CARIBBEAN DEVELOPMENT BANK

TWO HUNDRED AND EIGHTY-EIGHTH MEETING OF THE BOARD OF DIRECTORS

TO BE HELD IN BARBADOS

DECEMBER 12, 2019

PAPER BD 111/19
PAPER BD 111/19 Corr.1

SOUTH COAST OUTFALL PROJECT – BARBADOS
(President's Recommendation No. 983)

The attached Report appraises a proposal for a loan to the Government of Barbados (GOBD) to finance the construction of a new permanent marine outfall for the South Coast Sewerage System (SCSS) (the Project). The new outfall is a critical component of GOBD's response to addressing issues with SCSS, which affected the island to such an extent that the situation was termed a national crisis. The Project is estimated to cost a total of USD42.315 million (mn) with GOBD's counterpart contribution being USD12.515 mn.

2. On the basis of the Report, I recommend a loan to GOBD of an amount not exceeding the equivalent of twenty-nine million eight thousand United States dollars (USD29.8 mn) (the Loan) consisting of an amount not exceeding the equivalent of twenty-nine million eight thousand United States dollars (USD29.8 mn) from the Ordinary Capital Resources of the Caribbean Development Bank (CDB), on CDB's standard terms and conditions, and on the terms and conditions set out and referred to in Chapter 7 of the Report.

3. In addition, with respect to procurement relating to the Junction-to-Outfall Works contract, I recommend a waiver of CDB's Procurement Policy for Projects Financed by CDB (November 2019) and CDB's Procurement Procedures for Projects Financed by CDB (November 2019), to enable country eligibility to be extended to all countries which are not CDB Member Countries. The Junction-to-Outfall Works involves a proprietary type of trenchless technology, determined to be best suited for this application and most of the contractors with the license to use the technology are from non-CDB member countries. The total value of the waiver is estimated at USD22 mn.

4. Funds are available within CDB's existing resources and/or borrowing programme for the relevant disbursement period.

CARIBBEAN DEVELOPMENT BANK

APPRAISAL REPORT

SOUTH COAST OUTFALL PROJECT – BARBADOS

Considered at the Two Hundred and Eighty-Eighth Meeting of the Board of Directors on December 12, 2019

BD 111/19
BD 111/19 Corr.1
AR 19/6 BS

Director, Projects Department	*Mr Daniel Best*
Division Chief	*L. O'Reilly Lewis*

DECEMBER 2019

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CURRENCY EQUIVALENT

[Dollar ($) throughout refer to United States Dollars (USD) unless otherwise stated]

USD1.00 = BBD2.00
BBD1.00 = USD0.50

ABBREVIATIONS

BBD	-	Barbados Dollar
BERT	-	Barbados Economic Recovery and Transformation Programme
BSCOP	-	Barbados South Coast Outfall Project
BSLC	-	Barbados Survey of Living Conditions
BSS	-	Bridgetown Sewerage System
BSTP	-	Bridgetown Sewage Treatment Plant
BWA	-	Barbados Water Authority
CCVA	-	Climate Change Vulnerability Assessment
CDB	-	Caribbean Development Bank
CG	-	Central Government
CZMU	-	Coastal Zone Management Unit
DA	-	Designated Account
DRM	-	Disaster Risk Management
EFF	-	Extended Fund Facility
EPD	-	Environmental Protection Department
ERR	-	Economic Rate of Return
ESIA	-	Environmental and Social Impact Assessment
ESMP	-	Environmental and Social Management Plan
FY	-	Financial/Fiscal Year
GAP	-	Gender Action Plan
GDP	-	Gross Domestic Product
GHW	-	Graeme Hall Wetland
GM	-	General Manager
GOBD	-	Government of Barbados
GRM	-	Grievance Redress Mechanism
GSC	-	Garbage and Sewage Contribution
HDI	-	Human Development Index
HDPE	-	High Density Polyethylene
HDSU	-	Human Development Statistical Update
IDB	-	Inter-American Development Bank
IMF	-	International Monetary Fund
IT	-	Information Technology
MEWR	-	Ministry of Energy and Water Resources
MIGPD	-	Millions of Imperial Gallons per Day
mn	-	Million
MOF	-	Ministry of Finance, Economic Affairs and Investment
MOH	-	Ministry of Health
NPO	-	Needham's Point Outfall
NPV	-	Net Present Value

OA	-	Operating Account
OCR	-	Ordinary Capital Resources
ORM	-	Office of Risk Management
PAS	-	Performance Assessment System
PC	-	Project Coordinator
PCR	-	Project Completion Report
PMO	-	Project Management Office
PRP	-	Projects, Research and Planning
PSC	-	Project Steering Committee
PU-PMO	-	Planning Unit, Prime Minister's Office
PV	-	Photovoltaic
RMF	-	Results Monitoring Framework
SCSS	-	South Coast Sewerage System
SCSTP	-	South Coast Sewage Treatment Plant
SDGs	-	Sustainable Development Goals
SEP	-	Stakeholder Engagement Plan
SES	-	Social and Environmental Safeguards
SESO	-	Social and Environmental Safeguards Officer
SOEs	-	State-owned Enterprise
TCDPO	-	Town and Country Development Planning Office
TOR	-	Terms of Reference
VAT	-	Value Added Tax
WatSNUP	-	Water Supply Network Upgrade Project
WWD	-	Wastewater Division

