



**Environmental
Protection
Agency**

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Environmental Permit

Issued under the Environmental Protection Act, Cap. 20:05, Laws of Guyana, the Environmental Protection (Amendment) Act, 2005, and the Environmental Protection (Authorisations) Regulations, 2000.

Reference No.:	20191001-EEPGL - 12
Fee:	Extra Large (C1) – USD 3,100 per year
Fees Paid:	USD 9,300 – Three (3) years (February 2022 to January 2025)

Addressee(s): Mr. Alistair Routledge
President
Esso Exploration and Production Guyana Ltd.
86 Duke Street
Kingston
Georgetown, Guyana.

ENVIRONMENTAL PROTECTION AGENCY
Database Updated

Activity: Offshore Petroleum Exploratory Drilling within the Stabroek Block – Kiru Kiru-1 Well.

Esso Exploration and Production Guyana Limited (EEPGL), hereinafter referred to as the “Permit Holder”, is hereby authorised by the Environmental Protection Agency (EPA) in accordance with the Environmental Protection Act, Cap. 20:05, Laws of Guyana (hereinafter referred to as “the Environmental Protection Act”), the Environmental Protection (Amendment) Act, 2005, the Environmental Protection (Authorisations) Regulations, 2000, and the Maritime Zones Act, Cap. 63:01 (hereinafter referred to as the “Maritime Zones Act”) to undertake Offshore Petroleum Exploratory Drilling of the Kiru Kiru-1 Well, the Twelfth Well under the 25 Multi-Well Programme, within the Stabroek PPL, hereinafter referred to as the “Project”, in the manner indicated in the Application submitted on October 1, 2019, the approved Revised Environmental Assessment Management Plan dated October, 2020, the Oil Spill Response Plan, dated September, 2020, the Intent to Drill Meeting (January 17, 2022), the Prognosis for Kiru Kiru-1 Well, and the Wildlife Response Plan and subject to the terms and conditions set forth herein and the provisions of the Environmental Protection Act, the Maritime Zones Act and any applicable regulations made thereunder taking into account the international rules and standards, international treaties and conventions to which Guyana is a party, and any forthcoming regulations, best practices, guidelines and standards made under the Environmental Protection Act.

The Permit Holder shall comply with the following Terms and Conditions.

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1.0 GENERAL

- 1.1 Notify the Agency in writing to obtain its approval for **ANY** proposed changes to the operation at least **fourteen (14) days** prior to making the change. The notification shall contain a description of the proposed change in operation. It is not necessary to make such a notification if an application to vary this Permit has been made and the application contains a description of the proposed change. In this condition, 'change in operation' means a change in the nature or functioning of the operation, or an extension, or any additional installation, which may have consequences for the environment. Changes in operation may include but are not limited to the following:
- a. Change in drill ship, or method(s) of drilling and well testing;
 - b. Installation of new and/or changes (excluding routine maintenance) to equipment, machine, apparatus, mechanism, system or technology serving the facility or operation;
 - c. Any change of technology used or installed at the facility from which effluents may be discharged or any changes in the nature, composition, concentration or quantity of the discharge; or
 - d. Any other variance prescribed by Regulation 20(3) of the Environmental Protection (Authorisations) Regulations.
- 1.2 Comply with the approved Revised Environmental Assessment and Management Plan (EAMP) dated October, 2020, inclusive of all protocols, plans and mitigation measures stipulated therein, all of which constitute terms and conditions of this Permit. Failure to comply with the approved Revised EAMP (October, 2020) constitutes a breach of this Permit, **EXCEPT** where an alternative course of action is proven more appropriate or applicable, to the satisfaction of the Agency, in a given circumstance.
- a. Pursuant to **Condition 1.2** above, the application of an alternative course of action which is proven more appropriate in a given circumstance shall be communicated to the Agency **within twenty-four (24) hours** of the determination of the alternative course.
- 1.3 Comply with the provisions of the Environmental Protection Act, Cap. 20:05, Petroleum Exploration and Production Act, 1986, the Petroleum Exploration and Production (Amendment) Act, 1992, the Pesticides and Toxic Chemicals Act, No. 13 of 2000, the Pesticides and Toxic Chemicals Regulations, No. 8 of 2004, and the Pesticides and Toxic Chemicals (Amendment) Regulations, No.8 of 2007.
- 1.4 Comply with the following legislation and regulatory instruments as specified under **"3.0 Administrative Framework"** in the approved Revised Environmental Assessment and Management Plan (EAMP), dated October, 2020, under the following headings:

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- a. National Legal Framework;
 - b. National Policy Framework; and
 - c. All applicable policies, laws and regulations of Guyana.
- 1.5 Provide adequate fire protection measures, in accordance with the International Guidelines in the approved Revised EAMP (October, 2020), where applicable, and marine fire protection systems on the Drill Ship and all other supporting vessels.
- 1.6 Conduct training for all employees on the conditions of this Environmental Permit and on good environmental management practices. Document such training and submit to the Agency, in the End of Well Report, a report on the content, and duration of training..
- 1.7 Conduct weekly meetings on Environmental Health and Safety with staff involved in the operation.
- 1.8 Provide specialised training, equipment, and standard operating procedures for employees in all aspects of the operation, including but not limited to well control and, the drilling process (solids control and fluid recovery system, drilling fluids and handling system, etc.). Standard operating procedures shall be complied with to ensure compliance with this Permit and shall be made available to the Agency upon request.
- 1.9 The terms and conditions of this Permit are binding upon the Permit Holder and the Permit Holder is responsible for any violations hereunder, including violations by its agent(s) or contractors (and their sub-contractors). The Permit Holder shall make such agent(s) or contractors (and their sub-contractors) aware of the Conditions of this Permit.

2.0 NOISE AND AIR QUALITY MANAGEMENT

- 2.1 Comply with the provisions of the **Environmental Protection (Noise Management) Regulations, 2000** and the **Environmental Protection (Air Quality) Regulations, 2000**.
- 2.2 Ensure that all sound-making devices or equipment are fitted with silencers or mufflers, and/or are enclosed, to reduce noise emanating from both onshore and offshore operations.
- 2.3 Operate and maintain all mechanical equipment in accordance with their respective manufacturer's specifications. Mechanical equipment, vehicles, vessels and helicopters, utilised during exploration works, must be maintained and operated at optimal levels to minimise atmospheric emissions.
- 2.4 Combust waste oil at an optimum temperature to minimise atmospheric emissions keeping combustion temperatures between 850°C and 950°C.

