and maintained through clearing and landscaping practices. Dirt and gravel access roads transect the site and are associated with the single-family residence on the northern portion of the site. The wooded land consists of a mix of pine and hardwood species, ranging from approximately 5 to 80 years in age. Moderately dense understory vegetation was observed within the wooded land. Large dominant stands of mature pine trees over 30 years old with open understories were not observed on the site.

Based on our knowledge and site observations, suitable habitat for the RCW is not located on site.

Piping Plover

Description: Piping plovers are 18 cm (7.25 in) in length. Color during breeding season is pale brown above, lighter below; black band across forehead; bill orange with black tip; legs orange; white rump. Males have complete or incomplete black band encircles the body at the breast. Female have a paler head band with incomplete breast band. The winter coloration is a black bill; all birds lack breast band and head band.

Habitat: Piping plovers nest above the high tide line on coastal beaches, sandflats at the ends of sands pits and barrier islands, gently sloping fore dunes, blowout areas behind primary dunes, sparsely vegetated dunes, and wash over areas cut into or between dunes. Feeding areas include intertidal portions of ocean beaches, wash over areas, mudflats, sandflats, wrack lines, and shorelines of coastal ponds, lagoons, or saltmarshes. Wintering plovers on the Atlantic Coast are generally found at accreting ends of barrier islands, along sandy peninsulas, and near coastal inlets.

Conclusion: The site consists of wooded land, fields, and a single-family residence. Coastal beaches and sandy dunes are not located on the site or in the immediate surrounding areas.

Based on our assessment and site observations, suitable habitat for the Piping Plover is not located on the site.

Red Knot

Description: Red knots are 25-28 cm in length. Adults in spring: Above finely mottled with grays, black and light ochre, running into stripes on crown; throat, breast and sides of head cinnamon-brown; dark gray line through eye; abdomen and undertail coverts white; uppertail coverts white, barred with black. Adults in winter: Pale ashy gray above, from crown to rump, with feathers on back narrowly edged with white; underparts white, the breast lightly streaked and speckled, and the flanks narrowly barred with gray. Adults in autumn: Underparts of some individuals show traces of the "red" of spring.

Habitat: The Red Knot Breeds in drier tundra areas, such as sparsely vegetated hillsides. Outside of breeding season, it is found primarily in intertidal, marine habitats, especially near coastal inlets, estuaries, and bays.

Conclusion: The site consists of wooded land, fields, and single-family residences. Saltwater and tidal marsh, wetland areas, and other low-lying drainage areas were observed during the

site reconnaissance. However, Coastal beaches and inlets habitats are not located on the site. Additionally, the Red Knot was not observed during the site reconnaissance.

Based on our knowledge and site observations, suitable habitat for the Red Knot is located on site; however, Red Knots were not observed during the site reconnaissance and ECS does not anticipate impacts to the saltwater, tidal marsh, or wetlands on site. If confirmation or a development plan is needed to confirm for the agencies review, ECS will work with the client to provide.

Eastern Black Rail

Description: Adult eastern black rails range from 10-15 centimeters in total length and have a wingspan of 22-28 cm. Males and females are similar in size and adults are generally pale to blackish-gray, with a small blackish bill and bright red eyes. The underparts from chin to abdomen are uniformly colored but are lighter on the chin and throat. The nape and upper back are chestnut and the remaining back, upper tail feathers and remiges (wing flight feathers) are dark gray to blackish with small white spots, sometimes washed with chestnut-brown. The lower abdomen, under tail feathers and flanks are streaked with black and have narrow white and dark gray barring washed with chestnut. Overall, males are darker and have pale to medium gray throats, while females are lighter and have pale gray to white throats. The lower legs and toes are a brownish-gray or gray to blackish-brown.

Habitat: The eastern black rail can typically be found in salt and brackish marshes with dense cover but can also be found in upland areas of these marshes.

Conclusion: The site consists of wooded land, fields, and single-family residences. Saltwater and tidal marsh, wetland areas, and other low-lying drainage areas were observed during the site reconnaissance. However, Coastal beaches and inlets habitats are not located on the site. Additionally, the Eastern Black Rail was not observed during the site reconnaissance.

Based on our knowledge and site observations, suitable habitat for the Eastern Black Rail is located on site; however, Eastern Black Rails were not observed during the site reconnaissance and ECS does not anticipate impacts to the saltwater, tidal marsh, or wetlands on site. If confirmation or a development plan is needed to confirm for the agencies review, ECS will work with the client to provide.

Northern long-eared Bat

Description: The northern long-eared bat (NLEB) is a medium-sized bat with a body length of 3 to 3.7 inches but a wingspan of 9 to 10 inches. Their fur color can be medium to dark brown on the back and tawny to pale-brown on the underside. As its name suggests, this bat is distinguished by its long ears, particularly as compared to other bats in its genus, *Myotis*.

Habitat: During summer, NLEBs roost singly or in colonies underneath bark, in cavities, or in crevices of both live and dead trees. Males and non-reproductive females may also roost in cooler places, like caves and mines. This bat seems opportunistic in selecting roosts, using tree species based on suitability to retain bark or provide cavities or crevices. It has also been found, rarely, roosting in structures like barns and sheds. NLEBs spend winter hibernating in caves and mines, called hibernacula. They typically use large caves or mines with large passages and entrances; constant temperatures; and high humidity with no air currents. Specific areas where

they hibernate have very high humidity, so much so that droplets of water are often seen on their fur. Within hibernacula, surveyors find them in small crevices or cracks, often with only the nose and ears visible.

Conclusion: The site consists of wooded land, fields, and single-family residences. The majority of the site consists of grassed areas and fields that are routinely mowed and maintained through clearing and landscaping practices. Dirt and gravel access roads transect the site and are associated with the single-family residence on the northern portion of the site. The wooded land consists of a mix of pine and hardwood species, ranging from approximately 5 to 80 years in age. Moderately dense understory vegetation was observed within the wooded land. Saltwater and tidal marsh, wetland areas, and other low-lying drainage areas were observed during the site reconnaissance. According to the USFWS website, Charleston County is listed as a county within the range for this species; however, the site is not located in or adjoining a known hibernacula location.

Based upon the IPaC submission, any take of the northern long-eared bat that may occur as a result of the Action is not prohibited under the ESA Section 4(d) rule adopted for this species at 50 CFR §17.40(o). Based on the site reconnaissance and observations, ECS believes that this project should have no effect on the NLEB.

West Indian Manatee

Description: Manatees are protected under the Marine Mammal Protection Act, which prohibits the take (i.e., harass, hunt, capture, or kill) of all marine mammals. Manatees are found in marine, estuarine, and freshwater environments. The West Indian manatee, *Trichechus manatus*, includes two distinct subspecies, the Florida manatee (*Trichechus manatus latirostris*) and the Antillean manatee (*Trichechus manatus manatus*). While morphologically distinctive, both subspecies have many common features. Manatees have large, seal-shaped bodies with paired flippers and a round, paddle-shaped tail. They are typically grey in color (color can range from black to light brown) and occasionally spotted with barnacles or colored by patches of green or red algae. The muzzle is heavily whiskered and coarse, single hairs are sparsely distributed throughout the body. Adult manatees, on average, are about nine feet long (3 meters) and weigh about 1,000 pounds (200 kilograms). At birth, calves are between three and four feet long (1 meter) and weigh between 40 and 60 pounds (30 kilograms).

Habitat: Florida and Antillean manatees range freely between marine and freshwater habitats. Specific habitat types/use areas include foraging and drinking sites, resting areas, travel corridors and others. Florida manatees, living at the northern limit of the species' range, have little tolerance for cold. Historically, this sub-species has sought out natural, warm-water sites, including springs, deep water areas, and areas thermally influenced by the Gulf Stream, as refuges from the cold. In the 1930s and 40s, industrial plants, including power plants, paper mills, etc., were built along coastal and riverine shoreline areas. Plants discharging large volumes of heated discharge water into areas accessible to manatees have attracted large numbers of wintering manatees to these warm-water sites ever since. In the spring, manatees leave the warm-water sites and may travel great distances during the summer, only to return to warm water sites in the fall.

Conclusion: The site consists of wooded land, fields, and single-family residences. Saltwater and tidal marsh, wetland areas, and other low-lying drainage areas were observed during the site reconnaissance. Marine and estuarine habitats were observed on site; however, large

freshwater bodies of water connected to Coastal Rivers and Oceans are not located on site. Additionally, the West Indian Manatee was not observed during the site reconnaissance.

Based on our knowledge and site observations, suitable habitat for the West Indian Manatee is located on site; however, West Indian Manatee were not observed during the site reconnaissance and ECS does not anticipate impacts to the saltwater, tidal marsh, or wetlands on site. If confirmation or a development plan is needed to confirm for the agencies review, ECS will work with the client to provide.

American Chaffseed

Description: American Chaffseed is an erect perennial herb with unbranched stems (or stems branched only at the base) with large, purplish-yellow, tubular flowers that are borne singly on short stalks in the axils of the uppermost, reduced leaves (bracts). The leaves are alternate, lance-shaped to elliptic, stalkless, 1 to 2 inches (2 to 5 centimeters) long, and entire. The plant is densely, but minutely hairy throughout, including the flowers. Flowering occurs from April to June in the South, and from June to mid-July in the North. Chaffseed fruits are long, narrow capsules enclosed in a sac-like structure that provides the basis for the common name. Fruits mature from early summer in the South to October in the North. American Chaffseed is a hemiparasite (partially dependent upon another plant as host). Like most of the hemiparasitic Scrophulariaceae, it is not host-specific, so its rarity is not due to its preference for a specialized host.

Habitat: American Chaffseed occurs in sandy (sandy peat, sandy loam), acidic, seasonally moist to dry soils. It is generally found in habitats described as open, moist pine flatwoods, fire-maintained savannas, ecotonal areas between peaty wetlands and xeric sandy soils, and other open grass-sedge systems. Chaffseed is dependent on factors such as fire, mowing, or fluctuating water tables to maintain the crucial open to partly-open conditions that it requires. Historically, the species probably existed on savannas and pinelands throughout the coastal plain and on sandstone knobs and plains inland where frequent, naturally occurring fires maintained these sub-climax communities. Under these conditions, herbaceous plants such as American Chaffseed were favored over trees and shrubs. Most of the surviving populations, and all of the most vigorous populations, are in areas that are still subject to frequent fire. These fire-maintained habitats include plantations where prescribed fire is part of a management regime for quail and other game species, army base impact zones that burn regularly because of artillery shelling, forest management areas that are burned to maintain habitat for wildlife, including the endangered RCW, and various other private lands that are burned to maintain open fields. Fire may be important to the species in ways that are not yet understood, such as for germination of seed, or in the formation of the connection to the host plant.

Conclusion: The site consists of wooded land, fields, and single-family residences. The majority of the site consists of grassed areas and fields that are routinely mowed and maintained through clearing and landscaping practices. Dirt and gravel access roads transect the site and are associated with the single-family residence on the northern portion of the site. The wooded land consists of a mix of pine and hardwood species, ranging from approximately 5 to 80 years in age. Moderately dense understory vegetation was observed within the wooded land. Saltwater and tidal marsh, wetland areas, and other low-lying drainage areas were observed during the site reconnaissance. Longleaf and Loblolly pine savannahs and flatwoods are not located on site. Additionally, presence of fire maintained regimes were not observed on the site.

Based on our knowledge and site observations, suitable habitat for the American Chaffseed is not located on the site.

Pondberry

Description: Pondberry (*Lindera melissifolia*) is a deciduous shrub that grows to approximately 2 meters (6 feet) tall, and spreads vegetatively by stolons. Pale yellow flowers appear in the spring before the leaves emerge. The oval-shaped fruits are 0.5 inch (12 millimeter) long, and turn from green during the summer to bright red in the fall. Pondberry is distinguished from the two other North American members of the genus (*Lindera benzoin* and *Lindera subcoriacea*) by its drooping foliage, obtuse or rounded leaf base, conspicuous venation and the two lowest pairs of lateral nerves are not parallel to the ones above. Pondberry leaves have a distinct sassafras-like odor when crushed. Reproduction is primarily vegetative by means of stolons. The plants grow in clones of numerous stems which flower when little more than 2 to 3 years of age, but appear to live for only a few years. The dead stems are replaced by new ones that emerge from the rootstock. The plants flower in late February or March and are dioecious (male and female flowers are produced on separate plants). Mature fruits can be found on the plants in October. Seeds are only viable for a short period of time.

Habitat: Pondberry, for the most part, is associated with wetland habitats such as bottomland and hardwoods in the interior areas, and the margins of sinks, ponds and other depressions in the more coastal sites. The plants generally grow in shaded areas but may also be found in full sun.

Conclusions: The site consists of wooded land, fields, and single-family residences. The majority of the site consists of grassed areas and fields that are routinely mowed and maintained through clearing and landscaping practices. Dirt and gravel access roads transect the site and are associated with the single-family residence on the northern portion of the site. The wooded land consists of a mix of pine and hardwood species, ranging from approximately 5 to 80 years in age. Moderately dense understory vegetation was observed within the wooded land. Saltwater and tidal marsh, wetland areas, and other low-lying drainage areas were observed during the site reconnaissance. Pondberry was not observed during the site visit.

Based on our knowledge and site observations, ECS does not believe that suitable habitat for the Pondberry is located on the site.

Canby's Dropwort

Description: Canby's Dropwort is a perennial herb which grows 2.6 - 3.9 feet tall. The stems are round in cross section, ascending and stiff. They arise from scaly buds at the tips of the previous year's rhizomes or the first, second or third nodes. The stems branch well above the mid-stem, with the branches arching-ascending and forking. The quill-like leaves are slender, round, hollow and septate. The flowers consist of compound umbels of small five parted flowers which appear from mid-July through September with white petals and pale green sepals, some of which are tinged with red or pink. The fruit is a schizocarp about 0.16 - 0.24 inch long, broadly obovoid or ellipsoidal and strongly compressed.

Habitat: Canby's Dropwort has been found in a variety of coastal plain habitats, including natural ponds dominated by pond cypress, grass-sedge dominated Carolina bays, wet pine savannas, shallow pineland ponds and cypress-pine swamps or sloughs. The largest and most vigorous populations have been found in open bays or ponds that are wet throughout most of

the year but which have little or no canopy cover. Soils are sandy loams or acidic peat mucks underlain by clay layers which, along with the slight gradient of the areas, result in the retention of water.

Conclusion: The site consists of wooded land, fields, and single-family residences. The majority of the site consists of grassed areas and fields that are routinely mowed and maintained through clearing and landscaping practices. Dirt and gravel access roads transect the site and are associated with the single-family residence on the northern portion of the site. The wooded land consists of a mix of pine and hardwood species, ranging from approximately 5 to 80 years in age. Moderately dense understory vegetation was observed within the wooded land. Saltwater and tidal marsh, wetland areas, and other low-lying drainage areas were observed during the site reconnaissance. Canby's dropwort was not observed during the site reconnaissance. Additionally, wet pine savannahs, shallow pineland ponds, and cypress-pine swamps or sloughs are not located on site.

Based on our knowledge and site observations, suitable habitat for the Canby's Dropwort is not located on site.

Green Sea Turtle

Description: The green sea turtle grows to a maximum size of about 4 feet and a weight of 440 pounds. It has a heart-shaped shell, small head, and single-clawed flippers. Color is variable. Hatchlings generally have a black carapace, white plastron, and white margins on the shell and limbs. The adult carapace is smooth, keelless, and light to dark brown with dark mottling; the plastron is whitish to light yellow. Adult heads are light brown with yellow markings. Identifying characteristics include four pairs of costal scutes, none of which borders the nuchal scute, and only one pair of prefrontal scales between the eyes.

Habitat: Green turtles are generally found in fairly shallow waters (except when migrating) inside reefs, bays, and inlets. The turtles are attracted to lagoons and shoals with an abundance of marine grass and algae. Open beaches with a sloping platform and minimal disturbance are required for nesting. Green turtles apparently have a strong nesting site fidelity and often make long distance migrations between feeding grounds and nesting beaches. Hatchlings have been observed to seek refuge and food in Sargassum rafts.

Conclusion: The site consists of wooded land, fields, and single-family residences. Saltwater and tidal marsh, wetland areas, and other low-lying drainage areas were observed during the site reconnaissance. However, Coastal Beaches and Oceans are not located on site. Additionally, the Green Sea Turtle was not observed during the site reconnaissance.

Based on our knowledge and site observations, suitable habitat for the Green Sea Turtle is not located on the site.

Kemp's Ridley Sea Turtle

Description: The Kemp's Ridley turtle is the smallest of the sea turtles, with adults reaching about 2 feet in length and weighing up to 100 pounds. The adult Kemp's Ridley has an oval carapace that is almost as wide as it is long and is usually olive-gray in color. The carapace has five pairs of costal scutes. In each bridge adjoining the plastron to the carapace, there are four inframarginal scutes, each of which is perforated by a pore. The head has two pairs of prefrontal scales. Hatchlings are black on both sides. The Kemp's Ridley has a triangular-shaped head

with a somewhat hooked beak with large crushing surfaces. This turtle is a shallow water benthic feeder with a diet consisting primarily of crabs.

Habitat: Kemp's Ridley sea turtles occur in the Atlantic Ocean and the Gulf of Mexico. The females come ashore only to lay eggs.

Conclusion: The site consists of wooded land, fields, and single-family residences. Saltwater and tidal marsh, wetland areas, and other low-lying drainage areas were observed during the site reconnaissance. However, Coastal Beaches and Oceans are not located on site. Additionally, the Kemp's Ridley turtle was not observed during the site reconnaissance.

Based on our knowledge and site observations, suitable habitat for the Kemp's Ridley turtle is not located on the site.

Leatherback Sea Turtle

Description: The leatherback is the largest, deepest diving, and most migratory and wide ranging of all sea turtles. The adult leatherback can reach 4 to 8 feet in length and 500 to 2000 pounds in weight. Its shell is composed of a mosaic of small bones covered by firm, rubbery skin with seven longitudinal ridges or keels. The skin is predominantly black with varying degrees of pale spotting; including a notable pink spot on the dorsal surface of the head in adults. A toothlike cusp is located on each side of the gray upper jaw; the lower jaw is hooked anteriorly. The paddle-like clawless limbs are black with white margins and pale spotting.

Habitat: The leatherback is the most pelagic [open ocean dwelling] of the sea turtles. Adult females require sandy nesting beaches backed with vegetation and sloped sufficiently so the distance to dry sand is limited. Their preferred beaches have proximity to deep water and generally rough seas.

Conclusion: The site consists of wooded land, fields, and single-family residences. Saltwater and tidal marsh, wetland areas, and other low-lying drainage areas were observed during the site reconnaissance. However, Coastal Beaches and Oceans are not located on site. Additionally, the Leatherback Sea Turtle was not observed during the site reconnaissance.

Based on our knowledge and site observations, suitable habitat for the Leatherback Sea Turtle is not located on the site.

Loggerhead Sea Turtle

Description: Loggerheads were named for their relatively large heads, which support powerful jaws and enable them to feed on hard-shelled prey, such as whelks and conch. The carapace (top shell) is slightly heart-shaped and reddish-brown in adults and sub-adults, while the plastron (bottom shell) is generally a pale yellowish color. The neck and flippers are usually dull brown to reddish brown on top and medium to pale yellow on the sides and bottom. Mean straight carapace length of adults in the southeastern U.S. is approximately 36 in (92 cm); corresponding weight is about 250 lbs (113 kg). On July 28, 1978, the Fish and Wildlife Service and National Marine Fisheries Service (Services) issued a final rule listing the loggerhead sea turtle as threatened throughout its worldwide range. On September 22, 2011, the Services determined that the loggerhead sea turtle is composed of 9 distinct population segments and listed four DPSs as threatened and five DPSs as endangered under the ESA. All but two of these DPSs are wholly foreign species.

Habitat: The loggerhead is widely distributed within its range. It may be found hundreds of miles out to sea, as well as in inshore areas such as bays, lagoons, salt marshes, creeks, ship channels, and the mouths of large rivers. Coral reefs, rocky places, and ship wrecks are often used as feeding areas. Nesting occurs mainly on open beaches or along narrow bays having suitable sand, and it is often in association with other species of sea turtles. Most loggerhead hatchlings originating from U.S. beaches are believed to lead a pelagic existence in the North Atlantic gyre for an extended period of time, perhaps as long as 7 to 12 years, and are best known from the eastern Atlantic near the Azores and Madeira. Post-hatchlings have been found floating at sea in association with *Sargassum* rafts. Once they reach a certain size, these juvenile loggerheads begin recruiting to coastal areas in the western Atlantic where they become benthic feeders in lagoons, estuaries, bays, river mouths, and shallow coastal waters. These juveniles occupy coastal feeding grounds for about 13 to 20 years before maturing and making their first reproductive migration, the females returning to their natal beach to nest.

Conclusion: The site consists of wooded land, fields, and single-family residences. Saltwater and tidal marsh, wetland areas, and other low-lying drainage areas were observed during the site reconnaissance. However, Coastal Beaches and Oceans are not located on site. Additionally, the Loggerhead Sea Turtle was not observed during the site reconnaissance.

Based on our knowledge and site observations, suitable habitat for the Loggerhead Sea Turtle is not located on the site.

Agency Correspondence

ECS composed letter requests addressed to the South Carolina Department of Natural Resources (SCDNR) – the Heritage Trust Program (HTP) and the USFWS, dated July 11, 2019, to determination if the subject site is located in the immediate vicinity of registered sightings or habitats for endangered species.

ECS received a response letter from Mr. James Hagerty, with the HTP on July 26, 2019, that states that according to SCDNR data, there are currently no records of threatened and endangered species or species of conservation concern, within the project footprint; however, there are known occurrences of species of concern found within a 3-mile radius, including bald eagle (*Haliaeetus leucocephalus*). The letter mentions to be reminded that that this information is derived from existing databases, is not complete, and that there are areas not yet inventoried by SCDNR biologists may contain significant species or communities.

