TITAN
CARBON SEQUESTRATION

Underground Injection Control – Class VI Permit Application for

Cronos No. 1 and Rhea No. 1

Jefferson County, Texas

SECTION 10 – ENVIRONMENTAL JUSTICE IMPACT ANALYSIS

February 2024

LONQUIST
SEQUESTRATION LLC

SECTION 10 – ENVIRONMENTAL IMPACT ANALYSES

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10.1 Executive Summary

Large scale capture of anthropogenic CO_2, as previously discussed in this permit application, is increasingly viewed as critical for the United States and the global community to meet ambitious goals for greenhouse gas reductions by companies, states, and national governments. For example, the International Energy Agency has highlighted a potential need for carbon dioxide storage to increase from around 40 million metric tons per year (MMT/yr) today to more than 5,000 MMT/yr by mid-century[1]. Today, the United States is the global leader in CO_2 capture, utilization, and sequestration (CCUS), holding more than 60% of current CCUS capacity and half of all global CCUS capacity under development.[2] For the global community to have an impact on global greenhouse gas levels, carbon—generally in the form of CO_2—once captured from a source, must be safely disposed in some manner. One of the more common methods of dealing with captured CO_2 is injecting it into porous formations below the Earth's surface.

The U.S. Gulf Coast has long been viewed as suitable for long-term sequestration of CO_2.[3] Titan Carbon Sequestration, LLC (Titan) is proposing to develop a premier carbon capture and sequestration (CCS) facility in Jefferson County, Texas located within close proximity to several liquefied natural gas (LNG) terminals. These LNG terminals operating and under construction in southwest Louisiana and southeast Texas have enabled the United States to become a global leader in natural gas exports to foreign customers. Increasingly, these customers are seeking natural gas sourced through lower-CO_2 processes to meet their energy needs—and are looking to U.S. suppliers for this cleaner product.

Through disciplined, innovative processes and engineering designs, Titan will facilitate the permanent storage of captured CO_2 from the nearby Port Arthur LNG Liquefaction Project (PALNG), as well as potentially other industrial facilities located in the Gulf Coast region. Titan's commitment to facilitate lower carbon energy and industrial production will help these crucial manufacturers evolve as leaders in the global energy transition.

The location for this proposed facility is ideally suited to "offtake" captured CO_2 from PALNG as well as other industrial facilities in the vicinity. This site was selected for several reasons such as favorable geology, controlled pore-space storage rights, numerous nearby industrial facilities with sequestration needs, and existing pipeline rights-of-way by which to transport the captured carbon dioxide stream for injection. Proposing to drill and complete two CO_2 sequestration wells in Jefferson County, Titan is applying for a Class VI permit to construct and operate Cronos No. 1 and Rhea No. 1. The wells will be located on surface acreage, with CO_2 injected into and sequestered in subsurface pore space controlled by Titan through underground storage easements.

[1] "Carbon Capture, Utilisation [*sic*] and Storage." IEA. https://www.iea.org/energy-system/carbon-capture-utilisation-and-storage.
[2] Ibid.
[3] 2010 Carbon Atlas of the United States and Canada. National Energy Technology Laboratory, Department of Energy.

The Titan Carbon Sequestration Project (Titan Project), shown in Figure 10-1, will capture and compress low-pressure CO_2 at the PALNG site and then transport it by pipeline to the new Titan compression/dehydration facility to be constructed for this project on land owned by Sempra Infrastructure, or its affiliate. From that facility, the compressed CO_2 will then be transported in supercritical phase via a proposed high-pressure pipeline to the injection wells—where it will be injected into pore space suitable for geological sequestration of CO_2. The project will be sized to permanently store up to [redacted]

