

**PROJECT SUMMARY
FOR LIZA PHASE 2 DEVELOPMENT,
STABROEK LICENSE AREA, OFFSHORE GUYANA**

Esso Exploration and Production Guyana Ltd.

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BACKGROUND

Esso Exploration and Production Guyana Limited (EEPGL) is the designated Operator under a Petroleum Agreement signed by EEPGL, Hess Guyana Exploration Limited (Hess) and CNOOC Nexen Petroleum Guyana (Nexen) with the Government of the Cooperative Republic of Guyana. The Petroleum Agreement covers approximately 26,806 km² (10,350 square miles) and was executed together with a Petroleum Prospecting Licence for the Stabroek block. In 2014, Hess (30%) and Nexen (25%) acquired a commercial interest to the block. In May 2015, EEPGL announced a significant discovery of high-quality oil-bearing sands with the Liza-1 well (approximately 190 km [120 miles] offshore Guyana). In July 2017, EEPGL announced gross recoverable resources for the Stabroek block were estimated at 2.25-2.75 billion oil-equivalent barrels, which included Liza and other successful exploration wells associated with the Liza Deep, Payara, and Snoek discoveries.

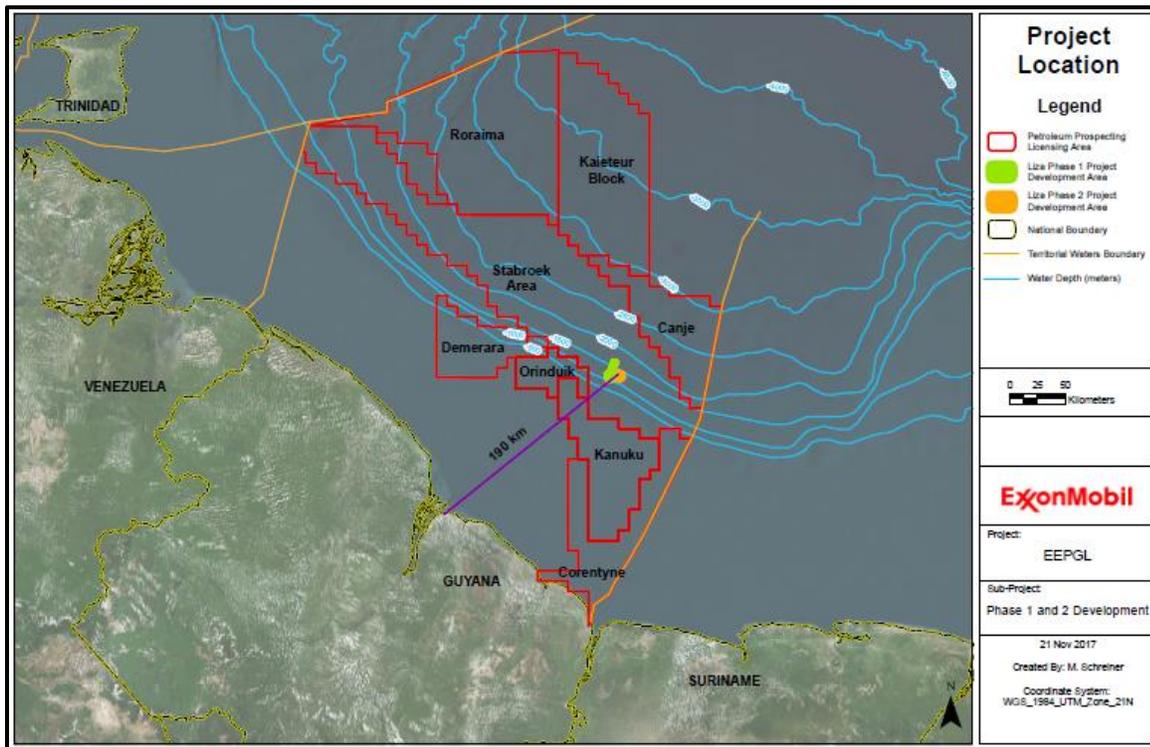
For historical context, petroleum exploration offshore Guyana began in the late 1950's and prior to the current activity by EEPGL and others, historical activity had peaked in the late 1960s. Exploration activity offshore Guyana decreased substantially from the mid-1970s through the early 2000s. Certain maritime border controversies restricted further drilling activities offshore Guyana until 2012. Most recently, EEPGL has undertaken over three years of exploration and assessment activities in the Stabroek Block starting with the first exploration well, Liza-1, which was drilled during the first half of 2015. Subsequent wells in the Stabroek Block have since been drilled, and EEPGL has an ongoing multi-well exploration drilling program in the Stabroek Block. In June 2017, the Ministry of Natural Resources (MNR) issued EEPGL a Petroleum Production License covering certain production area in the Stabroek Block and the Environmental Protection Agency (EPA) issued an Environmental Permit for the Liza Phase 1 Development associated with such Petroleum Production Licence. The Liza Phase 1 Development is currently in execution and includes 17 subsea development wells and a Floating Production Storage and Offloading (FPSO) vessel to process, store, and offload the recovered oil. EEPGL has also conducted several geotechnical, seismic, and environmental surveys since 2014 and further surveys are planned for 2018.

SITE, DESIGN, AND SIZE OF PROJECT

EEPGL is considering initiating the second phase of the Stabroek Block Liza discovery, the Liza Phase 2 Development, which would serve as the second oil and gas development project in Guyana. Figure A.1 shows the location of the Liza Phase 2 Development within the territorial waters of Guyana, approximately 190 km (120 miles) northeast of Georgetown, Guyana in the Stabroek Block.

The Stabroek Block is located on the continental slope between Guyana’s continental shelf and the deep marine plain of the tropical North Atlantic Ocean east of the Lesser Antilles. Guyana’s nearshore oceanography, bathymetry, water quality, and sedimentology are largely determined by the interaction of the Amazonian waters of the Guiana Current with the marine waters of the tropical North Atlantic and discharge from the Orinoco River. The entire continental shelf, continental slope, and the adjoining portion of the abyssal plain (including the Liza Area of Interest) are part of the North Brazil Large Marine Ecosystem (LME), which has a substrate which is generally composed of mud and silt deposited by the North Brazil Current.

Figure A.1 Location of the Liza Phase 2 Development within the Stabroek Block



NOTE: map does not represent a depiction of the maritime boundary lines of Guyana

The development plan for the Liza Phase 2 Development will use an FPSO and SURF production system similar to Liza Phase 1. Although the developments will be similar, they are independent development projects. The FPSO and subsea production system is proven approach for deepwater oil developments and would leverage both operator and industry proven technologies and experiences from other regions (e.g. West Africa).

