REQUEST FOR EXPRESSIONS OF INTEREST (CONSULTING SERVICES – FIRMS SELECTION)

SAINT VINCENT AND THE GRENADINES (SVG)
VOLCANIC ERUPTION EMERGENCY PROJECT (VEEP)
IDA 70060/ TF B7008

Assignment Title: Design and Supervision Consultancy for the North Windward Water Supply.

Reference No. SVG-VEEP-CS-QCBS-2

The Government of Saint Vincent and the Grenadines (GoSVG) has received financing from the World Bank toward the cost of the Volcanic Eruption Emergency Project (VEEP), and it intends to apply part of the proceeds for consulting services.

The consulting services ("the Services") include the following:

1. The development of a water supply system using groundwater source at Overland to replace the existing systems at Sandy Bay and Owia;
2. The improvement of water purification on the Perseverance water supply system; and
3. The improvement of the existing Fancy water supply system.

The duration of this consultancy is estimated to be 27 months.

The Terms of Reference (TOR) for the assignment is attached to this request for expressions of interest.

The Ministry of Finance, Economic Planning and Information Technology (MoFEP) now invites eligible consulting firms ("Consultants") to indicate their interest in providing the Services. Interested consultants must provide information demonstrating that they have the required qualifications and relevant experience to perform the Services. The shortlisting criteria are:

1. Experience in the design and Construction Supervision of small Gravity fed Water Supply Systems (10,000-30,000 persons)
2. Experience in design and supervision of both Ground water and surface water abstraction and distribution systems
3. Experience in Designing and supervising projects using Photo Voltaic as the primary source of energy in the extraction and distribution of Ground water
4. Experience in the Design and supervision of works in the Caribbean is preferable.

Key Experts will not be evaluated at the shortlisting stage.

The attention of interested Consultants is drawn to Section III, paragraphs, 3.14, 3.16, and 3.17 of the World Bank's "Procurement Regulations for IPF Borrowers" 4th Edition November 2020 ("Procurement Regulations"), setting forth the World Bank's policy on conflict of interest. In addition, consultants shall refer to the requirements on conflict of interest related to this assignment as per paragraph 3.17 of the Procurement Regulations.

Consultants may associate with other firms to enhance their qualifications but should indicate clearly whether the association is in the form of a joint venture and/or a sub-consultancy. In the case of a joint venture, all the partners in the joint venture shall be jointly and severally liable for the entire contract, if selected.

A Consultant will be selected in accordance with the Consultant's Quality and Cost Based Selection (QCBS) method set out in the Procurement Regulations.

Further information can be obtained at the address below during office hours 9:00am to 4:00pm EST.

Expressions of interest must be delivered in a written form to the address below (in person, or by mail, or by fax, or by e-mail) by **16:00 hours** (or 4:00pm SVG time) **April 11, 2022**.

Attn: Recardo Frederick
Director of Economic Planning
Economic Planning Division
Ministry of Finance, Economic Planning and Information Technology
First Floor, Administrative Building
Bay Street
Kingstown
Saint Vincent and the Grenadines

Email: cenplan@svgcpd.com, rjohn@svgcpd.com, mglynn@svgcpd.com,

Appendix 1 – Terms of Reference

ST. VINCENT & THE GRENADINES

NORTH WINDWARD WATER SUPPLY (VEEP PROJECT)

Terms of Reference

FOR CONSULTANCY

1.0 INTRODUCTION

1.1 Background

The Government of St Vincent and the Grenadines (GSVG) is the beneficiary of World Bank funds to finance the Saint Vincent and the Grenadines Volcanic Eruption Emergency Project (P176943), that includes a Water Supply Subproject. The Subproject includes: (1) the development of a water supply system using ground water source at Overland to replace the existing systems at Sandy Bay and Owia, (2) the improvement of water purification on the Perseverance water supply system along with storage and distribution expansion, and (3) the improvement of the existing Fancy water supply system.

The major beneficiaries of this project will be the residents, industries and businesses of the North Eastern section of the island (from Grand Sable in the South to Fancy in the North) that were severely impacted by the explosive eruptions of the La Soufriere volcano in April of 2021.

The Project is being implemented by the GoSVG, through its Project Management Unit in the Ministry of Economic Planning (PMU-VEEP). The Central Water and Sewerage Authority (CWSA), is the primary Technical Agency for the Consultant (ENGINEER) Contract.

A preliminary and conceptual design of this project and its components has been completed by the CWSA. This was facilitated by the collection and use of primary data and information over the years. It will also be made available through the following link https://1drv.ms/u/s!AhBtw_35ckZXgZwgfzB1LGs_IjS5yg?e=eWGBXl, which consists of the preliminary study made by CWSA for the project, including Text, Drawings and Profile of pipelines. This is a preliminary study, which may be used by the selected Consultant only as a guide for the preparation of the various engineering designs. The use of this document is the Consultant's sole responsibility and risk, and no liability can be claimed on the Government or the CWSA by the Consultant, for the use of the preliminary study.

1.2 Justification/Purpose

1.2.1 Fancy, Owia and Sandy Bay

The three (3) existing water supply systems of ***Fancy***, ***Owia*** and **Sandy Bay** are supplied from surface (river) water sources situated on the slopes of the La Soufriere volcano that recently erupted explosively in April 2021.

These eruptions resulted in the destruction of intake and treatment structures in the rivers and the deposition of thick layers of ash and pyroclastic material that now sit on the slopes of the volcano and are periodically washed into the supply river channels in the form of Lahars (mudflows) with every moderate to heavy rainfall event. The consequence of every moderate to heavy rainfall event is therefore an interruption of the water supply from these sources due to high turbidity, blockages, and closures from the resulting mudflows.

This situation also presents operational challenges for the CWSA with its engineering department being on constant alert for Lahars, having to finance and manage repeated cycles of damage and restoration.

1.2.2 Perseverance

One of the major impacts of the recent volcanic eruptions was extensive damage and destruction to many homes and industries situated along the river channels emanating from the summit of the volcano. This then required the mandatory relocation of many residents and some industries to much less vulnerable areas at *Orange Hill* and *Waterloo***,** both situated just North of the Rabacca River and presently supplied by the ***Perseverance*** source.

The existing surface water ***Perseverance*** system is supplied by intake, treatment and storage structures on the slopes of a separate mountain, Morne Garu, situated to the South of the La Soufriere volcano.

Although this system is considered much less vulnerable to mudflows, it presently experiences new and repeated shutdowns due to heavy rainfall and high turbidity. Of equal importance is the new and increased demand now being placed on this system due to new residential housing and the relocation of the Arrowroot and other Agriculture industries.

These recent developments will require significant improvements in both the quality and quantity of water available for consistent transmission and distribution.

