RESTORE Council Proposal Document

General Information

Proposal Sponsor: U.S. Department of the Interior (DOI)

Title:
Decommissioning Onshore Orphaned Energy Facilities on NPS and FWS lands

Project Abstract:
The U.S. Department of the Interior, through the U.S. National Park Services (NPS) and U.S. Fish and Wildlife Services (USFWS), is requesting $10,595,140 in Council-Selected Restoration Component funding for the proposed Decommissioning Onshore Orphaned Energy Facilities on NPS and FWS Lands program. This includes approximately $8.1M for project sites which are ready for implementation and planning as FPL Category 1 and approximately $2.5M for project implementation as Category 2. The program will support the primary RESTORE Comprehensive Plan goal to restore and conserve habitat through activities to decommission and restore orphaned energy facilities on USFWS and NPS preserves and refuges in coastal Texas. The proposed program builds on investments made in the Council's 2015 Initial FPL, and includes work to plug 5 wells and restore 25 orphaned sites. Environmental clearances for most NPS sites have been completed. FWS clearances and remaining NPS sites are not complete, but this is expected to be a straightforward process.

Orphaned oil and gas facilities include unplugged wells, surface equipment, roads, and production pads. They pose risks to human safety, environmental risks to surface and subsurface resources, and continued habitat loss. The program would decommission orphaned wells and restore sites to conditions that existed before the sites were established. Program duration is 5 years.

FPL Category: Cat1: Planning/ Cat2: Implementation

Activity Type: Program

Program: Decommissioning Onshore Orphaned Energy Facilities on NPS and FWS lands (DOI/NPS & FWS)

Co-sponsoring Agency(ies): N/A

Is this a construction project?:
Yes

RESTORE Act Priority Criteria:
(I) Projects that are projected to make the greatest contribution to restoring and protecting the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast region, without regard to geographic location within the Gulf Coast region.

Priority Criteria Justification:
Orphaned energy facilities pose risks to human safety, pose environmental risks to surface and subsurface resources through contaminant release, and perpetuate habitat loss. These risks increase with time due to continued deterioration and lack of maintenance, as does the cost to address them.

This program would result in the plugging of 5 orphaned wells, the removal of orphaned oil and gas infrastructure and development on 25 sites that are unsafe, unusable, or otherwise negatively impact natural resources and processes, and the restoration of coastal resources and habitats to pre-disturbance levels.

Individual projects would occur over a large geographic area along the Texas coast from Brownsville to Beaumont and include locations within three Fish and Wildlife Service refuges and two National Park Service parks.

This program would lead to permanent results and improved resiliency for 76 acres of Gulf coastal habitats and species due to the elimination of environmental hazards and removal of existing contamination on public lands. Restored natural processes would sustain habitats and enhance the overall health, availability, and diversity of natural resources that include migratory and protected species. The restoration of important wind tidal flats would create habitat that supports 22 species of shorebirds and wading birds, which enhances bird populations that contribute to restored areas being designated as Globally Important Bird Areas by the American Bird Conservancy and Sites of International Importance by the Western Hemisphere Shorebird Reserve Network. Restored habitats would contribute to existing habitats (coastal grasslands and dunes) along coastal barrier islands that function as hurricane protection for the mainland of Texas.

Project Duration (in years): 5

Goals

Primary Comprehensive Plan Goal:
Restore and Conserve Habitat

Primary Comprehensive Plan Objective:
Restore , Enhance, and Protect Habitats

Secondary Comprehensive Plan Objectives:
N/A

Secondary Comprehensive Plan Goals:
N/A

PF Restoration Technique(s):
Protect and conserve coastal, estuarine, and riparian habitats: Decommission unused, orphaned energy facilities
Protect and conserve coastal, estuarine, and riparian habitats: Habitat management and stewardship

Location

Location:
This program would occur in Texas at 3 Fish and Wildlife Service refuges (Laguna Atascosa National Wildlife Refuge, Aransas National Wildlife Refuge (Matagorda Island), and McFaddin National Wildlife Refuge) and 2 National Park Service parks (Padre Island National Seashore and Big Thicket National Preserve). (Figure 1)

HUC8 Watershed(s):
Texas-Gulf Region(Neches) - Neches(Lower Neches)
Texas-Gulf Region(Neches) - Neches(Village)
Texas-Gulf Region(Neches) - Neches(Pine Island Bayou)
Texas-Gulf Region(Galveston Bay-San Jacinto) - Galveston Bay-Sabine Lake(East Galveston Bay)
Texas-Gulf Region(Central Texas Coastal) - Central Texas Coastal(East San Antonio Bay)
Texas-Gulf Region(Nueces-Southwestern Texas Coastal) - Southwestern Texas Coastal(South Laguna Madre)
Texas-Gulf Region(Galveston Bay-San Jacinto) - Galveston Bay-Sabine Lake(Sabine Lake)
Texas-Gulf Region(Nueces-Southwestern Texas Coastal) - Southwestern Texas Coastal(North Laguna Madre)
Texas-Gulf Region(Nueces-Southwestern Texas Coastal) - Southwestern Texas Coastal(Central Laguna Madre)

State(s):
Texas

County/Parish(es):
TX - Aransas
TX - Calhoun
TX - Cameron
TX - Hardin
TX - Jefferson
TX - Kleberg

Congressional District(s):
TX - 27
TX - 14
TX - 36
TX - 34

Narratives

Introduction and Overview:

Public lands managed by the U.S. Fish and Wildlife Service (FWS) and National Park Service (NPS) have orphaned oil and gas wells and associated features, including impacts from previous energy exploration that are currently impairing 76 acres of coastal habitat. These energy sites generally consist of unplugged wells, tanks, production equipment, flowlines, roads, and well pads.

Orphaned energy sites located on FWS and NPS properties have no responsible party because: (1) the orphaned features pre-date the establishment or expansion of FWS and NPS properties; (2) the oil and gas operators abandoned their operations and the last operating company of record is bankrupt; or (3) the agencies exhausted regulatory avenues for holding previous operators responsible for taking necessary corrective actions. Operators abandon operations for various reasons. Most often operators are small ventures with very little capital, and while wells may have been profitable when drilled and placed into production, costs to maintain the wells exceeded their production levels and/or they became marginally productive over the years. Additionally, natural movements of stream channels can expose wellbores that now pose hazards within navigable waterways as has occurred in Big Thicket National Preserve.

Neither FWS nor NPS have funding to eliminate the hazards posed by orphaned facilities; to plug wells; to characterize and remediate spilled hydrocarbons, produced water, and associated liquids; and/or to restore habitat degraded by the construction of well and production pads and roads. The State of Texas (hereafter, the State) established the Oil and Gas Regulation and Cleanup (OGRC) Fund in 2011, replacing the previous Oil Field Cleanup Fund. This fund is administered by the Railroad Commission of Texas (RRC) and allows the RRC to plug abandoned oil and gas wells and clean-up abandoned oilfield sites. OGRC funds have been insufficient to address the large number of orphaned wells in need of plugging and sites in need of reclamation.

Orphaned wells pose risks to human safety and the environment, including surface and subsurface resources; they also presently impair habitat at the well pad and surrounding area. These wells can leak pollutants, including methane and brine, as well as heavy metals and naturally occurring radioactive substances that can contaminate groundwater, surface water, or, in the case of methane, be released into the atmosphere (Ho et al. 2016). Pollutants can be released because of mechanical integrity failure, failed well casings, and cement failure within the wellbore. These risks unfortunately increase with time due to continued deterioration and lack of maintenance, as does the cost to address them.

The missions of the National Wildlife Refuge and National Park Systems are to improve and maintain fish and wildlife resources and preserve natural and cultural resource unimpaired for the enjoyment of future generations, respectively. Plugging orphaned wells and restoring these sites is consistent with, and advances these missions.

The proposed program includes work to plug 5 wells (4 FWS, 1 NPS) and restore 25 orphaned energy sites (10 FWS, 15 NPS) for a cost estimate of $10.595 million. The wells and sites are located within the Gulf Coast Region defined as any adjacent lands, waters, and watersheds, that are within 25 miles of the coastal zones defined in section 304 of the Coastal Zone Management Act of 1972 (16 U.S.C. § 1453) (See Figure 1 and Table 1).

This program meets Goal 1: Restore and Conserve Habitat and Objective 1: Restore, Enhance and Protect Habitats of the Council's Comprehensive Plan by plugging orphaned wells and subsequently restoring surface habitats. The actions undertaken improves the health, diversity, and resilience of coastal and estuarine habitats by removing orphaned equipment, eliminating environmental risk, re-

establishing natural processes, creating foraging habitat, and enhancing the recovery of endangered species. This program directly aligns with two Planning Framework Techniques that are focused on 1) decommissioning orphaned energy facilities by plugging 5 wells and removing surface facilities and 2) the management and stewardship of habitat by restoring 25 sites.

Wells that are no longer producing in Texas are required to be plugged following RRC plugging standards (Texas Administrative Code, Title 16, Part 1, Chapter 3, Rule 3.14). The RRC's "Well Plugging Primer" (RRC 2000) is a useful guide describing plugging operations. In addition to state standards, the Bureau of Land Management's (BLM 1988) minimum standards of the Department of the Interior's Onshore Oil and Gas Order Number 2, Section III.G, Drilling Abandonment Requirements apply for plugging wells in parks. The plugging requirements of the Onshore Order were written specifically for plugging newly drilled wells; however, the NPS has applied the same standards to the permanent abandonment of wells. The use of state and federal plugging standards helps ensure that orphaned wells are plugged in a way that meets industry standards, as well as appropriate regulations. There are 5 wells in this proposal needing corrective actions: 4 land-based wells and 1 water-based well that poses a navigational hazard.

Producing oil or natural gas requires installation of various types of surface equipment. A battery of storage tanks and flowlines are used to transport produced oil or gas. Separation and treatment facilities are required to separate natural gas and water from oil. Storage tanks are required to hold brinewater produced during oil extraction. Proper disposal capability, most typically reinjection, must be developed. Upon well-plugging, well and production pads, access roads, surface equipment and flowlines can be removed to facilitate site reclamation.

Reclamation involves restoring a site with the following features: allows for safe movement of native wildlife, re-establishes native vegetative communities, re-creates the normal flow of surface and reasonable flow of subsurface waters, and returns the area to a condition that does not jeopardize visitor safety or public use. Reclamation projects may last a few days or weeks. Revegetation goals are based upon pre-operational analysis of the natural conditions that existed prior to drilling, or if unavailable, it is based on adjacent, undisturbed areas.

In this proposal, there are 30 individual projects that would result in reclaiming approximately 76 acres of coastal and riverine habitat with most of the projects occurring in wetland communities that have highly functional fish and wildlife values. The implementation of these projects involves relatively small land areas and pose very little risk or uncertainty. However, these orphaned energy sites represent significant sources of potential petroleum pollution that can impact groundwater, springs and seeps, and surface waters where ground waters enter.

Flowing rivers, streams, and ephemeral channels can quickly spread those contaminants coming to the surface and carry them into critical estuaries along the coast. This proposal offers full treatment of some of the potentially most damaging orphaned wells on federal lands found along the Texas coast. Therefore, the benefits of the individual projects in this proposal would have ecological benefits over a large geographical area.

The RRC and NPS have worked together previously to plug wells and remove surface equipment. Wells would be plugged using technical plugging standards established by the State and BLM. Contaminant characterization and remediation and site reclamation methodologies are well-established. FWS and NPS have a particularly strong understanding of the ecosystems they manage and extensive experience restoring native plant communities. The cost estimates and timelines outlined for the projects in this proposal are based on extensive knowledge and experience gained in the day-to-day management of these areas.

Previous energy exploration efforts caused significant vehicular impacts to wind tidal flats at Padre Island National Seashore. Seismic surveys conducted along the western shoreline resulted in compacted vehicle tracks that altered wind-driven inundation by Laguna Madre waters, thus affecting algal growth and degrading foraging habitat for migratory birds.

The strategy for restoration of tidal flat impacts would have an initial experimental design and test phase undertaken via a Cooperative Ecosystems Studies Unit (CESU) agreement with a university such as Texas A&M University-Corpus Christi, which has experience studying and researching wind tidal flats. In addition, the implementation of the projects in this proposal is anticipated to create more than 100 jobs, which would target youth, students, and veterans.

This program is anticipated to be completed in three to five years depending on the amount of funding awarded and specific sites selected. Many NPS sites have environmental clearances and are ready to begin implementation. Acquiring environmental clearances for the remaining sites is not expected to be particularly complicated and could be completed in 12 months once initiated. Contracting and site restoration is expected to take two to three years for cooperative agreement or contract development and preparing design documents needed for contractor bid packages. Up to two years of monitoring may be needed to meet restoration objectives for revegetation. Therefore, given the variety of sites and varying levels of readiness, up to five years could be necessary to fully complete this program.

Proposed Methods:

The 30 individual projects comprising this proposal present varied degrees of risk to human safety and habitat degradation, and the potential for impacting water quality. In general, wells needing plugging or re-plugging pose the highest risk and potential resource impacts, followed by sites requiring characterization and remediation of petroleum and other contaminating substances, then removal of orphaned surface equipment, and reclamation of sites to restore and protect habitats and water quality.

Both the FWS and NPS have well-defined processes to follow to ensure site reclamation is successful and that endemic plant communities are restored to the disturbed areas. For example, the National Park Service (NPS 1991) Natural Resource Management Reference Manual, Disturbed Lands Restoration, provides guidance for applying a planning process which includes the following 9 steps:

1. Inventory sites and select reference sites or conditions
2. Rank sites
3. Establish goals and objectives
4. Develop preliminary restoration alternatives
5. Undertake compliance and select alternative
6. Develop the project plan
7. Finalize the project plan
8. Implement and oversee the project
9. Report activities and results (including monitoring)

The sites identified in this proposal have already been inventoried and ranked by FWS and NPS. The planning phase of this program would begin with field assessments of the sites, if not already completed. Based on completed field assessments during which corrective actions have been determined, FWS and NPS would complete environmental compliance and permitting for their respective areas as needed and seek review by appropriate state and federal agencies on draft compliance documents for proposed corrective actions and mitigation measures. FWS and NPS would provide final compliance documents to the State.

Environmental compliance has been completed for some projects, and there are no anticipated complexities or uncertainties for completing the others.

Well plugging techniques can differ depending on the type of well drilled and the actual well conditions (Vrålstad et al. 2019). However, well plugging operations generally consist of removing the tubing, packer, and other completion equipment; pumping cement across producing zones; and placing cement plugs at various depths to protect freshwater zones (NPS 2006) (National Petroleum Council 2011) (Khalifeh and Saasen 2020). Finally, a cement plug is set at the surface to cap the well, and wellhead equipment is cut off. A permanent abandonment marker is often placed on the surface to identify the well's location.

Implementation of the well plugging would be done in cooperation with the RRC. FWS and NPS would enter into Cooperative Agreements with the RRC and would each designate an Agreements Technical Representative (ATR) to serve as the point of contact on each agreement. The ATRs would coordinate project implementation with their respective areas. The RRC would proceed to develop and award contracts to implement corrective actions. FWS and NPS would participate in the contracting process by providing information, assisting in the development of the contract scopes of work with the State, and reviewing draft contract scopes of work prior to the State advertising for bids. FWS and NPS would participate in contract monitoring, particularly with respect to avoiding visitor use conflicts and resource impacts. NPS and FWS have contracting programs that will evaluate potential programs and requirements to select the best contracting approach. Common business practices related to procurement and contracting will be followed.

The NPS has an established service-wide oil and gas management program and agency specific regulations that govern the management of non-federal oil and gas operations in parks. This program and the resulting regulations identify specific requirements needed for the exploration, drilling, production, and abandonment of oil and gas wells within national parks. One such requirement is the development of a robust Plan of Operation (PoP) for each well that outlines legal documentation and support not only for the operation, siting considerations, natural resource surveys and results, and detailed descriptions of each operational phase but also identification of mitigation measures, and remediation and reclamation actions (and more). Each PoP includes an environmental assessment or similar document that is made available for public review. Additionally, appropriate federal and state environmental, cultural, and regulatory permits are obtained that approve these operations. The PoP, its supporting documentation, program management requirements, industry standards, policies, regulations, and more are used to establish the expectations to be met. A similar program exists for the FWS. Plugging an abandoned well is a straightforward process and general risks are known. Environmental conditions known prior to a well being drilled or if unknown, the condition of habitat surrounding a well location provides a good baseline for what restoration should look like with respect to habitat type, vegetation composition, hydrology, soils, and more. Unknown risks may occur, but the use of best management practices minimizes these risks and enhance the likelihood of success. Implementation of this project would rely on the information available within each PoP, existing site conditions, and agency requirements to ensure that these wells can be plugged and sites restored.