MEASUREMENTS AND EQUIVALENTS

1 hectare (ha)	=	2.47 acres
1 kilometre (km)	=	0.621 mile (mi)
1 square kilometre (km^2)	=	0.386 square mile (mi^2)
1 metre (m)	=	3.281 feet (ft)
1 millimetre (mm)	=	0.039 inch (in)
1 square metre (m^2)	=	10.756 square feet (ft^2)

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COUNTRY DATA: BARBADOS

	2014	2015	2016	2017	2018
PER CAPITA GDP (USD)[1]	16,572.3	16,626.2	16,984.9	17,462.9	17,961.2
GROSS DOMESTIC PRODUCT (GDP)					
GDP at Current Market Prices (BBD mn)	9,392.7	9,430.0	9,660.0	9,956.3	10,173.4
Demand Components:					
Exports of Goods and Non-Factor Services	1,894.0	1,954.0	2,083.0	2,100.0	2,100.0
Imports of Goods and Non-Factor Services	2,115.0	2,032.0	2,035.0	2,027.0	2,020.0
Sectoral growth of constant GDP (%)					
Accommodation and Food Services	1.9	7.8	9.8	4.6	4.2
Manufacturing	(4.3)	4.8	(1.3)	1.6	0.5
Agriculture and Fishing	(2.5)	0.4	(1.0)	(3.3)	14.8
Financial & Insurance	0.1	3.5	2.7	3.7	(1.0)
Mining and Quarrying	39.1	29.9	(13.2)	25.6	2.4
Electricity, Gas and Water Supply	0.2	(1.8)	0.7	(1.9)	(0.4)
Construction	1.4	(1.2)	(2.6)	2.1	(6.4)
Distribution	(3.8)	3.4	(1.0)	(3.7)	(3.8)
Transport,etc.	7.3	4.0	13.7	0.3	(3.6)
Business Services	3.6	6.4	1.0	(2.3)	(1.4)
Public Administration, Defense & Social Security	(9.8)	(4.1)	(1.0)	(0.5)	(2.2)
Real GDP Market Prices (USD mn)	8,820.8	9,014.9	9,240.3	9,249.5	9,212.5
Real GDP growth (%)	0.0	2.2	2.5	0.1	(0.4)
MONEY AND PRICES					
Consumer prices (annual average % change)	1.8	(1.1)	1.5	4.5	3.7
Monetary Base (annual % change)	(10.0)	28.0	24.8	(4.6)	12.4
Credit to the Non-Financial Private Sector (BBD mn)	7,596.7	7,714.0	7,836.3	8,113.0	8,168.6
CENTRAL GOVERNMENT FINANCES (BBD mn)					
Current Revenues	2,349.8	2,440.4	2,744.2	2,823.4	2,993.5
Grants	57.5	18.0	9.8	22.0	0.1
Current Expenditures	2,918.7	3,085.5	3,053.0	3,123.8	2,826.4
Current Account Surplus/(Deficit)	(568.9)	(645.1)	(308.8)	(300.4)	167.1
Capital Expenditure and Net Lending	193.5	236.2	225.1	171.8	197.8
Other/ Statistical discrepancy					
Overall Surplus/(Deficit)	(704.9)	(863.3)	(524.1)	(450.2)	(30.6)
BALANCE OF PAYMENTS (USD mn)					
Merchandise Exports (f.o.b)	792.0	801.0	835.0	803.0	765.0
Merchandise Imports (c.i.f)	1,652.0	1,537.0	1,540.0	1,520.0	1,499.0
Merchandise Trade balance	(860.0)	(736.0)	(705.0)	(717.0)	(734.0)
Net Balance on service account	639.0	659.0	754.0	790.0	814.0
Income (net)	(197.0)	(213.0)	(221.0)	(224.0)	(282.0)
Transfers (net)	(14.0)	2.0	(33.0)	(38.0)	(40.0)
Current Account Balance	(433.0)	(289.0)	(206.0)	(189.0)	(242.0)
TOTAL PUBLIC DEBT (BBD mn)					
Gross Central Government Debt	11,445.2	12,243.0	13,397.4	13,665.9	12,755.8
Domestic debt outstanding	8,520.4	9,319.8	10,511.2	10,840.1	9,556.9
External debt outstanding	2,924.8	2,923.2	2,886.2	2,825.8	3,198.9
AVERAGE EXCHANGE RATE[2]					
BBD per USD	2.0	2.0	2.0	2.0	2.0

Sources: Ministry of Finance, Economic Affairs and Investment; Central Bank of Barbados (CBB); and International Monetary Fund (IMF).

Notes:

1. Data sourced from the IMF World Economic Outlook, April 2019.
2. Selling rate of the CBB at the end of each period.

COUNTRY DATA: BARBADOS

	2014	2015	2016	2017	2018
POPULATION					
Population	277,000	277,000	275,000	274,000	273,400
Population Growth Rate (%)	(0.2)	(0.1)	(0.4)	(0.4)	(0.4)
Birth Rate (per '000)	10.5	10.4	9.2	9.4	8.8
Death Rate (per '000)	9.3	9.2	9.3	9.6	9.2
Infant Mortality Rate (per '000 births)	10.0	8.0	13.5	8.9	9.1
EDUCATION					
School Enrollment (%)					
Primary	96	95	89	89	89
Secondary	97*	97*	97*	96	93
Pupil-Teacher Ratio					
Primary	13.0	13.0	14.0	14.0	14.0
Secondary	13.0	13.0	13.0	13.0	13.0
LABOUR FORCE					
Unemployment Rate (%)	12.3	11.3	9.7	10.0	10.1
Male	11.8	12.3	9.3	10.3	n.a.
Female	12.8	10.3	10.1	10.6	n.a.
Participation Rate (%)**	63.9	65.1	66.5	65.7	n.a.
Male	67.7	68.7	70.4	69.3	n.a.
Female	60.4	61.7	62.8	62.4	n.a.
INDICATORS OF HUMAN DEVELOPMENT					
Life Expectancy at Birth (years)	75.4	75.6	75.9	75.8	76.1
Male	73.5	73.2	73.4	73.3	73.6
Female	78.3	78.0	78.3	78.1	78.4
Dependency Ratio	40.0	42.9	42.9	50.4	51.6
Ages 0-14	29.1	26.7	26.7	29.1	28.9
Ages 65+	20.6	16.2	16.2	21.3	22.7
Human Development Index	0.793	0.794	0.795	0.795	0.800
TOURISM					
Total Stay-Over Visitors ('000)	519.6	591.9	631.5	661.2	679.5
Cruise Ship Visitors ('000)	563.0	586.6	594.0	681.2	682.2

Sources: Ministry of Finance, Economic Affairs and Investment; Central Bank of Barbados (CBB); World Bank Development Indicators; Barbados Labour Force Survey; UNDP Human Development Reports 2015 - 2018.

Notes:

* Data sourced from the World Bank Development Indicators.

** Barbados Labour Force Survey.

PROJECT SUMMARY

Financial Terms and Conditions	
Borrower	Government of Barbados (GOBD)
Executing Agency	Barbados Water Authority (BWA)
Disbursement Period	March 31, 2020 to December 31, 2021

Fund	Fund Source	Amount ('000's)	Amortisation Period (years)	Grace Period (years)	Interest Rate (%)
OCR-USD	Equity and	29,800	15	2	4.80
Loan Total:		29,800			
Counterpart Total:		12,515			
Total Project Cost		42,315			

Fees

Commitment Fee: A commitment charge of 1% will be payable on the undisbursed balance of the OCR resources commencing from the 60th day after the Loan Agreement.

Office of Risk Management (ORM) Commentary

This information is withheld in accordance with one or more of the exceptions to disclosure under the Bank's Information Disclosure Policy.

Project Summary

Project Outcome and Description:

The expected outcome of the Project will be a resilient and energy efficient outfall for the South Coast Sewerage System (SCSS). A Results Framework is presented at Table 2.1 and a Results Monitoring Plan at Appendix 2.2.

The proposed project consists of the following components:

(a) Project Preparation assistance

(b) Land

(c) Infrastructure Works

(d) Engineering and construction-related services

(e) Other Project Support Services

(f) Project Management

Exceptions to CDB Policies:

(a) A waiver of CDB's Procurement Policy for Projects Financed by CDB (November 2019), and CDB's Procurement Procedures for Projects Financed by CDB (November 2019) is sought to permit country eligibility for the Junction-to-Outfall Works contract to be extended beyond CDB member countries to all countries. This is required in order to maximise competition, given that the contract will utilise a proprietary type of trenchless technology determined to be best suited for the application, and most of the contractors licensed to use the technology are from non-CDB member countries. The estimated total value of the waiver is USD22 mn.

Gender Marker Summary

Analysis	Design	Implementation	Monitoring & Evaluation	Score	Code
0.5	0.5	1.0	0.0	2.0	Marginally Mainstreamed (MM)

Marginally Mainstreamed: The Project has limited potential to contribute to gender equality.

1. STRATEGIC CONTEXT AND RATIONALE

REQUEST

1.1 By letter dated December 4, 2019, the Government of Barbados (GOBD) confirmed its decision of April 18, 2019 to request the assistance of the Caribbean Development Bank (CDB) in financing a project to construct a new permanent marine outfall for the South Coast Sewage Treatment Plant (SCSTP) which is part of the South Coast Sewerage System (SCSS). The outfall is a critical component of GOBD's response to addressing the malfunctioning system, which affected the island to such an extent that the situation was termed a national crisis.

MACROECONOMIC CONTEXT

1.2 GOBD embarked on the Barbados Economic Recovery and Transformation (BERT) programme in mid-2018, aimed at restoring fiscal and debt sustainability, increasing reserves, and accelerating growth. GOBD has made a strong start in implementing BERT. The performance criteria and benchmarks for March and June 2019 were satisfied, although two with minor delays (See Appendix 1.1 for details).

1.3 A key pillar of BERT is to foster stronger economic growth. Economic activity contracted by 0.2% during the period January to September 2019 and is expected to remain weak in the coming months (see Appendix 1.1). One of the keys to restoring economic growth in the short-term is the need to boost the critical service sectors (including tourism and financial services) which contribute approximately 60% of gross domestic product (GDP) [directly and indirectly]. Issues related to public health such as the South Coast sewage crisis and the associated negative publicity, if sustained, can adversely affect the tourism sector and the livelihoods of persons in that sector, which could slow the pace of economic recovery. The restoration of, and improvement in, wastewater management services can therefore assist in efforts to safeguard the economic recovery of the domestic economy.

