

THE BAHAMAS WATER SUPPLY AND SANITATION SYSTEMS UPGRADE PROGRAM (BH-L1061)

**Component 3 - Access to Potable Water Supply
Environmental and Social Assessment (ESA) &
Environmental and Social Management Plan (ESMP)**

New Providence

March 2026

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EXECUTIVE SUMMARY

This Environmental and Social Assessment and Environmental and Social Management Plan (ESA/ESMP), prepared under the IDB-funded Water Supply and Sanitation Systems Upgrade Program (BH-L1061) and implemented by the Water and Sewerage Corporation (WSC), evaluates the potential environmental and social impacts of the water mains installation in communities throughout New Providence. The project will enhance access to safe and reliable piped water, improving public health, equity, and community resilience. Short-term impacts such as dust, noise, vegetation disturbance, and temporary access restrictions may occur during construction. These impacts will be effectively managed through site-specific mitigation and monitoring measures designed to ensure environmental protection and community safety. The ESA/ESMP also includes supporting management plans for environmental protection, community health and safety, stakeholder engagement, and grievance redress to promote transparency and responsiveness. With these safeguards in place, the New Providence water mains installation is expected to have low environmental and social risk while delivering lasting public health and socio-economic benefits for multiple communities.

Abbreviations

AMI	Advanced Metering Infrastructure
AoI	Area of Influence
BPL	Bahamas Power and Light
CoC	Code of Conduct
DAoI	Direct Area of Influence
DCC	Disaster Consultative Committee (DCC)
DEPP	Department of Environmental Planning and Protection
DMAs	District Metered Areas
EA	Executing Agency
E&S	Environmental and Social
EHSS	Environmental, Health, Safety and Social
ESAP	Environmental and Social Action Plan
ESF	Emergency Support Function
ESMPc	Environmental and Social Management Plan at the Construction Stage
ESPF	Environmental and Social Policy Framework
ESPS	Environmental and Social Performance Standards
FIA	Family Island Administrators
GHG	Greenhouse Gas
GoTB	Government of The Bahamas
GRM	Grievance Redress Mechanism
IAoI	Indirect Area of Influence
IDB	Inter-American Development Bank
IWA	International Water Association
KBA	Key Biodiversity Area
LMP	Labour Management Procedure
LS	Lift Station
NEMA	National Emergency Management Agency
NRW	Non-Revenue Water
PA	Protected Areas
PEU	Project Execution Unit
PMH	Princess Margaret Hospital
PPE	Personal Protective Equipment
SESA	Strategic Environmental and Social Assessment
SESMP	Strategic Environmental and Social Management Plan
URCA	Utilities Regulation and Competition Authority
USD	United States Dollars
WSC	Water and Sewerage Corporation
WWTP	Wastewater Treatment Plant

1 INTRODUCTION

1.1 BACKGROUND

This Environmental and Social Assessment (ESA) forms part of the broader Environmental and Social Management Framework under the Inter-American Development Bank (IDB)-funded Water Supply and Sanitation Systems Upgrade Program in The Bahamas (BH-L1061), implemented by the Water and Sewerage Corporation (WSC). This document specifically addresses environmental and social risks, mitigation strategies, and compliance requirements associated with the New Providence water mains installation works, which include the following intervention areas:

- Carmichael Road
- Bacardi Road
- Millers Heights
- Nassau Village
- Cowpen Road

These locations collectively represent a mix of major urban corridors, commercial zones, community roadways, and dense residential neighbourhoods characterized by high traffic volumes, roadside businesses, institutional facilities, and established housing. Baseline conditions include compacted limestone and paved roadways, limited formal drainage systems, and recurring surface water pooling in depressions following rainfall. Such conditions heighten the importance of trench stabilization, sediment control, storm preparedness, and safe traffic management throughout construction.

Mitigation measures will focus on minimizing disruption to businesses, residents, and road users through careful planning and phased construction. The water main installation will be carried out within the verge, and works will be implemented in segments to limit localized impacts. A Traffic Management Plan will guide detours, parking, and ensure safe traffic flow throughout the construction period. Advance notice and proactive communication through multiple channels will be used to keep the public informed of construction schedules, water service interruptions, and expected impacts, helping to maintain accessibility to businesses and residences.

Dust, noise, and drainage impacts will be managed on-site to minimize disruption, ensuring community safety and continuity throughout construction. Trenches will be opened in short segments and will not be left exposed for extended periods, access will be maintained through immediate backfilling of open trenches before moving onto the subsequent segment. Disruptive activities will be scheduled during off-peak hours and coordinated with businesses and residents to reduce interference with daily operations while maintaining continuous access to properties. No temporary relocation of vendors is anticipated, and impacts are not expected to result in significant income losses.

Socially, the project is expected to generate substantial benefits by improving water distribution reliability, reducing service disruptions, and enhancing household and commercial resilience. Many communities along the project routes experience aging water infrastructure, intermittent pressure, and localized leaks. Upgrading water mains within high-density areas directly supports public health, economic stability, and quality of life while reducing long-term operational costs for WSC and improving service equity across New Providence.

The project alignment traverses fully developed urban environments with minimal remaining natural habitat. However, landscaped verges, mature shade trees, private property boundaries, schools, churches, and small businesses lie in close proximity to construction works. These conditions require careful planning to manage dust, noise, traffic, pedestrian safety, and temporary access restrictions. While none of the project areas overlap with protected areas or ecological reserves, environmental controls, such as proper waste handling, storm water management, and stockpile containment, remain essential to prevent wider environmental impacts, maintain community safety, and uphold climate resilience objectives under the Program.

This ESA aligns with the Program-level Strategic Environmental and Social Assessment (SESA) and provides location-specific detail for the New Providence works, where there is moderate environmental risk due to the intensity of human interaction, scale of urban disturbance, and need for robust construction-phase controls in densely populated areas.

1.2 OBJECTIVES

The main objectives of this Environmental and Social Assessment (ESA) are to:

- Conduct an expedited diagnosis of the environmental and social baseline of the project intervention area;
- Identify and assess the main environmental and social impacts and risks across the construction, operation, and closing stages of the project; and
- Define the mitigation measures and management procedures required to minimize these impacts and outline the structure of the Project's Environmental and Social Management Plan (ESMP).

This assessment evaluates the potential physical, biological, and social impacts of construction activities along the project boundaries and outlines the measures required to ensure compliance with The Bahamas' national environmental legislation, including the *Environmental Planning and Protection Act (2019)* and the *Environmental Impact Assessment Regulations (2020)*, as well as the Inter-American Development Bank's (IDB) Environmental and Social Performance Standards (ESPS).

The ESA serves as the foundation for contractor obligations under the Contractor's Environmental and Social Management Plan (ESMPc), which guides the site-specific implementation of mitigation actions, monitoring, and social safeguards throughout the construction and operational phases.

1.3 STRUCTURE OF THE REPORT

The structure of this report is designed to align with IDB safeguards requirements and national regulatory frameworks. The report includes:

- A detailed description of the project scope and area of influence;
- Baseline environmental and social conditions, including physical, biological, and socio-economic context;
- Assessment of potential environmental and social risks and impacts;
- Mitigation measures and environmental management procedures;
- A dedicated Environmental and Social Management Plan (ESMP), including monitoring, supervision, and grievance redress mechanism;
- Institutional roles, responsibilities, and reporting requirements.

The analysis focuses on key environmental aspects such as:

- Air quality and dust control, particularly during dry and windy conditions;
- Soil erosion and storm water management
- Vegetation disturbance, especially of roadside native plants;
- Noise which may affect schools, residences, businesses and the flora and fauna in and around the project area

It also considers key social risks and opportunities, including:

- Temporary disturbances to residential communities and commercial facilities during construction, such as road access disruptions or noise;
- Roadway health and safety, potential traffic congestion as well as risks of vehicular and pedestrian accidents along this essential corridor.
- The importance of safe road access and preventative measures against open trenches
- The importance of transparent communication and stakeholder engagement;
- Long-term gains in public health, service delivery, and institutional functionality;
- The role of water access in advancing social equity, community resilience, and local development.

This assessment also reinforces the need for structured environmental and social supervision by WSC and its contractors, including:

- Clear monitoring responsibilities;
- Documentation of compliance with environmental and social safeguards;
- Integration with national disaster and emergency response protocols, particularly during hurricane season;
- Use of a functioning Grievance Redress Mechanism (GRM) to ensure that community, employees and workers concerns are addressed in a timely and transparent manner.

With appropriate mitigation measures, social engagement protocols, and consistent monitoring and evaluation, the New Providence works are expected to have moderate residual environmental and social risks and bring substantial long-term improvements to water security, community health, service equity, and infrastructure reliability for residents, visitors, and businesses in the targeted communities.

2 DESCRIPTION OF THE PROGRAM AND PROJECT

The broader Program aims to strengthen climate-resilient water supply infrastructure across selected islands of The Bahamas. Component 3 of the Water Supply and Sanitation Systems Upgrade Program (BH-L1061) aims to strengthen potable water infrastructure across The Bahamas by improving system reliability, reducing water losses, and expanding access to piped service in communities with aging or undersized distribution networks. Under this Component, the New Providence works include water main installation and replacement activities across several high-density and mixed-use corridors (“The Project”):

- Carmichael Road
- Bacardi Road
- Millers Heights
- Nassau Village
- Cowpen Road

These corridors encompass major arterial roadways, commercial and institutional zones, and medium- to high-density residential neighbourhoods with long-standing service demands. Many of these areas experience intermittent water pressure, localized leaks, and infrastructure deterioration due to the age and materials of existing pipelines. The planned upgrades will enhance system efficiency, improve water quality, reduce non-revenue water, and provide more reliable service to thousands of households and businesses within central and southern New Providence.

The project areas reflect diverse conditions typical of New Providence’s built environment:

- **Carmichael Road** is a heavily trafficked commercial and institutional corridor with businesses, schools, healthcare facilities, and residential subdivisions.
- **Bacardi Road** includes semi-industrial operations, commercial properties, agricultural lots, and scattered residential buildings along wide roadway shoulders.
- **Millers Heights** is a compact residential subdivision with narrow roads, informal drainage, and proximate property boundaries.
- **Nassau Village** is a densely populated community with limited road width, constrained pedestrian space, and high public interaction near schools, churches, and small businesses.
- **Cowpen Road** is a busy residential and mixed-use corridor in southern New Providence that supports moderate to high vehicular traffic and serves nearby residential subdivisions, small businesses, and community facilities.

These conditions require a construction approach that carefully manages traffic flow, pedestrian safety, noise and dust emissions, and access to homes and commercial properties.

The scope of works includes the installation of new PVC water mains and associated lateral connections. Final linear footage will be confirmed during detailed design; however, the activities will generally include:

- Trenching of approximately 18,485 linear feet for 4-inch and 6-inch PVC water mains;
- Installation of service lateral connections;
- Backfilling, site restoration, and reinstatement of affected areas.
- Tie-in connections to existing infrastructure;

The project will have a designated, fenced in, lay down area, where materials and equipment will be stored and refuelling can take place. This location will be determined by the Contractor as included in their Contractor's Environmental and Social Management Plan (c-ESMP).

Trenching (ranging from 12-16 inches) in width will be conducted along the edge of existing paved and unpaved roadway corridors across Carmichael Road, Bacardi Road, Millers Heights, and Nassau Village. These works will occur adjacent to residential properties, commercial establishments, institutional buildings, and vegetated roadside buffers, in accordance with the engineering drawings provided in Appendix C.

Although most of the project corridors are paved, several areas (particularly within residential subdivisions) include compacted limestone shoulders, narrow verges, and informal drainage paths.

Environmental sensitivities include:

- Limited engineered drainage infrastructure, which contributes to rapid surface-water accumulation during rainfall;
- Localized depressions and variable elevation, increasing the potential for trench flooding and sediment transport;
- High traffic volumes along major corridors such as Carmichael Road, requiring careful phasing and traffic control;
- Proximity to homes, businesses, schools, and churches, increasing exposure to dust, noise, and temporary access disruptions.

Social sensitivities include:

- High pedestrian activity in residential neighbourhoods, particularly near schools, churches, and community facilities, increasing the need for safe walkways and clear signage during construction;
- Close proximity of homes and small businesses to roadways, which may result in temporary access constraints to properties and driveways during trenching works;
- Dependence on major corridors such as Carmichael Road and Cowpen Road for daily commuting, public transportation, and local commerce, making traffic management and clear communication critical;
- The presence of vulnerable road users, including children, elderly residents, and persons with disabilities, who may be more sensitive to construction-related disruptions and safety risks.
- These conditions will directly influence construction scheduling, safety planning, equipment mobilization, and the implementation of active erosion, sediment, and storm water control measures throughout the works.

From a social standpoint, the project is expected to bring substantial public health and equity benefits to the community. The area currently lacks connection to the central water distribution network, and residents primarily depend on private wells, bottled water, and rainwater harvesting systems to meet their daily needs. These sources are often inconsistent, costly, and susceptible to contamination, particularly during periods of heavy rainfall or extended dry spells. By extending piped water infrastructure to New Providence, the project will significantly enhance the reliability, affordability, and quality of potable water for residents.

2.1.1 Project Implementation, Supervision, and Management

The implementation of activities under **Component 3: Access to Potable Water** in New Providence will be carried out collaboratively between the **WSC** and the **appointed contractor**. The **contractor** will be responsible for the direct execution of all construction and installation works, including trenching, pipe-laying, reinstatement, and associated environmental and social management measures. The contractor will also be responsible for ensuring adherence to environmental, occupational health and safety (OHS), and community engagement requirements as outlined in this Environmental and Social Management Plan (ESMP) and the Contractor's Environmental and Social Management Plan (C-ESMP).

The **WSC Site Supervisor** will have overall oversight of field implementation and compliance with safety, environmental, and social standards. This individual will serve as the primary liaison between the WSC Project Management Unit (PMU) and the contractor, conducting regular site inspections, verifying the proper use of Personal Protective Equipment (PPE), ensuring that mitigation and monitoring measures are implemented as planned, and certifying adherence to performance and safety requirements and submitting evidence about site encounters and implementation. The Site Supervisor will also coordinate with the **WSC Social and Environmental Specialists**, who will verify and monitor grievances received and general grievance management mechanisms, stakeholder engagement, and social performance indicators. This will be reflected in the monthly report submissions.

The **WSC Project Management Unit (PMU)** will be responsible for the overall coordination, supervision, and reporting of project activities. The PMU will review all contractor submissions, including daily safety reports, monitoring logs, and compliance documentation, to ensure conformity with national regulations and IDB safeguard requirements. The PMU will also oversee the contractor's performance in implementing the Occupational Health and Safety Subprogram, Community Health and Safety Subprogram, Labor Management Procedure, Disaster Risk Management, Community Information and Participation, Coordination with Service Providers, Chance Find Procedure, Traffic and Pedestrian Management Plan, and contractor's employees Grievance Redress Mechanism.

The contractor will be required to hold **daily toolbox meetings** and ensure continuous training and supervision of all work activities, while the WSC Site Supervisor will perform **weekly inspections** and report to the PMU on progress, safety compliance, and social or environmental non conformances observed in the field and remedial actions taken. The **Social Specialist** will oversee the **Grievance Redress Mechanism (GRM)**, ensuring that community and contractor employees complaints are received, documented, and resolved promptly.

Overall, project management will operate through a **three-tier structure**:

1. **Contractor** – Implements construction works and c-ESMP measures.
2. **WSC Site Supervisor** – Provides on-site supervision, compliance verification, and reporting.
3. **WSC PMU (Environmental and Social Specialists)** – Provides overall project oversight, coordination, and reporting to IDB.

2.1.2 Costs, Financing and Timeline

This structure ensures accountability, consistency, and compliance with both national regulations and IDB Environmental and Social Policy Standards (ESPS), while promoting safe, transparent, and efficient project execution throughout the island of New Providence.

The budget allocation for the New Providence Water Main Extension Project under Component 3 reflects the scale and logistical requirements of extending service across the island. The New Providence extension is estimated at \$4,049,000.00 supporting both residential needs and infrastructure serving the local economy, transport, education, and health sectors.

The works are expected to be completed within approximately eighteen months of continuous work.

2.1.3 Expected Benefits

The installation of new water mains across Carmichael Road, Bacardi Road, Millers Heights, and Nassau Village is expected to generate substantial community and system-wide benefits. In addition to improving household access to reliable potable water, the upgraded infrastructure will enhance service delivery to nearby schools, churches, clinics, businesses, and other critical facilities that support daily life in these densely populated urban areas. Reliable water access is essential for maintaining public health, supporting local commerce, and ensuring the uninterrupted operation of community services.

The project will also promote greater equity in water service delivery, particularly in communities that have historically experienced intermittent pressure, aging infrastructure, or frequent service disruptions. Improved distribution capacity and reduced leakage will contribute to more consistent household supply, lower maintenance burdens, and long-term operational efficiency for WSC.

Enhanced infrastructure will further support economic activity along commercial centers such as Carmichael Road and Bacardi Road, where businesses depend on reliable water service for continuity of operations, food service, retail activities, and customer safety. In residential areas like Millers Heights and Nassau Village, upgraded pipelines will contribute to improved living standards, household financial stability, and increased confidence in public utilities.

At the system level, the new water mains will strengthen the resilience of New Providence's distribution network by improving connectivity, reducing non-revenue water, and enhancing capacity to manage climate-related stresses such as drought, flooding, and storm impacts. These improvements support both network redundancy and long-term sustainability.

In summary, the planned works represent a strategic investment in climate-resilient water infrastructure, delivering lasting social, economic, and public health benefits. By ensuring more equitable and reliable access to potable water across key urban communities, the project advances national development priorities while improving the quality of life for thousands of residents and businesses in New Providence.

3 LEGAL AND INSTITUTIONAL FRAMEWORK

The legal and institutional framework that was reviewed include The Bahamas Environmental Health Services Act, the Planning and Subdivision Act, and environmental permitting procedures required by the Department of Environmental Planning and Protection (DEPP).

This assessment and management plan aligns with the requirements of the IDB's Environmental and Social Policy Framework (ESPF), which addresses risk management, labour conditions, pollution control, community health and safety, biodiversity, gender equality, stakeholder engagement, and involuntary resettlement.

3.1 NATIONAL LEGAL FRAMEWORK

The first section of the chapter describes the national legal framework applicable to the Program. The most relevant national legislation, which governs the project are summarised below:

3.1.1 Environmental Licensing

The environmental licensing framework governing this project is established under The Bahamas' Environmental Planning and Protection Act (2019), Environmental Impact Assessment (EIA) Regulations (2020), and the Ministry of the Environment Act (2019). Together, these instruments form the foundation for environmental oversight, pollution control, and sustainable resource management within the country.

In accordance with these regulations, all major infrastructure projects, such as the water mains works in New Providence, are subject to environmental review and approval through the Certificate of Environmental Clearance (CEC) process, administered by the Department of Environmental Planning and Protection (DEPP). The CEC ensures that project design, implementation, public consultation, disclosure of relevant documentation and operations adhere to national environmental standards and safeguard both ecological and community well-being.

For this project, the Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP) required by DEPP to support the issuance of the CEC are being developed in partnership with a recognized and DEPP-approved consulting firm. This collaboration ensures that the assessment and management measures align with national regulatory expectations, international best practice, and the IDB's ESPS.

Act/Policy Title	Summary
Environmental Planning and Protection Act, 2019	The Act provides for the prevention or control of pollution, the regulation of activities and the administration, conservation and sustainable use of the environment and for connected purposes. The Act establishes the Department of Environmental Planning and Protection (DEPP) which in addition to the preceding, manages multilateral environmental agreements, and is responsible for the development and implementation of policies, programmes, and plans for the effective management and conservation of the physical environment within The Bahamas.
Environmental Planning and Protection	The Environmental planning and protection (Extension of application) order applies throughout The Bahamas, including all islands and cays.

(Extension of application) Order, 2020	
Environmental Impact Assessment Regulations, 2020	To provide procedures for a Certificate of Environmental Clearance (CEC). The Regulations provide procedures for the review of proposed projects inclusive of monitoring and compliance requirements. The Regulations dictate the requirements for a Certificate of Environmental Compliance (CEC).
Ministry of the Environment Act, 2019	This Act establishes the Ministry of the Environment to oversee the integrity of the environment of The Bahamas, to make the minister responsible therefore a corporation sole, to establish the environmental administration fund and the environmental trust fund and for matters connected thereto.

3.1.2 Potable Water, Quality, Supply

Act/Policy Title	Summary
Water and Sewerage Corporation Act, 1976	An Act to establish a Water and Sewerage Corporation for the grant and control of water rights, the protection of water resources, regulating the extraction, use and supply of water, the disposal of sewage and for connected purposes.
Water Supplies (Out Islands) Act, 1953	An Act to regulate and control public water supplies in the Out Islands. This Act makes provision for the water supply in the Out Islands. It mainly concerns the construction and maintenance of water supply systems and the conditions of supply of water to private consumers.
Water Supplies (Out Islands) Rules (Cap. 197)	These Rules concern the public supply of water to consumers at the Out Islands and related matters such as the construction of water supply works, rates, and repairs. The Minister may, on application, agree to supply water for domestic or other purposes in accordance with the provisions of the Water and Sewerage Act and these Rules. The Rules also concern requirements for plumbing and metering, prohibit illegal consumption and waste of water supplied through the public system and prescribe charges for water-related services.
Environmental Health Services Act, 1987	Provides the framework for environmental regulations that will ensure compliance for the Project. The Act authorized the DEHS to develop regulations that prevent and control air pollution, soil contamination and preserve water quality.
Environmental Planning and Protection Act (No. 40 of 2019)	The Director shall maintain within the Environmental Registry data on the sources of water, air and noise pollution, particularly data that identifies the quantity, conditions or concentrations relevant to the identification of each pollutant.

Out Islands Utilities Act	An Act to encourage the construction of water supply and sewerage disposal systems on Out Islands by providing for the refund of customs duties and certain other concessions to the developer of such systems. This Act makes provision with respect to the enhancement of public utilities construction works on the Out Islands such as water supply systems and sewerage systems. A developer who wishes to develop a utility project may apply to the Minister. The Minister may, through an agreement, license the developer to construct, maintain and operate the utility project at specified conditions. No utility project shall be constructed without the approval of the Minister.
Reclamation and Drainage Act	An Act to provide for reclamation and drainage of swampy areas. This Act makes provision for land reclamation and drainage of land ordered by the State. The Act shall apply in parts of the Bahamas that are declared by the Minister to be a reclamation area for purposes of this Act. The Minister may order landowners in a reclamation area to conduct land reclamation works and in case of neglect or refusal in respect of such order the Minister may direct a reclamation officer to carry out the work. The Act grants regulation making powers for purposes of the Act to the Minister.
Licensed Plumbers Rules	When undertaking any work for which a licensed plumber is authorized under the provisions of the Act, one must adhere to the requirements of this Regulation. In any premises intended for human habitation or occupation with a pure water supply, it shall not be connected to any impure water supply, nor shall it intersect through any plumbing fixture with the drainage system. Every building designated for human habitation that has a toilet or other plumbing fixture must have a water supply adequate in volume and pressure to flush said toilet or plumbing fixture. Furthermore, any pipe leading water to such toilet must be of an appropriate size to supply water at a rate necessary for proper flushing without unduly reducing the pressure in any other fixture.
Sewerage Rates Regulations	In determining the sum payable under regulation for sewerage services the building fixture specified in the first column of the Schedule shall be classified under the number of units set out respectively in the second column of the Schedule against each fixture.
Water Supply Rules	The Minister when requested in writing may agree to supply water to a consumer for domestic purposes or any other purpose in accordance with the Water and Sewerage Act. Water will not be supplied through any one metered connection with the supply main to more than two water closets. Where more than two water closets are installed

	in any new building on one proposed metered water connection or in any part of any new building such part being on one proposed metered water connection, then no water connection will be made until an independent water supply system has been installed to supply all the water closets in such new building or such part of a new building. If a third water closet is installed in a building or part of a building on an existing water connection, then the connection will be cut off unless an independent water supply system is installed to supply all the water closets in the said building or part of a building.
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3.1.3 Effluent Discharge

Act/Policy Title	Summary
Environmental Health Services Act, 1987	Any individual who, contrary to the provisions of this Act and its regulations, releases or allows the release of any pollutant into the environment is committing an offense. Anyone who (a) discharges a pollutant or contaminating agent into the environment or (b) oversees a source that results in such discharge beyond regulatory limits must immediately notify the Director of such release. No person shall (a) modify or establish any facility or equipment capable of emitting pollutants; (b) change or undertake a production process that results in emissions; or (c) modify a production rate that alters the emission rate or manner, without prior certification approval from the Director endorsing the methods or devices used to control such emissions.

3.1.4 Solid Waste Management

Act/Policy Title	Summary
Environmental Health Services (Collection and Disposal of Waste) (Amendment) Regulations, 2013	These Regulations amend the Environmental Health Services (Collection and Disposal of Waste) Regulations, 2004 by repealing and replacing the Schedule. The Schedule, made under regulation 49, determines waste disposal charges for waste brought to a waste management facility. A waste disposal fee shall be assessed and shall be paid by all private collectors for each load of waste.
Environmental Protection (Control of Plastic Pollution) Act, 2019	An act to prohibit single use plastic food ware and non-biodegradable, oxo-biodegradable and biodegradable single use plastic bags; prohibit the release of balloons; regulate the use of compostable single use plastic bags, and for connected matters.
Environmental Health Services (Control of Plastic Pollution) Regulations, 2020	Where an environmental health officer, having inspected premises of a business pursuant to section 10 of the Environmental Protection (Control of Plastic Pollution)

	Act 2019, has reason to believe that the business has failed to comply with any provision of that Act, the officer may issue a notice of non-compliance.
Environmental Health Services Act, 1987	“Solid waste” includes ashes, garbage, refuse, litter, and other discarded solid material resulting from domestic, industrial, commercial, and agricultural operations and from community activities but does not include sewage. The Minister may prescribe regulations to effectuate and fulfill the purpose, intent, and provisions of this Act and, without prejudice to the generality of the foregoing, such regulations may provide for: subject to the provisions of Article 27 of the Constitution, the use, regulation, and control of beaches and coastal areas, both above and below the high-tide line, the removal of solid waste from them, and the cleaning and maintenance of the aforementioned beaches and areas, and generally for preserving the amenities thereof.

3.1.5 Hazardous Waste Management

Act/Policy Title	Summary
Environmental Health Services Act, 1987	“Solid waste” includes ashes, garbage, refuse, litter, and other discarded solid material resulting from domestic, industrial, commercial, and agricultural operations and from community activities but does not include sewage. The Minister may prescribe regulations to effectuate and fulfill the purpose, intent, and provisions of this Act and, without prejudice to the generality of the foregoing, such regulations may provide for: subject to the provisions of Article 27 of the Constitution, the use, regulation, and control of beaches and coastal areas, both above and below the high-tide line, the removal of solid waste from them, and the cleaning and maintenance of the aforementioned beaches and areas, and generally for preserving the amenities thereof.
International Regulations	
International Convention for the Prevention of Pollution from Ships (MARPOL), 1973, as modified by the Protocol of 1978 and Protocol of 1997 (Annexes I, II, III, IV, V & VI)	The Convention includes regulations aimed at preventing and minimizing pollution from ships - both accidental pollution and that from routine operations - and currently includes six technical Annexes. Special Areas with strict controls on operational discharges are included in most Annexes.
Stockholm Convention on Persistent Organic Pollutants, 2004	It aims to eliminate or restrict the production and use of persistent organic pollutants (POPs).

3.1.6 Occupational Health, Hygiene, and Safety

Act/Policy Title	Summary
Environmental Health Services Act, 1987	Legislation to advance the conservation and maintenance of the environment in the interest of public health, for proper sanitation concerning food and beverage matters, and more broadly, for the provision and oversight of services, activities, and other matters connected or incidental thereto. The Minister may issue regulations to effectuate and realize the purpose, intent, and provisions of this Act and, without limiting the scope of the foregoing, such regulations might provide for the establishment of standards for the hygienic maintenance and use of public sanitary facilities, restrooms, sinks, laundries, and dry cleaning establishments.
Health and Safety at Work Act	Law establishing provisions relating to occupational health and safety and other related purposes.
Health and Safety at Work (amendment)	The Health and Safety at Work Act has undergone an amendment targeting section 17. This revision establishes that any individual interfering with an inspector's duties, falsely claiming to be an inspector, altering official documents, or violating any aspect of the Act or its associated regulations is committing an offense. Penalties, upon summary conviction, range from a fine of five thousand dollars for a first-time offense (and additional charges for continuous offenses) to ten thousand dollars for recurrent violations. Legal action for these offenses can only commence with the Attorney General's direct involvement or endorsement.
Environmental Health (Fees for Services) Regulations, 1989	These Regulations, made under section 17 the Environmental Health Services Act, prescribe fees in respect of the services set out in the Schedule to these Regulations. Any fee or charge incurred in the performance of any service rendered may be recoverable summarily by the Minister and fees and charges shall be paid into the Consolidated Fund. Services include: inspection of cargos of ships and deratization of ships; analysis of drinking water; analysis of treatments involving pesticides; tests analysis of dairy products and food items; and hazardous waste analysis.
Health Rules Chapter 231	These Regulations make provision with respect to a wide variety of matters regarding public health in the Bahamas, including: abatement of nuisances (as defined); the keeping of animals (including birds, goats, pigs, horses and cattle) on premises; waste disposal and littering; discharge of wastewater in public drains; sewerage; digging and construction of wells and cisterns; protection of containers for the storage of water from mosquitoes; handling of food by diseased persons; notification of diseases affecting animals; sanitary conditions for the

	production, transportation, handling, storage and sale of foods and drugs (including drugs for animals; inspection of food establishments; special matters regarding dairies and the production and sale of (adulterated) milk and milk products; and labelling of dairy products.
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3.1.7 Noise

Act/Policy Title	Summary
Environmental Health Services	The Minister may make regulations to give effect to and carry out the purpose, intent and provisions of this Act and, without prejudice to the generality of the foregoing, such regulations may provide for -the prevention and control of air pollution, including the control of emissions of smoke, gases, dust, dust, particulates, fumes or any combination thereof, offensive odors or excessive noise from factories, vessels, vehicles or any other premises or thing.

3.1.8 Historical Pollution

Act/Policy Title	Summary
Environmental Planning and Protection Law (Act N°40 of 2019)	Section 28 refers to the Liability for Historical Pollution, determining that the Director may require a person who has polluted the environment to take measures to rehabilitate the site by notice. If more than one person is found responsible, the liability shall be assessed against those persons on a pro rata basis. Section 36 refers to the Environmental Restoration Order, establishing that the Director may issue an environmental restoration order that requires a person to restore the environment as near as they can to the state it was in before. Moreover, the order shall award compensation to a person whose environment, property or livelihood has been harmed by the action which is the subject of the order.

3.1.9 Labor Legislation

Act/Policy Title	Summary
Apprenticeship Act Chapter 320	An Act to make provision for the regulation of the training of trade apprentices.
Employment Act, 2001	Act establishing the minimum working hours and paid vacations for workers; the provision of maternity and family leave; severance compensation; provisions concerning notice periods for termination of employment contracts;

	stipulations related to summary dismissals and wrongful terminations; regulations regarding the employment of children and young people; provisions concerning workers' wages; regulations on fingerprinting and lie detection; and for related purposes.
Health and Safety at Work Act Chapter 321 C	An Act to make provisions relating to health and safety at work and for connected purposes.
Public Works Act	An Act to provide for the construction, management, and development of public works, buildings and roads.
Industrial Relations (Validation of Trade Unions) Act, Chapter 321D	An Act to validate certain Trade Unions deemed not to exist in consequence of failure to comply with transitional requirements of the Industrial Relations Act upon the repeal by it of the Trade Union and Industrial Conciliation Act.
Industrial Relations Act Chapter 321	An Act to provide for the registration and control of trade unions; for the recognition of trade unions by employers; for the registration of certain Industrial Agreements; for the establishment of an Industrial Tribunal and the regulation of trade disputes; for the repeal of certain parts of the Trade Union and Industrial Conciliation Act; and for other matters connected with or incidental to the aforesaid purposes.
Minimum Wages Act Chapter 321B	An Act to make provisions for minimum wages in employments and for connected purposes.
Recruiting of Workers Act Chapter 318	An Act to regulate the recruitment of workers.
International Regulations	
Forced Labor Convention, 1930 (No. 29)	It prohibits the use of forced or compulsory labor in all its forms, considering that the term “forced or compulsory labor” shall mean all work or service which is exacted from any person under the menace of any penalty and for which the said person has not offered himself voluntarily.
Freedom of Association and Protection of the Right to Organize Convention, 1948 (No.87)	It states workers and employers, without distinction whatsoever, shall have the right to establish and, subject only to the rules of the organization concerned, to join organizations of their own choosing without previous authorization.
Right to Organize and Collective Bargaining Convention, 1949 (No. 98)	It states workers shall enjoy adequate protection against acts of anti-union discrimination in respect of their employment.
C100 - Equal Remuneration Convention, 1951 (No. 100)	It states men and women workers shall be equally remunerated for work of equal value. It refers to rates of remuneration established without discrimination based on sex.

Abolition of Forced Labor Convention, 1957 (No. 105)	It states the obligation to suppress and not to make use of any form of forced or compulsory labor-- (a) as a means of political coercion or education or as a punishment for holding or expressing political views or views ideologically opposed to the established political, social or economic system; (b) as a method of mobilizing and using labor for purposes of economic development; (c) as a means of labor discipline; (d) as a punishment for having participated in strikes; (e) as a means of racial, social, national or religious discrimination.
Discrimination (Employment and Occupation) Convention, 1958 (No. 111)	It states the obligation to declare and pursue a national policy designed to promote equality of opportunity and treatment in respect of employment and occupation, with a view to eliminating any discrimination in respect thereof. The term discrimination includes (a) any distinction, exclusion or preference made based on race, color, sex, religion, political opinion, national extraction, or social origin, which has the effect of nullifying or impairing equality of opportunity or treatment in employment or occupation.
Minimum Age Convention, 1973 (No. 138)	It states the obligation to pursue a national policy designed to ensure the effective abolition of child labor and to raise progressively the minimum age for admission to employment or work to a level consistent with the fullest physical and mental development of young persons.
Worst Forms of Child Labor Convention, 1999	It states the obligation to take immediate and effective measures to secure the prohibition and elimination of the worst forms of child labor as a matter of urgency. For the purposes of this Convention, the term child shall apply to all persons under the age of 18, and the term the worst forms of child labor comprises: (a) all forms of slavery or practices similar to slavery, such as the sale and trafficking of children, debt bondage and serfdom and forced or compulsory labor, including forced or compulsory recruitment of children for use in armed conflict; (b) the use, procuring or offering of a child for prostitution, for the production of pornography or for pornographic performances; (c) the use, procuring or offering of a child for illicit activities, in particular for the production and trafficking of drugs as defined in the relevant international treaties; (d) work which, by its nature or the circumstances in which it is

	carried out, is likely to harm the health, safety or morals of children.
Maritime Labor Convention, 2006, as amended (MLC, 2006)	It states the obligation to secure the right of all seafarers to decent employment.

3.1.10 Flora, Fauna, and Native Forest

Act/Policy Title	Summary
Forestry Act, 2010	Provides regulatory framework for the management of forestlands and protected species of trees and other plants, which are either threatened, endangered, or endemic to The Bahamas.
Forestry Amendment Act	Regulation 36 of the principal Regulations is amended by inserting immediately after the sub-regulation the following new subregulation (3A) -- "(3A) The Minister, acting on the advice of the Director of Forestry, may where a hurricane, tornado or any other natural disaster has occurred on any island, islet or cay in The Bahamas which causes serious damage to any forest or non-forest product in any designated forest, forest estate, forest reserve, conservation forest or protected forest, reserve the right to make special provision for the reduction of fees payable as specified in the Second Schedule, for royalties, permits and licenses for the purposes of these regulations".
Declaration of Protected Trees Order, 2021	This Order declares protected trees for the management, development, and protection of the forest resources of The Bahamas. The Schedule of this Order lists the trees which are endemic or endangered or threatened in Part I and trees which are of cultural or historical or economic significance in Part II.
Forestry Regulations	The Minister may grant leases to Bahamian governmental and nongovernmental bodies for a period not exceeding 99 years for the use of land within a forest reserve, protected forest, and conservation forest for purposes other than the utilization of forest produce under section 17 (1) (a), 17 (1) (b) and 17 (1) (c) of the Act. All applications for leases in respect of Crown land vested in the Minister within forest reserves, protected forests and conservation forests shall be submitted to the Director of Forestry, who shall forward the applications with his recommendations to the Minister.

Wildlife Conservation and Trade	Law implementing the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), focused on the protection of wild species and the damage caused by unsustainable exploitation.
Accidental Fires Act (Cap. 74)	This Act provides for relief from liability for accidental fires. However, this relief shall not affect the civil liability of any person for any negligent or willful act or omission or the criminal or contractual liability of any person.
Wild Animals Protection Act, 1968	Prohibits the taking, capturing, or hunting of any animal without a permit.
Wild Birds Protection Act, 1952	Prohibits the taking, capturing, or hunting of any animal without a permit. Protects birds and eggs during closed season.
Marine Mammal Protection Act, 2005	This Act sets forth provisions to protect marine mammals, including prohibiting the import of marine mammals and barring illegal taking, harassing, and otherwise harming marine mammals, among other guidelines.
Conservation and Protection of the Physical Landscape of The Bahamas Act, 1997	Protects physical landscape from environmental degradation, flooding, and removal of hills; regulates filling of wetlands, drainage basins or ponds; prohibits digging or removing sand from beaches and sand dunes; prevents harvesting or removing protected trees. In order to perform activities that may affect the physical landscape of The Bahamas, permits must be obtained for these activities. The Department of Physical Planning issues the permits and enforces the regulations.
Coast Protection Act, 1968	This Act makes provision for the protection of the coast against erosion and encroachment by the sea and for purposes connected therewith.
National Policies and Reports	
National Invasive Species Strategy, 2003	Provides a national framework for the prevention, control, and eradication of invasive plant and animal species in The Bahamas.
National Biodiversity Strategy and Action Plan (NBSAP)	Outlines goals for the conservation and sustainable use of biodiversity in The Bahamas. Encourages protection of native ecosystems, restoration of disturbed areas, and integration of biodiversity safeguards into infrastructure development. Supports the project's commitment to flora/fauna protection and buffer zone restoration.