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- 2.5 Monitor exhausts daily for smoke and particulates. In instances of visible smoke, the Unit must be shut down, and the cause(s) investigated and resolved. Details of any such investigations must be reported under **Condition 13.6**.
- 2.6 Ensure that **only** trained personnel who are able to implement the guidance provided in the Manufacturer's Operating Manual, operate the incinerator.
- 2.7 Prioritise the use of low sulphur diesel or ultra-low sulphur diesel.
- 2.8 In accordance with the International Convention for the Prevention of Pollution from Ships (MARPOL) Annex VI, ozone-depleting substances (ODS) shall not be discharged during permitted activities on the vessel.
- 2.9 Submit in the End of Well Report (using the Agency's Form for Reporting and Record Keeping for Air Emissions), an air quality monitoring report detailing emissions data on air contaminants generated from the **Kiru Kiru-1** Well and incinerator. Contaminants reported on shall include, but not be limited to, particulate matter, sulphur dioxide, volatile organic compounds, ODS, carbon monoxide and nitrogen dioxide. The total volume of used oil incinerated shall also be included in the report.

3.0 VERTICAL SEISMIC PROFILING (VSP)

- 3.1 Notify the Agency of the intent to commence Vertical Seismic Profiling (VSP) of the **Kiru Kiru-1** Well.
- 3.2 Adhere to the Joint Nature Conservation Committee (JNCC) Guidelines (2010) during the conduction of VSP.
- 3.3 In accordance with the JNCC Guidelines, trained Marine Mammal Observers (MMOs) shall be on board the vessel during the conduct of VSP. At a minimum, one trained MMO and one non-dedicated MMO must be employed.
- 3.4 In accordance with the JNCC Guidelines, verify by Best Available Technology, including telescopic observations, that the mitigation zone (500 metres) is clear of marine mammals and marine turtles before commencing operations. All verifications must be recorded and submitted in the End of Well Report.
- 3.5 Record all marine mammals, protected species and marine turtle observations, and mitigation actions taken within the 500 metres mitigation zone. Records shall be submitted in the End of Well Report highlighting the date, location and time of the observations and contain the following information:
 - a. Project commencement;
 - b. Name, qualification and experience of the MMOs;
 - c. Observations affected/hampered by poor visibility or high winds;

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- d. Any start-up delays, power downs or stop work procedures due to marine mammal, protected species and marine turtle sightings;
- e. Marine mammal, protected species and marine turtle sightings including species and distance from vessel; and
- f. Project completion.

4.0 DRILL SHIP/EXPLORATION VESSEL, SUPPORT AND SUPPLY VESSELS

- 4.1 Comply with the International Maritime Organisation's regulations and/or standards for lighting on the vessel.
- 4.2 Comply with the International Convention for the Control and Management of Ship's Ballast Water and Sediments (2004).
- 4.3 In accordance with MARPOL 73/78 requirements, maintain an Oil Record Book to document the manner in which sludge, oil, bilge water, waste-oil, etc., are disposed.
- 4.4 In accordance with MARPOL 73/78 requirements, adhere to the vessel's Garbage Management Plan and maintain a Garbage Record Book.
- 4.5 Equipment on board (engines, compressors, generators, sewage treatment plant, oil-water separators, etc.) shall be checked and maintained in accordance with manufacturer's guidelines to maximise efficiency and minimise malfunctions.

5.0 WATER QUALITY MANAGEMENT

- 5.1 Comply with the provisions of the **Environmental Protection (Water Quality) Regulations, 2000.**
- 5.2 The discharge of any pollutant/contaminant in territorial waters is strictly prohibited (i.e. twelve (12) nautical miles). At no time, in territorial waters, should drilling fluids and cuttings be discharged on the sea bed. Instead, they are to be collected, properly transported, stored and recycled or treated, prior to disposal onshore at a facility approved by the Agency.
- 5.3 Subject to **Condition 5.2**, pre-treat drill cuttings to meet 6.9% wet weight limit as outlined in the approved Revised EAMP dated October, 2020, prior to discharge on the sea bed to minimise localised seafloor smothering, turbidity and oxygen depletion in surface sediments.
- 5.4 Ensure that the discharge point of the treated drill cuttings is at least fifteen (15) metres below the water surface.
- 5.5 Follow the Water Quality Monitoring Protocol as outlined in the approved Revised EAMP dated October, 2020. Results of water quality monitoring must be reported

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- monthly and at the closure of every activity (in both a printed copy and in an editable Standard Reporting Matrix).
- 5.6 Obtain prior approval from the EPA regarding any changes in the type of drilling fluid to be used, and outline the disposal/recycle/treatment methods to be applied.
 - 5.7 Treat oily or contaminated effluents from the drilling unit, drainage systems, bilges ballasts and vessels, etc., via the oil-water separator, prior to discharge to abide with the 1-day minimum oil and grease limit of 42 g/L and the 30-day average of 29 mg/L, (in accordance with the *IFC EHS Guidelines for Offshore Oil and Gas Development*) and submit (in both a printed copy and in an editable Standard Reporting Matrix), a summary of the oil and grease discharge data in monthly reports throughout the duration of the project.
 - 5.8 Adhere to all operational controls regarding material storage, wash-downs and drainage systems.
 - 5.9 Curbs, gutters, drip pans, and drains shall be installed in deck areas in a manner necessary to collect all contaminants prior to discharge. All gravity drains shall be equipped with a water trap or other means to prevent gas in the sump system from escaping through the drains.
 - 5.10 All containers containing hydrocarbons, chemicals, drilling fluids, and hazardous materials shall be placed inside an impervious berm or otherwise protected to contain spills. Drainage shall be directed away from the drilling rig to a sump. Drains and sumps shall be constructed to prevent seepage.
 - 5.11 Report the type, composition, composition concentrations, and volume of drilling fluids and drill cuttings discharged. The times, dates and duration of discharges shall also be reported. The information must be submitted in the End of Well Report.
 - 5.12 Discharge ballast water in accordance with established International Maritime Guidance and Legal Requirements including the International Convention for the Prevention of Pollution from Ships (MARPOL).
 - 5.13 Install and maintain a bilge-oil separator and undertake maintenance of oil-water separator equipment in accordance with MARPOL 73/78 requirements.
 - 5.14 In accordance with MARPOL 73/78 requirements, undertake routine bilge water testing and submit results to the EPA in the End of Well Report.
 - 5.15 Do not discharge water streams containing free-oil. Use solids control and cuttings dryer systems to treat cuttings to achieve an end of well maximum weighted mass ratio (averaged over all well sections drilled using non-aqueous fluids) not exceeding 6.9 % wet weight base fluid retention on cuttings.

