**Attachment 1: Embedded Controls for the Canje 12 Well Exploration and Appraisal Drilling Programme.**

| Potential Embedded Controls | Resources/Receptors Benefited |
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| Perform daily visual inspections of discharge points to confirm that there are no floating solids or discoloration of the surrounding waters. | Marine water quality, marine mammals, marine turtles, marine fish, marine benthos, seabirds, ecological balance and ecosystems |
| Inspect and maintain onboard equipment (engines, compressors, generators, sewage treatment plant, and oil-water separators) in accordance with manufacturers' guidelines, in order to maximize efficiency and minimize malfunctions, and unnecessary discharges into the environment. | Marine geology and sediments, marine water quality, marine mammals, marine turtles, marine fish, marine benthos, seabirds |
| Use low-sulfur (less than 0.5% sulfur content) fuels and/or natural gas on all Project vessels in turbines, reciprocating engines, or boilers used for heat or power generation or to drive machinery such as compressors or pumps. | Air quality and climate |
| If well testing[3] is performed, implement the following measures:<br>• Flow only the minimum volume of hydrocarbons required for the test and reduce the test duration to the extent practical;<br>• Use an efficient test-flare burner head equipped with an appropriate combustion enhancement system to minimize incomplete combustion, black smoke, and hydrocarbon fallout to the sea;<br>• Record volumes of hydrocarbons flared during well drilling in End of Well Reports and make available to the EPA upon request;<br>• Provide adequate gas sensors that are appropriately located during testing operations, as a means of detecting all sources of gas;<br>• Monitor pipes and joints on a daily basis for leakages and fugitive emissions. Burn all collected gaseous streams in high-efficiency flares, and implement and maintain a leak detection and repair program;<br>• Keep the well test to the minimum practical time, in keeping with a pre-approved schedule with the EPA. Notify the EPA immediately in case of any deviation/variation to the well test; and<br>• Provide sufficient compressed air to the oil burner for | Air quality and climate |

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| efficient flaring assignment. | |
| With respect to prevention of spills of hydrocarbons and chemicals during the drilling stage:<br>• Change liquid hydrocarbon transfer hoses periodically;<br>• Use dry-break connections on liquid hydrocarbon bulk transfer hoses;<br>• Use a liquid hydrocarbon checklist before every bulk transfer; | Marine geology and sediments, marine water quality, protected areas and special status species, coastal habitats, coastal wildlife, marine mammals, marine turtles, marine fish, marine benthos, ecological balance and ecosystems |

| **Potential Embedded Controls** | **Resources/Receptors Benefited** |
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| Regularly inspect and service shorebase cranes and construction equipment to mitigate the potential for spills and to reduce air emissions to the extent reasonably practicable. | Air quality and climate, marine water quality |
| Shut down (or throttle down) sources of combustion equipment in intermittent use where reasonably practicable in order to reduce air emissions. | Air quality and climate |
| Implement chemical selection processes and principles that exhibit recognized industry safety, health, and environmental standards. Use low-hazard substances. The chemical selection process is aligned with applicable Guyanese laws and regulations and includes;<br>• Review of Safety Data Sheets;<br>• Evaluation of alternate chemicals;<br>• Consideration of hazard properties, while balancing operational effectiveness and meeting performance criteria, including:<br>– Using the minimum effective dose of required chemicals;<br>– Minimum safety risk relative to flammability and volatility;<br>• Risk evaluation of residual chemical releases into the environment; | Air quality and climate, marine water quality, marine geology and sediments, marine mammals, marine turtles, riverine mammals, marine fish, marine benthos, seabirds |
| Use secondary containment for storage of bulk fuel, drilling fluids, and hazardous materials, where reasonably practicable. | Marine water quality |
| Regularly (e.g., monthly) check pipes, storage tanks, and other equipment associated with storage or transfer of hydrocarbons/chemicals for leaks. | Marine water quality |

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| Confirm wastewater released from the onboard sewage treatment plant complies with aquatic discharge standards in accordance with MARPOL 73/78 regulations. | Marine geology and sediments, marine water quality, marine mammals, marine turtles, marine fish, marine benthos, seabirds |
| Treat food waste in accordance with MARPOL 73/78 (e.g., food comminuted to 25-millimeter-diameter particle size or less) prior to discharge. | Marine geology and sediments, marine water quality, marine mammals, marine turtles, marine fish, marine benthos, seabirds |
| For transport of hazardous wastes offsite for treatment or disposal, the waste should be accompanied by a manifest signed by the hazardous waste generator and transporter. | Waste management infrastructure capacity |
| Provide for adequate onshore waste-management equipment and facilities for the proper management of waste in accordance with local regulation and good international oil field practice | Waste management infrastructure capacity |
| For wastes that cannot be reused, treated, or discharged/disposed on the drill ships, they should be manifested and safely transferred to appropriate onshore facilities for management. | Waste management infrastructure capacity |
| Periodically audit waste contractors to verify appropriate waste management practices are being used. | Waste management infrastructure capacity |
| Avoid, reduce, and reuse/recycle wastes preferentially prior to disposal in accordance with waste management hierarchy. | Waste management infrastructure capacity |

