

**GOVERNMENT OF SAINT VINCENT AND THE GRENADINES**

**World Bank Volcanic Eruption Emergency Project - Saint Vincent and the Grenadines**

**National Emergency Management Organization (NEMO) Headquarters Expansion**

**Design Consultancy**



**Environmental and Social Impact Assessment and Management Plan**

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National Emergency Management Organization (NEMO) Headquarters Expansion  
Environmental and Social Impact Assessment and Management Plan

**Picture on front cover of the National Emergency Management Organization (NEMO) Headquarters  
Old Montrose , Kingstown Saint Vincent and the Grenadines . Date of Photo February 2023**

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National Emergency Management Organization (NEMO) Headquarters Expansion  
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## Acronyms

BMP	Best Management Practices
BRAGSA	Roads Buildings and General Services Authority
CARPHA	Caribbean Public Health Agency
CCCCC	CARICOM Climate Change Centre
CBD	Convention on Biological Diversity
CDEMA	Caribbean Disaster and Emergency Management Agency
C-ESMP	Contractor's Environmental and Social Management Plan
CHaRIM	Caribbean Handbook on Disaster Information Management
CIMH	Caribbean Institute of Meteorology and Hydrology
CITES	Convention on International Trade in Endangered Species of Fauna and Flora
CWSA	Central Water and Sewerage Authority
dB	Decibel
DRR	Disaster Risk Reduction
E&S	Environmental and Social
EHD	Environmental Health Department
EOC	Emergency Operations Centre
ESF	Environmental and Social Framework
ESHS	Environmental, Social and Health Standards
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
ESS	Environmental and Social Standards
GHG	Greenhouse Gas
GIS	Geographic Information System
GRM	Grievance Redress Mechanism
GOSVG	Government of Saint Vincent and the Grenadines
HQ	Headquarters
IFC	International Finance Corporation
ILO	International Labour Organization
IPCC	Inter-Governmental Panel on Climate Change
LBS	Land Based Sources
MOW	Ministry of Public Works
NAP	National Adaptation Plan
NBSAP	National Biodiversity Strategy and Action Plan
NEMO	National Emergency Management Organisation
OECS	Organisation of Eastern Caribbean States
OSH	Occupational Safety and Health
PM	Particulate Matter
PPE	Personal Protective Equipment
PPU	Physical Planning Unit
SDA	Seventh Day Adventist
SDU	Sustainable Development Unit
SGD	St. Georges Declaration of Principles on Environmental Sustainability in the OECS
SDG	Sustainable Development Goal
SIDS	Small Island Developing State
SLR	Sea Level Rise
SPO	Site planning option

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SVG	Saint Vincent and the Grenadines
TSS	Total Suspended Solids
UN	United Nations
UNCBD	United Nations Convention on Biodiversity
UNCCD	United Nations Convention to Combat Desertification
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
US	United States
USD	United States Dollar
VINLEC	St. Vincent Electricity Company Limited
WB	World Bank
WHO	World Health Organisation
XCD	Eastern Caribbean Dollar

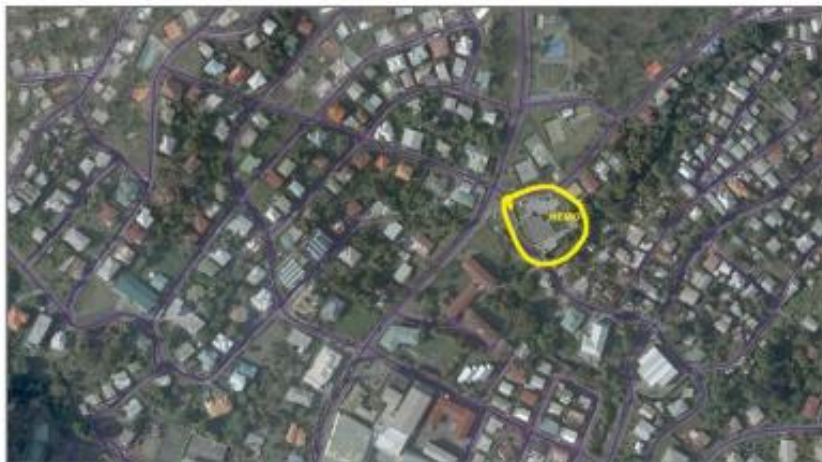
## Executive Summary

### E1. The project

Under the World Bank (WB) Volcano Eruption Emergency Project (VEEP), the Government of Saint Vincent and the Grenadines (GOSVG) (“the Client”) has received funding to support the implementation of a variety of emergency response activities, including a funding package from the European Union (EU) to support emergency management improvements. The National Emergency Management Organization (NEMO) has identified the need to renovate, upgrade and improve its Headquarters (HQ) located in Old Montrose as part of this activity. The assessment is to address existing structural, mechanical, electrical and plumbing and design for improvements in these and for expansion to better facilitate modern NEMO operations. The requirement for Environmental and Social Impact Assessment (ESIA)/ Environmental and Social Management Plan (ESMP) of the proposed activities was added into the consultancy scope after contract award.

### E2. NEMO

The National Emergency Management Organization (NEMO) was established in January of 2002 to coordinate the use of all available resources (local, regional, and international) to ensure that all the people of St. Vincent and the Grenadines (SVG) are better able to mitigate against, prepare for, and respond to disasters, and to recover from the impact of disasters in the shortest possible time. The NEMO Headquarters (HQ) in suburban Kingstown was completed in 2006 on a site measuring 1848 sm (19,900 sf).



**Figure E1. Aerial view of NEMO HQ site**

The NEMO compound sits between 2 roads feeding into a busy 5-way junction on the Nelson Mandela Highway (formerly known as the Leeward Highway). The property is bounded by these two public roads on its north and west, a residential plot to the east and the North River to the south. Main access to the NEMO compound is located on the Largo Height Road. A secondary access to NEMO’s lower storage area connects to the road that crosses the North River on NEMO’s boundary and then runs past the SDA HQ. Neither of these boundary roads has pedestrian sidewalks, except in the immediate vicinity of the main junction. The upper and lower site levels are divided by a retaining wall that runs across the entire NEMO site and separates the single- and two-storey sections of the building. The surrounding community is

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mixed use, with middle- and lower- income residential, institutional, and commercial uses within a 100m radius.

### E3. Consultant's Assessment

The Consultant's assessment finds that there are several significant performance deficiencies in the existing building that need to be addressed to enable it to perform and remain serviceable through extreme climate and other hazard events. Three broad building options were developed for client consideration. All included construction of a standalone structure(s) with covered connections to the existing building. The new buildings will accommodate essential EOC operations, and the existing building will be put to non-essential use. Nine site planning options (SPOs) were also developed. Of the possible combinations, the three top performing options were developed in greater detail. The environmental and social impact assessment (ESIA) findings and environmental and social assessment management plan recommendations do not vary significantly with the top three options, as all include elements of:

- site preparation;
- demolition;
- new building construction; and
- temporary relocation of some or all of NEMO's operations,

with similar scale of environmental and social (E&S) impacts. The biggest difference between options in the operational phase is the parking provision. SPO 3 offers 25 parking spaces, and SPO 7 offers 18 parking spaces. Parking availability under both options exceed the existing provision of 14 parking spaces. All three options provide for relocation of the main site entrance away from the junction, which will reduce traffic impacts associated with the proximity of site entrance location to the main highway junction.

At the time of writing, NEMO had selected SPO 7.

### E4. Area of Influence

The area of influence of this proposed sub-project includes:

- Residential buildings in the immediate vicinity
- Watercourse on the southeast boundary
- Nelson Mandela (Leeward) Highway, and the 5-way junction adjacent to the NEMO HQ
- Largo Height road that also provides access to the official residence of the Prime Minister
- The boundary road that crosses the North River
- Nearby institutions including Kingstown Baptist Church, Windsor Primary School, Kingstown Government School and SDA Church HQ which includes dental and health clinics
- Botanical Gardens.

The Milton Cato Memorial (General) Hospital is located some 450m away, on the Nelson Mandela (Leeward) Highway in the direction of central Kingstown. The Nelson Mandela (Leeward) Highway is the only access to communities on the northwest coast.

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## E5. Impact Assessment and Management

The World Bank (WB) Environmental and Social Standards (ESS) used to frame this ESIA are as follows:

- ESS1: Assessment and Management of Environmental and Social (E&S) Risks and Impacts
- ESS2: Labour and Working Conditions
- ESS3: Resource Efficiency and Pollution Prevention
- ESS4: Community Health, Safety, and Security
- ESS5: Land Acquisition and Involuntary Resettlement
- ESS6: Biodiversity Conservation and Sustainable Management of Living Natural Resources
- ESS8: Cultural Heritage
- ESS10: Stakeholder Engagement and Information Disclosure

Potential impacts of the proposed sub-project were identified under each of these ESSs, and recommended mitigation measures developed.

### E5.1. Highly significant impacts

#### **Construction phase**

In the construction phase, potential adverse impacts of high significance include:

1. Occupational safety and working conditions of sub-project workers
2. Typical construction impacts such as traffic, noise, dust, solid waste, disease vectors and performance of the site through a natural hazard event, affecting neighbours and adjacent road users

All of these will persist for the duration of construction. Application of construction BMPs as outlined in Section 6 of this document will ensure that these are adequately mitigated, with no significant residual impacts.

#### **Operations phase**

Once operational, the proposed development will provide the environment to facilitate improved performance of NEMO in both emergency planning and EOC operations, with benefits for both the staff and the entire affected population. This outcome is contingent on a thoughtful design that better meets the operational needs of NEMO, within a building that is designed and constructed to the appropriate standards to enable it to perform through and after extreme events. This is also important to protect the safety of users during an extreme event.

Highly significant potential adverse impacts during the operations phase include:

1. Structural and fire safety, for building occupants
2. Occupational health of the workforce in the building
3. Traffic, affecting neighbours and adjacent road users

Potential traffic impacts on community in the operations phase are of concern due mainly to lack of sufficient parking space to accommodate NEMO/EOC meeting attendees. Approaches to help mitigate this include:

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1. Relocation of the warehousing function to another location, to both increase available parking space and reduce parking requirements at this location
2. Prior arrangements by NEMO management for parking at nearby facilities
3. Carpooling by meeting attendees

#### E5.2. Moderately significant impacts

##### **Construction phase**

During construction, there is moderate potential to generate jobs for local communities. This is expected to benefit mostly men. Care must be taken to ensure that vulnerable groups including women living in the vicinity are not discriminated against and have an equal opportunity to access employment on the sub-project. Other potential risks of moderate significance in the construction phase are:

1. Occupation health of construction workers and other workers on site
2. Pollution of land, air, and water resources within the site footprint
3. Pollution of water resources beyond the site in the event of inadvertent diesel spill or other pollutants

##### **Construction and Operations phases**

For the life of the sub-project (i.e., through both construction and operations), the following risks are considered of moderate significance:

1. Visual impacts on upslope communities
2. Greenhouse gas emissions, due mainly to fossil fuel combustion (whether on site or at municipal power plants)

##### **Operations phase**

In the operations phase, also of potential moderate significance are:

1. Occupational safety and working conditions of the workforce in the building
2. Pollution of water resources on and beyond the site

Implementation of best management practices would mitigate all these risks.

Potential impacts on biodiversity are considered of low significance despite the site being located on the bank of the North River, as the property is relatively small and is already developed, within an urbanized space of relatively low biodiversity value, and well upstream of the Kingstown Bay.

As is the case for many construction projects, the number of potentially adverse impacts identified is considerably greater than the number of potentially beneficial impacts, mainly during the construction phase. Construction works typically involve a wide range of activities, many of which are potentially damaging to the environment. This should not be construed as indicating that the sub-project is environmentally or socially unacceptable. Assuming implementation of the specified mitigation measures, potential adverse impacts can typically be reduced to acceptable residual levels.

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### E5.3. Cumulative Impacts

This development together with other developments within Kingstown that may occur simultaneously (e.g. new port development, construction of a nurses hostel, construction of a Health EOC on the vacant lot opposite NEMO HQ) could significantly impact city and area traffic.

It is understood that other civil works are proposed adjacent to the North River, including construction of a Health EOC and development of a nurses' hostel. Should these works coincide with the NEMO HQ works and occur in combined with port development in the Kingstown Bay, there could be cumulative impacts on river and coastal water quality and biodiversity. Noise, dust, and other construction impacts on neighbours and road users could also be compounded in the immediate vicinity.

### E5.4. Residual Impacts

With genuine and sustained application of best management practices by the contractor and NEMO, potential adverse impacts may be satisfactorily mitigated. There are no significant residual impacts, except for potential traffic impacts in the operations phase, due to inadequate parking provisions.

## E6. Management Recommendations

GOSVG has ratified many international environmental and social conventions, and typically, there is a regulatory framework in place in all areas addressed in the ESS, and many public institutions with responsibilities in these areas. However, monitoring and enforcement by existing agencies is constrained by limited resources. Furthermore, the State is often not bound by existing laws. Notwithstanding, one of the recommendations of this assessment is that public agencies such as Physical Planning Unit (PPU), Environmental Health Department (EHD), Labour Department, Fire Service and Ministry of Works be engaged to review designs and intermittently inspect the sub-project through implementation, to ensure that requisite standards are continuously met.

Recommendations are also made for staffing within the contractor's organization, dedicated to monitoring and reporting to project management on sub-project environmental and social impacts, and to provide community liaison functions on behalf of the contractor. The Supervising Consultant is also required to routinely monitor and report to the client agencies on the management of environmental and social issues.

VEEP has developed a Grievance Redress Mechanism (GRM) and this should be used through this sub-project implementation.

## E7. Overall Sub-project Environmental Impact

Although many potentially adverse impacts have been identified, all can be mitigated satisfactorily through adoption of the specified mitigation measures, and residual impacts can be reduced to acceptable levels, provided that the measures are fully adopted and/or enforced.

The beneficial impacts associated with the sub-project relate primarily to enhancement of the NEMO HQ, to make it fit for purpose in this modern era, and to improve its structural and fire safety. The long-term benefits of sub-project implementation outweigh the adverse impacts, if recommended BMPs are implemented, thereby mitigating potential adverse impacts. With this assumption, from a social and environmental impact perspective, there are no grounds for concluding that the sub-project as currently conceived should not proceed.



## 1.0 Introduction

### 1.1 Assessment and Design Services required for NEMO HQ Upgrade

Under the World Bank (WB) Volcano Eruption Emergency Project (VEEP), the Government of Saint Vincent and the Grenadines (GOSVG) (“the Client”) has received funding to support the implementation of a variety of emergency response activities. Included in this support is a funding package provided by the European Union (EU) supporting emergency management improvements. Under this activity, the National Emergency Management Organization (NEMO) has identified the need to renovate, upgrade and improve its Headquarters (HQ) located in Old Montrose.

NEMO has identified specific requirements although other activities may be developed. The consultant is responsible for carrying out all assessment and design services in accordance with acceptable international design standards and engineering codes of practice. Activities include a complete architectural, structural, and building services assessment of the existing building, and a redesign to accommodate the current and future requirements of NEMO, including, but not limited to:

- an extension (lateral and/or vertical) of the operations room;
- a conversion of the layout and function of all existing office spaces such as the Director and Deputy Director’s Office,
- the construction of an office space dedicated to the Seismic Monitoring Unit;
- the creation of a Call Center and Radio room;
- the relocation of the kitchen and IT/Server room;
- the inclusion of an Executive Room; and
- the retrofitting of electrical and water supply systems to maximize energy efficiency, water conservation and backup storage.

The objective of the consultancy is to:

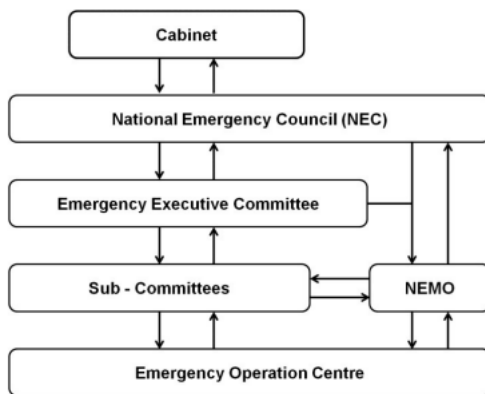
- consult with NEMO and other key stakeholders to gather all requirements relevant to the redesign of the HQ;
- conduct a complete assessment of the architecture, engineering, and building services of the existing building and external property; and
- prepare detailed designs, construction drawings, technical specifications, bills of quantities, proposed construction methodology (including construction sequence and time schedule) and bidding documents for the renovation, retrofitting and upgrade of the NEMO Headquarters to satisfy the organization's current and future functional requirements.

The requirement for Environmental and Social Impact Assessment (ESIA)/ Environmental and Social Management Plan (ESMP) was added into the consultancy scope after contract award, in light of the sub-project location and proposed scope of works.

### 1.2 Role of NEMO and Sub-project Rationale

The National Emergency Management Office (NEMO) was established in January of 2002 to coordinate the use of all available resources (local, regional, and international) to ensure that all the people of SVG are better able to mitigate against disasters, prepare for disasters, respond to disasters, and recover from the impact of disasters in the shortest possible time. The organization structure of the National Emergency Management Organisation is shown in Figure 1.1.

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**Figure 1.1. Organisation Structure of NEMO Organisation** (Source: Reynolds, 2014)

- The National Emergency Council is chaired by the Prime Minister with overall responsibility for Disaster Management. The Council consists of Ministers of Government of key agencies, NGOs, the private sector and other specialist groups.
- The Emergency Executive Committee (EEC) is chaired by the Director of NEMO and consists of representatives from ministries and other key stakeholders, grouped into 10 national sub-committees with specific thematic responsibilities. The EEC is responsible for the activities of the sub-committees as well as the policies and plans of the National Executive Committee.
- Disaster Management at the local level is undertaken by 13 district disaster committees, community disaster groups and community organizations.
- The NEMO Secretariat is responsible for implementing the policy and strategies of the organization, coordination of the various groups and disaster management activities and day to day operations. The emergency office is staffed by a Director, technical and supporting staff.

The National Disaster Plan (2005) outlines the roles and responsibilities of these various groups, and consists of the hurricane plan, the volcano evacuation plan, the flood response plans and various forms and guidelines. The NEMO Office and EOC was constructed in 2005 with funding from the World Bank (Murray, 2014).

Today, NEMO has a staff complement of 20 persons. The proposed organization structure would increase that staff complement to approximately 30 persons (pers. Comm., NEMO), and NEMO has outgrown the current accommodation. Space constraints were made clear during the COVID and La Soufriere eruption responses. To effect the volcanic eruption response, NEMO commandeered a pre-school building nearby to accommodate the call center function. Some of the issues to be addressed through this sub-project include:

1. The need for proper accommodation for the Soufriere Monitoring Unit which has been housed at NEMO since 2020 and is growing.
2. The EOC room is too small and is not configured to meet modern requirements (screens, dashboards etc.). It must accommodate both the numbers and the necessary technology. Additional EOC operations space requirements were estimated by the

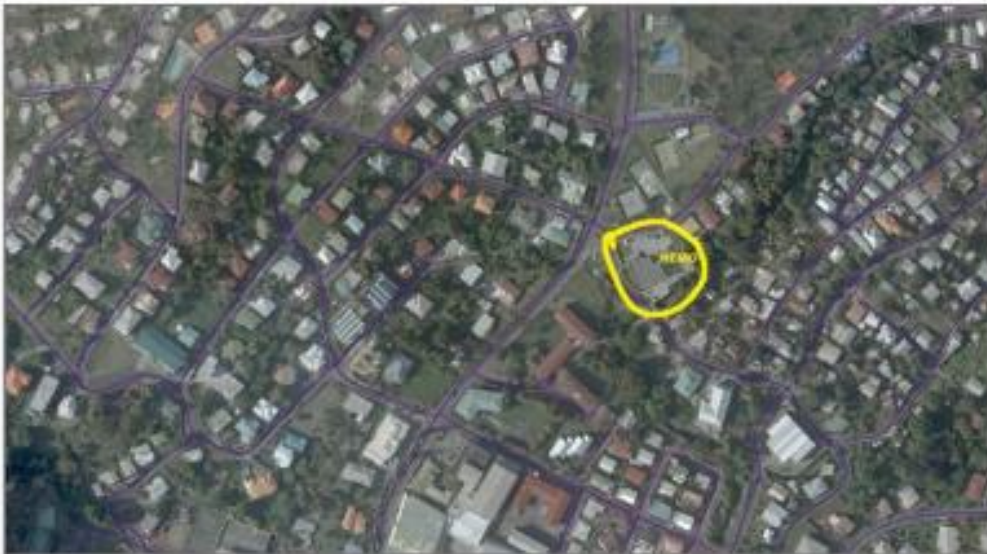
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design consultant in collaboration with NEMO to be at least 647 sm (6,958 sf) (ECMC, 2023).

3. The EOC room is not sufficiently private, and needs some restricted area built in.
4. Greater separation between the EOC and Media Room is required.
5. A space is required to accommodate executive meetings of the Prime Minister, separate from the EOC.
6. MIS, radios, ICT all need to be accommodated.
7. Storage space for EOC supplies needs to be increased.
8. NEMO must also stock sufficient supplies on site for distribution to affected persons who come to the HQ location. It is noted too that the network of emergency supply warehouses is inadequate.

### 1.3 NEMO building location and condition

The NEMO Headquarters compound is in suburban Kingstown on a site measuring 1848 sm (19,900 sf).



**Figure 1.2. Aerial view of NEMO HQ site**

The NEMO compound sits between 2 roads feeding into a busy 5-way junction on the Nelson Mandela Highway. The property is bounded by these two public roads on its north and west, a residential plot to the east and the North River to the south. Main access to the NEMO compound is located on the Largo Height Road. A secondary access to the lower storage area connects to the road that crosses the North River on NEMO's boundary and then runs past the SDA HQ. Neither of these roads has pedestrian sidewalks, except in the immediate vicinity of the main junction.

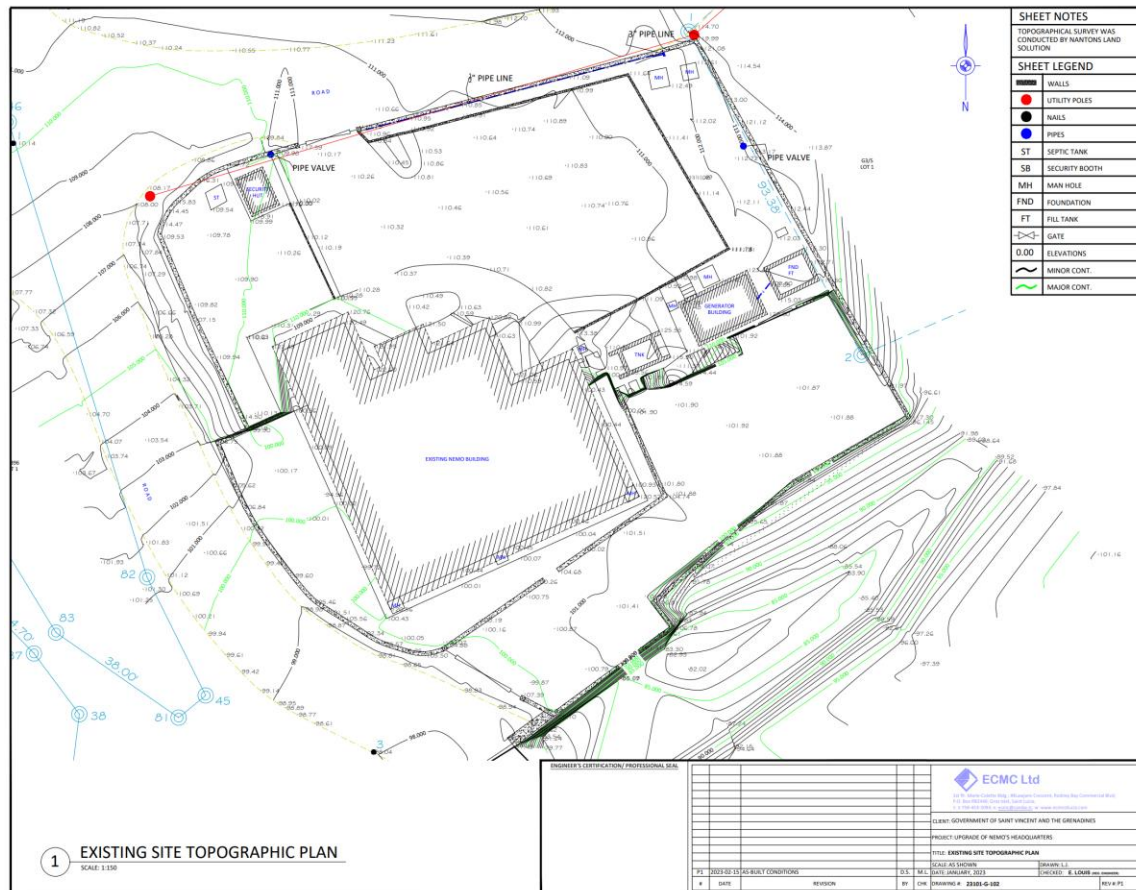
The upper and lower site levels are divided by a retaining wall that runs across the entire NEMO site and separates the single- and two-storey sections of the building.

The surrounding community is mixed use, with middle and lower income residential, institutional, and commercial uses within a 100m radius.

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The main structure comprises two storeys with a footprint of 483 sm (5.200 sf). Ancillary structures include:

- a generator room
- a 1,000 gal steel fuel storage tank with secondary containment adjacent to the generator room
- a security hut at the entrance
- an elevated structure supporting two 800 gal tanks for potable water storage
- a car park with 14-car capacity
- five storage containers (one at the top site level, and 4 at the lower site level)
- A septic tank and soakaway



**Figure 1.3. Existing NEMO HQ site**

Information on the building condition is provided in the consultant's options report. Some of the structural assessment findings are that:

- there is significant cracking of structural elements.
- cracking of exterior block walls suggests differential settlement.
- structural irregularities may cause the building to perform poorly in a seismic event.
- structural design of roof slab, ground floor slab, ground floor level columns and pad foundations does not conform with Code requirements.

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Some of the conclusions the consultant's options report were:

- The building appears not to have the capacity to facilitate vertical expansion without significant retrofit which might make a new structure more economically feasible.
- There is insufficient space to expand laterally to accommodate NEMO's requirements, and such an expansion could exacerbate structural irregularities within the existing building unless a seismic joint is installed.
- Lateral expansion northwards could surcharge the basements walls of the existing structure.

The building services assessment which is also provided in the consultant's options report found that:

- Plumbing is dated.
- There is no fire hydrant within 152m (500') of the building.
- The building is air conditioned by 22 individual AC split units, with no RCDs or Double Pole Ingress Protection isolation switches. 9 units require replacement.
- Electrical installation is unsafe.

Some of the conclusions were that:

- The AC system requires review for increased efficiency and air changes.
- Urgent remedial work is required to the electrical installation.

Some other pertinent observations made in the Options Report in relation to the existing site and building are as follows:

- The main entrance to the compound is very close to a major traffic junction.
- The road reserve on the north boundary is 6m (19.7'), inadequate for incorporation of a sidewalk.
- The 2.4m (8') high wall on the boundary with the public roads provides site security, but reduces lines of sight, particularly for vehicles traveling from the direction of NEMO's main entrance towards the junction.
- The North River on the southern boundary runs approximately 4.57m (15') below the lower site level. A rubble wall is constructed on that boundary, to define the river edge.
- The site slopes generally westerly. There are no drainage structures within the site except for the swale across the main site entrance.
- Roof drainage is conveyed by downspouts through the slab to 120mm (4") PVC pipes embedded in the columns. These empty into a network of manholes and buried pipes that convey water to roadside drainage.
- Electricity, telecoms and water are connected at the northeast corner of the site and are located along the site's eastern boundary.
- There is no rainwater harvesting. Solar panels are mounted on the flat roof, visually obscured by a parapet wall.
- The compound is adequately covered for fire safety (alarm and suppression systems) but there is no fire hydrant.
- Wastewater is treated in an onsite septic tank on the south side of the compound, with soakaway located below the secondary entrance pavement.

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Overall, the existing structure is rated in the Options Report as being in fair to average condition.

Photos of the existing site are provided in Appendix 1.

#### 1.4 Sub-project options

Three scenarios were considered for development of a Facility Condition Index (FCI):

1. Repair only
2. Remodel and repair
3. Repair and retrofit

Guiding principles developed by the consultants related to:

1. Climate and Disaster-Resilient design
2. User-centred
3. Sustainability
4. Use of local resources

FCIs for all three scenarios ranged from poor to very poor, suggesting that the most feasible options would entail demolition and reconstruction of an entirely new complex at this or an alternate site. It must be noted that relocation to another site was not included as an option for consideration by the Consultants. The condition assessment indicates that significant retrofitting of the existing building would be required to substantially meet performance objectives stipulated in the sub-project TOR.

Three broad options were developed for client consideration. All include construction of a standalone structure(s) with covered connections to the existing building. Nine site planning options (SPOs) have been developed. Some would require demolition of sections of the existing building. The combinations of site planning options and treatments for the existing building yield 27 sub-options, ranging in cost from XCD7.25m to XCD9.84m.

Options proposed for the existing building are:

1. remodelling after **Basic Structural Repairs** (estimated cost XCD2.01m)
1. **Life Safety Retrofit** to enable performance at Risk Category II level (estimated cost XCD2.351m)
2. **Immediate Occupancy Retrofit** to enable performance at Risk Category IV level (estimated cost XCD2.7m)

Option 1, basic structural repairs, could be implemented on a phased basis with continued partial building occupation. The other options are destructive and intrusive, generating noise and air pollution, and would require temporary relocation of NEMO's operations for the duration of implementation.

Application of a multi-criteria analysis to the 27 sub-options yielded a best score for the Immediate Occupancy Retrofit with site planning option 7, at a cost of XCD 9.84m. Second- and third-rated sub-options include combinations of site planning options 7 and 3 with Life Safety Retrofit and Immediate Occupancy Retrofit. SPO3 entails construction of one new building (1992 sf) at the northeast corner and one new building at the southeast corner and using the existing foyer. All parking is consolidated on the upper level. SPO7 entails construction of two new buildings at the northeastern and northwestern corners (2,001 sf and 1474 sf respectively), demolition of the existing foyer, parking at basement and



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upper levels, and construction of a covered walkway over the staircase. Both SPO3 and SPO7 options require:

- relocating the generator,
- Relocating/replacement of the fuel storage tank,
- new entrance gate and security hut,
- demolition of the support staff area, and
- realigning the northwest boundary.

The two top SPOs are depicted in Figures 1.4 and 1.5 below.

### 1.5 Implications of options for ESIA

The ESIA findings and ESMP recommendations will not vary significantly with the top three options, as all include elements of:

- site preparation;
- demolition;
- new building construction; and
- temporary relocation of some or all of NEMO's operations,

with similar scale of impacts. The biggest difference between options in the operational phase will be parking provision. SPO 3 offers 25 parking spaces, and SPO 7 offers 18 parking spaces. Parking availability under both options exceed the existing provision of 14 parking spaces.

### 1.6 Zone of influence

The area of influence of this proposed sub-project includes:

- Residential buildings in the immediate vicinity
- Watercourse on the southeast boundary
- Botanical Gardens
- Nelson Mandela (Leeward) Highway, and the 5-way junction adjacent to the NEMO HQ
- Largo Height road that provides access to the official residence of the Prime Minister
- Nearby institutions including Kingstown Baptist Church, Windsor Primary School, Kingstown Government School and SDA Church HQ which includes dental and health clinics.

The Milton Cato Memorial (General) Hospital is located some 450m away, on the Nelson Mandela (Leeward) Highway in the direction of central Kingstown. The Nelson Mandela (Leeward) Highway is the only access to communities on the northwest coast.

### 1.7 Purpose and Objectives of the ESIA

The purpose of this ESIA and ESMP is to ensure that the significant environmental and social impacts, both beneficial and adverse, of the proposed sub-project, have been considered and assessed, and that appropriate mitigation and enhancement measures are outlined, inclusive of identification of responsibilities for their implementation. The objectives of the ESIA are to:





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- Facilitate an understanding of the existing baseline conditions that are relevant to resources/receptors that could be significantly impacted by the proposed sub-project;
- Document how stakeholders have been engaged during the ESIA process, and how stakeholder feedback has been considered in the ESIA;
- Recommend the means for adequate engagement with affected communities throughout the sub-project cycle on issues that could potentially affect them and to ensure that relevant environmental and social information is disclosed and disseminated;
- Identify the aspects of the proposed sub-project that are likely to result in significant impacts to resources/receptors;
- Determine and assess the significance of the impacts of the proposed sub-project;
- Identify the environmental, social, health and safety aspects of the proposed sub-project that need to be managed and recommend appropriate and justified mitigation and enhancement measures to be undertaken during and after implementation;
- Develop a mitigation hierarchy to anticipate and avoid, or where avoidance is not possible, minimize, and, where residual impacts remain, compensate for/offset risks and impacts to workers, affected communities and the environment;
- Recommend cost-effective measures to be used to mitigate the anticipated negative impacts;
- Determine and evaluate the significance of residual impacts of the proposed sub-project;
- Analyse environmental and social impacts of alternatives to the proposed sub-project;
- Develop a gender-sensitive Environmental and Social Management Plan compliant with GOSVG guidelines and international standards.

The World Bank (WB) Environmental and Social Framework (ESF) is used to frame this assessment. The standards are as follows:

- ESS1: Assessment and Management of Environmental and Social (E&S) Risks and Impacts
- ESS2: Labour and Working Conditions
- ESS3: Resource Efficiency and Pollution Prevention
- ESS4: Community Health, Safety, and Security
- ESS5: Land Acquisition and Involuntary Resettlement
- ESS6: Biodiversity Conservation and Sustainable Management of Living Natural Resources
- ESS8: Cultural Heritage
- ESS10: Stakeholder Engagement and Information Disclosure

Application of the ESSs ensures that projects do not result in significant adverse environmental and social impacts. ESS policies across leading IFIs are consistent with these and seek to enhance sustainable development benefits while avoiding unnecessary harm to the environment, public health, and vulnerable communities.

The policies require identification and management of potential environmental and social risks of proposed activities. All projects are to be screened for environmental and social impacts and categorized according to potential impacts. This sub-project may be classified as having moderate impacts. The environmental impact assessment of the sub-project is required to:

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- consider all potential direct, indirect, transboundary, and cumulative impacts and risks that could result from the proposed project;
- assess alternatives to the project; and
- assess possible measures to avoid, minimize, or mitigate environmental and social risks of the proposed project.

The assessment is to be accompanied by an environmental and social management plan (ESMP) that identifies those measures necessary to avoid, minimize, or mitigate the potential environmental and social risks, and this is to inform the monitoring and reporting plan for that project.

The results of the screening, assessment, and monitoring are to be available for public consultation in a timely and effective fashion.

A Grievance Redress Mechanism is to be available.

### 1.8 Key outputs of the ESIA

The key output of this ESIA is a gender-sensitive, participatory, and consultative-oriented assessment report which addresses the potential positive and negative environmental and social impacts, and the proposed measures for inclusion in the construction and operation of the sub-project to enhance the expected positive impacts and mitigate the potential negative impacts. This includes a consideration of the differential impacts of the sub-project (e.g., construction impacts, employment and/or livelihood opportunities, safety, and security) on the economic and social activities of males and females.

An ESMP is included in this report, identifying responsible parties, required timing and estimated cost of the recommended interventions for environmental and social management and monitoring.

### 1.9 Stakeholder Analysis

Stakeholders are individuals or groups that experience the proposed sub-project impacts, whether positive or negative. Their input is critical to the identification and assessment of socioeconomic and gender impacts, and aids in understanding potential impacts and assessing severity and duration. Table 1.1 below identifies stakeholders to be engaged, and the reasons for their inclusion on this list. Persons engaged as part of the ESIA/ESMP process are listed in Appendix 2.

Section 4.11 describes stakeholder engagement undertaken to inform the ESIA and ESMP. Section 7.9 provides the recommended stakeholder engagement plan through the sub-project implementation phase.

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**Table 1.1. Identification of Stakeholders**

Stakeholder Group	Sub-project Interest
NEMO Management and Staff	Project proponent that will benefit from enhanced HQ. Staff potentially affected by continuing to work within a construction site, and by increased road traffic, and rerouting of existing traffic patterns due to construction
NEMO users	Potentially affected by increased road traffic, and rerouting of existing traffic patterns due to construction. Beneficiaries of improved NEMO operation.
Residents in the immediate vicinity	Potentially affected by increased road traffic, noise and dust, and rerouting of existing traffic patterns due to construction
Institutions in the immediate vicinity (staff and users)	Potentially affected by increased road traffic, noise and dust, and rerouting of existing traffic patterns due to construction
Businesses in the immediate vicinity (owners and operators)	Potentially affected by increased road traffic, noise and dust, and rerouting of existing traffic patterns due to construction and loss of livelihood
Area road users	Potentially affected by increased road traffic, noise and dust, and rerouting of existing traffic patterns due to construction
Government agencies	Regulatory agencies reviewing project proposals, issuing permits and other approvals. Involved with project implementation e.g., information dissemination, sources of data, monitoring, mitigation and enforcement measures.
Persons with Disabilities	Potentially affected by increased road traffic, noise and dust, and rerouting of existing traffic patterns due to construction
Non-Governmental Organizations (NGOs) and Community-Based Organizations (CBOs)	Representatives of affected and/or interested groups

## 2.0 Sub-project description

The sub-project proposes to accommodate an enhanced NEMO and NEOC operation. The existing building conditions and top three development options are outlined earlier. The anticipated approach to implementation is outlined in this section.

### 2.1 History of site development

A longtime area resident recalls the evolution of this site as follows:

- There was a brick chimney on the site that he assumed was part of a sugar factory.
- The government later established a carpentry/joinery training school for boys at this location.
- The chimney was later demolished and offices for the Housing and Land Development Corporation constructed.
- The Housing and Land Development Corporation offices were later demolished, and the NEMO headquarters were established.

The river wall appears to have been built and backfilled to accommodate the Housing and Land Development Corporation offices.

### 2.2 Overview of this sub-project design

The proposed sub-project upon completion will feature, within the government-owned property that presently accommodates NEMO's operations:

- Rehabilitated existing structure with solar panels above
- New structures at heights between 40' and 60'
- Generator, diesel storage tank, and secondary containment (relocation of existing may be required)
- Water tanks (relocation of existing may be required)
- Security hut (relocation of existing required)
- Parking area(s)

Building heights range from 2 to 4 storeys.

The new building will likely be concrete frame cast in situ, with blockwork infill for external walls. Some interior walls will likely be made of gypsum board with mineral wool filling, constructed with certified systems providing the required sound and thermal insulation.

A new main (upper) site access is proposed, set slightly further back from the 5-way junction. The existing lower access will continue to be used. Parking will be on concrete slab on grade. A separate access will also be developed, to the generator and fuel tank.

Drainage designs will be guided by the use of [the OECS Building Code 7th Edition](#) to provide a combination of covered and open box and slipper drains, to convey water to existing roadside drainage and then to the adjacent North River.

Electricity supply is already on site and will be upgraded as required to accommodate new construction. Existing solar PV will remain, except where panels are installed on roofing to be demolished. Additional PV panels will be installed on the new building roofs. There will be a net increase in PV capacity. Existing

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backup generation (fossil fuel powered) is also adequate. There may be an opportunity to reduce the onsite fuel storage capacity.

Water supply is already on site and will not require upgrading. However, a fire hydrant will be recommended to be installed on the closest 100 mm (4") public water mains within 750 feet of the NEMO compound, to improve fire safety. Existing water storage is potable water in two no. 800 gal tanks. Water storage capacity will be increased by installation of underground water tanks below both new buildings, with two potable and two rainwater tanks in each building basement, with the capacities tabulated below. The storage tanks will have adequate capacity - a total of 50,250 gallons of potable water – to meet future building needs:

**Table 1: Water Storage Capacity**

Building	Volume – US gallons	
	Rainwater	Potable
East	28,900	27,700
West	20,900	22,550

The tank depths will be dictated by geotechnical conditions but will not exceed 1800 mm (6'), for both rainwater and potable water storage. Harvested rainwater will be used for toilet flushing and external non-potable water requirements and the new buildings will be plumbed accordingly.

Fire safety provisions will include:

- Appropriately located smoke detectors throughout the buildings;
- Use of an addressable fire alarm system for fire detection;
- Inclusion of portable CO2 and dry chemical fire extinguishers for fire suppression.

The feasibility of connecting to the existing sewer that runs on the road on the north boundary will be explored and will likely be a preferred option for the new build, as this approach would significantly reduce or remove the requirement for onsite management of wastewater and transfer this responsibility to the existing national authority. The system is expected to be better able to respond to shock loads anticipated when the EOC is in operation. This sewer is connected to the Kingstown system presently being upgraded to facilitate new port development. The existing septic tank and soakaway will continue to service the existing structure. Relative elevations preclude connection of the existing building to the sewer without pumping.

IT & Telecommunications Services proposed include installation of:

- IT & Telecommunications both internally and externally to all buildings inclusive of all mechanical plants that require data feed;
- Telecommunication link between the new building and the existing building via fibre;
- Dome and fish eye cameras in strategic areas throughout the building, at locations identified in consultation with the Client;
- Magnetic locks at critical entrances and doors to secure areas such as the server rooms;

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- Card readers at the entrance, secure areas, and floors, particularly in the Eastern Block, where the Executive office is located.

In the operational phase, solid waste collection services will continue to be provided once weekly by Central Water and Sewerage Authority (CWSA), for disposal at the CWSA landfill site on the east coast.

Cameras and alarm systems will be installed for security.

## 2.3 Sub-project Construction

### 2.3.1 Construction Site Access

The existing accesses will be used to access the upper and lower-level areas of the site during construction. Once the new main access is developed, it will be put into use and the original main access will be closed.

### 2.3.2 Temporary Relocation of NEMO Operations

NEMO operations will have to be partially or fully relocated to another location for the duration of the works, estimated to be in the order of 18 months. Relocation requirements for the 1<sup>st</sup> building option (remodeling after Basic Structural Repairs) will be lower, and availability of suitable options is expected to be better (location, proximity to existing HQ, affordability, etc.). However, maintaining partial occupation brings other issues such as:

- OSH issues for staff remaining in occupation of the HQ building
- Conflict between construction and NEMO operational activities within a confined space
- Inconvenience to the public and other agencies that must continue to access the HQ for NEMO services and activities.

For the temporary relocation of the NEMO Headquarters an approximate space of 10,000 square feet is required to accommodate staff, conference room and EOC in a location that continues to be readily accessible to all users, quotations for monthly rental costs range between XCD 16,000 and 20,000 per month. This does not include utility costs, which could raise the total monthly bill to a range of XCD 20,000 to 25,000 per month. Assuming temporary space would be required for a period in the order of 21 months (to allow for moving, commissioning etc.), the total bill could exceed XCD 500,000. This bill would have to be paid with government revenue.

In order to reduce this cost, NEMO may need to make some concessions for the relatively short duration of temporary accommodation. These could include:

- obtaining lower-cost rental space at a location that is not as conveniently accessible to all citizens;
- renting office space only, in the order of 5,000 square feet, on the assumption that workshops and EOC meetings if and when required during the period will be convened at another location. It is assumed that the government could make conference and meeting room space available at no cost to NEMO during this period.

With this approach, the rental and utility bill for temporary accommodation could likely be reduced to a figure in the order of XCD 200,000 to 250,000.

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### 2.3.3 Utility Connections for Construction

Connections to water and electricity supplies are already available, and these will continue to be used for construction purposes. Construction demands are not expected to exceed available supplies nor to diminish available supplies to existing users.

### 2.3.4 Site Clearance and Grading

The site has no vegetation except for grassed areas. No site clearing is required.

New site levels required for new construction including parking areas and proposed site drainage will have to be established with site grading. This is anticipated to be minimal. No significant spoil quantities are likely to be generated.

### 2.3.5 Demolition and relocation of facilities

Parts of the existing structure will be demolished, both externally and internally. Storage containers on site exert a surcharge on the river retaining wall. They will be emptied to internal storage on the lower floor of the existing structure, and the containers hauled off site.

Ancillary buildings and equipment (generator and fuel storage, security hut) will be relocated within the site.

Relocation of the generator and fuel tank will require mobilization of a small crane /crane truck. An assessment of the fuel tank capacity revealed that the existing tank capacity of 720 US gallons is insufficient if a five-day supply is needed. A 4,000 US-gallon tank would be required. Provision for the increased requirement is made. The existing fuel tank relocation will be managed in collaboration with St. Vincent Electricity Company Limited (VINLEC) support. It will need to be emptied prior to transfer within the existing site or to a new site. The decanted fuel may be replaced in the tank after relocation and requisite tank inspections are completed. If relocated to a new site, it will have to be hauled by truck to the new location. The tank will be made accessible from the road on the southern boundary, to facilitate servicing of the generator and tank, from a new opening on that boundary.

There is no asbestos at this location.

### 2.3.6 Excavation and temporary site drainage

Excavation will be limited to preparation of foundations and drainage.

During construction, surface water drainage will be managed with temporary berms and/or cut-off drains to confine eroded material within the site, and to limit sedimentation of the adjacent road drainage and North River.

#### 2.3.6.1 Foundations

New buildings will likely be supported on raft foundations, and no piling will be necessary. Ready-mix concrete will be used.

### 2.3.7 Building Works

Building works will be programmed to minimize the construction period. New building construction and remedial work to the existing building will be scheduled to run concurrently.

Concrete will be produced off site, hauled in as required from the concrete supplier's yard, and pumped into forms prepared to receive concrete on site.