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- 5.16 Treat bilge water in accordance with MARPOL 73/78 requirements and do not exceed an oil in water content of <15 ppm.
- 5.17 Measure residual chlorine concentration of treated sewage and waste water discharges on the Petroleum Exploratory Drilling Vessel weekly, in compliance with MARPOL 73/78 requirements, and submit the summary of the weekly readings in the End of Well Report.
- 5.18 Perform daily visual inspections of discharge points to detect if there is any floating solid or discolouration in the surrounding waters and submit a summary of observations in the End of Well Report.
- 5.19 Implement a safety management system on board that includes steps for regular checks and maintenance of the sewage plant's pipes, storage tanks, and other equipment as per manufacturer's instructions. Keep and submit a record of checks and maintenance of the sewage plant and other equipment in the End of Well Report.
- 5.20 Wastewater that is released from the Sewage and Wastewater Treatment Facility on board must meet the aquatic discharge standards in accordance with MARPOL 73/78 regulations.
- 5.21 Prohibit the discharge of cuttings generated using drilling fluids, which contain conventional mineral oil (IOGP Group 1), **except** when the mineral oil is used as a carrier fluid (transporter fluid), lubricity additive, or pill.
- 5.22 The cooling water discharge shall be designed to ensure that the temperature is within 3°C of ambient seawater temperature at 100 metres.
- 5.23 Prohibit the discharge of completion and well work-over fluids that have not been neutralized to attain a pH of 5 or more. Prepare a report on completion and well work-over fluids. The report must include but not be limited to the pH of the fluids in the discharge. This information must be submitted in the End of Well Report.
- 5.24 Perform a Static Sheen Test (stating the method used) on separate samples of applicable waste discharges. If the static sheen test indicates the presence of free oil, discharge of the tested material shall cease. If subsequent tests do not indicate free oil, discharge may continue.
- 5.25 Track all additional effluent discharges according to field reporting spreadsheet: e.g. seawater, fresh water, cement slurry/dye, dry cement/bentonite/barite, Blow Out Preventer fluid, waste water from drill ship pits, completion and well work-over fluids, etc. Information must be submitted to the Agency in a monthly report. Please see **Condition 13.2** for submission format.

- 5.26 Record the concentration ($\mu\text{g/L}$) of the following parameters/pollutants in discharges released into the marine environment and submit record (in both a printed copy and in an editable Standard Reporting Matrix) within one (1) month of completion of drilling activities:
- a. Cadmium;
 - b. Chlorine;
 - c. Mercury;
 - d. Methyl mercury;
 - e. Oil & Grease;
 - f. pH;
 - g. Total suspended solids; and
 - h. Temperature.
- 5.27 Submit a monthly report on the monitoring and management of the wastewater generated on the vessel.

6.0 WASTE MANAGEMENT

- 6.1 Manage and dispose all wastes in accordance with the most recently EPA approved Waste Management Plan, and seek the approval of the Agency for any changes in the disposal methods **prior** to disposal.
- 6.2 Monitor and treat drill cuttings and mud waste prior to discharge into the environment. Drill cuttings must not exceed limits for heavy metals, hydrocarbons, biocides and other toxic substances, i.e. levels which may induce toxicity to marine organisms or directly/indirectly impact human health and/or the environment. These results must be submitted within the monthly report (in both a printed copy and in an editable Standard Reporting Matrix), along with the disposal method(s) utilised.
- 6.3 Handle, store, and dispose sewage and sullage in accordance with Annex IV of MARPOL 73/78, Regulations for the Prevention of Pollution by Sewage from Ships.
- 6.4 During the lifetime of the Project, the Permit Holder shall be responsible for stewarding and auditing the activities of all downstream subcontractors handling Project waste streams, and shall contractually require them to conduct all treatment and disposal of such waste streams in keeping with the most recently EPA approved Waste Management Plan. Any deviations from the Plan shall be immediately reported to the EPA.
- 6.5 Profile all waste streams in accordance with the most recently updated Waste Profile Sheet from the EPA.
- 6.6 Ensure that all third party contractors abide by the approved Revised EAMP dated October, 2020, the most recently EPA approved Waste Management Plan and the most recently EPA approved Oil Spill Response Plan, for the disposal of all forms of

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waste produced and obtained, and submit monthly reports (in both printed copy and in an editable Standard Reporting Matrix) from third party disposal services, including but not limited to, information on the final deposit of the waste and compliance with any testing requirements prior to final deposit.

- 6.7 Operate the incinerator to combust **only** used/waste oil. Burning of any other waste in the incinerator is **strictly prohibited**.
- 6.8 Do not discharge diesel oil, halogenated phenol compounds, or chrome lignosulphonate.
- 6.9 Implement lifting and transfer procedures to cater for retrieval of any waste accidentally released overboard.
- 6.10 Record any accidental release of waste into the marine environment and corrective actions implemented and submit a copy of the Report to the EPA **within twenty-four (24) hours** of the release. A compilation of such reports must be included in the End of Well Report.
- 6.11 Manage and dispose putrescible waste in accordance with Annex V of MARPOL 73/78, Regulations for the Prevention of Pollution by Garbage from Ships.
- 6.12 Prohibit the disposal of equipment, cables, chains, containers, or other materials into the offshore environment.
- 6.13 Materials, equipment, tools, containers, and other items used which are of such shape or configuration that they are likely to snag or damage fishing devices shall be handled and marked as follows:
 - I. All loose material, small tools, and other small objects shall be kept in a suitable storage area or a marked container when not in use and in a marked container before transport over offshore waters;
 - II. All cable, chain, or wire segments shall be recovered after use and securely stored until suitable disposal is accomplished; and
 - III. Skid-mounted equipment, portable containers, spool or reels, and drums shall be tracked using the request form and manifest.
- 6.14 Any of the items described in **Condition 6.13** that are lost overboard shall be recorded on the facility's daily operations report, as appropriate, and reported to the EPA in the monthly report.

