

BARBADOS CLIMATE RESILIENT SOUTH COAST WATER RECLAMATION PLANT (BA-L1063)

CONSULTATION REPORT

PREPARED FOR: INTER-AMERICAN DEVELOPMENT BANK ENVIRONMENTAL SOLUTIONS LTD. 1300 NEW YORK AVENUE, N.W. WASHINGTON, D.C. 20577,USA

PREPARED BY: 7 HILLVIEW AVENUE **KINGSTON 10** JAMAICA



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Table of Contents

1	INTF	RODUCTION1
	1.1	PROJECT OVERVIEW
	1.2	WORKSHOP OBJECTIVES1
	1.3	Approach1
	1.3.1	1 Method of Coordination
	1.3.2	2 Target Participants
		Participation
	1.3.3	3
2	том	/N HALL MEETINGS PROCEEDINGS2
	2.1	INTRODUCTION
	2.2	PRESENTATION OF PROJECT BACKGROUND AND ESIA.ESMP
	2.3	QUESTIONS AND ANSWERS SESSION
	2.4	PRESENTING PANEL
3	KEY	TAKEAWAYS4
	3.1	May 9, 2024 – Hawthorn Methodist Church
	3.1.1	1 Queries
	3.1.2	
	3.2	May 11, 2024 – Deighton Griffith Secondary School
	3.2.1	x
	3.2.2	2 Comments and Recommendations7
	3.3	RECOMMENDATIONS
4	APP	ENDIX I – REGISTER OF ATTENDEES9
5	APP	ENDIX II – MEETING AGENDA 11
6	APP	ENDIX III – WORKSHOP PRESENTATION
	6.1 6.2	BWA'S PRESENTATION ON THE CONTEXT AND BACKGROUND OF THE PROJECT
7	APP	ENDIX IV – TOWN HALL MEETINGS INVITATIONAL MATERIAL
	7.1 7.2	FLYER

1 INTRODUCTION

This document presents the report on the Town Hall meetings that were held on **May 9th** at the **Hawthorn Methodist Church**, and on **May 11th** at the **Deighton Griffith Secondary School**. This report represents the comprehensive overview of the proceedings of these meetings and the key takeaways from each session. A total of **64 participants (31 males and 33 females)** attended both meetings, representing different organisations/institutions/agencies and communities identified as having a vested interest in the potential impacts and benefits of the Project.

1.1 Project Overview

Environmental Solutions Limited (ESL) was contracted to prepare the Environmental and Social Impact Assessment (ESIA) Report as well as the Environmental and Social Management Plan (ESMP) for the Barbados Climate Resilient South Coast Water Reclamation Plant (BA-L1063). The Project aims to improve the resiliency of the island's water supply, reduce water insecurity and strengthen key institutions through the upgrade of the existing South Coast Sewage Treatment Plant (SCSTP), the construction of a new water reclamation facility and the installation of a ~30km pipeline, among other components. Important components of the Project included the agricultural reuse of reclaimed water for irrigation and recharging aquifers. This suggested that there would be key socioeconomic benefits/impacts that needed to be assessed, along with the different physical and ecological impacts.

1.2 Workshop Objectives

Due to the extent of the Project activities and area, a series of Town Hall meetings were recommended to act as public consultation sessions to accommodate engagement with key stakeholders who could benefit and/or potentially be negatively impacted by the works. The primary objectives of these meetings were to:

- **1.** *Provide Context of the Project:* the Executing Agency presented on the justification of the Project, the different Project components, the funding, and the Project timeline.
- 2. Present on ESIA/ESMP: the Consultant presented on the key findings of the ESIA, primarily the findings of the physical, ecological and socioeconomic assessment which included the assessment of gender disparities and the needs of persons with disabilities (PWDs). The potential impacts of each Project component were presented on as well as the recommended measures included in each management plan included in the overall ESMP to mitigate against the potential impacts identified.
- **3.** Facilitate Questions/Comments/Feedback: the Question and Answer session of each meeting allowed for stakeholders to pose questions regarding the ESIA and ESMP. Stakeholders were also allowed the opportunity to provide any comments and feedback that could be used to improve the validity of the report.

1.3 Approach

Each meeting utilized an interactive format whereby stakeholders were encouraged to raise questions and/or concerns as well as to prove comments and feedback based on their professional and personal experiences and insights, and relationship with the Bajan environment. Stakeholders were first informed of the Project context and background, then the potential impacts of the different Project components that were identified during the consultancy, as well as the recommendations to address those issues. Prior to the meetings, the ESIA.ESMP was made public to sensitise stakeholders on the key findings and recommended management plans. The meetings were separated into three (3) sessions:

- 1. A **Welcome and Introductory Session** in which a member of the presenting panel extended welcome to all attendees before introducing the panel and outlining the meeting's agenda.
- 2. **Presentations on Project Background and ESIA.ESMP** in which the attendees were informed of the justification of the Project, the different components and the timeline. This was followed by the presentation of the key findings of the Environmental and Social Impact Assessment that was conducted, and the key mitigation measures recommended.
- 3. A **Question and Answer Session** in which attendees were encouraged to pose questions on what was presented and to provide any comments and feedback.

1.3.1 Method of Coordination

The execution of the Town Hall meetings were facilitated by the Barbados Water Authority (BWA) in collaboration with ESL. Internal meetings were held with the Project team to settle on suitable dates and methods of hosting each Town Hall meeting, as well as to identify target participants/stakeholders. Following the confirmation of the date and time, the BWA issued invitations to the identified stakeholders via letters and a flyer which included the logistics of each meeting (date, time, medium), the intended purpose of the meetings and the method to access the ESIA.ESMP report.

1.3.2 Target Participants

Participants were expected to include stakeholders from communities that were identified as at risk from Project activities in the ESIA, as well as from NGOs, CBOs, government and regulatory agencies, private sector and civil society agencies, and farmers who would receive reclaimed water for agricultural reuse. Those with a general interest in the environment and development initiatives on the island were also expected to attend. These target participants were consistent with those recommended in the Stakeholder Engagement Plan (SEP) included in the ESMP.

1.3.3 Participation

Appendix I presents the list of attendees at each town hall meeting and the organization, sector, or community that each represented. The actual number of attendees were less than what was anticipated as there was a need for representation across multiple sectors and communities that could be affected by the Project activities. Despite this, the participation of the attendees during both meetings were adequate as stakeholders raised key points, comments and questions that would aid in the enhancement of the validity of the ESIA and ESMP presented.