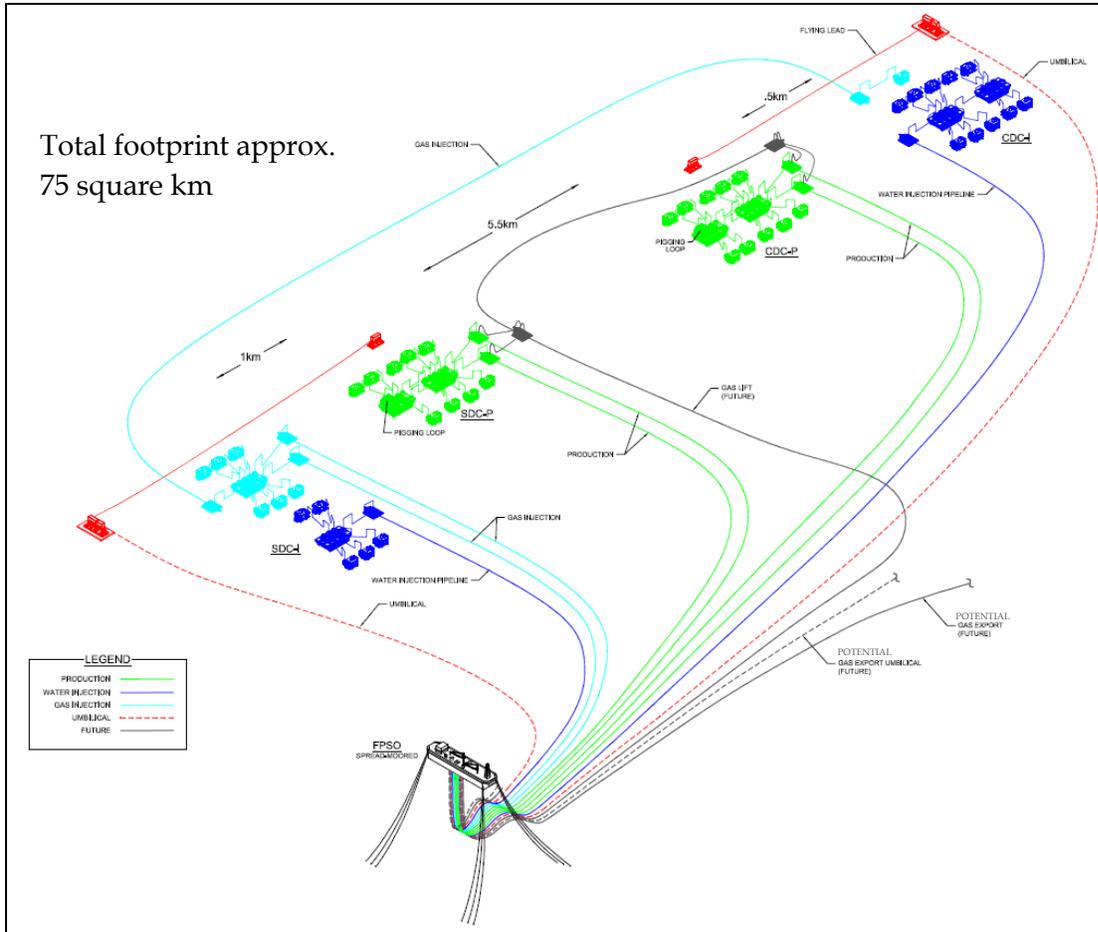
The major components of the Liza Phase 2 Development are shown in Table 1. The key differences between the proposed Liza Phase 2 Development and the approved Liza Phase 1 Development are highlighted in Table 1.

Table 1 - Major Components of Liza Phase 2 Development

Major Component	Phase 2 Development	Phase 1 Development
Surface Production Facility Design Concept	A single Floating Production, Storage, and Offloading (FPSO) vessel is used for each development	
Distance from Shore	Each FPSO is approx 190km from Georgetown	
FPSO Mooring System	Each FPSO uses a spread mooring system with mooring lines connected to anchor piles embedded in seafloor	
Oil Production Capacity (barrels per day)	Approx 190,000 to 220,000	100,000, capable of sustained peaks up to 120,000
FPSO Oil Storage Capacity	Approx 1.6 to 2 million barrels, depending on selected hull	1.6 million barrels
Offloading Frequency by Export Tankers	Every 4-6 days	Every 5-10 days
Subsea Production Facility Design Concept	Each development uses subsea production trees, and gas/water injection trees clustered around subsea manifolds	
Wells	Approx 35-40 wells	17 wells
Drill Ships	Each development may use up to two dynamically-positioned drill ships	
Onshore Support including Shorebase	Onshore infrastructure includes shorebase, pipe yards, fabrication facilities, fuel supply facilities, and waste management facilities; potential sharing between developments	
Logistics Support	Marine vessels and helicopters throughout all stages; potential sharing between developments	