| **Potential Embedded Controls** | **Resources/Receptors Benefited** |
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| Regularly maintain equipment, marine vessels, vehicles, and helicopters and operate them in accordance with manufacturers' specifications and at their optimal levels to minimize atmospheric emissions and sound levels to the extent reasonably practicable. | Air quality and climate, sound, marine water quality, marine mammals, marine turtles, riverine mammals |
| Adhere to operational controls regarding material storage, wash- downs, and drainage systems. | Marine water quality, marine mammals, marine turtles, marine fish, marine benthos, seabirds, ecological balance and ecosystems |
| Equip Project vessels with radar systems and communication mechanisms to communicate with third-party mariners. | Marine use and transportation |

| Potential Embedded Controls | Resources/Receptors Benefited |
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| Perform onshore waste treatment for certain categories of waste, thereby reducing demand on landfill capacity. | Waste management infrastructure capacity |
| Operate incinerators in accordance with the manufacturers' operating manuals and Waste Management Plan. The incinerators should be operated only by trained personnel. | Waste management infrastructure capacity, air quality and climate |
| Confirm there is no visible oil sheen from commissioning-related discharges (e.g., flowlines/risers commissioning fluids, including hydrotesting waters). | Marine geology and sediments, marine water quality, marine mammals, marine turtles, marine fish, marine benthos, seabirds |
| Treat bilge water in accordance with MARPOL 73/78 so that it may comply with an oil-in-water content of less than 15 parts per million, as applicable. | Marine geology and sediments, marine water quality, marine mammals, marine turtles, marine fish, marine benthos, seabirds |
| Provide awareness training to Project-dedicated marine personnel to recognize signs of marine mammals and riverine mammals at the sea surface. Provide standing instruction to Project-dedicated vessel masters to avoid marine mammals, riverine mammals, and marine turtles while underway and reduce speed or deviate from course, when possible, to reduce probability of collisions. | Marine mammals, marine turtles, riverine mammals |
| Provide standing instruction to Project-dedicated vessel masters to avoid any identified rafting seabirds when transiting to and from Project Development Area. | Seabirds |
| Provide standing instructions to Project-dedicated vessel masters to reduce their speed within 300 meters (984 feet) of observed marine mammals and marine turtles, and to not approach the animals closer than 100 meters (328 feet). | Marine turtles |
| Observe standard international and local navigation procedures in and around the Georgetown Harbour and Demerara River, as well as best ship-keeping and navigation practices while at sea. | Marine use and transportation |
| Employ Guyanese citizens having the appropriate qualifications and experience where reasonably practicable. Partner with select local institutions and agencies to support workforce development programs and proactively message Project-related employment | Socioeconomic conditions, employment and livelihoods |

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| opportunities. | |
| Procure Project goods and services locally when available on a timely basis and when they meet minimum standards and are commercially competitive. | Socioeconomic conditions, employment and livelihoods |
| Use an established Safety, Security, Health, and Environment program to which all Project workers and contractors will be required to adhere to mitigate against risk of occupational hazards. All workers and contractors should receive training on implementation of these principles and are required to adhere to them in the daily execution of their duties. | Workforce |
| Maintain an OSRP to enable an effective response to an oil spill, including maintaining the equipment and other resources specified in the OSRP and conducting periodic training and drills including regular inspection and periodic testing of oil spill | All resources and receptors potentially impacted by an oil spill |

| **Potential Embedded Controls** | **Resources/Receptors Benefited** |
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| response equipment, preventive maintenance program execution, and annual exercise and simulated activation of oil spill response equipment to test readiness and response capability. | |
| Where reasonably practicable, direct lighting on major Project vessels to required operational areas rather than at the sea surface or skyward. Lighting on vessels should adhere to maritime safety regulations/standards. | Seabirds, marine turtles |
| Provide screening for seawater intakes to avoid entrainment and impingement of marine flora and fauna. | Marine fish |
| Implement a community safety program for potentially impacted schools and neighborhoods to increase awareness and minimize potential for community impacts due to vehicle incidents. | Marine and Land Transportation |