2 TOWN HALL MEETINGS PROCEEDINGS

2.1 Introduction

Each meeting commenced at approximately 6:30 p.m. and all participants were invited to indicate their names as well as the name of the organization they represented for registration purposes. The meetings were introduced by a member of the presenting panel, who also expressed gratitude for the participants' attendance. An overview of the meeting agenda was then shared.

2.2 Presentation of Project Background and ESIA.ESMP

During this session, the main focus was to first present on the justification, details and timeline of the Project before presenting on the key issues and recommendations that were identified in the consultancy. The Project Components presented on included:

- 1. Component 1: Water Reclamation Infrastructure
- 2. Component 2: Reclaimed Water Reuse
- 3. Component 3: Climate Change and Biodiversity Opportunities
- 4. Component 4: Institutional Strengthening

The presentation of the ESIA.ESMP first provided an overview of the existing conditions of the physical, ecological and socioeconomic environment. This was followed by presenting on the potential impacts identified for each phase of Components 1-3. The following list is a summary of the potential impacts that were identified and discussed in the presentation:

- Dust and Noise Nuisances
- Damage to Property and Infrastructure
- Restricted Access to Communities and Businesses
- Relocation of Informal Vendors
- Disruption to Heritage Assets
- Inclusion of Vulnerable Groups
- Gender Disparities

- Contamination of Physical Resources (soil and groundwater)
- Water and Sewage Supply
- Traffic Disruptions
- Disruption to Ecological Resources (Organisms and Habitats)
- Health and Safety of Communities and Workers

The presentation also touched on the different management plans of the ESMP that comprise recommended measures to mitigate against potential impacts related to the aforementioned issues of concern.

See Appendix for the presentations shared.

2.3 Questions and Answers Session

Both meetings followed a similar structure in which the introductory session was followed by the presentations then culminated with the Question and Answer Session. Key takeaways from each meeting were mainly from the Question and Answer Session of each meeting. Participants were instructed to direct their questions to a specific member of the presenting panel if necessary, as well as to share their names. Participants were also advised to focus questions on the presentations that were shared as well as that any comments or feedback would be welcomed.

2.4 Presenting Panel

The table below shows the members of the presenting panel during each meeting.

DATE	PANEL								
May 9, 2024	 Mrs. Yvette Harris-Griffith – Marketing Officer, BWA Mrs. Shelley Parris – Project Manager, BWA Mr. Rodane Samuels – ESL Consulting (Jamaica) Mr. Alex Ifill – Manager, Water Resources & Environmental Management Unit 								
May 11, 2024	 Mrs. Yvette Harris-Griffith – Marketing Officer, BWA 								

DATE	PANEL
	 Mrs. Shelley Parris – Project Manager, BWA Mr. Rodane Samuels – ESL Consulting (Jamaica) Mr. Alex Ifill – Manager, Water Resources & Environmental Management Unit Mr. Keithroy Halliday – General Manager, BWA

3 KEY TAKEAWAYS

3.1 May 9, 2024 – Hawthorn Methodist Church

3.1.1 Queries

- A representative from Land Conservancy Barbados queried the inclusion of the farmers that are located adjacent to the headquarters of the Ministry of Agriculture and Food Security in the socioeconomic assessment and was then informed that the farmers that were mainly included in the assessment were those located in St. Phillip and St. George on the different plantations. A cursory assessment of the potential impact of those farmers was included in the ESIA.ESMP report.
- The location of the proposed Solar Facility was a common query raised throughout the session. Participants were made aware that it is proposed that the solar facility be situated at the Belle Plantation. It was noted that this location did not fall within the area of assessment indicated during the presentation and so it was suggested that a more thorough assessment of the potential impacts of constructing the solar facility at the proposed site be conducted. The main concern raised for the construction of the solar facility was the method of land clearance and how this would affect the communities/businesses in the surrounding areas. The suggestion to use low-impact machinery was also raised for this point.
- As it relates to Component 1, one individual queried if the intention was to upgrade the existing plant along with constructing a new reclamation facility. It was then reiterated that Project Component 1 includes potential works to both upgrade the existing plant and to construct a new reclamation facility that would facilitate the tertiary treatment of wastewater.
- The follow-up question to this matter focused on the future usage of the temporary outfall locations and the resulting effect on the environment. It was stated that there is no concrete intention to completely abandon the usage of these temporary outfall locations but that the successful implementation of the Project could reduce the need for these temporary outfall locations.
- A common concern shared by participants was how effective the works would be and what measures would be put in place to prevent a repeat of the overflow incident in 2018 that had severe impacts on the physical, ecological and socioeconomic environment. This was accredited to an overwhelmed SCSTP operational infrastructure, and with the Project intending to upgrade the operational infrastructure of this existing plant as well as construct a new reclamation facility, it is deemed highly unlikely that an incident of that magnitude will be

repeated. Measures have been added to the Stakeholder Engagement Plan (SEP) of the ESMP to account for this. See Chapter 15.5 of the ESIA.ESMP report.

- An individual representing the Future Centre Trust expressed curiosity on the exact pipeline route and dimensions, considering the impacts on the palms that line the ABC Highway and the trees being planted along the trailway route. It was explained that at the time of the town hall meetings, the Project was still in the preliminary phase as it related to exact designs. This was also the response given to individuals who queried the exact locations of the proposed storage locations at Staple Grove and those who queried the exact timeline of the Project. Measures to prevent impacts on the palms and trees along the trailway route were included in the Biodiversity Management Plan, included in the Environmental, Health and Safety Plan on the ESMP.
- Other queries focused on the maintenance of the facility and whether lab facilities for quality monitoring would be established on-site. It was stated that an Operations and Maintenance Plan for the facilities is recommended and should be in effect during the Operational Phase. This should encourage the real-time monitoring of activities, including ensuring all equipment are fully functional and without damage (particularly as it relates to possible leaks in the pipeline).