Mr. Hagerty also states that an active bald eagle nest is known to occur 3 miles north of the project footprint. Bald eagles are a state listed threatened species and are federally protected under the Bald and Golden Eagle Protection Act. If bald eagle nests are found to be within the project area, please consult with the U.S. Fish and Wildlife Service before proceeding with construction. Mr. Hagerty mentions that the Spotted Turtle (*Clemmys guttata*), a state listed threatened species, is also known to exist nearby to the project footprint and relies on wetland habitats. If spotted turtle are found within the project footprint, efforts must be made to avoid any negative impacts or “take” of the species. No spotted turtle can be moved without first obtaining a permit from SCDNR. The letter also states that additional species of concern are found within three miles of the project site, including the southern Twayblade (*Listera australis*), eastern woodrat (*Neotoma floridana haematoria*), Pondspice (*Litsea aestivalis*), monarch butterfly (*Danaus plexippus*), painting bunting (*Passerina ciris*), and seaside sparrow (*Ammodramus maritimus*). There are also various waterbird colonies found within three miles of

the project site. The aforementioned species are designated as having conservation priority as designated through the South Carolina State Wildlife Action Plan (SWAP). SWAP species are those species of greatest conservation need not traditionally covered under any federal funded programs. Species are listed in the SWAP because they are rare or designated as at-risk due to knowledge deficiencies; species common in South Carolina but 2 listed rare or declining elsewhere; or species that serve as indicators of detrimental environmental conditions. SCDNR recommends that appropriate measures should be taken to minimize and avoid impacts to all the aforementioned species of concern. The letter also mentions SCDNR comments and BMPs regarding the projects potential impacts to natural resources. A copy of this correspondence is attached.

On July 11, 2019, ECS sent Mr. Mark Caldwell, with the USFWS, an email stating ECS has conducted a preliminary threatened and endangered species determination review for the site. Please note that our services did not include detailed studies for threatened and endangered species. Based on the site visit, available resources concerning Threatened and Endangered Species review, and other desktop review information, ECS does not believe that endangered species are located on site.

On July 11, 2019, ECS received an email response from Mr. Caldwell, with the USFWS, stating that there are no database records of T&E on the site. Mr. Caldwell also stated that Wood Storks could be present during feeding in the pond on the property and along the Stono River banks. He also mentioned that there is an active rookery just over four miles away and Wood Storks travel a long distance to feed. However, Mr. Caldwell does say that ECS still can utilize the option of the clearance letter. Therefore, ECS will visit the www.fws.gov/charleston/regulatory.html and download the Species and Habitat Assessment Clearance letter to serve as the USFWS response on the site request. The Species and Habitat Assessment Clearance Letter – No Effect states that for all sites with potential projects that have no effect or impact on federally protected species or designated critical habitat, no further coordination with the Service is necessary at this time. However, the letter indicated a determination of May Affect but is Not Likely to Adversely Affect the NLEB. The letter states “As a conservation measure for all projects it is recommended that all tree clearing activities be conducted during the NLEB inactive season of November 15 to March 31 of any given year”. A copy of the email correspondence and the USFWS – No Effect letter are included as attachments.

Conclusions

ECS has conducted a preliminary threatened and endangered species determination review for the site. Please note that our services did not include detailed studies for threatened and endangered species.

The site consists of single-family residences, wooded land, and fields. Surrounding properties consist of wooded land, fields, single-family residences, and commercial properties. Based on our knowledge, habitat description, and agency concurrence and correspondence from the USFWS and the SCDNR – HTP, it appears that the proposed action is not likely to adversely affect federally listed endangered or threatened species, their formerly designated critical habitat, or species currently proposed for listing under the Act at the site; however, if wood storks or bald eagles and/or their nests are found within the project area during development and construction activities, please notify ECS in order to properly consult with the U.S. Fish and Wildlife Service before proceeding with construction. Additional assessment is not recommended at this time.

In order to protect aquatic resources, erosion and sedimentation controls should be installed and maintained between the construction side and any nearby downgradient surface waters. In addition, ECS recommends maintaining natural, vegetative buffers on all streams and surface waters on site and adjacent to the project area.

Closure

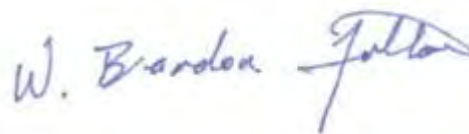
ECS appreciates the opportunity to provide our services to you. Please contact Paul Stephens at (843) 284-7823, or via email at pstephens@ecslimited.com if you questions or require additional information.

Sincerely,

ECS Southeast, LLP



Paul M. Stephens IV, E.I.
Environmental Project Manager



W. Brandon Fulton, LSS, PSC, PWS
Environmental Principal

Attachments: Figure 1 – Site Location Map
 Figure 2 – USGS Topographic Map
 Figure 3 – Aerial Site Map
 Figure 4 – HTP State Listed Species Map
 SCDNR – HTP Letter
 USFWS Email Correspondence
 USFWS Response Letter
 Photographs



Client:

CRESCENT
HOMES

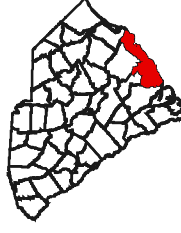
Project:

RIVER ROAD SITE
1389 RIVER ROAD,
JOHNS ISLAND,
CHARLESTON COUNTY
SOUTH CAROLINA

Title:

SITE LOCATION
MAP

CHARLESTON COUNTY



Drawn By:

PMS1

Scale:

1 in = 2,000 ft

Approved By:

WBF

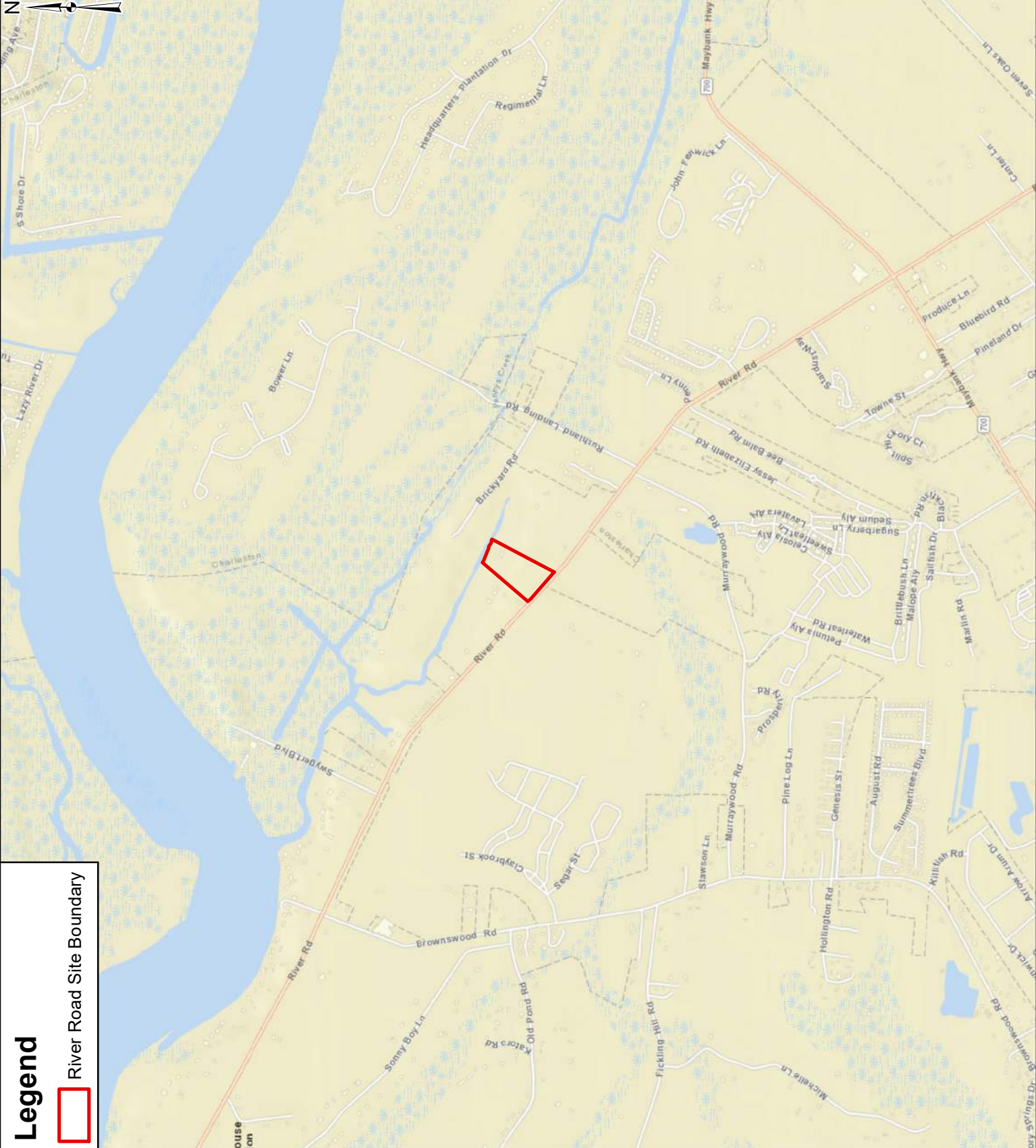
Date:

6/26/2019

ECS Project No.

49: 9588-A

FIGURE 1



Legend

 River Road Site Boundary



Client:

CRESCENT
HOMES

Project:

RIVER ROAD SITE
1389 RIVER ROAD,
JOHNS ISLAND,
CHARLESTON COUNTY
SOUTH CAROLINA

Title:

USGS
TOPOGRAPHIC MAP
JOHNS ISLAND;
DATED: 1979;
LEGAREVILLE;
DATED: 1988
SC QUADRANGLES



Drawn By:

PMS1

Scale:

1 in = 1,000 ft

Date:

6/26/2019

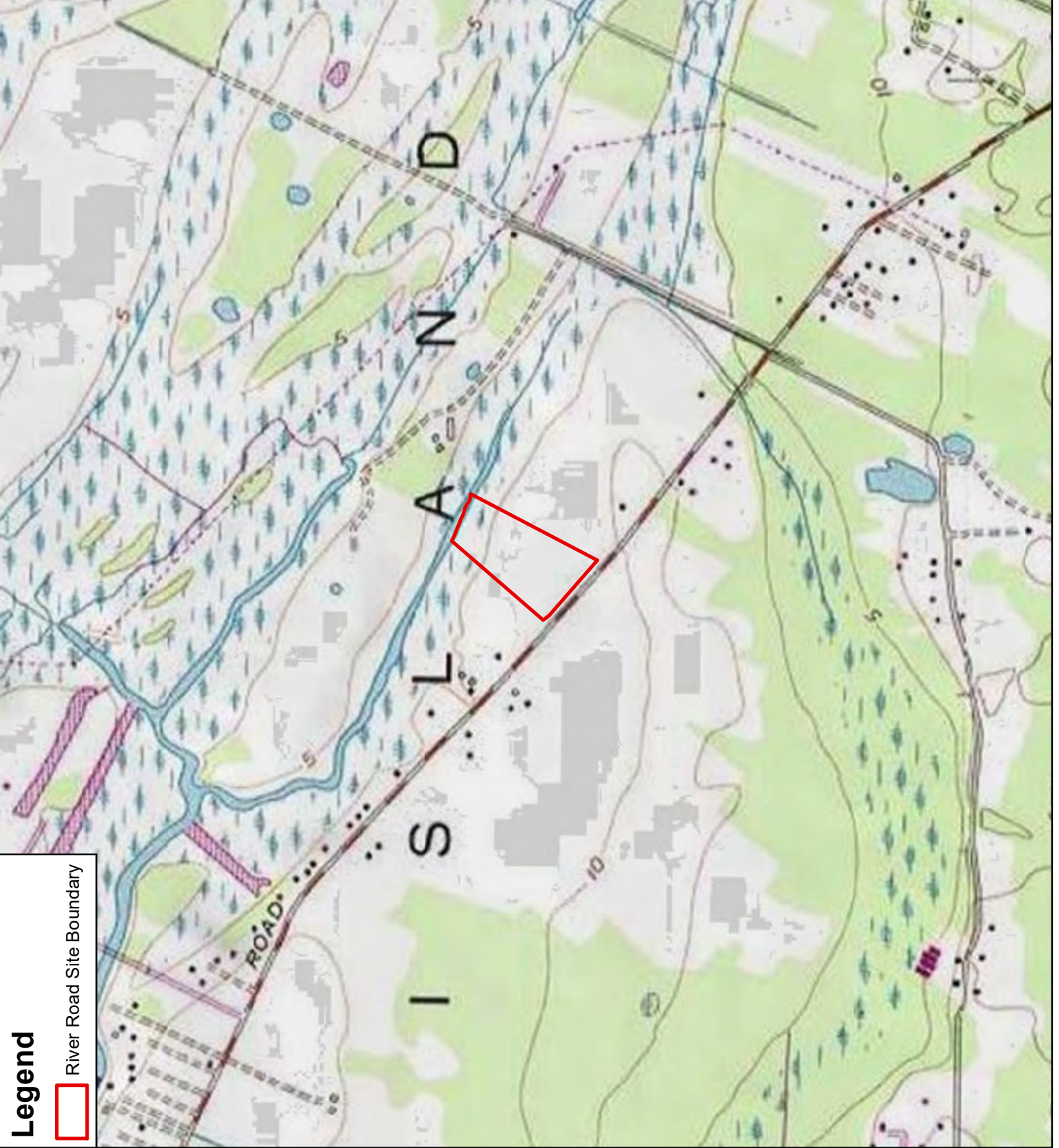
Approved By:

WBF

ECS Project No.

49: 9588-A

FIGURE 2



Legend

 River Road Site Boundary



Client:

CRESCENT
HOMES

Project:

RIVER ROAD SITE
1389 RIVER ROAD,
JOHNS ISLAND,
CHARLESTON COUNTY
SOUTH CAROLINA

Title:

AERIAL SITE MAP



Drawn By:

Scale:

PMS1

1 in = 250 ft

Approved By:

Date:

WBF

6/26/2019

ECS Project No.

49: 9588-A

FIGURE 3



Legend

 River Road Site Boundary

South Carolina Department of Natural Resources



PO Box 167
Columbia, SC 29202
(803) 734-1396
HagertyJ@dnr.sc.gov

Robert H. Boyles, Jr.
Interim Director

Emily C. Cope
Deputy Director for
Wildlife and Freshwater Fisheries

July 26, 2019

Paul Stephens
Environmental Project Manager
ECS Southeast
3820 Faber Place Drive, Suite 200
North Charleston, SC 29405

Electronic submission

Re: Request for Threatened and Endangered Species Consultation
ECS Southeastern Crescent Homes River Road Site Project Charleston County

Mr. Stephens,

The South Carolina Department of Natural Resources has received your request for threatened and endangered species consultation for the proposed ECS Southeast Crescent Homes River Road Site Project in Charleston County (approximately 32.760° N, -80.053° E). According to the provided description, the proposed project will consist of a residential development. Aerial images indicate the existing project site consists of fields, marshland, existing structures and other disturbed areas, and is surrounded by wooded land, waterways, and residential developments.

According to SCDNR data, there are no records of listed threatened and endangered species or designated critical habitat within the project footprint. However, there are known occurrences of species of concern found within 3-miles of the project site, including bald eagle (*Haliaeetus leucocephalus*). Please keep in mind that this information is derived from existing databases and do not assume that it is complete. Areas not yet inventoried may contain significant species or communities.

An active bald eagle nest is known to occur approximately 3 miles north of the project footprint. Surveys to rule out nests in the project area are advised to avoid negative impacts to bald eagle. Bald eagles are a state listed threatened species and are federally protected under the Bald and Golden Eagle Protection Act. If bald eagle nests are found to be within the project area, please consult with the U.S. Fish and Wildlife Service before proceeding with maintenance/construction.

Spotted turtle (*Clemmys guttata*), a state listed threatened species, is also known to exist nearby to the project footprint. This species relies on wetland habitats. If spotted turtle are found within the project footprint, efforts must be made to avoid any negative impacts or 'take' of the species. No spotted turtle can be moved without first obtaining a permit from SCDNR.

Additional species of concern are found within three miles of the project site, including the southern twayblade (*Listera australis*), eastern woodrat (*Neotoma floridana haematoria*), pondspice, (*Litsea aestivalis*), monarch butterfly (*Danaus plexippus*) painted bunting (*Passerina ciris*) and seaside sparrow (*Ammodramus maritimus*). There are also various waterbird colonies found within three miles of the project site. The aforementioned species are designated as having conservation priority as designated through the South Carolina State Wildlife Action Plan (SWAP). SWAP species are those species of greatest conservation need not traditionally covered under any federal funded programs. Species are listed in the SWAP because they are rare or designated as at-risk due to knowledge deficiencies; species common in South Carolina but

listed rare or declining elsewhere; or species that serve as indicators of detrimental environmental conditions. SCDNR recommends that appropriate measures should be taken to minimize or avoid impacts to the aforementioned species of concern.

Review of National Wetland Inventory (NWI) maps and aerial photography indicate that wetlands and/or hydric soils may be present near and on the project area. SCDNR advises that you consult with the U.S. Army Corps of Engineers (www.sac.usace.army.mil/Missions/Regulatory) to determine if jurisdictional wetlands are present and if a permit and mitigation is required for activities impacting these areas. If jurisdictional features are present, SCDNR recommends that developed project plans avoid or minimize impacts where practicable. We recommend vegetative buffers at least 50' wide be maintained between the construction activities and any wetlands and streams.

SCDNR offers the following comments and Best Management Practices (BMPs) regarding this project's potential impacts to natural resources:

- All necessary measures must be taken to prevent oil, tar, trash and other pollutants from entering the adjacent offsite areas/wetlands/water.
- Once the project is initiated, it must be carried to completion in an expeditious manner to minimize the period of disturbance to the environment.
- Upon project completion, all disturbed areas must be permanently stabilized with vegetative cover (preferable), riprap or other erosion control methods as appropriate.
- The project must be in compliance with any applicable floodplain, stormwater, land disturbance, shoreline management guidance or riparian buffer ordinances.
- If clearing must occur, riparian vegetation within wetlands and waters of the U.S. must be conducted manually and low growing, woody vegetation and shrubs must be left intact to maintain bank stability and reduce erosion.
- Construction activities must avoid and minimize, to the greatest extent practicable, disturbance of woody shoreline vegetation within the project area. Removal of vegetation should be limited to only what is necessary for construction of the proposed structures.
- Where necessary to remove vegetation, supplemental plantings should be installed following completion of the project. These plantings should consist of appropriate native species for this ecoregion.
- Your project boundary lies within a coastal county in South Carolina which means you may also need a Coastal Zone Consistency Certification for your project from the SC Department of Health and Environmental Control. For more information, visit <https://www.scdhec.gov/environment/your-water-coast/ocean-coastal-management/beach-management/coastal-permits/coastal-zone>
- If your project could affect coastal waters, tidelands, beaches and beach/dune systems, you may also need a critical area permit from the SC Department of Health and Environmental Control. For more information, visit <https://www.scdhec.gov/environment/your-water-coast/ocean-coastal-management/beach-management/coastal-permits/critical-1>

These technical comments are submitted to speak to the general impacts of the activities as described through inquiry by parties outside the South Carolina Department of Natural Resources. These technical comments are submitted as guidance to be considered and are not submitted as final agency comments that might be related to any unspecified local, state or federal permit, certification or license applications that may be needed by any applicant or their contractors, consultants or agents presently under review or not yet made available for public review. In accordance with its policy 600.01, Comments on Projects Under Department Review, the South Carolina Department of Natural Resources, reserves the right to comment on any permit, certification or license application that may be published by any regulatory agency which may incorporate, directly or by reference, these technical comments.

Interested parties are to understand that SCDNR may provide a final agency position to regulatory agencies if any local, state or federal permit, certification or license applications may be needed by any applicant or their contractors, consultants or agents. For further information regarding comments and input from SCDNR on

your project, please contact our Office of Environmental Programs by emailing environmental@dnr.sc.gov or visiting www.dnr.sc.gov/environmental.

Thank you for the opportunity to review this project and provide comments. Please feel free to contact Joseph Lemeris via email at LemerisJ@dnr.sc.gov or via phone at 803-734-1396 regarding needs for additional information.

Sincerely,

A handwritten signature in black ink, appearing to read "James Hagerty", written in a cursive style.

James Hagerty
Heritage Trust Program
SC Department of Natural Resources

Paul M. Stephens IV, E.I.

From: Mark Caldwell <mark_caldwell@fws.gov>
Sent: Thursday, July 11, 2019 1:30 PM
To: Paul M. Stephens IV, E.I.
Subject: RE: [EXTERNAL] River Road Site - USFWS Request
Attachments: River Road Site USFWS Request Letter.pdf

Follow Up Flag: Follow up
Flag Status: Completed

Paul,

There are no database records of T&E on the site but I would be surprised if there wasn't an occasional wood stork or two seen feeding in the pond on the property or along the Stono River banks. There is an active rookery just over four miles away and they can travel a long distance to feed. I am not saying the storks will be there, but just because you didn't see some during your survey, doesn't mean they are never there. You still have the option of using the clearance letter.

Also, here is our new website <https://www.fws.gov/southeast/charleston/project-planning/>. It has a new look but the same information.

Mark A. Caldwell
Deputy Field Supervisor
U.S. Fish and Wildlife Service
South Carolina Ecological Services
176 Croghan Spur Road, Suite 200
Charleston, SC 29407
843-727-4707 ext 215
843-300-0426 (direct line)
843-727-4218 – facsimile

This email correspondence and any attachments to and from this sender is subject to the Freedom of Information Act and may be disclosed to third parties.

From: Paul M. Stephens IV, E.I. <PStephens@ecslimited.com>
Sent: Thursday, July 11, 2019 1:01 PM
To: mark_caldwell@fws.gov
Cc: Samantha I. Ward <SWard1@ecslimited.com>; Brandon Fulton, LSS, PSC, PWS <BFulton@ecslimited.com>
Subject: [EXTERNAL] River Road Site - USFWS Request

Good Afternoon Mark,

Attached is our Request for Information and Concurrence for the above referenced site. ECS has conducted a preliminary threatened and endangered species determination review for the site. Please note that our services did not include detailed studies for threatened and endangered species. Based on our knowledge, site observations, available resources concerning Threatened and Endangered Species, and other desktop information, ECS does not believe that endangered species are located on site. Threatened and Endangered Species were not observed during the site reconnaissance and ECS does not anticipate impacts to the saltwater and tidal marsh on site. If confirmation or a development plan is needed to confirm for the agencies review, ECS will work with the client to provide. Otherwise, ECS will visit the www.fws.gov/charleston/regulatory.html and download the Species and Habitat Assessment Clearance

letter to serve as the USFWS response on the site request. The Species and Habitat Assessment Clearance Letter – No Effect states that for all sites with potential projects that have no effect or impact on federally protected species or designated critical habitat, no further coordination with the Service is necessary at this time.

