

# **CONOCOPHILLIPS COMPANY PROJECT ROUX LAFOURCHE PARISH, LOUISIANA**



## **LOUISIANA DEPARTMENT OF NATURAL RESOURCES, OFFICE OF COASTAL MANAGEMENT**

### **NEEDS, ALTERNATIVES, AND JUSTIFICATION ANALYSIS P20221112**

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**LIST OF ATTACHMENTS**

**Attachment**

- A Identification of Potential Areas of Interest for CO<sub>2</sub> Sequestration
- B Alternative Sites Habitat Assessment and Proposed Impacts
- C Land Use/Land Cover

## **1.0 INTRODUCTION**

### **1.1 Purpose and Scope**

This report addresses the Louisiana Department of Natural Resources (LDNR) Office of Coastal Management's (OCM's) request for an all-inclusive Category 3 alternatives assessment and complex justification analysis. This report summarizes the alternative sites investigated and the criteria used to ensure the site would meet the objective of the proposed project. Responses to the Justification Analysis portion of OCM's guidance document are provided.

### **1.2 Background**

ConocoPhillips Company (COP) is the world's largest independent oil and natural gas exploration and production company headquartered in Houston, Texas. The company has operations and activities in 13 countries, with most of its production in Alaska and the Lower 48 states. COP is focused on exploration for and production of oil, natural gas, natural gas liquids, liquefied natural gas, and bitumen.

COP employs the latest technology in both conventional and unconventional developments. All operations strive to improve subsurface understanding, leverage existing infrastructure and reduce our environmental impact.

COP strives to operate safely, reliably, and responsibly – achieving operational excellence through continuous improvement and ongoing learning. This means understanding how work is done, being mindful of risks, and predicting potential errors so we can minimize or eliminate unexpected events.

COP manages operations to reduce environmental impact and make every effort to prevent, control, and mitigate unintentional releases from our infrastructure. COP monitors, assesses, and seeks to mitigate impacts throughout the lifecycles of assets.

Carbon capture and sequestration (CCS) is a process that captures carbon dioxide (CO<sub>2</sub>) emissions from industrial sources (and/or the atmosphere) and permanently stores it in geologic environments. COP is proposing to construct a pad and road to facilitate the drilling of a site characterization well (appraisal well) to further evaluate the subsurface formations and assess the viability of permanent geologic sequestration of CO<sub>2</sub>. The scope of work includes construction of a 4.85-acre pad and a 3.72-mile access road to accommodate the appraisal well and all associated equipment.

Preliminary geological information indicates the subsurface of the proposed pad site is well suited for permanent geologic sequestration of CO<sub>2</sub>. COP is targeting permanent sequestration in deep saline aquifers. The appraisal program will further characterize the subsurface geology and evaluate the feasibility of the target formation. For the appraisal well objectives and in accordance with Environmental Protection Agency (EPA) and LDNR rules and guidance, COP plans to conduct extensive coring, logging, formation testing, and injectivity tests to obtain detailed information to further evaluate the capacity, injectivity, and containment of the subsurface geology.

## 2.0 ALTERNATIVE SITES ANALYSIS

### 2.1 Guidance Document Questions

1. **Define the project objective(s) and identify the proposed features required to meet the objective(s). Identify any project objectives that may limit the range of alternatives to be considered.**

#### Project Objective

The Mississippi River Industrial Corridor, particularly the portion in St. Charles Parish, consists of 17 industrial reporting facilities emitting approximately 16 million metric tons of CO<sub>2</sub> per year. The area is well-suited to serve the needs of the industrial sites located along the Mississippi River Corridor, both within St. Charles Parish as well as other parishes in the region. COP is leveraging their technical expertise, project development skills, and safety commitment to potentially provide cost-effective and permanent carbon storage services to industrial sites in the area.

#### Project Description and Proposed Features

COP proposes to construct a 4.85-acre pad and 3.72-mile access road to accommodate an appraisal well and associated equipment. The access road is designed to minimize wetlands/biodiversity impacts by using areas that have been previously impacted while providing safe, reliable access. The appraisal program will consist of drilling a characterization well to further assess the viability of permanent sequestration. This will include one Class V well with the potential for future conversion to a Class VI injection well, pending EPA approval.

#### Project Objective Limiting Factors (Siting Criteria)

An analysis was performed addressing the siting criteria for an appraisal well necessary to further characterize geologic information including porosity, permeability, and other characteristics needed to evaluate suitability for carbon dioxide sequestration. The analysis was conducted within a 25-mile radius (referred to as “Study Area”) surrounding sources of CO<sub>2</sub> emissions in which multiple alternative project sites and access routes were identified and further scrutinized. The Study Area included Lafourche, St. Charles, and St. James Parishes. The selection of a CCS project requires surface and subsurface evaluations. The potential for suitable reservoirs for carbon sequestration along the Gulf Coast basin and in the South Louisiana Salt Basin is well documented and studies such as the *National Assessment of Geologic Carbon Dioxide Storage Resources – Methodology, and Implementation and the Geologic Framework for the National Assessment of Carbon Dioxide Storage Resources – U.S. Gulf Coast* both performed by the United States Geological Survey (USGS). In addition, Louisiana State University recently published a study highlighting the proposed screening criteria for CCS projects (GCS site selection in saline Miocene formations in South Louisiana, Zulqarnain et al, 2022). Similar methodologies were utilized in this assessment. The following aspects were used to identify potential areas of interest to be further evaluated:

- A. **Distance to emissions:** COP elected to focus on potential sites within the Study Area.
- B. **Available 3D Seismic:** COP focused on areas where there was existing 3D seismic data to assist with subsurface evaluations.
- C. **Population:** Densely populated areas contain many surface parcels. COP elected to avoid these areas, if possible, as the areas have a lower probability of receiving the necessary agreements in a feasible time for project execution.
- D. **Areas with high structural complexity:** Faulted areas and areas with high dips were avoided as they could lead to increased subsurface complexity.
- E. **Proximity to existing wellbores:** COP elected to target areas with minimized proximity to existing wells. Existing well penetrations that will be in contact with the potential CO<sub>2</sub> plume must be evaluated and remediated accordingly. These operations represent an additional project cost and can also increase the subsurface containment risk.
- F. **Land availability:** Areas where land is already under contract by a third party were avoided. Access rights are necessary for a site's appraisal and development.

**Attachment A** shows the progressive combination of these aspects, highlighting areas that were identified for further review.

After identifying possible locations to target within the Study Area, COP further reviewed each site in relation to the following limiting factors for final site selection:

- A. **Access Rights:** COP has identified alternative site locations on state and privately-owned lands within the Study Area. Project siting, pad, and infrastructure construction, and future injection operations are dependent on surface land and pore space availability. Commercial lease terms must align with project economics to move forward with any state or fee land negotiations. An operator of a future Class VI Geologic Sequestration Well must secure enough surface land and pore space to accommodate the injected CO<sub>2</sub> volumes. The boundary of the injection plume and Area of Review (AoR, defined by EPA regulation) is unique to each individual geologic sequestration project and is determined by extensive computational modeling. COP also elected to avoid populated and residential areas as these would require a significant number of leases to be obtained to be viable for future sequestration.
- B. **Storage Capacity and Containment Site Suitability:** Proper site selection and accurate site characterization is a fundamental step toward containment assurance as it is needed to identify a site that has sufficient storage and seal capacity to enable permanent sequestration of injected CO<sub>2</sub>. EPA rules for Class VI Carbon Dioxide Geologic Sequestration Wells require a detailed demonstration that a proposed project site has a suitable injection zone to receive CO<sub>2</sub> and a confining

zone that will prevent fluid movement out of the injection zone (40 CFR 146.83). To further reservoir characterization in service of a future Class VI permit, COP will gather additional data from the proposed appraisal well to demonstrate site suitability. COP has used previously obtained subsurface data, including 3D seismic to characterize the area and identify the proposed and alternative sites considered for appraisal. Additionally, COP estimated the potential and site suitability of the preferred site through reservoir modeling and CO<sub>2</sub> injection and plume modeling.

To investigate the relative differences in viable pore volume and how the CO<sub>2</sub> saturation front may affect nearby well penetrations in the alternative site locations, the radius of an estimated CO<sub>2</sub> plume was calculated through sensitivity analysis (SA). The proposed site was used as an anchor for the SA, and the plume size for the identified alternate locations was estimated based on how properties like temperature, pressure, permeability, and dip differ from the alternative sites. Reservoir properties across all sites are comparable since they target zones with similar characteristics within the upper Miocene and upper Lower Miocene sands. The study also found that the formation dips in the alternative site's areas do not vary significantly from the preferred site. However, they can change quickly outside the identified polygons depending on the vicinity's structural complexity.

**C. Proximity to Existing Wells:** Existing and abandoned wellbores within a geologic sequestration project's AoR pose a risk to containment of injected CO<sub>2</sub> stream if not properly mitigated. Operators may be required to perform corrective action by means of well intervention to prevent fluid movement. COP has identified alternative locations with minimal proximity to existing and abandoned wellbores to reduce or eliminate this risk.

**2. Identify, on a map, the location of each site considered for development. If less than the minimum number of sites, as specified above, have been considered, please explain why and provide documentation demonstrating the efforts made to find alternate sites.**

See Sections 3.0 through 8.0 and Vicinity Map (**Attachment B - Figure 1**)

**3. Describe each site considered. Include parcel size relative to development size, topography, water/wetland features, habitat type(s) present and amount of impact to each. If access to the property is limited or unavailable, explain the limitations and provide any information that can be gained about the site using current photography and topographic and habitat maps. Identify any limiting factors and explain how those factors limit development.**

See Sections 3.0 through 8.0

**4. Identify the availability and capacity of existing infrastructure (roads, utilities, water, sewer, etc.). Describe any new infrastructure required (excluding tie-in from individual units to existing infrastructure)**

See Sections 3.0 through 8.0

5. **Describe the surrounding land use with one (1) mile of each site considered. Include type and extent of existing use and any planned future uses, if known.**

See **Attachment C**: Land Use/Land Cover figures.

6. **Identify the current zoning of the site and indicate if any zoning variances will be required prior to development.**

See Sections 3.0 through 8.0

7. **Explain how the use will affect existing infrastructure, including evacuation and identify any additional permits required (e. g. DOTD driveway permit). Describe any secondary infrastructure (excluding tie-in from individual units) that may be required to service the development. Include location and/or route of the needed infrastructure and type and extent of impacts associated with installation of that infrastructure.**

See Sections 3.0 through 8.0

8. **Provide a narrative explaining the reasons for the elimination of each site considered but not selected for development. Please note that the factors used to compare each site should be identified and should be consistent among sites.**

See Sections 3.0 through 8.0

## 2.2 Method

Per OCM's Needs, Alternatives and Justification (NAJ) guidelines, feasible sites are defined as "any available parcel of land within the general vicinity of the proposed site that can support the main objective of the proposed project." Using this guidance, five sites were selected and evaluated alongside the proposed project site using the criteria described in above sections. The purpose of this activity was to determine the location with the least amount of adverse impacts to coastal resources while allowing the project to fulfill its objectives.

Each site, including the proposed project site, was compared equally using the same three criteria described above.

## 3.0 ALTERNATIVE 1 – SPAHR'S SITE

### 3.1 Site Description

The Spahr's Site is centered at Latitude 29° 45' 50.27"N; Longitude 90° 29' 21.68"W approximately five miles from Raceland, Louisiana. The habitat composition is palustrine emergent and scrub shrub vegetation (**Figure 4 of Attachment B**). Primary access is via barge from Bayou des Allemands. This access would require additional dredging and likely

maintenance dredging to keep necessary water depths for ingress/egress of various barges and watercraft used for construction and well site maintenance.

### 3.2 Siting Criteria

#### Access Rights

This area includes 23 individual landowners. COP had initial conversations with landowners in the area regarding carbon sequestration agreements in Q1 2022; however, COP's offers were either rejected or mutually agreeable terms could not be reached.

#### Storage Capacity

The injection targets for this site are upper and middle Miocene sands with good reservoir properties, suitable for CO<sub>2</sub> sequestration. The depth range for this interval is 8,000 feet to 11,000 feet. Based on the SA, this area can store approximately 1 million tonnes per annum (MTPA) for 12 years. The structural complexity of the site is low; however, it increases to the south near Raceland field. The dips of this site are comparable to the proposed site, approximately 2 degrees. This site has limited opportunity for growth outside of the initial storage capacity demand due to the lack of access to land and pore space in the immediate vicinity.

#### Proximity to Existing Wells

This area is located between two large oil and gas fields - the south portion of Paradis to the north and Raceland field to the south. The proximity to two large fields can lead to an incremental cost of monitoring as it is necessary to ensure that the CO<sub>2</sub> sequestration will not interfere with current oil and gas production. Additionally, the initial execution of the site will require the mitigation of at least three wells compared to the proposed site that only requires the mitigation of one well.

***In summary, COP has been unsuccessful in acquiring the necessary rights to access this site, the site has minimal growth potential for storage capacity due to land availability, and the site has more wells within the proposed zone that would require mitigation and additional monitoring. Impacts to wetlands caused by the development of this site is shown Attachment B. Therefore, Alternative 1 is not a suitable alternative site to meet the proposed project objectives.***

## 4.0 ALTERNATIVE 2 – LAKE CATAOUATCHE SITE

### 4.1 Site Description

Lake Cataouatche is centered at Latitude 29° 50' 35.45"N; Longitude 90° 17' 37.45"W approximately 10 miles from New Orleans, Louisiana. The entire site is open water, meaning all impacts would be related to dredging and spoil disposal (**Figure 5 of Attachment B**). Most of this area is owned and operated by the state of Louisiana. Primary access is via Bayou Segnette and Lake Cataouatche.

## 4.2 Siting Criteria

### Access Rights

This area is primarily State lands. COP submitted a proposal of general terms for a carbon sequestration agreement to the Louisiana Office of Mineral Resources on 1/6/22. COP decided not to pursue an agreement with the State on these lands because mutually agreeable terms could not be reached. The remainder of this area of interest is subject to private land ownership and one landowner has granted a CCS lease to a third party.

### Storage Capacity

The injection targets for this site are upper and middle Miocene sands with good reservoir properties, suitable for CO<sub>2</sub> sequestration. The depth range for this interval is 7,500 feet to 10,000 feet. Based on the SA, this area can store approximately 1 MTPA for 12 years. The structural complexity of the site is low; nonetheless it increases to the south near Bayou Couba Field. Although the dips of this site vary from south to north, the average is still comparable to the proposed site, approximately 2 degrees. However, this site has limited opportunity for growth outside of the initial storage capacity demand due to the lack of access to land and pore space in the immediate vicinity.

### Proximity to Existing Wells

This site is not near any current oil and gas production.

***In summary, COP has been unsuccessful in acquiring the necessary rights to access this site. This site has minimal growth potential for storage capacity due to land availability, making it undesirable in comparison to the proposed site. Wetland impacts caused by the development of this site are on the attached alternative site figures. Therefore, Alternative 2 is not a suitable alternative site to meet the proposed project objectives.***

## 5.0 ALTERNATIVE 3 – KENNER SITE

### 5.1 Site Description

The Kenner Site is centered at Latitude 29° 59' 39.28"N; Longitude 90° 19' 31.31"W approximately 4.5 miles from Kenner, Louisiana. The habitat composition is open water, palustrine emergent vegetation, and cypress/tupelo (**Figure 6 of Attachment B**). Access to the site is via Interstate 310 and Louisiana Highway 61.

### 5.2 Siting Criteria

#### Access Rights

This area contains over 300 parcels that are primarily 10 acres or less. Securing agreements would not be feasible to achieve COP's operational timeline.

### **Storage Capacity**

The injection targets for this site are upper and middle Miocene sands with good reservoir properties, suitable for CO<sub>2</sub> sequestration. The depth range for this interval is 6,200 feet to 9,000 feet. Based on the SA, this area can store 1 MTPA for 12 years. The formation dips are comparable to the proposed site, approximately 2 degrees, and the structural complexity of the site is low; however, it increases quickly to the east towards the existing Big Hope Oil and Gas Field. The proximity of this site to areas of high structural complexity to the west and highly populated areas to the east decreases the ability for growth. Further, this site has limited opportunity for growth outside of the initial storage capacity demand due to the lack of access to land and pore space in the immediate vicinity.

### **Proximity to Existing Wells**

The execution of this site will require the remediation of at least two wells. However, there is a high uncertainty due to the structural complexity in the area whether more wells would require future remediation.