3.1.2 Comments and Recommendations

- It was shared that to say that the Graeme Hall wetlands are last remaining source of mangroves on the island is incorrect but that the wetlands are instead the last source of mangrove forests on the island.
- It was recommended that low-impact mechanisms be implemented to reduce the potential impacts on the environment. This was in light of the acknowledgement that there is a tendency on the island to opt for heavy machinery to conduct tasks that could be done via less influential methods. The example given was using manual labour to clear fields instead of heavy machinery. Some suggested measures have been included in the ESIA/ESMP, Chapter 9.12.3.
- The representative from the Future Centre Trust expressed support for the Project. This was followed by a discussion about the possibility of supporting larger palm trees along the highway and the possible methodology of pipeline installation that would preserve the trees along the trailway.
- It was suggested that the list of communities identified as being at greatest risk to the Project include Watts Village, north of Staple Grove where it is proposed that the treated wastewater is stored. It was indicated that the ESIA includes the complete list of communities that would be potentially affected.
- It was lastly requested that a more detailed Operational Management and Risk Management Plan be included as a constituent of the ESMP.

3.2 May 11, 2024 – Deighton Griffith Secondary School

3.2.1 Queries

- Highlighting the intention to construct a solar facility as a sub-component of Project Component 3 sparked interest in the sources of greenhouse gas emissions and what aspects of the operation of the treatment facilities would be most influential to greenhouse gas emissions. Participants were informed that the ESIA.ESMP report includes a chapter that details the extent to which the operations at the existing facility emit greenhouse gases. Examples were also provided, highlighting some of the different activities that contribute to greenhouse gas emissions. It was also declared that the intention is to achieve a net reduction in emissions, considering the solar facility offsetting energy requirements as well as more efficient practices at the treatment facilities.
- Concerns were raised about the potential management and handling of the sludge generated from the treatment process. It was reiterated that considerations are being made to use the sludge as a form of soil conditioner and that the Sludge Management Plan details other potential uses of the sludge. Still, there were concerns about the eventual disposal/introduction of sludge into the environment. Measures regarding information disclosure and consultation on sludge management during project execution were added to the Stakeholder Engagement Plan (SE) that is part of the ESMP (Chapter 15.5).
- Relating to Component 2, it was unclear based on the presentation if the ESIA accounted for the possible impacts of the actual water supply along with the impacts of installing the pipeline. It was reiterated that the assessment conducted accounted for both the construction and operational phase of each Project component and so would include the potential impacts of water distribution and agricultural reuse. The examples that were given included the assessment of excessive irrigation or the possible alteration of soil quality/characteristics.
- Several questions were raised to better understand the overall pipeline route and proposed usage of the treated wastewater. The map detailing the key locations of the overall project area was explained. This included detailing the sections of the pipeline route where the water would be pumped and gravity-fed, potential areas of storage and aquifer recharge points.
- As it relates to the recommended standards of water quality in the associated management plan, questions were posed seeking clarity on the source of the standards, if baseline studies show that these standards are maintained and the frequency with which testing must be done. Participants were informed of the source of the standards included in the ESMP (that being the United States Environmental Protection Agency and World Health Organization) and were also made aware of the fact that specific standards were developed by the island's Environmental Protection Department for this Project. A representative from the Barbados Agricultural Development and Marketing Corporation (BADMC) also provided input on the existing standards of the water supply, indicating that testing is done monthly and should be done periodically throughout the duration of the Project to ensure that the recommended standards are maintained.
- Following on the topic of the quality of water being supplied, one individual questioned whether it would be more beneficial to the people to supply the water for domestic use as

opposed to for agricultural reuse and aquifer recharge. This was challenged by indicating the immediate need for addressing the water insecurity issue in the agricultural sector and the need to improve the resilience of the island's groundwater resources as they are the primary source of water on the island. As well, it was shared that there would be legislative obstacles to simply supply treated wastewater for domestic use.

- Questions were also raised related to the price of the water supply to which it was shared that there are ongoing conversations to settle on a price that would be fair to potential beneficiaries. Measures for information disclosure and consultation on price of the water supply during project execution were included in the Stakeholder Engagement Plan (SEP) included in the ESMP (Chapter 15.)
- With emphasis on the Grievance Redress Mechanism included in the ESMP, there were concerns about how the mechanism would be monitored and who would be responsible for continued engagement with the communities identified. It was clarified that it is recommended that a Community Liaison Officer be assigned to ensure that grievances are collected and resolved in a timely manner as well as to ensure that there is effective engagement with all communities potentially affected.
- A similar question was asked about the responsibility for ensuring measures are followed as stipulated in each management plan. To address this concern, it was explained that each management plan details the role and responsibilities of the involved parties in addition to the measures that were presented. Examples were also given of the different indicators included in each plan that would be used as a measure of the effectiveness of the plan. Lastly, it was explained that these indicators would have to be monitored, documented and reported on in a stipulated timeframe. It was also added that contractors would have to establish their intention of adhering to the requirements of the management plans.
- The final queries focused on the details of Project Component 4 and if the intended strengthening of the institutional framework would allow for an increase in youth employment in the sector. It was again reinforced that the exact details of these components were not yet finalised, but it was agreed that it would be beneficial if this was to become a concrete possibility.

3.2.2 Comments and Recommendations

- A representative from the Future Centre Trust stated that the assessment emphasized the need for improvement of the trailway for tourism-related reasons but added that the possible improvement of the trailway would have several benefits related to different Sustainable Development Goals. It was emphasized that the improvement of the wastewater, road and trailway infrastructure would ultimately be most beneficial to the citizens of Barbados.
- One individual supported the intention of the Project but stated that there would be a more efficient way to use the reclaimed water, noting that recharging of aquifers would be most beneficial in the Buckley Valley or in the general Belle area.
- Another individual supported the Project but stated his desire to one day see initiatives taken to augment the water supply by tapping into water from the sea. This sparked a discussion

which culminated in the agreement that the island is not yet at a stage to accommodate desalination efforts.

3.3 Recommendations

The following summarizes the different recommendations that were put forward across both meetings to be incorporated into the final version of the ESMP.

- There was an insistence on the recommendation to use low-impact machinery particularly during land clearance activities to minimise the environmental impact. There is a concern that there is too high of a dependency on heavy machinery to perform tasks that could otherwise be done in a more controlled, less impactful manner. Relevant measures were included in the ESMP (Chapter 9.12.3).
- Concerns were raised about the detailed use and disposal of sludge and the products of the sludge treatment process. It was shared that the intended purpose of the sludge treatment process is to eventually use the byproduct (biosolids) for land application purposes and so it was recommended that the ESMP includes measures to ensure that the method of land application be controlled to reduce the potential impacts as well as to account for the inevitable disposal of sludge. Measures for information disclosure and consultation regarding sludge management were included in the Stakeholder Engagement Plan (SEP) for project execution (ESMP, Chapter 15.5).
- It was suggested that there be some written documentation of the measures that will be put in place to ensure that a repeat of the 2018 wastewater overflow incident is prevented. Measures for information disclosure and consultation regarding incident prevention and response were included in the Stakeholder Engagement Plan (SEP) for project execution (ESMP, Chapter 15.5).
- It was recommended that each management plan that is constituent of the broader ESMP clearly indicate the roles and responsibilities of different players in the implementation of each plan as well as the metric to be used to determine the effectiveness of each plan.

