NEEDS ALTERNATIVE AND JUSTIFICATION ANALYSIS

For

ST. CHARLES CLEAN FUELS, LLC

ST. CHARLES CLEAN FUEL PROJECT

Located in St. Charles Parish, Louisiana

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1. Introduction

St. Charles Clean Fuels, LLC (SCCF) is requesting authorization to construct and operate a new low-carbon production facility in St. Rose, St. Charles Parish, Louisiana. The SCCF Blue Ammonia Facility (Project) would be located on a 218-acre site on the east side of the Mississippi River within leased International Matex Tank Terminal (IMTT) property at St. Rose. SCCF seeks to construct two (2) 4,000 metric-tons-per-day (MTD) low-carbon ammonia trains, producing ammonia from synthesis gas (syngas), via the reforming of natural gas, with total production capacity of 8,000 MTD of blue ammonia. Pure liquid blue ammonia, the final product, would be stored in refrigerated storage tanks located in the adjacent IMTT Terminal, then transferred via pipeline to adjacent ship-loading facilities on the Mississippi River for transport to market. The carbon dioxide produced in the blue ammonia production process would be segregated and shipped via a third-party pipeline to a third-party sequestration facility for subsurface storage.

2. Project Need

Due to an increased focus on climate change and greenhouse gas emissions, demand has soared for low-carbon and carbon-free fuel options in the global energy market. The U.S. Environmental Protection Agency (EPA) states that in 2021, the U.S. emitted over 6 billion metric tons of greenhouse gases. Carbon dioxide (CO2) accounted for 79% of all the greenhouse gases released nationally and over 92% of all Louisiana greenhouse gas emissions (as of 2018) (U.S. Environmental Protection Agency, 2023). Further, though in the U.S. greenhouse gases are heavily concentrated in power-generation and transportation, Louisiana's greenhouse gases are heavily concentrated in industry; therefore, decarbonization of industrial projects is of critical importance in Louisiana. The proposed Project will help Louisiana to achieve the net-zero CO2 emission goal set forth in Louisiana's Climate Action Plan.

Most ammonia production facilities do not capture CO2 emissions, and the global ammonia industry is responsible for 1-2 percent of global greenhouse gas emissions into the atmosphere (The Royal Society, 2020). Historically, ammonia production has supported fertilizer manufacturing with over 80 percent of the current global ammonia production being used for fertilizer production. In the current marketplace existing ammonia trains emit approximately 2.1 million tons of CO2 for each ton of ammonia produced. With an increased focus on greenhouse gas emissions and climate change concerns, including the demand for low-carbon and carbon-free fuels, blue ammonia is emerging as a hydrogen carrier and as a direct fuel source. The demand for ammonia going forward will be focused on low carbon ammonia sources, requiring that the ammonia produced shall either have an efficient means of effective carbon capture (blue ammonia), or produced by alternate methods strictly from renewable energy (green ammonia). Green ammonia requires significant unused renewable power resources that are currently not available on the grid for the electrolysis of water to produce hydrogen, and then conversion of the hydrogen into ammonia again without directly or indirectly producing any greenhouse gasses, with technologies not currently available at the large scale needed to underpin demand. This Project with the use of blue ammonia provides a meaningful reduction in CO2 emissions while deploying state of the art proven technologies to produce a clean ammonia product.

The current demand for ammonia is for use in the fertilizer industry. A growing demand for ammonia is driven by it's potential for use as a clean fuel source both independently and when converted to hydrogen. The overall demand for ammonia is expected to grow from 184 million metric tons in 2021 to over 470 million metric tons

in 2050 (Statista Research Department, 2023). Two hundred and thirty-eight million metric tons of this increased demand is predicted to arise from new energy applications for hydrogen carriers such as shipping and power generation.

This Project would utilize responsibly sourced natural gas, meaning, natural gas from those suppliers committed to reducing methane emissions to below industry averages. The facility would use the Topsoe SynCOR Ammonia™ process technology, with its advanced autothermal reforming, to produce low-carbon hydrogen. The Topsoe SynCOR technology, coupled with carbon capture technology, will result in production of ammonia with very low carbon intensity (which is referred to as "blue" ammonia). Traditionally, steam methane reforming (SMR) of natural gas into synthesis gas for ammonia production generates a significant amount of CO2 in the process, and carbon capture applications for SMR, at best, effectively remove only 60% of the CO2 produced. The Topsoe SynCOR process allows for the capture of over 99% of the CO2 generated in the facility for sequestration, achieving near-zero levels of emissions at commercially viable economics. Fundamentally, the SCCF project takes natural gas, strips out and sequesters the carbon to produce low-carbon hydrogen, then combines the remaining hydrogen with nitrogen from an onsite Air Separation Unitto create blue ammonia for transportation to market.

SCCF is building a project for the future, with near zero greenhouse gas emissions. This Project will be built to serve the growing need for blue ammonia as a fuel and as a hydrogen carrier. The manufacturing process will capture up to 99% of the (CO2) emissions from the process plant operations and sequester the (CO2) at offsite third-party sequestration sites.

3. Project Description and Objective

The Proposed Facility will consist of the following elements.

- Two blue ammonia production trains, each with nameplate capacity of 4,000 MTPD pure ammonia.
- Each train includes carbon capture and compression facilities to capture CO_2 generated from the process, compress and route to CO_2 off-taker meter stations for transport via pipeline for injection and sequestration in Class VI well.
- One incoming natural gas pipeline and metering station for the natural gas supply to the two ammonia production trains.
- One onsite high voltage electrical substation constructed and operated by Entergy for electrical power supply to support operation of the two ammonia production trains.
- Pipeline routing from the ammonia production trains to an ammonia storage tank farm comprising of four 75,000 million tonne (MT) capacity aboveground full containment storage tanks (two tanks per ammonia train), and with pipeline connection to the ship loading facility.
- IMTT loading dock extension with new loading pumps and loading arms to facilitate ammonia product loading to ships.
- One raw water (Mississippi River water) intake system for supply to the two ammonia production trains.
- Potable water supply from the Parish for use at the eyewash/safety showers and the buildings.

- Two cooling towers – one per train.
- Two independent flare systems, maintained under nitrogen purge:
    1. One elevated process gas flare common to the two ammonia production trains, for potential process gas releases.
    2. One elevated ammonia flare common to the two ammonia production trains, for potential ammonia releases.
- Two onsite Air Separation Units (ASUs) – one per train, constructed and operated by the selected ASU vendor, integrated with the associated ammonia train to provide the oxygen and nitrogen requirement for the ammonia production process.
- One firefighting system for the ammonia production site.
- One stormwater system for the site, with a retention pond to support proper stormwater drainage.
- One shared control building, inclusive of an in-house laboratory, for the two ammonia trains and ASUs.
- Shared building/workspace and parking for personnel of the two ammonia trains. Workspace buildings:
    1. Administration, HSE and Technical
    2. Maintenance, Workshop & Warehouse
    3. Emergency Response – for storage and maintenance of emergency vehicles
- One security team, with one security building, for the production site.
- Heavy haul road – 100 ft wide to be constructed for transportation of equipment and prefabricated modules to the site during construction.
- A permanent access road to be constructed, inclusive of a railroad tunnel (otherwise known as a bridge) to facilitate access across the railroad tracks.

3.1 Construction Description

The Project's Path of Construction is west-to-east, south-to-north (Appendix A). Initial activities after developing access to the work site are dewatering, clearing, grubbing, site fill, and surcharge which facilitate the opening of work fronts for piling, underground piping and underground electrical, as well as establishing onsite areas for constructing temporary facilities such as project parking, lunch shelter(s), material laydown / module staging, craft and subcontractor fabrication areas, and project offices.

The path of construction for piling and works at grade (foundations and structures) will advance in a progression generally following the pipe rack module set down sequence, then into the adjacent process areas. The Path of Construction will continue to follow the west-to-east, south-to-north general progression from the southern areas to Train 1 to Train 2.

3.2 Operation and Maintenance Description

Once operational, the facility will have a permanent workforce of about 216 on-site personnel. In addition to the plant operations and maintenance jobs (which make up approximately 60% of the workforce), additional positions will exist in engineering, health, safety & environmental compliance, finance, accounting and purchasing, information technology, site security, human resources, public affairs and plant management and support.

SCCF will operate and maintain the Project Facilities in accordance with all applicable government safety standards and regulations as well as established industry best practices intended to ensure adequate protection for our personnel, the public, and the environment through prevention of facility accidents and failures.

The facility has a designed operational life of over 20 years, and it has been common for similar facilities to operate safely and reliably for decades. After completion of the planned life, SCCF will continue to operate the facility as long as it is economically viable. Long-term operations of the facility could be affected by future CO_2 legislation and regulations, process performance, and economics. For this application, SCCF assumes that the facility would operate for a minimum of 20 years.

SCCF will prepare Operating Procedures for the Project after the final design is completed. The Operating Procedures will address safe startup, shutdown, cool down, purging, maintenance, and emergencies, as well as routine operation and monitoring.

The facility will have minor maintenance that does not require extended or planned plant shutdown on an ongoing basis. Planned major maintenance will be conducted on a 4–5-year cycle, typically lasting 4 weeks.

4. Alternative Site Review

SCCF evaluated five feasible alternative sites for the proposed Project (**Appendix B-F**). “Feasible sites” are defined as any available parcel of land within the general vicinity of the proposed site (within same parish/geographic area and/or near preferred features such as existing industrial areas or transportation features) that can support the main objective(s) of the proposed development.