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### 2.3.8 Construction Waste Management

Various waste streams may be generated during construction:

- Demolition waste
- Septage from servicing of the existing septic tank and portable toilets on site
- Construction waste
- Food waste

The building contractor will collect and properly contain C&D waste on site. Demolition waste will primarily comprise a mix of concrete rubble, lumber, drywall and roof protection material. Construction waste will comprise mainly packaging material and scrap. When quantities accumulated warrant a trip, C&D waste will be appropriately transported and disposed of at the government landfill site. It is estimated that 1 to 2 truck trips per week to landfill will typically be required.

Septage will be disposed of in the EHD-approved facility operated by CWSA.

Spoil and vegetation generation will be minimal. Any excess spoil material will be used on site to the extent possible.

Food waste will be collected in dedicated containers provided for the workers and disposed of at the landfill site, at least twice weekly by the building contractor or a contracted waste collector.

#### 2.3.8.1 Hazardous Material Management

No weedicide will be used on site.

Foundations will be treated for termites, and the chemical to be applied may be stored on site for a short period in limited quantities. Often these applications are conducted by a contracted service provider, and so material is stored on site outside of the application period.

Fuels and oils for equipment operation will be stored in small quantities on site.

No other hazardous material will be stored on site.

In the operations phase, fuel will be stored permanently for generator operation.

### 2.3.9 Procurement of Local Services and Supplies

Many building supplies will be purchased locally, including concrete blocks, concrete, cement, aggregate, reinforcing steel and lumber. Floor tiles, structural steel and fixtures will be imported.

River sand is available from government-owned Buildings, Roads, and General Services Authority (BRAGSA) at Rabacca. Coarse aggregate is available from several privately-owned quarries around the island. The closest quarry location is a half hour drive from Kingstown, at Layou on the northwest coast, where two quarries (Concrete and Aggregates, a CO Williams subsidiary, and SVG Aggregates) operate. Two new quarries will soon commence operations. One will be the OB Sadoo operation in Georgetown on the west coast, and the other will be the RQ Quarry operation in Richmond on the northwest coast. This latter is not easily accessible by road, and material will typically be hauled by barge. The former is en route to the BRAGSA Rabacca operation, and an approximate 45-minute drive from Kingstown. This will be operational within 2023.



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### 2.3.10 Contractual Matters

#### 2.3.10.1 Construction Management

The Options Consultant's role will end with production of detailed design drawings and tender documents for the Client's preferred design option. A separate contract will be let for consultants with responsibility to support the Client through the works procurement, construction and defects liability period, including:

- Issuance of tender invitations
- Convening of site visit with prospective tenderers
- Responding to tenderer queries
- Evaluation of tenders submitted and production of tender evaluation report
- Supervision of construction, including:
  - site inspections,
  - instructions to contractor,
  - convening of site meetings,
  - review of contractor invoices and certification of payments, and
  - production of site meeting minutes, and progress and completion reports.

The client represented by the VEEP office will maintain high level oversight, which includes attendance at site meetings, and review of Supervising Consultant's minutes and reports.

The NEMO office will be represented at site meetings and will be given an opportunity by VEEP to review and comment on the Consultant's Monthly Reports. The VEEP office will report at the required frequency to the designated officers at the WB. It is expected that World Bank representatives will conduct occasional supervision visits.

#### 2.3.10.2 Contracting

Supervision and works contracts will be let on a competitive basis in accordance with the WB's procurement requirements. This process will be implemented by the VEEP office, under the supervision of designated World Bank officers.

#### 2.3.10.3 Insurances

All requisite contractor liability insurances will be a contractual obligation under the contract(s), to be valid for the duration of the works, and through the defects liability period.

## 2.4 Workforce

### 2.4.1 Staffing Requirements

It is expected that employment generated over an 18-month construction period will be in the order of 16,000 person-months. An average of 40 skilled and unskilled construction workers will be employed. It is expected that more than 80% of the required construction workforce will originate from communities in and around Kingstown.

NEMO will continue to fill approved vacant positions in its staff structure as budget and priorities dictate. It is expected that office space will not be a constraint.

### 2.4.2 OSH and PPE

All construction staff will be provided with high visibility vests, hard hats, and construction boots. Other PPE (e.g. dust masks) will be provided as required, appropriate to tasks assigned.

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2.4.3 Gender Considerations

The proportion of male to female staff varies in different areas and phases.

During construction, staff is usually predominantly female in office administration, and predominantly male in project management and construction. Overall, more males than females are employed in the building construction phase. Facilities for female staff will be provided if there are females employed by contractor or consultant, on site.

The gender balance of staff engaged in future NEMO operations will likely continue along current trends, with slightly more females than males employed.

### 3.0 Policy, Legal and Institutional Framework

#### 3.1 Summary of pertinent agencies, the supporting legislation and scope of influence

Table 3.1 identifies key agencies, the legislation that provides their mandate, and their scope of influence.

**Table 3.1. Pertinent agencies, supporting legislation and scope of influence**

Ministry	Agency	Legislation	Scope
Ministry of National Security, Air and Sea Port Development	National Emergency Management Organisation (NEMO)	<ul style="list-style-type: none"> <li>• National Emergency and Disaster Management Act, Cap 288 of the laws of Saint Vincent and the Grenadines. Act #15 of 2006.</li> <li>• Emergency Powers Act # 45 of 1970</li> <li>• Natural Disaster Relief Act, 1947</li> </ul>	<p>The Act provides for:</p> <ul style="list-style-type: none"> <li>• prevention, preparedness, response, mitigation and recovery in relation to hazards, disasters and emergencies,</li> <li>• establishment of the National Emergency Management Organisation,</li> <li>• appointment of a Director of the National Emergency Management Organisation,</li> <li>• establishment of a National Emergency Council,</li> <li>• development of a National Disaster Management Plan,</li> <li>• regulation of emergency operation centres and shelters,</li> <li>• coordination of activities of persons involved in disaster management,</li> <li>• designation of specially vulnerable areas, and</li> <li>• related matters.</li> </ul> <p>NEMO is the primary agency for the coordination of Disaster Risk Reduction (DRR) activities in SVG. The organization is affiliated to Caribbean Disaster and Emergency Management Agency (CDEMA), CARICOM Climate Change Centre (CCCCC), Caribbean Public Health Agency (CARPHA) and the Caribbean Institute of Meteorology and Hydrology (CIMH).</p>
	Police Service	<ul style="list-style-type: none"> <li>• Motor Vehicles and Road Traffic Regulations (2009)</li> </ul>	<p>The Motor Vehicles and Road Traffic Regulations (2009) are designed to regulate and control the flow of traffic.</p> <p>The traffic branch of the Royal St. Vincent and the Grenadines Police Force is responsible for enforcement of roadway safety and the regulation of traffic provisions under these regulations.</p>

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Ministry	Agency	Legislation	Scope
			<p>Special authority can be issued to wardens to regulate the flow of traffic to facilitate the execution of road works.</p> <p>Contractors on public projects are required to submit a Traffic Management Proposal to the Ministry of Works, which consults with Traffic Police in its review. Non-compliance with an approved proposal is deemed breach of contract.</p>
	Fire Service		<p>There is no legislation.</p> <p>The Fire Service is responsible for fire prevention education, fire suppression, and other related emergency and non-emergency activities.</p>
Ministry of Health, Wellness and the Environment	Central Water and Sewerage Authority (CWSA)	<ul style="list-style-type: none"> <li>• Central Water and Sewerage Act (No.6 of 1978), amended in 1992</li> <li>• Central Water and Sewerage Authority Act (No.17 of 1991)</li> </ul>	The Central Water and Sewerage Authority (CWSA) is established as a statutory body responsible for the production and distribution of piped water and for waste management on Saint Vincent, and advises the Minister on the improvement, preservation, conservation and utilization of the country's resources.
	Solid Waste Management Unit (SWMU)	<ul style="list-style-type: none"> <li>• Waste Management Act (No.31 of 2000)</li> <li>• Solid Waste Regulations (No. 11 of 2005)</li> <li>• Litter Act</li> </ul>	<p>The Waste Management Act and Regulations contain rules in conformity with best environmental practices for public management and disposal of solid waste, including hazardous waste. The Litter Act provides for the control of emissions and effluent discharge into water.</p> <p>The SWMU was established within CWSA in 1999 to execute activities under the "Organization of Eastern Caribbean States (OECS) Solid and Ship-generated Waste Management Project". It is also responsible for the collection and disposal of solid waste on St. Vincent and for the development of waste management facilities on the Grenadine islands of Bequia, Union Island and Canouan.</p>

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Ministry	Agency	Legislation	Scope
	Environmental Health Division (EHD)	<ul style="list-style-type: none"> <li>• Environmental Health Services Act (No.14 of 1991)</li> <li>• Noise Control Act (No. 18 of 1988)</li> <li>• Public Health Act (1977)</li> <li>• Litter Act (1991)</li> <li>• Environmental Impact Assessment (EIA) Regulations (Draft, 2009)</li> <li>• Environmental Management Act (Draft, 2009)</li> </ul>	<p>The Environmental Health Services Act makes provision for the conservation and maintenance of the environment in the interest of health generally, and particularly in relation to places frequented by the public. It regulates activities that may affect public health and the environment and provides for pollution control.</p> <p>The Noise Control Act provides for the control and abatement of noise and vibration. Section 8 of the Act makes provision for a noise abatement order and a noise abatement zone. Section 5 of the Act applies to construction work - the erection, construction, alteration, repair or maintenance of buildings, structures, or roads. Where it appears to the Board that works to which this section applies are being carried out on any premises, it may serve a notice imposing requirements as to the way the work is being carried out and may publish notice of the requirements in such a way as appears to it to be appropriate.</p> <p>Under the Public Health Act, if the Chief Environmental Health Officer is of the opinion that a source of contaminant or pollutant is adding to, emitting or discharging into the environment any contaminant or pollutant that constitutes an immediate danger to life or the health of any person or to property, s/he may, under the Public Health Act, issue an order directed to the person responsible for the source of the contaminant or pollutant to abate the public nuisance.</p> <p>Also under the Public Health Act, the Environmental Health Department (EHD) reviews development plans for large developments (commercial, institutional), to ensure public health issues are addressed. EHD is responsible for sanitation services such as street cleaning. The Vector Control Unit which falls within EHD is responsible for baiting for mosquitoes and rodents, which is done selectively, mainly in public buildings including NEMO. The Chief Environmental Health Officer sits on the Planning Board. Inspections are usually done only in response to complaints. There is no public health laboratory.</p> <p>The following drafts, while not enforceable, are of note:</p> <ul style="list-style-type: none"> <li>• The draft EIA regulations require that any project that converts prime agriculture lands to non-agricultural use or impairs the agricultural productivity of prime agricultural lands shall be subject to an ESIA.</li> </ul>

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Ministry	Agency	Legislation	Scope
			<ul style="list-style-type: none"> <li>The Environment Management Act (2009 Draft) defines the limits of pollution allowed and the process for receiving a pollution permit should the quantities to be produced during the process surpass the established national limits. The Act makes the Department of Environment responsible for the continuous and long-term assessment of the status of natural resources and of pollution, environmental degradation and other adverse impacts on the environment; the coordination, monitoring and ensuring the protection and sustainable use of natural resources for the benefit of the present and future generations; the prevention and control of pollution where there is no existing legal provision for such control by coordinating all activities relating to the discharge of wastes into the environment. Although the Act does not mention the Sustainable Development Unit (SDU), this Unit should be informed and included in the monitoring and review process.</li> </ul>
Ministry of Agriculture, Forestry, Fisheries, Rural Transformation, Industry and Labour	Division of Fisheries	<ul style="list-style-type: none"> <li>Fisheries Act (No.8, 1986), &amp; later amendments (No.32, 1986, and No.25, 1989)</li> <li>Marine Parks Authority Act 1997 (No.33, 2002)</li> </ul>	<p>The Fisheries Act relates to the promotion and management of fisheries and matters pertaining there to. It protects and preserves marine resources.</p> <p>The Marine Parks Authority Act establishes and controls Marine Parks and provides for other related matters.</p>
	Forestry Department	<ul style="list-style-type: none"> <li>Forest Resource Conservation Act (No.47, 1992)</li> <li>Natural Forest Resource Act (1947)</li> <li>Forestry Act (1945)</li> </ul>	<p>The Forest Resource Conservation Act and other forestry and wildlife legislation provide for:</p> <ul style="list-style-type: none"> <li>the conservation, management and proper use of the forest and watersheds, declaration of forest reserves, cooperative forest and conservation areas.</li> <li>the protection of wildlife and any connected issues.</li> </ul>

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Ministry	Agency	Legislation	Scope
		<ul style="list-style-type: none"> <li>• Wildlife Protection Act (No.16, 1987) &amp; later amendments (1988, 1991)</li> <li>• Wildlife Conservation Act (1991)</li> </ul>	<ul style="list-style-type: none"> <li>- the conservation and sustainable management of the nation's forest, wildlife, and national park resources</li> </ul>
	National Parks, Rivers and Beaches Authority	<ul style="list-style-type: none"> <li>• National Parks Act (No.33, 2002)</li> <li>• National Parks (Amendment) Act (No.13, 2010)</li> </ul>	<p>The National Parks Act makes provision for national parks and establishes an authority for national parks, to make further provision for the preservation, protection, management and development of the natural physical and ecological resources and the historical and cultural heritage of SVG and for connected matters. The Act establishes the National Parks, Beaches and Rivers Authority, with power and control over all rivers, streams, springs, swamps, and beaches.</p> <p>The Authority coordinates matters regarding parks and protected areas management in Saint Vincent and the Grenadines. They deal with biodiversity, conservation, natural resources management and tourism.</p>
	Sustainable Development Unit (SDU)	<p>MEAs</p> <ul style="list-style-type: none"> <li>• Montreal Protocol Act (2003)</li> <li>• Montreal Protocol Regulations (2005) (to be amended)</li> </ul>	The SDU is responsible for initiatives and reporting under the various MEAs - Montreal Protocol, SDGs, UNFCCC (Climate Change), Biodiversity and Chemicals Management.
	Labour Commissioner	<ul style="list-style-type: none"> <li>• OSH Act (2017) (not yet in force)</li> <li>• Protection Of Employment Act 2003</li> </ul>	Inspection of premises to ensure compliance with the law (e.g., use of PPE, working conditions). Mediation in dispute resolution between employer and employee. The purview of the Labour Department is the private sector. The Public Service Commission deals with public sector issues.

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Ministry	Agency	Legislation	Scope
		<ul style="list-style-type: none"> <li>• Wages Act</li> <li>• Labour Inspections Convention</li> <li>• Equal Pay Act (No. 3) of 1994</li> <li>• Employment of Women, Young Persons and Children Act (No.53) of 1992</li> </ul>	<p>The Occupational Safety and Health Act sets standards for occupational safety and health.</p> <p>The Protection of Employment Act supports successful employment relationships by promoting confidence in employment relationships. The Act lists terms and conditions under which employment can be fairly terminated and addresses protection against unfair dismissal.</p> <p>The Equal Pay Act provides for the removal and prevention of discrimination in the rates of remuneration based on gender. The employer must pay equal pay for equal work. The burden of proving that equal pay has been paid for equal work rests with the employer.</p> <p>The Employment of Women, Young Persons and Children Act addresses employment-related concerns of women and children. It sets out equal remuneration for all workers including industrial and agricultural workers, maternity leave to be granted to women.</p>
Ministry of Transport, Works, Lands and Surveys, and Physical Planning	Transport and Works Division	<ul style="list-style-type: none"> <li>• Roads Act</li> <li>• Chief Engineers Act</li> <li>• The Motor Vehicles and Road Traffic Regulations (2009)</li> </ul>	<p>The Transport and Works Division is responsible for regulation of the traffic and land transportation system in conjunction with the police. It is the lead agency in the development and maintenance of all public roads, buildings, bridges, airports, seaports, jetties and other public assets. It is also responsible to develop, monitor and regulate all components of the energy sector.</p> <p>The Motor Vehicles and Road Traffic Regulations (2009) are designed to regulate and control the flow of traffic. This is done by way of signposts, markings, reflectors, and bumps on the street's surface.</p> <p>Contractors on public projects are required to submit a Traffic Management Proposal to the Ministry of Works. The Ministry consults with Traffic Police in its review. Non-compliance with an approved Proposal is deemed breach of contract.</p>



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Ministry	Agency	Legislation	Scope
	Electrical Inspectorate Division		The Electrical Inspectorate Division promotes electrical regulation and electrical safety.
	Lands and Surveys	<ul style="list-style-type: none"> <li>• Land Acquisition Act (Chapter 241, 1947)</li> </ul>	The Act provides for the acquisition of land by the GOSVG for a public purpose. The government may declare the intention to acquire land required for a public purpose. The Act details the procedures to be followed to acquire the land, including notification of intention, survey, negotiation procedures and compensation guidelines. Issues relating to payment of compensation can be submitted to a Board of Assessment, and the award must be filed in the High Court.
	Physical Planning Unit (PPU) Lands and Surveys	<ul style="list-style-type: none"> <li>• Town and Country Planning Act (No.45, 1992)</li> <li>• OECS Building code 2008 (Only the Administrative Section of the 2015 OECS Building Code has been assented to)</li> </ul>	<p>The Town and Country Planning Act (No.45, 1992) is the principal legislation governing physical development in St. Vincent and seeks to ensure orderly and progressive physical development in SVG. It provides for “the orderly development of land, the assessment of the environmental impacts of development, the grant of permission to develop land and for other powers to regulate the use of land, and for related matters.”</p> <p>The Physical Planning and Development Board (PPDB) has the legal authority for carrying out the purpose and provisions of the Town and Country Planning Act. The PPU functions as the technical/advisory arm of the Physical Planning and Development Board (PPDP) and is responsible for ensuring project development occurs within the environmental and social requirements of St. Vincent &amp; the Grenadines. The Act gives the Minister the ultimate and final decision on any planning matter. The Chair, Deputy Chair and Committee member of the PPDB are civil society members with the Town Planner as Secretary. Other members of the PPDB include representatives from the Police, National Properties, Transport and Works (Chief Engineer), Housing and Land Development Corporation, CWSA, VINLEC, Lands and Surveys, Kingstown Town board, the Ministry of Health Wellness and the Environment, Ministry of Agriculture, and the Permanent Secretary in the Ministry of Housing.</p>

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Ministry	Agency	Legislation	Scope
			<p>Under Article 29 of the Act, an EIA for environmentally sensitive projects or activities is required. The PPU has the legal authority for environmental management in relation to development, including the evaluation of the need for and level of EIA requirements. EIA regulations are in draft, and it is not clear when they will be declared. The scope of the EIA required is determined through discussion with the PPU.</p> <p>PPU is also responsible for the management of the national Geographic Information Systems (GIS).</p> <p>As part of its regular responsibilities, the PPU will review the EIA and development applications as well as oversee all other development control related matters, from inspection, to monitoring and enforcement.</p> <p>This ESIA along with technical drawings and application forms will constitute the request for planning approval to undertake this project.</p> <p>The Act does not bind the Crown.</p>
	Saint Vincent and the Grenadines National Trust	<ul style="list-style-type: none"> <li>• Saint Vincent and the Grenadines National Trust Act, 1969</li> <li>• Saint Vincent and the Grenadines National Trust Amendment Act, 2007</li> <li>• Preservation of Historic Buildings and Antiquities Act, 1976</li> </ul>	<p>The Act establishes the SVG National Trust with responsibility for conservation of the historical and natural heritage of SVG. The National Trust is mandated to identify, document, and preserve buildings, monuments and places of historic and archaeological interest, protect cultural assets, island wildlife reserves, and museums, including the acquisition of property and the raising of funds for the management of such property.</p> <p>The Preservation of Historic Buildings and Antiquities Act empowers the Minister of Tourism to list historic buildings. A listed building cannot be demolished, altered, or extended without the permission of the Planning Authority. The government may also acquire any building to be a historic building either by agreement or in accordance with the provisions of the Land Acquisition Act.</p>

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Ministry	Agency	Legislation	Scope
Ministry of National Mobilisation, Social Development, the Family, Gender Affairs, Persons with Disabilities, Youth, Sports and Culture		<ul style="list-style-type: none"> <li>• Domestic Violence (Summary Proceedings) Act, 1995</li> <li>• Saint Vincent and the Grenadines Domestic Violence Act, 2015</li> <li>• Criminal Code Cap. 124 ("1990 Rev") as amended by Family Court Act, 1992 and the Criminal (Amendment) Code, 1993</li> <li>• The Status of Children Act (Chapter 243, 2009)</li> </ul>	<p>The 1995 Act aims to reduce incidences of domestic violence. Victims of abuse, whether married or within common-law unions, can obtain a Protection, Occupation or Tenancy Order against perpetrators, issued by the Family Court. These various orders can prohibit abuse and molestation; exclude the abuser person from the home, school, workplace, or other specified area; convey a right to remain in the household residence; vest tenancy in the person who applied for the order; address issues related to use of furniture and household effects, payment of rent, mortgage, utilities etc.</p> <p>The 2015 Act expands the protection for victims of domestic violence. It broadens the definition of domestic violence to mean any controlling or abusive behaviour that harms the health, safety or well-being of an applicant or a child in the applicant's care. These behaviours include physical and sexual abuse or threat of abuse; emotional, verbal or psychological abuse; intimidation; harassment; stalking; damage to or destruction of property or entry into the applicant's residence without consent (where the parties do not share the same residence). It also strengthens the protection of children from abuse, particularly incest.</p> <p>Physical, sexual, and other forms of abuse is also addressed under the Criminal Code where sexual offenses (Chapter VIII); offenses against the person, including femicide; and abduction and kidnapping attract various penalties. The Code also includes penalties for encouraging prostitution and detention in a brothel.</p> <p>The Status of Children Act prescribes that all children have equal status and protects children's right related to inheritance whether their parents are married to each other or not. The Act describes the procedures to be followed to determine paternity.</p>

### 3.2 Regional and International Agreements

St. Vincent & the Grenadines is signatory to several MEAs and the St. Georges Declaration of Principles on Environmental Sustainability (SGD) in the Organization of the Eastern Caribbean States (OECS) of 2001, obliging the country to reduce its greenhouse gas emissions, protect and sustainably manage its biological diversity, prevent land degradation, manage hazardous wastes, protect the ocean and the ozone layer, and ensure that livelihood issues are not threatened or compromised. Environmental Conventions to which SVG is signatory or has acceded to include:

- Vienna Convention for the Protection of the Ozone Layer and the Montreal Protocol
- Stockholm Convention on Persistent Organic Pollutants
- Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade
- Sustainable Development Goals (SDGs)
- UN Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol
- Convention on Biological Diversity (UNCBD)
- Biosafety Protocol<sup>1</sup>
- Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal
- United Nations Convention to Combat Desertification (UNCCD)
- Cartagena Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region
- Convention on International Trade in Endangered Species of Fauna and Flora (CITES)
- United Nations Convention on the Law of the Sea
- MARPOL 73/78<sup>2</sup>

The *St. Georges Declaration (SGD) of Principles on Environmental Sustainability in the OECS* is a sub-regional agreement designed to support sustainable development and covers a wide range of environmental issues. It declares Principles for Environmental Sustainability which seek to build the capacity of Member States and regional institutions to guide and support processes of sustainable development. Principle 1 of the SGD requires that participating countries integrate Social, Economic and Environmental Considerations into National Development Policies, Plans and Programmes. Principle 4 calls for the participation of civil society in decision making while Principle 13 calls for protection and conservation of biodiversity.

Other regional commitments include the CARICOM *Liliendaal Declaration on Climate Change and Development*, the *Regional Framework for Achieving Development Resilient to a Changing Climate and its Implementation Plan (2011-2021)* and the *Comprehensive Disaster Management Strategy 2014-2024*. The *Regional Framework* is spearheaded by the Caribbean Community Climate Change Centre (CCCCC) and reflects the region's strategic direction for climate change response. It outlines four key objectives including:

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<sup>1</sup> Outlines documentation requirements and other procedures for promoting the safety of international trade in living (or genetically) modified organisms.

<sup>2</sup> The main international convention covering prevention of pollution of the marine environment by ships from operational or accidental causes.

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- mainstreaming climate change adaptation into the sustainable development agendas of Members of CARICOM;
- promoting actions to reduce greenhouse gas emissions through energy efficiency and conservation and renewable energy sources;
- encouraging action to reduce the vulnerability of natural and human systems in CARICOM countries to the impacts of climate change; and
- promoting the sustainable management of standing forests in CARICOM countries.

The *Comprehensive Disaster Management Strategy* is led by the Caribbean Disaster and Emergency Management Agency (CDEMA) and outlines the regional response for operationalizing the Sendai Framework for Disaster Risk Reduction.

*The United Nations Convention on Biological Diversity (UNCBD)* seeks to protect the diversity of life and their supporting habitats. SVG is therefore obligated to protect its biological resources including marine life forms. Currently, SVG is preparing its fifth report and its Biodiversity Strategy and Action Plan (NBSAP) for submission to the Secretariat of the Convention. The country set several targets it intended to achieve by 2020 among which was the conservation of 20% of its near shore and marine environment.

SVG has not yet ratified the *Cartagena Convention/Protocol against land-based sources of marine pollution (LBS Protocol)* but has participated in regional efforts mounted under this Protocol and is preparing for ratification. Draft *Discharge Standards* are being developed in compliance with the Protocol.

*The United Nations Convention on Biological Diversity (UNCBD)* seeks to protect the diversity of life and their supporting habitats. SVG is obligated to protect its biological resources including marine life forms.

Under the *United Nations Convention to Combat Desertification (UNCCD)*, SVG developed its National Action Plan in line with the global strategy for the ten-year period 2008 to 2018.

Under the *United Nations Framework Convention on Climate Change (UNFCCC)*, SVG has completed its Second National Communications for submission to the Secretariat of the UNFCCC. Under this Convention, consideration is given to variability in weather pattern and the accompanying intense storms and floods. The built environment must also reflect these imperatives.

The Government of SVG is party to or has acceded to the following treaties and accords designed to formalise international cooperation on regional and global social protection strategies:

- Convention on the Protection of the Underwater Cultural Heritage
- Convention on the Rights of Persons with Disabilities
- Convention for the Safeguarding of the Intangible Cultural Heritage
- Convention on the Protection and Promotion of the Diversity of Cultural Expressions
- Convention concerning the Protection of the World Cultural and Natural Heritage
- Convention concerning Discrimination in Respect of Employment and Occupation
- Maritime Labour Convention
- Convention on the Elimination of All Forms of Discrimination against Women (CEDAW)
- Inter-American Convention on the Prevention, Punishment and Eradication of Violence against Women (known as the Convention of Belém do Pará)
- Convention on the Rights of the Child

### 3.3 World Bank Safeguard Policies

The World Bank's [Environmental and Social Framework \(ESF\)](#) was approved by the Bank in 2016 and applies to projects initiated after October 1, 2018. The framework consists of a [Vision for Sustainable Development](#); ten [Environmental and Social Standards](#) (ESSs), which set out the requirements that apply to Borrowers; an [Environmental and Social Policy for Investment Project Financing \(IPF\)](#), which sets out the requirements that apply to the Bank; an [Environmental and Social Directive for IPF](#) and a [Directive on Addressing Risks and Impacts on Disadvantaged or Vulnerable Individuals or Groups](#) (World Bank Group, 2023).

The ESF supports green, resilient, and inclusive development by strengthening protections for people and the environment and making important advances in areas such as labour, inclusion and non-discrimination, gender, climate change, biodiversity, community health and safety, and stakeholder engagement. It uses a risk-based and proportionate approach that applies increased oversight and resources to complex projects and allows for greater responsiveness to changes in project circumstances through adaptive risk management and stakeholder engagement. It promotes integrated environmental and social risk management (World Bank Group, 2023).

The ESF places an emphasis on strengthening national environmental and social management systems and institutions and supporting Borrower capacity building. It promotes enhanced transparency and stakeholder engagement through timely information disclosure, meaningful and ongoing consultations throughout the project life cycle, and responsive grievance mechanisms to facilitate resolution of concerns and grievances of project-affected parties (World Bank Group, 2023).

### 3.4 National policies and plans

#### 3.4.1 Social and Environmental Policy

There are several national social, environmental and climate change policies and plans of relevance to this sub-project. An understanding of the national policy framework is important as it helps ensure that project designs and implementation are consistent with the objectives of national policy. Relevant social and environmental policies include:

- The *National Economic and Social Development Plan 2013-2025* (NESDP) (GOSVG, 2013)
- *SVG Environmental Management Strategy and Action Plan 2004-2006* (Homer and Shim, 2004)
- The *Revised National Biodiversity Strategy and Action Plan (NBSAP) (2015 - 2020)* (Simmons and Associates, 2017)
- Draft *Discharge Standards* (consistent with the LBS Protocol)

All of these acknowledge national circumstances and constraints, and the need to conserve natural resources in the interest of sustainable national development and improved quality of life of Vincentians. Constraints and challenges include:

1. Limited land space
2. High dependence on imported fuel
3. High vulnerability to natural hazard impacts
4. Low capacity to mitigate disasters
5. Numerous natural and anthropogenic threats to biodiversity

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The roles of robust land use planning, increased climate change resilience and effective disaster management are identified as important in this regard. Some of the objectives that this and other public sector projects should support include:

1. Enhanced capacity to prepare effectively for, respond to and mitigate disasters.
2. Natural resource (including water supplies) conservation and reducing the rate of biodiversity loss.
3. Climate change adaptation and mitigation including energy conservation.

### 3.4.2 Climate Change Policy

In the area of climate change, the following policies, plans, and programmes are of note:

- *National Climate Change Policy of Saint Vincent and the Grenadines* (CANARI, 2019)
- *National Adaptation Plan (NAP)* (2019)
- *National Appropriate Mitigation Action (NAMA)* for the transport sector (CANARI, 2019).
- *SVG's Nationally Determined Contribution (NDC)* (2015)
- *The Pilot Programme for Climate Resilience (PPCR)*

The *National Climate Change Policy of Saint Vincent and the Grenadines* (CANARI, 2019) provides overarching guidance for building resilience and mainstreaming climate change into the national development agenda for low carbon and sustainable growth. It identifies priorities for action for the period 2018-2030 including specific objectives for adaptation and mitigation. The Policy is aligned with the National Economic and Social Development Plan (2013-2025) as well as the draft National Adaptation Plan (2018-2030) and Nationally Determined Contributions (2015) that guide climate change adaptation and mitigation respectively. Areas identified for climate change adaptation and mitigation that this sub-project should align with include:

- Reduced vulnerability to the adverse impacts of climate variability and climate change on human health and well-being through improved preparedness and response.
- Sustainable physical development and green infrastructure to build resilience.
- Efficient use of water resources to build resilience.
- Integrated waste management for a resilient, safe, and healthy population and environment.
- Adoption of renewable energy and energy efficiency measures for low carbon and sustainable growth.

*SVG's Nationally Determined Contribution (NDC)* (2015) commits the country to a reduction in Greenhouse Gas (GHG) emissions of 22% by 2025, compared to the business-as-usual scenario.

### 3.5 Environmental Management Capacities

Several public sector environmental management agencies operate under the various legislation outlined in Table 3.1 above. However, overlapping and sometimes unclear responsibilities often plague effective responses to environmental management issues. This, together with limited resources and inadequate coordination, compromises environmental management. As such, it is important to ensure that the project management framework is designed to support public agencies in their mandate to monitor environmental and social impacts, and to ensure that sub-project activities comply with national laws and regulations, the World Bank safeguards, and international Conventions that have been ratified by GOSVG.

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The VEEP project has established a dedicated PPU that includes personnel with skills in project management, and environmental and social management. They are tasked with ensuring, among other things, that the World Bank ESS are complied with in the implementation of VEEP sub-projects.

## 4.0 Baseline Data

### 4.1 Country Description

Saint Vincent and the Grenadines is an archipelagic state in the Eastern Caribbean (See Figure 4.1). The country comprises a main island, St. Vincent, and the Grenadines, a chain of 32 islands and cays, of which only seven are inhabited. The total area of the country is 150 sq. miles (389 km<sup>2</sup>) of which the main island is 133 sq. miles (344 km<sup>2</sup>).



**Figure 4.1. Location Map of Saint Vincent and the Grenadines**

The country has a territorial sea of 12 nautical miles and an exclusive economic zone (EEZ) and continental shelf of 200 nautical miles. Saint Vincent is of volcanic origin, and the terrain of the main island and several of the Grenadines is mountainous. The main island consists of a central axial range of mountains starting from La Soufriere (height 1,234m) (the highest point on the main island) in the north, to Mount St. Andrew (height 736m) in the south. This range divides the island longitudinally into two nearly equal parts which are further subdivided by lateral spurs radiating outwards to the windward and leeward coasts. Highly dissected ridges and valleys extending down to the edge of the water characterize the topography on the



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leeward side. The spurs are steep and the valleys deep and narrow, with numerous deep embayments. The relief is more gently rolling on the windward side, with a straighter coastline and lower cliffs. The more gently undulating foothills on the windward side enclose shallow valleys which occasionally merge into extensive coastal plains (Murray, 2014). See Figure 4.2 for a topographic map.



**Figure 4.2. Topographic Map of St. Vincent**

#### 4.1.1 The Sub-project Site

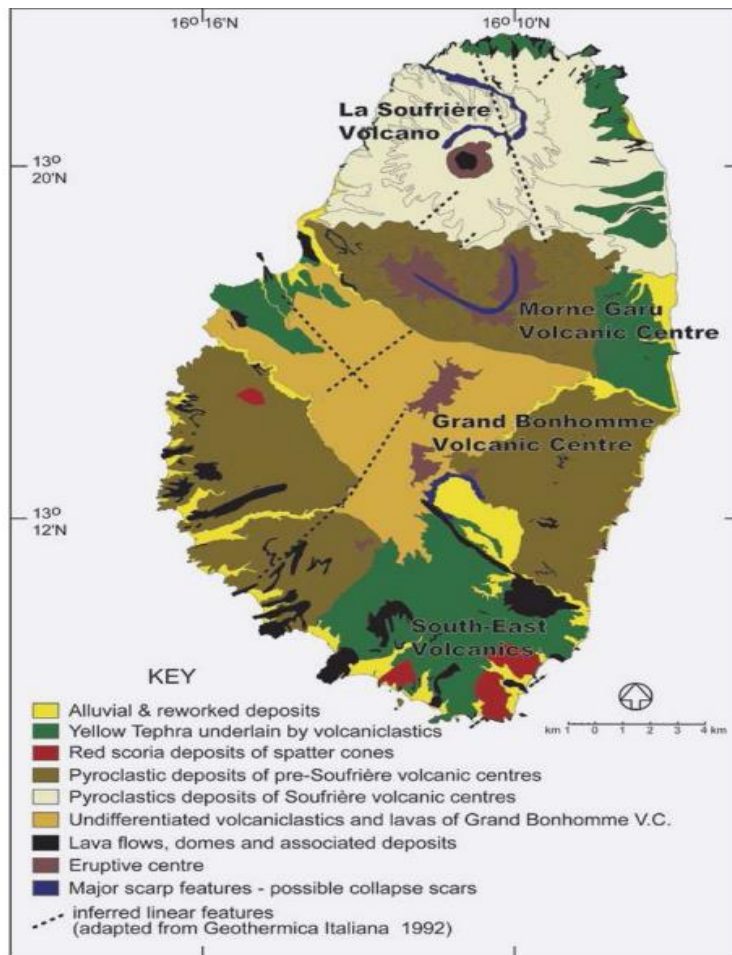
The site is located on the leeward side of the island, in suburban Kingstown, on the bank of the North River and approximately 700m inland of the Kingstown waterfront.

#### 4.2 Geology

St. Vincent and the Grenadines is part of the wider Antillean Arc of islands that are geologically young and predominantly volcanic in origin. While the active tectonic processes may not appear evident every day, the region is still active as evidenced by earthquakes and eruptions of the active La Soufriere volcano in 1812, 1902, 1979 and 2021. La Soufriere's crater and dome form the northern quarter of St. Vincent, giving rise to its topography and modifying its climate. Volcanic ash also enriches the soils of St. Vincent making for immensely fertile conditions.

Saint Vincent and the Grenadines is almost entirely volcanic with the oldest rocks, largely of andesite and various basalts, forming as long as 3 million years ago with the youngest rocks being erupted as recently as 2021. The most recent volcanic centres and the Pre-Soufriere volcanic centres (Fig. 4.3) all appear to have evolved in a similar manner. Early eruptive activities were effusive (non-explosive) and produced a

substructure of basaltic lava flows. These activities then alternated with periods of explosive eruptions which produced large strato-cones by depositing layer upon layer of ash and scoria, followed by voluminous nuee-ardente ("glowing cloud or pyroclastic deposits such as ash-flow tuff layers), and finally culminating with collapse features with the emplacement of summit domes and plugs (Robertson, 2003). The focus of volcanic activity and the creation of eruptive centres has migrated northward over the last 3 million years, currently culminating in the active volcano of Soufriere on the north end of the island of St. Vincent. The southeast volcanics are the oldest rocks exposed on the island and are about 2.75 million years old. Apart from recent alluvial deposits such as river and beach sands, and a few outcrops of sedimentary and marine deposits such as limestone and coral, only igneous rocks are found on the island (Robertson, 2003).



**Figure 4.3. Geologic Map of St. Vincent**

The soils of SVG are fertile, highly permeable, and susceptible to erosion. They are grouped into five categories: shoal, alluvial, recent volcanic ash, yellow earth and central mountain (GOSVG, 2019). The eastern side of the island contains most of the flat and arable lands.

The geology of St. Vincent imposes limitations on the development of the country and need to be deliberately planned for.

#### 4.2.1 The Sub-project Site

According to Figure 4.3, the site is located within Pyroclastic deposits of pre-Soufriere volcanic centres. At the time of writing, a geotechnical investigation was underway, to properly classify the engineering properties of this site, to inform new foundation design. As a preliminary assessment, the Building Condition Assessment and Options Analysis (ECMC, 2023) indicates that the natural subsoil evident at the southern embankment of the adjacent North River suggests an agglomeration of small, medium and large boulders, combined with granular fines.

#### 4.3 Topography and Drainage

The volcanic mountain range divides the island almost equally between a gently sloping eastern or windward side and a deeply dissected and rugged western or leeward side. Volcanic materials that make up the island have been severely affected by erosion and are deeply weathered due to the tropical climate, the steep topography, and the unconsolidated nature of the materials. Many pronounced gulleys and valleys descend to the coast on both the western and eastern side of the central ridge. The combination of natural vegetation, mountainous terrain and climate has created a network of streams which provides the main source of potable water on the main island. There are several large rivers including the Colonaire, Richmond, Yambou, Buccament and Wallilabou rivers. Most of these rivers flow year-round. There are also some seasonal ones located mainly in the north of the island, including the famed Rabacca River, commonly called the dry river (GOSVG, 2019).

Four major watersheds are currently used to supply for the water supply to the population of St. Vincent: Richland, Cumberland, Colonaire, and Montreal (See Figure 4.4). The source of the water is rainfall in the high-elevation mountainous terrains. The streams and rivers are also used to produce hydroelectric energy.

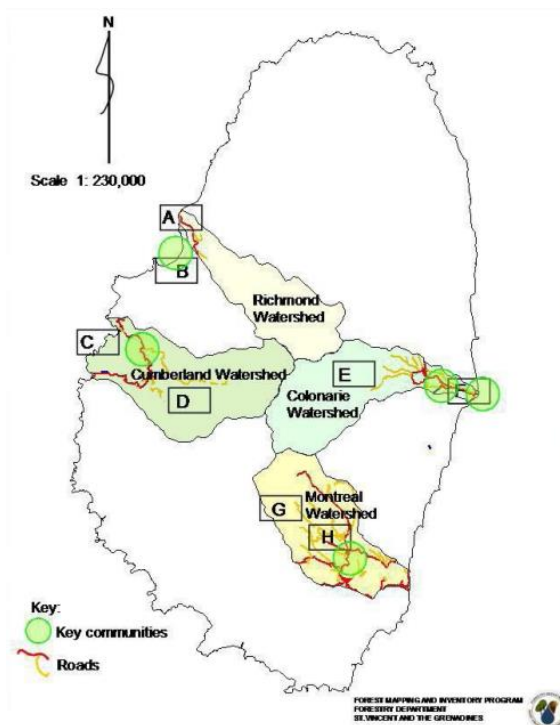


Figure 4.4. Major watersheds used for waters supply of St. Vincent

#### 4.3.1 The Sub-project Site

The site's water supply is drawn from the largest system in St. Vincent with originates in the Vermont Valley, in the Cumberland Watershed. The site itself is located on the slopes above the capital Kingstown, on the bank of the North River.

### 4.4 Biological Resources

#### 4.4.1 Protected Areas

There are 35 protected areas in St Vincent and the Grenadines. These protected areas have been established under different legislation including the Forest Resources Conservation Act (1992), the Wildlife Protection Act (1987), and the Fisheries Act (1986)<sup>3</sup>.

In 1993, land at elevation exceeding 305 meters was designated as forest reserve for the purpose of conserving the remaining resources. There are 4 designated forest reserves in the upper mountainous regions of St. Vincent (Soufriere, Colonaire, Mesopotamia, Cumberland) and another at Tobago Cays (where a marine preserve is also located). SVG also has designated 26 wildlife reserves and 5 recreation areas. In total, 11% of the land area (36 km<sup>2</sup>) is under some protection.

The marine protected area closest to the North River mouth downstream of this site is the South Coast Marine Conservation Area (SCMCA), located some 5.5 km south-east of Kingstown. It encompasses a sea area of 260 hectares and comprises coral reefs with sand and seagrass habitats (GOSVG, 2009). Although designated as a National Park in 1987 for protection of the marine life in this area of high biodiversity, the area is intensively used by a range of stakeholders, and is largely unregulated due to limited human, financial and technical capacity within the various government agencies with that mandate. The land side is densely populated with extensive touristic development. The seaward side is a popular yacht anchorage and recreational area for locals and visitors engaged in swimming, snorkeling, and other water sports. It is an important fish landing site.

#### 4.4.2 Terrestrial ecosystems

Forests are key to biodiversity in St. Vincent, with some having more than 100 tree species per hectare. A national forest inventory conducted in 1993 described 38% of St. Vincent as covered by forest, of which approximately 5% was mature, undisturbed primary forest (4,308 hectares). Forest cover was estimated to have decreased from 14,038 hectares in 1949 to 12,690 hectares in 1993 (Knights and Joselyn, 2008). Deforestation was estimated to average 17 hectares per year, approaching 30 hectares per year in some watershed areas. Clandestine cultivation of ganja in the rough terrain on the slopes of La Soufriere and other mountainous areas was identified as a major cause of deforestation and land degradation.

In 2017 St. Vincent's tropical forest measured an estimated 31,500 acres (12,748 hectares). Natural forest constitutes about 70% of this area, with planted forest and agro-forest representing about 25% and 5%, respectively (Simmons et al, 2017).

The varying physical and environmental conditions of rainfall, soils, elevation, terrain, and exposure to the trade winds across SVG has resulted in an impressive diversity of eco-systems and forest types. Some of these have been further altered by human activity, hurricanes and volcanic eruption. Eco-system types include:

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<sup>3</sup> [Protected areas \(nationalparks.gov.vc\)](http://nationalparks.gov.vc)

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- Elfin Woodland: On exposed summits above 500 metres on both sides of the central mountains. They consist of pure stands of dwarfed trees about three metres in height covered with epiphytes. This vegetation type is commonly associated with the Palm Brake vegetation type.
- Palm Brake: This sub-climax type is typically found at elevations over 500 metres in areas that have been disturbed by landslide or treefall that opens up the forest canopy.
- Rain Forest: Confined to areas in the upper Colonaire, Cumberland and Buccament Valleys between elevations of 300 and 488 metres.
- Secondary Rain Forest: This describes the forests arising from disturbances from volcanic eruptions, hurricanes, and human activity. The largest areas lie around the Soufriere Mountains. Vegetation ranges from almost bare soil on the upper slopes of the Soufriere volcano to significant stands of new forest at lower elevations.
- Deciduous Seasonal Forests/Cactus Scrub: On the dry southern and southwestern coasts of St. Vincent and the Grenadines where the soils are extremely thin, deciduous to semi-deciduous and xerophytic species predominate.
- Littoral Woodland: This type of vegetation is characterized by manchineel, button mangrove, sea grape and similar species, on small narrow strips along the eastern coastline on St. Vincent and on several islets and cays of the Grenadines. This type of vegetation is fast disappearing as development takes place along the coast.
- Swamp: Only small areas of swamp occur in St. Vincent and the Grenadines. These exist in the southern section of the mainland on the coast and on a few of the Grenadine islets. Typical species are Red Mangrove, Black Mangrove, White Mangrove and Button Mangrove.

#### *4.4.2.1 The Sub-project Site*

The sub-project is located within a developed site, with no vegetation. The riverbank on which the site sits has been hardened with a river wall, and there is no vegetation there. The opposite and adjacent banks are covered with secondary vegetation and subsistence crops cultivated by residents in occupation of those lands.

#### *4.4.3 Marine Ecosystems*

A dive survey at the proposed port site in Kingstown Bay was undertaken to inform the proposed port development ESIA (Sellhorn Ingenieurgesellschaft mbH and HPC Hamburg Port Consulting GmbH, 2019), and the following observations were made:

- The almost complete lack of big fish and corals was noticeable. Big fish species that are typically found at or near reefs, e.g., groupers and parrot fish, were not observed.
- Nearly all hard substrates were densely populated by different species of sponges. There is a direct relation between overfishing, strong growth of sponges, and the destruction of coral reefs. Climate change and associated increased water temperature further contribute to the destruction of coral reefs.
- Low visibility at the project site suggests eutrophication along this coastline, most probably because of nutrient input from the land via the rivers, leading to reduced water clarity.
- Despite the proximity to the city and the harbor, the seafloor at the project site looked clean, with some scattered garbage, mostly old tyres which were being used by marine organisms as shelter or as a hard substrate to settle on. It was assumed that lighter garbage is carried away by the strong counterclockwise current.