4 APPENDIX I – REGISTER OF ATTENDEES

The table below lists those who were in attendance for both meetings. It should be noted that not all participants shared their full name.

May 9									
(41 Participants: 15 M, 26 F)								
NAME	ORGANIZATION/SECTOR/COMMUNITY								
Ann Marie Burke	-								
Annie Alleyne	BWA								
Ardith Burgess	3R Cruise								
Barney Gibbs	Future Centre Trust								
Charles Leslie	BWA								
Elon Cadogan	-								
Elvin Jordan	BWA								
Floris Vermeulen	BWA								
Lana Harewood	Barbados Tourism Product Authority								
Marlene Hurdle-Walcott	Rendezvous								
Melanie Haynes	BWA								
Patricia Innis	Pine								
Ricardo Blackman	BWA								
Sade Dean	-								
Sara Odle	-								
Stephen Griffith	-								
Vickindra Simon	ССССС								
Kayla Thomas	CERMES								
Gina Hinds	-								
Alex	ССССС								
Andrea	BWA								
Andrew	Unnamed Community								
Barbara	Graeme Hall Nature Sanctuary								
Cornenie	Rendezvous Gardens								
Deana	CERMES								
Eucline	BWA								
Hallam	Maxwell								
Jackie	Unnamed Community								
John	Rockley								
Judette	BWA								
Lani	The Land Conservancy								

Laura	Dover and Maxwell
Michael	Ministry of Agriculture and Food Security
Mikia	BWA
Natalia	CCCCC
Nicole	BWA
Patricia	Pine
Roger	BWA
Shade	BHTA
Shara	The Land Conservancy
Trevor	Barbados Association of Professional Engineers

May 11										
(23 participants: 16 M, 7 F)										
NAME	ORGANIZATION/SECTOR/COMMUNITY									
Eric Small	Christ Church									
Lennox Devonish	Photography Nation									
Leslie Seale	BADMC St. Thomas									
Sherey Hinds										
Stacyann Newsam	BWA									
Jonathan Pile	St. George									
Andrew	-									
Ann	Christ Church									
Annemarie	-									
Carol	- -									
Eleanor										
Elwy	Chancellery Lane									
Jamekal	BADMC									
John	Nation BWA									
Judette										
Kenton	Durants									
Leo	CZMU									
Michael	St. George									
Nicole	BWA									
Percival	BWA									
Roger	BWA									
Stacey	Future Centre Trust									
Vincent	Barbados Association of Professional Engineers									

5 APPENDIX II – MEETING AGENDA

No.	Item Description	Person Assigned	Estimated Duration	Special Notes
1	Introduction of Head Table	Mrs. Yvette Harris- Griffith – Marketing Officer, BWA	5 mins	Master of Ceremonies – Refer to list of invitees
2	Presentation – Introduction to /Background of the project	Mrs. Shelley Parris – Project Manager, BWA	10 mins	Basic Information only
3	Main Presentation – ESIA/ESMP Findings for the SCRWRP	Mr. Rodane Samuels, ESL Consulting (Jamaica)	50 mins	Detailed presentation of findings
4	Question & Answer	 Mrs. Shelley Parris – Project Manager, BWA Mr. Rodane Samuels, ESL Consulting (Jamaica) Mr. Alex Ifill – Manager, Water Resources & Environmental Management Unit 	30-40 mins	Limit of questions or comments to the ESIA/ESMP document and/or presentation material ONLY
5	Closing	Mrs. Yvette Harris- Griffith – Marketing Officer, BWA	2 mins	Reminder to the website or the hardcopy placement areas for further review and refer any additional queries/comments to the projectoffice@bwa.gov.bb email and

The following shows the agenda that was utilized for both meetings.

6 APPENDIX III – WORKSHOP PRESENTATION

6.1 BWA's Presentation on the Context and Background of the Project

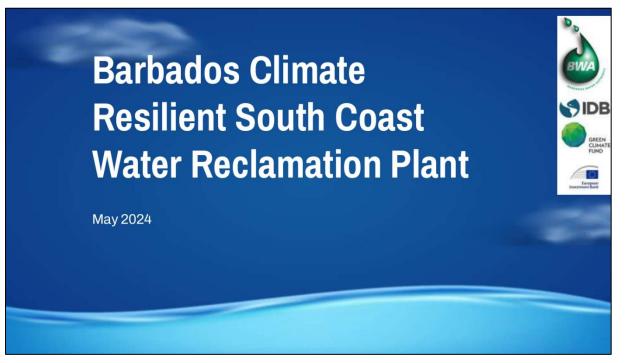


Table of contents

- 01 Project Background
- 02 Objectives
- 03 Components
- 04 Project Investment
- 05 Timeline



01 Background



Climate Change Factors

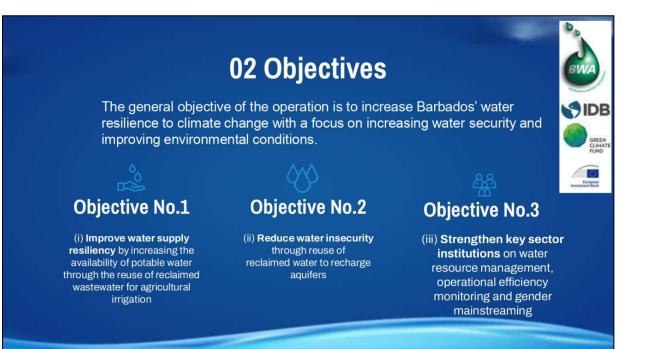
International temperature increases are continuing to intensify evapotranspiration rates, reducing soil moisture, infiltration and aquifer recharge. Reduced rainfall and sea level rise also serve to reduce availability of groundwater resources and exacerbate the country's water scarcity.



How are we addressing it?

