Guyana

Beebei-1

Environmental Post Well Survey

SCOPE OF WORK

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1. Project Information

1.1 Background

Repsol Exploración Guyana S.A. (herein after Repsol) plans to drill two exploratory wells within the exploration permit Kanuku, offshore Guyana.

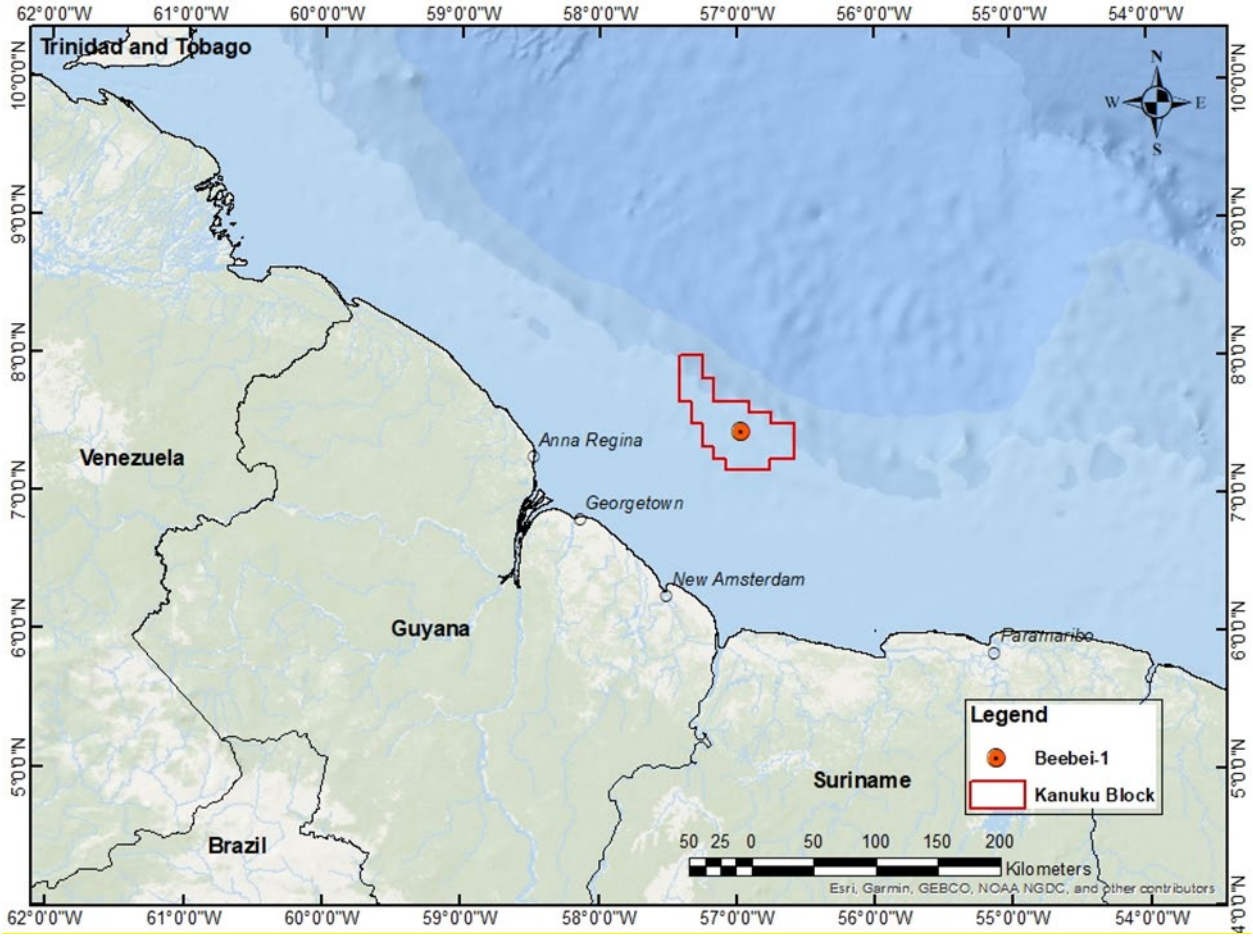

Figure 1. - Approximated Location for two Site Surveys (Red dashed polygon)