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- The sea floor at the project site is nearly entirely covered by seagrass, with a few small sandy patches, presumably caused by anchors. Up to a depth of >8 m, the area is well-illuminated, and the seagrass meadows are intact. This is of high ecological value, stabilizing sediments and providing grazing, nursery and shelter for marine animals, and removing carbon dioxide from the marine environment. The seagrass is the invasive species *H. stipulacea*. The ecological consequences of this are not yet fully known.
- Three invasive species were observed in the project area: the seagrass *Haliophila stipulacea*, a small starfish *Ophiothela mirabilis*, and two species of lionfish (*Pterois volitans*, the Red Lionfish, and *P. miles*, the Devil Firefish).

#### 4.4.3.1 The Sub-project Site

The site is located some 800m upstream of the Kingstown Bay waterfront, and site discharges into the North River could have some adverse impact on water quality and biodiversity within the Bay.

#### 4.4.4 Biodiversity

The country has recorded some 14 endemic animals, 19 endemic plants and 29 regionally endemic tree species. Five mammals are Lesser Antillean endemics, two of which are restricted to Grenada and Saint Vincent and the Grenadines (Simmons et al, 2017). Endemic birds include:

- Grenada flycatcher
- Caribbean Elena
- Antillean crested Hummingbird
- Yellow banana quit
- Yellow crown night Heron

In addition to the endemics, there are over 1,150 species of plants and 163 species of ferns, including 15 endemic flowering plants and 4 ferns. The faunal diversity consists of all five groups of faunal vertebrates, including 7 species of amphibians, over 20 species of reptiles, over 170 species of birds, 22 species of terrestrial mammals, excluding agricultural and domestic species, and 516 species of marine animals. Added to these are thousands (and perhaps millions) of invertebrates, of which approximately 500 have been identified (Simmons et al, 2017). Reptiles include the Congo snake/Cheboa which is not venomous. None of the three snakes found in Saint Vincent are venomous. Mammals on St. Vincent include the Agouti, Mongoose and Opossum, which were brought into Saint Vincent to enhance the wildlife stock.

The Amazona guildingii, the country's national bird, is an important symbol for conservation. Of the over 170 bird species recorded, there are 76 species of water birds and sea birds. 95 of these birds breed locally and include several regionally and globally important populations. (Simmons et al, 2017). Fifteen Important Bird Areas (IBAs) have been recognized in St. Vincent and the Grenadines.

Coastal and marine habitats include seagrass and lagoons, areas of mangrove and a variety of patch, fringing and bank barrier reefs. These habitats provide many commercially important marine resources such as conch, lobster, and reef fish, as well as several ecosystem goods and services for the coastal communities. Over 500 marine species have been identified. Among these are at least 450 species of fin-fish, 12 species of whale and dolphin, 4 species of turtle (endangered), 9 of gastropods, 11 seaweeds and 30 different coral species.



#### 4.4.4.1 *The sub-project site*

This site is part of the built environment of Kingstown, and there is no significant biodiversity within the site boundary. The most significant biodiversity in the general area is expected to be concentrated along the North River, particularly where banks remain under vegetation, and within the nearby Botanical Gardens and its vegetated surroundings.

#### 4.4.5 The Botanical Gardens

The Botanical Gardens were established in 1765 on 20 acres of land just north of NEMO as an offshoot of Kew Gardens in Surrey, UK. Nine acres were later converted to the Governor General's residence, leaving 13 acres for the Botanical Gardens. These are the oldest Botanical Gardens in the Western Hemisphere, celebrating their 265th anniversary this year. The National Trust manages the Curator's House, also located in the Gardens.

Traditionally, the Gardens were engaged in a culture of plant exchange across the tropical Commonwealth. There are no endemics in the Gardens. The tree collection includes:

- eucalyptus de gupta (Australia)
- cannonball tree (South America)
- ficus elastic
- Indian rubber fig
- pride of India
- lignum Vitae (used to be used to treat syphilis)
- breadfruit tree (intended to feed slaves)
- Soufriere tree, the national flower of Saint Vincent and the Grenadines

Refer to [Trees - Botanical Gardens of St Vincent and the Grenadines](#) and [Shrubs - Botanical Gardens of St Vincent and the Grenadines](#) for more information.

The Gardens also produce ornamentals for sale and use by the government at different locations.

Wild birds found in the Gardens include garden birds and migratory birds including:

- Perygrine Falcon
- Osprey
- Plover
- Heron

The Nicholls Wildlife Complex, named after the former Director of Forestry, Calvin Nicholls, was established in the Gardens in 1990. The Complex accommodates the successful captive breeding programme of the Saint Vincent parrot, which is on the CITES endangered list. Other wildlife captive in the Wildlife Complex includes agouti and tortoises.

The Gardens are significant both as a national tourism product and a source of proud, national, natural heritage. It is one of the highest visited sites in the country. Visitorship is seasonal with most revenue earned in the cruise season from November 1 to April 30. The amphitheater and other locations within the Gardens provide venues for various national and private events for residents and visitors.

The Gardens have several layers of protection, as a declared important bird area in Saint Vincent and the Grenadines, and as protected natural heritage under the Antiquities Act.

#### 4.4.5.1 *The sub-project site*

The site is less than 200m south of the closest vegetated area contiguous with the Botanical Gardens, and noise, dust and traffic impacts from site activity could have a minor impact on operations within the Gardens.

### 4.5 Physical - Cultural Resources

The rich culture and history of St. Vincent has created physical cultural resources, which are features or objects of interest and value to nation's people because of their archaeological, paleontological, historical, architectural, religious, aesthetic, or other cultural significance. These may include artefacts, objects, sites, structures, groups of structures, and natural features and landscapes, and may be in urban or rural settings, above or below ground, or under water. Cultural resources are important as sources of valuable historical and scientific information, as assets for economic and social development, and as integral parts of a people's cultural identity and practices.

Recognition of physical cultural resources may be at the local, national level, or within the international community. Examples of physical cultural resources on St. Vincent include natural treasures such the Botanical Gardens; the petroglyphs in Mesopotamia, Layout, and Barrouallie; and the old cemetery at Dorsetshire Hill; marine reserves such as the Tobago Cays or forest trails; historical buildings and structures; or other features of community importance or international renown. Several historical sites are located within Kingstown. St Mary's Catholic Cathedral of the Assumption and the St George's Anglican Cathedral were both built in the 1800's. The Kingstown Methodist Church was built in 1790 by Methodist missionaries who purchased an old Roman Catholic Church. The old library, the Carnegie Building on Halifax Street was built in 1909 and was declared a protected National Heritage Site in 2009. Other heritage buildings in Kingstown are the Court House, Kingstown Police Headquarters, and the Peace Memorial Hall.

Historically, the Botanical Gardens accommodated the Sergeant for Saint Vincent and the Grenadines, at a time when Fort Charlotte was a major military post for the UK. In 1763, the UK waged war on the indigenous Garifuna/Kalinago/Caribs, and uniquely, the cannons at Fort Charlotte are pointed inland. The National Trust manages the Curator's House also located in the Gardens.

#### 4.5.1 *The Sub-project Site*

The site is not known to be the location of cultural resources. The closest known cultural site is the Botanical Garden, some 200m to the north. The site is located approximately 500 m from the St Mary's Catholic Cathedral of the Assumption, the St George's Anglican Cathedral, and the Kingstown Methodist Church. The police HQ and public library are approximately 1km away.

### 4.6 Weather and Climate

#### 4.6.1 *Precipitation*

The location and size of St. Vincent and the Grenadines make it highly susceptible to climatic influences. There is an almost unimodal pattern in the island's rainfall, with the wet season occurring June-November and the dry season between January and May. The rainy season, during which the island receives ~70% of total annual rainfall, coincides with the period of highest tropical storm activity in the region. In the



drier months, higher than normal atmospheric pressure ensures dryness and drought conditions in coastal areas and the Grenadines.

On average, St. Vincent and the Grenadines receives 219 cm (86 inches) of rainfall per year, making it one of the wetter islands of the Eastern Caribbean. Rainfall is highest in the north central portion of St. Vincent and the Grenadines (308 cm (150 inches)) and decreases on the coast (152 cm (about 60 inches)). The leeward side of the island is in a “rain shadow” and shows marked variation in rainfall compared with the windward side.

There is considerable inter-annual variability in the rainfall record. 1997 was among the driest years on recent record (~160 cm) but was followed by one of the wettest years in 1998 (~295 cm). There is evidence that some of the variability is driven by global climatic fluctuations such as the El Niño-Southern Oscillation (ENSO) or by large scale gradients in tropical Atlantic and Pacific Sea surface temperatures.

#### *4.6.1.1 The sub-project site*

At this location, rainfall patterns are expected to be typical of the leeward side of the island.

### 4.6.2 Hurricanes

The wet season is characterized by tropical waves, depressions, and hurricanes. As part of the Caribbean, SVG’s geographical coordinates place it in the Caribbean Hurricane Belt. This makes it susceptible to hurricanes during the Atlantic hurricane season which commences on the first of June and ends on the thirtieth of November, annually (GOSVG, 2019).

#### *4.6.2.1 The Sub-project Site*

The site is susceptible to hurricanes through the hurricane season, with extreme winds and rainfall intensities likely when a hurricane tracks near or over SVG.

### 4.6.3 Temperature

Temperatures are high (27°C) all year round due to the moderating influences of the trade winds. The diurnal range is about 3 – 5°C and widest in the dry season on account of cool nights.

Maximum temperatures can reach a high of 31°C between May and October, and minimum temperatures reach a low of around 23°C in February.

Both the maximum and minimum temperature records show a warming trend over the past 22 years. (The trend is however not statistically significant at the 95% level). This warming is consistent with the rest of the Caribbean (Peterson et al, 2002) and the globe (Alexander et al, 2006). As for global averages, maximum temperatures for St. Vincent are increasing at a slightly faster rate (0.2°C/decade) than minimum temperatures (0.15°C/decade).

#### *4.6.3.1 The sub-project site*

The site is expected to be subjected to typical temperatures. There are no trees on the site that could have a cooling effect on the site.

### 4.6.4 Other Climate Elements

Relative humidity across the country tends to be generally high year-round (above 70%) and predictably highest during the main rainfall period. Winds are generally E to ESE, and wind speed is strongest (>9 metres per second) through the dry period to the beginning of the rainy period (December-June). During

this period, the north Atlantic high is a persistent and dominant influence on the region. However, strong wind gusts are also common from June to November during the passage of tropical waves, depressions, storms, or hurricanes.

#### *4.6.4.1 The Sub-project Site*

Relative humidity on the site is expected to be typical of SVG, above 70% year-round.

### **4.7 Climate Change**

Climate models project the following trends for SVG (CANARI, 2019; GOSVG, 2019):

- Mean temperature is expected to increase by 0.15 °C per decade over the next century. A similar warming trend was projected for seasonal changes.
- Frequency of hot days and nights is expected to increase by the end of the century while cold days and nights will show significant decline, almost reaching nonexistence by the 2060s.
- Most models point to a reduction in rainfall, with negative median values ranging from 10 % to 22 % annually by the 2090s.
- Models also suggest drying in the wet season from June to November, with the greatest seasonal change seen in the summer months (7.1 % per decade), significantly affecting water availability.

Other predictions (from the Inter-Governmental Panel on Climate Change (IPCC)) are that:

- Future hurricanes of the north tropical Atlantic will likely become more intense, with higher peak wind speeds and heavier near-storm precipitation.
- Sea level rise (SLR) in the Caribbean is expected to be near the global mean of 0.5 m to 0.6 m in the range of 2018 to 2100 when compared to 1986 to 2005.
- All models show continued ENSO inter-annual variability.

Ocean acidification which will continue as carbon dioxide is absorbed into the ocean, affecting calcification of shellfish and formation of coral reefs (CANARI, 2019).

This site will not be directly exposed to SLR and ocean acidification, given its elevation and distance inland. However, direct and indirect potential adverse CC impacts relevant to the implementation of this sub-project and the future operations of NEMO include:

- Reduced food and water security,
- Increased incidence of vector-borne diseases,
- Increased heat stress on humans,
- Increased flooding,
- Increased droughts,
- Increased damage to infrastructure,
- Increased incidence of pests and diseases,
- Threatened livelihoods,
- Increased insurance risks and costs,
- Increased damage to settlements and infrastructure,
- Increased loss of human life,
- Reduced water quality, affected by sedimentation and soil erosion,

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- Increased emergency preparedness requirements and costs,
- Increased business interruption.

These various impacts strain the limited national technical and financial resources and the country's ability to respond to CC. Relevant SVG CC policy documents that outline the country's plans to mitigate and adapt to the impacts of CC are discussed in Section 3.4.2

#### 4.8 Hazard Vulnerability

Saint Vincent and the Grenadines is vulnerable to several natural hazards, including tropical storms, hurricanes, earthquakes, volcanic activity, tsunamis, sea surges, high winds, droughts, wildfires, flooding, landslides, soil erosion, and agricultural pests. The effects of these phenomena are often exacerbated by human activity such as deforestation, indiscriminate garbage disposal, poor building practices, and unplanned settlements in environmentally sensitive areas. Some of the more recent extreme events are discussed below:

- The active La Soufriere Volcano, located at the most northern part of the island, averages one explosive eruption every 100 years. It erupted in 1902, 1979 and in 2020-21. Loose deposits of volcanic ash also cause many of the devastating landslides which affect the island.
- Hurricane Tomas which impacted St. Vincent and the Grenadines in October 2010 was a major disaster resulting in landslides, infrastructural damage, and loss of property across the country. Major landslides and debris flows occurred along major roadways and settlements on the north-eastern side of the island, as well as in forested areas affecting critical water supply infrastructure.
- Two droughts (in 2002 and 2009/2010) placed immense strain on the limited national water supply. To mitigate drought events, the CWSA has intensified its search for underground water resources, and several boreholes have been dug.

Zones in the north part of the island have the highest risk level in the event of a **La Soufriere volcano eruption** (See Figure 4.6). The sub-project site is within a low hazard zone for volcanism. There is also an underwater volcano ("Kick Em Jenny") in off the Grenada coast that poses a tsunami threat to coastal areas. It has caused small tsunamis with an amplitude of 1-2 m in the past (1939, 1955 and 1965), with travel times below 10 minutes.

**Seismic hazards** result from tectonic activity (the subduction of the Atlantic Plate beneath the Caribbean Plate). In St. Vincent the peak ground acceleration (expressed as a percentage of g, the acceleration of gravity), is up to 15%g every 100 years, 25%g every 500 years, and 40%g every 1,000 years. It is estimated that the earthquake zone in which St. Vincent is located could experience earthquakes of level 7 ("very strong") on the Mercalli intensity scale with a return period of 50 years, which could cause major damages to constructions (SRC).

Two main rivers (North- and South River) and their tributaries drain the Kingstown catchment area into the Kingstown Bay. The North River flows adjacent to the NEMO HQ. These rivers are small and carry low flows in the dry season. In the rainy season they swell and regularly overtop their banks, resulting in **flash flooding** in the city. Much of lower Kingstown may be affected. See Figure 4.5. Flash floods can also cause landslides and mud flows. In inhabited areas, these can cause significant casualties and damage to private property and public infrastructure, and impact livelihoods.

Human behavior can exacerbate these risks e.g.:

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- Deforestation which increases runoff rates, soil erosion and downstream sedimentation;
- Increased development density, reducing infiltration rates and increasing surface runoff rates;
- Unplanned and informal settlements on riverbanks, with inadequate drainage infrastructure;
- Poor waste management practices by residents resulting in flow blockage by debris, particularly at flow constrictions such as bridges;
- Bridges are under dimensioned (e.g., the bridges at the North River), which leads to backflow and rising water levels; and
- Hardening, narrowing and/or realignment of rivers in built up areas, that increases flow speeds.

The sub-project site has reportedly not flooded since the NEMO HQ was constructed. The site is located on the north bank of the North River. The flood hazard map for St. Vincent, prepared through CHaRIM<sup>14</sup>, shows that the site is not at risk of flooding at the 50-year level. The topography of the river reach at this location results in a low flood risk as the south bank is notably lower than the north bank, and high water levels will first spill toward the south, away from the site. Thus, the flood risk to the project site from North River is very low.

CWSA has a Water Resource Unit that collects data on rivers including high level flows. They also manage early warning systems on rivers.



**Figure 4.5. Flood Hazard Map for Kingstown** (Source: CHaRIM Project St Vincent National Flood Hazard Map)

Coastal zones are also vulnerable to **storm surge** during hurricanes, and **erosion from wave energy**. Storm surge from hurricanes is pronounced on the southwest coast, where up to 5 meters of sea level

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<sup>14</sup> CHaRIM, a programme for developing of the Caribbean Handbook for Risk Information Management through a grant from the Caribbean Risk Information Program.

rise during hurricanes could occur. Elsewhere, up to 2 meters may be expected during hurricanes. The eastern side of St. Vincent is exposed to long-fetch waves across thousands of miles of open Atlantic Ocean, and consequently has several erosion hot spots vulnerable to wave energy.

**Tsunamis** also pose a hazard in the Eastern Caribbean and can be caused by:

- earthquakes,
- avalanches off the side of La Soufriere or other volcanoes (Le Friant et al, 2009), and
- eruptions of the Kick-em Jenny submarine volcano near Grenada, which could result in a 2-meter tsunami arriving at St. Vincent within 15 minutes of eruption (Gibbs, 2001).

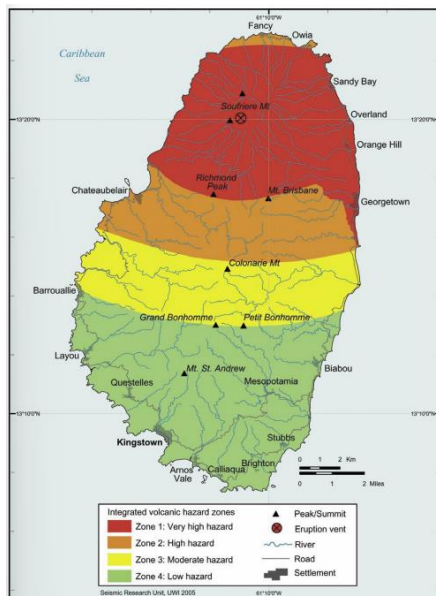
#### 4.8.1 The Sub-project Site

At the sub-project site vulnerability to hazards is highest for extreme winds, earthquake, flooding under extreme rainfall intensity conditions and drought. The site is not vulnerable to storm surge and erosion, or tsunamis.

### 4.9 Utilities and Services

#### 4.9.1 Water supply

Saint Vincent has 11 water systems, managed by CWSA. Abstraction is by a run-of-the-river intakes. Water quality is good on most systems, and the supply is typically reliable. EHD monitors water quality on the CWSA systems and investigates public complaints. Although in the dry months in some years some rationing is required, this is not typically done in the Kingstown area. The northeast of St. Vincent was worst affected by the volcano, and ash continues to affect water quality in that area when it rains. CWSA is considering tapping into groundwater supplies to mitigate this issue.



**Figure 4.6. Volcanic hazard zones in St. Vincent** (Source: Robertson, 2005)

##### 4.9.1.1 The Sub-project Site

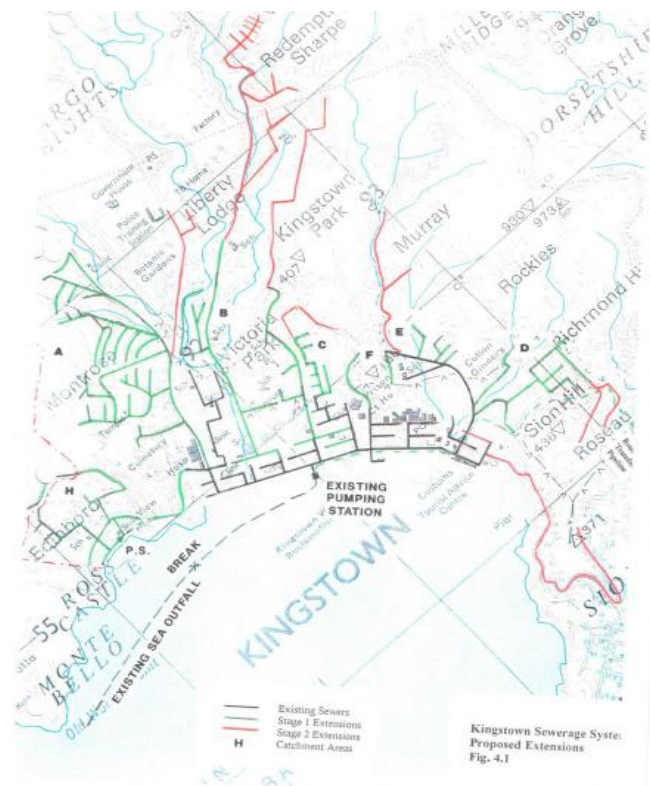
The biggest water system is the Vermont Valley system which treats 2.4 million gallons per day, producing 40% of the national supply. Treatment on the Vermont Valley system is with a slow sand gravity filter and sedimentation tank. Storage on the Vermont Valley system is sufficient to meet one day's supply, in the



order of 2.5 million gallons. There is an aged reservoir on the CWSA compound that provides storage for the Kingstown (including NEMO) water supply. A 300 mm dia. line along the Leeward highway feeds Kingstown and its environs. Other locations on this system include NEMO, the hospital, Campden Park Industrial Estate and Arnos Vale. Distribution to NEMO and the hospital is via a 50mm dia. line. There are no plans to upgrade the Vermont Valley system currently. There is a small fire hydrant about 200 metres (656 feet) away (i.e. near the Central Water and Sewerage Authority's compound) close to NEMO on the 50 mm dia. line. Because of the elevation of NEMO, it would not be sufficient for firefighting at that location. Although not currently set up, it would be possible to bypass the tank if necessary, to elevate pressures at this location.

#### 4.9.2 Sewerage

Most household waste is treated with onsite septic tanks and soakaway systems. There are small municipal sewerage systems in Arnos Vale and Kingstown, owned and managed by CWSA. Most of commercial Kingstown, approximately 310 customers, is connected to the Kingstown municipal sewerage system. There is rudimentary treatment located behind the Coreas Hazells car park to settle out solids and the liquid portion is pumped to a sea outfall. The existing outfall is approximately 1,500m long, and ends about 100 m off Old Woman Point, Edinboro. The existing comminutor is not working, and most of the sewage collected is pumped out to sea. Any solids from cleaning etc. are transported to either the CWSA septage lagoon or landfill at Diamond. See Figure 4.7 below.



**Figure 4.7. Kingstown Sewerage System**

EHD does not monitor the performance of these systems, and only acts in response to public complaints. The new port development is expected to upgrade the system performance. The outfall is presently being replaced as part of that project, and a new comminutor will also be installed.

#### *4.9.2.1 The Sub-project Site*

There is a collection branch on the Kingstown Sewerage System that starts at CWSA offices and runs down Leeward Road. NEMO is not presently connected to that, although the existing line in the road runs in front of NEMO's main entrance. NEMO has the option to connect to the system if the plumbing arrangements are confirmed feasible. This should be considered in the new design.

### *4.9.3 Solid Waste*

#### *4.9.3.1 Collection*

Residential collection services are provided once weekly, except in Kingstown proper where service is provided daily. There are nine collection districts, four of which are managed by CWSA. The remaining five districts (on the western and eastern sides and central Mesopotamia) are contracted out to three collectors. Waste is collected commingled.

#### *4.9.3.2 Disposal*

There are two disposal sites on the St. Vincent mainland -Diamond and Belle Isle- and three in the Grenadines. The 5-cell Diamond site is located approximately 2km southwest of the Argyle International Airport and receives some 80% of Saint Vincent's waste. The Diamond landfill was established in 1999/2000 with an estimated 25-year life. However, cell 3 is currently in use, and CWSA estimates that only 50% of the capacity has so far been used. It is not an engineered (lined) site, but has the following characteristics:

1. It sits on clay which is relatively impermeable;
2. As far as possible, waste is covered daily using material from the site as well as stockpiled material brought in by generators;
3. There is perimeter drainage to leachate ponds.

Waste is not covered daily at the other disposal site at Belle Isle on the west side of the island. Covering of waste is especially challenging under wet conditions when it is difficult to manage the soils there. Fly baiting and other pest control measures are undertaken to reduce impacts there.

All port and hospital wastes are deep-buried.

#### *4.9.3.3 Waste diversion*

Styrofoam importation is banned in St. Vincent and the Grenadines, and this is no longer a component of waste to be managed in SVG.

At the landfill, some waste diversion is practiced. Green waste that is not commingled (e.g., from lawn care, landscaping and site clearance), soil and metal are separated. CWSA operates a metal baler at the landfill, and has so far baled 500 cubes, consisting mostly of derelict vehicles), and hopes that an exporter will engage in a partnership with them. CWSA also produces compost from green waste, wood chips from soft wood, and charcoal from harder wood. These are sold for a nominal fee from Arnos Vale, at the location of the closed landfill site.

#### *4.9.3.4 Waste charges*

The government pays a subvention to CWSA for solid waste management, and public institutions are not charged. An Environmental Fee of XCD11 per month is included on domestic water bills. As most households in Saint Vincent are connected to the CWSA water supply, there is a high rate of collection for

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waste management services. Commercial generators are charged a rate based on the size of their business (small, medium, large).

Construction waste disposal fees vary e.g., soil may be accepted at a rate of \$10 per cubic yard disposed. No contractor, including contractors engaged in government projects, are exempt from this fee.

#### *4.9.3.5 Private sector participation in waste management*

CWSA is responsible for waste management in St. Vincent and the Grenadines:

- In St. Vincent, collection services are provided by both private operators and CWSA, and the disposal sites are managed by CWSA.
- All waste collection and disposal in the Grenadines is by private contractors (three islands, five contractors). The Grenadines collection is twice weekly for a \$10 monthly fee. Because CWSA does not supply water in the Grenadines, the fee is included on VINLEC's bill, but payment is optional.

#### *4.9.3.6 Illegal dumping*

Illegal dumping is less prevalent than in the past, attributed to the success of education and beautification drives. Because the waste management fee is attached to the water bill and must be paid, generators generally do not dump illegally. However, dumping of tyres is a challenge in some locations.

#### *4.9.3.7 Recycling*

A private company, All Island Recycling, receives and pays for plastic bottles. It is understood that persons, mostly women, can make up to XCD 1,000 a month from the sale of plastic bottles. Persons collecting bottles may do so from shops, events, and other people's garbage; some place boxes out for persons to deposit their bottles. Another private company collects aluminum cans and other scrap metals.

### *4.9.4 Electricity*

Electricity in St. Vincent was first provided in 1931 by the Crown Colony Government to thirty-two customers in Kingstown at night. The Commonwealth Development Corporation (CDC) took over the operations in 1953. The St. Vincent Electricity Services Limited (VINLEC) was formed in 1961. In the early 1970's the government acquired 49% shares, and 51% remained with the CDC. The operations were further streamlined with the enactment of the Electricity Supply Act of 1973. In 1985, the government acquired the CDC shares and VINLEC became a state-owned entity. Today, VINLEC serves just over 46,000 customers and the service is accessible to 98% of the population. VINLEC supplies electricity to its customers through a 350-mile network of 33kV, 11kV, 400V and 230V lines.

VINLEC owns and operates power plants on the islands of St. Vincent, Bequia, Union Island, Canouan and Mayreau. The system on mainland St. Vincent has both diesel and hydroelectric generating stations. There are two diesel generating stations located at Cane Hall and Lowmans Bay, while the hydroelectric generating plants are located at South Rivers, Richmond, and Cumberland:

- The Lowmans Bay Power Plant, completed in 2007, has a capacity of 17.4 MW and provides approximately 60% of all power generated on mainland St. Vincent. The Plant also houses a small solar PV farm which was officially commissioned 2014 with a capacity of 370 kWp.



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- The Cane Hall Power Station was officially opened in 1976, and the capacity to produce 19.66 MW. The Cane Hall Engineering Complex, located a few meters away, houses some solar systems with a total PV capacity of 224 kWp.
- The South Rivers Plant was the first hydroelectric installation to be built in St. Vincent. This is one of three Hydropower Plants in the country. It was commissioned in 1952. Rehabilitation work to upgrade the facility was completed in 2018 and the plant's nominal capacity is 960kW.
- The Richmond Hydropower Plant was built in 1962 to facilitate the expansion of electricity to rural areas in St. Vincent. This run of river plant has a nominal capacity of 1100kW. Rehabilitation work on the Plant was completed in 2016. Officially commissioned in 1987, the Cumberland Hydro Plant comprises three separate run of the river Power Stations and a total capacity of 3,650kW. The stations are served by a series of diversion weirs and pipelines.

Approximately 19% of electricity is produced annually at the mainland hydro plants, while solar farms account for approximately 2% of annual production. Figure 4.8 shows the distribution of power plant across St. Vincent.



**Figure 4.8. Power stations in St. Vincent**

The main benefit of multi-plant operation is the reduced probability that any single disaster will render VINLEC incapable of generating any electricity at any time.

#### 4.9.5 Telecommunications

FLOW provides the range of telecommunication services – telephone, mobile, TV and broadband, while Digicel provides mobile services. Fixed-line teledensity exceeds 11 per 100 persons with 12,483 lines in (2020), and mobile-cellular teledensity is about 87 per 100 persons with 102,700 mobile cellular accounts in 2019.

#### 4.9.6 Air and Noise

Air quality in St. Vincent is relatively good as the country has limited industrial activity, and the northeast Trade Winds blow across the country, making air pollution a minor concern. In 2019, the average amount of fine particulate matter (PM 2.5) in SVG was  $9.41 \mu\text{g}/\text{m}^3$  air (range 6.18 to  $13.21 \mu\text{g}/\text{m}^3$ ). The average in urban areas was  $9.51 \mu\text{g}/\text{m}^3$  air and  $8.88 \mu\text{g}/\text{m}^3$  air in rural areas. This figure is within the range of a “safe” level of PM 2.5, which is according to the World Health Organisation (WHO) at around  $10 \mu\text{g}/\text{m}^3$ . This level is far surpassed by most other countries.

Road traffic is the main source of noise in Kingstown and surrounding areas.

### 4.10 Social Baseline

#### 4.10.1 Governance

Saint Vincent achieved Independence from Great Britain in 1979, and the country became known officially as Saint Vincent and the Grenadines. The new government was formed as a constitutional monarchy and became a member of the Commonwealth. Saint Vincent and the Grenadines has a parliamentary form of government. The British monarch is the head of state and is represented by an appointed governor-general. A prime minister, the leader of the majority party, is the head of government. The unicameral legislature is the House of Assembly. It is composed of 15 representatives elected to five-year terms by universal adult suffrage, along with six nonelected members (called senators) who are appointed by the governor-general—four on the advice of the prime minister and two on the advice of the leader of the opposition. Two additional seats in the legislature are designated for the attorney general and the speaker. The number of members of the House of Assembly may vary between 21 and 23, depending on whether the attorney general and the speaker are elected from inside or outside the House.

The people of Saint Vincent and the Grenadines see the deepening of a regional integration movement as one of their goals. Saint Vincent and the Grenadines is a member of the Organisation of Eastern Caribbean States and of CARICOM.

#### 4.10.2 Justice

Saint Vincent and the Grenadines’ court system consists of a lower and an upper judiciary. The lower courts include magistrates’ and family courts; the High Court and the Court of Appeal form the upper level. Saint Vincent retains its connection with the Eastern Caribbean Supreme Court. This consists of an appeals court and a high court, while the final court of appeal remains the Judicial Committee of the Privy Council in London<sup>5</sup>.

#### 4.10.3 Demographics

The population of St. Vincent and the Grenadines was 109,188 in 2012, a 0.89% increase since 2001 (GOSVG, 2012), an average annual increase of 81 persons per year. The sex ratio was approximately 1:1 female to male. See Figure 4.9. Six of the 13 census districts had positive growth over the period, with greatest increases in the Calliaqua and the Stubbs to Kingstown census divisions (7% and 5.8 % respectively).

The population is comprised mainly of persons of African, mixed, and Carib descent, at 72.8%, 20 % and 3.6 % respectively. Remaining groups are East Indians, Caucasians, Syrians, and Portuguese. The official

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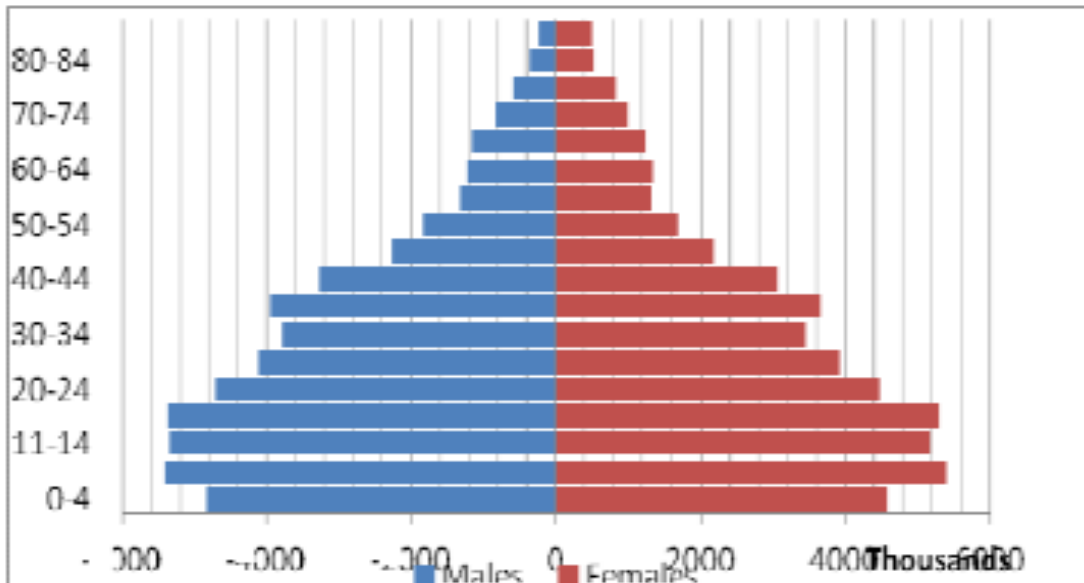
<sup>5</sup> [Windward Islands | islands, West Indies | Britannica](#)

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language is English, but some residents also speak French patois. The main religions are Protestant (75%), Anglican (47%), Methodist (28%), Roman Catholic (13%), and others (Hindu, Seventh Day Adventist, other Protestant) (12%) (Murray, 2014).

Life expectancy at birth is 74 years.

In 2020, the overall Human Development Index (HDI) was 0.76, increased from 0.69 in 2001.



**Figure 4.9. Population Pyramid at June 2007** (Source: Statistical Unit, CPU)

#### 4.10.4 Land tenure

The GOSVG owns more than 60% of the total land area, including all the land above the 1,000-foot contour (approximately 34,000 acres) and more than 7,000 acres of agricultural land. State-owned lands are managed by the Land and Surveys Department (more than 80%), Forestry Department, National Parks Authority and the Housing and Lands Development Corporation. Abandoned plantations were acquired by the State to promote economic activity in rural areas.

Urban land tenure in 1991 was distributed as follows:

- freehold 74%
- squatting 9.7%
- leasehold 2.2%

The remainder were rented or some informal arrangement.

#### 4.10.5 Settlement Patterns

The average density for St. Vincent is 707 persons per sq mile. In 1980, 92.6 % of the total population of St. Vincent and the Grenadines resided on mainland St. Vincent. In 1991, the figure was 92.1 %. In 2001, this decreased slightly to 91.9%. 85 percent of St Vincent's population lives in the coastal zone. Historical settlement patterns have followed along flat coastal areas near major rivers or fishing banks. According to the 2001 Census, approximately 48 % of the total population of the country resided in the south-central

area of mainland St. Vincent, particularly in Kingstown and Calliaqua and their suburbs, in an area of approximately 20.1 sq. miles or 13.4 % of the total land area of the country. As the population has increased, the settlement pattern has slowly crept up from the low-lying urban areas into the surrounding hillsides, expanding suburban settlements.

There are some unplanned settlements consisting mainly of lower income households on vulnerable slopes or other marginal lands that tend to be prone to environmental degradation. Inadequate drainage and unplanned sewage systems and services make these areas vulnerable to landslides during rainstorms. Lack of basic sanitation services such as running water and proper sewage disposal predisposes the residents, particularly children, to water borne diseases such as diarrhea. Residents have little or no vested interest or capacity to sustainably manage these lands.

#### 4.10.6 Education

The literacy level of St. Vincent and the Grenadines is approximately 96%. Universal education and free education have helped to achieve this result. The Government provides subsidies to advance the provision of private and tertiary education.

#### 4.10.7 Gender

In most societies including SVG, because of gender and other forms of exclusion, women and girls face discrimination in many areas while men and boys have privileges that influence their life chances at all levels. SVG has implemented many institutional and policy measures, programmes and projects towards disrupting patterns and manifestations of gender discrimination that are embedded in economic, social and political structures and systems. Reforms have been implemented to ensure the fair and impartial treatment (equity) of both sexes and the achievement of gender equality. There is gender equity in SVG with respect to equal opportunity, entitlement and access to:

- primary and secondary education,
- health care,
- social security,
- social, financial and legal services,
- employment,
- information and communication,
- utilities,
- property ownership,
- inheritance and tenure.

Gender socialisation shapes and affects men and women, boys and girls across and throughout the life cycle (Vassall, 2015). This is manifested in several ways in SVG e.g.:

- Males are under-represented in post-secondary education;
- Women are the primary caregivers;
- Women are primary or sole income earners in over 40% of households;
- Female-headed households receive lower incomes than male headed households.  
Unemployment rates are generally higher for women. Young females represent approximately 53% of the country's unemployed;
- Average income for work is lower for women than for men in the same occupational category;

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- Females have lower (but increasing) labour force participation rates than males;
- There remains under-representation of women in most areas of paid employment;
- There is low participation of women in decision-making and the political arena, and on government-appointed public sector boards;
- The main victims of gender-based and sexual violence are young, unemployed women between 13-34 years of age.

The range of jobs available tends to reinforce gender stereotypes. Women were employed as managers and professionals in human health and social work activities (82.8%), education (73.1%), accommodation and food service activities (62.7%) and public administration and defence (54.4%), more than men. Although women made up 11.4% of the total construction industry, they represented 20.4% of managers. Women made up 50.1% of the total wholesale and retail trade industry, but 42.7% of managers and professionals.

In 2015, employed women in St. Vincent and the Grenadines were more likely than employed men to be engaged in formal employment and to benefit from social protection. 57.4% of employed women benefited from paid annual leave, compared with 38.7% of employed men. Employed women were more likely than employed men to be entitled to insurance benefits from National Insurance Services (NIS), as 72.5% of employed women were entitled, compared with 58.4% of employed men. However, men were more entitled to benefit from other types of insurance (6.5% versus 4.4%).

One challenge is to ensure that women also benefit from the expenditure of public funds in the national reconstruction process. Construction is seen as a male domain, and women tend to be marginalized in this sector. Consequently, they are not equal beneficiaries of the public investments in infrastructural development.

#### 4.10.8 Livelihood

In 2001, 41.6 percent of the total population worked in agriculture, construction, and wholesale industries.

Out-migration is still significant, and remittance income is high, estimated at over 20% of household income.

The 2008 Country Poverty Assessment (CPA) report indicated that 30.2 % of the population was poor, and 2.9 % was indigent. An additional 18 % was vulnerable (defined as being at risk of falling into poverty in face of economic shock, or other disaster). Altogether, 48.2 percent of the population was below the vulnerability line.

#### 4.10.9 Health

Recent basic health indicators for St. Vincent and the Grenadines have been positive, particularly in infant and maternal health, and primary health care coverage. There is full immunization coverage for the under 5 age group and maternal deaths (per 1000) are negligible. Fertility rate is stable at 2.8 children per woman with an average life expectancy at birth of 74.3 years, comparable to that of developed countries.

Several line ministries implement social assistance programmes to support the vulnerable. However, these programmes are poorly coordinated and under sourced, resulting in inadequate coverage and duplication. Weaknesses in this area of the social sector have been observed throughout the OECS and reflect the need for organised social planning.

#### 4.10.10 Economy

St. Vincent and the Grenadines is internationally classified as a lower-middle-income country. The country is a Small Island Developing State (SIDS) with a small open economy and all the inherent challenges, such as a narrow economic base and high vulnerability to external economic shocks such as liberalization of markets and global recessions, and natural disasters e.g.:

- collapse of the banana industry following changes in external trading arrangements, and severe dislocations in the rural economy, particularly in the lives of women.
- Hurricane Tomas in 2010.
- December 2013 floods. Damage to infrastructure, housing, utilities, agriculture, and small businesses was estimated at 13% of GDP, with severe consequences for sustenance of livelihoods and the overall performance of the economy.

The La Soufriere volcano last erupted in 2021, damaging the agricultural sector and disrupting life across SVG. The mainstay of the economy is agriculture, but increasingly, tourism and other services, and construction have become important contributors to the economy (GOSVG, 2013). The country relies heavily on imports to satisfy local demand. Despite the constraints, the government is committed to reducing poverty, increasing the standard of living, and accelerating the rate of growth (Murray, 2014). During the period of 2000 to 2013, the economy grew by a real annual average of 2.48% (GOSVG, 2019).

Extensive forests cover the central mountain ranges (Figure 4.10). The eastern side of the island has most of the relatively flat-lying land and the most commercial agriculture. St. Vincent and the Grenadines was among the world's top producers of arrowroot flour, but the crop is now of minor importance, dwarfed by banana and other agricultural production. Other crop commodities of significance in SVG include dasheen, eddoes, sweet potatoes, and yams. Major tree crops include mango, coconut, avocado and citrus. The livestock industry is relatively small. According to the 2000 Agriculture Census, livestock production was dominated by sheep, goats, and poultry.

The economy is increasingly dominated by tourism. In 2004, the number of stopover tourists reached 86,700 with tourism receipts totaling US\$95.6 million. With contraction in the agricultural sector, the tourism sector makes a greater contribution to national development with direct investment and ancillary development in support service sectors. This trend is anticipated to increase as national development policy seeks to place the hospitality sector within the main engines of economic growth. Tourism in SVG has been focused primarily on the "sea and sand" experience in the Grenadine islands. However, the rise in eco-tourism in SVG is noteworthy in the context of land conservation. Sustainable management of land-based resources is of critical importance to protect the quality of the eco-touristic excursion experience as well as marine ecosystems with dive site potential. The new Argyle International Airport is the island's first international airport and has opened the island up to non-stop international flights.

The industrial sector in SVG employs around 8% of the workforce and in 2008 contributed about 29.2% to GDP. Industrial activity is focused primarily on agricultural processing of foodstuffs such as flour, rice, animal feeds, beans, and other dried grain. Manufacturing production is concentrated at the Campden Park Industrial Estate where the following companies are established:

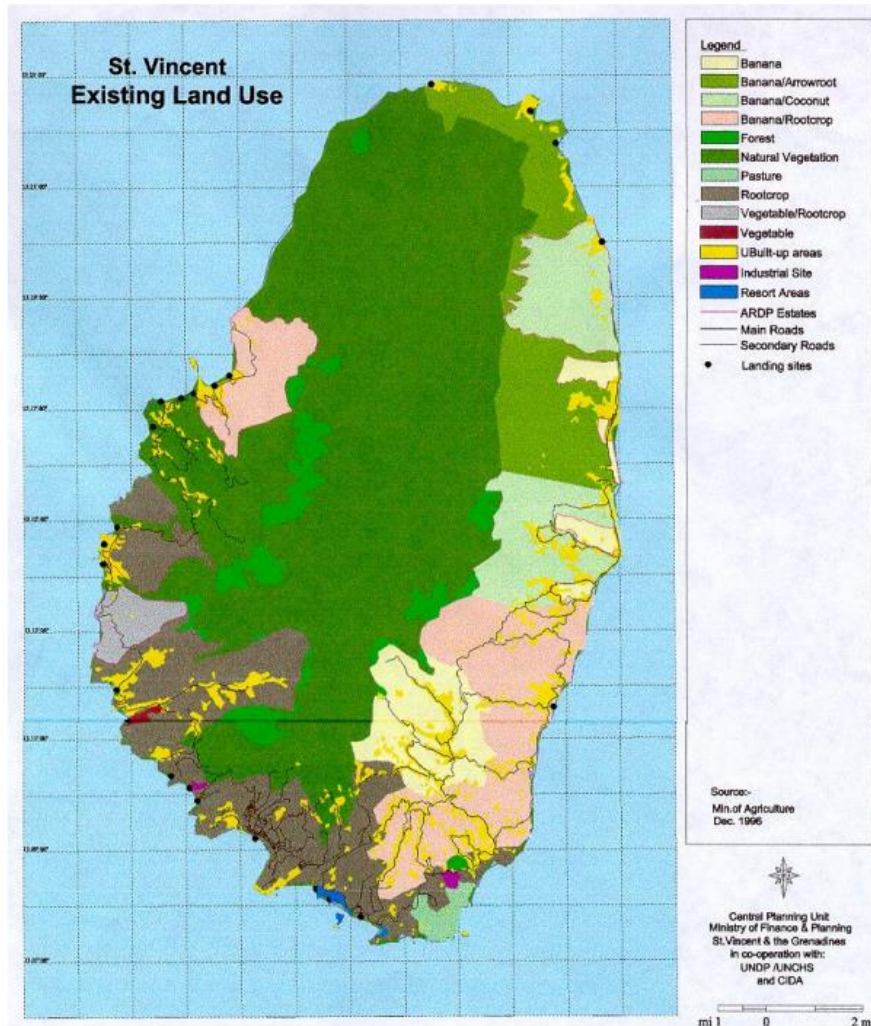
- East Caribbean Grain Company (flour, rice, and animal feed)
- Hairoun Brewery (beverages)
- Saint Vincent Container Corporation (paper products)



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- Saint Vincent Packaging Limited (plastics)
- East Caribbean Metal Industry (steel products).