3.1.11 Gaseous Emissions Management

National Policies and Reports	
Third National Communication (TNC) of The Commonwealth of The Bahamas to the United Nations Framework Convention on Climate Change (UNFCCC), 2024	The TNC outlines The Bahamas' greenhouse gas emissions profile, national vulnerabilities, and adaptation priorities. It highlights water scarcity, saltwater intrusion, and infrastructure damage as key risks, especially in low-lying islands. The report calls for improved climate-resilient water systems and better data for adaptation planning—directly supporting the design rationale of the New Providence water mains project.
Vision 2040 – National Development Plan (Climate Adaptation Chapter)	This long-term development framework incorporates climate resilience across economic, environmental, and infrastructural pillars. The plan calls for robust disaster risk governance, sustainable water management, and reduced vulnerability in Family Island communities.
State of the Environment Report (Draft)	Although not finalized, the draft provides baseline information on climate-related pressures and vulnerabilities across sectors, including freshwater availability, infrastructure exposure, and land degradation. It reinforces the importance of environmental monitoring and safeguards in Family Island infrastructure projects.
National Policy for the Adaptation to Climate Change, 2005	The National Climate Change Policy (2005) was The Bahamas' first formal policy framework aimed at addressing the causes and impacts of climate change. It was developed to fulfill national commitments under the United Nations Framework Convention on Climate Change (UNFCCC) and sets the foundation for integrating climate change into national development planning.
Act/Policy Title	Summary
Disaster Risk Management Act, 2022	This Act establishes the legal framework for disaster risk governance, preparedness, response, recovery, and resilience building in The Bahamas. It also creates the Disaster Risk Management Authority (DRMA) as the lead coordinating body and executor of the Act.
Environmental Health Services	The Minister may make regulations to give effect to and carry out the purpose, intent and provisions of this Act and, without prejudice to the generality of the foregoing, such regulations may provide for -the prevention and control of air pollution, including the control of emissions of smoke, gases, dust, dust, particulates, fumes or any combination thereof, offensive odors or excessive noise from factories, vessels, vehicles or any other premises.

Climate Change and Carbon Market Initiatives Act, 2022 (Act No. 15 of 2022)	Gives effect to the Paris Agreement, to aid in the global response to the threat of climate change and to create and implement the initiatives to offset carbon emissions.
International Regulations	
Montreal Protocol on Substances that Deplete the Ozone Layer, 1987	It was designed to stop the production and import of ozone depleting substances and reduce their concentration in the atmosphere to help protect the earth's ozone layer. It regulates the production and consumption of nearly 100 man-made chemicals referred to as ozone depleting substances.
Kyoto Protocol, 1992	It commits state parties to reduce greenhouse gas emissions, based on the scientific consensus that global warming is occurring and that human-made CO2 emissions are driving it.
The Paris Agreement, 2015	One of the primary goals of the Agreement is to pursue a development trajectory characterized by low greenhouse gas emissions, ensuring that food production remains uncompromised. The Agreement aims to contain the global average temperature increase well below 2°C relative to pre-industrial levels, with continued efforts to further limit this increase to 1.5°C. To achieve this, the signatories intend to peak global greenhouse gas emissions as soon as possible. It is acknowledged that developing nations will require more time to reach this zenith, and once achieved, there will be a swift decline in emissions. Developing nations are expected to augment their mitigation measures. Over time, they are encouraged to adopt comprehensive emission reduction or limitation objectives, considering their distinct national circumstances. Least developed countries and small island developing states have the provision to devise and convey strategies, plans, and actions for low greenhouse gas emission development, reflecting their unique situations.
United Nations Framework Convention on Climate Change (UNFCCC)	The United Nations Framework Convention on Climate Change (UNFCCC) established an international environmental treaty to combat "dangerous human interference with the climate system". All parties should promote and support the development, application, and diffusion, including transfer, of technologies, practices and processes that control, reduce or prevent anthropogenic emissions of greenhouse gases not controlled by the Montreal Protocol in all sectors, including energy, transport, industry, agriculture,

	forestry and waste management. In addition, they should promote sustainable management and cooperatively support the conservation and enhancement of sinks and reservoirs of all greenhouse gases not controlled by the Montreal Protocol, including biomass, forests and oceans, as well as other terrestrial, coastal and marine ecosystems. Each party should submit to the Conference of the Parties a national inventory, within its capabilities, of anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol, using comparable methodologies to be promoted and approved by the Conference of the Parties.
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3.1.12 Energy

Act/Policy Title	Summary
Bahamas Electricity Corporation (Vesting Of Land) Act No. 2 of 1958	Act Granting the Bahamas Electricity Corporation a land extension located on the Southern Side of New Providence Island, which constitutes a portion of Clifton Estate, with said land being separated by an existing thirty-foot-wide public roadway.
Electricity Act, 2015	Its objective is to overhaul the country's energy sector and edict policy targets, among others: 1) security and diversification of power supply and distribution, 2) access to cheap and reliable environmentally sustainable electricity, 3) and the establishment of the Utilities Regulations and Competition Authority (URCA) as the independent regulator of the sector. The Act encourages a higher capacity of renewables electricity generation under several ways. It seeks a reorganization of the electricity sector, so that public suppliers shall increase the proportion of renewables in their generation mix. It also promotes residential renewable energy generation for connection to the grid, and for self-generation. All stages are regulated by Utilities Regulation & Competition Authority (URCA).
The Bahamas National Energy Policy (2013 – 2033)	Sets out a long-term vision for a modern, diversified, efficient and resilient energy sector; emphasizes affordability, low-carbon technologies, and reducing reliance on imported fossil fuels.
Draft The Bahamas National Energy Policy (2025-2030)	Updates the previous policy; prioritizes renewable energy deployment, battery storage, micro-grids

	for Family Islands, and incentives for clean technology.
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3.1.13 Vehicular Traffic

National Regulations	
Road Traffic Act	An Act to declare, amend and codify the law relating to motor vehicles, and to regulate traffic on highways and of motor vehicles; to establish a Road Traffic Authority; to protect third parties against risks arising from the use of motor vehicles; to amend the law with respect to the licensing of motor vehicles operated for hire or reward, and to regulate public transportation services; and to regulate matters relating to the above matters.
Road Traffic (vehicle inspection)	The owner of a motor vehicle applying for the registration of such vehicle shall present the vehicle to the Inspector for inspection and shall provide him with the data required in the application for registration of a motor vehicle.

3.1.14 Cultural Heritage, Archaeological and Historical Sites

National Regulations	
The Bahamas National Trust Act, Chapter 391	An Act to incorporate and confer powers upon The Bahamas National Trust for Places of Historic Interest or Natural Beauty.
Antiquities, Monuments and Museum Act, 1998	This law provides for the preservation, conservation, and restoration of historical, paleontological and archaeological resources.

3.1.15 Other Laws/ Regulations

Act/Policy Title	Summary
Bahamas National Maritime Policy, 2015	This Policy was established in 2015 and updated in 2017 to ensure the sustainable development of the Maritime sector, protection of the marine environment, and to utilize the valuable resources efficiently and effectively within The Bahamas.
Port Authorities Act, 2006	This Act sets forth provisions appointing port authorities to all ports and harbors of the Bahamas to better regulate and control port operations.
Planning and Subdivision Act, 2010	An Act to combine, consolidate and revise the law relating to town planning and the law relating to the development of subdivisions and

	to provide for matters connected thereto. The purposes of this Act include ensuring the efficient and orderly provision of infrastructure and services to the built environment and promoting sustainable development in a healthy natural environment.
Local Government Act, 1996	This Act divides the Family Islands into 23 districts, each administered by a District Council. With this Act, much authority has devolved from Central Government to the District Councils. The Council and their respective Town Committees are responsible for town planning, licensing and administering budgets. They are also mandated to create open spaces for community use, including recreational parks and to provide community services, such as water, health care, sanitation, and waste collection and disposal.

4 IDB ENVIRONMENTAL AND SOCIAL POLICY FRAMEWORK

This section presents a summary of the Environmental and Social Performance Standards (ESPS) that are relevant to the project.

ESPS 1: Assessment and Management of Environmental and Social Risks and Impacts

ESPS 1 guides the overall structure of this ESA/ESMP and requires systematic identification, assessment, and management of environmental and social risks throughout the project life cycle.

For the New Providence target communities, ESPS 1 is relevant due to the presence of:

- High-density residential and commercial activity near construction zones,
- Major traffic flows along arterial roads,
- Limited formal drainage infrastructure, resulting in localized flooding after rainfall,
- Sensitive receptors such as schools, churches, and businesses directly adjacent to trench alignments.

ESPS 1 ensures that the project incorporates appropriate mitigation for dust, noise, temporary access disruptions, waste management, traffic safety, storm water control, and erosion risks during trenching. It also requires integration of community engagement processes and a grievance mechanism to support effective information flow throughout implementation.

This ESA builds on the findings of the SESA and contextualizes those requirements for densely populated, mixed-use urban environments.

ESPS 2: Labour and Working Conditions

This standard ensures that all workers engaged in the project are treated fairly, operate under safe conditions, and have access to grievance redress mechanisms. For this project, ESPS 2 requires that the contractor provide proper Personal Protective Equipment (PPE), training on equipment and safety procedures, and fair terms of employment to both WSC staff and contracted workers. It prohibits child or forced labour and requires measures to prevent discrimination, harassment, or gender-based violence in the workplace. In the context of New Providence, ESPS 2 also underscores the importance of hiring locally where possible, thus providing income opportunities while ensuring workers are safeguarded under a clear Labour Management Procedure (LMP), Contractor's employees Grievance Redress Mechanism and Workers Code of Conduct.

ESPS 3: Resource Efficiency and Pollution Prevention

ESPS 3 is applicable to the New Providence Water Mains works due to the nature of construction activities involved namely, excavation, material handling, vehicle and equipment operation, and temporary storage of supplies, which inherently generate solid waste, noise, dust, and pose risks of fuel or lubricant spills. The applicability of this standard is based on the potential for environmental degradation linked to pollution and inefficient resource use.

While the project's physical footprint varies by community, site conditions such as unpaved shoulders, sandy soils, and the lack of formal drainage infrastructure elevate the risk of erosion, sedimentation, and surface runoff during rainfall events. Without proper mitigation, these conditions could lead to particulate emissions, water quality degradation, and short-term disruption of nearby drainage channels.

To comply with ESPS 3, contractors will be required to implement resource efficiency and pollution prevention measures, into the Contractor's Environmental and Social Management Plan (c-ESMP), with oversight from WSC and the supervising engineer. Additionally, all machinery must be regularly serviced to reduce emissions, and fuel or chemical storage must follow national environmental guidelines to prevent accidental releases. Given the scale and nature of the works, with appropriate mitigation, the residual environmental impacts are expected to be low, localized, and fully manageable.

ESPS 4: Community Health, Safety, and Security

ESPS 4 is triggered because the project will be carried out within active urban communities where pedestrians, motorists, schoolchildren, and commercial users are in close proximity to construction zones. The primary community health and safety risks include temporary restrictions to homes, businesses, and public facilities; increased traffic congestion and potential vehicular conflicts; exposure to dust, noise, and construction equipment; and hazards associated with open trenches or uneven surfaces. These risks are amplified along high-traffic corridors such as Carmichael Road, where heavy vehicle flow and limited pedestrian space require additional precautions.

Compliance with ESPS 4 will be achieved through the implementation of a detailed Traffic Management Plan (TMP), installation of safety barriers, trench covers, and signage, and ongoing communication to inform residents of construction schedules and temporary service disruptions. Controlled equipment movement, pedestrian safety measures, and proper housekeeping to prevent debris or runoff from entering drains or private property will also be required. Through these measures, the project ensures that both community members and workers remain safe and protected throughout construction.

ESPS 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources

ESPS 6 applies to the New Providence works despite the urbanized project setting, as roadside vegetation, shade trees, landscaped verges, and informal green buffers contribute to soil stabilization and provide limited habitat for birds, insects, and small fauna. The project does not intersect protected areas, Key Biodiversity Areas (KBAs), wetlands, or any ecologically sensitive environments. Nonetheless, vegetation along roadway edges must be managed carefully to prevent unnecessary disturbance.

Compliance with ESPS 6 requires that vegetation clearance be limited to the minimum footprint necessary for trenching; mature trees be preserved wherever feasible; disturbed verges be reinstated following backfilling; and all vegetation management activities follow national environmental regulations and Department of Environmental Planning and Protection (DEPP) guidance. With these measures in place, biodiversity-related impacts will be minimal and temporary.

ESPS 9: Gender Equality

ESPS 9 emphasizes equitable access to project benefits and opportunities for both men and women. In the Bahamas, men traditionally dominate construction-related employment, while women bear a disproportionate share of responsibility for household water management. By applying ESPS 9, the project can actively promote women's participation in employment opportunities and ensure that contract documents include equal pay and non-discriminatory provisions.

ESPS 10: Stakeholder Engagement and Information Disclosure

This standard requires transparent, inclusive, and continuous engagement with affected communities and stakeholders. For this project, ESPS 10 involves providing timely information about works, water service interruptions, and anticipated benefits; holding community meetings; distributing notices through

accessible channels; and operating a functional Grievance Redress Mechanism (GRM). By implementing ESPS 10, the project ensures accountability, builds trust with all types of groups in communities including women and vulnerable groups and creates space for local feedback to shape project delivery.

5 ENVIRONMENTAL AND SOCIAL BASELINE

5.1 INTRODUCTION

The main objective of this chapter is to characterize the areas where the project to be financed under the BH-L1061 Program will be developed. This chapter analyzes general aspects and components of the physical, biological, and socioeconomic environment and specifies the area of influence (AoI) of the project.

The environmental baseline assessment provides an overview of the physical, biological, and environmental conditions within the New Providence project corridors—Carmichael Road, Bacardi Road, Millers Heights, and Nassau Village. These characteristics establish the context for identifying potential environmental risks and inform the mitigation and monitoring measures outlined in the ESMP. The baseline focuses on key environmental attributes such as land use, topography, soils, drainage patterns, vegetation, and existing infrastructure constraints that may influence or be affected by trenching and water main installation activities.

The social baseline assessment examines the existing demographic, infrastructural, and socioeconomic conditions within the various sites around New Providence. It focuses on patterns of settlement, community infrastructure, and access to basic services such as potable water, and local livelihoods that may be influenced by the project. The assessment also considers aspects of public health, safety, and equity to establish a foundation for evaluating the project’s potential social impacts and benefits. It also provides the necessary foundation for identifying environmental and social risks and supports the definition of mitigation and monitoring measures in the ESMP.

The project areas traverse fully developed urban and semi-urban environments, characterized by a mix of paved roadways, compacted limestone verges, and roadside landscaping. Land use varies from high-density commercial zones along Carmichael Road, to mixed residential and institutional areas in Nassau Village and Millers Heights, to residential areas along Bacardi Road. While these roadways are heavily modified and lack intact natural ecosystems, they contain intermittent roadside vegetation, including grasses, shrubs, shade trees, and ornamental landscaping, that contributes to localized soil stabilization and provides limited ecological function.

No protected areas, wetlands, Key Biodiversity Areas (KBAs), or formally designated ecological reserves occur within or adjacent to the construction footprint. Vegetation along the roadway shoulders is largely discontinuous and consists of maintained landscaping or naturally regenerating species typical of disturbed urban environments. No protected flora or fauna species have been identified within the immediate works area, and no critical habitats intersect the alignment.

The project area is subject to environmental constraints that require tailored construction approaches. Soils along the roadways range from compacted limestone fill to loose aggregates and urban backfill materials, which may affect trench stability during excavation. Drainage infrastructure is limited or absent in several communities, contributing to localized water pooling and surface runoff following moderate rainfall. Terrain variability, particularly in residential subdivisions, may influence how stormwater

collects within open trenches if not properly managed. Several areas, especially along Carmichael Road and Nassau Village, experience chronic drainage congestion, heightening the need for active erosion and sediment control practices.

Air quality and noise levels in the project areas are influenced by ongoing urban activity. Major communities, such as Carmichael and Bacardi Roads, experience high traffic volumes that contribute to elevated baseline noise and dust levels. Residential areas are more sensitive, with lower background noise conditions and closer proximity between homes and trenching works. These characteristics underscore the importance of dust suppression, equipment noise control, and scheduling measures to minimize nuisance impacts.

Although the project does not introduce long-term operational environmental impacts, the construction phase requires careful management due to its proximity to households, businesses, schools, and other public facilities. The lack of formal pedestrian pathways in several neighborhoods necessitates temporary barriers, controlled equipment movement, and clearly marked walking routes to ensure community safety during active works.

Overall, the environmental baseline indicates that while the project area contains no high-value natural resources or sensitive habitats, it presents a set of urban environmental constraints (drainage limitations, soil variability, pedestrian exposure, and proximity to sensitive receptors) that must be considered to minimize construction-phase impacts. These conditions inform the risk assessment and guide the development of targeted mitigation and monitoring measures throughout the implementation of the water mains works.

In terms of social impact, the proposed works are expected to deliver substantial public health, equity, and service reliability benefits. Many households in New Providence continue to rely on private wells, bottled water, or rainwater harvesting systems, which are often costly and inconsistent. By extending piped potable water through the island of New Providence, the project will enhance the quality, affordability, and security of water supply for residents, churches, and public institutions. Improved access to reliable water will contribute to higher living standards, reduced household expenditure on alternative water sources, and better overall community health outcomes.

5.2 DEFINITION OF AREA OF INFLUENCE

This section defines the Direct Area of Influence (DAoI) and Indirect Area of Influence (IAoI) for the New Providence water mains installation works. The areas of influence reflect the localized, linear nature of trenching activities within established urban and residential corridors and are based on the final project alignments, site inspections, and anticipated construction methods.

The definition of these areas supports the identification of potential environmental risks and the application of appropriate mitigation and monitoring measures during construction and reinstatement.

5.2.1 Direct Area of Influence (DAoI)

The Direct Area of Influence (DAoI) is defined as the immediate zone where direct environmental and social impacts are expected to occur during construction and operation of the water mains. It refers to the spaces, households, institutions, and community activities that are located immediately along or adjacent to the project footprint that may experience direct, immediate, and measurable social and environmental effects resulting from construction or operational activities. This includes the physical footprint of excavation, staging areas, pipe installation, excavated trench material, and access for machinery and

workers. It also includes people and properties exposed to temporary disruptions such as changes in access, noise, dust, utility interruptions, work-crew presence, and short-term traffic modifications. From a social perspective, the direct area encompasses those residents, community facilities, and local institutions whose daily routines, mobility, and interaction with public services may be directly altered by the project's physical works.

For the New Providence works, the DAoI is conservatively defined as extending approximately 6–8 meters from the trench centerline, encompassing the roadway, shoulders, verges, and immediately adjacent areas required for construction access and safe operation. This distance reflects typical working widths for trenching, pipe installation, backfilling, and reinstatement in urban environments.

Physical Components of the DAoI

The DAoI includes the following construction-related elements:

- The trench alignment and immediate buffer for equipment maneuvering and material placement
- Temporary construction zones used for short-term activities such as trench material handling and storage
- The unpaved roadway throughout the community, extending to the vegetated roadside where trenching, excavated material, and temporary access routes will occur

Environmental Influence Area

From an environmental perspective, the DAoI includes:

- Vegetated roadside areas that may be temporarily disturbed, cleared, or compacted during trenching activities
- Exposed soils that may be subject to temporary dust generation or minor surface runoff during construction

Social and Operational Influence Area

The DAoI also includes zones where temporary disruptions to road use and public access may occur. These include:

- Residences, community facilities, and institutions located immediately adjacent to the alignment that may experience short-term disturbances such as noise, dust, or temporary access changes
- Paths and informal pedestrian routes commonly used by residents, including schoolchildren, elderly persons, and pedestrians without vehicles, which may be temporarily affected by trenching or equipment movement
- Driveways, property entrances, and yard spaces requiring coordination with residents to maintain access during construction
- Sections of the roadway that support daily community services, including waste collection, deliveries, school transport, and emergency access, which may be influenced by construction activities
- Zones with vulnerable or mobility-restricted individuals whose daily routines may be more affected by temporary access limitations or construction-related obstacles

Temporal Nature of the DAoI

It is important to note that the DAoI is not static. Construction activities will progress sequentially along the alignment, meaning:

- Impacts at any given location will be short-term and transient
- Only a limited section of the corridor will be actively disturbed at any one time
- Disturbed areas will be reinstated progressively following pipe installation

Within this zone, the following activities will occur:

- Trenching and installation of 4-inch and 6-inch PVC water mains;
- Placement of service laterals;
- Temporary excavated trench material and backfill preparation;
- Movement of materials and machinery.
- Due to the proximity of driveways, pedestrian paths, and canal access points, this DAoI also encompasses key residential interfaces where safety measures and communication protocols will be prioritized.

Specific locations to be intervened are listed below:

New Providence

- Cowpen Rd Water Mains Extension
- Millar Heights Water Mains Extension
- Nassau Village Water Mains Extension
- Bacardi Rd Mains Extension
- Carmichael Rd Mains Extension

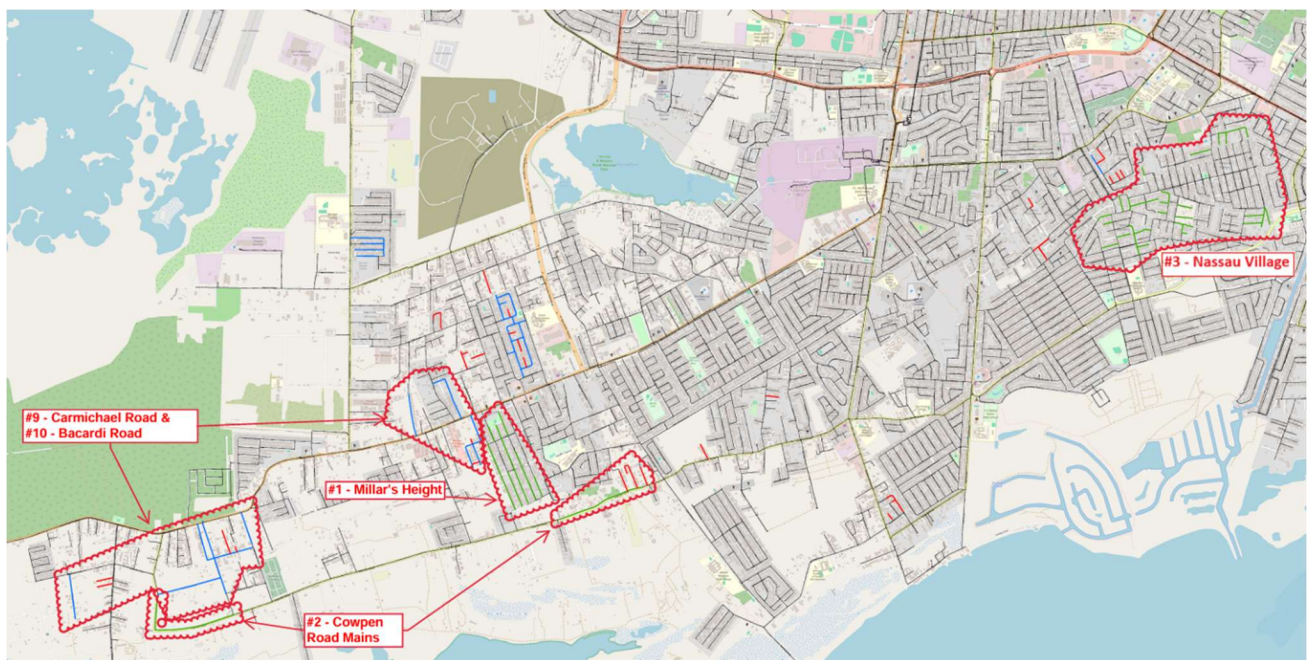


Figure 1. Map of proposed work areas

5.2.2 Indirect Area of Influence (IAoI)

The Indirect Area of Influence (IAoI) encompasses the broader surrounding area that may experience temporary or secondary environmental effects associated with construction activities, even though it lies outside the immediate construction footprint.

For the New Providence works, the indirect area of influence (IAoI) is defined as extending approximately 20 meters from the trench alignment, with the exact extent varying based on local land use, road width, drainage patterns, and proximity to residential and commercial properties. Within this zone, temporary construction-related effects such as noise, dust generation, traffic diversions, access restrictions, and changes in surface drainage may occur during trenching, pipe installation, and reinstatement activities.

From a social perspective, the indirect area of influence encompasses individuals, households, businesses, and institutions that rely on the same transportation corridors, pedestrian routes, community services, or utility networks as those located within the direct area of influence. This includes road users, public transport operators, service providers, schools, churches, and small businesses whose daily routines, mobility patterns, access to services, or economic activities may be temporarily disrupted by construction activities or positively affected over the longer term by improvements to potable water supply reliability and service coverage. Social dynamics within the IAoI may also be influenced by increased construction presence, altered traffic flows, and changes in accessibility, underscoring the need for proactive stakeholder engagement, clear communication, and responsive grievance management throughout project implementation.

Within the IAoI, potential temporary impacts may include:

- Intermittent noise and dust generation during excavation and machinery operation;
- Visual disturbances related to construction signage, equipment staging, and road reinstatement;
- Minor delays or restricted access to driveways and paths during active works.

The IAoI includes adjacent residential properties, roadside landscaping, utility corridors, and shared public spaces that interact with the same road network and drainage environment as the DAoI.

Although the indirect impacts are expected to be short-term and reversible, they require appropriate planning and communication to ensure environmental nuisance is minimized, particularly in residential neighbourhoods with lower baseline noise levels.

5.3 SITE CONDITIONS ANALYSIS

The New Providence water main installation works are located within defined residential and mixed-use corridors that correspond to the project locations described in Section 2 and illustrated in Figure 1.

Site visits were conducted on July 15 and 16, 2025, to assess the physical and biological characteristics of each project location within the defined direct and indirect areas of influence. The field studies aimed to document the local topography, geology, soil conditions, surface hydrology, vegetation composition, and fauna presence within the direct and indirect area of influence. Vegetation types were mapped and

verified on-site, guided by the classification framework established by Areces et al. (1999), while plant species identification followed the taxonomy of Correll and Correll (1982).^{1 2}

During the survey, the presence and relative abundance of vascular plant species were documented, with specific attention to flora listed under the Protected Trees Order (2021) and invasive species flagged in the National Invasive Species Strategy for The Bahamas (2013). An extensive review of New Providence's environmental data indicates that there are no designated protected areas or Key Biodiversity Areas (KBAs) identified within or near the project areas. This baseline assessment supports the evaluation of potential environmental impacts associated with trenching and water mains installation and informs the mitigation strategies outlined in the ESMP.

5.3.1 Nassau Village Area

This project area is characterized by dense residential development, narrow internal roads, and high pedestrian activity (Figure 2). Existing roadways are paved asphalt community roads but generally lack formal sidewalks and storm water infrastructure. Utility infrastructure is present along the corridors, including overhead electricity distribution lines, utility poles, and roadside fencing. Road widths vary but generally accommodate two-way local traffic. Residential yards and driveways often extend close to the road edge in some areas, resulting in limited setbacks between trenching works and private properties (Figure 3).

Vegetation within this area is largely secondary urban vegetation and ornamental landscaping, consisting of grasses, shrubs, fruit trees, and small shade trees maintained by residents. Native vegetation is minimal and fragmented, reflecting long-established urban land use. The visible soils in exposed areas and roadside verges appear to consist of sandy to sandy-loam materials typical of New Providence, with sparse ground cover in some locations. These soils are generally well-drained but may be prone to localized erosion or sediment displacement during excavation activities if not properly managed.

The project area does not show formal stormwater drainage channels in most locations. Surface runoff likely flows along road edges and natural depressions during rainfall events. Some areas show low-lying roadside depressions and informal drainage paths, which could lead to temporary water pooling during heavy rain. The Nassau Village targeted roadways areas considered low ecological sensitivity, as the environment is already heavily modified by residential development and existing infrastructure. Environmental concerns associated with the proposed works would therefore primarily relate to construction-phase disturbances, including temporary dust generation, noise, traffic disruption, vegetation trimming, and localized soil disturbance. No protected areas, wetlands, or ecologically sensitive habitats occur within this area.

Nassau Village is a low/middle-density residential neighborhood located in central Nassau, accessed by Charles Saunders Highway on the south and Soldier Road on the north. There are gaps in terms of water provision in the neighborhood on 1.3 miles of inner roads. Homes to be included into the piped water system are expected to be 131. The neighborhood is primarily residential, featuring a mix of single-family homes, townhouses, and some apartment complexes. There are also local amenities, including small shops, grocery stores and restaurants.

¹ Areces-Mallea, A. E., Weakley, A. S., Li, X., Sayre, R. G., Parrish, J. D., Tipton, C. V., & Boucher, T. (1999). A Guide to Caribbean Vegetation Types: Preliminary Classification System and Descriptions. The Nature Conservancy.

² Correll, D., & Correll, H. (1982). The Flora of the Bahama Archipelago: Including Turks & Caicos Islands. J. Cramer.

Electricity is overhead via low middle tension lines. Streets are narrow, 12-15 ft wide and possess asphalt pavement. There are interferences such as palm trees, electricity poles, tree roots, trash and abandoned cars in the areas where the mains extension are proposed.

Figure 2. Nassau Village and Village Road project sites.

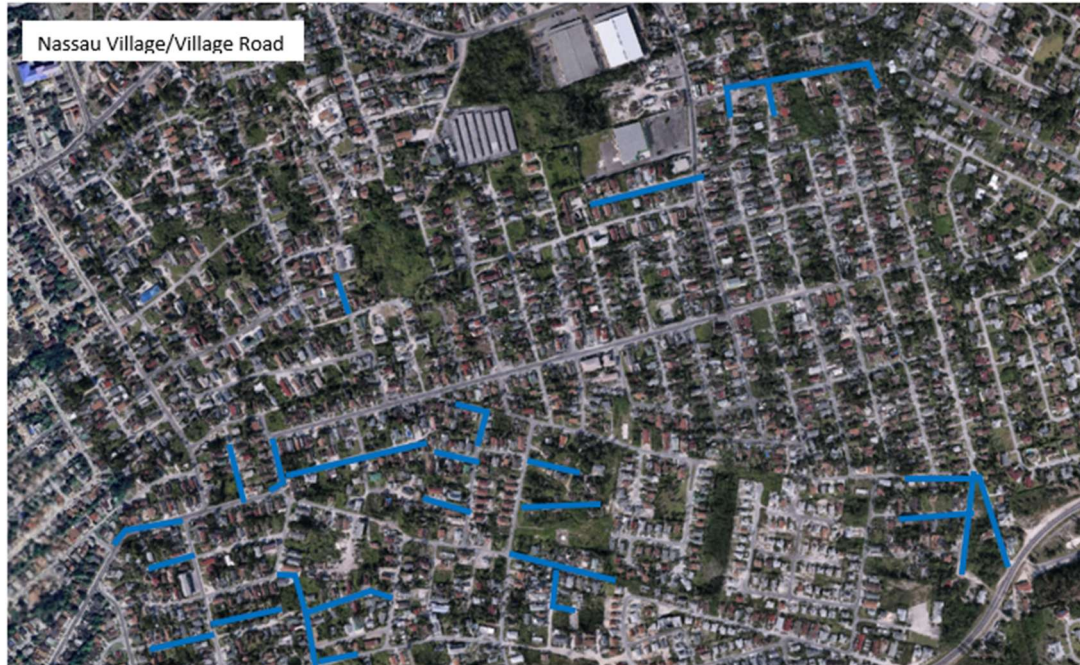


Figure 3. Nassau Village/Village site photos.



5.3.2 Carmichael Road, Bacardi Road, and Millers Heights Area

This area encompasses a combination of major arterial roadway segments and adjacent residential subdivisions. Carmichael Road functions as a high-traffic corridor with commercial, institutional, and residential land uses, while the Bacardi Road and Millers Heights sections assessed under this project are located entirely within residential community areas, consisting of single-family homes, apartment structures, and fenced and open private properties. Residential yards, boundary walls, and driveways are common along the project corridor. Several vacant or partially developed lots are also present, contributing to areas of open space and informal vegetation within the community.

Roadways are predominantly paved, with compacted limestone or earthen shoulders. Setbacks between the road edge and properties vary, but in several sections, particularly within Millers Heights, space is constrained. Some sections appear worn, with localized patching or minor surface deterioration. The roads are generally narrow and directly bordered by residential properties, which indicates that construction activities will occur in close proximity to homes, parked vehicles, and pedestrian activity.

Vegetation within the project area is characteristic of urban secondary vegetation and residential landscaping. This includes coconut palms, shrubs, hedges, grasses, and scattered trees along property boundaries and undeveloped parcels. In some areas, dense roadside vegetation and hedgerows are present, particularly along less developed road segments. The vegetation is largely disturbed and non-sensitive, typical of urban residential environments in New Providence, and does not indicate the presence of protected habitats or significant ecological features within the immediate construction footprint.

Exposed areas and roadside verges suggest sandy-limestone soils typical of New Providence, often covered by thin grass or shrub vegetation. In some areas, bare soil and gravel surfaces are visible along road edges and vacant parcels. These soils are generally well-drained but may be susceptible to temporary sediment displacement during trenching or excavation activities.

The environmental sensitivity of the area is considered low, as the environment is already heavily modified by residential development, roads, and utility infrastructure. Potential environmental impacts from the proposed works are expected to be short-term and construction-related, including dust generation, temporary noise, traffic disruption, vegetation trimming, and localized soil disturbance.

Millar Heights is a 15 blocks subdivision in south Nassau, New Providence, located in between Carmichael Road and Cowpen Road (Figure 6). The mains extension projected is on 5 of the 6 streets perpendicular to Carmichael Road on the neighborhood. Homes estimated to be included into the piped water system are 244. Entrance to the area can be done via Oxford Street, a 25ft wide asphalt road with low tension lines on the south , or via Carmichael Road, 25ft wide, asphalt road with middle tension lines on the north side and main road of the area.

The neighborhood is a mixed density residential and semi-urban area, there is overhead electricity lines and underground cable. The streets are narrow, around 20ft wide, and there are some house fences that seem to be located on the right of way. Because of the narrow streets, there were parked cars partially blocking the road in some areas or occupying the right of way. There was also noticeable waste on the sides of the roads. WSC informs that the area is not known for flooding and there were not issues from the last hurricane. There is a preschool located on Margaret Ave where the mains extension will take place. Since there is limited space on the side of the preschool, it was informed by WSC that the water main will be installed on the opposite side. This will be the case for all interferences that could be found on the proposed projects.

Figure 4. Carmichael Road project sites.

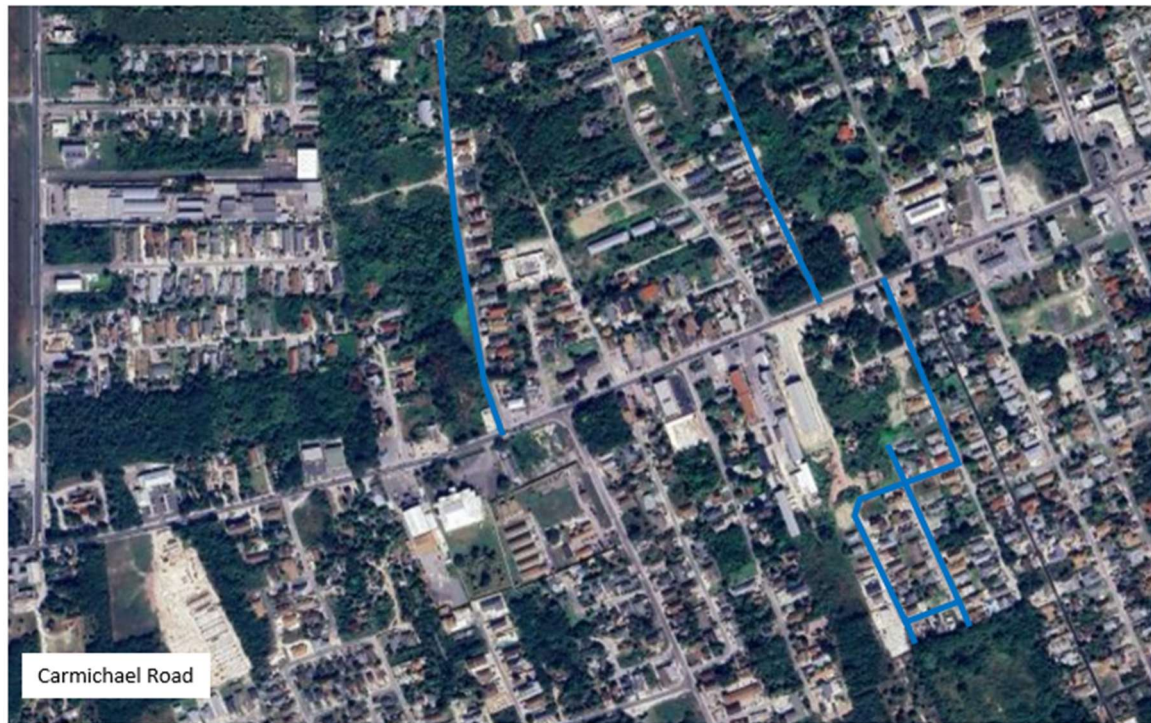


Figure 5. Carmichael Road site photos.



Figure 6. Millar's Height project sites.



Figure 7. Miller's Heights site photos.



Figure 8. Bacardi Road and Cowpen Road project sites.



Figure 9. Bacardi Road and Cowpen Road site photos.



5.3.3 Cowpen Road Area

This project area is defined by established residential neighbourhoods with moderate road widths and a mix of paved streets and compacted shoulders. Land use is residential in character, with scattered community facilities and small roadside businesses along major roads.