***In summary, securing the appropriate access rights to this location under the existing project timeline would not be feasible. This site contains additional structural complexities, making it unfavorable in comparison to the proposed site. Wetland impacts caused by the development of this site are detailed in the attached alternative site figures. Therefore, Alternative 3 is not a feasible alternative site to meet the proposed project objectives.***

## **6.0 ALTERNATIVE 4 – LAKE PONTCHARTRAIN SITE**

### **6.1 Site Description**

The Lake Pontchartrain Site is centered at Latitude 30° 03' 14.94"N; Longitude 90° 23' 58.62"W approximately 4.5 miles from LaPlace, Louisiana. The habitat composition is scrub shrub vegetation, bottomland hardwoods, and cypress/tupelo (**Figure 7 of Attachment B**). Primary access is via Louisiana Highway 61.

### **6.2 Siting Criteria**

#### **Access Rights**

This Pontchartrain alternative is in the federally-controlled Bonnet Carre' Spillway. It is our understanding, based on the 2010 Bonnet Carre Spillway Master Plan Draft, that no structures or facilities will be allowed to be constructed within the floodway. Therefore, the Pontchartrain alternative is not viable from an access rights perspective.

#### **Storage Capacity**

The injection targets for this site are upper and middle Miocene sands with good reservoir properties, suitable for CO<sub>2</sub> sequestration. The depth range for this interval is 6,000 feet to 9,000 feet. Based on the SA, this area can store 1 MTPA for 12 years. The formation dips of this site are comparable to the proposed site, approximately 2 degrees. However, the structural complexity of the site is moderate to high, driven by the presence of multiple faults.

The proximity of this site to nearby oil and gas production and populated areas to the west and south decreases the chances of a growth case. Further, this site has limited opportunity for growth outside of the initial storage capacity demand due to the lack of access to land and pore space in the immediate vicinity as well as the proximity to existing oil and gas fields.

#### **Proximity to Existing Wells**

The initial execution of this site will require one existing well to be remediated. Furthermore, this site might require additional roads and pads for monitoring purposes due to its close proximity to populated areas and existing oil and gas fields.

***In summary, securing the appropriate access rights to this location under the existing project timeline would not be feasible. Additionally, this site contains little growth potential for storage capacity due to complex surface impacts and close proximity to existing oil and gas fields making the site unfavorable compared to the proposed site. This site would also include impacts to wetlands as detailed in the attached alternative site figures. Therefore, Alternative 4 is not a suitable alternative site to meet the proposed project objectives.***

## **7.0 ALTERNATIVE 5 – VACHERIE AREA**

### **7.1 Site Description**

The Vacherie Site is centered at Latitude 29° 58' 26.08"N; Longitude 90° 41' 29.84"W approximately 2.6 miles from Vacherie, Louisiana. The habitat composition is palustrine emergent vegetation and cypress/tupelo (**Figure 8 of Attachment B**). Primary access to the Site is via Louisiana Highway 3127.

### **7.2 Siting Criteria**

#### **Access Rights**

There are 142 parcels of land that are 50 acres or less. Securing agreements from private landowners would not be feasible to achieve COP's timeline.

#### **Storage Capacity**

The injection targets for this site are upper and middle Miocene sands with good reservoir properties, suitable for CO<sub>2</sub> sequestration. The depth range for this interval is 6,000 feet to 9,000 feet. Based on the SA this area can store 1 MTPA for 12 years. The formation dips for this site are comparable to the proposed site (approximately 2 degrees), however, they increase quickly to the north due to a structural high in the area. The structural complexity of the site is moderate to high. This site has limited opportunity for growth outside of the initial storage capacity demand due to the lack of access to land and pore space in the immediate vicinity as well as the proximity to existing oil and gas fields.

#### **Proximity to Existing Wells**

The initial execution of this site will require at least one to two wells to be remediated.

***In summary, securing the appropriate access rights to this location under the existing project timeline would not be feasible due to the number of land agreements necessary. The site contains structural complexities making it unfavorable compared to the proposed site. This site would also include impacts to wetlands as detailed in Attachment B. Therefore, Alternative 5 is not a suitable alternative site to meet the proposed project objectives.***

## 8.0 PROPOSED SITE

### 8.1 Site Description

The proposed site is centered at Latitude 29° 49' 30.83"N; Longitude 90° 32' 36.18"W approximately five miles from Raceland, Louisiana. The habitat composition is comprised of bottomland hardwoods, cypress/tupelo, and freshwater marsh (**Figure 3 of Attachment B**). A portion of the project site is considered previously disturbed cypress as it was used for access to old well pad sites. Primary access to the road and pad for the proposed site is via Louisiana Highway 307. Much of the area is owned and managed by COP.

### 8.2 Siting Criteria

#### Access Rights

The proposed site is currently owned and controlled by The Louisiana Land & Exploration Company LLC (LL&E) which is a wholly owned subsidiary of COP. This allows for existing rights to the site at a low cost and allows COP to operate primarily on its own property rather than impacting properties owned by others. Additionally, COP controls both the surface and mineral rights. This allows the company to control future mineral development, limiting drilling activity through the CO<sub>2</sub> storage zone.

#### Storage Capacity

The injection targets for this site are upper and middle Miocene sands with good reservoir properties, suitable for CO<sub>2</sub> sequestration. The depth range for this interval is 8,000 feet to 10,000 feet. Based on the SA, this area can store 1 MTPA for 12 years. The structural complexity of the site is low; however, it increases to the south near Roux Oil and Gas Field. The formation dips for this site are very low, around 2 degrees. The site is away from population centers and oil and gas fields. Further, this site has favorable growth potential as project growth could be achieved using adjacent company owned properties. Project growth would also be achieved with minimal wetland impact as infrastructure could be tied to the infrastructure being proposed for the current appraisal well program. Growth in the area would also be favored by a similar structural setting including low dips and low structural complexity and would be away from existing oil and gas development.

#### Proximity to Existing Wells

The initial development of this site will require remediation of one existing well.

***In summary, the proposed site uses existing COP-owned properties, has minimal structural complexity, is removed from populated areas and oil and gas development,***

***and has growth potential for storage capacity that could be achieved with minimal wetland disturbance or the need for securing additional access rights. Therefore, the proposed site is ideal for meeting the proposed project objectives.***

## 9.0 ALTERNATIVE SITE SUMMARY

As stated in **Section 1.1**, OCM requested an all-inclusive Category 3 assessment along with a complex justification analysis per the Industrial Development Section of the OCM *NAJ Guidelines* for the proposed access road and well pad project. As OCM is aware, the goal of an Alternatives Analysis is to *identify a location for a proposed development which results in the least amount of adverse impact to coastal resources while allowing the project to fulfill its main objective(s)*. To satisfy the Alternatives component of this requirement, COP reviewed the feasibility of using five alternative locations using a specific set of siting criteria. Through this review, COP has clearly documented that each location was compared equally, and it is therefore COP's position that the proposed site is the least damaging feasible alternative to satisfy the project's main objectives.

## 10.0 COMPLEX JUSTIFICATION ANALYSIS

### 10.1 NAJ Guidance Document Questions

- 1. State the objective(s) of the coastal use (what products and/or services will the development provide) and describe or identify on a map the market to which the products and/or service will be provided.***

The objective of the coastal use is to facilitate the drilling of an appraisal well to perform site characterization operations to further evaluate the subsurface formations and assess the viability of injection and permanent geologic sequestration of CO<sub>2</sub>. CCS is a process that is designed to remove CO<sub>2</sub> emissions from industrial operations and permanently store it safely deep underground. COP plans to use deep saline aquifers as the permanent storage zone. According to a study completed by the Great Plains Institute, the buildout of a CCS network across Louisiana will not only serve as an important source of job growth and emissions reduction but could also generate nearly \$14 billion in private investment across many communities as facilities are retrofitted with new equipment and CO<sub>2</sub> pipelines are constructed.

The Louisiana Midcontinent Oil and Gas Association highlights that in 2021, Louisiana was the 3<sup>rd</sup> largest producer of natural gas in the United States and among the top 10 crude oil producing states. As the home of 14 refineries, Louisiana processes nearly 3.2 million barrels of crude oil per day. As the oil and natural gas industry continues to innovate and reduce emissions, CCS will have an important role in maintaining Louisiana's status as a leading energy state. CCS technology could work to capture nearly 40 million metric tons of CO<sub>2</sub> emissions annually. To put that into perspective, that's the equivalent of the CO<sub>2</sub> sequestered by 47 million acres of U.S. forests annually.

- 2. Identify on a map all competitor facilities (those providing the same or similar products and/or services to the same market). Provide a narrative explaining the competitor's location(s) relative to the proposed facility and include any identifiable limitations of each competitor.***

No competitor facilities have been constructed in the area.

- 3. Provide a narrative explaining how the proposed development will introduce or enhance the existing availability of products and/or services in the market area. Include in the narrative an explanation of the coastal water dependent nature of the proposed development (i.e. why the development must be located within or near coastal waters), difference in transport time between that offered by the new development compared to that offered by existing facilities and any other information that the applicant feels demonstrates a demand for the products and/or services to be provided. If proposing a multiple-use development, provide data for each different type of use proposed.**

The capture, injection, and permanent sequestration of CO<sub>2</sub> is a necessary component to reduce emissions contributing to the impacts of climate change while also stimulating the economy and protecting the health of residents living in close proximity to industrial emissions. In order for the project to remain economically feasible, it must be located in close proximity to the industrial emitters and, therefore, in the coastal zone.

The proposed development of a pad and road in support of an appraisal well is a necessary precursor to the permitting and development of a potential CCS project. An appraisal well must be close to the potential injection site to achieve its objectives of determining the feasibility of CCS.

- 4. Indicate the density and % occupancy of any residential developments identified in #1 and an estimate of how long those developments have been available. If not residential, indicate the type and nature of the existing developments identified in #1 and provide an estimate of available customers that may be drawn to the proposed development.**

N/A

- 5. Include a map showing the geographic area identified in #1 above to which the development will provide goods and/or services. Identify on this map the location of other similar existing facilities.**

COP is not legally permitted to disclose the names of any potential industrial partner(s) for CCS at this time.

- 6. Provide the anticipated volume of users from various driving distances and various socio-economic groups within the target geographic area.**

N/A

- 7. Provide existing retail goods and services expenditures trends over the last ten years for the target geographic area.**

N/A

8. **Provide population trend data and household income trend data over the last ten years.**

N/A

9. **Provide labor force trend data over the last ten years in the target geographic area.**

N/A

10. **If a multiple-use development is proposed, provide letters of intent from potential tenants (indicate if confidential).**

N/A

## 11.0 JUSTIFICATION SUMMARY

According to OCM's *Guide to Developing Alternatives and Justification Analyses for Proposed Uses within the Louisiana Coastal Zone*, the goal of a Justification Analysis is to ensure that there is a public need and demand for goods to be provided by the development and that there is a reasonable chance that the development will be successful.

There is a public need to reduce emissions to limit contribution to the impacts of global climate change and protect the health of residents; the capture, injection, and permanent sequestration of CO<sub>2</sub> will enable significant reductions. COP is in discussion with multiple potential industrial partners and a similar project has been permitted by a competitor, both of which indicate demand for CCS services.

Completion of the proposed pad and road to facilitate the drilling of an appraisal well is a necessary first step in determining an area's viability for CCS operations.

## 12.0 CONCLUSION

OCM is responsible for determining if a project adheres to Coastal Use Guidelines and minimizing adverse impacts to coastal resources wherever possible. Pursuant to La. RS 49:214.27.B and C., OCM uses the Coastal Use Guidelines, in LAC Title 43, Part I, Chapter 7, Subpart B, §701-719, to determine the type of information needed to fully evaluate a particular use and the adverse impacts that must be avoided to the maximum extent practicable.

Part of these guidelines, §701.H, charges OCM with ensuring that the public benefits of a proposed coastal use clearly outweigh any adverse impacts to public resources resulting from that use.

Based on the information included in Joint Permit Application and figures (P20221112) and the information presented in this report, it is COP's position that the proposed project at the proposed site has avoided/minimized impacts to coastal resources to the maximum extent practicable and the need for this project has been clearly demonstrated. Therefore, the proposed project adheres to the Coastal Use Guidelines mentioned above and meets the requirements defined in the NAJ Guidance Document.

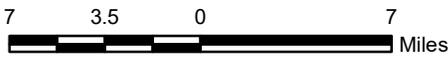
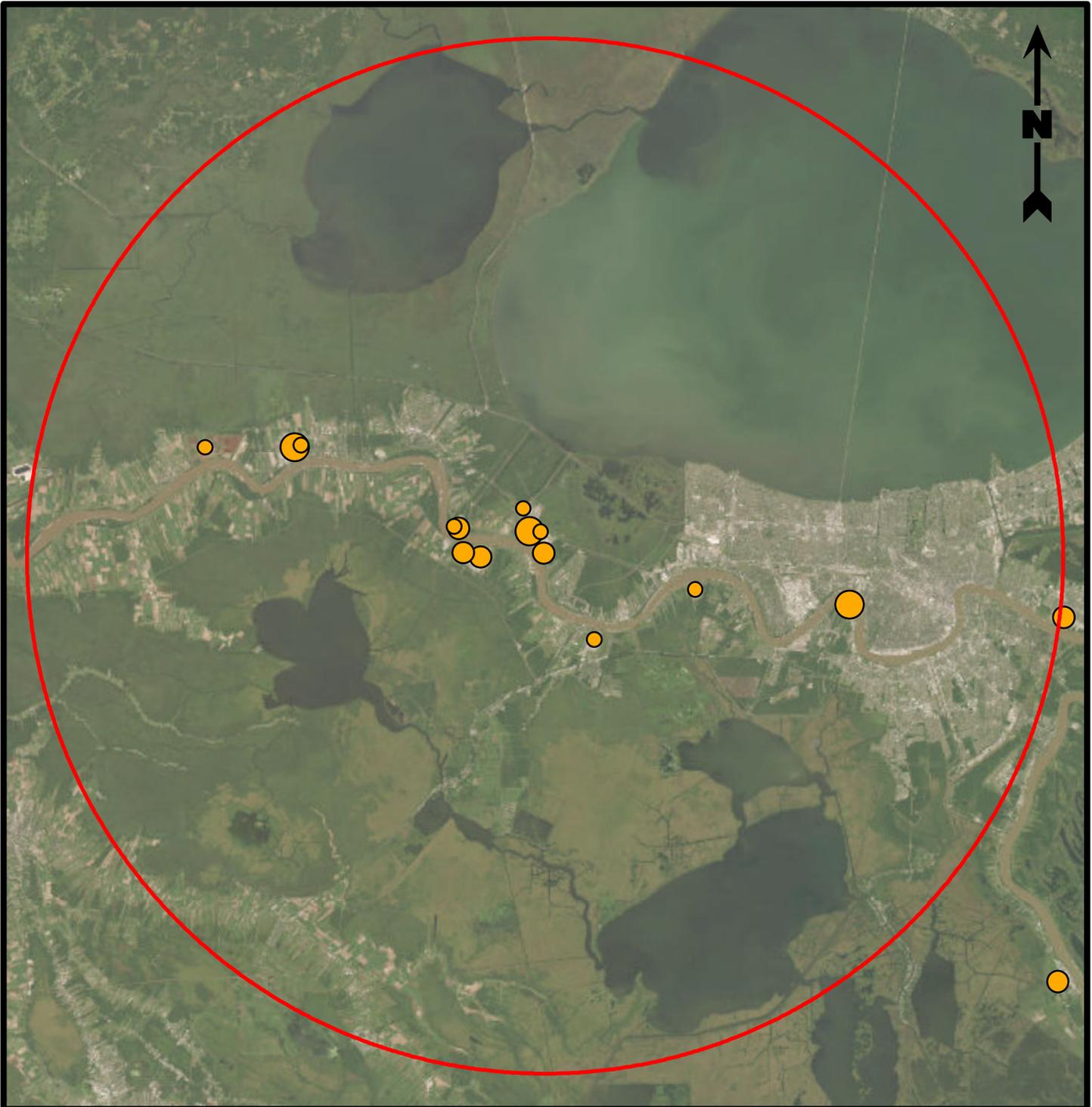
## 13.0 REFERENCES

Blondes, M. et. al & Geological Survey issuing body (2013). *National assessment of geologic carbon dioxide storage resources : Methodology implementation*. U.S. Department of the Interior, U.S. Geological Survey. <https://permanent.fdlp.gov/gpo41260/OF13-1055.pdf>

Roberts-Ashby, T. & Geological Survey issuing body. (2014). *Geologic framework for the national assessment of carbon dioxide storage resources*. Chapter H. U.S. Gulf Coast. U.S. Department of the Interior, Geological Survey. <https://permanent.fdlp.gov/gpo111309/ofr2012-1024h.pdf>

Zulqarnain, M, Sears, S. O., Zeidouni, M., Hughes, R. G., Carlson, D., & Rivera, C. F. (2023). GCS site selection in saline Miocene formations in South Louisiana. *International Journal of Greenhouse Gas Control*, 122, 103818. <https://doi.org/10.1016/j.ijggc.2022.103818>

**ATTACHMENT A**  
**IDENTIFICATION OF POTENTIAL AREAS OF INTEREST FOR CO<sub>2</sub>**  
**SEQUESTRATION**



**Legend**

- 25 Mile Buffer (Study Area)
- 2019 CO<sub>2</sub> Emissions
- 0.5 - 1.5 MTPA
- 1.5 - 3.5 MTPA
- 3.5 - 7.5 MTPA
- 7.5 - 13 MTPA

**Reference**

Base map comprised of ESRI World Imagery exported 01/12/2023.