The five sites considered were the Noel Site, the River-Plex Site, the St. Charles Intermodal Terminal Site, Welham Site and St. Rose IMTT Site (the Selected Site). The five alternatives were compared using the factors identified in **Table 1.**

Table 1: Factors for Project Siting

Minimum Requirements	Optimal Requirements
Minimum of 200 acres	200-500 acres (Includes laydown area)
Mississippi River Access	Minimal tanker transit time to Gulf of Mexico
	Railroad access for potential future use
Capable of being zoned industrial	Industrial zoning designation
Dock Access	Existing dock access and dock infrastructure that can accommodate the needs of the Project
Access to utilities, water, and sewer	Existing utility, water, and sewer
Access to natural gas	Existing natural gas line to tie into
	Proximity to potential CO_2 sequestration network
Capable of installing required infrastructure that supports the project	Availability to use existing infrastructure for product movement and storage
Avoid impacts to wetlands	Avoid, minimize, and/or mitigate wetland impacts
Sites with no known or low probability of encountering cultural resources	Sites with low probability for encountering cultural resources
Minimize impacts to prime farmland	Avoid impacts to prime farmland

The results of the desktop analysis are provided in **Table 2** and detailed in **Sections 4.1** and **5**. The prospective sites were ranked based on the required and the desired factors identified in **Table 1**.

The color rankings for **Table 2** are as follows:

- Factors were coded green if they were both required and desired and existing on site.
- Factors were coded yellow if they were required, did not exist on site, but had the potential to exist on site.
- Factors were coded red if they were considered an elimination factor.
- Factors with no color are for information purposes only.

Table 2: Alternative Site Locations Desktop Assessment

Assessment	Noel Site	River-Plex Site	St. Charles Intermodal Terminal Site	Welham Site	St. Rose IMTT Site (Selected Option)
Site Location	Ascension Parish	Ascension Parish	St Charles Parish	St. James Parish	St. Charles Parish
Facility Footprint (Acres)	561.7	607.6	471.8	554.1	218.6
Mississippi River Access	Yes	Yes	Yes	Yes	Yes
Railroad Access	Off Site	Off Site	On Site	On Site	On Site
Zoning Designation	Industrial	Industrial/ Commercial	Industrial	Industrial	Industrial
Dock Access	Not Existing	Not Existing	Not Existing	Not Existing	Existing
Existing Natural Gas Access	Yes	Yes	Yes	Yes	Yes
Existing Electricity Access	Yes	Yes	Yes	Yes	Yes
Existing Water Access	No	No	No	No	Yes
Existing Sewage Access	No	No	No	No	Yes
CO_2 Tie In Access	Yes	Yes	Yes	Yes	Yes
NWI Wetlands Disturbed (Acres)	6.0	20.5	215.0	17.0	183.5
Known Cultural Resource on Site	Yes	Yes	Yes	Yes	No
Prime Farmland (Acres)	471.2	596.8	414.3	516.7	0

4.1. Narratives on the Alternative Sites and their Reason(s) for Elimination

The Noel Site (**Appendix B**) is located in Ascension Parish along the Mississippi River at 30.179722, -91.028333. Thus, this Site has Mississippi River access. There is no railroad access or existing dock on the site. The potential dock location associated with this site poses numerous concerns. Located across from the Intl-Matex Tank Terminals (IMTT) Geismar terminal, the potential dock site will create a challenging situation when turning a loaded departing vessel at the same time that the IMTT terminal is occupied. Additionally, the right descending bank in this location is very shallow and would require dredging as far as 1,800 feet from the bank in order to get to the 45 ft water depth required. Due to the flow of the river, this site would take on constant silt deposits and require frequent dredging which will present both environmental and safety concerns. This area of the river has a marked narrow channel that, with the addition of a dock on the Noel Site bank, will also cause safety concerns for vessels. This site poses an increased potential for risks to the public and the environment caused by accidental collisions or groundings due to the narrow channel and proximity to other docks. The site is zoned industrial. There is existing natural gas and electrical access, but no water or sewer access at present. The site does appear to have the potential for CO_2 offtake. Per the National Wetland Inventory (NWI) data this 561.7-acre site would impact an estimated 6.0 acres of freshwater forested/shrub wetlands, 1.0 acres of freshwater pond waters, and 5.91 acres of riverine waters. Upon review of the State Historic Preservation Office (SHPO) data this site has known cultural resources site present.

This site was eliminated for its lack of railroad access, safety and logistics concerns associated with dock placement along the Mississippi River, Prime Farmland designation, and the presence of known cultural resources.

The River-Plex Site (**Appendix C**) is located in Ascension Parish along the Mississippi River at 30.1447, -91.038706. Thus, the site has Mississippi River access. There is no railroad access or existing dock. The potential dock location associated with this site poses numerous concerns. The right descending bank in this location of the river is very shallow and would require dredging as far as 1,800 feet from the bank in order to get out to the 45’ curve required. Due to constant silt deposition at this location, the site will be unable to maintain its depth without frequent dredging which will present both environmental and safety concerns. Additionally, the site is located in a bend of the river at the 81-mile point which is a high current area, increasing the difficulty and risk of turning a loaded vessel. Mooring buoys located across the river pose additional safety concerns for this location. Thus, this site poses increased safety risks for vessels, the public and the environment due to accidental collisions and groundings. The site is zoned partly commercial and partly industrial. There is existing natural gas and electrical access. However, there is no existing water or sewer access. The site does appear to have the potential for CO2 offtake. Per the NWI data, this 607.6-acre site will impact an estimated 20.5 acres of freshwater forested/shrub wetlands and 7.52 acres of riverine waters. Upon review of the SHPO data this site has known cultural resources site present.

This site was eliminated due to the lack of railroad access, safety and logistics concerns associated with dock placement along the Mississippi River, Prime Farmland designation, and the presence of known cultural resources.

The St. Charles Intermodal Site (Appendix D) is located in St. Charles Parish along the Mississippi

River at 30.009189, -90.495331. Thus, the site has Mississippi River access. There is no railroad access. The site is zoned industrial. There is existing natural gas and electrical access. However, there is no existing dock, water, or sewer access. This could all potentially be added in the future but may require additional wetland impacts, and further investigation is needed. The site does appear to have the potential for CO_2 offtake. Per the NWI data, this 471.8-acre site will impact an estimated 215 acres of freshwater forested/shrub wetlands and 2.4 acres of riverine waters. While the site is 471.8 acres, the project would be forced to use the high percentage wetland areas the site due to the required residential buffer. Upon review of the SHPO data, this site has known cultural resources site present.

This site was eliminated due to, the amount of wetlands on site, Prime Farmland designation, and the presence of known cultural resources.

The Welham Site (**Appendix E**) is located in St. James Parish, along the Mississippi River at 30.022986, -90.796769. Thus, the site has Mississippi River access. There is no existing dock access. The potential dock location associated with this site is inside of a designated anchorage area. Anchorage areas in the river are sparse and in constant use. For this reason, it is unlikely that building a berth within and consequently sacrificing an existing anchorage, would be approved. The site is zoned industrial. There is existing natural gas and electrical access. However, there is no existing water or sewer access. The site does appear to have the potential for CO2 offtake. Per the NWI data this 554.1-acre site will impact an estimated 17.0 acres of freshwater forested/shrub wetlands and 8.0 acres of riverine waters. Upon review of the SHPO data this site has known cultural resources site present.

This site was eliminated due to, the unfavorable location of the potential dock site, Prime Farmland designation, and the presence of known cultural resources.

5. Selected Option: St Rose IMTT

The St. Rose IMTT Site (**Appendix F-H**), is a 218.6-acre tract, located in St. Charles Parish, along the Mississippi River. Thus, the site has Mississippi River access, railroad access, is zoned industrial, has existing natural gas, electrical, water and sewer access. The site does appear to have the potential for CO_2 offtake. The site has an estimated 183.5-acres of wetlands. Upon review of the SHPO data this site has no known cultural resources site present. In addition, this site abuts IMTT's St. Rose facility which provides many options for utilization of existing structures that will reduce wetland impacts. As a result, this site was selected, and details are provided in the sections below.

5.1 Steps taken to minimize environmental impacts (Appendix G).

1. Utilization of **existing IMTT docks** for ship loading eliminates the need to install additional docks in the Mississippi River. Two of the existing docks will be outfitted with liquid ammonia product and vapor return loading arms to accommodate the new product. New pilings will be installed using barge-mounted cranes positioned adjacent to the existing dock and approach way structures. Above water bracing and framing will be installed. Prefabricated steel decks will be lifted into place utilizing the barge-mounted cranes and welded in place. Cast in place concrete will be poured atop new dock containment areas. Loading arms and piping will be

installed. Water intake pumps, screens, and piping will be installed. Electrical equipment, duct bank, and wiring will be installed.

2. Utilization of **existing pipe racks** for new ammonia loading / vapor return piping will eliminate the need to disturb additional land. The existing pipe bridges over River Road and the pipeline in the facility will be used or modified as necessary to accommodate the new ammonia piping.

3. Landside track cranes will be used to drive **new pipe rack pilings adjacent to existing pipe racks**. Prefabricated cross-member and bracing sections will be lifted into place and attached to driven piles. Pipe rack bracing will be installed. Utility piping, process piping, and electrical duct bank and wiring will be installed in pipe racks.

4. The SCCF ammonia production trains are strategically located, away from any existing public areas (residential offset), in the northern sections of the leased property. An existing road right-of-way will be used for over half the access road (construction and permanent operations access) to minimize impacts to undisturbed property for **site access**. The remainder of the route will be adjacent to an existing pipeline right-of-way.

5. To avoid the need to construct an emergency access/egress route to the site across undisturbed property to the east or north in the event that a Canadian National (CN) Railroad train is blocking the primary southern access, a **permanent site access railroad crossing** bridge will be installed as part of the primary access route. This provides an added layer of site and personnel safety by providing continuous access to the site regardless of activities on the existing CN railway.

6. SCCF has leased a total of 238 acres from IMTT for its proposed new process production facility including permanent plant and temporary construction requirements. A **compact modular design** will be utilized to minimize both the requirement for laydown area and the size of the permanent plant footprint, limiting the actual disturbed area to approximately 218.6 acres (including setbacks from the property lines and construction access).