Vegetation consists primarily of residential landscaping and roadside grasses, with occasional mature trees providing shade. No wetlands, agricultural lands, or natural habitats occur within the assessed area. Soils are generally composed of compacted fill and limestone aggregate, which may influence trench stability during excavation.

Environmental sensitivities in this area relate to storm water management, pedestrian exposure, and proximity of homes to trenching activities. As with the other project areas, no protected environmental features are present, and impacts are expected to be short-term and localized with appropriate mitigation.

The mains extension connects at the intersection with Cowpen Road, a 25ft wide asphalt road that has middle tension lines on the left margin. There is a sidewalk on the right side of Cowpen Rd and street lighting. The road, on the first 0.45-mile portion of the extension, is flanked by extensive vegetation and farm areas. There are no visible residential homes on this part of the road.

There is an access road to Bonefish Pond National Park, located 0.3 miles south of Cowpen Rd, therefore works pose no impact on the national park system.

The road has an existing water main for 1.95 miles, after which there is another gap of 0.5 miles. This is a low-density residential area, with some local businesses (Bettidel's Plaza, Johnny's Restaurant and Bar, Claridge Farm and Brenda's Bakery) and Kingdom Ministries.

5.4 DIRECT AREA OF INFLUENCE (DAOI) BASELINE

5.4.1 Topography and Erosion Potential

The topography within the Direct Area of Influence (DAoI) across the New Providence project corridors is generally flat to gently undulating, consistent with urban residential development on reclaimed limestone terrain. Elevation changes are minor and typically associated with road camber, driveway access points, and localized fill used during housing development. No steep slopes or engineered embankments are present within the construction footprint.

Roadways within the DAoI are predominantly paved, with compacted limestone or earthen shoulders in residential sections such as Millers Heights, Nassau Village, and the residential portions of Bacardi Road. In several areas, road edges transition directly into private driveways, yard spaces, or informal pedestrian paths. These conditions result in limited buffering between trenching activities and adjacent properties.

Formal drainage infrastructure is limited or absent in many sections of the DAoI. As a result, localized surface-water pooling can occur in low-lying depressions and along road edges following rainfall events. While prolonged flooding is not typical, temporary water accumulation may influence trench stability and construction sequencing if not actively managed.

Vegetation within the DAoI consists mainly of residential landscaping, roadside grasses, hedges, and scattered shade trees. This vegetation provides informal surface stabilization and reduces sediment

mobilization during rainfall. The risk of erosion is therefore considered low, given the absence of steep gradients and the generally coarse-textured soils. However, localized softening of soils may occur during wet conditions, particularly where shoulders are unpaved or heavily compacted.

Erosion control within the DAoI will rely on good construction housekeeping, controlled excavation widths, timely backfilling and compaction, and stabilization of disturbed surfaces. Vegetation disturbance will be minimized and managed in accordance with national environmental regulations and Department of Environmental Planning and Protection (DEPP) guidance.

5.4.2 Geology and Soil Profile

The geological setting of the New Providence project corridors is dominated by carbonate limestone bedrock of Quaternary age, which underlies most of the island. Overlying the bedrock is a variable layer of unconsolidated to semi-compacted fill material, consisting of sandy soils, crushed limestone, coral fragments, and construction backfill associated with urban development.³

Within the DAoI, soils observed during site inspections include compacted limestone road base, sandy fill material, and mixed urban substrate beneath paved and unpaved surfaces. These materials are generally porous and low in cohesion, particularly where unconsolidated fill or older road base is present. Soil depth varies depending on historic road construction and infill practices.

Due to these characteristics, trenching activities may encounter variable soil stability, particularly in areas with shallow cover above bedrock or where soils have been disturbed by previous utility installations. Immediate backfilling and compaction will therefore be required to maintain trench integrity and prevent sidewall sloughing or collapse.

No evidence of contaminated soils, buried waste, or hazardous fill material was observed within the DAoI during site assessments. Nevertheless, excavation activities will be monitored to identify any unexpected materials, and appropriate procedures will be implemented should unsuitable soils be encountered. Existing roadside and yard vegetation will be protected from unnecessary root disturbance during trenching.

5.4.3 Hydrology

The hydrological conditions within the DAoI are influenced by flat terrain, porous soils, and limited engineered drainage infrastructure. New Providence does not contain permanent surface watercourses, and storm water management in residential areas typically relies on surface infiltration, roadside depressions, and informal drainage paths.

Within the project corridors, rainfall runoff is generally shallow and localized, with water temporarily accumulating along road edges, driveways, and low or disturbed points in the roadway profile. In areas where road shoulders are compacted or paved, infiltration rates may be reduced, contributing to short-term ponding following moderate to heavy rainfall.

According to national hydrogeological assessments, including The Bahamas' Third National Communication to the UNFCCC (2024), the archipelago lacks perennial rivers and instead depends entirely on direct rainfall infiltration as the sole means of freshwater recharge. The freshwater resources

³ Government of The Bahamas (2024). Third National Communication of The Commonwealth of The Bahamas to the United Nations Framework Convention on Climate Change (UNFCCC). Nassau, The Bahamas.
<https://unfccc.int/sites/default/files/resource/2024%20The%20Bahamas%20TNC%20to%20the%20UNFCCC.pdf>

occur as thin, lens-shaped bodies that float above saline groundwater, typically situated 0.3 to 1.5 meters below the surface in inland areas. These lenses are highly susceptible to salinization, particularly due to sea level rise, tidal movement, and surface contamination from anthropogenic activities.

Groundwater in New Providence occurs as a freshwater lens overlying saline groundwater within the limestone substrate. This lens is vulnerable to contamination from surface activities, particularly in densely developed areas. While the project does not involve deep excavation or groundwater abstraction, construction activities must be managed to prevent the introduction of contaminants through spills, uncontrolled runoff, or improper waste handling.

Seasonal rainfall patterns and storm events, particularly during the Atlantic hurricane season and winter months (October to April into early May) may temporarily elevate groundwater levels or increase surface saturation.⁴ These conditions can affect trench stability and equipment access if works are not appropriately phased.

To address these hydrological considerations, construction planning will incorporate weather-responsive scheduling, staged excavation, temporary trench protection, and rapid backfilling. With appropriate controls in place, no significant long-term hydrological impacts are anticipated following installation and reinstatement of the water mains.

National climate change projections highlight the increasing vulnerability of freshwater resources across The Bahamas. Projected trends include higher temperatures, more variable rainfall patterns, and longer dry periods, all of which are expected to reduce groundwater recharge and place greater pressure on centralized and decentralized water supply systems. At the same time, intensified rainfall events increase the risk of surface runoff carrying contaminants into the subsurface, particularly in urban environments where impervious surfaces and informal drainage are prevalent.

As summarized in the National Communication and previous water sector assessments New Providence's freshwater lens was estimated to be over 51,000 acres in size with a lens area of 0.34 (Table 1). This places New Providence among the islands with relatively low freshwater resource coverage, particularly when considered in relation to its population size and level of urban development. As the most densely populated island in The Bahamas, New Providence faces heightened pressure on limited freshwater resources, increasing the importance of effective groundwater management and protection.

The island continues to experience challenges related to monitoring groundwater abstraction, minimizing contamination risks, and regulating private well systems, many of which operate outside of centralized oversight. In densely developed areas, the freshwater lens is especially vulnerable to pollution from surface runoff, wastewater systems, and land-based activities. These pressures underscore the importance of reducing reliance on decentralized and unregulated water sources and strengthening centralized, treated potable water supply systems.

Climate-resilient water infrastructure, including strategic water mains upgrades and system interconnections, is therefore critical to improving water security, enhancing regulatory oversight, and safeguarding groundwater quality in New Providence. In response, this project incorporates environmental safeguards to manage hydrological exposure during construction. These include staged excavation, weather-responsive scheduling, protective backfill selection, and erosion-resistant materials.

⁴ Department of Meteorology (2022). Climate of The Bahamas. Nassau, The Bahamas. <https://met.gov.bs/wp-content/uploads/2022/03/Climate-of-the-Bahamas.pdf>

While no significant operational hydrological risks are anticipated post-installation, pre-emptive planning during construction is essential to avoid exposure-related setbacks or degradation of the surrounding environment.

Table 1. Freshwater Resources of The Bahamas 2007

Island	Size (Acres)	Freshwater Lens (Acres)	Lens/Area Size
Abaco	415,360	116,280	0.28
Acklins	96,000	15,783	0.16
Andros	1,472,000	338,585	0.23
Bimini	7,040	395	0.06
Cat Island	96,000	14,774	0.15
Crooked Is.	58,900	5,923	0.10
Eleuthera	128,000	16,599	0.13
Exumas	71,680	6,586	0.09
Grand Bahama	339,200	147,884	0.44
Gr. Inagua	383,360	3,571	0.01
Long Island	147,200	9,301	0.06
Mayaguana	70,400	--	0.03
New Providence	51,200	2,340	0.34
Totals	3,336,340	678,021	2.08

5.4.4 Hazards, Vulnerability, and Island Risks

The Commonwealth of The Bahamas is one of the most hazard-prone countries in the Atlantic region, primarily due to its geographical characteristics and exposure to multiple natural hazards. As a flat, low-lying archipelago of over 700 islands and cays, The Bahamas faces frequent and intensifying threats from tropical cyclones, storm surges, coastal flooding, and climate-induced extremes. The national risk profile, as outlined in recent assessments by the Pacific Disaster Center and ThinkHazard, identifies hurricanes and tropical storms as the most significant hazards, followed closely by storm surge, coastal flooding, high winds, and rain-induced erosion. While seismic risk is minimal, the combination of climate-related hazards presents ongoing challenges for infrastructure, public services, and community resilience.

Historically, The Bahamas has experienced numerous severe storm events with widespread impacts. Hurricane Matthew in 2016 caused major flooding and wind damage in New Providence and Grand Bahama. In 2017, Hurricane Irma delivered widespread wave action and flooding to several islands including Bimini. This was followed by Hurricane Dorian in 2019, a catastrophic Category 5 storm that devastated Abaco and Grand Bahama and exposed significant gaps in national preparedness, response capacity, and infrastructure resilience. Together, these events underscore the need for robust, climate-resilient design in all infrastructure projects, particularly those serving the Family Islands.

From a climate change perspective, The Bahamas faces a range of acute and chronic environmental threats that disproportionately affect small island nations. As a low-lying archipelago, the country is particularly vulnerable to slow-onset climate hazards such as sea level rise, saltwater intrusion into

freshwater reserves, and shifts in rainfall patterns that contribute to extreme precipitation events. These phenomena threaten critical infrastructure, reduce groundwater quality, and undermine the reliability of potable water supply. Rising sea levels further increase the likelihood of saltwater intrusion into freshwater lenses, compounding long-term water insecurity. Intensifying rainfall events also increase runoff and erosion along unpaved or poorly drained corridors, such as New Providence, posing operational challenges for buried water infrastructure.

Given these risks, it is imperative that all infrastructure investments, especially in climate-vulnerable zones, undergo site-specific climate and disaster risk assessments that inform resilient design. This approach aligns with the IDB's ESPS and the strategic priorities outlined in The Bahamas' National Climate Change Adaptation Policy, which calls for enhanced planning and design of water supply systems to reduce climate risks, increase adaptive capacity, and promote long-term sustainability. The policy further emphasizes the importance of integrating adaptation considerations into all development planning, including efforts to safeguard water infrastructure, diversify freshwater sources, and ensure equitable access in the face of growing environmental pressures.

5.4.5 Island-Specific Profile: New Providence

New Providence is the most densely populated and economically significant island in The Bahamas, hosting the national capital, Nassau, and accommodating approximately 246,329 residents, or nearly 70% of the national population.⁵ Despite its relatively modest land area of approximately 207 km², New Providence supports the country's highest concentration of residential development, commercial activity, public infrastructure, and critical services.⁶ This high population density and infrastructure concentration fundamentally shape the island's environmental risk profile and place sustained pressure on land, water, and drainage systems.

Unlike smaller Family Islands, New Providence's vulnerability is driven less by geographic isolation and more by concentrated development pressure and aging infrastructure systems. According to the Pacific Disaster Center (PDC) Island Risk Profile, New Providence exhibits a Very Low Multi-Hazard Risk score (0.316; Rank 14 of 17 islands), largely due to strong institutional capacity, logistics access, and emergency response systems.⁷ However, this aggregate score masks important hazard exposure and environmental stress dynamics that are highly relevant at the local and site-specific scale. Notably, New Providence ranks 4th of 17 islands for Multi-Hazard Exposure (Score: 0.542), reflecting the extent to which people, assets, and infrastructure are exposed to climate-related hazards. The island's hazard exposure profile reflects these compounded risks. ThinkHazard identifies New Providence as having high cyclone and coastal flood hazard, while inland surface flooding, though often underrepresented in national-scale models.⁸

Hazard exposure assessments indicate that 100% of New Providence's population and capital assets are exposed to tropical cyclone winds, underscoring the island's universal vulnerability to hurricane-related impacts. In addition, approximately 41.8% of the population and \$19.8 billion in capital assets are

⁵ Pacific Disaster Center (PDC). (2019). *The Bahamas: Island Risk Profiles- Multi-Hazard Exposure and Vulnerability Assessment*. State of Hawaii, USA: Pacific Disaster Center.

⁶ Pacific Disaster Center (PDC). (2019). *The Bahamas: Island Risk Profiles- Multi-Hazard Exposure and Vulnerability Assessment*. State of Hawaii, USA: Pacific Disaster Center.

⁷ Pacific Disaster Center (PDC). (2019). *The Bahamas: Island Risk Profiles- Multi-Hazard Exposure and Vulnerability Assessment*. State of Hawaii, USA: Pacific Disaster Center.

⁸ Think Hazard (n.d.). *Bahamas-Natural hazard risk overview*. Global Facility for Disaster Reduction and Recovery (GFDRR). [Think Hazard - The Bahamas](#)

exposed to storm surge, particularly in low-lying coastal and near-coastal areas.⁹ While direct exposure to flooding is lower at the island scale (7.8% of population), inland flooding events are frequent and recurrent across Nassau due to flat topography, high impervious surface coverage, constrained drainage systems, and intense rainfall events, resulting in localized but disruptive flooding along major and secondary road corridors.¹⁰

Climatically, New Providence experiences a tropical marine climate with high humidity and seasonal rainfall concentrated between May and October.¹¹ Rainfall is increasingly delivered through short-duration, high-intensity events, overwhelming local drainage capacity and contributing to surface ponding, roadway flooding, and groundwater infiltration risks. These conditions are particularly relevant for linear infrastructure such as water mains, where trenching and backfilling activities can be disrupted by saturated soils and elevated water tables.

Environmental vulnerability on New Providence is driven primarily by environmental stress and population pressure, rather than ecological sensitivity. The PDC profile indicates that 74.1% of land area is subject to environmental stress, while 88.6% of the population is exposed to compounded environmental pressures, including urbanization, groundwater stress, and waste and drainage challenges. Although access to piped water is high (92.4% of households), the island faces persistent challenges related to freshwater resource management, including contamination risks, saltwater intrusion, and the widespread presence of unregulated private wells, particularly in older and lower-income residential areas. Climate change projections indicate that declining rainfall reliability, rising temperatures, and sea-level rise will further stress the island's freshwater system, increasing the importance of centralized, treated water supply networks.

New Providence has been impacted by several major hurricanes over the past two decades, including Hurricanes Floyd (1999), Matthew (2016), Irma (2017), and Dorian (2019). Hurricane Matthew caused extensive wind damage, coastal flooding, and prolonged service outages, while Irma produced heavy rainfall and localized flooding despite passing at a distance.¹² Although Hurricane Dorian's most severe impacts were concentrated in Abaco and Grand Bahama, New Providence experienced mass flooding, heavy rainfall, and extended power outages. These hurricane events continue to highlight the country's national vulnerabilities in disaster preparedness, response coordination, and infrastructure resilience, prompting renewed emphasis on climate adaptation across all islands, including New Providence.¹³

From a vulnerability standpoint, New Providence ranks 12th of 17 islands, reflecting relatively strong household composition indicators but notable challenges related to housing density, transportation dependence, and environmental stress. Approximately 29.2% of households experience crowding, and 18.7% lack private vehicle access, increasing sensitivity to service disruptions, flooding events, and construction-related access constraints.

Despite these vulnerabilities, New Providence demonstrates Very High Coping Capacity (Score: 0.822; Rank 1 of 17) and Very High Resilience (Score: 0.827; Rank 1 of 17), driven by robust emergency

⁹ Pacific Disaster Center (PDC). (2019). *The Bahamas: Island Risk Profiles- Multi-Hazard Exposure and Vulnerability Assessment*. State of Hawaii, USA: Pacific Disaster Center.

¹⁰ Pacific Disaster Center (PDC). (2019). *The Bahamas: Island Risk Profiles- Multi-Hazard Exposure and Vulnerability Assessment*. State of Hawaii, USA: Pacific Disaster Center.

¹¹ Government of The Bahamas (2024). Third National Communication to the UNFCCC

¹² Neely, W. (2019). The greatest and deadliest hurricanes to impact The Bahamas. URLink Print & Media, LLC.USA.

¹³ The Tribune. (2017, September 8). PM warns: Stay indoors and heed all warnings. The Tribune 242. <https://www.tribune242.com/news/2017/sep/08/pm-warns-stay-indoors-and-heed-all-warnings/>

services, communications networks, health infrastructure, and logistics capacity. These strengths support effective mitigation and recovery but do not eliminate the need for site-level environmental risk management, particularly for linear infrastructure projects located within active residential and commercial corridors.

Within this context, the proposed water mains works along Carmichael Road, Bacardi Road, Millers Heights, Nassau Village, and adjacent communities represent a critical intervention to strengthen service reliability, reduce reliance on vulnerable groundwater extraction, and improve resilience to climate-related disruptions. Given the island's exposure to extreme rainfall, inland flooding, and groundwater stress, the application of climate-responsive construction practices, drainage-aware trenching methods, and pollution prevention measures is essential to safeguard both the environment and public investment.

5.5 BIOTIC ENVIRONMENTAL BASELINE

5.5.1 Flora

Vegetation within the project corridors across Carmichael Road, Bacardi Road, Millers Heights, Nassau Village, and adjacent residential communities reflects a highly modified urban and peri-urban landscape typical of New Providence. The biotic environment is dominated by disturbed vegetation assemblages, ornamental landscaping, roadside grasses, and remnant native species persisting within residential yards, road verges, and undeveloped lots.

The direct area of influence (DAoI) is characterized by previously disturbed road shoulders, utility corridors, driveways, and landscaped setbacks, where vegetation is discontinuous and shaped largely by individual property management practices. Natural vegetation cover is limited and fragmented, with most plant species occurring in small clusters rather than continuous stands. No agricultural lands, natural forests, wetlands, or formally protected habitats occur within the project footprint.

Field observations from the July 2025 site visit identified the following common and/or dominant species within or near the DAoI:

- Sea Grape (*Coccoloba uvifera*): native, legally protected under the Protected Trees Order (2021)
- Coconut Palm (*Cocos nucifera*): widely planted ornamental species
- Australian Pine (*Casuarina equisetifolia*): invasive tree species per National Invasive Species Strategy (2013)
- Mango Tree (*Mangifera indica*): non-native fruit tree seen in some yards
- Florida Thatch Palm (*Thrinax radiata*): native, occasionally used in residential landscaping
- Bougainvillea spp. and other decorative shrubs, found throughout maintained parcels

Vegetation within the project corridors does not constitute natural habitat, and ecological value is considered low due to long-standing anthropogenic disturbance, routine maintenance, and fragmentation. No mangrove communities, wetlands, or coastal dune systems occur within the DAoI for the New Providence project locations.

Vegetation clearance is expected to be minimal and limited strictly to the narrow trench footprint, which follows existing road shoulders and utility alignments. No removal of protected trees is anticipated. Should incidental pruning or temporary disturbance of vegetation be required, activities will comply with the *Forestry Act* (2010), the *Protected Trees Order* (2021), and guidance from DEPP. Disturbed areas will be reinstated following backfilling, using appropriate ground cover or native landscaping where feasible.

5.5.2 Fauna

The faunal environment within the project corridors reflects typical urban and suburban fauna assemblages commonly found throughout New Providence. Species present are well adapted to human activity, traffic, noise, and habitat fragmentation. The direct area of influence does not provide specialized habitat or support significant wildlife populations.

Common terrestrial fauna likely to occur within or near the DAoI include:

- Northern Curly-tailed Lizard (*Leiocephalus carinatus*)
- Brown Anole (*Anolis sagrei*)
- Zenaida Dove (*Zenaida aurita*)
- Northern Mockingbird (*Mimus polyglottos*)
- Small mammals such as rodents (*Rattus spp.*)
- Domestic and feral cats and dogs
- Common insects and arthropods including ants, flies, butterflies, wasps, and beetles

No evidence of protected, endemic, or threatened terrestrial species, nesting sites, burrows, or critical habitat was identified through site reconnaissance or desktop review. The project alignment does not intersect any mapped wildlife corridors, Important Bird Areas (IBAs), or Key Biodiversity Areas (KBAs).

Given the fully developed nature of the project areas, faunal use of the corridor is expected to be transient and opportunistic, with species moving freely between residential yards, vacant lots, and roadside vegetation. Potential interactions with fauna during construction are expected to be minimal and short-term.

No direct or indirect impacts to aquatic or marine fauna are anticipated, as trenching activities are confined to inland road corridors and do not intersect canals, wetlands, tidal creeks, or coastal waters. Standard construction good-practice measures, including daily site inspections and proper waste management, will further minimize any risk of incidental harm to fauna.

In the unlikely event that wildlife is encountered during excavation, works will be temporarily halted, and appropriate measures will be implemented in consultation with WSC and DEPP.

5.5.3 Protected Areas and Biodiversity Sensitivity

The defined Direct and Indirect Areas of Influence (DAoI and IAoI) for the proposed water mains works along Carmichael Road, Bacardi Road, Millers Heights, Nassau Village, and adjacent residential communities do not intersect any formally designated Protected Areas, Key Biodiversity Areas (KBAs), Important Bird Areas (IBAs), or nationally protected ecological reserves. Spatial analysis using national datasets from the Bahamas Protected Areas Fund (BPAF), in conjunction with desktop review and site reconnaissance, confirms the absence of legally protected conservation zones within or immediately adjacent to the project corridors.

The project areas are situated entirely within fully developed urban and suburban environments, characterized by residential housing, commercial activity, paved and unpaved road networks, and long-established utility networks. As such, the biotic environment within the DAoI reflects high levels of historical anthropogenic disturbance, with limited ecological connectivity and low habitat integrity. Vegetation present is primarily ornamental, managed roadside landscaping, or remnant native species persisting in fragmented patches within private properties.

No wetlands, mangrove systems, tidal creeks, coastal dune environments, or marine habitats occur within the project footprint. While New Providence contains ecologically sensitive coastal and wetland systems elsewhere on the island, including mangroves, tidal flats, and nearshore marine habitats, the proposed works are inland and physically separated from these systems by existing development, road infrastructure, and built environments. As a result, direct impacts to sensitive ecosystems are not anticipated.

Notwithstanding the low intrinsic biodiversity sensitivity of the project corridors, indirect environmental risks, such as sediment mobilization, improper material storage, or unmanaged runoff during construction, remain relevant given New Providence's flat topography, frequent heavy rainfall events, and known drainage constraints. Poorly managed construction practices could influence localized flooding or contribute to sediment transport into downstream drainage pathways if not adequately controlled.

To address these risks, the project adopts a precautionary, risk-based approach to biodiversity protection, consistent with the IDB Environmental and Social Performance Standards (ESPS 6). This includes restricting vegetation clearance to the minimum required footprint, maintaining existing roadside vegetation where feasible, implementing erosion and sediment control measures, and enforcing strict housekeeping and spill prevention protocols.

A pre-construction environmental walkthrough will be conducted to confirm baseline conditions and identify any site-specific sensitivities that may not be evident through desktop analysis. In the unlikely event that protected flora or fauna are encountered during excavation, a chance-find procedure will be activated, and works will be temporarily halted pending guidance from the WSC and the DEPP.

Overall, the biodiversity sensitivity of the project area is assessed as low, and with appropriate environmental controls in place, residual impacts to ecological resources are expected to be negligible and fully manageable.

5.5.4 Summary of Environmental Baseline

The project locations across Carmichael Road, Bacardi Road, Millers Heights, Nassau Village are located within a highly urbanized and modified environment characteristic of central and southern New Providence. The environmental baseline is shaped primarily by dense residential development, extensive road infrastructure, and long-standing anthropogenic disturbance, rather than by natural or intact ecological systems.

Topographically, the project areas are generally flat to gently undulating, with low elevation and limited natural relief. Soils consist predominantly of shallow, porous limestone and sandy substrates, which are highly permeable but susceptible to saturation during intense rainfall events. The absence or limited functionality of engineered drainage infrastructure, combined with extensive impervious surfaces, contributes to frequent inland flooding and surface ponding, particularly along major and secondary road routes. These conditions represent a key environmental constraint influencing construction logistics and risk management.

The biotic environment within the direct area of influence is characterized by fragmented and disturbed vegetation, consisting mainly of ornamental landscaping, roadside grasses, and remnant native species within residential yards and verges. No wetlands, mangrove systems, coastal habitats, or protected ecological areas occur within the project footprint. Ecological value is assessed as low, reflecting the urban context and limited habitat continuity. Faunal presence is restricted to common urban-adapted species, including small reptiles, birds, insects, and mammals tolerant of human activity. No protected, endemic, or threatened species or habitats were identified within the direct or indirect areas of influence.

Hydrologically, New Providence faces systemic challenges related to surface water management and groundwater protection. Inland flooding events, a recurring issue, driven by flat terrain, constrained drainage, and increasingly intense rainfall. The island's reliance on a thin freshwater lens, combined with widespread use of unregulated private wells, heightens vulnerability to groundwater contamination from surface runoff, septic systems, and saline intrusion. These pressures are exacerbated by climate change projections indicating declining recharge reliability and increasing extreme rainfall variability.

Collectively, the environmental baseline conditions indicate low biodiversity sensitivity but elevated hydrological and pollution-related risk, particularly during the construction phase. These conditions underscore the importance of implementing robust environmental management measures focused on erosion and sediment control, runoff management, spill prevention, and prompt site reinstatement. With appropriate safeguards and good construction practices, residual environmental impacts are expected to be localized, temporary, and fully manageable, while supporting long-term improvements in water service resilience across New Providence.

5.6 BASELINE SOCIAL CONDITIONS

This section presents a description of the existing social conditions within the Project's area of influence, establishing a baseline against which potential social risks and impacts may be assessed and managed. The social baseline draws on available secondary data sources, including national census information, as well as site-specific observations, to characterize the communities and social receptors that may be affected by project activities.

Key elements of the baseline assessment include an overview of transportation infrastructure and roadway conditions, population distribution and settlement patterns, and other relevant social components that influence community access, mobility, safety, and quality of life. Particular attention is given to residential areas located along or near project corridors, where proximity to works may increase sensitivity to temporary disturbance.

The information presented in this section supports the identification of vulnerable receptors, informs the design of mitigation and management measures, and provides a foundation for stakeholder engagement and monitoring under the Environmental and Social Management Plan (ESMP).

Bacardi Road and Cowpen Road (Golden Isles)

Cowpen Road and Bacardi Road are located within the Golden Isles constituency, which, according to the 2022 Bahamas Census, contains approximately **4,768 occupied dwellings**. This constituency represents a well-established residential area with a moderate to high concentration of households, reflecting sustained settlement patterns and a stable resident population. The number of occupied dwellings indicates a substantial population presence within the Project's area of influence, with daily activities closely tied to local infrastructure, including roadways, utilities, and community services.

The residential nature of Golden Isles suggests that a significant proportion of residents rely on Cowpen Road and Bacardi Road for routine mobility, including commuting to employment centers, accessing schools, healthcare facilities, and commercial services. Population density within these areas heightens the importance of maintaining uninterrupted access for residents, emergency services, and service providers during any project-related activities.

Bacardi Road functions as a secondary collector road and is wider than most purely residential streets, with an average width of approximately 24 to 30 feet. It supports two-way traffic and serves both local residents and through-traffic connecting nearby communities and commercial areas. Traffic flow is moderate and can increase during peak morning and evening hours. The roadway is generally paved and in fair condition, though drainage issues, edge deterioration, and localized potholing may be present, particularly along shoulders and intersections with smaller side roads.

Cowpen Road is a mixed-use roadway serving residential areas while also functioning as a connector between larger roads. Road widths typically range from 22 to 26 feet, accommodating two-way traffic with limited shoulder clearance. Traffic flow is moderate, with regular use by residents, utility vehicles, and local businesses. The road is mostly paved, but conditions vary along its length, with some sections exhibiting surface degradation, poor drainage, and uneven edges, especially where informal access points and roadside activity are present.

Within the context of the ESMP, the concentration of occupied dwellings within Golden Isles underscores the need for careful planning of construction schedules, traffic management measures, and community engagement activities. Mitigation measures should be designed to minimize disturbance to households, particularly during peak travel hours, and to ensure that residents are adequately informed of anticipated disruptions. The population baseline for Golden Isles, therefore serves as a key input for assessing social risk, community exposure, and the scale of potential project impacts.

Carmichael Road and Millar's Heights (Carmichael)

Millar's Heights and Carmichael Road fall within the Carmichael constituency, which comprises approximately **3,186 occupied dwellings** based on the 2022 Bahamas Census. This constituency includes a mix of residential neighborhoods and major transportation corridors, resulting in both localized residential activity and higher-volume commuter movement. The population distribution reflects a combination of long-established communities and areas experiencing ongoing development and infrastructure use.

Carmichael Road serves as a principal arterial route for the constituency and the wider island, meaning that residents of Millar's Heights are exposed not only to local traffic but also to significant through-traffic. The number of occupied dwellings indicates a substantial resident population whose daily routines are closely linked to the functionality and safety of this roadway. As a result, disruptions to Carmichael Road may have broader implications, affecting both local residents and non-resident road users.

Carmichael Road is a major arterial roadway in New Providence, characterized by a wide paved cross-section typically exceeding 40 feet, with multiple travel lanes and defined shoulders in some segments. Traffic flow is consistently high, supporting commercial, public transport, and commuter traffic throughout the day. The road is fully paved and generally maintained in good condition, although congestion, worn lane markings, and localized surface distress are common due to heavy usage. This roadway plays a critical role in east-west connectivity across the island.

The road network within Millar's (Miller) Heights consists mainly of narrow residential streets, generally measuring between 18 and 22 feet in width. These roads are designed for low-speed, two-way local traffic, primarily serving residents and essential services. Traffic volumes are low, and pedestrian activity is relatively high. Road conditions are mixed; while most streets are paved, maintenance levels vary, with visible patching, surface wear, and occasional drainage-related issues.

Within the ESMP framework, the population baseline for Carmichael underscores elevated sensitivity to traffic management, road safety, and access continuity. Mitigation measures must balance the needs of a sizeable residential population with the strategic importance of Carmichael Road as a transportation corridor. This constituency therefore represents a critical interface between social receptors and infrastructure systems within the Project's area of influence.

Nassau Village

Nassau Village constitutes a distinct residential constituency with approximately **2,839 occupied dwellings**, as recorded in the 2022 Bahamas Census. This figure reflects a sizeable but comparatively lower number of households than some surrounding constituencies, indicating a moderately dense residential community. The population is largely concentrated within planned residential developments, with internal roadways designed primarily for local access rather than through-traffic.

Residents of Nassau Village depend on the internal road network and connecting arterial routes for daily mobility, including access to employment, education, healthcare, and commercial services. Given the residential character of the constituency, population activity patterns are closely aligned with morning and evening peak periods, school schedules, and weekend community movement. Any disruption to road access or traffic flow has the potential to affect a significant portion of the resident population simultaneously.

Nassau Village features a combination of internal residential roads and larger perimeter access routes. Internal streets are typically 20 to 24 feet wide and support two-way, low-speed traffic with primarily local circulation. Traffic flow within the community is low to moderate, increasing near access points connecting to larger arterial roads. Road conditions are generally fair, with paved surfaces that show signs of routine wear, including minor cracking and patch repairs, but remain largely passable year-round.

In ESMP terms, the documented number of occupied dwellings highlights the importance of safeguarding residential access and minimizing prolonged or repeated disturbances. The population baseline supports the identification of Nassau Village as a socially sensitive area where construction-related impacts—such as increased traffic, temporary road closures, or noise—must be carefully managed through appropriate mitigation and communication measures. This information also informs the scale and scope of stakeholder engagement activities within the constituency.

5.7 SOCIOECONOMIC BASELINE OF THE INDIRECT AREA OF INFLUENCE

5.7.1 Population and Growth

The following table is based on official data from the 2010 and 2022 Bahamian censuses. It is important to mention that the results for 2022 are preliminary, so they may vary from the results. The data were used anyway to make an estimated analysis of growth in the intercensal period.

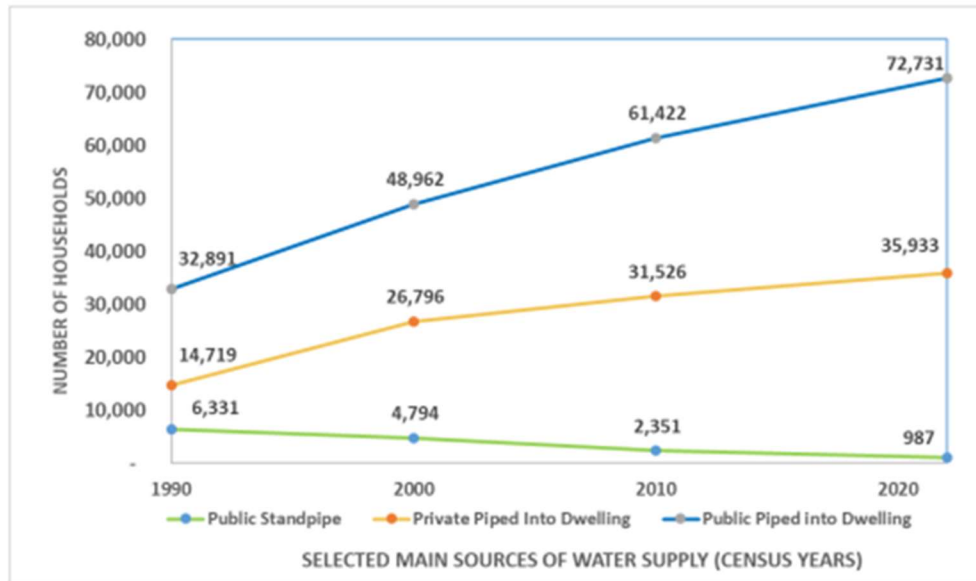


Figure 10. Selected Main Sources of Water Supply: 1990, 2000, 2010 and 2022

Of particular interest, the previous censuses have observed a significant decline in the number of households reporting ‘Public standpipe’ as their main source of water supply. A closer look at the option ‘Public standpipe’ showed that New Providence accounted for more than three quarters of the private dwellings in this group.

5.7.2 Infrastructure and Services

New Providence is the most urbanized and infrastructure-intensive island in The Bahamas and serves as the country’s primary administrative, commercial, and service hub. The island is characterized by a well-developed but unevenly distributed network of infrastructure and public services, including roadways, electricity, telecommunications, solid waste collection, healthcare, and education facilities. While core services are widely available, the quality, reliability, and continuity of service provision vary across communities, particularly between established residential areas and rapidly developing or historically underserved neighborhoods.

Potable water supply infrastructure in New Providence consists of a combination of centralized distribution networks, household connections, and, historically, public standpipes. Census data indicate a long-term decline in reliance on public standpipes as the main source of water, reflecting gradual expansion of piped household connections and changing service delivery patterns. Notwithstanding this progress, pockets of the island continue to experience intermittent supply, limited network coverage, or dependence on alternative water sources, underscoring the need for targeted water mains extensions to improve service equity and system resilience within the indirect area of influence.

Transportation infrastructure across New Providence includes a dense network of arterial roads, secondary roads, and residential streets that support daily commuting, commercial activity, and access to schools, healthcare facilities, and community services. In many residential corridors within the project’s indirect area of influence, roads are paved but lack formal sidewalks, stormwater drainage systems, or adequate shoulders. These conditions heighten sensitivity to construction-related disruptions but also highlight the importance of coordinated infrastructure upgrades that minimize cumulative impacts and protect access during works.

Public services such as healthcare centers, schools, churches, small businesses, and community facilities are distributed throughout New Providence and serve both local neighborhoods and surrounding areas. Reliable access to potable water is fundamental to the effective functioning of these services, particularly in relation to sanitation, hygiene, and public health standards. Improvements to water distribution infrastructure are therefore expected to generate indirect benefits beyond the immediate project corridors, supporting service delivery, household wellbeing, and broader socioeconomic stability across affected communities.

5.7.3 Household size

Household size is a key indicator for examining social issues such as poverty and health, especially as it relates to the risk of exposure to communicable diseases. The following table provides insights into the population and household statistics for New Providence according to the 2022 Bahamian Census results:

Table 2: Bahamian Census Household Statistics for New Providence

Island/ Supervisory District	Number Of Building Units	Number Of Dwelling Units	Number Of Occupied Dwelling Units	Number Of Vacant Dwelling Units
All Bahamas	110,043	144,198	119,138	25,060
New Providence	67,616	88,376	79,659	8,717
Yamacraw	2,034	2,660	2,562	98
Elizabeth	2,301	3,737	3,256	481
St Anne's	2,854	4,322	3,968	354
Fox Hill	3,152	3,998	3,742	256
Freetown	2,704	3,767	3,006	761
Sea Breeze	2,778	3,919	3,624	295
Marathon	2,556	3,573	3,310	263
Centerville	3,006	3,313	2,804	509
Bain and Grants Town	3,819	3,059	2,731	328
Englerston	2,411	3,180	2,911	269
St Barnabas	2,201	2,987	2,615	372
Garden Hills	3,214	3,137	2,832	305
Nassau Village	2,318	3,124	2,839	285
Golden Gates	2,666	2,848	2,670	178
Bamboo Town	3,588	3,968	3,679	289
Pinewood	2,517	2,732	2,574	158
South Beach	3,024	3,792	3,443	349
Southern Shores	2,297	3,848	3,713	135
Tall Pines	2,824	4,720	4,276	444
Carmichael	3,035	3,465	3,186	279
Golden Isles	3,794	5,266	4,768	498

The 2022 Bahamas Census data on building and housing stock provides important insight into settlement patterns, population distribution, and housing occupancy across New Providence. With 67,616 building units, 88,376 dwelling units, and 79,659 occupied dwelling units, New Providence accounts for a substantial proportion of the national housing stock, reinforcing its role as the primary population center of The Bahamas. The relatively high number of occupied dwellings compared to vacant units (8,717 vacant dwellings) indicates strong residential demand and sustained use of housing infrastructure across the island.