As part of the Beebei-1 Post Well Activities, Repsol is requesting to conduct Environmental Post Well Surveys at the well location, including an environmental sampling campaign followed by samples lab analysis. Table-1 refers to BEEBEI-1 coordinate

	Beebei-1
Coordinates	**Lat:** 7° 27' 38.68" N **Long:** 56° 56' 58.92" W
Location	Offshore Guyana (127km from Coast line approximately)

Table-1: Beebei-1 offshore well coordinate

The coordinate of second well within the site survey area still to be defined and will be communicated to Contractor as soon as they are available.

The scope of the proposals to be submitted by the Contractor shall include all the activities and deliverables described in this document. Figure 1 shows the Kanuku area, and in red the approximated area where the wells will be located.

2. Scope of Services

The objectives of the Environmental Baseline Survey are:

- Regional environmental characterization of the exploration area
- Identification of potential sensitive habitats and associated biota that should be considered in the planning of future activities;
- To identify potential existing environmental liabilities in the area prior to starting other exploratory activities that may have potential impacts.

The scope of services shall include the following tasks:

- Bibliographical study
- Field survey
    - Seabed Visual survey: Underwater video / stills
    - Sediment sampling to assess biological (benthic community structure) and physico-chemical properties including nature of sediments and contamination levels;
    - Seawater profiling (Optional)
    - Seawater sampling (Optional)
    - Marine fauna observation
- Sample analysis
- Reports and deliverables

2.1 Bibliographical study

The Bibliographical analysis of the marine area considered will used existing information sources focusing in particular on:

- Study of oceanographic and meteorological data, in particular of currents and sediment characteristics
- Morphology of the seabed, limit of benthic formations, seaweed patches, coral reefs, cold water corals
- Physicochemical and biological properties of the sediments and water column
- Ecosystems and remarkable species: birds, fishes, turtles and marine mammal populations
- Sensitiveness of the area (migration routes, spawning areas.)
- Degree of any pollution, particularly regarding hydrocarbons and heavy metals
- Regulations

2.2 Field Survey

(a) Sampling Grid design

For the definition of the sampling methodology, Contractor is expected to present a strategy based on:

- Local requirements for Offshore Environmental Baseline surveys (if applicable);
- Local common practices for offshore Environmental Baseline surveys based on previous experiences in the area.

In the absence of local requirements or methodologies of reference, internationally recognized practices will be followed. Contractor is expected to propose a representative sampling grid design, optimizing the number of sampling stations. Side Scan Sonar and other preliminary data may be used to determine best location for sampling stations. Optimization of the number of sediment and water samples will be considered when evaluating proposals. As a reference, in similar projects the number of sediment sampling stations has been between 15 and 20.

Proposed sampling stations will be reviewed in conjunction with the Repsol for final approval before any work is undertaken.

(b) Sampling equipment

Contractor is expected to provide a proposal with different sampling systems available and suitable for the project conditions, such as:

- Dual Van Veen grab 0.1m2
- Box corer
- 0.1m2 Day Grab
- Autosiever (WAS)
- Set of Sieves (0.5mm)
- Drop Down camera
- Niskin Water Samplers
- CTD
- Others

All equipment offered by Contractor must be suitable for the environmental conditions as described in this scope of work. Contractor is expected to offer fit for purpose equipment, optimizing survey needs and cost. Calibration, maintenance and other relevant certificates must be included in the proposal along with technical specifications. Enough spare parts must be kept on board vessel to avoid unnecessary stand-by time.

(c) Sample Pre-treatment and conservation

Contractor will provide the resources to pre-treat and preserve the samples. Equipment may include but is not limited to:

- Latex/Vinyl gloves;
- Plastic or metallic tray;
- 0.5 mm sieve (textile);
- High volumen tray (>100L);
- Plastic bags;
- Plastic bottles 1L;

- Markers.

(d) Record keeping and Chain of Custody forms

Records of samples and observations acquired during the sampling effort must be kept and attached to the final reports Chain of custody forms must be prepared for each of the shipments made to the laboratory. These will be also attached to the final report.