7.0 RADIOACTIVE SOURCES MANAGEMENT

7.1 General Safety Measures for Radioactive Sources

Comply with the US Nuclear Regulatory Commission Regulations on Radioactive materials, as well as, the guidelines outlined within the IAEA - TECDOC series reports as cited below:

- a. DS379 International Basic Safety Standards for Protection against Ionizing Radiation and for the Safety of Radiation Sources January (2010).
- b. International Basic Safety Standards for protection against Ionizing radiation and for the safety of Radiation sources, Safety Series No. 115 (1996).
- c. RS-G-1.1 Occupational Radiation Protection (1999).
- d. RS-G-1.8 Environmental and Source Monitoring for Purposes of Radiation Protection (2005).
- e. RS-G-1.10 Safety of radiation generators and sealed radioactive sources (2006).
- f. GS-G-2.1 Arrangements for Preparedness for a Nuclear or Radiological Emergency (2007).

7.2 Transport Safety Measures for Radioactive Sources

- a. TS-G-1.3 Radiation Protection Programmes for the Transport of Radioactive Material (2007).
- b. TS-G 1.5 Compliance Assurance for the Safe Transport of Radioactive Material (2009).
- c. TS-R-1 Regulations for the Safe Transport of Radioactive Material (2009).
- d. TS-G-1.2 (ST-3) Planning and Preparing for Emergency Response to Transport Accidents involving Radioactive Material (2002).

Where *GS refers to standards for General Safety, RS to Radiation Safety and TS to Transport Safety.

Ensure all activities related to the transport, use and handling of the Radioactive Sources comply with the IATA Dangerous Good Regulations and the technical documents of the IAEA (see **Condition 7.1** above).

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7.3 Radiation Protection

7.3.1 Radiation Safety Officer (RSO)

- a. Appoint a RSO, within one (1) week of commencement of the project to oversee the radiation protection programme. The name and qualifications of the RSO shall be submitted to the EPA within one (1) week of appointment.
- b. Conduct continuous training of all Occupationally Exposed Personnel (OEP) on the presence and type of radioactive sources on board and on the safety procedures for handling and transport of radioactive materials as highlighted in Permit **Conditions 7.1** and **7.2**.
- c. Document and submit to the Agency a report on the frequency of the training cycles and names and designations of recipients.

7.4 Radiation Monitoring

7.4.1 Source Monitoring

- a. Maintain a source inventory and register of the activity level of all radioactive sources during its period of use. A **Geiger Muller Detector** owned and stored within the facility is to be used to take readings of activity level.

7.4.2 Environmental Monitoring

- a. Conduct area surveys of sites on the vessel/project where radioactive sources are used. A copy of the survey must be immediately made available to the Agency if requested.
- b. Inspect the ship daily to ascertain whether all emissions are below relevant dose limits, and provide every two (2) months, a report to the Agency, including detailed recordings of 7.4.1.
- c. Immediately inform the Agency if emissions exceed dose limits.

7.4.3 Individual Monitoring

- a. Provide means for OEP to monitor their radiation exposure accurately in the presence of a radioactive source(s), as well as, their accumulated exposure during their tenure on the project.

7.5 Personal Protective Equipment (PPE)

- a. Equip all OEP responsible for the use/operation of the equipment with appropriate Personal Protective Equipment (PPE) including but not limited to remote handling devices and shields.

7.6 Warning Labels

- a. All radioactive sources must be clearly labelled in its packing with the following symbol:



- b. Clearly label the locations where radioactive sources are stored and used in large visible block letters against a yellow background.

7.7 Radioactive Source Storage and Use

- a. Do not use Radioactive Sources for any purpose other than the approved intended use and ensure that their use is restricted to the permitted **Kiru Kiru-1** Well site.
- b. Prohibit smoking in locations where radioactive sources are used or stored.
- c. Apply best management practices that align with international policies and guidelines for the transport, handling and use of radioactive sources including practices whereby:
 - All sources are housed when not in use, in an adequately shielded containment, fully labelled, and isolated from areas of high occupancy.
 - Sources are clearly labelled as indicated in Condition 7.6 (a). above with its name, Initial Activity level and the date of the recorded Initial Activity level.
 - No radioactive source is to be disposed of in the Marine Environment or onshore Guyana.

7.8 Radiation Protection Plan

- a. Establish and submit to the Agency within **two (2) weeks** of issuance of this Permit, a **Radiation Protection Plan** including all the above-mentioned requirements.

7.9 Disposal of Radioactive Sources

- a. Identify and inform the Agency of the party responsible for the disposal of the radioactive sources.

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- b. Inform the EPA of the frequency with which sources will be replaced and disposed, at least **three (3) months prior** to the expiration of the useful lifetime of a radioactive source.

8.0 HAZARDOUS WASTES/MATERIALS MANAGEMENT

- 8.1 Comply with the provisions of the **Environmental Protection (Hazardous Waste Management) Regulations, 2000.**
- 8.2 Prepare and submit to the Agency in the End of Well Report, a report on the activities undertaken including:
 - a. Identification information of the facility;
 - b. Types and quantities of hazardous waste generated;
 - c. Date concerning off-site shipments of wastes;
 - d. Applied waste treatment standards;
 - e. A summary of any accidents and any action taken;
 - f. Any waste minimisation efforts undertaken; and
 - g. Any other matter the Agency may require.

The Agency considers the materials listed in Schedules I and II of the Environmental Protection (Hazardous Waste Management) Regulations, 2000, to be hazardous.