The distribution of occupied dwelling units across supervisory districts reflects varying degrees of residential density and urbanization. Districts such as Golden Isles (4,768 occupied dwellings), Tall Pines (4,276), St. Anne's (3,968), South Beach (3,443), and Carmichael (3,186) exhibit higher concentrations of households, indicating established residential communities with consistent reliance on surrounding infrastructure and services. These areas are characterized by stable settlement patterns and are likely to

experience heightened sensitivity to disruptions affecting access, transportation, utilities, and public services.

Vacancy rates across New Providence vary by district and provide insight into housing availability, mobility, and potential socioeconomic dynamics. Districts such as Freetown (761 vacant dwellings), Bain and Grants Town (328), Tall Pines (444), and Golden Isles (498) show relatively higher numbers of vacant units. These figures may reflect a combination of transitional housing, redevelopment activity, seasonal occupancy, or economic factors influencing housing utilization. Vacancy data assists in contextualizing population exposure and potential temporary displacement sensitivity, particularly where construction activities coincide with areas of ongoing housing turnover or redevelopment.

The relationship between building units and dwelling units also highlights the presence of multi-dwelling structures in several districts. For example, Golden Isles shows 3,794 building units supporting 5,266 dwelling units, suggesting a prevalence of multi-family or subdivided residential structures. This has implications for social risk assessment, as impacts affecting a single structure may affect multiple households simultaneously, increasing the scale of potential disruption relative to footprint size.

At the island-wide scale, the housing stock profile underscores the interconnected nature of New Providence's communities. High occupancy levels across most districts indicate limited redundancy in residential capacity, meaning that disruptions to infrastructure or services in one area may have cascading effects across neighboring districts. This is particularly relevant in the context of transportation networks, where communities with high residential density rely on shared arterial and collector roads for access to employment centers, healthcare facilities, educational institutions, and commercial areas.

Table 3: Percentage Distribution of Overcrowding by Household Characteristics

Household Characteristic	Persons per Room			
	Less than 1.0	1.00 - 1.99	2.00 - 2.99	Overcrowding (3.00 or higher)
Sex of Head of Household				
Male	57.2	36.0	5.6	1.3
Female	55.7	35.8	6.8	1.6
Age-Group of Head of Household				
Under 40	43.2	45.0	9.1	2.8
40 – 49	46.5	43.7	8.1	1.8
50 – 59	59.0	34.9	5.2	1.0
60 – 64	63.6	30.3	5.2	0.9
65 or older	73.2	23.6	2.8	0.4
Nationality of Head of Household				
Bahamas	58.0	35.0	5.7	1.3
Haiti	40.7	46.1	10.7	2.5
Other	65.3	30.8	3.4	0.6
Annual Household Income (B\$)				
Under 15,000	63.0	30.2	5.2	1.6
15,000 - 29,999	56.4	35.6	6.4	1.6
30,000 - 44,999	53.2	38.5	6.7	1.5
45,000 - 69,999	52.7	39.2	6.8	1.3
70,000 and over	57.4	36.3	5.5	0.9

Table 3 examines the distribution of crowding by the household characteristics. According to the 2022 Census, 1.6% of female-headed households were overcrowded which was 0.3 percentage points higher than the male-headed households (1.3%). An inverse relationship was observed between the age of the household head and the likelihood of overcrowding: only 0.4% of households headed by persons aged 65 and older were overcrowded, compared to 2.8% of those headed by persons under 40.

Differences in overcrowding were also observed by nationality of the head of household. A little more than one percent (1.3%) of households headed by Bahamians were overcrowded. Haitian-headed households had the highest rate (2.5%) of overcrowding when compared to Bahamian-headed households and all Other Nationalities-headed households (0.6%) in 2022. The likelihood of a household in The Bahamas experiencing overcrowding decreased as the annual household income increased. According to **Table 8**, households with annual incomes under \$15,000 (1.6%) and those earning \$15,000 to \$29,999 (1.6%) recorded the highest rates of overcrowding. Households with annual incomes of \$70,000 or higher had an overcrowding rate of 0.9%, which was 0.7 percentage points below that of lower-income groups.

Table 4: Total Population by Sex and Age New Providence

Age In Years Last Birthday	Sex		Total
	Male	Female	
All Ages	141,337	155,395	296,732
0 - 4	9,917	9,959	19,876
Under 1 Year	1,913	1,767	3,680
1	1,819	1,875	3,694
2	2,048	2,168	4,216
3	2,052	1,970	4,022
4	2,085	2,179	4,264
5 - 9 Years	11,839	11,782	23,621
5	2,261	2,179	4,440
6	2,324	2,515	4,839
7	2,278	2,204	4,482
8	2,447	2,413	4,860
9	2,529	2,471	5,000
10 - 14 Years	12,871	13,052	25,923
10	2,598	2,709	5,307
11	2,636	2,612	5,248
12	2,528	2,561	5,089
13	2,496	2,599	5,095
14	2,613	2,571	5,184
15 - 19 Years	13,534	13,919	27,453
15	3,150	3,053	6,203
16	2,856	2,716	5,572
17	2,677	2,739	5,416
18	2,500	2,648	5,148
19	2,351	2,763	5,114
20 - 24 Years	13,105	13,853	26,958
20	2,682	3,087	5,769
21	2,898	2,887	5,785
22	2,720	2,863	5,583
23	2,421	2,513	4,934
24	2,384	2,503	4,887
25 - 29 Years	12,242	12,768	25,010
25	2,379	2,405	4,784
26	2,516	2,544	5,060
27	2,454	2,654	5,108
28	2,400	2,485	4,885
29	2,493	2,680	5,173
30 - 34 Years	11,500	12,535	24,035
30	2,591	2,644	5,235
31	2,278	2,460	4,738
32	2,385	2,617	5,002
33	2,312	2,511	4,823
34	1,934	2,303	4,237
35 - 39 Years	10,218	11,807	22,025
35	2,080	2,435	4,515
36	2,013	2,619	4,632
37	2,146	2,261	4,407
38	2,013	2,213	4,226
39	1,966	2,279	4,245
40 - 44 Years	9,243	10,734	19,977
40	1,843	2,164	4,007
41	1,931	2,178	4,109
42	1,892	2,171	4,063
43	1,858	2,103	3,961
44	1,719	2,118	3,837

The New Providence population has a slightly higher proportion of females (approximately 52 percent) compared to males (48 percent). The age structure reflects a relatively young population, with a substantial share of residents under 35 years of age. Children and adolescents aged 0–14 years account for a notable portion of the population, while the largest cohorts are concentrated within the working-age groups between 20 and 39 years. This demographic profile highlights the importance of reliable basic services, including potable water supply, to support households with children, economically active adults, and dependent populations. The predominance of working-age residents also underscores the need to

manage construction-related impacts—such as access restrictions, traffic disruption, and noise—so as to minimize interference with daily commuting, employment, education, and caregiving responsibilities.

This housing and occupancy data supports the identification of socially sensitive areas, informs the prioritization of mitigation measures, and guides stakeholder engagement planning. Districts with higher concentrations of occupied dwellings warrant enhanced attention to access continuity, traffic management, noise control, and communication measures. Additionally, the data provides a quantitative foundation for assessing potential cumulative and indirect impacts across New Providence, ensuring that social risk management strategies are proportionate to population scale and settlement patterns.

5.7.4 Accessing Healthcare and Emergency Medical Services

Access to healthcare and emergency medical services in The Bahamas is structured around a combination of public sector provision, national insurance mechanisms, and community-based clinics, with significant geographic variation across islands. The Government of The Bahamas established the National Health Insurance Authority (NHIA) under the National Health Insurance Act to improve access to essential healthcare services and reduce financial barriers to care. Since its implementation in 2017, the National Health Insurance (NHI) program has become a central component of the country's healthcare system, particularly for primary and preventative care services.

Under the NHI framework, Bahamian citizens and legal residents may enroll through online platforms, telephone services, or in-person registration, provided they possess a valid National Insurance Board (NIB) smart card. Once enrolled, individuals select a preferred primary care provider and become NHI beneficiaries, allowing them to access covered services at no cost at the point of care. This model is intended to promote early intervention, continuity of care, and equitable access, particularly for low- and middle-income households that may otherwise face cost-related barriers to healthcare.

Despite the availability of the NHI program, health insurance coverage across The Bahamas remains uneven. Based on 2010 census data, approximately 47.2% of the national population reported having health insurance coverage. New Providence recorded the highest proportion, with 49.5% of residents insured, reflecting the island's concentration of healthcare facilities, employment opportunities, and administrative services. Other islands demonstrated lower coverage rates, including Exuma (42%), Eleuthera (40.8%), Abaco (38.5%), and New Providence (23%). These disparities highlight ongoing differences in access to formal healthcare financing mechanisms and underscore the importance of geographic context when assessing potential impacts on healthcare access.

Healthcare infrastructure in The Bahamas is highly centralized. There are only three public hospitals nationwide, two of which—Princess Margaret Hospital (PMH) and the Sandilands Rehabilitation Centre—are located in Nassau, New Providence, while the third, Rand Memorial Hospital, is located in Freeport, Grand Bahama. Princess Margaret Hospital serves as the country's principal tertiary care facility and national referral hospital, providing specialized and emergency services to residents of New Providence and patients referred from the Family Islands. The proximity of key infrastructure and communities to these facilities increases their importance as critical social receptors within the Project's area of influence.

Outside of New Providence and Grand Bahama, healthcare delivery relies primarily on a network of community clinics that provide basic medical services, preventative care, and initial emergency response. For example, Abaco Island has nine clinics, Eleuthera has fourteen, and New Providence has two. While

these clinics play a vital role in extending healthcare access to smaller populations, they generally have limited capacity and depend on referral pathways to Nassau or Freeport for advanced or emergency treatment. As a result, access to timely emergency medical services in the Family Islands is closely linked to transportation availability, weather conditions, and inter-island connectivity.

Within the ESMP context, understanding healthcare access and emergency service provision is critical for assessing potential social risks, particularly those related to temporary disruptions in mobility, traffic congestion, or access routes near healthcare facilities. Any project-related activities that could affect road access, response times, or service reliability—especially in proximity to Princess Margaret Hospital or key arterial routes—may have implications for community health and safety. Accordingly, baseline information on healthcare access informs the development of mitigation measures, emergency preparedness planning, and coordination protocols with relevant authorities to ensure that project activities do not adversely affect the delivery of essential health services.

5.7.5 Access to electricity

Access to electricity in New Providence is generally high and reflects the island's role as the primary administrative, economic, and population center of The Bahamas. Electrical power generation, transmission, and distribution are managed by the Bahamas Power and Light (BPL), the national utility responsible for supplying electricity to New Providence and other islands. The majority of residential, commercial, institutional, and tourism-related facilities on the island are connected to the public electricity grid, supporting daily household activities, business operations, and essential public services.

New Providence's electricity network is characterized by a centralized generation system supported by an extensive distribution network that reaches most established communities. Residential access to electricity is widespread, including in densely populated constituencies such as Golden Isles, Carmichael, Nassau Village, and Fox Hill. This high level of connectivity contributes to overall quality of life and underpins the delivery of essential services, including healthcare, education, water supply, telecommunications, and emergency response. While off-grid solutions and private generators are present, particularly for backup purposes, reliance on the public grid remains the norm across the island.

Despite broad access, the electricity system on New Providence has historically faced challenges related to reliability, aging infrastructure, and peak demand management. Periodic outages and voltage fluctuations have been reported, particularly during periods of high electricity demand or following severe weather events. As a result, some households and businesses maintain standby generators or alternative power solutions to mitigate service interruptions. From a social risk management perspective, these conditions underscore the importance of maintaining uninterrupted electricity supply to critical facilities, such as hospitals, clinics, water pumping stations, and communication infrastructure.

Electricity access and reliability are closely linked to social vulnerability, particularly for households that rely on electrically powered medical devices, refrigeration for medications, or climate control in a tropical environment. Interruptions in service may disproportionately affect elderly residents, persons with disabilities, and low-income households with limited capacity to invest in backup systems. Within the ESMP framework, electricity access is therefore considered an important baseline component for evaluating community resilience and sensitivity to potential project-related disruptions.

In the context of project implementation, activities that involve excavation, trenching, or movement of heavy equipment carry the potential to affect underground or overhead electrical infrastructure if not

properly managed. Accordingly, baseline understanding of electricity access and network distribution informs the development of mitigation measures, including utility coordination, infrastructure mapping, and emergency response procedures. These measures are essential to ensure that project activities do not adversely affect electricity supply to communities within the Project’s direct or indirect area of influence and that any unplanned disruptions are promptly addressed.

5.7.6 Access to Potable Water and Wastewater Services

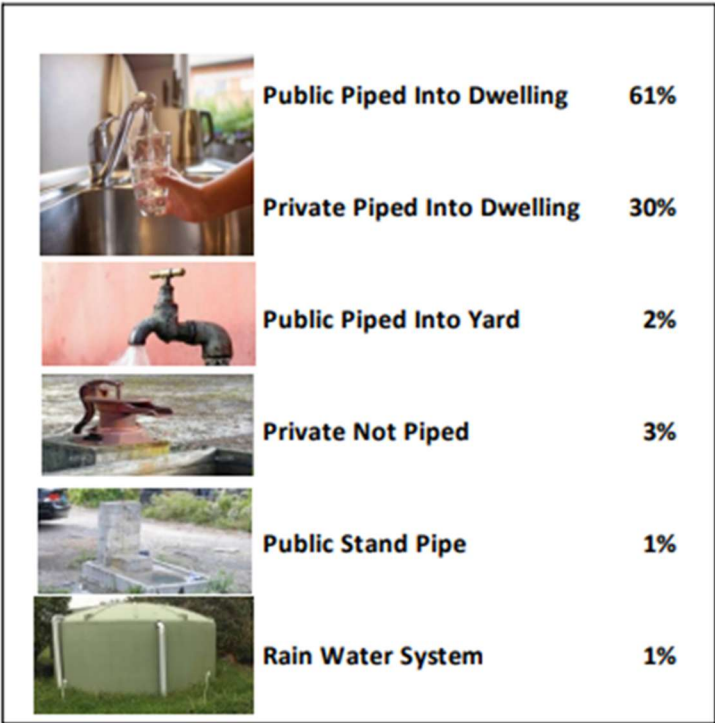


Figure 11. Private Dwellings by Main Sources of Water Supply (Percentages), 2022

Access to potable water in The Bahamas is primarily supported through centralized piped supply systems, with the majority of households relying on public or privately operated infrastructure. According to the 2022 Census, the main source of water supply for private dwellings was public piped water directly into the dwelling, accounting for 61.1 percent (72,731 dwellings) of all households. A further 30.2 percent (35,933 dwellings) reported private piped water into the dwelling as their primary water source, reflecting the presence of privately developed and managed water systems, particularly within planned subdivisions. Alternative sources of water supply are limited, with less than one percent of households reporting rainwater harvesting systems as their main source, indicating a strong dependence on piped potable water across the country.

Water supply services are predominantly delivered by the Water and Sewerage Corporation (WSC), which owns, operates, and manages approximately 83 percent of the national water systems. The remaining 17 percent are operated by private utility providers, including the Grand Bahama Utility Company (GBUC) on Grand Bahama and Paradise Island Utilities on Paradise Island, New Providence. In addition, the New Providence Water Development Company (NPWDCO) provides potable water services to selected areas of New Providence, particularly within private residential developments. This mixed institutional framework reflects a combination of public service provision and private sector participation, with varying service standards and infrastructure characteristics across service areas.

According to the WSC Corporate Business Plan (2023–2028), the overall estimated potable water supply coverage in 2022 was 63 percent nationwide. New Providence recorded a potable water coverage level of approximately 61 percent, which is lower than the estimated 70 percent coverage in the Family Islands. In contrast, wastewater service coverage remains limited across the country, with New Providence estimated at 13.5 percent coverage and the Family Islands at 0.7 percent, resulting in a national average of approximately 10.8 percent. These figures highlight the continued reliance on on-site sanitation systems, such as septic tanks, particularly outside centralized service areas.

Potable water production in New Providence is heavily dependent on desalination technologies. Approximately 90 percent of potable water on the island is produced through reverse osmosis (RO) plants, which treat brackish groundwater and manage concentrate disposal through deep injection wells. This production approach is exemplified by RO facilities located within the Project’s Direct Area of Influence. While RO technology enables reliable water production in a water-scarce environment, it is energy-intensive and closely linked to electricity supply reliability, operational efficiency, and system losses.

In terms of household access to piped water connections, coverage rates across major islands are relatively high. It is estimated that 92.4 percent of households in New Providence have access to piped water, comparable to levels observed in Abaco (85.1 percent), Eleuthera (92.2 percent), Exuma (93.6 percent), and New Providence (97.1 percent). These figures indicate that while piped infrastructure is widely available, service quality, continuity, and pressure may vary, particularly in areas affected by aging infrastructure or operational inefficiencies.

A key factor affecting access to reliable and high-quality potable water is the level of Non-Revenue Water (NRW), which includes physical losses from leaks, illegal connections, and metering inaccuracies. High NRW levels require increased water production, thereby raising operational costs, particularly given the reliance on energy-intensive RO plants. In New Providence, NRW levels declined between 2011 and 2019 but subsequently increased to approximately 3.85 million imperial gallons in 2022. In the Family Islands, NRW increased from 1.66 million imperial gallons (41 percent) in 2019 to 2.67 million imperial gallons (55 percent) in 2022. These values exceed the commonly accepted benchmark of below 30 percent NRW for a well-performing utility.

Information provided by WSC during site visits indicates that, particularly in the Family Islands, there is limited infrastructure in place to enable remote detection of leaks or real-time monitoring of water consumption. Meter reading and system inspections must therefore be conducted manually on site, constraining the utility’s ability to promptly identify losses and manage demand. From an ESMP perspective, elevated NRW levels and limited monitoring capacity represent both operational and social risk factors, as they may affect service reliability, water availability, and the financial sustainability of water supply systems.

Within the context of the ESMP, baseline information on water supply and wastewater services is critical for assessing potential project-related impacts, particularly where construction activities may interact with existing pipelines, pumping stations, or RO facilities. Understanding service coverage, production methods, and system vulnerabilities supports the development of mitigation measures aimed at protecting essential infrastructure, minimizing service disruptions, and enhancing overall system resilience.

5.7.7 Transportation

New Providence, which hosts the capital city of Nassau, benefits from a relatively well-developed and diverse transportation network that supports residential mobility, commercial activity, tourism, and national connectivity. As the political and economic center of The Bahamas, the island accommodates high daily traffic volumes associated with commuting, service delivery, tourism flows, and freight movement. The transportation system therefore plays a critical role in supporting access to employment, healthcare, education, and essential services, as well as facilitating emergency response and disaster preparedness.

The island's road network is structured around a series of primary arterial roads, secondary collectors, and local access streets. Bay Street, the principal coastal thoroughfare, runs parallel to the northern shoreline and serves as a key east–west corridor linking downtown Nassau with residential, commercial, and tourism areas toward the eastern and western ends of the island. Bay Street functions not only as a transportation route but also as a major commercial and tourism corridor, experiencing consistently high traffic volumes, pedestrian activity, and public transport usage. Additional arterial roads, such as Carmichael Road and East Street, provide inland connectivity and link residential communities to employment centers and public services.

Transportation conditions within the areas where project works will be completed are primarily characterized by local and secondary road networks serving residential communities. These roadways—including those within and adjacent to Golden Isles, Carmichael, Nassau Village, Fox Hill, and surrounding neighborhoods—are predominantly two-lane roads with varying widths, surface conditions, and levels of maintenance. Traffic flow in these areas is generally moderate and composed largely of residents, service vehicles, public transport minibuses, and utility providers. Several of the project corridors also function as connector routes between residential neighborhoods and major arterial roads, resulting in periodic congestion during peak morning and evening travel periods.

Public transportation on New Providence is predominantly provided through a network of privately operated minibuses, locally referred to as “jitneys,” which operate along established routes that run through or intersect many of the project locations and provide essential mobility for residents without access to private vehicles. Pedestrian activity is also common, particularly in denser residential areas where homes, schools, shops, and community facilities are located in close proximity to the roadway. As a result, road space is frequently shared by vehicles, pedestrians, and cyclists, often within constrained rights-of-way. These conditions increase sensitivity to construction-related disruptions, including lane closures, temporary detours, reduced parking availability, and changes to public transport operations.

The island's transportation infrastructure represents a critical social and economic system with the potential to experience both direct and indirect effects from project activities. Temporary disruptions to road access, traffic flow, or public transport routes may have implications for commuters, businesses, emergency services, and tourism operations. Accordingly, baseline understanding of transportation systems on New Providence informs the assessment of potential impacts and the development of mitigation measures, including traffic management plans, stakeholder communication strategies, and coordination with transport authorities to maintain safe and efficient mobility during project implementationⁱ.

5.7.8 Education

Education in New Providence forms a fundamental component of the social baseline, reflecting both the structure of the national education system and the distribution of educational institutions within communities where project works will be undertaken. The Government of The Bahamas, through the Ministry of Education and Technical and Vocational Training (MOETVT), administers a comprehensive education system that is compulsory for children between the ages of 5 and 16 and tuition-free at public institutions. This legal framework ensures broad access to primary and secondary education, and while pre-school and post-secondary attendance are not compulsory, they are recognized as critical stages in foundational skill development and workforce readiness across the archipelago.

New Providence, as the country's most populous island and economic center, hosts a significant share of the nation's educational infrastructure, accommodating a diverse mix of public and private institutions spanning pre-school, primary, junior high, senior high, special education, and tertiary levels. According to Ministry of Education records, New Providence currently hosts more than 90 registered preschools and early childhood education centers, most of which are privately operated and embedded within residential communities. This reflects the Ministry's ongoing efforts to expand early childhood education access in urban areas and aligns with broader national objectives to strengthen early learning pathways.

At the compulsory education levels, New Providence is served by an extensive network of public and private schools. The island features 84 primary schools providing six-year primary education (grades 1–6), seven junior high schools serving grades 7–9, and nine senior high schools offering upper secondary education (grades 10–12). In addition, there is one secondary school that accommodates a range of grade levels and eight special education institutions dedicated to students with diverse learning needs. Combined, these establishments comprise approximately 100 formal primary and secondary education institutions on the island, making New Providence the locus for the majority of the nation's student population.

The distribution of schools across New Providence reflects both historical development patterns and contemporary population dynamics. Public schools are organized into district clusters that facilitate administration, school placement, and resource allocation, with distinct entities responsible for Northern and Southern secondary schools and Western and Eastern primary schools, among others. Private independent schools also contribute to the education landscape on the island, offering alternatives to public instruction and often catering to families seeking smaller class sizes, alternative pedagogical approaches, or international curricula. These independent providers operate across the spectrum of primary and secondary education and must be registered with and recognized by the Ministry of Education to ensure alignment with national standards.

Educational facilities represent sensitive social receptors within the project area, as several public and private schools serving early childhood, primary, junior high, and senior high students are located along or in proximity to Cowpen Road, Bacardi Road, Nassau Village, Millar's Heights and Carmichael Road. These corridors traverse established residential communities that support a mix of government-operated and privately run educational institutions, including early childhood centers, primary schools, and secondary schools. Notable public institutions within these communities include Sadie Curtis Primary School in Nassau Village, Sandilands Primary School, and C. H. Reeves Junior High School, all of which serve catchment populations that rely on daily pedestrian, private vehicle, and public transportation access along the affected roadways. Cowpen Road, hosts several educational institutions, primarily private ones like Kidz College (early childhood/primary), Royal Kidz Academy (preschool with pool), and Excellence

for Higher Learning (all-age), plus Jordan Prince William High School (JPW) nearby. The Millar's Heights community accommodates several educational facilities, including The Remnant MiniVersity and Academy, Gerald Cash Primary School, and NexGen Preparatory School, all of which are located within or immediately adjacent to the project area and serve early childhood and primary-level students residing in the surrounding neighbourhoods.

Baseline information on education infrastructure and access is critical to understanding potential social impacts and sensitivities associated with project implementation. Schools are essential community receptors, and disruptions to access—whether due to traffic diversion, construction noise, or interruptions to pedestrian routes—may affect daily routines for students, parents, and school staff. This baseline also informs the planning of stakeholder engagement strategies, particularly in areas proximate to educational facilities, and supports the identification of mitigation measures to safeguard uninterrupted access to education throughout the course of project works.

5.7.9 Economy

Economic activity within the project area is predominantly small-scale, community-based, and service-oriented, reflecting the mixed residential and commercial character of Cowpen Road, Bacardi Road, Nassau Village, Millar's Heights, and Carmichael Road. These corridors support a concentration of micro-enterprises and small businesses that cater primarily to surrounding neighbourhoods rather than island-wide or tourism-focused markets. Commercial activity in these areas includes convenience retail, food services, personal services, education-related enterprises, automotive repair, construction supply outlets, and informal vending, many of which operate from street-front premises or converted residential structures. As a result, economic activity in the project locations is closely linked to daily mobility, pedestrian access, and uninterrupted roadway function.

Along Carmichael Road and in Millar's Heights, the local economy includes a notable cluster of registered businesses such as small grocery stores, hardware outlets, auto repair garages, salons, barbershops, childcare centers, and private educational institutions, including The Remnant MiniVersity and Academy and nearby service-oriented enterprises. Nassau Village and Sandilands Village similarly host community retail establishments, food vendors, churches with ancillary economic activities, schools, and home-based businesses, which collectively provide employment opportunities and essential services for residents. Bacardi Road, and Cowpen Road support a mix of light commercial uses and informal economic activities, including roadside vendors, small workshops, and locally owned service providers that rely heavily on direct customer access from the roadway. Across the combined project corridors, it is estimated that several dozen small and micro-scale businesses operate within or immediately adjacent to the construction areas, many of which employ fewer than five persons and have limited operational buffers.

Given the localized and often informal nature of economic activity in these communities, temporary construction-related disruptions—such as restricted access, reduced parking availability, noise, and traffic delays—may have a disproportionate effect on business operations and household incomes. Businesses in the project area generally lack alternative access routes, on-site storage capacity, or the financial resilience to absorb prolonged interruptions. As such, these enterprises are considered economically sensitive receptors under the ESMP. Mitigation measures, including advance notification of works, maintenance of access to commercial premises, phased construction scheduling, and coordination with business owners, are critical to minimizing adverse economic impacts and supporting continuity of local livelihoods during project implementation.

5.7.10 Archaeological, Historical and Cultural Heritage

Based on a review of available heritage registers, land-use patterns, and the established character of the project corridors, no formally designated cultural heritage sites are known to be located within the areas where works will be undertaken for the New Providence mains extension project, including Cowpen Road, Bacardi Road, Nassau Village, Millar's Heights and Carmichael Road.

These locations are predominantly established residential and mixed-use urban communities that have been subject to long-term development, road construction, and utility installation. Unlike central Nassau and the historic downtown area—which contains nationally protected sites such as Forts, colonial-era buildings, and listed monuments—none of the project areas fall within or immediately adjacent to protected heritage zones administered by the Bahamas National Trust (BNT) or other statutory heritage authorities. No registered archaeological sites, monuments, historic buildings, or landscapes of recognized cultural significance have been identified within the project footprint or its immediate surroundings.

Nevertheless, consistent with IDB Environmental and Social Standard (ESPS) 8 on Cultural Heritage, the absence of known or designated heritage resources does not preclude the possibility of previously unidentified subsurface cultural materials being encountered during excavation activities, particularly given the island's long history of settlement. As such, the ESMP appropriately requires the implementation of a Chance Finds Procedure, ensuring that any unexpected archaeological or cultural materials discovered during construction are managed in accordance with national legislation and IDB requirements, including work stoppage, site protection, and notification of the relevant authorities.

6 IDENTIFICATION AND ASSESSMENT OF ENVIRONMENTAL AND SOCIAL IMPACTS & RISKS

This section presents an assessment of the anticipated environmental and social impacts associated with the construction and operation of the proposed water mains across selected corridors on New Providence, including Carmichael Road, Bacardi Road, Millers Heights, and Nassau Village. The analysis is based on a qualitative, criteria-based methodology that considers the type, magnitude, duration, reversibility, and spatial extent of each impact.

The assessment draws on field observations, site-specific baseline data, and relevant national and international safeguards frameworks. Emphasis is placed on the construction phase, where most impacts are expected to occur, with consideration also given to long-term operational risks.

6.1.1 Data Sources and Tools

The assessment used a combination of desktop review, site inspections conducted on July 15 and 16, 2025, and reference to the SESA methodology and relevant Bahamian legislation. Supporting sources included but not limited to:

- The Third National Communication to the UNFCCC (March 2024)
- Think Hazard risk profiles
- Bahamas Protected Area Registry
- Pacific Disaster Center Island Risk Profiles
- Vegetation and biodiversity reference texts
- The National Invasive Species Strategy (2013)
- Protected Trees Order (2021)
- 2022 Census of Population and Housing: Official Census Results and Data Highlights Summary

6.2 ASSESSMENT METHODOLOGY

This ESA follows the standardized methodology outlined in the SESA for this project. The methodology is designed to identify, evaluate, and manage the potential impacts of water infrastructure projects across both construction and operational phases.

6.2.1 Impact and Risk Assessment Process

The process for assessing environmental and social risks and impacts consists of four core steps:

1. **Impact Identification:**

This step determines what environmental and social changes may result from the proposed activities. For this project, the main construction activities include trench excavation, pipe installation, and backfilling. The operational phase includes the continued use and maintenance of the potable water network.

2. **Impact Assessment:**

Each identified impact is evaluated based on its expected magnitude, geographic scope (direct or indirect area of influence), probability of occurrence, sensitivity of the receiving environment, and whether the impact is temporary or permanent. The assessment considers both the physical and biological environment (e.g., soils, hydrology, flora, fauna) and the socio-economic context (e.g., access, safety, infrastructure services).

3. **Mitigation and Enhancement Measures:**

Appropriate environmental and social mitigation measures are proposed to eliminate or reduce negative impacts and to enhance potential benefits. Measures are prioritized based on the mitigation hierarchy: (i) avoid, (ii) minimize, (iii) restore/rehabilitate, and (iv) offset or compensate.

4. **Residual Impact Determination:**

After mitigation measures are applied, residual impacts are re-evaluated to assess their significance. This considers the effectiveness of the proposed mitigation and the likelihood of lingering risks or benefits.

6.2.2 Project Activity Phases Considered

Impacts and risks are assessed across two main project phases:

- **Construction Phase:**

Activities include material storage, movement of machinery and vehicles affected by the work, cleaning of the land, excavations, movement of soils, civil works for infrastructure upgrades (i.e. trenching, pipe laying, backfilling, and site clean-up). These may result in temporary air quality disturbances, dust, noise, minor soil displacement, and disruption to roadside vegetation.

- **Operation and Maintenance Phase:**

This involves operation and maintenance of the infrastructure. Activities conducted during infrastructure maintenance may involve excavations for repairs due to leaks or losses.

Decommissioning was not included in this assessment.

6.2.3 Environmental and Social Components Evaluated

The following components were considered in the impact assessment:

- **Physical Environment:** Air quality, noise and vibration, hydrology and groundwater, soils, flora and fauna, waste generation, existing contamination, and climate/disaster sensitivity.
- **Biological Environment:** Flora (including protected trees), fauna (including common and expected species), and sensitive habitats.
- **Socio-Economic Environment:** Community access and mobility, Occupational Health and Safety, Community information and participation, Coordination with service providers, Chance Find Procedure.

For the impact identification, the **interactions between the project phases and the environmental components** (physical, biological, and socioeconomic environment) were analysed. Table 5 presents the identified impacts of the project.

Table 5: Environmental Impacts Matrix

Environmental Component	Construction Phase Impact	Operational Phase Impact	Residual Risk (Post-Mitigation)
Air Quality	Temporary dust generation during trenching, backfilling, and spoil handling, particularly during dry or	No emissions; water mains are underground and passively operated.	Low

	windy conditions. Minor emissions from construction equipment.		
Noise & Vibration	Intermittent noise and minor vibration from excavation equipment and vehicle movement along active road corridors.	No noise or vibration anticipated during routine operations.	Low
Hydrology & Groundwater	Temporary interference with surface runoff patterns; localized pooling due to flat terrain, compacted soils, and limited drainage infrastructure. Risk of groundwater contamination if poor housekeeping occurs.	Improved long-term water security; no adverse hydrological impacts anticipated.	Low
Soils	Disturbance of shallow, unconsolidated limestone and sandy soils; risk of trench wall instability if left exposed.	Stable following backfilling and compaction; minor impacts during maintenance only.	Low
Flora & Fauna	Limited clearance of roadside and ornamental vegetation; temporary disturbance of urban-adapted fauna. No protected species within work zones.	No anticipated impact during operation.	Low
Waste Generation	Generation of vegetation debris, spoil, packaging, and minor domestic waste; risk of dispersal without containment.	No significant waste generation post-construction.	Low
Existing Contamination	No evidence of contaminated soils or hazardous materials within project footprint.	Not applicable.	Negligible
Climate / Disaster Sensitivity	Exposure to heavy rainfall, high winds, and inland flooding may affect trench stability and scheduling.	Infrastructure designed for low-elevation, urban conditions; minimal climate exposure.	Low

6.3 PHYSICAL ENVIRONMENT IMPACTS

This section outlines the anticipated physical environmental impacts associated with the construction and operation of the potable water mains infrastructure across selected corridors on New Providence, including Carmichael Road, Bacardi Road, Millers Heights, Nassau Village, and adjacent residential communities. The assessment focuses on key components of the physical environment across all stages of project execution, including mobilization, trenching, installation, reinstatement, and operation.

Although the project footprint is linear and relatively narrow, the urban context of New Providence introduces specific environmental sensitivities. These include flat terrain, shallow limestone and sandy soils, limited or aging drainage infrastructure, frequent inland flooding during heavy rainfall events, and dense residential and commercial land use along active road corridors. Trenching activities will occur primarily within existing paved and unpaved road shoulders and verges, often adjacent to residences, businesses, driveways, and pedestrian routes.

No protected ecological areas, wetlands, mangroves, or coastal habitats are located within the project footprint. However, the combination of impermeable surfaces, poor surface drainage, and high groundwater vulnerability necessitates careful management of excavation, runoff, and construction-

related pollutants. Identified impacts are expected to be localized, temporary, and reversible, and will be managed through standard environmental controls and site-specific mitigation measures outlined in the ESMP.

During the operational phase, environmental impacts are expected to be negligible. The water mains will be fully buried, passively operated, and will not generate emissions, noise, or surface disturbance.

All environmental impacts have been assessed based on magnitude, duration, probability, and likelihood of recovery, and have been addressed through targeted mitigation and monitoring measures included in the ESMP, ensuring compliance with The Bahamas' national environmental regulations and the IDB's ESPs.

6.3.1 Air Quality: Dust, Emissions, and Contamination Risks

Temporary degradation in air quality may occur during construction activities due to dust generation from excavation, backfilling, spoil handling, and vehicle movement, particularly in areas with exposed sandy soils, unpaved shoulders, or deteriorated road surfaces. These conditions are common along secondary roads and residential corridors on New Providence.

Dust impacts are expected to be short-term and localized to active work zones. No known sources of legacy soil contamination, industrial emissions, or hazardous airborne pollutants were identified within the areas of influence. Construction equipment will produce minor exhaust emissions; however, these will be temporary and managed through routine equipment maintenance and avoidance of unnecessary idling.

No known sources of contaminated soils or industrial activities were identified within the project areas during the environmental review. However, as trenching activities involve excavation along existing road corridors, there remains a low potential for encountering previously disturbed or contaminated materials associated with historical dumping, buried waste, or roadside debris. Should such materials be encountered during construction, works will be temporarily halted in the affected area and the appropriate authorities notified in accordance with established environmental management procedures.

Mitigation measures:

To minimize impacts, contractors will be required to implement dust suppression measures, including regular wetting of exposed surfaces, covering of stockpiled materials, speed control for construction vehicles, and covering of trucks transporting excavated material.

With mitigation measures in place, air quality impacts are assessed as **low in magnitude, short-term in duration, and fully reversible**. No air quality impacts are anticipated during the operational phase, as the infrastructure is underground and non-emitting.

6.3.2 Noise and Vibration Impacts

Short-term noise impacts will arise from trench excavation, pipe installation, backfilling, and the movement of construction vehicles and equipment. Given the dense residential and commercial setting of New Providence, receptors may include homes, businesses, pedestrians, and road users located immediately adjacent to work areas.

Vibration impacts are expected to be minimal, as excavation depths are shallow and soils are generally soft. No vibration-sensitive structures, heritage buildings, or critical facilities were identified within the direct area of influence.

Overall, noise and vibration impacts are classified as **low to moderate in magnitude, temporary, and fully reversible**, with effects confined to the construction phase. No noise or vibration impacts are expected during the operational phase.

Mitigation measures:

Noise-generating activities will be limited to daytime working hours and phased in short segments to reduce prolonged exposure. Construction equipment will consist primarily of small to medium-sized machinery appropriate for urban corridors, and no high-impact activities such as pile driving or blasting are anticipated.