**Identification of Potential Areas of Interest for CO<sub>2</sub> Sequestration**

St. James, St. John the Baptist, St. Charles, and Lafourche Parishes, Louisiana

**ConocoPhillips Company**

Project Roux

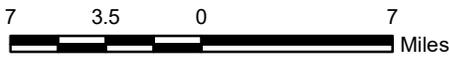
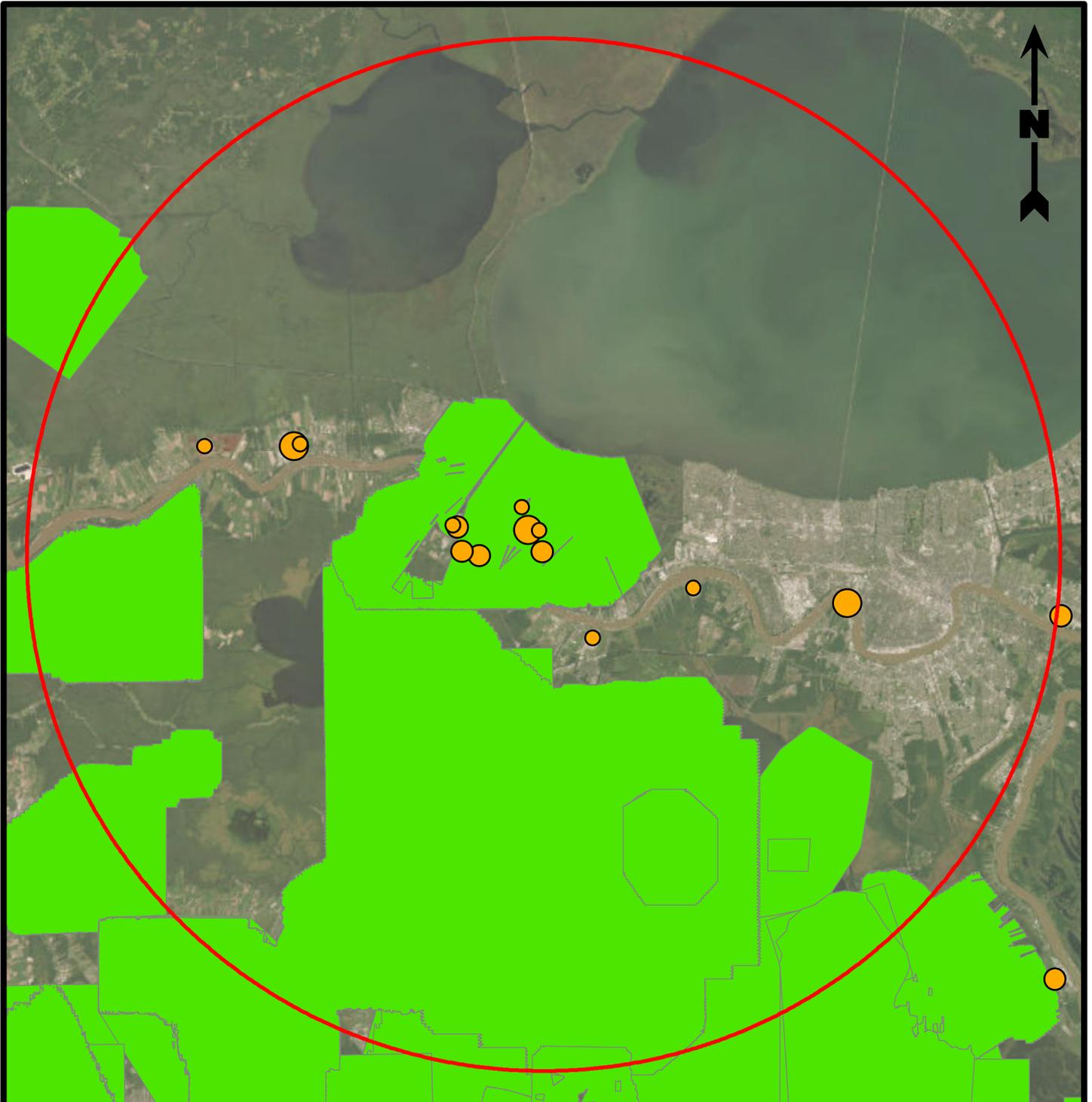


**PROVIDENCE**

Drawn By	AFA	01/20/23
Checked By	TDJ	01/20/23
Approved By	TK	01/20/23

Project Number 1429-002
Drawing Number 1429-002-A081

<b>1</b>
Figure



**Legend**

- |   |  |
|---|--|
|  3D Seismic Data             | <b>2019 CO<sub>2</sub> Emissions</b>   |
|  25 Mile Buffer (Study Area) |  0.5 - 1.5 MTPA |
|   |  1.5 - 3.5 MTPA |
|   |  3.5 - 7.5 MTPA |
|   |  7.5 - 13 MTPA  |

**Reference**

Base map comprised of ESRI World Imagery exported 01/12/2023.

**Identification of Potential Areas of Interest for CO<sub>2</sub> Sequestration**

St. James, St. John the Baptist, St. Charles, and Lafourche Parishes, Louisiana

**ConocoPhillips Company**

Project Roux

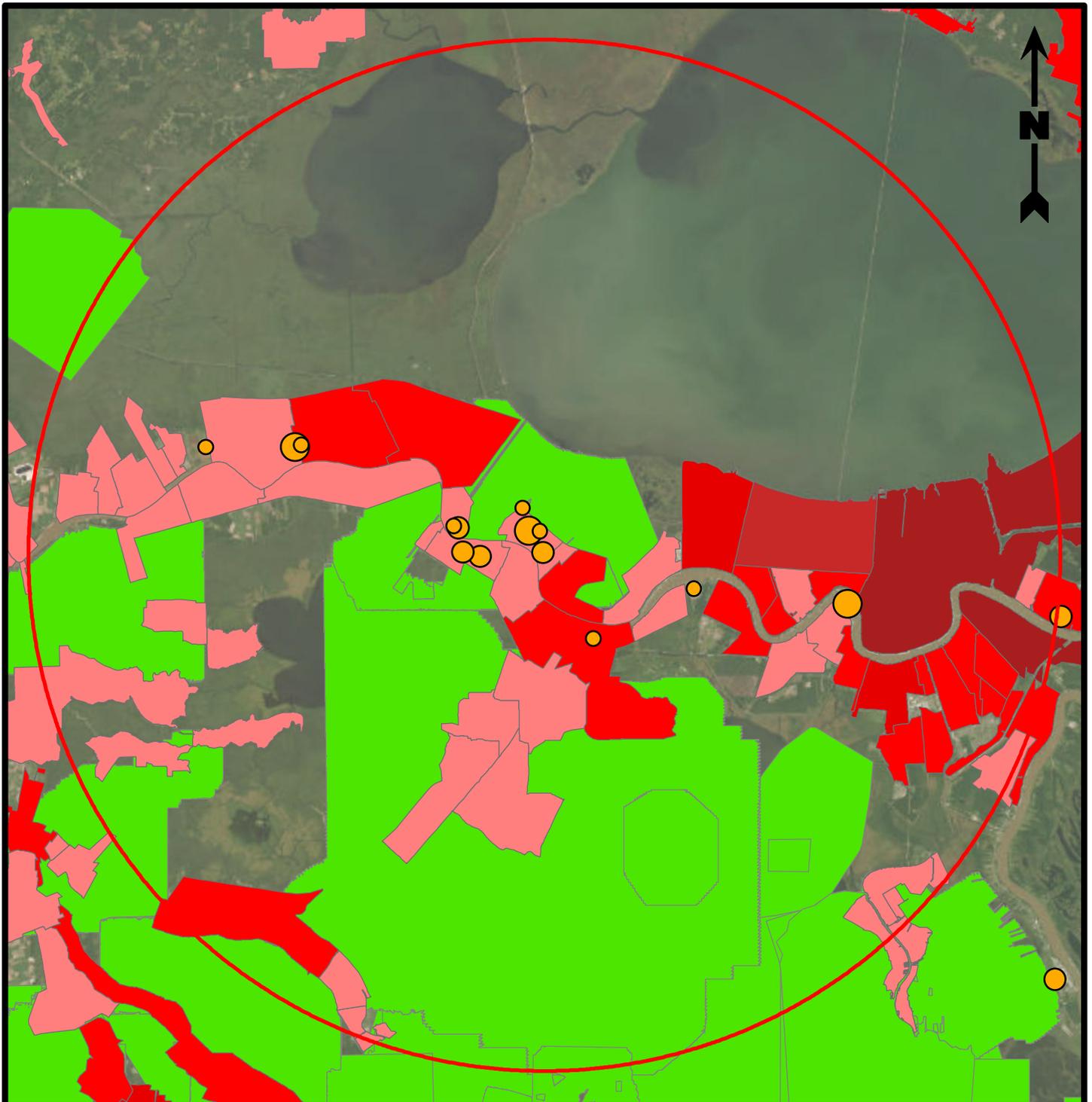


**PROVIDENCE**

Drawn By	AFA	01/20/23
Checked By	TDJ	01/20/23
Approved By	TK	01/20/23

Project Number 1429-002
Drawing Number 1429-002-A082

<b>2</b> Figure
--------------------



**Legend**

3D Seismic Data	2020 Census Population Data	2019 CO <sub>2</sub> Emissions
25 Mile Buffer	12 - 7526	0.5 - 1.5 MTPA
	7527 - 30617	1.5 - 3.5 MTPA
	30618 - 71993	3.5 - 7.5 MTPA
	71994 - 229493	7.5 - 13 MTPA
	229494 - 383997	

**Reference**

Base map comprised of ESRI World Imagery exported 01/12/2023.

**Identification of Potential Areas of Interest for CO<sub>2</sub> Sequestration**

St. James, St. John the Baptist, St. Charles, and Lafourche Parishes, Louisiana

**ConocoPhillips Company**

Project Roux

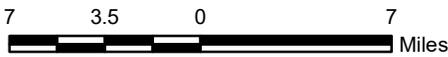
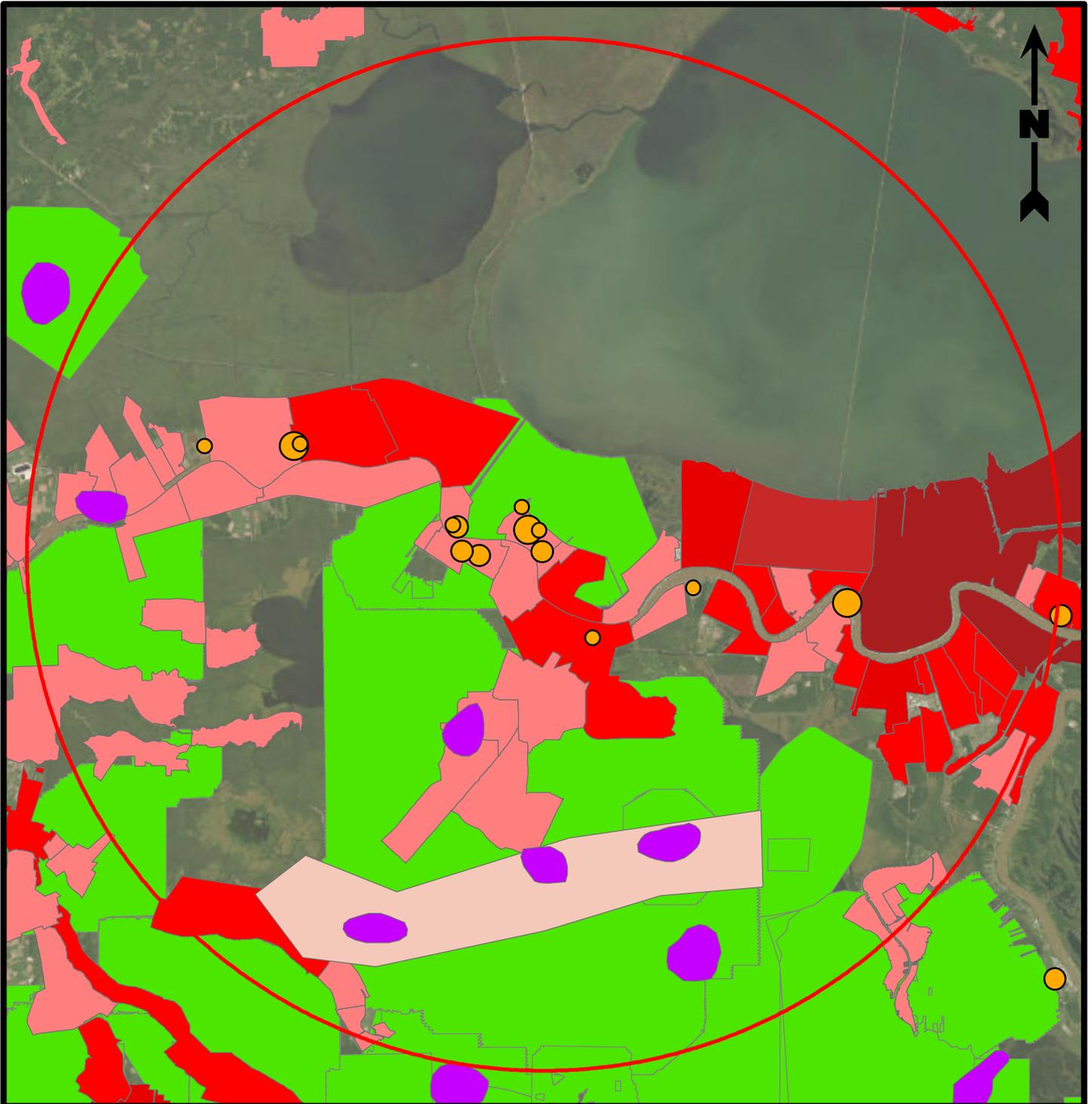


**PROVIDENCE**

Drawn By	AFA	01/20/23
Checked By	TDJ	01/20/23
Approved By	TK	01/20/23

Project Number	1429-002
Drawing Number	1429-002-A083

<b>3</b>
Figure



**Legend**

	2020 Census Population Data	2019 CO <sub>2</sub> Emissions
	12 - 7526	
	7527 - 30617	
	30618 - 71993	
	71994 - 229493	
	229494 - 383997	

**Reference**

Base map comprised of ESRI World Imagery exported 01/12/2023.