1.4 Persistent fiscal imbalances have pushed up the public debt. This notwithstanding, there have been efforts towards fiscal consolidation including the restructuring of the public debt, which resulted in a gradual reduction in the fiscal deficit. The Budget for fiscal year (FY) 2019/20 continues the fiscal consolidation through efforts to broaden the tax base, reduce expenditure and promote measures to boost growth. The public debt restructuring resulted in an immediate reduction in the Central Government (CG) debt to GDP ratio of about 22 percentage points in nominal terms to 126.3% of GDP as at December 2018. The conclusion of the external debt restructuring will further reduce public debt and uncertainty.

1.5 Foreign exchange reserves which reached a low of $220 million (5-6 weeks of import coverage) at end-May 2018, have more than doubled since then mainly due to lending from international financial institutions and the ongoing external commercial debt moratorium.

1.6 Economic activity for the 12-month period in 2019 is likely to remain close to 0%. However, the medium-term outlook is optimistic, as reduced policy uncertainty, and increased private sector investment under-girded by the strong implementation of BERT, will help to boost growth. Over the next 3-4 years, growth is projected to return to its medium-term average of about 2%.

SOCIAL CONTEXT

1.7 Human development achievements in Barbados, since 1990, are trending upward with long and healthy life, quality education and training, and a decent standard of living. The 2018 Human Development Statistical Update (HDSU) ranked Barbados among the high human development countries with a Human Development Index (HDI) of 0.8. Life expectancy at birth in 2018 was 76.1 years (78.1 years for females and 73.3 years for males). According to the 2018 HDSU, the expected years of schooling was 15.3 years per child with a measureable difference between females (16.7 years) and males (13.9 years). The 2017 Barbados Economic and Social Report outlined that significant investments in quality education, accessible health care services, inclusive social services and the economic empowerment of citizens have fostered these high human development attainments in Barbados.

1.8 Nonetheless, the sustainable development of Barbados, like other Caribbean islands, is threatened by the issues of a changing population structure as well as increased poverty and vulnerability. First, Barbados has registered a negative population growth rate of 0.4%, over the past three years, characterised by low birth rates and a high dependency ratio (50.4) among the Barbados population. There is an emerging demographic shift towards a greater proportion of persons aged 65+ (14.95%) compared to the child population, ages below 14 years (19%). In addition, the 2016 Barbados Survey of Living Conditions (BSLC) outlined that increased poverty and vulnerability threaten to undermine the economic resiliency and social development accomplishments of Barbados. The BSLC revealed increased poverty and vulnerability over the past 7 years. The prevalence of poverty increased from 15.1% in 2010 to 17.5% in 2016. Comparatively, the vulnerable population also grew from 10.4% to 11% during the same period. The BSLC outlined cogently that there was a significant gender component between poor females (21%) and poor males (14%) as well as vulnerable females (13%) and vulnerable males (10%). Moreover, the most vulnerable populations within the poverty profile of Barbados are large households with multiple children; female-headed households; and the rural parishes of St. John (23.9%) and St. Joseph (20.26%).

1.9 The necessity of availability and sustainable management of water and sanitation for all was declared a basic human right within the framework of the United Nations Sustainable Development Goals (SDGs) 2015. Inadequate access to safe water, sanitation and hygiene is directly associated with diseases and has detrimental impacts on the social and economic development of any society. On average, the BSLC estimates of utilities among households within the poorest quintile for flush toilets, pipe-borne water and electricity were 70%, 75% and 78%, respectively. Comparatively, the estimates for flush toilets, pipe-borne water and electricity among the households within the richest quintile were 98%. The most significant physiological deprivation, among the utilities measurements, was the absence of flush toilets, which was 30% among households within the poorest quintile.

1.10 There is mounting fiscal pressure to sustainably finance public investments in health, water, sanitation, public utilities and social protection programmes. Despite the current economic challenges and pressures experienced by Barbados, a significant proportion of the population, including poor and

vulnerable persons, households, communities, older persons, children, persons with disabilities and the unemployed, depends on Government's provision of social infrastructure and essential utilities for their survival and well-being. For example, during the period 2015-2018, the failure of the SCSS negatively impacted the health, well-being, livelihoods and investments of residents, businesses and visitors in Barbados. This situation, among other development challenges, demonstrates that strategic interventions for the provision of water, sanitation and health services are imperative for inclusive and sustainable human development.

SECTOR ISSUES

1.11 **Organisation and Structure**: BWA is the statutory corporation with responsibility for water and sewerage services in Barbados, and is in the process of institutional reform. The Environmental Protection Department (EPD) provides oversight by monitoring sewage inflows, effluent outflows and marine water quality. The utility is regulated by the Fair Trading Commission.

1.12 **Low Availability of Sewerage Services**: Sewerage service is available to approximately 6% of Barbados' population, with BWA operating two sewerage systems with approximately 4,500 connections - the Bridgetown Sewerage System (BSS) serving the south-western coast and SCSS serving the southern coast. This situation potentially threatens groundwater and marine resources. GOBD has plans to expand coverage by constructing a West Coast Sewerage System and to connect 300 domestic properties which do not have waterborne toilets to SCSS.

1.13 **Limited Levels of Sewage Treatment**: Each sewerage system has a treatment plant. The Bridgetown Sewage Treatment Plant (BSTP) treats sewage to the secondary level (screening and aeration) and accepts septage from trucks owned by private companies. SCSTP provides primary treatment (screening only). Both plants discharge the treated liquid waste (effluent) out to sea via marine outfalls. Sludge from BSTP is ploughed into a field offsite. SCSTP's screened debris is disposed in the island's landfill. The quality of effluent and method of disposal potentially threatens marine resources, especially the reefs needed to protect against the impacts of climate change. GOBD has secured financing to undertake preliminary designs for the upgrade of the two plants to tertiary treatment level.