A program goal would be to find efficiencies and cost-savings by combining multiple projects in as few contracts as possible. This is likely given that some energy sites are located near others, which provides for logical groupings of locations.

Some projects would be managed by the FWS and NPS, through contracts or agreements. In some cases, seasonal or term staff could be hired to carry out site reclamation projects, or to assist in administering project coordination, providing opportunities for youth, students, and veterans to

work and gain knowledge and experience in habitat restoration.

Most unplugged wells would be accessed using existing roads. Where roads have naturally reclaimed, or new access would require construction of new roads through areas that would be very difficult to reclaim, access would be by barge or other method to avoid or minimize impacts. Wells would be flushed, the existence of any previous cement plugs would be confirmed, and if needed, the wells would be plugged. Some wells are so old that plugging information is unavailable. Onsite inspection utilizing specialized equipment to "tap" the plug may be required to determine whether additional corrective actions are needed.

Upon well plugging, well and production pads and access roads can be reclaimed. Reclamation involves returning the area to conditions that existed before drilling the well. Steps in the reclamation process include:

- Remove all above ground structures, equipment, and roads used or generated during operations;
- Remove or neutralize any contaminating substances;
- Restore topographic contours of disturbed areas to near original grade;
- Construct plugs or other water control / hydrologic restoration features;
- Spread and prepare natural topsoil for vegetative restoration (importing suitable topsoil that is free of non-native weed seed and plant materials from outside the FWS or NPS areas might be needed);
- Re-establish native vegetative communities based on a planting plan;
- Apply erosion protection measures such as mulching; and
- Monitor vegetation and erosion control efforts. Conduct follow-up treatment of any invasive species that have established in the reclamation site.

It is possible due to a well's age, past development practices, and current conditions of some wells, that contamination could exist. Unknown areas of contamination would be characterized to determine what is present and how best to remediate it. Characterization of possible contaminants at well sites would follow guidance developed by the National Park Service and outlined in its Operator's Handbook (NPS 2006) and characterization procedures (NPS 2004). This guidance describes when and where to collect samples, what contaminants to test for, how to collect samples (from sediment, groundwater, and surface water), sample collection methodologies, quality assurance/quality control, how to analyze samples in the laboratory, detection limits, and sample plan and reporting requirements. While this is an internal guidance document, it references applicable EPA sources, in addition to scientific literature describing the effects of oil and gas contaminants on wildlife and natural resources.

Revegetation goals are developed based on pre-operational analysis, or if unavailable, are based on adjacent, undisturbed areas. Reclamation of orphaned oil and gas sites would be deemed successful when the canopy cover of native vegetation communities is at least 70% on NPS and FWS areas and sustained over at least 2 complete growing seasons. Canopy cover is defined as the vegetative cover above the soil surface that intercepts raindrops, but it does not contact the soil.

FWS and NPS have a particularly strong understanding of the ecosystems they manage and extensive experience restoring native plant communities. The cost estimates and timelines outlined for the projects in this proposal are based on extensive FWS and NPS knowledge and experience gained in the day to day management of FWS and NPS areas. FWS and NPS also have extensive experience working with oil and gas operators conducting operations under the agencies' respective permitting mechanisms.

Environmental Benefits:

The natural resources restored and protected by this project include over 76 acres of coastal habitats such as freshwater and tidal wetlands, prairies, Tamaulipan thornscrub, bottomland hardwoods, cypress swamp, mudflats, beaches, and dunes. These areas are significant in that they protect portions of the largest freshwater wetland in Texas, conserve protected species, and provide wintering habitat for millions of migratory birds. This program ultimately provides for public safety and restores important habitat on public lands along coastal Texas, while building upon investments made in FPL1.

Specific benefits to state resources and values include:

- Protection and restoration of water resources, water quality and hydrology by plugging wells, removing fill material associated with roads, production pads and surface equipment, and restoring surface and subsurface habitats and ecological functions.
- Elimination of pollution by removing existing and potential contamination that can pollute coastal groundwater and surface water, alter habitats, degrade water quality, and reduce water availability.
- Restoration and improvements of wildlife habitat and ecological health in priority Texas landscapes where significant investment has been made such as the Chenier Plain (McFaddin NWR beach) and Bahia Grande corridor (Laguna Atascosa NWR).
- Increased public recreation at parks and refuges through restoration and transformation of orphaned well sites into native coastal habitat that support species of interest to visitors such as migratory and coastal birds.
- Enhancing public safety by eliminating sources of contamination that pose a health risk and removing orphaned equipment that can break free during storm events.

The highest priority site for plugging and restoration is a well posing a navigational hazard in Big Thicket National Preserve. Plugged in the 1980's in accordance with State plugging standards, the well has become exposed in the main channel of the Neches River. Well casings have become exposed due to natural river processes and now pose a serious threat to park visitors and boat traffic. These casings could also be damaged by collision from boats and flood-borne debris thereby causing contamination of the river through the release of fluids into the water. This program would ensure the well is plugged properly below the mudline and all structures in the water body are removed.

One component of this proposal is the restoration of wind-tidal flat habitat, which is a very limited and specialized environment. Wind-tidal flats are low, flat areas inundated when high water conditions are created by northerly winds and left uncovered when low-water conditions are created by southerly winds. Tidal flat elevation changes range from sea level to .8 feet and change on the order of 0.2 feet per mile (Watson 1979).

Tidal flats provide abundant amounts of blue-green microalgae, which contribute to the primary productivity of estuarine systems comparable to seagrass beds and to 20-40 percent of a typical marshhay cordgrass (*Spartina patens*) marsh. These flats play a crucial role in the life history of some of Texas' most important commercial fish and shellfish industries and offer significant feeding areas for aquatic bird life (Withers 1993).

Wind-tidal flats provide winter and migration foraging habitats for 22 species of shorebirds and waterbirds, including the federally threatened piping plover and red knot (Withers 1994). Padre Island National Seashore is designated a Globally Important Bird Area by the American Bird Conservancy and a Site of International Importance by the Western Hemisphere Shorebird Reserve Network. Forty-five (45) species of algae have been identified in Laguna Madre tidal flats, with cyanobacteria representing the dominant taxa (Fisk 1950, Sorenson and Conover 1962, Zimba et al.

2017, Shalygin et al. 2019).

Approximately 3,038 acres of these flats have been damaged by past seismic surveys for energy resources that have altered surface hydrology and resulted in the loss of algal mats. The addition of fill material and soil compaction are disturbances that adversely affect blue-green algal mat production, which is dependent upon flats that are alternately inundated. The use of fill not only converts the flats to an elevated landform, but it also disrupts the hydrological cycle. The filled area acts as a barrier to inundation or allows retention of water behind the filled area. Soil compaction by vehicular traffic disturbs the hydrological regime by allowing compacted areas to remain submerged. Wind-tidal flats that are submerged too frequently do not have extensive algal mats (Weise and White 1980).

This project would implement a trial into the best methods to be used to restore tidal flat habitat, enhance benthic communities for shorebird foraging, support protected species conservation, and increase algal biomass that contributes to the high productivity of adjacent wetland communities. Though there are no established or standard methods to restore this type of wetland, the project team has considerable knowledge and tools for such restoration. By example, the NPS has substantial experience in beach restoration, such as but not limited to Cape Hatteras National Seashore where 2.6 million cubic yards of beach quality sand along approximately 2.2 miles of shoreline (USACE 2015), Cape Lookout National Seashore where 3,850 linear feet of beach was restored (Schupp 2017) and with several projects at Gulf Islands National Seashore where approximately 4.9 miles of shoreline along the eastern end of Perdido Key (Gibson and Looney 2020), and a beach nourishment project where approximately 500,000 cubic yards of beach quality sand was placed along 10,000 feet of the northern shoreline of West Ship Island, within the Mississippi District of Gulf Islands National Seashore (USACE 2016). Though tidal mudflat restoration is somewhat different, the basic principles are the same: establish a proper slope in the tidal range, restore with similar grain sized sediments and plant with appropriate flora.

The NPS has existing relationships with experts in mudflat ecology from Texas A&M University-Corpus Christi. Restoration techniques are not extensively developed, but the project team and practitioners in the field know enough to be able to perform a series of exploratory test plots to inform the larger restoration efforts. Suzuki (2004) and Lee and Lee (2000) studies show that newly groomed sediments can be a successful platform for tidal flat restoration. In general, restoration will involve grooming of the tracks with the use of hand tools and ambient soils, to prevent further impacts, establishing the proper slope within the tidal range, and inoculating the soils with a mixture of the 12 dominant algal species, all of which can easily be grown in controlled conditions in roughly 30 days (Zimba, pers. comm. 6/3/2020). Only 0.2 grams of algal material has been shown to reestablish 1m2 of tidal flat. Salinity concentrations will be monitored using salinity recorders at low, medium and highest elevations. Up to 41-1.0 cm cores will be obtained monthly to determine the developing algal community structure. This information will help to determine how best to approach large-scaled restoration efforts.

Metrics:

Metric Title: PRM013 : Restoration planning/design/permitting - # environmental compliance documents completed
Target: 30
Narrative: The metric is to measure when an orphaned energy site has received all environmental compliance documents including NEPA, cultural resource, and various other environmental laws. Once they receive these clearances, they will be considered ready to implement. FWS and NPS have completed environmental compliance for some projects. For those projects where cultural and environmental compliance needs to be completed,

there are no anticipated complexities or uncertainties for completing the necessary compliance.

Metric Title: HC005 : Decommissioning energy facilities - Number of wells plugged
Target: 30
Narrative: The metric is to measure when an orphaned energy site has been decommissioned which may include well plugging, surface restoration and removal of derelict structures. The program proposes to plug 5 wells and restore 25 orphaned sites.

Metric Title: HR004 : Habitat restoration - Acres restored
Target: 76
Narrative: An objective of this proposal is to restore decommissioned energy sites to the natural habitats which were impacted by the sites' establishment. The natural resources restored and protected by this project include over 76 acres of coastal habitats such as freshwater and tidal wetlands, prairies, Tamaulipan thornscrub, bottomland hardwoods, cypress swamp, mudflats, beaches, and dunes.

Risk and Uncertainties:

One component of this program that presents risk is the project to reclaim vehicle tracks in wind tidal flats caused by past seismic surveys. The project would mitigate these risks by only implementing a small trail to assess restoration techniques. If that trial proved successful the project proponent could, at a later date, seek funding for the extensive tidal flat restoration that is needed. Although there are no established and standard method to restore wind tidal flats, the NPS would test potential techniques on a relatively small portion of Padre Island National Seashore, based upon its experience in Big Cypress National Preserve reclaiming and restoring vehicle tracks from oil and gas work in sensitive habitats. To reduce uncertainty, the NPS would assemble an expert team from the park, NPS and US Army Corps of Engineers wetland scientists, reclamation specialists and local university professors who have conducted extensive studies, some of which are published in peer reviewed journals, on the wind tidal flats, to evaluate alternative restoration practices to develop one or more preliminary restoration methods to test in a small area. There is distinct value in developing and evaluating a transferrable method for this and future restoration efforts in wind tidal flat systems. Based upon techniques established at Texas A&M University – Corpus Christi (Zimba pers. comm. 6/3/2020), starter colonies from the dominant taxa can be grown under controlled conditions and used to establish tidal flat algal communities.

Plugging land-based wells and removing surface equipment, debris and fill material used to construct well pads and roads will follow standard procedures, which have very low levels of risk or uncertainty.

Plugging or re-plugging water-based wells introduces some risk as access by barge is required, which increases project complexity due to potential conflicts with other boating traffic; however, standard mitigation would be applied, such as stationing shoreline monitors and employing navigational warning beacons to alert other boats of slower barge traffic and work occurring in navigable waterways.

The risks of leaving a well unplugged are well documented in literature and examples across the country. Many of these wells are located in an environment that is highly corrosive. In some cases, wells have had little to no maintenance for years, which further exacerbates the likelihood of failure. Abandoned wells pose a continual risk and will eventually fail at which time contamination will affect subsurface and surface resources causing additional damage that is unnecessary and costly. Risks associated with well plugging operations exist and impacts can be caused at any stage of the well plugging operation. However, reliance on industry standards, best management practices, past

experiences, existing NPS and FWS program management requirements, and more considerations minimize or eliminate these risks. As an example, Padre Island National Seashore has identified approximately 80 mitigation measures within their Oil and Gas Management Plan/EIS that are designed to minimize risks to visitor experience, night sky, threatened and endangered species, coastal habitats, and more resources. Additionally, natural resource trustee agencies require risk mitigations as part of their permit processes that are designed to lessen the impact on the environment and species, which would be required for plugging operations. There isn't an effective way to eliminate all risks, but relying on past experiences, applying existing mitigation measures, and using best available techniques will substantially reduce these risks. When compared to leaving a well unplugged in areas with sensitive habitats, well plugging operations when completed and surface and subsurface habitats restored are expected to be the least impactful overall.

Risk and uncertainty associated with successfully revegetating sites would be reduced to insignificant levels by: 1) selecting appropriate native seed and plant materials to provide for rapid surface cover, 2) applying appropriate mulching materials to prevent erosion and allow for retaining moisture to facilitate seed germination and growth, 3) planting at the right time of the year when rainfall and temperature provide the most advantageous growing conditions, 4) seeding and planting areas in close timing upon completion of re-contouring and surface preparation, 5) conducting routine monitoring to ensure re-vegetation, and 6) taking corrective actions in the event re-vegetation is not occurring at the rate anticipated.

A hurricane or other large storm could jeopardize revegetation success, particularly for projects along shorelines; however, risk could be avoided or minimized by scheduling reclamation around hurricane season or applying mitigation techniques to reduce damage by wave action.

Monitoring and Adaptive Management:

FWS and NPS would implement the projects through Cooperative Agreements with State Oil and Gas Divisions or agency administered contracts or agreements if needed. The initial phases for reclamation of vehicle tracks in wind tidal flats at Padre Island National Seashore would be conducted via an existing CESU agreement with Texas A&M University-Corpus Christi. Cooperative Agreements would provide one method for tracking project status and budget.

FWS and NPS would also maintain separate tracking systems to track progress in completing projects and monitoring expenditures.

Well plugging would be monitored and approved by the RRC inspector or qualified contractor to ensure well plugging meets required standards. After plugging a well, there would be no further monitoring required.

Monitoring of the experimental reclamation design for reclaiming the vehicle tracks in wind tidal flats at Padre Island National Seashore would be conducted by graduate and possibly undergraduate students with guidance of a university professor under a scope of work developed by NPS and the professor, with student participation. This project would be administered and managed by the NPS.

Reclamation of orphaned oil and gas sites would be monitored by FWS and NPS staff, although monitoring revegetation would be the primary responsibility of the reclamation contractor, with the agencies conducting limited monitoring. Revegetation success would be monitored for 2 years following initial reseeding and plantings. Should monitoring show revegetation is not progressing as planned, or that invasive species have been introduced, reassessment and application of adaptive revegetation strategies will occur.

Routine conference calls would be held between FWS, NPS, and the RRC to discuss progress, identify

deficiencies, and adjust as needed. Information regarding seed and plant material sources, mulch sources, and other aspects of the projects would be shared to improve efficiencies and maximize revegetation success.

Reclamation of orphaned oil and gas sites would be deemed successful when the canopy cover of native vegetation communities is at least 70% on NPS and FWS areas and sustained over at least 2 complete growing seasons. Canopy cover is defined as the vegetative cover above the soil surface that intercepts raindrops but does not contact the soil.

Data Management:

Data on the locations treated and monitoring results would be collected and maintained by NPS, FWS, or RRC; however, this program will not include significant data collection. Progress and accomplishment reports, which would include site data, would be shared with the RESTORE Council staff and Steering committee, which would include site data.

Collaboration:

The FWS and NPS have collaborated on the development of this proposal including the selection and prioritization of the sites. The implementation of this program would also involve the RRC, which has worked closely with FWS and NPS for many years. The RRC administers the State's Oil and Gas Regulation and Cleanup (OGRC) Funds. The OGRC Fund is a fund that was created by the 82nd Texas Legislature in 2011. This fund replaced the previous Oil Field Cleanup Fund. This fund allows the RRC to plug abandoned oil and gas wells and clean-up abandoned oilfield sites. OGRC funding has been unavailable to address the sites proposed in this program. The plugging of wells would be done in cooperation with the RRC through a cooperative agreement between FWS and NPS. The two bureaus would coordinate project implementation with their respective areas. The RRC would proceed to develop and award contracts to implement corrective actions. FWS and NPS would participate in the contracting process by providing information, assisting in the development of the contract scopes of work with the State, and reviewing draft contract scopes of work prior to the State issuing for solicitation. FWS and NPS would participate in contract monitoring, particularly with respect to avoiding visitor use conflicts and resource impacts.