2.0 OBJECTIVES

2.1 VEEP WATER COMPONENT OBJECTIVES

The Design and Review Stage comprises the following main components:

- Assessment, testing and design of well field at Overland, using solar power system and their associated facilities;
- Review hydraulic design of the pump main and all distribution pipelines and storage;
- Design of a water treatment facility at Perseverance to increase capacity from 35 m^3/h to a minimum of 70 m^3/h and the proposed distribution extensions;
- Design of a new surface water intake structure at Fancy and water treatment facility with minimum capacity of 5 m^3/h;
- Prepare Environmental and Social Impact Assessments (ESIAs), Environmental and Social Management Plans (ESMPs) and if needed, Resettlement Action Plans (RAPs), for all proposed facilities in accordance with **Environmental and Social Management Framework (ESMF)**.the **Resettlement Policy Framework (RPF)** and the **Stakeholder Engagement Plan (SEP)** available at http://www.gov.vc/index.php/volcanic-eruption-emergency-project-veep;

- Preparation of tender documents for procurement of works, services, material and equipment, as well provide technical support (for example evaluation of all bids, contract negotiations) to CWSA during the procurement process;
- Ensure that tender documents for procurement of works, duly incorporate and take into consideration the requirements (as applicable) of the Environmental and Social Standards (ESS) of the Environmental and Social Framework (ESF) of the Bank-this includes the provisions of the ESMF, Labor Management Procedures (LMP), RPF, SEP, and the Environmental and Social Commitment Plan (ESCP);

- Review, and ensure sure that relevant aspects of the ESCP and ESS documents are incorporated into the Environmental Social Health and Safety (ESHS) specifications of the procurement documents. Support with monitoring, to ensure that the consultants/contractors comply with the ESHS specifications of their respective contracts;

- Supervision of construction of the works contract.

3.0 SCOPE OF SERVICES

3.1 Task 1: Inspect and Evaluate the existing borehole

- Provide a summary level water resources assessment including summaries of the hydrogeologic setting of the existing borehole, including an evaluation of the well depth, aquifer horizontal and vertical extent, recharge area and quantity, and other information relevant to wellfield design.

- Conduct a video inspection of the borehole. Check well casing integrity and inspect the uncased area to investigate potential of gravel slough and also look at the fractures in the basalt section of the borehole. Make appropriate recommendations based on findings, including the optimum depth, types of casing and screens.

- Conduct step-drawdown tests at 30, 50, and 80 m3/hr. Analyse results to determinate the recommended pumping rate for the extended period aquifer test.

- Conduct an extended period aquifer test (48 to 72 hours of drawdown and subsequent recovery) at the recommended pumping rate to determine maximum sustainable yield and to estimate aquifer hydraulic characteristics (transmissivity).

- Test water for the following parameters during the extended tests and analyse results through a laboratory (Metals, volatile organic compounds (VOCs), pesticides and synthetic organic compounds (SOCs), Inorganics (major ions, metals, alkalinity, dissolved solids), Physical parameters (turbidity, temperature, pH), Bacteriological (E. Coli))

- Properly estimate the boreholes' safe yield (based on the aquifer testing and simple analytical modelling) and future expansion possibilities and drilling of additional test wells and boreholes to meet the determined demand.

- Design Borehole(s) at to meet International acceptable engineering standards or best practices to ensure adequacy of supply and other design parameters including appropriate screening, rising main(s) and necessary fittings such as valves. This investigation and design must discuss the use of two or more boreholes to make the system more resilient. Cost comparison for the use of one or two or more boreholes in the wellfield should be presented.

- Design and determine the capacity or size of submersible pump for borehole(s) based on the outcome of the hydraulic simulations and prepare detailed bills of quantities, drawings and technical specifications for the procurement and installation of well pump including all equipment needed for the installation and withdrawal of the well pump.

- Design a Photovoltaic system to meet the overall energy requirements of the project. Provide detail drawings and specifications.

  Prepare as necessary detailed layout drawings, designs, bills of quantities, drawings, and technical specifications for civil works, including but not limited to the generator house, fuel depot, caretaker room, washroom, fencing, etc. at Overland borehole site.

- Prepare detailed designs, bills of quantities, drawings, and technical specifications for all civil and other works. Where technically and financially feasible, apply the concept of universal access to the design and construction of buildings and structures.

  Preparation of tender documents for procurement of works, services, material and equipment, as well as provide technical support ((for example evaluation of all bids, contract negotiations) to CWSA during the procurement process and to PMU-VEEP as requested. Duly incorporate into tender documents for procurement, the requirements (as applicable) of the Environmental and Social Standards of the Environmental and Social Framework (ESF) of the World Bank.
- Assessment of the existing situation:
    - GIS information, existing preliminary study made by CWSA and/or other Studies previously elaborated;
    - Existing geological and geotechnical surveys;
    - Topographic surveys;
    - Relevant environmental baseline data to inform the development of the ESMP;
    - Social baseline data collection with the purpose to collect social indicators of intervention areas, to identify social risks and impacts of the project, as

well as mitigation measures of adverse social impacts and to give recommendations about types of stakeholder engagement and consultations to be implemented during design phase.

3.2 Task 2: Hydraulic design and pipe sizing

- Review water demand for the communities between Overland and Owia based on existing usage and possible future expansion. For this review consult stakeholders as per the requirements of the project's SEP.

- Review and amend preliminary hydraulic designs as prepared by the CWSA to meet International acceptable engineering standards or best practices utilising Bentley WaterCAD water distribution modelling software to ascertain adequacy of tank storage capacity, pipe diameters and valving requirements inclusive of gate valves, air valves, control valves and washout valves.

- Selection of most appropriate pipe material based on suitability for the local conditions, hydraulic performance and ease of handling.

- Identify locations for river crossings for new works, and design appropriate climate resilient type of river crossing with pipe and fittings details and specifications. Particular attention to be paid to the occurrence and movement of lahars, and to a preliminary determination of sensitive or vulnerable locations from the environmental and social perspective.

- Assess the vulnerability to damage from flooding and lahars of at least (8) existing river crossings on the Perseverance system and prepare designs for rehabilitation or reinforcement of appropriate resilient river crossing where necessary with pipe and fittings details and specifications.

- Review and amend CWSAs' Preliminary design of distribution system improvements in the Waterloo and Orange Hill areas to meet international acceptable engineering standards or best practices utilizing Bentley's WaterCad water distribution modelling software to ascertain adequacy of tank storage capacity, pipe diameters and valving requirements inclusive of gate valves, air valves, control valves and washout valves.

- Prepare detailed designs, bills of quantities, drawings, and technical specifications for all civil and other works

- Preparation of tender documents for procurement of works, services, material and equipment, as well provide technical support (for example evaluation of all bids, contract negotiations) to CWSA and PMU-VEEP during the procurement process.

Duly incorporate into tender documents for procurement, the requirements (as applicable) of the Environmental and Social Standards of the Environmental and Social Framework (ESF) of the World Bank.