1.14 **Wastewater as a Water Resource**: Barbados is completely reliant on groundwater resources, and climate change impacts are expected to reduce the ability of aquifers to be recharged. Upgrading both sewage treatment plants to tertiary level and utilising treated wastewater as a water resource have been a long mooted policy of GOBD and some of the enabling policies to support this decision have been drafted e.g. a Water Reuse Policy. More recently, GOBD secured financing to examine what plant upgrades are required to enable treated wastewater to be used for aquifer recharge.

1.15 **High Energy Costs**: The cost of electricity for pumping is one of BWA's highest operating costs, accounting for approximately 35% of its total operational budget. BWA is implementing several renewable energy projects designed to reduce their energy bill, primarily photovoltaic (PV) installations. The option of converting wastewater to energy is already supported by GOBD policy and is to shortly be explored as an option for upgrading the two wastewater treatment plants.

1.16 **Lack of Investment and Maintenance**: Based on BWA's current project portfolio, water has been receiving capital investment priority. Financial constraints have hindered maintenance of, and investment in, wastewater infrastructure, and contributed to the South Coast sewage crisis. In response, GOBD implemented a Garbage and Sewage Contribution (GSC) in August 2018, a portion of which goes to the BWA, specifically for its wastewater infrastructure. Those funds and GOBD support have facilitated repairs to both sewerage systems. Alternative investment and financing models for the upgrade of the two wastewater treatment plants are to be explored shortly.

1.17 **South Coast Sewage Crisis**: SCSS, commissioned in 2003, comprises 34km of sewers installed along roads using the open-cut method, 6km of sewers (collector and forcemain in a carrier pipe) installed along Highway 7 using the micro-tunnelling method, 5 lift stations, SCSTP and a marine outfall. It serves a 10km long by 300m wide coastal strip, and currently has 2,700 connections, with capacity for at least 300 more. The SCSTP, located at Graeme Hall, currently handles between 9,500-11,400 m3/day or 2.5-3.0 mn imperial gallons per day (MIGPD); peak flows of 22,700-30,300 m3/day (6.0-8.0 MIGPD) and has the capacity to store 8 hours of sewage flow. It was designed to pump effluent 7.15km via the forcemain to the marine outfall at Needham's Point, which discharged at a depth of 36.5m. SCSS began experiencing major problems in November 2017 with sewage overflowing from manholes in several areas along the South Coast. Investigations revealed that the collector pipe delivering sewage to SCSTP and the forcemain connecting SCSTP to the marine outfall had failed at several locations, due primarily to subsurface differential settlements. Various unsuccessful attempts were made to repair the sewers with the forcemain still in operation. Eventually, BWA had to resort to discharging effluent into the Graeme Hall Wetland (GHW), and to intermittently draining the wetland into the sea at Worthing Beach. This resulted in adverse impacts to the terrestrial and coastal/marine environment, with negative socio-economic impacts on residents, tourists and businesses in the area. Barbados' reputation as a tourist destination also suffered internationally. An emergency outfall was constructed in late 2018 across the lagoon at Worthing Beach, allowing the forcemain to be taken offline, and repairs to be made to the collector sewer, ending the crisis. It comprises one 450mm (18") diameter (dia) ductile iron pipe connected at a junction box to two high density polyethylene (HDPE) pipes, 200mm (8") and 300mm (12") in diameter. The HDPE pipes are buried on Worthing Beach, and then run on the seabed, discharging 800m offshore at a depth of 30m. The HDPE section was not designed to be a permanent solution and will likely fail should Barbados be affected by a tropical storm or hurricane, which can occur between June to November annually. Peak tourist season runs November to April annually, so a failure would undoubtedly impact that sector.

COUNTRY SECTOR STRATEGY

1.18 The National Strategic Plan of Barbados 2006-2025 has as one of its goals 'Strengthening the Physical Infrastructure and Preserving the Environment'. One of the strategies in obtaining this goal is to "protect the island's groundwater resources and coastal waters from contamination". A functional and resilient wastewater management system is key to implementing that strategy. GOBD has within recent years, been moving to establish the sector's utility, BWA, as an efficient, financially self-sustaining entity. More recently, there has been an urgency to develop policy, restore current infrastructure and plan for the infrastructural upgrades necessary to strengthen the wastewater sector.

1.19 The proposed project supports GOBD's policies and plans for the development of Barbados' economy. It represents an appropriate response to current and anticipated needs within the wastewater

sector in Barbados, and seeks to ensure that all citizens benefit from safe and reliable wastewater disposal in order to maintain a high quality of health and sanitation.

LINKAGE OF PROJECT TO CDB'S COUNTRY AND SECTOR STRATEGY AND POVERTY GOALS

1.20 The Project is consistent with CDB's Country Strategy Paper for Barbados (2015-2018) outcome of 'Improved Quality of Climate Resilient Infrastructure'.