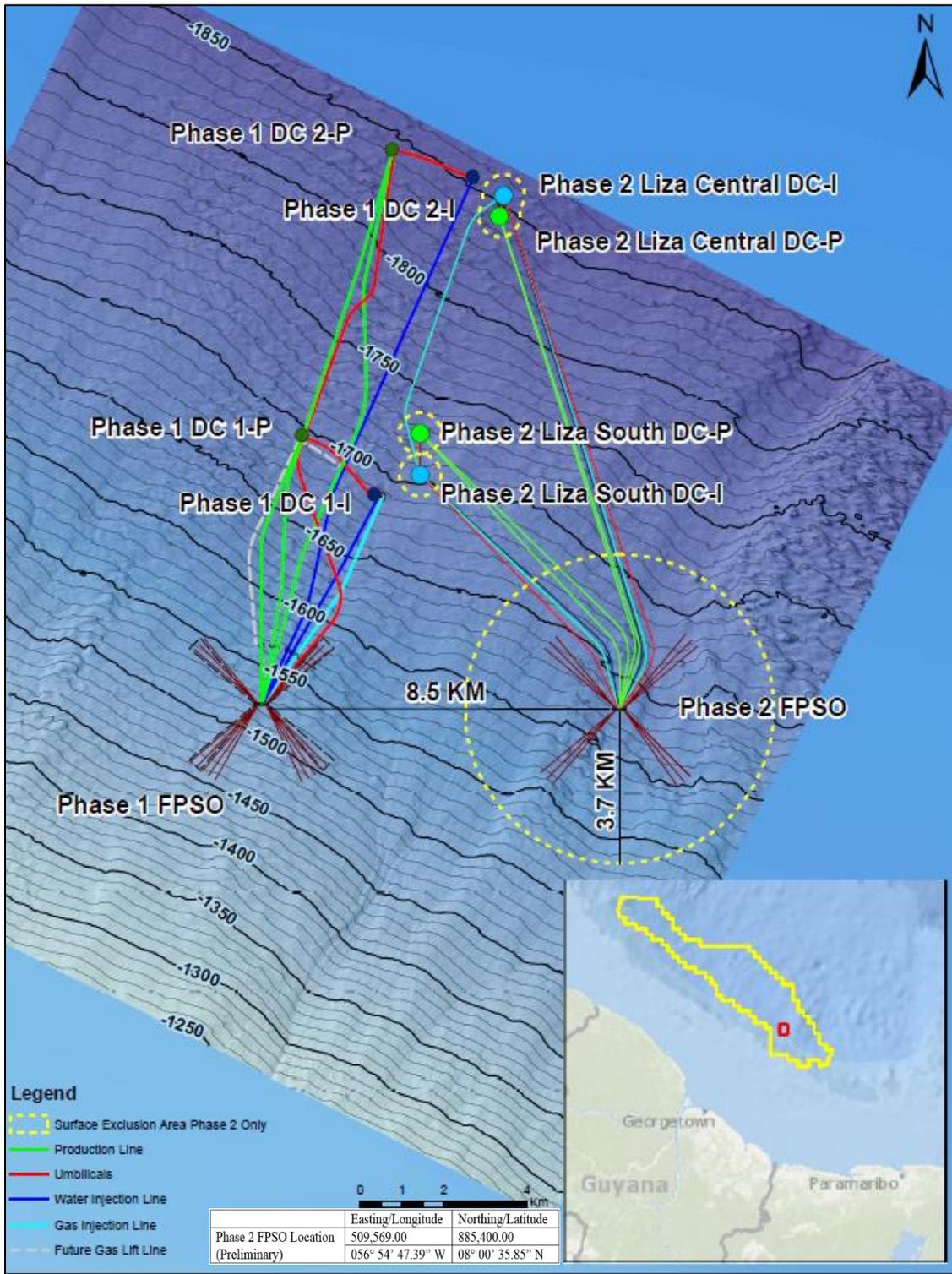
Figure A.2 illustrates the preliminary conceptual layout of the production system, as the Liza Phase 2 Development is in the preliminary design phase. Figure A.3 illustrates the preliminary areal layout of the Liza Phase 2 Development in relation to the Liza Phase 1 Development. The FPSO for Phase 2 will be located approximately 8.5 km to the east of the FPSO for Phase 1.