Public Engagement, Outreach, and Education:

In addition to public engagement through the NEPA process, where necessary, public outreach would also be achieved by FWS and NPS posting updates on the agencies' public websites, in visitor centers and in entrance stations where projects are proposed. During project implementation, particularly near park or refuge visitor use areas, interpretive information such as brochures, exhibits, social media postings, websites, interpretive programs, a banner or large sign, or similar items would be posted notifying visitors that the project is restoring the Gulf Coast. The initial phase of the project to reclaim vehicle tracks in wind tidal flats at Padre Island National Seashore would be undertaken with the Texas A&M University-Corpus Christi. The initial phase would enable students to participate in the development of experimental reclamation method(s) and conduct the test phase and monitoring on a small plot. The students could earn credit while learning how to design wetland restoration methods. Monitoring the restoration of tidal flats would likely involve students who would conduct field assessments, gather scientific information, implement actions to modify restoration efforts if needed, and report and publish findings. There will be opportunities for youth to learn about habitat restoration and work on revegetation projects where success depends on the planting of large numbers of trees by hand over a short time span.

Leveraging:

Funds: $1,371,567.00
Type: Bldg on Others

Status: Received
Source Type: Other
Description: This proposal is a continuation of the FPL1 project, “Plug Abandoned Oil and Gas Wells on Padre Island National Seashore” and addresses additional sites on the Seashore and other parts of coastal Texas. This proposal also complements other FPL1-funded projects including the Bahia Grande Coastal Corridor.

Funds: $200,000.00
Type: Bldg on Others
Status: Received
Source Type: Other Federal
Description: Additional funding provided through forfeiture of a performance bond that is associated with the FPL1 project, “Plug Abandoned Oil and Gas Wells on Padre Island National Seashore.”

Environmental Compliance:
Most National Park Service (NPS) sites and wells have completed environmental compliance, and DOI is preparing the documentation needed to move the implementation component of this proposed activity into FPL Category 1. DOI will provide this documentation - as needed - prior to publication of the draft FPL and will revise the proposal accordingly.

Remaining NPS sites and sites located on FWS Refuge lands have not acquired full environmental clearances necessary for the decommissioning. These FWS sites are proposed as Category 2 to complete site planning and necessary clearances. For those projects where cultural and environmental compliance needs to be completed, there are no anticipated complexities or uncertainties for completing the necessary compliance. (See attached checklist).

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Budget

Project Budget Narrative:
The overall budget for this project is $10,595,140. The bulk of the funds requested will be used for implementation of well plugging and site restoration in the amount of $9,162,000. Most sites and wells on the NPS lands have completed environmental clearances and are ready for implementation (approximately $7.4M). Planning funds are also sought in the amount of approximately $740,000 to complete the environmental clearances and planning needs for FWS refuges and remaining NPS sites. The FPL Category 1 funding requested for implementation ready project sites and planning for other sites is approximately $8.4 million. Once planning is complete, FPL Category 2 implementation funds of approximately $2.5 million are included in the request to carry-out well plugging and site restoration on FWS sites also. Monitoring and adaptive management (MAM) funds in the amount of $396,080 are requested for monitoring the restoration sites and adapting to changes in site conditions. Project management (PM) in the amount of $297,060 are requested to provide oversight of contracts, agreements, and field activities. As appropriate, funds for contingency will be considered for inclusion in the budgets for the individual restoration sites as these are developed. MAM and PM funds are included in the estimates below for implantation or planning.

Estimated sites costs
Cat 1: implementation of most NPS sites = $7,401,190
- South Sprint (PAIS) ($999,380)
- Lemon Wells (PAIS) ($722,250)
- Shorebased Production (PAIS) ($1,605,000)
- Peach Wells (PAIS) ($532,860)
- A4 Pad (PAIS) ($419,440)
- A3/A8 Pad (PAIS) ($606,690)
- PanAm Road (PAIS) ($2,248,070)
- TEEL Well (BITH) ($267,500)

Cat 1: planning for remaining FWS and NPS sites = $740,000

Cat 2: implementation of all FWS sites and 2 sites at BITH = $2,453,050
- Aransas NWR ($983,300)
- Laguna Atascosa NWR ($563,000)
- McFaddin NWR ($164,000)
- Kirby Wells (BITH) ($267,500)
- ZigZag Road (BITH) ($155,150)
- Wind Tidal Flats (PAIS) ($321,000)

Obligation of these funds will be accomplished using various procurement methods. An existing Cooperative Agreement allows funding to be provided to the Railroad Commission of Texas for the management and contracting of well plugging actions and possibly site restoration. While the agreement will help expedite the obligation of funding, contracts might be awarded by either NPS or FWS for individual plugging and/or restoration projects if appropriate. Restoration monitoring will be accomplished via a contract or the hiring of temporary staff.

Total FPL 3 Project/Program Budget Request:
$ 10,595,140.00

Estimated Percent Monitoring and Adaptive Management: 4 %
Estimated Percent Planning: 6 %
Estimated Percent Implementation: 87 %

Estimated Percent Project Management: 3 %
Estimated Percent Data Management: 0 %
Estimated Percent Contingency: 0 %

Is the Project Scalable?:
Yes

If yes, provide a short description regarding scalability.:
This program involves actions that take place at discreet locations within the State, refuges, or parks that can be addressed independently from other project locations. Additionally, the proposed plugging and restoration activities are consistent between locations and therefore can be combined in numerous ways to capitalize on the proximity of locations.

Environmental Compliance[1]

Environmental Requirement	Has the Requirement Been Addressed?	Compliance Notes (e.g.,title and date of document, permit number, weblink etc.)
National Environmental Policy Act	Yes	Council's Planning CE.
Endangered Species Act	N/A	Note not provided.
National Historic Preservation Act	N/A	Note not provided.
Magnuson-Stevens Act	N/A	Note not provided.
Fish and Wildlife Conservation Act	N/A	Note not provided.
Coastal Zone Management Act	N/A	Note not provided.
Coastal Barrier Resources Act	N/A	Note not provided.
Farmland Protection Policy Act	N/A	Note not provided.
Clean Water Act (Section 404)	N/A	Note not provided.
River and Harbors Act (Section 10)	N/A	Note not provided.
Marine Protection, Research and Sanctuaries Act	N/A	Note not provided.
Marine Mammal Protection Act	N/A	Note not provided.
National Marine Sanctuaries Act	N/A	Note not provided.
Migratory Bird Treaty Act	N/A	Note not provided.
Bald and Golden Eagle Protection Act	N/A	Note not provided.
Clean Air Act	N/A	Note not provided.
Other Applicable Environmental Compliance Laws or Regulations	N/A	Note not provided.

[1] Environmental Compliance documents available by request (restorecouncil@restorethegulf.gov).

Maps, Charts, Figures

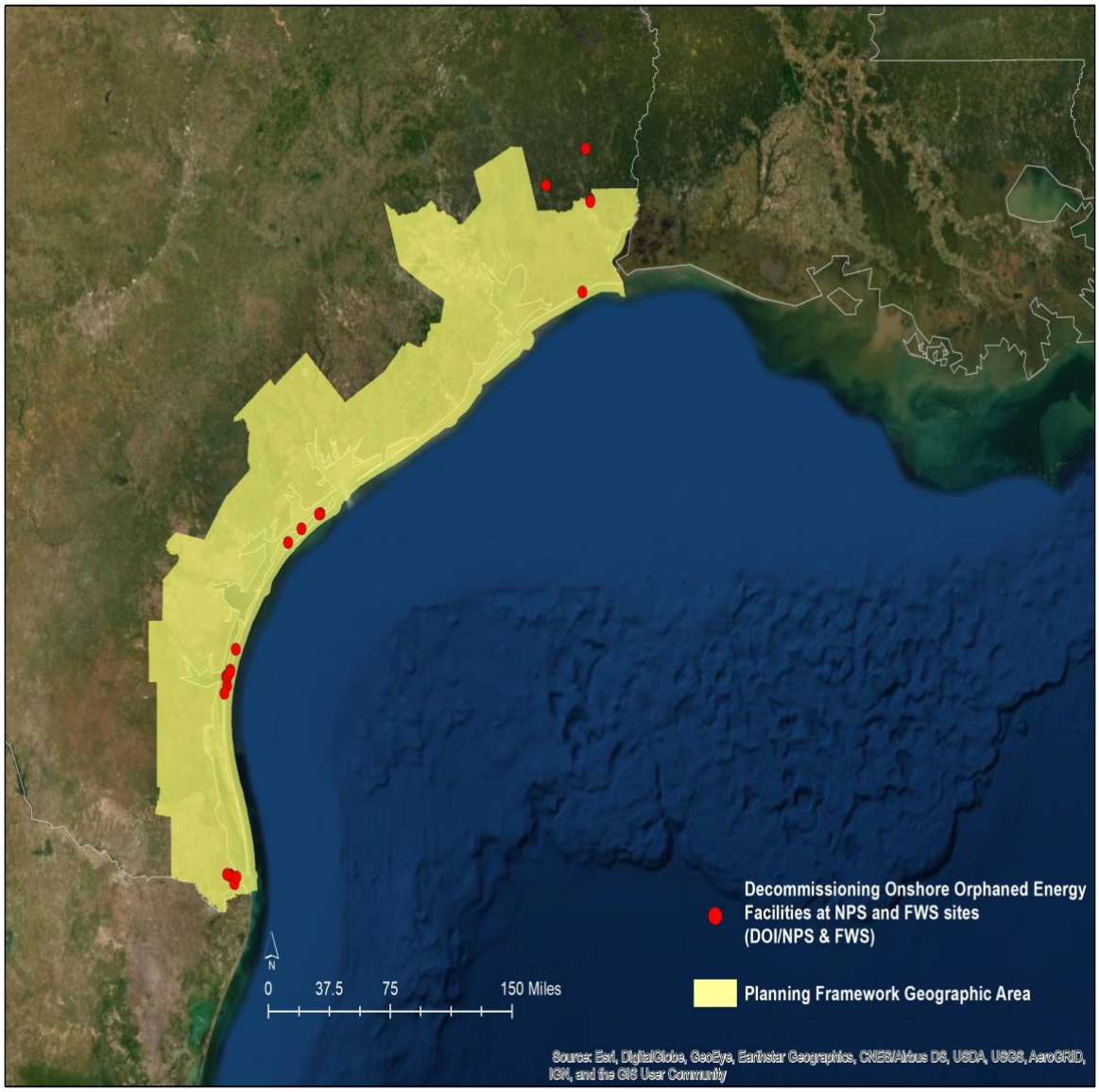

Figure 1: Location of onshore orphaned energy facility sites.

Other Uploads

Main Uploads_0:
RRC Public Comment_Restore FPL Number 3.pdf
Caption : N/A
Link to Download
http://www.restorethegulf.gov/apps/piper/web/Uploads/Download/proposal/554/50

Tables_2:
TABLE 1 - Proposed NPS and FWS Oil and Gas Sites to be Decommissioned.pdf
Table 1
Link to Download
http://www.restorethegulf.gov/apps/piper/web/Uploads/Download/proposal/544/50

RESTORE Council FPL 3 Proposal Document

General Information

Proposal Sponsor:
U.S. Department of the Interior – U.S. National Park and Fish and Wildlife Services

Title:
Decommissioning Onshore Orphaned Energy Facilities on NPS and FWS lands

Project Abstract:
This program will decommission and restore orphaned energy facilities on National Park Service (NPS) and U.S. Fish and Wildlife Service (FWS) preserves and refuges in coastal Texas. Neither bureau has funding to correct the hazards and resource impacts associated with orphaned oil and gas operations that exist because the operations/facilities either pre-date the establishment of the area, the last operating company of record is bankrupt, or a regulatory avenue does not exist to hold the previous operator responsible.

Orphaned oil and gas facilities include unplugged wells, surface equipment, roads, and production pads. They pose risks to human safety, environmental risks to surface and subsurface resources, and continued habitat loss. This program would decommission orphaned wells and restore sites to conditions that existed before the sites were established. As much as 3,100 acres of coastal habitat could be restored. The proposed program includes work to plug 5 wells and restore 25 orphaned sites for an estimated cost of $12.985 million. The program includes planning and implementation. Environmental clearances for most NPS sites have been completed but FWS clearances and remaining NPS sites are not complete, although it is expected to be a relatively straightforward process. Estimated timeline for completion is 3-5 years. This program builds upon investments made in FPL1.

FPL Category: Cat1: Planning/ Cat2: Implementation

Activity Type: Program

Program: Decommissioning Onshore Orphaned Energy Facilities on NPS and FWS lands (DOI/NPS & FWS)

Co-sponsoring Agency(ies): N/A

Is this a construction project?
Yes

RESTORE Act Priority Criteria:
(I) Projects that are projected to make the greatest contribution to restoring and protecting the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches, and coastal wetlands of the Gulf Coast region, without regard to geographic location within the Gulf Coast region.

Priority Criteria Justification:
Orphaned energy facilities pose risks to human safety, pose environmental risks to surface and subsurface resources through contaminant release, and perpetuate habitat loss. These risks increase with time due to continued deterioration and lack of maintenance, as does the cost to address them.

This program would result in the plugging of 5 orphaned wells, the removal of orphaned oil and gas infrastructure and development on 25 sites that are unsafe, unusable, or otherwise negatively impact natural resources and processes, and the restoration of coastal resources and habitats to pre-disturbance levels.

Individual projects would occur over a large geographic area along the Texas coast from Brownsville to Beaumont and include locations within three Fish and Wildlife Service refuges and two National Park Service parks.

This program would lead to permanent results and improved resiliency for 3,100 acres of Gulf coastal habitats and species due to the elimination of environmental hazards and removal of existing contamination on public lands. Restored natural processes would sustain habitats and enhance the overall health, availability, and diversity of natural resources that include migratory and protected species. The restoration of important wind tidal flats would create habitat that supports 22 species of shorebirds and wading birds, which enhances bird populations that contribute to restored areas being designated as Globally Important Bird Areas by the American Bird Conservancy and Sites of International Importance by the Western Hemisphere Shorebird Reserve Network. Restored habitats would contribute to existing habitats (coastal grasslands and dunes) along coastal barrier islands that function as hurricane protection for the mainland of Texas.

Project Duration (in years): 5

Goals

Primary Comprehensive Plan Goal:
Restore and Conserve Habitat

Primary Comprehensive Plan Objective:
Restore , Enhance, and Protect Habitats

Secondary Comprehensive Plan Objectives:
N/A

Secondary Comprehensive Plan Goals:
N/A

PF Restoration Technique(s):
Protect and conserve coastal, estuarine, and riparian habitats: Decommission unused, orphaned energy facilities
Protect and conserve coastal, estuarine, and riparian habitats: Habitat management and stewardship

Location

Location:
This program would occur in Texas at 3 Fish and Wildlife Service refuges (Laguna Atascosa National Wildlife Refuge, Aransas National Wildlife Refuge (Matagorda Island), and McFaddin National Wildlife Refuge) and 2 National Park Service parks (Padre Island National Seashore and Big Thicket National Preserve) (Figure 1).

HUC8 Watershed(s):
Texas-Gulf Region(Neches) - Neches(Village)
Texas-Gulf Region(Neches) - Neches(Pine Island Bayou)
Texas-Gulf Region(Galveston Bay-San Jacinto) - Galveston Bay-Sabine Lake(East Galveston Bay)
Texas-Gulf Region(Central Texas Coastal) - Central Texas Coastal(East San Antonio Bay)
Texas-Gulf Region(Nueces-Southwestern Texas Coastal) - Southwestern Texas Coastal(South Laguna Madre)
Texas-Gulf Region(Nueces-Southwestern Texas Coastal) - Southwestern Texas Coastal(North Laguna Madre)

State(s):
Texas

County/Parish(es):
TX - Aransas
TX - Calhoun
TX - Cameron
TX - Hardin
TX - Jefferson
TX - Kleberg

Congressional District(s):
TX - 27
TX - 14
TX - 36
TX - 34

Narratives

Introduction and Overview:

Public lands managed by the U.S. Fish and Wildlife Service (FWS) and National Park Service (NPS) have orphaned oil and gas wells and associated features, including impacts from previous energy exploration that are currently impairing 3,100 acres of coastal habitat. These energy sites generally consist of unplugged wells, tanks, production equipment, flowlines, roads, and well pads.