(e) Seabed Visual survey

The main objective of the visual survey will be to observe and document the seafloor and associated biological communities along defined sampling stations. Visual survey shall be conducted with either a drop-down frame camera filming of the seafloor.

Project information (Client, site, etc.), positional information (latitude / longitude or easting / northing), date, time and station number will be collected at each station. Digital stills will be acquired in each sampling station. A minimum of four (4) good quality photographs will be taken at each sampling location if visibility allows. Parallel lasers may also be attached to the camera system if it is mounted in a drop-down frame to allow quantification and to assess scale of all observed fauna. In addition, laser scaling is important in determining sediment size classes, especially for assessment of geogenic or biogenic reef.

A number of camera transects may be required at specific locations in order to footage of potential well locations or specific features previously identified from the analogue data acquisition.

(f) Sediment Sampling

Sediment sampling will be conducted using a Dual van Veen (DVV) grab, Box Corer or any other fit for purpose equipment proposed by contractor.

Equipment will be operated by highly experienced personnel and will be maintained in line with the industry guidelines and manufacturers recommendations. Samples must undergo rigorous QA / QC checks with all samples retained photographed. Survey logs will be kept detailing, as a minimum:

- Sample ID;
- Date and Time;
- Fix number;
- Geographical location;
- Water depth;
- Sea state;
- Sediment type;
- Layering of sediment;
- Depth / volume of sample; and
- Conspicuous fauna.

If a grab sample is deemed unacceptable then a further two attempts shall be made. If the grab sample is still unacceptable on the third occasion, then the sample location will either be moved or completely abandoned. For performing the analysis, three (3) replicas should be taken per sampling station. This number could change depending on operation and timing issues. Biological analysis will be focused in the first 10-15 cm (next to surface), where 90% of organisms are located.

The preservation protocol will be provided by the laboratory contracted to perform the analysis and will be discussed together with Contractor prior to starting the sampling campaign.

For macrofaunal analysis, samples retained will be processed (i.e. sieved) using a sieving machine, Wilson Auto-Sieve (WAS) or a sieve chute over a 0.5 mm sieve. The samples will then be fixed in 10% formal saline solution and stored appropriately in preparation for demobilization.

For physic-chemical analysis, samples retained will be stored in the deep freeze until demobilization whereupon they will be analyzed in house or transported to an accredited laboratory for analysis. The analyses tested will include parameters as detailed in Annex I.

(g) Seawater profiling (OPTIONAL)

Water profiles will be acquired using a CTD certified to the maximum water depth of the exploration arear depth. A water quality profile will be obtained to provide continuous data from the sea surface to the seabed. A maximum depth interval between readings will be specified by Contractor. Parameters that will be measured will be:

- Depth
- pH
- Conductivity (salinity)
- Dissolved Oxygen
- Temperature
- Turbidity

(h) Seawater Sampling (OPTIONAL)

Water samples will be taken at discrete water depths (1-2m below surface, mid water column and as close above bottom as practicable) using 5 L Niskin water samplers in order to carry out physical and chemical analysis on the water column. All samples will be collected in duplicate (one sample to be analyzed and one kept as a spare in case of loss/damage to primary sample). The parameters to be analyzed are included in Annex I

Samples will be packaged and stored according to the requirements of the analyzing laboratories, with the majority of physic-chemical sub-samples stored in glass or plastic bottles with appropriate fixatives and refrigerated. Onboard refrigerated storage will be maintained at 4˚C (±2 ˚C), with daily checks of temperature made and logged throughout operations. Chlorophyll pigments and pheopigments will be gathered immediately by filtering (0.45 µm) water samples.

Number of water sampling stations will be optimized as much as possible, keeping a representative approach that captures regional variation of parameters. Technical justification for the number of sampling stations will be provided.

2.3 Sample laboratory analysis

Laboratories proposed by Contractor must be able to comply with all the parameters described in this Scope of Work. Laboratories must have in place recognized methods and standards to ensure reliability of the analytical methods. Accreditation under international Standards will be required.

