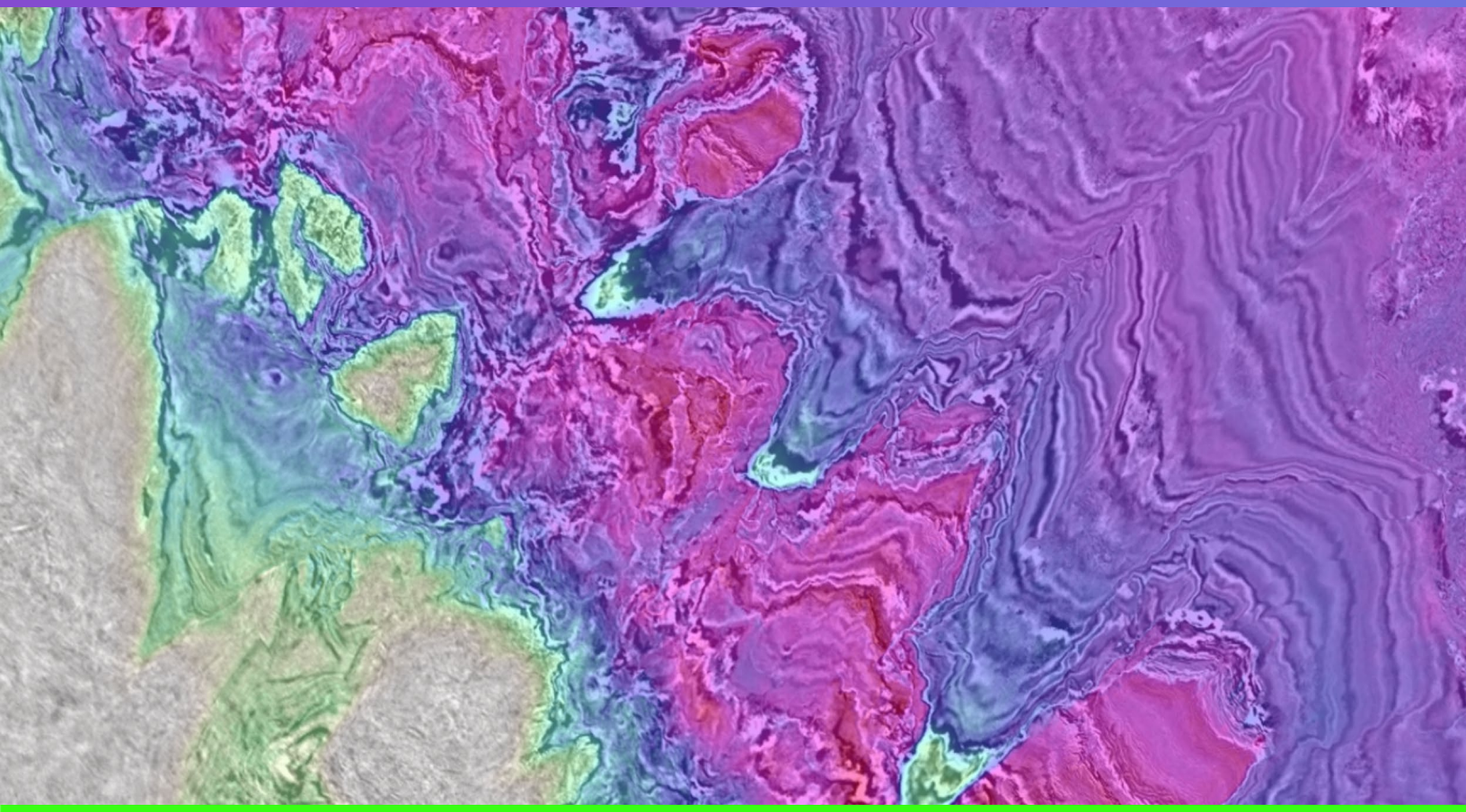

GUYANA 3D SEISMIC SURVEY (SHALLOW WATER)

Project Summary

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Introduction

CGG (part of the Viridien group) is a global advanced technology, digital and Earth data company that provides a comprehensive range of data, products, services and solutions for complex digital, energy transition, natural resource, environmental and infrastructure challenges. In addition to proprietary offshore projects for clients such as Exxon, which discovered the successful Liza field from CGG data, CGG acquired the only two offshore multi-client projects available for licensing in Guyana (Stabroek Phase 1 & 2). Regionally, CGG recently completed a multi-client project in Suriname in 2023. Covering 1,800 sq km, Phase IV completed the programmed 14,500 sq km survey of newly acquired 3D data in deep and shallow water in the Guyana-Suriname basin.