Orphaned energy sites located on FWS and NPS properties have no responsible party because: (1) the orphaned features pre-date the establishment or expansion of FWS and NPS properties; (2) the oil and gas operators abandoned their operations and the last operating company of record is bankrupt; or (3) the agencies exhausted regulatory avenues for holding previous operators responsible for taking necessary corrective actions. Operators abandon operations for various reasons. Most often operators are small ventures with very little capital, and while wells may have been profitable when drilled and placed into production, costs to maintain the wells exceeded their production levels and/or they became marginally productive over the years. Additionally, natural movements of stream channels can expose wellbores that now pose hazards within navigable waterways as has occurred in Big Thicket National Preserve.

Neither FWS nor NPS have funding to eliminate the hazards posed by orphaned facilities; to plug wells; to characterize and remediate spilled hydrocarbons, produced water, and associated liquids; and to restore habitat degraded by the construction of well and production pads and roads. While the State of Texas established the Oil Field Clean Up Fund in 1992 to plug orphaned wells and remediate and cleanup sites across the state, this fund is insufficient to address the large number of orphaned wells in need of plugging and sites in need of reclamation.

Orphaned wells pose risks to human safety and the environment, including surface and subsurface resources; they also presently impair habitat at the well pad and surrounding area. These wells can leak pollutants, including methane and brine, as well as heavy metals and naturally occurring radioactive substances that can contaminate groundwater, surface water, or, in the case of methane**,** be released into the atmosphere (Ho et. al. 2016). Pollutants can be released because of mechanical integrity failure, failed well casings, and cement failure within the wellbore. These risks unfortunately increase with time due to continued deterioration and lack of maintenance, as does the cost to address them.

The missions of the National Wildlife Refuge and National Park Systems are to improve and maintain fish and wildlife resources and preserve natural and cultural resource unimpaired for the enjoyment of future generations, respectively. Plugging orphaned wells and restoring these sites is consistent with, and advances these missions.

The proposed program includes work to plug 5 wells (4 FWS, 1 NPS) and restore 25 orphaned energy sites (10 FWS, 15 NPS) for a cost estimate of $12.985 million. The wells and sites are located within the Gulf Coast Region defined as any adjacent lands, waters, and watersheds, that are within 25 miles of the coastal zones defined in section 304 of the Coastal Zone Management Act of 1972 (16 U.S.C. § 1453) (See Figure 1and Table 1).

This program meets *Goal 1: Restore and Conserve Habitat* and *Objective 1: Restore, Enhance and Protect Habitats* of the Council's Comprehensive Plan by plugging orphaned wells and subsequently restoring surface habitats. The actions undertaken improves the health, diversity, and resilience of coastal and estuarine habitats by removing orphaned equipment, eliminating environmental risk, re-establishing natural processes, creating foraging habitat, and enhancing the recovery of endangered

species. This program directly aligns with two Planning Framework Techniques that are focused on 1) decommissioning orphaned energy facilities by plugging 5 wells and removing surface facilities and 2) the management and stewardship of habitat by restoring 25 sites.

Wells that are no longer producing in Texas are required to be plugged following Railroad Commission of Texas (RRC) plugging standards (Texas Administrative Code, Title 16, Part 1, Chapter 3, Rule 3.14). The RRC's "Well Plugging Primer" (RRC 2000) is a useful guide describing plugging operations. In addition to state standards, the Bureau of Land Management's (BLM, 1988) minimum standards of the *Department of the Interior's Onshore Oil and Gas Order Number 2, Section III.G, Drilling Abandonment Requirements* apply for plugging wells in parks. The plugging requirements of the Onshore Order were written specifically for plugging newly drilled wells; however, the NPS has applied the same standards to the permanent abandonment of wells. The use of state and federal plugging standards helps ensure that orphaned wells are plugged in a way that meets industry standards, as well as appropriate regulations. There are 5 wells in this proposal needing corrective actions: 4 land-based wells and 1 water-based well that poses a navigational hazard.

Producing oil or natural gas requires installation of various types of surface equipment. A battery of storage tanks and flowlines are used to transport produced oil or gas. Separation and treatment facilities are required to separate natural gas and water from oil. Storage tanks are required to hold brinewater produced during oil extraction. Proper disposal capability, most typically reinjection, must be developed. Upon well-plugging, well and production pads, access roads, surface equipment and flowlines can be removed to facilitate site reclamation.

Reclamation involves restoring a site with the following features: allows for safe movement of native wildlife, re-establishes native vegetative communities, re-creates the normal flow of surface and reasonable flow of subsurface waters, and returns the area to a condition that does not jeopardize visitor safety or public use. Reclamation projects may last a few days or weeks. Revegetation goals are based upon pre-operational analysis of the natural conditions that existed prior to drilling, or if unavailable, it is based on adjacent, undisturbed areas.

In this proposal, there are 30 individual projects that would result in reclaiming approximately 3,100 acres of coastal and riverine habitat with most of the projects occurring in wetland communities that have highly functional fish and wildlife values. The implementation of these projects involves relatively small land areas and pose very little risk or uncertainty. However, these orphaned energy sites represent significant sources of potential petroleum pollution that can impact groundwater, springs and seeps, and surface waters where ground waters enter.

Flowing rivers, streams, and ephemeral channels can quickly spread those contaminants coming to the surface and carry them into critical estuaries along the coast. This proposal offers full treatment of some of the potentially most damaging orphaned wells on federal lands found along the Texas coast. Therefore, the benefits of the individual projects in this proposal would have ecological benefits over a large geographical area.

The RRC and NPS have worked together previously to plug wells and remove surface equipment. Wells would be plugged using technical plugging standards established by the State and BLM. Contaminant characterization and remediation and site reclamation methodologies are well-established. FWS and NPS have a particularly strong understanding of the ecosystems they manage and extensive experience restoring native plant communities. The cost estimates and timelines outlined for the projects in this proposal are based on extensive knowledge and experience gained in the day-to-day management of these areas.

Previous energy exploration efforts caused significant vehicular impacts to wind tidal flats at Padre Island National Seashore. Seismic surveys conducted along the western shoreline resulted in compacted vehicle tracks that altered wind-driven inundation by Laguna Madre waters, thus affecting algal growth and degrading foraging habitat for migratory birds.

The strategy for restoration of tidal flat impacts would have an initial experimental design and test phase undertaken via a Cooperative Ecosystems Studies Unit (CESU) agreement with a university such as Texas A&M University-Corpus Christi, which has experience studying and researching wind tidal flats. In addition, the implementation of the projects in this proposal is anticipated to create more than 100 jobs, which would target youth, students, and veterans.

This program is anticipated to be completed in three to five years depending on the amount of funding awarded and specific sites selected. Many NPS sites have environmental clearances and are ready to begin implementation. Acquiring environmental clearances for the remaining sites is not expected to be particularly complicated and could be completed in 12 months once initiated. Contracting and site restoration is expected to take two to three years for cooperative agreement or contract development and preparing design documents needed for contractor bid packages. Up to two years of monitoring may be needed to meet restoration objectives for revegetation. Therefore, given the variety of sites and varying levels of readiness, up to five years could be necessary to fully complete this program.

Proposed Methods :

The 30 individual projects comprising this proposal present varied degrees of risk to human safety and habitat degradation, and the potential for impacting water quality. In general, wells needing plugging or re-plugging pose the highest risk and potential resource impacts, followed by sites requiring characterization and remediation of petroleum and other contaminating substances, then removal of orphaned surface equipment, and reclamation of sites to restore and protect habitats and water quality.

Both the FWS and NPS have well-defined processes to follow to ensure site reclamation is successful and that endemic plant communities are restored to the disturbed areas. For example, the National Park Service (NPS, 1991) Natural Resource Management Reference Manual, Disturbed Lands Restoration, provides guidance for applying a planning process which includes the following 9 steps:

1. Inventory sites and select reference sites or conditions
2. Rank sites
3. Establish goals and objectives
4. Develop preliminary restoration alternatives
5. Undertake compliance and select alternative
6. Develop the project plan
7. Finalize the project plan
8. Implement and oversee the project
9. Report activities and results (including monitoring)

The sites identified in this proposal have already been inventoried and ranked by FWS and NPS. The planning phase of this program would begin with field assessments of the sites, if not already completed. Based on completed field assessments during which corrective actions have been determined, FWS and NPS would complete environmental compliance and permitting for their respective areas as needed and seek review by appropriate state and federal agencies on draft

compliance documents for proposed corrective actions and mitigation measures. FWS and NPS would provide final compliance documents to the State.

Environmental compliance has been completed for some projects, and there are no anticipated complexities or uncertainties for completing the others.

Well plugging techniques can differ depending on the type of well drilled and the actual well conditions (Vrålstad et. al. 2019). However, well plugging operations generally consist of removing the tubing, packer, and other completion equipment; pumping cement across producing zones; and placing cement plugs at various depths to protect freshwater zones (NPS 2006) (National Petroleum Council 2011) (Khalifeh and Saasen 2020). Finally, a cement plug is set at the surface to cap the well, and wellhead equipment is cut off. A permanent abandonment marker is often placed on the surface to identify the well's location.

Implementation of the well plugging would be done in cooperation with the Railroad Commission of Texas (RRC). FWS and NPS would enter into Cooperative Agreements with the RRC and would each designate an Agreements Technical Representative (ATR) to serve as the point of contact on each agreement. The ATRs would coordinate project implementation with their respective areas. The RRC would proceed to develop and award contracts to implement corrective actions. FWS and NPS would participate in the contracting process by providing information, assisting in the development of the contract scopes of work with the State, and reviewing draft contract scopes of work prior to the State advertising for bids. FWS and NPS would participate in contract monitoring, particularly with respect to avoiding visitor use conflicts and resource impacts.

A program goal would be to find efficiencies and cost-savings by combining multiple projects in as few contracts as possible. This is likely given that some energy sites are located near others, which provides for logical groupings of locations.

Some projects would be managed by the FWS and NPS, through contracts or agreements. In some cases, seasonal or term staff could be hired to carry out site reclamation projects, or to assist in administering project coordination, providing opportunities for youth, students, and veterans to work and gain knowledge and experience in habitat restoration.

Most unplugged wells would be accessed using existing roads. Where roads have naturally reclaimed, or new access would require construction of new roads through areas that would be very difficult to reclaim, access would be by heliportable plugging equipment or other method to avoid or minimize impacts. Wells would be flushed, the existence of any previous cement plugs would be confirmed, and if needed, the wells would be plugged. Some wells are so old that plugging information is unavailable. Onsite inspection utilizing specialized equipment to "tap" the plug may be required to determine whether additional corrective actions are needed.

Upon well plugging, well and production pads and access roads can be reclaimed. Reclamation involves returning the area to conditions that existed before drilling the well. Steps in the reclamation process include:

- Remove all above ground structures, equipment, and roads used or generated during operations;
- Remove or neutralize any contaminating substances;
- Restore topographic contours of disturbed areas to near original grade;
- Construct plugs or other water control / hydrologic restoration features;
- Spread and prepare natural topsoil for vegetative restoration (importing suitable topsoil that is free of non-native weed seed and plant materials from outside the FWS or NPS

areas might be needed);
- Re-establish native vegetative communities based on a planting plan;
- Apply erosion protection measures such as mulching; and
- Monitor vegetation and erosion control efforts. Conduct follow-up treatment of any invasive species that have established in the reclamation site.

It is possible due to a well's age, past development practices, and current conditions of some wells, that contamination could exist. Unknown areas of contamination would be characterized to determine what is present and how best to remediate it. Characterization of possible contaminants at well sites would follow guidance developed by the National Park Service and outlined in its Operator's Handbook (NPS 2006) and characterization procedures (NPS 2004). This guidance describes when and where to collect samples, what contaminants to test for, how to collect samples (from sediment, groundwater, and surface water), sample collection methodologies, quality assurance/quality control, how to analyze samples in the laboratory, detection limits, and sample plan and reporting requirements. While this is an internal guidance document, it references applicable EPA sources, in addition to scientific literature describing the effects of oil and gas contaminants on wildlife and natural resources.

Revegetation goals are developed based on pre-operational analysis, or if unavailable, are based on adjacent, undisturbed areas. Reclamation of orphaned oil and gas sites would be deemed successful when the canopy cover of native vegetation communities is at least 70% on NPS and FWS areas and sustained over at least 2 complete growing seasons. Canopy cover is defined as the vegetative cover above the soil surface that intercepts raindrops, but it does not contact the soil.

FWS and NPS have a particularly strong understanding of the ecosystems they manage and extensive experience restoring native plant communities. The cost estimates and timelines outlined for the projects in this proposal are based on extensive FWS and NPS knowledge and experience gained in the day to day management of FWS and NPS areas. FWS and NPS also have extensive experience working with oil and gas operators conducting operations under the agencies' respective permitting mechanisms.

Environmental Benefits:

The natural resources restored and protected by this project include over 3,100 acres of coastal habitats such as freshwater and tidal wetlands, prairies, Tamaulipan thornscrub, bottomland hardwoods, cypress swamp, mudflats, beaches, and dunes. These areas are significant in that they protect portions of the largest freshwater wetland in Texas, conserve protected species, and provide wintering habitat for millions of migratory birds. This program ultimately provides for public safety and restores important habitat on public lands along coastal Texas, while building upon investments made in FPL1.

Specific benefits to state resources and values include:
- Protection and restoration of water resources, water quality and hydrology by plugging wells, removing fill material associated with roads, production pads and surface equipment, and restoring surface and subsurface habitats and ecological functions.
- Elimination of pollution by removing existing and potential contamination that can pollute coastal groundwater and surface water, alter habitats, degrade water quality, and reduce water availability.
- Restoration and improvements of wildlife habitat and ecological health in priority Texas landscapes where significant investment has been made such as the Chenier Plain (McFaddin NWR beach) and Bahia Grande corridor (Laguna Atascosa NWR).

- Increased public recreation at parks and refuges through restoration and transformation of orphaned well sites into native coastal habitat that support species of interest to visitors such as migratory and coastal birds.
- Enhancing public safety by eliminating sources of contamination that pose a health risk and removing orphaned equipment that can break free during storm events.

The highest priority site for plugging and restoration is a well posing a navigational hazard in Big Thicket National Preserve (TX). Plugged in the 1980's in accordance with State plugging standards, the well has become exposed in the main channel of the Neches River. Well casings have become exposed due to natural river processes and now pose a serious threat to park visitors and boat traffic. These casings could also be damaged by collision from boats and flood-borne debris thereby causing contamination of the river through the release of fluids into the water. This program would ensure the well is plugged properly below the mudline and all structures in the water body are removed.

A significant component of this proposal is the restoration of wind-tidal flat habitat, which is a very limited and specialized environment. Wind-tidal flats are low, flat areas inundated when high water conditions are created by northerly winds and left uncovered when low-water conditions are created by southerly winds. Tidal flat elevation changes range from sea level to .8 feet and change on the order of .2 feet per mile (Watson, 1979).

Tidal flats provide abundant amounts of blue-green microalgae, which contribute to the primary productivity of estuarine systems comparable to seagrass beds and to 20-40 percent of a typical marshhay cordgrass (*Spartina patens*) marsh. These flats play a crucial role in the life history of some of Texas' most important commercial fish and shellfish industries, and offer significant feeding areas for aquatic bird life (Withers, 1993).

Wind-tidal flats provide winter and migration foraging habitats for 22 species of shorebirds and waterbirds, including the federally threatened piping plover and red knot (Withers, 1994). Padre Island National Seashore is designated a Globally Important Bird Area by the American Bird Conservancy and a Site of International Importance by the Western Hemisphere Shorebird Reserve Network.

Approximately 3,038 acres of these flats have been damaged by past seismic surveys for energy resources that have altered surface hydrology and resulted in the loss of algal mats. The addition of fill material and soil compaction are disturbances that adversely affect blue-green algal mat production, which is dependent upon flats that are alternately inundated. The use of fill not only converts the flats to an elevated landform, but it also disrupts the hydrological cycle. The filled area acts as a barrier to inundation or allows retention of water behind the filled area. Soil compaction by vehicular traffic disturbs the hydrological regime by allowing compacted areas to remain submerged. Wind-tidal flats that are submerged too frequently do not have extensive algal mats (Weise and White 1980).

This project would restore tidal flat habitat, enhance benthic communities for shorebird foraging, support protected species conservation, and increase algal biomass that contributes to the high productivity of adjacent wetland communities. However, there are no established or standard methods to restore this type of wetland. The NPS would assemble an expert team to evaluate alternative restoration practices to develop one or more preliminary restoration methods.