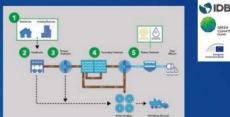
To confront the challenges of climate change, the Government of Barbados (GoB) launched the Roofs to Reefs Programme (R2RP) as a holistic, integrated national initiative for the resilient development of Barbados. R2RP is an integrated public investment program founded on principles of sustainable development and climate change resilience and represents the development model for Barbados for the next decade. The South Coast Reclamation Project is a major step within the programme towards achieving this end





03 Project Components –pt 1

- 1. Component 1. Water Reclamation Infrastructure
 - a. This component will finance the construction of the New South Coast Water Reclamation and Re-use Facility (SCWRRF) Design Build EPC/Turnkey modality and O&M costs for a number of years.
 - b. The Upgrade of the existing South Coast Sewage Treatment Plant (SCSTP)
- 2. Component 2: Reclaimed Water Reuse
 - a. Sub-component 1 Agriculture Reuse of Reclaimed Water Pipeline
 - b. Sub-component 2 Aquifer Recharge Infrastructure (pipeline, injection wells, boreholes (exploration/abstraction), monitoring wells and pumping stations.







12	05	Project 1		m	el		10							
1	Initiative	Activity Description	Jan	Feb	Mar	Apr	Mav	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	IDB Investment Loan	Loan Application Preparation and Approval												
N	Preparation for Component 1- Plant Upgrade	Advance procurement of Design / Build Contractor by Prequalification												
	Loan & Grant from Green Climate Fund	Loan and Grant Application Preparation and Approval												
	Implementation	Commencement of Components												



6.2 ESL's Presentation on the ESIA.ESMP







Project Components

- UN OCHA, 2022



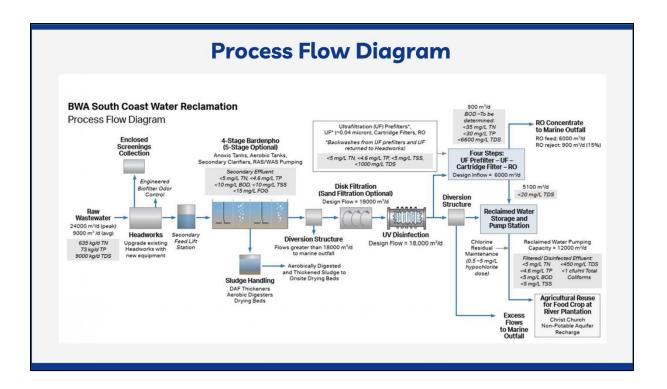
from aquifer sources.

Component 1 - Construction of the New South Coast Water Reclamation Plant (SCWRP) This component will finance the construction of the New South Coast Water Reclamation and Reuse Facility (SCWRRF). It will provide secondary and tertiary treatment followed by an Advanced Water Treatment (AWT) including safe and sustainable treatment and management of sludge with the aim to reduce GHG emissions.



Component 2 - Agriculture Reuse of Reclaimed Water and Aquifer Recharge

- Agriculture Reuse of Reclaimed Water consisting of the installation of a 25 km pipeline for transporting reclaimed water for irrigation of approximately 160 hectares at River Plantation along the old trainline ("Trailway")
- 2. Aquifer Recharge Infrastructure consisting of the installation of water pipeline, injection wells, boreholes, and pumping stations for aquifer recharge



Project Components



Component 3 - Graeme Hall Swamp Conservation and Construction of 7 MW Solar Facility

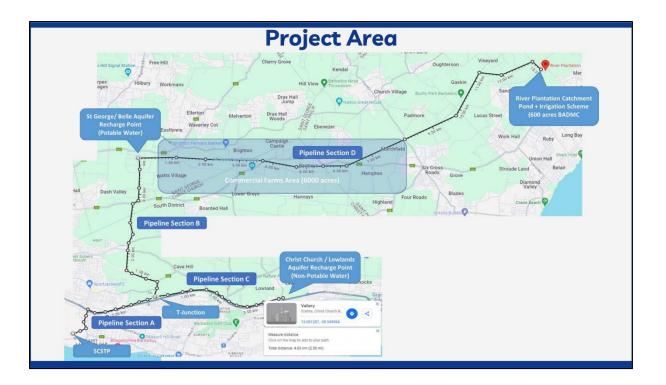
1. Graeme Hall Swamp Conservation will support the development and implementation of a Monitoring Plan for the Natural Heritage Conservation Area.

2. Solar Energy Generation with Battery Storage consisting of 7 MW solar photovoltaic plant and associated energy storage capacity, increasing the sustainability of the Barbados' power grid, and also fostering the resilience of BWA's pumping stations.



Component 4 - Institutional Strengthening

This component will finance institutional strengthening of the executing structure, including the FTC, GAS laboratory, MAFS, EPD, BADMC Irrigation Engineering Unit, and BWA





	The Existing Environment Method of Data Collection								
	PHYSICAL								
	 Observations made during project area walk-through Secondary/Literature Review Assessment of geographical maps and satellite imagery 								
	ECOLOGICAL								
	 Biodiversity Assessment conducted via photographs from Site Visit Review of past ecological studies 								
03	SOCIOECONOMIC								
	 Social Survey conducted during Site Visit Demographic statistics retrieved from the Barbados Statistical Institute Assessment of local policies; secondary/literature review 								



The Physical Environment

- Barbados is primarily flat, with most of its developed areas located in coastal regions.
- Sea level rise and storm surges are serious risks threatened by the changing climate.
- Air and noise pollution are mainly due to vehicular traffic and socioeconomic activities.
- There is a strain on groundwater reserves in the face of water scarcity.



The Ecological Environment

- The Graeme Hall Wetlands are the last remaining home of mangroves in the island; red and black mangroves.
- Untreated water discharge during emergencies as well as runoff of untreated stormwater, agricultural, and commercial water further degraded this ecosystem.
- There are ongoing projects to plant fruit trees along the Barbados Trailway; the ABC Highway is lined with palms.
- Corals and endangered turtle species characterise the marine ecosystems.



The Socioeconomic Environment

- The areas surrounding the SCSTP (Graeme Hall, St. Lawrence Gap) are densely populated.
- Vegetable and coconut vendors are typically found along sections of the ABC Highway; along with many small and large businesses in the surrounding communities.
- Traffic is a primary issue raised and will potentially be exacerbated by the works.
- Improvement of the Barbados Historic Trailway could reap the socioeconomic benefits of improved transportation and recreation.