7. Using a **modular design** in **conjunction with the compact layout** substantially reduces the temporary facilities required for construction laydown, including the site facilities to accommodate workers (parking areas, break rooms, ablution facilities). A typical stick-build construction strategy requires approximately three (3) times the plant area for temporary facilities, or over 300 acres. The current plot plan including construction is approximately 218.6 acres within the lease area.

8. The new, dedicated **ammonia storage tanks**, refrigeration, and emergency flare will be located on 18.60 acres of existing wetlands located on IMTT property. It was originally going to be located within IMTT's existing facility, but a parish ordinance requiring a 2,000-foot buffer between the storage tanks and the nearest residential or residential commercial zone placed the tanks in existing wetlands.

9. The SCCF project has access to **potable water**, either through existing IMTT connections or direct connections to parish water lines on/adjacent to the IMTT property.

10. Sewage designs are still being finalized, but it is expected that the sanitary **sewage loads from the SCCF project will be able to be tied into the existing parish sewer system**, either through existing forced mains or by vacuum truck transfer to underutilized parish lift stations.

11. IMTT has an extensive reticulated ring main fire water system associated with their existing storage facilities. SCCF will be able to **tie into the existing fire water system** to provide unlimited back-up firewater to the new production plant without the need to run additional large diameter piping to the Mississippi River or to install new intake infrastructure in the river.

5.2 Reasons for selection of least damaging alternative

1. Mississippi River access to assist with delivering the product via barge.
2. The railroad is on the southern edge of the Project, so no additional access or rights-of-way are needed to use rail.
3. The existing docks are accessible, in an easier/safer berthing location compared to the alternative sites and are suitable for ammonia loading with minimal upgrading.
4. Pipeline and pipe racks exist that can be added to or modified to carry the product.
5. Ability to reduce wetland impacts by using some existing developed property for temporary facilities and access.
6. IMTT is an experienced tank terminal and logistics provider, having provided these services to multiple parties/customers since the 1930's, and will own and operate storage & loading of SCCF product.00
7. Existing industrial presence in the region, not a new industrial base.
8. IMTT has existing community relations and an outreach program, Community Action Panel.
9. Sufficiently isolated site. Ammonia production has a well-established record for decades of safe operation and an established regulatory regime governing design and operations. Having a well-isolated site provides an additional level of inherent, passive safety, with the ammonia producing facilities located a minimum of 1.2 miles from the nearest public access property.
10. Access to reliable electric power as existing Entergy 230 kV high voltage power supply lines run within 1600 ft (500 meters) of the SCCF leased property.
11. Access to natural gas feedstock supply as the Gulf South pipeline network runs within 2000 ft (600 meters) of the SCCF leased property.
12. Availability to CO_2 offtake locations.
13. The site has existing access to potable water and sewage system.
14. There is an existing fire water system.

15. Wetland impacts for this site are approximately 183.5-acres (162.86 permanent and 20.60 temporary) which includes impacts for any potential tie-ins for utilities and CO_2 offtake, the SCCF facility site, storage tanks, and heavy haul road access (**Appendix H**).

5.3 Environmental Justice Review

Using the EPA's Environmental Justice Screening and Mapping Tool, St. Rose IMTT Site's potential impact on surrounding communities was analyzed. It was determined that the St. Rose IMTT Site is in the 67th percentile for the supplemental demographic index within the state of Louisiana; indicating that communities surrounding the St. Rose IMTT Site have high levels of EJ concerns. The category contributing most to this high percentage is percent people of color at the 74th percentile for Louisiana. The population with less than a high school education is also high at the 64th percentile for the state.

Additionally, this area is in the 79th percentile for unemployment rates in the state, making the 200 plus jobs that will be created by this project critically important to the community of St. Rose. However, it is also noted that due to the number of industrial facilities in the area, levels of toxic releases to air, diesel particulate matter, ozone, air toxics cancer risk, air toxics respiratory HI, and wastewater discharge are all over the 75th percentile for the state.

6. Discussion of alternative site configurations of selected St Rose IMTT:

6.1 Heavy Haul Access Road

A total of three (3) alternative route configurations were considered during development of the plot plan to access the site location. The three configurations are highlighted as green, yellow, and blue (**Appendix I**). A heavy haul road will be constructed for the purpose of transporting equipment and prefabricated modules to the site during construction. Once construction has been completed, the proposed permanent access road will be sufficient for typical access needs at the SCCF facility. The elevated portion of the heavy haul road above the highway and levee will be removed after construction of the facility is completed.

Option 1, Selection Option (Yellow Route): This is an existing access road located with the existing IMTT facility that can accommodate the large modules safely. This area is currently permitted by IMTT for industrial use and would result in no additional impacts. Thus, this is the selected route.

Option 2 (Green Route): This access route was initially considered since it was linear and near the proposed facility that could accommodate the large modules. Upon further desktop assessment it was eliminated, as the heavy haul route was a great distance from the proposed facility site and posed logistical challenges like making the turns with large modules, the setback requirements for the railroad, additional wetland impacts anticipated north of the railway to get to the facility and potential constraints of the residential homes along the east side of the route heading toward the proposed facility.

Option 3 (Blue Route): This access route area is currently within the permitted limits of IMTT and would result in no additional impacts. However, this route was eliminated due to the type of modules that

would be brought in to construct the facility. These 100-foot wide by 125-foot-long table modules would not be able to manipulate through the additional turns easily and safely.

6.2 Pipe Racks

Pipe racks to transport the product from the storage tanks to the dock where it can be transferred are fixed. The Project proposes to use IMTT's existing pipe rack infrastructure and if needed make additional modifications (**Appendix G**). This would result in no wetland impacts.

6.3 Detention Ponds

The detention ponds are required due to St. Charles Parish stormwater management criteria and floodplain mitigation requirements. The parish requires a site be designed such that the post development peak stormwater runoff flows are equal to or less than the predevelopment peak stormwater runoff flows. These design requirements were taken into consideration when selecting a site and configuring the components of the development i.e., detention pond. **Option 1**, in the original design (17.77-acres) of the project the applicant proposed to collocate tanks and the detention pond (**Appendix J**). However due to the requirements from the gas and electrical companies for metering substations onsite and pipeline and access servitudes along the property boundaries, the layout was modified to represent two (2) additional detention pond configurations.

As such, the detention pond was reconfigured on the West and an additional pond was added to the north end of the proposed project area based on areas selected for the metering substations due to St. Charles 2000' Residential Offset Demarcation line as shown. Option 2 resulted in two detention ponds for a total of 20.89-acres.

The alternative **Option 2** shows two (2) ponds smaller than those in **Option 1**, but when the preliminary hydrology model was run the size was insufficient for the storm water during a 100-year storm event, which resulted in the third option, which ultimately became the selected option. Additionally, pipeline access and drainage servitudes are required on the eastern and western boundaries of the facility site. For this reason, the facility area layout was adjusted and ponds relocated to accommodate these changes. Option 3 resulted in two detention ponds for a total of 31.11-acres.

For **Option 3**, the selected option, the site would consist of two detention ponds. One is located to the northeast of the site area and the second pond is located to the southeast of the facility site. The pond construction will consist of dredging and clearing out the pond areas. The detention pond will be a wet pond with a bottom elevation of -2 feet. The southeastern pond will outfall into the drainage ditch along the east side of the property which flows north into the existing site which is remaining undisturbed. The northern pond will outfall directly into the undisturbed cypress swamp areas at the north side of the site. Based on results of a hydrologic review and an attempt to minimize wetland impacts, the northern most pond was removed from the planned facility. The area of the pond will be a temporary laydown yard and restored upon completion of the project.

6.4 Storage Tanks

There were two options reviewed for the placement of the Ammonia Storage Tanks. Option 1 (**Appendix K, Exhibit AA-13**) had the storage tanks constructed within IMTT's existing facility, which would have resulted in no wetland impacts. This option, though preferred, was ruled out due to a local parish ordinance that stated the storage tanks needed to be 2000-feet away from the nearest residential or residential commercial designated zone. This resulted in the creation of Option 2, the selected option (Appendix K, **Exhibit AA-14**), which impacted 18.6 acres of wetlands.

6.5 Relocation of the Existing Pipeline and Pipe Rack.

The existing pipeline, which runs near the center of the proposed facility will be rerouted along the southern and western perimeter of the SCCF facility site. The landowner and pipeline owner has requested a 60' right of way be provided along said boundaries; therefore, the relocation of the pipeline is fixed. The 60' right of way for the pipeline reroute has resulted in 9.73 acres of wetland impact. The pipeline reroute will be above ground and on pipe racks. Piperack installation will include the use of landside track cranes to drive new pipe rack pilings adjacent to existing pipe racks. Prefabricated cross-member and bracing sections will be lifted into place and attached to driven piles. Pipe rack bracing will be installed. Utility piping, process piping and electrical duct bank and wiring will be installed in pipe racks (**Appendix G**). It should be noted this activity will be **permitted under a separate activity** proposed by IMTT**.**

7. Infrastructure Needs

7.1 Roads

There is an existing partial access road that extends northward to the railroad tracks, which is the southern edge of the SCCF facility site. However, this existing access road that runs from River Road to the railroad tracks is not sufficient to accommodate the construction and operational needs for the project. As a result, a heavy haul road will be constructed from River Road which will loop through the facility. This road will be 100-feet wide, elevated approximately 6-feet, and will be capable of accommodating any load requirements needed for the construction of the project. Upon completion of construction, portions of the heavy haul road will remain in place for permanent access into the site. The road will be 40' wide and a new bridge will be constructed to span over the railroad tracks. The 40' roadway will be continued around the site for permanent access into the facility.