3.3 Task 3: Design of Water intake and Water Treatment Facilities

- Prepare and produce designs for appropriate surface water intake and water treatment facility at Fancy utilising gravity to effect purification processes of 5 m^3/h minimum capacity (preferred option). Facilities must be designed for resilience against flooding including lahars and consistent with the requirements of the project's ESMF If required, energy for chemical dosing to be provided by a renewable energy source.

- Prepare and produce designs to increase the capacity and modify the processes of the existing water treatment facility at Perseverance to meet increased demand. The capacity of the facility must be at least 70 m^3/h and utilise gravity to effect treatment processes (preferred option). If required, energy for chemical dosing to be provided by a renewable energy source.

- Prepare detailed designs, bills of quantities, drawings, and technical specifications for all civil and other works

- Preparation of tender documents for procurement of works, services, material and equipment, as well provide technical support (for example evaluation of all bids, contract negotiations) to CWSA and PMU-VEEP during the procurement process. Duly incorporate into tender documents for procurement, the requirements (as applicable) of the Environmental and Social Standards of the Environmental and Social Framework (ESF) of the World Bank.

3.4 Task 4: Electromechanical design and sizing

- Select electric motors that matches the required pump(s) considering power output of the pump, borehole(s) yield, operating pressure head against which the pumps must discharge.

- Review, calculate/design power requirement for the well field submersible pumps, site lighting and other ancillary equipment from a PV supply.

- Prepare design of SCADA system for Overland water abstraction, transmission system and storage.

- Prepare detailed list of materials such as pipes, fittings, valves, pumps, generators, PV panels, meters, cables etc. with detailed technical specifications for procurement.

- Prepare detailed designs, bills of quantities, drawings, and technical specifications for all civil and other works

- Preparation of tender documents for procurement of works, services, material and equipment, as well provide technical support (for example evaluation of bids, contract negotiations) to CWSA and PMU-VEEP during the procurement process. Duly incorporate into tender documents for procurement, the requirements (as applicable) of the Environmental and Social Standards of the Environmental and Social Framework (ESF) of the World Bank

3.5 TASK 5: ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENTS AND RESETTLEMENT ACTION PLANS

Prepare Environmental and Social Impact Assessments (ESIAs), including the Environmental and Social Management Plans (ESMPs) and if needed Resettlement Action Plans (RAPs), for all proposed works and facilities in accordance with the project's Environmental and Social Management Framework (ESMF). Resettlement Policy Framework (RPF) and Stakeholder Engagement Plan for Subprojects.

The ENGINEER must identify measures to deal with potential emergency situations, such as the situation of COVID-19. The measures to be proposed can take several forms: the adoption of specific procedures such as adjustments to work practices, additional personal protective equipment and specific training, respecting the procurement regulations and protocols of responsible agencies and the World Bank.

The ENGINEER shall verify and ensure that the CONTRACTOR complies with the items below in relation to socio-environmental requirements, during all phases of the Construction Contract. For this, the ENGINEER must:

1. Submit to the CWSA for analysis and validation all documents resulting from the ESMPs and RAPs;

2. Perform supervision to verify compliance with the ESMPs, RAPs, and other relevant ESF instruments, which can be obtained from links below:

- **Environmental and Social Management Framework (ESMF).**

Involuntary Resettlement Policy Framework (MRI).

3. Supervise and verify compliance with current environmental legislation and report conditions or practices that represent a risk to safety, damage or threat to the environment, in the broad sense and to human populations;

4. Establish and report to CWSA on the procedures for monitoring and assessing socio-environmental, occupational safety and occupational health;

5. Certify that the CONTRACTOR obtains all the necessary Permits, Licenses or Approvals from the competent regulatory authorities according to the current legislation;

6. Monitor and supervise compliance with the conditions established in any licenses, permits, or renewals issued by relevant authorities;

7. Ensure that the height of any dams or reservoir banks does not exceed 10 meters, in conformance with community health and safety requirements of the ESMF.

8. Identify areas of potential cultural heritage impacts to address during the design and construction. Adopt, and implement a Chance Finds Procedure in the works contracts for the activity involving civil works as part of corresponding ESIAs and ESMPs.

9. Analyze the adequacy of the ESIA and ESMP and PGS documents to the ESF and the Project's ESMF and RPF and, when necessary, request the due review by the Contractor;

10. Analyze and prove that, as an integral and important part of the Project, the ESMP is prepared, and complies with specifications and standards defined in the Requirements of the Construction Contract;

11. Ensure that the mitigating, control and environmental monitoring measures provided for in the ESMP and any authorizations, permits or licenses are implemented and fully complied with by the CONTRACTOR;

12. Assess and submit the ESMP to CWSA and PMU-VEEP, for its validation, in case of a favorable opinion by the ENGINEER. ESMP will be sent to the World Bank for "No Objection". If the document receives "No Objection" from the World Bank and is approved by the PMU-VEEP, the ENGINEER must inform the CONTRACTOR. If the document is not adequate to the Standards provided in the Contract, the Engineer will request adjustments from the CONTRACTOR and the entire analysis and review process will be repeated;

13. Consistent with the SEP, analyze and approve all visual communication material produced by the CONTRACTOR and subsequently submit the analysis to CWSA and PMU-VEEP for final approval;

14. Analyze and approve the specific Communication Plans for each municipality within up to 07 (seven) consecutive days, with approval being a mandatory requirement for authorization to start work in the municipality;

15. Authorize the beginning of the communication activities to be carried out by the CONTRACTOR in the municipalities;

16. Consistent with project level plans, analyze adopt and adapt specific measures to address Socio-Educational, Gender, and Gender Based Violence for each municipality within up to 07 (seven) consecutive days, with approval being a mandatory requirement for authorization to start work in the municipality;

17. Authorize the beginning of Socio-Educational and Gender Actions to be carried out by the CONTRACTOR in the municipalities. This includes measures to address Sexual Exploitation and Abuse and Sexual Harassment (SEA/SH); Maintaining a Code of Conduct and the implementation of a subproject level Grievance Mechanism.