1.21 This project is consistent with the following of CDB's strategic objectives:

- Supporting Inclusive and Sustainable Growth and Development

1.22 This project is consistent with the following of CDB's corporate priorities:

- Promote Environmental Sustainability (Climate Change Resilience, Environmental Management and DRM)
- Strengthen/Modernise Social and Economic Infrastructure

1.23 This project is expected to contribute to the following Sustainable Development Goals:

- SDG 6. Clean water and sanitation
- SDG 9. Industry, innovation and infrastructure
- SDG 11. Sustainable cities and communities
- SDG 13. Climate action

1.24 This Project is consistent with the following of CDB's Sector and Thematic Policies:

- Energy Sector Policy and Strategy
- Climate Resilience Strategy

RATIONALE

1.25 Barbados' key foreign exchange earner is tourism and the image of this sector suffered during the South Coast sewage crisis. Beyond tourism, the crisis also negatively impacted the country's reputation as an investment hub, and on its people as a place to live. The approximately 50,000 persons living in the communities along the South Coast corridor suffered a degradation of living conditions, and the sustainability of the GHW, a Ramsar site (a wetland site designated to be of international importance under the Ramsar Convention) was threatened. While GOBD has constructed a temporary outfall which facilitated an end to the crisis, a permanent outfall is required that can be constructed with the least disruption to the South Coast corridor. It should also be operational in the shortest possible time given the risk of damage to the temporary outfall from wave and current action associated with a high wind event.

1.26 The Project will assist GOBD in meeting its developmental objectives by creating a permanent and resilient solution to effluent disposal from SCSTP, with the least disruption to the marine and landside environment. The outfall's location will also lend to operational efficiencies, not only in energy costs at SCSTP, but in maintenance of SCSS by separating the collector pipes from the outfall pipes, which is not currently the case along Highway 7. Its design caters for both future growth in the connected populace, as well as the possible addition of another sewerage network to the plant, while providing needed redundancy to an anticipated treatment level upgrade of SCSTP. This intervention is critical to maintaining the living conditions of residents and restoring the tourism and investment climate.

2. PROJECT DESCRIPTION

PROJECT OUTCOME

2.1 The expected outcome of the Project will be a resilient and energy efficient outfall for the South Coast Sewerage System (SCSS). A Results Framework is presented at Table 2.1 and a Results Monitoring Plan at Appendix 2.2.

PROJECT COMPONENTS

2.2 The Project consists of the following components, detailed descriptions of which are presented in Appendix 2.1.

1. **Project preparation** comprising the completed works, services and project management associated with the design, construction and supervision of the temporary outfall.

2. **Land** comprising public and private property to be utilised for the permanent Works.

3. **Infrastructure Works** comprising the decommissioning of the temporary outfall, and the construction of a 2,000m long permanent outfall, using primarily trenchless technology.

4. **Engineering and Construction-related Services** associated with the design and construction supervision of the permanent works, including the social, environmental and economic considerations.

5. **Other Project Support Services** comprising the engagement of an external auditor to monitor the project accounts.

6. **Project Management** comprising the engagement of a Project Coordinator (PC) and a Social and Environmental Safeguards Officer (SESO), to serve in BWA's Project Management Office (PMO). Oversight will be provided by the Project Steering Committee (PSC) for the ongoing CDB-funded Water Supply and Network Upgrade Project (WatSNUP), which will be augmented with relevant stakeholders for the Barbados South Coast Outfall Project (BSCOP).

RESULTS FRAMEWORK

Project Impact
Improved wastewater management and environmental health on the South Coast.

Outcome	Indicator	Baseline	Target	Data Sources, Reporting Mechanisms and Report Frequency
1 Resilient and energy efficient outfall to the SCSS	1.1 Ability to resist a Category 1 Hurricane (Yes/No)	No; 12/12/2019	Yes; 12/31/2035	BWA Reports, Media Reports
	1.2 Reduced monthly energy consumption at SCSTP (MWh)	33; 11/21/2019	30; 11/26/2021	SCSTP electricity bills

Assumptions for achieving outcomes
1. BWA maintains SCSS.

Output	Indicator	Baseline	Target	Data Sources, Reporting Mechanisms and Report Frequency
1 New permanent marine outfall	1.1 Temporary outfall decommissioned (Yes/No)	No; 12/12/2019	Yes; 2/26/2021	PC Reports
	1.2 New 750mm dia. outfall commissioned (Yes/No)	No; 12/12/2019	Yes; 10/23/2020	PC Report

Assumptions for achieving outputs
1. Works not affected by adverse weather.

LESSONS LEARNT

Description	Project Response
Physical and financial constraints to maintenance can negatively impact the sustainability of outcomes.	The Project will reduce the operational costs to BWA for effluent disposal from SCSTP, potentially releasing funds for maintenance. Separating the sewage collection and effluent disposal network will simplify the

Description	Project Response
	maintenance programme. CDB will also require the submission of annual maintenance plans for SCSS for the duration of the Loan as part of its monitoring operations.
Local experience in the construction and operation of similar works should inform current design.	Project design has noted the experience from use of open cut and trenchless technologies in the construction of the SCSS. The construction technology to be employed represents the best solution to mitigating the negative experiences in both cases.
Entities with compromised financial positions may not be able to meet counterpart contributions.	BWA has applied to the Ministry of Finance for an exemption of Value Added Tax (VAT) to remove that tax obligation from BWA and its contractors, consultants and suppliers during implementation. Counterpart financing comprises primarily in kind contributions such as sunk costs, regular operational expenditure and property values. While GOBD has opted not to capitalise the financing charges, this has historically been their approach, with no record of default.