If you have any questions or comments, please be sure to let us know.

Thank you and have a great day,

PAUL M. STEPHENS IV, E.I. | Environmental Project Manager

T 843.654.4448 | **D** 843.284.7823 | **C** 843.670.8821

3820 Faber Place Drive, Suite 200 | North Charleston | SC | 29405

ECS SOUTHEAST, LLP

www.ecslimited.com

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This message has been analyzed by Deep Discovery Email Inspector.

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This message has been analyzed by Deep Discovery Email Inspector.



United States Department of the Interior
FISH AND WILDLIFE SERVICE
176 Croghan Spur Road, Suite 200
Charleston, South Carolina 29407
May 30, 2019



U.S. Fish and Wildlife Service Clearance Letter for Species and Habitat Assessments

The U.S. Fish and Wildlife Service (Service) is one of two lead Federal Agencies mandated with the protection and conservation of Federal trust resources, including threatened and endangered (T&E) species and designated critical habitat as listed under the Endangered Species Act of 1973 (16 U.S.C. 1531 *et seq.*) (ESA). Development of lands in South Carolina have the potential to impact federally protected species. Accordingly, obligations under the ESA, National Environmental Policy Act (NEPA), Clean Water Act (CWA), Federal Power Act (FPA), and other laws, require project proponents to perform an environmental impact review prior to performing work on the site. These projects may include a wide variety of activities including, but not limited to, residential or commercial developments, energy production, power transmission, transportation, infrastructure repair, maintenance, or reconstruction of existing facilities on previously developed land.

Project applicants, or their designated representatives, may perform initial species assessments in advance of specific development proposals to determine the presence of T&E species and designated critical habitat that are protected under the ESA. These reviews are purposely speculative and do not include specific project or site development plans. Many of these speculative proposals are for previously developed or disturbed lands such as pasture lands, agricultural fields, or abandoned industrial facilities. Due to historical uses and existing conditions, these sites often do not contain suitable habitat to support T&E species. Therefore, an assessment may conclude that any future development of the site would have no effect to T&E species or adversely modify designated critical habitat. If the applicant, or their designee, determines there is no effect or impact to federally protected species or designated critical habitat, no further action is required under the ESA.

Clearance to Proceed

For all sites with potential projects that have no effect or impact upon federally protected species or designated critical habitat, no further coordination with the Service is necessary at this time. This letter may be downloaded and serve as the Service's concurrence or agreement to the conclusions of the species assessment. Any protected species survey or assessment conducted for the property should be included with this letter when submitting the project to Federal permitting agencies. Due to obligations under the ESA potential impacts must be reconsidered if: (1) new information reveals impacts of this identified action may affect any listed species or critical habitat in a manner not previously considered; (2) this action is subsequently modified in a manner which was not considered in this assessment; or (3) a new species is listed or critical habitat is designated that may be affected by the identified action.

Please note this Clearance Letter applies only to assessments in South Carolina but may not be used to satisfy section 7 requirements for projects that have already been completed or currently under construction.

If suitable habitat for T&E species or designated critical habitat occurs on, or nearby, the project site, a determination of no effect/impact may not be appropriate. In these cases, direct consultation requests with the Service should be initiated. Additional coordination with the Service may also be required if the potential project requires an evaluation under another resource law such as, but not limited to, NEPA, CWA, FPA, and the Coastal Zone Management Act.

Northern Long-eared Bat Consideration

The Service issued a nationwide programmatic biological opinion (PBO) for the northern long-eared bat (*Myotis septentrionalis*, NLEB) on January 5, 2016. The PBO was issued pursuant to section 7(a)(2) of the ESA to address impacts that Federal actions may have on this species. In addition, the Service published a final 4(d) rule on January 14, 2016, which details special consultation provisions for Federal actions that may affect the NLEB. Briefly, the PBO and the 4(d) rule allow for "incidental" take of the NLEB throughout its range under certain conditions. Take is defined in section 3 of the ESA as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Further, incidental take is defined as take that results from, but is not the purpose of, carrying out an otherwise lawful activity. Under the PBO and 4(d) rule, all incidental take of the NLEB is exempted from the ESA's take prohibitions under certain conditions. However, incidental take is prohibited within one quarter mile from known hibernacula and winter roost, or within 150 feet from a known maternity roost tree during the months of June and July.

In consideration of known hibernacula, winter roosts, and maternity roost tree locations in South Carolina, this letter hereby offers blanket concurrence for a may affect, but is not likely to adversely affect determination for the NLEB if the proposed work occurs more than one quarter mile from known hibernacula, winter roosts, or is further than 150 feet from a known maternity roost trees. If an activity falls within one-quarter mile of hibernacula or winter roost or within 150 feet of a maternity roost tree additional consultation with the Service will be required. As a conservation measure for all projects it is recommended that all tree clearing activities be conducted during the NLEB inactive season of November 15th to March 31st of any given year.

The Service appreciates your cooperation in the protection of federally listed species and their habitats in South Carolina.

Sincerely,

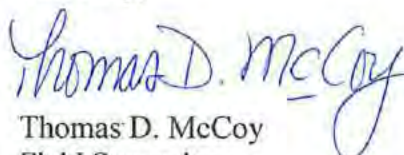

Thomas D. McCoy
Field Supervisor



Photo 1: View along River Road and the southern site boundary, facing north.



Photo 2: View of the dirt access road and the northern portion of the site, facing northeast.



Photo 3: View of the marsh and wetland areas on the northeastern portion of the site, facing northeast.



Photo 4: View of the pier and marsh area located on the northeastern portion of the site, facing northeast.



Photo 5: View of the dirt access road and equipment on the northern portion of the site, facing southwest.



Photo 6: View of the fields located on the southern portion of the site, facing south.



Photo 7: View of the fields located on the southeastern portion of the site, facing east.



Photo 8: View of the single-family residence and equipment located on the northern portion of the site, facing northwest.



Photo 9: View of the fields and equipment located on the western portion of the site, facing southwest.



Photo 10: View of the fields located on the southwestern portion of the site, facing west.



DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, CHARLESTON DISTRICT
69A HAGOOD AVENUE
CHARLESTON, SOUTH CAROLINA 29403-5107

REPLY TO
ATTENTION OF:

NOV 28 2018

Regulatory Division

Ms. Sydni Redmond
Passarella & Associates, Inc.
505 Belle Hall Parkway
Mt. Pleasant, South Carolina 29464

Dear Ms. Redmond:

This letter is in response to your request for an Approved Jurisdictional Determination (AJD) (SAC-2018-01695) received in our office on October 17, 2018, for a 11.50-acre site located on River Road, Charleston County, South Carolina (Latitude: 32.7594 °N, Longitude: - 80.0531 °W). An AJD is used to indicate that this office has identified the presence or absence of wetlands and/or other aquatic resources on a site, including their accurate location(s) and boundaries, as well as their jurisdictional status pursuant to Section 404 of the Clean Water Act (CWA) (33 U.S.C. § 1344) and/or navigable waters of the United States pursuant to Section 10 of the Rivers and Harbors Act of 1899 (RHA) (33 U.S.C. § 403).

The site in question is shown on the enclosed depiction entitled "Figure 7. Aerial with Boundary Coordinates and Features Knapp Parcel" and dated October 4, 2018, prepared by your office. Based on an on-site inspection, a review of aerial photography, topographic maps, National Wetlands Inventory maps, soil survey information, and Wetland Determination Data Forms, this office has determined that the referenced depiction accurately reflects the location and boundaries of the aquatic resources found within the site. The site in question contains 1.92 acres of jurisdictional wetlands that are subject to regulatory jurisdiction under both Section 404 of the CWA and Section 10 of the RHA.

The site in question also contains aquatic resources that are not subject to regulatory jurisdiction under Section 404 of the CWA or Section 10 of the RHA.

Enclosed is a form describing the basis of jurisdiction for the area(s) in question. You should be aware that a Department of the Army (DA) permit from this office may be required for certain activities in the areas identified as subject to regulatory jurisdiction of the Corps of Engineers, and these areas may be subject to restrictions or requirements of other state or local government entities.


If a permit application is forthcoming as a result of this AJD, a copy of this letter, as well as the depiction should be submitted as part of the application. Otherwise, a delay could occur in confirming that an AJD was performed for the proposed permit project area. It should also be noted that some or all of these areas may be regulated by other state or local government entities. Specifically, you are encouraged to contact the South Carolina Department of Health and Environmental Control, Bureau of Water or the Department of Ocean and Coastal Resource Management, to determine the limits of their jurisdiction.

Please be advised that this AJD is valid for five (5) years from the date of this letter unless new information warrants revision before the expiration date. This AJD is an appealable action under the Corps of Engineers administrative appeal procedures defined at 33 CFR Part 331. The administrative appeal options, process and appeals request form is attached for your convenience and use.

This AJD has been conducted pursuant to Corps of Engineers' regulatory authority to identify the limits of Corps of Engineers' jurisdiction for the particular site identified in this request. This AJD may not be valid for the wetland conservation provisions of the Food Security Act of 1985. If you or your tenant are USDA program participants, or anticipate participation in USDA programs, you should request a certified wetland determination from the local office of the Natural Resources Conservation Service, prior to starting work.

In all future correspondence concerning this matter, please refer to file number SAC-2018-01695. A copy of this letter is being forwarded to certain State and/or Federal agencies for their information. If you have any questions concerning this matter, please contact Tyler L. Sgro, Project Manager, at (843) 329-8037.

Sincerely,



Tracy D. Sanders
Biologist

Enclosures:

Approved Jurisdictional Determination Form
Notification of Appeal Options
Figure 7. Aerial with Boundary Coordinates
and Features Knapp Parcel

Copies Furnished:

Mr. Joshua Craig
Levi Grantham, LLC
572 Savannah Hwy
Charleston, South Carolina 29407

South Carolina Department of Health
and Environmental Control
Office of Ocean and Coastal
Resource Management
1362 McMillan Avenue, Suite 400
Charleston, South Carolina 29405

APPROVED JURISDICTIONAL DETERMINATION FORM
U.S. Army Corps of Engineers

NOV 28 2018

This form should be completed by following the instructions provided in Section IV of the JD Form Instructional Guidebook.

SECTION I: BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD):

B. DISTRICT OFFICE, FILE NUMBER, FILE NAME: JD Form 1 of 1; SAC-2018-01695 Knapp Parcel

C. PROJECT LOCATION AND BACKGROUND INFORMATION:

State: South Carolina County/parish/borough: Charleston County City: Charleston

Center coordinates of site (lat/long in degree decimal format): Lat. 32.7594° N, Long. -80.0531° W.

Universal Transverse Mercator:

Name of nearest waterbody: Pennys Creek

Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: Pennys Creek

Name of watershed or Hydrologic Unit Code (HUC): 03050202

Check if map/diagram of review area and/or potential jurisdictional areas is/are available upon request.

Check if other sites (e.g., offsite mitigation sites, disposal sites, etc...) are associated with this action and are recorded on a different JD form.

D. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):

Office (Desk) Determination. Date: November 26, 2018

Field Determination. Date(s):

SECTION II: SUMMARY OF FINDINGS

A. RHA SECTION 10 DETERMINATION OF JURISDICTION.

There Are "navigable waters of the U.S." within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 CFR part 329) in the review area. [Required]

Waters subject to the ebb and flow of the tide.

Waters are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce.

Explain: TNW 1/OCRM Critical Area is a tidally influenced, saltwater march that abuts Pennys Creek. TNW 1 is a navigable water of the U.S., as it is subject to the ebb and flow of the tide.

B. CWA SECTION 404 DETERMINATION OF JURISDICTION.

There Are "waters of the U.S." within Clean Water Act (CWA) jurisdiction (as defined by 33 CFR part 328) in the review area. [Required]

1. Waters of the U.S.

a. Indicate presence of waters of U.S. in review area (check all that apply):¹

TNWs, including territorial seas

Wetlands adjacent to TNWs

Relatively permanent waters² (RPWs) that flow directly or indirectly into TNWs

Non-RPWs that flow directly or indirectly into TNWs

Wetlands directly abutting RPWs that flow directly or indirectly into TNWs

Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs

Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs

Impoundments of jurisdictional waters

Isolated (interstate or intrastate) waters, including isolated wetlands

b. Identify (estimate) size of waters of the U.S. in the review area:

Non-wetland waters: linear feet: width (ft) and/or acres.

Wetlands: TNW 1/OCRM Critical Area: 1.92 acres.

c. Limits (boundaries) of jurisdiction based on: 1987 Delineation Manual, Established by mean (average) high waters.,

Pick List

Elevation of established OHWM (if known):

2. Non-regulated waters/wetlands (check if applicable):³ [Including potentially jurisdictional features that upon assessment are NOT waters or wetlands]

¹ Boxes checked below shall be supported by completing the appropriate sections in Section III below.

² For purposes of this form, an RPW is defined as a tributary that is not a TNW and that typically flows year-round or has continuous flow at least "seasonally" (e.g., typically 3 months).

³ Supporting documentation is presented in Section III.F.

- Potentially jurisdictional waters and/or wetlands were assessed within the review area and determined to be not jurisdictional. Explain: The site contains 2 non-jurisdictional, upland excavated irrigation/ag ponds and 9 upland excavated non-jurisdictional ditches. The 2 non-jurisdictional ponds were wholly excavated out of upland and do not meet the three parameters of a wetland. Based on a review of aerial photographs and onsite photographs, the 9 non-jurisdictional ditches do not appear to contain a bed and bank, nor Ordinary High Water Mark. In addition, these features were excavated wholly out of upland and only drain upland, and therefore, were determined to be non-jurisdictional features.

SECTION III: CWA ANALYSIS

A. TNWs AND WETLANDS ADJACENT TO TNWs

The agencies will assert jurisdiction over TNWs and wetlands adjacent to TNWs. If the aquatic resource is a TNW, complete Section III.A.1 and Section III.D.1. only; if the aquatic resource is a wetland adjacent to a TNW, complete Sections III.A.1 and 2 and Section III.D.1.; otherwise, see Section III.B below.

1. TNW

Identify TNW: TNW 1/OCRM Critical Area - Pennys Creek.

Summarize rationale supporting determination: TNW 1/OCRM Critical Area is a tidally influenced, saltwater marsh that is part of Pennys Creek. Therefore, TNW 1 is a navigable water of the U.S., as it is subject to the ebb and flow of the tide.

2. Wetland adjacent to TNW

Summarize rationale supporting conclusion that wetland is "adjacent":

B. CHARACTERISTICS OF TRIBUTARY (THAT IS NOT A TNW) AND ITS ADJACENT WETLANDS (IF ANY):

This section summarizes information regarding characteristics of the tributary and its adjacent wetlands, if any, and it helps determine whether or not the standards for jurisdiction established under *Rapanos* have been met.

The agencies will assert jurisdiction over non-navigable tributaries of TNWs where the tributaries are "relatively permanent waters" (RPWs), i.e. tributaries that typically flow year-round or have continuous flow at least seasonally (e.g., typically 3 months). A wetland that directly abuts an RPW is also jurisdictional. If the aquatic resource is not a TNW, but has year-round (perennial) flow, skip to Section III.D.2. If the aquatic resource is a wetland directly abutting a tributary with perennial flow, skip to Section III.D.4.

A wetland that is adjacent to but that does not directly abut an RPW requires a significant nexus evaluation. Corps districts and EPA regions will include in the record any available information that documents the existence of a significant nexus between a relatively permanent tributary that is not perennial (and its adjacent wetlands if any) and a traditional navigable water, even though a significant nexus finding is not required as a matter of law.

If the waterbody⁴ is not an RPW, or a wetland directly abutting an RPW, a JD will require additional data to determine if the waterbody has a significant nexus with a TNW. If the tributary has adjacent wetlands, the significant nexus evaluation must consider the tributary in combination with all of its adjacent wetlands. This significant nexus evaluation that combines, for analytical purposes, the tributary and all of its adjacent wetlands is used whether the review area identified in the JD request is the tributary, or its adjacent wetlands, or both. If the JD covers a tributary with adjacent wetlands, complete Section III.B.1 for the tributary, Section III.B.2 for any onsite wetlands, and Section III.B.3 for all wetlands adjacent to that tributary, both onsite and offsite. The determination whether a significant nexus exists is determined in Section III.C below.

1. Characteristics of non-TNWs that flow directly or indirectly into TNW

(i) General Area Conditions:

Watershed size: Pick List ;

Drainage area: Pick List

Average annual rainfall: inches

Average annual snowfall: inches

(ii) Physical Characteristics:

(a) Relationship with TNW:

Tributary flows directly into TNW.

Tributary flows through Pick List tributaries before entering TNW.

⁴ Note that the Instructional Guidebook contains additional information regarding swales, ditches, washes, and erosional features generally and in the arid West.

Project waters are **Pick List** river miles from TNW.
Project waters are **Pick List** river miles from RPW.
Project waters are **Pick List** aerial (straight) miles from TNW.
Project waters are **Pick List** aerial (straight) miles from RPW.
Project waters cross or serve as state boundaries. Explain:

Identify flow route to TNW⁵:
Tributary stream order, if known:

(b) **General Tributary Characteristics (check all that apply):**

Tributary is: Natural
 Artificial (man-made). Explain:
 Manipulated (man-altered). Explain:

Tributary properties with respect to top of bank (estimate):

Average width: feet
Average depth: feet
Average side slopes: **Pick List**.

Primary tributary substrate composition (check all that apply):

Silts Sands Concrete
 Cobbles Gravel Muck
 Bedrock Vegetation. Type/% cover:
 Other. Explain:

Tributary condition/stability [e.g., highly eroding, sloughing banks]. Explain:

Presence of run/riffle/pool complexes. Explain:

Tributary geometry: **Pick List**.

Tributary gradient (approximate average slope): %

(c) **Flow:**

Tributary provides for: **Pick List**

Estimate average number of flow events in review area/year: **Pick List**

Describe flow regime:

Other information on duration and volume:

Surface flow is: **Pick List**. Characteristics:

Subsurface flow: **Pick List**. Explain findings:

Dye (or other) test performed:

Tributary has (check all that apply):

Bed and banks
 OHWM⁶ (check all indicators that apply):
 clear, natural line impressed on the bank the presence of litter and debris
 changes in the character of soil destruction of terrestrial vegetation
 shelving the presence of wrack line
 vegetation matted down, bent, or absent sediment sorting
 leaf litter disturbed or washed away scour
 sediment deposition multiple observed or predicted flow events
 water staining abrupt change in plant community
 other (list):
 Discontinuous OHWM.⁷ Explain:

If factors other than the OHWM were used to determine lateral extent of CWA jurisdiction (check all that apply):

High Tide Line indicated by: Mean High Water Mark indicated by:
 oil or scum line along shore objects survey to available datum;
 fine shell or debris deposits (foreshore) physical markings;
 physical markings/characteristics vegetation lines/changes in vegetation types.
 tidal gauges
 other (list):

⁵ Flow route can be described by identifying, e.g., tributary a, which flows through the review area, to flow into tributary b, which then flows into TNW.

⁶ A natural or man-made discontinuity in the OHWM does not necessarily sever jurisdiction (e.g., where the stream temporarily flows underground, or where the OHWM has been removed by development or agricultural practices). Where there is a break in the OHWM that is unrelated to the waterbody's flow regime (e.g., flow over a rock outcrop or through a culvert), the agencies will look for indicators of flow above and below the break.

⁷ Ibid.

(iii) Chemical Characteristics:

Characterize tributary (e.g., water color is clear, discolored, oily film; water quality; general watershed characteristics, etc.).

Explain:

Identify specific pollutants, if known:

(iv) Biological Characteristics. Channel supports (check all that apply):

Riparian corridor. Characteristics (type, average width):

Wetland fringe. Characteristics:

Habitat for:

Federally Listed species. Explain findings:

Fish/spawn areas. Explain findings:

Other environmentally-sensitive species. Explain findings:

Aquatic/wildlife diversity. Explain findings:

2. Characteristics of wetlands adjacent to non-TNW that flow directly or indirectly into TNW

(i) Physical Characteristics:

(a) General Wetland Characteristics:

Properties:

Wetland size: _____ acres

Wetland type. Explain:

Wetland quality. Explain:

Project wetlands cross or serve as state boundaries. Explain:

(b) General Flow Relationship with Non-TNW:

Flow is: Pick List. Explain:

Surface flow is: Pick List

Characteristics:

Subsurface flow: Pick List. Explain findings:

Dye (or other) test performed:

(c) Wetland Adjacency Determination with Non-TNW:

Directly abutting

Not directly abutting

Discrete wetland hydrologic connection. Explain:

Ecological connection. Explain:

Separated by berm/barrier. Explain:

(d) Proximity (Relationship) to TNW

Project wetlands are Pick List river miles from TNW.

Project waters are Pick List aerial (straight) miles from TNW.

Flow is from: Pick List.

Estimate approximate location of wetland as within the Pick List floodplain.

(ii) Chemical Characteristics:

Characterize wetland system (e.g., water color is clear, brown, oil film on surface; water quality; general watershed characteristics; etc.). Explain:

Identify specific pollutants, if known:

(iii) Biological Characteristics. Wetland supports (check all that apply):

Riparian buffer. Characteristics (type, average width):

Vegetation type/percent cover. Explain:

Habitat for:

Federally Listed species. Explain findings:

Fish/spawn areas. Explain findings:

Other environmentally-sensitive species. Explain findings:

Aquatic/wildlife diversity. Explain findings:

3. Characteristics of all wetlands adjacent to the tributary (if any)

All wetland(s) being considered in the cumulative analysis: Pick List

Approximately () acres in total are being considered in the cumulative analysis.

For each wetland, specify the following:

Directly abuts? (Y/N)	Size (in acres)	Directly abuts? (Y/N)	Size (in acres)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Summarize overall biological, chemical and physical functions being performed:

C. SIGNIFICANT NEXUS DETERMINATION

A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of a TNW. For each of the following situations, a significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or insubstantial effect on the chemical, physical and/or biological integrity of a TNW. Considerations when evaluating significant nexus include, but are not limited to the volume, duration, and frequency of the flow of water in the tributary and its proximity to a TNW, and the functions performed by the tributary and all its adjacent wetlands. It is not appropriate to determine significant nexus based solely on any specific threshold of distance (e.g. between a tributary and its adjacent wetland or between a tributary and the TNW). Similarly, the fact an adjacent wetland lies within or outside of a floodplain is not solely determinative of significant nexus.