Mining is done for igneous rocks, as well as beach sand for the local construction industry.



**Figure 4.10. Land Use in St. Vincent as of 1996**

#### 4.10.11 Indigenous Peoples

The island of St. Vincent is known in the Garifuna language as Yurumein, the Garifuna homeland. The Garifuna or Garinagu (plural) – referred to as the “Black Caribs” in colonial accounts – are an Afro-Indigenous group whose ethnogenesis can be traced back to the island. Their Kalinago ancestors were the native inhabitants of Yurumein when the Europeans arrived. They resisted the Europeans, particularly the British. They permitted a few French farmers and missionaries to settle with them on the western and southern areas of St. Vincent in the late 1600s.

The British took control of St. Vincent following the 1763 Treaty of Paris. The Garinagu resisted occupation and there was a lengthy struggle that culminated in the first and second Carib Wars. In 1796, Garifuna Paramount Chief Joseph Chatoyer was ambushed and killed by British troops near the present-day capital

of Kingstown. Some 4000 Garinagu were captured and transported to the island of Balliceaux in the Grenadines, where more than 2000 Garinagu perished. In 1797, the survivors were exiled to Roatan in the Bay Islands, located in the present-day Republic of Honduras.

Some Garinagu escaped the 1797 exile and hid in the mountainous interior and northern section of St. Vincent. The 1902 eruption of the La Soufriere volcano devastated the indigenous communities in the north. More than two thousand persons died during that eruption, including many indigenous. The “Morne Ronde Caribs” were largely resettled at Rose Bank on the west coast. In 1902, they petitioned the King of England and complained about their resettlement at Rose Bank, noting that the location was not suited to their ancestral farming and fishing practices, and the individual small plots assigned was contrary to their traditional, collective land tenure arrangements. Some historians are of the view that the indigenous displacement and resettlement schemes played a significant role in the erosion of indigenous culture in SVG post-exile. After the recent 2020-21 eruption which displaced the Garinagu from their lands in the red zone, Senator Shevern Lewis-John who is of Garifuna descent, noted that indigenous communities had deep ties to place in the north of St. Vincent which are critical to their material, cultural and spiritual survival. She stressed that rebuilding must be considered carefully.

Diasporic Garifuna play a vital role in cultural revitalization projects in SVG, centred on the recuperation of Garifuna identity, culture, and language. Indigenous communities and lands of St. Vincent are also important to the maintenance of the Garifuna culture outside of SVG. Central American Garinagu return to the sacred homeland of Yurumein, visiting Garifuna and Kalinago communities and historical sites, and making the pilgrimage to Balliceaux island (Palmer and Fraser, 2021).

The Garifuna are currently not considered to meet all criteria under ESS7 in Saint Vincent and the Grenadines, although it is a sensitive issue that is under review.

## 4.11 The Public Consultation Process

### 4.11.1 Overview

The aim of the public consultation undertaken as part of this ESIA development process was to solicit the views, perceptions, and concerns on the sub-project, explore ways of avoiding or minimizing all concerns and reach a consensus that all concerns have been adequately addressed. This necessitated an overall approach that sought to engage a cross section of stakeholders to the extent practical, inclusive of neighbours and representative organisations.

A stakeholder analysis is provided in Section 1.9.

### 4.11.2 Methods of ESIA Stakeholder Participation

Consultations were held both virtually and in person over the week of February 20, 2023, and virtually thereafter where stakeholders were unavailable during that week. Engagement activities are described below.

#### 4.11.2.1 Meetings with Neighbours

The NEMO HQ is surrounded by mixed uses – primarily residential and institutional, with some commercial. In most instances, meetings were not formally arranged, but premises were visited and persons engaged. The following were engaged in this way:

- Botanical Gardens



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- Immediate neighbour
- SDA Church HQ
- Windsor Primary School
- Baptist Church

CWSA is also a neighbour, and was also consulted in that capacity.

The meetings provided an opportunity to brief neighbours on the likely scope of the proposed sub-project, while enabling them to ask questions, raise concerns and articulate ways in which concerns and challenges could be satisfactorily addressed.

#### *4.11.2.2 Meetings with Public Officers*

Meetings were held with public officers representing the client and other stakeholder institutions/ departments of the public service. The aim of the meetings was to discuss the sub-project with the officials and to obtain relevant data and information related to their sphere of operations.

Representatives of the following were included in this process:

- NEMO
- VEEP
- CWSA
- EHD
- Fire Service
- Traffic Police
- Labour Department
- Ministry of Works
- PPU
- SDU

#### *4.11.3 Conclusions of Stakeholder Engagement and Gender Assessment*

Stakeholders engaged were generally supportive of the proposed sub-project and were prepared to endure minor inconveniences and adverse impacts through the construction phase. Potential construction impacts of greatest concern were noise and/or dust that could impact Baptist church activities or SDA clinic operations, if not well managed.

A few institutional stakeholders were concerned that the site is too small to properly accommodate future NEMO operations. While most agreed that the HQ should be located such that access from Kingstown is convenient, concerns related to:

1. “peacetime” when large meetings are sometimes convened, and parking provisions are inadequate, and parking spills over into the adjacent roadway;
2. The simultaneous use of the site for warehousing and distribution, which consumes space that could be dedicated to parking and expanded EOC operations.

The neighbouring resident was concerned about tall trees on the bank of the North River that he perceived as a threat to his property.

## 4.12 Trends in Baseline Environmental and Social Conditions

### 4.12.1 Natural hazards and Climate Change

Within Saint Vincent, the La Soufriere volcano is active, and a persistent threat to the people and property, particularly those residents in the designated “red zone” in the north of the island. The underwater volcano Kick ‘Em Jenny off the Grenada coast, is also a potential tsunami threat to Saint Vincent. Saint Vincent is also vulnerable to climate hazards and is located within the hurricane belt. With climate change, increasing temperatures, sea level rise, changing rainfall patterns and increasingly intense extreme events will all increase the climate vulnerability of the country. The built environment, without appropriate mitigation, becomes increasingly vulnerable, potentially increasing the scale and frequency of demands on the NEMO emergency management system. At the sub-project site location, climate hazards of greatest concern are high winds and high rainfall intensities and associated increased flood risk during extreme weather events. Increasing temperatures are also anticipated, with adverse implications for working conditions and cooling requirements, with associated increased power requirements. Lower water availability over time is also a concern for municipal water supplies, both at an operational level within NEMO, and for the entire country.

### 4.12.2 Public Utilities

Under drought conditions, Saint Vincent’s CWSA is required to ration water to some communities. The NEMO HQ is located within the same service area as the hospital and Prime Minister’s and Governor General’s residences, and the sub-project area’s water supply is prioritized, and seldom rationed. In other areas, the water supply is less secure, but efforts are being made by CWSA to improve this. In the aftermath of the volcanic eruption in 2020 -2021, water supplies were critically affected, and those in the north continue to suffer from mobilization of fallen ash that contaminates water supplies during rainfall events. CWSA is actively pursuing solutions to mitigate this impact in the future. Implementation of such solutions would increase water security generally, and particularly in the north of Saint Vincent.

There is limited sewerage service available in Saint Vincent. The existing sewerage system in Kingstown will be upgraded as part of the new port development, and this is expected to significantly improve water quality within the harbour area. However, the proposed upgrades do not include wastewater treatment, and raw sewage will continue to be pumped into the coastal area.

Waste management at a national level is adequate, and the main disposal site at Diamond has significant remaining capacity, in the order of decades, assuming waste generation rates do not increase significantly.

Power supply is also reliable at the sub-project location, and is likely to remain so, particularly due to the importance of the location.

### 4.12.3 Protected Areas and Riverbanks

There are several legal mechanisms to declare protected areas, and these have been used to create forest and marine reserves and national parks across SVG. However, the institutional capacity to protect these areas is insufficient, and many protected areas, including the nearby marine park, continue to be impacted by undesirable human activity. Without a deliberate effort to improve capacity across agencies

to monitor and enforce legal protective mechanisms, these rich biodiversity areas will continue to deteriorate.

The law requires that 40 feet on both sides of the river center be maintained as river reserve. This requirement is not respected by state authorities or individuals and built development to the edge of riverbank is common in urban and suburban areas. This has significant implications for downstream water quality. Among other things, this can continue to adversely impact a myriad of development opportunities reliant on downstream environmental services. These include water security, recreational activity and livelihoods based on aquatic and marine biodiversity. Reduced riverbank stability is also of concern. These adverse impacts will be compounded by climate change in the future.

#### 4.12.4 Traffic

Car ownership in St. Vincent increases by an average of 250 cars monthly. Traffic congestion within urban and suburban spaces will continue to increase as additional vehicles are imported into the country. The centralization and reinstatement of port facilities in Kingstown as the primary commercial port will significantly reduce container traffic on the nearby Leeward Road, as port operations at Camden Park Container Port (CPCP) are mothballed. However, congestion will continue to escalate on St. Vincent's roads if there is no significant intervention.

## 5.0 Environmental and Social Impact Assessment

### 5.1 Approach to Impact Analysis

The primary purpose of an ESIA is to predict the impacts resulting from a project and identify measures to avoid, reduce, or compensate for adverse impacts. Sources of data included information gathered during site visits, stakeholder consultations and document review.

The main stages in the ESIA process consisted of:

- Preliminary studies to identify the baseline conditions (including physical, ecological, and socio-economic conditions).
- Review of available literature.
- Participation in meetings with members of the Design Team.
- Consultations with relevant ministries, other government organisations, local community residents and other stakeholders operating in the vicinity.
- Site visits.
- Full ESIA of all proposed activities under consideration.
- Identification of mitigation measures and residual impacts for these proposed activities.

Based on information gathered, potential project impacts of the proposed works were predicted and quantified as far as possible, and mitigation/enhancement measures were identified for significant potential impacts through all phases of the project with respect to the ESS of the World Bank which are as follows:

- ESS1: Assessment and Management of E&S Risks and Impacts
- ESS2: Labour and Working Conditions
- ESS3: Resource Efficiency and Pollution Prevention
- ESS4: Community Health, Safety, and Security
- ESS5: Land Acquisition and Involuntary Resettlement
- ESS6: Biodiversity Conservation and Sustainable Management of Living Natural Resources
- ESS8: Cultural Heritage
- ESS10: Stakeholder Engagement and Information Disclosure

Potential risks in all project phases (i.e., site investigation, design, implementation, operation, maintenance) are identified and their significance assessed, within this ESS framework advocated by the WB.

The magnitude of an impact is a function of the following characteristics:

- Type of impact (direct, indirect, or induced)
- Size, scale, or intensity of impact
- Geographical extent (e.g., local, regional, international)
- Duration and/or frequency (e.g., temporary, short-term, long-term, permanent)

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Magnitude describes the actual change that is predicted to occur in the resource (e.g., water and air) or receptor (e.g., people, communities, wildlife species, habitats). All the various impact characteristics are considered in the determination of whether an impact is negligible or significant. Some impacts can result in changes to the environment that may be immeasurable, undetectable, or within the range of normal natural variation, and these may be characterized as having very low or negligible magnitude. The analysis assumes a worst-case scenario with no significant mitigation effort in determining potential impacts on resources and receptors. Impact magnitudes are designated as very low, low, medium, or high.

The sensitivity of the impacted resource or receptor is also characterized. Sensitivity to change, vulnerability, importance, and quality are assessed. Resource and receptor sensitivity are also designated as very low, low, medium, or high.

The significance of a potential project impact is evaluated by considering the magnitude of the impact in combination with the sensitivity/vulnerability/importance of the impacted resource or receptor. The significance rating enables decision-makers and stakeholders to gauge the weighting that should be ascribed to the issue.

Significance is assigned for each impact using the matrix shown in Table 5.1.

**Table 5.1: Risk and Adverse Impact Significance Matrix**

Risk/Impact Magnitude	Resource or Receptor Sensitivity <sup>6</sup>			
	Very Low	Low	Moderate	High
Very Low	Negligible	Negligible	Negligible	Negligible
Low	Negligible	Negligible	Low significance	Moderate significance
Moderate	Negligible	Low significance	Moderate significance	High significance
High	Low significance	Moderate significance	High significance	High significance

The significance levels of impacts are defined using the following terms:

- *Negligible*. An impact of negligible significance is one where a resource or receptor would not be affected by a particular activity, or the predicted effect is imperceptible.
- *Low Significance*. A minor impact where a resource or receptor could experience a noticeable effect, but the impact magnitude is sufficiently below applicable standard threshold limits (with or without mitigation) and/or the resource or receptor is of low sensitivity.

<sup>6</sup> Resource or receptor sensitivity collectively refers to characteristics including sensitivity to change, vulnerability, importance, and quality, as applicable.

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- *Moderate Significance.* An impact that is within applicable standards but approaches the threshold limit.
- *High Significance.* An impact where an applicable standard threshold limit would or could be exceeded or a highly valued or very scarce resource could be substantially affected.

In addition to the risks and adverse effects, the proposed project may have positive effects, and it is possible to enhance these beneficial impacts. Although some of these positive effects are identified in the impact evaluation, the evaluation focuses primarily on adverse impacts. The matrix below is applied for qualitative assessment of potential benefits.

**Table 5.2: Benefit Impact Significance Matrix**

Impact Magnitude	Resource or Receptor Sensitivity <sup>7</sup>			
	Very Low	Low	Moderate	High
Very Low	Negligible	Negligible	Negligible	Negligible
Low	Negligible	Negligible	Low significance	Moderate significance
Moderate	Negligible	Low significance	Moderate significance	High significance
High	Low significance	Moderate significance	High significance	High significance

## 5.2 Environmental and Social Impacts under the World Bank ESF

The potential impacts of the proposed works are considered against the ESS of the World Bank in the sections below. In this discussion, the Developer is the State, represented by the VEEP office and NEMO. Notably, the Developer implements the sub-project through a Contractor under a Works Contract let in accordance with World Bank procedures, which include the requirements for compliance by the Contractor with the World Bank's ESS. This will be achieved, among other things, by the requirement of the contractor to develop a Contractor's Environmental and Social Management Plan (C-ESMP) in accordance with the recommendations contained in this ESIA. More detail in relation to the development of the C-ESMP is provided in Section 7 of this report.

The World Bank's Environmental, Health and Safety (EHS) Guidelines provide limit values for various parameters, and these are reproduced below. The tables are as numbered in the EHS. Table 1.3.1 refers to the quality requirements of treated sanitary sewage discharges, but provide a good guide for the quality of effluents and discharges originating from the site.

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<sup>7</sup> Resource or receptor sensitivity collectively refers to characteristics including sensitivity to change, vulnerability, importance, and quality, as applicable.

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Table 1.1.1: WHO Ambient Air Quality Guidelines <sup>7, 8</sup>		
	Averaging Period	Guideline value in $\mu\text{g}/\text{m}^3$
Sulfur dioxide (SO <sub>2</sub> )	24-hour	125 (Interim target-1) 50 (Interim target-2) 20 (guideline)
	10 minute	500 (guideline)
Nitrogen dioxide (NO <sub>2</sub> )	1-year	40 (guideline)
	1-hour	200 (guideline)
Particulate Matter PM <sub>10</sub>	1-year	70 (Interim target-1) 50 (Interim target-2) 30 (Interim target-3) 20 (guideline)
	24-hour	150 (Interim target-1) 100 (Interim target-2) 75 (Interim target-3) 50 (guideline)
Particulate Matter PM <sub>2.5</sub>	1-year	35 (Interim target-1) 25 (Interim target-2) 15 (Interim target-3) 10 (guideline)
	24-hour	75 (Interim target-1) 50 (Interim target-2) 37.5 (Interim target-3) 25 (guideline)
Ozone	8-hour daily maximum	160 (Interim target-1) 100 (guideline)

Source: IFC, World Bank Group, 2007. Environmental, Health, and Safety (EHS) Guidelines. General EHS Guidelines: Introduction

Table 1.3.1 Indicative Values for Treated Sanitary Sewage Discharges <sup>a</sup>		
Pollutants	Units	Guideline Value
pH	pH	6 – 9
BOD	mg/l	30
COD	mg/l	125
Total nitrogen	mg/l	10
Total phosphorus	mg/l	2
Oil and grease	mg/l	10
Total suspended solids	mg/l	50
Total coliform bacteria	MPN <sup>b</sup> / 100 ml	400 <sup>a</sup>
<b>Notes:</b> <sup>a</sup> Not applicable to centralized, municipal, wastewater treatment systems which are included in EHS Guidelines for Water and Sanitation. <sup>b</sup> MPN = Most Probable Number		

Source: IFC, World Bank Group, 2007. Environmental, Health, and Safety (EHS) Guidelines. General EHS Guidelines: Introduction

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Table 1.7.1- Noise Level Guidelines <sup>54</sup>		
	One Hour L <sub>Aeq</sub> (dBA)	
Receptor	Daytime 07:00 - 22:00	Nighttime 22:00 - 07:00
Residential; institutional; educational <sup>55</sup>	55	45
Industrial; commercial	70	70

Source: IFC, World Bank Group, 2007. Environmental, Health, and Safety (EHS) Guidelines. General EHS Guidelines: Introduction

## ESS1. Assessment and Management of E&S Risks and Impacts

### The ESS

ESS1 sets out the Developer's responsibilities for assessing, managing, and monitoring environmental and social risks and impacts associated with each stage of a project to achieve environmental and social outcomes consistent with the Environmental and Social Standards (ESS). The ESS are designed to help Developers to manage the risks and impacts of a project, and improve their environmental and social performance, through a risk- and outcomes-based approach. Developers are required to conduct environmental and social assessment of projects to help ensure that projects are environmentally and socially sound and sustainable. The environmental and social assessment is to be proportionate to the risks and impacts of the project. It will inform the design of the project and be used to identify mitigation measures and actions and to improve decision making. Developers are to manage environmental and social risks and impacts of the project throughout the project life cycle in a systematic manner, proportionate to the nature and scale of the project and the potential risks and impacts.<sup>8</sup>

The Developer is required to:

1. Conduct an environmental and social assessment (ESIA) of the proposed project, including stakeholder engagement;
2. Undertake stakeholder engagement and disclose appropriate information;
3. Develop and implement an Environmental and Social Management Plan (ESMP); and
4. Conduct monitoring and reporting on the environmental and social performance of the project against the ESS.

The ESMP is required to set out measures and actions required for the project to achieve compliance with the ESSs over a specified timeframe.

### Application to This Sub-project

This report provides the ESIA and ESMP for the proposed sub-project site. Information on community and institutional stakeholder engagement undertaken so far is provided in Section 4.10 above.

<sup>8</sup> [9914-Guidance Notes 1.indd \(worldbank.org\)](#)



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The ESMP includes recommended management, monitoring, and reporting requirements for this proposed development.

## ESS2. Labour and Working Conditions

### The ESS

This ESS recognizes the importance of employment creation and income generation in the pursuit of poverty reduction and inclusive economic growth. Developers can promote sound worker-management relationships and enhance the development benefits of a project by treating workers in the project fairly and providing safe and healthy working conditions. The objectives of ESS2 are to:

- promote the fair treatment, non-discrimination, and equal opportunity of workers.
- establish, maintain, and improve the worker-management relationship.
- promote compliance with national employment and labour laws.
- protect workers, including vulnerable categories of workers such as children, migrant workers, workers engaged by third parties, and workers in the client's supply chain.
- promote safe and healthy working conditions, and the health of workers.
- avoid the use of forced labour.

### Application to This Sub-project

The scope of application of the ESS depends on the type of employment relationship that the developer has with the worker. It is expected that for this sub-project, construction workers in the construction phase will be workers employed by contractors engaged by the Developer, and their subcontractors. However, if some or all of the NEMO operations continue at the same location through construction, NEMO will also have a responsibility to ensure that the health and safety of its staff are protected. In the operations phase, most staff will be directly employed by NEMO. Exceptions will be the staff of service providers that support the operation and maintenance of the premises.

Construction is an inherently dangerous occupation. Sub-project-specific OSH risks in the construction phase of this project are attached to:

- General workplace health and safety
- Physical hazards (may include slips, trips and falls, hazards related to transport, hazards related to height and falling, and use of fixed and mobile equipment)
- Dust, noise, and vibration
- Hazardous substances
- Electrical safety and isolation
- Fitness for work

Hazardous substances may affect the skin or lungs of construction workers or may poison them. These substances come in many forms including gases, vapors, fumes, dusts, and mists. Common materials are (Craig, 2017):

1. Solvents in adhesives, paints, and cleaning fluids, including acetone, alcohol, benzene, esters, ketones, and mineral spirits. These substances are dangerous because inhalation, skin contact or ingestion immediately affects nerves and brain function and are also stored in body fat. These materials are also flammable. Symptoms of exposure include dizziness, lack of coordination, headache, nausea, stomach pain, cracked or bleeding skin, and irritated eyes, nose, and throat.

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Solvents can cause blindness, damage internal organs and harm the nervous system. They also cause irregular heartbeats, cancer, and death.

2. Dust e.g., silica dust, wood dust, and lower toxicity dusts. Silica dust comes from grinding, sawing, polishing, and cutting materials containing silica like concrete, mortar, and sandstone. Fine silica dust gets deeply lodged in the lungs when inhaled, resulting in silicosis, asthma, chronic obstructive pulmonary disease, and lung cancer. Wood dust is generated when cutting or sanding wood products such as softwood, hardwood, plywood, OSB, and medium density fiberboard. Lower toxicity dusts come from working with materials like drywall, limestone, and marble. Dusts from these sources have damaging effects on your airways and lungs.
3. Man-made mineral fibers, generally made from glass, ceramic, rockwool, and slagwool, are usually used for temperature and sound insulation. During installation or removal, tiny fibers can get lodged in the lungs. They are often irritating to the skin and can damage the eyes. Working with some of these fibers, particularly the fibers classed as refractory ceramic fibers, may require specialized PPE.
4. Mold exposure is increasingly a concern on construction sites, especially in remodeling and moisture-trapped buildings. Molds come in many colors, and they can adapt to varying levels of moisture. People exposed may suffer from respiratory symptoms, asthma, allergies, and respiratory infections. Mold can also break down building materials and can release volatile organic compounds.
5. Termite control agents pose health risks. Prolonged exposure to termite treatment chemicals or any other pesticide could have severe side effects including respiratory disorders, skin conditions, cancer, organ failure, sterility & infertility, brain damage, and congenital disabilities. Absorption of the insecticide through skin or by inhaling has been correlated to an increase in pancreatic and liver problems, the development of certain types of cancers, including leukemia, and an increase in spontaneous abortions and stillbirths as well as other fertility issues such as decreased sperm count.
6. Health effects of exposure to fuels (petroleum, oils, lubricants) may include irritation to unprotected skin, eye and upper respiratory irritation, fatigue, breathing difficulty, headaches, dizziness, and sleep disturbances. Drinking fuels is dangerous and may result in convulsions, coma and even death. Scientific research on the long-term effects of exposure to fuels is inconclusive; however, if an individual is exposed to fuel at very high levels over a long period of time, lung and heart problems may develop.

In the operations phase, operational health and safety impacts are primarily physical hazards and biological–chemical hazards. Indoor air quality in spaces designed to provide services is represented by concentrations of pollutants and thermal conditions that affect the health, comfort, and performance of employees and occupants. Providing good indoor air quality is critical to asthma and allergy prevention and the prevention of other health effects and discomfort situations, such as headaches and nausea. Typical indoor air-quality contaminants may include ammonia (from cleaning products), VOCs (from use of interior products, such as solvents, paints, adhesives), odors, dust, carbon dioxide and nitrogen oxides, and bacteria and fungi (mold and mildew from HVAC filters).

Without appropriate measures, the OSH risks in both construction and operations phases are high.

The Table below assesses impact significance of the proposed sub-project on Labour and Working Conditions. It assesses potential impact significance with and without implementation of recommended

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mitigation measures. The detailed recommended mitigation measures are contained in Section 6 of this document. Links to the relevant recommendations are also provided in the following table.

**Table 5.3. Summary of impacts on Labour and Working conditions**

Resource/ Receptor	Impact	Sensitivity	Magnitude	Pre- Mitigation Significance	Mitigation Measures	Residual Significance
<b>CONSTRUCTION</b>		<b>PHASE</b>				
Construction Workforce	Safety/ accident risk	High	High	High significance	<a href="#">Safety-1</a> through <a href="#">Safety-13</a> <a href="#">Natural Hazards-1</a>	Low significance
Construction Workforce	Health risk	Moderate	Moderate	Moderate significance	<a href="#">Safety-1</a> through <a href="#">Safety-13</a>	Low significance
Construction Workforce	Poor working conditions	High	Moderate	High significance	<a href="#">Safety-1</a> through <a href="#">Safety-13</a> <a href="#">Gender-1</a>	Low Significance
Local Community Workforce - both phases	Access to job opportunities (+)	High	High		As outlined in 3c and 3d above <a href="#">Gender-1</a> <a href="#">Labour-1</a> <a href="#">Labour-2</a>	High significance
Female workforce	Access to job opportunities (+)	High	Low		As outlined in 3b above <a href="#">Gender-1</a> <a href="#">Labour-1</a>	Moderate significance
<b>OPERATIONS</b>		<b>PHASE</b>				
Operations workforce	Safety/ accident risk	High	Low	Moderate significance	<a href="#">Safety-1</a> through <a href="#">Safety-13</a> <a href="#">Natural Hazards-1</a>	Low significance
Operations Workforce	Health risk	High	Moderate	High significance	<a href="#">Safety-1</a> through <a href="#">Safety-13</a>	Low significance

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Resource/ Receptor	Impact	Sensitivity	Magnitude	Pre- Mitigation Significance	Mitigation Measures	Residual Significance
Operations Workforce	Poor working conditions	High	Low	Moderate significance	<a href="#">Safety-1</a> through <a href="#">Safety-13</a> <a href="#">Gender-1</a>	Low Significance
Female workforce	Access to job opportunities (+)	High	High		As outlined in 3c and 3d above <a href="#">Gender-1</a> <a href="#">Labour-1</a> <a href="#">Labour-2</a>	High significance

### ESS3: Resource Efficiency and Pollution Prevention

#### The ESS

This ESS recognizes that economic activity and urbanization often generate pollution to air, water, and land, and consume finite resources that may threaten people, ecosystem services and the environment at the local, regional, and global levels. The current and projected atmospheric concentration of greenhouse gases (GHG) threatens the welfare of current and future generations. At the same time, more efficient and effective resource use, pollution prevention, and GHG emission avoidance, and mitigation technologies and practices have become more accessible and achievable. The ESS sets out the requirements to address resource efficiency and pollution prevention and management throughout the project life cycle. ESS objectives are to:

1. promote the sustainable use of resources, including energy, water, and raw materials.
2. avoid or minimize adverse impacts on human health and the environment by avoiding or minimizing pollution from project activities.
3. avoid or minimize project-related emissions of short- and long-lived climate pollutants.
4. avoid or minimize generation of hazardous and nonhazardous waste.
5. minimize and manage the risks and impacts associated with pesticide use.

There are two distinct aspects to this principle. Projects/programmes shall on the one hand minimize in a reasonable and cost-effective way the resources that will be used during implementation. This applies to all sources and forms of energy, to water, and to other resources and materials inputs. On the other hand, the project/programme will minimize the production of waste and the release of pollutants (including GHGs).

#### Application to This Sub-project

The sub-project will consume locally available non-renewable resources such as sand and coarse aggregates. For a project of this size, the quantities are expected to be available without constraint, as long as the operators are made aware of requirements sufficiently in advance. Most other sub-project resources will be imported, either directly by the contractor, or by local construction material suppliers.

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Construction works have the potential to pollute the land, air, adjacent waterbodies, and the coastal and marine environment by:

- Spills of fuels, oils, pesticides or other pollutants;
- Poor management of materials and solid waste;
- Poor wastewater management;
- Dust generated from materials handling;
- Air emissions including products of combustion (e.g., carbon dioxide, nitrogen and sulphur oxides, hydrocarbons) and particulates from operation of diesel-powered generators and heavy equipment, and pesticide application.

During operations, pollution sources will include:

- Spills of fuels, oils or other pollutants;
- Poor management of materials and solid waste;
- Poor wastewater management;
- Dust generated from materials handling;
- air emissions including products of combustion from fossil fuel-operated stoves, generators, and mobile equipment; volatile organic compounds (VOC) from refrigeration and air conditioning services.

Potential issues associated with erosion and sedimentation are addressed under ESS6 below.

Sensitive resources that could be affected by pollutants generated through this sub-project include:

1. Terrestrial quality within the site
2. Air quality within and downwind of the site
3. Water quality in drainage channels traversing and surrounding the site, including the North River on the site boundary
4. Water quality in the Kingstown Bay, almost 800m downstream of the sub-project site

The operation and maintenance of equipment through construction and operation requires the use, storage, and transfer of varying quantities of fuels and lubricants.

Fumigants used to treat termites can damage vegetation, harm pets and cause property damage if not properly handled during the application process.

Air quality guidelines provided in the World Bank EHSg are reproduced in Section 5.2.

Wastewater will be generated during construction, by construction workers on site. Wastewater will also continue to be generated from the occupied building if NEMO operations remain at the site through construction. This latter will continue to be treated by the existing septic tank and soakaway system. During future operations, wastewater generated in the existing building will continue to be treated in the existing septic tank/soakaway system. Wastewater generated in the new buildings may be discharged into the municipal sewer if this proves feasible; otherwise it will be discharged to the existing on-site system. Quality of discharge from the onsite system into the adjacent watercourse should be within the guidelines provided in the World Bank EHSg, reproduced in Section 5.2. Generation levels are expected to spike during emergency responses when the EOC is in operation, and building occupation

increases significantly. This includes grey water that will be produced in the kitchens and bathrooms on the site. Septage removed from the septic tank during tank servicing will be contaminated with faecal matter and must be handled separately. Poorly managed wastewater is potentially disease-causing and can exert significant biochemical oxygen demand (BOD) on receiving waters, reducing Dissolved Oxygen (DO) levels in the adjacent watercourse and downstream coastal areas, causing eutrophication, and adversely affecting biodiversity.

Solid waste is generated through construction and operation. There is no vegetation to be removed from this site. It is also not expected that large quantities of spoil material will be stripped and removed from this site. Such spoil wastes are generally inert and non-hazardous, unlike the waste from many other processes. However, there is still potential for damage to the environment, particularly with water contamination, depending on how they are managed.

Other types of solid wastes generated during construction will include demolition waste, food waste, packaging waste, as well as waste oils and other potentially hazardous wastes. During operations, waste will comprise mainly office and kitchen waste, as well as small quantities of waste oils and other potentially hazardous wastes from generator operations and servicing. These can contaminate the site, attract rodents and other disease vectors, and blow or seep into the adjacent drainage channels affecting aquatic and downstream marine biodiversity.

Emissions of Air Pollutants may occur through construction and operation from a wide variety of activities. Projects and facilities should avoid, minimize, and control air emissions. Where unavoidable, generation and release of emissions should be managed through:

- Energy use efficiency;
- process modification;
- selection of materials that may result in less polluting emissions;
- application of emission control techniques.

Fugitive dust during the construction phase may emanate from stockpiles of materials and spoil, and trafficked and cleared areas within the site. Gases from combustion of fuels in stationary and mobile equipment will be released in both construction and operation phases. These may impact workers and other persons on site. Prevailing winds will carry these towards the Leeward Highway and the residential / institutional area on the opposite side of the highway.

The main driver of climate change to be considered here is from the use of fossil fuels. This sub-project will emit greenhouse gases during implementation and operation, primarily carbon dioxide from the use of diesel-driven equipment and vehicles of site users.

Consumption of municipal power in both the construction and operations phases will also contribute to carbon dioxide emissions.

The Table below assesses pollution risk and impact significance at various locations. It assesses potential impact significance with and without implementation of recommended mitigation measures. The detailed recommended mitigation measures are contained in Section 6 of this document. Links to the relevant recommendations are also provided in the following table.

**Table 5.4: Resources and Pollution Impact Significance of Proposed Activity**

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Resource/ Receptor	Impact	Sensitivity	Magnitude	Pre- Mitigation Significance	Mitigation Measures	Residual Significance
<b>CONSTRUCTION</b>		<b>PHASE</b>				
Lands within the site	Pollution from fuel, oil or chemical spills, and waste/ wastewater disposal	Moderate	Moderate	Moderate significance	<a href="#">Water-2</a> <a href="#">Water-3</a> <a href="#">Water-4</a> <a href="#">Water-5</a> <a href="#">Waste-1</a> <a href="#">Chemicals-1</a> <a href="#">Chemicals-2</a>	Negligible
Water resources within the site	Pollution from fuel, oil or chemical spills and waste/ wastewater disposal	Moderate	Moderate	Moderate significance	<a href="#">Water-2</a> <a href="#">Water-3</a> <a href="#">Water-4</a> <a href="#">Water-5</a> <a href="#">Waste-1</a> <a href="#">Chemicals-1</a> <a href="#">Chemicals-2</a>	Negligible
Water resources beyond the site	Pollution from fuel, oil or chemical spills and waste/ wastewater disposal	High	Low	Moderate significance	<a href="#">Water-2</a> <a href="#">Water-3</a> <a href="#">Water-4</a> <a href="#">Water-5</a> <a href="#">Waste-1</a> <a href="#">Chemicals-1</a> <a href="#">Chemicals-2</a>	Negligible
Air quality within the site	Dust from exposed material and emissions from equipment operation	Moderate	Moderate	Moderate significance	<a href="#">Safety-13</a> <a href="#">Air-1</a> <a href="#">Air-2</a>	Negligible
Air quality downwind of the site	Dust from exposed material and emissions from equipment operation	Moderate	Low	Low significance	<a href="#">Air-1</a> <a href="#">Air-2</a>	Negligible
Climate	CO2 emissions from equipment operation	High	Low	Moderate significance	<a href="#">Air-1</a> <a href="#">Air-2</a> <a href="#">Energy-1</a> <a href="#">Energy-2</a>	Low significance
<b>OPERATIONS</b>		<b>PHASE</b>				



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Resource/ Receptor	Impact	Sensitivity	Magnitude	Pre- Mitigation Significance	Mitigation Measures	Residual Significance
Lands within the site	Pollution from fuel, oil or chemical spills, and waste/ wastewater disposal	Moderate	Low	Low significance	<a href="#">Water-4</a> <a href="#">Water-5</a> <a href="#">Waste-1</a> <a href="#">Chemicals-1</a> <a href="#">Chemicals-2</a>	Negligible
Water resources within the site	Pollution from fuel, oil or chemical spills and waste/ wastewater disposal	Moderate	Moderate	Moderate significance	<a href="#">Water-3</a> <a href="#">Water-4</a> <a href="#">Water-5</a> <a href="#">Waste-1</a> <a href="#">Chemicals-1</a> <a href="#">Chemicals-2</a>	Negligible
Water resources beyond the site	Pollution from fuel, oil or chemical spills and waste/ wastewater disposal  Compromised availability of public water supplies	High	Low	Moderate significance	<a href="#">Water-3</a> <a href="#">Water-4</a> <a href="#">Water-5</a> <a href="#">Water-6</a> <a href="#">Waste-1</a> <a href="#">Chemicals-1</a> <a href="#">Chemicals-2</a>	Negligible
Air quality within the site	Dust and emissions from equipment operation	Moderate	Low	Low significance	<a href="#">Safety-13</a> <a href="#">Air-1</a> <a href="#">Air-2</a> <a href="#">Energy-1</a> <a href="#">Energy-2</a>	Negligible
Air quality downwind of the site	Dust and emissions from equipment operation	Moderate	Low	Low significance	<a href="#">Air-1</a> <a href="#">Air-2</a> <a href="#">Energy-1</a> <a href="#">Energy-2</a>	Negligible
Climate	CO2 emissions from equipment operation	High	Low	Moderate significance	<a href="#">Air-1</a> <a href="#">Air-2</a> <a href="#">Energy-1</a> <a href="#">Energy-2</a>	Low significance

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#### ESS4: Community Health and Safety

##### The ESS

ESS4 recognizes that project activities, equipment, and infrastructure can increase community exposure to risks and impacts. In addition, communities that are already subjected to impacts from climate change may also experience an acceleration or intensification of impacts due to project activities. ESS4 addresses the health, safety, and security risks and impacts on project-affected communities and the corresponding responsibility of Developers to avoid or minimize such risks and impacts, with particular attention to people who, because of their circumstances, may be vulnerable. The objectives of ESS4 are to:

- anticipate and avoid adverse impacts on the health and safety of project-affected communities during the project life cycle from both routine and non-routine circumstances.
- promote quality and safety, and considerations relating to climate change in the design and construction of infrastructure, including dams.
- avoid or minimize community exposure to project-related traffic and road safety risks, diseases, and hazardous materials.
- have in place effective measures to address emergency events.
- ensure that the safeguarding of personnel and property is carried out in a manner that avoids or minimizes risks to the project-affected communities.

##### Application to This Sub-project

The Developer is required to evaluate the risks and impacts of the sub-project on the health and safety of the affected communities during the sub-project life cycle, including those who, because of their circumstances, may be vulnerable. The Developer is required to identify risks and impacts and propose mitigation measures in accordance with the mitigation hierarchy. Potential impacts of construction on community health and safety may arise from (WB, 2017):

- Water quality and availability;
- Structural safety of sub-project infrastructure;
- Life and fire safety;
- Traffic accidents and disruption;
- Transport of hazardous materials;
- Disease (communicable, water-borne and vector-borne);
- Emergency Preparedness and Response.

The sub-project should not compromise the availability and quality of public services such as water supply, electricity supply, telecommunications and solid waste management. Because NEMO HQ already operates at this location, potential adverse impacts on these services is expected to be low. Increased demands associated with expanded size of operations should be balanced by sustainable design and operations. Should a connection be made to the sewer, checks should be made as part of the sub-project's feasibility, to confirm that the system's installed capacity is not exceeded as a result, during an emergency response, when the EOC is in full operation.

The following are considered significant and warranting mitigation to reduce risks to community health and safety:

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**Structural and fire safety:** Hazards include structural failure, fire risks, equipment failure, respiratory issues, and exposure to hazardous materials. Because these building plans are being developed by certified and registered engineers in compliance with relevant building codes, designs are expected to significantly mitigate these concerns. It is expected that Fire Service inspections and approvals in advance of building occupancy will further mitigate these concerns.

**Traffic Accidents and Disruption:** During construction, increased heavy vehicle traffic volume and spilt loads on public roadways all have the potential to cause traffic accidents, and affect motor vehicles, pedestrians, and workers. Heavily loaded trucks cause the road pavement to deteriorate, reducing quality of riding surface for all road users. Slow or queuing loaded or turning trucks may interfere with routine traffic. This will affect local area traffic, particularly commuters using the busy Leeward Highway in the vicinity. This risk is considered moderate without mitigation.

In the operations phase, no significant increase in local area traffic volume above current levels is anticipated. However, stakeholders advise that NEMO regularly hosts large meetings with parking requirements that exceed compound capacity in both “peacetime” and periods of disaster preparedness and response, resulting in use of the narrow adjacent road for parking, and adversely affecting traffic. The recommended options increase parking provisions, but this is still unlikely to fully meet the demand. The significance of traffic impacts is considered high without mitigation but could be reduced to low with mitigation.

The existing main site entrance is very close to the 5-way junction, and the consultant’s preferred options all require relocation of that entrance further away from the junction.

The existing NEMO boundary wall restricts lines of sight for persons approaching the junction.

**Noise and air pollution:** This sub-project has the potential to generate significant noise and dust levels in the construction phase, during:

- Demolition activity
- Site preparation (grading and excavating);
- Building construction; and
- Transportation, handling, and stockpiling of materials.

Note that pile driving which could have been a significant source of noise, is not intended.

In the operations phase, noise from NEMO HQ operations will not be dissimilar from current levels, and are not a concern for the surrounding area.

Noise levels at nearby sensitive receptors should not exceed the levels presented in Table 5.5 or result in a maximum increase in background levels of 3 dB at the nearest receptor location off-site. These noise level limits are provided in the WB EHSR reproduced in Section 5.2.

**Table 5.5. Noise level guidelines (WB, 2017)**

Receptor	one hour $L_{Aeq}$ (dBA)	
	Daytime 07:00 - 22: 00	Nighttime 22:00 - 07:00
Residential; institutional; educational	55	45
Industrial; commercial	70	70

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**Exposure to hazardous materials:** Significant quantities of hazardous materials are not likely to be transported or stored on this site either during construction or operation. However, accidental spills during transportation, or accidental release of chemicals such as fuels and oils stored on site for use in the works or operations are possible. Herbicides should not be used for vegetation control, particularly in the construction phase. Because the operations are near a waterbody, the sensitivity is high, but this may be managed with good construction and operational practice. All necessary precautions should be taken to reduce this risk from moderate to very low.

**Exposure to solid wastes:** This is possible if waste is not properly managed on site or is not properly transported and disposed of. Works contractors or waste collectors may dispose of waste illegally, resulting in environmental and aesthetic degradation at the illegal disposal site(s). Badly managed waste causes odour issues, attracts flies, vermin, and foraging animals, reduces area aesthetics, and is a nuisance to persons in the vicinity. These impacts are potentially highly significant for the surrounding communities but may be reduced to negligible levels with appropriate mitigation and good construction practice.

**Disease prevention:** This sub-project is not expected to require an influx of foreign labour into the community, with its attendant risks of increased communicable disease transmission. Transmission of agents of infectious disease is possible from human excreta (sanitation, hygiene and water-related). Increased incidence of vector-borne disease is possible through increased mosquito and rodent populations resulting from poor site water and waste management. Standing water can increase the incidence of mosquitoes, which may transmit dengue, chikungunya and zika. Poor solid waste management (particularly of food waste) can increase the incidence in rodents that may carry leptospirosis. Good site waste management and drainage will reduce this risk for the surrounding communities from moderate to negligible.

**Visual impacts:** Construction may result in negative visual impacts for the surrounding area. Potential contributors to adverse visual impacts include loss of views, poor design aesthetic, erosion, discolored waters, waste and material stockpiles, inadequate site housekeeping practices resulting in increased incidence of litter and garbage, and denuded landscape from loss of vegetation.

**Natural hazards:** The site's downslope boundaries are drained by a roadside drain to the west and a watercourse to the southeast. It should be ensured that existing drainage capacity is not reduced by site development. Flow volumes are not expected to increase significantly due to the proposed development, as impervious areas will not increase significantly. Impaired drainage due to blockage by debris and sediment resulting in flooding, unsecured materials that could become airborne missiles in high wind conditions, and poor storage of hazardous materials and wastes that become mobilized in high rainfall/flood conditions are all concerns during extreme weather events, during both construction and operation. These extreme events are expected to become more severe with climate change, increasing the potential scale of such impacts.

**External security:** NEMO HQ is the repository of important information for national security and equipment and must be adequately protected. NEMO has been broken into and supplies stolen on several occasions. The site is fenced but easily scaled. The river wall is also easily scaled. NEMO uses a private company for security. There is usually one unarmed guard on duty. The location of NEMO HQ and its inadequate security makes its compound vulnerable to pilferage in peacetime, and civil strife and unrest in post-disaster situations when persons become desperate for scarce supplies. The accommodation of

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security officers deployed during emergencies is also inadequate. During the sub-project construction, the contractor may rely on NEMO's security, or may augment this with additional security staff to protect items stored on site. If so, a security personnel plan should be required, to ensure that such staff are properly screened, trained and briefed regarding the specific requirements at the sub-project location.

**Internal security:** The safety of persons working in the building when the EOC is in operation is a concern. There is inadequate separation of male and female accommodation and washroom facilities.

The Table below assesses overall community health and safety risk and impact significance of the proposed works and operations at the various sites. It assesses potential impact significance with and without implementation of recommended mitigation measures. The detailed recommended mitigation measures are contained in Section 6 of this document. Links to the relevant recommendations are also provided in the following table.

**Table 5.6. Impact Significance of Proposed Activity on Community Health and Safety**

Resource/ Receptor	Impact	Sensitivity	Magnitude	Pre- Mitigation Significance	Mitigation Measures	Residual Significance
<b>CONSTRUCTION</b>		<b>PHASE</b>				
Residential areas and other users in the vicinity of the sub-project property	Utilities, noise, dust, traffic, wastes, disease vectors, natural hazards	High	Moderate	High significance	<a href="#">Noise-1</a> <a href="#">Water-3</a> <a href="#">Air-1</a> <a href="#">Waste-1</a> <a href="#">Traffic-1</a> <a href="#">Community Safety-2</a> <a href="#">Natural Hazards-1</a>	Low significance
Upslope communities	Visual impact	Moderate	Moderate	Moderate significance	<a href="#">Land-Use-1</a> <a href="#">Land-use-2</a>	Low significance
<b>OPERATIONS</b>		<b>PHASE</b>				
Facility users	Structural and fire safety	High	High	High sensitivity	<a href="#">Community Safety-1</a>	Low significance
Residential areas in the vicinity of the sub-project property	Utilities, noise, traffic, wastes, disease vectors, natural hazards, civil strife	High	Moderate	High significance	<a href="#">Community Safety-2</a> <a href="#">Community-Safety-3</a> <a href="#">Noise-2</a> <a href="#">Water-3</a> <a href="#">Air-1</a> <a href="#">Waste-1</a> <a href="#">Traffic-1</a> <a href="#">Natural Hazards-1</a> <a href="#">Land-Use-1</a>	Low significance

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Resource/ Receptor	Impact	Sensitivity	Magnitude	Pre- Mitigation Significance	Mitigation Measures	Residual Significance
Upslope communities	Visual impact	Moderate	Moderate	Moderate significance	<a href="#">Land-Use-1</a> <a href="#">Land-use-2</a>	Low significance

## ESS5. Land Acquisition, Restrictions on Land Use and Involuntary Resettlement

### The ESS

ESS5 requires that involuntary resettlement be avoided. Where involuntary resettlement is unavoidable, it will be minimized and appropriate measures to mitigate adverse impacts on displaced persons (and on host communities receiving displaced persons) will be carefully planned and implemented.