Figure A.2 Preliminary FPSO and SURF SYstem Layout for Phase 2



NOTE: Locations in figure subject to change

Figure A.3 Preliminary Areal Layout for Phase 2 Development

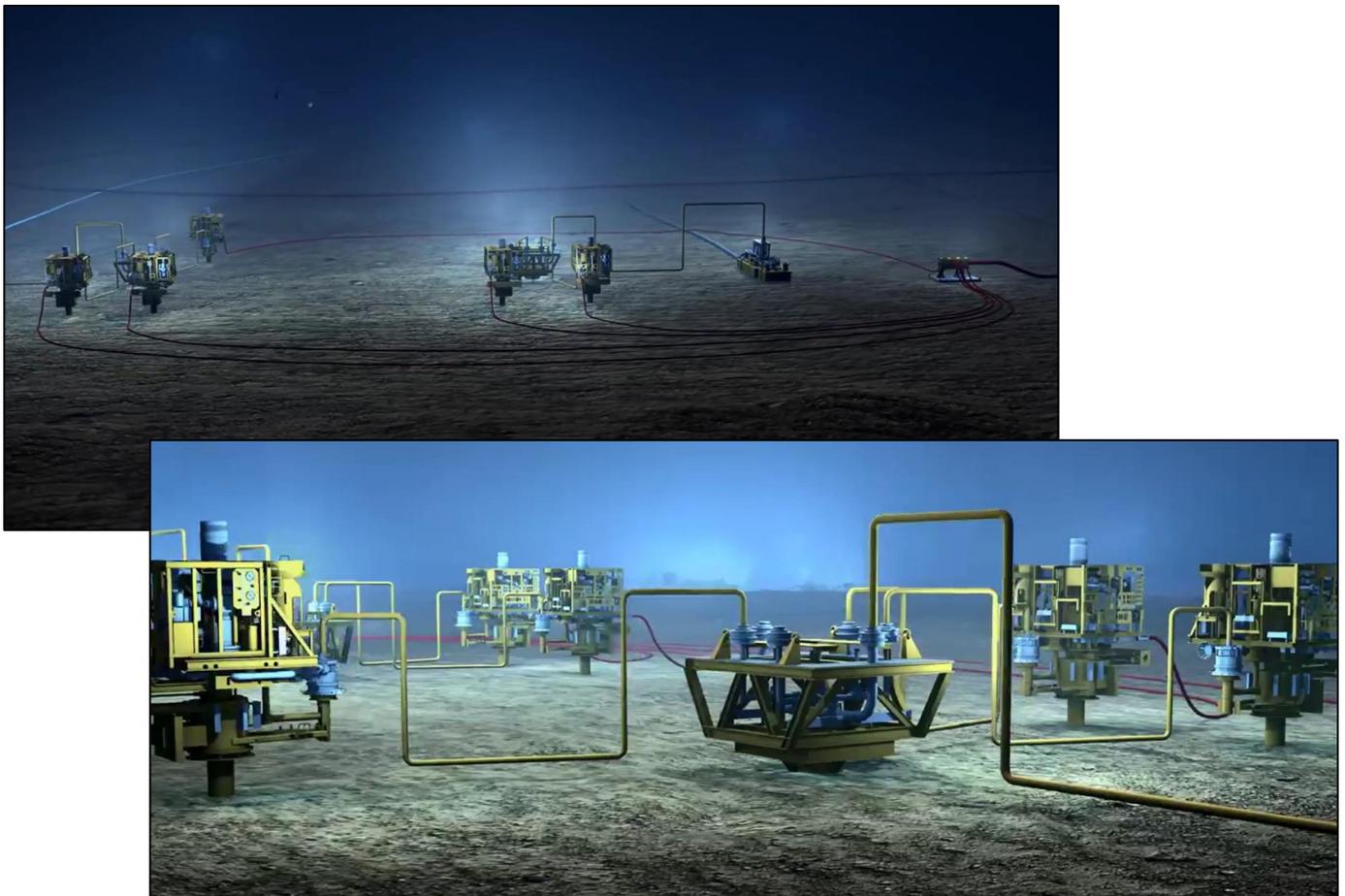


NOTE: Locations in figure subject to change

The SURF facilities for the Liza Phase 2 Development are composed of subsea production and injection wells clustered around subsea manifolds. Approximately 35-40 wells could be drilled at two subsea drill centers, consisting of a combination of producers and injectors (e.g. for the injection of water and reinjection of associated gas). Produced well stream fluids which include associated gas will be transported through subsea flowlines to the FPSO at the surface. The risers and umbilicals will connect the equipment on the sea floor to the FPSO. The subsea system will be monitored and controlled using a control system connected to the FPSO through a control umbilical which also supplies chemicals to the subsea facilities. The hydraulic fluid for operating the subsea control system will be water-based. Figure A.4 represents an example of subsea facilities on the sea floor.

Most of the major SURF equipment will be preassembled, pre-tested, and shipped directly to the offshore Phase 2 Project Development Area from their points of origin. Other minor equipment, supplies, and materials may be temporarily staged at a shorebase and associated laydown yards and warehouses until transferred offshore for installation or use.

Figure A.4 Example Subsea Facilities (SURF)



The FPSO will be a VLCC-size (Very Large Crude Carrier) floating facility with double hull protection, with approximate dimensions of 340m long by 60m wide by 33m deep (1115 ft long by 197 ft wide by 108 ft deep), and will be moored on location. See Figure A.5 for a conceptual representation of an FPSO. The Phase 2 FPSO will be moored approximately 190 km (120 miles) offshore. Oil produced from the reservoirs will be stored in the FPSO tanks prior to export. All oil produced from the FPSO would be exported to market via conventional tankers owned/operated by others.

Figure A.5 Example of FPSO and Export Tanker



The FPSO will have a production capacity of approximately 190,000 to 220,000 barrels of oil per day. During the early stage of production operations, the project is anticipated to produce an average of approximately 5,700,000 to 6,600,000 barrels of crude oil per month. These estimates are preliminary and are subject to change. The FPSO will have an oil storage capacity of approximately 1.6 to 2 million barrels of oil within its hull, depending on the selected hull. Its mooring system will be designed to keep the FPSO on station continuously for at least 20 years. At peak production during Phase 2, the FPSO will offload oil to conventional tankers approximately every 4 - 6 days. The conventional tanker will be held in position with the assistance of tug(s) to maintain a safe separation distance from the FPSO. Figure A.6 shows an example of a potential FPSO offloading configuration.

Figure A.6 Example of a Potential FPSO Offloading Configuration



Based on the water depths in the Liza Phase 2 Project Development Area, up to two dynamically-positioned drill ships as shown in Figure A.7 would be used to drill the wells. The process of drilling the wells for the Liza Phase 2 Development will be similar to the process followed during exploration/appraisal wells campaigns (e.g., Liza-1, Liza-2, and Liza-3), as well as the Liza Phase 1 Development drilling program. After drilling to total depth, the wells will be completed and the subsea production equipment will be installed.

During the drilling process, drill ships will require various materials, instruments, and devices to connect the drill bit to the drill ship. Various size casings will be set as the well is drilled deeper. The drilling process will also require drilling fluid to remove cuttings and control formation pressures, and cement to support the casing and to isolate reservoir formations. Completion equipment and completion fluids will be also be required. The raw materials above are in addition to the basic supplies required to operate the production equipment and support vessels such as fuel, food for the crews, fresh water, and industrial consumables.

Figure A.7 Example of Drill Ship



Operating processes during production operations will include flowing the reservoir hydrocarbons from the wells to the FPSO, where further processing, storage, and management occurs prior to offloading the oil to the conventional tankers. General maintenance of the production equipment will also be required. Some industry standard chemicals will be required as part of the processing of the oil. The production facilities will also require the use of industry standard additives to prevent corrosion, scale, and hydrate formation. The preliminary chemical requirements and estimated quantities will be defined as part of the ongoing facility design work, and will be addressed in the EIA.

Hazardous and non-hazardous wastes as well as sanitary discharges will be produced throughout the Liza Phase 2 Development. Garbage/Waste Management Plans that address the types and quantities of waste to be generated as a result of offshore operations will be utilized. EEPGL will have a Waste Management Plan that is part of the Environmental and Socioeconomic Management Plan. The objective of the waste management plan will be to verify that all wastes are managed in accordance with internationally accepted standards and applicable Guyana laws and regulations. Discharges of bilge and other wastewaters from all vessels utilized for the project will be managed in accordance with MARPOL (International Convention for the Prevention of Pollution from Ships).

The project will utilize onshore infrastructure which may include a shorebase, pipe yards, fabrication facilities, fuel supply facilities, and waste management facilities in Guyana. Such infrastructure will be used to support the drilling, installation, production operations, and decommissioning stages. Additional logistical support may be provided by others outside of Guyana, which will be determined by the project contractors. Helicopters required for crew changes are planned to be operated out of the Ogle Airport as is currently being done for exploration drilling and as planned for the Liza Phase 1 Development. In some cases, crew transfer may occur by marine vessel.

The project is in the initial stages of planning and design, and detailed estimates of workforce requirements have not yet been developed. Preliminary workforce estimates are provided below. These estimates will be refined following selection and contracting for the drill ships, FPSO, SURF installation vessels, and support vessels. The following manpower levels in Table 2 are preliminary projections for the offshore components during each stage of the Liza Phase 2 Development; some stages may occur concurrently.

Table 2 – Preliminary Workforce Levels

Well Drilling	Approximately 600 persons at peak utilizing up to two Drill Ships (approx 300 persons per Drill Ship). Estimate is dependent upon final Drill Ships and support vessels selected.
FPSO and SURF Mobilization/ Installation/ hookup	Approximately 600 persons at peak. Estimate is dependent upon final construction/installation and support vessels selected.
Production Operations, including FPSO and conventional tanker	Approximately 100-140 persons at peak, with an additional 25-30 persons onboard the tanker. Estimate is dependent upon conventional tanker schedule.
Demobilization	Approximately 60 persons at peak.