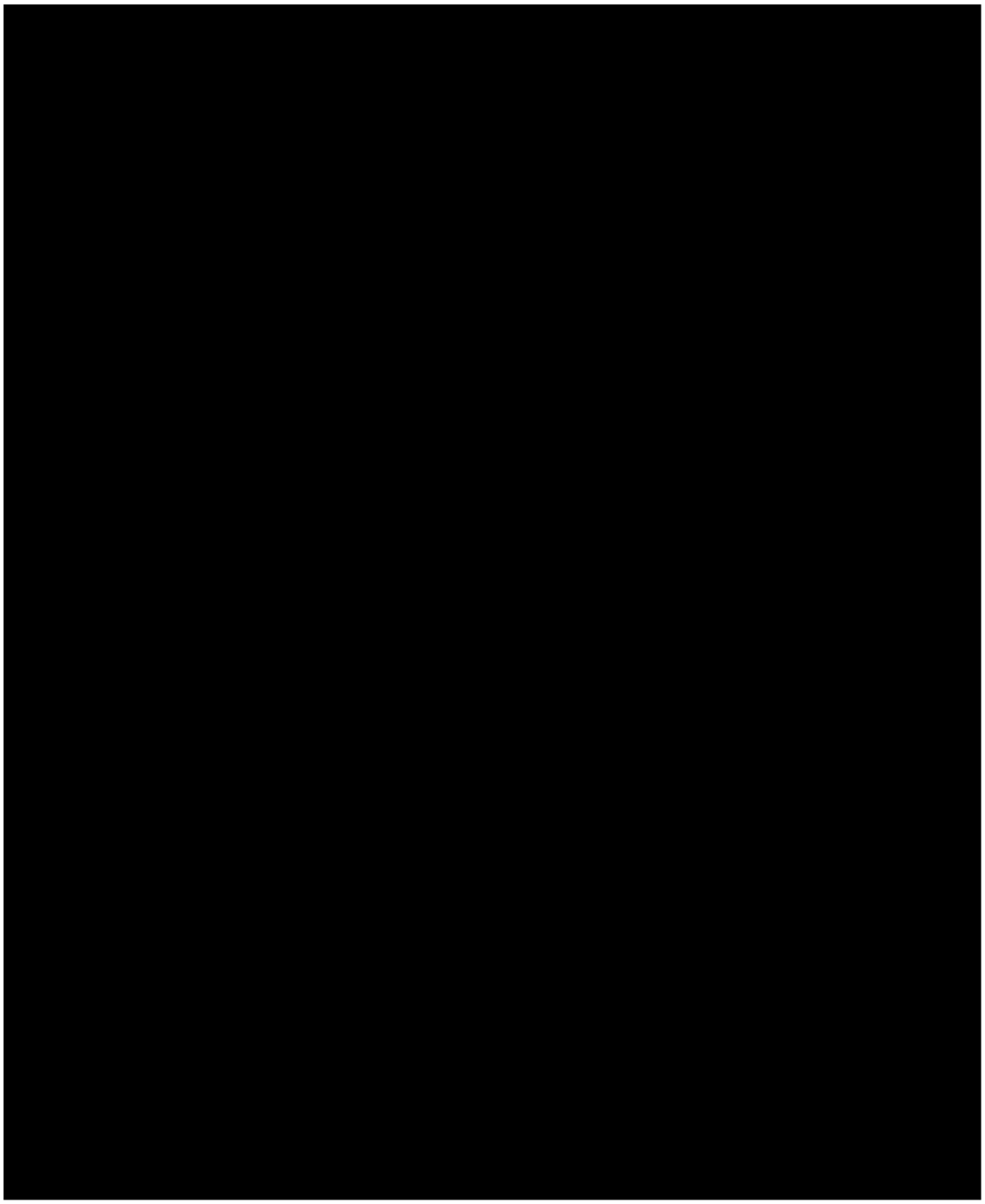

Figure 10-1 – Titan Project Overview Map

10.2 Environmental Justice

Environmental justice (EJ) refers to the "fair treatment and meaningful involvement of all people regardless of race, color, national origin, income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies" (EPA, 2020(a)). "Fair treatment" means that no group of people should bear a disproportionate share of negative environmental consequences because of industrial, governmental, and commercial operations or policies. The EJ communities include populations of color, low-income populations, Native American Tribes, and/or indigenous communities.

To define an analysis area and identify potentially impacted EJ populations, guidance issued by the Council on Environmental Quality (CEQ) in 1997 advises using an "appropriate unit of geographic analysis" that does not "artificially dilute or inflate" the population. The selected area may be a neighborhood census tract or block group, a governing body's jurisdiction, or other similar geographic unit. The census block group (CBG) is the smallest geographic unit for which U.S. Census Bureau demographic data are available and represents the geographic unit of analysis used in this desktop review.

The EJ review followed federal guidance and recommended methodologies outlined by the EPA's Geologic Sequestration of Carbon Dioxide – UIC Quick Reference Guide of June 2011 (Reference Guide), as supplemented by memo dated August 17, 2023, which referenced the use of EJScreen (EJ Guidance Memo). The EJScreen is a tool developed by the EPA to identify if a proposed Class VI project affects communities with potential EJ concerns. Using EJScreen, Titan determined that a 3-mi radius around the two Titan Project injection wells falls within CBG No. 48245011600 (Figure 10-2).