6.3.3 Water Resources: Groundwater, Surface Water, and Coastal Areas

New Providence experiences frequent inland flooding and surface water ponding, particularly during heavy rainfall events, due to flat topography, limited drainage capacity, and extensive impervious surfaces. Construction activities may temporarily interfere with surface runoff patterns, especially where trenching occurs in low-lying road segments or areas prone to water accumulation.

While the project does not involve groundwater abstraction or direct discharge to surface water bodies, improper management of excavated materials, fuels, or waste could pose a localized risk to groundwater quality, given the island's reliance on a shallow and vulnerable freshwater lens.

Potential impacts to water resources during construction are assessed as low to moderate, short-term, and localized. No operational-phase impacts to surface water or groundwater are anticipated. In the long term, the project is expected to have a positive indirect effect by improving access to centralized, treated water and reducing reliance on unregulated private wells.

Mitigation measures:

Potential impacts to water resources during construction will be mitigated through staged excavation, prompt backfilling, avoidance of stockpiling in flood-prone areas, spill prevention measures, and weather-responsive scheduling.

6.3.4 Soil: Erosion, Contamination, and Compaction

Soils along the project corridors consist primarily of shallow limestone, sandy substrate, and compacted fill, typical of urbanized areas on New Providence. These soils are susceptible to disturbance, rutting, and localized erosion when exposed, particularly under wet conditions.

Construction activities will involve trenching through road shoulders and verges, which may temporarily destabilize soils and increase erosion risk if excavations are left open or inadequately protected. Trench wall instability may occur in saturated conditions, and spoil piles may be vulnerable to wind or stormwater dispersal.

Despite these risks, the absence of steep slopes or natural drainage channels limits the potential for large-scale erosion. Soil-related impacts are assessed as moderate in magnitude, short-term, and fully reversible, provided that proper excavation sequencing, compaction, and reinstatement practices are applied.

Following construction, disturbed areas will be restored to pre-construction condition or better, and no long-term soil impacts are anticipated during operation.

6.3.5 Waste Management

Construction activities will generate non-hazardous waste streams, including excavated spoil, minor vegetation debris, packaging materials, and domestic waste from site personnel. Given the urban residential setting, improper waste handling could result in visual nuisance, obstruction of access, pest attraction, or dispersal into adjacent properties and drainage pathways.

Small quantities of regulated waste may also be generated, including used oils, filters, spill-contaminated materials, and contaminated PPE. Although volumes are expected to be low, improper handling could pose localized environmental risks. Details of the Waste Management Plan can be found in Section 8.8 of this document.

Waste-related impacts are assessed as low in magnitude and short-term, but the likelihood of localized effects increases without structured management.

Mitigation measures:

To prevent impacts, waste will be segregated, securely stored, regularly removed, and disposed of at approved facilities in accordance with the Contractor's Environmental and Social Management Plan (c-ESMP).

With proper housekeeping and timely removal, waste-related impacts will be fully mitigated, and post-construction cleanup will restore affected areas to their original condition.

6.4 BIOLOGICAL ENVIRONMENT IMPACTS

This section assesses the potential impacts of water mains construction on biological resources within the project corridors on New Providence, including Carmichael Road, Bacardi Road, Millers Heights, and Nassau Village. The assessment considers impacts to vegetation, fauna, and general habitat conditions within a highly modified urban environment.

The project alignment traverses fully developed residential and mixed-use communities, where biological conditions are shaped primarily by long-standing human activity, road infrastructure, and residential landscaping. The direct area of influence consists largely of paved and unpaved road shoulders, verges, driveways, and utility corridors that have been previously disturbed. While vegetated areas are present, they occur mainly as ornamental plantings, roadside grasses, and fragmented native shrubs within private lots and public rights-of-way.

The project does not intersect any protected areas, Key Biodiversity Areas (KBAs), Important Bird Areas (IBAs), wetlands, mangroves, or coastal habitats. **Biological sensitivity within the project footprint is therefore considered low. Anticipated impacts to biological resources are expected to be localized, temporary, and fully reversible, occurring primarily during the construction phase.**

However, with proper site controls and restoration, these impacts are localized and fully reversible. Site-level measures to manage these risks are included in the ESMP, ensuring compliance with the Forestry Act (2010), the Protected Trees Order (2021), and the DEPP permitting requirements.

6.4.1 Flora and Vegetation Cover

Vegetation within the project corridors reflects typical urban and suburban residential landscaping found across New Providence. Plant cover is discontinuous and includes ornamental shrubs, roadside grasses, scattered native species, fruit trees within private yards, and occasional shade trees along verges and

property boundaries. Vegetation within the direct area of influence is largely limited to previously disturbed road shoulders and utility margins.

Field observations confirmed that no intact native plant communities or sensitive habitats occur within the trenching zones. While protected tree species may be present within private properties or landscaped verges, no protected trees were identified within the anticipated excavation footprint. Nevertheless, pre-construction ecological walkthroughs will be conducted to verify the presence of any species listed under the *Protected Trees Order* (2021).

Vegetation disturbance is expected to be minor and unavoidable only where trenching passes through vegetated verges or landscaped areas. Disturbance will be minimized through careful alignment of trenches, clear demarcation of work zones, and coordination with property owners. Where pruning or removal is unavoidable, appropriate approvals will be obtained in accordance with the *Forestry Act* (2010) and DEPP guidance.

Post-construction reinstatement will restore disturbed areas to pre-construction condition or better, using native or appropriate ornamental species consistent with surrounding land use. Impacts to flora are assessed as **low in magnitude, short-term, and fully reversible**.

6.4.2 Fauna and Wildlife Disturbance

While no critical terrestrial habitats or known wildlife corridors were identified within the trenching zone, the canal-edge vegetation and adjacent shrubbery offer habitat for commonly encountered fauna such as Brown Anole (*Anolis sagrei*) and the Northern Curly-tailed Lizard (*Leiocephalus carinatus*). Feral cats and rodents may also be present. These species are adaptable and not considered sensitive to temporary construction-related disturbances.

During excavation, noise, vibration, and worker activity may temporarily displace these animals from the immediate area. However, due to the patchy nature of the vegetation and the residential layout, fauna are expected to return once works are complete. **The impact to fauna is assessed as low in magnitude and short in duration, with moderate probability of encounters during early morning or post-rain periods. Impacts are localized to the direct work zone and fully reversible post-construction.**

Standard site protocols will include pre-clearing inspections, worker orientation to avoid wildlife disturbance, and incident reporting procedures if nests, burrows, or injured animals are discovered. Feeding, hunting, or trapping of fauna by workers will be strictly prohibited.

6.5 SOCIAL IMPACTS

The installation and extension of potable water mains across multiple residential and mixed-use corridors in New Providence are expected to generate significant positive social impacts at both the community and island-wide levels. The project will improve the reliability, quality, and continuity of potable water supply for households, small businesses, and community institutions located along the project corridors, thereby supporting improved public health, hygiene, and overall quality of life.

Improved access to a consistent potable water supply will reduce reliance on intermittent service, private water hauling, or alternative water storage practices that may pose health and safety risks. In residential communities such as Nassau Village, Carmichael Road, Cowpen Road, and surrounding areas, the project will enhance household water security, support safer food preparation and sanitation practices, and reduce time and financial burdens associated with securing water. Over the long term, the works will contribute to more resilient urban infrastructure and improved service equity across New Providence.

Construction of the proposed water mains across several residential and mixed-use corridors in New Providence may result in temporary social impacts primarily associated with trenching activities, traffic management, worker safety, and short-term disruptions to daily routines. These impacts are expected to be localized, short in duration, and manageable through the implementation of appropriate mitigation measures, stakeholder communication, and adherence to established health and safety protocols.

During the construction phase, potential adverse social impacts are expected to be temporary, localized, and manageable. These may include short-term noise and dust generation, traffic disruptions, restricted access to homes and businesses, and temporary inconvenience to pedestrians and road users. Given the dense residential nature of several project areas, particular sensitivity is associated with maintaining access to private properties, community facilities, and emergency services.

6.5.1 Community Access and Mobility

Temporary and localized access restrictions may occur during trenching, pipe installation, and backfilling in New Providence. As works will take place primarily within the roadside verge, only short sections of one lane may be partially obstructed at a time on the two-lane roadway. Minimal disruption to traffic flow, pedestrians, and local access is therefore expected. Work sequencing will be planned to minimize delays and avoid full lane closures, ensuring continuous access to key facilities such as the airport, ferry terminal, and nearby businesses.

The anticipated impact on community access and mobility is considered **low to moderate in magnitude, short-term in duration**, occurs in the direct area of influence, **highly probable during construction**, but **localized and fully reversible** upon completion. No adverse impacts are expected during operation, as the water mains will be buried and non-intrusive.

Mitigation Measures:

To minimize disruptions to community access and mobility, construction activities will be carefully phased so that only short sections of roadway are affected at any given time. Traffic management measures, including clear signage, barriers, and flag personnel, will be implemented to safely guide vehicles and pedestrians around work zones while maintaining at least partial lane access wherever possible. Temporary solutions such as driveway crossings or steel plates will be used to maintain access to homes and businesses, and advance notification will be provided to residents and stakeholders regarding construction schedules, expected disruptions, and alternative routes. Prompt restoration of road surfaces and access points will be undertaken following completion of trenching works.

Trenches will be opened in short segments and will not be left exposed for extended periods, access will be maintained through immediate backfilling of open trenches before moving onto the subsequent segment. Disruptive activities will be scheduled during off-peak hours and coordinated with businesses and residents to reduce interference with daily operations while maintaining continuous access to properties.

6.5.2 Occupational Health and Safety

Construction activities present potential occupational health and safety (OHS) risks to site workers, including exposure to heat stress, dust inhalation, noise, vibration, and machinery-related hazards. Additional risks may arise from trench instability, vehicle movements, and manual handling of pipes and fittings.

Contractors are required to prepare and implement a **Health, Safety, and Environmental (HSE) Plan**, consistent with national labor standards and IDB Environmental and Social Performance Standard 2 (ESPS 2). The plan must include:

- Mandatory use of personal protective equipment (PPE);
- Daily safety briefings and task-specific health and safety training;
- Heat stress management protocols, including rest breaks and hydration stations;
- Emergency response procedures (fire, hurricanes, medical) and first-aid provisions on site.
- Security of community and workers where applicable (contractor badges on sites etc.)

The OHS impact is assessed as **moderate in magnitude, short-term in duration**, occurs in the direct area of influence and **highly probable** without proper management. However, with the application and monitoring of the standard health and safety protocols, residual risks are expected to be **low** and **fully manageable**. No operational OHS impacts are anticipated, as the infrastructure is passive and will require only routine inspection.

Mitigation Measures:

These risks will be mitigated through advance public notification via WSC's social media pages, traffic management plans, community and occupational health and safety protocols, and ongoing stakeholder engagement (Town Hall Meetings, Door-to-Door exercises conducted by WSC, public notices, flyers, etc). Stakeholder engagement will include a functioning grievance redress mechanism through which grievances may be received and addressed in a timely manner.

No significant long-term adverse social impacts are anticipated during the operational phase. On the contrary, the project is expected to deliver sustained social benefits by strengthening water service delivery, supporting public health objectives, and improving living conditions within the affected communities.

Occupational health and safety risks will be managed through the implementation of a contractor-developed Health, Safety, and Environmental (HSE) Plan consistent with national regulations and IDB Environmental and Social Performance Standard 2. The plan will require the creation of a safe work environment, use of appropriate safety signage in prominent locations, personal protective equipment, regular safety briefings, and task-specific training for workers. Additional measures will include heat stress management protocols, safe operation of machinery, proper trench stabilization, and secure work zones to prevent unauthorized access by the public. Emergency response procedures and first-aid provisions will also be maintained on-site to ensure that potential incidents can be addressed promptly and effectively.

6.5.3 Service Delivery and Public Health

During construction, minor interruptions to local utilities or temporary inconvenience to road users may occur. However, the long-term effect of the project is **strongly positive**, as it will extend reliable access to potable water for residents, businesses, and public institutions in New Providence. The improvement in water quality and availability will directly enhance public health, reduce household costs associated with bottled water or rainwater catchment, and support hygienic practices in schools, clinics, and hospitality establishments.

Coordination with utility providers and public agencies for project activities will ensure that any temporary disruptions are minimized. Communication with affected communities, through notices, public briefings, and the **Grievance Redress Mechanism (GRM)**, will help manage expectations and maintain transparency throughout implementation.

Service delivery impacts are classified as **low to moderate in magnitude, short-term** during construction, and **highly beneficial in the long term**. The operational phase will yield sustained social benefits through improved water reliability, equity, and institutional functionality.

Mitigation Measures:

To reduce potential disruptions to service delivery and public health during construction, project activities will be coordinated with relevant utility providers and public agencies to prevent unnecessary service interruptions. Dust suppression, proper management of excavated materials, and good housekeeping practices will be implemented to maintain sanitary conditions around work sites. Communication with residents and businesses will be maintained throughout the construction period through public notices and stakeholder engagement, and a grievance redress mechanism will be available to address concerns in a timely manner. Upon completion of works, affected areas will be promptly restored to ensure that communities can resume normal activities without lasting disruption.

Summary of Social Impacts by Project Phase

Social Component	Construction Phase Impact	Operational Phase Impact	Residual Risk (Post-Mitigation)
Community Access and Mobility	Trenching will occur in small sections at a time, with stakeholders receiving advanced notice. All trenches will be filled immediately once work is complete, restoring community access and mobility.	Improved access to reliable potable water for airport staff and travellers	None: benefits sustained post-installation
Occupational Health and Safety	Heat stress, dust inhalation, noise, vibration, machinery-related hazards and sanitation risks near work zones	Consistent water supply improves hygiene, reduces reliance on unsafe sources	Low: mitigated through proper construction protocols
Service Delivery and Public Health	Exposure to dust/noise; minor work disruptions	Better sanitation and working conditions for airport personnel	Low: if temporary impacts are managed
Community Livelihoods	Small disruption to residential flow and access	Enables future residential and tourism growth, and economic diversification	None: long-term socioeconomic benefit

Equity and Service Distribution	No direct impact during works	Supports more equitable access to reliable services in New Providence	None: improves service delivery gap
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7 DISASTER AND CLIMATE CHANGE RISK ASSESSMENT

This section presents the results of the Disaster and Climate Change Risk Assessment (DRA) for the water mains project in New Providence. The objective is to evaluate the extent to which the proposed works may be exposed to, or exacerbate, natural hazards, and to determine the overall risk classification to inform resilience planning and mitigation.

7.1.1 Legal Framework

The primary regulation relevant to risk management for the Program is:

Disaster Risk Management Act (2022): The Disaster Management Plan of 2022 for the Bahamas outlines a comprehensive approach to disaster risk management, aiming to mitigate socio-economic and environmental impacts, including those exacerbated by climate change. It promotes the active involvement of all societal sectors and stakeholders in planning, financing, and executing disaster response and recovery efforts. Key provisions include the establishment of critical infrastructure such as the National Disaster Emergency Operations Centre (NEOC), early warning systems (EWS), and humanitarian assistance standards. The Act also defines the roles and responsibilities of the Disaster Risk Management Authority (DRMA), a body responsible for disaster risk management in The Bahamas that merges the former National Emergency Management Agency (NEMA) and Disaster Reconstruction Authority (DRA), local administrators for Family Islands, public institutions, and the Minister of Finance across all phases of disaster management, from alert to rehabilitation and recovery, and establishes funds for disaster response, risk reduction, and Risk Management Plan, and the National Disaster Emergency Plan, to be prepared by the authority, as well as requiring every local administrator to prepare, after consultation with the Disaster Risk Management Consultative Committee a Local Disaster Risk Management Plan and a Local Disaster Emergency Plan. Additionally, it outlines procedures for international assistance, ensuring a coordinated and inclusive approach to disaster resilience and mitigation in the Bahamas.

ESPS 4, 'Community Health and Safety.'. In compliance with this standard, all projects involving infrastructure works financed with Program funds must undergo a Disaster Risk Analysis using the IDB Methodology.

7.2 REFERENCE FRAMEWORK AND METHODOLOGY

The methodology employed for this evaluation is delineated in the IDB document “Disaster and Climate Change Risk Assessment Methodology for IDB Projects”. This methodology is structured around three core pillars:

- **Identification of Hazards and Vulnerabilities:** This involves pinpointing the natural hazards that may impact a project, as well as assessing the physical, social, and economic characteristics that could render it vulnerable to these hazards.

- **Risk Assessment:** This entails estimating the likelihood of adverse events occurring and evaluating the potential consequences for the project.
- **Risk Management:** This includes implementing measures to reduce the risk from disasters and climate change, such as prevention, mitigation, and preparedness strategies.

The IDB methodology is designed to be flexible, allowing it to be tailored to the specific needs of each project. It encompasses various phases and steps, with efforts and resources allocated according to then identified risk levels. The steps outlined in the IDB methodology are illustrated in the accompanying figure.

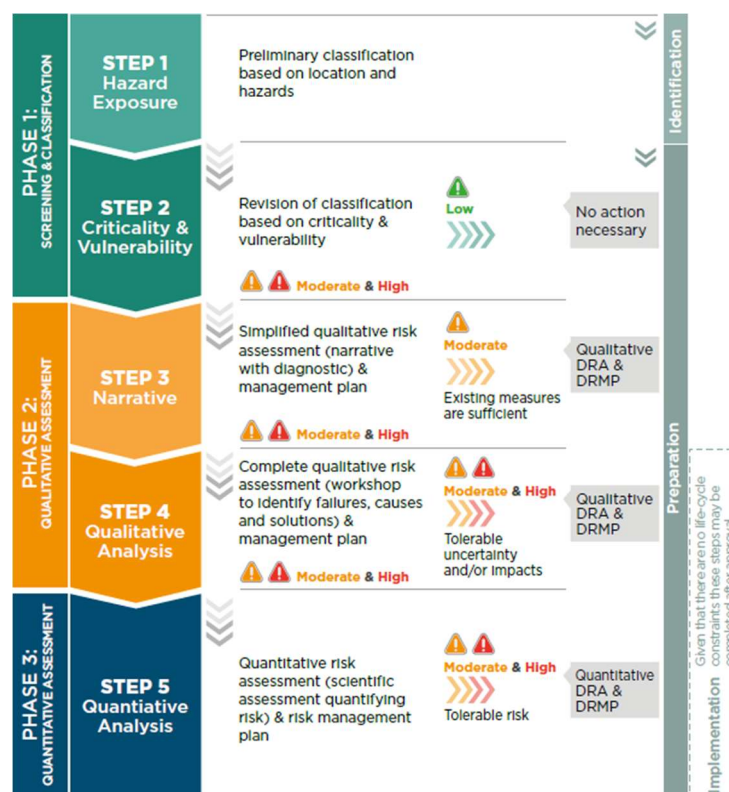
The analysis follows the five-step process outlined in the IDB's 2019 guidance document¹⁴, which includes:

- **Hazard Exposure:** preliminary classification based on location and hazards
- **Criticality and Vulnerability:** revision of classification based on criticality and vulnerability
- **Narrative Assessment:** simplified qualitative risk assessment (narratives with diagnostic) & management plan
- **Qualitative Analysis:** Complete qualitative risk assessment (workshop to identify failures, causes and solutions) & management plan
- **Quantitative Analysis:** Quantitative risk assessment (scientific assessment quantifying risk) & risk management plan

Each risk is rated qualitatively as low, moderate, or high based on the severity of impacts and likelihood of occurrence.

¹⁴ Inter-American Development Bank (IDB). Disaster and Climate Change Risk Assessment Methodology for IDB Projects: Technical Reference Document. 2019. <https://publications.iadb.org/en/disaster-and-climate-change-risk-assessment-methodology-idb-projects-technical-reference-document>

Figure 12. *Disaster and Climate Change Risk Assessment Methodology*¹⁵



7.2.1 Procedure

In accordance with the IDB Methodology, the process is developed through the following steps:

Step 1: Exposure to Hazardss

Current and future hazards are identified, and the level of exposure of the project to each hazard is determined.

Step 2: Criticality and Vulnerability

The level of vulnerability and criticality is assessed by considering the potential for losses and damages that could result from project activities in the event of failure, in relation to the existing physical, environmental, and socioeconomic conditions.

A simplified and qualitative analysis of the project risk is conducted, considering the previous steps and available information about the project design and the environment.

Based on this analysis, mitigation measures for the identified risks are proposed and structured within the Disaster Risk Management Plan (DRMP).

¹⁵ Inter-American Development Bank (IDB). Disaster and Climate Change Risk Assessment Methodology for IDB Projects: Technical Reference Document. 2019. <https://publications.iadb.org/en/disaster-and-climate-change-risk-assessment-methodology-idb-projects-technical-reference-document>

The activities undertaken as part of the risk assessment and the findings of this procedure are detailed below.

7.2.2 Step 1: Hazard Exposure

The New Providence water mains project comprises works across multiple established residential and mixed-use corridors within New Providence, including areas such as Nassau Village, Carmichael Road, Cowpen Road, Millar's (Miller) Heights, and Bacardi Road. These locations are generally characterized by relatively flat to gently undulating terrain, limestone-based soils with a shallow soil cover, and varying levels of formal drainage infrastructure.

In several project areas, drainage systems are limited or absent, with storm water managed primarily through overland flow and roadside infiltration. As a result, localized ponding may occur during periods of heavy rainfall, particularly where road profiles are depressed or drainage pathways are obstructed. While the project areas are not coastal or canal-based, their urban setting and underlying geological conditions necessitate careful management of trenching activities to address potential flooding, soil instability, and storm water accumulation during construction, especially during the rainy season and extreme weather events. Construction activities will occur along narrow residential corridors adjacent to waterways, where runoff management, trench stability, and heat exposure present additional operational and occupational safety considerations.

The table below summarizes the primary hazard exposures identified through the World Bank's ThinkHazard! platform¹⁶, their contributing factors, and the potential effects on construction activities and worker safety:

Table 6: Relevant Hazards for the New Providence Community Watermain Works

Hazard	Contributing Factors	Potential Impacts	Hazard Risk Level
Coastal Flood	Low elevation and flat topography, storm surges, hurricanes, sea level rise and high tides (king tide events)	Water pooling, trench collapse, damage to infrastructure, public health risk, and Economic losses.	High
Tropical Cyclones and Storm Surge	Coastal location within the Atlantic hurricane belt; seasonal storm activity	Wind damage, heavy rainfall, debris hazards, temporary work stoppage, and risk to worker safety	High
Extreme Heat	Climate change and rising temperatures, tropical latitude and solar radiation, high humidity levels, sea surface temperatures.	Worker heat stress, dehydration, reduced productivity, and occupational health risks, water resource pressure.	Medium

¹⁶ <https://thinkhazard.org/en/>

Tsunami	Undersea Earthquakes (tectonic activity), distant sources, coastal geometry and low elevation.	Coastal inundation and flooding, loss of life and injury, damage to infrastructure and economic disruption.	Medium
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Although the project alignment is not exposed to coastal storm surge or marine wave action, secondary storm impacts, particularly rainfall-driven flooding and groundwater rise, represent the most relevant hazards for linear infrastructure on New Providence. These risks will be mitigated through weather-responsive scheduling, staged excavation, rapid backfilling, erosion and sediment control, and secure material storage, as outlined in the Disaster Risk Management measures incorporated into the ESMP.

In accordance with the IDB Disaster and Climate Change Risk Assessment Methodology, a supplementary internal hazard screening was undertaken to better characterize site-specific exposures. This analysis identified inland flooding as moderate-level hazard requiring focused management during construction. Other hazards, including extreme heat and tropical cyclone exposure, were assessed as medium risk but remain relevant for worker safety and contingency planning.

This hazard profile informs both design considerations (e.g., trench depth, bedding stability, runoff management) and construction practices (e.g., heat safety protocols, weather monitoring, emergency preparedness), strengthening the project's climate resilience and environmental performance.

7.2.3 Step 2: Project Criticality and Vulnerability

The New Providence water main installation across Carmichael Road, Bacardi Road, Millers Heights, Nassau Village, and surrounding communities represent a critical public infrastructure intervention on New Providence. These works support the expansion and reinforcement of centralized potable water supply systems in areas where households continue to rely on private wells, rainwater harvesting, bottled water, or intermittent service connections.

Given New Providence's high population density, asset concentration, and dependence on centralized services, disruption to water infrastructure has island-wide implications for public health, economic activity, and emergency response. The project is therefore considered to have moderate criticality, despite the linear and localized nature of individual construction segments.

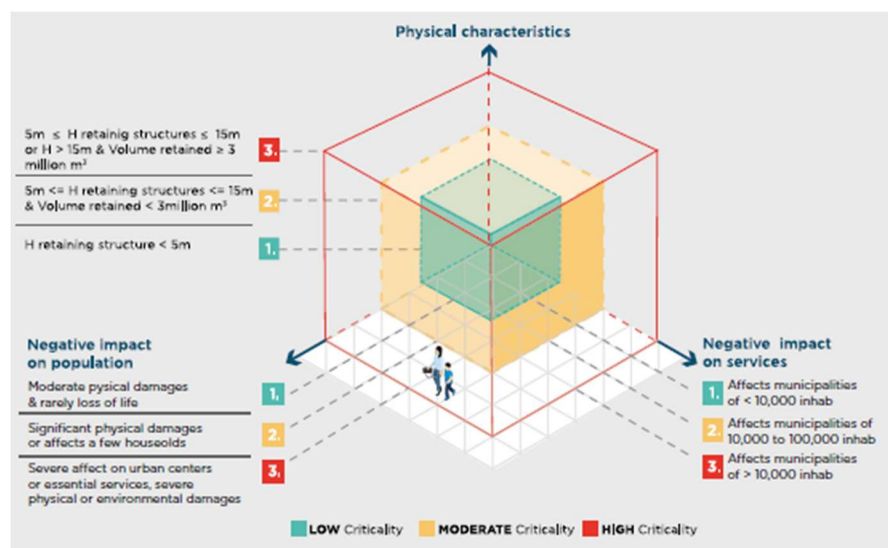
Failure or significant delay in completing the installation could:

- Prolong reliance on vulnerable and unregulated groundwater extraction, increasing contamination risk and inequitable access to safe water;
- Exacerbate service disruptions during extreme rainfall events or post-hurricane recovery, when demand for potable water is highest;
- Increase construction costs and material losses if works are repeatedly interrupted by flooding or adverse weather;
- Disrupt mobility and emergency access along key residential and commuter routes during storm preparedness or response periods.

While New Providence benefits from strong institutional capacity and emergency response systems, the environmental vulnerability associated with flooding, groundwater stress, and climate variability elevates the importance of timely completion and robust construction management. Accordingly, the project's

vulnerability is driven less by isolation and more by exposure concentration and service dependence, reinforcing the need for climate-responsive execution and risk-informed scheduling.

Figure 13. *Criticality and Vulnerability Table for Drainage and Water and Wastewater Infrastructure*¹⁷



7.2.3.1.1 Thresholds for Dimension 1: Impact on Service Functionality

The proposed potable water mains installations across Carmichael Road, Bacardi Road, Millers Heights, and Nassau Village form part of the broader centralized water distribution network serving New Providence. While individual pipeline segments are linear and localized, they support critical service continuity in densely populated residential and mixed-use areas.

In the event of a localized system failure or temporary disruption, impacts would generally be confined to specific service zones and could be addressed through existing WSC maintenance protocols, including isolation valves and sectional repairs. Redundancy within the wider network allows for restoration without prolonged island-wide service interruption.

Given the essential nature of potable water supply, but the localized service footprint and availability of operational controls, the **impact on service functionality is classified as Low** (Error! Reference source not found.).

7.2.3.1.2 Thresholds for Dimension 2: Impacts on Population and Environment

The project sites are within fully urbanized environments and do not intersect protected areas, sensitive ecosystems, wetlands, or critical habitats. Potential installation or operational failures, such as leaks or localized pipe damage, would be spatially limited and could be contained and remediated without significant environmental consequences.

¹⁷ Inter-American Development Bank (IDB). Disaster and Climate Change Risk Assessment Methodology for IDB Projects: Technical Reference Document. 2019. <https://publications.iadb.org/en/disaster-and-climate-change-risk-assessment-methodology-idb-projects-technical-reference-document>

From a population perspective, while the number of residents served within each community is substantial due to New Providence's density, impacts from isolated failures would be temporary and manageable through established response mechanisms. Environmental risks associated with leaks are considered low, provided that spill response and repair protocols are implemented promptly.

Accordingly, **the impact on population and environment is classified as Low** (Error! Reference source not found.).

7.2.3.1.3 Thresholds for Dimension 3: Physical Characteristics

The proposed infrastructure consists of buried PVC pipelines operating passively, without reliance on mechanical or electrical systems. Routine operation does not require continuous monitoring, and maintenance activities are limited to periodic inspections, pressure testing, flushing, and occasional localized repairs.

Exposure to climate-related hazards primarily affects above-ground fittings, such as hydrants and valve boxes, which may be subject to flooding, debris impact, or heat exposure during extreme weather events. However, damage to these components would not pose significant risk to public safety or ecological integrity and can be repaired without specialized intervention.

Based on low operational complexity, passive functionality, and periodic maintenance requirements, the physical characteristics are classified as **Moderate**. (Error! Reference source not found.).

Table 7: Summary of the Criticality Assessment

Project Type	Dimension 1 Impact on Service Functionality	Dimension 2 Impacts on Population and Environment	Dimension 3 Physical Characteristics	Classification
Access to Potable Water Supply	Low Localized failures do not disrupt island-wide service delivery	Low Failures are containable with minimal environmental consequence	Moderate Passive underground system with minimal O&M	Moderate

7.2.4 Step 3: Risk Narrative

The primary hazards relevant to the New Providence water mains works include coastal flooding, tropical cyclones/ storm surge, extreme heat and tsunamis. Of these, **extreme heat is classified as a Medium level hazard and require standard occupational and environmental controls. In contrast Tropical cyclones and extreme rainfall events are also considered high hazards that can lead to significant economic and property loss.**

The project's criticality assessment indicates:

- Physical characteristics: Moderate
- Impact on service functionality: Low
- Impact on population and environment: Low

Accordingly, the overall infrastructure criticality is rated as **Moderate**.

Considering the moderate hazard exposure and criticality of the infrastructure, and the limited potential for risk exacerbation, the overall Disaster and Climate Change Risk Classification for the project is Moderate.

Climate change considerations are integral to this assessment. Projections indicate increasing rainfall intensity, more frequent extreme precipitation events, elevated temperatures, and rising groundwater levels, all of which may exacerbate flooding, trench instability, and construction delays if unmanaged.

- Design and construction measures to manage these risks include:
- Staged excavation and rapid backfilling to reduce flood exposure;
- Erosion and sediment control to protect trench integrity;
- Weather-responsive scheduling and storm preparedness protocols;
- Secure placement and anchoring of hydrants, valve boxes, and fittings.

Risk exacerbation will be avoided through:

- Implementation of the Disaster Risk Management Plan (DRMP);
- Pre-storm inspections and emergency preparedness procedures;
- Avoidance of construction during peak hurricane periods where practicable.

No significant risk gaps were identified. The primary uncertainty relates to climate variability and extreme rainfall timing, which will be managed through adaptive scheduling, continuous site monitoring, and coordination with national emergency response systems.

Based on these findings, progression to Step 4 (Detailed Qualitative Risk Assessment) of the IDB DCCRAM is not required, as risks can be reduced to tolerable levels through the measures already identified.

7.2.5 Disaster Risk Management Plan (DRMP)

This Disaster Risk Management Plan (DRMP) outlines site-specific mitigation measures to address the priority hazards identified for the New Providence water mains project. It is structured according to IDB's 2019 methodology and draws on best practices outlined in the program-wide Disaster Risk Mitigation Measures Table in the Programs's SESA.

The DRMP focuses on minimizing risks across all phases of the project, engineering design, construction, and operation and maintenance (O&M), with clearly assigned responsibilities and a distinction between structural and non-structural measures.

Table 8: Disaster Risk Mitigation Measures for the New Providence Community (Access to piped water supply)

Hazard Type	Measure Description	Project Phase	Type of Measure	Responsible for Execution
Flooding / Surface Water Accumulation	Select valve boxes, washouts, and hydrant locations in slightly elevated or well-drained areas to minimize exposure to pooled water.	Design	Structural	WSC Design Team, Contractor

	Anchor and secure all above-ground components (hydrants, valve boxes) to prevent displacement or floatation during flooding.	Construction	Structural	Contractor, WSC Supervision
	Establish shallow side drains or graded shoulders along the corridor to channel runoff away from open trenches.	Construction	Structural	Contractor, verified by WSC
	Implement periodic clearing of vegetated and canal-edge buffers to maintain surface water flow paths and prevent waterlogging.	O&M	Non-Structural	WSC, PEU, Local Government
Extreme Rainfall	Limit open trench exposure during the wet season; schedule excavation and backfilling to align with forecasted dry periods.	Construction	Non-Structural	Contractor
	Cover stockpiles, use silt fencing, and stabilize disturbed areas using compacted fill or native groundcover vegetation.	Construction	Structural	Contractor, supervised by WSC
Tropical Cyclones / Storm Surge	Secure loose materials, piping, and machinery ahead of storms; activate contractor storm-preparedness protocol.	Construction	Non-Structural	Contractor, WSC
	Incorporate thrust blocks and reinforced joints at all bends and terminal points to reduce uplift or separation during extreme rainfall or flooding.	Design	Structural	WSC Design Team, Contractor
Heat Stress (Occupational)	Adjust work hours to avoid peak sun; provide shaded rest areas and hydration	Construction	Non-Structural	Contractor
Trench Collapse / Worker Safety	Use trench boxes or shoring methods in deeper or unstable sections	Construction	Structural	Contractor, WSC
Fire Risk (Minor)	Keep work area free of dry vegetative debris and flammable materials	Construction	Non-Structural	Contractor

Runoff and Canal Interaction	Maintain vegetated buffers between trenching zones and canal edges; avoid stockpiling near waterways.	Construction	Non-Structural	Contractor, WSC
System Redundancy / Supply Interruption	Allow bypass valves to isolate sections during repairs without shutting down entire network	Design	Structural	WSC Design Team
Regular Monitoring	Conduct periodic maintenance checks and walk-through inspections	O&M	Non-Structural	WSC, Local Government

7.3 SUMMARY OF ENVIRONMENTAL AND SOCIAL ASSESSMENT

The Environmental and Social Assessment for the proposed water mains works on New Providence identifies overall low, short-term, and manageable environmental and social impacts during construction, with substantial long-term benefits once operational.

Environmental impacts are limited to temporary dust, noise, soil disturbance, minor vegetation disruption, and construction-related waste generation. These impacts are localized, reversible, and effectively managed through standard mitigation measures included in the ESMP. No protected habitats or sensitive ecological features are affected, and operational-phase environmental impacts are negligible.

From a disaster and climate perspective, the project is classified as Moderate Risk, driven primarily by exposure to inland flooding, extreme rainfall, and construction-phase vulnerabilities. These risks are effectively addressed through the DRMP and climate-responsive construction practices.

Overall, the New Providence water main project is environmentally sound, climate-resilient, and operationally robust, supporting improved water security, reduced groundwater vulnerability, and enhanced public health outcomes across some of the island's most heavily populated communities.

From a social perspective, the Environmental and Social Assessment concludes that the proposed water main works in New Providence will generate predominantly positive and lasting social benefits, with only minor, short-term, and manageable adverse impacts during construction. Temporary social risks are limited to localized disturbances such as noise, dust, traffic disruption, and restricted access to residences, businesses, and community facilities along active work zones. Given the dense residential context of many project corridors, these impacts require careful management but are not expected to result in significant or lasting social harm when mitigation measures are applied.

Over the operational phase, the project will deliver substantial social benefits through improved reliability, quality, and equity of potable water service across multiple communities. Enhanced water access will support improved household sanitation and hygiene, strengthen public health outcomes, reduce the time and financial burdens associated with securing water, and improve overall quality of life. The project also contributes to social resilience by strengthening critical infrastructure that underpins daily living, community services, and economic activity. With the implementation of appropriate stakeholder engagement, grievance management, and occupational health and safety measures, the project

is considered socially acceptable and aligned with national development priorities and IDB social safeguard requirements.

8 ENVIRONMENTAL & SOCIAL MANAGEMENT PLAN (ESMP) FOR WATER MAINS WORKS

This Environmental and Social Management Plan (ESMP) provides a structured and actionable framework for implementing environmental mitigation, monitoring, and compliance activities associated with Component 3: Water Mains Works under the broader water supply and sanitation program. The works designed for New Providence addresses distinct environmental characteristics, construction contexts, and levels of sensitivity.

The ESMP supports the operationalization of the findings and recommendations from the Environmental and Social Assessment and is intended for use by the WSC, project contractors, and the supervising WSC staff. It provides a set of site-specific mitigation measures, organized into thematic environmental management programs, alongside defined institutional responsibilities, reporting protocols, and monitoring mechanisms that align with national environmental laws and the IDB's ESPF.

Key environmental risks addressed in this ESMP include:

- Dust emissions and localized air quality impacts resulting from trenching, backfilling, and vehicle movement through sandy and shallow limestone soils within active residential and mixed-use corridors;
- Soil instability, erosion, and surface water ponding in flat, low-lying road segments with constrained or aging drainage infrastructure, particularly during intense rainfall events;
- Noise and vibration impacts associated with excavation and construction equipment operating in close proximity to residences, businesses, schools, and other community facilities;
- Construction-related waste generation and material management risks, including the potential dispersal of lightweight debris along roadways, verges, and adjacent properties in windy or wet conditions;
- Temporary disturbance to roadside vegetation and landscaped verges, including ornamental plantings and isolated native species within public rights-of-way and private frontages;
- Climate- and weather-related construction hazards, including extreme heat, heavy rainfall, and storm events, which may affect trench stability, material staging, and environmental protection controls if not properly managed.