Metrics:

Metric Title: PRM013 : Restoration planning/design/permitting - # environmental compliance documents completed : Planning, Research, Monitoring
Target: 30
Narrative: The metric is to measure when an orphaned energy site has received all environmental compliance documents including NEPA, cultural resource, and various other environmental laws. Once they receive these clearances, they will be considered ready to implement. FWS and NPS have completed environmental compliance for some projects. For those projects where cultural and environmental compliance needs to be completed, there are no anticipated complexities or uncertainties for completing the necessary compliance.

Metric Title: HC005 : Decommissioning energy facilities - Number of wells plugged : Habitat Conservation
Target: 30
Narrative: The metric is to measure when an orphaned energy site has been decommissioned which may include well plugging, surface restoration and removal of derelict structures. The program proposes to plug 5 wells and restore 25 orphaned sites.

Metric Title: HR004 : Habitat restoration - Acres restored : Habitat Restoration
Target: 3,100
Narrative: An objective of this proposal is to restore decommissioned energy sites to the natural habitats which were impacted by the sites' establishment. The natural resources restored and protected by this project include over 3,100 acres of coastal habitats such as freshwater and tidal wetlands, prairies, Tamaulipan thornscrub, bottomland hardwoods, cypress swamp, mudflats, beaches, and dunes. Most of the 30 sites have small acreage. One of the reclamation projects in this proposal accounts for most of the acreage target. There are 3,038 acres of wind tidal flats along the western shoreline at Padre Island National Seashore (TX) that are proposed for restoration in this program. If this program is scaled down in size this metric target could be reduced drastically.

Risk and Uncertainties:
One component of this program that presents risk is the project to reclaim vehicle tracks in wind tidal flats caused by past seismic surveys. Despite no established and standard method to restore wind tidal flats, the NPS would manage the risk of a large restoration failure by piloting techniques on a relatively small portion of Padre Island National Seashore. To reduce uncertainty, the NPS would assemble an expert team from the park, NPS and US Army Corps of Engineers wetland scientists, reclamation specialists and a local university professor who has conducted extensive studies on the wind tidal flats, to evaluate alternative restoration practices to develop one or more preliminary restoration methods to test in a small area. Based on the test phase, the team would assist NPS to select the method to apply on the remaining vehicle tracks. As proposed, the preliminary experimentation of one or more restoration methods in a small area would limit the risk and uncertainty. If the preliminary experimental phase does not result in a restoration method that can be applied with reasonable certainty to restore hydrologic flow to support algal growth without further impacting the wind tidal flats, the restoration of the larger affected areas would not proceed. There is distinct value in developing and evaluating a transferrable method for this and future restoration efforts in wind tidal flat systems.

Plugging land-based wells and removing surface equipment, debris and fill material used to construct well pads and roads will follow standard procedures, which have very low levels of risk or uncertainty.

Plugging or re-plugging water-based wells introduces some risk as access by barge is required, which increases project complexity due to potential conflicts with other boating traffic; however, standard mitigation would be applied, such as stationing shoreline monitors and employing navigational warning beacons to alert other boats of slower barge traffic and work occurring in navigable waterways.

Risk and uncertainty associated with successfully revegetating sites would be reduced to insignificant levels by: 1) selecting appropriate native seed and plant materials to provide for rapid surface cover, 2) applying appropriate mulching materials to prevent erosion and allow for retaining moisture to facilitate seed germination and growth, 3) planting at the right time of the year when rainfall and temperature provide the most advantageous growing conditions, 4) seeding and planting areas in close timing upon completion of re-contouring and surface preparation, 5) conducting routine monitoring to ensure re-vegetation, and 6) taking corrective actions in the event re-vegetation is not occurring at the rate anticipated.

A hurricane or other large storm could jeopardize revegetation success, particularly for projects along shorelines; however, risk could be avoided or minimized by scheduling reclamation around hurricane season or applying mitigation techniques to reduce damage by wave action.

Monitoring and Adaptive Management:

FWS and NPS would implement the projects through Cooperative Agreements with State Oil and Gas Divisions or agency administered contracts or agreements if needed. The initial phases for reclamation of vehicle tracks in wind tidal flats at Padre Island National Seashore would be conducted via an existing Cooperative Ecosystem Studies Unit (CESU) agreement with Texas A&M University-Corpus Christi. Cooperative Agreements would provide one method for tracking project status and budget.

FWS and NPS would also maintain separate tracking systems to track progress in completing projects and monitoring expenditures.

Well plugging would be monitored and approved by the RRC inspector or qualified contractor to ensure well plugging meets required standards. After plugging a well, there would be no further monitoring required.

Monitoring of the experimental reclamation design for reclaiming the vehicle tracks in wind tidal flats at Padre Island National Seashore would be conducted by graduate and possibly undergraduate students with guidance of a university professor under a scope of work developed by NPS and the professor, with student participation. This project would be administered and managed by the NPS.

Reclamation of orphaned oil and gas sites would be monitored by FWS and NPS staff, although monitoring revegetation would be the primary responsibility of the reclamation contractor, with the agencies conducting limited monitoring. Revegetation success would be monitored for 2 years following initial reseeding and plantings. Should monitoring show revegetation is not progressing as planned, or that invasive species have been introduced, reassessment and application of adaptive revegetation strategies will occur.

Routine conference calls would be held between FWS, NPS, and the RRC to discuss progress, identify deficiencies, and adjust as needed. Information regarding seed and plant material sources, mulch sources, and other aspects of the projects would be shared to improve efficiencies and maximize revegetation success.

Reclamation of orphaned oil and gas sites would be deemed successful when the canopy cover of

native vegetation communities is at least 70% on NPS and FWS areas and sustained over at least 2 complete growing seasons. Canopy cover is defined as the vegetative cover above the soil surface that intercepts raindrops but does not contact the soil.

Data Management:

Data on the locations treated and monitoring results would be collected and maintained by NPS, FWS, or RRC; however, this program will not include significant data collection. Progress and accomplishment reports, which would include site data, would be shared with the RESTORE Council staff and Steering committee.

Collaboration:

The FWS and NPS have collaborated on the development of this proposal including the selection and prioritization of the sites. The implementation of this program would also involve the Railroad Commission of Texas, which has worked closely with FWS and NPS for many years. The plugging of wells would be done in cooperation with the RRC through a cooperative agreement between FWS and NPS. The two bureaus would coordinate project implementation with their respective areas. The RRC would proceed to develop and award contracts to implement corrective actions. FWS and NPS would participate in the contracting process by providing information, assisting in the development of the contract scopes of work with the State, and reviewing draft contract scopes of work prior to the State issuing for solicitation. FWS and NPS would participate in contract monitoring, particularly with respect to avoiding visitor use conflicts and resource impacts.

Public Engagement, Outreach, and Education:

In addition to public engagement through the NEPA process, where necessary, public outreach would also be achieved by FWS and NPS posting updates on the agencies' public websites, in visitor centers and in entrance stations where projects are proposed.

During project implementation, particularly near park or refuge visitor use areas, interpretive information such as brochures, exhibits, social media postings, websites, interpretive programs, a banner or large sign, or similar items would be posted notifying visitors that the project is restoring the Gulf Coast. The initial phase of the project to reclaim vehicle tracks in wind tidal flats at Padre Island National Seashore would be undertaken with the Texas A&M University-Corpus Christi.

The initial phase would enable students to participate in the development of experimental reclamation method(s) and conduct the test phase and monitoring on a small plot. The students could earn credit while learning how to design wetland restoration methods. Monitoring the restoration of tidal flats would likely involve students who would conduct field assessments, gather scientific information, implement actions to modify restoration efforts if needed, and report and publish findings.

There will be opportunities for youth to learn about habitat restoration and work on revegetation projects where success depends on the planting of large numbers of trees by hand over a short time span.

Leveraging:

Funds: $1,371,567.00
Type: Bldg on Others
Status: Received
Source Type: Other
Description: This proposal is a continuation of the FPL1 project, "Plug Abandoned Oil and Gas Wells on Padre Island National Seashore" and addresses additional sites on the Seashore and other parts of coastal Texas. This proposal also complements other FPL1-funded projects including the Bahia Grande Coastal Corridor.

Funds: $200,000.00
Type: Bldg on Others
Status: Received
Source Type: Other Federal
Description: Additional funding provided through forfeiture of a performance bond that is associated with the FPL1 project, "Plug Abandoned Oil and Gas Wells on Padre Island National Seashore."

Environmental Compliance:
Most National Park Service (NPS) sites and wells have completed environmental compliance, and DOI is preparing the documentation needed to move the implementation component of this proposed activity into FPL Category 1. DOI will provide this documentation - as needed - prior to publication of the draft FPL, and will revise the proposal accordingly.

Remaining NPS sites and sites located on U.S. Fish and Wildlife Service (FWS) Refuge lands have not acquired full environmental clearances necessary for the decommissioning. These FWS sites are proposed as Category 2 to complete site planning and necessary clearances. For those projects where cultural and environmental compliance needs to be completed, there are no anticipated complexities or uncertainties for completing the necessary compliance. (See attached checklist).

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National Park Service. 1991. Natural Resource Management Guideline Manual, NPS-77, Disturbed Lands Restoration. https://irma.nps.gov/DataStore/DownloadFile/152697

NPS. 2004. Guideline for the Detection and Quantification of Contamination at Oil and Gas Operations. 16 pp.

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National Petroleum Council. 2011. Paper #2-25 Plugging and Abandonment of Oil and Gas Wells. 21 pp.

Railroad Commission of Texas. 2000. Well Plugging Primer. 20 pp. https://www.rrc.texas.gov/media/2142/plugprimer1.pdf

Texas Administrative Code. Title 16, Part 1, Chapter 3, Rule 3.14, Plugging. https://texreg.sos.state.tx.us/public/readtac$ext.TacPage?sl=R&app=9&p_dir=&p_rloc=&p_tloc=&p_ploc=&pg=1&p_tac=&ti=16&pt=1&ch=3&rl=14

Vrålstad T., A. Saasen, E. Fjær, T. Øia, J.D. Ytrehus, and M. Khalifeh. 2019. Plug & Abandonment of Offshore Wells: Ensuring Long-term Well Integrity and Cost-efficiency. Journal of Petroleum Science and Engineering. Vol 173. Pages 478-491.

Watson, R.L. 1979. Geological History of South Padre Island Wind-Tidal Flats. Unpublished paper, Port Aransas, Texas.

Weise, B.R. and W.A. White. 1980. Padre Island National Seashore: A Guide to the Geology, Natural Environments, and History of a Texas Barrier Island. Bureau of Economic Geology. Reprinted 1981.
Withers, Kim. 1993. "Study to Determine the Abundance and Distribution of Benthic Invertebrates and Shorebirds on a North Padre Island Blue-Green Algal Flat." Unpublished paper, National Park Service, Corpus Christi, Texas.

Withers, Kim. 1994. "The Relationship of Macrobenthic Prey Availability to Shorebird Use of Blue-Green Algal Flats in the Upper Laguna Madre." Published Ph.D. Thesis. Texas A&M University, College Station, Texas.

Budget

Project Budget Narrative:
The overall budget for this project is $12,985,210. The bulk of the funds requested will be used for implementation of well plugging and site restoration in the amount of $11,346,300. Most sites and wells on the National Park Service (NPS) lands have completed environmental clearances and are ready for implementation. However, planning funds in the amount of $756,420 are requested to complete the environmental clearances and planning needs for U.S. Fish and Wildlife Service (FWS) refuges and remaining NPS sites. Once planning is complete, implementation funds are included in the request to carry-out well plugging and site restoration on FWS sites also. Monitoring and adaptive management funds in the amount of $504,280 are requested for monitoring the restoration sites and adapting to changes in site conditions. Project management in the amount of $378,210 are requested to provide oversight of contracts, agreements, and field activities.

Obligation of these funds will be accomplished using various procurement methods. An existing Cooperative Agreement allows funding to be provided to the Railroad Commission of Texas for the management and contracting of well plugging actions and possibly site restoration. While the agreement will help expedite the obligation of funding, contracts might be awarded by either NPS or FWS for individual plugging and/or restoration projects if appropriate. Restoration monitoring will be accomplished via a contract or the hiring of temporary staff.

Total FPL 3 Project/Program Budget Request:
$ 12,985,210.00

Estimated Percent Monitoring and Adaptive Management: 4 %
Estimated Percent Planning: 6 %
Estimated Percent Implementation: 87 %
Estimated Percent Project Management: 3 %
Estimated Percent Data Management: 0 %
Estimated Percent Contingency: 0 %

Is the Project Scalable?
Yes

If yes, provide a short description regarding scalability.:
This program involves actions that take place at discreet locations within the State, refuges, or parks that can be addressed independently from other project locations. Additionally, the proposed plugging and restoration activities are consistent between locations and therefore can be combined in numerous ways to capitalize on the proximity of locations.

Environmental Compliance[1]

Environmental Requirement	Has the Requirement Been Addressed?	Compliance Notes (e.g.,title and date of document, permit number, weblink etc.)
National Environmental Policy Act	Y	Council's Planning CE
Endangered Species Act	N/A	Note not provided.
National Historic Preservation Act	N/A	Note not provided.
Magnuson-Stevens Act	N/A	Note not provided.
Fish and Wildlife Conservation Act	N/A	Note not provided.
Coastal Zone Management Act	N/A	Note not provided.
Coastal Barrier Resources Act	N/A	Note not provided.
Farmland Protection Policy Act	N/A	Note not provided.
Clean Water Act (Section 404)	N/A	Note not provided.
River and Harbors Act (Section 10)	N/A	Note not provided.
Marine Protection, Research and Sanctuaries Act	N/A	Note not provided.
Marine Mammal Protection Act	N/A	Note not provided.
National Marine Sanctuaries Act	N/A	Note not provided.
Migratory Bird Treaty Act	N/A	Note not provided.
Bald and Golden Eagle Protection Act	N/A	Note not provided.
Clean Air Act	N/A	Note not provided.
Other Applicable Environmental Compliance Laws or Regulations	N/A	Note not provided.

[1] Environmental Compliance document uploads available by request (restorecouncil@restorethegulf.gov).