In addition to the offshore components, there will be a comparatively small number of personnel providing shorebase and logistical support onshore. The onshore staff will be expected to ramp up gradually through the mobilization and installation stage until reaching a maximum level during the drilling campaign and installation activities, and then diminishing during production operations. The onshore staff is expected to increase again briefly during demobilization. Logistical support may be shared between the Phase 1 and Phase 2 Developments.

Prior to the end of the term of the Petroleum Production Licence, decommissioning program for the Liza Phase 2 Development will be submitted for the approval of the government. EEPGL will select, in consultation with the appropriate Guyanese agencies, the final decommissioning strategy based on a comparative assessment, which is designed to evaluate the potential safety, environmental, technical, and economic impacts and associated mitigation measures in order to finalize the decommissioning program.

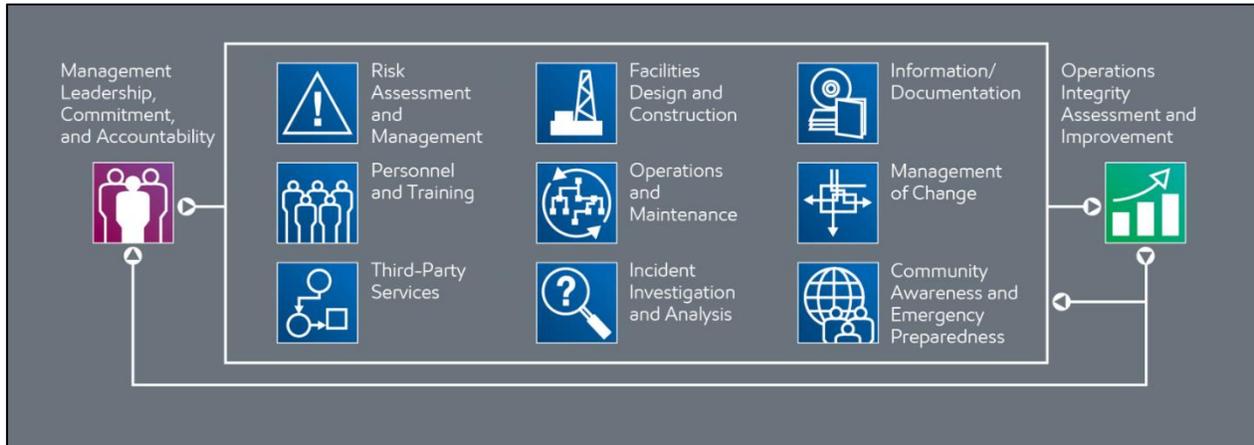
Subject to future comparative assessment, the expectation is that the SURF components would be detached from the FPSO and abandoned-in-place on the sea floor, consistent with standard industry practice. Flowlines, risers, and umbilicals would be flushed before being abandoned and wells would also be plugged and abandoned consistent with standard industry practice. The FPSO is expected to be towed away, and the FPSO mooring system would be disconnected and abandoned on the sea floor, consistent with standard industry practice.

EEPGL is committed to conducting business in a manner that is compatible with the environmental and economic needs of the communities in which it operates, and that protects the safety, security, and health of its employees, those involved with its operations, its customers, and the public. These commitments are documented in its Safety, Security, Health, Environmental, and Product Safety policies.

These policies are put into practice through a disciplined management framework called the Operations Integrity Management System (OIMS). Company's OIMS Framework establishes common expectations used by its affiliates worldwide for addressing risks inherent in its business. The term Operations Integrity is used to address all aspects of its business that can impact personnel and process safety, security, health, and environmental performance.

Application of the OIMS Framework is required across all of Company's affiliates, with particular emphasis on design, construction, and operations. Management is responsible for ensuring that management systems satisfying the Framework are in place. Management system implementation will be consistent with the risks associated with the business activities being planned and performed. A graphical model of OIMS is shown in Figure A.8.

Figure A.8 Operations Integrity Management System (OIMS)



POSSIBLE EFFECTS ON ENVIRONMENT

EEPGL’s environmental consultant has identified possible effects from the project which are related to physical, biological, socioeconomic, community health, and human environment values. Possible effects could potentially be related to:

- Air quality and climate
- Sound
- Marine geology and sediments
- Oceanic conditions and marine water quality
- Coastal habitats
- Coastal wildlife and shorebirds
- Protected areas and special status species
- Seabirds
- Marine mammals
- Marine turtles
- Marine fish
- Marine benthos
- Ecological balance and ecosystems
- Cultural heritage
- Community health and wellbeing
- Employment and livelihoods
- Marine use and transportation
- Social infrastructure and services
- Land use
- Ecosystem services
- Indigenous people and traditional use of resources and land
- Economy/economic conditions
- Cumulative impacts

The possible effects, which are similar to those identified in the Phase 1 Environmental Impacts Assessment, could be directly and/or indirectly generated by the Liza Phase 2 Development during development, production operations, and/or decommissioning, and such effects could be adverse or positive in nature. The potential for cumulative impacts exists where impacts from Phase 2 overlap with Phase 1 (or other existing or planned future activities) in space or time. As such, a robust cumulative impacts assessment will be performed as part of the Phase 2 assessment of environmental impacts. Additional information on potential effects are included in Attachment A.

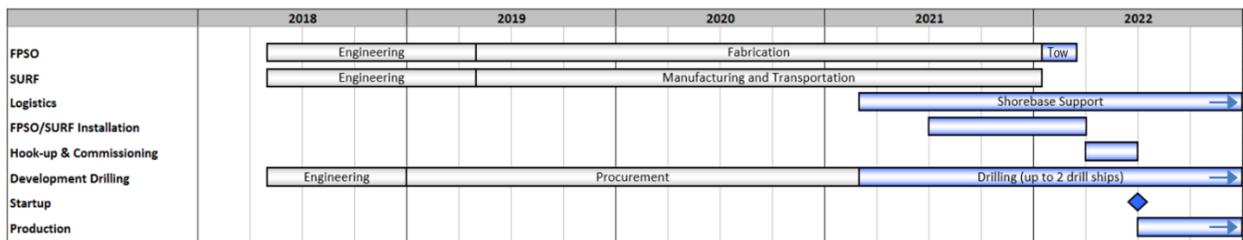
Should an Environmental Impact Assessment (EIA) be required by the EPA, EEPGL will scope, study, and assess possible effects in its EIA covering the Liza Phase 2 Development per the laws of Guyana, in particular the Environmental Protection Act 1996. Through an EIA, EEPGL would study and assess the significance of possible adverse effects generated by the project, and would identify mitigation measures and monitoring programs to address any identified adverse impacts of significance.