Key social risks addressed in this ESMP include:

- Lack of Community access and mobility
- Road and traffic impacts;
- Occupational and Community health and safety risks;
- Lack of community information and participation
- Lack of coordination with service providers
- Potential risk of a chance find in the project area -

This plan applies to both construction and operational phases, with particular emphasis on:

- Site establishment and clearance;
- Trenching and pipe laying activities;
- Backfilling and restoration of road surfaces;
- Sanitary testing and final commissioning.
- Maintenance activities

8.1 ROLES & RESPONSIBILITIES

8.1.1 Design

During the design phase of the interventions, WSC will prepare the bidding documents for the works, and the environmental and social specialist from WSC will incorporate the necessary environmental, social, and occupational health and safety clauses and requirements, both general and specific to the projects, which arise from this ESA and ESMP. These aspects will then be included in the Environmental and Social Technical Specifications of the bidding documents. The bidding documents must outline the minimum content of the Environmental and Social Management Plan for the Construction Stage (**Error! Reference source not found.**).

The proposals received during the bidding process for the works must contain a budget that includes the cost of implementation and compliance with the environmental, social, and occupational health and safety mitigation measures required by the project, to guarantee compliance with the IDB ESPF and applicable national and local regulations.

8.1.2 Construction Phase

Prior to the start of the works, WSC will conduct the due diligence with, the DEPP, to obtain the national required Certificate of Environmental Clearance, and the respective nationally accepted EIA and EMP, for the works.

During the Construction Phase, the Contractor Company will be responsible for preparing and implementing the Environmental and Social Management Plan at the construction level (ESMPc) of the project, as well as obtaining the environmental and occupational health and safety qualifications and insurances required according to the national regulatory framework.

The Contractor will also need to obtain others applicable permits, as needed, which could include tree cutting permits for protected trees according to the Protected Trees Act, although not anticipated, excavation and construction permits from the Ministry of Works (MoW).

Before the start of the works, the Contractor must submit to the PEU, for its approval, an Environmental and Social Management Plan at the construction level (ESMPc). The ESMPc of the project will contain, as a minimum, the programs described in Section 9 of this ESA.

Once the ESMPc is approved, the Contractor Company will be responsible for its compliance, using the necessary means to implement the Programs that are formulated within its framework. The Contractor Company must have an environmental and social representative and a person responsible for health and safety matters, who will be responsible for conducting the implementation of the ESMPc. Likewise, the contractor must comply with and ensure that the operators comply with all the provisions contained in said Plan, national and local environmental legislation, appropriate construction codes and best practices and the IDB Environmental and Social Policy Framework, during all stages of the execution of the works.

The Contractor Company will prepare monthly reports to the PEU, detailing the actions and results of the ESMPc implementation.

The inspection, control, and monitoring activities of the ESMPc will be conducted by WSC. WSC may conduct inspection visits, prepare reports for internal use for the Project, and determine and impose corrective measures based on the stipulations of the bidding documents. The environmental and works authority may also conduct control audits of the work.

At the finalization of the works, the Contractor must submit a *Final Environmental and Social Report*, which includes the information corresponding to the implementation of ESMPc, including records of implementation of plans and programs, and a report on compliance with all environmental and social indicators considered at various stages of the project cycle.

8.1.3 Operation and Maintenance

During the operational stage, WSC will be responsible for the operation and maintenance of the infrastructure built under the Project, in accordance with its current environmental policies and environmental and social management systems, including the ESMP for the operational and maintenance stage.

8.1.4 Role of IDB

The IDB will oversee and supervise the implementation of the environmental and social management system for this water mains project. This includes the review and approval of the semi-annual environmental and social compliance reports submitted by WSC, as well as conducting environmental and social supervision missions. This is expected to last throughout project implementation.

Table 9: Roles and Responsibilities for E&S Management of the Projects

Project Cycle Phase	Activity	Responsible Party	Monitoring	Supervision
Design	Grievance Redress Mechanism (for the duration of the Program)	WSC	-	IDB
	Environmental Permits as required by The Department of Environmental Planning and Protection	WSC	-	DEPP
	Executive Project / Engineering Design	WSC	-	IDB
	Environmental and Social Assessment / ESMP	WSC	-	IDB
	Public Consultation / Public Information Campaigns	WSC	-	IDB

	Preparation of E&S Technical Specifications for Bidding Documents	WSC	-	IDB
Construction	ESMPc: Preparation and Implementation Contractors WSC IDB	Contractors	WSC	IDB
	E&S Progress Reports	Contractors to WSC (monthly)	WSC	
	E&S Progress Reports	WSC to IDB (bi-annually)	-	IDB
	Final E&S Report	Contractors	WSC	-
	Final E&S Report	WSC		IDB
Operation	Operation and maintenance of the water and sewage infrastructure	WSC	WSC	IDB (for a period of 3 years after commissioning)

8.2 ENVIRONMENTAL AND SOCIAL MANAGEMENT PLANS

Mitigation measures for both environmental and social impacts were grouped into two different ESMPs, each one targeting different phases of the project:

Construction/installation ESMP: aimed at mitigating the impacts and risks of construction activities.

Operation/maintenance ESMP: measures to be implemented during operation and maintenance activities.

8.2.1 Construction Environmental and Social Management Plans

This ESMP presents the minimum environmental and social guidelines that must be implemented during the construction activities of the project's infrastructure.

The **Error! Reference source not found..** below presents the requirements of programs included in the ESMP.

Table 10: ESMP for the Construction Phase of the Project

Program Number	ESMP Plan
1	Monitoring and Control of Compliance with Mitigation Measures
2	Construction Sites Management

3	Air Quality, Noise and Vibrations Management
4	Erosion Control
5	Flora and Fauna Management
6	Waste Management
7	Effluent Management
8	Chemical Substances Management
9	Occupational and Community Health and Safety
10	Traffic and Pedestrian Management
11	Pest and Vector Control
12	Socio-Environmental Training for Site Personnel
13	Disaster Management and Emergency Response
14	Community Information and Participation
15	Coordination with Service Providers
16	Environmental Liabilities Program
17	Chance Find Procedure
18	Works Closure

Based on these guidelines, the Contractor Company must prepare the construction ESMP. Below, the guidelines for each of the Construction ESMP programs are presented.

8.3 MONITORING AND CONTROL OF COMPLIANCE WITH MITIGATION MEASURES

Objective: To ensure that all environmental mitigation measures outlined are systematically implemented, tracked, and corrected as needed during the construction and operational phases of the Water Mains Works. The goal is to maintain compliance with national regulations, safeguard community and environmental health, and align with IDB ESPs.

Summary: This plan establishes a structured monitoring framework that outlines how environmental controls will be implemented in New Providence. Contractors will be responsible for conducting routine inspections, keeping compliance logs, and reporting on environmental mitigation actions. The WSC will oversee verification of compliance through site visits and monthly reviews. In cases where non-compliance is observed, prompt corrective actions will be triggered in accordance with the project's corrective action procedures.

8.3.1 Management Measures

Action Area	Management Measure	Corrective Action if Deviations Occur	Timeline
Compliance Verification	Contractors will be responsible for conducting routine site inspections using standardized checklists to verify implementation of air quality, waste, noise, erosion, and vegetation measures.	Retraining of staff; intensified site supervision; resubmission of corrected inspection reports.	Continuous during construction activities
Inspection Protocols	Contractors will document site compliance through weekly inspections, supported by dated photographs and logs. Field engineers must review compliance forms before payment milestones.	Follow-up inspections within 5–7 days; documentation of deficiencies; escalate to WSC if unresolved.	Weekly during active trenching periods
Reporting	Contractors will submit monthly compliance reports (with summaries of mitigation performance, non-compliance issues, and corrective actions) to WSC.	Issue formal non-compliance notice; suspend payment or works for persistent failures.	Monthly, throughout construction phase
WSC Oversight	WSC will assign a site supervisor to monitor the works daily and the WSC PEU or Project Management Team will conduct monthly verification visits and random spot checks across all sites, including Abaco and New Providence.	Request immediate corrective actions; coordinate with IDB for high-risk violations or environmental harm.	Daily/Monthly (random checks in Family Islands)
Non-Compliance Protocol	In cases of significant deviation, Works Inspector or WSC may issue stop-work orders.	Written corrective action plan required within 5 days. Re-inspection required before resumption of work.	As needed, within 5–7 days of infraction
Grievance-linked Monitoring	All community feedback submitted through the project grievance mechanism must be reviewed weekly for any flagged environmental concerns.	Immediate site inspection; issue warning or correction order if claim verified.	Weekly review of grievance logs

8.3.2 Monitoring, Indicators, and Responsibilities

Monitoring Parameter	Indicator	Method/Frequency	Responsible Entity
Compliance with mitigation measures	Percentage of measures implemented at each work front	Weekly field inspections using standardized checklist	WSC; Contractor (HSE Officer)
Field supervision reports	Number of non-conformities recorded; trends in observations	Weekly summary reports from contractor and WSC	Contractor; WSC Field Supervisor

Corrective action implementation	Timeliness and completeness of corrective actions	Verified within 7 days of deviation occurrence	Contractor; verified by WSC
Safety and environmental signage	Proper placement, visibility, and maintenance of signage	Checked during each weekly inspection	Contractor
Documentation and reporting	Up-to-date reports, logs, photos, and compliance documentation	Reviewed monthly as part of compliance submissions	Contractor; submitted to WSC

8.4 CONSTRUCTION SITES MANAGEMENT

Objective: To ensure that all construction sites are maintained in a clean, safe, and environmentally responsible manner across all work fronts in New Providence. This plan minimizes environmental degradation, safeguards worker health and safety, and ensures preparedness for potential emergencies throughout the construction phase.

Summary: This management plan outlines site-level protocols that contractors must implement to maintain orderly and environmentally compliant work areas. The plan emphasizes sanitation, materials handling, fire safety, erosion control, and post-construction demobilization. Site-specific measures must be adapted based on conditions such as road layout and vegetation. Contractors are fully responsible for implementing all required protocols, while WSC and its supervising engineer will monitor compliance through scheduled inspections and escalate corrective actions as needed.

8.4.1 Management Measures

Action Area	Management Measure	Corrective Action if Deviations Occur	Timeline	Responsible Entity
Site layout and setup	Contractors will designate and mark secure areas for material storage and staging, ensuring safety and containment.	Reorganize storage layout; implement secondary containment; suspend deliveries until corrected.	Prior to mobilization; weekly reviews	Contractor Site Manager; WSC oversight
Waste management area	Contractors will set up labelled bins and maintain a collection schedule; hazardous and non-hazardous waste must be separated.	Immediate cleanup and sorting; reinforce worker training.	Daily checks; weekly disposal log	Contractor
Sanitation and hygiene	Contractors will provide and maintain clean toilets and handwashing facilities with adequate water.	Halt construction if hygiene is compromised; install temporary services.	Daily	Contractor

Safety signage and fencing	Contractors will install and maintain warning and informational signs, reflectors, and secure fencing around active work zones.	Replace missing/damaged signs and fences within 24 hours.	Initial setup; checked weekly	Contractor; verified by WSC
Emergency response readiness	Contractors will equip each site with a stocked first aid kit, fire extinguishers, and reliable communication tools (radio or phone).	Restock kits; replace expired or missing equipment; retrain crew.	Weekly kit check; comms checked daily	Contractor
Fire safety preparedness	Fire extinguishers must be fully functional, accessible, and inspected regularly.	Install before works begin; inspect monthly.	Prior to works and monthly thereafter	Contractor
Drainage and runoff control	Contractors will use berms, silt fences, or other erosion controls to protect nearby drainage paths.	Reinforce barriers; halt trenching during heavy rainfall.	Continuous during trenching	Contractor; monitored by WSC
Emergency training and awareness	Contractors will train all personnel in hygiene, emergency response, fire safety, and site protocols.	Retrain affected workers; require refresher sessions and induction training logs.	Pre-mobilization and quarterly	Contractor HSE Officer
Site demobilization and cleanup	Contractors will remove waste, signage, and temporary structures at the end of each work phase, restoring the area to pre-existing condition.	Delay handover sign-off; require photographic proof of cleanup.	End of construction at each site	Contractor; signed off by WSC

8.4.2 Monitoring, Indicators, and Responsibilities

Monitoring Parameter	Indicator	Method/Frequency	Responsible Entity
Site setup and storage layout	Presence of clearly demarcated organized storage and staging areas	Weekly visual inspections; photo documentation	WSC; Contractor
Waste bin availability and use	Labelled bins present; waste is separated and not overflowing	Daily site checks; weekly waste disposal log	Contractor Site Manager
Sanitation facilities functionality	Toilets and handwashing stations present and hygienic	Daily inspections; restocking logs	Contractor
Safety signage and fencing	Signs posted, reflectors visible, fencing intact around all active sites	Weekly checklist inspections	Contractor; verified by WSC

Emergency readiness	Accessible first aid kits, fire extinguishers, and communication devices	Weekly inspections; emergency equipment inventory checklist	Contractor HSE Officer
Drainage and runoff control	Absence of standing water; berms/silt fences functioning	Observations during rainfall; weekly walkthroughs	Contractor; monitored by WSC
Staff emergency preparedness	Number of trained workers; records of induction sessions	Pre-mobilization and quarterly refresher training logs	Contractor (HSE Officer)
Site demobilization compliance	Complete removal of equipment, signage, waste, and restoration performed	Final site walkthrough with photographic evidence	Contractor; signed off by WSC Site Inspector

8.5 AIR QUALITY, NOISE AND VIBRATIONS MANAGEMENT

Objective: To minimize environmental and community-level impacts associated with dust emissions, vehicle exhaust, and construction-related noise and vibration during the installation of potable water mains in New Providence. These impacts are particularly relevant due to the proximity of occupied residences, businesses, schools, and community facilities, as well as the sandy and shallow limestone soils and constrained roadway conditions that increase dust generation and noise sensitivity during construction.

Summary: Construction activities such as trenching, earthmoving, hauling, and the operation of heavy machinery pose risks to air quality and ambient noise levels. This plan outlines emission controls, dust suppression measures, noise mitigation protocols, and contractor responsibilities. WSC and the supervising engineer will verify field compliance through inspections, community feedback tracking, and review of contractor reports.

8.5.1 Management Measures

Action Area	Management Measure	Corrective Action if Deviations Occur	Timeline	Responsible Entity
Equipment emissions	Maintain equipment per manufacturer specs to reduce emissions	Remove or repair malfunctioning machinery	Weekly maintenance log review	Contractor Site Manager
Dust control	Water dusty roads and trenches; limit material drop heights	Apply additional suppression; retrain workers	Daily during dry conditions	Contractor
Haul truck loading	Cover loads with tarpaulin; avoid overfilling	Stop transport until load secured	Continuous	Contractor
Construction timing	Schedule noisy works during business hours	Reschedule non-compliant activities	BiWeekly planning meetings	Contractor; approved by WSC
Stakeholder communication	Implement Construction Communications Plan	Distribute notices; meet with affected stakeholders	Before noisy activities	WSC
Grievance response	Track and resolve dust/noise complaints through (GRM)	Investigate and respond in 3 business days; update log	Within 48–72 hrs of complaint	Contractor/WSC

Noise Levels	High-noise activities will be limited to standard working hours, and advance notice will be provided to adjacent users.	Reschedule noisy activities; notify affected parties; log deviation	Daily during construction	Contractor; approved by WSC
Noise Levels/ Equipment Maintenance	Ensure maintenance of all construction equipment in accordance with manufacturer's specifications to minimize noise emissions	Review equipment logs; repair or replace noisy machinery	Weekly maintenance reviews	Contractor Site Manager
Noise Levels	Discourage unnecessary idling of construction equipment and trucks to minimize noise emissions and environmental impact.	Brief site staff; monitor and issue reminders; document repeated non-compliance	Continuous monitoring	Contractor Site Manager/Supervisor

8.5.2 Monitoring, Indicators, and Responsibilities

Monitoring Parameter	Indicator	Method/Frequency	Responsible Entity
Dust suppression	Work areas are visibly damp; no visible airborne dust during activities.	Daily visual inspections with photo logs.	Contractor; verified by WSC
Equipment emissions	Low or no visible exhaust; up-to-date equipment servicing logs.	Weekly log review and spot checks.	Contractor Site Manager
Noise near receptors	Noise during construction	Ensure works are done during normal working hours and provide advance notice of works commencement to stakeholders in the direct area of influence,	WSC Site Manager
Stakeholder engagement	Notices distributed that specify construction schedule; communication records maintained Consideration will also be given to vulnerable groups and methods of engagement	Reviewed before each new work phase; maintain records of outreach.	WSC
Complaint resolution	Timely resolution of complaints with log updates and feedback to complainants.	Weekly grievance log review and summary of monthly site reports.	WSC

8.6 EROSION CONTROL PLAN

Objective: To prevent soil erosion, sediment displacement, and runoff-related environmental impacts during water mains installation on New Providence. The plan ensures soil stability is maintained in an environment characterized by sandy and shallow limestone soils, flat to gently undulating terrain, and localized surface water ponding following heavy rainfall. Given the urban residential and mixed-use setting, effective erosion control is critical to prevent sediment dispersion into roadways, driveways, and adjacent properties, while maintaining safe and orderly construction conditions.

Summary: Excavation and trenching along New Providence's paved and unpaved road corridors present short-term risks of erosion and sediment movement, particularly during intense rainfall events. Although large-scale runoff is limited by generally flat terrain, exposed trenches and spoil piles may become unstable or spread fine sediments if not properly managed. This plan establishes measures to stabilize exposed soils, protect stockpiles, and maintain erosion controls during and after construction. These measures will minimize soil loss, protect nearby properties and infrastructure, and prevent sediment accumulation in low-lying roadway sections and drainage pathways.

8.6.1 Management Measures

Action Area	Management Measure	Corrective Action if Deviations Occur	Timeline	Responsible Entity
Phasing of works	Schedule trenching in short, phased sections to limit the area of open excavation.	Adjust sequencing; close or backfill exposed sections sooner.	Weekly planning and review	Contractor; verified by WSC
Work zone delineation	Clearly mark trenching zones with cones or temporary fencing to confine equipment and vehicles.	Re-mark boundaries; relocate materials placed outside limits.	Before mobilization and weekly	Contractor Site Supervisor
Excavation limits	Restrict excavation and material stockpiling within designated work zones.	Halt works; retrain personnel on excavation boundaries.	Continuous during trenching	Contractor
Erosion controls	Use small berms or sandbags around excavation points to divert runoff and stabilize slopes.	Repair or replace controls immediately after rain.	During excavation and post-rainfall	Contractor; verified by WSC
Stockpile protection	Cover soil or sand piles with tarpaulin and avoid placing stockpiles near canal edges or residential boundaries.	Replace covers or relocate stockpiles to stable ground.	Daily during excavation	Contractor
Drainage management	Keep roadways and verges free from sediment; ensure no runoff enters canals.	Sweep and remove sediment; document action in logbook.	After ≥ 10 mm rainfall or weekly	Contractor

Vegetation preservation	Retain existing lawn, ornamental vegetation where possible.	Replant with native species	Immediately post-construction	Contractor; verified by WSC
Documentation	Maintain a logbook with records, photos, and corrective actions for erosion control activities.	Update logbooks and submit a summary to WSC.	Weekly updates and monthly reporting	Contractor; reviewed by WSC

8.6.2 Monitoring, Indicators, and Responsibilities

Monitoring Parameter	Indicator	Method/Frequency	Responsible Entity
Erosion control structures	Berms, sandbags, and covers in place and intact post-rainfall.	Weekly inspections and after ≥ 10 mm rainfall.	Contractor; oversight by WSC
Trench exposure	No prolonged open trenches; backfilled sections stabilized promptly.	Weekly inspection with photos in logbook.	Contractor; verified by WSC
Sediment containment	No sediment runoff beyond work area or into public-interacting areas and vegetation.	Daily visual checks during works; post-rain inspection.	Contractor
Documentation compliance	Logbook includes inspection records, photos, and corrective actions.	Weekly review and monthly submission to WSC.	Contractor; reviewed by WSC
Vegetation protection	No unnecessary vegetation removal or damage to lawns/ornamentals.	During layout and weekly verification.	Contractor; verified by WSC
Post-rain cleanup	Roads and access paths cleared of sediment within 24 hours of rainfall.	Post-rain inspection and log entry.	Contractor; verified by WSC

8.7 FLORA AND FAUNA MANAGEMENT PLAN

Objective: The objective of this plan is to avoid, minimize, and mitigate impacts on native coastal vegetation and any incidental fauna within communities, that may be affected by trenching and installation of water mains infrastructure. The program emphasizes both preventative actions and restoration commitments in line with good international practices and national requirements.

Summary: Project sites on New Providence traverse developed residential and mixed-use areas characterized by landscaped yards, roadside verges, ornamental plantings, and scattered native vegetation. The works do not intersect designated protected areas or mapped critical habitats, and no protected species are anticipated within the direct trench footprint. Contractors will respect clearly marked work limits, avoid vegetation disturbance beyond the trench line, and allow incidental fauna to vacate the area

naturally. Good housekeeping practices will be enforced to prevent unnecessary disturbance to adjacent properties, roadside vegetation, and landscaped features, with reinstatement of disturbed areas following construction.

The Contractor shall implement an EA-approved revegetation scheme to ensure zero net loss of vegetation, including a minimum 3:1 compensation ratio for all trees removed. Topsoil shall be carefully stripped, stored, and reused in accordance with the natural edaphic sequence to support site restoration. The introduction of invasive species is strictly prohibited, and only native or site-appropriate vegetation shall be used to promote sustainable revegetation.

8.7.1 Management Measures

Action Area	Management Measure	Corrective Action if Deviations Occur	Timeline	Responsible Entity
Vegetation boundary marking	Flag trench line clearly and limit any clearing to the immediate work zone.	Reflag zones; retrain workers on vegetation limits.	Prior to site mobilization	Contractor; verified by WSC
Vegetation protection	Avoid clearing ornamental trees, palms, and vegetation near yards or canal edges.	Pause works; issue non-conformance notice and rebrief site crew.	During site prep and trenching	Contractor
Minimize habitat disturbance	Allow birds, reptiles, or small fauna to vacate naturally; avoid trapping or handling.	Record in fauna log; notify WSC and DEPP if protected species encountered.	Continuous during works	Contractor
Buffer and verge protection	Do not store equipment, fuel, or spoil in vegetated canal buffers, lawns, or soft verges.	Remove material immediately; clean area; log and report deviation.	Ongoing during construction	Contractor Site Manager; verified by WSC
Revegetation and restoration	Backfill and regrade disturbed areas; allow natural regrowth or reseed if needed.	Inspect site 4–6 weeks post-construction; stabilize areas as needed.	Post-construction	Contractor; reviewed by WSC

8.7.2 Monitoring, Indicators and Responsibilities

Monitoring Parameter	Indicator	Method/Frequency	Responsible Entity
Vegetation clearance limits	No excessive clearing beyond flagged trench alignment.	Weekly visual inspections; geo-tagged photo documentation.	Contractor; verified by WSC
Canal-side buffer protection	No materials or vehicles placed within 3–5 ft of mangrove or waterway edge.	Spot checks during construction; log any buffer encroachment.	Contractor Site Supervisor; WSC
Fauna encounters	No evidence of trapped or handled wildlife; fauna vacate site freely.	Continuous observation; log if nests, burrows, or unusual species found.	Contractor
Revegetation progress	Natural regrowth observed or erosion-controlled surfaces maintained.	Visual checks 2–4 months post-works.	Contractor; verified by WSC
Verge and yard integrity	Yards, driveways, and vegetated setbacks restored to pre-construction condition.	Final walkover with homeowner (where relevant); photographic comparison.	End of construction

8.8 WASTE MANAGEMENT PLAN

Objective: To ensure the safe and environmentally responsible handling, segregation, storage, and disposal of all waste types generated during the construction of water mains infrastructure. The objective is to prevent pollution of land, water, or air and minimize risks to human health, wildlife, and surrounding communities. This program addresses both non-hazardous and hazardous waste streams.

Summary: This section outlines the minimum waste management standards required during construction activities under the water mains infrastructure program in New Providence. It provides clear guidance on the segregation, storage, and disposal of both hazardous and non-hazardous waste. All contractors are required to prepare site-specific Waste Management Plans (WMPs) as part of their ESMPC, aligned with the baseline requirements in this ESMP. The Waste Management component emphasizes pollution prevention, proper waste tracking, spill response, and worker training. WSC will be responsible for oversight, including monitoring contractor compliance through regular inspections and documentation review.

Types of Waste Expected:

Construction activities will generate a variety of waste types, including:

- **Non-hazardous waste:** excavated soils, vegetation debris, plastic pipe packaging, and general domestic waste;
- **Hazardous or regulated waste:** used oils and filters, spill-contaminated soils, and PPE contaminated with fuel or lubricants.

Contractors must plan for the safe handling, segregation, containment, and disposal of both hazardous and non-hazardous materials, using licensed haulers and the designated waste management site, the New Providence Ecology Park (NPEP).

Minimum Requirements for Contractor WMPs:

Contractor-developed Waste Management Plans (WMPs), as part of their ESMPc, must:

- Clearly describe waste types expected at their site;
- Identify waste collection points, labeled containers, and impermeable storage areas;
- Outline collection frequency, disposal methods, and final disposal locations;
- Include spill prevention protocols and response procedures for accidental release;
- Include spill prevention in the event of natural disasters or extreme weather such as flooding
- Include training and supervision plans to ensure proper waste segregation and handling;
- Provide reporting templates for waste volumes, incidents, and disposal logs.
- Provide waste disposal certificates if / where applicable

WSC will review and approve all Contractor WMPs prior to mobilization. Non-compliance will result in corrective actions, withheld payments, or suspension of works.

Waste Disposal Prohibitions:

No form of waste generated during the construction phase, whether it is of household or special nature, solid or liquid, may be incinerated, buried, or discharged into water bodies or the soil. Strict adherence to these prohibitions is mandatory.

8.8.1 Management Measures

Action Area	Management Measure	Corrective Action if Deviations Occur	Timeline	Responsible Entity
Waste identification and categorization	Classify all waste generated by type and characteristics (e.g., solid, liquid, hazardous) using a site-specific system	Update WMP; retrain team; update signage	Weekly	Contractor; verified by WSC
Waste Documentation	A comprehensive record of the waste generated at each construction site must be diligently maintained, documenting the type, volume, and detailed characterization of the waste produced.	Update WMP; launch investigation on reason for non compliance retrain team;	Daily	Contractor; verified by WSC
Waste segregation and storage	Set up labeled containers for hazardous, recyclable, organic, and general	Reorganize storage area; retrain crew; notify WSC	Daily checks	Contractor

	waste; store on impermeable surfaces			
Personnel training	Train workers to recognize, handle, and segregate different waste streams	Repeat training; maintain attendance logs	Pre-mobilization and quarterly	Contractor
Effluent and liquid waste	Collect any effluent from tools, machinery, or material washing in designated tanks; remove to approved facility	Suspend works if leaking observed; install containment systems	Continuous during works	Contractor
Disposal of hazardous waste	Store hazardous waste in secure containers; remove via licensed waste transporters	Immediate removal; escalate to WSC and DEPP if delays occur	Weekly or as needed	Contractor; verified by WSC
Domestic and C&D waste	Ensure regular pickup and transport to authorized disposal facilities	Remove accumulated waste within 48 hours; report to WSC	Daily to weekly	Contractor
Special/hydrocarbon waste	Use spill kits and other tools as directed by DEPP; isolate contaminated soils; record incidents and disposal method	Initiate cleanup and notify WSC within 12 hours	Immediately upon incident	Contractor; WSC oversight
Equipment decontamination	Restrict washing of machinery to designated impermeable areas with drainage controls	Cease activities; relocate washing stations	Prior to works	Contractor
Final site cleanup	Remove all containers, leftover material, and debris at demobilization; restore site	Delay project sign-off until verified by WSC	End of works at each site	Contractor; certified by WSC
Waste Disposal	No form of waste generated during the construction phase, whether it is of household or other type of waste, solid or liquid, may be incinerated, buried, or discharged into	Update WMP; launch investigation on reason for non compliance retrain team;	Daily	Contractor; verified by WSC

	water bodies or the soil. Strict adherence to these prohibitions is mandatory.			
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8.8.2 Monitoring, Indicators, and Responsibilities

Monitoring Parameter	Indicator	Method/Frequency	Responsible Entity
Waste segregation and container setup	Clearly labeled containers for general, recyclable, and hazardous waste	Daily visual inspection	Contractor; reviewed by WSC
Waste collection frequency	Regular removal of on-site waste to avoid buildup or overflow	Weekly checklists; daily log for active work fronts	Contractor
Hazardous waste disposal	Presence of secure storage and licensed disposal (if applicable)	Waste manifest (if generated); visual check weekly	Contractor; verified by WSC
Worker training on waste handling	Number of workers trained; records of refresher sessions	Training logbook updated quarterly	Contractor HSE Officer
Incident and spill response	Number of spill incidents and actions taken	Incident log; immediate follow-up within 24 hrs	Contractor; monitored by WSC
Site condition post-demobilization	Evidence of final cleanup; absence of residual waste	Photographic evidence and WSC inspection before sign-off	Contractor; approved by WSC

8.9 EFFLUENT MANAGEMENT

Objective: To ensure that effluent generation and disposal during construction are properly managed, avoiding contamination of soils, groundwater, or surrounding areas.

Summary: This section is not applicable to the New Providence works, as no sanitation or equipment washing facilities will be established within the work zone. Site personnel will access designated restroom facilities located at the laydown yard. No effluent will be generated, stored, or discharged on-site. The project area's flat terrain and lack of drainage infrastructure reinforce the importance of avoiding localized wastewater accumulation.

This plan therefore applies only as a procedural safeguard to confirm that workers are informed of proper sanitation arrangements and that no greywater or blackwater discharge occurs at the construction corridor.

8.9.1 Management Measures

Action Area	Management Measure	Corrective Action if Deviations Occur	Timeline	Responsible Entity
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Worker sanitation access	Workers will use existing restroom facilities at the laydown yard.	Remind workers of designated sanitation site; implement enforcement through daily briefings.	Continuous during construction	Contractor; verified by WSC
On-site effluent control	No portable toilets, washing, or effluent storage will be permitted at the worksite.	Stop noncompliant activity; report to WSC.	Ongoing	Contractor Site Supervisor
Equipment washing	All machinery washing will be prohibited on-site; maintenance must occur at approved off-site facilities.	Suspend activity; relocate equipment.	Ongoing	Contractor; monitored by WSC
Site inspections	Confirm no wastewater, greywater, or effluent release in active or staging areas.	Issue corrective order; re-inspect.	Weekly	WSC Field Supervisor
Chemical Toilet Placement and Installation	Install toilets on level, stable ground away from drainage lines, watercourses, stormwater inlets, and high-traffic areas. Ensure toilets are secured to prevent tipping.	Relocate units if placed too close to drainage or unstable areas. Re-secure or stabilize if units become unstable.	At installation; monitor weekly	Contractor; monitored by WSC
Servicing and Waste Removal	Contract licensed waste service provider for regular pumping and cleaning. Maintain servicing logs.	Increase servicing frequency if overflows or odor issues occur. Investigate cause of inadequate servicing.	Weekly	Contractor; monitored by WSC

8.9.2 Monitoring, Indicators, and Responsibilities

Monitoring Parameter	Indicator	Method/Frequency	Responsible Entity
Sanitation compliance	Workers using designated restroom facilities; no unauthorized on-site use	Weekly inspections; worker briefings	Contractor; verified by WSC
Effluent absence	No pooling, runoff, or discharge observed in active or staging areas	Visual inspections after rainfall	Contractor; monitored by WSC
Equipment washing compliance	No evidence of on-site machinery washing or fluid disposal	Weekly inspections	Contractor; verified by WSC

8.10 CHEMICAL SUBSTANCES MANAGEMENT

Objective: To prevent pollution, spills and proper storage of machine fuel in compliance with national chemical safety regulations.

Summary: Contractors are required to follow strict protocols for the use and storage of chemicals on-site, particularly petroleum-based products used during equipment fueling and maintenance. Priority will be placed on safe storage, proper storage containment clear labeling, emergency preparedness, and compliance with occupational health and environmental protection standards. Training, safety data sheets, and appropriate signage must be provided and maintained throughout the construction period.

Spill procedure: This procedure outlines the steps to be taken in the event of a diesel or fuel spill to minimize risks to human health, safety, and the environment during construction activities in New Providence. It applies to all project personnel responsible for handling, storing, transporting or using fuel for vehicles, or construction equipment.

In the event of a spill, the first priority is to stop the source of the leak, provided it is safe to do so. This may involve shutting off valves, pumps, or engines and isolating the damaged hose, tank, or container. Personnel must immediately alert the Site Supervisor or HSE Officer and ensure that no ignition sources, such as smoking or open flames, are present within at least 100 feet of the spill area.

Once safety has been ensured, the spill must be contained to prevent fuel from entering nearby soils. Sand should be placed around the spill to create a barrier. For spills occurring on bare soil, small berms of sand or soil should be formed to limit spreading.

All soil should be collected utilizing gloves and placed in sealed, labeled containers for safe disposal at the waste facilities on island. The affected area should then be cleaned and inspected to ensure no residual contamination remains before normal operations resume.

Refueling should take place only in designated, well-ventilated areas equipped with spill kits. Hoses, fittings, and tanks should be inspected regularly for leaks or wear, and any damaged equipment replaced promptly. Sand and waste bags maintained at each fuel storage and refueling location. Routine toolbox talks and EHS briefings will reinforce staff awareness and preparedness for spill response.

All associated PPE where spills are concerned should be provided including but not limited to goggles, spill protective gear, eyewash stations/ eye flushes.

8.10.1 Management Measures

Action Area	Management Measure	Corrective Action if Deviations Occur	Timeline	Responsible Entity
Refueling protocols	Follow proper procedures for vehicle/machinery fueling (turn off engine, fire extinguisher nearby, no ignition sources, use spill trays)	Stop refueling immediately; retrain staff; report incident	Ongoing during fuel activities	Contractor Site Supervisor
Storage of fuels and chemicals	Store flammables >6m away from structures; use ventilated and labeled	Relocate substances; label appropriately;	Weekly inspections	Contractor; verified by WSC

	containers; place storage on impermeable surfaces Use spill pallets Have spills kits available for emergency use. Spill kit locations should be clearly identified	conduct compliance inspection		
Emergency response	Maintain emergency spill kits, fire extinguishers, and first responder training on all sites where fuel/chemicals are stored or used	Replenish kits; retrain staff; submit incident reports	Monthly review and post-incident	Contractor
Documentation and labelling	Maintain inventory of all stored chemical substances with labels and Safety Data Sheets (SDS) visible and accessible	Update logs; re-label containers; hold refresher training	Prior to mobilization and monthly	Contractor HSE Officer
Disposal of contaminated materials	Treat contaminated soil as hazardous waste and remove in coordination with DEPP per Environmental Liabilities protocols	Isolate area; conduct lab testing if required; dispose via licensed provider	Within 48–72 hours of detection	Contractor with DEPP coordination
Fuel transfer authorization	All refueling events must be logged and approved in advance by authorized personnel	Investigate any unauthorized activity; apply disciplinary action	As needed per fuel delivery	Contractor
Training and awareness	Provide training on chemical handling, PPE, emergency procedures, and incident reporting	Retrain personnel; document participation logs	Pre-mobilization and semi-annually	Contractor; monitored by WSC

8.10.2 Monitoring, Indicators, and Responsibilities

Monitoring Parameter	Indicator	Method/Frequency	Responsible Entity
Chemical substance compliance	% of compliance in inspections conducted on chemical substance management	Bi-weekly inspections of storage areas and chemical use logs	WSC
Training documentation	Registration forms for key personnel in chemical substance management	Prior to works and updated quarterly	Contractor HSE Officer
Chemical substance inventory and storage	Registration forms for all chemical substances stored on site	Initial inventory + monthly updates	Contractor

Transportation of Hazardous Materials Subprogram

- The Contractor shall adopt strict protocols for the safe transport and handling of hazardous materials used during construction, such as fuels, lubricants, and chemicals:
- Ensure all hazardous materials are labeled, packaged, and transported in compliance with international best practice and national regulations.
- Maintain updated Safety Data Sheets (SDS) on-site and during transport for immediate reference.
- Train personnel in spill prevention, containment, and cleanup procedures.
- Designate specific routes for the movement of hazardous materials to minimize risks to the community.
- Develop a spill response plan and ensure spill kits are available in all vehicles transporting hazardous materials.

8.11 OCCUPATIONAL AND COMMUNITY HEALTH AND SAFETY

- The contractor shall regularly ensure compliance with relevant standards and regulations, including international best practices.
- All personnel are required to receive training on equipment operation, machinery use, and vehicle operation in accordance with prevailing regulations within protected areas.
- Clear and permanent identification of all available elements must be conducted, alongside the use of signage and instructional materials for educational purposes.
- The contractor must supply Personal Protective Equipment (PPE) and provide comprehensive induction training to workers, covering PPE types, proper usage, characteristics, and limitations.

Occupational Health and Safety Subprogram

A comprehensive assessment of risk factors associated with each job role, including an enumeration of the workforce exposed to these risks, must be conducted. The following measures are recommended to enhance workplace safety:

- The Contractor is responsible for conducting daily 5-Minute Safety Talks before commencing work. Topics should be tailored to the specific risks associated with ongoing activities.
- The Contractor is responsible for developing and implementing Safe Work Procedures for the safe execution of activities. Emphasize adherence to established safety protocols.
- The Contractor should regularly inspect and ensure the proper functioning of equipment, machinery, and essential safety apparatus such as fire extinguishers.
- The Contractor is responsible for applying Safety Data Sheets for hazardous products, ensuring that relevant information is readily accessible to workers.
- The Contractor must provide necessary Personal Protective Equipment (PPE) to all workers on the construction site in accordance with the specific requirements of their tasks.
- The contractor shall be responsible for providing adequate portable sanitation and handwashing facilities at all active work sites to ensure proper hygiene and safeguard worker health in accordance with occupational health and safety standards.
- Workers must demarcate work areas using appropriate signalling to promote awareness and help prevent accidents.