Draw connections between the features documented and the effects on the TNW, as identified in the *Rapanos* Guidance and discussed in the Instructional Guidebook. Factors to consider include, for example:

- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to carry pollutants or flood waters to TNWs, or to reduce the amount of pollutants or flood waters reaching a TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), provide habitat and lifecycle support functions for fish and other species, such as feeding, nesting, spawning, or rearing young for species that are present in the TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to transfer nutrients and organic carbon that support downstream foodwebs?
- Does the tributary, in combination with its adjacent wetlands (if any), have other relationships to the physical, chemical, or biological integrity of the TNW?

Note: the above list of considerations is not inclusive and other functions observed or known to occur should be documented below:

1. Significant nexus findings for non-RPW that has no adjacent wetlands and flows directly or indirectly into TNWs. Explain findings of presence or absence of significant nexus below, based on the tributary itself, then go to Section III.D:
2. Significant nexus findings for non-RPW and its adjacent wetlands, where the non-RPW flows directly or indirectly into TNWs. Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:
3. Significant nexus findings for wetlands adjacent to an RPW but that do not directly abut the RPW. Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:

Documentation for the Record only: Significant nexus findings for seasonal RPWs and/or wetlands abutting seasonal RPWs:

D. DETERMINATIONS OF JURISDICTIONAL FINDINGS. THE SUBJECT WATERS/WETLANDS ARE (CHECK ALL THAT APPLY):

1. **TNWs and Adjacent Wetlands.** Check all that apply and provide size estimates in review area:
 - TNWs: linear feet width (ft), Or, TNW 1/OCRM Critical Area: 1.92 acres.
 - Wetlands adjacent to TNWs: acres.
2. **RPWs that flow directly or indirectly into TNWs.**
 - Tributaries of TNWs where tributaries typically flow year-round are jurisdictional. Provide data and rationale indicating that tributary is perennial:

- Tributaries of TNW where tributaries have continuous flow “seasonally” (e.g., typically three months each year) are jurisdictional. Data supporting this conclusion is provided at Section III.B. Provide rationale indicating that tributary flows seasonally:

Provide estimates for jurisdictional waters in the review area (check all that apply):

Tributary waters: linear feet width (ft).

Other non-wetland waters: acres.

Identify type(s) of waters:

3. **Non-RPWs⁸ that flow directly or indirectly into TNWs.**

- Waterbody that is not a TNW or an RPW, but flows directly or indirectly into a TNW, and it has a significant nexus with a TNW is jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional waters within the review area (check all that apply):

Tributary waters: linear feet width (ft).

Other non-wetland waters: acres.

Identify type(s) of waters:

4. **Wetlands directly abutting an RPW that flow directly or indirectly into TNWs.**

- Wetlands directly abut RPW and thus are jurisdictional as adjacent wetlands.

Wetlands directly abutting an RPW where tributaries typically flow year-round. Provide data and rationale indicating that tributary is perennial in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW:

Wetlands directly abutting an RPW where tributaries typically flow “seasonally.” Provide data indicating that tributary is seasonal in Section III.B and rationale in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW:

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

5. **Wetlands adjacent to but not directly abutting an RPW that flow directly or indirectly into TNWs.**

- Wetlands that do not directly abut an RPW, but when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

6. **Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs.**

- Wetlands adjacent to such waters, and have when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional wetlands in the review area: acres.

7. **Impoundments of jurisdictional waters.⁹**

As a general rule, the impoundment of a jurisdictional tributary remains jurisdictional.

- Demonstrate that impoundment was created from “waters of the U.S.,” or
 Demonstrate that water meets the criteria for one of the categories presented above (1-6), or
 Demonstrate that water is isolated with a nexus to commerce (see E below).

Explain:

E. **ISOLATED [INTERSTATE OR INTRA-STATE] WATERS, INCLUDING ISOLATED WETLANDS, THE USE, DEGRADATION OR DESTRUCTION OF WHICH COULD AFFECT INTERSTATE COMMERCE, INCLUDING ANY SUCH WATERS (CHECK ALL THAT APPLY):¹⁰**

- which are or could be used by interstate or foreign travelers for recreational or other purposes.
 from which fish or shellfish are or could be taken and sold in interstate or foreign commerce.
 which are or could be used for industrial purposes by industries in interstate commerce.
 Interstate isolated waters. Explain:
 Other factors. Explain:

⁸See Footnote # 3.

⁹ To complete the analysis refer to the key in Section III.D.6 of the Instructional Guidebook.

¹⁰ Prior to asserting or declining CWA jurisdiction based solely on this category, Corps Districts will elevate the action to Corps and EPA HQ for review consistent with the process described in the Corps/EPA Memorandum Regarding CWA Act Jurisdiction Following Rapanos.

Identify water body and summarize rationale supporting determination:

Provide estimates for jurisdictional waters in the review area (check all that apply):

- Tributary waters: linear feet width (ft).
- Other non-wetland waters: acres.
 Identify type(s) of waters: .
- Wetlands: acres.

F. NON-JURISDICTIONAL WATERS, INCLUDING WETLANDS (CHECK ALL THAT APPLY):

- If potential wetlands were assessed within the review area, these areas did not meet the criteria in the 1987 Corps of Engineers Wetland Delineation Manual and/or appropriate Regional Supplements.
- Review area included isolated waters with no substantial nexus to interstate (or foreign) commerce.
 - Prior to the Jan 2001 Supreme Court decision in "SWANCC," the review area would have been regulated based solely on the "Migratory Bird Rule" (MBR).
- Waters do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction. Explain: .
- Other: (explain, if not covered above): **The site contains 2 non-jurisdictional, upland excavated irrigation/ag ponds and 9 upland excavated non-jurisdictional ditches. The 2 non-jurisdictional ponds were wholly excavated out of upland and do not meet the three parameters of a wetland. Based on a review of aerial photographs and onsite photographs, the 9 non-jurisdictional ditches do not appear to contain a bed and bank, nor Ordinary High Water Mark. In addition, these features were excavated wholly out of upland and only drain upland, and therefore, were determined to be non-jurisdictional features.**

Provide acreage estimates for non-jurisdictional waters in the review area, where the sole potential basis of jurisdiction is the MBR factors (i.e., presence of migratory birds, presence of endangered species, use of water for irrigated agriculture), using best professional judgment (check all that apply):

- Non-wetland waters (i.e., rivers, streams): linear feet width (ft).
- Lakes/ponds: acres.
- Other non-wetland waters: acres. List type of aquatic resource: .
- Wetlands: acres.

Provide acreage estimates for non-jurisdictional waters in the review area that do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction (check all that apply):

- Non-wetland waters (i.e., rivers, streams): linear feet, width (ft).
- Lakes/ponds: acres.
- Other non-wetland waters: acres. List type of aquatic resource: .
- Wetlands: acres.

SECTION IV: DATA SOURCES.

A. SUPPORTING DATA. Data reviewed for JD (check all that apply - checked items shall be included in case file and, where checked and requested, appropriately reference sources below):

- Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: **Figure 7. Aerial with Boundary Coordinates and Features Knapp Parcel.**
- Data sheets prepared/submitted by or on behalf of the applicant/consultant. Office concurs with the conclusions reached by the data sheets/report.
 - Office concurs with data sheets/delineation report.
 - Office does not concur with data sheets/delineation report.
- Data sheets prepared by the Corps:
- Corps navigable waters' study:
- U.S. Geological Survey Hydrologic Atlas:
 - USGS NHD data.
 - USGS 8 and 12 digit HUC maps.
- U.S. Geological Survey map(s). Cite scale & quad name: **USGS Topo Quad - Johns Island.**
- USDA Natural Resources Conservation Service Soil Survey. Citation: **NRCS Soil Survey.**
- National wetlands inventory map(s). Cite name: **USFWS NWI.**
- State/Local wetland inventory map(s):
- FEMA/FIRM maps:
- 100-year Floodplain Elevation is: (National Geodectic Vertical Datum of 1929)
- Photographs: Aerial (Name & Date): .
 or Other (Name & Date): **Site Photographs.**
- Previous determination(s). File no. and date of response letter:
- Applicable/supporting case law:
- Applicable/supporting scientific literature:
- Other information (please specify):

B. ADDITIONAL COMMENTS TO SUPPORT JD: The site contains 1.92 acres of TNW/OCRM Critical Area, as this area is subject to the ebb and flow of the tide. The site also contains 2 non jurisdictional ponds, which were wholly excavated out of uplands, and 9 non-jurisdictional ditches. Only the 1.92 acres of TNW are subject to regulation under Section 10 of the RHA and Section 404 of the CWA. No other features onsite are jurisdictional.

NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND REQUEST FOR APPEAL

Applicant:	File Number:	Date:
Attached is:		See Section below
	INITIAL PROFFERED PERMIT (Standard Permit or Letter of permission)	A
	PROFFERED PERMIT (Standard Permit or Letter of permission)	B
	PERMIT DENIAL	C
	APPROVED JURISDICTIONAL DETERMINATION	D
	PRELIMINARY JURISDICTIONAL DETERMINATION	E

SECTION I - The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at <http://usace.army.mil/inet/functions/cw/cecwo/reg> or Corps regulations at 33 CFR Part 331.

A: INITIAL PROFFERED PERMIT: You may accept or object to the permit.

- **ACCEPT:** If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- **OBJECT:** If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the district engineer. Your objections must be received by the district engineer within 60 days of the date of this notice, or you will forfeit your right to appeal the permit in the future. Upon receipt of your letter, the district engineer will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the district engineer will send you a proffered permit for your reconsideration, as indicated in Section B below.

B: PROFFERED PERMIT: You may accept or appeal the permit

- **ACCEPT:** If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- **APPEAL:** If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

C: PERMIT DENIAL: You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

D: APPROVED JURISDICTIONAL DETERMINATION: You may accept or appeal the approved JD or provide new information.

- **ACCEPT:** You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice, means that you accept the approved JD in its entirety, and waive all rights to appeal the approved JD.
- **APPEAL:** If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the Division Engineer, South Atlantic Division, 60 Forsyth St, SW, Atlanta, GA 30308-8801. This form must be received by the Division Engineer within 60 days of the date of this notice.

E: PRELIMINARY JURISDICTIONAL DETERMINATION: You do not need to respond to the Corps regarding the preliminary JD. The Preliminary JD is **not appealable**. If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also you may provide new information for further consideration by the Corps to reevaluate the JD.

SECTION II - REQUEST FOR APPEAL or OBJECTIONS TO AN INITIAL PROFFERED PERMIT

REASONS FOR APPEAL OR OBJECTIONS: (Describe your reasons for appealing the decision or your objections to an initial proffered permit in clear concise statements. You may attach additional information to this form to clarify where your reasons or objections are addressed in the administrative record.)

ADDITIONAL INFORMATION: The appeal is limited to a review of the administrative record, the Corps memorandum for the record of the appeal conference or meeting, and any supplemental information that the review officer has determined is needed to clarify the administrative record. Neither the appellant nor the Corps may add new information or analyses to the record. However, you may provide additional information to clarify the location of information that is already in the administrative record.

POINT OF CONTACT FOR QUESTIONS OR INFORMATION:

If you have questions regarding this decision and/or the appeal process you may contact the Corps biologist who signed the letter to which this notification is attached. The name and telephone number of this person is given at the end of the letter.

If you only have questions regarding the appeal process you may also contact: Jason W. Steele
Administrative Appeals Review Officer
USACE South Atlantic Division
60 Forsyth St, SW
Atlanta, GA 30308-8801
(404) 562-5137

RIGHT OF ENTRY: Your signature below grants the right of entry to Corps of Engineers personnel, and any government consultants, to conduct investigations of the project site during the course of the appeal process. You will be provided a 15 day notice of any site investigation, and will have the opportunity to participate in all site investigations.

Signature of appellant or agent.

Date: _____

Telephone number: _____

COE JURISDICTIONAL DETERMINATION INFORMATION

PROJECT NAME: KNAPP PARCEL
 APPLICANT: LEVI GRANTHAM, LLC
 572 SAVANNAH HIGHWAY
 CHARLESTON, SOUTH CAROLINA 29407
 COUNTY: CHARLESTON COUNTY
 STATE: SOUTH CAROLINA

PROJECT LOCATION

Upland (9.11 Ac.±)

TNW 1
 OCRM Critical Area
 (1.92 Ac.±)

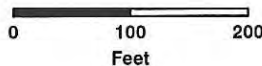
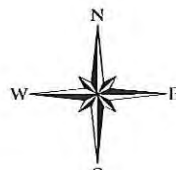
NON-JURISDICTIONAL FEATURES		
MAP No.	Length	Acreage
F-1		0.23 Ac.±
F-2		0.03 Ac.±
F-3	460 Lf.±	0.02 Ac.±
F-4	556 Lf.±	0.04 Ac.±
F-5	640 Lf.±	0.03 Ac.±
F-6	761 Lf.±	0.03 Ac.±
F-7	86 Lf.±	<0.01 Ac.±
F-8	173 Lf.±	0.01 Ac.±
F-9	412 Lf.±	0.03 Ac.±
F-10	416 Lf.±	0.03 Ac.±
F-11	442 Lf.±	0.03 Ac.±
TOTAL	3946 Lf.±	0.48 Ac.±

PROJECT ACREAGE TABLE		
TYPE	ACREAGE	% OF TOTAL
UPLAND	9.10 Ac.±	79.1%
TNW	1.92 Ac.±	16.7%
FEATURES	0.48 Ac.±	4.2%
TOTAL	11.50 Ac.±	100.0%

LEGEND

- KNAPP PARCEL
- NON-JURISDICTIONAL FEATURE
- OCRM CRITICAL LINE
- NON-JURISDICTIONAL FEATURES 1 & 2
- USACE TNW / OCRM CRITICAL AREA

MAP No.	LAT	LONG
1	32.75781947	-80.0534028
2	32.75886483	-80.05478918
3	32.75896745	-80.05488161
4	32.76088806	-80.0528821
5	32.76047385	-80.05171204



NOTES:

AERIAL PHOTOGRAPHS WERE ACQUIRED FROM GOOGLE EARTH WITH AN IMAGERY DATE OF MARCH 8, 2018.

PROPERTY BOUNDARY ESTIMATED FROM THE CHARLESTON COUNTY GIS WEBSITE.

UPLAND/WETLAND LIMITS HAVE NOT BEEN REVIEWED BY ANY REGULATORY AGENCY AND ARE SUBJECT TO CHANGE.

FIGURE 7. AERIAL WITH BOUNDARY COORDINATES AND FEATURES KNAPP PARCEL

DRAWN BY	DATE
D.B.	10/04/18
REVIEWED BY	DATE
S.R.	10/04/18
REVISED	DATE



J:\SOUTH CAROLINA\2018\SC-18CHS297A\GIS\2018\COE_WETLAND_JD\FIGURES\FIGURE_7_AERIAL_WITH_BOUNDARY_COORDINATES_FEATURES.MXD

Traffic Impact Analysis

**Johns Island Development
Johns Island, SC**

Prepared for:
Levi Grantham

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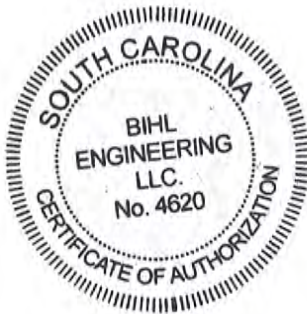
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**Traffic Impact Analysis
Johns Island Development
Johns Island, SC**

**Prepared for:
Levi Grantham**

**Prepared by:
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July 2019

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1.0 Executive Summary

The Johns Island development is proposed to be located on River Road on Johns Island, SC. The development is planned to consist of 39 single-family homes. The development will be accessed via one full access site driveway located on River Road. For the purposes of this Traffic Impact Analysis (TIA) the development is assumed completed in 2022.

For this study the intersections of Maybank Highway at River Road and River Road at Site Driveway were reviewed.

The intersection of Maybank Highway at River Road currently experiences elevated delay, operating at LOS F, during the AM peak hour and operates at LOS D during the PM peak hour. The intersection has recently been improved and additional improvements are planned in the near future to install dual southbound left-turn lanes on River Road and an additional receiving lane on eastbound Maybank Highway. With the planned improvements and signal optimization, the intersection is projected to experience elevated delay, operating at LOS F and LOS E, during the AM and PM peak hours, respectively, in the 2022 No Build conditions and is projected to operate similarly in the Build conditions. Based on the projected 2022 Build traffic volumes, this development is projected to contribute approximately 0.8% and of the total vehicles to the intersection of Maybank Highway at River Road during the AM and PM peak hours.

Based on the analysis, the intersection of River Road at Site Driveway is projected to operate at LOS C during the AM peak hour and to experience elevated delay, operating at LOS E, during the PM peak hour in the 2022 Build conditions. It is not uncommon for stop-controlled side streets and driveways on major streets to experience longer delays during peak hours while the majority of the traffic moving through the corridor typically experiences little or no delay. The westbound queueing exiting the site is projected to be approximately one vehicle during the AM and PM peak hours in the Build conditions.

The intersection of River Road at Site Driveway was further reviewed for consideration of the installation of an exclusive northbound right-turn lane and an exclusive southbound left-turn lane on River Road based on South Carolina Department of Transportation (SCDOT) *Roadway Design Manual* (2017) guidelines and projected intersection volumes. It was found that the AM and PM peak hour conditions did not meet the guidelines for installation of either turn lane on River Road at the intersection of River Road at Site Driveway.

Based on the results of the analysis it is recommended as a part of this project that the driveway location and design (spacing from other driveways, sight distance, geometric details, etc.) should be coordinated with SCDOT and the City of Charleston.

Results in this report are based solely on traffic studies and are considered input into final design considerations. The final design will be determined by the project engineer after other design elements (such as, but not limited to, utilities, stormwater, etc.) are taken into consideration.

2.0 Introduction

The Johns Island development is proposed to be located on River Road on Johns Island, SC. The development is planned to consist of 39 single-family homes. The development will be accessed via one full access site driveway located on River Road. For the purposes of this TIA the development is assumed completed in 2022.

This report presents the trip generation, distribution, traffic analyses, and any recommendations for transportation improvements required to meet anticipated traffic demands.

3.0 Inventory

3.1 Study Area

The study area for the traffic impact analysis includes the existing intersection of Maybank Highway at River Road.

Figure 1 (Appendix) shows the site location and **Figure 2 (Appendix)** shows the project conceptual site plan.

3.2 Existing Conditions

Roadways in the project vicinity include River Road and Maybank Highway.

River Road is a two-lane roadway with a posted speed limit of 45 miles per hour (mph). North of Maybank Highway, River Road (S 54) has a 2018 SCDOT AADT of 8,300 vehicles per day (vpd). South of Maybank Highway River Road (S 91) has a 2018 SCDOT Annual Average Daily Traffic (AADT) of 6,700 vpd. Currently, during the AM peak hour the northbound and southbound approaches on River Road at the intersection of Maybank Highway experience significant queueing. A project is planned in the near future to install dual southbound left-turn lanes on River Road and an additional eastbound receiving lane on Maybank Highway. These improvements were assumed in the future 2022 No Build and Build conditions.

Maybank Highway (SC 700) is a two-lane roadway with a posted speed limit of 45 mph and a 2018 SCDOT AADT of 28,500 vpd east of River Road and 17,000 vpd to the west of River Road. Currently, at the intersection of Maybank Highway at River road experience significant queueing on the eastbound approach during the AM peak hour and some queueing on the westbound approach during the PM peak hour.

Figure 3 (Appendix) shows the existing roadway laneage in the study area.

4.0 Traffic Generation

The trip generation of the proposed development was determined using trip generation rates published in the Institute of Transportation Engineers’ (ITE) *Trip Generation, 10th Edition* (2017).

Table 1 summarizes the peak hour trips associated the proposed development.

Table 1: Trip Generation							
Land Use and Intensity	ITE Land Use Code	AM Peak Hour			PM Peak Hour		
		Total	In	Out	Total	In	Out
39 Single-Family Homes	210	32	8	24	41	26	15
New Trips		32	8	24	41	26	15

Source: ITE *Trip Generation, 10th Edition*

The proposed development is projected to generate 32 trips during the AM peak hour (8 entering and 24 exiting) and 41 trips during the PM peak hour (26 entering and 15 exiting).

5.0 Traffic Distribution

The proposed project traffic was assigned to the surrounding roadway network. The directional distribution and assignment were based on qualitative knowledge of the project area, quantitative application of existing traffic patterns, and expected trip length.

The following general trip distribution was applied to the project trips:

- 55% to/from the east on Maybank Highway
- 15% to/from the west on Maybank Highway
- 10% to/from the south on River Road
- 20% to/from the north on River Road

Figure 4 (Appendix) shows the traffic distribution through the study area.

6.0 Traffic Volumes

6.1 Existing Traffic

Peak hour intersection turning movement counts including vehicular, pedestrian, and heavy vehicle traffic were performed in May 2019 from 7:00 AM to 9:00 AM and from 4:00 PM to 6:00 PM at the intersection of Maybank Highway at River Road.

The turning movement count data is included in the **Appendix** and the AM and PM peak hour existing traffic volumes are shown in **Figure 5 (Appendix)**.

6.2 2022 No Build Traffic

Historic growth is defined as the increase in existing traffic volumes due to usage increases and non-specific growth throughout the area. Based on historic daily traffic trends, a 4.5% per year growth rate was applied for this analysis.

The 2022 No Build traffic volumes include existing traffic grown to the buildout year. **Figure 6 (Appendix)** and **Figure 7 (Appendix)** show the 2022 No Build AM and PM peak hour traffic volumes, respectively.

6.3 Project Traffic

The AM peak hour and PM peak hour projected project trips were assigned based on the trip distribution discussed in **Section 5**.

6.4 2022 Build Traffic

The 2022 total traffic volumes include the 2022 background traffic and the proposed development traffic at buildout. The 2022 AM and PM peak hour total traffic volumes are shown in **Figure 6 (Appendix)** and **Figure 7 (Appendix)**, respectively.

Intersection volume development worksheets are included in the **Appendix**.

7.0 Capacity Analysis

Capacity analyses were performed for the AM and PM peak hours for the Existing, 2022 No Build and 2022 Build conditions using the Synchro Version 10 software to determine the operating characteristics of the adjacent roadway network and the impacts of the proposed project. The analyses were conducted with methodologies contained in the *2010 Highway Capacity Manual* (Transportation Research Board, December 2010).