DURATION OF PROJECT

The project lifecycle for the Liza Phase 2 Development will include engineering, construction, installation, commissioning, start-up, operations and maintenance, and decommissioning. The engineering phase will include design, Front-End Engineering and Design (FEED), and detailed engineering. The construction phase will include procurement, fabrication and construction, drilling, installation, and hook-up. Operations and maintenance will follow commissioning and start-up, and will be the longest phase of the project with a duration of at least 20 years. Startup of the facilities is expected to occur in approximately mid-2022.

Figure A.9 provides a preliminary sequence of major scheduling milestones for the construction, installation, and commissioning of the SURF and FPSO for the Liza Phase 2 Development; however, it is still being refined and is subject to change.

Figure A.9 Preliminary Project Schedule



NON-TECHNICAL EXPLANATION OF PROPOSED PROJECT

EEPGL is proposing to develop an oil production facility in the offshore waters of Guyana. The Liza Phase 2 Development will be located in the eastern area of the Stabroek Block which is approximately 190 km (120 miles) from Georgetown. See Figure A.1.

Oil production from the Liza Phase 2 Development is expected to last at least 20 years.

EEPGL will drill approximately 35-40 wells offshore to support extraction of the oil from below the sea floor. Each well will be drilled using a floating drill ship (see Figure A.7). Each well will be drilled to a depth which is over 5,000 meters (m) below the sea floor.

EEPGL will install some of the oil production facilities on the sea floor at approximately 1500-1900 m (4900-6200 ft) water depth. These subsea facilities include various types of pipes and hardware. The subsea facilities allow the oil from the wells to be gathered and moved to the surface of the ocean for further processing. See Figure A.4.

EEPGL will install other oil production facilities on a vessel which floats on the surface of the ocean. The vessel is called a Floating Production, Storage, and Offloading (FPSO). See Figure A.5. The FPSO will be moored on location in approximately 1,600 m (5250 ft) of water depth and will remain on location throughout the life of the facility. Oil production facilities on the FPSO will further process the oil extracted from below the sea floor.

The FPSO will have the capacity to produce approximately 190,000 to 220,000 barrels of oil per day. During the early stage of production operations, the FPSO is anticipated to produce an average of approximately 5,700,000 to 6,600,000 barrels of crude oil per month. These estimates are preliminary and are subject to change.

Processed oil will be stored in tanks in the FPSO hull which have the capacity to hold approximately 1.6 to 2 million barrels of oil, depending on the selected hull. Approximately every 4 - 6 days, the oil will be pumped from the FPSO to a conventional oil tanker which is owned/operated by others. The tanker will then bring the oil to buyers. Figure A.6 shows an example of an FPSO and a tanker while oil is being offloaded.

EEPGL will utilize onshore support facilities to support drilling the wells, installing the offshore production facilities, and operating the offshore production facilities. This may include a shorebase, storage facilities, and waste management facilities. Helicopters and supply boats will also be needed to support the project.

At peak, EEPGL will utilize approximately 1,200 personnel offshore during the stage where the wells are being drilled and the offshore oil production facilities are being installed. This number will decrease to less than 200 personnel during the production operations phase. A smaller number of personnel will be utilized at the onshore support facilities.

At the end of the life of project (at least 20 years), EEPGL would develop a plan to decommission the offshore production facilities. The plan would be approved by the government.

Key Differences Between the Liza Phase 2 Development and the Liza Phase 1 Development:

- Oil Production Rates: Phase 2 production rate will be approximately 190,000 to 220,000 barrels of oil per day. Phase 1 production rate is 100,000 barrels of oil per day with ability to operate at sustained peaks of 120,000 barrels per day.
- FPSO Oil Storage Volume: Phase 2 storage volume will be approximately 1.6 to 2 million barrels, depending on the hull selected. Phase 1 storage volume is 1.6 million barrels.
- Number of Wells: Phase 2 will have approximately 35-40 wells. Phase 1 has 17 wells.
- Oil Offloading Frequency: Oil will be offloaded from the Phase 2 FPSO approximately every 4-6 days. Oil from Phase 1 FPSO will be offloaded every 5-10 days.

Possible Effects on People, Wildlife and the Environment:

- Changes in quality of air
- Changes in noise and light levels
- Disturbance of seabed
- Changes in quality of ocean water
- Impacts to whales, dolphins, sea turtles, fish, birds and protected species
- Changes in food sources for fish and wildlife
- Increase in number of available jobs
- Increase in government revenue
- Inflation of currency
- Increase in foreign workers
- Increased demand for local goods and services
- Increased road and vessel traffic and use of local shorebases
- Restriction on fishing around drill ships (temporary) and FPSO
- Oil spill, which could impact the environment (e.g. coastline, protected areas), indigenous communities, and livelihoods of farmers and fishermen
- Cumulative impacts

Attachment A - Possible Effects of Phase 2 Liza Development

Resource or Receptor	Possible Effect	Primary Sources of Possible Effects	How Possible Effects Could Impact Human Life and Environment
Physical Resources			
Air Quality and Climate	Air emissions resulting from the Project have the potential to change ambient air quality in the Project Area of Interest (AOI) on a localized basis. Potential impact of greenhouse gas emissions from the Project on climate change is not expected.	<ul style="list-style-type: none"> • Power generation • Other combustion sources • Non-routine, temporary flaring • Fugitive emissions and venting • Waste incineration • Extreme weather events 	Increased concentrations of pollutants in ambient air could contribute to health concerns to exposed humans and wildlife. With respect to climate, the combustion of hydrocarbons in support of Project activities will generate GHG emissions. The potential influence of those GHG emissions on global climate change is not measurable with an acceptable level of confidence.
Sound	Subsea sound could cause impacts to sensitive marine fauna (e.g., whales, turtles, and fish) in the PDA.	<ul style="list-style-type: none"> • Drilling of development wells • Vertical seismic profiling • Offshore pile driving operations • Installation of FPSO and SURF components • FPSO operations 	Exposure to humans and wildlife to increased sound could result in potential damage/behavioral concerns.
Marine Geology and Sediments	The Project will disturb marine geology and sediments on a localized basis in the PDA and could impact sediment quality from non-aqueous base fluid (NABF) on drill cuttings discharges.	<ul style="list-style-type: none"> • Drilling of development wells • Installation of FPSO and SURF components 	Changes to sea floor morphology from drill cuttings accumulation or from impacts on sediment quality from drill cuttings, which could potentially damage wildlife habitat and cause wildlife death/injury, or potentially cause direct damage to wildlife.
Oceanographic Conditions/Marine Water Quality	The Project could have localized impacts to marine water quality in the PDA from discharge of drill cuttings and from routine operational and hydrotesting discharges. The Project could potentially impact marine water quality in the Project AOI as a result of non-routine, unplanned events (e.g. spill or release).	<ul style="list-style-type: none"> • Drilling of development wells (cuttings and fluid discharge) • Cooling water discharges • Sulfate removal and potable water processing brines • Installation of FPSO and SURF components • Wastewater discharges • Produced water discharges • Hydrotesting discharges • Ballast water discharges • Non-routine, unplanned event (e.g., spill or release) 	Increased total suspended solids, chemical concentrations, or temperature in water column, which could potentially damage wildlife habitat and cause wildlife death/injury, or potentially cause direct damage to wildlife.