7.2 Utilities

A utility line is located on the southern boundary of the project alongside the rail system. The Project proposes to elevate this line to accommodate the heavy haul road construction traffic and permanent bridge structure that will be installed. The Project will tie into this existing system. There will be a power substation within the facility to provide permanent power for operations.

7.3 Natural Gas

An existing natural gas pipeline will be extended to the site and service the facility at a gas metering station located within the facility site.

7.4 Water

There is an existing 10” public waterline located along the southern side of the railroad. The facility will tie into and meter the potable water required for the facility from this existing 10” water main. The existing IMTT facility has an independent fire water system which will be utilized for fire water routing through the proposed facility.

7.5 Sewage

There is an existing 10” sewer force main located along the north side of the railroad. The proposed sewer loading from the facility will ultimately be tied into the existing parish infrastructure. If the existing parish sewer force main has capacity, the facility will discharge the sewer loading directly into the existing force main via a pump station. If capacity is limited, the sewer loading will be captured in an onsite holding tank and directly trucked to the Parish treatment plant, which currently has capacity to handle the additional load being created with the facility.

7.6 Drainage

Existing drainage is such that everything north and south of the railroad drains northward away from River Road and residential areas south of the railroad tracks into the existing swamp. From there water continues north under Interstate 310 then Airline Highway and finally through the Cross Bayou Canal Pump Station or opened control structures which are a part of the Hurricane and Storm Damage Risk Reduction System (HSDRRS) levee system that separates the swamp immediately north of the SCCF site from the larger LaBranche wetlands on the outside of the HSDRRS levee system. As a part of the construction of the facility a detention pond will be constructed within the facility site. The pond will be located at the southeast corner of the SCCF facility site. A portion of the drainage from the facility will be routed into the detention pond via open ditch and subsurface drainage. The pond will detain stormwater so that the post development peak flow rates are equal to or less than the predevelopment peak flow rates, in accordance with Parish requirements. Stormwater from the existing IMTT facility will be routed around the proposed facility site to the east and west to bypass the detention pond. There will also be a drainage feature constructed on the east side (inside) of the heavy haul road which will discharge at the northwest corner of the SCCF facility. This will prevent stormwater from having any effects on developed areas to the southeast and southwest of the SCCF facility.

7.7 Bridge

A portion of the Canadian National (CN) Railway must be crossed to access the proposed facility. The CN Railway runs along the southern perimeter of the proposed facility. Currently there is only one at-grade railway crossing for access. Due to the railways frequent use and stopped railcars blocking the at-grade crossing, a bridge over the railway will be constructed to facilitate a permanent unencumbered access point into the proposed facility site. The bridge will be designed for HS-20 highway loading. Vertical and Horizontal clearance requirements specified by CN will be specified for alignment of the bridge structure spanning over the railroad. The bridge will be supported on deep foundations.

8. Raw materials to be used and the method(s) and route(s) of delivery of those raw materials to the proposed facility.

The identified raw product is blue ammonia and will be transported via pipelines and placed within storage tanks.

The product will then be transported via a pipeline located on IMTT's property, across the levee and to the existing IMTT dock where it will be loaded and transported to off-takers.

9. Destination(s) of the products to be manufactured and the method(s) and route(s) of delivery of those products.

The selected site is the destination of product manufacturing. Natural gas feedstock will be delivered via lateral from an existing pipeline in close proximity to the Project. The plant will produce ammonia which will be stored in the proposed tanks. CO2 from the production process will be sent via a third-party lateral to existing CO2 pipelines and sequestered in Class VI wells. All product(s) are to be offloaded and delivered via bulk loading dock as mentioned in the objective of the proposed activity. The product will then be transferred to ship loading facilities on the Mississippi River.

10. Explain how the use will affect existing infrastructure, including evacuation, and identify any additional permits required. Describe any secondary infrastructure that may be required to service the development.

Community evacuations in response to fires, explosions, oil discharges, and hazardous material spills are the responsibility of local emergency managers, together with the municipal police and fire departments, and are conducted in accordance with the Local Emergency Response Plan (LERP).

The existing operations at IMTT identified Louisiana Highway 48/River Road (east and west from the entrance) and St. Rose Avenue (LA 626) north from River Road serve as the major conveyors of vehicular traffic near the facility and should be recognized as the community-wide evacuation routes.

The St. Charles Parish Emergency Operations Center (EOC/DEP) together with the St. Rose Volunteer Fire Department and St. Charles Parish Sheriff's Office will make determinations regarding public evacuation and selecting the proper evacuation routes to use in the event of an emergency.

The construction and operations of the proposed SCCF project would not alter or impact those evacuation routes already identified for the IMTT terminal.

Additional Permits Required:

- USACE REGULATORY PERMIT - WETLANDS PERMIT (SECTION 404 - JOINT PERMIT APPLICATION)
- USACE REGULATORY PERMIT - CWA PERMIT (SECTION 10 - JOINT PERMIT APPLICATION)
- LDEQ – WATER QUALITY CERTIFICATION (SECTION 401)
- UNITED STATES ARMY CORPS OF ENGINEERS – COMPLETED WORKS DIVISION (USACE SECTION 408)
- COASTAL USE PERMIT (JOINT PERMIT APPLICATION)
- LA DOTD PROJECT PERMIT & LETTER OF ENDORSEMENT
- LA DOTD ACCESS CONNECTION PERMIT
- LOUISIANA POLLUTANT DISCHARGE ELIMINATION SYSTEM (LPDES) GENERAL PERMIT

- CANADIAN NATIONAL (CN) PERMITTING
- ST. CHARLES PARISH FLOOD DEVELOPMENT PERMIT
- ST CHARLES PARISH BUILDING PERMIT
- PONTCHARTRAIN LEVEE DISTRICT LEVEE PERMIT

11. Conclusion:

After careful consideration and analysis of each site and the factors provided above, it has been determined that IMTT St. Rose is the least damaging and feasible alternative. SCCF reviewed several sites before identifying the proposed site as the preferred site. The four sites that were eliminated all contained large amounts of land that is designated as Prime Farmland under the Farmland Protection Policy Act (FPPA). The FPPA is intended to minimize the impact federal programs have on the unnecessary or irreversible conversion of farmland to nonagricultural uses. While FPPA protections don't always apply to privately funded projects, there is currently no requirement to mitigate the conversions of Prime Farmland to nonagricultural uses. When Prime Farmlands are converted, there is not a "no net loss" as with wetlands through the wetland mitigation process. When Prime Farmlands are developed, they are not mitigated or returned to native habitats but are instead lost, in most cases in perpetuity.

The proposed site is directly adjacent to the IMTT facility which has existing logistics and docking facilities that can handle the Project needs and SCCF's blue ammonia product with minimal modification. The pipes used to transport the product to the dock will run through IMTT's existing pipe rack. The portion of the heavy haul road in IMTTs facility footprint above 5' was previously permitted as an access corridor for IMTT. The facility and detention ponds have been designed to reduce impacts to the maximum extent practicable. Therefore, to meet the objective of the proposed use, the IMTT St Rose site was chosen to serve as the site for the proposed facility due to its existing infrastructure which allows for a reduction in wetland impacts, safety concerns, and resource usage, as well as its avoidance of cultural resource sites and prime farmland.

Works Cited:

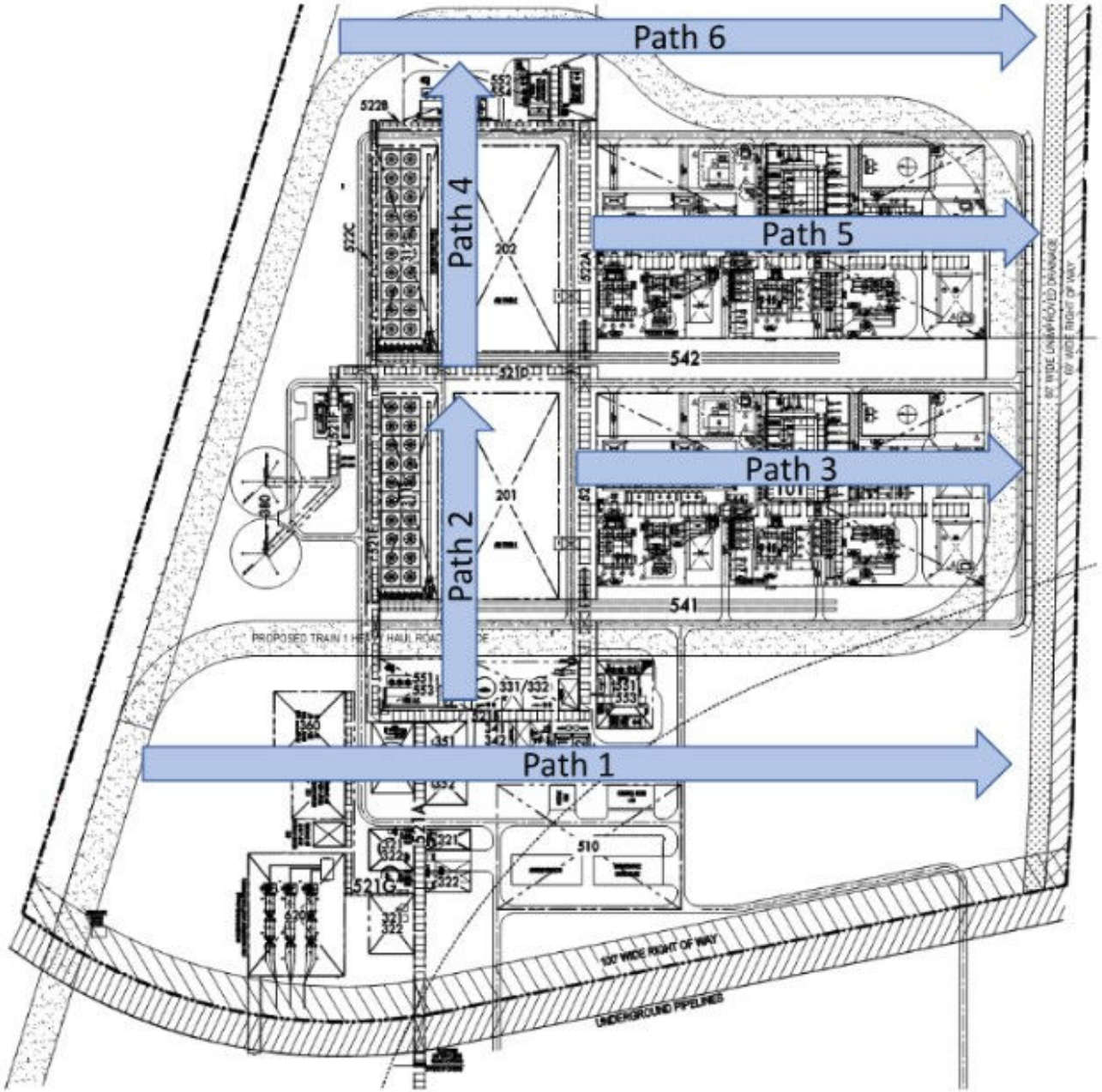
Ammonia: zero-carbon fertilizer, fuel, and energy store. (2020, February). *The Royal Society,* DES5711 ISBN: 978-1-78252-448-9, page 4. https://royalsociety.org/-/media/policy/projects/green-ammonia/green-ammonia-policy-briefing.pdf