Notably, a pillar of CGG's core values is 'Being Responsible' i.e., caring deeply about the Earth and doing the right thing, always acting safely and with integrity. CGG's ESG ratings consistently place it in the Top 3 of Energy Services companies.

On 11 November 2025, CGG applied for an Environmental Authorization to the Environmental Protection Agency (EPA) in Guyana, to conduct geophysical 3D surveys within shallow waters offshore of Guyana. The areas of interest for the shallow water survey are depicted in Figure 1 and encompass Lot 2 through Lot 4, hereafter referred to as the "Project".

The Application submitted to the Guyana EPA is a notification of offshore surveys that could be performed and is subject to approval by the Government of Guyana. This Project summary is submitted as a part of the legal requirements of the EPA for the environmental authorization process applicable for any new project.

1 Description of the Project

The survey area is offshore of Guyana, east of the border of Venezuela and west of the border of Suriname. The closest shore distance is around 120 km away and ranges with water depths ranging from approximately 10 metres to 70 metres deep.

The project will involve multiple phases. The Project support team will be available to coordinate logistics for the vessels with the Ministry of Natural Resources (MNR), the Guyana Geology and Mines Commission (GGMC) and other key stakeholders.

A research vessel with a towed streamer will be used for the seismic acquisition. This is a common method used to gather detailed subsurface geological information in offshore exploration for oil and gas. CGG currently plans to use the *BGP Prospector* for this project. This vessel is fully furnished with state-of-the-art equipment for seismic 3D surveys. Towed streamer 3D seismic acquisition allows for the efficient and comprehensive mapping of offshore geological formations, providing valuable insights for oil and gas exploration and production activities.

Onshore facilities with pier/port/quayside space and sufficient draft may be used for marine support vessels to service the offshore activities and operations. The table below provides details and description of the process by stages.

Table 1 : Stages of seismic survey

Phase	Details
1. Setup and Deployment	▪ A seismic research vessel will be equipped with one or more long cables, called streamers, typically several kilometres in length. • Each streamer contains multiple hydrophones (receptors for sound waves) evenly spaced along its length. • The streamers are connected to the vessel by towing cables and deployed behind it in a spread formation.
2. Source Deployment	• Seismic sources, such as air guns, are activated at regular intervals along predetermined survey lines. • These sources emit acoustic waves that penetrate the seafloor and subsurface formations.
3.Data Acquisition	• As the seismic vessel moves along the survey lines, the hydrophones in the streamers detect the acoustic waves reflected from subsurface geological structures. • The timing and amplitude of these reflected waves are recorded by the onboard data acquisition system in real-time.
4.Navigation and Positioning	• Precise navigation and positioning systems onboard the vessel ensure accurate recording of the seismic data. • Global Positioning System (GPS), Inertial Navigation Systems (INS), and acoustic positioning systems are commonly used to track the vessel's position and maintain the desired survey geometry.
5.Streamer Steering and Control	• To maintain the desired spread and geometry, streamer steering systems are employed. • These systems use underwater paravanes or deflectors to control the lateral position and depth of the streamers.
6.Continuous Monitoring and Quality Control	• Throughout the survey, data quality is continuously monitored to identify and mitigate any issues that may affect the accuracy of the results. • This may involve adjusting the speed or course of the vessel, optimizing the positioning of the streamers, or troubleshooting equipment malfunctions.
7.Streamer Retrieval	• Once the survey is completed, the streamers are retrieved back onto the vessel.

Phase	Details
	• Careful attention is paid to avoid entanglement or damage to the streamers during retrieval.
8.Data Processing and Interpretation	• The recorded seismic data undergoes extensive processing to enhance clarity and remove noise. • Advanced processing techniques, such as filtering, stacking, migration, and inversion, are applied to create detailed 3D images of the subsurface geology. • Geoscientists and geophysicists interpret these images to identify potential hydrocarbon reservoirs, geological structures, and other subsurface features.