Maps, Charts, Figures

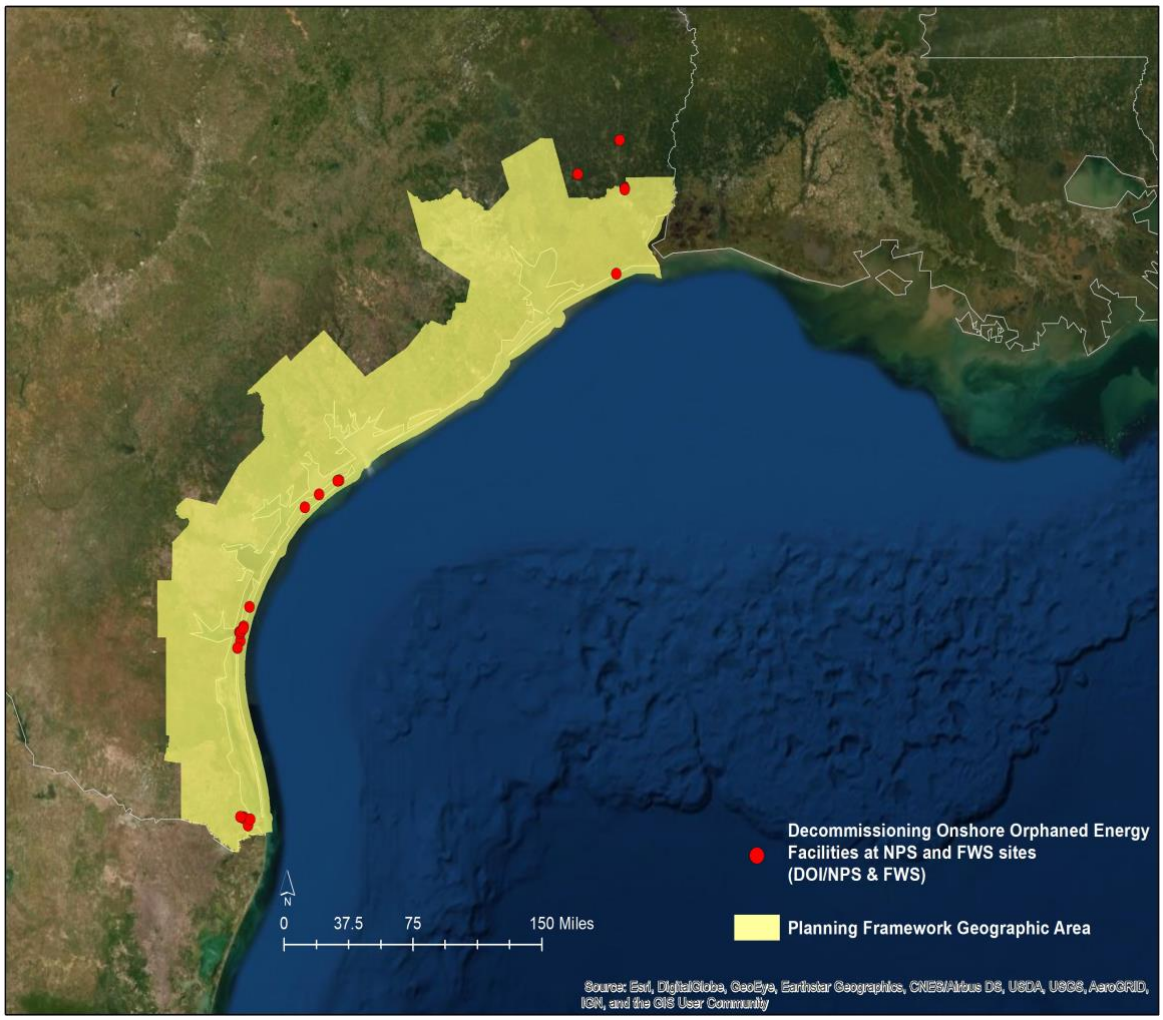

Figure 1. DOI NPS/FWS Map

Other Uploads

Main Uploads_0:
RRC Public Comment_Restore FPL Number 3.pdf
Link to Download
http://www.restorethegulf.gov/apps/piper/web/Uploads/Download/proposal/554/50

Tables_2:
TABLE 1 - Proposed NPS and FWS Oil and Gas Sites to be Decommissioned.pdf
Table 1
Link to Download
http://www.restorethegulf.gov/apps/piper/web/Uploads/Download/proposal/544/50

FPL 3b Internal Staff Review of Proposal Submitted 4/24/2020

Project/Program	Decommissioning Onshore Orphaned Energy Facilities on NPS and FWS lands (DOI/NPS & FWS)		
Primary Reviewer	Jean Cowan	Sponsor	DOI
EC Reviewer	John Ettinger	Co-Sponsor	

1. Is/Are the selected Priority Criteria supported by information in the proposal?	Yes
Notes	

2. Does the proposal meet the RESTORE Act geographic eligibility requirement?	Yes
Notes	

3. Are the Comprehensive Plan primary goal and primary objective supported by information in the proposal?	Yes
Notes	

4. Planning Framework: If the proposal is designed to align with the Planning Framework, does the proposal support the selected priority approaches, priority techniques, and/or geographic area?	Yes
Notes	

5. Does the proposal align with the applicable RESTORE Council definition of project or program?	Yes
Notes	

6. Does the budget narrative adequately describe the costs associated with the proposed activity?	More information needed
Notes	Council staff recommend that the budget narrative be edited to include the amount of funding being requested in FPL Category 1 and FPL Category 2. The proposed budget describes the amounts needed for the various activities (including planning, implementation, data management, monitoring and adaptive management, and project management), but does not indicate which activities and associated budgeted amounts are in Category 1 and which are in Category 2. It is anticipated that only the Implementation and construction funding for sites where environmental clearances have not been obtained would be requested in Category 2. The need for contingency funds for construction activities is not discussed. Please consider adding a statement that, as appropriate, funds

	for contingency will be considered for inclusion in the budgets for the individual restoration sites as these are developed.

7. Are there any recommended revisions to the selected leveraged funding categories?			No
Notes			

8. Have three external BAS reviews been completed?	More information needed
Notes	Please see the external BAS review comments, and external reviews summary attached with these review comments.

9. Have appropriate metrics been proposed to support all primary and secondary goals?	Yes
Notes	

10. Environmental compliance: If FPL Category 1 has been selected for the implementation component of the project or program, does the proposal include environmental compliance documentation that fully supports the selection of Category 1?	N/A
Notes	

11. Geospatial Compliance: Have the appropriate geospatial files and associated metadata been submitted along with a map of the proposed project/program area?	More information needed
Notes	The submitted GIS project boundary intersects more locations than selected. Council staff recommends the sponsor add Kenedy County to selected county list and Central Laguna Madre, Lower Neches, and Sabine Lake watersheds to the selection.

FPL3b BAS Review Summary -- Decommissioning Onshore Orphaned Energy Facilities on NPS and FWS lands

May 2020

The external Best Available Science reviews for the *Decommissioning Onshore Orphaned Energy Facilities* proposal are mixed, with some concerns regarding planning, especially regarding the proposed tidal flats activity. All reviewers agree that the proposal identifies likely environmental benefits of the program. They also agree that the program has clearly defined objectives and measures of success for the program align with the primary Comprehensive Plan goal and objective.

Reviewers did not agree on whether the proposal objectives, including proposed methods, have been justified using peer reviewed and/or publicly available information. Reviewer 1 notes the applicants' extensive experience in the restoration field and that the program couples this with information from the academic community. While also supportive, Reviewer 2 would like to see the addition of the contracting process to the applicants' nine planning steps: "Evaluating the contractor's financial stability, workforce, safety record, equipment upkeep and availability, work planning and management must be factored into the proposal objectives." They would also like to see more information on crisis management and further discussion of the engineering and planning, especially in "[...] developing implementation techniques and methods of plugging and abandonment, equipment clean up and removal, pipeline removals, etc." Reviewer 3 believes plugging wells and restoring impacted lands have been clearly discussed, but does not believe that the proposed methods for the restoration of tidal flats have been defined and that these should be addressed before funding is awarded. Conversely, Reviewer 1 sees the possibility of developing new knowledge on the restoration of tidal flats a strength of the program.

All reviewers are in agreement that literature sources used to support the proposal are accurately and completely cited. Reviewer 1 believes the literature is "thoroughly documented and well dovetailed" and this sentiment is supported by Reviewer 2, though they would like to see the addition of Louisiana Department of Natural Resources, Office of Conservation, Oilfield Site Restoration Commision in the literature cited (and also in regards to benchmarking and best practices) and more outreach undertaken towards agencies and experts with similar expertise. Reviewer 3 also agrees that the cited literature is sufficient, except in the case of tidal flat restoration. They would like to see the addition of previous tidal flat restoration studies, increased discussion of methodologies planning to be used, and the inclusion of more outside experts familiar with tidal flat restoration.

Reviewers 1 and 3 feel the proposal addresses short- and long-term risks and contingencies associated with the program. Reviewer 1 states, "Along with risks and contingency plans for the duration of the project (i.e. 5 years), the applicants also consider long term risks and make a convincing case that, if they achieve their goals at the end of the project and secure well-established restored systems, these newly restored systems should be resilient to long-term

perturbations and, thus, little further risks expected upon restoration." However, Reviewer 2 would like a more detailed discussion of the risks, especially in regards to decommissioning wells in remote areas. Particularly they feel that the proposal should elaborate on the use of helicopters and the risks associated with bringing in additional equipment in the event said helicopters lose control. "A Hazop should be performed for all activities as also a detail[ed] risk matrix for all aspects of the project and especially equipment and manpower availability and techniques to be used in the implementation of the proposal. Worst case scenarios should be developed for all activities[...]."

Overall, the three Reviewers differ in their assessment of this proposal. Reviewer 3 does not think that the proposal should advance until approaches and methods for achieving tidal restoration are developed. Reviewer 2 believes that the proposal demonstrates the use of science but should also address additional work in the risk, crisis management, data management, contractor selection and management, engineering assurance, benchmarking and setting defined goals (including stretch goals) – not just targets." Finally, Reviewer 1 states, "The benefits of this work are several, including healthier and more resilient coastal communities. The applicants are in a superior position to carry out the work successfully, given their history of accumulated knowledge. It is clear they have thought the proposal over carefully and methodically, and have chosen the right partners and developed contingency plans to ensure they accomplish the goals successfully."

FWS/NPS responses to FPL3b BAS Review comments on Decommissioning Onshore Orphaned Energy Facilities on NPS and FWS lands proposal

FWS and NPS were pleased to receive helpful comments as part of the Best Available Science review of this project. We have added additional information in the proposal to address the comments but have provided extensive information below that may also be helpful in clarifying some of the material presented in the proposal.

Tidal Flats restoration details – **Reviewer 3 had many comments that indicated our tidal flat restoration information was insufficiently detailed.**
Additional information was added on Pages 10, 11, and 12 to provide additional detail about the wetland restoration methods and vehicle track restoration. And, a major change was made: Instead of including both the trial project and the implementation the proposal has been modified to be the trial only. A discussion follows that aims to further articulate the approach we have identified and why the project should be successful.

Wind-tidal flats are low, relatively flat areas inundated when high water conditions are created by northerly winds and left uncovered when low-water conditions are created by southerly winds (hence the term "wind-tidal flats"). Tidal flat elevation changes range from sea level to .8 feet and change on the order of .2 feet per mile (Watson, 1979). These mudflats form an almost continuous band along the Laguna Madre side of Padre Island National Seashore. Tidal flats begin at mean sea level and extend upward to at least mean high tide. In the southern areas of the park, wind-tidal flats may extend to high wind-tide levels. They are generally covered with a blue-green algal mat that ranges between a thin layer up to 0.4 inches (2 cm) thick.

Frequently inundated by Laguna Madre waters driven by wind, some parts of the flats support extensive mats of blue-green algae, and are essential habitat for the piping plover (Withers 1993). Wind-tidal flats play a crucial role in the life history of some of Texas' most important commercial fish and shellfish industries and offer significant feeding areas for aquatic bird life (Withers, 1993). They provide abundant amounts of blue-green microalgae, which contribute to the primary productivity of estuarine systems. Their productivity is comparable to seagrass beds and to 20-40 percent of a typical marshhay cordgrass (*Spartina patens*) marsh. The mats of blue-green algae are also essential habitat for the piping plover (Withers 1993). These mats of algae are quite distinct from the harmful algal blooms that have been increasing in frequency and extent in recent years in the Gulf of Mexico and form the critical base of the food chain supporting the ecology and economy of the Gulf.

Macrobenthic invertebrates inhabit the wind-tidal flats in the Laguna Madre and create an abundant and diverse benthic community that exists throughout most of the year (Withers 1994). Detritus from other estuarine habitats such as seagrass beds is deposited in large quantities on the flats, and, combined with the large algal biomass, contribute to the high productivity found in this area. As a result of the high productivity, the wind-tidal flats are inhabited by a diverse set of benthic invertebrates, which are then preyed upon by demersal fish and crabs. In addition, shorebirds utilize these areas making them significant feeding areas during the winter and migration seasons along the Texas Gulf Coast (Withers 1994), particularly the endangered and/or threatened piping and snowy plovers.

The addition of fill materials and soil compaction are anthropogenic disturbances that adversely affect blue-green algal mat production. Extensive blue-green algal mat production is dependent on flats that are alternately emergent and submerged in regular cycles. The use of fill in the wind-tidal flat areas not only converts the flats to an elevated landform, it also disrupts the hydrological cycle. The filled area could act

as a barrier to inundation or allow water to be retained behind the filled area. Irregular inundation and excessive water retention both adversely affect blue-green algal mat production. Soil compaction by vehicular traffic in wind-tidal flats disturbs the hydrological regime by allowing compacted areas to remain submerged. Wind-tidal flats that are submerged too frequently do not have extensive algal mats (Weise and White 1980).

The project therefore proposes an effort to test restoration techniques on the wind tidal flats at Padre Island National Seashore from these types of disturbances. The project proponents acknowledge, however, that restoration of wind tidal flats has not previously been attempted within Padre Island National Seashore, and restoration of wind tidal flats in the surrounding area has never been attempted. A literature search revealed that few tidal flat restoration projects have been conducted in the United States, Canada, and Japan. Those projects that were undertaken focused on man-made habitats rather than natural habitats. Though there are no established or standard methods to restore this type of wetland, NPS has considerable knowledge and tools that have been used for similar restoration. The NPS has considerable experience in beach restoration, including but not limited to: 1) Cape Hatteras National Seashore where 2.6 million cubic yards of beach quality sand was placed along approximately 2.2 miles of shoreline (USACE, 2015), 2) Cape Lookout National Seashore where 3,850 linear feet of beach was restored (Schupp, 2017), 3) several projects at Gulf Islands National Seashore where approximately 4.9 miles of shoreline was restored along the eastern end of Perdido Key (Gibson and Looney, 2020), and 4) a beach nourishment project where approximately 500,000 cubic yards of beach quality sand was placed along 10,000 feet of the northern shoreline of West Ship Island, within the Mississippi District of Gulf Islands National Seashore (USACE, 2016). Though tidal mudflat restoration is somewhat different, the basic principles are the same: establish a proper slope in the tidal range, restore with similar grain sized sediments, and plant with appropriate flora.

Because there has been no previous restoration of wind tidal flats in the park or surrounding area, we have no successful restoration project to base an assured method to restore the wind tidal flats. In the proposal, we describe our plan to form a technical team consisting of park staff, NPS and USACE wetlands scientists, Dr. Kim Withers, Dr. Paul Zimba, and wetlands restoration technical specialists (from private industry) to develop and test restoration methods on small plots. Upon completing the experimental phase, the team will recommend how to proceed with restoration on the remaining area.

The methodology to restore vehicle tracks may include a variety of hand and mechanized tools to decompress the tracks without causing new impacts along the tracks or adjacent wind tidal flats. This technology will reduce the impacts resulting from the restoration activities themselves. Preliminary evidence suggests that re-contouring plus the addition of cultured algae can restore these sites. Timing restrictions will be defined to avoid impacting wildlife use of the flats and to maximize restoration success.

NPS has existing relationships with experts in mudflat ecology from Texas A&M University – Corpus Christi. Restoration techniques are not extensively developed, but NPS knows enough to perform a series of exploratory test plots to inform the larger restoration efforts. Suzuki (2004) and Lee and Lee (2000) show that newly groomed sediments can be a successful platform for tidal flat restoration. In general, restoration will involve grooming tracks with the use of hand tools and ambient soils to prevent further impacts, establishing the proper slope within the tidal range, and inoculating the soils with a mixture of the 12 dominant algal species - all of which can easily be grown in controlled conditions in roughly 30 days (Zimba, pers. comm.). Only 0.2 grams of algal material has been shown to reestablish $1m^2$ of tidal flat. Salinity concentrations will be monitored using salinity recorders at low, medium and highest elevations. Up to 41 1.0 cm cores will be obtained monthly to determine the developing algal community structure. This information will help to determine how best to approach large-scaled restoration efforts.

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Engineering and planning detail – **Reviewers 2 and 3 commented that additional details are needed about the specifics of how the well plugging operations would be conducted (including engineering, planning, risk management and benchmarking).**

A paragraph was added on page 7 detailing how the project would develop a robust Plan of Operation (PoP) for each well that outlines legal documentation and support for the operation, siting considerations, natural resource surveys and results, detailed descriptions of each operational phase, identification of mitigation measures, remediation and reclamation actions, and more.

The NPS, USFWS, and state agencies such as the Railroad Commission of Texas rely on existing industry standards and agency experience to ensure that well plugging operations are conducted in the

safest and appropriate manner. These programs along with existing regulations, policies, and best management practices are used to manage and implement oil and gas operations including undertaking well plugging. Agency policies and regulations (including 36 CFR Part 9, Subpart B) would not allow a plugging operation to be undertaken without appropriate engineering and design review and approval., Additionally, engineering and planning are required in order to obtain permits from the State of Texas, the National Park Service, and the U.S. Fish and Wildlife Service. Each of these agencies have staff with expertise and experience with oil and gas operations who will ensure that proposed well plugging operations meet legal and industry standards. As identified in the proposal, the Railroad Commission of Texas has a robust management program and decades of experience plugging wells. This agency would be the primary agency to implement this project.

These agencies have decades of experience regulating, permitting, and monitoring the oil and gas industry throughout Texas. As such, they routinely evaluate the successes and failures to ensure that more recent oil and gas operations, including well plugging actions, are undertaken in a way that protects parks and refuges. Plugging and abandonment benchmarks have been established by the oil and gas industry and are utilized by operators. These benchmarks include such considerations as the use of certain drilling fluids to sustain formation pressures, identifying permeability requirements for the cement composition of well plugs, potentially using blowout preventers that are appropriate for the individual characteristics of a well, and more. The oil and gas industry routinely evaluates the equipment and techniques used to establish new and updated benchmarks. As such, it is the practice of the NPS and FWS to utilize these benchmarks along with other management requirements to ensure that oil and gas reclamation activities are conducted in a manner that protects the natural and cultural resources and values of parks and refuges.