- 8.3 Utilise low toxicity chemicals, where practical in the operation. All chemicals must be utilised in accordance with their Safety Data Sheets.
- 8.4 The concentration of mercury and cadmium shall not exceed 1 mg/kg dry weight in stock barite, and 3 mg/kg dry weight in stock barite, respectively.
- 8.5 Prepare a report on the concentrations of cadmium and mercury in stock barite and suspended particles, contained in the discharge. This information must be submitted in the End of Well Report.
- 8.6 Secure fuel, oils and chemicals in areas far away from the discharge points of the vessel or onshore storage location, and in accordance with their Safety Data Sheets.
- 8.7 Submit a report on the types and quantities of chemicals stored, consumed in the various processes, and discharged in the marine environment. Information must be contained in the End of Well Report.
- 8.8 Contain and return spent oils, lubes and chemicals to shore for disposal by an EPA authorised operator. Discharge of used/waste oils and chemicals in the marine environment or in any waterways is **prohibited**, as well as, disposal onshore if untreated.

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- 8.9 Oil and chemical spills must be cleaned up in accordance with the most recently EPA approved Oil Spill Response Plan with the prior **consent** of the Agency and other relevant regulatory bodies.

9.0 EMPLOYEES

- 9.1 Operate in accordance with Guyana's Occupational Safety and Health Act, No. 32 of 1997.
- 9.2 Provide employees with the necessary protective gear to fit their job specification.
- 9.3 Conduct and document training for all employees and third parties on the conditions of this Environmental Permit and on good environmental management practices.
- 9.4 Employ a Health Safety and Environmental Officer or establish a Health and Safety Committee to be responsible for the implementation of the Health, Safety, Environmental and Social Management Plan and the terms and conditions of this Permit.

10.0 EMERGENCY MANAGEMENT

- 10.1 Notify the EPA **within twenty-four (24) hours** of the occurrence of any environmental emergencies, such as accidental or unintended discharges which may constitute an offence under the Environmental Protection Act and Regulations, sudden onset disaster, accident, natural, technological or human-induced factors that cause or threaten to cause severe environmental damage as well as harm to human health or livelihood.
- 10.2 A completed Initial Incident Notification Form using the most recent EPA Template shall be submitted to the EPA **within forty-eight (48) hours** of any spills, unwanted or accidental discharges to the environment amounting to five (5) gallons or more. Spills amounting to less than five (5) gallons shall be recorded and reported to the EPA in the monthly report. The Permit Holder shall comply with requests from the EPA for further information and/or investigation regarding any such incidents or environmental emergencies.
- 10.3 The Permit Holder shall provide the financial, equipment and technical capacity to adequately respond (including containment, clean up and damages resulting from any discharge/spill) to any emergency that may occur that is associated with the permitted activity, and respond to any emergency immediately, for the environmental protection of Guyana and surrounding regions (including the neighbouring South American Coast and Caribbean Sea) likely to be affected.

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- 10.4 Adhere to the most recent and updated Oil Spill Response Plan approved by the EPA.
- 10.5 Install a Main Emergency Shutdown Device (ESD) to initiate automatic shutdown actions if any unsafe condition is observed. The Permit Holder shall provide notification of the Main Emergency Shutdown to the EPA **within twenty-four (24) hours** of its initiation, and provide any other relevant information requested by the Agency thereafter. Resumption of Drilling Operations specifically after an Emergency Shutdown must be approved by the Agency.
- 10.6 Implement robust personnel training and field exercises in oil spill prevention containment and response.
- 10.7 Prepare and submit to the Agency, the identification details of persons responsible for managing and participating in spill response efforts, their specific training requirements, responsibilities, authority, roles and contact details within **two (2) weeks** of issuance of the Environmental Permit for **Kiru Kiru-1** Well.
- 10.8 Undertake monthly maintenance and testing of oil spill response containment equipment, and submit a monthly report on their state of readiness.
- 10.9 Subject to **Conditions 10.1** and **10.2**, document and report all spills, as well as, near misses to the Agency and other relevant authorities. Following a spill or near miss, conduct a root cause investigation and undertake corrective actions to prevent recurrence, and provide any other information or documentation as may be requested by the EPA in relation to the incident.
- 10.10 Adhere to cooperative measures with Government Agencies, as it relates to oil spill response as applicable and relevant notification process and procedures.
- 10.11 Inform and justify to the Agency, the need for *In-situ* burning in the event of an oil spill for consideration and approval, and subsequent follow-up action(s). *In-situ* burning is prohibited unless approved by the Agency and other relevant Government authorities **prior to application**.
- 10.12 Maintain emergency spill response equipment on site for response to potential spills.
- 10.13 **Condition 10.10**, above, is not to be interpreted as meaning that the Permit Holder will not be liable to fulfil its obligations under any other oil spill response plans, whether existing or forthcoming.

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11.0 WELL TEST

- 11.1 Monitor all pipes and joints for leakage and fugitive emissions **daily**. All collected streams must be burned in high efficiency flare(s), and leak detection and repair programs must be implemented and maintained.
- 11.2 Provide gas sensors during testing operations which are capable of detecting all sources of gas.
- 11.3 Install an efficient test-flare burner head which is equipped with an appropriate combustion enhancement system capable of minimising incomplete combustion, black smoke, and hydrocarbon fallout to the sea.
- 11.4 Keep the well test and flaring duration to the minimum practical time, in accordance with a pre-approved schedule between the Agency and the Permit Holder. Any deviations from or variations to the pre-approved schedule shall be approved by the EPA.
- 11.5 Provide sufficient compressed air to the oil burner for efficient flaring assignment.

12.0 VENTING AND FLARING

- 12.1 Notify the EPA at least **forty-eight (48) hours** prior to the start of any flaring or venting, and provide ample notice to other applicable regulatory Agencies. Such notification shall include data regarding:
 - a. Location where flaring and venting will occur;
 - b. Period during which the activity will be carried out;
 - c. The expected volume of hydrocarbons to be flared, the expected quantity of specific pollutants that may be emitted (including carbon dioxide or carbon dioxide equivalent), and the expected amount of energy that may be released. Note that fuel gas flared or vented, must be reported as fuel gas and not flare gas; and
 - d. Any mitigation measures to be applied to reduce gas emissions and prevent/reduce harm to seabirds.
- 12.2 Only use flare equipment that have been thoroughly inspected, well maintained, monitored, certified and function-tested, prior to and throughout well testing operations.
- 12.3 Flaring must cease if an oil sheen is observed, and can only resume when the cause is identified and rectified.
- 12.4 Assign experienced person(s) responsible for observing the flare during the Well Testing.