2 Site, Design and Size of the Project

2.1 Project Site

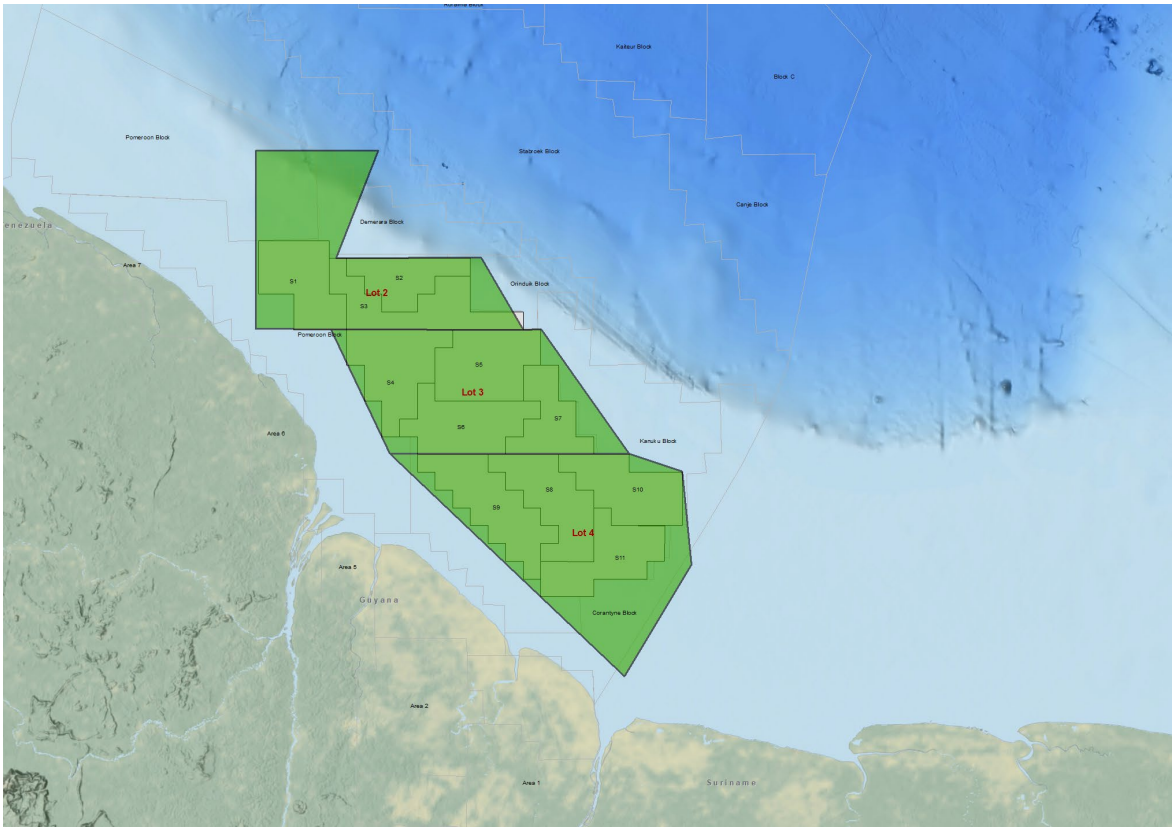

Figure 1 : Survey Area

NAME	POINT_X	POINT_Y	Lat	Long
Lot 2	306010.7	958803.4	8.669862	-58.7631
Lot 2	369616.7	958556.4	8.66986	-58.1851
Lot 2	347555.3	903221.4	8.168807	-58.3838
Lot 2	423075.7	903144.2	8.169872	-57.6983
Lot 2	444873.9	865906.5	7.833343	-57.5
Lot 2	344728.2	866488.9	7.836554	-58.4083
Lot 2	305603.2	866655.1	7.836721	-58.7631
Lot 2	306010.7	958803.4	8.669862	-58.7631
Lot 3	344728.2	866488.9	7.836554	-58.4083
Lot 3	444873.9	865906.5	7.833343	-57.5
Lot 3	454213.5	866251.1	7.836552	-57.4153
Lot 3	500146.2	801742.9	7.253232	-56.9987
Lot 3	375177.3	801898.6	7.253233	-58.1307
Lot 3	344728.2	866488.9	7.836554	-58.4083
Lot 4	500146.2	801742.9	7.253232	-56.9987
Lot 4	527747.6	792538.5	7.169901	-56.7487
Lot 4	532536.9	744211.9	6.732719	-56.7056
Lot 4	497476.9	686415.7	6.209974	-57.0228
Lot 4	375177.3	801898.6	7.253233	-58.1307
Lot 4	500146.2	801742.9	7.253232	-56.9987

Design and Size of the Project

CGG plans to conduct the survey in multiple phases within the Survey area.