Here are some additional references that the project proponents may use to ensure a successful project.

PoPs developed by oil and gas operators and subsequently approved by NPS to serve as the operator's permit to conduct the operations.
These plans of operations and the NPS's or FWS's associated environmental assessments, biological assessments, and wetlands and floodplains statements of findings describe how the operations will be ultimately reclaimed. The plans of operations and EAs and SOFs were released for public and agency review prior to the NPS or FWS approving the operations. Also included are examples of Special Use Permits issued by the U.S. Fish and Wildlife Service to operators conducting oil and gas operations on refuges.

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https://tpwd.texas.gov/landwater/land/tcap/documents/gcpm_tcap_2012.pdf) [pertains to issues raised in Comments 6, 7 and 8 (see pages 30-31).]

Examples of NPS PoPs prepared by active oil and gas operators, and associated NPS compliance documentation:

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_____. 2012b. *Environmental Assessment: Cimarex Energy Company Proposal to Conduct the Rivers Edge 3D Seismic Survey within the Big Thicket National Preserve, Hardin, Jasper, Jefferson, and Orange Counties, Texas.*

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_____. 2005. Supplement to the BNP Petroleum Corporation's Peach #1 Plan of Operations for Proposed Drilling and Production Operations for the Dunn-Peach #2, #3, #4, #5, and #6 Wells within Padre Island National Seashore, Kleberg County, Texas.

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U.S. Fish and Wildlife Service. 2006. Special Use Permit SLR-06-031 issued by USFWS Atchafalaya NWR to Gulf South Operators, Inc., to drill the Glen Diaz #1 Gas Well, issued on April 3, 2006.

U.S. Fish and Wildlife Service. 2012. Special Use Permit (SUP) OG12002 issued by U.S. Fish and Wildlife Service (USFWS) Hagerman NWR to Jetta Operating Company, Inc., for drilling and operation of J&M 1H well on 3/16/2012 in conjunction with U.S. Army Corps of Engineers-Lake Texoma- Mineral Consent DACW56-C-12-081 issued on January 31, 2012.

U.S. Fish and Wildlife Service. 2012. Special Use Permit OG13002 issued by USFWS Hagerman NWR to Cholla Petroleum for reclamation/restoration work on Bailey Unit #1 well site (Well plugged on 10/19/12) issued on 11/16/2012. Final restoration inspection conducted by Hagerman NWR on August 8, 2013. Letter sent to U.S. Army Corps of Engineers Lake Texoma on October 17, 2013 requesting to release bond held by U.S. COE with Mineral Consent DACW56-C-07-012.

Reference related to oil and gas pipelines and access canals, their effects in Gulf of Mexico coastal wetlands, and reclamation/restoration opportunities:

Baumann, R.H., and R.E. Turner. 1990. Direct impacts of outer continental shelf activities on wetland loss in the central Gulf of Mexico. Environmental Geology and Water Sciences 15(3):189-198.

Baustian, J.J., and R.E. Turner. 2006. Restoration Success of Backfilling Canals in Coastal Louisiana Marshes. Restoration Ecology 14(4):636-644

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Contracting strategy/contractor evaluation **- Reviewer 2 felt additional details on the contracting process were needed.**

All contracting will be completed according to Federal government standards, including the Federal Acquisition Regulations (https://www.acquisition.gov/browse/index/far), which is the primary regulation used by all executive branch agencies in their acquisition of supplies and services. The steps identified in the proposal refer to text provided in the listed citation that outline the planning steps for undertaking restoration. The steps were not intended to outline other actions commonly considered normal business functions such as contracting, hiring staff, public communication, safety evaluation, and more, as these

actions are required of any project. How a project is contracted depends on a variety of economic and business factors including requirements of Small Business Administration programs, the ability of existing contracts to be modified, cost thresholds that either identify or eliminate certain contracting programs, past contracting success, recent bidder activity, and much more. The NPS and FWS have contracting programs that will evaluate potential programs and requirements to select the best contracting approach. A statement reinforcing this has been added to page 7.

Helicopter-based well work – **Review 2 felt that some risks were not fully evaluated, especially that helicopter operations were not fully evaluated given the potential for very heavy payloads**.
While helicopter-based oil and gas operations have been successful in other areas, it is not a technology normally used by NPS and FWS for plugging. NPS/FWS removed the text about "heliportable plugging equipment" on page 7. The FPL3b proposal no longer relies upon helicopter-based plugging. NPS/FWS anticipate truck or barge access will be the most appropriate.

A paragraph was added to page 12 outlining risks associated with leaving wells unplugged.

Monetary measures of success – **Reviewer 2 commented that monetary targets for success should be added.**
Given the variability in costs depending on the features of the well, this is not a suitable success measure. The purpose of the project is to restore the footprint of the oil and gas operations and prevent future harm to surrounding natural resources. Instead, success should be tailored to the restoration objectives. In addition, the costs associated with plugging a well and restoring a site vary depending on multiple factors such as the age of a well, site access conditions, availability of equipment or contractors, the existing oil and gas economy, and more. Cost estimates in the proposal represent reasonable and expected costs based on input from regulatory agencies, management agencies, existing operations, and other sources. If orphaned wells are not properly plugged, they will eventually fail causing unnecessary impacts and elevated costs to address the impacts. The wells identified in this proposal do not have a viable operator and as such are not maintained to a level that can prolong the life of a well or prevent their eventual failure.

Number of other wells, sites and acres – **Reviewer 2 asked for additional information about these items**
Other wells and sites exist at the NPS and FWS locations identified other than ones addressed in this proposal; however, those wells and sites are either not eligible for funding or have a viable responsible party who is actively managing these operations. Federal and state agencies are using existing programs, technical staff, regulations, policies, management programs, and other means available to actively manage these operations. As such, there is not a need to seek funding opportunities to address them at this time, which is why they have not been included in this proposal.

Second phase details – **Reviewer 2 asked if additional evaluation should be included in this project to identify a 2nd phase of activity?**
The locations identified in this proposal represent the current known well locations that are orphaned and need to be properly plugged. No other sites are known to exist that could be eligible for Gulf restoration funding.

FPL 3b Response to comments from RESTORE Council staff

Budget narrative - **Council staff recommend that the budget narrative be edited to include the amount of funding being requested in FPL Category 1 and FPL Category 2.**
Funding details for Cat 1 and Cat 2 were added to the budget narrative on page 17.

Contingency funds – **Council staff asked us to address contingency funds**
A statement was added on page 18, as suggested.

Project boundary – **Council staff asked to add a set of HUCs and counties**
We added Kennedy County to selected county list and Central Laguna Madre, Lower Neches, and Sabine Lake watersheds to the selection list.

Gulf Coast Ecosystem Restoration Council

FPL 3b Internal Best Available Science Review Panel Summary

July 2020

Introduction

On Tuesday, June 30, and Wednesday July 1, 2020 the RESTORE Council convened the Funded Priorities List (FPL) 3b Internal Best Available Science (BAS) Review Panel. The purpose of this internal panel was to use Council member-agency expertise to address external BAS review comments provided for FPL 3b submitted project/program proposals, and potentially identify project/program synergies not identified prior to proposal submission. The ultimate goal of the panel was to provide Council members with substantive best available science content to inform their decision-making.

The internal panel was convened via webinar with representatives from each of the Council's eleven member agencies present. Each BAS Panel member was provided the following:

1) Full FPL 3b proposals
2) 3 external BAS reviews for each proposal
3) Summary of external BAS reviews for each proposal
4) Proposal Sponsor's response to the BAS reviews summary
5) Any proposed revisions to the proposal

Proposal sponsors provided a brief synopsis of their proposal to the panel, a summary of comments made in external reviews, and discussed their proposed response to the external reviews. Council staff then solicited feedback from the panel on the proposal sponsor's presentation of comments and responses to those comments, and any additional BAS concerns. Council staff also solicited feedback on any existing or future synergies with other Gulf restoration activities. The proceedings of the meeting for this proposal are summarized below.

Department of the Interior

Decommissioning Onshore Orphaned Energy Facilities on NPS and FWS lands

Feedback from the panel on the proposal sponsor's presentation of comments and responses to those comments, and any additional BAS concerns:

Tidal flat restoration information: Tidal flat restoration information is insufficiently detailed.

- The BAS panel agrees that DOI has appropriately addressed this comment.

Methodological details: Well plugging operations details and additional details on the contracting process are needed.

- The BAS panel agrees that DOI has appropriately addressed this comment.

Risks and uncertainties: Some risks were not fully evaluated, including helicopter operations (given the potential for very heavy payloads).

- The BAS panel agrees that DOI has appropriately addressed this comment.

Metric targets: Monetary targets for success should be added.

- The BAS panel agrees that DOI has appropriately addressed this comment.

Site selection: Additional information is requested about the number of other wells and sites and if additional evaluation should be included in this project to identify a 2nd phase of activity.

- The BAS panel agrees that DOI has appropriately addressed this comment.

Other: Panelists note that acreage and costs have changed significantly for this proposal as a result of comments from BAS reviewers.

- DOI response: The reduction in cost and total restoration acres are due entirely to changes we made in response to the BAS review. We retained only five acres of tidal flat restoration which is sufficient to implement a trial of restoration methods. The reduction in total cost is a reflection of limiting the scope to just the trial acreage rather than including all the tidal flat acres (~3000) that warrant restoration.

Other: Panelists suggest that conducting a trial program could help provide a better idea of tidal restoration costs.

- DOI response: We agree. It is our expectation that the tidal flat restoration trial as outlined in our modified proposal will provide DOI and other agencies the information needed to identify successful techniques for tidal flat restoration and that the methods will be well enough understood to provide accurate cost estimates for future tidal flat restoration.

Other: A panelist asks whether there has been previous restoration in Laguna Madre to tidal flats damaged by vehicular traffic.

- DOI response: There have been small-scale efforts to address tidal flat restoration, but there has not been a focused effort to address oil and gas site remediation. If successful, this type of tidal flat restoration could be scaled up and used in other restoration and conservation applications.

Panel comments on existing or future synergies with proposed activity:
Panel members had no further comments on proposal synergies.

SCIENCE EVALUATION

Bucket 2: Comprehensive Plan Component

Proposal Title: Decommissioning Onshore Orphaned Energy Facilities at NPS and FWS Lands
Location (If Applicable): Texas
Council Member Bureau or Agency: U.S. Department of the Interior, U.S. National Park Service & U.S. Fish and Wildlife Service
Type of Funding Requested: Planning / Implementation

Reviewed by: Reviewer 1
Date of Review: May 3, 2020

Best Available Science:

These 4 factors/elements help frame the reviewer's answers to A, B and C found in next section:

Question 1.	
Have the proposal objectives, including proposed methods, been justified using peer reviewed and/or publicly available information?	Yes
Comments:	
The applicants (NPS and FWS) have ample experience in the conservation and restoration of natural resources. The restoration component of this project is based on solid knowledge developed by these agencies and academic community, including new (and somewhat risky) efforts to restore wind tidal flats. For the well plugging and infrastructure removal part of the proposal, they also rely on sound knowledge provided by RRC and BLM.	

Question 2.	
If information supporting the proposal does not directly pertain to the Gulf Coast region, are the proposal's methods reasonably supported and adaptable to that geographic area?	Yes
Comments:	
The methods for the work proposed transcend geographical borderlines. They are based on deep knowledge and experience amassed over many years of successes and failures by federal agencies, state agencies, and the academic community. The methods and techniques proposed are sound and suitable for the sites selected.	

Question 3.	
Are the literature sources used to support the proposal accurately and completely cited? Are the literature sources represented in a fair and unbiased manner?	Yes
Comments:	
The proposal rests on a combination of information generated by federal agencies, state agencies, and the academic communities. This collective knowledge is wonderfully combined in the proposal to present a reassuring and compelling case. The literature sources are thoroughly documented and well dovetailed.	

Question 4.	
Does the proposal evaluate uncertainties and risks in achieving its objectives over time? (e.g., is there an uncertainty or risk in the near- and/or long-term that the project/program will be obsolete or not function as planned?)	Yes
Comments:	
The applicants do a superior job at explaning the risks associated with this work and, most importantly, how those risks can be minimized. In particular, they make a strong case that the new, challenging efforts towards restoring wind tidal flats have a very high probability of being successful due to thorough consideration and minimization of involved risks.	

Based on the answers to the previous 4 questions, and *giving deference to the sponsor to provide within reason the use of best available science,* the following three questions can be answered:

Question A	
Has the applicant provided reasonable justification that the proposal is based on science that uses peer- reviewed and publicly available data?	Yes
Comments:	
This proposal is strong. It is based on solid knowledge developed over many years of work by public agencies, the private sector and the academic community. The plan proposed to restore the 25 sites targeted is certainly based on the best science available. Even more, this proposal will develop new knowledge (i.e. restoration of wind tidal flats) that will improve our understanding of natural resource conservation and restoration.	

Question B	
Has the applicant provided reasonable justification that the proposal is based on science that maximizes the quality, objectivity, and integrity of information (including, as applicable, statistical information)?	Yes
Comments:	
The proposal presents choices for well plugginig, removal and site restoration based on lessons learned from past work. The work the applicants lay out is highly defensible and based on prior convincing results. Thus the work proposed here has the quality and integrity warranted by best-science practices.	

Question C	
Has the applicant provided reasonable justification that the proposal is based on science that clearly documents and communicates risks and uncertainties in the scientific basis for such projects/programs?	Yes
Comments:	
The proposal thoroughly considers the risks and uncertainties involved with the work plan. Most importantly, it convincingly explains how all those risks and uncertainties will be minimized using best practices, pilot experiments, continuous re-evaluation, and concerted team discussion.	

Science Context Evaluation:

Question A	
Has the project/program sponsor or project partners demonstrated experience in implementing a project/program similar to the one being proposed?	Yes
Comments:	
NPS and FWS have ample experience in preserving and restoring environmental resources. As a matter of fact, they are arguably world leaders in such activities. This proposal adds to their long list of habitat restoration projects, and there is no doubt they are highly proficient and will apply best practices to restore native vegetation in the sites. Furthermore, to ensure the project is carried out to excellent standards, they are teaming up with RRC and BLM for successful execution of well plugging and infrastructure removal.	

Question B	
Does the project/program have clearly defined goals objectives?	Yes
Comments:	
The applicants present a thorough and well-elaborated list of goals. The different phases to accomplish such goals (i.e. planning, well pluggling and infrastructure removal, vegetation restoration, and monitoring) are also well fleshed out. As a reader of the proposal, I am re-assured the applicants have methodically and carefully thought over what they can accomplish and offer evidence that they will accomplish it.	

Question C	
Has the proposal provided a clear description of the methods proposed, and appropriate justification for why the method is being selected (e.g., scientifically sound; cost-effectiveness)?	Yes
Comments:	
The applicants do a superior job at explaning the methods and, most importantly, justifying why such methods are excellent choices for this proposal. Through the use of best science, best practices, and the right partners, the proposal collectively presents a suite of methods that will certainly accomplish the goals sought.	

Question D	
Does the project/program identify the likely environmental benefits of the proposed activity? Where applicable, does the application discuss those benefits in reference to one or more underlying environmental stressors identified by best available science and/or regional plans?	Yes
Comments:	
The proposal elaborates well on the environmental and societal benefits of the work proposed, since that is part of the mission of NPS and FWS. The restoration achieved with this work will create new habitat for important species, increase the resilience and health of coastal environments, and benefit the well-being of coastal human populations.	

Question E	
Does the project/program have measures of success (i.e., metrics) that align with the primary Comprehensive Plan goal(s)/objectives? (Captures the statistical information requirement as defined by RESTORE Act)	Yes
Comments:	
The applicants do a good job at explaning how they will measure project success. In particular they offer a number of well-thought metrics that can quantitatively gauge the extent to which their goals are achieved. Importantly, they will be continuously applying such metrics and evaluating success of the project throughout its duration, so the specific details of the metrics can be revisited and modified as granted by unexpected contingencies.	

Question F	
Does the proposal discuss the project/program's vulnerability to potential long-term environmental risks (i.e., climate, pollution, changing land use)? (Captures risk measures as defined under best available science by the RESTORE Act)	Yes
Comments:	
Along with risks and contingency plans for the duration of the project (i.e. 5 years), the applicans also consider long term risks and make a convincing case that, if they achieve their goals at the end of the project and secure well-established restored systems, these newly restored systems should be resilient to long-term perturbations and, thus, little further risks expected upon restoration.	