EPA (2023) Inventory of U.S. Greenhouse Gas Emissions and Sinks: (1990-2021). U.S. Environmental Protection Agency, EPA 430-R-23-002, pages 2-1 and 2-3. https://www.epa.gov/ghgemissions/inventory- us-greenhouse-gas-emissions-and-sinks-1990-2021.

Statista Research Department. (2023, June 15). *Topic: Ammonia-Statistics & Facts*. Statista. https://www.statista.com/topics/10358/ammonia/#topicOverview

APPENDIX A

CONSTRUCTION EXECUTION PLAN
Needs Alternative and Justification Analysis
St. Charles Clean Fuels, LLC
St. Charles Parish, Louisiana



PERMIT SET

ST. CHARLES PARISH, LOUISIANA

FOR ST. CHARLES CLEAN FUELS

DDG

314 EAST BAYOU ROAD | THIBODAUX, LA

985.447.0090

SCCF

PRELIMINARY
FOR PERMIT
PURPOSES ONLY

PROJECT NO. 22-1814

SCCF/IMTT AREA PROJECT

07/07/2023

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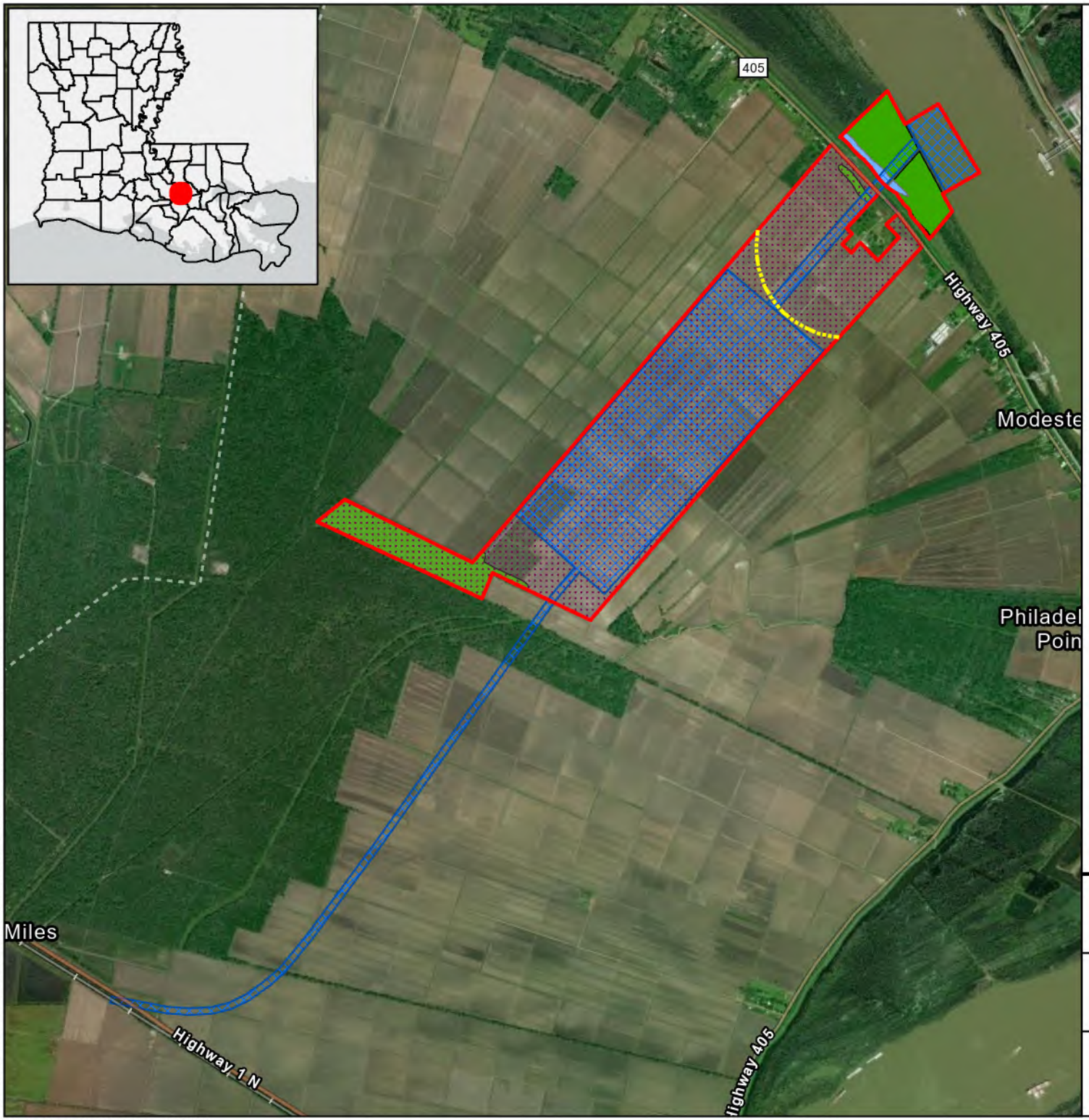
AA-1

Construction
Execution Plan

Path: Z:\2022\22-1814\COASTAL\GIS\22-1814 ArcGIS Pro Project\22_1814.aprx

APPENDIX B

NOEL SITE DESKTOP ASSESSMENT
Needs Alternative and Justification Analysis
St. Charles Clean Fuels, LLC
St. Charles Parish, Louisiana



ST. ROSE, LOUISIANA
ST. CHARLES PARISH
ST. CHARLES CLEAN FUEL

RESIDENTIAL BUFFER

ORIGINAL SITE BOUNDARY: 915.51 AC.

FACILITY IMPROVEMENT AREA: 561.71 AC.

NWI WETLANDS

FRESHWATER FORESTED/SHRUB WETLAND
TOTAL: 131.29 AC. | DISTURBED: 5.95 AC.

FRESHWATER POND
TOTAL: 6.27 AC. | DISTURBED: 1.02 AC.

RIVERINE
TOTAL: 9.31 AC. | DISTURBED: 5.91 AC.

PRIME FARMLAND
TOTAL: 806.69 AC.
DISTURBED: 471.24 AC.

PRELIMINARY FOR PERMIT PURPOSES ONLY

N

0 0.3 0.5 1 Mi

Noel Site Alternative Concept

Figure 1

Duplantis Design Group
314 East Bayou Rd
Thibodaux, LA 70301

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Date Saved: 12 January 2024

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Noel_Site_Boundary
Cemeteries
Archaeological Sites
Phase 1
Hydrographic
Certified Local Government
Local Historic District
Cultural District Locations
Cultural District Boundary
Main Street
National Register Eligible Districts
LHRI Standing Structure Survey
National Register Districts
National Register Individual Listings
Parishes
State Lands

N

1:36,112

0 0.28 0.55 1.1 mi
0 0.42 0.85 1.7 km

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ArcGIS Web AppBuilder

CONANP, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA | LA Divisions of Archaeology and Historic Preservation | USGS National Map 3D Elevation Program (3DEP), May 16, 2023, |