**Identification of Potential Areas of Interest for CO<sub>2</sub> Sequestration**

St. James, St. John the Baptist, St. Charles, and Lafourche Parishes, Louisiana

**ConocoPhillips Company**

Project Roux

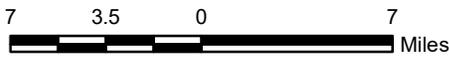
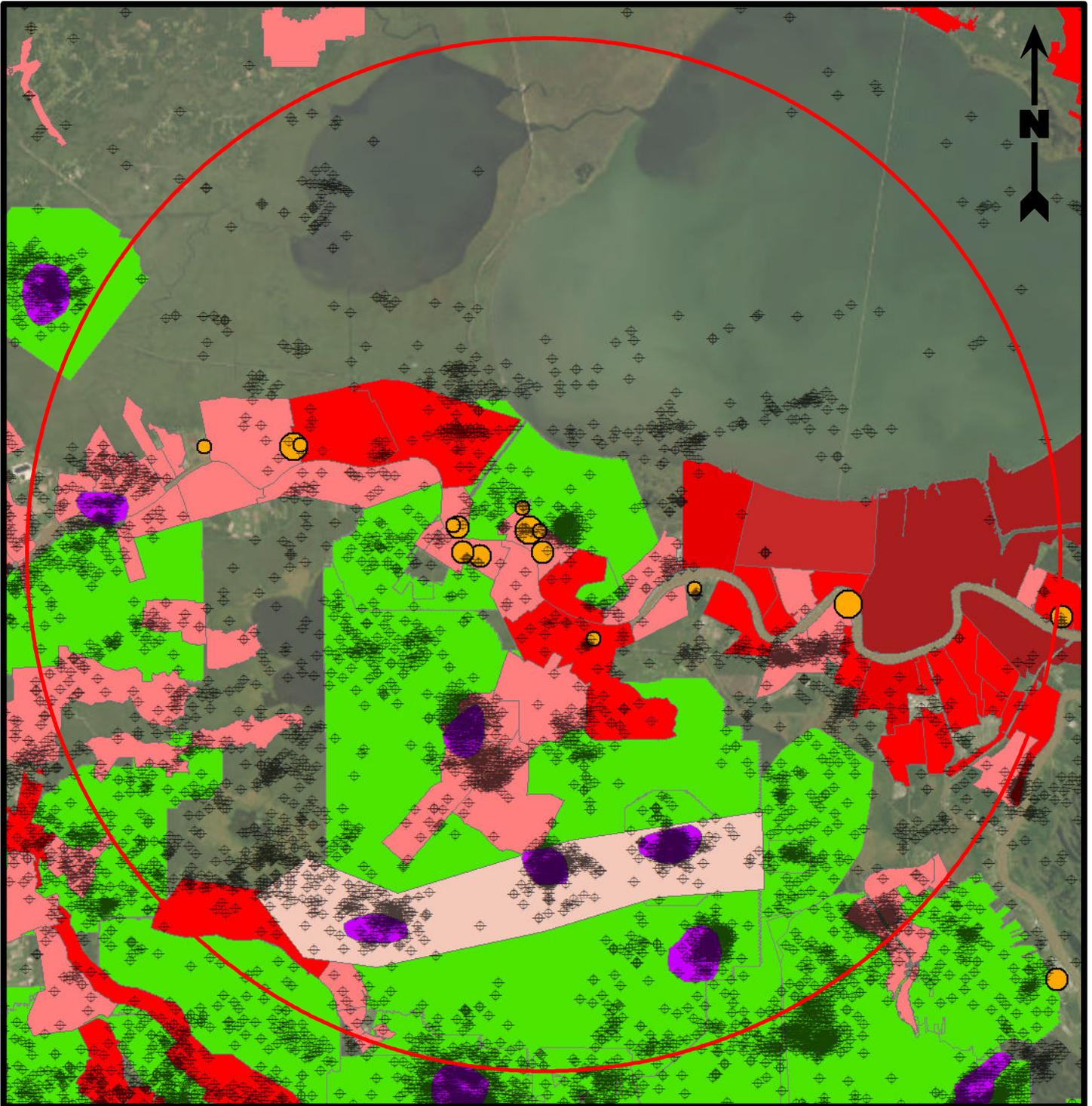


**PROVIDENCE**

Drawn By	AFA	01/20/23
Checked By	TDJ	01/20/23
Approved By	TK	01/20/23

Project Number	1429-002
Drawing Number	1429-002-A084

<b>4</b>
Figure



**Legend**

	2020 Census Population Data	2019 CO <sub>2</sub> Emissions
Salt Features	12 - 7526	0.5 - 1.5 MTPA
Fault Buffer	7527 - 30617	1.5 - 3.5 MTPA
3D Seismic Data	30618 - 71993	3.5 - 7.5 MTPA
25 Mile Buffer	71994 - 229493	7.5 - 13 MTPA
Existing Wells	229494 - 383997	

**Reference**

Base map comprised of ESRI World Imagery exported 01/12/2023.

**Identification of Potential Areas of Interest for CO<sub>2</sub> Sequestration**

St. James, St. John the Baptist, St. Charles, and Lafourche Parishes, Louisiana

**ConocoPhillips Company**

Project Roux

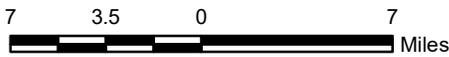
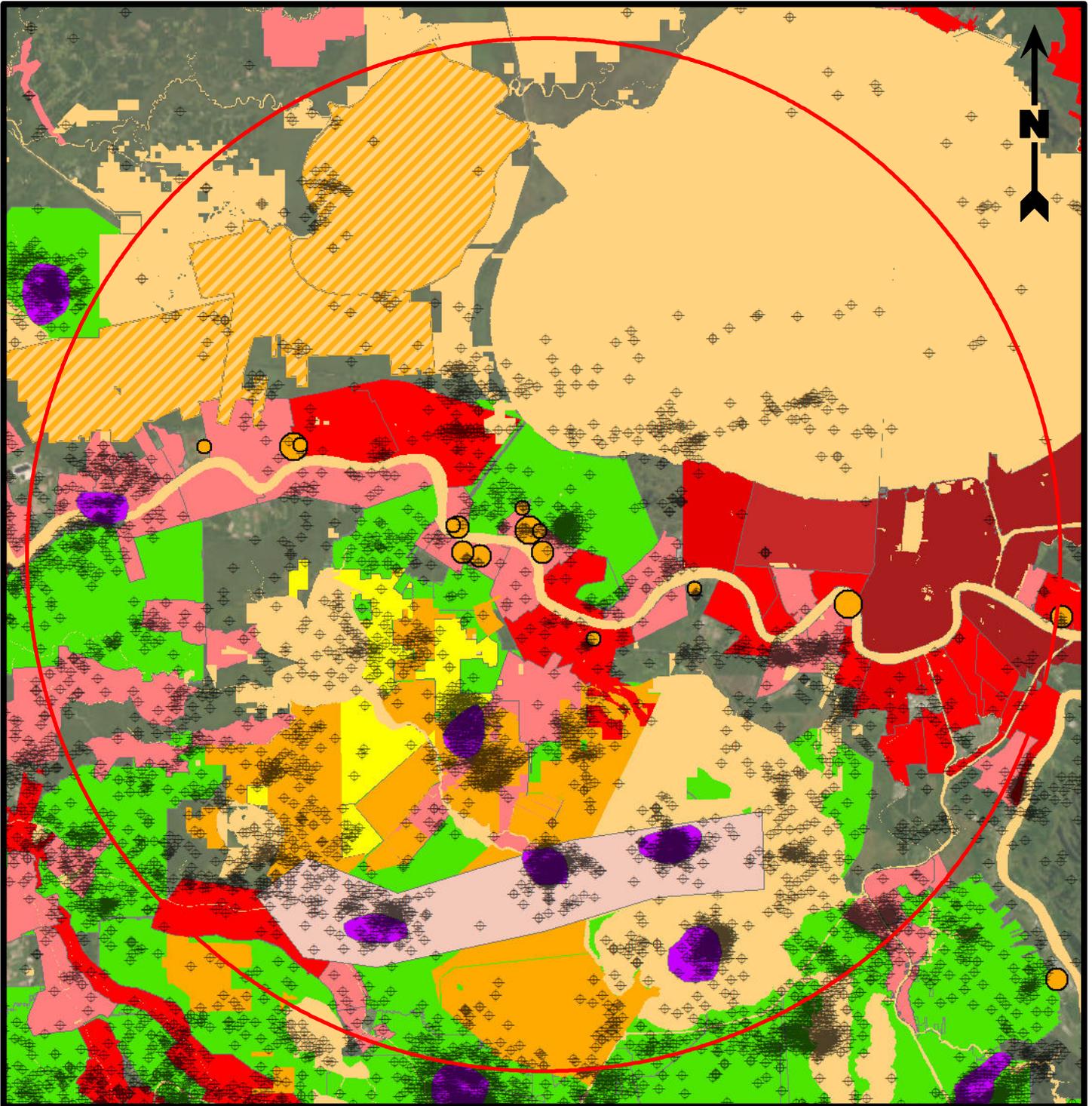


**PROVIDENCE**

Drawn By	AFA	01/23/23
Checked By	TDJ	01/23/23
Approved By	TK	01/23/23

Project Number	1429-002
Drawing Number	1429-002-A085

<b>5</b>
Figure



**Legend**

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|--|--|--|

**Reference**

Base map comprised of ESRI World Imagery exported 01/12/2023.

**Identification of Potential Areas of Interest for CO<sub>2</sub> Sequestration**

St. James, St. John the Baptist, St. Charles, and Lafourche Parishes, Louisiana

**ConocoPhillips Company**

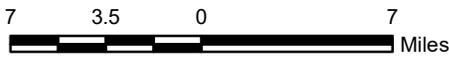
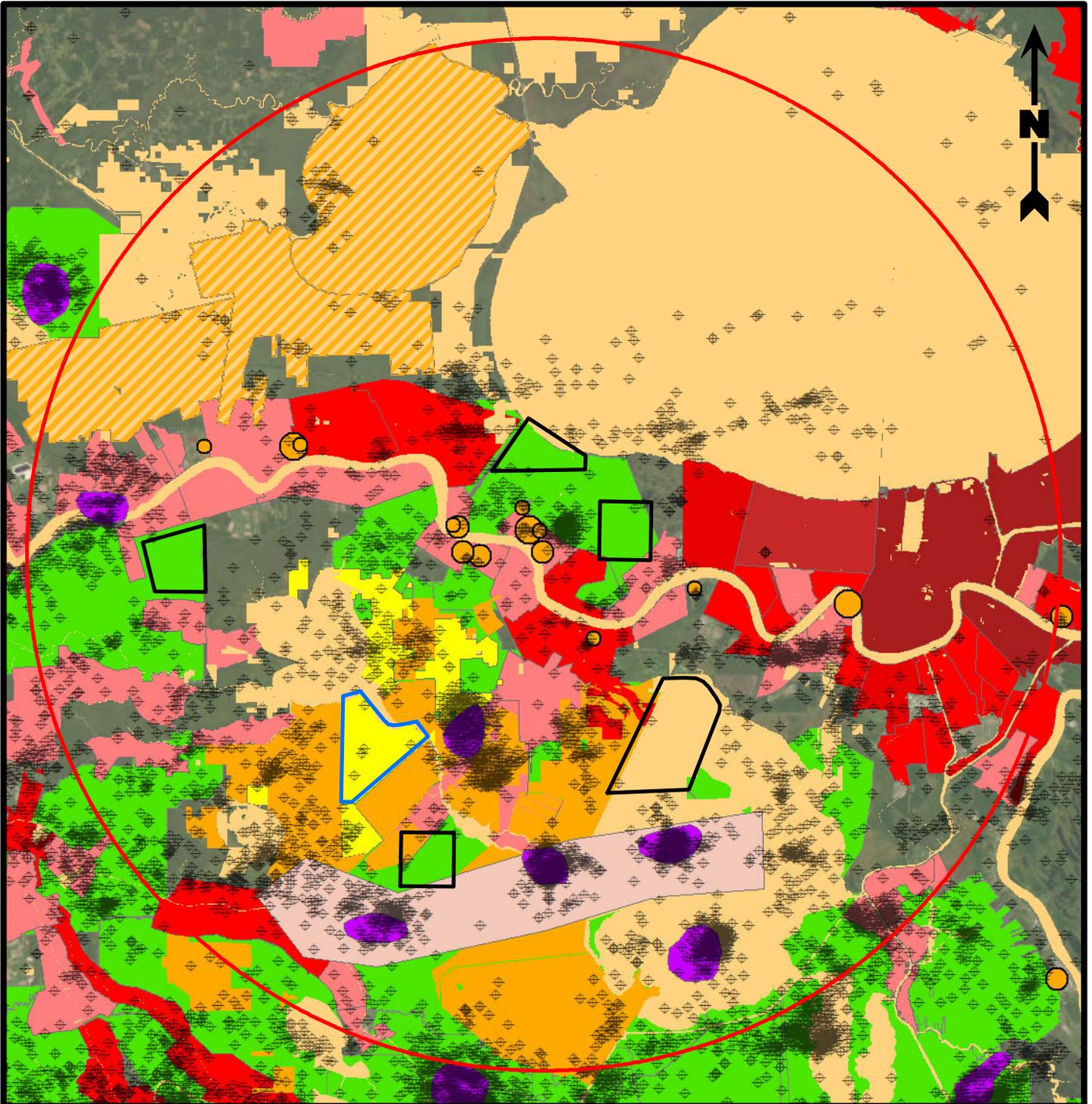
Project Roux



**PROVIDENCE**

Drawn By	AFA	01/23/23
Checked By	TDJ	01/23/23
Approved By	TK	01/23/23

Project Number	<b>6</b>
1429-002	
Drawing Number	Figure
1429-002-A086	



**Legend**

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|---|--|---|
| <ul style="list-style-type: none"> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: yellow; border: 1px solid black; margin-right: 5px;"></span> COP Owned</li> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: orange; border: 1px solid black; margin-right: 5px;"></span> State Owned Land</li> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: lightorange; border: 1px solid black; margin-right: 5px;"></span> Leased State Lands</li> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: yelloworange; border: 1px solid black; margin-right: 5px;"></span> Committed to Third Parties</li> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: purple; border: 1px solid black; margin-right: 5px;"></span> Salt Features</li> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: lightgrey; border: 1px solid black; margin-right: 5px;"></span> Fault Buffer</li> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: lightgreen; border: 1px solid black; margin-right: 5px;"></span> 3D Seismic Data</li> <li><span style="display: inline-block; width: 15px; height: 10px; border: 2px solid red; margin-right: 5px;"></span> 25 Mile Buffer</li> <li><span style="display: inline-block; width: 15px; height: 10px; border: 2px solid blue; margin-right: 5px;"></span> Proposed Site</li> <li><span style="display: inline-block; width: 15px; height: 10px; border: 2px solid black; margin-right: 5px;"></span> Alternative Site</li> <li><span style="display: inline-block; width: 10px; height: 10px; border: 1px solid black; margin-right: 5px;"></span> Existing Wells</li> </ul> | <p><b>2020 Census Population Data</b></p> <ul style="list-style-type: none"> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: lightpink; border: 1px solid black; margin-right: 5px;"></span> 12 - 7526</li> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: pink; border: 1px solid black; margin-right: 5px;"></span> 7527 - 30617</li> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: red; border: 1px solid black; margin-right: 5px;"></span> 30618 - 71993</li> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: darkred; border: 1px solid black; margin-right: 5px;"></span> 71994 - 229493</li> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: maroon; border: 1px solid black; margin-right: 5px;"></span> 229494 - 383997</li> </ul> | <p><b>2019 CO<sub>2</sub> Emissions</b></p> <ul style="list-style-type: none"> <li><span style="display: inline-block; width: 15px; height: 15px; border: 1px solid black; border-radius: 50%; background-color: yellow; margin-right: 5px;"></span> 0.5 - 1.5 MTPA</li> <li><span style="display: inline-block; width: 15px; height: 15px; border: 1px solid black; border-radius: 50%; background-color: orange; margin-right: 5px;"></span> 1.5 - 3.5 MTPA</li> <li><span style="display: inline-block; width: 15px; height: 15px; border: 1px solid black; border-radius: 50%; background-color: yelloworange; margin-right: 5px;"></span> 3.5 - 7.5 MTPA</li> <li><span style="display: inline-block; width: 15px; height: 15px; border: 1px solid black; border-radius: 50%; background-color: orange; margin-right: 5px;"></span> 7.5 - 13 MTPA</li> </ul> |
|---|--|---|

**Reference**

Base map comprised of ESRI World Imagery exported 01/12/2023.