The Survey area to be studied includes three (3) Lots offshore of Guyana with the following characteristics.

Lot	Location at Nearest Point	Total Area in square kilometres	Water Depth (m)
Lot 2	Est. 14 km offshore	25,604.78	10-170 m
Lot3	Est. 32 km offshore		20-100 m
Lot4	Est. 30 km offshore		40-120 m

Table 2 : Details of Lots included within Survey Area

2.1.1 3D Seismic Exploration Vessels Set Up and Deployment

Based on the dynamics in the shallow water, a streamer vessel will be used to conduct the seismic survey. An example of these vessels is pictured below in Figures 3. The vessel will be equipped to deploy streamers that detect sound waves, from sources such as air guns, reflected at intervals from subsurface geological structures along pre-determined survey lines.

Figure 2: EXAMPLE OF A STREAMER VESSEL (BGP PROSPECTOR)

2.1.2 Work Force

According to the vessel specifications, the table below summarizes the quantity of personnel who can be accommodated on board per vessel. It is assumed that any qualified employee who will be deployed offshore will be provided with health and safety training (including emergency preparedness and response) appropriate for the role they would assume. These estimates will be refined following selection and contracting for the seismic research vessels.

Vessel	Number of Persons who can be accommodated Onboard
BGP Prospector	66

Table 3: Personnel that can be accommodated on Vessel

In addition to the offshore components, there may be a smaller number of personnel providing logistical and coordination support onshore for the period of the survey.

2.1.3 Waste Management

The Project will generate hazardous and non-hazardous waste daily. Some of the waste will be transported and delivered to an onshore facility for treatment and disposal. The vessels are equipped with marine incinerators for non – hazardous waste. For domestic wastewater, greywater, effluent and sewage generated, the vessels are also equipped with sewage processing plants in accordance with MARPOL regulations. Table 4 below captures the characterization and quantity of waste.

Specific Classification	BGP Prospector Estimated waste generation per day (in m3)
Non-Hazardous Waste	
Food waste	0.02
Paper	0.005
Plastic	0.02
Glass	0.0001
Metal	0.050
Wood	0.001
Cooking Oil	0.005
Hazardous Waste	
Incinerator Ashes	0.007
Fluorescent Bulbs	0.0005
Medical Waste	0.0005
Aerosol cans	0.0005
Oily Waste/Sludge	0.2
E-waste	0.00001

Table 4: Waste Characteristics and Volume

A Waste Management Plan will be developed to ensure that effluents and waste generated during the Project activities (storage, handling, treatment and disposal requirements of the Project wastes for the offshore and onshore operations). The plan will define the waste management philosophy, responsibilities for waste management, waste management methodology and controls for various waste types and classifications; and inspection, monitoring, auditing and reporting of waste management activities.

3 Potential Impacts on the Environment and Proposed Mitigation easures

3.1 Impacts

The impact assessment process is a comparative process that identifies differences between existing physical, biological, and socioeconomic conditions and the projected conditions that are directly or indirectly attributable to the Project, as well as potential cumulative impacts that may result from the Project in combination with other past, present, and reasonably foreseeable future activities. The potential impacts, which are expected to be similar to impacts identified in previous Seismic Research Environmental Assessment and Management Plans in Guyana and other countries could be directly and/or indirectly generated by the Project during the 3D survey, and such impacts could be adverse or positive in nature.

CGG has identified potential impacts from the Project related to physical, biological, and socio-economic tenets. Potential impacts and proposed mitigation measures are outlined in the table below.

Table 5: POTENTIAL IMPACTS AND MITIGATION MEASURES

	Potential Impacts	Mitigation Measures
	Physical Components	
Marine Noise	The increase in underwater noise resulting from 3D seismic surveys can have several significant abiotic impacts on the marine environment. These impacts primarily affect the physical and chemical properties of the marine ecosystem and can indirectly affect the	Mitigation measures to minimize the impacts caused by increased in noise can encompass some of the measures listed below. - Timing of surveys to avoid sensitive periods for marine life. - Monitoring and Surveillance, employing real-time monitoring techniques, such as acoustic monitoring and environmental