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- 12.5 Install the flare at least 50 metres from storage tanks containing flammable liquids or vapours.
- 12.6 Only use combustion equipment designed and built to certified engineering codes and standards. The flare must not be operated outside designed operating ranges.
- 12.7 Submit within **three (3) weeks** of issuance of this Permit, methods and measures identified to reduce sources gas emission.
- 12.8 Use efficient flare tips and optimise the size and number of burning nozzles.
- 12.9 Minimise flaring from purges and pilots (without compromising safety) through the installation of purge gas reduction devices, vapour recovery units, inert purge gas, soft sea valve technology, where appropriate, conservation pilots, etc.
- 12.10 Minimise risk of pilot blowout by providing sufficient exit velocity and wind guards.
- 12.11 Use a reliable pilot ignition system.
- 12.12 Install high-integrity instrument pressure protection systems, as necessary, to reduce overpressure events and avoid or reduce flaring situations.
- 12.13 Operate flare to control odour and visible smoke emissions (not visible black smoke). Aside from the start-up process, if operations result in continuous visible emissions, the existing flare, nozzles, burner, equipment must be modified or replaced. Flaring should only commence during good light.
- 12.14 Position flare at a safe distance (at least 50 metres) from accommodation units.
- 12.15 Record and submit in the End of Well Report, the volumes of hydrocarbons flared, the quantity of specific pollutants emitted (including carbon dioxide or carbon dioxide equivalent), and the amount of energy released during flaring.
- 12.16 Implement burner maintenance and replacement programs to ensure continuous maximum flare efficiency.
- 12.17 Maximise flare combustion efficiency by controlling and optimising flare fuel, air and stream flow rates to ensure the correct ratio of assist stream to flare stream.
- 12.18 Minimise liquid carryover and entrainment in the gas flare stream with a liquid separation system with sufficient holding capacity for liquids that may accumulate designed in accordance with good engineering practice.

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- 12.19 Equip the liquid separation system (e.g. knockout drum) with high level facility shut down or high level alarms, and empty them in keeping with manufacturer's specifications.
- 12.20 Remove any liquids from the separator after flaring is complete.
- 12.21 Minimise flare lift off and/or flame lick.
- 12.22 Any changes or variances to the pre-approved schedule must be approved by the Agency. Fines and penalties may apply to any unauthorised flaring, or any extended period to the pre-approved flaring schedule.

13.0 COMPLIANCE MONITORING AND REPORTING

- 13.1 Notify the Agency in writing of the intended spud date **at least seven (7) days** prior to spud. Should spudding be delayed after notification was given, the Agency must be informed in writing of the delay and of the new intended spud date.
- 13.2 Sign and certify all information submitted to the Agency. All submissions on analyses, contaminant reports, discharges or any other environmental data shall be submitted in both a printed copy and in an editable Standard Reporting Matrix.
- 13.3 Provide any information or copies of records requested within the timeframe requested by the Agency.
- 13.4 Monitor the implementation of the conditions of this Permit, insofar as they involve adherence by employees and all other third parties under your direction. Provide a list of all third parties, their responsibilities and compliance with the terms and conditions herein. Information must be contained in the End of Well Report.
- 13.5 Report to the Agency, any non-compliance with the Environmental Permit, within **twenty-four (24) hours** of the time the Permit Holder (or third parties) becomes aware of the said non-compliance, outlining the anticipated manner in which it may endanger human health or the environment.
- 13.6 Within **seventy-two (72) hours** of the awareness of the non-compliance, submit to the Agency, a written report containing a description of the non-compliance, its causes, the period of non-compliance including exact dates and times known at the time of reporting, and the anticipated time it is expected to continue if the non-compliance has not been corrected within **seventy-two (72) hours**.
- 13.7 Submit **monthly reports** to the EPA on the progress of the operation and compliance with the conditions under which this Permit was granted on or before **the last day of the reporting month**. In addition, submit the End of Well Report at least **forty-five (45) days** following the completion of drilling operations.

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- 13.8 Collaborate with the EPA to determine a sampling schedule to monitor any changes in the biological environment due to the discharge of wastes and drill cuttings into the marine environment within **two (2) weeks** of the issuance of the Permit. The results from these samples, the sample sites, site identification criteria, and methods of analyses (dates and times included), must be submitted to the Agency in the End of Well Report.
- 13.9 Comply with any lawful directions given by the EPA from time-to-time in furtherance of the implementation of any international or other obligations for the environmental protection of Guyana and surrounding regions (including neighbouring South American Coast and Caribbean Sea) likely to be affected.
- 13.10 Foster good corporate relations involving the Regional Council, Ministry of Agriculture and Fisheries Department, residents and other stakeholders, where general information can be shared and major concerns or complaints resolved. Evidence of the Company's corporate relations with Stakeholders shall be provided within **two (2) weeks** of issuance of the Permit. Immediately inform the EPA of any conflicts with other stakeholders.
- 13.11 Inform the Agency in a timely manner of any variation or intentions to conduct other activities not stipulated in this Permit, such as, but not limited to, Side-tracking of Well.
- 13.12 Keep on site, a copy of the Manufacturer's Operating Manual for the Incinerator, which shall also be available upon request by the Agency.
- 13.13 Be responsible for payment for all environmental audits and compliance monitoring requested and/or conducted by the EPA in relation to this Permit, as well as any independent investigations into pollution incidents.
- 13.14 Notify the Agency within **one (1) month** prior to well abandonment and submit all Well Abandonment Plan(s) for approval.
- 13.15 Submit to the Agency within **one (1) week** of commencement of drilling, a list and quantities of all additives to be used in the drilling mud to maintain its required properties. Information should be submitted in both a printed copy and in an editable Standard Reporting Matrix.
- 13.16 Inform the Agency, in the End of Well Report, of tests conducted with the Blow Out Preventer (BOP) equipment, detailing occasions where there was an influx of formation fluids, the well control methods applied and their effectiveness.
- 13.17 Submit for approval to the Agency within **two (2) weeks** of the issuance of the Permit, details of dispersants to be used in the event of spills.