- Analytical Methods to be used (or equivalent), parameters and detection limits are described in Annex I;
- Results must be compared against recognized reference values for the area (or region if not available).

Laboratories must be selected according to certifications as well as experience. Company reserves the right to audits the laboratories for validation. Contractor shall provide all information concerning:

- References and certifications
- Methods and norms used for analyses
- Laboratory QA/QC standards
- Available laboratory equipment

2.4 Reports and Deliverables

The following deliverables shall be provided by Contractor:

- Daily Operational Report (activities performed, weather conditions, significant findings, MFO sightings and HSE)
- Operational Field Survey Report, on completion of the field work before demobilization of personnel and equipment;
- Draft and Final Environmental Baseline Reports;
- Photo Catalogue database;
- GIS database
- Any HSE or Operational incidents

Final report must include but not limited to:

- Bibliographical study
- Work program;
- Sampling Strategy;
- Materials and Methods;
- QA/QC summary;
- Results and Discussion;
- Environmental liabilities identified
- Conclusions (comparing to reference values);

Draft version of the Operational Field Work Report shall be made available to Company within 5 days after the field work has been completed. Final version will be issued to Company within one (1) week of receipt of comments on draft version. Final Environmental Baseline report will be issued within two (2) weeks of receipt of comments from Repsol.

Electronic copies in English as well as 2 hard copies will be provided as part of deliverables.

3. Vessel, Equipment and Personnel

3.1 Survey Vessel

The vessel proposed for the campaign must be fit for purpose and have all equipment required to perform the job in comply with GUY-RGU-KANUKU-BB1-S-SW-005 Beebei-1 EPW Survey -Vessel requirement Contractor shall present a vessel with valid IMO number. If available OVID, or other, audit reports must be presented before commencement of operations. If considered necessary, Repsol will conduct audit and acceptance process following the HSE Criteria for Marine and River Vessels Contracting procedure (20-00035PR).

Contractor will consider the possibility of performing a third-party audit, upon Company's request.

3.2 Survey Vessel Specification

Full description and technical specifications of the vessel must be included in proposal, including but not limited to:

- Navigation systems
- Communication systems
- Lifting equipment, including winches and A-Frames
- Laboratory onboard for samples treatment and preservation
- Lifesaving equipment
- Safety systems on board
- Medical facilities
- Crew and other personnel, including on board medic

Contractor shall propose a vessel with valid IMO number (or OVID). Repsol will conduct and audit with a 3rd party inspector to make sure vessel is fit for purpose and complies with minimum technical and HSE requirement.

Sufficient accommodation space is as well expected to hold crew and technicians onboard to work in shifts, as per Contractor working schedules.

3.3 Port Definition

Contractor shall define the appropriate port to sail from and back, and receive samples, as well as to sail in case of emergency in Kanuku Block.

3.4 Personnel

Contractor shall designate a focal point of contract to attend and manage following issue owning to service of contract.

- Technical issues (project planning, field survey information, operations, etc)
- HSE aspects (reporting, incidents, statistics, etc)
- Administrative (contracts, finance, invoicing, etc)

Contractor shall submit project organization chart along with CVs of the technical team (including sub-contractors) in the technical proposal. Company´s expectation is that each team member:

1) Environment Survey Specialist more than 10 years' experience
2) Onboard Medic More than 5 experience
3) All vessel crew more than 10 years of experience

Contractor shall make statement that the team members proposed will be available through the life of the project.

Contractor shall submit nomination of a local partner or Contractor (name, address, e-mail, telephone, years on the activity, references), in case it is used in the technical proposal

Contractor shall submit number of Guyanese as part of the proposed team with minimum of 50% of whole crew in proposed organisation chart in technical proposal shall indicate.

Contractor shall fulfill local content requirement per Guyanese law and regulation.

4. Work Schedule

Contractor shall present in the technical proposal a work schedule that fulfills the Scope of Work and would allow Company to timely present report to Guyanse EPA.

Appropriate timing for the sampling shall be proposed based on technical specifications, weather restrictions, contractor's experience and bibliographic research.