	Potential Impacts	Mitigation Measures
	overall health and stability of marine ecosystems and may result in the following. Sound Propagation - Seismic surveys generate intense sound waves that can be reflected and refracted by various underwater surfaces such as the seabed, rocks, and other geological formations. This can alter the natural propagation of sound in the water. High levels of noise from vessels can also cause scattering of sound waves, impacting how sound travels through different water layers and affecting the detection and communication ranges of other marine operations. Physical Structures and Underwater Features - Continued seismic noise may also impact the stability of underwater geological features potentially causing destabilization. The Vibrations from Seismic Noise may also influence erosion and deposition processes on the seabed which can impact marine habitats.	observers / Marine Mammal / Marine Bird Observers (MMOs) on vessels to detect potential impacts on marine mammals, sea turtles, and other marine species. - Regular maintenance of vessel engines, generators and other equipment being used. - Respecting of exclusion zones - Soft start / ramp up procedures - Gradually ramp up sound levels during survey initiation to allow marine mammals and birds to detect and react to noise, reducing sudden impacts.

	Potential Impacts	Mitigation Measures
Air Quality and Climate	The vessels and generators may emit pollutants such as nitrogen oxides (NOx), sulfur oxides (SOx), particulate matter (PM), and carbon dioxide (CO_2) from combustion that occurs in engines. The extent of these emissions depends on the type and size of vessels used, as well as the duration and scale of the survey. The impacts from these emissions are typically temporary and localized.	These impacts can be managed through regulatory measures and best practices in the industry such as the following. - Use of Low sulfur Marine Gas Oil (LS- MGO) - Development and Implementation of a Ship Energy Efficiency Management Plan (SEEMP) - Regular maintenance and monitoring of equipment from Tero Marine Master (TM) - Use of Diesel particulate filter - Inspection and replacement of broken or malfunctioning parts - Establishment of emission monitoring systems
Marine water quality	Accidental discharge from vessels and other unplanned activities can cause untreated waste, hydrocarbons, sewage, grey water, bilge water and ballast water to enter the marine environment thereby causing disturbance to marine habitats and impact marine life.	Water quality management can be improved by implementation of the some of the techniques listed below. - Bilge waters with oily content shall pass through an oil-water separator to remove the contents and ensure compliance in accordance with the provisions stipulated by MARPOL. - Regular maintenance of the oil water separator. - Wastewater discharges will be carried out and discharged in accordance with the project's effluent management procedures,

	Potential Impacts	Mitigation Measures
	Acoustic Waves generated through seismic surveys can result in disturbances in the seabed causing sediment resuspension which may lead to increased turbidity. Resuspension of sediments can also trigger the release of nutrients and pollutants trapped in the seabed into the water potentially altering the water chemistry.	following local and international regulations and the requirements of MARPOL. - Implementing spill prevention measures and having contingency plans in place to respond quickly to any accidental spills or leaks.
	Biological Components	
Marine Species inclusive of Marine Mammals, Birds, Marine Benthos and Corals, Fishes, Turtles, Seabirds, Special Status Species and Planktonic Community.	The Project and its associated activities – both planned and unplanned may have the following impacts on the biological environment. Seismic air guns and other survey equipment produce intense underwater noise that can disrupt communication, feeding, and breeding behaviours of marine mammals. Direct exposure to high-intensity sound waves can cause physiological stress, hearing damage, or displacement of marine mammals. Additionally, disturbance to fish habitats and benthic communities due to vessel movement and deployment of equipment is highly likely. Fish and other marine organisms may also alter their behaviour, such as avoiding noisy areas or abandoning feeding and breeding grounds.	Some measures which can be considered to minimize the impacts on the plethora of Marine Life include. - Use passive acoustic monitoring (PAM) and visual observers to detect marine mammal presence and adjust operations accordingly to avoid vessel collision and other events which may harm marine life. - If marine mammals are likely to be present, a search should normally be conducted, prior to activation of the air chambers over a period of 30 minutes. The MMO and PAM operator should make an assessment to determine if any marine mammals are within 500 metres of the center of the compressed air chamber array.