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- 13.18 Submit to the EPA, report(s) on the progress of the operation and compliance with the conditions under this Permit in the End of Well Report.
- 13.19 Maintain a precise inventory of all drilling fluid constituents added downhole for each well.
- 13.20 Retain records of all monitoring information, including, all calibration and maintenance records and all original strip chart records for continuous monitoring instrumentation, and copies of all reports required by this Permit, for a period of at least **three (3) years** from the date of the sample, measurement, report or application.
- 13.21 Report to the EPA, the composition of each mud system used and discharged. Mud composition data shall be submitted to EPA within the End of Well Report.
- 13.22 Report the following for each mud system in the End of Well Report:
- a. base (generic) drilling fluid type;
 - b. product name and total amount (volume or weight) of each constituent in discharged drilling fluid;
 - c. total volumes of drilling fluids discharged; and
 - d. number of days of discharge.
- 13.23 Report the estimated maximum concentration of each constituent in the discharged drilling fluid, if no toxicity test is conducted on the drilling fluid system. Information must be contained in the End of Well Report.
- 13.24 Do not assign or transfer the Environmental Permit to any person without prior consent from the Agency.
- 13.25 Notify the Agency within **twenty-one (21) days** in the event of death, bankruptcy, liquidation or receivership of the Permit Holder or if the Company becomes a party to an amalgamation.
- 13.26 Inform the Agency prior to or within **thirty (30) days** of any change of name or ownership of the operation.
- 13.27 Geodata/shapefile information for the **Kiru Kiru-1** well shall be submitted to the Agency within **forty-five (45) days** following the completion of drilling operations. The information must be compatible with ArcMap Version 10.3 and must include, but not be limited to the following:
- a) Location (GIS coordinates with relevant attribute data) of the **Kiru Kiru-1** Well; and

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- b) Well information, including well depth, size, surrounding water depth, etc.;
- 13.28 Submit to the Agency, a copy of the following documents/reports in the End of Well Report:
- a. Copy of the Oil Record Book;
 - b. Records of vessels and helicopter movements (routes, speed, heights, etc. where applicable) and of any incidents associated with these;
 - c. Garbage Record Book; and
 - d. Garbage Management Plan.
- 13.29 All discharges are to be done in the manner outlined in the Revised Environmental Assessment and Management Plan for the Stabroek Block, dated October, 2020. The Permit Holder shall submit the testing protocols and procedures for each discharge within **two (2) weeks of issuance of the permit**.
- 13.30 The Agency reserves the continuous and irrevocable right to order the sampling and analysis of any discharges, effluent or waste emanating from the Project, to be analysed by an independent certified laboratory or institution, approved by the Agency, at the expense of the Permit Holder.

14.0 LIABILITY FOR POLLUTION DAMAGE

- 14.1 The Permit Holder shall have insurance of such type in such amount as is customary in the international petroleum industry in accordance with good oil fields practices for Petroleum Operations in progress Offshore Guyana in respect of:
- a. Loss or damage to all assets used in Project;
 - b. Pollution caused in the course of the Project for which EEPGL will be, jointly and severally, held responsible;
 - c. Loss or damage to property or bodily injury suffered by any third party in the course of the Project for which EEPGL is liable to, according to the terms of the policy;
 - d. EEPGL's liability to its employees engaged in the Project; and
 - e. Any other requirement made by the EPA under **Condition 14.3** below.
- 14.2 **Condition 14.1** shall not be interpreted to mean that the Permit Holder, its Parent Company, Servant and/or Agent will not be liable to any other existing or forthcoming applicable laws, rules and regulations related to insurance for Petroleum Operations within or out of the jurisdiction of Guyana.
- 14.3 The Permit Holder shall submit the environmental liability insurance policy required by **Condition 14.1** to the Agency for its review and approval, including the following documents, **within two (2) weeks** of issuance of this Permit or as soon as reasonably possible:

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- a. Provision of documentary evidence that the insurer is authorised to provide the insurance in the jurisdiction and of the insurer's financial strength;
 - b. Evidence of Bank of Guyana's no-objection or approval of the insurance policy, where applicable;
 - c. Provision of details of the amount of cover and the cost profile, evidence of authorisation of the institution or parent (insurer's) to provide insurance;
 - d. Where applicable, the submission of evidence of any supplementary cover required to cover gaps in the primary cover, inclusive of details relevant to the excess level which is the responsibility of the policyholder to cover;
 - e. Agreement to provide notification to the EPA of modification, cancellation, expiration, intent to renew, renewal or non-renewal and expiry dates of the policy;
 - f. Provision of reports on whether the insurance policy is maintained or renewed so that the EPA can determine if it is acceptable or if it requires a replacement policy, and
 - g. Provide the final insurance policy or certificate of insurance, evidence of financial strength and payment of premium.
- 14.4 The Permit Holder must as soon as reasonably practicable provide from the Parent Company or Affiliate Companies of Permit Holder and its Co-Venturers ("Affiliates") one or more legally binding agreements to the EPA, effective both during and after the term of the Permit, undertaking to provide adequate financial resources for Permit Holder and its Co-Venturers to pay or satisfy their respective environmental obligations regarding the Stabroek Block if EEPGL or its Co-Venturers fail to do so. As a consequence, EEPGL will be required to:
 - 1) Provide evidence of the following:
 - a. That the Affiliate(s) are authorised to provide that guarantee or agreement in this jurisdiction.
 - b. That the Affiliate(s) have sufficient financial strength for the amount of the potential liability.
 - c. That the Affiliate(s) have the corporate legal capacity to enter into the agreement.
 - 2) Agree to the following:
 - a. To provide notification of cancellation, renewal or non-renewal and expiration dates of the Agreement.
 - b. To provide annual audited financial statements and notification if the Affiliate(s) are no longer likely to be able to meet specified financial obligations.
- 14.5 Liability of the Permit Holder, agents and/or sub-contractors shall survive the expiration of this Permit, provided always that nothing in this clause shall alter, add to or abrogate the Limitation Act, Cap. 7:02 of the Laws of Guyana, in any manner whatsoever.