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| Implement a Road Safety Management Procedure to mitigate increased risk of vehicular accidents associated with Project- related ground transportation activities. The Road Safety Management Procedure has been implemented as of the writing of this, and the procedure includes the following components:<br>• Definition of typical, primary travel routes for ground transportation in Georgetown area;<br>• Development of an onshore logistics/journey management plan to reduce potential conflicts with local road traffic when transporting goods to/from onshore support facilities;<br>• Definition of required driver training for Project-dedicated drivers, including (but not limited to) defensive driving, loading/unloading procedures, and safe transport of passengers, as applicable;<br>• Designation and enforcement of speed limits through speed governors, global positioning system, or other monitoring systems for Project-dedicated vehicles;<br>• Avoidance of deliveries during typical peak-traffic hours as well as scheduled openings of the Demerara Harbour Bridge, to the extent reasonably practicable;<br>• Monitoring and management of driver fatigue;<br>• Definition of vehicle inspection and maintenance protocols that include all applicable safety equipment for Project- dedicated vehicles; and<br>Community outreach to communicate information relating to major delivery events or periods. | Marine and Land Transportation |

| **Potential Embedded Controls** | **Resources/Receptors Benefited** |
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| • Perform required inspections and testing of all equipment prior to deployment/installation;<br>• Use dynamically overbalanced drilling fluids to control wells while drilling;<br>• Perform operational training certification (including well-control training) for key drill ship leadership positions;<br>• Regularly audit field operations on the drill ships to confirm application of designed safeguards; and<br>• Use controls for mitigating a failure of the Dynamic Positioning (DP) system on the drill ships and maintaining station-keeping, which include:<br>– Use of a Class 3 DP system, which includes numerous redundancies;<br>– Rigorous personnel qualifications and training;<br>– Sea trials and acceptance criteria;<br>– DP proving trials;<br>– System Failure Mode and Effects Analysis;<br>– DP failure consequence analysis; and | |

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| – Establishment of well-specific operations guidelines. | |
| Maintain marine safety exclusion zones to be issued through the Maritime Administration Department with a 500-meter radius around drill ships and major installation vessels, to prevent unauthorized vessels from entering areas with an elevated risk of collision. | Marine use and transportation |
| All vessel wastewater discharges (e.g., storage displacement water, ballast water, bilge water, deck drainage) should comply with International Maritime Organization (IMO)/International Convention for the Prevention of Pollution by Ships, 1973, as modified by the Protocol of 1978 (MARPOL 73/78) requirements. | Marine water quality, marine mammals, marine turtles, marine fish, marine benthos, seabirds, ecological balance and ecosystems |
| Confirm leak detection systems are in place for equipment, treatment, and storage facilities (fuel, chemical, etc.) on drill ships in accordance with international offshore petroleum industry standards. | Marine geology and sediments, marine water quality, marine mammals, marine turtles, marine fish, marine benthos, seabirds |

| Potential Embedded Controls | Resources/Receptors Benefited |
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| Coordinate with relevant aviation authorities and stakeholders to understand peak Project-related utilization rates. | Marine and Land Transportation |
| Use water-based drilling fluids to the extent reasonably practicable (upper sections of the wells). For well sections requiring non-aqueous drill fluid (NADF), use only low-toxicity International Oil and Gas Producers Group III base fluid. | Marine geology and sediments, marine water quality, marine mammals, marine turtles, marine fish, seabirds, marine benthos |
| When NADF is used, use a solids control and cuttings dryer system to treat drill cuttings such that end-of-well maximum weighted mass ratio averaged over all well sections drilled using NADF does not exceed 6.9 percent wet weight base fluid retained on cuttings. | Marine geology and sediments, marine water quality, marine mammals, marine turtles, marine fish, seabirds, marine benthos |
| Install a blowout preventer (BOP) system that can be closed rapidly in the event of an uncontrolled influx of formation fluids and that allows the well to be circulated to safety by venting the gas at surface and routing oil so that it may be contained. | Marine geology and sediments, marine water quality, marine mammals, marine turtles, marine fish, seabirds, marine benthos |
| Conduct BOP equipment inspections, after disconnection or repair of any pressure containment seal, and at regular intervals (at least every 21 days or as operations allow). | Marine geology and sediments, marine water quality, marine mammals, marine turtles, marine fish, seabirds, marine benthos |
| Visually check and take appropriate measures to mitigate occurrence of free oil resulting from discharge of NADF drill cuttings. | Marine geology and sediments, marine water quality, marine mammals, marine turtles, marine fish, seabirds, marine benthos |
| Employ trained Protected Species Observers (PSOs) during the conduct of seismic-related activities. | Marine mammals, marine turtles |
| Conduct a continuous observation of a mitigation zone (500 meters [1,640 feet] around the sound source) to verify whether it is clear of marine mammals and marine turtles before commencing sound producing seismic operations. Do not commence sound-producing seismic operations (including soft starts) if marine mammals or turtles are sighted within the mitigation zone during the 30 minutes prior to commencing sound-producing operations in water depths less than 200 meters [656 feet], or 60 minutes prior to commencing sound-producing operations in water depths greater than 200 meters [656 feet]. | Marine mammals, marine turtles |
| Where reasonably practicable, equip sound-making devices or equipment with silencers or mufflers and are | Marine mammals, marine fish, marine turtles |

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| enclosed, and/or use soft-start procedures (e.g., for pile driving, vertical seismic profiling, etc.) to reduce noise to levels that do not cause material harm or injury to marine species. | |
| Adhere to the Joint Nature Conservation Committee guidelines (JNCC 2017) during the conduct of seismic-related activities. | Marine mammals, marine turtles |