A detailed schedule of activities, showing the deliverables of each phase shall be presented as part of the technical proposal. However, the Environmental Post Well Survey milestones are proposed as follows:

Activity or Deliverable	Date
EPWS Project Plan	March 2023
EPWS Filed Word	Mid March 2023
EPWS Darft Report	Mid April 2023
Final report	May 2023

Contractor shall add details of work schedule in technical proposal, including planning, field work, lab analysis, report writing timelines, and other activities as per Contractor advise.

5. Coordination Meetings

5.1 Kick-off meeting

A kick-off meeting will be organized between Repsol and the awarded contractor upon Contract signature. The kick-off meeting will be done either by Video-conference or at Repsol/Contractor offices. The relevant Repsol parties will be present at the kick-off meeting, and the same is expected for the successful bidder. The following aspects will be defined at this meeting:

- Objectives of the work
- Introduction of Contractor project management team and Repsol focal point.
- Revision of the Scope of Work to refine, as needed, the content, methodology, standards to be followed and deliverables
- Deadlines for delivery
- Questions and answers regarding the project
- Definition of communication lines
- Contractual issues
- Required permits

5.2 Start-up meeting

Contractor will be required to attend a start-up meeting at a designated place (Port of Departure). The purpose of the meeting is to verify the Contractor terms for the equipment, personnel and procedures and verify the contractual terms are implemented and areas of responsibility are clear.

Technical and HSE issues (risk assessment, HSE inspection findings, HSE plan, Emergency Response, etc.) together with the project plan shall be discussed and reviewed during the start-up meeting. Minutes of Start-up meeting should be properly signed and agreed by both parties.

5.3 Post-survey meeting

Contractor at Company's discretion may be required to attend, at its own cost, a post-survey meeting that will be arranged by Company after the field work completes. Contractor's representatives, sub-Contractors' representatives and QA/QC supervisor shall attend the meeting.

Presentations may be required for technical topics that are subject to Company's confirmation, including to Guyanese Authorities.

6. HSE REQUIREMENTS

Contractor is required to have an HSE management system in place that complies with local regulations and international standards. Within the Project Plan, contractor shall present the HSE Plan of the survey, including:

- HSE activities to be followed and the Project HSE Key Performance Indicators.
- Activity risk assessment and risk register.
- Standard operation procedures and critical task procedures and assurance.

- Emergency Response Plans for: fire, oil spill, medical emergency and SAR (Search and Rescue) plans.

Contractor is required to answered questionnaire attached to the bid package. The result of the HSE assessment will be part of the technical evaluation.

Contractor must comply with the following minimum HSE standard, as a minimum:

- Compliance with local legal requirements in HSE.
- Basic training of personnel on offshore work (i.e. sea survival, firefighting, basic first aid).
- Offshore medical fitness to work.
- Alcohol and drug policy.
- Incident management procedures.

7. Instruction to Bidder

The following documents shall be presented as part of the proposal:

- Detailed technical proposal describing how each part of the Scope of Work will be developed.
    - Sampling design
    - Sampling equipment and lab analysis methods
    - Quality assurance of sampling and analysis
    - Analysis and comparison with EBL
    - Vessel or vessels proposed and their specifications
    - Ports proposed and survey logistics plan
    - Project schedule, survey duration
    - Reports
- Relevant Contractor experience in the development of environmental surveys. Experience in Caribbean region.
- Guyanese and/or in Repsol projects is highly valued.
- Project Organization Chart and experience of the personnel assigned, along with the CV's of the key staff (i.e. consultants, technicians).
- Relevant information of the project will be available to awarded Contractor, upon contract award: permits, Environmental Baseline Study report, Environmental Impact Assessment, Cuttings discharge modelling reports, and other project details considered necessary to conduct the job.
- Contractor is responsible for obtaining vessel operation permits and any other permits o notifications needed to conduct the sampling (e.g. foreign technicians visas, seaman's books, etc.)
- List of sub-contractors and their experience in the job they will perform.
- HSE management relevant information of the HSE management system, including subcontractor HSE management. Completion of HSE questionnaire and submission of evidence is required (See ANNEX HSE QUESTIONNAIRE).
- Detailed commercial proposal, including equipment and personnel rates.
- Additional services proposed by Contractor shall be added in the technical and commercial proposal as additional. Technical justification of these services is required to be added to the proposal.
- Any deviation of the Scope of Work must be duly detailed and justified.