**Identification of Potential Areas of Interest for CO<sub>2</sub> Sequestration**

St. James, St. John the Baptist, St. Charles, and Lafourche Parishes, Louisiana

**ConocoPhillips Company**

Project Roux



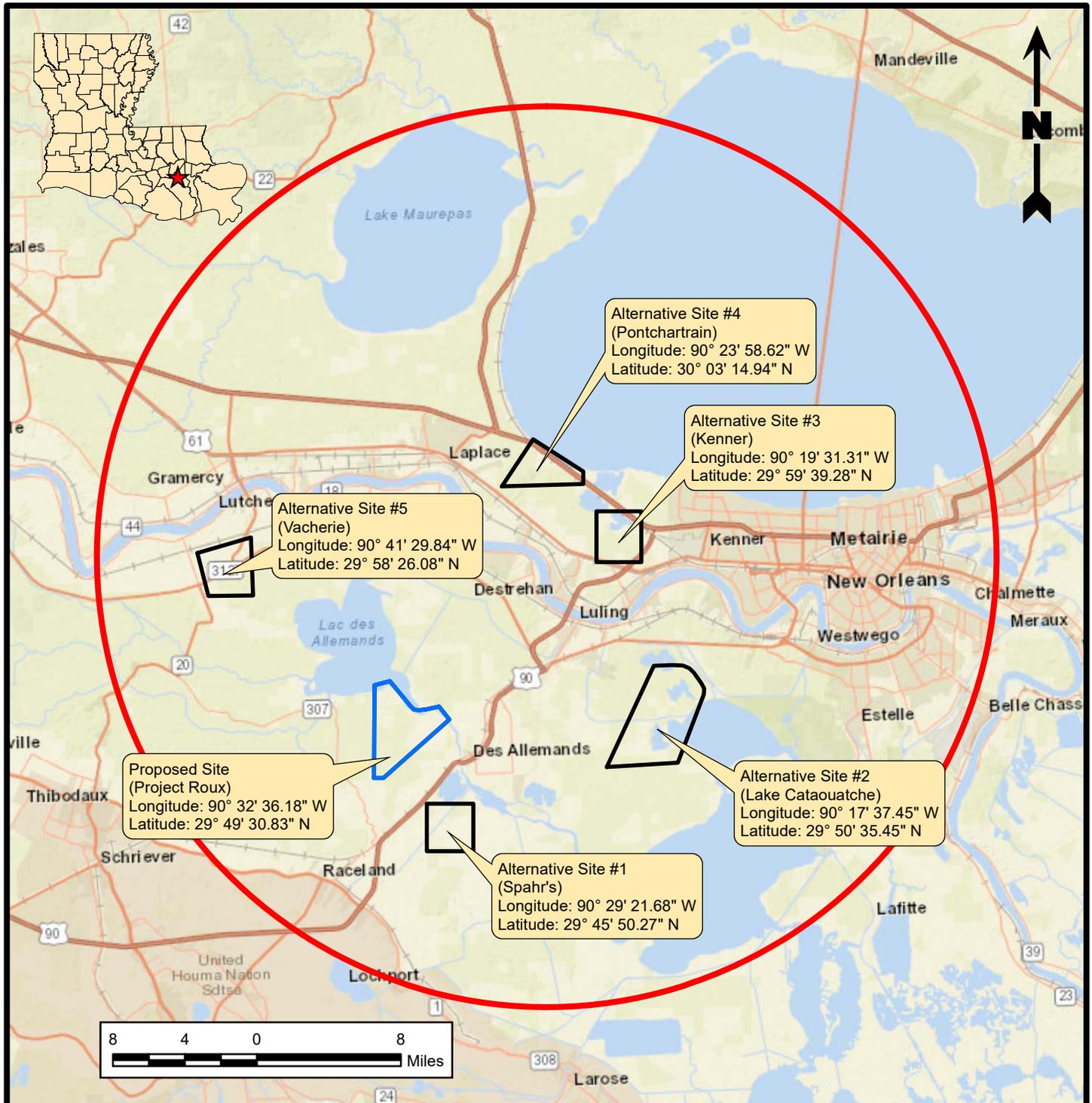
**PROVIDENCE**

Drawn By	AFA	01/23/23
Checked By	TDJ	01/23/23
Approved By	TK	01/23/23

Project Number	1429-002
Drawing Number	1429-002-A088

<b>7</b>
Figure

**ATTACHMENT B**  
**ALTERNATIVE SITES**  
**HABITAT ASSESSMENT AND PROPOSED IMPACTS**



**Legend**

- Proposed Site
- 25-Mile Radius Study Area
- Alternative Site

**Note**

All coordinates shown are referenced to geographic coordinate system (NAD83).

**Reference**

Base map comprised of ESRI StreetMap USA data.

**Vicinity Map**

**Needs, Alternatives, and Justification Analyses  
Habitat Assessment and Proposed Impacts**

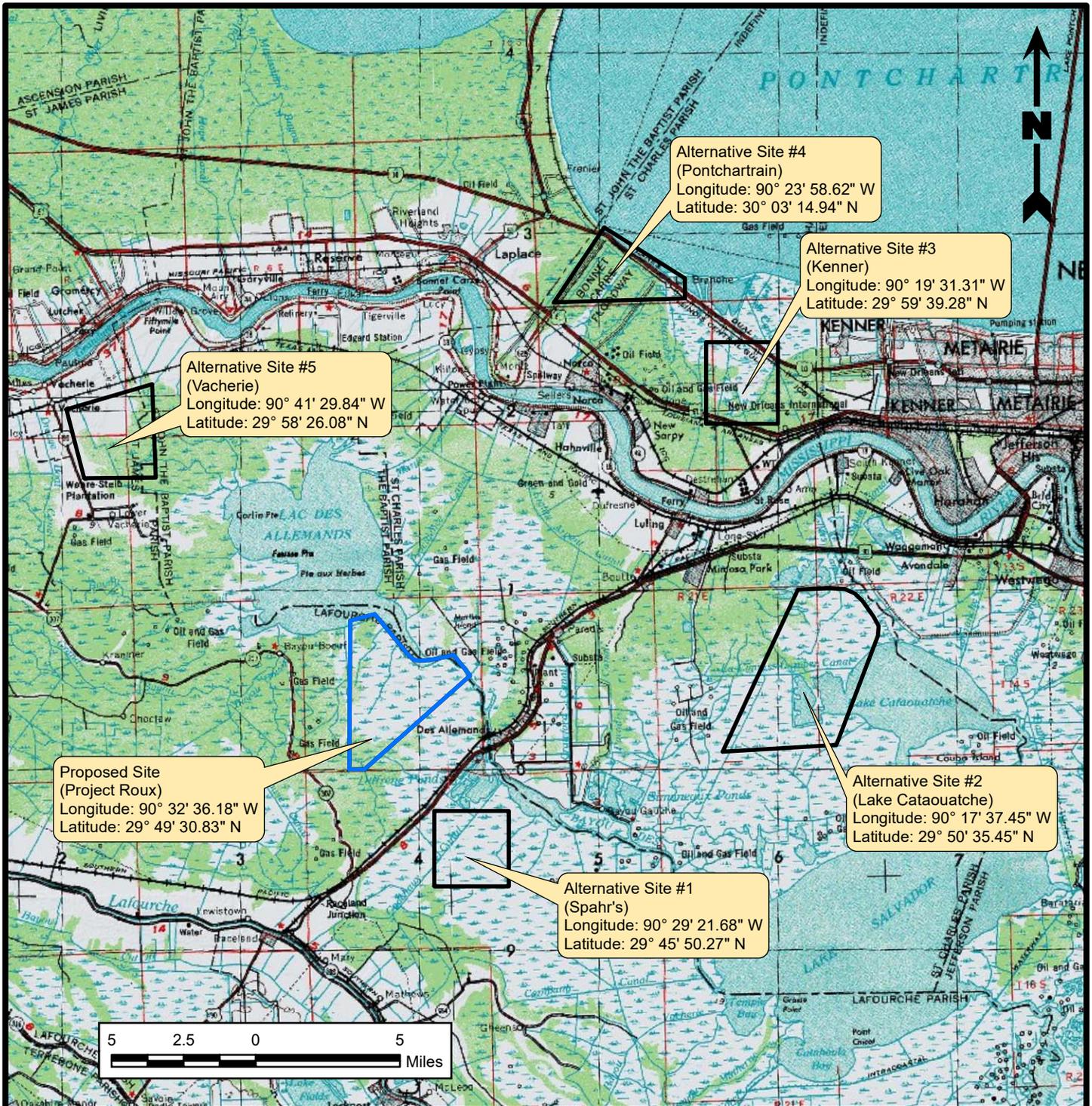
St. Charles, St. James, St. John the Baptist, and Lafourche Parishes, Louisiana

**ConocoPhillips Company**

Project Roux



Drawn By	LMH	01/17/23
Checked By	LMH	01/17/23
Approved By	GJL	01/17/23
Project Number		<b>1</b> Figure
1429-002		
Drawing Number		
1429-002-A068		



Proposed Site  
(Project Roux)  
Longitude: 90° 32' 36.18" W  
Latitude: 29° 49' 30.83" N

Alternative Site #5  
(Vacherie)  
Longitude: 90° 41' 29.84" W  
Latitude: 29° 58' 26.08" N

Alternative Site #4  
(Pontchartrain)  
Longitude: 90° 23' 58.62" W  
Latitude: 30° 03' 14.94" N

Alternative Site #3  
(Kenner)  
Longitude: 90° 19' 31.31" W  
Latitude: 29° 59' 39.28" N

Alternative Site #1  
(Spahr's)  
Longitude: 90° 29' 21.68" W  
Latitude: 29° 45' 50.27" N

Alternative Site #2  
(Lake Cataouatche)  
Longitude: 90° 17' 37.45" W  
Latitude: 29° 50' 35.45" N



**Legend**

- Proposed Site
- Alternative Site

**Note**

All coordinates shown are referenced to geographic coordinate system (NAD83).

**Reference**

Base map comprised of United States Geological Survey (USGS) 100K topographic map, "Ponchatoula, LA" and "New Orleans, LA".

**Site Location Map**

**Needs, Alternatives, and Justification Analyses  
Habitat Assessment and Proposed Impacts**

St. Charles, St. James, St. John the Baptist, and Lafourche Parishes, Louisiana

**ConocoPhillips Company**  
Project Roux



Drawn By	LMH	01/17/23
Checked By	LMH	01/17/23
Approved By	GJL	01/17/23
Project Number	1429-002	
Drawing Number	1429-002-A069	
	2	Figure



Project Area (26.77 Acres)  
 Bottomland Hardwoods - 0.42 Acre  
 Cypress Impact - 7.60 Acres  
 Degraded Cypress Impact - 8.81 Acres  
 Flotant - 5.32 Acres  
 Upland - 4.62 Acres

Well Pad

Longitude: 90° 32' 36.18" W  
 Latitude: 29° 49' 30.83" N

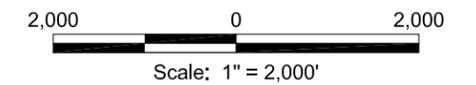


**Note**

All coordinates shown are referenced to geographic coordinate system (NAD83).

**Reference**

Base map comprised of Bing Maps aerial imagery (c) 2022 Microsoft Corporation and its data suppliers, exported 11/15/22.



**Proposed Site  
 (Project Roux)**

**Needs, Alternatives, and Justification Analyses  
 Habitat Assessment and Proposed Impacts**  
 St. Charles, St. James, St. John the Baptist, and Lafourche Parishes, Louisiana

**ConocoPhillips Company**  
 Project Roux



Drawn By	LMH	01/17/23
Checked By	LMH	01/17/23
Approved By	GJL	01/17/23
Project Number	1429-002	
Drawing Number	1429-002-B070	
	<b>3</b>	Figure

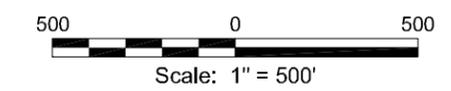


**Notes**

1. All coordinates shown are referenced to geographic coordinate system (NAD83).
2. Habitat acreages were based on National Wetland Inventory Data.

**Reference**

Base map comprised of Bing Maps aerial imagery (c) 2022 Microsoft Corporation and its data suppliers, exported 11/15/22.



**Alternative Site #1  
(Spahr's)**  
Needs, Alternatives, and Justification Analyses  
Habitat Assessment and Proposed Impacts  
St. Charles, St. James, St. John the Baptist, and Lafourche Parishes, Louisiana

**ConocoPhillips Company**  
Project Roux

	Drawn By	LMH	01/17/23
	Checked By	LMH	01/17/23
	Approved By	GJL	01/17/23
	Project Number	1429-002	
Drawing Number	1429-002-B071		
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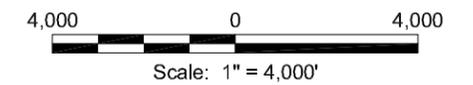


**Note**

All coordinates shown are referenced to geographic coordinate system (NAD83).

**Reference**

Base map comprised of Bing Maps aerial imagery (c) 2022 Microsoft Corporation and its data suppliers, exported 11/15/22.



**Alternative Site #2  
(Lake Cataouatche)**  
Needs, Alternatives, and Justification Analyses  
Habitat Assessment and Proposed Impacts  
St. Charles, St. James, St. John the Baptist, and Lafourche Parishes, Louisiana

**ConocoPhillips Company**  
Project Roux

	Drawn By	LMH	01/17/23
	Checked By	LMH	01/17/23
	Approved By	GJL	01/17/23
Project Number		1429-002	
Drawing Number		1429-002-B072	
			<b>5</b> Figure

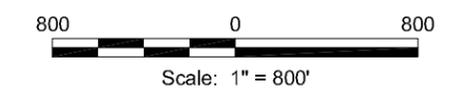


**Notes**

1. All coordinates shown are referenced to geographic coordinate system (NAD83).
2. Habitat acreages were based on National Wetland Inventory Data.

**Reference**

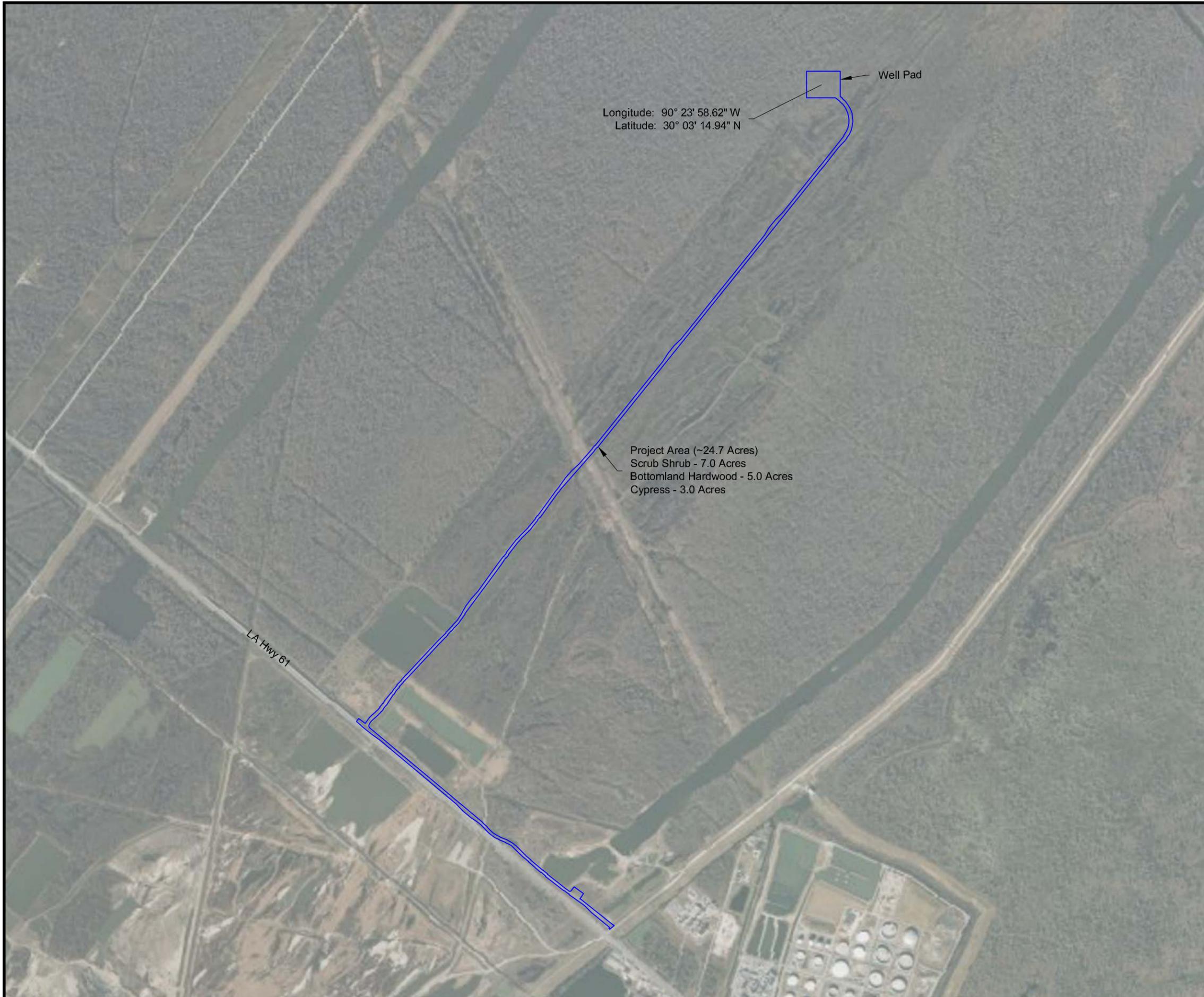
Base map comprised of Bing Maps aerial imagery (c) 2022 Microsoft Corporation and its data suppliers, exported 11/15/22.



**Alternative Site #3  
(Kenner)**  
Needs, Alternates, and Justification Analyses  
Habitat Assessment and Proposed Impacts  
St. Charles, St. James, St. John the Baptist, and Lafourche Parishes, Louisiana

**ConocoPhillips Company**  
Project Roux

	Drawn By	LMH	01/17/23
	Checked By	LMH	01/17/23
	Approved By	GJL	01/17/23
Project Number		1429-002	
Drawing Number		1429-002-B073	
			<b>6</b> Figure

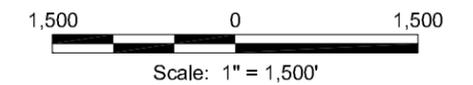


**Notes**

1. All coordinates shown are referenced to geographic coordinate system (NAD83).
2. Habitat acreages were based on National Wetland Inventory Data.