18. Monitor and supervise the full implementation of the plans, programs and projects that are part of the PGS in strict compliance with the Construction Contract, as well as report its execution;

19. Prepare and approve each of the RAPs, including appraisal of land and improvements, and send it to CWSA and PMU-VEEP within a period of up to 15 days for its validation. The RAPs will be referred to the World Bank for "No Objection". If the documents are not in compliance with the aforementioned Standards and the Construction Contract, the ENGINEER will be requested to adjust, and the entire analysis and review process will be repeated;

20. Support CWSA and PMU-VEEP in the mobilization to carry out public consultations or other outreach/engagement activities, as described in the SEP, including the participation and registering through reports of the entire process;

21. Submit to the CONTRACTOR supporting documentation of the RAP implementation process carried out by PMU-VEEP, after its conclusion;

22. The commencement of the works, for each segment, will only be authorized by the ENGINEER after all parties approval is sought to the RAP;

23. Supervise the execution of the works to implement the Construction Contract, requiring that the works be carried out in accordance with the World Bank's Environmental and Social Standards, environmental legislation, current environmental licensing and, with the ESMPs and RAPs;

24. Analyze and approve the monthly reports resulting from the implementation of the ESMPs to be submitted to CWSA for validation;

25. Hold quarterly meetings to monitor and assess the results and the implementation of the RAPs with the participation of CWSA, PMU-VEEP and, when necessary, the CONTRACTOR;

26. Officially provide immediate notification to CWSA and PMU-VEEP should any incident, accident or fatality occur during the performance of the Construction Contract. All details of such incidents, accidents or fatalities will be provided officially and immediately afterwards through oral or electronic communication, including, whenever possible, photographic record. In the case of fatalities, a complete written report must be submitted within a maximum of 24 hours after the event, including the measures taken by the CONTRACTOR to resolve, mitigate and correct the incident or accident;

3.6 TASK 6: ASSIST IN THE TENDERING PROCESS

- Prepare Tender documents for required works, material and services contracts according to the World Bank Procurement Regulations, in collaboration with the CWSA and the PMU-VEEP. Duly incorporate into tender documents for procurement, the requirements (as applicable) of the Environmental and Social Standards of the Environmental and Social Framework (ESF) of the Bank

- Assist CWSA and PMU-VEEP in responding to requests for clarifications from interested bidders throughout the tendering process.

- Assist CWSA in evaluating all technical offers during the evaluation process of the tendering process.

3.7 TASK 7: CONSTRUCTION SUPERVISION OF WORKS CONTRACTS

- The Consultant shall act as ‘Engineer’ or ‘Government’s Representative for the construction of all contracted works including civil works, pipelines, treatment facilities and borehole development. The Consultant should issue necessary instructions to the Contractor as required for the smooth execution of the Works, provided that no instruction, which may have financial consequences or may entail extension of time, will be issued without the prior approval of the CWSA, as

dictated by the Conditions of Contract. The Consultant shall negotiate with the Contractors and make recommendations to the CWSA for approval on rates for any additional works and services that would be discussed with PMU-VEEP.

- Update Designs as it becomes necessary and provide all pertinent information including documentation, drawings, specification etc. to enable contractor to carry out the work as construction progresses. All changes to be presented to CWSA with cost estimated and time implications for approval.

- Ensure that the Contractor's proposed schedule is realistic, updated, and allows for local conditions such as climatological patterns.

- Survey, measure and inspect all aspect of the work carried out by the contractor during the construction process to ensure accuracy to the provided design and adherence with the construction standards and codes. The consultant also should review the adherence to the Social and Environmental documents for the project.

- Chair at least fortnightly progress meetings with the CWSA, Contractor and other relevant stakeholders, then prepare and distribute relevant minutes in a timely manner.

- The Consultant must review the Contractor's monthly progress reports complete with all the data required within the time periods required and in sufficient detail. The Consultant also should review the ESMP compliance status monthly to be submitted to the World Bank. All payments will be certified by the Consultant based on receipt of applications for payment received from the Contractor and verified independently by the Consultant's records.

- The Consultant will undertake supervisory duties to ensure the proper construction of the works and produce a monthly report in a format approved by the CWSA.

- Ensure that all infrastructure and ESS requirements are in place prior to commissioning of borehole(s), Photo Voltaic system, generators, pumps and all other major works, i.e. pressure testing of all pipelines, commissioning of all electromagnetic equipment and water purification facilities, fencing etc.

- Total construction supervision and certification.

The ENGINEER shall verify and ensure that the CONTRACTOR complies with the items below, during all phases of the Construction Contract. For this, the ENGINEER must:

1. Ensure that the CONTRACTOR provides all necessary information for any clarifications, when requested by CWSA, in accordance with the contractual terms;

2. Establish, for CWSA, a system for project management, including the document control and management of this system.

3. Analyze any and all documentation submitted by the CONTRACTOR including planning, programming, progress, quality and timeliness of the services, as established in the contractual terms for the implementation of the Construction Contract;

4. Carry out the supervision of the quality of materials and equipment when received and installed in the works, including their conformity with what was proposed in studies, projects and specifications of the Construction Contract;

5. Monitor the storage of materials and equipment to be applied in the implementation of the Construction Contract, thus safeguarding the technical conditions of use and the manufacturer's guarantees;

6. Monitor and keep up with the execution of operational tests, including the effective functioning of the installed equipment.

7. Perform the supervision of the physical and financial development of the execution of the work and of the acquisitions and respective installations of materials and equipment for the purpose of controlling the supervision of the Construction Contract;
8. Assess the monthly progress reports issued by the CONTRACTOR, which will include, at least, the percentage of completion achieved compared to the planned percentage of completion for each activity, comments, possible consequences and corrective actions being taken; and the Grievance Log.

9. Request the CONTRACTOR to submit a revised work program every 3 month or whenever there are delays, including the review of the PERT CPM, containing the preventive and mitigating measures and the suggested steps to enable the completion of the facilities within the expected period;

10. Issue the Taking-Over Certificate, stating that the facility or a part of it has reached completion and, if necessary, the ENGINEER will notify the CONTRACTOR, in writing, of any defects or deficiencies found;

11. Monitor the Tests on Completion and Tests After Completion of Works, according to clauses of the Construction Contract, respectively, in partnership with the CONTRACTOR's team, in order to verify if the installations or relevant parts meet the Functional Guarantees defined in the Construction Contract;

12. Monitor and verify the current rules of Occupational Medicine, Hygiene and Safety, in accordance with the provisions of the Construction Contract and the peculiarities of each service, as well as the use of Personal Protective Equipment - EPIs and Collective Protective Equipment - EPC's, all according to current legislation;

13. Verify that all employees linked to the contract are duly registered in accordance with current labor laws, as well as that they work properly dressed and identified; Ensure that they understand and implement the code of conduct.

14. Check according to Construction Contract, if the CONTRACTOR performed the tests in accordance with the applicable clauses. If a work or any part of it does not pass the trials, the ENGINEER may request a repetition;

15. According to the Construction Contract, provided that the tests have been approved, the ENGINEER must inform the CONTRACTOR about the stage of the services and if they are able to be accepted by CWSA. If the conditions have been fulfilled, it will issue the Taking-Over Certificate of any part of the works carried out that do not require repair;

16. It will verify in accordance with the Construction Contract, that all works and CONTRACTOR's documents are in the necessary and sufficient conditions for 365 days, to be requested on demand, established as a period of defects liability, and inform CWSA at the end of this period that the pending works indicated in the Taking-Over Certificate have been completed and, if not, may request the CWSA and PMU-VEEP to extend the deadline for notification of defects;

17. Review, in accordance with the Construction Contract, the form of payment of the CONTRACTOR and the compliance with the list of documents required for the payment as requested by CWSA;