Capacity of an intersection is defined as the maximum number of vehicles that can pass through an intersection during a specified time, typically an hour. Capacity is described by level of service (LOS) for the operating characteristics of an intersection. LOS is a qualitative measure that describes operational conditions and motorist perceptions within a traffic stream. The *Highway Capacity Manual* defines six levels of service, LOS A through LOS F, with A being the best and F being the worst.

LOS for signalized intersections is determined by the overall intersection operations and is reflected in average delay per vehicle. LOS D or better is typically considered acceptable for signalized intersections.

LOS for a two-way, stop-controlled intersection is determined by the delay of the poorest performing minor approach, as LOS is not defined for two-way, stop-controlled intersections as a whole. It is typical for stop-controlled side streets and driveways on major streets to experience longer delays during peak hours while the majority of the traffic moving through the corridor typically experiences little or no delay.

Capacity analyses were performed for the Existing, 2022 No Build, and 2022 Build AM and PM peak hour traffic conditions for the following intersections:

- Maybank Highway at River Road (signalized)
- River Road at Site Driveway (unsignalized, Build conditions only)

Existing signal timings were applied to the signalized intersection. It was assumed that the intersection traffic signal timings of Maybank Highway at River Road would be updated with the area roadway network changes. Therefore, the 2022 No Build traffic signal timings were optimized in the analysis and applied in the 2022 Build analysis.

Results in this report are based solely on traffic studies and are considered input into final design considerations. The final design will be determined by the project engineer after other design elements (such as, but not limited to, utilities, stormwater, etc.) are taken into consideration.

Table 2 summarizes LOS and control delay (average seconds of delay per vehicle) for the projected Existing, 2022 No Build, and 2022 Build AM and PM peak hour conditions at the study area intersections.

Table 2: Level of Service and Delay (average seconds of delay per vehicle) Summary							
Intersection	Traffic Control ¹	Existing Conditions		2022 No Build Conditions		2022 Build Conditions	
		AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
Maybank Highway at River Road	S	F (100.5)	D (46.3)	F (129.3) ^{3,4}	E (63.2) ^{3,4}	F (131.3) ⁴	E (64.2) ⁴
River Road at Site Driveway	U	N/A ²	N/A ²	N/A ²	N/A ²	C (24.1) – WB	E (41.2) – WB

1. S = Signalized, U = Unsignalized
2. N/A = Not Applicable
3. Includes signal optimization
4. Includes southbound left-turn lane improvements and additional eastbound receiving lane on Maybank Highway

7.1 Maybank Highway at River Road

As shown in **Table 2**, the signalized intersection of Maybank Highway at River Road currently experiences elevated delay, operating at LOS F, during the AM peak hour and operates at LOS D during the PM peak hour. Currently the intersection experiences significant queuing on the northbound, southbound, and eastbound approaches during the AM peak hour and some queuing on the westbound approach during the PM peak hour.

As discussed in **Section 3.2**, planned improvements to the intersection of Maybank Highway at River Road include installation of a dual southbound left-turn lane on River Road and an additional eastbound receiving lane on Maybank Highway. These improvements were applied in the 2022 No Build and Build conditions. In addition, the signal timings were optimized in the 2022 No Build conditions and applied in the 2022 Build conditions. With the improvements the intersection is projected to continue to experience elevated delay, operating at LOS F and LOS E, during the AM and PM peak hours, respectively, in the 2022 No Build conditions. The intersection is projected to continue to operate similarly in the 2022 Build conditions. Based on the projected 2022 Build traffic volumes, this development is projected to contribute approximately 0.8% and of the total vehicles to the intersection of Maybank Highway at River Road during the AM and PM peak hours.

7.2 River Road at Site Driveway

The intersection of River Road at Site Driveway was reviewed for consideration of the installation of an exclusive northbound right-turn lane and an exclusive southbound left-turn lane on River Road based on SCDOT *Design Manual* guidelines and projected intersection volumes. It was found that the AM and PM peak hour conditions did not meet the guidelines for installation of an exclusive northbound right-turn lane or an exclusive southbound left-turn lane on River Road at the intersection of River Road at Site Driveway. The worksheets are included in the **Appendix**. It is recommended that the driveway location and design (spacing from other driveways, sight distance, geometric details, etc.) should be coordinated with SCDOT and the City of Charleston.

As shown in **Table 2**, the intersection of Maybank Highway at Site Driveway is projected to operate at LOS C during the AM peak hour and to experience elevated delay, operating at LOS E, during the PM peak hour in the 2022 Build conditions. The maximum westbound queue of vehicles exiting the site is projected to be approximately one vehicle during the AM and PM peak hours in the 2022 Build conditions. It is typical for stop-controlled side streets and driveways on major streets to experience longer delays during peak hours while the majority of the traffic moving through the corridor typically experiences little or no delay.

8.0 Conclusion

The Johns Island development is proposed to be located on River Road on Johns Island, SC. The development is planned to consist of 39 single-family homes. The development will be accessed via one

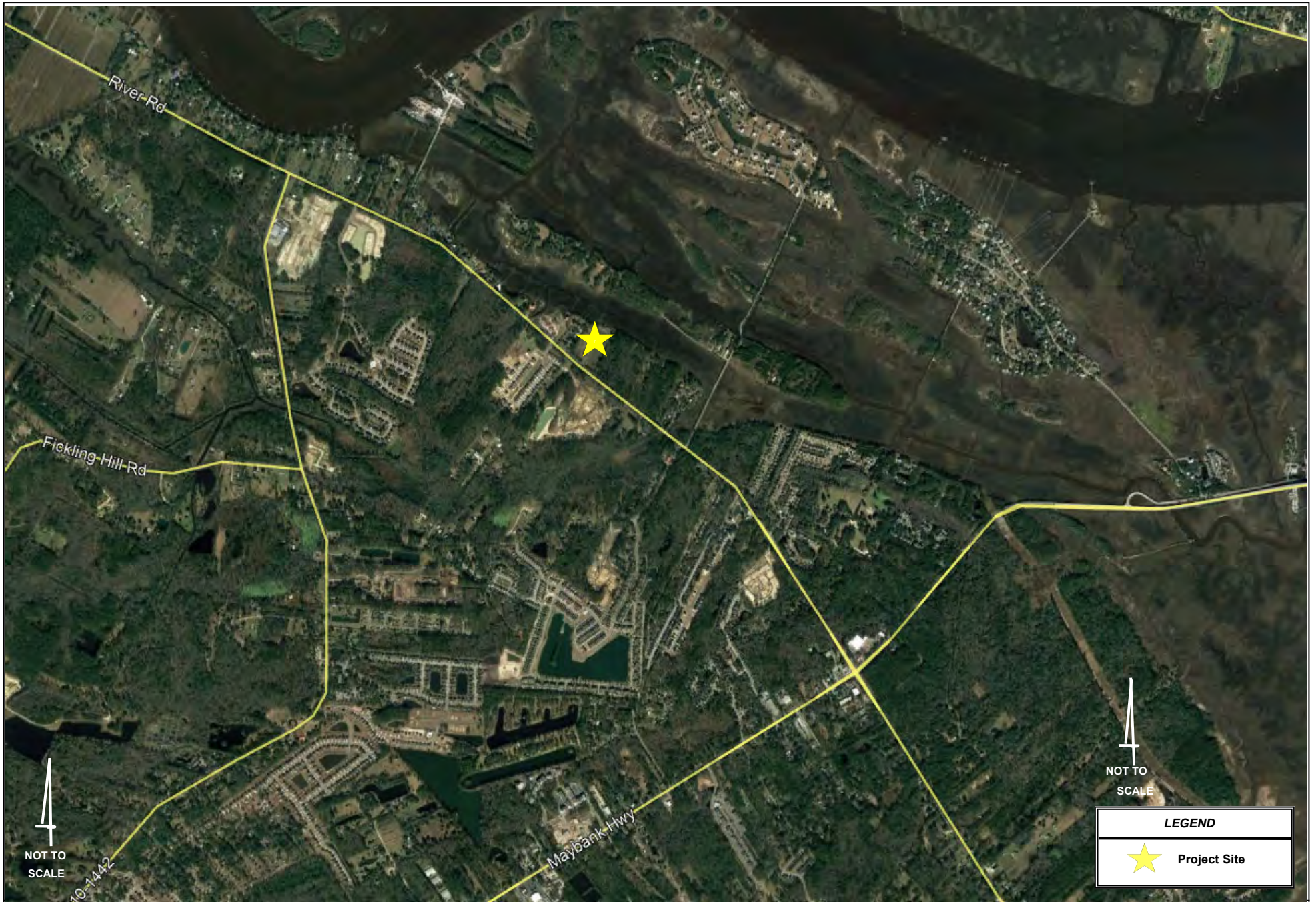
full-access site driveway located on River Road. For the purposes of this TIA the development is assumed completed in 2022.

The existing study area intersection currently experience elevated delay during the AM peak hour. Planned background transportation improvements were included in the 2022 No Build and Build analysis. With the improvements the existing intersection is projected to continue to experience elevated delay in the No Build conditions and is projected to operate similarly in the Build conditions. The unsignalized intersection of River Road at Site Driveway is projected to experience elevated delay during the evening peak hour. It is typical for stop-controlled side streets and driveways on major streets to experience longer delays during peak hours while the majority of the traffic moving through the corridor typically experiences little or no delay.

Based on the results of the analysis it is recommended as a part of this project that the driveway location and design (spacing from other driveways, sight distance, geometric details, etc.) should be coordinated with SCDOT and the City of Charleston.

Results in this report are based solely on traffic studies and are considered input into final design considerations. The final design will be determined by the project engineer after other design elements (such as, but not limited to, utilities, stormwater, etc.) are taken into consideration.

Appendix



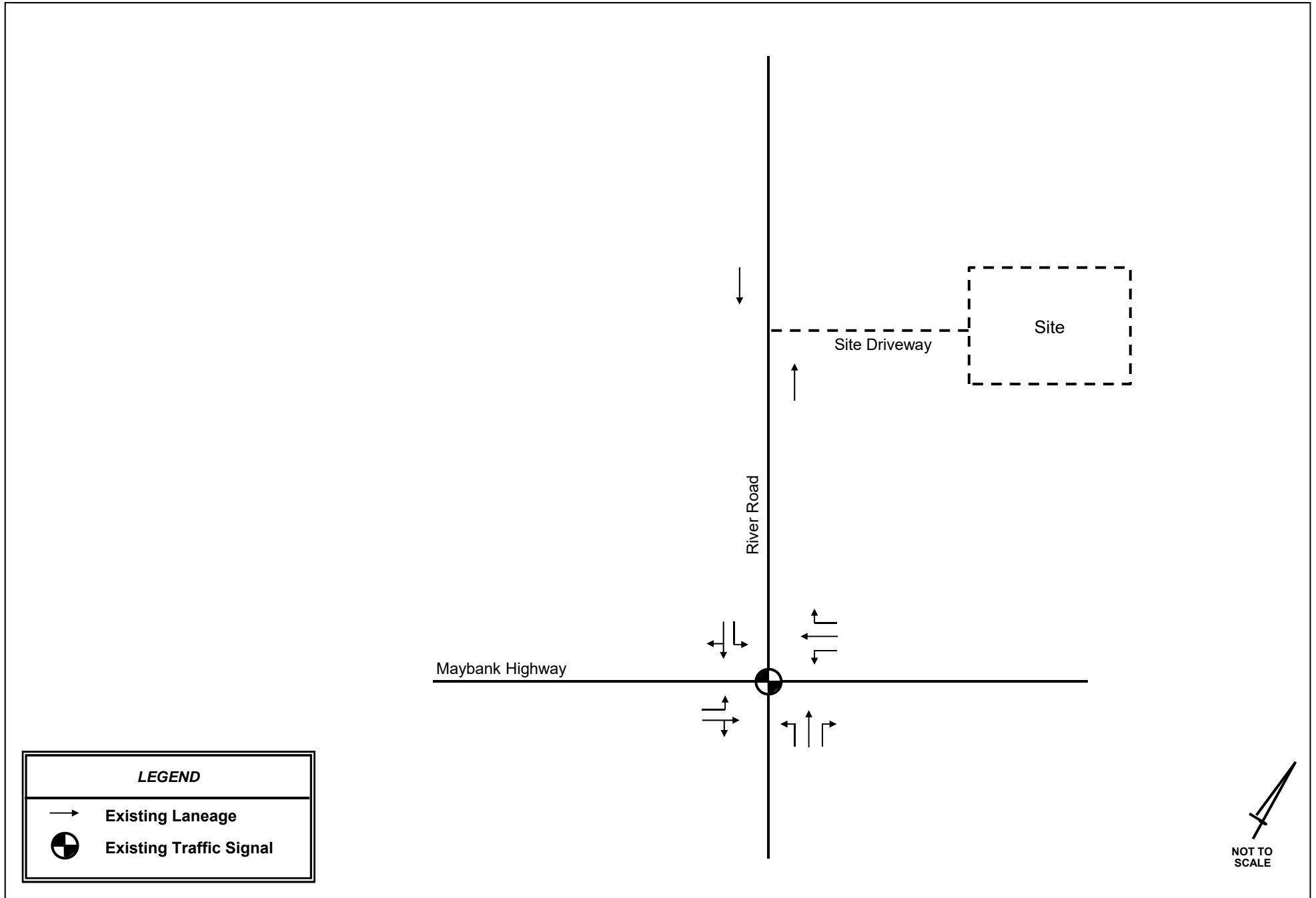


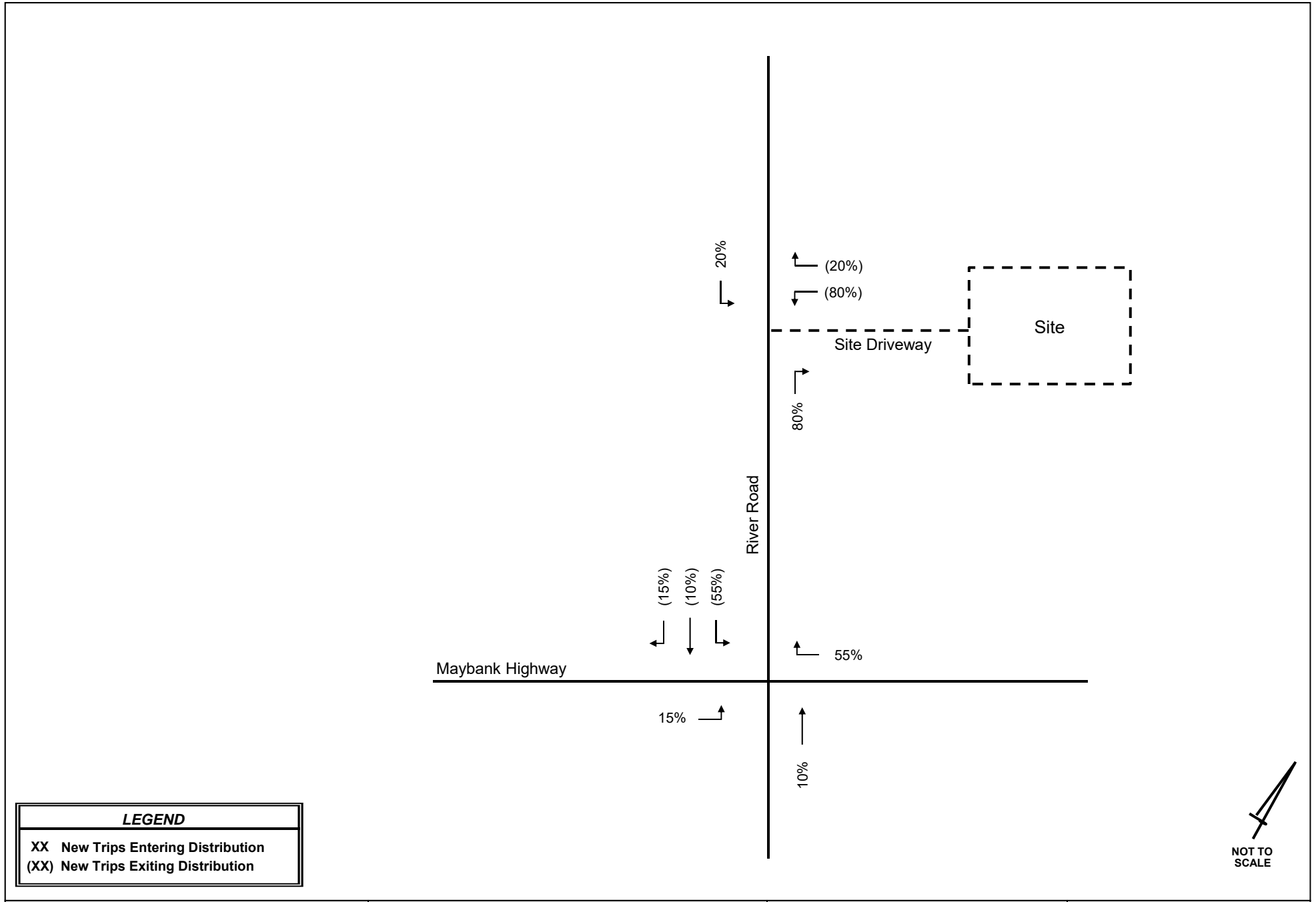
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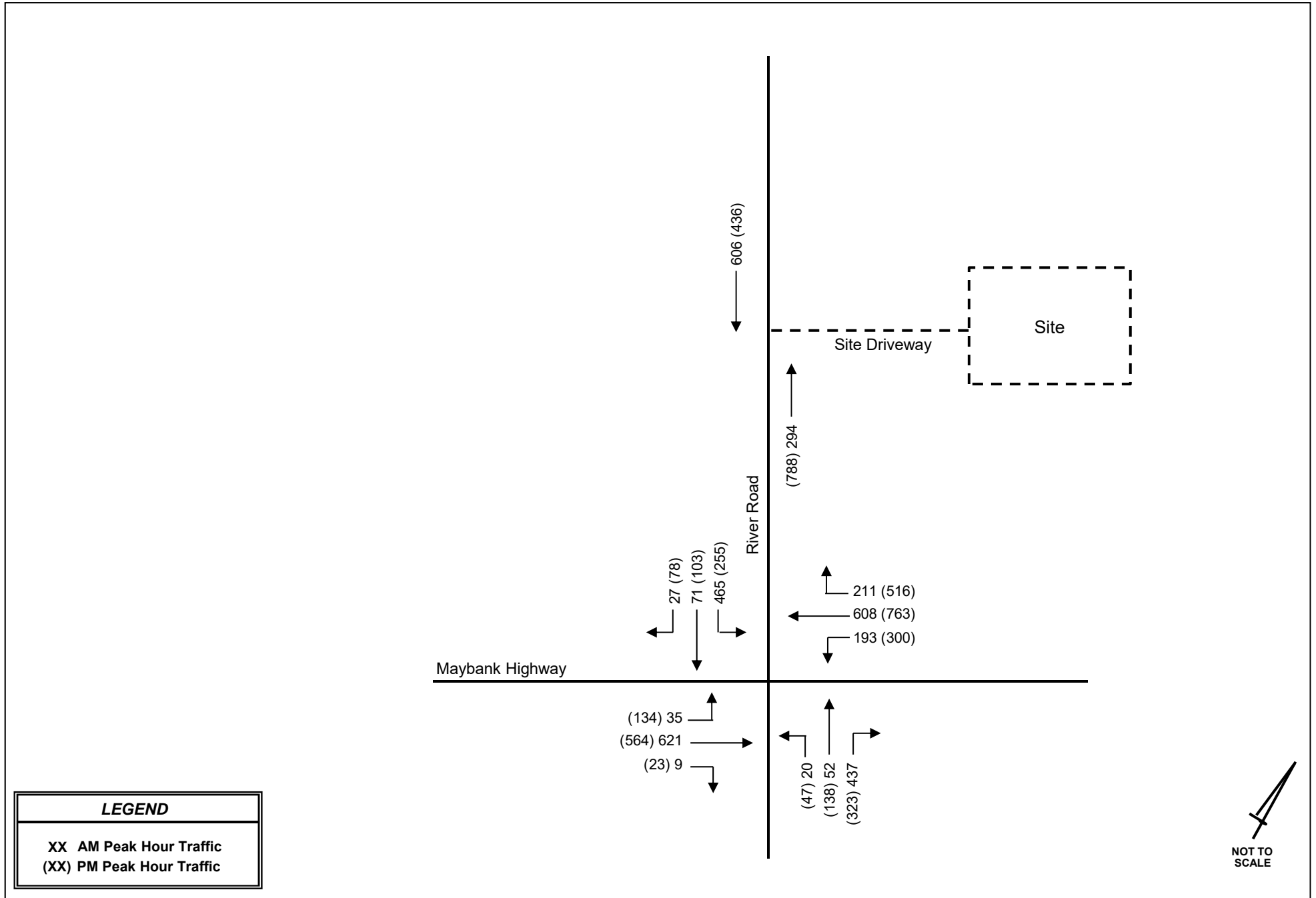
Johns Island Development
Traffic Impact Analysis