**Reference**

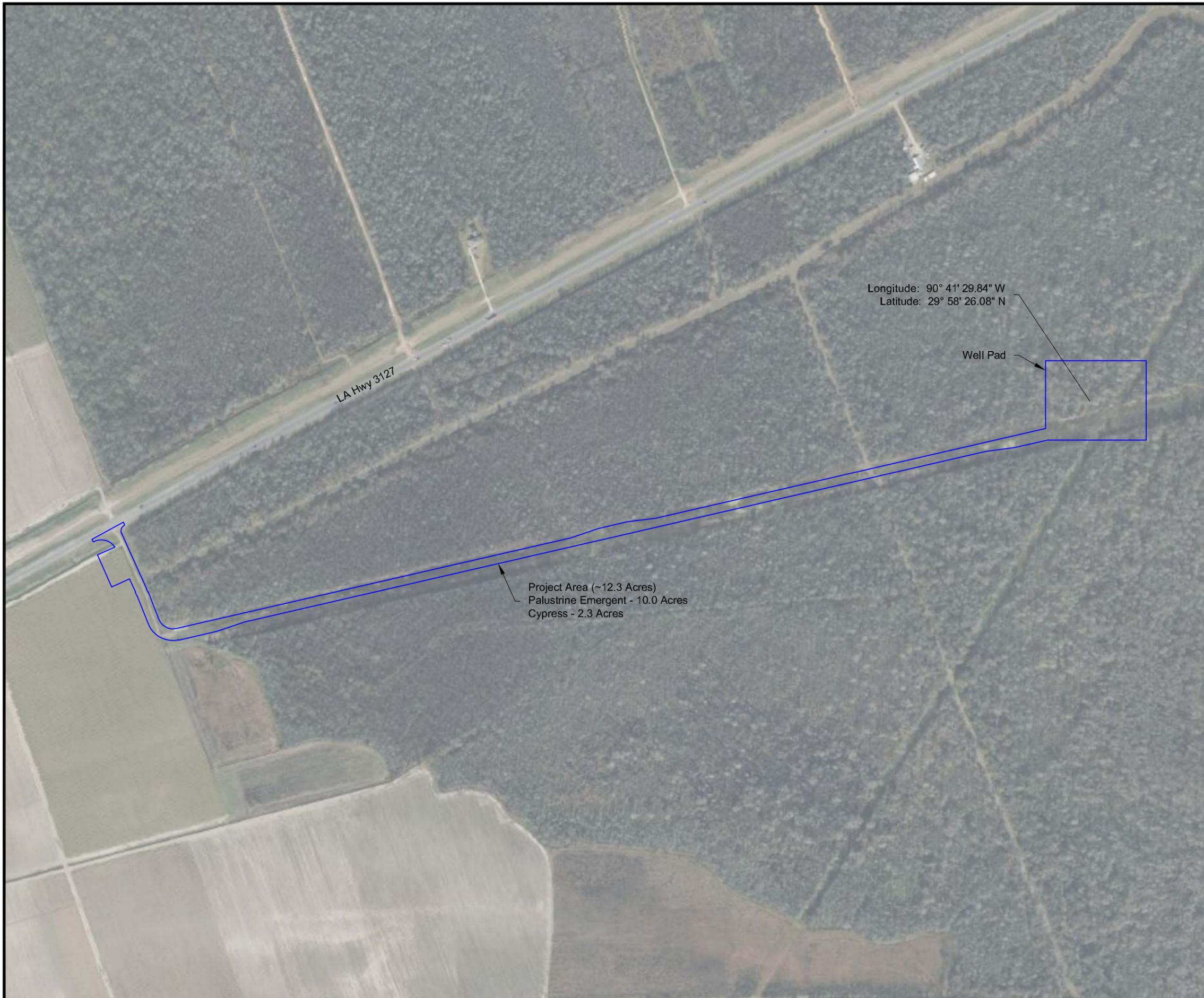
Base map comprised of Bing Maps aerial imagery (c) 2022 Microsoft Corporation and its data suppliers, exported 11/15/22.



**Alternative Site #4  
(Pontchartrain)**  
Needs, Alternatives, and Justification Analyses  
Habitat Assessment and Proposed Impacts  
St. Charles, St. James, St. John the Baptist, and Lafourche Parishes, Louisiana

**ConocoPhillips Company**  
Project Roux

	Drawn By	LMH	01/17/23
	Checked By	LMH	01/17/23
	Approved By	GJL	01/17/23
	Project Number	1429-002	
	Drawing Number	1429-002-B074	
		<b>7</b> Figure	

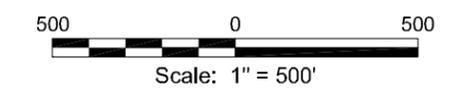


**Notes**

1. All coordinates shown are referenced to geographic coordinate system (NAD83).
2. Habitat acreages were based on National Wetland Inventory Data.

**Reference**

Base map comprised of Bing Maps aerial imagery (c) 2022 Microsoft Corporation and its data suppliers, exported 11/15/22.



**Alternative Site #5  
(Vacherie)**  
Needs, Alternatives, and Justification Analyses  
Habitat Assessment and Proposed Impacts  
St. Charles, St. James, St. John the Baptist, and Lafourche Parishes, Louisiana

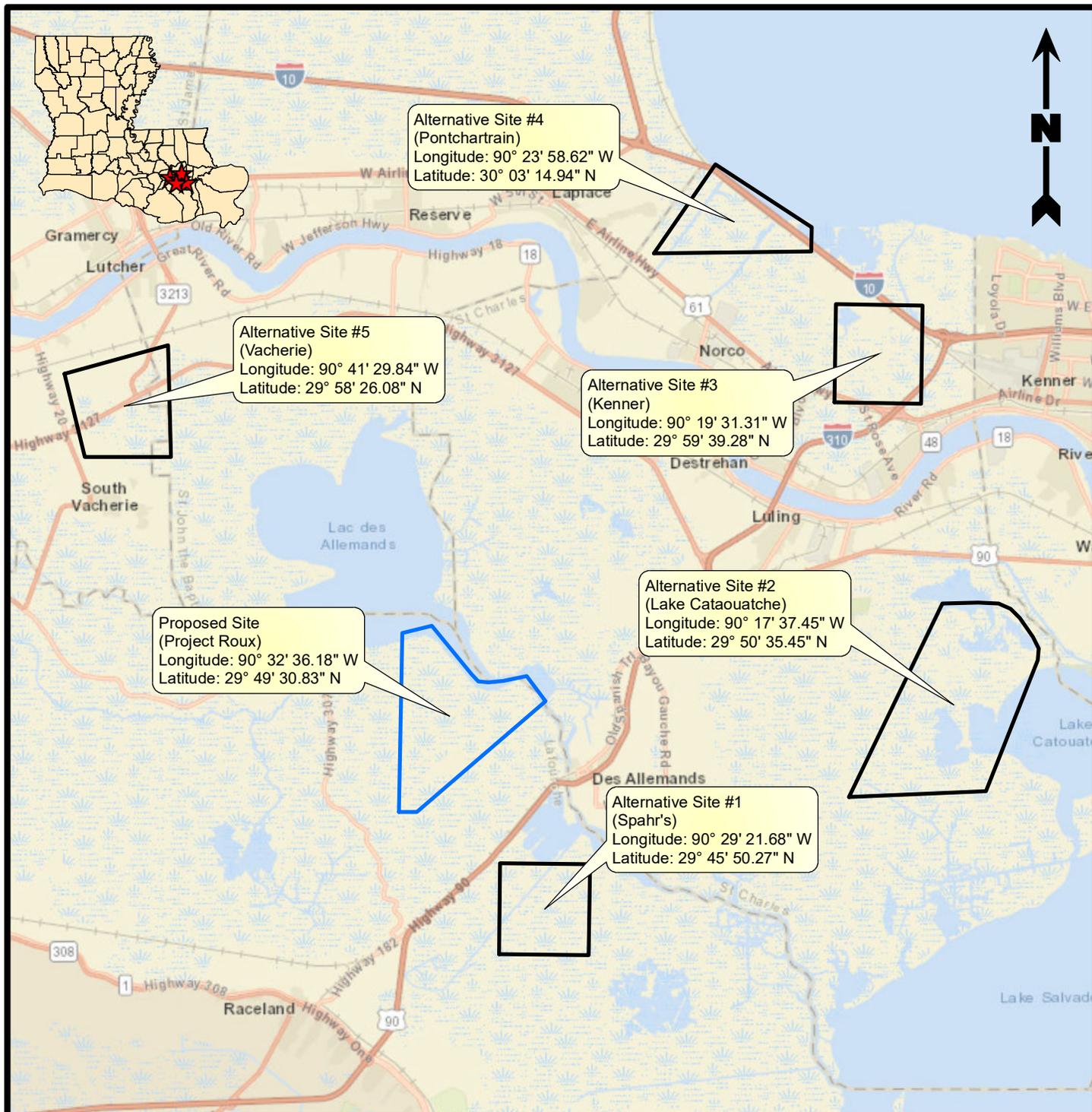
**ConocoPhillips Company**  
Project Roux



Drawn By	LMH	01/17/23
Checked By	LMH	01/17/23
Approved By	GJL	01/17/23
Project Number	1429-002	
Drawing Number	1429-002-B075	
	<b>8</b>	Figure

Providence Engineering and Environmental Group LLC

**ATTACHMENT C**  
**LAND USE/LAND COVER**



**Legend**

- Proposed Site
- Alternative Site

**Reference**

Base map comprised of ESRI StreetMap USA data.

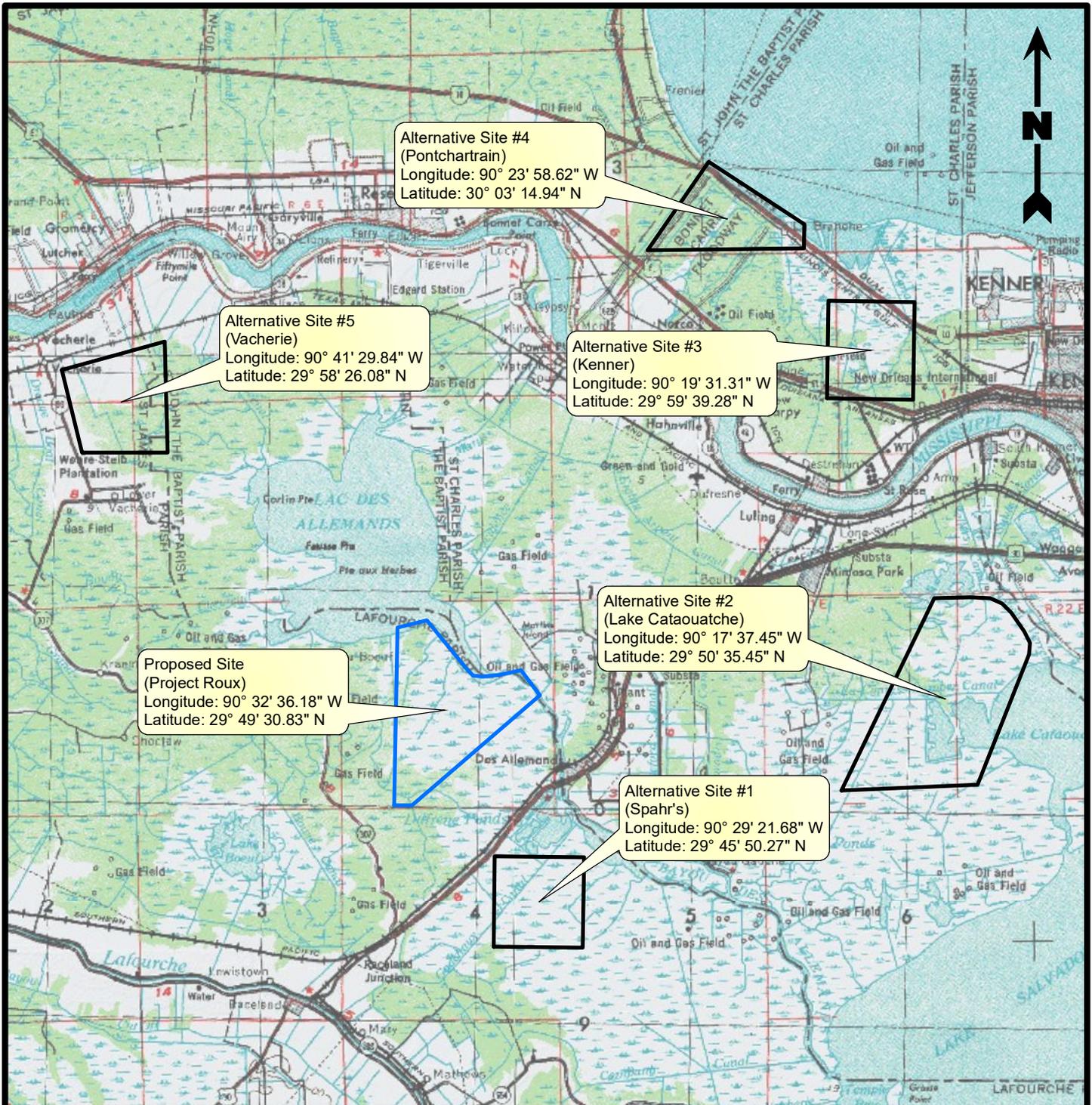
**Vicinity Map**  
Needs, Alternatives, and Justification Analyses  
Land Use/ Land Cover  
St. James, St. John the Baptist, St. Charles, and  
Lafourche Parishes, Louisiana

**ConocoPhillips Company**  
Project Roux



Drawn By	AFA	01/16/23
Checked By	TDJ	01/16/23
Approved By	TK	01/16/23
Project Number 1429-002		<b>1</b> Figure
Drawing Number 1429-002-A014		

Providence Engineering and Environmental Group LLC



Alternative Site #4  
(Pontchartrain)  
Longitude: 90° 23' 58.62" W  
Latitude: 30° 03' 14.94" N

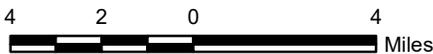
Alternative Site #5  
(Vacherie)  
Longitude: 90° 41' 29.84" W  
Latitude: 29° 58' 26.08" N

Alternative Site #3  
(Kenner)  
Longitude: 90° 19' 31.31" W  
Latitude: 29° 59' 39.28" N

Proposed Site  
(Project Roux)  
Longitude: 90° 32' 36.18" W  
Latitude: 29° 49' 30.83" N

Alternative Site #2  
(Lake Cataouatche)  
Longitude: 90° 17' 37.45" W  
Latitude: 29° 50' 35.45" N

Alternative Site #1  
(Spahr's)  
Longitude: 90° 29' 21.68" W  
Latitude: 29° 45' 50.27" N



**Legend**

- Proposed Site
- Alternative Site

**Reference**

Base map comprised of United States Geological Survey (USGS) 100k topographic maps, "New Orleans, LA" and "Ponchatoula, LA".