	Potential Impacts	Mitigation Measures
	The equipment used in seismic surveys, such as air guns and towed arrays, have the potential to cause physical harm to marine organisms. Direct exposure to sound waves at close range can injure or disorient marine animals. Discharging of waste and ballast water may also cause alteration to the abundance and composition of benthic and coral communities. Ballast water dumping can also lead to the introduction of invasive alien aquatic organisms, potentially toxicogenic, and pathogens. Light emissions and movement from vessels may cause changes in the composition, abundance and behavior of seabirds and mammal communities due to the generation of light emissions and movement from vessels.	- In deep water (>200m) the pre-search period should be extended to 60 minutes, as it is known that species that dive to great depths (e.g. whales) can remain submerged for more than 30 minutes. - If marine mammals are detected within 500 metres of the exclusion zone, during the survey prior to the activation of the air chambers, the soft start of operations should be delayed until their passage, or the transit of the vessel causes the marine mammals to be more than 500 metres from the source. In both cases, there should be a 30-minute delay from the time of the last sighting within 500 metres of the source to the start of the soft start. - Supervise the ballast water disposal records of each of the seismic vessels of the project, in order that all vessels comply with the International Ballast Water Management (BWM) Convention. - Implement a system and procedure while washing anchors and chains to remove organisms and sediments in their place of origin and the exchange of ballast water will be done in the middle of the ocean. A record of the cleaning of the ship's hull and anchors will be kept as part of the vessel's activity log. - Avoid conducting surveys during sensitive periods such as breeding, calving, or migratory seasons. - In the case of luminosity, the best technologies and lighting equipment will be implemented in the boats. The lighting will be

	Potential Impacts	Mitigation Measures
		controlled so that it is only directed at the work area (internal lighting of the vessels), being limited only to those necessary for safety issues in navigation and operation of the Project. - Maintain a record and documentation of the Marine Birds and Marine Mammals observed. - Report any sightings of injured or dead marine mammals and birds to the respective authorities.
Socio-Economic Component		
Marine Traffic Marine Waste Management	No significant impacts are expected to these resources throughout the Project: Economic Conditions, Employment and Livelihood Community Health and Wellbeing Social Infrastructure and Services, Coastal Cultural Heritage, Land Use and Ecosystem Services. However, there can be an array of positive and negative impacts triggered by the operation, mobilization and transiting of vessels as captured below.	Some measures which can be considered to manage the impacts associated with socio economic impacts can involve- - Constant Communication, for notification to the relevant marine authorities and prior notification to mariners. - The routes of the ships between the site and the port to be used as a logistics base will be carefully evaluated with the aim of minimizing possible interference with the existing shipping routes. - Use of navigation signals and lights on all the vessels in the project. - Development of a Waste Management Plan which highlights details of how both onshore and offshore waste from the Project will be

	Potential Impacts	Mitigation Measures
	Due to the increase in marine traffic, there may be a potential for vessel collision especially considering the recent increase in the oil and gas activities offshore of Guyana. There may be potential impacts due to the vessels operating for the 3D Seismic activities on Waste Management Infrastructure and Capacity provided that some waste will be transported offshore for treatment and disposal.	treated, managed, and disposed of in accordance with applicable international guidelines.
Local Economy	Seismic surveys require a range of skilled professionals and support staff, including marine technicians, geophysicists, engineers, and vessel crew members. This may create job opportunities, both directly within the survey operations, and indirectly in related industries such as transportation and logistics.	Consideration may be given to the development and implementation of a local procurement strategy to try to obtain as much material and services as possible from local suppliers.

	Potential Impacts	Mitigation Measures
	Seismic survey data can also contribute to scientific research and understanding of marine ecosystems, geology, and environmental dynamics, benefiting academic institutions and researchers.	
Fishing	The vessels used to conduct the 3D Seismic survey can potentially impact fishermen by possible collisions with fishing vessels and temporary disruption of fishing activities especially for fishermen who operate close to the coast along Regions 1 to 6.	

4 Non-Technical Explanation of the Proposed Project

Seismic surveys are routinely used in offshore oil and gas exploration activities worldwide to detect and define geological structures under the seabed. Marine seismic data acquisition is based on the principle of 'seismic reflection'. The method involves releasing pulses of acoustic energy (i.e., sound waves) at regular intervals along designated transect lines. In general, the energy penetrates subsurface formations and is reflected back to the surface where it can be detected by acoustic receivers, or hydrophones, encased in a long cable (i.e., streamer), which is towed behind the seismic vessel. Each time a seismic pulse meets a change in rock properties; part of the pulse is reflected back to the surface and received by the hydrophones. Consequently, by measuring precisely the difference in arrival time of reflected seismic energy, distinct subsurface rock layers can be identified, and subsequently mapped. This map helps geoscientists understand the geology and structure of natural resources. It plays an integral role in decision making when exploring for and developing oil and gas reserves in ocean waters.

5 Duration of the Project

Due to fluid client priorities and interests coupled with commodity market demand fluctuations, CGG is requesting a valid permit for seismic acquisition for 3 years (2026-2028) starting January 1, 2026.