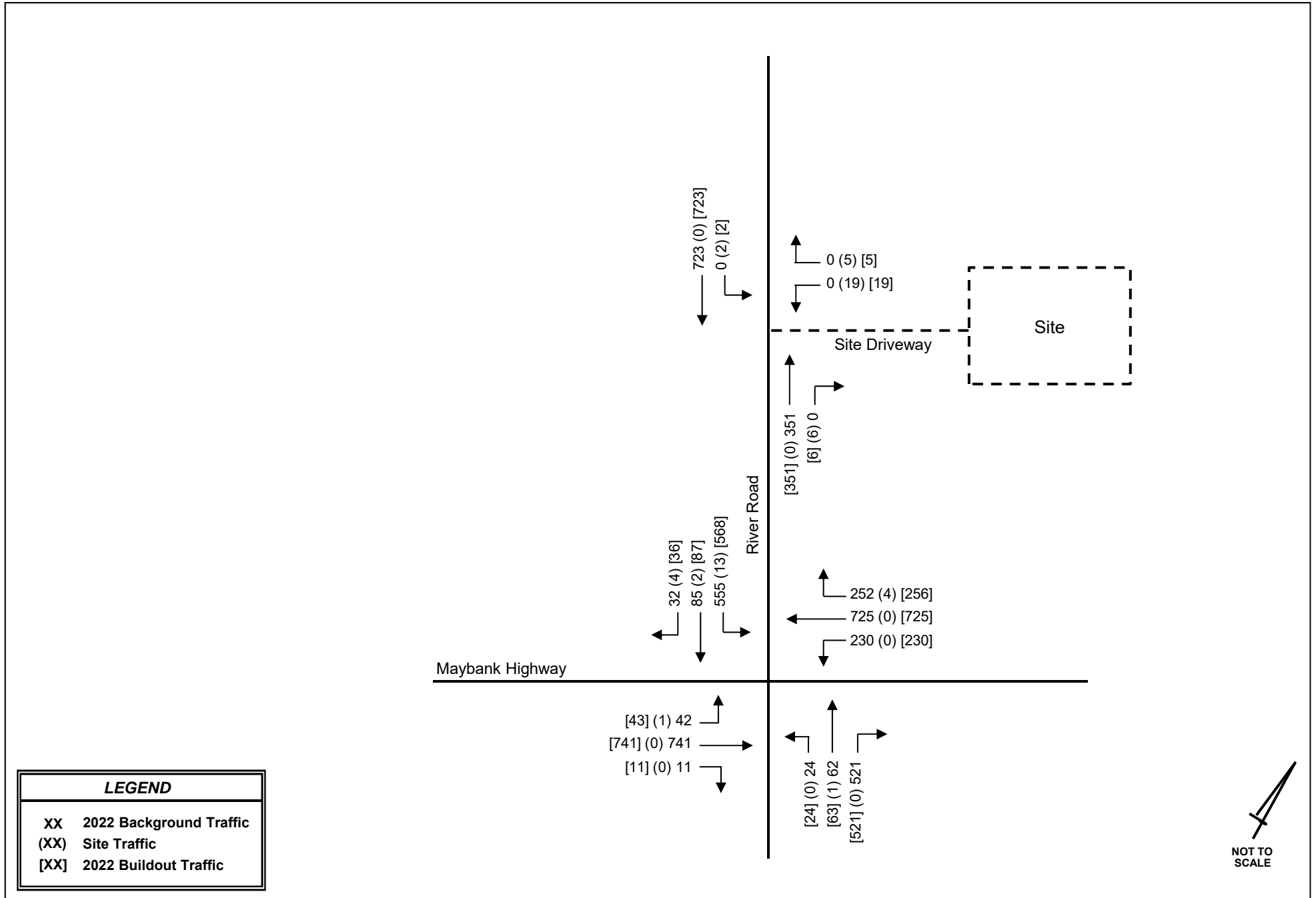
Site Plan

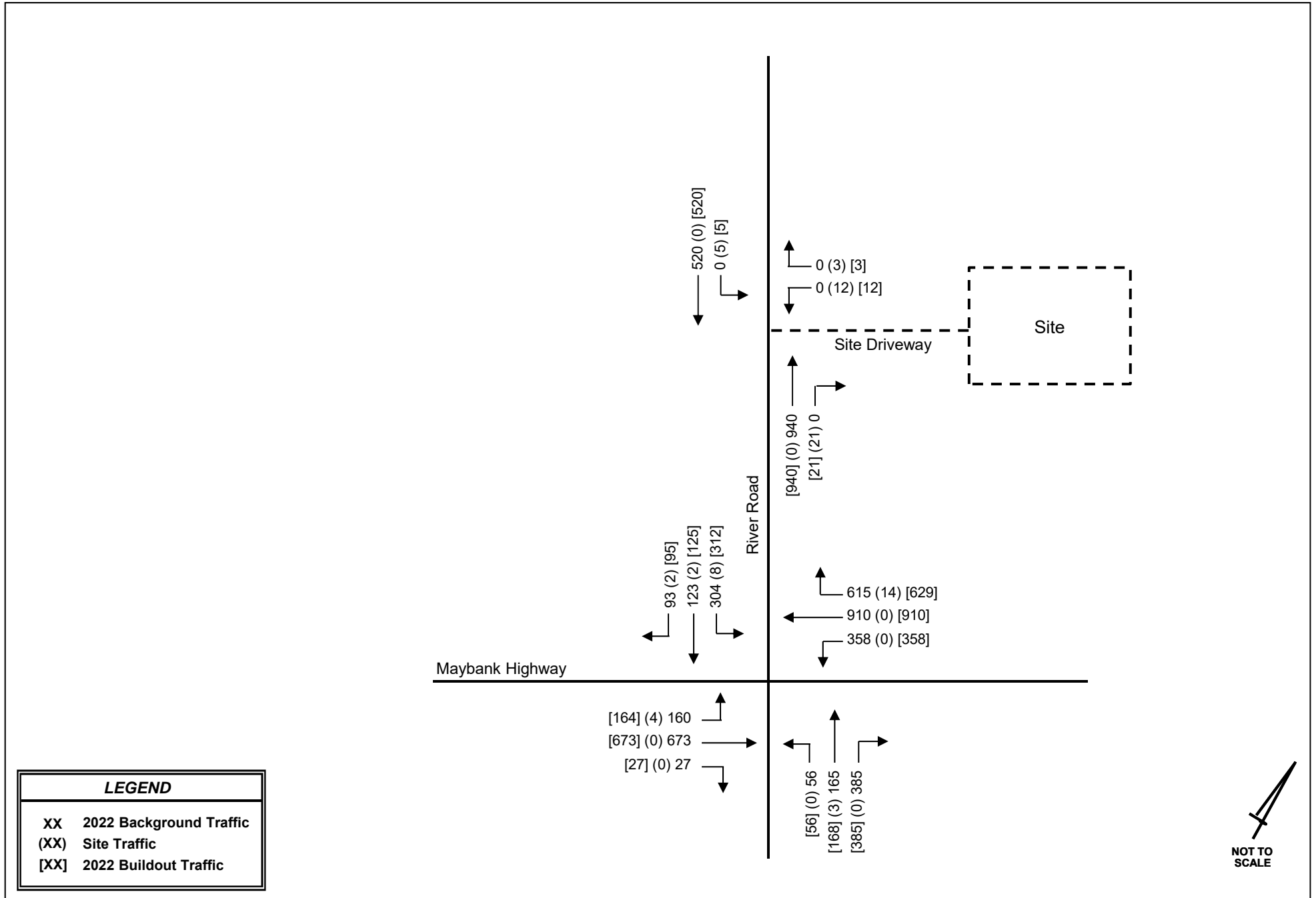
Figure 2











Short Counts

File Name : Maybank Hwy @ River Rd

Site Code :

Start Date : 5/21/2019

Page No : 1

Groups Printed- Passenger Vehicles - Heavy Vehicles - Buses

Start Time	River Rd From North				Maybank Hwy From East				River Rd From South				Maybank Hwy From West				Int. Total
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	
07:00 AM	110	11	6	0	36	137	37	0	1	11	104	0	6	194	0	1	654
07:15 AM	154	18	7	0	50	118	45	0	4	7	110	0	7	148	1	0	669
07:30 AM	106	14	8	0	52	168	40	0	6	11	125	0	11	163	0	0	704
07:45 AM	116	11	7	0	49	151	66	0	3	12	93	0	8	171	1	0	688
Total	486	54	28	0	187	574	188	0	14	41	432	0	32	676	2	1	2715
08:00 AM	132	27	6	0	41	129	56	0	3	21	115	0	10	120	4	0	664
08:15 AM	111	19	6	0	51	160	49	0	8	8	104	0	6	167	4	0	693
08:30 AM	121	26	12	0	49	141	32	0	5	5	90	0	5	161	3	0	650
08:45 AM	125	15	12	0	51	130	39	0	10	22	94	0	19	131	4	0	652
Total	489	87	36	0	192	560	176	0	26	56	403	0	40	579	15	0	2659
04:00 PM	67	24	29	0	64	180	96	0	10	34	89	0	26	132	6	0	757
04:15 PM	56	32	19	0	65	192	102	0	12	34	65	0	20	156	7	0	760
04:30 PM	65	26	21	0	78	181	132	0	13	30	85	0	31	147	5	0	814
04:45 PM	56	28	14	0	80	197	112	0	14	39	83	0	37	141	6	0	807
Total	244	110	83	0	287	750	442	0	49	137	322	0	114	576	24	0	3138
05:00 PM	74	26	22	0	81	173	143	0	11	34	71	0	49	128	4	0	816
05:15 PM	60	23	21	0	61	212	129	0	9	35	84	0	17	148	8	0	807
05:30 PM	59	23	21	0	69	209	118	0	8	25	73	0	23	137	4	0	769
05:45 PM	45	25	27	0	82	189	103	0	9	28	57	0	23	108	8	0	704
Total	238	97	91	0	293	783	493	0	37	122	285	0	112	521	24	0	3096
Grand Total	1457	348	238	0	959	2667	1299	0	126	356	1442	0	298	2352	65	1	11608
Apprch %	71.3	17	11.6	0	19.5	54.2	26.4	0	6.5	18.5	74.9	0	11	86.6	2.4	0	
Total %	12.6	3	2.1	0	8.3	23	11.2	0	1.1	3.1	12.4	0	2.6	20.3	0.6	0	
Passenger Vehicles	1430	335	237	0	931	2628	1268	0	123	342	1414	0	292	2330	62	1	11393
% Passenger Vehicles	98.1	96.3	99.6	0	97.1	98.5	97.6	0	97.6	96.1	98.1	0	98	99.1	95.4	100	98.1
Heavy Vehicles	25	12	1	0	26	26	29	0	3	14	25	0	6	22	1	0	190
% Heavy Vehicles	1.7	3.4	0.4	0	2.7	1	2.2	0	2.4	3.9	1.7	0	2	0.9	1.5	0	1.6
Buses	2	1	0	0	2	13	2	0	0	0	3	0	0	0	2	0	25
% Buses	0.1	0.3	0	0	0.2	0.5	0.2	0	0	0	0.2	0	0	0	3.1	0	0.2

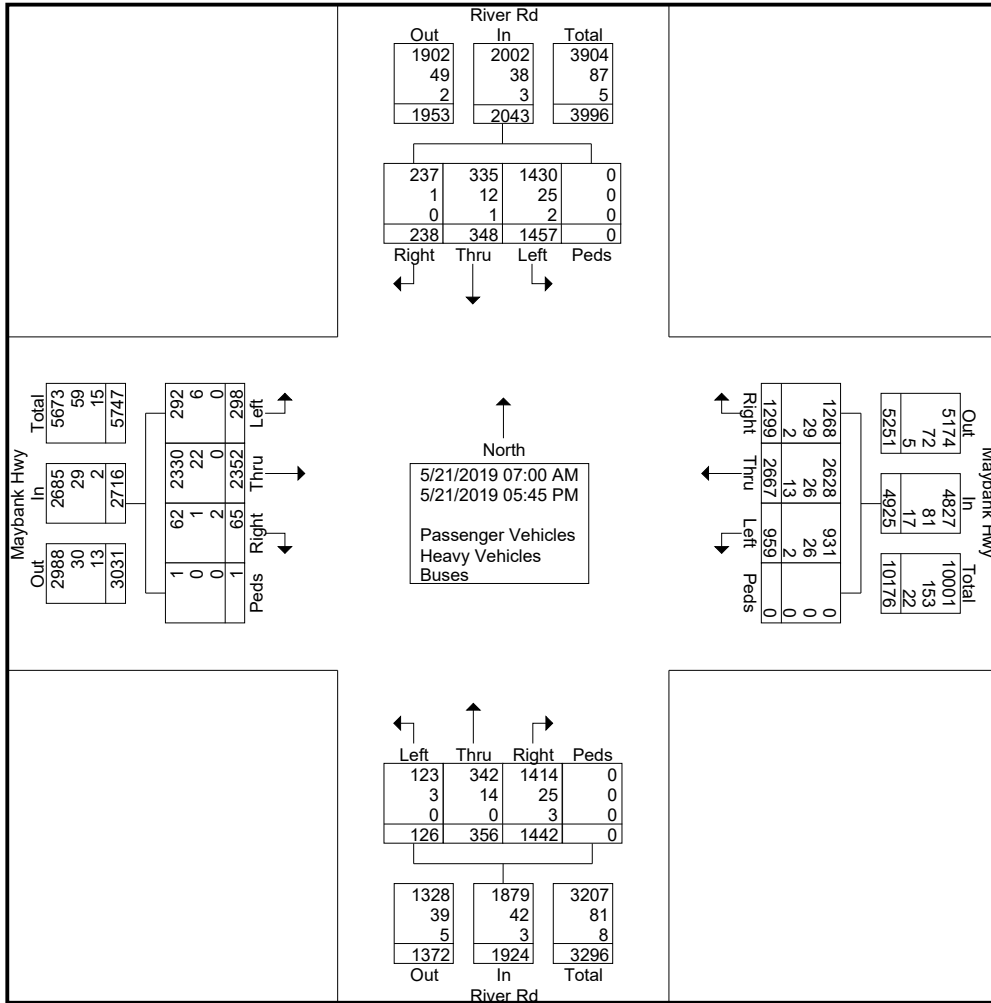
Short Counts

File Name : Maybank Hwy @ River Rd

Site Code :

Start Date : 5/21/2019

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Short Counts

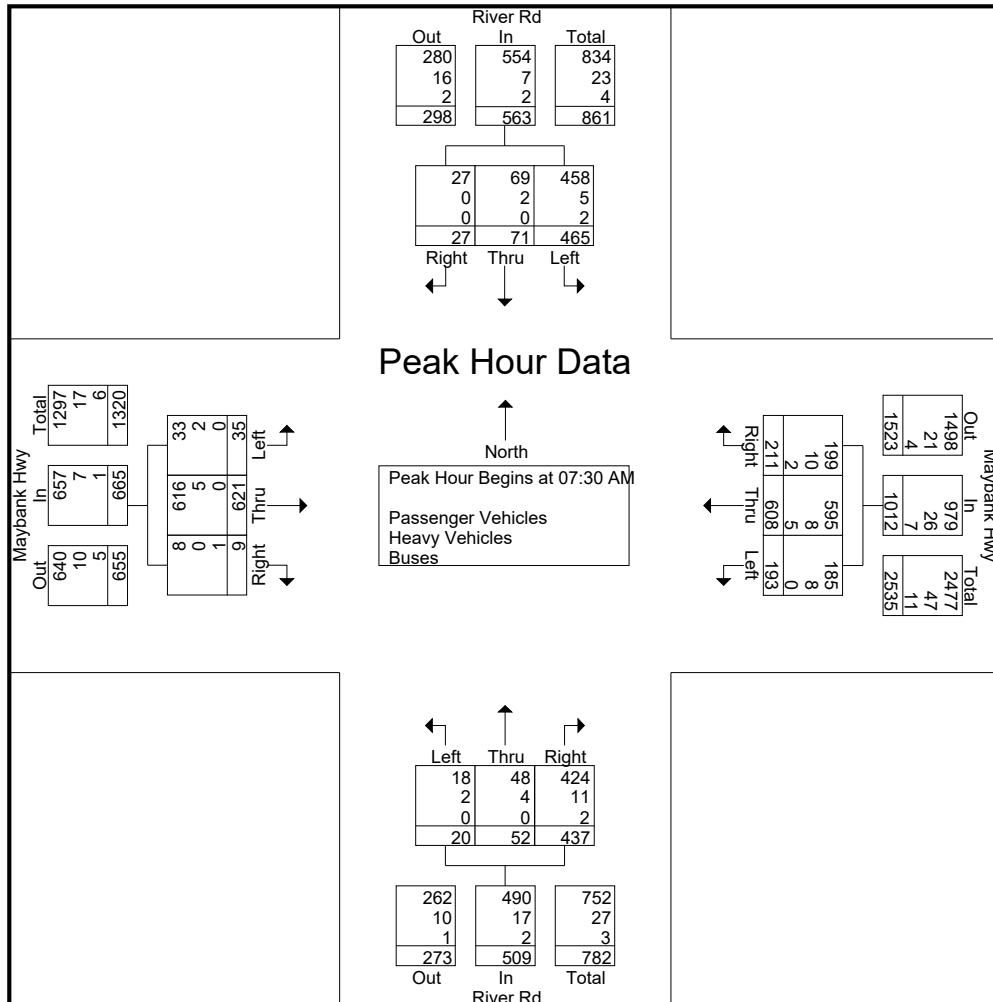
File Name : Maybank Hwy @ River Rd

Site Code :

Start Date : 5/21/2019

Page No : 3

Start Time	River Rd From North				Maybank Hwy From East				River Rd From South				Maybank Hwy From West				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	106	14	8	128	52	168	40	260	6	11	125	142	11	163	0	174	704
07:45 AM	116	11	7	134	49	151	66	266	3	12	93	108	8	171	1	180	688
08:00 AM	132	27	6	165	41	129	56	226	3	21	115	139	10	120	4	134	664
08:15 AM	111	19	6	136	51	160	49	260	8	8	104	120	6	167	4	177	693
Total Volume	465	71	27	563	193	608	211	1012	20	52	437	509	35	621	9	665	2749
% App. Total	82.6	12.6	4.8		19.1	60.1	20.8		3.9	10.2	85.9		5.3	93.4	1.4		
PHF	.881	.657	.844	.853	.928	.905	.799	.951	.625	.619	.874	.896	.795	.908	.563	.924	.976
Passenger Vehicles	458	69	27	554	185	595	199	979	18	48	424	490	33	616	8	657	2680
% Passenger Vehicles	98.5	97.2	100	98.4	95.9	97.9	94.3	96.7	90.0	92.3	97.0	96.3	94.3	99.2	88.9	98.8	97.5
Heavy Vehicles	5	2	0	7	8	8	10	26	2	4	11	17	2	5	0	7	57
% Heavy Vehicles	1.1	2.8	0	1.2	4.1	1.3	4.7	2.6	10.0	7.7	2.5	3.3	5.7	0.8	0	1.1	2.1
Buses	2	0	0	2	0	5	2	7	0	0	2	2	0	0	1	1	12
% Buses	0.4	0	0	0.4	0	0.8	0.9	0.7	0	0	0.5	0.4	0	0	11.1	0.2	0.4



Short Counts

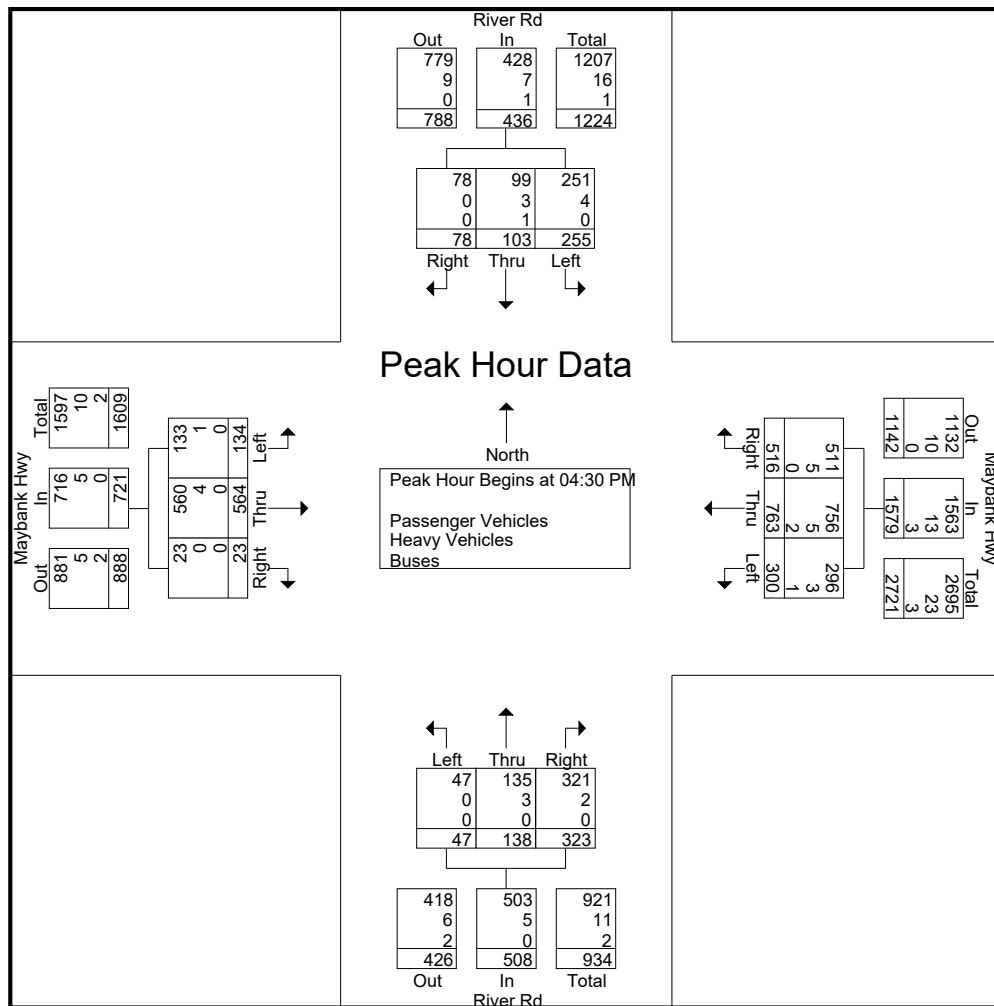
File Name : Maybank Hwy @ River Rd

Site Code :

Start Date : 5/21/2019

Page No : 4

Start Time	River Rd From North				Maybank Hwy From East				River Rd From South				Maybank Hwy From West				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	65	26	21	112	78	181	132	391	13	30	85	128	31	147	5	183	814
04:45 PM	56	28	14	98	80	197	112	389	14	39	83	136	37	141	6	184	807
05:00 PM	74	26	22	122	81	173	143	397	11	34	71	116	49	128	4	181	816
05:15 PM	60	23	21	104	61	212	129	402	9	35	84	128	17	148	8	173	807
Total Volume	255	103	78	436	300	763	516	1579	47	138	323	508	134	564	23	721	3244
% App. Total	58.5	23.6	17.9		19	48.3	32.7		9.3	27.2	63.6		18.6	78.2	3.2		
PHF	.861	.920	.886	.893	.926	.900	.902	.982	.839	.885	.950	.934	.684	.953	.719	.980	.994
Passenger Vehicles	251	99	78	428	296	756	511	1563	47	135	321	503	133	560	23	716	3210
% Passenger Vehicles	98.4	96.1	100	98.2	98.7	99.1	99.0	99.0	100	97.8	99.4	99.0	99.3	99.3	100	99.3	99.0
Heavy Vehicles	4	3	0	7	3	5	5	13	0	3	2	5	1	4	0	5	30
% Heavy Vehicles	1.6	2.9	0	1.6	1.0	0.7	1.0	0.8	0	2.2	0.6	1.0	0.7	0.7	0	0.7	0.9
Buses	0	1	0	1	1	2	0	3	0	0	0	0	0	0	0	0	4
% Buses	0	1.0	0	0.2	0.3	0.3	0	0.2	0	0	0	0	0	0	0	0	0.1