3. FINANCING PLAN

FINANCING STRUCTURE AND COSTS

3.1 The Project is estimated to cost $42.315 mn which will be financed with resources from GOBD, BWA and CDB. Cost estimates for the Works were prepared by engineering consultants engaged by BWA. The costs were based on designs that were deemed acceptable to CDB staff. A physical contingency of 15% was applied to Infrastructure Works; 10% to Project Management and Other Project Support Services; and 5% to Engineering and Construction-related Services. A price contingency was assigned using a 2.0% inflation rate based on IMF forecasts. A summary of the Project Cost and Financing Plan is shown in Table 3.1, and a detailed Project Cost, Phasing and Financing Plan is presented at Appendix 3.1.

3.2 The proposed project will be financed by:

1. a Loan to GOBD of an amount not exceeding $29.8 mn from CDB's Ordinary Capital Resources (OCR). Those funds will be used to finance the infrastructure works and aspects of project management; and

2. counterpart funding of $12.515 mn (BBD 25.030 mn), representing land, interest and commitment charges, engineering and construction-related services, project preparation assistance and aspects of project management.

3.3 The Loan will be repayable over a period of 15 years following a grace period of 2 years. Interest on the OCR, which is variable, is currently 4.8%. A commitment charge of 1% p.a. will be payable on the undisbursed balance of the OCR resources commencing from the 60th day after the Loan Agreement.

TABLE 3.1: SUMMARY OF PROJECT COSTS AND FINANCING

Components	TOTALS				
	OCR-USD		COUNTERPART		
	Equity and Market Resources	Total	GOBD	BWA	Total
1. Project Preparation 2. Land 3. Infrastructure Works 4. Engineering and Construction-related Services 5. Other Project Support Services 6. Project Management	25,290,500	25,290,500	2,583,000	7,151,000	35,024,500
Base Cost	**25,290,500**	**25,290,500**	**2,583,000**	**7,151,000**	**35,024,500**
7. Physical Contingency	3,782,950	3,782,950	-	181,800	3,964,750
8. Price Contingency	726,550	726,550	-	231,200	957,750
Total Project Cost	**29,800,000**	**29,800,000**	**2,583,000**	**7,564,000**	**39,947,000**
9. Interest During Implementation	-	-	2,144,600	-	2,144,600
10. Commitment Fees	-	-	223,400	-	223,400
Total Financing	**29,800,000**	**29,800,000**	**4,951,000**	**7,564,000**	**42,315,000**
Percentage Financing	**70%**	**70%**	**12%**	**18%**	**100%**

4. PROJECT VIABILITY

TECHNICAL ANALYSIS

4.1 **Design**: Design services for the permanent outfall are being provided by the consultants who designed the emergency outfall. Repair/replacement of the original forcemain was explored and found not to be the preferred option based on cost and level of disruption. The location of the temporary outfall was confirmed to be viable based on extensive bathymetric and oceanographic information for the South Coast, and is therefore suitable for a permanent solution, especially given its proximity to SCSTP. Ten months of water quality monitoring has also confirmed that the temporary outfall performed as expected. The permanent outfall will be further offshore and deeper, and will be mostly buried to provide storm resilience. Geotechnical and geophysical investigations have shown subsurface conditions similar to those encountered during SCSS construction. Two methodologies for constructing the new outfall were considered - open cut or trenchless. The trenchless approach was found to be the quicker and less disruptive option, and best suited for the application given the lessons from SCSS' construction and operation. Design life of the permanent outfall will be 50 years with a capacity to handle average flows of 19,000-23,000 m^3/day (5-6 MIGPD) and peaks of 53,000 m^3/day (14 MIGPD). Those design flows are based on additional connections, property upgrades at the current connections, and the possible addition of an inland sewer network to the plant. The planned plant upgrade to enable use of the effluent will still require an outfall for emergencies and maintenance.

4.2 **Construction**: The scheme comprises replacing the marine portion of the temporary outfall with a 750mm (30") dia HDPE pipe, to deliver effluent to a 60m long multi-port diffuser 1km offshore at a depth of 45m. Construction is to be undertaken on a 24-hour basis utilising a trenchless technology called Direct Pipe(TM). Direct Pipe(TM) differs from other trenchless technologies by pulling the pipe in as the tunnel is being drilled. The technology allows pipe lengths of around 13m, resulting in significantly less jointing than micro-tunneling (1.5-3.0m lengths), and a higher tolerance to differential settlement. It has been successfully used since 2007 for similar installations in various countries. Once works are completed the switchover from the temporary to permanent outfall can be completed in the eight hours that SCSTP can store sewage since the plant will have to halt operations. Ongoing repairs to SCSTP should be completed by December 2019. However, no upgrades (e.g. new pumps) are required at SCSTP to accommodate the new permanent outfall.

4.3 **Construction Supervision**: BWA may retain the services of the consultants previously appointed to prepare designs and contract documents and to provide construction supervision services under the Project. The qualifications and experience of any person(s) subsequently appointed to provide these services shall be acceptable to CDB.

4.4 **Operation**: The new outfall is expected to provide enhanced effluent dispersal and energy savings to what have been achieved with the commissioning of the temporary outfall. The removal from service of the original forcemain will simplify maintenance as the collector sewer and that forcemain share space within a larger pipe (carrier pipe).

4.5 **Decommissioning**: Once the new outfall is complete, the marine portion of the temporary outfall will be decommissioned. The Works will be executed during regular hours, seven days a week and will consist of the removal of the HDPE pipe, ductile iron sections and concrete anchor blocks. The landside portion will remain as to provide additional redundancy. The forcemain and diffuser comprising the Needham's Point Outfall (NPO) will remain. Sections of NPO may be incorporated in GOBD's future development plans.