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- 14.6 The Permit Holder, his Servant and/or Agents shall be liable for any activity that causes pollution of the environment unless the person takes all reasonable and practicable measures to prevent or minimise any resulting adverse effect, in accordance with Section 19(1) (a) of the Environmental Protection Act, Cap. 20:05, Laws of Guyana.
- 14.7 The discharge or release of contaminants such as hydraulic fluids, lubricants, fuel, or other industrial fluids relative to the Project, which are not stipulated or authorised herein are strictly prohibited. Any such discharge or release shall be deemed a violation of Section 19(1)(b) of the Environmental Protection Act Cap. 20:05, Laws of Guyana.
- 14.8 The Permit Holder shall compensate any Party who suffers any loss or damage as a result of the project. (Section 19(3)(e)) of the Environmental Protection Act, Cap. 20:05, Laws of Guyana)
- 14.9 The Permit Holder, his Servants and/or Agents shall be liable to penalties prescribed for any material or environmental harm caused by pollution of the environment intentionally or recklessly in accordance with section 39 (1), (2), (3) and (4) of the Environmental Protection Act, Cap. 20:05, Laws of Guyana.
- 14.10 The Permit Holder, his Servants and/or Agents shall be liable jointly and/or severally for any gross negligence or wilful misconduct to the marine environment, biodiversity, protected species and natural habitat with respect to any release or discharge, spill, contaminant fluids, oil, or lubricants from any facilities permitted under this project.
- 14.11 The Permit Holder, his Servants and/or Agents shall be liable jointly and/or severally for environmental damage due to pollution from its activities within Guyana, its territorial waters, contiguous zone, continental margins, continental shelf, and Exclusive Economic Zone, inclusive of damage to the marine environment, biodiversity, protected species and natural habitat with respect to any release or discharge, spill or contamination which is attributable to the Permit Holder and his agents or contractors. This is in accordance with Section 49 (1) of the Maritime Zones Act, Cap. 63:01, Laws of Guyana and is subject to any other existing or forthcoming laws, regulations and standards governing the protection of the marine environment.
- 14.12 Where it appears to the EPA that the Permit Holder is engaged in any activity that may pose a serious threat to natural resources or risk of serious pollution of the environment or any damage to public health, the EPA shall issue to the Permit Holder a Prohibition Notice ordering the immediate cessation of the offending activity in accordance with Section 27 of the Environmental Protection Act, Cap 20:05, Laws of Guyana.

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- 14.13 Should the Permit Holder contravene or be likely to contravene any condition of this Permit, the EPA may issue an Enforcement Notice in accordance with Section 26 of the Environmental Protection Act, Cap. 20:05, Laws of Guyana.

15.0 INSTITUTIONAL AUTHORITY

- 15.1 The EPA reserves the right to conduct regular inspections of the Permit Holder's operation as part of its monitoring and enforcement requirements under the Environmental Protection Act, Cap. 20:05, Laws of Guyana, the Environmental Protection (Amendment) Act, 2005, and the Environmental Protection (Authorisations) Regulations, 2000, and any forthcoming regulations, best practices, guidelines and standards made under this Act; including the most recent version of the 'Guidelines for the Conduct of Remote Inspections'.
- 15.2 The Permit Holder shall, at all times, allow entry to the permitted facility any Officer designated by the EPA for the purposes of conducting inspections or any other legitimate business of the Agency.
- 15.3 The EPA reserves the right to review/amend the fees and conditions attached to this Permit in consideration of any changes in fee structure or environmental standards as determined by the Agency for projects of this nature.
- 15.4 The Permit Holder shall bear the expenses to facilitate transportation by authorised officers of the EPA to conduct offshore inspections.
- 15.5 EPA shall have the right to cancel, modify or suspend this Permit for breach of any of the terms and conditions contained herein, or any other circumstance prescribed by Regulation 14(2) of the Environmental Protection (Authorisations) Regulations.
- 15.6 This Environmental Permit is not the final development consent. Permission from the other relevant regulatory bodies must be obtained prior to project implementation.
- 15.7 This Permit shall be governed by, interpreted and construed in accordance with the Laws of Guyana including but not limited to the Environmental Protection Act and Regulations and consistent with such rules of international laws as may be applicable or appropriate, including the generally accepted customs and usages of the international petroleum industry.
- 15.8 This Permit is effective from the period stipulated herein (**Februaryary, 2022 to January, 2025**).
- 15.9 This Environmental Permit shall remain valid until **January, 31, 2025**, unless otherwise suspended, cancelled, modified or varied in accordance with its

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provisions or the Environmental Protection Act, Cap 20:05, Laws of Guyana, the Environmental Protection (Amendment) Act, 2005, and the Environmental Protection (Authorisations) Regulations, 2000.

- 15.10 This Permit must be renewed by submitting a completed *Application Form for Renewal of Environmental Authorisation* to the Agency at least six months before this Permit expires, that is, no later than **July 31, 2024**.
- 15.11 Any late submission of renewal application(s) after the specified date as stated above, may require the Permit Holder to pay, in addition to the renewal fee, **a late penalty fee (accruing at the time such obligation was first owed for renewal) at a rate of two thousand dollars (GY\$2,000.00) per day for every day late**, until such renewal application is submitted to the Agency, without prejudice to any other rights of the Permit Holder in connection therewith.
- 15.12 Failure to comply with the requirements of this Permit or with applicable laws and regulations, whether existing or forthcoming, shall render the Permit Holder liable to prosecution and to penalties prescribed under the Environmental Protection Act, Cap. 20:05, Laws of Guyana, the Environmental Protection Regulation, 2000 and other applicable Laws of Guyana.

Signed by


Kemraj Parsram
Executive Director

on behalf of the Environmental Protection Agency.

Date

21.2.22

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Esso Exploration and Production Guyana Limited (EEPGL) hereby accepts the above terms and conditions upon which this Environmental Permit is granted and agrees to abide by the Environmental Protection Act, Cap, 20:05, Laws of Guyana, the Environmental Protection (Amendment) Act, 2005, the Environmental Protection (Authorisations) Regulations, 2000, and the Maritime Zones Act, Cap. 63:01, Laws of Guyana, and any applicable existing and forthcoming written law, best practices, guidelines, standards, codes of practice and other statutory or regulatory instruments made thereunder and of relevance to this project, taking into account the international rules and standards, international treaties and conventions to which Guyana is a party.

NAME	MICHAEL B. PERSAUD
DESIGNATION	ENVIRONMENTAL, REGULATORY & SOCIOECONOMIC MANAGER
DATE	FEBRUARY 21, 2022
SIGNATURE	Michael B. Persaud