ESS5 objectives are to:

1. avoid involuntary resettlement or, when unavoidable, minimize involuntary resettlement by exploring project design alternatives.
2. avoid forced eviction.
3. mitigate unavoidable adverse social and economic impacts from land acquisition or restrictions on land use by:
  - providing timely compensation for loss of assets at replacement cost; and
  - assisting displaced persons in their efforts to improve, or at least restore their livelihoods and living standards in real terms, to pre-displacement levels or to levels prevailing prior to the beginning of project implementation, whichever is higher.
4. improve living conditions of poor or vulnerable persons who are physically displaced, through provision of adequate housing, access to services and facilities, and security of tenure.
5. conceive and execute resettlement activities as sustainable development programs, providing sufficient investment resources to enable displaced persons to benefit directly from the project, as the nature of the project may warrant.

This ESS applies to permanent or temporary physical and economic displacement resulting from the following types of land acquisition or restrictions on land use undertaken or imposed in connection with project implementation:

1. Land rights or land use rights acquired or restricted through expropriation or other compulsory procedures in accordance with national law;
2. Land rights or land use rights acquired or restricted through negotiated settlements with property owners or those with legal rights to the land, if failure to reach settlement would have resulted in expropriation or other compulsory procedures;
3. Restrictions on land use and access to natural resources that cause a community or groups within a community to lose access to resource usage where they have traditional or customary tenure, or recognizable usage rights. This may include situations where legally designated protected areas, forests, biodiversity areas, or buffer zones are established in connection with the project;

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4. Relocation of people without formal, traditional, or recognizable usage rights, who are occupying or utilizing land prior to a project-specific cut-off date;
5. Displacement of people as a result of project impacts that render their land unusable or inaccessible;
6. Restriction on access to land or use of other resources including communal property and natural resources such as marine and aquatic resources, timber and non-timber forest products, fresh water, medicinal plants, hunting and gathering grounds, and grazing and cropping areas;
7. Land rights or claims to land or resources relinquished by individuals or communities without full payment of compensation; and
8. Land acquisition or land use restrictions occurring prior to the project, but which were undertaken or initiated in anticipation of, or in preparation for, the project.

### Application to This Sub-project

The sub-project is confined to the existing NEMO HQ boundary. There will be no involuntary resettlement associated with this sub-project as no individual, farm-holding or household will be relocated from lands proposed to be developed under the sub-project, and no other lands are affected by sub-project implementation. Surrounding landowners may be affected by short term, moderate impacts such as increased traffic or noise during construction that are addressed under ESS4. Although beyond the scope of this project, it is worth noting that it would be prudent to develop a [Land-Use](#) plan for this and other suburban areas of Kingstown, to ensure that potential land use conflicts are minimized in the future.

### ESS6: Biodiversity Conservation and Sustainable Management of Living Natural Resources

#### The ESS

This ESS recognizes that protecting and conserving biodiversity and sustainably managing living natural resources are fundamental to sustainable development and it recognizes the importance of maintaining core ecological functions of habitats, including forests, and the biodiversity they support. ESS6 also addresses sustainable management of primary production and harvesting of living natural resources and recognizes the need to consider the livelihood of project-affected parties, including Indigenous Peoples, whose access to, or use of, biodiversity or living natural resources may be affected by a project.

The Convention on Biological Diversity (CBD) defines biological diversity as “the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems.” This definition implies that biological diversity concerns not only living organisms of all taxa but also ecosystem processes, habitats, hydrological cycles, processes of erosion and sedimentation, landscapes, etc. Biodiversity often underpins ecosystem services valued by humans. Impacts on biodiversity can therefore often adversely affect the delivery of ecosystem services.

ESS6 objectives are to:

1. protect and conserve biodiversity and habitats.
2. apply the mitigation hierarchy and the precautionary approach in the design and implementation of projects that could have an impact on biodiversity.
3. promote the sustainable management of living natural resources.



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4. support livelihoods of local communities, including Indigenous Peoples, and inclusive economic development, through the adoption of practices that integrate conservation needs and development priorities.

The environmental and social assessment is required to consider direct, indirect, and cumulative project-related impacts on habitats and the biodiversity they support. This assessment will consider threats to biodiversity, for example, habitat loss, degradation and fragmentation, invasive alien species, overexploitation, hydrological changes, nutrient loading and pollution. It will determine the significance of biodiversity or habitats based on their vulnerability and irreplaceability at a global, regional, or national level and will also consider the differing values attached to biodiversity and habitats by project-affected parties and other interested parties.

Habitat alteration is one of the most significant potential threats to biodiversity associated with intensive development, with the greatest potential for temporary or permanent alteration of terrestrial and aquatic habitats occurring during construction activities. Construction activities often require land clearing for the building footprint and supporting site management needs, waste and stockpile areas, and infrastructure such as temporary buildings and access, water management structures and transmission lines which can lead to:

- Loss of habitat and possibly biodiversity
- Impacts on adjacent eco-systems by noise, dust, pollution and contaminated water
- Disruption to existing movement of surface water and groundwater
- Reduced quantity and quality of downstream water bodies
- Potential harm to on-site and off-site wetlands
- Potential loss and fragmentation of continuous natural environment

Recommended strategies include consideration of the following:

- Determining whether any critical natural habitats will be adversely impacted or critically endangered or endangered species reduced;
- Determining whether the project is likely to impact any protected areas;
- Determining the potential for biodiversity offset projects (e.g. proactive management of alternative high biodiversity areas in cases where losses have occurred on the main site due to the mining development) or other mitigative measures;
- Determining whether the project or its associated infrastructure will encourage in-migration, which could adversely impact biodiversity and local communities;
- Consideration of partnerships with internationally accredited scientific organizations to, for example, undertake biodiversity assessments, conduct ongoing monitoring, and manage biodiversity programs;
- Consultation with key stakeholders (e.g. government, civil society, and potentially affected communities) to understand any conflicting land use demands and the communities dependency on natural resources and / or conservation requirements that may exist in the area.

### Application to This Sub-project

As explained under ESS3, environmental degradation is possible through nutrient loading and pollution. Water, erosion, and sediment control are a concern, primarily during construction. Earthworks will

change the natural surface and sub-surface water flow. Areas of excavation are prone to erosion, especially if located in areas with high intensity rainfall. Poor drainage can result in site damage in a very short time. The release of eroded sediment into water bodies is a significant factor in the degradation of downstream water quality and habitats (aquatic and marine), also potentially affecting downstream water resource users. Controlling storm water run-off is fundamental. It is essential to reduce the amount and speed of water runoff, to minimise its erosive power and the amount of sediment generated. The site is located more than 700m upstream of the North River mouth, so that sediment washed off this small site is unlikely to immediately reach the waterfront area in significant quantities. It could continue to move downstream in subsequent events until finally reaching the coastline.

A pollutant spill (e.g. diesel) at this location could be very damaging to aquatic and marine habitats if not well managed. This could occur in both construction and operational phases. A spill in the operational phase is potentially more damaging, due to the quantity of diesel stored at the location to run the generator.

It is noted that the existing site has no vegetation except for grass, and there is little if any opportunity for landscaping within the proposed development, given the high plot coverage by buildings proposed within this small site. As such, introduction of invasive species is highly unlikely. The immediate area is not considered to be a biodiversity hotspot, and there are no endangered species that will be impacted by the proposed development. The nearby Botanical Gardens is listed as one of the Important Bird Areas (IBA) of St. Vincent and could potentially be affected by noise generated by the sub-project.

The habitat supported by the watercourse adjacent to the sub-project site is not expected to be high value given the presence of dense built development on the riverbanks as they transit suburban and urban Kingstown towards the coast. Sewage management within riverbank properties is likely to be septic tank with or without soakaway or latrines, and water quality within the adjacent North River is expected to be relatively high in nutrients and coliforms. However, aquatic biodiversity is notoriously understudied in the region, and the precautionary principle should be applied in the management of this resource. The coastal area at the North River mouth is predominated by invasive sea grass that is unlikely to be significantly affected by sediment derived from erosion of this site.

The laws and regulations within St. Vincent that protect natural habitats and biodiversity are described earlier. The protection and conservation of biodiversity is fundamental to sustainable development. All identified potential impacts on biodiversity may be mitigated by the imposition of requirements for Best Management Practices (BMP) to be applied in construction and operation, and compliance with laws relating to noise, solid waste, chemicals and wastewater management outlined earlier. With careful planning and management, it is possible to minimise the effect of the development on biodiversity. With appropriate mitigation measures instituted, the proposed works will not result in loss of significant biological diversity and has low potential to introduce known invasive species.

Recommendations specific to this proposed development include:

1. Minimize bare soil exposure to prevent run-off.
2. Manage site drainage to divert clean water from active working areas, and direct it to drainage.

The Table below assesses risk and impact significance of the proposed works. It assesses potential impact significance with and without implementation of recommended mitigation measures. The

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detailed recommended mitigation measures in addition to the site-specific recommendations listed above are contained in Section 6 of this document. Links to the relevant recommendations are also provided in the following table.

**Table 5.7: Impact Significance of Proposed Activity on Natural Habitats and Biological Diversity**

Resource/ Receptor	Impact	Sensitivity	Magnitude	Pre- Mitigation Significance	Mitigation Measures	Residual Significance
<b>CONSTRUCTION</b>		<b>PHASE</b>				
Site biodiversity	Loss of critical habitat and biodiversity	Very Low	Low	Negligible		
Downstream biodiversity	Loss of critical habitat and biodiversity	Low	Low	Low significance	<a href="#">Water-1</a> <a href="#">Water-2</a> <a href="#">Water-3</a> <a href="#">Water-4</a> <a href="#">Water-5</a> <a href="#">Biodiversity-1</a> <a href="#">Biodiversity-2</a> <a href="#">Waste-1</a> <a href="#">Chemicals-1</a> <a href="#">Chemicals-2</a>	Negligible
Downstream landowners and coastal area users	Reduced water quality in adjacent watercourse and coastal areas	Moderate	Low	Low significance	<a href="#">Safety-8</a> <a href="#">Chemicals-1</a> <a href="#">Water-1</a> <a href="#">Water-2</a> <a href="#">Water-3</a> <a href="#">Water-4</a> <a href="#">Water-5</a> <a href="#">Biodiversity-2</a>	Negligible
<b>OPERATIONS</b>		<b>PHASE</b>				
Site biodiversity	Loss of critical habitat and biodiversity	Very Low	Very Low	Negligible		

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Resource/ Receptor	Impact	Sensitivity	Magnitude	Pre- Mitigation Significance	Mitigation Measures	Residual Significance
Downstream biodiversity	Loss of critical habitat and biodiversity	Low	Low	Low significance	<a href="#">Water-1</a> <a href="#">Water-3</a> <a href="#">Water-4</a> <a href="#">Water-5</a> <a href="#">Biodiversity-1</a> <a href="#">Biodiversity-2</a> <a href="#">Waste-1</a> <a href="#">Chemicals-1</a> <a href="#">Chemicals-2</a>	Negligible
Downstream landowners and coastal area users	Reduced water quality in adjacent watercourse	Low	Moderate	Low	<a href="#">Safety-8</a> <a href="#">Chemicals-1</a> <a href="#">Water-1</a> <a href="#">Water-3</a> <a href="#">Water-4</a> <a href="#">Water-5</a> <a href="#">Biodiversity-2</a>	Negligible

#### ESS8. Cultural Heritage

##### The ESS

ESS8 recognizes that cultural heritage provides continuity in tangible and intangible forms between the past, present and future. ESS8 sets out measures designed to protect cultural heritage throughout the project life cycle. Objectives of ESS8 are to:

1. protect cultural heritage from the adverse impacts of project activities and support its preservation.
2. address cultural heritage as an integral aspect of sustainable development.
3. promote meaningful consultation with stakeholders regarding cultural heritage.
4. promote the equitable sharing of benefits from the use of cultural heritage.

The term 'cultural heritage' encompasses tangible and intangible heritage, which may be recognized and valued at a local, regional, national, or global level, as follows:

- Tangible cultural heritage, which includes movable or immovable objects, sites, structures, groups of structures, and natural features and landscapes that have archaeological, paleontological, historical, architectural, religious, aesthetic, or other cultural significance. Tangible cultural heritage may be located in urban or rural settings, and may be above or below land or under the water; and
- Intangible cultural heritage, which includes practices, representations, expressions, knowledge, and skills—as well as the instruments, objects, artifacts, and cultural spaces associated therewith—that communities and groups recognize as part of their cultural heritage, as

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transmitted from generation to generation and constantly recreated by them in response to their environment, their interaction with nature, and their history.

#### Application to This Sub-project

The 1972 UNESCO Convention Concerning the Protection of the World Cultural and Natural Heritage is the reference for international recognition of physical and cultural heritage. Saint Vincent ratified this in 2003.

The sub-project site itself has reportedly been subject to several developments over time, and any chance finds during construction are likely to relate to those uses, rather than to the pre-Columbian and Colonial era. However, contractors should always be aware of the possibility of chance finds, and how to respond to them.

The Botanical Gardens are an important cultural heritage site within the sphere of influence of this sub-project. The site management does not anticipate that there will be significant adverse impacts on the assets of the Gardens, or on the access to these. Any adverse impacts on site flora and fauna will be low and short term.

**Table 5.8. Impact Significance of Proposed Activity on Cultural Heritage (construction and operations phases)**

Resource/ Receptor	Impact	Sensitivity	Magnitude	Pre- Mitigation Significance	Mitigation Measures	Residual Significance
Unknown cultural heritage within the site	Damage or destruction	Moderate	Low	Low significance	<a href="#">Culture-1</a>	Negligible

#### ESS10: Stakeholder Engagement and Information Disclosure

The ESS recognizes the importance of open and transparent engagement between the Borrower and project stakeholders as an essential element of good international practice. Effective stakeholder engagement can improve the environmental and social sustainability of projects, enhance project acceptance, and make a significant contribution to successful project design and implementation.

“Stakeholder” refers to individuals or groups who:

- (a) Are affected or likely to be affected by the project (project-affected parties); and
- (b) May have an interest in the project (other interested parties).

Objectives of ESS10 are to:

1. establish a systematic approach to stakeholder engagement that will help identify stakeholders and build and maintain a constructive relationship with them, in particular project-affected parties.

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2. assess the level of stakeholder interest and support for the project and enable stakeholders' views to be account for in project design and environmental and social performance.
3. promote and provide means for effective and inclusive engagement with project-affected parties throughout the project life cycle on issues that could potentially affect them.
4. ensure that appropriate project information on environmental and social risks and impacts is disclosed to stakeholders in a timely, understandable, accessible, and appropriate manner and format.
5. provide project-affected parties with accessible and inclusive means to raise issues and grievances and allow Borrowers to respond to and manage such grievances.

[Application to This Sub-project](#)

The Stakeholder Analysis for this sub-project is provided in Section 1.9. This identifies the sub-project stakeholders.

Section 4.11 describes the Public Consultation Process applied for this sub-project. Persons engaged as part of the ESIA/ESMP process are listed in Appendix 2.

The Stakeholder Engagement plan recommended for the remainder of sub-project implementation is provided in Section 7.9.

## 6.0 Mitigation Measures

### 6.1 Overview

The previous section outlined the type and scope of sub-project activities in relation to specific ESS, and their possible impacts. It also referenced mitigations that may be implemented as outlined below. Some of these are further expounded on in Appendices.

The World Bank Environmental and Social Framework provides a mitigation hierarchy, in which preference is given to avoid or minimize the potential impact. This hierarchy is as follows:

1. **Avoid Impacts.** Remove the source of the impact (by avoiding the specific action or resource area).
2. **Minimize Impacts.** Where the impact cannot be completely avoided, reduce the magnitude of the impact.
3. **Compensate or Offset Impacts.** Where significant residual impacts would remain after exhausting avoidance and minimization options, provide compensation or offsets for the impact, where technically and financially feasible.

All of the following ESS have been determined to be relevant:

- ESS1: Assessment and Management of E&S Risks and Impacts
- ESS2: Labour and Working Conditions
- ESS3: Resource Efficiency and Pollution Prevention
- ESS4: Community Health, Safety, and Security
- ESS5: Land Acquisition and Involuntary Resettlement
- ESS6: Biodiversity Conservation and Sustainable Management of Living Natural Resources
- ESS8: Cultural Heritage
- ESS10: Stakeholder Engagement and Information Disclosure

Most recommended management measures are considered best practice or are required in compliance with the law, and ascribed a cost of USD 0, as they should not result in additional cost. All BMPs are to be properly inspected and maintained on a frequent basis to ensure they are functioning properly, and this is also assumed to be at no incremental cost. Monitoring costs are detailed in the summary of costs in the following section.

The implementation of a Grievance Redress Mechanism that would facilitate receipt and response to public complaints among other things through construction and operation phases is also addressed in a later section.



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## 6.2 Environmental and Social Mitigation Measures

Appendix 3 provides details of recommended environmental and social mitigation measures referenced in Section 5. For ease of access, and an overview of the scope of recommended measures detailed in Appendix 3, they are listed below and links to each measure are provided. The Contractor and NEMO are ultimately responsible for compliance with recommendations in the construction and operations phases respectively. They are expected to contract service providers and works contractors, and these entities should also be required to comply. As such, in the table below, the responsibility for mitigation measure implementation is shared with the designers in the design phase; the contractors in the construction phase, and NEMO in the operations phase.

### 6.2.1 Labour, Health and Safety

[Safety-1](#): Health and Safety Features of Site Design and Equipment

[Safety-2](#): Occupational Health and Safety Policy and Plan

[Safety-3](#): Personal Protective Equipment

[Safety-4](#): First Aid and Accident Response

[Safety-5](#): Monitoring and Reporting

[Safety-6](#): Electrical Safety and Isolation

[Safety-7](#): Noise and Vibration

[Safety-8](#): Chemicals and Hazardous Substances

[Safety-9](#): Training in Safe Working Conditions

[Safety-10](#): Working Environment Temperature

[Safety-11](#): Ergonomics, Repetitive Motion, Manual Handling

[Safety-12](#): Working at Height

[Safety-13](#): Air Quality

[Gender-1](#): Gender Equality

[Labour-1](#): Access to new job opportunities

[Labour-2](#): Capacity to access job opportunities

### 6.2.2 Water Resources

[Water-1](#): Stormwater, Erosion, and Sediment Control

[Water-2](#): Water Quality Monitoring Program

[Water-3](#): Wastewater Management

[Water-4](#): Vehicle and Equipment Operation and Maintenance

[Water-5](#): Storage and Movement of Petroleum and other Fuel

[Water-6](#): Water Conservation

### 6.2.3 Air Quality

[Air-1](#): Fugitive Dust Management

[Air-2](#): Equipment Emissions and Pollution Controls

[Energy-1](#): Energy Efficiency

[Energy-2](#): Energy Conservation

### 6.2.4 Solid Waste

[Waste-1](#): Solid Waste Management Plan (construction and operations phases)

### 6.2.5 Chemicals Management

[Chemicals-1](#): Hazardous Materials Management

[Chemicals-2](#): Spill prevention and Control

### 6.2.6 Community health, safety and security

[Community Safety-1](#): Structural Safety

[Community Safety-2](#): Disease Prevention

[Community-Safety-3](#): Site Security

[Noise-1](#): Noise Abatement and Community Coordination (construction phase)

[Noise-2](#): Noise Abatement and Community Coordination (operations phase)

### 6.2.7 Land use, Landscape and Visual Character

[Land-Use-1](#): Community participation in area land use plans

[Land-use-2](#): Visual impacts on community

### 6.2.8 Biodiversity

[Biodiversity-1](#): Terrestrial Habitat Management

[Biodiversity-2](#): Aquatic/Marine Habitat Management

### 6.2.9 Traffic Circulation and Safety

[Traffic-1](#): Traffic Management Plan

### 6.2.10 Cultural Heritage

[Culture-1](#): Chance Finds of Heritage Value

### 6.2.11 Natural Hazards and Climate Change

[Natural Hazards-1](#): Emergency Response Plan

## 6.3 Summary of significant impacts and mitigations

### 6.3.1 Highly significant impacts

#### **Construction phase**

In the construction phase, potential adverse impacts of high significance include:

1. Occupational safety and working conditions of sub-project workers
2. Typical construction impacts such as traffic, noise, dust, solid waste, disease vectors and performance of the site through a natural hazard event, affecting neighbours and adjacent road users

All of these will persist for the duration of construction. Application of construction BMPs as outlined will ensure that these are adequately mitigated, with no significant residual impacts.

#### **Operations phase**

Once operational, the proposed development will provide the environment to facilitate improved performance of NEMO in both emergency planning and EOC operations, with benefits for both the staff and the entire affected population. This outcome is contingent on a thoughtful design that better meets the operational needs of NEMO, within a building that is designed and constructed to the appropriate standards to enable it to perform through and after extreme events. This is also important to protect the safety of users during an extreme event.

Highly significant potential adverse impacts during the operations phase include:

1. Structural and fire safety, for building occupants
2. Occupational health of the workforce in the building
3. Site traffic, affecting neighbours and adjacent road users

Potential traffic impacts on community in the operations phase are of concern due mainly to lack of sufficient parking space to accommodate NEMO/EOC meeting attendees. Approaches to help mitigate this include:

1. Relocation of the warehousing function to another location, to both increase available parking space and reduce parking requirements at this location
2. Prior arrangements by NEMO management for parking at nearby facilities
3. Carpooling by meeting attendees

### 6.3.2 Moderately significant impacts

#### **Construction phase**

During construction, there is moderate potential to generate jobs for local communities. This is expected to benefit mostly men. Care must be taken to ensure that vulnerable groups including women and indigenous persons living in the vicinity are not discriminated against and have an equal opportunity to access employment on the sub-project.

Other potential risks of moderate significance in the construction phase are:

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1. Occupational health of construction workers and other workers on site
2. Pollution of land, air and water resources within the site footprint, due to storage and burning of diesel for power supply
3. Pollution of water resources beyond the site in the event of inadvertent diesel or other pollutant loads

### **Construction and Operations phases**

For the life of the sub-project (i.e., through both construction and operations), the following risks are considered of moderate significance:

1. Visual impacts on upslope communities
2. Greenhouse gas emissions, due mainly to fossil fuel combustion (whether on site or at municipal power plants)

### **Operations phase**

In the operations phase, also of potential moderate significance are:

1. Occupational safety and working conditions of the workforce in the building
2. Pollution of water resources on and beyond the site

Implementation of best management practices would mitigate all of these risks.

Potential impacts on biodiversity are of low significance despite the site being located on the bank of a river, as the property is relatively small and is already developed, within an urbanized space of low biodiversity value, well upstream of the coast.

As is the case for many construction projects, the number of potentially adverse impacts identified is considerably greater than the number of potentially beneficial impacts, particularly during the construction phase. This is because a rigorous approach has been taken to impact identification, and reflects the fact that construction works of the type proposed involve a wide range of activities, many of which are potentially damaging to the environment. It should not be construed as indicating that the sub-project is environmentally unacceptable. Assuming implementation of the specified mitigation measures, potential adverse impacts can typically be reduced to acceptable residual levels. In the interest of enhancing overall environmental performance of the sub-project, benefit enhancement and adverse impact mitigation measures have been specified in relation to all significant impacts, even when a low level of impact can be anticipated.

## **6.4 Cumulative Impacts**

This development together with other developments within Kingstown that may occur simultaneously (e.g. new port development on the Kingstown waterfront, nearby construction of a nurses hostel, construction of a Health EOC on the vacant lot opposite NEMO HQ) could significantly impact city and area traffic.

NEMO HQ works and other simultaneous developments adjacent to the North River (such as the Health EOC and nurses hostel) combined with port development in the Kingstown Bay could have cumulative

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impacts on coastal water quality and biodiversity. Noise, dust and other construction impacts on neighbours and road users could also be compounded in the immediate vicinity.

## 6.5 Residual Impacts

With genuine and sustained application of best management practices by the contractor and NEMO, potential adverse impacts may be satisfactorily mitigated. There are no significant residual impacts, except for potential traffic impacts in the operations phase, due to inadequate parking provisions.

## 6.6 Analysis of Alternatives

### 6.6.1 Sub-project Alternatives and Options

A number of options have been derived to enhance the existing NEMO HQ location to meet the performance specifications provided to the extent possible within the physical constraints of this site. A preferred option from among these had not been selected at the time of writing this report. As noted earlier, this does not have any real implications for the findings and recommendations in this report.

Notably, consideration of an alternate site was not an option. This was an option that was recommended by several stakeholders engaged, for reasons including:

1. Inadequate space to properly accommodate all requirements (staff accommodation, facilities, storage of relief supplies, parking) within the boundary. In the last disaster, containers were parked on the road between the bridge and the junction, requiring road closure.
2. Poor access for large container traffic, necessary for movement relief supplies. This affects area traffic.
3. Parking is grossly inadequate and spills over to the adjacent road where there is no verge or pedestrian accommodation.

Despite these site-related drawbacks, the current location is ideal given, by virtue of the road network, with features including:

1. Proximity to the hospital
2. Proximity to Kingstown
3. Proximity to residences of the Prime Minister and the Governor General. Both are important functionaries in emergencies.
4. Ready access to windward, leeward, and central areas.

Note that relocation of the warehousing function from this location was considered and recommended in this analysis.

### 6.6.2 The “Do Nothing” Alternative

NEMO HQ requires expansion, reconfiguration and updating to meet the needs of modern emergency management. Without this, the NEMO/EOC operations will be inadequate, and compromise future emergency planning, preparedness, and response. Sub-project implementation is critical, given the high vulnerability of the country to a broad range of disasters.

The existing HQ building is not performing optimally and requires retrofitting to ensure acceptable health and safety conditions for NEMO staff and other building users.

### 6.6.3 Uncertainties in the Analysis

This EIA was prepared during the initial sub-project design phase. Consequently, the precise nature and scope of works and the final form of the proposed structures and ancillary works had not been fully defined.

There is limited national and/or local area data available to provide baseline information and benchmarks, to inform both the environmental and social analyses. This statement applies to areas such as:

1. Water quality (aquatic and marine)
2. Noise
3. Dust
4. Emissions
5. Traffic (volume and loads)
6. Community health
7. Gender
8. Workplace-related accidents

Sources and experts with subject and geographical area knowledge are typically able to provide valuable qualitative information, together with their sense of level of uncertainty, and to provide their expert judgement. Use of expert judgement is acceptable, provided that it takes into account any relevant available data and involves reasoned formation of opinions by someone with special knowledge or experience with the particular quantity being examined, and provided that the judgement is documented and can be explained with sufficient clarity to satisfy outside scrutiny (Cullen and Frey, 1999). While there must be considerable reliance on expert judgement, going forward, it is important to develop databases to improve knowledge and more reliably inform policy decisions.

In the absence of reliable data, the approach of rigorously applying the precautionary principle is critical to minimize possible harm to people, communities, and natural resources, as is the need to ensure constant and consistent monitoring of recommended mitigation measures and actions. A rigorous approach has been taken to impact identification, considering the likelihood of occurrence and other characteristics of a very wide range of potential impacts, based on experience of similar projects in the vicinity and elsewhere, as well as on consultation with several local bodies with social and environmental interests. As such, there is very little uncertainty in this impact assessment. A rigorous approach has also been adopted in relation to adverse impact minimisation and avoidance and to benefit enhancement, such that effective control of impacts will be possible, regardless of the effect which any residual uncertainties regarding the precise nature and scope of the works may have on the nature and extent of predicted impacts.

## 6.7 Overall Sub-project Environmental Impact

Although many potentially adverse impacts have been identified, all can be mitigated satisfactorily through adoption of the specified mitigation measures, and residual impacts can be reduced to acceptable levels, provided that the measures are fully adopted and/or enforced.

The beneficial impacts associated with the sub-project relate primarily to enhancement of the NEMO HQ, to make it fit for purpose in the modern era, and to improve its structural and fire safety. The long-term benefits of sub-project implementation outweigh the adverse impacts, if recommended BMPs are

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implemented, thereby mitigating potential adverse impacts. With this assumption, from a social and environmental impact perspective, there are no grounds for concluding that the sub-project as currently conceived should not proceed.

## 7.0 Environmental and Social Management Plan

Mitigation measures outlined in the previous sections are recommended to avoid or reduce impacts to less than significant levels. The following were also provided for each recommended mitigation measure:

1. The potential impact to be mitigated
2. The party(s) responsible for implementation of the specified measure(s)
3. The timing required for implementation of the recommended measure

This section provides details of institutional arrangements required to properly manage and monitor this sub-project and summarises costs of proposed mitigation and monitoring.

### 7.1 General Considerations

Effective implementation of the recommended measures is necessary to avoid, minimise or offset adverse impacts and to promote beneficial impacts, resulting in an enhancement of the overall environmental performance of this sub-project. Effective environmental management can only be achieved if it is carried out within a formalised framework based on some fundamental general principles. These are:

1. Environmental management should be fully integrated within the overall project management framework, directed towards achieving an environmentally sustainable project which meets its intended purpose, functions efficiently throughout its life, and results in minimal adverse environmental impact.
2. Environmental management should not be considered as separate from other activities relating to preparation, implementation and subsequent operation of the sub-project.
3. Individual management/monitoring responsibilities and functions need to be clearly defined to ensure that there are no gaps which might prejudice environmental performance of the sub-project.
4. Procedures relating to environmental management should be formulated to cause minimum disruption to, and fully integrate with, other aspects of project management. The usual management structure, reporting systems and meetings should be used for environmental management.
5. Successful environmental management requires a strong commitment at all levels of project management, and in all bodies concerned, if it is to achieve worthwhile results. Effective and timely liaison between the various relevant bodies is also vital.

Environmental monitoring is a basic tool to provide information for decision-making by project management. It should be organised in a manner that facilitates the early recognition of potential problems, so that appropriate remedial action can be initiated before serious environmental damage, danger or inconvenience have been caused. Monitoring of social and environmental impacts is required for:

1. Assurance of contractor compliance with standards and conditions set by the regulatory authorities and the client's contract
2. Assessment and control of emerging impacts and risks

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3. Dissemination of accurate and timely information to stakeholders
4. Determination of the efficiency and effectiveness of the mitigation measures required of the Contractor/NEMO
5. Identification of required adjustment to mitigation measures when necessary, to enable the project to meet the expected ESSs

## 7.2 Organisational Aspects

Project environmental management and monitoring usually involves several bodies, both private and public, each with its own organisational structure, role and responsibilities, and this sub-project is no exception. These bodies will need to work co-operatively, within a coordinated framework, if efficient and effective environmental management of this sub-project is to be achieved.

The environmental monitoring framework should be underpinned by the following imperatives:

1. The need to utilise existing arrangements where possible
2. The need to improve and augment inter-agency co-operation and collaboration
3. The need to ensure that local communities are appropriately and adequately represented
4. The need to ensure transparency in the overall process of monitoring

The following key responsibilities are central to the successful and effective functioning of this framework:

1. Oversight of compliance with contract and regulator requirements
2. Data collection, management and analysis
3. Information dissemination
4. Formulation of follow up/redress actions

Responsibilities of the various parties through the various project phases are outlined in subsequent sections.

### 7.2.1 VEEP PIU

The PIU E&S Specialists in collaboration with the PSIMPU Focal Point are charged with intermittently spot checking the works for compliance with the approved plans and ESS, as well in response to public complaints. This includes ensuring that environmental aspects are given due consideration during construction and operation. These officers will call in their counterpart(s) in other government or statutory agencies as the situation warrants, and in accordance with the approved monitoring plan. 7.2.2 Physical Planning Unit (PPU)

Although the planning legislation does not bind the Crown, the PPU should be requested by the VEEP to review all development plans and this ESIA in advance of commencement of construction, and make recommendations for VEEP consideration prior to plan finalisation, to ensure that all aspects of the sub-project, including environmental aspects, are properly managed and implemented, in accordance with this ESIA and planning requirements.

The PPU will undertake inspections required in accordance with the Town and Country Planning Act (Cap. 334), to support later issuance of an Occupancy Certificate by the Physical Planning and Development Board. The Physical Planner is to be notified in accordance with the Act.



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### 7.2.3 Ministry of Works (MOW)

The MOW is required to, in consultation with the Traffic Police, approve the Contractor's Traffic Management Plan and any signage proposed to be erected by the Contractor on public roads, intended to warn the public of construction traffic.

All the proposed works will be confined to within the Developer-owned property. If any significant disruption of normal traffic is anticipated, such as loss or reduction of one or more traffic lanes or parking, or slow traffic due to construction traffic turning on or off site, this would be most likely on the boundary with the main site entrance.

The Electrical Inspectorate within the Ministry is required to inspect electrical installations certified by licensed electricians for compliance with the relevant Codes before they can be powered up by GRENLEC. The building should be required to re-certify compliance by the same procedure every three years once in operation.

### 7.2.4 Fire Service

The Fire Service should be requested to review development plans and make recommendations in advance of plan approval, as part of the recommended PPU review. The support of the Fire Service should be solicited, to participate in specific inspections in advance of the issuance of the Occupancy Certificate by the Physical Planning and Development Board. This is to ensure that LFS requirements are adequately met.

### 7.2.5 Department of Labour

This Department is responsible for checking Contractor compliance with the prevailing labour laws and regulations. They will respond to and investigate any complaint made by an employee against the Contractor. *Ad hoc* inspections by Labour Officers are anticipated.

### 7.2.6 Ministry of Health, Environmental Health Department (EHD)

This Department is responsible for administering the environmental and public health provisions of the various public health laws.

The EHD is typically required to review and approve design plans submitted for PPU approval. They should be requested to review these plans as part of the PPU-review process, to verify that requisite vector control measures, wastewater management provisions and other public health requirements are adequately built into the design before approval is granted.

In the construction phase, they will be concerned, in the interest of public health protection, with the Contractor's sanitation provisions within the work site and in the proper management of activities relating to emptying and disposal of septage from septic tanks.

### 7.2.7 Department of Forestry

The Department is a referral agency of the PPU and acts in an advisory capacity to agencies such as the PPU, to ensure that activities will not unnecessarily compromise area biodiversity.

### 7.2.8 Supervision Consultant

The VECP will procure, using the applicable procurement rules for project financing, the services of a suitably qualified Supervising Consultant to manage, coordinate and supervise the procurement of sub-project goods, services, works and related activities. The Consultant is expected to use Standard Forms

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of Contract for these, which effectively protect the interests of all contracting parties by mutual agreement. The VEEP will require a competitive bidding process to be developed by the Supervising Consultant for the selection of suppliers, service providers and contractors. These will be required to meet stipulated criteria, whether through a prequalification process or as part of their tender submissions. Selected contractor(s) will be required to have on their project management teams, personnel with the appropriate project management and other skills required for the successful construction of this sub-project. Environmental management requirements of the Contractor should be included in their contract conditions.

Environmental management and monitoring responsibilities of the supervising consultant will relate primarily to ensuring that provisions that will protect the safety of workers are complied with and that the Contractor is following all approved plans such that the impacts of construction activities on the environment as well as on building occupants, and users of adjacent roadways, properties and public spaces are minimised. The supervising consultant is to be authorised under the Contract to order immediate suspension or a halt to any activity which is causing or is likely to cause significant environmental damage or social disruption, and to require the contractor to make good any such damage at his own expense, in accordance with the instructions of the supervising consultant. The supervising consultant is also to have the power to require the immediate and permanent dismissal from site of any member of the workforce who is committing or has committed acts prejudicial to the environment including unsanctioned felling of trees, theft or interference with property, washing of tools in watercourses and offensive behaviour.

Monitoring responsibilities of the various consultants through the various phases are outlined below.

### 7.3 Pre-Construction Phase Activities and Responsibilities

For the purposes of environmental management, the pre-construction phase is considered to extend from the initial stages of project preparation to completion of final designs and tender documents, Contract award, and Contractor preparations in advance of mobilisation on site.

Environmental management activities during this phase comprise ensuring that:

1. all government procedures relating to environmental matters have been (or will be) complied with, prior to commencement of construction,
2. detailed designs incorporate appropriate features aimed at minimising adverse impacts and enhancing beneficial impacts,
3. tender documents for contractors contain appropriate clauses to allow effective and efficient control of environmental impacts arising from construction activities,
4. Contractor submissions comply with contractual requirements.

#### 7.3.1 Design and Supervision Consultant Responsibilities

The pre-construction functions will be split across the Design Consultant (to document finalization stage) and the Supervision Consultant (through procurement stage).

The design recommendations for improved environmental performance are to be incorporated into the sub-project plans in advance of commencement of site works. The Consultant should also develop Environmental, Social and Health Standards (ESHS) to be included in the technical specifications in the works tender documents.

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The VEEP through its designer is expected to obtain Environmental Health Department approval. It is recommended that the plans also be submitted to PPU for review, which will include review by the Fire Service, Ministry of Works, the Electrical Inspectorate and any others deemed necessary by the PPU.

Tenderer briefings by the Supervising Consultant to inform tender preparation should include the background and context of the approach to environmental management which will be taken during the construction phase. A summary of key adverse impacts and the contractual obligations which will be imposed on contractors to minimise occurrence and severity of construction impacts should be provided.

The briefing of tenderers should draw attention to the following:

1. Their contracts will contain several clauses which are intended to control adverse impacts, in line with meeting the environmental policies of the Government.
2. Environmentally friendly construction involves little more than the adoption of good construction practices.
3. Contractor is required to take all reasonable steps to protect the environment on- and off-site, and to avoid damage or nuisance to persons or property arising from pollution, noise or other issues arising because of his methods of operation.
4. The Environmental Management Plan and Site Management Plan (inclusive of traffic management plan) that must be part of their tender must comply with the BMPs outlined and will require approval of the relevant authorities.
5. Contractor will be responsible at its own cost for taking immediate remedial action and payment of compensation for any environmental damage resulting from his actions.
6. Environmental monitoring and reporting will be required of the Contractor.
7. Contractor will be required to immediately and permanently dismiss from site, any member of the workforce who is committing or has committed acts prejudicial to the environment and in contravention of its Environmental Management Plan.
8. Construction supervision will include monitoring of, and reporting on, environmental aspects.

The successful tender is expected to have been vetted by the Supervising Consultant to ensure it meets the environmental requirements stipulated before a contract is awarded.

#### 7.3.2 Contractor Submissions required before Mobilizing

As part of its tender, the Contractor is to develop a simple **Contractor's Environmental and Social Management Plan (C-ESMP)** as part of its tender, that adequately addresses, in accordance with BMPs:

1. Traffic management
2. Health and safety (of the workforce and the public)
3. Worker sanitation
4. Noise and dust management
5. Erosion and sedimentation control
6. Protection of biodiversity
7. Construction waste management (to include a description of how wastes will be stored, collected, and disposed of in accordance with the laws of St. Vincent and the Grenadines)

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8. Fuel, oil, and other hazardous material management (including estimated quantities to be used, storage plans, spill control plans, and waste disposal practices to be followed)
9. Emergency preparedness (particularly for accidents and extreme natural events)

Before mobilizing, the Contractor is expected to have obtained approval of the Supervising Consultant and relevant authorities (as outlined below), of the following documentation:

1. Method Statement including an Environmental Management Plan that expands on the Plan provided in the tender, and a Site Management Plan
2. Proposed Construction Programme
3. Traffic Management Plan
4. Code of Conduct for Contractor's Personnel that will apply to the contractor's employees and subcontractors, to ensure compliance with its Environmental, Social, Health and Safety (ESHS) obligations under the contract (See Appendix 4).

The **Site Management Plan** to be approved by the Supervising Consultant, must show details of:

- Limits of site clearance
- parking of heavy equipment and other vehicles
- location of waste receptacles and sanitary facilities
- storage of materials
- stockpile locations
- measures to be employed to protect drainage and water courses from accidental spills, debris and silt
- erosion control measures

The Traffic Management Plan is to be submitted to the Ministry of Works/Traffic Police and the Environmental Management Plan to the EHD for review and approval in advance of contractor mobilization.

### 7.3.3 Requirements of PPU and Referral Agencies

The PPU and referral agencies are to be requested by VEEP to:

1. Review design plans and ESIA submitted for approval
2. Review specific Contractor submissions, such as the Traffic Management Plan and Environmental Management Plan
3. Make their staff aware of the requirements for their monitoring, advice, and enforcement.

### 7.4 Construction Phase Activities and Responsibilities

From the point of view of environmental management and monitoring, the construction phase is considered to extend from the mobilization of the Contractor to completion of the construction works.

Environmental management during the construction phase will ensure that environmental aspects of construction implementation are managed so that adverse impacts associated with the construction process are satisfactorily mitigated and reduced to an acceptable level.

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All supervisory staff and management are to be familiar with the Contractor's Environmental Management Plan (C-ESMP) and their role in its successful implementation. High level project management during construction, including general oversight and direction, will be the responsibility of the Contractor's Project Manager and the Supervision Consultant. Overall primary responsibility for day-to-day construction supervision and contract management, and therefore for environmental management during construction, will lie with the contractor's Foreman and Assistant Foremen.

Effective routine and periodic maintenance of infrastructure and equipment is critical to ensure optimal environmental performance of project activities. Routine maintenance activities will include:

1. Routine inspection and maintenance of site infrastructure and works including safety elements such as access, signage, drainage, excavations, scaffolding, PPE, spill response equipment, toilets, water supply, oil and fuel storage, etc.
2. Equipment servicing and maintenance in accordance with manufacturers' recommendations and observing relevant BMPs.

Some of these may require the use of external service providers. Most will be undertaken by in-house staff, who are to be adequately trained and provided with the requisite tools, consumables, spare parts, and fittings. Supervision Consultants must maintain a log of maintenance work undertaken and stores and consumables used, using a simple template that should be developed by the Contractor.

Emergency drills should be undertaken to prepare staff to respond to emergencies or other adverse events.

A senior member of the contractor's workforce should also be designated as the Health, Safety and Public Liaison Officer. This Officer will take lead responsibility in ensuring that the Developer's Environmental Management Plan is complied with and that proper records are kept and are available for inspection and auditing by the Supervising Consultant and external agencies as required. The officer will also be the Contractor's designated Grievance Redress Mechanism focal point.

The PSIMPU/PIU E&S Specialists will also perform a monitoring role through the construction phase, as outlined in Section 7.2.1. It will be their responsibility to ensure that other public sector agencies with a monitoring role are kept informed of implementation progress and are provided with sufficient notice to facilitate their effective monitoring at milestones to be agreed.

#### 7.4.1 Environmental Monitoring and Reporting

The Contractor is to ensure that adequate resources are made available and deployed in a timely manner to support its environmental management and monitoring responsibilities.

##### 7.4.1.1 Staff Briefing

Staff briefings should include the background and context of the approach to environmental management which will be taken during the construction phase, and should draw their attention to the following:

1. A summary of key potential adverse impacts and the requirement to minimise their occurrence and severity.

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2. Their role in the implementation of Best Management Practices (as contained in the Contractor's Environmental Management Plan in line with the environmental policies of the Government) to be observed to control adverse impacts.
3. Supervision and direction on site by their supervisors will include monitoring and enforcement of their compliance daily.
4. The role of the Contractor's designated Health, Safety and Public Liaison Officer in monitoring and reporting on site, and the need to cooperate fully.
5. The role of the Supervising Consultant.

*7.4.1.2 Day-to-day Monitoring and Reporting by Contractor*

Day-to-day environmental monitoring will be carried out by the Health, Safety and Public Liaison Officer, working under the supervision and immediate direction of the Project Manager. Their work will comprise systematic observation of all site activities, as a check that the requirements relating to environmental matters are being complied with, and that no unforeseen impacts are occurring. The Project Manager's inspections will also cover wider environmental matters not directly concerned with actual construction such as off-site temporary storage and impacts of haulage activities on the public.

Monitoring will take the form of visual observations carried out concurrently with the engineering monitoring activities. No instrumental monitoring will be carried out, unless there is an issue determined by the relevant authorities that warrants effects monitoring to be undertaken.

Site inspections will take place with emphasis on early identification of any environmental problems and the initiation of suitable remedial action through instructions to the workers or sub-contractors. Where remedial actions have been required, further checks will need to be made to ensure that these are being implemented to the agreed schedule and in the required form. As experience of the principal problem areas is gained, attention will be concentrated on activities which are known to be the most troublesome.

The Health, Safety and Public Liaison Officer will report to the Project Manager daily, using the company's standard report form which should include key environmental matters in addition to the normal engineering observations. This should capture the areas of concern identified in the recommended E&S monitoring form provided in Appendix 6. The Project Manager will decide on the appropriate course of action to be taken in cases where unsatisfactory environmental reports are received from the Health, Safety and Public Liaison Officer. In the case of minor matters, verbal advice to the workers on the need for remedial action may suffice. In all serious cases the Project Manager has the responsibility to order a stop to any aspect of the works where serious environmental damage or public nuisance/safety hazard is either imminent or has already been caused.