18. Inform the CWSA, in accordance with the Clause of the Construction Contract, if the CONTRACTOR breaches the obligations of the Construction Contract and request that the CONTRACTOR comply with or rectify the obligation, within a stipulated period of time. will communicate the CWSA and PMU-VEEP so that he takes the decision to terminate the Contract;

19. Certify that the CONTRACTOR hires and maintains Insurance for Works and Equipment, Personal Injury, Accidents and Property, among others, stipulated in the contractual terms;

20. Verify and report to CWSA the working conditions, safety and compliance with the environmental, social legislation and approved socio-environmental management plans, and the compliance with the conditions that may be established in the Installation License;

21. Verify that the respective environmental licenses and permits are valid and duly available at the construction sites;

22. Supervise, verify and report to CWSA if the CONTRACTOR complies with the defined in the Socio-Environmental Program, in the licenses and permits for the construction stage of the work;

3.8 Task 8: Other requirements

- The consultants are expected to undertake the services as described in this TOR in close collaboration with CWSA for technical aspects of the Project. The TOR tasks for this engagement have been outlined as detailed as possible. However, the design consultant shall bear in mind that the list of tasks and activities are not exhaustive and hence, is not a complete description of their duties. It is the consultants' responsibility to critically verify the scope of services indicated and to extend, reduce or amend it wherever deemed necessary in their own professional judgment. It is to be understood that the experts shall perform all work as necessary to meet the objectives of the project described in the VEEP.

4.0 STANDARDS AND CODES

These Specifications refer to the standards of the AWWA (American Water Works Association) and the others listed below, may be used. All standards and codes mentioned in this specification must be adopted in their latest published review.

The design of the main structures in reinforced concrete, according to the BS EN 1992 (Eurocode2) -1,2&3 (The Structural use of Concrete) (http://www.bsigroup.com) for a useful life of 30 (thirty) years and consider the Class of Environmental Aggressiveness (CAA) IV (very strong). The Class of Environmental Aggressiveness (CAA) III (strong), may be used in specific situations, if the justification presented is accepted. From these conditions, the designer must adopt the concrete strength class, the water/cement ratio and the reinforcement cover according to BS EN 1992 (EC2). The admission of the ACI 318-95 Building Code Requirements for Structural Concrete and other American standards will be permitted provided that the conditions of high environmental aggressiveness for "corrosion protection of reinforcement" for a useful life of 50 (fifty) years are obeyed.

To guarantee water-tightness and delay the attack of harmful chemical elements on concrete and reinforcement, the Consultant must include in design a waterproofing system for concrete structures.

All materials, components and accessories used must comply with the latest revisions to the standards mentioned below, as applicable. Other standards will be accepted if they are internationally recognized and previously approved by the CWSA.

As alternatives to the BS EN 1992 and AWWA Standards, the standards of the following entities will be considered:

DIN	Deutsche Institut für Normung
AISC	American Institute of Steel Construction
AWS	American Welding Society
AISE	Association of Iron and Steel Engineers
ANSI	American National Standards Institute
AISE	Association of Iron and Steel Engineers
ASME	American Society of Mechanical Engineers
JIS	Japanese Industrial Standard
FEM	Federation Europeenne de la Maintenance
AGMA	American Gear Manufacturers Association
NEMA	National Electrical Manufacturers Association
NEC	National Electrical Code
EEI	Edison Electric Institute
ISA	The Instrumentation, System and Automation Society

The following documents must be considered for the development of the socio-environmental requirements contained in this section:

1. Draft Environment and Social Commitment Plan (ESCP)

2. Stakeholder Engagement Plan (SEP)

3. Negotiated Environment and Social Commitment Plan

All available at http://www.gov.vc/index.php/volcanic-eruption-emergency-project-veep

4. **Environmental and Social Management Framework (ESMF)**. *[to be shared as soon as completed by the Implementation Agency*]

5. **Resettlement Policy Framework (RPF)**. ***)***. *[to be shared as soon as completed by the Implementation Agency*]

6. Since the project has been processed as an emergency project, the E&S instruments are being prepared during project implementation. Once the documents are finalized by the Government and cleared by the Bank, the link can be updated. In the meantime, the ESCP can be used to provide a general understanding of E&S requirements.

5 - Water Mains

5.1 - General Considerations

The pipelines were divided into 2 groups: main and secondary. The main pipeline is the one with a diameter greater than or equal to 100 mm. For pipelines with a smaller diameter, they will be considered secondary water supply systems.

The layout of the water mains should prioritize the shortest distances, but always preferably following the existing public roads. In cases of use of private properties, they will only be allowed with the prior approval of the CWSA, who must consult the World Bank, as RAP need to be prepared.

In buried sections of the pipeline where there is the presence of 2nd and 3rd category material, the use of a sand mat shall be provided to protect the pipeline.

In crossings where the interference is access roads or paths, always perform a buried type seating. In the case of interference with rivers, streams, lakes or wetlands, the pipeline shall preferably be aerial and, when buried, adopt a minimum covering of 2.5 m.

In overhead sections the metal pipes must be protected against corrosion and weather.

For metal pipes, it is forbidden to adopt galvanization as an exclusive system to protect against corrosion and weather, being allowed its use combined with polyurethane or epoxy coatings.

When crossing the highway, obey the requirements of the competent authorities including the Ministry of Transport and Works. The interventions may only be carried out after approval by the responsible authorities.

The Consultant must carry out studies of hydraulic transients to design the protection system to be implemented, in accordance with the standards listed above and technical specifications of the manufacturer of hydraulic equipment and materials.

The pump mains (pressurized pipelines) shall be dimensioned for a maximum daily operating time of 10 hours using the solar panels as the only source of energy, avoiding pumping during nights hours when the solar electricity is not available.

The air relief valves shall only be used as devices necessary for filling and emptying the pipes, allowing the automatic admission and expulsion of air (including the expulsion of air dissolved in the liquid). For the use of triple function suction cups to

deal with transients, the maximum service pressures must be respected for this purpose.

Shut-off valves shall be provided along the pipeline with a maximum spacing of 1 km. The valves must have a full flow section and be manually operated.

The diameters and materials will be defined from the outputs defined in the Design, and the economic diameter studies, which shall consider at least: the solar energy cost, hours of operation (<10 hours), the material supply, the cost of installation, and the maintenance cost.

The economic diameter corresponds to the diameter which presents a minimum cost, for each specific output, in the curve elaborated from the sum of fixed and operational costs, considering the different diameters and materials studied (at least 2 diameters for the study). Considering a 30 (twenty) years project horizon, a discount rate of 8% per year to calculate the present value.

An output flow and pressure control system shall be provided in the pipeline branches when these are not preceded by a pumping plant. The system must be remote controlled from the operating control center to be implemented on the secured compound of the well field.

6 - Reservoir

6.1 - General Considerations

The Consultant shall foresee the need to rehabilitate the existing reservoir or implement new reservoirs of treated water at all municipal and district seats with minimum reserve capacity to be implemented equal to 1.5 times the average daily demand.