Impact Assessment

COMPONENT 1 - CONSTRUCTING THE RECLAMATION FACILITY

The potential impacts identified for the **CONSTRUCTION PHASE** are:

- Employment opportunities for local labourers, contractors, engineers, etc.
- Environmental pollution and degradation if improper waste management techniques are practiced.
- Air and noise pollution due to excavation and the use of machinery and equipment.
- Traffic issues limiting access to businesses and restricting mobility in communities.
- Pest (mosquito) proliferation due to settled water on construction site.
- Runoff into the Graeme Hall wetlands if a proper drainage network on site isn't developed.
- Health and safety risks for workers during works





Impact Assessment

COMPONENT 1 - CONSTRUCTING THE RECLAMATION FACILITY

The potential impacts identified for the **OPERATIONAL PHASE** are:

- Odour issues if there is a failure in odour control mechanisms.
- Contamination of aquifer and irrigation water due to malfunctioning equipment.
- Artificial lighting disrupting the behavioural patterns of nocturnal organisms.
- Reduced discharge into wetlands and marine environments, allowing them the opportunity for rehabilitation.
- Effective management of sludge for beneficial purposes, such as for fertilizer.
- Health and safety risks for workers working at the new facility; operating machinery/equipment.

Impact Assessment

COMPONENT 2 - INSTALLATION OF THE PIPELINES FOR REUSE AND RECHARGE

The potential impacts identified for the **CONSTRUCTION PHASE** are:

- Potential for flooding and pest (mosquito proliferation).
- Air and noise pollution due to excavation and the use of machinery and equipment; excavation could disrupt soil ecology.
- Traffic issues limiting access to businesses and restricting mobility in communities.
- Possible disruption of gas, telecommunication and other utility lines.
- Employment opportunities for local labourers, contractors and engineers.
- Improved road and trailway infrastructure.
- Possible contamination of farmlands through which the trailway passes.
- Health and safety risks for workers during works





Impact Assessment

COMPONENT 2 - INSTALLATION OF THE PIPELINES FOR REUSE AND RECHARGE

The potential impacts identified for the **OPERATIONAL PHASE** are:

- An opportunity for the Graeme Hall Wetlands to rehabilitate itself.
- Reduced strain of water supplies with increased supply, reuse and aquifer recharge.
- Potential pseudomonas buildup in pipelines need to be managed, otherwise there will be health and safety risks.
- Potential for leakages in the pipelines.

Impact Assessment

COMPONENT 3 - CONSTRUCTION OF SOLAR POWER FACILITY

The potential impacts identified for the **CONSTRUCTION PHASE** are:

- Clearing of grasslands may lead to drainage and erosion issues.
- Noise from construction activities may impact nearby communities.
- Possible spillages of fuels or other contaminants can affect groundwater quality if leached by rainfall or activities that use a lot of water.
- Health and safety of workers may be at risk to operating heavy machinery and hauling materials.





Impact Assessment

COMPONENT 3 - CONSTRUCTION OF SOLAR POWER FACILITY

The potential impacts identified for the **OPERATIONAL PHASE** are:

- Glint and glare from panels may have a visual impact on nearby communities.
- Improper waste disposal could prove harmful to the environment and the health and safety of workers.
- Noise from the substation may impact the existing operations at the Belle Pumping Station and at the commercial and industrial properties to the East and West of the site.
- An increase in runoff quantities that may cause flooding in downstream areas.
- Improper disposal and storage of waste generated when the life cycles of batteries and solar panels are expired.





COMMUNITIES

Graeme Hall St. Lawrence Gap Warners Vauxhall Maxwell Hill Kendall Hill Kingsland **Newton Terrace Pilgrim Place** Bennatyne Haggat Hall Stepney Eastlvnne Waverly Cot Brighton Windsor Brereton

Sensitive Receptors

BUSINESSES

Popular Discounts Kooyman Gildan Activewear Newton Industrial Estate Central Vet Clinic Rubis The Oasis TSL Barbados Limited Eastern Vet Clinic Tyre Masters Brian Hall Pavilion

AGRICULTURAL SECTOR

Coconut Vendors close to Kooyman

Coconut Vendors along the ABC Highway

Vegetable Vendors close to SCSTP

Edgecumbe Plantation

River Plantation

Sunbury Plantation

Constant Plantation Valley Island Farms

KEY ISSUES ASSESSED

- Dust and Noise Nuisances
- Damage to Property and Infrastructure
- Restricted Access to Communities and Businesses
- Relocation of Informal Vendors
- Disruption to Heritage Assets
- Inclusion of Vulnerable Groups
- Gender Disparities
- · Contamination of Physical Resources (soil and groundwater)
- Water and Sewage Supply
- Traffic Disruptions
- Disruption to Ecological Resources (Organisms and Habitats)
- Health and Safety of Communities and Workers





Management Plans

More detailed mitigation measures are presented in the following management plans developed:

1. The Environmental Health and Safety Plan

- Air Quality Management
- Water Quality Management
- Noise Management
- Waste Management
- Traffic Management
- Worker Health and Safety Management
- Community Health and Safety Management
- Access to Community Management
- Emergency Response Management
- Biodiversity Management
- Sludge Management
- Construction Management (Solar Power Facility)

Management Plans

2. Social Management Plan

- Enhancing Representation of Women in the Project Workforce
- Plan to Address Damage to Property and Infrastructure and Enable Continuity of Business Activities and Public Services in the Area
- Water Supply Management
- Management of Unions and General Workers
- 3. Security Management Plan
- 4. Contractor Management Plan
- 5. Labour Management Plan
- 6. Livelihood Restoration Plan
- 7. Heritage Management Plan
- 8. Stakeholder Engagement Plan



Air Quality

MITIGATION MEASURES

- · Cover sources of dust emissions
- Implement frequent wetting
- Equip workers with adequate PPE
- Regularly maintain equipment
- Implement effective odour control (include scrubbers in design)

INDICATORS

Maintenance Log

- Notice to Stakeholders
- Wetting Frequency Log
- PPE Log
- Log of Complaints
- Parameters within defined
 Standards



Water Quality

MITIGATION MEASURES

- Enforce appropriate waste disposal practices
- Ensure all walkways are kept clear to avoid runoff discharge
- Enforce freqent monitoring of STP, pipeline infrastructure and the Graeme Hall Wetlands

INDICATORS

- Maintenance Log
- Notice to Stakeholders
- Log of Complaints
- Parameters within defined Standards