**Site Location Map**

Needs, Alternatives, and Justification Analyses  
Land Use/ Land Cover  
St. James, St. John the Baptist, St. Charles, and  
Lafourche Parishes, Louisiana

**ConocoPhillips Company**

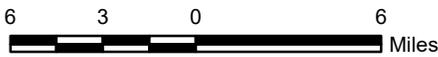
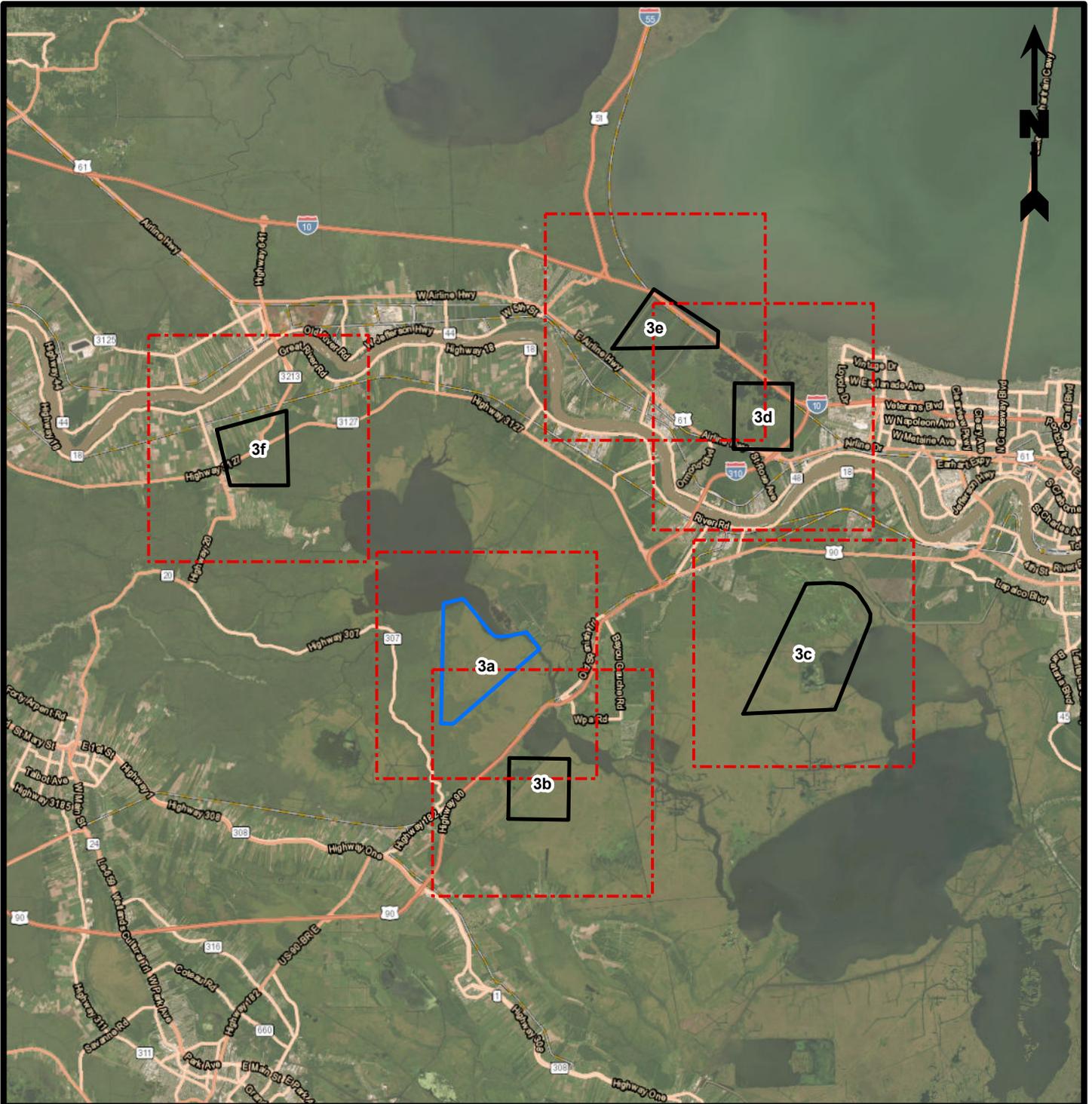
Project Roux



**PROVIDENCE**

Drawn By	AFA	01/16/23
Checked By	TDJ	01/16/23
Approved By	TK	01/16/23

Project Number	<b>2</b>
1429-002	
Drawing Number	Figure
1429-002-A015	



**Legend**

- Proposed Site
- Alternative Site
- Map Index

**Reference**

Base map comprised of ESRI World Imagery exported 11/11/2022.

**Map Index**

Needs, Alternatives, and Justification Analyses  
 Land Use/ Land Cover  
 St. James, St. John the Baptist, St. Charles, and  
 Lafourche Parishes, Louisiana

**ConocoPhillips Company**

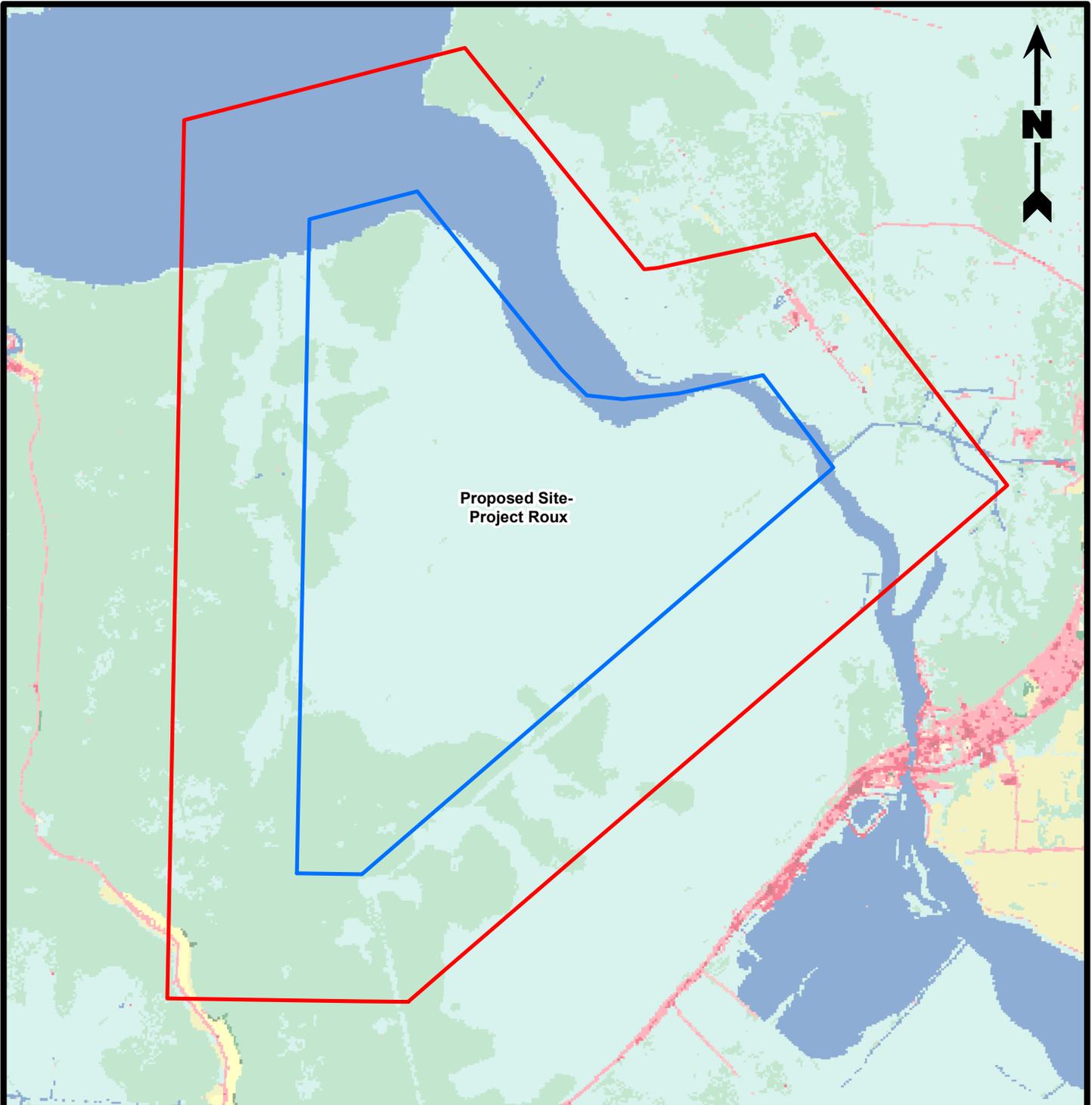
Project Roux



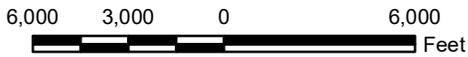
**PROVIDENCE**

Drawn By	AFA	01/16/23
Checked By	TDJ	01/16/23
Approved By	TK	01/16/23

Project Number 1429-002	<b>3</b> Figure
Drawing Number 1429-002-A016	



Proposed Site-  
Project Roux



**Legend**

Proposed Site	Barren Land	Lichens
1-mile Buffer	Deciduous Forest	Moss
Open Water	Evergreen Forest	Pasture/Hay
Perennial Snow/Ice	Mixed Forest	Cultivated Crops
Developed Open Space	Dwarf Scrub	Woody Wetlands
Developed Low Intensity	Shrub/Scrub	Emergent Herbaceous Wetlands
Developed Medium Intensity	Grassland/Herbaceous	
Developed High Intensity	Sedge/Herbaceous	

**Reference**

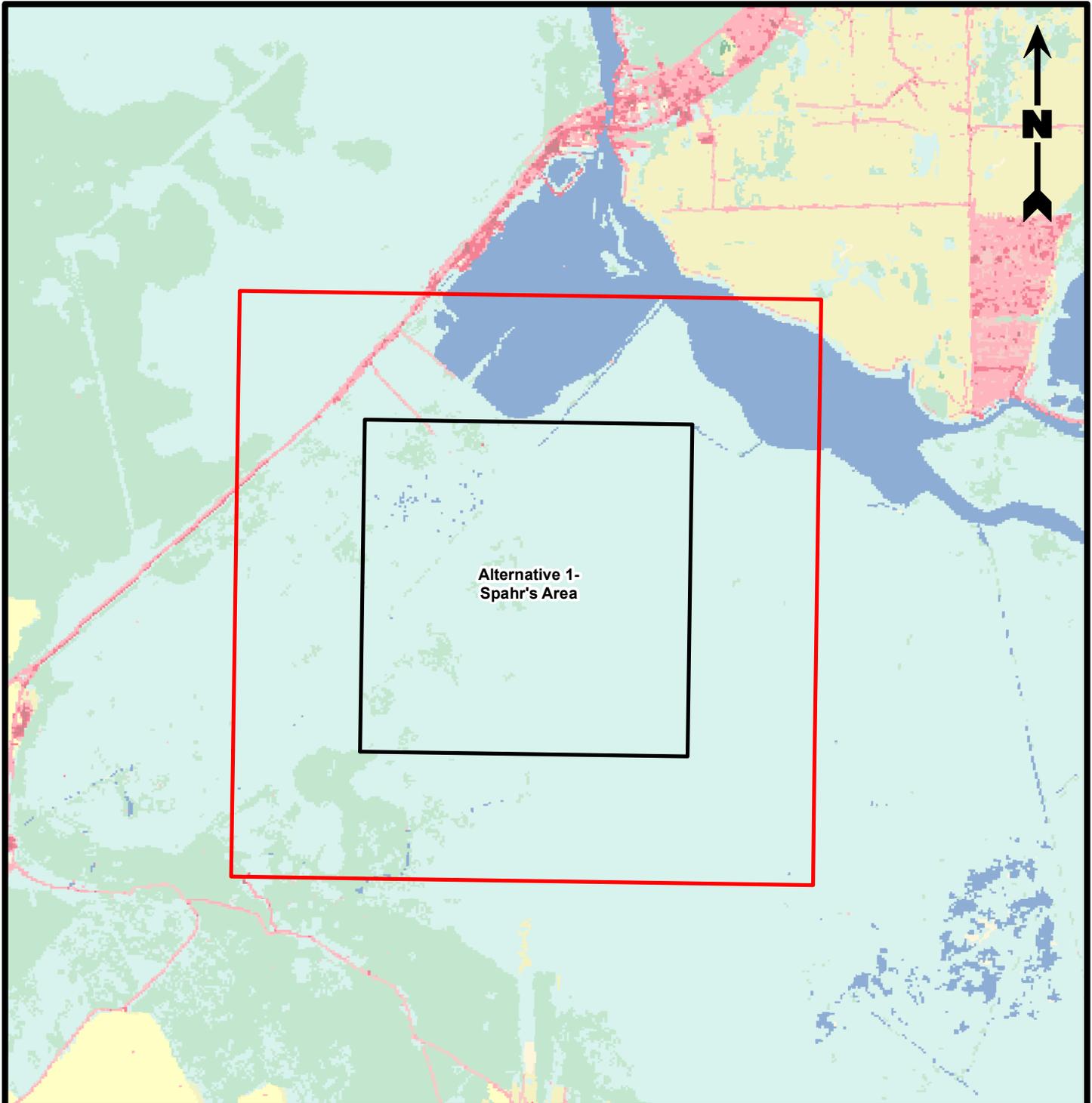
Base map comprised of ESRI USA NLCD Land Cover exported 11/11/22.

**Land Use/Land Cover Map**  
Needs, Alternatives, and Justification Analyses  
Land Use/ Land Cover  
St. James, St. John the Baptist, St. Charles, and  
Lafourche Parishes, Louisiana

**ConocoPhillips Company**  
Project Roux



Drawn By	AFA	01/16/23
Checked By	TDJ	01/16/23
Approved By	TK	01/16/23
Project Number 1429-002		<b>3a</b> Figure
Drawing Number 1429-002-A023		



**Legend**

Alternative Site	Barren Land	Lichens
1-mile Buffer	Deciduous Forest	Moss
Open Water	Evergreen Forest	Pasture/Hay
Perennial Snow/Ice	Mixed Forest	Cultivated Crops
Developed Open Space	Dwarf Scrub	Woody Wetlands
Developed Low Intensity	Shrub/Scrub	Emergent Herbaceous Wetlands
Developed Medium Intensity	Grassland/Herbaceous	
Developed High Intensity	Sedge/Herbaceous	

**Reference**

Base map comprised of ESRI USA NLCD Land Cover exported 11/11/22.

**Land Use/Land Cover Map**  
Needs, Alternatives, and Justification Analyses

Land Use/ Land Cover  
St. James, St. John the Baptist, St. Charles, and  
Lafourche Parishes, Louisiana

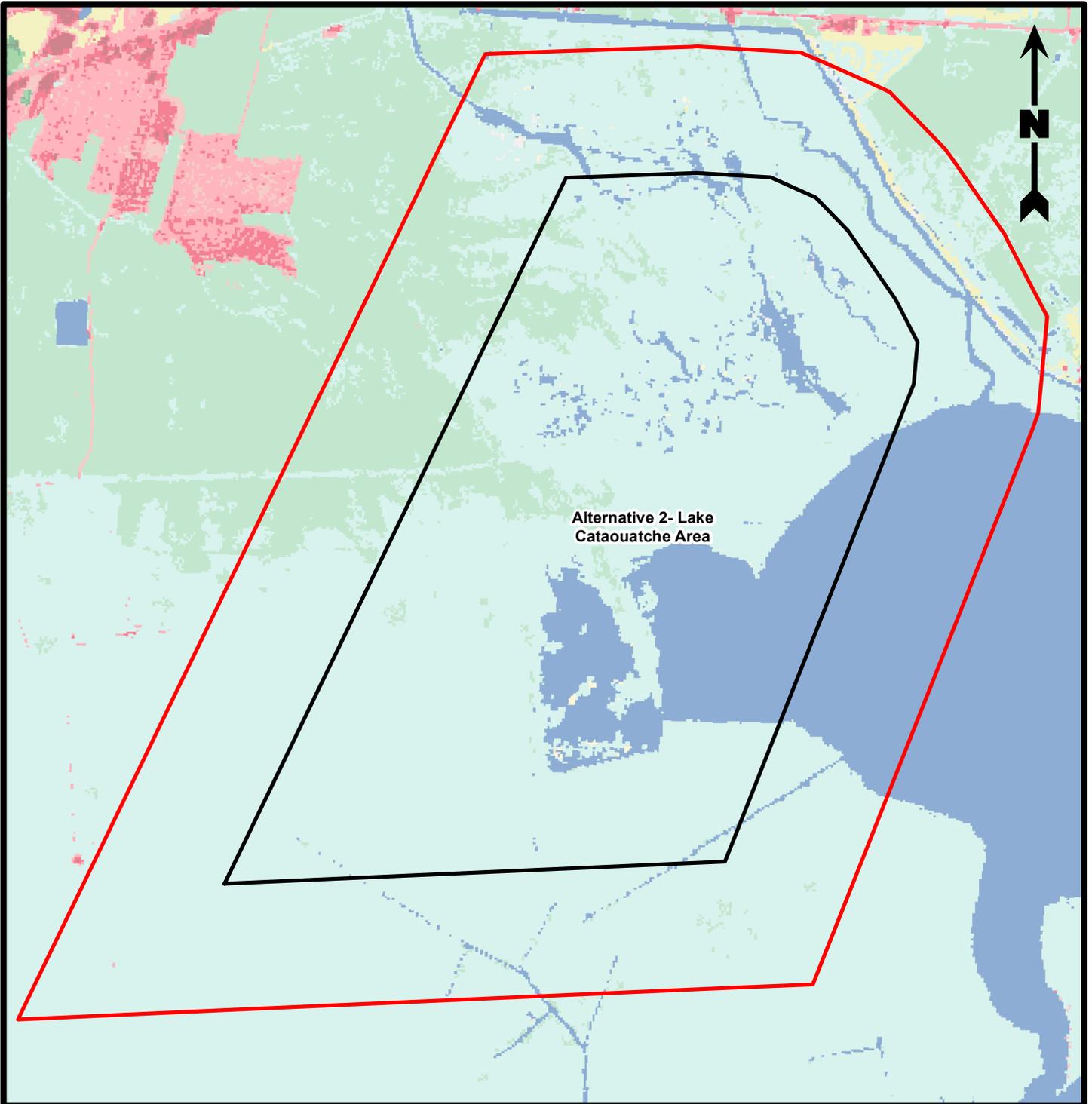
**ConocoPhillips Company**  
Project Roux