Figure 10-22 – Census Block Group 48245011600 with 3-mile radius from the Titan injection wells[4]

For minority populations, the 50% and the "meaningfully greater" analysis methods were used. If the minority population of the CBG in the area exceeds 50%, or if the minority population in the CBG identified is 10% percent higher than the minority population percent in the county, then an EJ community may be present. To identify low-income populations, the low-income threshold criteria method was used. If the percent of low-income population in the identified CBG is 20% greater than that of the county (not using a "meaningfully greater" factor), then an EJ community may be present.

Data for minority and low-income populations was determined from a review of EJScreen. The demographic indicators for race, ethnicity, and income for the CBG 48245011600, along with other socioeconomic indicators, are shown in Table 10-1. No potential EJ populations were identified for any CBGs as none of the census tracts or CBGs exceed the threshold for minority or low-income populations.

[4] https://ejscreen.epa.gov/mapper/

Table 10-1 – Socioeconomic Indicators for Populations in CBG 4824501160

Area	Minority Population	Low-Income Population	Unemployment Rate	Limited English-Speaking Households	Less Than High School Education
United States of America	39%	31%	6%	5%	12%
State of Texas	58%	34%	5%	8%	16%
Jefferson County, Texas	38%	61%	6%	5%	15%
Block group 4824501160	17%	21%	8%	1%	17%

10.2.1 EJ Indices

Consistent with the Reference Guide and EPA Guidance Memo, Titan used the EPA's EJScreen tool to evaluate the Titan Project area for potential EJ communities. The EJScreen tool employs a framework of 13 Environmental Justice (EJ) indices, yielding a comprehensive overview of the relative environmental burdens faced within a chosen area in comparison to broader geographic scales such as state, EPA region, or nation. These indices are computed by integrating demographic variables, encompassing minority and low-income populations, with corresponding environmental metrics. Unlike a cumulative scoring approach, each EJ index is derived through the multiplication of the percentile rank of an environmental indicator with either the standard demographic index or a supplementary demographic index. The standard demographic index represents the mean of the percentile ranks of minority and low-income populations within the block group. Consequently, block groups with elevated concentrations of minority or low-income residents, coupled with higher environmental indicator values, yield higher calculated EJ indices. In the EPA's EJScreen "How to Interpret EJScreen Data"[5], an initial screening point for EJ indices has been established at the 80th percentile relative to state and national averages.

The EJ index results from EJScreen are provided in Table 10-2.

Table 10-2 – EJ Index Measurements for CBG 48245011600

EJ Index	Percentile in State	Percentile in U.S.
Particulate Matter 2.5	9	42
Ozone	30	53
Diesel Particulate Matter	11	18

[5] https://www.epa.gov/ejscreen/how-interpret-ejscreen-data

EJ Index	Percentile in State	Percentile in U.S.
Air Toxics Cancer Risk	50	61
Air Toxics Respiratory Hazards Index	36	43
Toxic Releases to Air	46	64
Traffic Proximity	8	16
Lead Paint	44	37
Superfund Proximity	26	27
Risk Management Plan (RMP) Facility Proximity	14	32
Hazardous Waste Proximity	32	38
Underground Storage Tanks	16	30
Wastewater Discharge	32	43

None of the thirteen measures reached greater than the EPA guidance for the 80th percentile versus the state and national levels.

Additionally, the EPA computes a supplemental demographic index within the block group context, which combines "data on percent low-income, percent linguistically isolated, percent less than high school education, percent unemployed, and low life expectancy with a single environmental factor", as described on the EJScreen Community Report provided in Appendix I-1. The supplemental EJ index is determined by the multiplication of the environmental indicator with the calculated supplemental demographic index, followed by the identification of its percentile rank. This index serves to offer further insight into the vulnerability of communities at a localized level.

The supplemental EJ index results are presented in Table 10-3.

Table 10-3 – Supplement EJ Index Measurements for CBG 48245011600

EJ Index	Percentile in State	Percentile in U.S.
Particulate Matter 2.5	15	56
Ozone	53	73
Diesel Particulate Matter	18	21
Air Toxics Cancer Risk	65	72
Air Toxics Respiratory Hazards Index	53	53
Toxic Releases to Air	74	83
Traffic Proximity	12	18
Lead Paint	58	47

EJ Index	Percentile in State	Percentile in U.S.
Superfund Proximity	46	37
Risk Management Plan (RMP) Facility Proximity	24	44
Hazardous Waste Proximity	54	52
Underground Storage Tanks	20	33
Wastewater Discharge	55	60

One of the thirteen indices, "Toxic Releases to Air" is identified as being over the 80th percentile nationally. However, in combination with the index percentiles relative to the state plus the lower percentages identified in the socioeconomic indicators, this area is less likely to be identified as an EJCommunity.