Resource or Receptor	Possible Effect	Primary Sources of Possible Effects	How Possible Effects Could Impact Human Life and Environment
Biological Resources			
Coastal Habitats	The Project is not expected to impact beaches, mangroves, or wetlands in the Project AOI during routine, planned operations and activities. The Project could potentially impact beaches, mangroves, and wetland habitats in the Project AOI as a result of non-routine, unplanned events (e.g. spill or release).	<ul style="list-style-type: none"> • Non-routine, unplanned event (e.g., spill or release) 	Potentially decreased value of beaches, mangroves, and wetlands as wildlife habitat, declines in fisheries productivity, and/or other ecosystem services (e.g., flood control).
Coastal Wildlife and Shore Birds	The Project is not expected to impact coastal wildlife or shore birds during routine, planned operations and activities in the Project AOI. The Project could potentially impact coastal wildlife and shore birds in the Project AOI as a result of non-routine, unplanned events (e.g. spill or release).	<ul style="list-style-type: none"> • Non-routine, unplanned event (e.g., spill or release) 	Potentially decreased survivability of shore birds and coastal wildlife, and/or chronic sublethal effects such as decreased vigor or reproductive impacts from direct exposure or ingestion of contaminated prey items.
Protected Areas and Special Status Species	The Project is not expected to impact Protected Areas during routine, planned operations and activities in the Project AOI. The Project could potentially impact Protected Areas in the Project AOI as a result of non-routine, unplanned events (e.g. spill or release). The Project could potentially impact some special status species (e.g., endangered or listed species) in a localized manner in the PDA as a result of underwater sound, light, seawater withdrawal, and changes in marine water quality. The Project could potentially impact special status species in the Project AOI as a result of non-routine, unplanned events (e.g. spill or release).	<ul style="list-style-type: none"> • Underwater sound generated by marine component operations and activities • Lighting on offshore facilities (e.g., FPSO, drill ships) • Seawater intake by FPSO • Wastewater discharges • Drilling of development wells (cuttings and fluid discharge) • Cooling water discharges • Produced water discharges • Hydrotesting discharges • Ballast water discharges • Vessel movements • Non-routine, unplanned event (e.g., spill or release) 	Negative effects on general wildlife habitat quality, sea turtle nesting activities, tourism, and foraging/gathering activities of local communities might occur. Potential declines in local abundance of some species within the direct AOI caused by decreased water quality and entrainment of early life stages of special status fish species, auditory impacts on noise-sensitive species, and injury/death from vessel collisions. Non-routine/unplanned events (e.g. spill or release) could potentially cause acute and/chronic mortality or sublethal toxic effects throughout the indirect AOI depending on the magnitude of the event.
Seabirds	The Project could potentially impact seabirds in a localized manner in the PDA as a result of light (i.e., disorientation). The Project could potentially impact seabirds in the Project AOI as a result of non-routine, unplanned events (e.g. spill or release).	<ul style="list-style-type: none"> • Lighting on offshore facilities (e.g., FPSO, drill ships) • Non-routine, temporary flaring • Waste incineration • Non-routine, unplanned event (e.g., spill or release) • Indirect effects on prey availability due to changes in distribution of fish in vicinity of FPSO 	Direct mortality and injury of seabirds related to attraction to flares and direct mortality and injury related to vessel (ship or air) strikes may occur. Potential minor benefits from the Project to seabirds from use of the FPSO, drill ship, and installation vessels for rest or shelter during adverse weather conditions and, if such vessels acts as consistent attractants for seabird prey, providing a reliable food resource for seabirds Non-routine/unplanned events (e.g. spill or release) could potentially cause acute and/chronic mortality or sublethal toxic effects throughout the indirect AOI depending on the magnitude of the event.

Resource or Receptor	Possible Effect	Primary Sources of Possible Effects	How Possible Effects Could Impact Human Life and Environment
Marine Mammals	The Project could potentially impact some marine mammals in a localized manner as a result of underwater sound and ship strikes. The Project could potentially impact marine mammals in the Project AoI as a result of non-routine, unplanned events (e.g. spill or release).	<ul style="list-style-type: none"> • Underwater sound generated by marine component operations and activities (mammals and fish only) • Ship strikes • Changes in forage availability • Lighting on offshore facilities (e.g., FPSO, drill ships) • Seawater intake by FPSO • Wastewater discharges • Drilling of development wells (cuttings and fluid discharge) • Cooling water discharges • Produced water discharges • Hydrotesting discharges • Ballast water discharges • Vessel movements • Non-routine, unplanned event (e.g., spill or release) 	Potential injury to mammals' ears from Project-related noise, and auditory disturbance of marine mammals. Potential injury/mortality of marine turtles from collisions with Project-related vessel traffic may occur. Minor potential impacts from decreased water quality on all taxa related to decreased water quality in the direct AOI. Entrainment of early life stages of fish, and potential trophic effects associated with concentration of prey species around artificial lights. Non-routine/unplanned events (e.g. spill or release) could potentially cause acute and/chronic mortality or sublethal toxic effects throughout the indirect AOI depending on the magnitude of the event.
Marine Turtles	The Project could potentially impact some marine turtles in a localized manner in the Project AOI as a result of underwater sound, ship strikes, and light. The Project could potentially impact marine turtles in the Project AOI as a result of non-routine, unplanned events (e.g. spill or release).		
Marine Fish	The Project could potentially impact some marine fish as a result of underwater sound, light, seawater withdrawal, and changes in marine water quality in the PDA. The Project could potentially impact marine fish in the Project AOI as a result of non-routine, unplanned events (e.g. spill or release).		
Marine Benthos	The Project could potentially disturb some benthic habitat and organisms in a localized manner in the PDA.	<ul style="list-style-type: none"> • Drilling of development wells (cuttings discharge and deposition) • Installation of FPSO (mooring structures) and SURF components 	Potential disturbance of benthic habitat in the PDA and smothering of benthos within footprint of cuttings deposition zones.
Ecological Balance and Ecosystems	The Project could cause localized changes in nutrient cycles, gene flow, and biodiversity.	<ul style="list-style-type: none"> • Indirect impacts on the base of the marine foodweb (phytoplankton) due to localized changes in water quality • Indirect physiochemical barriers to migration, breeding, or dispersal/colonization occur due to localized changes in water quality, acoustic impacts, or general human activity • Introduction of invasive species • Non-routine, unplanned event (e.g., spill or release) 	Ecological impacts could potentially have ramifications for commercial and/or subsistence fisheries.