Annex I : Parameters, Analytical Methods and Detection Limits

Marine Water Analysis (OPTIONAL)

Parameter	Analytical method	Limit of Quantification	Unit
Chl-a	DIN 38412L16	-	µg/l
Phaeopigments	DIN 38412L16	-	µg/l
Nitrite	NF EN ISO 10304-1	0.01	mg/l
Nitrate	NF EN ISO 10304-1	1	mg/l
Sulfate	NF EN ISO 10304-1	1	mg/l
Sulfite	NF EN ISO 10304-1	0.5	mg/l
Ortho-phosphate	NF EN ISO 6878	0.04	mg/l
Total Suspended Matter	NF EN 872	2.0	mg/l
Oil and grease	DIN 38409-56	5.0	mg/l
Total Organic Carbon	NF EN 1484	0.5	mg/l
Total Hydrocarbons C10-C40	NF EN ISO 9377-2	0.1	mg/l
BTEX	ISO 11423-1	0.5	µg/l
Naphthalene	NFT 90-115	0.02	mg/l
Acenaphthene	NFT 90-115	0.02	mg/l
Fluorene	NFT 90-115	0.02	mg/l
Phenanthrene	NFT 90-115	0.02	mg/l
Anthracene	NFT 90-115	0.02	mg/l
Fluoranthene	NFT 90-115	0.02	mg/l
Pyrene	NFT 90-115	0.02	mg/l
Benzo(a)anthracene	NFT 90-115	0.02	mg/l
Chrysene	NFT 90-115	0.02	mg/l
Benzo(b)fluoranthene	NFT 90-115	0.02	mg/l
Benzo(k)fluoranthene	NFT 90-115	0.02	mg/l
Benzo(a)pyrene	NFT 90-115	0.02	mg/l
Dibenzo(a,h)anthrecene	NFT 90-115	0.02	mg/l
Benzo(g,h,i)pérylène	NFT 90-115	0.02	mg/l
Indeno(1,2,3-cd)pyrene	NFT 90-115	0.02	mg/l
Acenaphthylene	NFT 90-115	0.02	mg/l
Arsenic	NF EN ISO 17294-2	3.0	µg/l
Barium	NF EN ISO 17294-2	Variable*	Variable*
Cadmium	NF EN ISO 17294-2	1.5	µg/l
Chromium	NF EN ISO 17294-2	5.0	µg/l
Copper	NF EN ISO 17294-2	Variable*	Variable*
Mercury	NF EN ISO 17294-2	0.5	µg/l
Nickel	NF EN ISO 17294-2	10.0	µg/l
Lead	NF EN ISO 17294-2	10.0	µg/l
Zinc	NF EN ISO 17294-2	50.0	µg/l

Marine Sediment Analysis

Parameter	Analytical method	Limit of Quantification	Unit
Grain size	NF X31-107		%
Dry matter	NF ISO 11465	0.1	%
Total Organic Carbon	NF ISO 10694	0.05	%
Oil and grease	DIN 38409-56	250	mg/kg dry wt.
Total Petroleum Hydrocarbons C10-C40	NF EN ISO 16703	10	mg/kg dry wt.
PAH (16)	NF ISO 18287	0.01	mg/kg dry wt.
BTEX	NF EN ISO 22155	0.1	mg/kg dry wt.
PCB (7)	NF ISO 10382	0.01	mg/kg dry wt.
Aluminum	NF EN ISO 17294-2 NF ISO 11466	5	mg/kg dry wt.
Arsenic		2	mg/kg dry wt.
Barium		0.5	mg/kg dry wt.
Cadmium		0.5	mg/kg dry wt.
Chromium		1	mg/kg dry wt.
Copper		1	mg/kg dry wt.
Lead		10.0	mg/kg dry wt.
Mercury		0.1	mg/kg dry wt.
Nickel		1	mg/kg dry wt.
Vanadium		1	mg/kg dry wt.
Zinc		5.0	mg/kg dry wt.