At the municipal and district seats included in the pipeline system project, water tank car collection points shall be placed in the treated water reservoirs, both in the existing reservoirs and in the reservoirs to be built. In the reservoirs to be built, a water intake for the tank car with a minimum diameter of 100 mm in shall be considered. All water withdrawals must be measured.

The reservoirs must be built in reinforced concrete (preferred option). Bolted glazed steel construction will be accepted for capacity greater than 500 m^3. For bolted steel reservoirs it must be with vitrified coating or epoxy FBE (Fusion Bonded Epoxy).

For concrete reservoirs, reinforced concrete shall be used with break-joints in a hydro-expansive profile and waterproofing reducing additive covered with PVC blanket or prestressed concrete and covered in elastomeric polyurethane with 100% solids and free of solvents.

The reservoir must be equipped with sensors and level controllers, allowing better operational control and avoiding water waste.

Float-operated valve or self-hydraulically operated level control valve should be used.

Protect the reservoir area with a wall, including a spiral concertina fence located at the top of the wall.

External piping shall be of flanged cast iron or carbon steel with disassembled coupling.

The guardrails and handrails, walkways, level areas, external and internal stairs must be made of 304 stainless steel or higher.

When necessary, the reservoirs must be equipped with an underground drainage system to protect the bottom slab.

The bottom of the reservoir must have a minimum slope of 0.5% towards the point of exhaustion, to facilitate washing operations.

All boxes for storing electrical devices subject to flooding must have a drainage system.

The areas destined for the implantation of the Reservoirs must be equipped with a surface drainage system that prevents the formation of any accumulation of water from rainfall in localized points and allows the grouping of all these waters in one single point, which will discharge into the existing rain drainage on the road or other appropriate location.

All reservoirs must be interconnected to the pipeline system provided for their supply and to the distribution network at the most appropriate operational point.

7 - Documentation

All documents and correspondence will be written in English, the original documents must be accompanied by the respective translation to English if in different language. In some cases, such as, for example, in the case of catalogs and technical publications, the CWSA may decline this requirement by accepting texts in other language than English, but being entitled, however, to require the translation of any text deemed important.

The measurement units of the Metric System used in SVG must be used for all references, including technical description, specifications, drawings and any additional documents or data.

All studies, plans, designs and programs must be delivered in printed and digital media, in at least 03 printed copies, with the respective electronic signature of the technicians responsible, to be provided digital certificate by the Consultant, for insertion in the CWSA's Technical File system.

All products and reports must be prepared and presented with strict quality control (including texts, maps, memorials, etc.). The reports must strive for clarity, objectivity, consistency of information, justification of results, freedom from language and typing errors, to reflect the quality standard of the documents.

The products must be written in English and delivered in at least 03 (three) printed volumes of each product and bound, in "Laser print" or similar quality, on A4 paper, containing in the body of the text: graphics, tables, profiles and similar, maps and charts, all duly referenced in the text. They must also be delivered in digital format, in a language compatible with the Windows 7 software or more current version, and in

editable graphic language, as well as PDF format, both in 01 (one) copy, in the same organizational presentation of the graphic document.

7.1 Drawings, Bills of Material and Calculation Report

Specifications and calculation report must be presented to CWSA. All formulas used must be presented in their literal form, clarifying the meaning of each letter, the unit of measure and the numerical value adopted. Reference sources must always be cited.

7.1.1 Conditions for the Preparation of Drawings

The drawings must be prepared according to the AWWA standards. All drawings must have a caption where the following information will be clearly read, among others:

- CWSA'S Name (CWSA);
- Name of the work for which it is intended;
- Specific title of the design, identifying the equipment through the code and name.

In all drawings there must be a square blank space, at least ten centimeters on the side, for the stamp of the CWSA (CWSA) or its representative.

All revisions to drawings must be clearly marked by a letter, date and subject of the revision, in a convenient space on the drawing itself.

The general drawings of the subsystems or equipment must clearly highlight their operational characteristics, such as: capacities, speeds, courses, flows, etc., as well as the main dimensions, weights, assembly details, finishes, clearances and other information pertinent to them.

The main dimensions that will affect the installation, such as location of anchors, location of pipes, current sockets, etc., must be indicated.

The drawings must show in highlight and in sequence, all the connections and changes that will be carried out in the works when the equipment is assembled. The specification of the electrodes, for the execution of welds, will appear in the drawings.

Each equipment will have all its drawings duly listed in A-4 format lists (210 x 297 mm), in which the number of each drawing, the revision number, the designation of the design and the date of issue of the list will be indicated.

The drawing of the general set will be accompanied by a list that identify the partial sets that make it up.

Each partial set will be accompanied by its list, with the drawings of the details that refer to each subset identified.

7.1.2 Conditions for the Preparation of Bills of Materials

Bills of materials will be drawn up for groups of drawings within a subset or assembly. Bills of materials must contain:

- Discrimination of applied material;
- Quantities per piece and per set;
- Standard brand and code of the material;
- Reference, manufacturer, catalogue, brochure, etc.

The quantities indicated in the bills of materials will be net, with no additions for losses. The consultant will be responsible for supplying the materials in the quantities necessary for the installation and operation of the object of supply, considering losses, replacements, etc.

8.0 DESIGN TEAM COMPOSITION AND QUALIFICATIONS

8.1 Key Experts Composition and input durations

The design team shall be comprised of the following key experts, to be deployed at different stages of the assignment and shall work directly under the Team Leader.

Area of Expertise	Estimated Work Duration
Team Leader/ Water Distribution System Design Engineer	8 months
Hydrogeologist	60 days
Electrical Engineer/Electromechanical Expert	30 days
Water Treatment Expert	90 days
Environmental Specialist	60 days
Procurement Specialist	30 days
Social Specialist	60 days
Team Leader/Civil/Construction Engineer	18 months

It is acceptable that the Construction Engineer assumes the Team Leader position, after 8 months of commencing of the construction contract.

8.2 Team qualifications and experience.

Team Leader/ Water Distribution System Design Engineer	This expert shall be the Team Leader of the assignment and shall have the overall responsibility for the executing the assignment including coordinating the assignment deliverables and comments and for the delivery of the final assignment. The TL is expected to have the following qualifications and experience. *Qualifications and skills*

	• At least a Master's degree in Water Supply Engineering, Civil Engineering (with Water Specialization) or any other relevant water related field. • Registered professional engineer with a recognized engineering body in the country of origin • Demonstrated excellent command of spoken and written English *General professional experience* • Minimum of 12 years' experience working in senior level in water supply sector projects. • Minimum of 10 years' experience in planning, design, implementation or construction of similar water supply systems. • Minimum of 5 years' experience in the Caribbean. *Specific professional experience* • Minimum of 7 years' experience with design or construction of water supply systems using multiple boreholes as a water source which pump directly to elevated storage. • Minimum of 5 years' experience in use of water transmission or distribution modelling software such as EPANET, WaterCAD, Water GEMS, AutoCAD etc. • Must have executed at least 2 similar assignments in the last 10 years. • At least one contract with energy supply by solar panels.
Hydrogeologist	The Hydrogeologist shall be responsibility for the executing of all aspects of the borehole development tasks and water resource assessment of the assignment. The Hydrogeologist is expected to have the following qualifications and experience. *Qualifications and skills* • At least a Bachelor's degree in Geology, Hydrogeology or Hydrology, or Engineering. • Demonstrated excellent command of spoken and written English *General professional experience* • Minimum of 5 years' experience in designing and development of water production wells.