10.2.2 EJ Themes

Table 10-3 highlights each of the five themes outlined in the EPA's August 17, 2023 UIC Class VI Permitting guidance memo and how Titan plans to address each theme.

Table 10-4 – EJ Guidance Theme Summary

Theme	Action	Titan Project Plan
Identify Communities with potential EJ concerns	UIC programs should encourage owner/operators to conduct EJScreen assessments during site selection and before submitting a Class VI permit application. UIC programs should conduct and/or verify EJScreen assessments for every Class VI permit application received or sooner if possible. The Area of Review will be used as the boundary to be investigated unless a more relevant EJ boundary is identified. UIC programs should: • Work with appropriate EJ organizations to create structured communication between EJ experts and UIC permitters. • Direct UIC permitters to work with EJ experts to conduct EJScreen for all Class VI projects and develop a community engagement plan for affected communities.	Titan has conducted an EJScreen assessment as part of the preparation of this Class VI application (Section 10.2 and Appendix I-1). The area of review included the complete Census Block Group surrounding the project area of review (maximum plume extent). Titan has developed a community engagement plan as provided in Appendix I-2.
Enhance public involvement	UIC programs should encourage owner/operators to conduct community outreach early for all Class VI permit applications, regardless of if there are apparent EJ concerns. Activities to consider are: • Conduct engagement prior to submittal of the application and throughout the life of the project. • Provide UIC programs a summary of outreach activities in the application. • Conduct outreach while developing plans such as the Emergency and Remedial Response Plans, to better understand community concerns and needs.	Although no EJ communities were identified, Titan has developed a community engagement plan and has begun engaging the local community leaders as discussed in Section 10.7 and Appendix I-2.

Conduct appropriately scoped EJ assessments	For projects that have been identified as having EJ concerns, UIC programs should conduct additional assessments evaluating project impacts on overburdened communities. Assessments will vary according to the specific circumstances of the permit application and may include • Further consideration of how Class VI projects may affect subpopulations identified in the EJScreen analysis. • Further input from stakeholders, including the affected community. • Evaluation of existing environmental data, including water monitoring, identification of wellhead protection areas, ongoing and climate or, as appropriate, other data. • Assessment of compliance record of permit applicant (e.g., may result in additional requirements related to increased monitoring, reporting, etc.). • Evaluation of potential health and environmental effects of the permitting action on the affected community. • Evaluation of the potential health and non-health adverse effects (e.g., noise, odor, and traffic) of the permitting action. • Evaluation of the potential impact of the permit action together with impacts from other regulated and non-regulated sources of pollution and non-pollution stressors in the affected community. • Evaluation of mitigation measures to minimize potential adverse effects of the permitting action on the affected community.	While no EJ Communities have been identified for the Titan Project, Titan has considered the potential adverse effects on the community and is working to minimize the impact of these potential effects as discussed in Sections 10.5 and 10.6

Enhance the transparency throughout the permitting process	UIC programs should post all Class VI applications on an appropriate public website. UIC programs should release EJ information developed from the review of Class VI application, including EJ screening results and any follow-up EJ and community needs assessments on an appropriate public website. UIC programs should make available reporting data (e.g., injection pressures, monitoring data, mechanical integrity test results) on an appropriate public website, in a manner that is user-friendly and understandable to the general public. UIC programs should provide public notification of all Class VI permit violations on an appropriate public website.	Titan supports transparency of the Titan Project to the public with regards to EJ and communities needs and will assist in that transparency throughout the life of the project.
Minimize adverse effects to USDWs and the communities they may serve	Where practicable, UIC programs should encourage owners/operators to consider additional mitigation measures to address concerns raised by the local community. Such actions could include: • Installation of carbon dioxide monitoring and release notification networks. • Installation of enhanced pollution controls. • Adoption of other measures to offset impacts by improving other environmental amenities for the communities near GS projects, and provision of resources for clean-up of previously degraded public areas. • Ensure appropriate community representatives are a part of the development of the Emergency and Remedial Response and Testing and Monitoring plans. • Planning activities could include: o Training for local responders while training facility staff to respond to emergencies at the facility.	As discussed in Section 5 – Testing and Monitoring, Titan plans to install extensive monitoring and notification systems throughout the project site. They have developed an Emergency Response and Remediation Plan, as discussed in Section 8, to address any potential emergency events and ensure local responders and company personnel are sufficiently trained to respond to such events.

	o Working with community to identify the chain of command for notifying the public of an emergency and incorporate these details into their Emergency and Remedial Response Plans. o Developing plans for notification of well related issues and emergencies, including a consideration of local community language needs and the needs of persons with disabilities. o Working with the community to develop a Testing and Monitoring plan that addresses the risks of the project.	