Resource or Receptor	Possible Effect	Primary Sources of Possible Effects	How Possible Effects Could Impact Human Life and Environment
Social, Cultural, and Economic Resources			
Cultural Heritage	The Project has the potential to adversely impact cultural heritage through localized disturbance of archaeological or historical sites related to Project development. These resources have conservation, cultural, and other values to stakeholders. The Project could potentially impact cultural heritage in the Project AOI as a result of non-routine, unplanned events (e.g. spill or release).	<ul style="list-style-type: none"> • Drilling of development wells • Installation of FPSO and SURF components • Non-routine, unplanned event (e.g., spill or release) 	Disturbance of the seabed could potentially affect submerged archaeological resources (e.g., shipwrecks).
Community Health and Wellbeing	Most Project activities will be located offshore in the PDA and would have no direct impacts on communities in Guyana. Introduction of limited levels of foreign labor could potentially have health and socioeconomic impacts. The Project could potentially impact community health and wellbeing in the Project AOI due to onshore traffic, social interaction, or as a result of non-routine, unplanned events (e.g. spill or release).	<ul style="list-style-type: none"> • Increased traffic as a result of Project activities at the Guyana shorebase locations • Social interaction between Project workers and residents • Pressure on wages from introduction of foreign workers and increased competition for skilled labor • Noise and light near shore by Project marine and aviation operations • Non-routine, unplanned event (e.g., spill or release) 	Increased vehicular traffic, increased demand for limited emergency and health services in Guyana, and a slight increased risk of communicable disease transmission could potentially result from Project activities and influence community health and wellbeing.
Employment and Livelihoods	The Project is expected to build capacity in the local labor force, increase demand for skilled labor, and increase demand for service industries (beneficial impact). There is also the potential for limited adverse impacts to fishing activities as a result of marine safety exclusion zones or marine traffic, and non-routine, unplanned events (e.g. spill or release).	<ul style="list-style-type: none"> • Local employment for: <ul style="list-style-type: none"> ○ Drill ships ○ Installation vessels ○ FPSO operations ○ Marine support and supply vessels ○ Aviation operations ○ Other related service industries • Marine safety exclusion zones • Project-related marine traffic • Drilling; FPSO/SURF installation, hookup and commissioning; and FPSO and support vessel operations (aspects relating to occupational health and safety for Project workforce) • Non-routine, unplanned event (e.g., spill or release) 	Direct and indirect employment for the Project would enhance livelihoods and family incomes, but could result in some competition with other businesses for skilled workers. Marine safety exclusion zones for the FPSO, drill ship, and major installation vessels, and Project-related vessel traffic could potentially interfere with fishing activities in certain areas.
Marine Use and Transportation	The Project may result in increased marine shipping and general marine-related traffic, which could potentially contribute to marine vessel congestion in port areas.	<ul style="list-style-type: none"> • Marine vessel operations 	Increased vessel traffic could result in localized potential congestion near shorebase and marine safety exclusion zones around the FPSO, drill ship, and major installation vessels would restrict access by unauthorized vessels.

Resource or Receptor	Possible Effect	Primary Sources of Possible Effects	How Possible Effects Could Impact Human Life and Environment
Social Infrastructure and Services	The Project will use public infrastructure and services and thus could potentially compete with other existing businesses and consumers across a range of services (e.g., roads, medical and emergency response, accommodation, and utilities). The Project may result in increased vehicular traffic in Georgetown, which could potentially contribute to vehicular congestion in certain areas.	<ul style="list-style-type: none"> • Project demand requirements for selected infrastructure and services which could overburden existing capacity and supply • Shorebase operations • Ground transportation operations 	Increased demand for public infrastructure, services, and housing by the Project workforce could influence the availability of these services; and increased Project-related traffic could result in localized traffic congestion.
Land Use	No new Project-dedicated land disturbance is planned. There is the potential that third-party onshore facilities may elect to expand or impact adjacent land as a result of supporting Project-related needs; however, these impacts are outside the scope of this EIA.	<ul style="list-style-type: none"> • Shorebase operations • Pipeyards • Warehouses • Bulk fuel storage and transfers • Onshore recycling of materials, waste treatment, and disposal facilities 	Potential development or expansion of shorebases by third-parties could affect nearby properties. Some Project solid wastes will be treated/disposed at permitted third-party facilities onshore.
Ecosystem Services	The Project will not have measurable impacts on ecosystem services during its planned, routine activities. The Project could potentially impact ecosystem services in the coastal areas of Guyana as a result of non-routine, unplanned events (e.g. spill or release).	<ul style="list-style-type: none"> • Non-routine, unplanned event (e.g. spill or release) 	In the unlikely event that some oil from a large Marine Oil Spill reaches the Guyana shoreline, many provisioning services, particularly for indigenous communities that rely on fishing, hunting, and harvesting activities for subsistence and livelihoods, could be affected potentially. In addition, coastal flood protection services offered by mangrove forests could be affected. Cultural services could also be affected for some communities that make use of the seashore in traditional and/or religious ceremonies.
Indigenous People and Traditional Use of Resources and Land	The Project is not expected to directly cause any changes to population and demographics in indigenous communities. The Project could potentially impact indigenous peoples in the Project AOI as a result of non-routine, unplanned events (e.g. spill or release).	<ul style="list-style-type: none"> • Non-routine, unplanned event (e.g. spill or release) 	In the unlikely event that some oil from a large Marine Oil Spill would reach the Guyana shoreline, some natural resources used by indigenous people for sustenance or their livelihoods could be potentially affected.