Question G	
Does the project/program consider other applicable short-term implementation risks and scientific uncertainties? Such risks may include the potential for unanticipated adverse environmental and/or socio-economic impacts from project implementation. Is there a mitigation plan in place to address these risks? Any relevant scientific uncertainties and/or data gaps should also be discussed. (Captures risk measures as defined under best available science by the RESTORE Act)	Yes
Comments:	
The project presents a detailed elaboration of risks/uncertainties over the duration of the project, and most importantly what measures will be implemented to minimize such rinks/uncertainties. The applicants have made a strong case that their proposal will indeed be successful because they have thoroughly thought of what can go wrong and what to do to "fix" it.	

Question H	
Does the project/program consider recent and/or relevant information in discussing the elements above?	Yes
Comments:	
The information used by the applicants to back up and elaborate their case is state-of-the art. The proposal is based on the latest developments and it is truly solid.	

Question I	
Has the project/program evaluated past successes and failures of similar efforts? (Captures the communication of risks and uncertainties in the scientific basis for such projects as defined by the RESTORE Act)	Yes
Comments:	
NPS and FWS have a long history of dealing with projects similar to the one presented here. They have had many failures and successes, which has allowed them to develop a wealth of knowledge in natural resource conservation and restoration paralleled by very few other agencies in the world. This project is based on such wealth of knowledge, and there is little doubt the applicants will be successful with these efforts.	

Question J	
Has the project/program identified a monitoring and data management strategy that will support project measures of success (i.e., metrics). If so, is appropriate best available science justification provided? If applicable, how is adaptive management informed by the performance criteria? (Captures statistical information requirement a defined by the RESTORE Act)	Yes

Comments:

The applicants present strong monitoring and adapative management plans based on best-knowledge practices. I am reassured they will be successful at correcting unexpected contingencies and achieving their goals. Regarding data management plans, the applicants will be implementing their existing data sets with the new data collected, and transferring the implemented data sets to the RESTORE council for further data management.

Please summarize any additional information needed below:

This is an excellent proposal. It involves a timely and important topic, i.e. orphaned oil and gas wells, and presents a convincing case of how to decommission the wells and restore the sites successfully. The benefits of this work are several, including healthier and more resilient coastal communities. The applicants are in a superior position to carry out the work successfully, given their history of accumulated knowledge. It is clear they have throught the proposal over carefully and methodically, and have chosen the right partners and developed contingency plans to ensure they accomplish the goals successfully. Superb job!

SCIENCE EVALUATION

Bucket 2: Comprehensive Plan Component

Proposal Title: Decommissioning Onshore Orphaned Energy Facilities at NPS and FWS Lands
Location (If Applicable): Texas
Council Member Bureau or Agency: U.S. Department of the Interior, U.S. National Park Service & U.S. Fish and Wildlife Service
Type of Funding Requested: Planning / Implementation

Reviewed by: Reviewer 2
Date of Review: May 5, 2020

Best Available Science:

These 4 factors/elements help frame the reviewer's answers to A, B and C found in next section:

Question 1.	
Have the proposal objectives, including proposed methods, been justified using peer reviewed and/or publicly available information?	Yes
Comments:	
The 9 planning steps take into most all of the necessary steps but leaves out a contracting strategy as an individual step. This should be a stand alone step since it is so critical to success of the project. Evaulating the contractor's financial stability, workforce, safety record, equipment upkeep and availability, work planning and management must be factored into the proposal objectives. Also crisis management is not addressed in this proposal.	

Question 2.	
If information supporting the proposal does not directly pertain to the Gulf Coast region, are the proposal's methods reasonably supported and adaptable to that geographic area?	Yes
Comments:	
The information directly pertains to the Gulf Coast region.	

Question 3.	
Are the literature sources used to support the proposal accurately and completely cited? Are the literature sources represented in a fair and unbiased manner?	Yes
Comments:	
Yes. In addition, the Louisiana Department of Natural Resources, Office of Conservation, Oilfield Site Restoration Commission should be used as a resource because of their vast knowledge and experience in plugging and abandoning wells and locations in the marsh and state coastal waters. They have vast processes and should be used in this case.	

Question 4.	
Does the proposal evaluate uncertainties and risks in achieving its objectives over time? (e.g., is there an uncertainty or risk in the near- and/or long-term that the project/program will be obsolete or not function as planned?)	Yes
Comments:	
I do no think the risk is factored as heavily as it should be in plugging and abandoning wells in remote areas – some with very little information. As an example using a helicopter to get plugging equipment into the marsh area has not been thoroughly evaluated in the case where well control is lost and equipment must be brought in in large numbers and sizing above what a helicopter can ferry. There are very few rigs that are broken down into small enough loads to be handled by helicopters. A Hazop should be performed for all activities as also a detail risk matrix for all aspects of the project and especially equipment and manpower availability and techniques to be used in the implementation of the proposal. Worst case scenarios should be developed for all activities – don't do more damage than what is already present.	

Based on the answers to the previous 4 questions, and *giving deference to the sponsor to provide within reason the use of best available science,* the following three questions can be answered:

Question A	
Has the applicant provided reasonable justification that the proposal is based on science that uses peer- reviewed and publicly available data?	Yes
Comments:	
The need for the project is properly justified, more work needs to be put into the planning and implementation phase	

Question B	
Has the applicant provided reasonable justification that the proposal is based on science that maximizes the quality, objectivity, and integrity of information (including, as applicable, statistical information)?	Yes
Comments:	
The project as is should be a go but additional work should be done on benchmarking efforts of industry and other states in performing this kind of work.	

Question C	
Has the applicant provided reasonable justification that the proposal is based on science that clearly documents and communicates risks and uncertainties in the scientific basis for such projects/programs?	Need more information
Comments:	

See question 4 above for explanation. This is not just a science based project and requires detailed engineering and planning. That portion of the project has not been significantly addressed.

Science Context Evaluation:

Question A	
Has the project/program sponsor or project partners demonstrated experience in implementing a project/program similar to the one being proposed?	Need more information
Comments:	
The only agency referred to here is the TRRC which has experience in this type of activity. However, marsh and shallow coastal water plugging takes specific experience and equipment. An outreach should be made to other agencies and industry experts to help in design in the implementation of the techniques, personnel and equipment to be used to achieve high success.	

Question B	
Does the project/program have clearly defined goals objectives?	Yes
Comments:	
The goals and objectives are clearly defined.	

Question C

Has the proposal provided a clear description of the methods proposed, and appropriate justification for why the method is being selected (e.g., scientifically sound; cost-effectiveness)?	Need more information
Comments:	
The proposal does a good job of providing the methods and appropriate justification for the restoration and environmental improvements methods being used but needs to spend addition effort on developing implementation techniques and methods of plugging and abandonment, equipment clean up and removal, pipeline removals, etc.	

Question D	
Does the project/program identify the likely environmental benefits of the proposed activity? Where applicable, does the application discuss those benefits in reference to one or more underlying environmental stressors identified by best available science and/or regional plans?	Yes
Comments:	
Yes, very good job is done in this area.	

Question E	
Does the project/program have measures of success (i.e., metrics) that align with the primary Comprehensive Plan goal(s)/objectives? (Captures the statistical information requirement as defined by RESTORE Act)	Yes
Comments:	
Click here to enter text.	

Question F	
Does the proposal discuss the project/program's vulnerability to potential long-term environmental risks (i.e., climate, pollution, changing land use)? (Captures risk measures as defined under best available science by the RESTORE Act)	Need more information
Comments:	
See Question G above for same response	

Question G	
Does the project/program consider other applicable short-term implementation risks and scientific uncertainties? Such risks may include the potential for unanticipated adverse environmental and/or socio-economic impacts from project implementation. Is there a mitigation plan in place to address these risks? Any relevant scientific uncertainties and/or data gaps should also be discussed. (Captures risk measures as defined under best available science by the RESTORE Act)	Need more information
Comments:	
More work should be done in this area before the project is implemented. The risk of not doing the work has been adequately addressed but need additional risk work done on project implementation.	

Question H	
Does the project/program consider recent and/or relevant information in discussing the elements above?	Need more information
Comments:	
It includes some information. Should be additional benchmarking done in performing this type of activity.	

Question I	
Has the project/program evaluated past successes and failures of similar efforts? (Captures the communication of risks and uncertainties in the scientific basis for such projects as defined by the RESTORE Act)	Need more information
Comments:	
Briefly addresses the TRRC efforts but basically dismisses the activity as not having enough money. Need to reach out to industry and State of Louisiana for good practices and process benchmarking.	

Question J	
Has the project/program identified a monitoring and data management strategy that will support project measures of success (i.e., metrics). If so, is appropriate best available science justification provided? If applicable, how is adaptive management informed by the performance criteria? (Captures statistical information requirement a defined by the RESTORE Act)	Need more information
Comments:	
There are very few defined statistical measures that are defined in this proposal as to what achieving success will look like. There are targets but what is the monetary levels tied to achieving those targets. Can more be done with good management. How many other wells, sites and acres have been identified as needing PxA and restoration. Should additional evaluation be included in this project to identify a 2nd phase of activity.	

Please summarize any additional information needed below:

Overall the proposal is adequate to move forward but could be significantly enhanced by additional work in the risk, crisis management, data management, contractor selection and management, engineering assurance, benchmarking and setting defined goals (including stretch goals) – not just targets. The project and proposal should move forward concurrently with this additional work.

SCIENCE EVALUATION

Bucket 2: Comprehensive Plan Component

Proposal Title: Decommissioning Onshore Orphaned Energy Facilities at NPS and FWS Lands
Location (If Applicable): Texas
Council Member Bureau or Agency: U.S. Department of the Interior, U.S. National Park Service & U.S. Fish and Wildlife Service
Type of Funding Requested: Planning / Implementation

Reviewed by: Reviewer 3
Date of Review: May 7, 2020

Best Available Science:

These 4 factors/elements help frame the reviewer's answers to A, B and C found in next section:

Question 1.	
Have the proposal objectives, including proposed methods, been justified using peer reviewed and/or publicly available information?	No
Comments:	
Plugging wells and restoration of energy activity impacted land have been clearly discussed. Restoration of tidal flats is well justified, however, the proposed methods have not been defined. The applicant states that upon award of funding, the proposal team will assemble a group of expertis to identify which methods to implement. Methods should be evaluated and discussed before the project is awarded.	

Question 2.	
If information supporting the proposal does not directly pertain to the Gulf Coast region, are the proposal's methods reasonably supported and adaptable to that geographic area?	No
Comments:	
The answer is yes, with the exception of tidal flat restoration. Well plugging is standard although methods are site dependent. Land recovery is also relatively standard, irrespective of location, although methods are site dependent.	

Question 3.	
Are the literature sources used to support the proposal accurately and completely cited? Are the literature sources represented in a fair and unbiased manner?	No
Comments:	
The answer is yes, with the exception of tidal flat restoration. Additional discussion of methods to be employed in tidal flat restoration is missing and should be added.	

Question 4.	
Does the proposal evaluate uncertainties and risks in achieving its objectives over time? (e.g., is there an uncertainty or risk in the near- and/or long-term that the project/program will be obsolete or not function as planned?)	Yes
Comments:	
Risks associated with well plugging and land restoration from energy activities are not significant, as noted. There are significant risks if wells, pipelines, and facilities are not remediated. The aponsor has included contingency plans in the event that tidal flat restoration is not successful when initially tested.	

Based on the answers to the previous 4 questions, and *giving deference to the sponsor to provide within reason the use of best available science,* the following three questions can be answered:

Question A	
Has the applicant provided reasonable justification that the proposal is based on science that uses peer- reviewed and publicly available data?	No
Comments:	
Restoration of tidal flats is well justified, however, the proposed methods to remedy this problem have not been defined. The sponsor states that upon award of funding, the proposal team will assemble a group of expertis to identify which methods to implement. Granted tidal flat restoration has greater uncertainty than well plugging etc, nonetheless research by the university professor identified for this task should have some documentation on what methods are under consideration.	

Question B	
Has the applicant provided reasonable justification that the proposal is based on science that maximizes the quality, objectivity, and integrity of information (including, as applicable, statistical information)?	No
Comments:	
Again, the answer is yes, with the exception of the tidal flat restoration activity. Well plugging and land restoration (aside from tidal flats) are standard activities with minimal uncertainty and risk if standard practices are followed.	

Question C	
Has the applicant provided reasonable justification that the proposal is based on science that clearly documents and communicates risks and uncertainties in the scientific basis for such projects/programs?	No
Comments:	

Again, the answer is yes, with the exception of the tidal flat restoration activity. Well plugging and land restoration (aside from tidal flats) are standard activities and easily justified. There are minimal uncertainty and risk if standard practices are followed.

Science Context Evaluation:

Question A	
Has the project/program sponsor or project partners demonstrated experience in implementing a project/program similar to the one being proposed?	No
Comments:	
By teaming with the RRC, well plugging will be well informed. Land restoration (aside from the tidal flats) is activity that should be correctly undertaken and easily monitored. Minimal or no expertise in tidal flat restoration is cited in the proposal, other than reference to a local university professor and other personnel from agencies such as the USACOE..	

Question B	
Does the project/program have clearly defined goals objectives?	Yes
Comments:	
Justification for the proposed activities is adequate.	

Question C

Has the proposal provided a clear description of the methods proposed, and appropriate justification for why the method is being selected (e.g., scientifically sound; cost-effectiveness)?	No
Comments:	
Yes, with the exception ot tidal flat resoraton. The application is silent on the science and methods to be used to remedy this issue.	

Question D	
Does the project/program identify the likely environmental benefits of the proposed activity? Where applicable, does the application discuss those benefits in reference to one or more underlying environmental stressors identified by best available science and/or regional plans?	Yes
Comments:	
Justification for all objectives is well described.	

Question E	
Does the project/program have measures of success (i.e., metrics) that align with the primary Comprehensive Plan goal(s)/objectives? (Captures the statistical information requirement as defined by RESTORE Act)	Yes
Comments:	
Success in well plugging is essentially binary, either the well is successfully plugged or not. Land restoration metrics are provided in terms of vegetation resoration. NPS and DWS have established soil and water monitoring programs that would be used.	

Question F	
Does the proposal discuss the project/program's vulnerability to potential long-term environmental risks (i.e., climate, pollution, changing land use)? (Captures risk measures as defined under best available science by the RESTORE Act)	Yes
Comments:	
Click here to enter text.	

Question G	
Does the project/program consider other applicable short-term implementation risks and scientific uncertainties? Such risks may include the potential for unanticipated adverse environmental and/or socio-economic impacts from project implementation. Is there a mitigation plan in place to address these risks? Any relevant scientific uncertainties and/or data gaps should also be discussed. (Captures risk measures as defined under best available science by the RESTORE Act)	Yes
Comments:	
Short term risks to well plugging and land restoration (aside from tidal flats) are not significant. Short-term risks from tidal flat restoration are possible and recognized.	

Question H	
Does the project/program consider recent and/or relevant information in discussing the elements above?	No
Comments:	
Addressing well plugging and land restoration (aside from tidal flats) are established science and technology. Recent refinements are not significant. Recent science advances in tidal flat restoration are not discussed.	

Question I	
Has the project/program evaluated past successes and failures of similar efforts? (Captures the communication of risks and uncertainties in the scientific basis for such projects as defined by the RESTORE Act)	No
Comments:	
Yes in terms of the history of the RRC to plug orphan wells. Land restoration (aside from tidal flats) also has a rich history that should be familiar to the NPS and FWS staff. Similar studies of tidal flat restoration are not discussed and should be added.	

Question J	
Has the project/program identified a monitoring and data management strategy that will support project measures of success (i.e., metrics). If so, is appropriate best available science justification provided? If applicable, how is adaptive management informed by the performance criteria? (Captures statistical information requirement a defined by the RESTORE Act)	Yes
Comments:	
In this case, the proposal includes an experimental first phase of tidal flat restoration to determine the efficacy of the selected remediation approach. NPS and DWS have established soil and water monitoring programs.	

Please summarize any additional information needed below:

The proposed project has three objectives: (i) plug abandoned oil/gas wells; (ii) restore lands directly impacted by oil/gas acitivities; and (iii) restore tidal flats impacted from road and other land alteration. All three objectives are clearly justifiable and have been adequately justified. Approaches and methods for achieving the first two are well established. Approaches and methods to achieve the third, however, are not well established. How to achieve the restoration of tidal flats needs further development before proceeding. It is not advisable to leave this determination until after the project is approved and initiated. Certainly, additional preparation and foreshight is possible as part of the proposal. Additional information would be desirable and advisable.