Water Quality Monitoring

PARAMETERS

Temperature (deg Celsius)

pH Conductivity (µS/cm) Dissolved Solids (µg/L) Suspended Solids (mg/L) Salinity (µS/cm) Dissolved Oxygen (µg/L) Total Phosphorus (µg/L) Turbidity Manganese (µg/L) Copper (µg/L) faecal coliform (no./100 mL)

enterococci (no./100 mL)



Noise

MITIGATION MEASURES

- · Sensitize residents of the works
- Schedule works during daytime
- Equip workers with adequate PPE
- Regularly maintain equipment
- Frequently rotate workers doing noisy works

INDICATORS

Maintenance Log

- Notice to Stakeholders
- PPE Log
- Log of Complaints
- · Parameters within defined Standards





Waste

MITIGATION MEASURES

- Contain waste on site in designated area until approved pickup
- Prohibit waste burning and burial
- Worker capable of handling hazardous material must be on site
- Equip workers with adequate PPE
- Collaborate with recycling companies to ensure expired solar
- batteries and panels are recycled. Consult Sludge Management Plan

INDICATORS

- Site Inspection
- Leakages/Spills
- Sediment-laden runoff
- Sludge management
- Approved contractors

Traffic

MITIGATION MEASURES

- Implement the use of traffic signs and wardens
- · Restrict works to non-peak traffic hours
- Inform the public of all alternate routes identified
- Identify areas where vendors could be relocated
- · Prevent storage of materials or debris along roads or sidewalks

INDICATORS

- Detour Signs
- Media Advertisements
- Log of Complaints
- Presence of Wardens
- · Accidents/Near-misses



Worker Health

MITIGATION MEASURES

- Provide adequate PPE and safe working conditions
- Provide health and safety trainings
- Frequently maintain equipment
- Workers must have access to adequate sanitation, hydration, shading and toilet facilities
- Label all potentially harmful material, equipment and areas

- H&S Policy including Code of Conduct
- Signage
- Training Log and Schedule
- Log of Incidents and Complaints
- Maintenance Log
- Emergency Kit

Community Health 🎬

MITIGATION MEASURES

- Establish communication channels with communities
- Maintain equipment and emergency kit
- Demarcate construction zonesAssign an officer with
- responsibility for community H&S

 Avoid any activities that could
- attract pests or vermin
- Routinely check for repairs

INDICATORS

- H&S Policy and Signs
- Log of Incidents and Complaints
- Maintenance Log
- Project Landing Page
- Emergency Kit



DANGER

CONSTRUCTION ZONE

Community Access

MITIGATION MEASURES

- Proper signage and safety guidelines should be introduced into communities
- Notify communities in advance of unavoidable restrictions to community access
- Identify appropriate routes and location for material transfer and storage

INDICATORS

- Inspection Log
- Log of Complaints
- Notices
- Signage

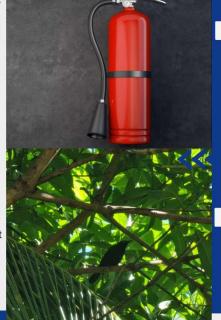
Emergency Response

MITIGATION MEASURES

- Keep informed about forecasts
- Ensure emergency kits/equipment are maintained and serviced
- Workers should be trained in emergency response
- Cease work during heavy rains
- Tie down loose material
- Ensure workers are aware of emergency contacts
- Develop a plan for temporary shutdown of facilities

INDICATORS

- Emergency Kit/Supplies/Equipment
- Log of Incidents and Complaints
- Maintenance Log
- Training Schedule and Log



Biodiversity

MITIGATION MEASURES

- Implement silt traps to control drainage
- Avoid clearing of vegetation outside of construction zone
- Properly handle hazardous
 chemicals
- Use tame artifical lighting with low glare
- Implement biodiversity monitoring programmes

- Signage
- Loss of priority species
- Spills
- Monitoring status

Sludge

MITIGATION MEASURES

- Workers should be provided with adequate PPE
- Equipment should be periodically scraped and cleaned to not have anoxic sludge build up in the treatment facility
- Workers are to be appropriately trained
- Sludge should be considered as harmful to health and is to be handled and managed with this in mind.

INDICATORS

- Maintenance Log
- Training Schedule and Log
- Use of PPE



Construction (Solar Facility)

MITIGATION MEASURES

- Ensure equipment are muffled and maintained
- Incorporate silt screens for drainage control
- Establish tree screen around site boundary to reduce glare
- Ensure panels used produce minima glare
- Develop Operations and
- Maintenance Management Plan

 Adopt measures from previous
- management plans where necessary

INDICATORS

- Maintenance Log
- Log of Incidents and Complaints
 Post-Construction Monitoring
- Report

Enhancing Women Representation

MITIGATION MEASURES

- Publicly advertise job opportunities and exercise a fair and equal hiring process
- Emphasize the training of semiskilled female professionals
- Utilize worker GRM
- Include in the Code of Conduct for employees and contractors the prohibition of GBV and SEAH
- Ensure the GRM can channel and respond to Sexual and Genderbased Violence

INDICATORS

Recruitment Policy

- Training Log and Schedule
- Register of Workers with age and
- gender
- Code of Conduct and GRM





Property Damage

MITIGATION MEASURES

- Identify ownership of lands
- Avoid the disruption or cessation of any business activities or public services
- Identify alternative routes to business centres, allowing for pedestrian access
- Promote the use of the Grievance Redress Mechanism
- Promptly repair any damage to vital infrastructure and services

- Assessment of Costs of Damage
- Log of Complaints
- Compensation Package

Water Supply

MITIGATION MEASURES

- Communicate scheduled
 disruptions in water supply
- Identify and plan for alternative water sources
- Implement temporary water storage solutions
- Conduct works in phases to reduce risk of extended disruptions
- Install temporary bypass systems to redirect water flows
- Control dust and sediment to prevent water contamination

INDICATORS

- Log of Complaints
- Log of Disruptions
- Schedule of Shutoffs



Unions and General Workers

MITIGATION MEASURES

- Establish channels of communication with unions
- Clearly communicate policies, procedures, and any changes affecting workers
- Include workers in decision-making processes that affect working conditions
- Provide conflict resolution training Provide opportunities for personal
- development

 Regularly assess workplace hazards

INDICATORS

- Employee Turnover Rate
- Log of Complaints and Conflicts
- Training Schedule and Register