- The Contractor and WSC must conduct proper Waste Management by exercising control over the collection, treatment, and disposal of residues and waste, while adhering to basic sanitation standards.
- The Contractor is responsible for verifying that personnel operating equipment possess the necessary licenses and certifications.
- The Contractor is responsible for training in Environmental, Health, Hygiene, and Occupational Safety.
- The Contractor is responsible for understanding the Grievance Redress Mechanism that WSC is responsible for deploying and have cards/flyers which will specify how complaints should be submitted.
- The Contractor must implement the emergency preparedness and response plan outlined in this ESMP. Maintain first aid kits and fire extinguishers at all work sites.

The WSC site supervisor and contractors must implement an emergency preparedness and response plan and WSC's hurricane preparedness plan.. Maintain first aid kits and firefighting equipment such as extinguishers at all work sites. Machinery maintenance has the potential to introduce hazards like electrical hazards (maintenance of electrical components, such as pumps, generators, or control panels, may expose workers to live circuits), and fuel hazards (spill and leaks can lead to environmental contamination, and fire/explosion risks if ignited). It is therefore classified as high-risk within the occupational context of Component 3, and require a high level of commitment to safety protocols, continuous training, and strict adherence to established guidelines to mitigate potential hazards and ensure the well-being of personnel involved.

8.11.1 Monitoring, Indicators, and Responsibilities

Monitoring Parameter	Indicator	Method/Frequency	Responsible Entity
PPE usage and compliance	100 % of workers properly equipped with PPE	Weekly spot checks, photo documentation	WSC Site Supervisors/Contractor
Safety talks and training	Number of daily safety talks conducted; training attendance logs	Daily toolbox talks; training logs	WSC Site Supervisors/Contractor
Emergency preparedness	Presence of functional first aid kits and emergency equipment Presence of climate and weather protocols	Monthly checks	WSC Site Supervisors/Contractor
Accidents and incidents	Number of Work accident and incident registration forms received.	Monthly	WSC Site Supervisors/Contractor
Fire Prevention Readiness	Availability and functionality of extinguishers at every active staging zone, #1 drill per month	Equipment checklists; Monthly audits, Monthly drills	Contractor HSE Officer;

Community Health and Safety Subprogram

This subprogram is designed to address potential risks and impacts on the health and safety of communities affected by the project. The key aspects to consider are:

- All workers must implement clear and effective signalling and delineation measures at work sites to enhance safety and minimize potential hazards.
- If hazardous materials are to be used during activities, rigorous management and safety protocols should be in place to prevent any harm to the health and safety of the communities.
- The Contractor is responsible for the development and implementation of a comprehensive emergency preparedness and response plan, ensuring swift and effective actions in the event of unforeseen circumstances.

The Contractor is expected to integrate these measures into the project's execution, reflecting a commitment to responsible and conscientious project management.

Labor Management Procedure (LMP) Subprogram

The primary objective of the LMP is to establish and maintain employment relationships grounded in the principles of equal opportunities and equitable treatment. The employment of child or forced labor is strictly prohibited. The WSC, contractor, along with its subcontractors, are expressly prohibited from engaging individuals below the minimum age of employment as prescribed by relevant legal statutes, with a minimum threshold of no less than 15 years of age.

The LMP will include the creation of a grievance redress mechanism. This mechanism is designed to provide a channel through which workers, and where applicable, their affiliated organizations, can voice concerns related to the workplace. Additionally, it serves as a platform for the lodging of complaints pertaining to instances of sexual and gender-based violence. The contractor is tasked with ensuring the effectiveness and accessibility of this grievance redress mechanism to facilitate a transparent and responsive resolution process.

The WSC and contractors shall develop and implement the code of conduct and provide training for its knowledge and understanding. See Appendix A for the proposed content of the code of conduct. This Code is aimed at ensuring respectful and harmonious ties in the workplace in which the Program and its projects are developed in such a way as to ensure a work environment free of discrimination and/or violence based on gender, gender identity, sexual orientation, cultural identity, religion, ethnic or national origin, trade union membership, disability or any other discrimination typified in current legislation.

8.11.2 Monitoring and Compliance

Indicators	Description	Responsibility
Number of workers with Medical and Labor Insurance	Total number of workers in the project	WSC Social Specialist/Contractor
Grievances received	Monthly report on number of grievances and category of grievances received by email or phone will be logged into the Water and Sewer Corporations GRM system and attended	WSC Social Specialist

Code of Conduct signed	Code of conduct signed by all workers	WSC Site Supervisor/Project Manager/Social Specialist/Contractor
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Protection of Community Critical Infrastructure Subprogram

For all works under the Program, the following measures will be implemented to protect sensitive receptors in the area of works (such as hospitals, schools or residents):

- **Identification and Mapping:** Clearly identify and map all sensitive receptors in the project area, including hospitals, schools, and residences.
- **Communication and Notification:** Inform affected communities and institutions about the project timeline, potential impacts, and planned mitigation measures. Provide regular updates through community meetings, flyers, and digital platforms.
- **Noise and Vibration Control:** When applicable, implement noise barriers and schedule noisy activities during less sensitive times (e.g., avoiding school hours and hospital visiting hours). Use low-vibration equipment and techniques to minimize disturbances.

Protection Measures for Historical Sites Subprogram

For all works under the Program, the following measures will be implemented to protect historical sites:

- **Identification and Documentation:** Conduct thorough surveys to document all historical sites within the project area.
- **Physical Protection Measures:** Install protective barriers around historical sites to prevent accidental damage during construction. Restrict construction activities within a defined buffer zone around each site.
- **Monitoring and Reporting:** Regularly monitor the condition of historical sites throughout the construction process. Document any changes or damages and report them to relevant authorities.
- **Stakeholder Engagement:** Involve local heritage organizations and community groups in the planning and monitoring process. Provide opportunities for stakeholders to give input on protection measures.
- **Training and Awareness:** Train construction personnel on the importance of preserving historical sites and the specific measures in place. Raise awareness among workers about the cultural significance of these sites.

To minimize risks related to the spread of communicable diseases, particularly influenza and other respiratory illnesses, the Contractor shall enforce preventive health and hygiene measures for all workers:

- Ensure all workers' hygiene practices are compliant with national regulations.
- Provide handwashing stations with soap and clean water at worksites and ensure their regular maintenance.
- Encourage and enforce the use of facemasks in situations where close contact is unavoidable.
- Conduct awareness sessions for workers on respiratory hygiene, handwashing practices, and reporting symptoms early.
- Implement policies to ensure that sick workers are not required to report to work, thereby reducing the risk of workplace transmission.
- Regularly clean and disinfect high-contact surfaces and shared tools or equipment.

Indicators

- Frequency rate (number of accidents x 200,000/person-hours worked in the period).
- Severity Index (number of serious accidents x 200,000/ person-hours worked in the period).
- Fatal Accident Incidence Rate (Number of fatal accidents x 200,000/Number of exposed workers).
- Number of personnel using PPE according to the risk of the activity / Total number of personnel.
- Number of workers with Medical and Labor Insurance / Total number of workers in the project.

Monitoring

- Work accident registration forms.
- PPE delivery record forms.
- Record sheets for training in the use of PPE.
- Certification forms for the use of specific machinery.
- Safety procedures for critical activities.
- Risk analysis and checklists for critical activities.

8.12 TRAFFIC AND PEDESTRIAN MANAGEMENT

An assessment of the vehicular and pedestrian traffic needs to be first completed. Then the Contractors will prepare the Traffic and Pedestrian Management Program. Consultation with key stakeholders will be conducted in accordance with ESPS#10. The Contractors will ensure implementation of this Program.

The Traffic and Pedestrian Management Program shall:

- Notify communities about upcoming works
- Identify the sensitive location (religious facility, educational facility, health facility, commercial areas) along the site access roads.
- Identify the road condition, traffic congestion areas and peak traffic load period.
- Identify the traffic hotspots like road junctions, market areas, school areas.
- Provision of traffic marshal (signal person) in identified traffic sensitive locations.
- Identify any major road repairing requirement along the site access road.
- Prepare the Traffic and Pedestrian Management Program based on local sensitivity (religious gathering, school timing, market timing and peak traffic timings);
- Implement procedure to follow road safety requirements by the drivers & helpers.
- Implement procedure to check fit certificates of the vehicles to minimize the emission of air and noise.
- Monitor road conditions to identify any damage of road or structures and remedy immediately to reduce the potential for significant impacts to the local communities.

Contractors will provide instructions to drivers to maintain the speed as per Traffic and Pedestrian Management Program.

Contractors will provide induction/training to all drivers for safe driving. Contractors will require drivers to follow all legal and project related safety requirements applicable in respect of road safety.

8.12.1 Monitoring and Compliance

Indicators	Monitoring Measure	Responsible Entity
Number of work fronts marked with signs in accordance with the approved Traffic and Pedestrian Management Program /Number of work fronts that require signage in accordance with Traffic and Pedestrian Management Program.	Weekly inspections/Monthly inspections	Contractor; reviewed by WSC
Number of road accidents.	Road safety accident records	Contractor; reviewed by WSC

8.13 PEST AND VECTOR CONTROL

Objective: To prevent the spread of disease, minimize environmental health risks, and ensure clean and sanitary construction sites by managing pests and vectors such as rodents, insects, and snakes. This program outlines responsibilities and required actions to reduce infestations, particularly those caused by poor waste management and stagnant water.

Summary: In New Providence, dense residential development, roadside drainage depressions, and periodic inland flooding create conditions that may attract pests such as mosquitoes, rodents, and insects if construction areas are not properly managed. Trenching and material staging can exacerbate these risks through water pooling, food waste, or unmanaged debris. Contractors must actively control stagnant water, secure waste, and maintain orderly work sites to limit vector attraction. Where pest activity is observed, contractors will coordinate with licensed pest control providers and implement corrective measures as needed to protect worker health, nearby residents, and surrounding properties during construction activities.

8.13.1 Management Measures

Action Area	Management Measure	Corrective Action if Deviations Occur	Timeline	Responsible Entity
Waste management	Prompt removal of waste containers and green debris; monitor for rodent activity and signs of infestation	Increase collection frequency; apply additional control measures	Daily waste check	Contractor
Municipal coordination	Collaborate with municipal or local sanitation teams to prevent vector migration from adjacent neighbourhoods	Document communication; implement joint actions if needed	Weekly during construction	Contractor; reviewed by WSC
Food handling protocols	Ensure food waste is securely disposed of; avoid open food or ash	Enforce crew training and penalties for non-compliance; secure food storage areas	Daily inspections	Contractor Site Supervisor

	that may attract rodents, snakes, or pests			
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8.13.2 Monitoring, Indicators, and Responsibilities

Action Area	Management Measure	Corrective Action if Deviations Occur	Timeline	Responsible Entity
Waste management	Prompt removal of waste containers and green debris; monitor for rodent activity and signs of infestation	Increase collection frequency; apply additional control measures	Daily waste check	Contractor
Municipal coordination	Collaborate with municipal or local sanitation teams to prevent vector migration from adjacent neighborhoods	Document communication; implement joint actions if needed	Weekly during construction	Contractor; reviewed by WSC
Food handling protocols	Ensure food waste is securely disposed of; avoid open food or ash that may attract rodents, snakes, or pests	Enforce crew training and penalties for non-compliance; secure food storage areas	Daily inspections	Contractor Site Supervisor

8.14 SOCIO-ENVIRONMENTAL TRAINING FOR CONSTRUCTION PERSONNEL

Objective: To ensure that all construction personnel are equipped with the knowledge, awareness, and behavioral standards required to protect the environment, maintain occupational safety, and uphold respect for human rights, gender equality, and community safety during project implementation.

Summary: To conduct the training process, informative sessions will be conducted prior to the commencement of work and as needed throughout project duration. Trainings must cover environmental management, health and safety protocols, familiarization and adherence with the organization's Code of Conduct, the Project's General GRM and Worker's GRM and addressing gender-related issues (Sexual Exploitation and Abuse (SEA) and Prevention of Gender-Based Violence (GBV)). These activities will be monitored, logged and reported in monthly reports to the WSC for compliance verification.

8.14.1 Management Measures

Action Area	Management Measure	Corrective Action if Deviations Occur	Timeline	Responsible Entity
Pre-mobilization Training	Deliver environmental, health, and safety training to all site workers before mobilization.	Delay work start until training is completed.	Pre-construction	Contractor; verified by WSC
Quarterly Refreshers	Conduct training sessions on safety, environmental compliance, SEA/GBV,	Schedule make-up sessions; reinforce via toolbox talks.	Quarterly	Contractor; verified by WSC

	and emergency procedures.			
Gender-Based Violence (GBV) Training	Provide GBV prevention sessions that include protocols for reporting, support, and zero-tolerance enforcement.	Retrain staff; address specific incidents with targeted training.	Yearly and/or post-incident	WSC
Code of Conduct Awareness	All workers must receive and sign the Code of Conduct addressing SEA, non-discrimination, safety, and behavior.	Retrain workers and enforce disciplinary actions if breached.	Pre-mobilization and onboarding	WSC Social Specialist
Records and Evaluation	Maintain detailed training logs, attendance sheets, and evaluation reports after each session.	Submit missing documentation; revalidate participation.	Ongoing	Contractor

8.14.2 Monitoring, Indicators, and Responsibilities

Monitoring Parameter	Indicator	Method/Frequency	Responsible Entity
Training Participation	Percentage of personnel trained in accordance with the Training Program	Review of attendance logs and monthly reports	WSC Project Manager/Social Specialist
Training Coverage	Percentage of training sessions given out of total required sessions	Comparison of sessions conducted vs. sessions planned	WSC Project Manager/Social Specialist
SEA/GBV Protocol Implementation	Compliance with SEA/GBV protocols, including reporting, support, and grievance mechanisms	Review of documented SEA protocols, grievance logs, and resolution timelines	WSC Project Manager/Social Specialist/Contractor
Code of Conduct Acknowledgement	Percentage of workers who signed the Code of Conduct	Review of signed acknowledgment forms and personnel files	WSC Project Manager/Social Specialist

8.15 DISASTER RISK MANAGEMENT AND EMERGENCY RESPONSE

Objective: To ensure that construction activities under Component 3 are resilient to natural hazards and emergencies, safeguard workers and the surrounding communities, and do not obstruct local emergency operations. This program supports hazard monitoring, preparedness, and emergency coordination in line with national disaster frameworks and local disaster committees.

Summary: New Providence's high population density, extensive impervious surfaces, aging drainage systems, and concentration of critical infrastructure increase exposure to inland flooding, traffic

disruption, and emergency access constraints during heavy rainfall or tropical storm events. Climate-related risks such as extreme rainfall, heat stress, and hurricane-related impacts pose additional risks to worker safety and construction scheduling. This Disaster Risk Management and Emergency Response Plan provides site-level operational safeguards, early warning triggers, and escalation procedures to mitigate and respond to these risks. It applies to all works in the direct and indirect area of influence of the project and emphasizes pre-storm preparedness, flood-safe staging, fire and heat response, and emergency coordination with local agencies (e.g., DEPP, DRA, Ministry of Works).

8.15.1 Management Measures

Action Area	Management Measure	Corrective Action if Deviations Occur	Timeline	Responsible Entity
Hazard Monitoring	Monitor Met Office, DRA, and global alert systems; activate storm protocol for any severe weather advisories.	Suspend works immediately; secure equipment and excavations; notify staff.	Daily (especially May–Nov)	Contractor Site Lead; WSC Field Supervisor
Flood Preparedness	Identify or establish elevated staging zones in advance; do not store materials in low-lying or compacted areas prone to pooling.	Relocate materials within 6 hrs of forecast; restrict access to flood-affected zones.	Pre-storm & post-rainfall	Contractor; WSC Operations Team
Fire and Heat Risk Response	Install fire extinguishers in all staging areas; post heat advisory signage; provide water stations and shaded zones.	Replace missing equipment; restrict strenuous activity during heat advisories.	Weekly checks	Contractor HSE Officer; WSC
Emergency Preparedness	Maintain updated emergency contact lists and evacuation routes; conduct safety briefings quarterly.	Retrain staff; reschedule drills; update contact logs.	Quarterly	Contractor; Verified by WSC
Asset & Equipment Protection	Secure or tie-down loose materials; cover trenches pre-storm; anchor light equipment; store fuel above-ground.	Implement emergency securing protocols; document storm losses.	Continuous	Contractor Logistics Lead; WSC
Access and Mobility Safeguards	Maintain open road shoulders and at least one accessible corridor for emergency vehicles and utilities.	Reroute traffic; implement temporary road plates or bypass detours.	Daily	Contractor Site Supervisor; WSC Field Staff

Incident Response Protocol	Report environmental, health, or safety incidents within 24 hours; maintain an incident and corrective action log.	Investigate cause; apply remedial actions; submit incident report to WSC and IDB if required.	Within 24 hrs of incident	Contractor (NP); WSC (New Providence, Abaco)
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8.15.2 Monitoring, Indicators, and Responsibilities

Monitoring Parameter	Indicator	Method/Frequency	Responsible Entity
Emergency Readiness	Availability of updated contact list, evacuation maps, and quarterly safety briefings	Log review; Quarterly safety audit	Contractor; Verified by WSC
Hazard Suspension Compliance	% of severe weather alerts where works were suspended and sites secured	Incident logs; Site inspections post-storm	Contractor Site Lead; WSC
Flood Prevention Measures	Pre-storm relocation of materials and proper site drainage setup	Site walkovers pre- and post-rainfall	Contractor; WSC Site Supervisor
Fire Prevention Readiness	Availability and functionality of extinguishers at every active staging zone	Equipment checklists; Monthly audits	Contractor HSE Officer; WSC
Heat Risk Safeguards	Presence of shade, hydration stations, and heat signage in open work areas	Weekly observation report	Contractor HSE; WSC
Access Route Availability	Unobstructed travel lane or alternative access maintained along New Providence residential roads to ensure continuous movement for residents, service vehicles, and emergency access during construction.	Daily field checks and construction layout logs	Contractor; WSC Field Operations
Incident Reporting & Logging	All safety/environmental incidents logged, investigated, and closed within 48 hours	Review of logbook; Corrective action report	Contractor; Verified by WSC and IDB

Life and Fire Safety Subprogram

- The Contractor shall assess the risk of fire hazard within the project activities
- A plan should be then developed and enforced on protocols to prevent and respond to fire hazards, particularly those associated with the storage and handling of flammable materials such as oily rags, solvents, or fuels. The following measures shall be implemented:
- Collect and dispose of oily rags and similar waste in sealed, fire-resistant containers at the end of each work shift.
- Prohibit the accumulation of flammable waste in work areas and storage zones.
- Ensure fire extinguishers and firefighting equipment are strategically placed, clearly marked, and inspected regularly.
- Provide training to workers on fire prevention, emergency response, and safe handling of flammable materials.

- Incorporate fire hazard awareness into daily toolbox talks and emergency drills.

8.16 COMMUNITY INFORMATION AND PARTICIPATION

Objective: To ensure timely, transparent, and inclusive communication between the WSC, project contractors, and all affected communities.

Socio-environmental effects to be prevented or corrected: Misinformation of the public regarding the progress and tasks of the project.

The identified stakeholders for Component 3 include but are not limited to:

- Residential property owners and tenants in project areas
- Businesses, especially water-intensive operations (hospitality, laundromats, restaurants)
- Community institutions (churches, schools, clinics)
- Local government and district councils
- Tourism operators and industry associations
- Civil society organizations and non-governmental organizations (NGOs)
- Vulnerable or marginalized groups, including elderly residents, persons with disabilities, and low-income households

8.16.1 Management measures

Monitoring Parameter	Indicator	Method/Frequency	Responsible Entity
Public Information Management	Availability of updated project progress records and reports addressing public inquiries, complaints, and claims	Review of project reports and complaint responses; Monthly review	Social Specialist
Public Communication Channels	Availability of flyers with information (telephone number and email address) for public feedback	Complaint log review; Monthly	Contractor; Social Specialist
Community Information & Participation Program	Implementation of the Community Information and Participation Program throughout the project lifecycle	Review of program records and participation reports; Quarterly	Social Specialist
Community Engagement	Evidence of communication with affected communities regarding project schedule and progress	Review of meeting records, notices, and community engagement reports; Quarterly	Contractor; Social Specialist
Access to Information & Gender Equity	Equal access to project information provided to all social sectors, including	Review records and participation	Contractor; Verified by

	gender-inclusive participation	documentation; Quarterly	Social Specialist
Complaint Management Effectiveness	Percentage of complaints properly managed during the month according to the defined mechanism over the total number of complaints received	Review of complaints logbook and resolution records; Monthly	Social Specialist

WSC in coordination with the Contractor, shall implement a structured and proactive stakeholder engagement approach to ensure that all affected and interested parties are informed of project activities in a timely, transparent, and accessible manner. Prior to the commencement of construction works, advance notification shall be provided to stakeholders within the Direct and Indirect Areas of Influence, including residents, businesses, and community institutions. Notifications shall include information on the scope of works, anticipated timelines, potential disruptions, and contact details for project representatives. Communication methods may include written notices, community postings, direct engagement, and, where appropriate, digital platforms to ensure broad dissemination of information.

Throughout the construction phase, ongoing communication shall be maintained to provide regular updates on project progress, changes in work schedules, and any unforeseen disruptions. Particular attention shall be given to sensitive receptors such as businesses, churches, and community facilities to ensure that their operations are not unduly affected. Engagement activities shall be conducted in a manner that is inclusive and accessible, taking into consideration the needs of vulnerable or marginalized groups, including elderly residents, persons with disabilities, and low-income households. Information shall be presented in clear and non-technical language to facilitate understanding across all stakeholder groups.

A Grievance Redress Mechanism (GRM) shall be established and maintained throughout the duration of the project to enable stakeholders to raise concerns, provide feedback, or seek clarification regarding project activities. The GRM shall include multiple channels for submission (e.g., telephone, email, in-person communication) and shall ensure that all grievances are logged, assessed, and addressed in a timely and transparent manner. Records of grievances and responses shall be maintained and made available for monitoring and reporting purposes.

These measures are intended to minimize the risk of misinformation, promote stakeholder trust, and ensure that community members remain informed and engaged throughout project implementation. Continuous monitoring and adaptive management of stakeholder engagement activities shall be undertaken to respond to evolving community needs and to maintain effective communication across all phases of the project.

WSC's Responsibilities:

Project Reporting: Collect and maintain timely and updated records on the project's implementation and progress in New Providence and Family Islands.

Community Information and Participation: Implement the Community Information and Participation Program consistently throughout the project's lifecycle. Give special attention to ensuring clear, transparent, and timely communication with all individuals benefiting from the program.

Communication Channels: Provide the public with a transparent and accessible means of communication. Establish and implement a Grievance Redress Mechanism. Make available a telephone

number, an email address (projectcomplaints@wsc.com.bs or (326-5048)) for the community to submit their claims, complaints, and suggestions. Ensure that all submitted comments are promptly analyzed and receive a swift response.

Access to Information: Facilitate equal access to information, with a commitment to promoting gender equity among all interested social sectors. These responsibilities underscore the contractor's commitment to effective communication, community engagement, and transparency throughout the project.

Community Engagement: Establish a mode of engagement with the community affected by the project's development. Inform the community about the project's schedule and progress to foster transparency.

Key Information to be shared with stakeholders through the Programs Communication Management Consultancy:

- Project purpose, benefits and scope of works
- Locations and schedules for installation activities
- Potential short-term social and environmental impacts (ex. Temporary water disruptions, property access, noise)
- Social and environmental mitigation measures
- Waste management
- Procedures for lodging complaints or feedback via the **Grievance Redress Mechanism (GRM)** and general modes of communication should also be covered

Contractor's Responsibilities:

Project Reporting: Maintain timely and updated records on the project's implementation and progress.

Communication Channels: Provide information to users, if needed, regarding contact information (telephone number, an email address) for submitting their claims, complaints, and suggestions.

8.16.2 Monitoring and Compliance

Indicators	Description	Responsibility
Community meetings/town halls	List of attendees from meetings/town halls, records of communication channels used for project information Before work starts in each community; mid-project updates	WSC
Flyers and door-to-door notices	Provide advance notice of installation or disruptions At least 48 hours before activity	WSC
Grievance Redress Mechanism	Percentage of complaints managed properly during the month according to the defined mechanism over the total number of complaints generated.	WSC
Social media posts (WSC accounts)	Real-time updates, photos, schedule changes, Central reference point for all information Continuous, updated weekly	WSC

8.17 COORDINATION WITH SERVICE PROVIDERS

8.17.1 Management Measures

The Contractor will establish coordination with utility service providers to address the interferences that the execution of the Work will cause with existing infrastructure. To comply with this, and with the

agreement of the Site Inspection, they will plan and propose the most appropriate solution and reach consensus with the respective company responsible for executing it, minimizing inconvenience to users. Additionally, actions will be scheduled so that the Contractor promptly resolves any unforeseen interference that may jeopardize service provision.

From the start of the project, the Contractor will manage the appropriate permits, coordinating with the technical teams of the service providers. The Contractor shall inventory existing public utility networks in accordance with the contract specifications and plans to identify and locate lines that may be affected.

Each utility company shall appoint a coordinator to attend project oversight committees, ensuring cordial management of all expansion, repair, or replacement work within the project intervention area. If removal or relocation of structures is required, the Contractor shall first locate public utility lines within the construction area, as indicated by the project design plans and information provided by the utility companies. Simultaneously, approval of the plans by the respective utility companies shall be obtained.

8.17.2 Monitoring and Compliance

Indicators	Monitoring Measure	Responsible Entity
Number of network service interruptions caused by construction activities with interferences / Number of network service interruptions caused by construction activities with interferences coordinated with network service providers.	Daily inspections and logs	WSC Site Supervisor/Contractor

8.18 ENVIRONMENTAL LIABILITIES PROGRAM

Objective: To ensure that any pre-existing environmental or social liabilities within the project's direct work zone are identified, documented, and appropriately addressed prior to excavation, trenching, or material staging. This includes the detection and management of contaminated soils, hydrocarbons, legacy construction waste, and informal waste deposits that may pose risks to human health, groundwater, or surrounding vegetation. The program also considers environmental vulnerabilities such as flood-prone depressions and erosion-prone soils that could worsen if unaddressed.

Summary: Preliminary site observations along New Providence road indicate compacted soils, localized surface water pooling in low-lying areas, and isolated informal waste accumulation near roadside verges, drains, and utility corridors. While no confirmed contaminated sites have been identified within the project footprint, the urban setting increases the likelihood of encountering legacy construction debris, buried utilities, hydrocarbons from vehicular activity, or undocumented fill materials during trenching. Prior to mobilization, contractors must conduct a site walkthrough to identify and document any potential environmental liabilities, including staining, buried waste, or drainage constraints. All findings must be logged and addressed through safe removal, stabilization, or reporting to WSC and DEPP as required. Site clearance must be verified before excavation begins to ensure a safe, controlled, and environmentally compliant work zone.

8.18.1 Management Measures

Action Area	Management Measure	Corrective Action if Deviations Occur	Timeline	Responsible Entity

Site Condition Screening	Conduct a visual inspection with photographic documentation to confirm absence of contamination, legacy waste, or informal encroachments.	Escalate to WSC Environmental Officer if unanticipated concerns are identified.	Prior to mobilization	Contractor; verified by WSC
Risk Flagging and Documentation	Use a standardized checklist to flag and document any unanticipated issues (e.g., buried debris, stained soils, or dumped materials).	Pause site activity in affected zone; initiate internal review process.	Ongoing during mobilization	Contractor
Contingency Action (if needed)	If risks are flagged, engage third-party specialist for sampling, classification, and safe removal/disposal per Waste and OHS protocols.	Implement site-specific Remediation Action Plan (RAP) if required.	Before excavation in flagged areas	Contractor; WSC Environmental Unit
Site Clearance Confirmation	Maintain site logbook confirming cleared status of each zone prior to excavation. Use photo evidence and signed forms.	Site cannot proceed to trenching until zone is verified "clear".	Pre-excavation per zone	Contractor; approved by WSC

8.18.2 Monitoring, Indicators, and Responsibilities

Monitoring Parameter	Indicator	Method/Frequency	Responsible Entity
Environmental Liability Status	% of work areas verified as free of legacy risks or liabilities	Pre-mobilization screening and visual inspection	Contractor; verified by WSC
Risk Documentation and Reporting	Number of unexpected issues identified and documented	Incident log, photo record, and weekly report	Contractor
Response to Unexpected Liabilities	Response time to investigate and manage flagged environmental risks	Within 48 hours of identification	Contractor; escalated to WSC
Site Clearance Validation	Signed logbooks and pre-excavation photo evidence submitted per site	Weekly validation prior to trenching activities	Contractor; reviewed by WSC

8.19 CHANCE FIND PROCEDURE

8.19.1 Management measures

This program will be systematically implemented throughout the duration of the project, with the following key provisions:

Continuous Monitoring: A permanent monitoring initiative will be conducted across the entire area directly impacted by the project to identify any archaeological elements.

Immediate Action on Discovery: Should any property of potential archaeological significance be discovered; the construction team is obligated to promptly cease activities that may impact the identified area. Adequate surveillance measures will be implemented to prevent unauthorized access and looting.

Alternative Worksite Consideration: If necessary, the project team will explore alternative locations for project activities to mitigate any potential impact on archaeological finds.

Notification of Competent Authority: The relevant national authority will be promptly notified, and the project will adhere to their instructions for further action in response to the archaeological discoveries.

Salvage Operations: In the event of cultural remains emerging during activities such as ditching, earth removal, or excavations, salvage operations will be promptly initiated. Recognized archaeologists, under supervision, will conduct these operations with the utmost consideration for preserving the contextual integrity of the archaeological remains. Work will resume only upon the archaeologist's determination of an appropriate timeframe and location.

Comprehensive Reporting: Upon completion of the project, a comprehensive final report will be prepared. This report will detail the quantity and nature of the recovered materials and will be submitted to the competent authority.

Consultation with Competent Authority: The competent authority will be consulted regarding the proper procedures for delivering archaeological materials as part of the project's commitment to compliance and transparency.

8.19.2 Monitoring and Compliance

Indicators	Monitoring Measure	Responsible Entity
Number of archaeological and cultural resources found in the project and managed according to the defined procedures / Number of archaeological and cultural resources found in the project.	Daily inspections and logs	WSC Site Supervisor/Contractor

8.20 WORKS CLOSURE

Objective: To ensure that all construction sites under Component 3 are systematically decommissioned in a manner that eliminates environmental liabilities, restores ecological and community conditions, and leaves no residual impact upon completion of works.

Summary: Closure of construction sites in New Providence must be executed with care to avoid leaving behind physical waste, safety risks, or unresolved environmental and social liabilities. Contractors must follow proper dismantling, waste removal, and site restoration protocols. Sites must be returned to a stable and aesthetically acceptable condition, with all cleared vegetation replaced and no legacy issues left unresolved. Photographic documentation before and after works is mandatory to support closure verification.

8.20.1 Management Measures

Action Area	Management Measure	Corrective Action if Deviations Occur	Timeline	Responsible Entity
Site Systematic Removal	All project installations must be removed systematically and completely post-works.	Notify contractor; delay closure sign-off until resolved.	At demobilization	Contractor; verified by WSC
Final Environmental & Social Review	Conduct a final review to identify and remediate unresolved liabilities.	Correct issues identified; submit updated closure plan.	End of works per site	Contractor with WSC oversight
Waste Disposal	Dispose of waste per ESMP guidelines using approved disposal facilities.	Submit disposal manifests; withhold final payment if violations occur.	Continuous during dismantling	Contractor
Vegetation Restoration	Replant with original/native species in cleared or disturbed zones.	Require replanting and photo evidence of survival.	Within 2 weeks of site closure	Contractor; monitored by WSC Environmental Officer
Site Appearance and Integration	Restore site to a clean, safe, and natural condition. No visible waste or infrastructure remnants.	Delay closure approval until standard met; require cleanup.	Final site inspection	Contractor; validated by WSC Inspector

8.20.2 Monitoring, Indicators, and Responsibilities

Monitoring Parameter	Indicator	Method/Frequency	Responsible Entity
Final Site Restoration	Absence of claims or complaints from community, local government, or regulators	Post-closure inspections; stakeholder confirmation	Works Director

Visual Closure Evidence	Photographic records of sites before and after dismantling	Site-by-site review at end of works	Works Inspector
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8.21 OPERATIONAL ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

This plan outlines the mitigation measures designed to address potential adverse impacts and risks during the operational and maintenance phase of the projects' implementation.

Throughout the operational phase, the WSC will assume responsibility for the operation and maintenance of the infrastructure, following the prescribed guidelines provided herein.

Table 11: Operational ESMP Requirements for the New Providence Watermain Project

ESMP Programs	Access to Piped Water Supply
Waste Management Program	x
Occupational Health and Safety Program	x
Grievance Redress Mechanism	x
Capacity Building Program for WSC Personnel	x
Contingency Plan	x
Socio-Environmental Training Program	x
Road Safety and Traffic Management Program	x

Plan/Program	Impact to Avoid	Minimum Mitigation Measures	Responsible Party	Indicators and Compliance Records	Supervision
Waste Management Program	Contamination due to inadequate management of waste.	Development and implementation of a Waste Management Program	WSC	Environmental Audit of the Site	DEPP
Occupational Health and Safety Program	Occupational risks due to the operation and maintenance of infrastructure	Compliance with current national regulations and international best practices	WSC	-Frequency Index (number of accidents x 200,000/person-hours worked in the period). -Severity Index (number of serious accidents x 200,000/person-hours worked in the period). -Fatal Accident Incidence Rate (Number of fatal accidents x 200,000/Number of exposed workers).	WSC/ DEPP
Grievance Redress Mechanism	Impacts on local community and workers of the work for the non-attention to the claims and complaints.	There must be an efficient tool for receiving, registering, monitoring, and resolving claims.	WSC	Registration of claims and complaints	DEPP
Capacity Building Program for WSC Personnel	Lack of knowledge on new equipment and systems to be in place.	Minimum training: - Introduction to SCADA Systems and AMI - Operation of SCADA, DMAs and AMI - SCADA and AMI Data Management and Reporting	WSC	Percentage of operators trained according to Training Program Training Registration Sheets	WSC

Contingency Plan	Poor management of environmental/occupational contingencies	Strategic Plan Define the structure and organization for emergency response, the roles and responsibilities of the people in charge of executing the plan, the necessary resources, and the preventive and operational strategies to be applied in each of the possible scenarios, defined from the evaluation of the risks associated with construction. Action Plan Establish the procedures to be followed in case of emergency.	WSC	Number of environmental and safety accidents managed according to the defined procedure / Total number of environmental and health accidents occurring in the project.	WSC/DEPP
Socio-Environmental Training Program	Lack of knowledge regarding the personnel's role in preserving, protecting, and conserving the environment, as well as ensuring occupational safety in the performance	Training on waste management, contingency plans, use of PPE, spill prevention and management, effective sludge handling, fire safety protocols, and environmental and social regulations and compliance.	WSC	Percentage of personnel trained in accordance with the Training Program.	WSC/DEPP
Road Safety and Traffic Management Program	Accidents and incidents that affect occupational and community health and safety	Identify sensitive locations, implement road safety requirements, implement procedures of marking work fronts	WSC	-Number of road accidents -Number of work fronts with signs/Number of work fronts that require signs	DEPP

8.22 BUDGET FOR IMPLEMENTATION OF THE ESMP

The table below includes the estimated costs, schedules, and responsible entities for the implementations of the ESMP.

Measure	Description	Estimated Cost	Schedule	Responsible
Implementation of Mitigation Measures and Programs of Construction ESMP	Preparation of the ESMP at the construction level and implementation during the construction of the project; socio-environmental monitoring of the works.	1.5% of the total cost of the Project	From the beginning of the works, until their finalization	Contractor

The cost for the implementation of the ESMP mitigation measures and programs is indicative and does not constitute a prescriptive element of contractual obligation. The implementation of the ESMP is monitored exclusively in terms of its performance (results) and not based on the inputs used (resources expended by the contractor).

9 CONCLUSIONS

Throughout the works of these characteristics, there are potential impacts and risks, mainly in the construction phase, such as negative impacts due to the risk of occupational accidents during the works, air pollution due to emissions from vehicles and machinery affected by the work, noise and vibrations, risk of soil and water contamination due to accidental spills, risk of soil erosion and sediment runoff, and risk of contamination due to poor management of the solid waste generated.

These negative impacts of the construction phase are limited in time, occur during the work period, and affect only the direct area of influence of the projects. The application of adequate mitigation measures previously detailed along with the application of good construction practices that guarantee compliance with national regulations, and the IDB Environmental and Social Performance Standards, ensures that these measures objectively will mitigate all the identified impacts and risks.

In the operational phases, the project is expected to yield long-term positive impacts on communities by providing enhanced access to potable water. This will contribute to an improved quality of life for residents and visitors alike. Therefore, the operation is considered feasible, without significant negative socio-environmental risks or impacts that cannot be mitigated.

10 ANNEX 1: LABOUR MANAGEMENT PROCEDURE (LMP)

Introduction

The purpose of this Labor Management Procedure (LMP) is to establish the scope and application of ESPS 2 "Labor and Working Conditions" for the BH-L1061 Program.

The Labor Management Procedure will be managed as part of the Environmental and Social Management Plan (ESMP). The requirements included in the LMP will be systematically integrated into the legal requirements of the Program, the tender documents and the contracts of the contracting companies and suppliers.

The LMP is a dynamic document and should therefore be revised and updated as necessary during the life cycle of the Program.

The LMP presents the guidelines, guidelines and minimum contents for the labor management and working conditions of the works of the Program to be fulfilled by the main contractor, the companies involved and the executing agency. The responsibility for ensuring compliance with this procedure shall be the responsibility of EA.

The LMP is governed by the principles of equality, opportunity and fair treatment ensuring that no employment decisions will be made based on personal characteristics outside the requirements inherent to the job, refraining from discrimination in any aspect of the employment relationship, such as recruitment and hiring, remuneration (wages and benefits), working conditions and terms of employment, access to training, job assignment, promotion, dismissal or retirement and disciplinary practices. Measures shall be taken to prevent and address violence, harassment, intimidation, or exploitation, especially regarding women, persons of diverse sexual orientations and gender identities, persons with disabilities, and migrant workers. Under no conditions shall child or forced labour be permitted.