INTERSECTION VOLUME DEVELOPMENT

Maybank Highway at River Road AM PEAK HOUR (7:30 AM - 8:30 AM)

Description	River Road <u>Northbound</u>			River Road <u>Southbound</u>			Maybank Highway <u>Eastbound</u>			Maybank Highway <u>Westbound</u>		
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
Existing 2018 AM Volumes	20	52	437	465	71	27	35	621	9	193	608	211
Pedestrians	0			0			0			0		
Heavy Vehicle %	2.3%			2.0%			1.1%			2.0%		
Peak Hour Factor	0.90			0.85			0.92			0.95		
Annual Growth Rate	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%
Growth Factor	1.193	1.193	1.193	1.193	1.193	1.193	1.193	1.193	1.193	1.193	1.193	1.193
Approved Development Traffic												
2022 Background Traffic	24	62	521	555	85	32	42	741	11	230	725	252
New Project Trips												
Trip Distribution IN		10%					15%					55%
Trip Distribution OUT				55%	10%	15%						
Pass-by Project Trips												
Trip Distribution IN												
Trip Distribution OUT												
New Trips	0	1	0	13	2	4	1	0	0	0	0	4
Pass-By Trips	0	0	0	0	0	0	0	0	0	0	0	0
Total Project Trips	0	1	0	13	2	4	1	0	0	0	0	4
2022 Buildout Total	24	63	521	568	87	36	43	741	11	230	725	256

PM PEAK HOUR (4:30 PM - 5:30 PM)

Description	River Road <u>Northbound</u>			River Road <u>Southbound</u>			Maybank Highway <u>Eastbound</u>			Maybank Highway <u>Westbound</u>		
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
Existing 2018 PM Volumes	47	138	323	255	103	78	134	564	23	300	763	516
Pedestrians	0			0			0			0		
Heavy Vehicle %	2.3%			2.0%			1.1%			2.0%		
Peak Hour Factor	0.93			0.89			0.98			0.98		
Annual Growth Rate	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%
Growth Factor	1.193	1.193	1.193	1.193	1.193	1.193	1.193	1.193	1.193	1.193	1.193	1.193
Approved Development Traffic												
2022 Background Traffic	56	165	385	304	123	93	160	673	27	358	910	615
New Project Trips												
Trip Distribution IN		10%					15%					55%
Trip Distribution OUT				55%	10%	15%						
Pass-by Project Trips												
Trip Distribution IN												
Trip Distribution OUT												
New Trips	0	3	0	8	2	2	4	0	0	0	0	14
Pass-By Trips	0	0	0	0	0	0	0	0	0	0	0	0
Total Project Trips	0	3	0	8	2	2	4	0	0	0	0	14
2022 Buildout Total	56	168	385	312	125	95	164	673	27	358	910	629

INTERSECTION VOLUME DEVELOPMENT

**Maybank Highway at River Road
AM PEAK HOUR (7:15 AM - 8:15 AM)**























Description	River Road <u>Northbound</u>			River Road <u>Southbound</u>			- <u>Eastbound</u>			Site Driveway <u>Westbound</u>		
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
Existing 2018 AM Volumes	0	294	0	0	606	0				0	0	0
Pedestrians	0			0			0			0		
Heavy Vehicle %	2.6%			2.0%						2.0%		
Peak Hour Factor	0.84			0.85						0.90		
Annual Growth Rate	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%
Growth Factor	1.193	1.193	1.193	1.193	1.193	1.193	1.193	1.193	1.193	1.193	1.193	1.193
Approved Development Traffic												
2022 Background Traffic	0	351	0	0	723	0	0	0	0	0	0	0
New Project Trips												
Trip Distribution IN			80%	20%								
Trip Distribution OUT										80%		20%
Pass-by Project Trips												
Trip Distribution IN												
Trip Distribution OUT												
New Trips	0	0	6	2	0	0	0	0	0	19	0	5
Pass-By Trips	0	0	0	0	0	0	0	0	0	0	0	0
Total Project Trips	0	0	6	2	0	0	0	0	0	19	0	5
2022 Buildout Total	0	351	6	2	723	0	0	0	0	19	0	5

PM PEAK HOUR (4:30 PM - 5:30 PM)

Description	River Road <u>Northbound</u>			River Road <u>Southbound</u>			- <u>Eastbound</u>			Site Driveway <u>Westbound</u>		
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
Existing 2018 PM Volumes	0	788	0	0	436	0				0	0	0
Pedestrians	0			0			0			0		
Heavy Vehicle %	2.6%			2.0%			0.0%			2.0%		
Peak Hour Factor	0.87			0.89						0.90		
Annual Growth Rate	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%
Growth Factor	1.193	1.193	1.193	1.193	1.193	1.193	1.193	1.193	1.193	1.193	1.193	1.193
Approved Development Traffic												
2022 Background Traffic	0	940	0	0	520	0	0	0	0	0	0	0
New Project Trips												
Trip Distribution IN			80%	20%								
Trip Distribution OUT										80%		20%
Pass-by Project Trips												
Trip Distribution IN												
Trip Distribution OUT												
New Trips	0	0	21	5	0	0	0	0	0	12	0	3
Pass-By Trips	0	0	0	0	0	0	0	0	0	0	0	0
Total Project Trips	0	0	21	5	0	0	0	0	0	12	0	3
2022 Buildout Total	0	940	21	5	520	0	0	0	0	12	0	3
























HCM 2010 Signalized Intersection Summary
3: River Road & Maybank Hwy

Existing AM
07/02/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	35	621	9	193	608	211	20	52	437	465	71	27
Future Volume (veh/h)	35	621	9	193	608	211	20	52	437	465	71	27
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	38	675	10	203	640	222	22	58	486	547	84	32
Adj No. of Lanes	1	1	0	1	1	1	1	1	1	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.95	0.95	0.95	0.90	0.90	0.90	0.85	0.85	0.85
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	245	686	10	252	767	867	240	233	344	406	423	161
Arrive On Green	0.05	0.37	0.37	0.09	0.41	0.41	0.12	0.12	0.12	0.14	0.33	0.33
Sat Flow, veh/h	1774	1831	27	1774	1863	1583	1271	1863	1583	1774	1286	490
Grp Volume(v), veh/h	38	0	685	203	640	222	22	58	486	547	0	116
Grp Sat Flow(s),veh/h/ln	1774	0	1858	1774	1863	1583	1271	1863	1583	1774	0	1776
Q Serve(g_s), s	1.1	0.0	32.2	6.1	27.1	6.5	1.4	2.5	11.0	12.0	0.0	4.1
Cycle Q Clear(g_c), s	1.1	0.0	32.2	6.1	27.1	6.5	1.4	2.5	11.0	12.0	0.0	4.1
Prop In Lane	1.00		0.01	1.00		1.00	1.00		1.00	1.00		0.28
Lane Grp Cap(c), veh/h	245	0	696	252	767	867	240	233	344	406	0	585
V/C Ratio(X)	0.15	0.00	0.98	0.81	0.83	0.26	0.09	0.25	1.41	1.35	0.00	0.20
Avail Cap(c_a), veh/h	309	0	696	290	767	867	240	233	344	406	0	585
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	18.1	0.0	27.3	20.3	23.2	10.5	34.3	34.8	34.5	31.9	0.0	21.2
Incr Delay (d2), s/veh	0.3	0.0	30.5	13.5	10.4	0.7	0.8	2.6	203.0	171.4	0.0	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.0	22.3	3.8	16.1	3.0	0.5	1.4	27.7	19.3	0.0	2.2
LnGrp Delay(d),s/veh	18.4	0.0	57.9	33.9	33.6	11.2	35.1	37.4	237.5	203.3	0.0	22.0
LnGrp LOS	B		E	C	C	B	D	D	F	F		C
Approach Vol, veh/h		723			1065			566			663	
Approach Delay, s/veh		55.8			29.0			209.1			171.6	
Approach LOS		E			C			F			F	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6		8				
Phs Duration (G+Y+Rc), s	14.1	39.0	18.0	17.0	10.8	42.3		35.0				
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	10.0	33.0	12.0	11.0	8.0	35.0		29.0				
Max Q Clear Time (g_c+I1), s	8.1	34.2	14.0	13.0	3.1	29.1		6.1				
Green Ext Time (p_c), s	0.1	0.0	0.0	0.0	0.0	2.4		0.5				
Intersection Summary												
HCM 2010 Ctrl Delay			100.5									
HCM 2010 LOS			F									
























HCM 2010 Signalized Intersection Summary
 3: River Road & Maybank Hwy

Existing PM
 07/02/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	134	564	23	300	763	516	47	138	323	255	103	78
Future Volume (veh/h)	134	564	23	300	763	516	47	138	323	255	103	78
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	141	594	24	316	803	543	51	148	347	287	116	88
Adj No. of Lanes	1	1	0	1	1	1	1	1	1	1	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.93	0.93	0.93	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	252	748	30	402	851	882	185	166	335	268	252	191
Arrive On Green	0.09	0.42	0.42	0.12	0.46	0.46	0.09	0.09	0.09	0.10	0.26	0.26
Sat Flow, veh/h	1774	1778	72	1774	1863	1583	1173	1863	1583	1774	984	747
Grp Volume(v), veh/h	141	0	618	316	803	543	51	148	347	287	0	204
Grp Sat Flow(s),veh/h/ln	1774	0	1850	1774	1863	1583	1173	1863	1583	1774	0	1731
Q Serve(g_s), s	3.8	0.0	26.1	8.9	36.9	20.8	3.7	7.1	8.0	9.0	0.0	8.9
Cycle Q Clear(g_c), s	3.8	0.0	26.1	8.9	36.9	20.8	3.7	7.1	8.0	9.0	0.0	8.9
Prop In Lane	1.00		0.04	1.00		1.00	1.00		1.00	1.00		0.43
Lane Grp Cap(c), veh/h	252	0	778	402	851	882	185	166	335	268	0	444
V/C Ratio(X)	0.56	0.00	0.79	0.79	0.94	0.62	0.28	0.89	1.04	1.07	0.00	0.46
Avail Cap(c_a), veh/h	257	0	778	422	851	882	185	166	335	268	0	444
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	19.5	0.0	22.6	17.4	23.3	13.4	38.9	40.5	35.4	35.2	0.0	28.1
Incr Delay (d2), s/veh	2.6	0.0	8.2	9.1	19.9	3.2	3.7	45.9	58.6	75.7	0.0	3.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	0.0	15.0	5.3	23.7	9.8	1.4	5.7	13.7	13.7	0.0	4.7
LnGrp Delay(d),s/veh	22.2	0.0	30.8	26.5	43.2	16.6	42.6	86.4	94.0	110.9	0.0	31.6
LnGrp LOS	C		C	C	D	B	D	F	F	F		C
Approach Vol, veh/h		759			1662			546			491	
Approach Delay, s/veh		29.2			31.3			87.1			77.9	
Approach LOS		C			C			F			E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6		8				
Phs Duration (G+Y+Rc), s	17.0	43.8	15.0	14.0	13.8	47.0		29.0				
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	12.0	37.0	9.0	8.0	8.0	41.0		23.0				
Max Q Clear Time (g_c+I1), s	10.9	28.1	11.0	10.0	5.8	38.9		10.9				
Green Ext Time (p_c), s	0.1	2.5	0.0	0.0	0.1	1.4		0.8				
Intersection Summary												
HCM 2010 Ctrl Delay			46.3									
HCM 2010 LOS			D									
























HCM 2010 Signalized Intersection Summary
 3: River Road & Maybank Hwy

No Build AM
 07/02/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	42	741	11	230	725	252	24	62	521	555	85	32
Future Volume (veh/h)	42	741	11	230	725	252	24	62	521	555	85	32
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	46	805	12	242	763	265	27	69	579	653	100	38
Adj No. of Lanes	1	1	0	1	1	1	1	1	1	2	1	0
Peak Hour Factor	0.92	0.92	0.92	0.95	0.95	0.95	0.90	0.90	0.90	0.85	0.85	0.85
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	244	802	12	273	938	1045	160	146	312	538	369	140
Arrive On Green	0.05	0.44	0.44	0.12	0.50	0.50	0.08	0.08	0.08	0.16	0.29	0.29
Sat Flow, veh/h	1774	1831	27	1774	1863	1583	1246	1863	1583	3442	1287	489
Grp Volume(v), veh/h	46	0	817	242	763	265	27	69	579	653	0	138
Grp Sat Flow(s),veh/h/ln	1774	0	1858	1774	1863	1583	1246	1863	1583	1721	0	1776
Q Serve(g_s), s	1.6	0.0	50.5	11.3	39.7	7.9	2.4	4.1	9.0	18.0	0.0	6.9
Cycle Q Clear(g_c), s	1.6	0.0	50.5	11.3	39.7	7.9	2.4	4.1	9.0	18.0	0.0	6.9
Prop In Lane	1.00		0.01	1.00		1.00	1.00		1.00	1.00		0.28
Lane Grp Cap(c), veh/h	244	0	814	273	938	1045	160	146	312	538	0	509
V/C Ratio(X)	0.19	0.00	1.00	0.89	0.81	0.25	0.17	0.47	1.86	1.21	0.00	0.27
Avail Cap(c_a), veh/h	319	0	814	371	938	1045	160	146	312	538	0	509
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	20.2	0.0	32.3	35.6	24.0	8.0	50.0	50.8	46.2	48.6	0.0	31.8
Incr Delay (d2), s/veh	0.4	0.0	32.4	17.3	7.7	0.6	2.3	10.7	397.3	112.5	0.0	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	33.1	8.8	22.3	3.6	0.9	2.5	44.4	16.9	0.0	3.6
LnGrp Delay(d),s/veh	20.5	0.0	64.7	52.9	31.7	8.6	52.3	61.5	443.6	161.1	0.0	33.1
LnGrp LOS	C		F	D	C	A	D	E	F	F		C
Approach Vol, veh/h		863			1270			675			791	
Approach Delay, s/veh		62.3			30.9			388.9			138.8	
Approach LOS		E			C			F			F	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6		8				
Phs Duration (G+Y+Rc), s	19.7	56.5	24.0	15.0	12.2	64.0		39.0				
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	20.0	49.0	18.0	9.0	11.0	58.0		33.0				
Max Q Clear Time (g_c+I1), s	13.3	52.5	20.0	11.0	3.6	41.7		8.9				
Green Ext Time (p_c), s	0.4	0.0	0.0	0.0	0.0	5.6		0.6				
Intersection Summary												
HCM 2010 Ctrl Delay			129.3									
HCM 2010 LOS			F									
























HCM 2010 Signalized Intersection Summary
 3: River Road & Maybank Hwy

No Build PM
 07/02/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	160	673	27	358	910	615	56	165	385	304	123	93
Future Volume (veh/h)	160	673	27	358	910	615	56	165	385	304	123	93
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	168	708	28	377	958	647	60	177	414	342	138	104
Adj No. of Lanes	1	1	0	1	1	1	1	1	1	2	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.93	0.93	0.93	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	213	712	28	376	914	935	174	168	412	344	247	186
Arrive On Green	0.08	0.40	0.40	0.17	0.49	0.49	0.09	0.09	0.09	0.10	0.25	0.25
Sat Flow, veh/h	1774	1780	70	1774	1863	1583	1133	1863	1583	3442	987	744
Grp Volume(v), veh/h	168	0	736	377	958	647	60	177	414	342	0	242
Grp Sat Flow(s),veh/h/ln	1774	0	1850	1774	1863	1583	1133	1863	1583	1721	0	1731
Q Serve(g_s), s	5.4	0.0	39.6	17.0	49.1	28.3	5.1	9.0	9.0	9.9	0.0	12.2
Cycle Q Clear(g_c), s	5.4	0.0	39.6	17.0	49.1	28.3	5.1	9.0	9.0	9.9	0.0	12.2
Prop In Lane	1.00		0.04	1.00		1.00	1.00		1.00	1.00		0.43
Lane Grp Cap(c), veh/h	213	0	740	376	914	935	174	168	412	344	0	433
V/C Ratio(X)	0.79	0.00	0.99	1.00	1.05	0.69	0.34	1.06	1.01	0.99	0.00	0.56
Avail Cap(c_a), veh/h	214	0	740	376	914	935	174	168	412	344	0	433
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	23.0	0.0	29.9	31.7	25.5	14.2	43.7	45.5	37.0	45.0	0.0	32.7
Incr Delay (d2), s/veh	17.8	0.0	31.8	46.9	43.1	4.2	5.3	85.1	45.8	46.7	0.0	5.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.7	0.0	26.6	15.2	36.1	13.3	1.9	8.6	16.6	6.9	0.0	6.5
LnGrp Delay(d),s/veh	40.8	0.0	61.6	78.6	68.6	18.4	49.1	130.6	82.8	91.7	0.0	37.8
LnGrp LOS	D		E	F	F	B	D	F	F	F		D
Approach Vol, veh/h		904			1982			651			584	
Approach Delay, s/veh		57.8			54.1			92.7			69.4	
Approach LOS		E			D			F			E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6		8				
Phs Duration (G+Y+Rc), s	23.0	46.0	16.0	15.0	13.9	55.1		31.0				
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	17.0	40.0	10.0	9.0	8.0	49.0		25.0				
Max Q Clear Time (g_c+I1), s	19.0	41.6	11.9	11.0	7.4	51.1		14.2				
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.0	0.0		0.9				
Intersection Summary												
HCM 2010 Ctrl Delay			63.2									
HCM 2010 LOS			E									

HCM 2010 Signalized Intersection Summary
3: River Road & Maybank Hwy

Build AM
07/02/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	43	741	11	230	725	256	24	63	521	568	87	36
Future Volume (veh/h)	43	741	11	230	725	256	24	63	521	568	87	36
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	47	805	12	242	763	269	27	70	579	668	102	42
Adj No. of Lanes	1	1	0	1	1	1	1	1	1	2	1	0
Peak Hour Factor	0.92	0.92	0.92	0.95	0.95	0.95	0.90	0.90	0.90	0.85	0.85	0.85
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	245	803	12	273	938	1044	159	145	312	538	359	148
Arrive On Green	0.05	0.44	0.44	0.12	0.50	0.50	0.08	0.08	0.08	0.16	0.29	0.29
Sat Flow, veh/h	1774	1831	27	1774	1863	1583	1239	1863	1583	3442	1255	517
Grp Volume(v), veh/h	47	0	817	242	763	269	27	70	579	668	0	144
Grp Sat Flow(s),veh/h/ln	1774	0	1858	1774	1863	1583	1239	1863	1583	1721	0	1772
Q Serve(g_s), s	1.6	0.0	50.5	11.3	39.7	8.0	2.4	4.1	9.0	18.0	0.0	7.3
Cycle Q Clear(g_c), s	1.6	0.0	50.5	11.3	39.7	8.0	2.4	4.1	9.0	18.0	0.0	7.3
Prop In Lane	1.00		0.01	1.00		1.00	1.00		1.00	1.00		0.29
Lane Grp Cap(c), veh/h	245	0	815	273	938	1044	159	145	312	538	0	507
V/C Ratio(X)	0.19	0.00	1.00	0.89	0.81	0.26	0.17	0.48	1.86	1.24	0.00	0.28
Avail Cap(c_a), veh/h	318	0	815	370	938	1044	159	145	312	538	0	507
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	20.2	0.0	32.3	35.6	24.1	8.0	50.1	50.9	46.3	48.6	0.0	31.9
Incr Delay (d2), s/veh	0.4	0.0	32.2	17.3	7.7	0.6	2.3	11.0	397.5	124.2	0.0	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	33.1	8.8	22.3	3.6	0.9	2.6	44.4	17.8	0.0	3.8
LnGrp Delay(d),s/veh	20.6	0.0	64.6	53.0	31.7	8.6	52.3	61.8	443.7	172.8	0.0	33.3
LnGrp LOS	C		F	D	C	A	D	E	F	F		C
Approach Vol, veh/h		864			1274			676			812	
Approach Delay, s/veh		62.2			30.9			388.6			148.1	
Approach LOS		E			C			F			F	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6		8				
Phs Duration (G+Y+Rc), s	19.7	56.5	24.0	15.0	12.2	64.0		39.0				
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	20.0	49.0	18.0	9.0	11.0	58.0		33.0				
Max Q Clear Time (g_c+I1), s	13.3	52.5	20.0	11.0	3.6	41.7		9.3				
Green Ext Time (p_c), s	0.4	0.0	0.0	0.0	0.0	5.6		0.7				
Intersection Summary												
HCM 2010 Ctrl Delay			131.3									
HCM 2010 LOS			F									

Intersection						
Int Delay, s/veh	0.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		T			T
Traffic Vol, veh/h	19	5	351	6	2	723
Future Vol, veh/h	19	5	351	6	2	723
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	84	84	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	21	6	418	7	2	851
























Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	1277	422	0	0	425
Stage 1	422	-	-	-	-
Stage 2	855	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218
Pot Cap-1 Maneuver	184	632	-	-	1134
Stage 1	662	-	-	-	-
Stage 2	417	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	183	632	-	-	1134
Mov Cap-2 Maneuver	183	-	-	-	-
Stage 1	660	-	-	-	-
Stage 2	417	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	24.1	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	215	1134
HCM Lane V/C Ratio	-	-	0.124	0.002
HCM Control Delay (s)	-	-	24.1	8.2
HCM Lane LOS	-	-	C	A
HCM 95th %tile Q(veh)	-	-	0.4	0