	Specific professional experience • Minimum of 5 years' experience with the development of ground water for water distribution. • Experience in use of ground water modelling software or related analytical programs.
Electromechanical Expert	The Electromechanical Expert shall be responsibility for the executing of all the electromechanical tasks of the assignment. The EME is expected to have the following qualifications and experience. *Qualifications and skills* • At least a Bachelor's degree in Electrical or Electromechanical Engineering. • Registered professional engineer with a recognized engineering body. • Demonstrated excellent command of spoken and written English *General professional experience* • Minimum of 10 years' experience in designing and installation of electromechanical equipment for the abstraction of ground water. *Specific professional experience* • Minimum of 7 years' experience with design of electromechanical components of water supply systems. • Minimum of 5 years' experience in use of electrical modelling software and AutoCAD etc. • Must have executed at least 2 similar assignments in the last 10 years.
Water Treatment Engineer	The Water Treatment Engineer shall be responsibility for the executing of all the water treatment tasks of the assignment. The WTE is expected to have the following qualifications and experience. *Qualifications and skills* • At least a Master's degree in Water Treatment or Environmental Engineering.

	• Registered professional engineer with a recognized engineering body in the country of origin. • Demonstrated excellent command of spoken and written English *General professional experience* • Minimum of 10 years' experience in designing of water treatment facilities for the purification of surface water. *Specific professional experience* • Minimum of 7 years' experience with design of water treatment, preferentially utilising gravity to effect the various processes. • Minimum of 5 years' experience in use of water treatment modelling software and AutoCAD etc. • Must have executed at least 2 similar assignments in the last 10 years.
Civil/Structural/ Construction Engineer	The Structural Engineer shall be responsibility for the design of all structures including water intake structure and treatment facilities. The SE is expected to have the following qualifications and experience. *Qualifications and skills* • At least a Master's degree in Structural or Civil Engineering. • Registered professional engineer with a recognized engineering body in the country of origin. • Demonstrated excellent command of spoken and written English *General professional experience* • Minimum of 10 years' experience in design of water supply systems. *Specific professional experience* • Minimum of 7 years' experience with the design of water retaining structures and pipeline installation. • Minimum of 5 years' experience in Project Management. • Must have executed at least 2 similar assignments in the last 10 years.

Procurement Specialist	The Procurement Specialist responsibility for the executing of all procurement of works, goods, and services for the implementation of all the works as per the detailed bills of quantities and specification. The PS is expected to have the following qualifications and experience. *Qualifications and skills* • At least a Bachelor's degree in Civil Engineering or Project Management or Procurement. • Registered professional with a recognized professional body. • Demonstrated excellent command of spoken and written English *General professional experience* • Minimum of 10 years' experience in general procurement for construction projects. *Specific professional experience* • Minimum of 7 years' experience in procuring works and goods for water supply systems. • Minimum of 5 years' experience with the WB procurement regulations on projects. • Must have participate in at least 2 similar assignments in the last 5 years.
Environmental Specialist	The Environmental Specialist shall be responsibility for the executing of the Environmental tasks of the assignment. The Environmental Specialist is expected to have the following qualifications and experience. *Qualifications and skills* • At least a Bachelor's degree in Environmental Management, Engineering, Earth Science or Geography, or related relevant field of study • Demonstrated excellent command of spoken and written English *General professional experience* • Minimum of 10 years' experience in environmental protection and environmental management. • Experience working in the Caribbean. *Specific professional experience*

	• Must have executed at least 2 similar assignments in the last 10 years financed by Multilateral Financiers
Social Specialist	The Social Specialist shall be responsible for the social aspects of the assignment. The Specialist is expected to have the following qualifications and experience. *Qualifications and skills* • At least a Bachelor's degree in Social Work, Social Sciences or related fields. • Demonstrated excellent command of spoken and written English *General professional experience* • Minimum of 5 years' experience in project development in the social area with communities in water supply or sanitary sewage works. • Experience working in the Caribbean. *Specific professional experience* • Minimum 1 year in the role of coordinating social and/or multidisciplinary field teams, involving the preparation of plans, diagnoses and technical social reports, also encompassing planning and execution of socio-educational, socio-environmental and gender actions. • Experience in at least 01 (one) contract for the execution of works in Projects financed by the World Bank or other donor funded, using their social safeguard policies.

Note on education levels:

- *BSc means an academic degree of at least 3 years*
- *MSc means an academic degree after BSc of at least 5 years in total.*
- *Meeting the requirement receives a satisfactory rating*
- *Not meeting the requirement receives an unsatisfactory rating*

Academic achievement beyond the requirement receives a very good rating

The estimated total number of professional staff-months required for the assignment, excluding suggested support staff, is 43 **staff-months**.

8.3 **Suggested Support Personnel**

The support personnel - administrative and technical - necessary for the full execution of the services, as well as for the approval and specific Technical Responsibilities, if any, will be the exclusive responsibility of the ENGINEER. However, the following professionals are suggested as members of the support personnel:

a) Environmental Technician;
b) Surveyor;
c) Surveyor Assistant;
d) CAD Designer;
e) Administrative Technician or Assistant;
f) Electrical Systems Specialist;
g) Specialist in Land and Improvement Appraisal; and
h) Specialist in Archeology and Historical and Natural Heritage;

The ENGINEER must keep the team of engineers, specialists, and technicians complete and available, regardless of medical leave of any kind (illness, accident, work accident, etc.), vacation, absences, etc., to avoid interruption or delay of activities of the CONTRACTOR and ENGINEER, and in order to fully comply with the terms of the Construction Contract, including: deadlines, costs, work plans, plans that are part of the PGS and the established schedule.

The ENGINEER team must be present to supervise and accompany, in any and all places where there is a construction work or service in execution by the CONTRACTOR, at any time, on any working day, Saturday, Sunday or holiday. The costs related to the total availability of the team must be included in the hourly costs of the professionals who are part of the proposed ENGINEER Technical Team for the development of the contracted supervision of work.