10.3 Sensitive Receptors

The EPA identifies sensitive receptors as areas where the occupants are more susceptible to the adverse effects of exposure to toxic chemicals, pesticides, and other pollutants.[6] These areas include, but are not limited to, hospitals, schools, daycare facilities, elderly housing, and convalescent facilities. Extra care must be taken when dealing with contaminants and pollutants near areas recognized as sensitive receptors. No sensitive receptors were identified within the 3-mi radius of the injection wells.

10.4 Social and Economic Benefits

The purpose of the Titan Project is to provide beneficial environmental impacts by sequestering CO_2 emissions that would otherwise be released to the environment. This environmental benefit, along with the social and economic benefits, outweighs potential adverse impacts associated with construction and operation of the project.

The Titan Project will provide important economic and social benefits to Jefferson County and the State of Texas. Construction of the project will create jobs, additional earnings for households, and rising business activity throughout the Texas economy—as measured by sales and personal earnings. The increase in employment that will be realized because of the Titan Project is estimated to be an average of over 300 workers needed during construction. Additionally, several full-time workers will be employed during ongoing operations.

While the economic benefits and spillovers from the construction of the Titan Project are substantial but temporary, those benefits and spillovers from the ongoing operation of the project facilities will be both substantial and permanent. Economic benefits will accrue to the State of Texas and the Jefferson County region for the duration of facility operations. Titan will be a good corporate citizen involved in employee/community partnerships in Jefferson County and the surrounding communities. Titan also plans to, when possible, buy goods and services locally—and hire locally for the project's construction and implementation. Employment opportunities will be provided to all aspects of the Texas workforce. As a result, the proposed project will result in a net social benefit to the community in the vicinity of the project.

The Titan Project intends to advance CCS infrastructure, recognized as a necessary means to reduce GHG emissions, to support decarbonization efforts of PALNG and nearby industrial facilities. Titan believes that the communal benefits of the project, coupled with the economic benefits that the project will bring to the area, outweigh the adverse environmental impacts from development and operation of the well pads, access roads and compression facility.

[6] U.S. Environmental Protection Agency (2022). What are Sensitive Receptors? Retrieved December 2022, from https://www3.epa.gov/region1/eco/uep/sensitivereceptors.html#:~:text=Sensitive%20receptors%20include%2C%20but%20are,%2C%20pesticides%2C%20and%20other%20pollutants

10.5 Overview of Environmental Impacts of the Project

The Titan Project has opted to utilize electric-powered compressors and dehydration facilities to minimize overall project emissions. The electric-powered equipment to be utilized at the project site will not generate emissions of carbon monoxide, volatile organic compounds, formaldehyde, or nitrogen oxides.

The Titan Project also will not treat or dispose of any hazardous waste or solid waste. Project operations will generate a small quantity of sanitary sewage, but that stream will be treated according to state water-quality regulations on tying into existing utilities. The discharge will have no impact on water quality.

Due to the size of the Titan Project, transportation to and from the project site is not anticipated to be a concern. Construction materials and process equipment will be delivered to the injection site and the compression/dehydration facility via trucks on existing public and rural roadways (Figure 10-1) and site access roads. If local traffic patterns may be potentially impacted by project activities, Titan will coordinate with local officials to mitigate any such disturbance.

10.6 Potential Environmental Effects

Titan selected the site based on the favorable geology for permanent sequestration and designed a monitoring and wellbore construction plan in accordance with regulatory standards to protect Underground Sources of Drinking Water (USDWs). The injection wells are located on private property covered by underground storage easements, and away from existing wellbores to avoid any potential impact to the containment of the injected CO_2. Surface development will not impact state and federal wildlife management areas near the project site; Titan has sited above-ground facilities, underground piping, and its Class VI wells to avoid these areas (Figure 10-1). Titan has also strategically created a robust monitoring program that will ensure the protection of USDWs, the surface environment, and local residents—balancing the program to protect people and the environment while minimizing surface disturbance to the nearby wetland environment.