Security

MITIGATION MEASURES

- Liaise and communicate with the Barbados Police Service
- Ensure that key assets and property are secured or removed to a secure location when not in use
- Control site access by ensuring limited access points and controlled entry
- Encourage security awareness among employees
- Contract licensed security services to guard and patrol sites where necessary

INDICATORS

- Security Risk Register
- Log of Incidents
- Training Schedule and Register





MITIGATION MEASURES

- Each contractor will have a legally binding, written contract that defines specific terms and conditions including workers code o conduct
- The Contractor will abide by the management actions and mitigations measures provided in the Environmental and Social Management Plan
- The Contractor is responsible for project management, for control and monitoring activities

- Project Sheet
- Inspection/Monitoring/Progress Reports
 Work Plan

Labour

MITIGATION MEASURES

- Prioritize sourcing local labour
 The contractor should work with local government and agencies to encourage participation from vulnerable groups
- Adopt recommended Code of Conduct
- It is essential to ensure that work is decent, fairly paid, nondiscriminatory and also free of all forms of violence, abuse and exploitation

INDICATORS

- Decent Work Matrix
- Sensitization Training
- Code of Conduct Training
- Gender Sensitive Training



Heritage

MITIGATION MEASURES

- Prepare heritage inventory Restrict works to hours that would
- not conflict with religious activities • Consult with the Future Centre
- Trust to reduce impacts on Barbados Trailway Project
- Initiate the Chance Find Procedure, when necessary
- Consult qualified cultural heritage experts
- Conduct heritage training sessions
 with workers
- Implement a monitoring programme

INDICATORS

- Heritage Inventory
- Monitoring Records

Livelihood Restoration Plan (LRP)

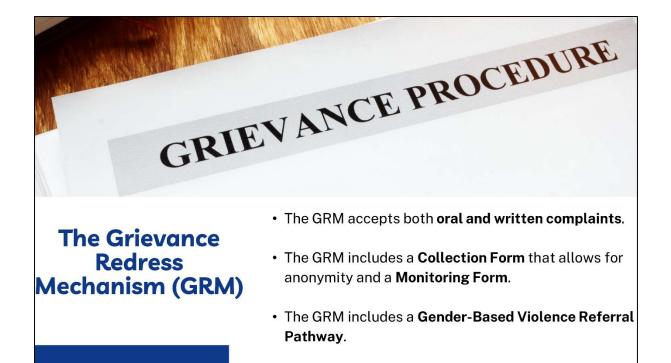
This plan focuses on project-related land acquisition and involuntary settlement, such as restrictions on land use, access to assets, and natural resources, which may result in physical and/or economic displacement.



SPECIFIC TO INFORMAL VENDORS

The following measures are recommended:

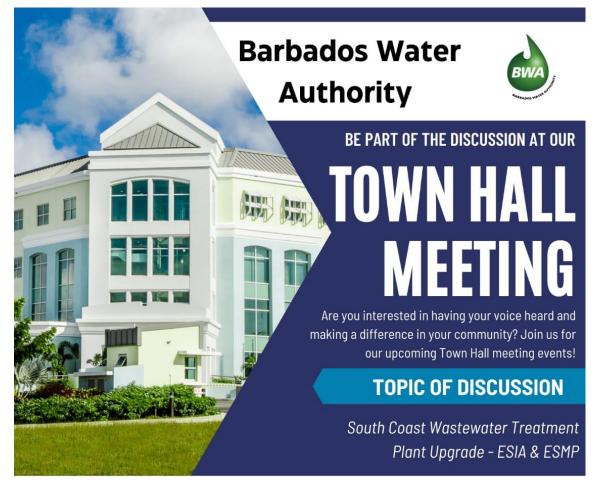
- It will be important to engage with the vendors collectively and individually to understand their specific circumstances, needs and concerns.
- Conduct a rapid gender-sensitive economic assessment of the potential income impact and ensure that alternative solutions minimize economic losses.
- Continued engagement with the Barbados Association of Retailers, Vendors and Entrepreneurs (BARVEN).
- Consider the safety and security of locations to which vendors may be relocated to temporarily including issues of safe access, lighting, clean environmental health conditions





7 APPENDIX IV – TOWN HALL MEETINGS INVITATIONAL MATERIAL

7.1 Flyer



Hawthorn Methodist Church

THURSDAY 6:30 PM 9th May, 2024

6:00 PM 11th May, 2024

SATURDAY

Deighton Griffith Sec School

Persons can expect to be informed about the following:

The ESIA on the planned upgrade of the South Coast Treatment Plant and the treated wastewater pipeline.

The ESIA & ESMP document will be available for viewing at the following locations (scan QR Code below):

- •Worthing Police Station
- Planning & Development Department (PDD)
- Oistins Police Station
- •BWA Headquarters



7.2 Letter of Invitation

April 18, 2024

Dear Valued Stakeholder,

<u>Re: Public Consultation Environmental and Social Assessment (ESA) and Environmental and</u> <u>Social Management Plan (ESMP) for BA-L1063: Barbados Climate Resilient South Coast Water</u> <u>Reclamation Plant</u>

The Barbados Water Authority (BWA), will be hosting a series of public consultations on the Environmental and Social Assessment (ESA), and Environmental and Social Management Plan (ESMP) for the captioned Project.

The objectives of the meeting will be:

- To bring attention to the proposed climate resilient initiative presenting and discussing the project concept;
- To review and share findings from the Environmental and Social Assessment (ESA) and Environmental and Social Management Plan (ESMP); and
- To provide opportunities for stakeholders to share their views and raise their concerns/questions on this project.

These meetings will take place on:

- 1. Saturday, May, 4 2024 at 6:00 p.m. at the Christ Church Parish Church, Church Hill, Oistins.
- 2. Saturday, May 11, 2024 at 6:00 p.m. at the Blackman and Gollop Primary School, Staple Grove, Oistins

A copy of the Environmental and Social Assessment (ESA) and Environmental and Social Management Plan (ESMP) may be accessed at:

- IDB's website:
- BWA's website:

As a stakeholder, we would be pleased if you would kindly accept the invitation to participate in this consultation. For further information, please contact the Barbados Water Authority, by telephone at +1 246-434-4292, or by sending an email to customercare@bwa.gov.bb.

We look forward to engaging with you.

Yours truly,

BARBADOS WATER AUTHORITY

Title