PERMIT SET
ST. CHARLES PARISH, LOUISIANA
FOR ST. CHARLES CLEAN FUELS

DDG
314 EAST BAYOU ROAD | THIBODAUX, LA
985.447.0090

PRELIMINARY
FOR PERMIT
PURPOSES ONLY

PROJECT NO. 22-1814

SCCF/IMTT AREA PROJECT
08/14/2023

CHECKED TH
DRAWN BY CC

AA-2c
Noel Site
Cultural Resources

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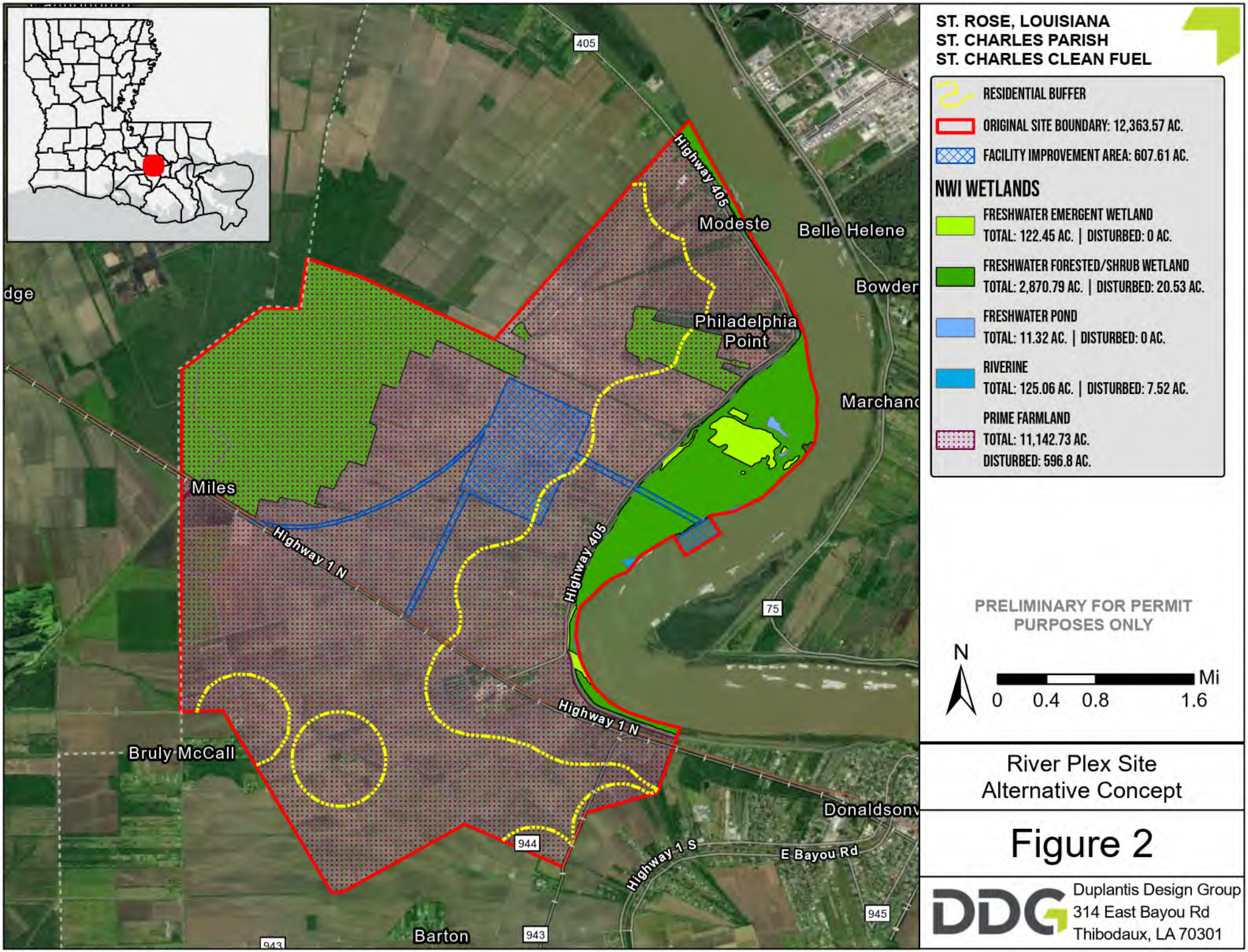
APPENDIX C

RIVER-PLEX SITE DESKTOP ASSESSMENT
Needs Alternative and Justification Analysis
St. Charles Clean Fuels, LLC
St. Charles Parish, Louisiana



River Plex Site
Alternative Concept

Figure 2

Duplantis Design Group
314 East Bayou Rd
Thibodaux, LA 70301

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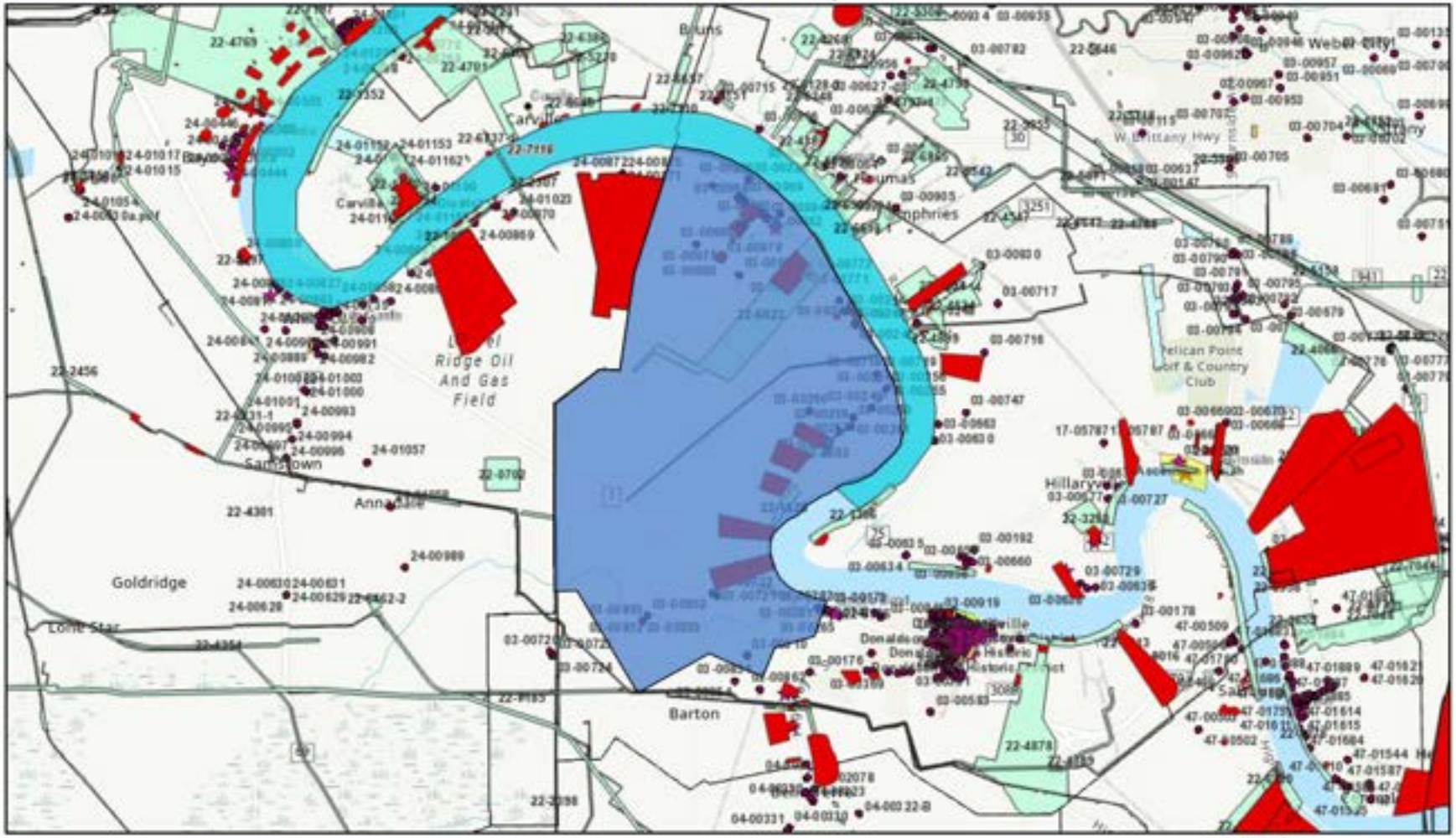
Date Saved: 12 January 2024

ArcGIS Web Map



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River_Plex_Boundary
Cemeteries
Archaeological Sites
Phase 1
Hydrographic
Certified Local Government
Local Historic District
Cultural District Locations
Cultural District Boundary
Main Street
National Register Eligible Districts
LHRI Standing Structure Survey
National Register Districts
National Register Individual Listings
Parishes
State Lands

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ArcGIS Web AppBuilder

CONANP, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, USDA | LA Divisions of Archaeology and Historic Preservation | USGS National Map 3D Elevation Program (3DEP), May 16, 2023. |

PERMIT SET
ST. CHARLES PARISH, LOUISIANA
FOR ST. CHARLES CLEAN FUELS

DDG
314 EAST BAYOU ROAD | THIBODAUX, LA
985.447.0090

PRELIMINARY
FOR PERMIT
PURPOSES ONLY

PROJECT NO. 22-1814

SCCF/IMTT AREA PROJECT
08/14/2023

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AA-3c
River-Plex Site
Cultural Resources