10.6.1 Air Quality

The potential air emissions from Titan Project construction and operation are minimal and will not cause any adverse impacts to air quality.

Air quality impacts associated with the project construction can be generally classified as temporary impacts from the operation of equipment during construction activities and impacts from dust generation. Impacts associated with the operating equipment during construction of the well pads and access roads plus drilling activities for the Class VI wells may result in minor, temporary increases in emissions. Equipment and movement of material for land clearing, grading, excavation, drilling, and concrete work, along with vehicular traffic on paved and

unpaved roads, could cause dust. The amount of dust will be based on the area of construction, silt and moisture contents of the soil, wind speed, frequency of precipitation, amount of vehicle traffic, vehicle types, and paved or unpaved roads. While "fugitive dust" may occur during all phases of construction, dust will be greater during the drier winter months and in areas of fine-textured soils. During these periods, dust suppression techniques (e.g., watering) will be used to minimize the impacts of fugitive dust.

10.6.2 Water Quality

All stormwater runoff at the well pads will be managed according to Titan's Stormwater Pollution Prevention Plan (SWPPP) currently under development. Titan will install all necessary erosion and sedimentation control structures as required by the State of Texas to minimize potential impacts from stormwater runoff.

10.6.3 Sensitive Soils and Vegetation

Construction of the Titan Project facilities will not generate waste that could leach into soils and affect shallow groundwater. Project operations will not cause the destruction of important vegetation or have any impact on forested lands.

The areas where the project facilities are to be located consist of either existing industrial facilities or undeveloped marsh land. The total land disturbance to accommodate these facility components will be minimized to the extent practicable. Mitigation for unavoidable impacts from construction of the well pads and access roads will be coordinated and approved by the U.S. Army Corps of Engineers, Galveston District office.

10.6.4 Sensitive Wildlife and/or Habitat

Titan will consult with the U.S. Fish and Wildlife Service and the National Marine Fisheries Service to determine the potential for occurrence of federally listed species and their critical habitats that are known or expected to be in the vicinity of the project. Titan will conduct habitat and wetland surveys of the entire proposed project area, to determine the presence or absence of endangered or threatened species or critical habitats in the project area.

10.6.5 Archaeological and Historic Resources

Titan will perform a Phase I Archaeological Survey of the 3-mile radius around the injection wells to identify archaeological and historical resources.

10.7 Community Engagement

Titan's parent company, Sempra Infrastructure Partners (Sempra) has been actively engaged in Jefferson County and the communities of Port Arthur and Sabine Pass since 2004 through the development of its PALNG facility. Community involvement, stakeholder engagement, and

feedback are critical components of both PALNG and the Titan project. Sempra also recognizes that effective communication with its stakeholders may address and reduce community concerns, help build trust and transparency, and contribute to the project's overall success. As part of the Titan Stakeholder Engagement Plan, the project team is committed to the following:

- Conducting a community assessment to help identify and validate concerns and opportunities related to the developmental and operational projects in the area. This assessment will also help to identify not only the project's environmental justice community status, but also opportunities for meaningful social investment.
- Implementing stakeholder engagement activities in which the team actively solicits feedback from the community and property owners about the Titan Project
- Providing regular Titan Project updates to local stakeholders during the calendar year
- Maintaining communication channels for stakeholders, to include a dedicated toll-free phone line, email address, website, and social media channels
- Providing a dedicated outreach team to address community questions and concerns
- Coordinating contributions of the company and employees' time, talent, and funding to support community investment initiatives and events in Jefferson County.

Sempra has established good relationships with stakeholders in the community and intends to continue to build on them. Community engagement specific to CCS is underway through multiple stakeholder-feedback roundtables. Sempra plans to continue to execute its full Stakeholder Engagement Plan (included in *Appendix I – Environmental Justice*) as it progresses in the development of the Titan Project.

10.8 Environmental Justice Summary

Sempra, and its Titan subsidiary, are dedicated to being good partners with the local community of Port Arthur and Sabine Pass. The Titan project is in an area where no identified Environmental Justice communities will be impacted by this project. Titan will take several key actions to minimize any potential impacts to the environment and to the community.

Additionally, the following documents can be found in *Appendix I – Environmental Justice.*

- Appendix I-1 EJ Screen for Census Block Group 48245011600
- Appendix I-2 Titan Stakeholder Engagement Plan