Weekly reports prepared by the Health, Safety and Public Liaison Officer for submission to the Project Manager and Supervising Consultant will summarise environmental matters, including the results of the daily site monitoring, remedial actions which have been initiated, and whether the resultant action is having the desired result. The reports will also identify any unforeseen environmental problems and will recommend suitable additional actions. Recommended Mitigations for this project are provided in Appendix 3.

The Project Manager will ensure that these reports are available for inspection by officers of named authorities, to include:

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- EHD,
- Ministry of Works,
- Electrical Inspectorate,
- PPU,
- Labour Department,
- Traffic Police.

All incidents, accidents or near misses related to the Project which has, or is likely to have, a significant adverse effect on the environment, communities, the public or workers including cases of sexual exploitation and abuse (SEA), sexual harassment (SH), accidents that result in death, serious or multiple injuries, cases of COVID-19, dengue and tuberculosis among project workers must be reported immediately to the Supervision Consultant and PSIMPU/PIU. The relevant authorities must be informed promptly and any relevant legal requirements adhered to. The form provided in Appendix 5 must be completed by the Contractor and provided to the Supervision Consultant and the PSIMPU/PIU within 48 hours of the incident.

An ESS File is to be maintained on site. The C-ESMP is to be included in this file.

#### 7.4.2 Supervision Consultant's Responsibilities

Environmental monitoring is an essential tool in relation to environmental management as it provides the basis for rational management decisions regarding impact control. The monitoring programme for the sub-project will be undertaken to check on whether mitigation and benefit enhancement measures have actually been adopted, and are proving effective in practice, and to provide a means whereby any unforeseen impacts can be identified, and to provide a basis for formulating appropriate additional impact control measures if these appear to be necessary. Recommended Mitigations for this project are provided in Appendix 3. There are two basic forms of environmental monitoring:

- *Compliance monitoring*, which checks whether prescribed actions have been carried out, usually by means of inspection and/or enquiries.
- *Effects monitoring*, which records the consequences of activities on one or more environmental components, and usually involves physical measurement of selected parameters or the execution of surveys, to establish the nature and extent of induced changes.

Compliance monitoring is usually given more emphasis in the case of building construction projects than effects monitoring. This is because most impact controls take the form of environmental protection measures incorporated in the design and contract documents, and the extent to which these are complied with by the contractor and his sub-contractors plays a major part in determining the overall environmental performance of the sub-project. Also, there is often a need for rapid response to construction impacts, and effects monitoring is more relevant to evaluating long-term and/or cumulative impacts, which are not anticipated in connection with the present sub-project.

The supervising consultant will receive the weekly reports of the Contractor's Health, Safety and Public Liaison Officer and will decide on the appropriate course of action to be taken in cases where unsatisfactory reports are received regarding environmental matters. For minor matters, verbal advice to the Contractor on the need for remedial action may suffice. In all serious cases the supervising



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consultant has the responsibility and authority to order a stop to any aspect of the works where serious environmental damage or public nuisance/safety hazard is either imminent or has already been caused.

Site inspections by the Supervising Consultant will take place with emphasis on early identification of any environmental problems and the initiation of suitable remedial action through instructions to the contractor. Where remedial actions have been required, further checks will need to be made to ensure that these are being implemented to the agreed schedule and in the required form. As experience of the principal problem areas is gained, attention will be concentrated on activities which are known to be the most troublesome. A draft screening form is provided in Appendix 6 for completion by the Supervising Consultant.

The Supervising Consultant should report substantively on environmental issues in its Monthly Reports to the VEEP/NEMO.

Environmental issues will be specifically addressed and reported against in Progress Meetings.

#### 7.4.3 Progress Meetings

The project management team will formally meet regularly at a frequency to be agreed between the Supervising Consultant and the Client. These are typically held at least monthly.

The progress meetings shall include an agenda item which specifically covers environmental matters. Environmental matters will usually form a relatively small part of the overall business to be discussed at such meetings, and it is recommended that environmental matters should be the first item on the meeting agenda, so the Health, Safety and Public Liaison Officer may be excused for the remainder of the meeting.

#### 7.4.4 Monitoring by Public Agencies

Several agencies have a statutory responsibility to investigate in response to complaints by the public regarding sub-project activities, and to intermittently inspect in the public interest. Such agencies include:

- EHD in accordance with its public health regulations
- Traffic Police for traffic management and control concerns
- Ministry of Works for impacts on road infrastructure
- Labour Department for worker employment, health and safety issues.

Although PPU is not required under its Act to monitor public sector projects, arrangements should be made for their intermittent inspections, to ensure contractor compliance with requisite environmental ESSs, and requirements to satisfy issuance of the Occupancy Certificate.

It is recommended that VEEP give 1 months' notice of the intended date of commencement of construction to:

- monitoring agencies so that they can make the necessary arrangements for their own monitoring; and
- stakeholders that may be affected by the works, so they have sufficient time to make the necessary preparations.



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#### 7.4.5 Monitoring by PSIMPU/PIU

The PSIMPU/PIU will monitor sub-project compliance with the World Bank ESS, and will be required to:

- undertake intermittent site inspections
- keep other public sector agencies informed, and coordinate tier sub-project related activities
- attend progress meetings
- review sub-project reports

#### 7.5 Operational Phase Activities and Responsibilities

From an environmental management and monitoring viewpoint, the operational phase of the sub-project commences at the point where construction works have been completed and the newly constructed works are put into use. Normally, routine maintenance works do not result in significant adverse impacts, and environmental management and monitoring requirements are minimal. Environmental management needs to be focused on taking actions to ensure that adequate maintenance resources are made available and deployed in a timely manner, and monitoring on ensuring that the maintenance works are carried out in an environmentally friendly manner.

The sub-project will only perform optimally if effective routine and periodic maintenance is carried out. Maintenance activities will include:

1. regular parking area cleaning
2. routine fire safety inspections
3. routine mechanical (e.g., HVAC, solar water heating systems, pumps, other site equipment) and electrical inspections and certification at prescribed frequency
4. routine drainage inspection
5. routine water tank and roof guttering inspection and servicing including removal of silt and debris
6. intermittent inspection and maintenance of roof and other structural elements
7. intermittent inspection and maintenance of onsite sewage management system
8. regular pressure washing of the building and walkways
9. regular painting of the building and other painted elements
10. minor mechanical, electrical and plumbing repairs as needed

Some will rely on NEMO's in-house maintenance team and others will require use of external service providers contracted by NEMO. A schedule of maintenance requirements and a log of maintenance work undertaken, and stores and consumables used should be maintained by NEMO's management team.

Emergency drills should be undertaken to prepare staff to respond to an adverse event. Records of these should be maintained by NEMO.

#### 7.6 Costs Associated with Environmental Management Action Plan

##### 7.6.1 Construction phase

Marginal costs incurred by the contractor in complying with environmental protection clauses in their works contracts should be incorporated into their unit rates and bill items and will thus be included in the tender prices. It should be noted that no significant increase in construction costs is expected in connection with requiring compliance with environmental protection clauses, since these merely require

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the contractor to behave in a responsible manner in relation to the environment and affected communities, in accordance with modern, good, international construction practice. Environmental monitoring carried out by the Supervising Consultant during construction will be an integral part of supervision duties and will be covered by their budget. As such, general costs associated with environmental management and monitoring will be an integral part of specific items to be incorporated into overall sub-project budgets, and no separate budget items will be necessary to cover these aspects.

Incremental costs identified are as follows:

**Table 7.1. Cost Estimates for the Implementation for the ESMP**

Activity	Frequency	Estimated Cost (XCD)	Responsibility	Comments
Relocation of Nemo	Preconstruction & construction	500,000	Client GOSVG	Estimated construction time is 18 months. Estimated cost 20 months at XCD 25000 per month
Preparation of management plans (Community health and safety Management Plan; training Plan; Waste management plan; Emergency Preparedness and response plan; cultural heritage)	Preconstruction	100,000	Contractor	Management controls of risk and impact, with roles and responsibilities
Traffic management measures (signage, public notices)		10,000	Contractor	
Air quality			Contractor	
Watering of site and adjacent roads for dust control as required		5,000	Contractor	Water spraying and covering with tarpaulin
PPE		13,000	Contractor	Provision of footwear, helmets, high viz vest etc. for approx. 20 workers
Provision of first aid kit			Contractor	Bandages etc
Water Quality Monitoring if required by authorities		4,000 (also include provisional sum of 2,000)	Contractor	Allow a provisional sum, applied only if required by authorities based on performance.
Chemicals, fuels and oils storage and spill response		10,000	Contractor	
Grievance Mechanism (Labour)			GOSVG	No additional cost
SEA/SH training			GOSVG	

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Activity	Frequency	Estimated Cost (XCD)	Responsibility	Comments
World Bank Environment and Safeguard			GOSVG	
Occupational health and safety			Contractor	
Citizen engagement		24,000	Contractor & GOSVG	At least 4 citizen engagements
<b>TOTAL</b>		<b>666,000</b>		

### 7.6.2 Operations phase

In the operational phase, costs of maintenance and supervision should be included in the recurrent operational budget or overheads of the Developer. Inspections and/or certifications to the requisite schedules by EHD, the Fire Service, the Electrical Inspector, Ministry of Works are either legal requirements to be fulfilled or are costs borne by the State. Provision should be made for the inspections and maintenance requirements outlined earlier.

The buildings should be insured against hazards to which they are exposed.

## 7.7 Capacity Building required of Contractor

### 7.7.1 Supervisory staff level training

Supervisors should be equipped to train staff assigned to them. The following may require specialist training:

1. Health, Safety and Public Liaison Officer
2. Supervisors, in areas of responsibility

### 7.7.2 Worker Orientation

The Contractor must provide all employees with orientation at the start of the sub-project. Orientation provides employees with, among other things:

- the necessary safety information about their job and tasks,
- specific details about workplace hazards,
- an opportunity to engage with co-workers and supervisors,
- a forum to ask questions to clarify new or confusing information
- environmental and social safety procedures and regulations applicable to the sub-project
- the Code of Conduct
- information on the Grievance Redress Mechanism (GRM) and worker's rights to use the GRM
- Chance Find Procedures

### 7.7.3 Toolbox Safety Talk

All Contractor staff should be trained to safely undertake assigned tasks.

The contractor is required to conduct Safety Talks at least three (3) times per week to reinforce key safety procedures and involve workers in a discussion of safety and health procedures and project requirements.

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The contractor must provide the Supervision Consultant with a copy of the Toolbox Safety Talk Plan. Areas to be addressed include:

- basic first aid
- awareness of risks and how to avoid hazards
- preventing and recognizing heat - related illnesses
- proper use of the equipment
- correct use of PPE
- handling and storage of hazardous chemical on site

Toolbox safety talk attendees should be required to sign an attendance roster that becomes part of the environmental and social file for the sub-project, available for safety inspections and audits.

### 7.8 Grievance Redress Mechanism

Stakeholders require a mechanism to engage with project management through implementation and operation. A Grievance Redress Mechanism (GRM) is designed to receive, evaluate, and address grievances from affected communities. It should be introduced during the project design phase and maintained through the construction of the sub-project. At the sub-project level it is a critical means for early identification and remedy of adverse environmental and social (E&S) impacts and other concerns resulting from sub-project execution and operations. A Grievance Redress Mechanism (GRM) receives and facilitates the resolution of affected peoples' concerns, complaints, and grievances about the sub-project's environmental and social performance. When and where the need arises, this mechanism will be used for addressing any complaints that may arise during the construction of the sub-project. The grievance mechanism addresses affected people's concerns and complaints promptly, using an understandable and transparent process that is gender responsive, culturally appropriate, and readily accessible to all segments of the affected people at no costs and without retribution. The IFC's Good Practice Note-Addressing Grievances from Project-Affected Communities (IFC, 2009) requires that the grievance mechanism must:

1. be legitimate and trusted;
2. be scaled to the risks and potential adverse impacts of the project;
3. be publicised and accessible, appropriately tailored to all potentially-affected persons and communities and other interested parties, irrespective of their literacy and administrative capacity;
4. be free of cost for the stakeholders;
5. include the anonymity option, where feasible, and guarantee confidential handling of requests, if so requested by the complainant;
6. be fair, transparent and inclusive;
7. be guided by engagement and dialogue;
8. be predictable in terms of process;
9. be timely;
10. not impede access to judicial remedy; and,
11. be a source of continuous learning for the project management.

Grievance Management is one of several components of stakeholder engagement. The GRM should be an integral part the broader stakeholder engagement. Having a good overall community engagement

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process in place and providing access to information on a regular basis can go a long way in preventing grievances from arising or from escalating to a level that can potentially undermine sub-project performance. Making the early and genuine effort to develop a well-functioning community engagement process is a good risk-management strategy for project proponents.

Common community grievances anticipated for this sub-project are likely to relate to the traffic impacts and noise and dust from construction, all impacting community quality of life. These and other potential impacts will require close involvement with the local community over the project lifecycle.

Project management is required to appropriately inform the people potentially affected by their project(s) about the GRM before commencement of any works. The IFC (2007) outlines the following in relation to Grievance Management:

1. Process is important
2. Scale the mechanism to project needs
3. Put it in writing and publicize it
4. Bring in third parties where needed
5. Make it accessible
6. Response time and transparency matter
7. Keep good records and report back
8. Don't impede access to legal remedies

These requirements are incorporated in the VEEP GRM process outlined in Section VI of the VEEP Stakeholder Engagement Plan.

#### 7.8.1 Functions of the GRM

The key functions of the GRM are to:

1. record, categorize and prioritize community grievances;
2. resolve the grievances in consultation with the complainant(s) and other stakeholders in a timely manner;
3. keep the aggrieved parties informed about the solutions;
4. forward unresolved cases to higher authorities for resolution;
5. monitor project impacts as perceived by affected communities, throughout sub-project design and construction, and institute project and GRM improvements based on lessons learnt.

It is important that the grievance mechanism be impartial, transparent and fair. Persons seeking redress through the GRM are likely to be persons within communities affected by sub-project or related works, but others may access it as appropriate.

The GRM is to be instituted in the early stages of the sub-project. This mechanism does not preclude, at any time, access to the more formal regulatory processes available to aggrieved parties. At any time, complainants are also able to seek legal redress in accordance with the laws and regulations of the country.

This grievance mechanism process is separate from internal grievance mechanisms available for employees of the contractor or its subcontractors, project partners or service providers.

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### 7.8.2 Officers identified to address grievances

A GRM has been developed for the VEEP project, that complies with the World Bank GRM requirements (The VEEP GRM is located at [VEEP GRM.pdf](#)). Grievances can be related to several issues, including labour, provision of service, environmental impact, social impact, health and safety, or sub-project execution.

Section VI of the VEEP Stakeholder Engagement Plan describes the projects GRM.

Contact information for submitting a grievance is provided in the table below.

**Table 7.2. Contact Information for submitting grievance** (Table 11-1 extracted from VEEP Labour Management Procedures)

Name	Title	Telephone	Email address	Physical location
Roxanne John	Project Coordinator	457-1746	<a href="mailto:rjohn@svgcpd.com">rjohn@svgcpd.com</a>	Administrative Building, Kingstown
De- Anna Ralph	Social Safeguard Focal Point	457-1746	<a href="mailto:dralph@svgcpd.com">dralph@svgcpd.com</a>	Administrative Building, Kingstown

GRIEVANCE RELATED TO THE PROJECT COORDINATOR AND/OR THE SOCIAL SAFEGUARD				
MARCELLE Edwards John	Deputy Director of Planning	457-1746	<a href="mailto:medwards-john@svgcpd.com">medwards-john@svgcpd.com</a>	Administrative Building, Kingstown

### 7.8.3 The VEEP GRM process

The PIU should receive all grievances. The procedure for managing grievances is set out in detail in the manual available at the link provided above.

4 levels of grievance are identified:

- Level 1: when an answer can be provided immediately and/or the safeguards team is already working on a resolution. The SET team and project coordinator are responsible.
- Level 2: one off event. The SET team and project coordinator are responsible.
- Level 3: the complaint is repeated. OR the complaint indicates a breach of law of applicable policy/regulation OR high-profile grievances that, if not resolved promptly, may represent significant risks to the environment or community. The grievance redress committee is responsible.
- Level 4: grievances that the grievance redress committee cannot resolve OR unfavorable land acquisition OR rape. The honorable attorney general and the court of law.

An officer will be identified to be the grievance focal point to receive, record, review, and address sub-project-related concerns in each of the following:

- within the contractor's team (the Health, Safety and Public Liaison Officer)
- Within the Supervising Consultant's team
- within a designated local authority to be agreed by community

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- within the VEEP/NEMO project management team

## 7.9 Stakeholder Engagement Plan

The VEEP Stakeholder Engagement Plan is located at [Stakeholder Engagement Plan \(veep.gov.vc\)](http://veep.gov.vc).

Stakeholder engagement already undertaken to inform this ESIS and ESMP is addressed earlier.

This sub-project Stakeholder Engagement Plan (SEP) is designed to ensure that consistency and co-ordination in the overall approach to engagement is applied. It is also important that such an approach is consistent with international best practices and standards. The objectives of the plan include: -

- Ensuring stakeholder understanding of the proposed development and its attendant impacts
- Involving stakeholders in the assessment and management of impacts
- Building sustainable relationships between the VEEP/NEMO/project management and stakeholders that is founded on trust and the sharing of timely, relevant and accessible information
- Managing of expectations with respect to benefits, impacts and respective roles and responsibilities
- Ensuring compliance with local/national regulations and conditionalities as well as international best practices

### 7.9.1 Community/stakeholder engagement post-ESIA Process

The continued engagement of stakeholders and in particular, residents of the neighboring communities will be critical to the successful roll out of this proposed development. In this regard an aggressive and proactive information, communication and outreach programme that coincides with specific phases of the cycle of the proposed development should be pursued. The main elements are as follows:-

#### *Proposal screening and refinement – prior to construction*

- More detailed sub-project information is disclosed, issues and concerns documented and specific actions/measures agreed upon to address and mitigate concerns – Traffic Management to prevent congestion is one example of such an issue that requires more detailed discussion and actions that would involve not just the VEEP/NEMO, residents and commuters but the Ministry of Works.
- Stakeholder presentation of proposed development – prior to construction
- Presentation of approved plans to stakeholders that would include final designs, the Grievance Redress Mechanism and arrangements for local representation and participation in the monitoring of development activity and status.
- Identification of local stakeholder focal points to participate in the overall monitoring process.

#### *Construction Phase*

- Progress meetings that provide stakeholders with an update on and assessment of construction activities undertaken to date as well as what is proposed in the ensuing time period.
- Prior notification to specific stakeholders of specific activities and schedules that will inconvenience and/or impact on their day-to-day way of life – this is particularly important with respect to activities that are likely to lead to increases in noise and dust pollution and traffic congestion.

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- More detailed dissemination of information using various media, that sensitizes residents, commuters and the wider public to activities and measures put in place to minimize adverse impacts.
- Engagement of local workforce and public and training organizations with respect to preparation for accessing employment and associated capacity development opportunities.

#### 7.9.2 Summary of Stakeholder Engagement

Recommended stakeholder engagement after completion of the ESIA process is summarized in Table 7.3 below.

**Table 7.3. Stakeholder Engagement Matrix**

Stakeholder	Level of influence of stakeholder to development	What is important to stakeholder	Strategy for engaging the stakeholder
Ministry of Works	High	Traffic safety	Submission of traffic management plan for approval. Providing regular reports on traffic management, to a programme to be mutually agreed.
Traffic Police	High	Traffic safety	Regular meetings and site visits to review progress of works in relation to approved traffic management plan
Physical Planning Unit	High	Contractor compliance with planning guidance and standards.	Submission of monthly reports and participation in regular meetings (quarterly or semi-annually) to update on progress.
Local/area community	Low	Minimal adverse impact on area residents and community services.	Periodic updates on progress; Advanced notification of activities likely to impact on noise and air pollution and traffic management



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## Appendices

### Appendix 1. Photo gallery



View from NEMO main gate up road on north boundary, towards Largo Height. Note narrow width of road, lack of sidewalks and car parked on opposite road verge.



View from NEMO gate to roundabout at 5-way junction.



View southwards from end of sidewalk along road to SDA HQ.



View from sidewalk across road to SDA HQ towards NEMO'S lower gate. There is no sidewalk on that boundary.



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View from bridge southwards towards SDA HQ.  
Note lack of sidewalks.



Pedestrian crossing a long Leeward highway  
and over the roundabout.



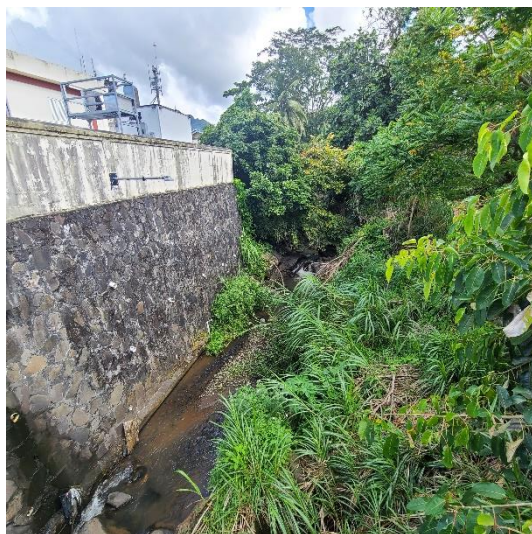
View of roundabout from corner near NEMO  
entrance.



River wall on NEMO's south boundary. Note  
drainage outfall in foreground and river gauge  
apparatus mounted on the wall. The opposite  
riverbank is vegetated.



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Another view of the river wall on NEMO's boundary.



Front of NEMO structure from the gate. Note elevated water tanks, then generator housing and then diesel storage tank.



NEMO entrance and car park looking eastwards. Orange structure beyond the wall is NEMO's closest neighbour.



Closer view of elevated water tanks, with generator structure behind.



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Generator housing.



Above ground diesel storage tank with secondary containment. The tank is not covered and the drainage outlets from the containment are not plugged.



Steps down to lower portion of site, where storage containers are located.



Lower portion of site viewed from within the building looking southwards towards the river boundary and SDA HQ.

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Signs of water penetration in roof slab.



Heavily corroded embedded reinforcement.

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## Appendix 2. Persons Engaged

### **VEEP PIU**

1. Sharika Mandeville, Environmental Safeguards Specialist
2. Josel John, Social Safeguards Specialist

### **NEMO**

3. Michelle Forbes, Director
4. Kemron Alexander, Seismic Engineer/ ES consultant designated Point of Contact
5. Kenson Stoddard, Deputy Director

### **Central Water and Sewerage Authority** (also responsible for Solid Waste Management (SWM))

6. Brian da Silva, Engineering Manager
7. Marco Audain, Engineer
8. Zinze Robertson, Environmental Engineer (SWM)

### **Environmental Health Division**

9. Denville Tony, EHO (Windward side)
10. Shamanti Labban, EHO

### **Ministry of Tourism – Sustainable Development**

11. Janeel Miller-Findley, Director, Sustainable Development Unit
12. Samantha Da Silva, Environmental Resource Analyst, Oceans
13. Brenton Quammie, Project Officer, Chemicals/Hazardous waste/POPs (Montreal protocol; Stockholm, Basel, Rotterdam Conventions; etc.)

### **Labour Department**

14. Mrs. Jacobs-Lawrence, Labour Commissioner (Actg.??)

### **Traffic Police**

15. ASP Browne
16. Superintendent Trumpet

### **Fire Service**

17. Superintendent James

### **Ministry of Physical Planning**

18. Kedahli Crichton, Planning Officer

### **National Parks, Rivers and Beaches Authority**

19. Andrew Lockhart, Director (Actg.)

### **Ministry of Transport and Works**

20. Alistair Campbell, Chief Engineer
21. Marla(sp?) Mulraine, Deputy Chief Engineer (Actg.)
22. Roger Alexander, Engineer



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**Community**

A few persons from the surrounding community were engaged, by knocking on their doors, or calling their cell phones to request meetings. Stakeholder interests engaged in this way included:

- 23. Windsor Primary School, Principal Kenneth Burgin
- 24. NEMO neighbour, Ernest Leslie
- 25. Kingstown Baptist Church, Pastor Cecil Richards
- 26. SDA Administrative Headquarters for Saint Vincent and the Grenadines, Pastor Ambrose

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### Appendix 3. Recommended Environmental and Social Mitigation Measures

Relevant ESS	Mitigation Measure	Responsible for Implementing	Timing of Requirements
<b>6.2.1 Labour, Health and Safety</b>			
ESS2: Labour and Working Conditions	<p><b>Safety-1: Health and Safety Features of Site Design and Equipment</b></p> <p>The VEEP/NEMO should seek to ensure that sub-project design, construction, operations and maintenance meet all requisite environmental, health and safety standards.</p> <p><u>Site and workplace structures:</u></p> <p><i>Design and Construction:</i></p> <p>The Designer and Contractor are to <b>design</b> and <b>construct</b>/equip permanent and recurrent places of work to protect OHS:</p> <ol style="list-style-type: none"> <li>Ensure surfaces, structures and installations are easy to clean and maintain, and do not allow for accumulation of hazardous compounds.</li> <li>Ensure buildings are structurally safe, provide appropriate protection against the climate, and have acceptable light and noise conditions.</li> <li>Use fire resistant, noise-absorbing materials, to the extent feasible, for cladding on ceilings and walls.</li> <li>Ensure floors are level, even, and non-skid.</li> <li>Ensure shower stalls are equipped with nonslip surfaces or anti-slip strips and secure handles.</li> <li>Install nonslip surfaces in areas with potentially slippery floors or subject to frequent wetting (e.g. open hallways)</li> <li>Locate heavy oscillating, rotating or alternating equipment in dedicated buildings or structurally isolated sections.</li> <li>Provide, for each worker and in total, adequate space for safe execution of all activities, including transport and interim storage of materials and products.</li> <li>Ensure exits are clearly marked to be visible in total darkness, and the number and capacity of emergency exits are sufficient for safe and orderly evacuation of the greatest number of people present at any time. There should be a minimum of two exits from any work area.</li> <li>Safe access should be provided by:</li> </ol>	Designer Contractor NEMO	During Design, Construction and Operation

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Relevant ESS	Mitigation Measure	Responsible for Implementing	Timing of Requirements
	<ul style="list-style-type: none"> <li>Segregating passageways in and outside of buildings for vehicles and pedestrians</li> <li>Sealing of openings by gates or removable chains</li> <li>Installation of covers, if feasible, to protect against accidental falls or falling items</li> <li>Measures to prevent unauthorized access to dangerous areas.</li> </ul> <p>Facilities should be <b>designed</b> and built considering the needs of disabled persons.</p> <p>The generator is the greatest source of noise during operation. Noise management measures should be <b>designed</b> into the development. Recommended control techniques to reduce indoor and outdoor noise pollution include:</p> <ol style="list-style-type: none"> <li>Installing windows with sound-reduction materials;</li> <li>Positioning, enclosing, and isolating noisy equipment (e.g. permitting space or buffer zones between the generator and functional areas).</li> </ol> <p><u>Occupational Safety</u></p> <p><i>Construction:</i></p> <p>The contractor will be ultimately responsible for the occupational safety of his workers in the <b>construction</b> phase and should be contractually required to comply with the standards and guidelines regarding health and safety contained in national legislation including the Protection of Employment Act, the Wages Act, and the OSH Act (2017) (not yet in force). The contractor is required to develop a C-ESMP (see Section 7.3.2.) that includes procedures and practices that protect workers and other site users from job-related safety and health hazards. The VEEP/NEMO should seek to ensure that:</p> <ol style="list-style-type: none"> <li>Sub-project design, operations and maintenance meet all requisite environmental, health and safety standards.</li> <li>Human resources policies and procedures are included in construction contracts and service agreements, as a requirement of the entities engaged.</li> <li>The construction contract engaged in by VEEP/NEMO should require, among other things, that: <ol style="list-style-type: none"> <li>The contractor engages in agreements with workers that set out working conditions, terms of employment and grievance mechanisms available to them.</li> <li>Equal work opportunities are offered to men and women in both construction and operations phases.</li> </ol> </li> </ol>		

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Relevant ESS	Mitigation Measure	Responsible for Implementing	Timing of Requirements
	<ul style="list-style-type: none"> <li>c. Local communities are prepared to benefit from potential work opportunities through timely access to information and training.</li> <li>d. Local communities are given priority in the selection of workers.</li> <li>e. Working conditions and provisions for OSH are made in accordance with the law and good industry practice (e.g., appropriate access to sanitation facilities, drinking water, PPE).</li> <li>f. Workers are provided and mandated to use the PPE required for assigned tasks.</li> <li>g. Staff are trained and re-trained as required, to ensure that they are equipped to identify, mitigate, and manage work-related risks associated with tasks assigned to them.</li> <li>h. An internal Grievance Redress Mechanism is formalized within the sub-project management, and staff are made aware of its existence.</li> </ul> <p><i>Operations:</i></p> <p>NEMO is ultimately responsible for the occupational safety of NEMO staff in the <b>operations</b> phase. NEMO should comply with the standards and guidelines regarding health and safety contained in national legislation including the Protection of Employment Act, the Wages Act, and the OSH Act (2017) (not yet in force). NEMO should seek to ensure that its Project operations and maintenance meet all requisite environmental, health and safety standards.</p> <p><u>Risk Assessment</u></p> <p>The application of prevention and control measures to occupational hazards in both construction and operations phases should be based on <u>job safety or job hazard analyses</u>. The results of these analyses should be prioritized as part of an action plan based on the likelihood and severity of the consequence of exposure to the identified hazards. Systems should be put in place to ensure that the measures are used effectively by employees. If the assessment of risk shows that further action is necessary, control measures should be selected according to the hierarchy of risk control (WB, 2017):</p> <ol style="list-style-type: none"> <li>1. Eliminating the hazard by removing the activity from the work process. Examples include substitution with less hazardous chemicals, using different processes, etc.</li> </ol>		

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	<ol style="list-style-type: none"> <li>2. Controlling the hazard at its source through use of engineering controls. Examples include acoustic insulating, etc.</li> <li>3. Minimizing the hazard through design of safe work systems and administrative or institutional control measures. Examples include job rotation, training in safe work procedures, lock-out and tag-out, workplace monitoring, limiting exposure or work duration, etc.</li> <li>4. Providing appropriate personal protective equipment (PPE) in conjunction with training, use, and maintenance of the PPE. Situations where the use of PPE may be necessary are: <ol style="list-style-type: none"> <li>a. where required by legislation;</li> <li>b. where adequate control of exposure cannot be achieved by elimination, reduction or minimization;</li> <li>c. as an interim measure, until further control measures indicated by the risk assessment have been introduced and deemed effective.</li> </ol> </li> </ol> <p>In the <b>construction</b> (as appropriate) and <b>operations</b> phases, the contractor and NEMO respectively are to:</p> <ol style="list-style-type: none"> <li>1. Maintain the site including trafficked areas and footpaths, providing sufficient water drainage, and preventing slippery surfaces with an all-weather surface, such as coarse gravel.</li> <li>2. Maintain frequently transited areas as dry as possible.</li> <li>3. Place temporary or permanent warning signs on wet floors during cleaning or after rain.</li> <li>4. Ensure that illumination systems are adequate and safe.</li> <li>5. Ensure passages to emergency exits are always unobstructed.</li> <li>6. Install signage for hazardous and risky areas, installations, materials, safety measures, emergency exits, and other such areas, in accordance with international standards, to be known and easily understood by workers, patrons and the general public.</li> <li>7. Label all vessels that may contain substances that are hazardous (chemical or toxicological properties, temperature or pressure) as to the contents and hazard, or appropriately color code them.</li> </ol> <p><u>Fire Precautions:</u> <i>Design and Operations</i></p>		

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	<p><b>Designer</b> to ensure:</p> <p>a. The workplace is <b>designed</b> to prevent the start of fires through the implementation of applicable fire codes. Other essential measures include:</p> <ul style="list-style-type: none"> <li>• Equipping facilities with fire detectors, alarm systems, and fire-fighting equipment, adequate for the dimensions and use of the premises, equipment installed, physical and chemical properties of substances present, and the maximum number of people present</li> <li>• Provision of manual firefighting equipment that is easily accessible and simple to use</li> <li>• Fire and emergency alarm systems that are both audible and visible.</li> </ul> <p>In the <b>operations</b> phase, NEMO to ensure that the fire response equipment is maintained in good working order and be readily accessible.</p> <p><u>Lighting</u></p> <p><i>Design and operations phases:</i></p> <ol style="list-style-type: none"> <li>1. Workplaces should receive natural light to the degree feasible, supplemented with sufficient artificial illumination to promote workers' safety and health, and enable safe equipment operation. Supplemental 'task lighting' may be required where specific visual acuity requirements should be met.</li> <li>2. Illumination controls should include: <ol style="list-style-type: none"> <li>i. Use of energy efficient light sources with minimum heat emission</li> <li>ii. Undertaking measures to eliminate glare / reflections and flickering of lights</li> <li>iii. Taking precautions to minimize and control optical radiation including direct sunlight. Exposure to high intensity UV and IR radiation and high intensity visible light should also be controlled</li> <li>iv. Controlling laser hazards in accordance with equipment specifications, certifications, and recognized safety standards. The lowest feasible class laser should be applied to minimize risks.</li> </ol> </li> <li>3. Emergency lighting of adequate intensity should be installed and automatically activated upon failure of the principal artificial light source to ensure safe shut-down, evacuation, etc.</li> </ol> <p><u>Air Supply and temperature</u></p> <p><i>Design and operations phases:</i></p>		

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	<ol style="list-style-type: none"> <li>1. Sufficient fresh air should be supplied for indoor and confined workspaces. Factors to be considered in ventilation <b>design</b> include physical activity, substances in use, and process-related emissions. Air distribution systems should be designed so as not to expose workers to draughts.</li> <li>2. Mechanical ventilation systems should be maintained in good working order. Point-source exhaust systems required for maintaining a safe ambient environment should have local indicators of correct functioning.</li> <li>3. Re-circulation of contaminated air is not acceptable. Air inlet filters should be kept clean and free of dust and microorganisms. Heating, ventilation and air conditioning (HVAC) should be equipped, maintained and operated so as to prevent growth and spreading of disease agents (e.g. <i>Legionnella pneumophila</i>) or breeding of vectors (e.g. mosquitoes and flies) of public health concern.</li> <li>4. The temperature in work and related facilities should, during service hours, be maintained at a level appropriate for the purpose of the facility.</li> </ol> <p><u>Hygiene and sanitation</u></p> <p><i>Construction and operations phases:</i></p> <ol style="list-style-type: none"> <li>1. Workers are to be provided with adequate lavatory facilities (toilets and washing areas) for the number of people expected to work in the facility.</li> <li>2. Where workers may be exposed to poisonous substances by ingestion or skin contamination, facilities for showering and changing should be provided.</li> <li>3. Adequate supplies of potable drinking water should be provided with a sanitary means of collecting the water for drinking.</li> </ol> <p><u>Water and food quality</u></p> <p><i>Operations phase:</i></p> <p>During <b>operations</b>, food and water provided to workers and other users should be safe. The following food hygiene measures should be adopted: -</p> <ol style="list-style-type: none"> <li>1. Compliance with food hygiene and water-quality standards defined by EHD</li> <li>2. Supply of safe potable water for drinking, bathing, food preparation, and other purposes where it may be ingested</li> <li>3. Regular testing of potable water according to World Health Organization (WHO) standards as a minimum.</li> </ol> <p><u>Rotating and Moving Equipment</u></p>		

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	<p><i>Design and operations (maintenance) phases:</i></p> <p>Injury or death can occur from being trapped, entangled, or struck by machinery parts due to unexpected starting of equipment or unobvious movement during operations. Recommended protective measures include:</p> <ol style="list-style-type: none"> <li>1. <b>Designing</b> machines to eliminate trap hazards and ensuring that extremities are kept out of harm's way under normal operating conditions. Where a machine or equipment has an exposed moving part or exposed pinch point that may endanger the safety of any worker, the machine or equipment should be equipped with, and protected by, a guard or other device that prevents access to the moving part or pinch point.</li> <li>2. Turning off, disconnecting, isolating, and de-energizing (Locked Out and Tagged Out) machinery with exposed or guarded moving parts, or in which energy can be stored (e.g. compressed air, electrical components) during servicing or <b>maintenance</b>.</li> <li>3. <b>Designing</b> and installing equipment, where feasible, to enable routine service, such as lubrication, without removal of the guarding devices or mechanisms.</li> </ol> <p><i>Construction Phase:</i></p> <ol style="list-style-type: none"> <li>1. Excavators, dumpers, dozers and other automated equipment that requires an operator should be equipped with air conditioned, dustproof, and soundproof cab.</li> <li>2. All heavy equipment should have a fire extinguisher and a First Aid Kit.</li> </ol>		
ESS2: Labour and Working Conditions	<p><b>Safety-2: Occupational Health and Safety Policy and Plan</b></p> <p><i>Construction and Operations phases:</i></p> <ol style="list-style-type: none"> <li>1. The Contractor shall have a company policy on occupational health and safety.</li> <li>2. The Contractor and NEMO shall prepare and implement Occupational Health and Safety Plans based on risk assessments that addresses the risks and prevention procedures applicable to the sub-project work and/or operation. At a minimum, the Occupational Health and Safety Plans shall address hazards that may be encountered during <b>construction</b> and <b>operation</b> respectively, including prevention and response procedures, for the following:</li> </ol>	Contractor NEMO	During Construction and Operation



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	<ul style="list-style-type: none"> <li>a. General occupational hazards that may be encountered (e.g., moving machinery and motorized equipment, working at heights, Working in excavations, repetitive motions, exposure to heat, noise, and hazardous materials, personal protective equipment (PPE));</li> <li>b. Emergency prevention and response procedures for fire, accidental spill of chemical or other hazardous material, motor vehicle accident, to be in compliance with the Laws of St. Vincent, relevant national policies and <b>construction</b> best practice;</li> <li>c. Natural hazards that may be experienced during <b>construction</b> and <b>operation</b> (e.g., hurricanes and tropical storms, earthquakes, flooding and tsunami), including designated response procedures and evacuation areas for each area that are consistent with the GOSVG's natural hazards and emergency response plans;</li> <li>d. Biological hazards in the environment (e.g., Covid-19, mosquitoes, vermin);</li> <li>e. Disease prevention.</li> </ul> <p>3. The Plan shall also address:</p> <ul style="list-style-type: none"> <li>a. Provision and maintenance of necessary emergency response and rescue equipment;</li> <li>b. Minimum requirements for operating vehicles, equipment, and machinery, in accordance with applicable laws and industry standards;</li> <li>c. Community safety considerations (e.g., traffic and unsafe areas);</li> <li>d. Emergency preparedness and response procedures, including the locations of hospitals and medical services in the event of an injury or medical emergency;</li> <li>e. Staff training on the contents of the Occupational Health and Safety Plan. All construction workers should be trained prior to working on the site, on work-site safety management and to recognise and prevent occupational hazards. Refresher training is to be provided biannually. Weekly toolbox meetings are to be held with all workers present, to review the previous week's issues including OSH concerns and how they should have been</li> </ul>		

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	<p>addressed, adjustments going forward, and the upcoming week's activities;</p> <p>f. Reporting requirements in accordance with the labour legislation (accidents, near misses, etc.).</p> <p>4. All senior site staff are required to study the plan, and are to be responsible for conveying the information contained to all personnel under their direct supervision.</p> <p>5. In the operations phase, all NEMO staff is to be provided with a copy of the OSH plan and oriented in its application before commencing employment.</p> <p>6. NEMO's responsibility in relation to the operations phase is to ensure that the sub-project design meets all relevant OSH standards, and that the buildings and plant are operated and maintained to sustain design performance. In this way, workers in the buildings will be in an environment where people are able to work without being injured and where the health of the workforce may be promoted. Safety should be a matter of continuing concern, equal in importance to all other operational considerations.</p>		
ESS2: Labour and Working Conditions	<p><b>Safety-3: Personal Protective Equipment</b></p> <p><i>Construction and Operations phases:</i></p> <p>1. Personal Protective Equipment (PPE) provides additional protection to workers exposed to workplace hazards in conjunction with other facility controls and safety systems. PPE is to be a last resort that is above and beyond other facility controls, that provides the worker with an extra level of personal protection. To the extent that alternative technologies, work plans or procedures cannot eliminate or sufficiently reduce a hazard or exposure, the contractor/NEMO should provide workers and visitors with the necessary personal protective equipment (PPE) that offers adequate protection without unnecessary inconvenience to the wearer, and provide instruction and monitoring in their appropriate maintenance and use.</p> <p>2. Selection of PPE should be based on the hazard and risk ranking. PPE for workers may include any or all the following, depending on the task(s) assigned:</p> <p>a. Safety headgear</p>	Contractor NEMO	During Construction and Operation

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	<ul style="list-style-type: none"> <li>b. Steel toed boots</li> <li>c. Water boots</li> <li>d. Safety glasses or impact-resistant eye protection</li> <li>e. Ear protective devices</li> <li>f. Harnesses for workers operating at height</li> <li>g. Masks</li> <li>h. Respirators</li> <li>i. Gloves</li> <li>j. High visibility clothing or vests</li> </ul> <p>3. All PPE shall be properly fitted for each worker, and workers shall be trained in the proper use of PPE, prior to working on the sub-project site.</p> <p>4. The contractor/NEMO shall ensure that workers use the proper PPE during all work activities.</p>		
ESS2: Labour and Working Conditions	<p><b>Safety-4: First Aid and Accident Response</b></p> <ul style="list-style-type: none"> <li>1. The Contractor shall ensure that: <ul style="list-style-type: none"> <li>a. the site is equipped with first aid and emergency response equipment;</li> <li>b. all safety equipment is maintained in good working order;</li> <li>c. there are at least two trained first aiders on site at any one time, to respond to emergencies.</li> <li>d. First aid kits are carried on all vehicles.</li> <li>e. enough First Aid Kits are kept fully stocked and on site. Each working area should have access to a Kit.</li> <li>f. First aid supplies are to be checked on a periodic basis.</li> </ul> </li> <li>2. It is recommended that each supervisor should receive Red Cross first aid and CPR training and renewal of certification as required.</li> <li>3. There may be cases when injured employees who need professional medical attention could be transported to the nearest health centre. There may be other cases, however, when injured employees should be transferred by ambulance to the hospital. If there is any doubt about the mode of transportation, an ambulance should be called. For example, the following conditions would definitely indicate ambulance service:</li> </ul>	Contractor	During Construction

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	<ul style="list-style-type: none"> <li>a. Employee is unconscious or in shock.</li> <li>b. Hemorrhaging.</li> <li>c. Severe abdominal cramps and/or vomiting.</li> <li>d. Any apparent fracture.</li> <li>e. Other symptoms of internal injury.</li> </ul> <p>4. Develop evacuation plans/procedures for seriously injured persons.</p> <p>5. There should be a vehicle and driver within 5 minutes of any worksite, available in the event transportation is required for an injured worker(s). Supervisors must have charged cell phones on their persons with sufficient credit and the following numbers stored:</p> <ul style="list-style-type: none"> <li>a. Nearest ambulance (Kingstown)</li> <li>b. Nearest fire tender (Kingstown)</li> <li>c. Nearest wellness centre (Kingstown)</li> <li>d. Nearest Hospital (Kingstown)</li> </ul> <p>These numbers should also be clearly posted on the site office building, to be accessible by all staff through the construction phase.</p> <p>6. All injuries, no matter how minor, are to be reported to the unit supervisor. Accident investigation report forms should be completed by the supervisor.</p>		
ESS2: Labour and Working Conditions	<p><b>Safety -5: Monitoring and Reporting</b></p> <p>Occupational health and safety monitoring programs should verify the effectiveness of prevention and control strategies. The selected indicators should be representative of the most significant occupational, health, and safety hazards, and the implementation of prevention and control strategies. The occupational health and safety monitoring program should include:</p> <ul style="list-style-type: none"> <li>1. <i>Safety inspection, testing and calibration:</i> This should include regular inspection and testing of all safety features and hazard control measures focusing on engineering and personal protective features, work procedures, places of work, installations, equipment, and tools used. The inspection should verify that issued PPE continues to provide adequate protection and is being worn as required. All instruments installed or used for monitoring and recording of working environment parameters should be regularly tested and calibrated, and the respective records maintained.</li> </ul> <p>Systems put in place should also ensure that the effectiveness of risk-reducing control measures does not decrease over time. This requires regular checking</p>	VEEP Contractor NEMO	During Construction and Operation

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	<p>and maintenance of controls implemented, to check their effectiveness and to confirm that occupational exposure limits (OELs) are not exceeded.</p> <p>2. <i>Surveillance of the working environment</i>: Employers should document compliance using an appropriate combination of portable and stationary sampling and monitoring instruments. Monitoring and analyses should be conducted according to internationally recognized methods and standards. Monitoring methodology, locations, frequencies, and parameters should be established individually for each project following a review of the hazards. Generally, monitoring should be performed during commissioning of facilities or equipment and at the end of the defects liability period, and otherwise repeated according to the monitoring plan.</p> <p>3. <i>Accidents and Diseases monitoring</i>: Employer should establish procedures and systems for reporting and recording:</p> <ul style="list-style-type: none"> <li>• Occupational accidents and diseases</li> <li>• Dangerous occurrences and incidents</li> </ul> <p>These systems should enable workers to report immediately to their immediate supervisor any situation they believe presents a danger to life or health. The systems and the employer should further enable and encourage workers to report to management all:</p> <ul style="list-style-type: none"> <li>• Occupational injuries and near misses</li> <li>• Suspected cases of occupational disease</li> <li>• Dangerous occurrences and incidents</li> </ul> <p>All such reports should be investigated with the assistance of a competent person to:</p> <ul style="list-style-type: none"> <li>• Establish what happened</li> <li>• Determine the cause of what happened</li> <li>• Identify measures necessary to prevent a recurrence</li> </ul> <p>Reports are to be made to the Labour Department in accordance with the labour legislation. Reports should also be simultaneously submitted to the VEEP E&amp;S maintained in the Site E&amp;S file.</p>		