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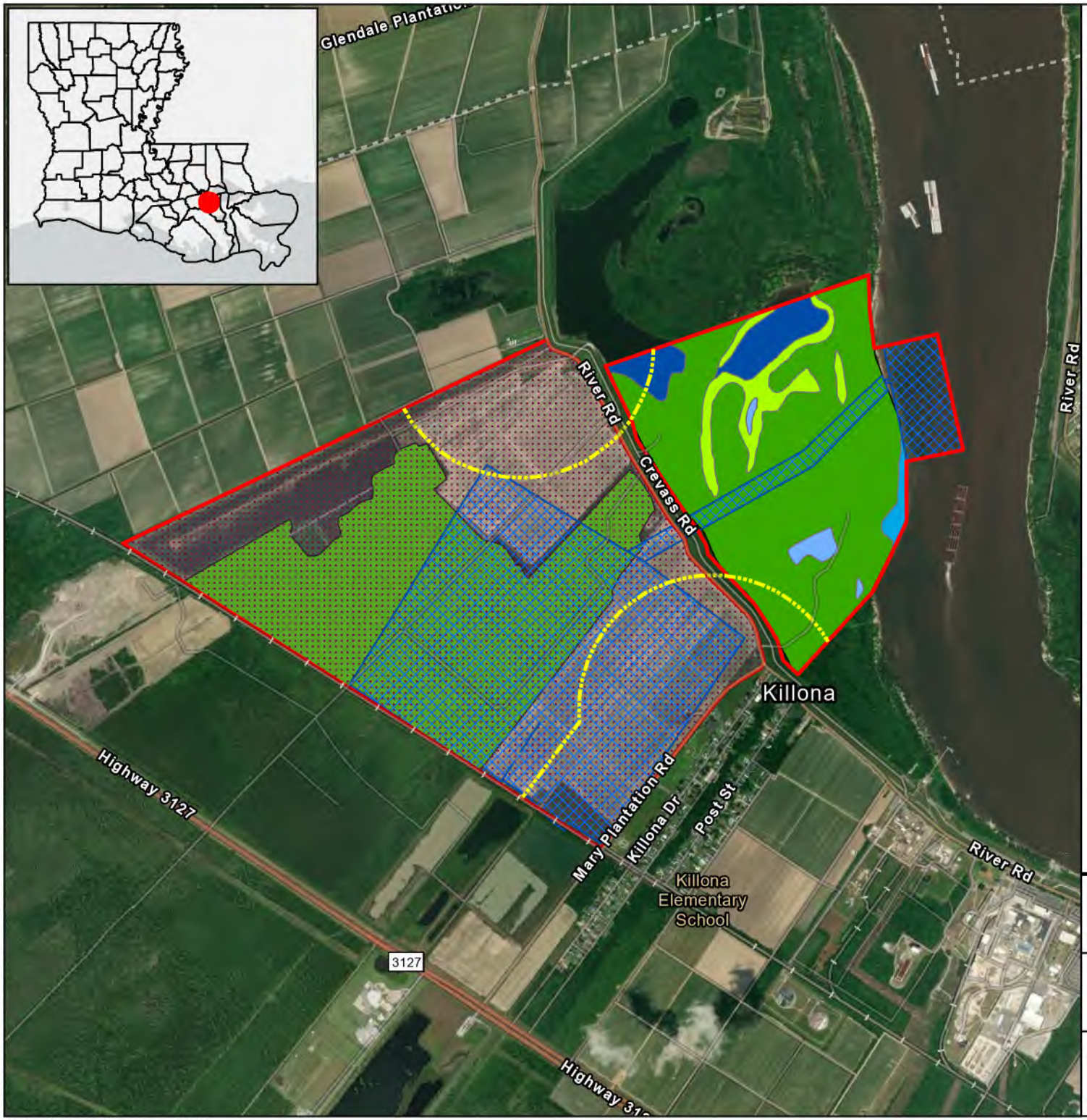
APPENDIX D

ST. CHARLES INTERMODAL SITE DESKTOP ASSESSMENT
Needs Alternative and Justification Analysis
St. Charles Clean Fuels, LLC
St. Charles Parish, Louisiana



ST. ROSE, LOUISIANA
ST. CHARLES PARISH
ST. CHARLES CLEAN FUEL

RESIDENTIAL BUFFER

ORIGINAL SITE BOUNDARY: 1,224.61 AC.

FACILITY IMPROVEMENT AREA: 471.81 AC.

NWI WETLANDS

FRESHWATER EMERGENT WETLAND
TOTAL: 30.48 AC. | DISTURBED: 0 AC.

FRESHWATER FORESTED/SHRUB WETLAND
TOTAL: 637.04 AC. | DISTURBED: 214.97 AC.

FRESHWATER POND
TOTAL: 7.06 AC. | DISTURBED: 0 AC.

LAKE
TOTAL: 32.27 AC. | DISTURBED: 0 AC.

RIVERINE
TOTAL: 9 AC. | DISTURBED: 2.39 AC.

PRIME FARMLAND
TOTAL: 829.63 AC.
DISTURBED: 414.25 AC.

PRELIMINARY FOR PERMIT PURPOSES ONLY

N

0 0.1 0.3 0.6 Mi

St Charles Intermodal Site Alternative Concept

Figure 3

Duplantis Design Group
314 East Bayou Rd
Thibodaux, LA 70301

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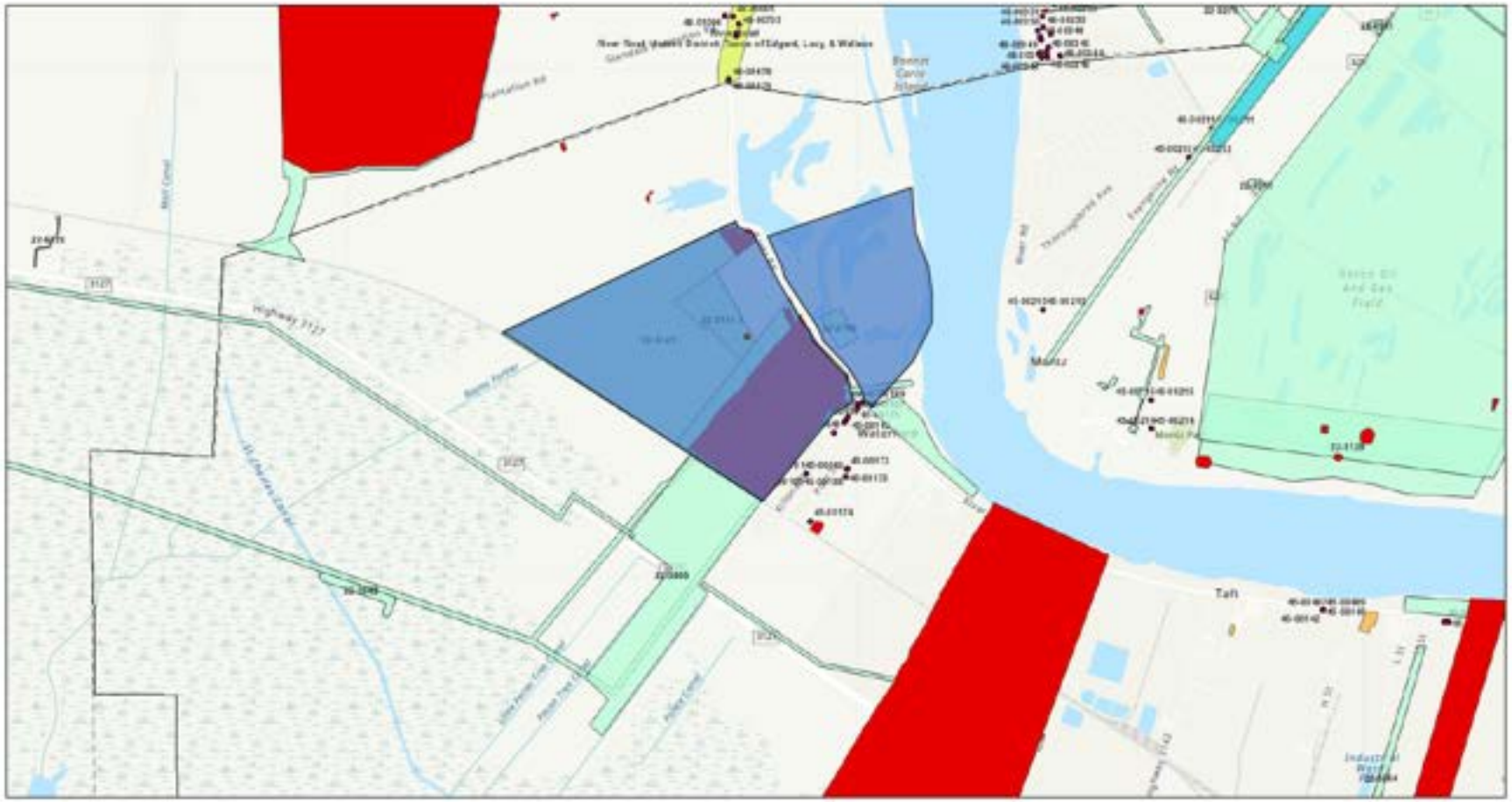
Date Saved: 12 January 2024