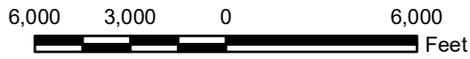
**PROVIDENCE**

Drawn By	AFA	01/16/23
Checked By	TDJ	01/16/23
Approved By	TK	01/16/23

Project Number 1429-002	<b>3b</b> Figure
Drawing Number 1429-002-A024	



Alternative 2- Lake  
Cataouatche Area



**Legend**

Alternative Site	Barren Land	Lichens
1-mile Buffer	Deciduous Forest	Moss
Open Water	Evergreen Forest	Pasture/Hay
Perennial Snow/Ice	Mixed Forest	Cultivated Crops
Developed Open Space	Dwarf Scrub	Woody Wetlands
Developed Low Intensity	Shrub/Scrub	Emergent Herbaceous Wetlands
Developed Medium Intensity	Grassland/Herbaceous	
Developed High Intensity	Sedge/Herbaceous	

**Reference**

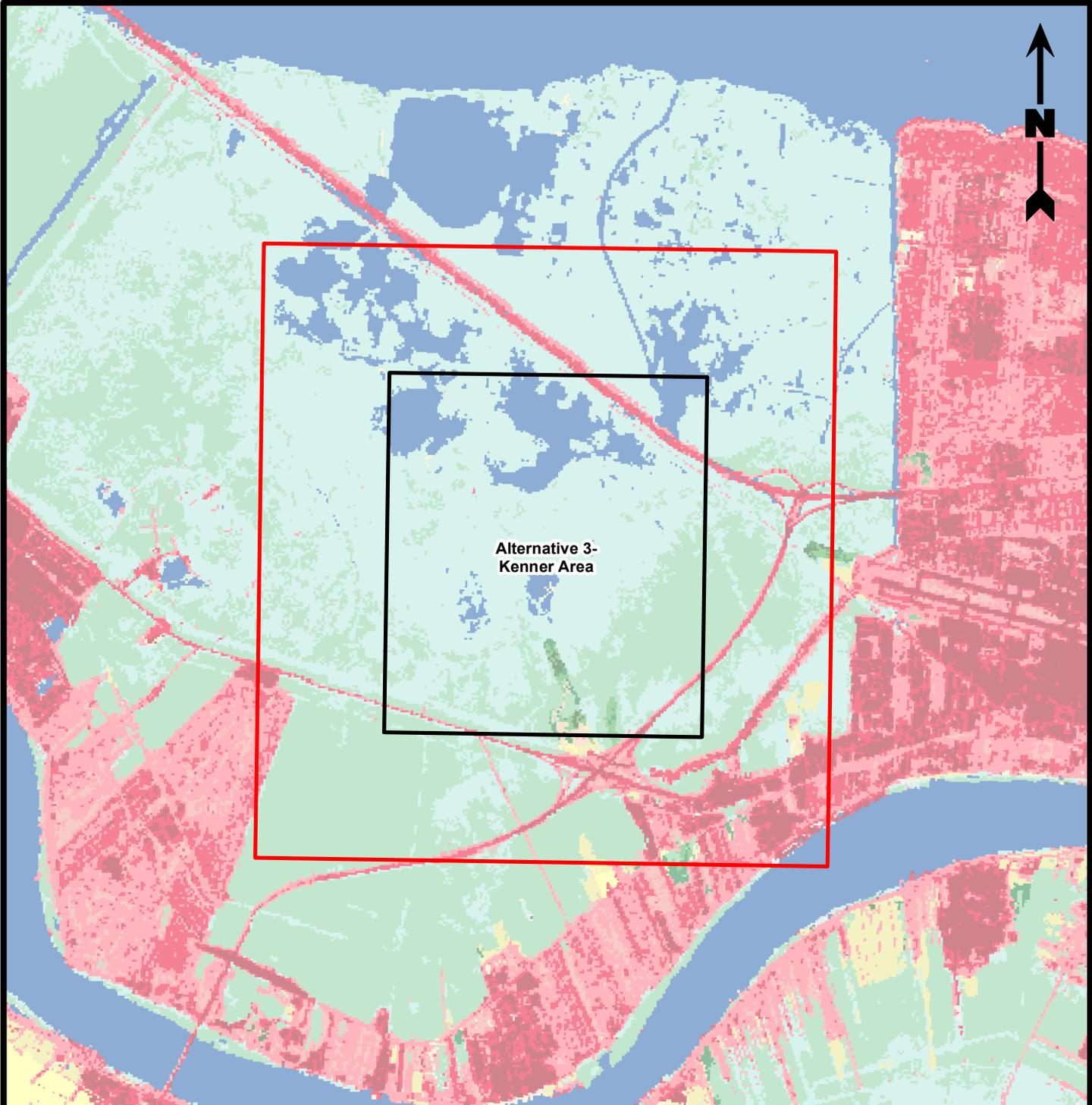
Base map comprised of ESRI USA NLCD Land Cover exported 11/11/22.

**Land Use/Land Cover Map**  
Needs, Alternatives, and Justification Analyses  
Land Use/ Land Cover  
St. James, St. John the Baptist, St. Charles, and  
Lafourche Parishes, Louisiana

**ConocoPhillips Company**  
Project Roux



Drawn By	AFA	01/16/23
Checked By	TDJ	01/16/23
Approved By	TK	01/16/23
Project Number 1429-002		<b>3c</b> Figure
Drawing Number 1429-002-A025		



**Legend**

Alternative Site	Barren Land	Lichens
1-mile Buffer	Deciduous Forest	Moss
Open Water	Evergreen Forest	Pasture/Hay
Perennial Snow/Ice	Mixed Forest	Cultivated Crops
Developed Open Space	Dwarf Scrub	Woody Wetlands
Developed Low Intensity	Shrub/Scrub	Emergent Herbaceous Wetlands
Developed Medium Intensity	Grassland/Herbaceous	
Developed High Intensity	Sedge/Herbaceous	

**Reference**

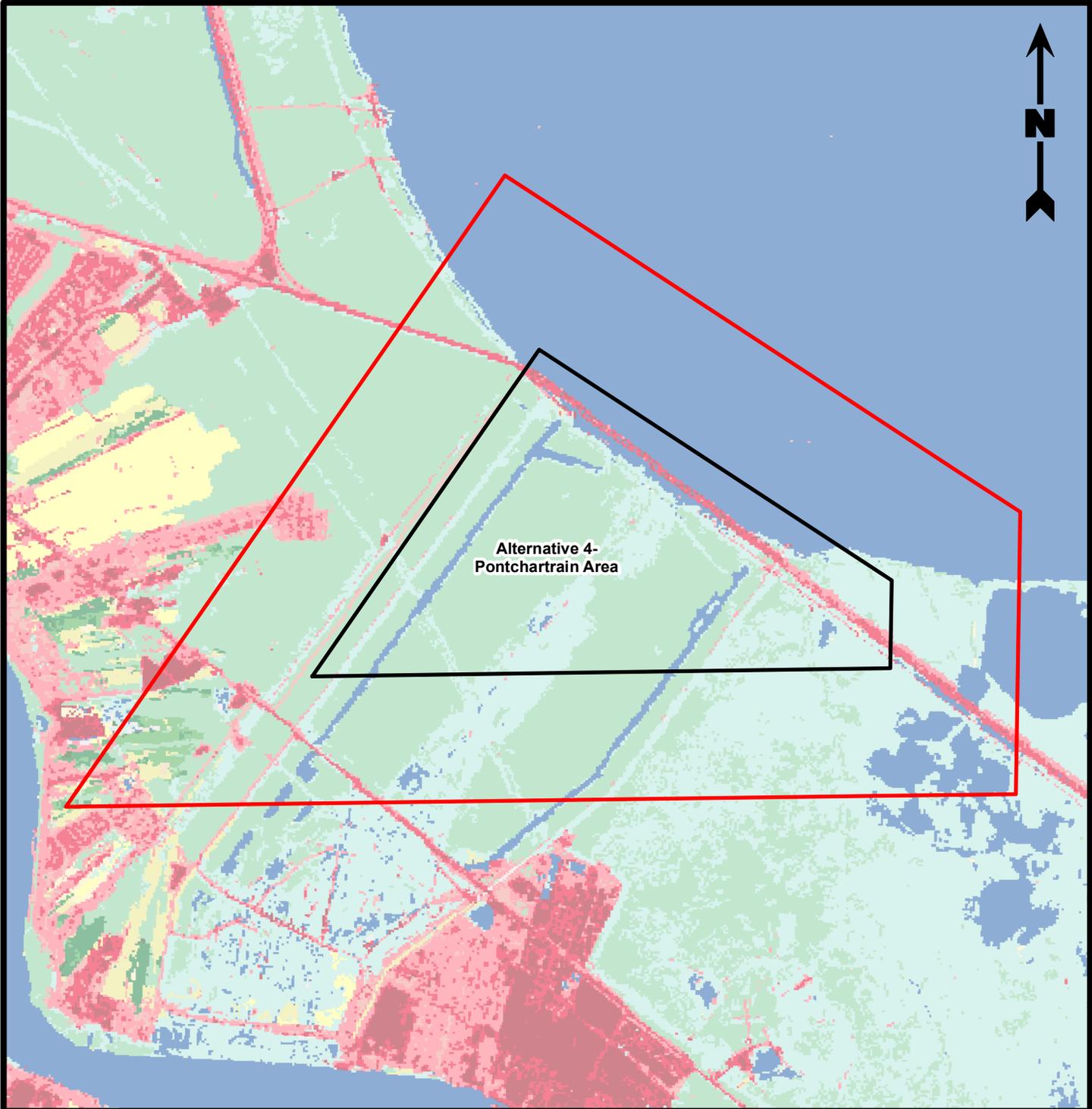
Base map comprised of ESRI USA NLCD Land Cover exported 11/11/22.

**Land Use/Land Cover Map**  
 Needs, Alternatives, and Justification Analyses  
 Land Use/ Land Cover  
 St. James, St. John the Baptist, St. Charles, and  
 Lafourche Parishes, Louisiana

**ConocoPhillips Company**  
 Project Roux



Drawn By	AFA	01/16/23
Checked By	TDJ	01/16/23
Approved By	TK	01/16/23
Project Number		<b>3d</b> Figure
1429-002		
Drawing Number		
1429-002-A026		



**Legend**

Alternative Site	Barren Land	Lichens
1-mile Buffer	Deciduous Forest	Moss
Open Water	Evergreen Forest	Pasture/Hay
Perennial Snow/Ice	Mixed Forest	Cultivated Crops
Developed Open Space	Dwarf Scrub	Woody Wetlands
Developed Low Intensity	Shrub/Scrub	Emergent Herbaceous Wetlands
Developed Medium Intensity	Grassland/Herbaceous	
Developed High Intensity	Sedge/Herbaceous	

**Reference**

Base map comprised of ESRI USA NLCD Land Cover exported 11/11/22.

**Land Use/Land Cover Map**  
 Needs, Alternatives, and Justification Analyses  
 Land Use/ Land Cover  
 St. James, St. John the Baptist, St. Charles, and  
 Lafourche Parishes, Louisiana

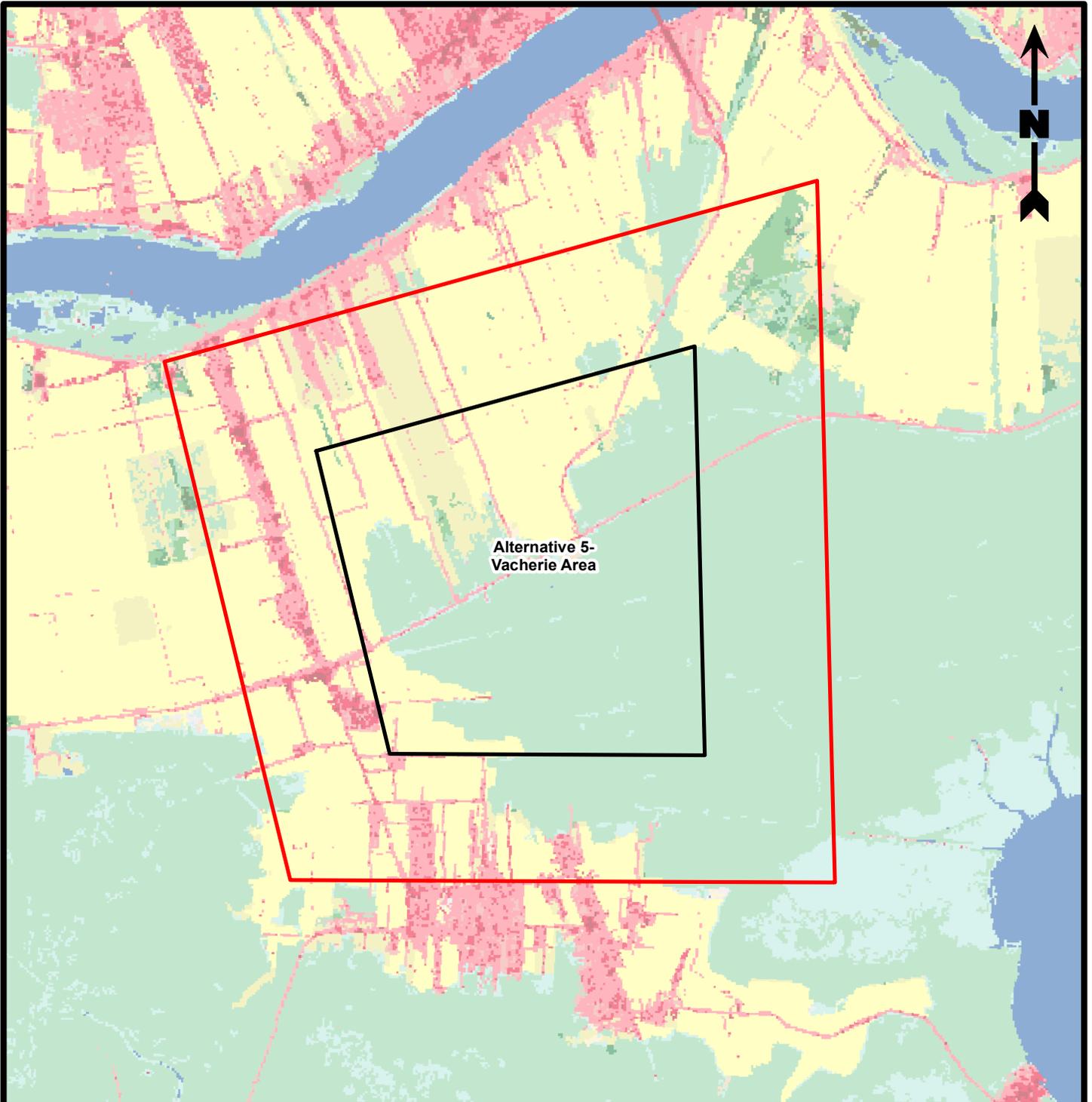
**ConocoPhillips Company**  
 Project Roux



**PROVIDENCE**

Drawn By	AFA	01/16/23
Checked By	TDJ	01/16/23
Approved By	TK	01/16/23

Project Number 1429-002	<b>3e</b> Figure
Drawing Number 1429-002-A027	



**Legend**

Alternative Site	Barren Land	Lichens
1-mile Buffer	Deciduous Forest	Moss
Open Water	Evergreen Forest	Pasture/Hay
Perennial Snow/Ice	Mixed Forest	Cultivated Crops
Developed Open Space	Dwarf Scrub	Woody Wetlands
Developed Low Intensity	Shrub/Scrub	Emergent Herbaceous Wetlands
Developed Medium Intensity	Grassland/Herbaceous	
Developed High Intensity	Sedge/Herbaceous	

**Reference**

Base map comprised of ESRI USA NLCD Land Cover exported 11/11/22.

**Land Use/Land Cover Map**  
 Needs, Alternatives, and Justification Analyses  
 Land Use/ Land Cover  
 St. James, St. John the Baptist, St. Charles, and  
 Lafourche Parishes, Louisiana

**ConocoPhillips Company**  
 Project Roux



**PROVIDENCE**

Drawn By	AFA	01/16/23
Checked By	TDJ	01/16/23
Approved By	TK	01/16/23

Project Number 1429-002	<b>3f</b> Figure
Drawing Number 1429-002-A028	