A safe and healthy work environment shall be ensured, considering the risks inherent in the Program and specific hazards for women, persons of diverse sexual orientations and gender identities, elderly persons, persons with disabilities, children (of working age, in accordance with this Performance Standard), and migrant workers. Measures shall also be taken to prevent accidents, injuries and illnesses that may arise from, be associated with, or occur during work, minimizing, to a reasonable extent practicable, the causes of hazard factors.

Scope of the Labor Management Procedure (LMP)

Environmental and Social Performance Standard 2 "Labor and Working Conditions" of the IDB's Environmental and Social Policy Framework pursues the following objectives:

Respect and protect the fundamental principles and rights of workers.

Promote fair treatment, non-discrimination, and equal opportunities for workers.

Establish, maintain, and improve relations between workers and the employer.

Ensure compliance with national legislation on employment and labor.

Protect workers, including those in vulnerable situations, such as women, persons of diverse sexual orientations and gender identities, persons with disabilities, children (of working age, in accordance with this Performance Standard) and migrant workers, workers hired by third parties and workers in the main supply chain.

Promote safe and healthy working conditions and promote workers' health and prevent the use of child labour and forced labour (as defined by the ILO).

This standard applies to:

- **Direct workers:** are persons employed or hired directly by the borrower to work specifically in relation to the Program. The direct worker is employed or hired by the borrower, is paid directly by the borrower, and is subject to the borrower's instructions and day-to-day control.
- **Contract workers:** Persons engaged through third parties to perform work related to core functions of the Program for a considerable period of time where that third party exercises continuous control over the work, working conditions and treatment of the worker in relation to the project.
- **Main supply chain workers:** Workers in the main supply chain, provides goods and materials to the project, where the supplier exercises control over this worker for the work, working conditions and treatment of the worker.

Where public employees are working in connection with the Project on either full-time or part-time basis, they will be subject to the terms and conditions of their existing public sector employment agreement or arrangement, unless their employment or hiring has been effectively legally transferred to the Project.

Requirements relating to gender equality and stakeholder participation (including a grievance mechanism) should also be considered in the implementation of this Performance Standard in accordance with ESPS 9 and 10. In no case and under no circumstances shall child and forced labor be permitted.

Description of the Project's Workforce.

Identification and characterization of workers involved in the project:

Depending on the activities foreseen in the project, it is estimated that the organization of the workforce involved will be as follows:

1. **Direct workers:** In accordance with the organizational structure foreseen for this Program, it is considered that the direct hiring of personnel under the modality of contracting services will be coordinated by WSC and are mostly linked to the hiring of personnel to carry out the supervision and technical inspections (environmental and social) of works.
2. **Project workers:** It is expected that the largest number of staff will be employed under this category. The contracting companies will conduct the construction works foreseen for each project.
3. **Workers in the main supply chain:** Personnel employed by the companies supplying inputs and infrastructure linked to the works foreseen by the Program. The Program must conduct due diligence to ensure that inputs produced under conditions of forced labor are not procured and that the working conditions of suppliers comply with current regulations with their personnel.

Table 12: Summary Table of Type of Workers Linked to the Project

Type of Worker	Characteristics
Direct Workers	Individual Consultants directly hired by the Program
Contract workers	Workers hired by the contracting firms hired by the project. It is expected by the type of works that the largest number of people involved in the Program be incorporated under this modality of contracting.
Primary Supplier Workers	The number of workers to be hired under this modality and the specific characteristics will be information provided by the contractor awarded the work.

Assessment of possible occupational hazards

Depending on the activities to be conducted by the staff in the project, the main risks for each of the most relevant jobs must be identified.

The existing risks involve adopting measures for the prevention of accidents and incidents with the development of safe working methods, with a correct choice and training of personnel to perform such work, in addition to using the appropriate tools and personal protection elements (PPE).

The following table provides a summary of the main activities, with the possible risks identified and those responsible.

Table 13: Example of activities and risks identified in the project

Activity	Location	Risks Identified	Responsible
Planning, design, execution and implementation, evaluation, and monitoring of Projects	Office: WSC	No specific and significant risks are identified. Risks related to occupational health and safety in internal environments (ergonomic risks, accidents, stress, mental load, psychophysical factors)	WSC
Train, inform and raise awareness especially among construction personnel both orally and in writing about the expected environmental and social problems, the implementation and control of environmental and social protection measures and the specific and relevant aspects applicable to the execution of projects in accordance with current	Workshops/Office	No specific and considerable risks are identified if the facilities of the workshops comply with current regulations. Possible risks linked to occupational health and safety in internal environments (accidents, stress, mental load, psychophysical factors).	Contractor (Environmental and Social Manager)

environmental and social regulations and regulations. Conduct gender-sensitive training and code of conduct for all contracted personnel, including the management staff of the contractor company. Have updated the technical file of the personnel with the training conducted and the elements of security and personal protection delivered			
Conducting interventions for improvement of water and sewage systems	[Project Locations]	Specific risks are identified that can be avoided with the corresponding security measures and protocols. In workshops and place of work: • Risks of gender-based violence • Occupational and community accident risks In the recruitment processes: • Risk of exclusion of vulnerable groups • Exclusion of local labor and discrimination • Influx of labor from outside the place. In the execution of the planned works: Occupational hazards: • Accidents and falls of different levels • Falling objects • Road accidents (circulation of trucks and machinery) • Temporary hearing loss due to operation of equipment and machinery. Ergonomic risks: • Forced posture; Repetitive motion; Cargo handling; Application of forces; Overexertion	Contractor Company

Construction supervision	Supervise the strategic environmental and social management plan, occupational safety and health; monitor environmental, social, health and safety risks, their impacts and actions taken (including in the field, if necessary).	Office / Field activities at the site of implementation of the works	In Office: No specific and considerable risks are identified. Possible risks linked to occupational health and safety in internal environments (accidents, stress, mental load, psychophysical factors). In the field: Risks linked to accidents in the work area. They can be minimized if PPE is properly used.	WSC / Construction Inspection
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Description of prevention and mitigation measures to address possible risks in the workplace

Based on the identification of the main risks by activity group, the priority measures to prevent and minimize the risks identified are detailed below, by way of example:

- Prevention and mitigation measures in the workshops:
- Implement hygiene, safety and health standards and conditions.
- Install workshops of size according to the number of people employed and as required by Laws and Decrees.
- Training and awareness on health and safety, non-discrimination, and prevention of gender-based violence, prevention of child exploitation, forced labor, prevention of discrimination and / or violence against people from indigenous communities or vulnerable groups in compliance with the code of conduct.

Prevention and mitigation measures in staff recruitment processes:

- The contractor will seek to approach its recruitment process with a gender perspective, seeking to make equal opportunities for men and women effective.
- Personnel with criminal records related to sexual crimes, sexual harassment, prostitution, and trafficking in persons will not be hired in order to protect the integrity of the population linked to the work.
- The contractor will try to prioritize the local skilled and unskilled local labor, especially of the beneficiary parties of the works and surrounding localities.
- Non discrimination requires that the contractor/ WSC not make employment-related decisions based on personal characteristics, such as gender, race, ethnic, social and indigenous origin, religion, political opinion, nationality, disability and sexual orientation that are not related to job requirements. They cannot affect equality of opportunity or treatment in employment.

- The contractor shall develop and implement the code of conduct and provide training for its knowledge and understanding. See Appendix A for the proposed content of the code of conduct. This Code is aimed at ensuring respectful and harmonious ties in the workplace in which the Program and its projects are developed in such a way as to ensure a work environment free of discrimination and/or violence based on gender, gender identity, sexual orientation, cultural identity, religion, ethnic or national origin, trade union membership, disability or any other discrimination typified in current legislation.

Prevention and mitigation measures in the execution of civil works of infrastructure and equipment of the project:

Review the environment in which the tasks will be developed. If power poles, hazardous materials tanks or other items are present in adjacent areas, they could catch fire or fall on workers in the event of evacuation.

- Provision of personal protection elements (PPE) and tools and machinery in perfect working order.
- Training and advisory programs for the people employed by the contractor on the inherent risks of their tasks and the mitigation measures, actions and good practices to be implemented to ensure the health, safety and hygiene of the employees, the population, and the protection of the environment
- Code of conduct.
- Evaluate the state of gas, electricity, and water facilities near the intervention area.
- Examine the distribution of workspaces verifying that there are no elements that could interfere with a rapid evacuation.
- Identify safe areas.
- Determine accessibility to fire protection equipment, emergency lights, first aid equipment, etc. (they should always be in place of easy access).
- Define the resources available to avoid and respond to an emergency.
- Make an inventory of those security elements that the organization has (fire extinguishers, first aid kit, etc.).
- In the case of works conducted in the vicinity of routes, traffic management measures, signaling and communication program to the community must be extreme.

Protocols and procedures to address cases of gender-based violence during the life cycle of the project.

The Contractor will establish reporting procedures, protocol for responses to unacceptable conduct and internal accountability measures in situations of gender-based violence within the framework of the operation.

In terms of prevention, in addition to urging the development of actions aimed at dismantling all types of situations of inequality, discrimination and exclusion in the workplace, actions can be implemented to raise awareness and train on gender issues. The training program will be defined according to the demands of the different work teams.

To address cases of gender violence, immediate and confidential contact should be made with local authorities who are experts in the field if the victim gives clear and enthusiastic consent to do so, to ensure adequate treatment of the victim of violence, providing specific advice and accompaniment. The

identity of the complainant should be kept confidential in order to protect against retaliation, stigmatization, revictimization or other consequences that frequently can happen.

Grievance Redress Mechanism (GRM) for Project Labor Management

The Program has a Grievance Redress Mechanism (GRM), and at the same time the LMP has a simultaneous mechanism that aims to arbitrate the means and mechanisms to facilitate the reception of concerns exclusively (queries, claims, complaints, suggestions) of workers linked to the Projects of the Program, and respond to them to solve them, and to anticipate potential conflicts.

Likewise, workers may appeal directly to the courts, applying the general system in force in the country.

Principles of the GRM for the Labor Management Procedure

Each project will have a feedback/claims management system that includes input/reception, analysis, monitoring, resolution and return to the people who are working linked to the projects.

The principles that the system will observe are the same as those that govern the general GRM of the Program:

- The interaction/claims management system will have mechanisms in accordance with the local context and the sociocultural characteristics of the people involved in each project, with special consideration and respect for the most vulnerable groups (young people, women, people with disabilities, migrants, among others).
- The complaint procedures, the process that will follow, the deadline and the resolution mechanisms will be widely disseminated for your knowledge by the interested parties, that is, by direct workers, contractors, and primary suppliers.
- In all cases, a record will be kept of the reception, analysis and resolution of claims and conflicts.

GRM Guidelines

In general, the mechanism will follow the following guidelines:

- **Proportional:** The Mechanism will proportionally consider the level of risk and possible negative impacts on the affected areas.
- **Culturally appropriate:** The Mechanism will be designed to consider the local customs of the area.
- **Accessible:** The Mechanism will be designed in a clear and simple way so that it is understandable to all people. There will be no cost related to it.
- **Anonymous:** The complainant may remain anonymous, as long as it does not interfere with the possible solution to the complaint or problem. Anonymity is distinguished from confidentiality in that it is an anonymous complaint, the personal data (name, address) of the complainant are not recorded.
- **Confidential:** The Program will respect the confidentiality of the complainant. Information and details about a confidential report will only be shared internally, and only when it is necessary to report or coordinate with the authorities.
- **Transparent:** The process and operation of the Mechanism will be transparent, predictable, and readily available for use by the population.

Management of the specific GRM for the Labor Management of the projects of the Program

The procedure begins with the presentation of the consultation, claim, complaint and / or suggestions (orally or written) by any worker linked to the works. The process ends with the closure and agreement in the resolution of both parties (the claimant and the contractor). The process will be documented by means of a record (in a physical and/or digitized file).

Complaints received by all means of receipt enabled during the implementation of the Project must be attended and classified.

The claims received via the contractors of each work, or agencies of the municipal authority (if applicable) must be redirected to WSC for management.

Reception and registration of claims for the labor management of the project

- Office of contractors (specific modality for operators and employees)
- Suggestion box / complaints book available in the workshops (Specific for operators and employees).

Claims Evaluation

All claims that enter through the various channels must be registered and managed considering the criterion of proportionality (level of risk and possible negative impacts).

In the case of a claim related to employees of the contractor, it will be considered and responded to by the Contractor Company with supervision of WSC.

The file must include, together with the complaint, a summary of the procedures and steps taken. Registration information will be updated periodically to reflect the status of the case until the complaint has been finalized.

Conflict resolution

In all cases, the contractor company must ensure that the attention of claims and the resolution of conflicts are conducted in an adequate and timely manner, and that all workers linked to the project of the Program have a satisfactory management of their claim.

Responding to Complaints

Low-importance claims will be dealt with within a maximum of 30 calendar days, medium importance claims will be dealt with within 15 calendar days and high-importance claims will be dealt with within a maximum of 7 calendar days. The established deadlines can be adjusted by the contractor company.

Monitoring and documentation

The contractor company will be responsible for maintaining an up-to-date database with all documentation and information related to complaints that are submitted as part of labor management. This team is also responsible for following up on the complaint processing process, in coordination with the areas involved, and for facilitating the participation of the worker in the process.

The complaint registry must demonstrate that all of these actions and processes were conducted in accordance with this document.

It will include:

- Date on which the complaint was registered;
- Person responsible for the complaint;
- Information on the corrective measures proposed/communicated by the complainant (if applicable);
- Date on which the complaint was closed; and
- The date of the reply was sent to the complainant.

Deadlines

All complaints must be registered, and the proposed solution must be communicated to the interested party within a stipulated period. The deadlines set can be adjusted.

Monitoring

Any complaint closed with compliance by the complainant must be monitored for a reasonable period in order to verify that the reasons for the complaint or claim were effectively resolved. The estimated period for this purpose is 6 (six) months from the response and / or solution to the claim.

As initially indicated, this document is dynamic in nature, therefore the specific procedures for the implementation of the Grievance Mechanism for Labor Management will be strengthened with the implementation of each project.

11 ANNEX 2: STAKEHOLDER ENGAGEMENT PLAN

Introduction

This Stakeholder Engagement Plan was developed to describe the socialization process of the Bahamas Water Supply and Sanitation Systems Upgrade Program (BH-L1061) Program.

This Plan sets out the general principles of participation and a collaborative strategy to identify stakeholders and plan a participatory process in line with Environmental and Social Performance Standard 10: "Stakeholder Engagement and Information Disclosure" along with ESPS 1 "Assessment and Management of Environmental and Social Risks and Impacts" and ESPS 9 "Gender Equality".

Stakeholder engagement is an inclusive, continuous, and iterative process that takes place throughout the project lifecycle (preparation, implementation, and closure). The process must be properly designed and conducted, sustained by the establishment of solid, constructive, and responsive relationships that are important for the satisfactory management of the environmental and social risks and impacts of the Program/Project.

The nature, scope and frequency of stakeholder engagement is commensurate with the nature and scale of each project, its development and implementation schedule, and its potential risks and impacts. WSC as the Executing Agency will be responsible for defining and evaluating the necessary instances of participation and dissemination of the works.

The entire participation process must be properly documented. WSC shall take steps to maintain confidentiality where required and where necessary to protect personal data.

It is in this context, the following Stakeholder Engagement Plant is proposed, which presents the minimum guidelines and criteria to conduct the consultation process.

Objective

The objective of the consultation process is to present to the affected population and other interested parties the description of the Project, its potential environmental and social impacts and the mitigation measures planned to ensure adequate environmental and social management during the execution of the works, and their subsequent operation.

This instance of participation aims to respond to the doubts and concerns that may arise, and to collect suggestions which will be evaluated to determine the possibility of incorporating them into the design of the Project, when appropriate.

Institutional Arrangements for Plan Implementation

WSC as the Borrower is responsible for leading and implementing the Stakeholder Engagement Plan.

Consultation Process

The programming and dissemination of the consultation should be conducted in such a way as to ensure the participation of stakeholders. Every effort will have to be made to involve groups likely to be affected

by the activities of the project, and those groups that have been identified as stakeholders, regardless of whether they do not belong to the affected population.

It is important to recognize the reduced accessibility to these consultation spaces by populations with greater vulnerabilities such as women, original communities, people in situations of immobility, people in street situations, LGBTIQ + populations (lesbian, gay, bisexual, trans, intersex, queer), among others. With this, it must be ensured that the call is made considering the obstacles that these populations may face for participation.

The consultation process shall consider at least the following elements:

- Stakeholder Mapping
- Documents to disclose and availability of information
- Dissemination of the consultation process through the WSC website, social media, and other means
- Development of content and documentation to be socialized
- Public consultation procedure
- Report of the public consultation process

Below is a brief description of the requirements to be considered at each stage of the consultation process.

Stakeholder Mapping

Stakeholder mapping consists of identifying the directly affected population and organizations relevant to the consultation.

From a preliminary identification, it emerges that, at a minimum, the stakeholders presented in Table 12 should be included in the process.

It is important to note that the proposed stakeholder mapping is preliminary, and that the final selection of the stakeholders can be adjusted by WSC. Therefore, any other stakeholders that the authorities consider appropriate to invite to contribute to guaranteeing a broad, representative, and meaningful participatory process may then join.

Table 14: Stakeholder Mapping

Mapping Type of Stakeholder	Stakeholder	Relationship with the Program/ Project	Stakeholder Interest in the Project (High / Medium / Low)	Stakeholder Influence on Project (High / Medium / Low)
Institutional Stakeholders	Water and Sewerage Corporation (WSC)	Executing Agency	High	High
	Department of Environmental Health Services (Family Islands Subdivisional Offices)	Interested Party	Low	Low
	Department of Environmental Planning and Protection	Interested Party	Low	Medium

	Stakeholders related to other infrastructure and services in the project areas (e.g., Bahamas Power and Light Company, Cable and Internet Companies, etc.)	Affected Party	Medium	Low
Civil Society Stakeholders	Population living in the direct area of influence of the projects	Affected Party	High	Medium
	Businesses and informal workers in the direct area of influence of the projects	Affected Party	High	Medium
	Representatives from institutions in the direct area of influence of the projects (e.g., schools, health centers, etc.)	Affected Party	Medium	Medium
	Civil Society Organizations (in particular, those working in environmental and social issues)	Interested Party	Medium	Low
Community	Population of the communities reached by the Project and community in general (indirect area of influence)	Interested Party	Medium	Low

Documents to Disclose and Availability of Information

Below are the documents to be socialized, which must be published on WSC's website and other means, and available to the public for at least 14 days prior to the consultation events.

- Strategic Environmental and Social Assessment, including the Strategic Environmental and Social Management Plan (first draft, Fit for Disclosure)
- Summary information on the Project (description of objectives, works, etc.)

Once the information is available on the website, the consultation process will be disseminated to interested parties.

Public Consultation Events

The date for the consultation process has yet to be determined, but has an anticipated date in the week of August 24, 2026, and will be updated once confirmed. It will consist of a single consultation event, conducted in in-person format, in Nassau, New Providence. The final date and venue, as well as the streaming platform to be used, will be defined by WSC.

This consultation event will be complemented with community information campaigns, to be conducted prior to the start of the works, on each work location, once the engineering design details of the projects are known.

WSC will be responsible for the invitations to the consultation event. The invitation to the event will be made directly to the interested parties identified in the stakeholder mapping, 14 days in advance of the event date.

To ensure maximum stakeholder participation, the event will also be disclosed to the public starting 14 days prior to the event date, through publication in relevant information media, such as radio, local TV

and / or digital media, important newspapers, and on the institutional website and social network profiles of WSC. Also, personal email submissions and brochure handouts can be used, to ensure adequate dissemination of the process.

Proposed content of the invitation

The following information shall be detailed in the invitation to the consultation event:

- Project Proponent: WSC
- Project/Program
- Website with the publication of the documentation (SESA/SESMP) and as a space for sending queries or concerns about the Project.
- Procedure of the consultation process
- Duration of the consultation process
- Topics to be addressed, including: Program and main works to be conducted, benefits associated with the operation of the Project, Parties involved and institutional responsibilities, Outline of the applicable regulatory framework and relevant standards, Main environmental and social impacts identified, main environmental and social management measures, and grievance redress mechanism.
- Documentation available

Development of the Public Consultation Process

Disclosure of Documents

WSC must publish the SESA/SESMP for a minimum of 14 days prior to the event.

The consultation process announcement should explain the objective of the consultation, clarifying that, although it is not in itself legally binding, the questions and proposals arising from the persons participating will be considered, where relevant, the proposed amendments will be incorporated.

Then the context in which the consultation takes place will be explained, and the description of the Project will be made, including its objectives, main characteristics and alternatives considered.

The presentation then follows with the environmental and social impacts and risks identified, both in the construction and operation stages, as well as the mitigation measures designed for an adequate environmental and social management of the Project.

The Grievance Redress Mechanism and the available channels for filing complaints or consultations on the Project will also be disclosed. The explanation should be clear, and the language used should allow the community to understand the main aspects of the project and its impacts.

After the presentation, adequate time will be allowed for questions and suggestions from participants, including both in-person as well as virtual attendees.

WSC shall disclose the estimated date and how the consultation report will be published so that all stakeholders can read it and make their observations, if any.

The development of the event, including questions from participants, replies given, and commitments made, will be properly documented to include in the consultation report [see next Section].

Proposed Structure of the Consultation Report

A report will be prepared containing the main concerns raised (both during the consultation process and any prior or subsequent requests that may be received), indicating how they were addressed at the time or, where appropriate, what responses were subsequently prepared and how they were communicated to stakeholders and the public.

Although, as mentioned, the consultation is not legally binding, the proposals received should be evaluated and the explanation of their relevance or not included in the report. If these are relevant, the consultation report will result in proposals for changes to the Project and/or the ESMP, specifically recommendations for: (i) project design; (i) mitigation measures and (iii) mechanism for dealing with complaints and grievances.

The consultation report, to be prepared by Plan EHS based on information gathered at the public consultations, will also include the invitation process, the links to the web pages where the project has been published and the corresponding environmental and social documentation, the description of the call mechanism used, the list of participants, photos or screenshots of the process, informative banners, publications made in local media, and other dissemination materials used.

The following is a minimum content outline / proposed structure of the Consultation Report:

1. Participation strategy: Description of how the consultation process was developed (prior coordination with authorities, key stakeholders, methodology, selection of topics to be addressed, etc.).
2. Stakeholder mapping (groups, institutions or people who were invited) and selection criteria of the invited stakeholders, Invitation mechanism.
3. Dissemination: Invitations issued and publications of the event on institutional websites and media.
4. Website used for disclosure of information.
5. Analysis of the people who participated compared to the invitees.
6. Gender-disaggregated data of participants.
7. Materials disclosed during the consultation process.
8. Questions and answers (suggestions, claims or questions made by the different stakeholders during the process, and how they were addressed).
9. Indication of how the suggestions and/or complaints received were incorporated/or will be incorporated into the design of the project. Any formal agreement reached with the persons consulted.
10. The main conclusions on positive or negative perception of the project by the participants, including the agreements.
11. Feedback collected from the consultations and included in the final version of the ESIA and ESGP.
12. ANNEX. Copy of the presentations made (it must be ensured that the impacts and mitigation measures of the specific project have been presented).
13. ANNEX. Sample copy of invitation letters sent.
14. ANNEX. Copy of the RSVPs of the invitation letters.

15. ANNEX. List of invited people.

16. ANNEX. List of participants: interested persons/affected persons, governmental, institutional, and general population participants.

17. ANNEX. Photographs of the activity / screenshots of online event.

The consultation report must be published on the institutional website of EA, as communicated to the persons participating in the consultation meeting.

12 ANNEX 3 GRIEVANCE REDRESS MECHANISM (GRM)

The Program and its projects will have a feedback / claims management system that includes their entry / reception, analysis, monitoring, and resolution.

GRM Guidelines

In general, the Mechanism will follow the following guidelines:

- Proportional: The Mechanism will proportionally consider the level of risk and possible negative impacts on the affected areas.
- Culturally appropriate: The Mechanism will be designed to consider the local customs of the area.
- Accessible: The Mechanism will be designed in a clear and simple way so that it is understandable to all people. There will be no cost related to it.
- Anonymous: The complainant may remain anonymous, as long as it does not interfere with the possible resolution of the complaint or problem. The GRM need to ensure that complaints can be raised anonymously. Anonymity is distinguished from confidentiality in that it is an anonymous complaint, the personal data (name, address) of the complainant are not recorded.
- Confidential: The Program will respect the confidentiality of the complaint. Information and details about a confidential report will only be shared internally, and only when it is necessary to report or coordinate with the authorities.
- Transparent: The process and operation of the Mechanism will be transparent, predictable, and readily available for use by the population.

Management of the GRM

The procedure begins with the presentation of the consultation, claim, complaint and / or suggestions (orally or written) by any person linked to the actions of the Program. The process ends with the closure and agreement in the resolution of both parties. The process will be documented by means of a record (in a physical and digitized file). Complaints received by WSC must be addressed and classified. Complaints received at the level of individual projects to be financed by the Program (via the contractors of each work, or departmental or municipal agencies) must be redirected to WSC for management and follow-up.

Scope

The GRM applies and may be used by any person (general population) who expresses any type of claim, complaint or query related to the activities planned by the projects to be financed by the Program.

- Point of Contact: projectcomplaints@wsc.com.bs or (326-5048)
- Complaints acknowledged within 3 working days
- Standard resolution time of 15 working days; escalation to senior management if unresolved
- Monthly reporting on number, type and resolution of grievances

12.1.1 Dissemination of the Grievance Redress Mechanism

Information on these means of receiving complaints must be disseminated through the various communication channels used by the Program, among which are:

1. Social Media Sites
2. Verbal communications given to customers who have complaints in the field
3. Consultation Process

12.1.2 Receipt and Registration of Claims

The following mechanisms and channels will be available for the reception of concerns. Once a concern/comment is received, it will be logged into an Excel document:

- Receiving email: projectcomplaints@wsc.com.bs

- Receiving phone number: 326-5048
- Claims received by the Contractor will also be logged into the Excel log to maintain complete records

12.1.3 Claims Evaluation

In the case of a claim related to the works, it will be considered and responded to by the Contractor Company or WSC.

If the claim or complaint is rejected, the complainant will be informed of the decision and the reasons for it. To this end, relevant and understandable information will be provided in accordance with the sociocultural characteristics of the claimant.

Complaints received will be categorized according to the following:

NOT ADMISSIBLE: Complaints or claims that do not meet one or more of these requirements:

- It is not directly related to the work, its contractors, or the actions of the project.
- Its nature exceeds the scope of GRM.
- There is no real cause of the action.
- There are other formal mechanisms and institutions for filing complaints according to the nature of the complaint.
- Related to labor issues must be addressed to the corresponding instances of the construction company.

LOW IMPORTANCE: This category corresponds to complaints that do not require resolution, but only require information or a certain clarification that must be provided to the complainant. This category includes complaints that have been previously evaluated and received a definitive response from the Program.

MEDIUM IMPORTANCE: Complaints and claims related to health, the environment, transportation, and contractors and subcontractors.

HIGH IMPORTANCE: Includes complaints related to the safety of personnel, as well as those related to the health and safety of construction workers.

Within a period not exceeding ten working days, the social manager of the contractor or the unit in which the complaint is registered will have to evaluate the documentation presented by the claimant.

Where possible, if additional information is required for the proper evaluation of the complaint, the executing agent (EA) will contact the complainant within a maximum of ten working days, to obtain the necessary information. Once the complaint is completed and reviewed, project staff will proceed to register the complaint.

12.1.4 Grievance Closure and Monitoring Mechanism

The resolution of claims will be conducted through two instances:

1. **Internal.** The management of reception of claims and resolution of conflicts is the responsibility of WSC and will be referred to the competent agency in the subject according to the complaint / claim.
2. **Mediation.** Cases of claims and conflicts not resolved in the first instance will be dealt with under the mediation mechanism. The person in charge of this instance must have

sufficient authority to mediate for the resolution of claims and conflicts, and sufficient independence to project credibility in the parties.

Conflict Resolution

If there is no agreement between WSC and a complainant, either because of a rejected concern or because there is no agreement on the solution to be implemented, the means to reach a joint agreement between the parties must be arbitrated. This may include, among others: promoting the participation of technical third parties, inviting dialogue tables, mediations, conciliations, etc.

WSC shall ensure that claims handling and dispute resolution are conducted in an appropriate and comprehensive manner.

In the event that the complaint cannot be managed within the scope of the work, the interested party may present his claim through the regular Justice procedures.

The IDB's Independent Consultation and Investigation Mechanism (ICIM), available on its website <https://www.iadb.org/mici/>, is also available.

Deadlines for Response to Claims

All complaints must be registered, and the proposed solution must be communicated to the interested party within the following deadlines: low importance complaints will be dealt with within a maximum period of 30 calendar days, medium-importance complaints will be dealt with within 15 calendar days, and high importance complaints will be dealt with within a maximum period of 7 calendar days. The deadlines set can be adjusted by WSC.

In all cases, a complaint response report will be drawn up and signed by the person who filed the complaint in accordance with the attention of the complaint. WSC will systematize the complaint records and the minutes of attention of these.

The information provided will be relevant and understandable according to the sociocultural characteristics of the person who consults. Likewise, it will oversee supervising the process, detecting deviations, and ensuring its solution.

Monitoring and Documentation

WSC will be responsible for maintaining an up-to-date database with all documentation and information related to complaints submitted. It will also be responsible for following up on the complaint processing process, in coordination with the areas involved, and for facilitating the complainant's participation in the process.

A follow-up form will be completed for each case. Once an agreement is reached, follow-up will be followed up to confirm that the relevant resolution measures are being implemented.

The complaint registry must demonstrate that all these actions and processes were conducted in accordance with this document.

It will include:

- Date on which the complaint was registered;
- Person responsible for the complaint;
- Information on the remedies proposed/communicated by the complainant (if applicable);

- Date on which the complaint was closed; and
- The date of the response was sent to the complainant.

In the Semiannual Compliance Reports, WSC will report to the IDB on the status and follow-up of the management of complaints and grievances received in the framework of the execution of the Program's projects.

Monitoring

Any complaint closed with conformity by the complainant must be monitored for a reasonable period in order to verify that the reasons for the complaint or claim were effectively resolved. The estimated period for this purpose is 6 (six) months from the response and / or solution to the claim.

Implementation Timeline

The GRM will be available throughout the execution of the Program.

IDB Program Grievance Mechanism

In addition to the Grievance Redress Mechanism (GRM) of the Program implemented by EA, the IDB, on the Project page, will present a public access mechanism with which complaints and claims that have not been resolved with the mechanism of each project can be managed.

IDB's Independent Consultation and Investigation Mechanism

The IDB also has an Independent Consultation and Investigation Mechanism (MICI, more info at <https://www.iadb.org/en/mici/mici-independent-consultation-and-investigation-mechanism>), which can also be accessed to process complaints that could not be resolved at the previous two levels of grievance mechanisms.

MICI is a grievance office independent of the project teams, which facilitates dispute resolution processes to resolve concerns raised. In addition, it conducts independent investigations to determine whether the IDB Group has met its standards and improve the Group's practices.

Keep in mind that the handling of a complaint must start at the local level to be eligible at the next level. All grievance mechanisms will be available throughout the duration of the Program.

13 APPENDIX A - CODE OF CONDUCT - MODEL AND SUGGESTED CONTENT

Model Standard Code of Conduct for Workers

Introduction

The company is committed to ensuring a work environment which minimizes any negative impacts on the local environment, communities, and its workers. The company also strongly commits to creating and maintaining an environment in which Sexual Exploitation and Abuse (SEA) and Sexual Harassment (SH) have no place, and where they will not be tolerated by any employee, sub-contractor, supplier, associate, or representative of the company. The purpose of this Code of Conduct is to:

1. Create a common understanding of what constitutes Sexual exploitation and abuse, and sexual harassment.
2. Create a shared commitment to standard behaviors and guidelines for company employees to prevent, report, and respond to SEA and SH.
3. Create understanding that breach of this code of conduct will result in disciplinary action.

Definitions

Sexual Exploitation and Abuse (SEA)

Is defined as any actual or attempted abuse of a position of vulnerability, differential power, or trust, for sexual purposes, including, but not limited to, profiting monetarily, socially or politically from the sexual exploitation of another.

Sexual Abuse: “The actual or threatened physical intrusion of a sexual nature, whether by force or under unequal or coercive conditions.”

Sexual Harassment:

Unwelcome sexual advances, request for sexual favors, and other verbal or physical conduct of sexual nature.

Sexual Harassment versus SEA

SEA occurs against a beneficiary or member of the community. Sexual harassment occurs between personnel/staff of an organization or company and involves any unwelcome sexual advance or unwanted verbal or physical conduct of a sexual nature. The distinction between the two is important so that agency policies and staff trainings can include specific instruction on the procedures to report each.

Consent is the choice behind a person’s voluntary decision to do something. Consent for any sexual activity must be freely given, ok to withdraw, made with as much knowledge as possible, and specific to the situation. If agreement is obtained using threats, lies, coercion, or exploitation

of power imbalance, it is not consent. Under this Code of Conduct consent cannot be given by anyone under the age of 18, regardless of the age of majority or age of consent locally. Mistaken belief regarding the age of the child is not a defense.

- There is no consent when agreement is obtained through:
- the use of threats, force or other forms of coercion, abduction, fraud, manipulation, deception, or misrepresentation
- the use of a threat to withhold a benefit to which the person is already entitled, or
- a promise is made to the person to provide a benefit.

While all forms of violence against a community resident or a co-worker are forbidden, this code of conduct is particularly concerned with the prevention and reporting of sexual exploitation and abuse (SEA) and sexual harassment which constitute gross misconduct, is grounds for termination or other consequences related to employment and employment status:

(1) Examples of sexual exploitation and abuse include, but are not limited to:

- A project worker tells women in the community that he can get them jobs related to the work site (cooking and cleaning) in exchange for sex.
- A worker that is connecting electricity input to households says that he can connect women headed households to the grid in exchange for sex.
- A project worker gets drunk after being paid and rapes a local woman.
- A project worker denies passage of a woman through the site that he is working on unless she performs a sexual favor.
- A manager tells a woman applying for a job that he will only hire her if she has sex with him.
- A worker begins a friendship with a 17-year-old girl who walks to and from school on the road where project related work is taking place. He gives her moto rides to school. He tells her that he loves her. They have sex.

(2) Examples of sexual harassment in a work context include, but are not limited to:

- Male staff comment on female staffs' appearances (both positive and negative) and sexual desirability.
- When a female staff member complains about comments male staff are making about her appearance, they say she is "asking for it" because of how she dresses.
- A male manager touches a female staff members' buttocks when he passes her at work.
- A male staff member tells a female staff member he will get her a raise if she sends him naked photographs of herself.

Individual signed commitment:

I, _____, acknowledge that sexual exploitation and abuse (SEA) and sexual harassment, are prohibited. As an (employee/contractor) of (contracted agency / subcontracted agency) in (country), I acknowledge that SEA and SH activities on the work site, the work site surroundings, or the surrounding community constitute a violation of this Code of

Conduct. I understand SEA and SH activities are grounds for sanctions, penalties or potential termination of employment. Prosecution of those who commit SEA and SH may be pursued if appropriate.

I agree that while working on the project I will:

- Treat all persons, including children (persons under the age of 18), with respect regardless of sex, race, color, language, religion, political or other opinion, national, ethnic or social origin, gender identity, sexual orientation, property, disability, birth or other status.
- Commit to creating an environment which prevents SEA and SH and promotes this code of conduct. In particular, I will seek to support the systems which maintain this environment.
- Not participate in SEA and SH as defined by this Code of Conduct and as defined under (country) law (and other local law, where applicable).
- Not use language or behavior towards women, children or men that is inappropriate, harassing, abusive, sexually provocative, demeaning or culturally inappropriate.
- Not participate in sexual contact or activity with anyone below the age of 18. Mistaken belief regarding the age of a child is not a defense. Consent from the child is also not a defense. I will not participate in actions intended to build a relationship with a minor that will lead to sexual activity.
- Not solicit/engage in sexual favors in exchange for anything as described above.
- Unless there is the full consent by all parties involved, recognizing that a child is unable to give consent and a child is anyone under the age of 18, I will not have sexual interactions with members of the surrounding communities. This includes relationships involving the withholding or promise of actual provision of benefit (monetary or non-monetary) to community members in exchange for sex—such sexual activity is considered “non-consensual” under this Code.

I commit to:

- Adhere to the provisions of this code of conduct both on and off the project site.
- Attend and actively partake in training courses related to preventing SEA and SH as requested by my employer.

If I am aware of or suspect SEA and SH, at the project site or surrounding community, I understand that I am encouraged to report it to the Grievance Reporting Mechanism (GRM) or to my manager. The safety, consent, and consequences for the person who has suffered the abuse will be part of my consideration when reporting. I understand that I will be expected to maintain confidentiality on any matters related to the incident to protect the privacy and security of all those involved.

Sanctions: I understand that if I breach this Individual Code of Conduct, my employer will take disciplinary action which could include:

- Informal warning or formal warning

- Additional training.
- Loss of salary.
- Suspension of employment (with or without payment of salary)
- Termination of employment.
- Report to the police or other authorities as warranted.

I understand that it is my responsibility to adhere to this code of conduct. That I will avoid actions or behaviors that could be construed as SEA and SH. Any such actions will be a breach this Individual Code of Conduct. I acknowledge that I have read the Individual Code of Conduct, do agree to comply with the standards contained in this document, and understand my roles and responsibilities to prevent and potentially report SEA and SH issues. I understand that any action inconsistent with this Individual Code of Conduct or failure to act mandated by this Individual Code of Conduct may result in disciplinary action and may affect my ongoing employment.

Signature: _____

Printed Name: _____

Title: _____

Date: _____

14 APPENDIX B – WSC HURRICANE PREPAREDNESS PLAN

15 APPENDIX C – PROJECT DRAWINGS – NEW PROVIDENCE