ArcGIS Web Map



PERMIT SET
ST. CHARLES PARISH, LOUISIANA
FOR ST. CHARLES CLEAN FUELS

DDG
314 EAST BAYOU ROAD | THIBODAUX, LA
985.447.0090

PRELIMINARY
FOR PERMIT
PURPOSES ONLY

PROJECT NO. 22-1814

SCCF/IMTT AREA PROJECT
08/14/2023

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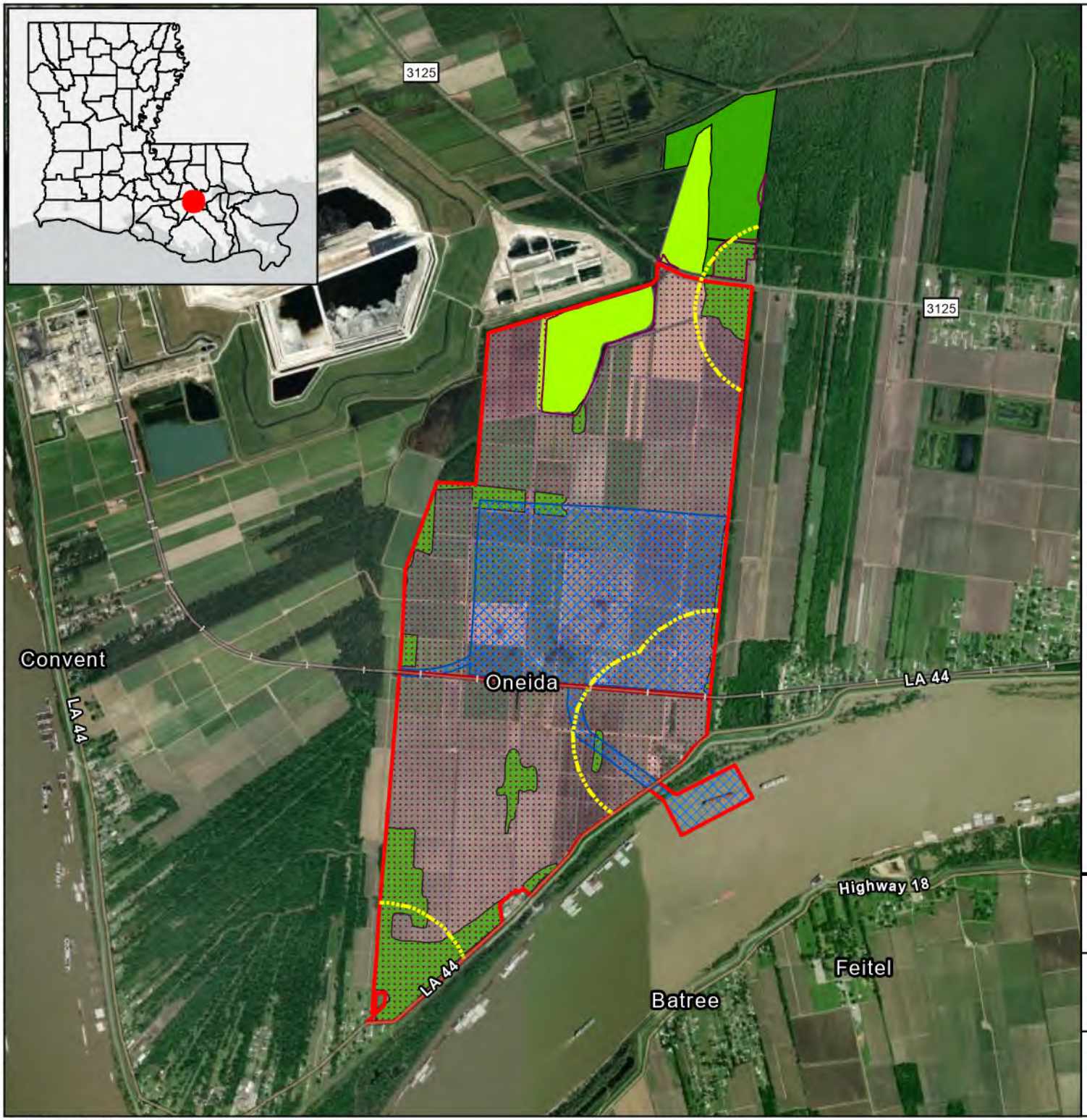
AA-4c
St. Charles Intermodal
Site Cultural Resources

Path: Z:\2022\22-1814\COASTAL\GIS\22-1814 ArcGIS Pro Project\22_1814.aprx

APPENDIX E

WELHAM SITE DESKTOP ASSESSMENT
Needs Alternative and Justification Analysis
St. Charles Clean Fuels, LLC
St. Charles Parish, Louisiana



ST. ROSE, LOUISIANA
ST. CHARLES PARISH
ST. CHARLES CLEAN FUEL

RESIDENTIAL BUFFER

ORIGINAL SITE BOUNDARY: 1,994.99 AC.

FACILITY IMPROVEMENT AREA: 554.12 AC.

NWI WETLANDS

FRESHWATER EMERGENT WETLAND
TOTAL: 143.01 AC. | DISTURBED: 0 AC.

FRESHWATER FORESTED/SHRUB WETLAND
TOTAL: 324.89 AC. | DISTURBED: 16.98 AC.

FRESHWATER POND
TOTAL: 0.01 AC. | DISTURBED: 0 AC.

RIVERINE
TOTAL: 21.24 AC. | DISTURBED: 8.03 AC.

PRIME FARMLAND
TOTAL: 1,887 AC.
DISTURBED: 516.7 AC.

PRELIMINARY FOR PERMIT PURPOSES ONLY

N

0 0.3 0.5 1 Mi

Welham Site Alternative Concept

Figure 4

Duplantis Design Group
314 East Bayou Rd
Thibodaux, LA 70301

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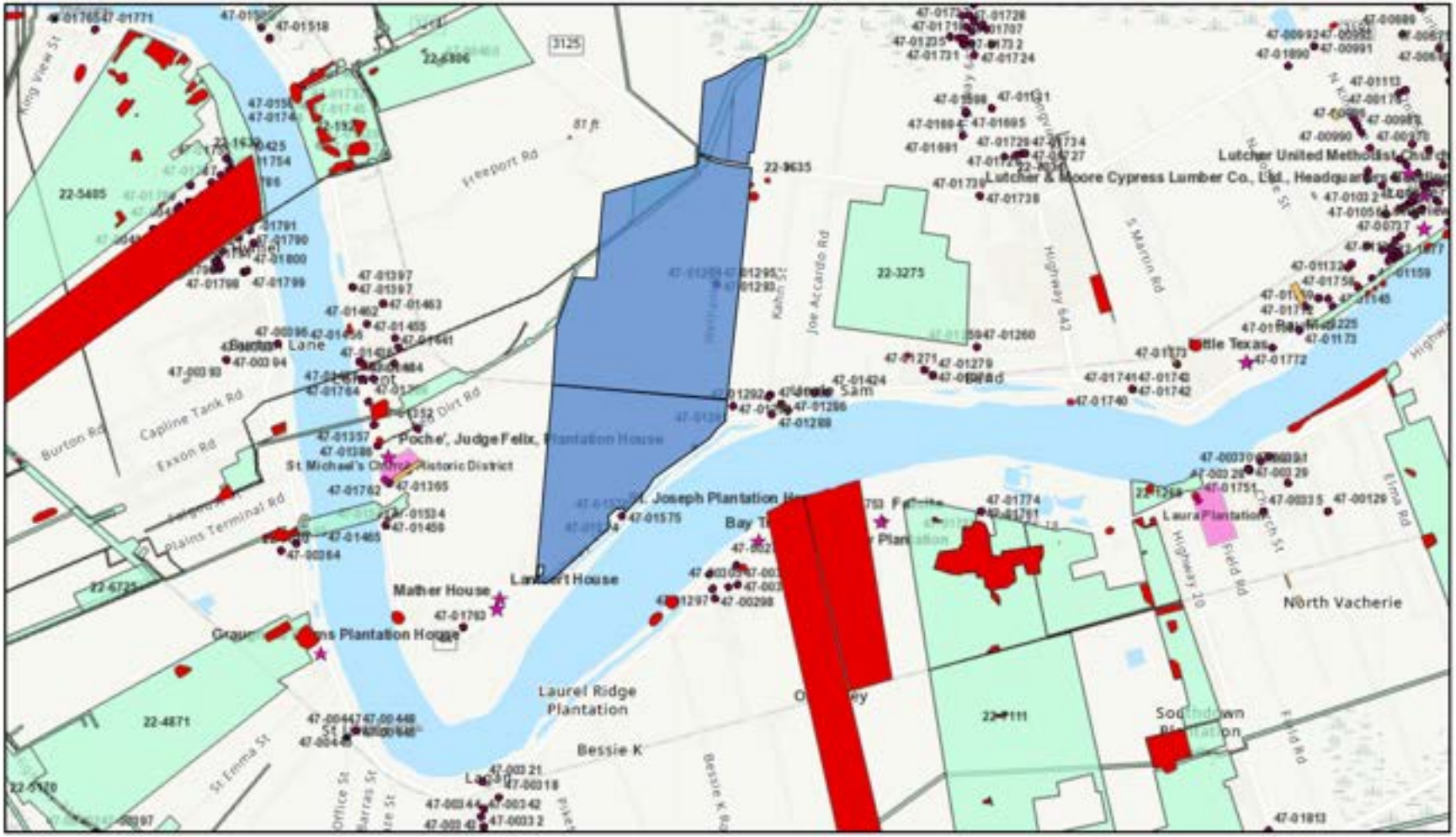
Date Saved: 12 January 2024

ArcGIS Web Map



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- Welham_Site_Boundary
- Cemeteries
- Archaeological Sites
- Phase 1
- Certified Local Government
- Local Historic District
- Cultural District Locations
- Cultural District Boundary
- Main Street
- National Register Eligible Districts
- LHRI Standing Structure Survey
- National Register Districts
- National Register Individual Listings
- Parishes
- State Lands
- Cities

N

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ArcGIS Web AppBuilder

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PERMIT SET
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FOR ST. CHARLES CLEAN FUELS

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985.447.0090

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FOR PERMIT
PURPOSES ONLY

PROJECT NO. 22-1814

SCCF/IMTT AREA PROJECT

08//14/2023

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AA-5c
Welham Site
Cultural Resources

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APPENDIX F

ST. ROSE IMTT (SELECTED SITE) DESKTOP ASSESSMENT
Needs Alternative and Justification Analysis
St. Charles Clean Fuels, LLC
St. Charles Parish, Louisiana

ArcGIS Web Map

8/4/2023, 9:45:45 AM

IMTT_Site_Boundary 7_31_23
Archaeological Sites
Cemetery
Assessment_Recon
Phase 1
Certified Local Government
Local Historic District
Cultural District Locations
Cultural District Boundary
Main Street
National Register Eligible Districts
LHRI Standing Structure Survey
National Register Districts

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LA Divisions of Archaeology and Historic Preservation, Esri Community Maps Contributors, CONANP, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA

ArcGIS Web AppBuilder

Esri Community Maps Contributors, CONANP, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA | LA Divisions of Archaeology and Historic Preservation | SGS National Map 3D Elevation Program (3DEP), July 18, 2023, |

PERMIT SET
ST. CHARLES PARISH, LOUISIANA
FOR ST. CHARLES CLEAN FUELS

DDG
314 EAST BAYOU ROAD | THIBODAUX, LA
985.447.0090

PRELIMINARY
FOR PERMIT
PURPOSES ONLY

PROJECT NO. 22-1814

SCCF/IMTT AREA PROJECT
08/014/2023

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AA-6c
St Rose IMTT Site
Cultural Resources

Path: Z:\2022\22-1814\COASTAL\GIS\22-1814 ArcGIS Pro Project\22_1814.aprx

APPENDIX G

OVERALL SITE PLAN
Needs Alternative and Justification Analysis
St. Charles Clean Fuels, LLC
St. Charles Parish, Louisiana