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ESS2: Labour and Working Conditions	<p><b>Safety -6: Electrical Safety and Isolation</b></p> <p>Electrical safety and isolation of all sources of hazardous energy should be undertaken. Exposed or faulty electrical devices, such as circuit breakers, panels, cables, cords, and hand tools, can pose a serious risk to workers. Overhead wires can be struck by metal devices, such as poles or ladders, and by vehicles with metal booms. Vehicles or grounded metal objects brought into proximity with overhead wires can result in arcing between the wires and the object, without actual contact. Recommended management practices include (WB, 2017):</p> <ol style="list-style-type: none"> <li>1. Marking all energized electrical devices and lines with warning signs</li> <li>2. Locking out (de-charging and leaving open with a controlled locking device) and tagging-out (warning sign placed on the lock) devices during service or maintenance</li> <li>3. Checking all electrical cords, cables, and hand power tools for frayed or exposed cords and following manufacturer recommendations for maximum permitted operating voltage of the portable hand tools</li> <li>4. Double insulating / grounding all electrical equipment used in environments that are, or may become, wet; using equipment with ground fault interrupter (GFI) protected circuits</li> <li>5. Protecting power cords and extension cords against damage from traffic by shielding or suspending above traffic areas</li> <li>6. Appropriate labeling of service rooms housing high voltage equipment ('electrical hazard') and where entry is controlled or prohibited</li> <li>7. Establishing "No Approach" zones around or under high voltage power lines</li> <li>8. Conducting detailed identification and marking of all buried electrical wiring prior to any excavation work</li> </ol>	Designer Contractor NEMO	During Design, Construction and Operation
ESS2: Labour and Working Conditions	<p><b>Safety-7: Noise and Vibration</b></p> <p>Recommendations for the management of occupational exposures to noise and vibrations include:</p> <ol style="list-style-type: none"> <li>1. Reduction of noise to acceptable occupational exposure levels; <ul style="list-style-type: none"> <li>• No employee should be exposed to a noise level greater than 85 dB(A) for more than 8 hours per day without hearing protection.</li> </ul> </li> </ol>	Contractor NEMO	During Construction and Operation

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	<ul style="list-style-type: none"> <li>No unprotected ear should be exposed to a peak sound pressure level (instantaneous) of more than 140 dB(C).</li> <li>The use of hearing protection should be enforced actively when the equivalent sound level over 8 hours reaches 85 dB(A), the peak sound levels reach 140 dB(C), or the average maximum sound level reaches 110dB(A). Hearing protective devices provided should be capable of reducing sound levels at the ear to at least 85 dB(A).</li> <li>Although hearing protection is preferred for any period of noise exposure in excess of 85 dB(A), an equivalent level of protection can be obtained, but less easily managed, by limiting the duration of noise exposure. For every 3 dB(A) increase in sound levels, the 'allowed' exposure period or duration should be reduced by 50 percent.</li> <li>Prior to the issuance of hearing protective devices as the final control mechanism, use of acoustic insulating materials, isolation of the noise source, and other engineering controls should be investigated and implemented, where feasible</li> <li>Periodic medical hearing checks should be performed on workers exposed to high noise levels.</li> </ul> <ol style="list-style-type: none"> <li>Ensuring that large equipment (e.g., excavators, dumpers, dozers and other automated equipment that requires an operator) is equipped with a soundproof cab;</li> <li>After all other options have been explored and implemented, use of personal hearing protection;</li> <li>Control of exposure to hand-arm vibration<sup>9</sup> from hand and power tools or whole-body vibration<sup>10</sup> from surfaces on which the worker stands or sits through the selection and maintenance of equipment which meets occupational vibration exposure standards. Exposure levels should be checked on the basis of daily exposure time and data provided by equipment manufacturers.</li> </ol>		

<sup>9</sup> Hand-arm vibration syndrome (HAVS), attributed to powered hand tools, can cause damage to the blood circulatory system, nerves and joints, which may result in severe pain and numbness in the fingers, and loss of sense of touch (vibration white finger)

<sup>10</sup> Whole-body vibration (WBV) produces symptoms such as back and neck pain. The actual health effects of such exposures are largely unknown. In the construction industry, vehicles can produce vibration



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ESS2: Labour and Working Conditions	<p><b>Safety-8: Chemicals and Hazardous Substances</b></p> <p><i>Design phase:</i></p> <p>Fires and or explosions resulting from ignition of flammable materials or gases can lead to loss of property as well as possible injury or fatalities to sub-project workers. Prevention and control strategies include:</p> <ol style="list-style-type: none"> <li>1. Storing flammables away from ignition sources and oxidizing materials. Oils and fuels stored on site shall be separate from equipment maintenance areas.</li> <li>2. Further, the flammables storage area should be: <ul style="list-style-type: none"> <li>• Remote from entry and exit points into buildings</li> <li>• Away from facility ventilation intakes or vents</li> <li>• Have natural or passive floor and ceiling level ventilation and explosion venting</li> <li>• Use spark-proof fixtures</li> <li>• Be equipped with fire extinguishing devices and self-closing doors, and constructed of materials made to withstand flame impingement for a moderate period of time</li> </ul> </li> <li>3. Where the flammable material is mainly comprised of dust, providing electrical grounding, spark detection, and, if needed, quenching systems.</li> <li>4. Defining and labeling fire hazard areas to warn of special rules (e.g., prohibition in use of smoking materials, cellular phones, or other potential spark-generating equipment).</li> <li>5. Providing specific worker training in handling of flammable materials, and in fire prevention or suppression.</li> </ol> <p><i>Construction and operations phases:</i></p> <p>Chemical hazards represent potential for illness or injury due to single acute exposure or chronic repetitive exposure to toxic, corrosive, sensitizing or oxidative substances. They also represent a risk of uncontrolled reaction, including the risk of fire and explosion, if incompatible chemicals are inadvertently mixed. This can lead to the release of flammable or toxic materials and gases, and may lead directly to fires and explosions. These types of substances have the additional hazard of causing significant personal injury upon direct contact, regardless of any intermixing issues. Chemical hazards can most effectively be prevented through a hierarchical approach that includes:</p>	Designer Contractor NEMO	During Design, Construction and Operation

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	<ol style="list-style-type: none"> <li>1. Transporting, using and storing all hazardous substances in accordance with national legislation and regulations.</li> <li>2. Replacing the hazardous substance with a less hazardous substitute.</li> <li>3. Implementing engineering and administrative control measures to avoid or minimize the release of hazardous substances into the work environment keeping the level of exposure below internationally established or recognized limits. e.g., When working with materials that generate dust, use engineering and work practice controls such as keeping the material wet as it is being cut or vacuuming the dust as it comes off the tool.</li> <li>4. Segregating corrosive, oxidizing and reactive chemicals from flammable materials and from other chemicals of incompatible class (acids vs. bases, oxidizers vs. reducers, water sensitive vs. water based, etc.), storing in ventilated areas and in containers with appropriate secondary containment to minimize intermixing during spills.</li> <li>5. Where corrosive, oxidizing, or reactive chemicals are used, handled, or stored, ensuring qualified first-aid is available at all times. Appropriately equipped first-aid stations should be easily accessible throughout the place of work, and eye-wash stations and/or emergency showers should be provided close to all workstations where the recommended first-aid response is immediate flushing with water.</li> <li>6. Keeping the number of employees exposed, or likely to become exposed, to a minimum. Workers who are required to handle corrosive, oxidizing, or reactive chemicals should be provided with specialized training and provided with, and wear, appropriate PPE (gloves, apron, splash suits, face shield or goggles, etc.).</li> <li>7. Training workers in the use of the available information (such as MSDSs), safe work practices, and appropriate use of PPE.</li> <li>8. When dealing with solvents, ensure workers have read the material safety data sheets. Solvents should be kept away from the skin. Workers should wash up before eating, drinking, or smoking, use solvents only where there is fresh air, and use personal protective equipment where engineering or work practice controls will not work.</li> <li>9. Communicating chemical hazards to workers through labeling and marking according to national and internationally recognized requirements and standards, such as Materials Safety Data Sheets (MSDS), or equivalent. All containers shall be labelled so that there is no doubt as to their contents. Any</li> </ol>		

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	<p>means of written communication should be in an easily understood language and be readily available to exposed workers and first-aid personnel.</p> <ol style="list-style-type: none"> <li>Keeping Material Safety Data Sheets (MSDS) available on site for all hazardous substances being used or stored. The MSDS shall be kept where it can be accessed by all staff within 5 minutes of needing it.</li> <li>Installing fire hydrants or other appropriate fire suppression devices at all locations where flammable materials are stored and in accordance with a plan approved by the Fire Service.</li> <li>Maintaining a hazardous substance inventory for all substances on site.</li> <li>See also <a href="#">Chemicals-1</a> and <a href="#">Chemicals-2</a>.</li> </ol> <p><i>Operations phase:</i></p> <p>Also, in the <b>operational</b> phase:</p> <ol style="list-style-type: none"> <li>Occupational dermatitis from chemical cleaners is one of the main occupational hazards for housekeeping workers. Prevention measures are focused on using nontoxic, hypoallergenic cleaning products and limiting skin exposure through the use of gloves and other PPE.</li> </ol> <p>See also <a href="#">Chemicals-1</a> and <a href="#">Chemicals-2</a>.</p>		
ESS2: Labour and Working Conditions	<p><b>Safety-9: Training in Safe Working Conditions</b></p> <p><i>Construction and operations phases:</i></p> <p>Employees should be given adequate information, instruction, and training, through:</p> <ol style="list-style-type: none"> <li>education on the hazards and risks involved in their work and how control measures will protect their health; and</li> <li>effective supervision and enforcement.</li> </ol> <p>In the <b>construction</b> and <b>operation</b> phases, all workers (male and female) including management and supervisors entering and working in areas or risk/hazard are to be trained in OSH requirements and their own role in ensuring safe working conditions. The following measures shall be implemented:</p> <ol style="list-style-type: none"> <li>Ensure that skilled workers are aware of the safety rules, particularly those that apply to their areas of work.</li> </ol>	Contractor NEMO	Prior to and through construction and operations

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	<p>2. Training for all new employees should consist of basic hazard awareness, site-specific hazards, safe work practices, and emergency procedures for fire, evacuation, and natural disaster, as appropriate.</p> <p>3. For new assignments, adequate training and information is to be provided to enable workers to understand work hazards and to protect their health from hazardous ambient factors that may be present. The training should adequately cover:</p> <ul style="list-style-type: none"> <li>• Knowledge of materials, equipment, and tools</li> <li>• Known hazards in the operations and how they are controlled</li> <li>• Potential risks to health</li> <li>• Precautions to prevent exposure</li> <li>• Hygiene requirements</li> <li>• Wearing and use of protective equipment and clothing</li> <li>• Appropriate response to operation extremes, incidents and accidents</li> </ul> <p>4. Identify a suitably qualified staff member to be based on site, to monitor performance in accordance with the ESMP, and to maintain appropriate records. Officer will manage and implement training needs as required.</p> <p>5. Provide workers with training on their roles, rights, and responsibilities in keeping with national legislation, and other international labour agreements such as the International Labour Organization (ILO) Decent Work Agenda.</p> <p>6. All Subcontractors, Supervisors, and Field Staff shall be provided with training on all matters related to safety, discrimination, harassment etc. (See also <a href="#">Gender-1</a>).</p> <p>7. Organize sensitivity training (environmental, safety etc.) for all sub-contractors, supervisors, and field personnel, and require them to attend.</p> <p>The construction worker induction/orientation should meet the minimum standard set out in the World Bank Group's <a href="#">Training for Construction Workers - General Induction: Safety, Health, and the Environment   Korea Green Growth Trust Fund (wbkggtf.org)</a></p> <p><u>Vehicle Driving and Site Traffic</u></p>		

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	<p>Poorly trained or inexperienced industrial vehicle drivers have increased risk of accident with other vehicles, pedestrians, and equipment. Industrial vehicles and delivery vehicles, as well as private vehicles on-site, also represent potential collision scenarios. Industrial vehicle driving and site traffic safety practices include:</p> <ol style="list-style-type: none"> <li>3. Training and licensing industrial vehicle operators in the safe operation of specialized vehicles such as forklifts, including safe loading/unloading, load limits.</li> <li>4. Ensuring drivers undergo medical surveillance.</li> <li>5. Ensuring moving equipment with restricted rear visibility is outfitted with audible back-up alarms.</li> <li>6. Establishing rights-of-way, site speed limits, vehicle inspection requirements, operating rules and procedures (e.g., prohibiting operation of forklifts with forks in the down position), and control of traffic patterns or direction.</li> <li>7. Restricting the circulation of delivery and private vehicles to defined routes and areas, giving preference to 'one-way' circulation, where appropriate.</li> </ol>		
	<p><b>Safety-10: Working Environment Temperature</b> Exposure to hot or cold working conditions in indoor or outdoor environments can result in temperature stress-related injury or death. Use of PPE to protect against other occupational hazards can accentuate and aggravate heat-related illnesses. Extreme temperatures in permanent work environments should be avoided through implementation of engineering controls and ventilation. Where this is not possible, such as during short-term outdoor work, temperature-related stress management procedures should be implemented which include:</p> <ol style="list-style-type: none"> <li>1. Monitoring weather forecasts for outdoor work to provide advance warning of extreme weather and scheduling work accordingly.</li> <li>2. Adjustment of work and rest periods according to temperature stress management procedures, depending on the temperature and workloads.</li> <li>3. Providing temporary shelters to protect against the elements during working activities or for use as rest areas.</li> <li>4. Use of protective clothing.</li> <li>5. Providing easy access to adequate hydration such as drinking water or electrolyte drinks and avoiding consumption of alcoholic beverages.</li> </ol>	Contractor NEMO	During Construction and Operations

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	<p><b>Safety-11: Ergonomics, Repetitive Motion, Manual Handling</b></p> <p>In the <b>construction</b> and <b>operations</b> phases, injuries due to ergonomic factors, such as repetitive motion, over-exertion, and manual handling, take prolonged and repeated exposures to develop, and typically require periods of weeks to months for recovery. These OHS problems should be minimized or eliminated to maintain a productive workplace. Controls may include:</p> <ol style="list-style-type: none"> <li>1. Facility and workstation design with 5th to 95th percentile operational and maintenance workers in mind.</li> <li>2. Use of mechanical assists to eliminate or reduce exertions required to lift materials, hold tools and work objects, and requiring multi-person lifts if weights exceed thresholds.</li> <li>3. Selecting and designing tools that reduce force requirements and holding times and improve postures.</li> <li>4. Providing user-adjustable workstations.</li> <li>5. Incorporating rest and stretch breaks into work processes and conducting job rotation.</li> <li>6. Implementing quality control and maintenance programs that reduce unnecessary forces and exertions.</li> <li>7. Taking into consideration additional special conditions such as left-handed persons.</li> </ol>	Contractor NEMO	During Construction and Operations
	<p><b>Safety-12: Working at Height</b></p> <p>In the <b>construction</b> and <b>operations</b> phases, fall prevention and protection measures should be implemented whenever a worker is exposed to the hazard of falling more than two meters; into operating machinery; into water or other liquid; into hazardous substances; or through an opening in a work surface. Fall prevention / protection measures may also be warranted on a case-specific basis when there are risks of falling from lesser heights. Fall prevention may include:</p> <ol style="list-style-type: none"> <li>1. Installation of guardrails with mid-rails and toe boards at the edge of any fall hazard area</li> <li>2. Proper use of ladders and scaffolds by trained employees</li> <li>3. Use of fall prevention devices, including safety belt and lanyard travel limiting devices to prevent access to fall hazard area, or fall protection devices such as full body harnesses used in conjunction with shock absorbing lanyards or self-</li> </ol>	Contractor NEMO	During Construction and Operations

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	<p>retracting inertial fall arrest devices attached to fixed anchor point or horizontal life-lines</p> <ol style="list-style-type: none"> <li>4. Appropriate training in use, serviceability, and integrity of the necessary PPE</li> <li>5. Inclusion of rescue and/or recovery plans, and equipment to respond to workers after an arrested fall</li> </ol>		
	<p><b>Safety-13: Air Quality</b></p> <p><i>Design and Operations Phase:</i></p> <p>In the operations phase, poor air quality due to the release of contaminants into the workplace can result in possible respiratory irritation, discomfort, or illness to workers. Employers should take appropriate measures to maintain air quality in the work area. Maintaining levels of contaminant dusts, vapours, and gases in the work environment at concentrations below recommended threshold limit values (concentrations to which most workers can be exposed repeatedly (8 hours/day, 40 hrs/week, week-after-week), without sustaining adverse health effects.</p> <p><i>Design Phase:</i></p> <p>Recommendations for design include:</p> <ol style="list-style-type: none"> <li>1. Designing and implementing work practices to minimize release of contaminants into the work environment including: <ul style="list-style-type: none"> <li>• Direct piping of liquid and gaseous materials</li> <li>• Minimized handling of dry powdered materials</li> <li>• Enclosed operations</li> <li>• Local exhaust ventilation at emission / release points</li> <li>• Indoor secure storage, and sealed containers rather than loose storage</li> </ul> </li> </ol> <p><i>Operations phase:</i></p> <p>The following control techniques are recommended for indoor contaminant sources associated with housekeeping and maintenance (e.g., cleaning products, drain cleaners, solvents, pesticides, lubricants, paints, and coatings, as well as those applicable to technical standards of building, such as construction adhesives, insulation, vinyl-plastic floor coverings and wall coverings, and asbestos products):</p>	<p>Designer NEMO</p>	<p>During Design and Operations</p>



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	<ol style="list-style-type: none"> <li>1. Use low-VOC-emitting products (e.g., water-based paints rather than oil-based paints, low VOC containing adhesives for flooring and wall decorations).</li> <li>2. Avoid aerosols and sprays.</li> <li>3. Use housekeeping and cleaning products during unoccupied hours taking care to follow safety precautions including appropriate ventilation.</li> <li>4. Avoid the use of “air fresheners”.</li> <li>5. Expose products in open or ventilated areas before installation and increase ventilation rates during and after installation.</li> </ol> <p>For contaminant sources such as tobacco products, cooking, tracked-in dirt or pollen, and personal products [perfumes, hairsprays, or deodorants]), recommended control techniques include the following:</p> <ol style="list-style-type: none"> <li>1. Institute a no-smoking policy.</li> <li>2. Use exhaust ventilation with pressure control for major local sources.</li> <li>3. Avoid paper clutter.</li> <li>4. Provide specific staff-training and user information.</li> </ol> <p>For contaminant sources associated with the HVAC system (e.g. contaminated filters, contaminated duct lining, dirty drain pans, humidifiers, refrigerants, and mechanical rooms), recommended control techniques include the following:</p> <ol style="list-style-type: none"> <li>1. Implement a program of periodic preventive maintenance, including cleaning drain pans and changing filters.</li> <li>2. Keep duct lining dry.</li> <li>3. Maintain clean mechanical rooms.</li> <li>4. Rapidly fix leaks and clean spills.</li> </ol>		
ESS2: Labour and Working Conditions	<p><b>Gender-1: Gender Equality</b></p> <p>To avoid gender discrimination and gender inequality, women and men shall be equally considered for employment opportunities created by the development and treated equally in all respects. Men and women will all be provided with safe working environments. Therefore, the following will be implemented:</p> <ol style="list-style-type: none"> <li>1. Job advertisements and notices shall be disseminated via local radio and television to enlist the participation of women and men in various construction activities on the development.</li> </ol>	VEEP Contractor NEMO	Before and During Construction and through operations

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	<ol style="list-style-type: none"> <li>2. Workers in particular vulnerable categories shall be equally considered for employment opportunities created by the development.</li> <li>3. Include in the advertisements and notices a preference for hiring workers from the location where the sub-project is being implemented.</li> <li>4. Ensure a zero-tolerance approach to violence, sexual harassment, discrimination, consumption of illicit drugs and alcohol, and carrying of harmful weapons including guns and knives. Complaints of workplace and sexual harassment shall be addressed with due diligence by the VEEP Grievance Redress Committee which has already been established. Women are included on the Committee.</li> <li>5. Adopt strategies towards flexible working conditions (shifts, increase in skills, more women in technical positions).</li> <li>6. Comply with national labour legislation including the Wages Act relevant to working conditions and equality and recognize workers' representative bodies.</li> <li>7. Ensure the provision of equal working conditions for women and men. This includes: <ol style="list-style-type: none"> <li>a. Gender-specific toilets and sanitation facilities with adequate capacity;</li> <li>b. Clean drinking water</li> <li>c. Childcare facility or other support for children under 5</li> <li>d. Protective equipment for women<sup>11</sup> and men</li> <li>e. Time off to attend to valid personal medical emergencies</li> <li>f. Applying the principles and standards of ILO's Decent Work Agenda.</li> </ol> </li> <li>8. Monitor the application of ILO's Decent Work principles and standard.</li> <li>9. Require contracted workers to sign a Code of Conduct. An example of this is found in Appendix 4.</li> </ol>		
ESS2: Labour and Working Conditions	<p><b>Labour-1: Access to new job opportunities</b></p> <p>Increase awareness of job opportunities among the local community, with the following measures:</p>	VEEP/Labour Department/ Ministry of Youth Development	<p>Before construction</p> <p>Before operational phase</p>

<sup>11</sup> Often, PPE designed for men is made available, and it is not sized to properly fit women

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Relevant ESS	Mitigation Measure	Responsible for Implementing	Timing of Requirements
	<ol style="list-style-type: none"> <li>2. Conduct needs assessment of potential job opportunities associated with the sub-project implementation.</li> <li>3. Disseminate Job advertisements and notices via appropriate social media platforms and through local representative organisations.</li> <li>4. Include in the advertisements and notices a preference for hiring workers from the area location in which the sub-project is being implemented.</li> <li>5. Give equal consideration to workers in particular vulnerable categories for employment opportunities created by the development.</li> </ol>		Before operational phase
ESS2: Labour and Working Conditions	<p><b>Labour-2: Capacity to access job opportunities</b></p> <ol style="list-style-type: none"> <li>1. Conduct Human Resource Assessment of area residents actively seeking employment opportunities.</li> <li>2. Establish appropriate training/HR programmes based on HR Assessment.</li> </ol>	<p>Equity/Department of Statistics</p> <p>Equity/Education</p>	During Construction phase

Relevant ESS	Mitigation Measure	Responsible for Implementing	Timing of Requirements
<b>6.2.2 Water Resources</b>			
ESS6: Biodiversity Conservation and Sustainable Management of Living Natural Resources	<p><b>Water-1: Stormwater, Erosion, and Sediment Control</b></p> <p><i>Design, construction and operations phases:</i></p> <p>Stormwater includes any surface runoff and flows resulting from precipitation, drainage or other sources, and typically contains suspended sediments, metals, petroleum hydrocarbons, Polycyclic Aromatic Hydrocarbons (PAHs), coliform, etc. Rapid runoff, even of uncontaminated stormwater, also degrades the quality of the receiving water by eroding stream beds and banks. To reduce stormwater treatment requirements, the following principles should be applied in <b>design, construction and operations</b> phases:</p>	<p>Designer</p> <p>Contractor</p> <p>NEMO</p>	During Design, Construction and operation

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	<ol style="list-style-type: none"> <li>1. Separate stormwater from sanitary wastewater streams, to reduce volumes of wastewater to be treated.</li> <li>2. Prevent surface runoff from areas of potential sources of contamination.</li> <li>3. Minimise runoff from areas without potential sources of contamination (e.g. by minimizing the area of impermeable surfaces) and reduce the peak discharge rate (e.g. by using vegetated swales).</li> <li>4. When water quality criteria allow, manage stormwater as a resource, either for groundwater recharge or for meeting facility water needs.</li> </ol> <p><i>Construction phase:</i></p> <p>The following procedures are to be implemented to prevent soil loss, erosion, and sediment transport in sub-project areas during <b>construction</b>:</p> <ol style="list-style-type: none"> <li>1. Undertake earthworks when conditions are suitable. Earthworks activities shall be scheduled, to the extent possible, to avoid the months of heaviest rainfall.</li> <li>2. Control sediment and prevent it from leaving disturbed sub-project areas.</li> <li>3. Maintain vegetated filter strips to help reduce Total Suspended Solids (TSS) production e.g. along roads and parking lots.</li> <li>4. Cut off or redirect water as often as possible. For water control, a contractor may use drains, berms, culverts, flumes and sediment control structures such as slash filters and sediment traps.</li> <li>5. Avoid directing lots of water into one place.</li> <li>6. No materials shall be stockpiled so that they result in siltation or blockage of drains.</li> <li>7. Make all construction personnel aware of the environmental values and the required mitigation measures, in advance of commencing the works.</li> </ol>		
ESS3: Resource Efficiency and Pollution Prevention	<b>Water-2: Water Quality Monitoring Programme</b>	VEEP/NEMO	During Construction

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Ess6: Biodiversity Conservation and Sustainable Management of Living Natural Resources	<p><i>Construction phase</i></p> <p>The water quality monitoring programme is the responsibility of the Contractor and is to be outlined in the Contractor's ESMP (C-ESMP). Results and analysis of all monitoring undertaken are to be included in the Contractor's reports on its ESMP implementation. SS and turbidity are to be monitored quarterly at locations immediately upstream and downstream of the site boundary with the North River. Other water quality testing will be as directed by the Supervising Consultant, in response to an event such as:</p> <ul style="list-style-type: none"> <li>• Extreme rainfall intensity (return period exceeding 1 in 5 years)</li> <li>• suspected or observed polluting event</li> </ul> <p>VEEP/NEMO representatives on site are required to monitor site activities and adjacent water quality through the <b>construction</b> phase to ensure the sub-project does not cause or substantially contribute to a condition that exceeds acceptable water quality standards. Their water quality monitoring will rely on visual monitoring of water quality in the adjacent watercourse daily, and after any significant rainfall or potentially polluting event.</p> <p>If a polluting event such as a fuel spill occurs or is suspected, VEEP/NEMO representatives on site are to require that the water quality immediately upstream and downstream of the site be tested for the appropriate parameters at stipulated frequencies. See also <a href="#">Water-5</a> and <a href="#">Chemicals-2</a>.</p> <p>If the EHD, VEEP/NEMO representatives or other responsible authority receives complaints about or otherwise determines that adverse water quality is associated with the works, they may direct that water quality testing be undertaken at the Contractor's cost, and/or that appropriate measures be implemented to reduce turbidity, SS or other contaminant to acceptable levels. They may require the Contractor to halt work in the interim.</p>	Supervising Consultant Contractor EHD	
ESS3: Resource Efficiency and Pollution Prevention	<p><b>Water-3: Wastewater Management</b></p> <p><i>Construction and Operations phases:</i></p> <ol style="list-style-type: none"> <li>1. Raw sewage is to be prevented from entering the drainage or adjacent water course.</li> </ol>	Contractor NEMO	During Construction and Operation

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<p>ESS4: Community Health, Safety, and Security</p> <p>Ess6: Biodiversity Conservation and Sustainable Management of Living Natural Resources</p>	<ol style="list-style-type: none"> <li>2. Workers are to be required to use the non-polluting site sanitary facilities to be provided. Workers who refuse to use sanitary facilities are to be subject to dismissal.</li> <li>3. If portable toilets are used during <b>construction</b>, the following BMPs are recommended: <ol style="list-style-type: none"> <li>a. Empty portable toilets before transporting them.</li> <li>b. Securely fasten the toilets to the transport truck.</li> <li>c. Use hand trucks, dollies, and power tailgates whenever possible.</li> <li>d. Locate portable toilets at least 20 feet from the nearest storm-drain inlet or sensitive-feature buffer area.</li> <li>e. Build an earthen berm or sandbag containment around portable toilets for spill containment and protection from leaks.</li> <li>f. Prepare a level ground surface with clear access to the toilets.</li> <li>g. Secure all portable toilets with a stake driven into the ground to prevent tipping by accident, weather, or vandalism.</li> <li>h. Inspect the toilets frequently (daily during the workweek) for leaks and have the units serviced and sanitized at time intervals that will maintain sanitary conditions of each toilet (typically weekly).</li> <li>i. A licensed waste collector should service all the toilets.</li> <li>j. Suppliers should carry bleach for disinfection in the event of a spill or leak.</li> <li>k. Properly store (cover) and handle chemical materials.</li> <li>l. Wastewater generated is to be disposed of at a Ministry of Health-approved facility.</li> <li>m. Train employees on these BMPs, prohibitions on discharging stormwater, and wastewater-discharge requirements.</li> </ol> </li> </ol> <p>In the <b>operations</b> phase, some or all sanitary wastewater will be discharged to the septic tank. Wastewater from the new buildings will be discharged to the municipal sewer if feasible. Sanitary wastewater in this phase includes grey water. Depending on its origin, wastewater may include cleaning agents, disinfectants including liquid bleach and ionic and nonionic</p>		

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	<p>detergents, oils and grease. The following management measures are recommended:</p> <ol style="list-style-type: none"> <li>1. Use water efficiently to reduce the amount of wastewater generated.</li> <li>2. Wastewater discharged to sewer must not interfere, directly or indirectly, with the operation and maintenance of the municipal collection and treatment systems, or pose a risk to worker health and safety, or adversely impact characteristics of residuals from wastewater treatment operations.</li> <li>3. Control consumption of cleaning chemicals.</li> <li>4. Substitute cleaning chemicals with biodegradable products, when possible.</li> </ol>		
<p>ESS3: Resource Efficiency and Pollution Prevention</p> <p>ESS6: Biodiversity Conservation and Sustainable Management of Living Natural Resources</p>	<p><b>Water-4: Vehicle and Equipment Operation and Maintenance</b></p> <p>The following are required for vehicle and equipment maintenance in <b>construction</b> and <b>operational</b> phases:</p> <ol style="list-style-type: none"> <li>1. Vehicle and equipment washing and maintenance activities with the potential for releasing pollutants such as fuel, lubricants, or hydraulic fluids should only be performed in designated areas <b>designed</b> for the purpose, and located outside the natural buffer area of any sensitive feature, unless it is infeasible to move a piece of equipment to the designated area.</li> <li>2. To the extent feasible, conduct all maintenance and repair of vehicles and equipment in a building or other covered impervious containment area that is sloped or bermed to prevent run-on of uncontaminated stormwater and runoff of contaminated stormwater. Emergency repairs at other locations should use BMPs such as drip pans, absorbent mats, and berms as necessary to control spills and leaks.</li> <li>3. Curbs or berms should be used to prevent runoff from entering or leaving the repair area.</li> <li>4. Pavement should be sloped to a contained drainage point.</li> <li>5. Remove batteries and liquids from vehicles and equipment only in designated areas that are <b>designed</b> to prevent stormwater</li> </ol>	Contractor NEMO	During Construction and Operation

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	<p>contamination. Store cracked batteries in a covered non-leaking secondary containment system.</p> <ol style="list-style-type: none"> <li>6. Empty oil and fuel filters before disposal. Provide for proper disposal of waste oil and fuel.</li> <li>7. Dispose of all used oil, solvents, and other automotive-related chemicals according to SWMU guidance. These wastes require special handling and disposal. Used oil and some solvents can be recycled at designated facilities.</li> <li>8. Vehicle-washing areas should be paved with a sealed bottom and wash water passed through an oil-water separator before discharge to surface water. Because water alone can remove most dirt adequately, use high-pressure water spray without detergents. If detergents must be used, avoid phosphate- or organic-based cleansers to reduce nutrient enrichment and biological oxygen demand in wastewater. Use only biodegradable products that are free of halogenated solvents. Quality of discharges into the adjacent watercourse should be within the guidelines provided in the World Bank EHSG, reproduced in Section 5.2.</li> <li>9. Use signs to clearly mark all washing areas and inform workers that all washing must occur in those areas.</li> <li>10. Do not perform other activities, such as vehicle repairs, in washing areas.</li> <li>11. Vehicles and equipment that are scheduled for maintenance or that have potential fluid leaks should be confined to the repair area described above.</li> <li>12. Use drip pans or containers under parts or vehicles that drip or that are likely to drip liquids, such as during dismantling of liquid-containing parts or removal or transfer of liquids.</li> <li>13. Do not pour or otherwise convey washwater, liquid waste, or any other pollutant into storm drains or into surface water.</li> <li>14. Designate parking spots to vehicles and equipment, inspect the vehicles, equipment, and parking area daily, and repair any leaks immediately.</li> </ol>		



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	<p>15. Park large mobile equipment, such as front-end loaders, in an area protected from run-on of stormwater and sealed with impermeable pavement to prevent infiltration.</p> <p>16. Post signs reminding operators to chock wheels, secure connections, check drain outlets, and report spills to the office.</p> <p>17. Check incoming vehicles and equipment (including delivery trucks, and employee and subcontractor vehicles) for leaking oil and fluids to the extent practicable. Do not allow leaking vehicles or equipment on-site. A leaking vehicle detected on-site should be moved to an area that eliminates the potential for discharges to surface water or groundwater.</p> <p>Refer also to <a href="#">Air-2</a> in relation to equipment maintenance.</p>		
<p>ESS3: Resource Efficiency and Pollution Prevention</p> <p>ESS6: Biodiversity Conservation and Sustainable Management of Living Natural Resources</p>	<p><b>Water-5: Storage and Movement of Petroleum and other Fuel</b></p> <p><u>Fuel storage</u></p> <p><i>All phases:</i></p> <p>Fuel storage poses a risk to water quality. Through all phases, the following principles should be observed:</p> <ol style="list-style-type: none"> <li>1. Minimise fuel and oil storage on site.</li> <li>2. Handle fuels and oils to minimize the risk of contaminating the site.</li> <li>3. Oils and fuels stored on site shall be located where an accidental spill cannot enter a waterway.</li> </ol> <p><i>Design and operation phases:</i></p> <p>The following are recommended regarding provisions for permanent fuel storage on site:</p> <ol style="list-style-type: none"> <li>4. Prior to relocation of the existing tank, fuel in that tank should be progressively drawn down. An arrangement to make fuel available to the works contractor may be considered. Residual fuel at the time of relocation should be decanted following fueling procedures outlined below, and stored in a suitable container(s), to be returned to the tank once properly installed at the new location.</li> <li>5. Underground storage is not recommended.</li> </ol>	<p>Designer</p> <p>Contractor</p> <p>NEMO</p>	<p>During Design, Construction and Operation</p>

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	<ol style="list-style-type: none"> <li>6. Develop an aboveground-storage-tank (AST) facility plan for the installation of permanent ASTs, storage tanks for oil (including used oil or petroleum) at a facility that will have a total capacity of 500 gallons or more.</li> <li>7. Develop a spill-prevention control and countermeasure (SPCC) plan if the tank is located where a spill from the tank could contaminate water - for example on or near a stream, lake, or river - or if total aboveground storage capacity exceeds 1,320 gallons. See <a href="#">Chemicals-2</a> for spill management.</li> <li>8. A secondary containment area is a required element of the plan. Containment areas should be covered to prevent the accumulation of rainwater. Double-walled tanks are acceptable in place of tank containment. Where secondary containment is exposed to the weather, the containment device shall have drainage fitting that allows rainwater to be released. Contaminated water must be passed through absorbent materials specifically <b>designed</b> for hydrocarbon capture.</li> <li>9. All tank pipes, seals, and fittings should be leak-free and regularly inspected.</li> <li>10. All tanks should have a functioning venting system and a method to measure the quantity of fuel remaining.</li> </ol> <p><i>Design, construction and operations phases:</i></p> <p><u>Fueling</u></p> <p>Fueling of vehicles and equipment should occur in designated areas equipped with spill kits:</p> <ol style="list-style-type: none"> <li>11. Designated fueling areas should be <b>designed</b> to prevent stormwater runoff and spills.</li> <li>12. Fuel-dispensing areas should be paved with concrete, or an equivalent impervious surface but not asphalt, and have a 2 to 4 percent slope to prevent ponding.</li> <li>13. The fueling area should be separated from the rest of the site by a grade break or curb that prevents run-on of stormwater.</li> </ol>		

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	<ol style="list-style-type: none"> <li>14. Fuel dispensing areas should be covered, and the cover's minimum dimensions should be at least as great as those of the area within the grade break or the fuel-dispensing area. The cover should not drain onto the fuel-dispensing area.</li> <li>15. Discourage topping off fuel tanks.</li> <li>16. Secondary containment such as a drain pan should be used when transferring fuel from the tank truck to the fuel tank.</li> <li>17. Place drip pans, or other appropriate temporary containment device, at locations where leaks or spills may occur such as hose connections, hose reels, and filler nozzles. Drip pans should always be used when making and breaking connections.</li> <li>18. Check loading and unloading equipment such as valves, pumps, flanges, and connections regularly for leaks and repair them as needed.</li> <li>19. Require usage of spillage trays during on-site refueling of minor equipment.</li> <li>20. Dispose of waste oils arising from emergency servicing of <b>construction</b> equipment at a licensed recycling facility or other facility approved by the solid waste management authority.</li> <li>21. Prohibit washing of vehicles, plant and tools in or adjacent to any watercourse.</li> <li>22. Maintain a sufficient stock of adsorbent and neutralizing material on site to respond to a spill as outlined in <a href="#">Chemicals-2</a>.</li> </ol>		
<p>ESS3: Resource Efficiency and Pollution Prevention</p> <p>ESS6: Biodiversity Conservation and Sustainable Management of Living Natural Resources</p>	<p><b>Water-6: Water Conservation</b></p> <p>Good practice in <b>design</b> and <b>operation</b> can significantly reduce water consumption. Facilities engaged in services should include water-efficient <b>design</b> features which typically include:</p> <ol style="list-style-type: none"> <li>1. Rainwater collection via a network of gutters and pipes, to be channeled into a cistern. Collected rainwater can be used for irrigation or toilet flushing. The latter requires dual plumbing of the building to ensure no cross contamination of potable water.</li> <li>2. Use water-saving equipment, including ultra-low-flush toilets, spray nozzles, urinals, faucet aerators, and low-flow showerheads,</li> </ol>	Designer NEMO	During Design and Operation

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Relevant ESS	Mitigation Measure	Responsible for Implementing	Timing of Requirements
	<p>infrared and ultrasonic sensors, water spigots, and pressure-control valves.</p> <p>Water conservation programs should promote the continuous reduction in water consumption and costs of pumping, treatment, and disposal. Further recommendations for water reuse and recycling during <b>operations</b> include:</p> <ol style="list-style-type: none"> <li>1. Engage in water monitoring and management to quantify principal flows and possible unaccounted use (leaks).</li> <li>2. Use high pressure, low volume cleaning systems rather than large volumes of water sprayed from hosepipes.</li> <li>3. Use flow timers and limit switches to control water use.</li> <li>4. Use 'clean-up' practices rather than hosing down.</li> </ol> <p>Additional recommendations for building facility <b>operations</b> include:</p> <ol style="list-style-type: none"> <li>5. Regular maintenance of plumbing, to promptly identify and repair leaks.</li> <li>6. Shutting off water to unused areas.</li> <li>7. Installing self-closing taps, automatic shutoff valves, spray nozzles, pressure reducing valves; and spring loaded or sensed faucets.</li> </ol> <p>Potable water storage provisions should be adequate to provide a minimum of 1 week's supply under EOC operating conditions.</p>		

### 6.2.3 Air Quality

<p>ESS3: Resource Efficiency and Pollution Prevention</p> <p>ESS4: Community</p>	<p><b>Air-1: Fugitive Dust Management</b></p> <p><u>Site dust</u></p> <ol style="list-style-type: none"> <li>1. Plan land clearing, removal of topsoil and excess materials, and location of stockpiles with due consideration to meteorological factors (e.g. precipitation, wind direction, and speed) and location of sensitive receptors.</li> <li>2. Load, transfer, and discharge materials with a minimum height of fall, shielded against the wind. Consider use of dust suppression spray systems.</li> </ol>	Contractor	During Construction
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Relevant ESS	Mitigation Measure	Responsible for Implementing	Timing of Requirements
Health, Safety, and Security	<ol style="list-style-type: none"> <li>3. Erect hoarding around laydown areas where there is a risk that neighbouring users may be affected by noise and dust.</li> <li>4. Preferentially locate material stockpiles that have potential to generate dust, in areas that may be protected from wind by topography, existing site structures, vegetation and/or hoarding.</li> <li>5. Preferentially locate stockpiles downwind of occupied buildings that could potentially be affected.</li> <li>6. Apply dust suppression techniques (e.g., wetting down) for work areas and reduce travel speeds. Wetting should be to the extent that water is readily available. Water shall not be over-applied so that it creates runoff that leaves the site.</li> <li>7. Stabilize and restore disturbed areas once sub-project activities are completed, to render them non-dust forming.</li> <li>8. Promptly revegetate or cover exposed soils and other erodible materials.</li> <li>9. Enclose storage of dusty materials or operate these areas with efficient dust suppressing measures.</li> <li>10. Cover friable materials in stockpiles to minimize dust emissions.</li> </ol> <p><u>Use of the public road</u></p> <p>In relation to use of the public road:</p> <ol style="list-style-type: none"> <li>11. Ensure that trucks are loaded and driven in a manner which does not result in spillage. Do not overload trucks. Ensure that all truck tailgates and drop sides are properly secured, there is no overloading of loose materials above truck sides, and all loads are properly secured.</li> <li>12. Public roads which have material deposited on them because of sub-project activities are to be cleaned and kept free of mud, soil, and other materials. The Contractor/truck owner will be responsible, at his own cost, for cleaning up spillages or shed loads without undue delay.</li> <li>13. Do not stockpile materials on the public roadway.</li> <li>14. Minimize quantum of mud and dust tracked onto the public roadways from this or any related site e.g. location of approved spoil disposal.</li> <li>15. Wet public roads as required to minimize dust generation.</li> <li>16. Cover/secure granular/light loads brought on site, and waste and other materials brought off site by a tarpaulin to minimize dust emissions and blowing of debris off vehicles.</li> </ol>		

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Relevant ESS	Mitigation Measure	Responsible for Implementing	Timing of Requirements
ESS3: Resource Efficiency and Pollution Prevention	<p><b>Air-2: Equipment Emissions and Pollution Controls</b></p> <p><i>All phases:</i></p> <ol style="list-style-type: none"> <li>1. To mitigate the contribution to climate change, sensible materials selection decisions should be made.</li> <li>2. The sub-project design and construction should minimize resource use through measures such as procurement of local supplies from nearby suppliers once they meet the requisite standards and are cost competitive, to reduce emissions associated with transportation.</li> <li>3. Consolidation of shipments may also reduce emissions associated with transportation and shipping, although the impact of this is quite small as shipments will be on regularly scheduled vessels bound for Saint Vincent.</li> </ol> <p><i>Construction and operations phases:</i></p> <p>The Contractor shall:</p> <ol style="list-style-type: none"> <li>1. Keep engine-driven equipment tuned up and running at peak efficiency.</li> <li>2. Fit all moveable plant with effective dust suppression equipment and operate and maintain plant in accordance with the manufacturer's manuals.</li> <li>3. Repair malfunctioning equipment immediately or remove from the site.</li> <li>4. Immediately attend to any vehicles/ plant /machinery which emit undue smoke or noise, for repair or maintenance.</li> <li>5. Monitor drivers to ensure they operate vehicles safely.</li> <li>6. Prohibit burning of wastes.</li> </ol> <p>In the <b>operations</b> phase, refrigeration and air conditioning services are additional sources of emissions. Avoid use of ozone-depleting refrigerants and select refrigerants with low global warming potential (GWP). Refrigerants chosen for cooling should be hydrocarbon technology, as other refrigerants are phasing out by 2030, and these are more climate and ozone friendly and energy efficient. Hydrocarbons are flammable gases and the same precautions as for LPG need to be taken.</p> <p>Refer also to <a href="#">Water-4</a> in relation to equipment maintenance.</p>	Designer Contractor NEMO	During Construction and Operation
ESS3: Resource Efficiency and	<p><b>Energy-1: Energy Efficiency</b></p> <p>For any energy-using system, a systematic analysis of energy efficiency improvements and cost reduction opportunities should include an examination of opportunities for Demand/ Load Side Management by reducing loads on the energy system.</p>	Designer NEMO	During Design and operations