HCM 2010 Signalized Intersection Summary
 3: River Road & Maybank Hwy

Build PM
 07/02/2019

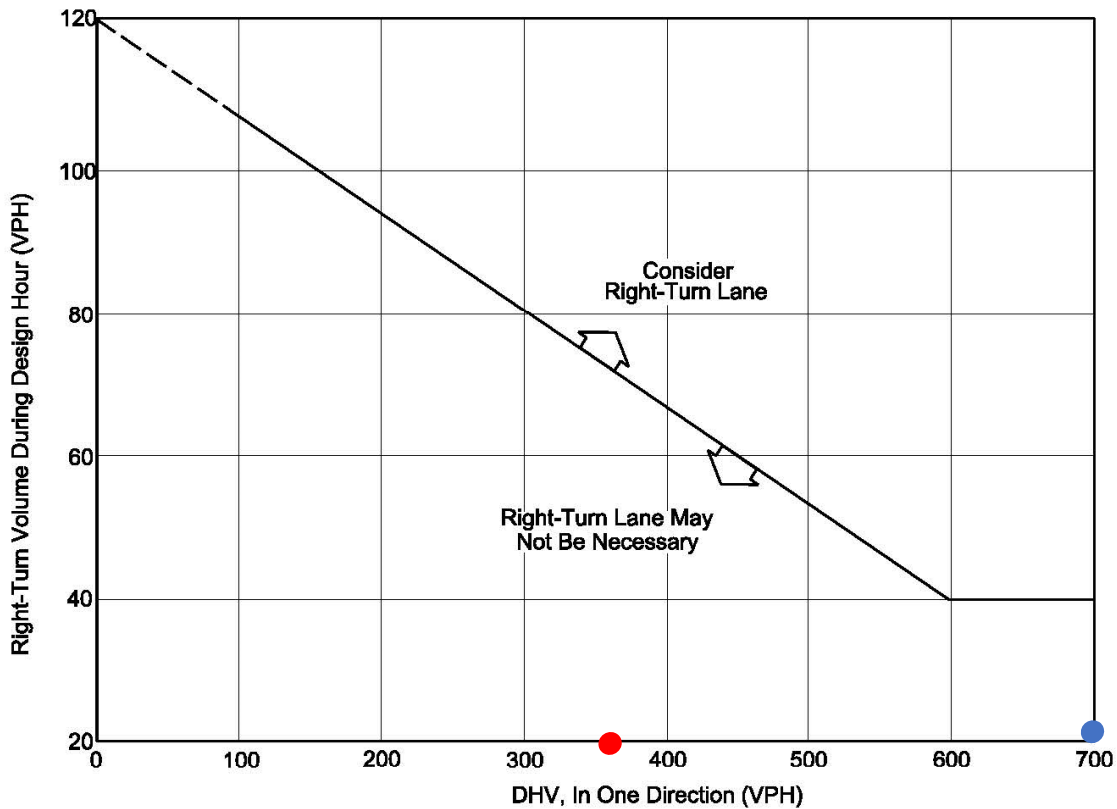
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	164	673	27	358	910	629	56	168	385	312	125	95
Future Volume (veh/h)	164	673	27	358	910	629	56	168	385	312	125	95
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	173	708	28	377	958	662	60	181	414	351	140	107
Adj No. of Lanes	1	1	0	1	1	1	1	1	1	2	1	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.93	0.93	0.93	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	213	712	28	376	914	935	174	168	412	344	245	187
Arrive On Green	0.08	0.40	0.40	0.17	0.49	0.49	0.09	0.09	0.09	0.10	0.25	0.25
Sat Flow, veh/h	1774	1780	70	1774	1863	1583	1128	1863	1583	3442	981	750
Grp Volume(v), veh/h	173	0	736	377	958	662	60	181	414	351	0	247
Grp Sat Flow(s),veh/h/ln	1774	0	1850	1774	1863	1583	1128	1863	1583	1721	0	1730
Q Serve(g_s), s	5.6	0.0	39.6	17.0	49.1	29.4	5.1	9.0	9.0	10.0	0.0	12.5
Cycle Q Clear(g_c), s	5.6	0.0	39.6	17.0	49.1	29.4	5.1	9.0	9.0	10.0	0.0	12.5
Prop In Lane	1.00		0.04	1.00		1.00	1.00		1.00	1.00		0.43
Lane Grp Cap(c), veh/h	213	0	740	376	914	935	174	168	412	344	0	433
V/C Ratio(X)	0.81	0.00	0.99	1.00	1.05	0.71	0.35	1.08	1.01	1.02	0.00	0.57
Avail Cap(c_a), veh/h	214	0	740	376	914	935	174	168	412	344	0	433
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	23.0	0.0	29.9	31.7	25.5	14.4	43.7	45.5	37.0	45.0	0.0	32.8
Incr Delay (d2), s/veh	20.7	0.0	31.8	46.9	43.2	4.5	5.4	92.3	45.8	53.7	0.0	5.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.9	0.0	26.6	15.2	36.1	13.8	1.9	8.9	16.6	7.3	0.0	6.6
LnGrp Delay(d),s/veh	43.7	0.0	61.6	78.6	68.7	18.9	49.1	137.8	82.8	98.7	0.0	38.2
LnGrp LOS	D		E	F	F	B	D	F	F	F		D
Approach Vol, veh/h		909			1997			655			598	
Approach Delay, s/veh		58.2			54.0			94.9			73.7	
Approach LOS		E			D			F			E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6		8				
Phs Duration (G+Y+Rc), s	23.0	46.0	16.0	15.0	13.9	55.1		31.0				
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	17.0	40.0	10.0	9.0	8.0	49.0		25.0				
Max Q Clear Time (g_c+I1), s	19.0	41.6	12.0	11.0	7.6	51.1		14.5				
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.0	0.0		0.9				
Intersection Summary												
HCM 2010 Ctrl Delay			64.2									
HCM 2010 LOS			E									

Intersection						
Int Delay, s/veh	0.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W	R	T	R	L	T
Traffic Vol, veh/h	12	3	940	21	5	520
Future Vol, veh/h	12	3	940	21	5	520
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	87	87	89	89
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	13	3	1080	24	6	584

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	1688	1092	0	0	1104
Stage 1	1092	-	-	-	-
Stage 2	596	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218
Pot Cap-1 Maneuver	103	261	-	-	632
Stage 1	322	-	-	-	-
Stage 2	550	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	102	261	-	-	632
Mov Cap-2 Maneuver	102	-	-	-	-
Stage 1	317	-	-	-	-
Stage 2	550	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	41.2	0	0.1
HCM LOS	E		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	116	632
HCM Lane V/C Ratio	-	-	0.144	0.009
HCM Control Delay (s)	-	-	41.2	10.7
HCM Lane LOS	-	-	E	B
HCM 95th %tile Q(veh)	-	-	0.5	0



Note: For highways with a design speed below 50 miles per hour with a DHV < 300 and where right turns > 40, an adjustment should be used. To read the vertical axis of the chart, subtract 20 from the actual number of right turns.

Example

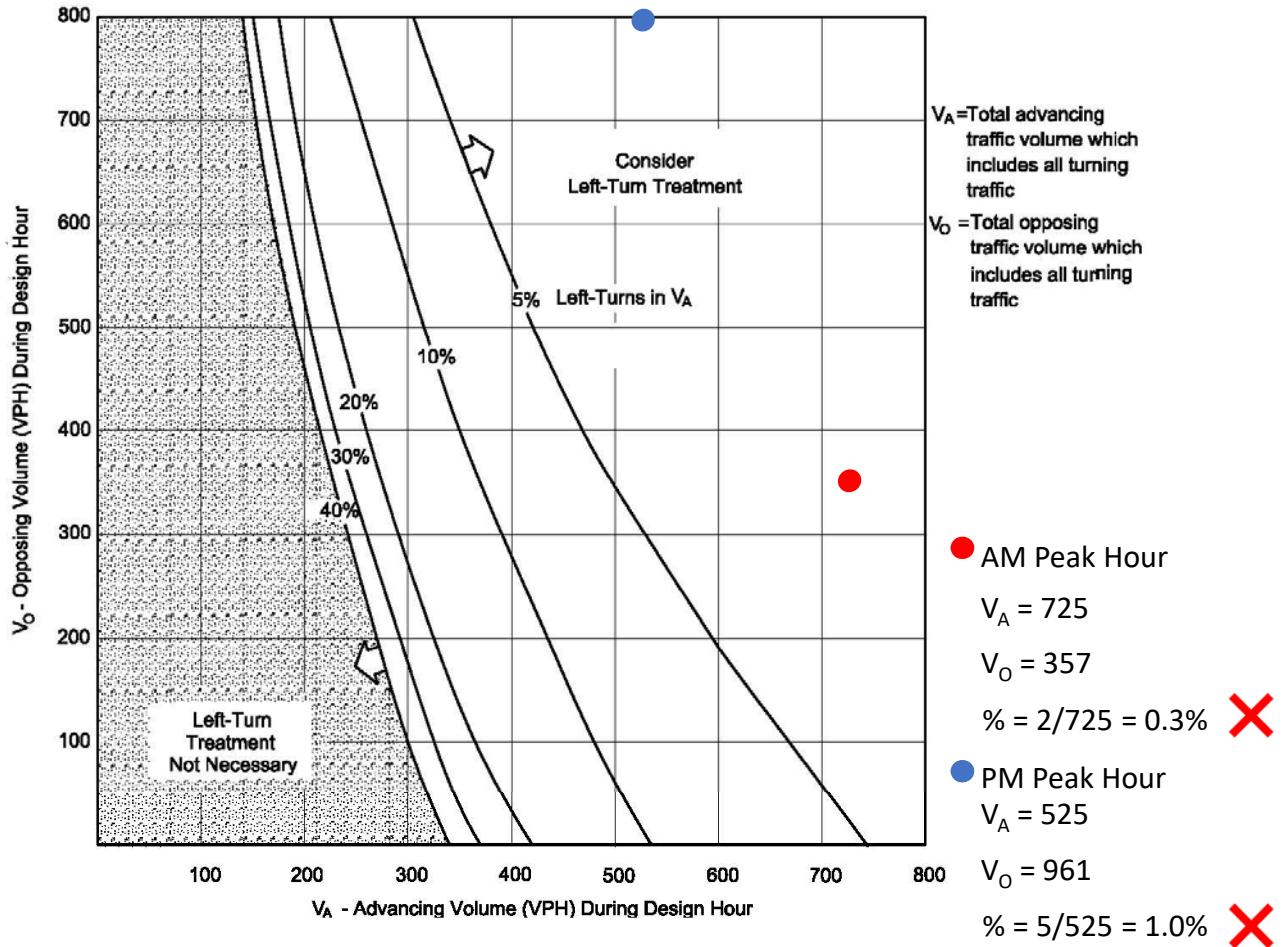
● AM Peak Hour ● PM Peak Hour

Given: Design Speed = 35 miles per hour Speed = 45 mph Speed = 45 mph
 DHV = 250 vehicles per hour DHV = 357 DHV = 961
 Right Turns = 100 vehicles per hour

Problem: Determine if a right-turn lane is necessary. R-Turns = 6 ❌ R-Turns = 21 ❌

Solution: To read the vertical axis, use $100 - 20 = 80$ vehicles per hour. The figure indicates that a right-turn lane is not necessary, unless other factors (e.g., high crash rate) indicate a lane is needed.

**GUIDELINES FOR RIGHT-TURN LANES AT UNSIGNALIZED INTERSECTIONS
ON TWO-LANE HIGHWAYS
Figure 9.5-A**



Instructions:

1. The family of curves represents the percent of left turns in the advancing volume (V_A). The designer should locate the curve for the actual percentage of left turns. When this is not an even increment of 5, the designer should estimate where the curve lies.
2. Read V_A and V_O into the chart and locate the intersection of the two volumes.
3. Note the location of the point in #2 relative to the line in #1. If the point is to the right of the line, then a left-turn lane is warranted. If the point is to the left of the line, then a left-turn lane is not warranted based on traffic volumes.

VOLUME GUIDELINES FOR LEFT-TURN LANES AT UNSIGNALIZED INTERSECTIONS ON TWO-LANE HIGHWAYS (45 mph)
Figure 9.5-F



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November 15, 2019

Travis Miller
CRESCENT HOMES
572 Savannah Highway
Charleston, South Carolina 29407

RE: TMS #311-00-00-025 and 097

Dear Travis Miller:

This letter is in response to your request for information on the availability of service at the above location by AT&T.

This letter acknowledges that the above referenced properties is located in an area served by AT&T. Any service arrangements for the properties will be subject to later discussions and agreements between the developer and AT&T. Please be advised that this letter is not a commitment by AT&T to provide service to these properties.

Please contact me at the phone number included in this letter with any questions.

Thank you for contacting AT&T.

Sincerely,
Allen Stanfield
Mgr Osp PIng & Engrg Design



Berkeley Electric Cooperative, Inc.

Your Touchstone Energy® Cooperative 

www.berkeleyelectric.coop

Post Office Box 1234, Moncks Corner, SC 29461

Electricity Letter of Availability

This Letter of Availability certifies that Berkeley Electric Cooperative Inc, is the electrical provider and owner of a utility easement off of 1389 River road on Johns Island, South Carolina. The utility easement runs across tax parcel #'s 311-00-00-025 & 311-00-00-09, currently owned by Knapp A. Partnership.

Keith Griggs

Right of Way Agent

Signed

A handwritten signature in blue ink, appearing to read "Keith Griggs", is written over a horizontal line.

Date

11-14-19



PO Box B
Charleston, SC 29402
103 St. Philip Street (29403)

(843) 727-6800
www.charlestonwater.com

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Dorothy Harrison, Chief Administrative Officer
Wesley Ropp, CMA, Chief Financial Officer
Russell Huggins, P.E., Capital Projects Officer

November 13, 2019

Travis Miller
Crescent Homes
Via email travis.miller@crescenthomes.net

Wastewater Availability to TMS: 311-00-00-025 and -097
40 single family lots

This letter is to certify our willingness and ability to provide wastewater service to the above referenced site in Charleston County, South Carolina. CWS currently has 10" PVC gravity sewer main in the right of way at the intersection of Thin Pine Drive and Farmland Road that may be extended to serve your property. We also have a 10" gravity sewer main in the right of way of Weeping Way which can be extended to serve your property.

Please be advised any extensions or modifications to the infrastructure will be a developer's expense. It will also be a developer responsibility to ensure there is sufficient capacity in the existing mains to receive the newly proposed sewer flow. All fees and cost associated with providing service to this site will be a developer expense and will be due prior to connection of any Charleston Water System's system. This letter does not reserve capacity in the Charleston Water System infrastructure and it is incumbent upon the developer or his agent to confirm the availability herein granted past 12 months of this correspondence.

The Charleston Water System certifies the availability of service only insofar as its rights allow. Should access to our existing main/mains be denied by appropriate governing authorities, the Charleston Water System will have no other option than to deny service.

This letter is not to be construed as a letter of acceptance for operation and maintenance from the Department of Health and Environmental Control.

If there are any questions pertaining to this letter, please do not hesitate to call on me at (843) 727-6869.

Sincerely,

A handwritten signature in blue ink that reads "Lydia H. Owens".

Lydia Owens
Charleston Water System

Office of the Sheriff



County of Charleston

Sheriff J. Al Cannon, Jr.

December 4, 2019

Travis Miller
572 Savannah Highway
Charleston, S.C., 29407

re: Letter of Coordination

Mr. Miller,

The Charleston County Sheriff's Office acknowledges your intention to develop property located in the area of 1389 River Road, Charleston, South Carolina. This location is currently under the jurisdiction of this agency.

Please understand that *all* law enforcement matters will need to be reported to this agency. This can be accomplished by calling the **Charleston County Consolidated Dispatch Center** at **843-743-7200** or dialing **911 for emergencies**. Additional information can be accessed on our agency website at www.ccsso.charlestoncounty.org.

If you have any questions, feel free to contact this office via telephone or by email.

Regards,

Sgt. H. M. Phillips

Sergeant Harold M. Phillips
Community Affairs
Charleston County Sheriff's Office
(843) 529-6221
hphillips@charlestoncounty.org

Administrative Office

3691 Leeds Avenue
N. Charleston, SC 29405
~ Sheriff ~
Voice (843) 554-2230
Fax (843) 554-2243

Law Enforcement Division

3691 Leeds Avenue
N. Charleston, SC 29405
~ Patrol ~
Voice (843) 202-1700
Fax (843) 554-2234

Al Cannon Detention Center

3841 Leeds Avenue
N. Charleston, SC 29405
Voice (843) 529-7300
Fax (843) 529-7406

Judicial Center

100 Broad Street, Suite 381
Charleston, SC 29401
Voice (843) 958-2100
Fax (843) 958-2128



Emergency Medical Services

DAVID ABRAMS, JD
Director

843.202.6700
Fax: 843.202.6712
dabrams@charlestoncounty.org
Lonnie Hamilton, III Public Services Building
4045 Bridge View Drive, Suite B309
North Charleston, SC 29405-7464

December 6, 2019

Mr. Travis Miller

RE: TMS# 311-00-00-025
TMS# 311-00-00-097

- 1389 River Rd. Johns Island, SC 29459

Dear Mr. Miller,

The Charleston County Emergency Medical Services (EMS) Department acknowledges your intention to rezone the above referenced properties. Charleston County EMS is the advanced life support paramedic first response and transport agency for this location – and all medical and trauma related incidents will need to be reported to this agency. This can be accomplished through the Charleston County Consolidated Dispatch Center by dialing 911.

EMS staff will be available to attend your scheduled Site Plan Review with Charleston County Planning Staff should our input be needed. If you have any questions or concerns please do not hesitate in contacting me.

Sincerely,

James Ciali
Assistant Chief



12/3/19

Travis Miller
Crescent Homes

Re: Gas Availability – Murray Creek/River Rd – TMS # 311-00-00-025 & 311-00-00-097

Dear Travis,

I am pleased to inform you that Dominion Energy will be able to provide natural gas service to the above referenced project. Services will be provided in accordance with Dominion Energy's General Terms and Conditions, other documents on file with the South Carolina Public Service Commission, and the company's standard operating policies and procedures.

Any cost associated with providing service will be determined when a finalized/approved plan is submitted to our office. In order to begin engineering work for the project, the following information will need to be provided:

- 1.) Detailed utility site plan (AutoCAD format preferred) showing water, sewer, and storm drainage. The finalized/approved plan must include lot numbers, street names, and 911 addresses for each lot.
- 2.) Additional drawings that indicate wetlands boundaries, tree survey with barricade plan and buffer zones (if required), as well as any existing or additional easements will also be needed.
- 3.) Copies of the Army Corp of Engineers official delineation and permits. If applicable, OCMR permits should also be included.
- 4.) Signed copy of this letter acknowledging its receipt and responsibility for its contents and authorization to begin engineering work with the understanding that SCE&G intends to serve the referenced project.

Dominion Energy's construction standards and specifications are available upon request. For more information or questions, contact me by phone at (843) 576-8923 or at Barron.Gossett@dominionenergy.com

Sincerely,

Barron Gossett

Barron Gossett
Dominion Energy

ST. JOHN'S WATER COMPANY, INC.
"This institution is an equal opportunity employer and provider"
Post Office Box 629
John's Island, South Carolina 29457-0629
Phone (843) 559-0186
Fax (843) 559-0371

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Cheryl Glover
Isaac Robinson
Becky J. Dennis
Glenda Miller
Tommy West
Richard Thomas

December 3, 2019

Mr. Travis Miller
Crescent Homes
572 Savannah Highway
Charleston, SC 29407

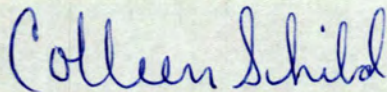
Re: TMS numbers 311-00-00-025 and 097
Water Availability and Willingness to Serve

Dear Mr. Miller:

This letter is to confirm that TMS numbers 311-00-00-025 and 097 on Johns Island is within the water service area of the St. John's Water Company, Inc. (SJWC). SJWC does have water available from an existing 10-inch water line located on River Road. Our system is SC DHEC approved and we have the capacity and willingness to provide potable water service to TMS numbers 311-00-00-025 and 097 for the development of approximately 40 single family units.

If you have any questions, please feel free to give me a call at 843-514-5570.

Sincerely,



Colleen Schild
Assistant Manager/Engineer



Steve L. Thigpen
Director

Public Works Department

843.202.7600
Fax 843.202.7601
Sthigpenl@charlestoncounty.org
Lonnie Hamilton, III
Public Services Building
4045 Bridge View Drive, Suite A301
North Charleston, SC 29405-7464

January 15, 2020

Travis Miller
Crescent Homes

RE: Proposed Subdivision
TMS # 311-00-00-025

Dear Mr. Miller,

This letter acknowledges that you have notified Charleston County Public Works regarding your intent to prepare a single-family subdivision off of River Road on Johns Island. The Public Works Department has reviewed the proposed Planned Development Document and is prepared to review your site plans.

Please continue to submit documentation directly to the County Zoning and Planning Department other than specific encroachment permit applications for County right-of-way. These applications should be provided to the Public Works Department to the attention of Mr. Herb Nimz at the address listed above.

Sincerely,

Brett Champion, P.E.
Civil Engineer II

cc: Ryan Petersen - Charleston County Planning Department



American Public Works Association

www.charlestoncounty.org

December 9, 2019

Crescent Homes
Attn: Travis Miller
572 Savannah Hwy
Charleston SC

Subject: TMS#'s: 311-00-00-025 & 311-00-00-097
Total Acreage: 12.22
1389 River Road, John's Island, SC

Operations Division

Gerrita Postlewait, Ed.D.
Superintendent of Schools

Jeffrey Borowy, P.E.
Chief Operating Officer

Dear Mr. Miller:

Please accept this letter as "Proof of Coordination" for adequate service capacity for the proposed Murray Creek Development Project consisting of a maximum of forty single family dwelling units.

To determine an estimate of additional students any development will create, the following formula is used: on an average of .4 students per single-family unit and .2 students per multi-family unit which is then divided by the number of kindergarten through twelfth grade levels (which is a total of 13 levels) to get a grade level average. That average is multiplied by the number of grade levels per school level and rounded to the nearest whole number.

On the basis of the location supplied to us, we expect minimal impact to enrollment from a capacity standpoint. The three (3) schools that fall within the attendance zone where the development will take place are listed below, and are subject to zoning modification.

- Angela Oak Elementary
- Haut Gap Middle
- St. John's High

Please contact me at (843) 566-1995 if you have any questions and/or concerns.

Sincerely,



Angela Barnette, M.Ed.
Director of Planning & Real Estate



PO Box B
Charleston, SC 29402
103 St. Philip Street (29403)

(843) 727-6800
www.charlestonwater.com

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November 13, 2019

Travis Miller
Crescent Homes
Via email travis.miller@crescenthomes.net

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Lydia Owens
Charleston Water System