9. REPORTING AND PROGRAMME

9.1 Deliverables

Table 6.1 provides a summary of the minimal required reports (deliverables)

Report	No. of Copies	Date of Submission

1. Inception Report	1 hard copies & 1 soft copy	four weeks after commencement of assignment
2. Investigative reports and proposed designs for Borehole(s) at Overland and Assessment of existing situation review	1 hard copies & 1 soft copy	Eight weeks after commencement of assignment
3. Draft detailed design report, including bills of quantities, drawings and cost estimates	1 hard copies & 1 soft copy	Sixteen weeks after commencement of assignment
4. Draft detailed list of Pipes, fittings, valves, submersible pumps, PV system components, generator etc. and other related items for procurement	1 hard copies & 1 soft copy	Sixteen weeks after commencement of assignment
5. ESIAs and ESMPs	1 hard copies & 1 soft copy	Sixteen weeks after commencement of assignment
6. RAP Reports	1 hard copies & 1 soft copy	Sixteen weeks after commencement of assignment (First Report)
7. Second draft detailed design report, bill of quantities, specifications, cost estimate & tender documents	1 hard copies & 1 soft copy	Twenty weeks after commencement of assignment
8. Final detailed design report, bill of quantities, specifications, engineering estimate & tender documents after incorporating final comments from CWSA	1 hard copies & 1 soft copy	Twenty-Four weeks after commencement of assignment

9. Monthly Progress Reports	1 hard copies & 1 soft copy	Monthly during implementation phase
10. Final Report	3 printed and 3 digital copies, in an editable format	Within 30 (thirty) calendar days after the date of the issuance of the last Taking-Over Certificate

The CWSA shall provide comments on each deliverable within ten (10) working days.

9.2 Minimum Content of key Reports:

a) Initial Report

The Inception Report must be submitted within four weeks of authorization by CWSA to start the consulting services. It will include proposals, guidelines and milestones on how to achieve the objectives set out in the Contract, as well as the Execution Schedule. It is necessary to make sure that the events are carried out so that the Engineering Design and works can be executed within the expected time and cost.

b) Boreholes Investigative Report and Assessment of existing situation review

The Investigative reports and proposed designs for Borehole(s) at Overland including appropriate screening, rising main (s) and necessary fittings such as valves must be submitted within six weeks of authorization by CWSA to start the consulting services. This investigation and design must discuss the use of two boreholes to make the system more resilient. Also, it is necessary to make sure that cost comparison for the use of one or two boreholes in the wellfield should be presented; the proposed capacity or size of submersible pump for borehole(s) based on the outcome of the hydraulic simulations and prepare detailed bills of quantities; drawings; and technical specifications for the procurement and installation of well pump including all equipment needed for the installation and withdrawal of the well pump. The Assessment of existing situation of the overall system should also be presented with main recommendations.

c) Draft and Final Detailed Design Reports

The ENGINEER must prepare the Engineering Design Report according to the terms of this TOR, as well as norms and standards listed in the TOR, if there are needs to meet CWSA's specific requirements during the elaboration and implementation stage. The ENGINEER should recommend or not its approval.

d) Environmental Reports

The ENGINEER must prepare the ESIAs and ESMPs, with information sufficient to address the requirements of Minister of Environment, the Environmental and Social Management Framework, and the CWSA's Requirements. The ESMPs must be reviewed together with the Monthly Reports.

e) RAP Reports

The ENGINEER must prepare RAP reports as needed, with information on their technical quality and suitability to the specific requirements of the RPF and the CWSA's Requirements during the elaboration of Engineering Design and during the construction of the works.

f) Monthly Progress Reports

The ENGINEER must produce monthly progress reports, throughout the contract period, based on the reports issued by the CONTRACTOR, and on the services performed by the ENGINEER Team, with clear information on the development of the Construction Contract, including the performance of socio-environmental activities, and submit them by the seventh day of the following month. The report will consist of the following chapters, among others:

- Status of the services for: elaboration of the Engineering Design, construction of the works, CONTRACTOR's equipment and mobilization of the personnel, during the construction progress until the issue of the Taking-Over Certificate;

- Status of preventive measures for environmental control and monitoring, according to the ESMP and the instructions contained in the Requirements of the Construction Contract;

- Status of elaboration and implementation of the RAPs, according to the instructions contained in the Requirements of the Construction Contract;

- Analysis of requests for interim payments submitted by the CONTRACTOR, for the purpose of issuing Interim Payment Certificates;

- Description of the delays, the works execution´s problems and the mitigating measures, and suggested steps to overcome them;

- Services and activities performed by the key and support personnel who are part of the ENGINEER team during the term of the overall contract;

- List of significant elements regarding actions on issues that require decision or authorization by CWSA, the CONTRACTOR, the ENGINEER or federal, state or municipal authorities.

g) Final report

The Final Report should reflect the general state of the completed Construction Contract, allowing the ENGINEER to issue the Performance Certificate, at the end of the defects liability period.

In this report the ENGINEER must present a history of the recommendations matrix since the Initial Report, the activities carried out by the operator for the preservation of the works, and if there are defects detected, he must inform the actions taken to correct them.

In this sense, the ENGINEER must inform CWSA and PMU-VEEP for approval of the completed works, emphasizing that the discharge of the final measurement will be conditioned to the approval of the Final Report.

The ENGINEER will submit the Final Report on the construction of the work in three printed and three digital copies, in an editable format (.pdf or similar format will not be accepted), within 30 (thirty) calendar days after the date of the issuance of the last Taking-Over Certificate; with a detailed summary of each volume, with the costs of construction and supervision, personnel and equipment used, compliance with deadlines, problems faced and solutions adopted, approval of completed works and "As Built", and any other relevant aspect that occurred during the execution of works; recommendations for operation and maintenance, suggestions for the execution of works in the future.

Special attention should be placed on the initial operation of the pipeline system; technical parameters and indicators of operation, and others related to the conclusion of the contract; compliance with deadlines; problems faced and adopted solutions, receipt of the completed work; and any other relevant aspect or situation that occurred during construction; as well as recommendations for operation and maintenance.

General Instruction- These reports shall include a table for quality assurance and version tracking with details on what, when, how and by whom the document was prepared (name and position of persons who prepared, revised and approved the Report including areas of responsibility, areas reviewed, number of revisions, start and completed dates and comments, and so on). A chapter on compliance with the ESMF & RPF safeguards instruments, specifically the ESMP and HSP should be included in each report.

10. MINIMUM EQUIPMENT AND MATERIALS REQUIRED

During the Construction phase, it will be made available in the Main Office installed by the CONTRACTOR, space for the ENGINEER and CWSA teams, with a minimum area of 50.00 m², furnished with tables for office and meeting, chairs and large cabinets; including a bathroom with ceramic tile and power supply. However, before the CONTRACTOR is mobilized, the ENGINEER must arrange temporarily office, preferentially close to the Main Office of CWSA.

The Consultant must provide all the equipment and materials necessary for the development of the contracted activities, including field and technical room services, which must contain the minimum structure listed in table 1.

Description	**Unit**	**Amount**
Computer	Unit	4
Multifunctional Printer	Unit	1
Surveying Equipment	Equipment	1
Truck of 140 to 165 hp, with 4x4 wheel drive and double cab	Unit	1

Table 1: Minimally necessary equipment