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Relevant ESS	Mitigation Measure	Responsible for Implementing	Timing of Requirements
Pollution Prevention	<p>For cooling systems:</p> <ol style="list-style-type: none"> <li>1. Ensure adequate insulation to reduce heat gains through cooling system structure and below-ambient temperature refrigerant pipes and vessels.</li> <li>2. Control temperature accurately to avoid overcooling.</li> </ol> <p>In the case of air conditioning applications, energy efficiency techniques include:</p> <ol style="list-style-type: none"> <li>1. Placing air intakes and air-conditioning units in cool, shaded locations.</li> <li>2. Improving building insulation including seals, vents, windows, and doors.</li> <li>3. Planting trees as thermal shields around buildings.</li> <li>4. Installing timers and/or thermostats and/or enthalpy-based control systems.</li> <li>5. Installing ventilation heat recovery systems.</li> </ol>		
ESS3: Resource Efficiency and Pollution Prevention	<p><b>Energy-2: Energy Conservation</b></p> <p>Energy management should be viewed in the context of overall consumption patterns, including those associated with supporting utilities, as well as overall impacts associated with emissions from power sources. Technical and financially feasible opportunities for improvement in energy conservation do exist and should be applied.</p> <p>Buildings may consume large amounts of energy in the form of cooling, heating and power. Building siting, <b>design</b>, <b>construction</b> and <b>operating</b> patterns all heavily influence energy use. The following aspects of building <b>design</b> can all reduce energy use when correctly applied:</p> <ol style="list-style-type: none"> <li>1. Optimize building orientation to take advantage of natural light and airflow.</li> <li>2. Use day lighting techniques, allowing sunlight to penetrate a building to illuminate interiors.</li> <li>3. Install renewable energy systems where local conditions permit (e.g., solar water heating, photovoltaic cells, wind turbines).</li> </ol> <p>Energy use of building services may be reduced by the following methods:</p> <ol style="list-style-type: none"> <li>1. Reduce energy consumption associated with heating, ventilation, and air conditioning (HVAC) systems through: <ul style="list-style-type: none"> <li>• Specification of well insulated building fabric to minimize heat transfer.</li> <li>• Use of variable air volume air handling systems.</li> <li>• Use of inverter-driven variable speed fans.</li> <li>• Adoption of temperature control settings which avoid simultaneous heating and cooling.</li> </ul> </li> </ol>	Designer Contractor NEMO	During Design, construction and operations

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Relevant ESS	Mitigation Measure	Responsible for Implementing	Timing of Requirements
	<ul style="list-style-type: none"> <li>• Building zoning according to temperature needs and heat gains (e.g., a north zone and a south zone).</li> <li>• Use of enthalpy control to vary volumes of fresh and recycled air according to ambient and internal building conditions.</li> </ul> <p>2. Reduce energy consumption associated with lighting through:</p> <ul style="list-style-type: none"> <li>• Use of occupancy sensors.</li> <li>• Use of high-efficiency light bulbs (e.g. LEDs and compact fluorescent light bulbs) where possible.</li> <li>• Daylight controls (e.g., to adjust interior lighting, based on incoming daylight, using a photoelectric sensor).</li> <li>• Dimming-control retrofits for fluorescent, high-intensity discharge and incandescent lamps.</li> <li>• Adoption of an energy management and control system, including centralized monitoring and reporting of energy and water use, switched time schedules, load-based reset and demand control.</li> </ul> <p>3. Reduce energy consumption associated with cooking and refrigeration equipment as follows:</p> <ul style="list-style-type: none"> <li>• Match use of cooking range burners to facility needs.</li> <li>• Use appropriate lids.</li> <li>• Select high efficiency refrigerators.</li> <li>• Use an exhaust system that automatically varies fan speeds.</li> </ul> <p>In the <b>construction</b> phase, the contractor should seek to procure materials such as fine and coarse aggregates from sources close to the sub-project site, to minimize haulage distance and associated energy costs. This is subject to materials meeting the requisite standards. For imported materials, the contractor should seek to consolidate shipments to the extent possible, to reduce energy consumption associated with shipping and transportation.</p>		



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Relevant ESS	Mitigation Measure	Responsible for Implementing	Timing of Requirements
6.2.4 Solid Waste			
ESS3: Resource Efficiency and Pollution Prevention	<p><b>Waste-1: Solid Waste Management Plan (construction and operations phases)</b></p> <p><i>Design phase:</i></p> <p>The <b>Designer</b> shall ensure that adequate provisions for solid waste management within the site including its storage prior to collection. as follows:</p> <ol style="list-style-type: none"> <li>1. Provide a designated waste storage location within the site for that has sufficient capacity to store one week's waste, calculated of the basis of appropriate occupancy levels and reasonable assumptions regarding institution of waste reduction measures by staff and other building users. The waste should be properly contained in a location that is readily accessible by waste collection vehicles while minimizing possible adverse traffic safety, environmental and aesthetic impacts. The storage location should ensure that waste is properly contained, and separated to facilitate recycling by the collector/disposal site. The solid waste storage area is to be paved, supplied with running water, and a drain to the sewer. The collection vehicle should be able to drive up to the waste storage area/room, so that the footmen are able to easily wheel the bins out, empty them and return them to the service area to be cleaned as required, before their being put back into use.</li> </ol> <p><i>Construction phase:</i></p> <p>The <b>Contractor</b> shall prepare and implement a Waste Management Plan as part of its Environmental Management Plan for prior approval by the SWMU. At a minimum, the plan must comply with the provisions of the Waste Management Act, and shall address:</p> <ol style="list-style-type: none"> <li>1. the sources of waste;</li> <li>2. waste minimization, reuse, and recycling opportunities; and</li> <li>3. waste collection, storage, and disposal procedures.</li> </ol> <p>The Waste Management Plan should distinguish between solid and liquid waste, as applicable, and include procedures for addressing waste that may be hazardous to health and the environment. Under the Waste Management Plan, the Contractor shall:</p>	Contractor NEMO SWMA	Before Construction  During Construction and Operation
ESS4: Community Health, Safety, and Security			
ESS6: Biodiversity Conservation and Sustainable Management of Living Natural Resources			

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	<ol style="list-style-type: none"> <li>2. Observe legal requirements for proper containment of the waste.</li> <li>3. Provide a sufficient number of adequate waste receptacles across the site. Trash bins shall be accessible at all locations where waste is generated.</li> <li>4. Locate solid waste receptacles to minimize possible adverse traffic safety, environmental and aesthetic impacts.</li> <li>5. Contain all food waste in covered bins and dispose daily to avoid attracting animals and vermin, or causing other public nuisance.</li> <li>6. Keep sub-project area clean and free of litter, not allowing litter to disperse to the surrounding area.</li> <li>7. Prevent entry of solid waste into drainage or coastal waters.</li> <li>8. Keep soil/spoil and green waste separate from other <b>construction</b> waste, to be reused on or near the site where possible, with appropriate sediment control, or taken to approved landfill or other approved disposal site. Non-hazardous solid waste should not be disposed of together with spoil.</li> <li>9. Manage waste generated from septic tank servicing separately from other wastes. This should be decanted by an approved handler and hauled immediately to disposal.</li> <li>10. Remove solid waste from the site and transport to the municipal landfill, or other approved disposal site. Illegal dumping of waste is prohibited, and a Contractor engaging in this practice will be prosecuted to the full extent of the law. Waste shall not be dumped or buried in unauthorized areas or burned.</li> <li>11. Ensure all workers receive training on proper disposal of all waste prior to working on the sub-project site.</li> <li>12. Enforce worker use of appropriate, accessible solid waste disposal facilities.</li> </ol> <p>Consideration shall be given to:</p> <ol style="list-style-type: none"> <li>13. Balancing cut and fill as far as possible to minimize haulage and disposal issues.</li> <li>14. Managing all green waste on site.</li> <li>15. Reusing materials where possible.</li> <li>16. Making potentially useable material reasonably available to surrounding communities and to workers.</li> </ol>		

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	<p>17. Identifying and obtaining approval of alternate locations for disposal of suitable spoil material.</p> <p><i>Operations phase:</i></p> <p>Possible strategies for application by NEMO to prevent or minimize quantities of wastes generated and hazards associated with the wastes include the following:</p> <ol style="list-style-type: none"> <li>1. Instituting good housekeeping and operating practices, including inventory control to reduce the amount of waste resulting from materials that are out-of-date, off-specification, contaminated, damaged, or excess to requirements.</li> <li>2. Buying in bulk quantities whenever possible.</li> <li>3. Substituting materials or inputs with less hazardous or toxic materials, or with those that generate lower waste volumes.</li> <li>4. Using refillable, bulk dispensers rather than individually packaged products.</li> <li>5. Instituting procurement measures that recognize opportunities to return usable materials such as containers and which prevent the over-ordering of materials.</li> <li>6. Working with suppliers to limit use of product packaging.</li> <li>7. Avoiding use of polystyrene foam in all operations.</li> <li>8. Implementing organic-waste composting.</li> <li>9. Identifying potentially recyclable materials in waste streams.</li> <li>10. Disposing of wastes only after all waste prevention and recycling strategies have been explored and maximized.</li> <li>11. Minimizing hazardous waste generation by implementing stringent waste segregation to prevent the commingling of non-hazardous and hazardous waste.</li> <li>12. Providing training and incentives to employees in order to meet objectives.</li> </ol>		

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Relevant ESS	Mitigation Measure	Responsible for Implementing	Timing of Requirements
<b>6.2.5 Chemicals Management</b>			
<p>ESS3: Resource Efficiency and Pollution Prevention</p> <p>ESS6: Biodiversity Conservation and Sustainable Management of Living Natural Resources</p>	<p><b>Chemicals-1: Hazardous Materials Management</b></p> <p><i>Construction and operations phases:</i></p> <p>Hazardous materials should be handled, stored, and transported so as to avoid leaks, spills or other types of accidental releases into soils, surface water, and groundwater resources. In relation to hazardous materials storage and use, management actions include:</p> <ol style="list-style-type: none"> <li>1. Development of a Hazardous Materials Management Plan to include management of fuels and oils.</li> <li>2. Inventory management and process changes to reduce inventories of hazardous materials and reduce or eliminate the potential off-site consequences of a release.</li> <li>3. Modifying process or storage conditions to reduce the potential consequences of an accidental off-site release.</li> <li>4. Improving shut-down and secondary containment to reduce the amount of material escaping from containment and to reduce the release duration.</li> <li>5. Reducing the probability that releases will occur, through improved site operations and control, and through improvements in maintenance and inspection.</li> </ol> <p>Operation and maintenance of equipment requires the use, storage and transfer of varying quantities of fuels and lubricants. See <a href="#">Water-5</a> for BMP of oils and fuels in <b>design, construction, and operations phases</b>. See also <a href="#">Safety-8</a>.</p>	<p>Contractor</p> <p>NEMO</p>	<p>Before Construction</p> <p>During Construction and Operation</p>
<p>ESS3: Resource Efficiency and Pollution Prevention</p> <p>ESS6: Biodiversity Conservation and Sustainable</p>	<p><b>Chemicals-2: Spill prevention and Control</b></p> <p><i>Construction and Operations phases</i></p> <p>Facilities should implement measures to prevent and control spills, including:</p> <ol style="list-style-type: none"> <li>1. Develop an inventory of potentially polluting materials, including their estimated quantities and size and number of storage containers. Use this inventory to determine the size and type of spill kits that should be present at the site.</li> </ol>	<p>Contractor</p> <p>NEMO</p>	<p>During Construction and Operation</p>

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Relevant ESS	Mitigation Measure	Responsible for Implementing	Timing of Requirements
Management of Living Natural Resources	<ol style="list-style-type: none"> <li>2. Summarize the procedures and information for dealing with spills in a written spill plan. At a minimum the plan should include: <ol style="list-style-type: none"> <li>a. a description of the facility</li> <li>b. an inventory of materials</li> <li>c. material safety datasheets (MSDS)</li> <li>d. a site plan including drainage features, BMPs, maintenance and fueling areas, and spill kits</li> <li>e. spill-prevention measures to be used on-site, such as: <ul style="list-style-type: none"> <li>• using containers suitable for the material stored—for example, a container designed for flammable liquids to store gasoline</li> <li>• overfill prevention for storage tanks such as a high-level alarm or audible vent</li> <li>• sized secondary containment for bulk storage tanks such as a berm or double-walled tank—a berm should hold 150 percent of the tank capacity plus possible rainfall</li> <li>• general secondary containment to catch the most likely spill, e.g. where fuel and oil transfers take place</li> <li>• periodically inspecting and testing tanks and pipes (both of which should be aboveground to enable visual inspections)—inspections should conform to industry standards</li> </ul> </li> <li>f. reporting requirements</li> <li>g. cleanup procedures</li> <li>h. the position of the person responsible for coordinating a spill response</li> </ol> </li> <li>3. The plan should be reviewed at least every five years. It should be maintained on-site for the use and benefit of the operator.</li> <li>4. Post a summary of the spill prevention procedures in appropriate locations, including areas with a high spill potential. The summary should identify the spill-cleanup coordinators, the locations of cleanup kits, and the phone numbers of regulatory agencies to be contacted in the event of a spill.</li> <li>5. Provide spill-cleanup kits at locations where spills are most likely to occur. Kits are available from several manufacturers or may be prepared by the facility owner. Each spill kit should have sufficient adsorbent capacity to handle a spill of the largest movable container at that location.</li> <li>6. Adsorbents used in spill cleanup kits may be targeted to specific substances such as oil-based liquids, water-based liquids, corrosive liquids, or may be of</li> </ol>		

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	<p>the “universal” type for all or unknown liquids. In general, a spill cleanup kit should have:</p> <ol style="list-style-type: none"> <li>adsorbent socks or an adsorbent boom to contain the spill</li> <li>adsorbent mats or wipes to clean up the spill</li> <li>disposal bags for the used adsorbent</li> <li>personal protective equipment such as gloves, a face mask, and safety goggles</li> <li>an instruction manual for the equipment</li> <li>a clearly labeled container</li> </ol>		

Relevant ESS	Mitigation Measure	Responsible for Implementing	Timing of Requirements
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6.2.6 Community health, safety and security

ESS4: Community Health, Safety, and Security	<p><b>Community Safety-1: Structural Safety</b></p> <p><i>Design phase:</i></p> <ol style="list-style-type: none"> <li>Reduction of potential structural hazards is best accomplished in the <b>design</b> phase when the structural <b>design</b>, layout and site modifications can be readily adapted. Considerations for the planning, siting, and <b>design</b> include: <ol style="list-style-type: none"> <li>Inclusion of buffer strips or other physical separation around the sub-project site to protect the public from nuisance issues related to noise, odors, or other emissions.</li> <li>Incorporation of siting and safety engineering criteria to prevent failures due to natural hazards such as earthquakes, tsunamis, wind, flooding, landslides, and fire. All structures should be <b>designed</b> in accordance with engineering and <b>design</b> criteria mandated by site-specific risks, in compliance with local codes, local fire service regulations, local legal/insurance requirements, and in accordance with an internationally</li> </ol> </li> </ol>	<p>VEEP/NEMO Designer</p> <p>PPU, Fire Service, Electrical Inspectorate Division, and EHD Labour Department</p>	<p>Design</p> <p>Construction</p> <p>Operations</p>
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	<p>accepted life and fire safety (L&amp;FS) standard, and international best practice.</p> <p>c. Engineers and architects responsible for designing and constructing the sub-project should certify the plans and their compliance.</p> <p>2. For Life and Fire Safety (L&amp;FS), the <b>designers</b> must treat with:</p> <ol style="list-style-type: none"> <li>Fire prevention</li> <li>means of egress</li> <li>detection and alarm systems</li> <li>compartmentation</li> <li>fire suppression and control</li> <li>emergency response plan</li> <li>operation and regular maintenance</li> </ol> <p>2. Design plans should be submitted to public agencies such as PPU, Fire Service, Electrical Inspectorate Division, and EHD for their review and input before finalization.</p> <p>3. Subject prospective contractors to a rigorous selection process.</p> <p>4. Provide quality supervision by competent professionals to help should ensure that the contractor builds according to approved plans.</p> <p>5. Require environmental health and labour authorities to intermittently inspect the building works.</p> <p>6. Re-certify building electrical systems regularly during operations.</p>		
ESS4: Community Health, Safety, and Security	<p><b>Community Safety-2: Disease Prevention</b></p> <p><i>Construction and operations phases:</i></p> <p>Reducing the impact of vector-borne disease on the long-term health of workers is best accomplished through implementation of diverse interventions aimed at eliminating the factors that lead to disease. Contractor/NEMO, in close collaboration with community health authorities, can implement an integrated control strategy for mosquito and other arthropod-borne diseases that might involve:</p> <ol style="list-style-type: none"> <li>Prevention of larval and adult propagation through sanitary improvements and elimination of breeding habitats close to human settlements</li> <li>Elimination of unusable impounded water</li> <li>Increase in water velocity in natural and artificial channels</li> <li>Implementation of integrated vector control programs</li> <li>Collaborating with public health officials to help eradicate disease reservoirs</li> </ol>	Contractor NEMO	During Construction and Operation

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	<ol style="list-style-type: none"> <li>6. Collaboration and exchange of in-kind services with other control programs in the sub-project area to maximize beneficial effects</li> <li>7. Educating sub-project personnel on risks and prevention</li> </ol>		
ESS4: Community Health, Safety, and Security	<p><b>Community Safety-3: Site Safety and Security</b></p> <p><i>Construction and operations phases:</i></p> <p>Reducing the vulnerability of the NEMO compound to illegal entry by unauthorized persons may be achieved by increasing site security as follows:</p> <ol style="list-style-type: none"> <li>1. Install a proper security system on the compound, including high quality night vision CCTV cameras and alarms.</li> <li>2. Use private sector armed guards (e.g., Guardsman, Amalgamated)</li> <li>3. Provide for two guards to be on duty - one at the top level, and one at the bottom level. They should have radios so they may be in constant communication with each other.</li> <li>4. Provide appropriate accommodation for security details deployed to the site in the emergency response phase.</li> </ol> <p>The protection of building users, particularly during EOC operations, should be enhanced by:</p> <ol style="list-style-type: none"> <li>1. Providing adequate separation between male and female accommodations and facilities.</li> <li>2. Providing adequate access to facilities for the differently abled.</li> <li>3. Providing adequate internal security (cameras in common spaces, security personnel, etc.)</li> </ol> <p>The options report already includes the following recommendations:</p> <ol style="list-style-type: none"> <li>1. Install panic doors for emergency egress from the building.</li> <li>2. Remove burglar bars on basement level external doors.</li> </ol>	Contractor NEMO	During Construction and Operation
ESS4: Community Health, Safety, and Security	<p><b>Noise-1: Noise Abatement and Community Coordination (construction phase)</b></p> <p>Compliance with the Noise Control Act (No. 18 of 1988) is required.</p> <p>For noise beyond the property boundary, recommended minimization and control techniques include the following:</p>	Contractor	During Construction



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Relevant ESS	Mitigation Measure	Responsible for Implementing	Timing of Requirements
	<ol style="list-style-type: none"> <li>1. Maintenance or installation of natural barriers at facility boundaries (e.g., vegetation curtains or soil berms) for visual and noise screening.</li> <li>2. Optimization of internal-traffic routing, particularly to minimize vehicle-reversing needs (reducing noise from reversing alarms) and to maximize distances to the closest sensitive receptors.</li> <li>3. Consider use of electrically driven machines.</li> <li>4. Consider a speed limit for trucks.</li> </ol> <p>Generally, <b>construction</b> noise and the associated effects shall be reduced or minimized, to the extent possible, by implementing the following procedures:</p> <ol style="list-style-type: none"> <li>1. Ensure that noise specifications for equipment are compliant with acceptable international standards for the occupational environment.</li> <li>2. Ensure motorized vehicles and equipment are equipped with the greatest possible noise reduction parts, such as mufflers, silencers, insulators, and enclosures.</li> <li>3. Select quieter equipment and <b>construction</b> activities, whenever feasible.</li> <li>4. Install acoustic enclosures for equipment casing radiating noise.</li> <li>5. Install acoustic barriers without gaps and with a continuous minimum surface density of 10 kg/m<sup>2</sup> in order to minimize the transmission of sound through the barrier. Barriers should be located as close as possible to the source or to the receptor location to be effective. The existing boundary wall should be effective in containing noise.</li> <li>6. Locate noisy activities further from sensitive receptors to the extent feasible.</li> <li>7. Limit work activities to daytime hours (7 am to 6:30 pm) to the extent feasible.</li> <li>8. Avoid noisy civil works/equipment operation during sensitive morning, evening, and nighttime periods, to the extent feasible.</li> <li>9. Limit the hours of operation for specific pieces of equipment or operations, especially mobile sources operating through community areas.</li> <li>10. Reduce sub-project traffic routing through community areas wherever possible.</li> <li>11. Switch off equipment when not in use.</li> </ol>		

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Relevant ESS	Mitigation Measure	Responsible for Implementing	Timing of Requirements
	<p>12. Noise impacts should not exceed the levels presented in Table 5.6 or result in a maximum increase in background levels of 3 dB at the nearest receptor location off-site.</p> <p>13. Develop a mechanism to record and respond to complaints. See Grievance Redress Mechanism in Section 7.8.</p>		
ESS4: Community Health, Safety, and Security	<p><b>Noise-2: Noise Abatement and Community Coordination (operations phase)</b></p> <p>The same principles from the construction phase apply. For noise beyond the property boundary, recommended minimization and control techniques include the following:</p> <ol style="list-style-type: none"> <li>1. Maintenance or installation of barriers at facility boundaries (e.g., boundary wall, vegetation curtains or soil berms) for visual and noise screening.</li> <li>2. Impose a speed limit within the compound.</li> </ol> <p>Generally, operational noise and the associated effects shall be reduced or minimized, to the extent possible, by implementing the following procedures:</p> <ol style="list-style-type: none"> <li>1. Ensure that noise specifications for equipment are compliant with acceptable international standards for the occupational environment.</li> <li>2. Ensure motorized vehicles and equipment are equipped with the greatest possible noise reduction parts, such as mufflers, silencers, insulators, and enclosures.</li> <li>3. Select quieter equipment whenever feasible.</li> <li>4. Install acoustic enclosures for equipment casing radiating noise.</li> <li>5. Locate noisy activities further from sensitive receptors to the extent feasible.</li> <li>6. Limit outdoor activities that use amplified music to reasonable hours, in consultation with community.</li> <li>7. Inform community when a proposed activity is going to generate noise into evening hours.</li> <li>8. Noise impacts should not exceed the levels presented in Table 5.6, or result in a maximum increase in background levels of 3 dB at the nearest receptor location off-site.</li> <li>9. Develop a mechanism to record and respond to complaints. See Grievance Redress Mechanism in Section 7.8.</li> </ol>	Designer NEMO Contractor	During Construction

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Relevant ESS	Mitigation Measure	Responsible for Implementing	Timing of Requirements
6.2.7 Land use, Landscape and Visual Character			
ESS4: Community Health, Safety, and Security  ESS5- Land acquisition and Involuntary Resettlement	<b>Land-use-1: Community participation in area land use plans</b> <i>Regulatory authorities, going forward:</i> To minimise issues of future incompatibility of land use, it is recommended that the authorities develop a physical plan for the Kingstown suburbs under development pressure, in consultation with all relevant area stakeholders.	PPU	Immediately
ESS4: Community Health, Safety, and Security	<b>Land-use-2: Visual impacts on community</b> <i>Designer</i> Site landscaping and tasteful site and building design should consider views of the site from the perspectives of existing area users. <i>Contractor</i> The construction activity should be hoarded off for several reasons that include reduction of negative visual impacts related to construction activity.	Designer Contractor	During design and construction

Relevant ESS	Mitigation Measure	Responsible for Implementing	Timing of Requirements
6.2.8 Biodiversity			
ESS6: Biodiversity Conservation and Sustainable	<b>Biodiversity-1: Terrestrial Habitat Management</b> <i>Design, construction and operation phases:</i>	Designer Contractor	During design, construction and operation

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Relevant ESS	Mitigation Measure	Responsible for Implementing	Timing of Requirements
Management of Living Natural Resources	<p>Construction of buildings may impact biota. Some invasive species may be introduced, affecting local ecosystems and reducing species diversity. Soil compaction (caused by erosion and water and nutrient loss) may also affect plant growth and the age structure of vegetation. Recommended methods to prevent and control damage to biodiversity include:</p> <ol style="list-style-type: none"> <li>1. Timely identification of sensitive habitats and implementation of protective measures (e.g., buffer zones or corridors) to maintain links between natural systems within and beyond the site, limiting habitat fragmentation.</li> <li>2. Minimizing disturbance to vegetation and soils.</li> <li>3. Implementing mitigation measures appropriate for the type of habitat and potential impacts.</li> <li>4. Avoiding or minimizing the creation of barriers to wildlife movement, or threats to migratory species (such as birds) and providing alternative migration routes when the creation of barriers cannot be avoided.</li> <li>5. Planning and avoiding sensitive areas and implementing buffer zones.</li> <li>6. Avoiding the introduction of new invasive species during <b>construction</b>, landscaping, and <b>operation</b> of facilities.</li> <li>7. After <b>construction</b>, restoring habitat through the use of native plants.</li> <li>8. Reducing the impact of buildings on nocturnal environments by avoiding lighting that extends off site or into the night sky.</li> <li>9. Coordinating with ancillary suppliers (e.g. food suppliers / farmers, <b>construction</b>-material suppliers, product suppliers) to ensure sustainable practices for biodiversity conservation in the supply chain.</li> <li>10. Conducting activities such that the risk of bank destabilization is minimized.</li> <li>11. Implementing soil conservation measures (e.g., segregation, proper placement and stockpiling of clean soils and spoil for reuse on site).</li> <li>12. Avoiding or minimizing the use of herbicides to control vegetation growth. If used, personnel should be trained in their use. Herbicides that should be avoided include those listed under the World Health Organization (WHO)-recommended Classification of Pesticides by Hazard Classes 1a and 1b, and Annexes A and B of the Stockholm Convention on Persistent Organic Pollutants (2001).</li> <li>13. Minimising noise to reduce adverse impacts on area fauna.</li> </ol>	NEMO Forestry Division	

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Relevant ESS	Mitigation Measure	Responsible for Implementing	Timing of Requirements
ESS6: Biodiversity Conservation and Sustainable Management of Living Natural Resources	<p><b>Biodiversity-2: Aquatic/Marine Habitat Management</b></p> <p><i>Design, construction and operation phases:</i></p> <p>Aquatic habitats may be altered through changes in surface water and groundwater regimes, resulting in increased pressures on fish and wildlife communities. Earth-moving operations (typically primarily in the <b>construction</b> phase) may mobilize sediment which can enter watercourses and marine spaces and disrupt water quality and quantity. Pollutant spills can also get into waters. Recommended management strategies include the following:</p> <ol style="list-style-type: none"> <li>1. Maintaining, to the extent possible, natural drainage paths and restoring them if they are disrupted.</li> <li>2. Protecting stream channel stability by limiting in-stream and bank disturbance, and employing appropriate setbacks from riparian zones.</li> <li>3. Attenuating surface runoff from high precipitation events using on-site storage and water management infrastructure (e.g., storage ponds, sumps, low gradient ditches, clean water diversions).</li> </ol>	Designer Contractor NEMO	During design, construction and operation

Relevant ESS	Mitigation Measure	Responsible for Implementing	Timing of Requirements
<b>6.2.9 Traffic Circulation and Safety</b>			
ESS4: Community Health, Safety, and Security	<p><b>Traffic-1: Traffic Management Plan</b></p> <p><b>Design</b></p> <p>Current location of the main site entrance and boundary wall are not best for traffic on the perimeter road along the north site boundary. Consultant-recommended options include relocation of the site entrance further from the junction. Consideration should</p>	Designer Contractor PPDB/PPU Ministry of Works Traffic police	During Design Before Construction

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	<p>also be given to a perimeter wall design and/or location that improves lines of sight on that road.</p> <p>The Contractor will develop a Traffic Management Plan applicable for the various phases of the works, for approval by the Ministry of Works and Traffic Police. This is required to assure the safety of the workforce and the traveling public, whether on foot or by vehicle and to keep traffic flowing as freely as possible. It is important to plan activities to optimize work efficiency and safety, and to minimize traffic delay, congestion and general inconvenience to the road user. The principles of safe and efficient traffic management are:</p> <ol style="list-style-type: none"> <li>1. Compliance with the principles of prevention, and application of the hierarchy of risk prevention and protection.</li> <li>2. Provision of clear and early warning of obstructions in the roadway.</li> <li>3. Optimization of road space and the provision of an adequate safety zone and workspace at work locations.</li> <li>4. Provision of clear directions relating to decisions/actions required from road users.</li> <li>5. Consideration for the needs of vulnerable road users,</li> <li>6. Minimization of potential conflict between road users.</li> <li>7. Provision of credible traffic signs and temporary requirements.</li> <li>8. Provision of appropriate speed limits and restrictions.</li> </ol> <p>The sub-project may contribute to a significant increase in traffic along existing roads, and recommended measures include:</p> <ol style="list-style-type: none"> <li>1. Minimizing pedestrian interaction with <b>construction</b> vehicles.</li> <li>2. Collaborating with responsible authorities to improve signage visibility and overall safety of roads.</li> <li>3. Collaborating with local communities including schools and other nearby institutions on education about traffic and pedestrian safety.</li> <li>4. Employing safe traffic control measures including road signs and flag persons to warn of dangerous conditions.</li> </ol> <p>In the <b>construction</b> phase, information on specific traffic arrangements will be publicized by suitable media. If there is to be any obstruction within the roadway, informational signage is to be posted at suitable locations from 7 days in advance of the works, and regularly thereafter up to and through the period that the arrangements are</p>		

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Relevant ESS	Mitigation Measure	Responsible for Implementing	Timing of Requirements
	<p>in effect. Public notices are to be similarly disseminated when the arrangements are changed, and/or normal traffic arrangements are reinstated.</p> <ol style="list-style-type: none"> <li>1. Local traffic laws and speed limits shall be observed at all times. Appropriate safety precautions shall be taken when transporting large equipment on public roadways.</li> </ol> <p>In the <b>operations</b> phase, NEMO should develop a traffic management plan that mitigates the traffic impacts associated with meetings convened at the HQ. Considerations could include carpooling and arranging to use nearby parking areas when a meeting is planned. Some stakeholders suggested that the warehousing and relief distribution function at the HQ location causes significant traffic disruption in the aftermath of a disaster, and suggested that consideration should be given to relocating this function.</p>		

Relevant ESS	Mitigation Measure	Responsible for Implementing	Timing of Requirements
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#### 6.2.10 Cultural Heritage

ESS8: Cultural Heritage	<p><b>Culture-1: Chance Finds of Heritage Value</b></p> <p><i>Construction phase:</i></p> <p>The contractor is required to develop a “Change Finds procedure”, which is appropriate to the low risk in this setting, to be submitted to the PIU as part of the final contract negotiations.</p> <p>If during any works activities any sensitive resources are identified, the resources are to be evaluated to determine appropriate treatment or avoidance procedures:</p> <ol style="list-style-type: none"> <li>1. If the site contains resources or if inadvertent discoveries are made during <b>construction</b> or <b>operation</b>, the National Trust shall be called in by the Contractor to investigate and advise. Potential resources discovered must be turned over to the Trust for proper record keeping and cataloging.</li> </ol>	Contractor	During Construction
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Relevant ESS	Mitigation Measure	Responsible for Implementing	Timing of Requirements
	Workers are to be briefed by the Contractor's Project management on the required procedure for reporting potential discoveries to the SVG National Trust.		

Relevant ESS	Mitigation Measure	Responsible for Implementing	Timing of Requirements
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#### 6.2.11 Natural Hazards and Climate Change

ESS2: Labour and Working Conditions	<p><b>Natural hazards-1: Emergency Response Plan</b></p> <p><b>Design phase:</b></p> <p>At the sub-project planning stage:</p> <p>The Designer should:</p> <ol style="list-style-type: none"> <li><b>Design</b> workplace structures to withstand the expected elements for the region and have an area designated for safe refuge, if appropriate. See <a href="#">Community Safety-1</a> for more detail.</li> </ol> <p><i>Construction and operations phases:</i></p> <p>In the <b>construction</b> and <b>operations</b> phases, the Contractor/NEMO should:</p> <ol style="list-style-type: none"> <li>Think through the possible incidents and emergencies which could arise during <b>construction</b> works and <b>operations</b> and assess the risks to be addressed by the Contractor/NEMO in its Emergency Response Plan. These risks may include: <ol style="list-style-type: none"> <li>Pollution incidents e.g., spillages.</li> <li>Failure of temporary works, slope collapse, vandalism, fire, etc.</li> <li>Extreme weather events – heavy rainfall, flooding, high winds.</li> <li>Accidents.</li> </ol> </li> <li>Prepare an <b>Emergency Management Plan</b> as appropriate, to be approved by NEMO and Fire Service. The Plan should include the following basic elements: <ol style="list-style-type: none"> <li>Administration</li> <li>organization of emergency areas</li> <li>rules and responsibilities</li> </ol> </li> </ol>	<p>Designer</p> <p>Contractor</p> <p>NEMO</p> <p>Fire Service</p> <p>CWSA Water Resource Unit</p> <p>Department of forestry</p> <p>BRAXA</p>	<p>Before Construction</p> <p>During construction and operation</p>
ESS4: Community Health, Safety, and Security			



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Relevant ESS	Mitigation Measure	Responsible for Implementing	Timing of Requirements
	<ul style="list-style-type: none"> <li>e. communication systems</li> <li>f. emergency response procedures</li> <li>g. emergency resources</li> <li>h. training and updating</li> <li>i. checklists (roll and action list and equipment list)</li> <li>j. business continuity and contingency</li> </ul> <ol style="list-style-type: none"> <li>4. All site entrances are to be accessible by fire truck in the event of emergency.</li> <li>5. Hydrants are to be installed at readily accessible locations with water backup, to recharge fire appliances. Hydrants should be the pillar type, rather than underground, and offset by at least 200 feet from any building.</li> <li>6. The Emergency Response Plan and procedures for dealing with emergencies are to be communicated to all staff before works commence. This plan must at least meet the requirements of NEMO and be approved by NEMO before works commence.</li> <li>7. The Contractor/NEMO must ensure that site staff responsible for taking action in emergencies are: <ul style="list-style-type: none"> <li>b. aware of their responsibilities;</li> <li>c. trained in the appropriate response; and</li> <li>d. know how to use the necessary equipment such as extinguishers, spill control equipment and shut-off valves.</li> </ul> </li> <li>8. Develop Standard Operating Procedures (SOPs) for sub-project shutdown, including an evacuation plan. Drills to practice the procedure and plan should also be undertaken annually.</li> <li>9. If a hurricane or other cyclonic activity threatens, tidy the site, ensure drainage channels are clear and secure light items that may become airborne under high wind conditions.</li> <li>10. Insure the works and facilities against natural hazards.</li> </ol> <p>With respect to <b>flood risk</b> the following are recommended:</p> <ol style="list-style-type: none"> <li>1. Stream flows including high level flows in the river adjacent to NEMO should be included in the CWSA Water Resource Unit's routine monitoring programme.</li> <li>2. The bridge at the downstream end of the river boundary should be routinely monitored and maintained by BRAXA and debris in the watercourse removed as required, to ensure that the bridge is not compromised in an extreme event.</li> </ol>		

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Relevant ESS	Mitigation Measure	Responsible for Implementing	Timing of Requirements
	3. Vegetation on the riverbank should be managed by the Department of Forestry to ensure optimal riverbank stability.		

#### Appendix 4. Code of Conduct for Contractor's Personnel

(Extracted from VEEP Labour Management Procedures, 2023)

The following Code of Conduct is part of our measures to deal with environmental and social risks related to the project works. It applies to all our staff, laborers and other employees at the camp and worksites. It also applies to the personnel of each subcontractor and any other personnel/suppliers assisting us in the execution of the project works. All such persons are referred to as "Contractor's Personnel" and are subject to this Code of Conduct.

The workplace is an environment where unsafe, offensive, abusive or violent behaviour will not be tolerated and where all persons should feel comfortable raising issues or concerns without fear of retaliation.

The Contractor's personnel shall:

1. Carryout his/her duties competently and diligently
2. Comply with this Code of Conduct and all applicable laws, regulations, and other requirements, including requirements to protect the health, safety and well-being of other Contractor's Personnel and any other person.
3. Maintain a safe working environment including by: (a) ensuring that workplaces machinery, equipment and processes under each person's control are safe and without risk to health; (b) wearing required personal protective equipment (PPE); (c) using appropriate measures relating to chemical, physical and biological substances and agents; and (d) following applicable emergency operating procedures.
4. Report work situations that they believe are not safe or healthy and remove themselves from a work situation that they reasonably believe presents an imminent danger to their life or health.
5. Treat other people with respect and not discriminate against specific groups such as women, people with disabilities, migrant workers or children.
6. Not engage in harassment (sexual or non-sexual in nature), which means unwelcome (sexual) advances, requests for sexual favours, and other verbal or physical conduct (of a sexual or nonsexual nature) with other Contractor's or Employer's Personnel.
7. Not engage in exploitation (sexual or non-sexual in nature), which means any actual or attempted abuse of position of vulnerability, differential power or trust for sexual or non-sexual purposes, including, but not limited to, profiting monetarily, socially or politically from the sexual or non-sexual exploitation of another.
8. Not engage in sexual abuse, which means the actual or threatened physical intrusion of a sexual nature, whether by force or under unequal coercive conditions/
9. Not engage in any form of sexual activity with individuals under the age of 18, except in the case of pre-existing marriage.
10. Complete relevant training courses that will be provided related to the environmental and social aspects of the Contract, including health and safety matters, Sexual Exploitation and Abuse (SEA), and Sexual Harassment (SH);
11. Report violations of this Code of Conduct;
12. Not retaliate against any person who reports violations of this Code of Conduct, whether to us or the Employer who makes use of the grievance mechanism for Contractor's Personnel or the project's Grievance Redress Mechanism.

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If any person observes behaviour that they believe may represent a violation of this Code of Conduct, or that otherwise concerns them, they should raise the issue promptly. This can be done in either of the following ways:

- i. Contact the Contractor's Social Expert with relevant experience in handling sexual exploitation, sexual abuse and sexual harassment cases, or if such person is not required under the Contract, or another individual designated by the Contractor to handle these matters or by telephone; or
- ii. Call [ ] to reach the Contractor's hotline (if any) and leave a message.

The person's identity will be kept confidential unless reporting of allegations is mandated by the country's law. Anonymous complaints or allegations may also be submitted and will be given all due and appropriate consideration. Any violation of this Code of Conduct by Contractor's Personnel may result in serious consequences, up to and including termination and possible referral to legal authorities.



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<b>II.</b>	<i>What were the conditions or circumstances under which the incident occurred (if known)?</i>
<b>III.</b>	<i>Are the basic facts of the incident clear, or are there conflicting versions? What are those versions?</i>
<b>IV.</b>	<i>Is the incident still ongoing, or is it contained?</i>
<b>V.</b>	<i>Have any relevant authorities been informed? Who was informed?</i>

B4: Actions taken to contain the incident / Accident			
Short Description of Action	Responsible Party	Expected Date	Status
Have the works been suspended? Yes <input type="checkbox"/> ; No <input type="checkbox"/> ;			

Please attach a copy of the instruction suspending the works.

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<b>B5: What support has been provided to affected people</b>

<b>B6: Injury Information</b>	
<b>Injured Employee</b>	
<b>Name:</b>	<b>Job Title:</b>
<b>Job at time of Injury:</b>	
<b>Type of Employment</b> <div style="display: flex; justify-content: space-around; margin-top: 10px;"> <span>Full – time <input type="checkbox"/></span> <span>Part – time <input type="checkbox"/></span> <span>Temporary <input type="checkbox"/></span> <span>Other <input type="checkbox"/></span> </div>	
<b>Length of time employed with the Company:</b>	
<b>Length of time in current position at the time of the incident:</b>	
<b>Description and severity of injury:</b>	
<b>Location at the time of the incident/accident</b>	
<b>Date and time of incident / Accident:</b>	

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## Appendix 6. NEMO (SVG) Inspection Checklist

Inspection date and time \_\_\_\_\_ Inspected by:

Weather:

Inspection items	implemented?			Remarks (i.e., specify location, good practices, problems observed, possible cause of nonconformity and or proposed corrective/preventative actions)
	Yes	No*	N/A	
<b>A. Air pollution control</b>				
1. Are active site areas watered to minimize dust generated?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2. Are stockpiles of dusty materials covered, vegetated, or watered?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3. Are all vehicles carrying dusty loads covered/watered over prior to leaving the site?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4. Are plant and equipment well maintained? (any black smoke observed, please indicate the plant/equipment details)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
5. Are service records maintained?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
6. Are dust plumes visible from nearby communities?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
7. Others (please specify)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>B. Water pollution control</b>				
1. Are septic tank systems being properly maintained on site?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2. Is drainage adequately separating uncontaminated and contaminated surface waters (including sediment laden waters)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3. Is any wastewater discharged to storm drains?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4. Is the watercourse traversing the site boundary visibly discolored or otherwise contaminated?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
5. Is the public road and site entrance kept clean and free of mud and dust?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
6. Others (please specify)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	



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Inspection items	implemented?			Remarks (i.e., specify location, good practices, problems observed, possible cause of nonconformity and or proposed corrective/preventative actions)
	Yes	No*	N/A	
<b>C. Noise control</b>				
1. Is idle plant/ equipment turned off or throttled down?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2. Are any noise mitigation measures adopted?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3. Is silenced equipment utilized?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4. Are hours of equipment operation limited to workdays and daylight hours?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
5. Others [please specify]	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>D. Waste management</b>				
1. Is the site kept clean and tidy (e.g., litter free, Good Housekeeping)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2. Are separate labeled containers provided for facilitating waste segregation?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3. Are oily and other chemical wastes if any, collected and disposed of properly?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4. Are construction wastes and general refuse removed off site regularly?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
5. Are oil drums and plant/ equipment provided with drip trays?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
6. Are drip trays free of oil and water?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
7. Is there any oil spillage?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
8. Is litter or other objectionable matter observed in drains and watercourses?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
9. Others [please specify]	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>E. Storage of chemicals and dangerous goods</b>				
1. Are chemicals stored and labeled properly?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2. Is secondary containment provided for fuel and waste oil storage areas?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

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Inspection items	implemented?			Remarks (i.e., specify location, good practices, problems observed, possible cause of nonconformity and or proposed corrective/preventative actions)
	Yes	No*	N/A	
3. Are proper measures in place to control oil spillage during maintenance or other activities?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4. Are spill kits/ sand/ sawdust used for absorbing chemical spillage readily accessible?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
5. Others [please specify]	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>F. Protection of flora, fauna, and historical heritage</b>				
1. Has any historical heritage been discovered on site, and if so, have appropriate measures being taken to preserve it?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>G. Resource conservation</b>				
1. Is water leakage or wastage prevented?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2. Are diesel powered plants and equipments shut off while not in use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3. Are materials stored in good condition to prevent deterioration and wastage?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4. Others (please specify)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>H. Fire and emergency preparedness and response</b>				
1. Are hazards known for the site and surrounding area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2. Are warning systems in place?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3. Is an evacuation plan in place?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4. Are assembly points determined and designated?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
5. Are drills conducted with employees, and records kept?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
6. Are suitable fire extinguishers provided?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
7. Are escapes not blocked/obstructed?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
8. Are accidents and incidents reported and reviewed, and	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

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Inspection items	implemented?			Remarks (i.e., specify location, good practices, problems observed, possible cause of nonconformity and or proposed corrective/preventative actions)
	Yes	No*	N/A	
corrective and preventive actions identified and recorded?				
9. Others [please specify]	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>I. Community complaints</b>				
1. Is the community complaints log maintained?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2. Are community complaints managed in accordance with the grievance redress system?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>J. Access/ egress</b>				
1. Is site security adequate?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>K. OSH</b>				
1. Have construction workers been exposed to appropriate safety, health and environment induction/orientation?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2. Are workers wearing appropriate PPE? (e.g., hard hats, safety boots, eye protection, hearing protection, masks, broad brimmed hats, gloves)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3. Are regular OSH meetings and daily toolbox meetings held and recorded?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4. Is there a safety issue reporting register/action items list in place?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
5. Are 1 <sup>st</sup> Aid Kits fully stocked?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
6. Are worker sanitation facilities adequate (place to wash hands, access to toilet, drinking water available)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>L. Electrical</b>				
1. Is all electrical work carried out by licensed electrical technicians?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

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Inspection items	implemented?			Remarks (i.e., specify location, good practices, problems observed, possible cause of nonconformity and or proposed corrective/preventative actions)
	Yes	No*	N/A	
2. Is all electrical equipment checked in accordance with best practice recommendations?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3. Is appropriate level of lighting provided for security and tasks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4. Is exposed electrical equipment protected against water ingress and appropriately rated?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

\* any “No” recorded represents the potential breach of regulations or improvement needed and details of nonconformity shall be recorded in the remarks. Report nonconformity in the following Improvement Request forms. Each nonconformity should make reference to the checklist as coded.

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**Records checked during this inspection** (check those audited and the period covered:

<b>Record</b>	<b>Period of record</b>	<b>Remarks (availability, details, findings, etc.)</b>
<input type="checkbox"/> Weekly report of Contractor's Health, Safety and Public Liaison Officer		
Inspection records for: <input type="checkbox"/> site security and signage <input type="checkbox"/> electrical systems		
Maintenance logs for equipment and infrastructure, including: <input type="checkbox"/> roads <input type="checkbox"/> drainage <input type="checkbox"/> septic tanks <input type="checkbox"/> extinguishers <input type="checkbox"/> 1 <sup>st</sup> aid kits <input type="checkbox"/> spill response kits <input type="checkbox"/> fuel tanks and containment		
<input type="checkbox"/> Training records		
<input type="checkbox"/> Emergency drills		
<input type="checkbox"/> Developer's Environmental, Health and Safety Monitoring Programme		
<input type="checkbox"/> Complaints log		

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**Improvement request – NEMO SVG site**

Inspected by: \_\_\_\_\_  
(Provide name, signature and date)

Nonconformity reference in form	
description of nonconformity	
root cause of nonconformity	
recommended remedial action and timelines	
verified by Health, Safety and Public Liaison Officer or designated representative	(signature and date)

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**References for Inspection Checklist**

WBC, 2006. Environmental Site Inspection Checklist. Form Number : EF-EI04-01 Revision Number : 1  
Date : 1-1-2006. Downloaded from [Environmental Site Inspection Checklist \(epd.gov.hk\)](http://epd.gov.hk)