INSTITUTIONAL ASSESSMENT

4.6 **Organisation**: The state of operations at BWA can be described as a State Owned Enterprise (SOE) in transition towards building an organisation that is transparent, accountable and with ethics that are widely respected by the people of Barbados. Consequently, BWA's key decision makers, who are relatively new to the organisation, have been focused on strengthening the company's accountability and oversight frameworks.

4.7 **Governance**: The key decision-making responsibility of BWA resides at the level of the General Manager (GM) and the Board of Directors. The GM was appointed in February 2017 and the Board of Directors was appointed by the Minister of Energy and Water Resources in May 2018. Over the last 2 years BWA has also filled other key management positions. Some of these are in the Internal Audit, Legal and Regulatory, Finance and Human Resources departments. A key component in BWA's transition is strengthening the relationship between staff and senior management. Consequently, BWA's management continues to collaborate with staff to improve key areas in the company's operations. These areas include, staffing, performance management, Information Technology (IT), and fiduciary compliance. Additional details are outlined below:

- **Staffing**: BWA is currently structured along functional lines as shown in the draft Organisational Chart at Appendix 4.1.1. Under the ongoing restructuring process, which is informed by a 2014, IDB-funded Management and Organisational Audit, that organisational structure is being revisited. The aim of the exercise is to ensure that related functions are grouped together to support greater coordination and the effective functioning of the various departments. It is expected that this organisational restructuring will be completed by December 31, 2020. As part of the ongoing restructuring and GOBD retrenchment programme, there has been a significant reduction in the number of BWA staff. The overall staff complement has been reduced from 775 employees in 2015 to 569 employees in 2019. This translates to a ratio of 5.7 employees per 1,000 connections, down from 7.1 employees per 1,000 in 2015. It also indicates that BWA has moved closer to the World Bank recommended target of 5 employees per 1,000 connections and suggests some improvement in efficiency. BWA is somewhat challenged to engage or maintain the number of professional staff required to effectively advance the SOE's restructuring and commercially driven ethos. As a result, the position of the Director of Projects, Research and Planning (PRP), the division to replace PMO, is yet to be filled. It shall be a condition of the Loan that BWA inform CDB when the appointment of Director of PRP has been made and when any subsequent appointments are made to the position of Director of PRP, as well as to the positions of GM, Director of Engineering and Director of Finance.

- **Performance Management**: BWA management and staff have been working to establish a performance management framework that includes Key Performance Indicators. This is another critical input required to strengthen the company's accountability and oversight framework. BWA's new performance system is more than 95% completed. All employees have been trained and their unions are amicably engaged on implementation of the system. It is expected that this new system will be rolled out by December 31, 2019.

- **IT**: BWA has taken steps to integrate the IT systems across various platforms, reducing the high level of manual data manipulation. The customer and maintenance systems have been integrated with the financial systems. This included replacing the Customer Information System, Distribution Management Systems and Accounting System. BWA is expected to install new Supervisory Control and Data Acquisition, Electronic Document Management, Geographic Information and Hydraulic Network Modelling systems by December 31, 2020. These systems are expected to reduce inefficiencies in the organisation's operations.

- **Fiduciary Compliance**: BWA's management is aware that an important element of an effective accountability and oversight framework is financial compliance. At the end of October 30, 2019, BWA's audited annual financial statements for the periods ending March 31, 2018 and March 31, 2019, were not available. It will be a condition of this Loan that BWA submit to CDB the audited annual financial statements for the periods ending March 31, 2018 and March 31, 2019 by June 30, 2020. Additionally, it will be a condition of the Loan that BWA submit to the Bank audited annual financial statements and applicable management letter within six months of the close of each financial year for the duration of the Loan.

- **Maintenance Capacity**: Operation of wastewater infrastructure currently lies with BWA's Wastewater Division (WWD), which comprises two Senior Engineers, who report to the Director of Engineering. Each Senior Engineer manages a sewerage system and is supported by a team of supervisors, technicians, labourers and administrative personnel. WWD is experienced in the operational requirements and is adequately staffed. No additional training or staff will be required. Written maintenance plans exist and WWD is in the habit of preparing its budgets. It will be a condition of the Loan that BWA adequately maintains the infrastructure financed under the Project. It will be a further condition of the Loan that BWA submit to the Bank, annual costed maintenance plans for SCSS, of which the outfall is a part, within four months of the end of the financial year, for the duration of the Loan.

4.8 **Summary**: CDB is satisfied with BWA's current progress towards building an accountability and oversight framework that provides its stakeholders with a degree of trust and confidence in the company's operations. However, there is the need to complete the organisational restructuring and IT upgrades, as well as address the managerial, staffing and fiduciary compliance gaps if BWA expects to effectively and efficiently deliver on its transformation mandate.

FINANCIAL ANALYSIS

4.9 – 4.15

This information is withheld in accordance with one or more of the exceptions to disclosure under the Bank's Information Disclosure Policy.

ECONOMIC ANALYSIS

4.16 **Background**: The economic analysis of the Project is based on a consideration of the cost of "no action" versus the cost of "specific action" to address the problem. In the long term, maintaining the temporary outfall is not a viable option for GOBD in the context of the country's macroeconomic goals, and specifically the contribution of the tourism sector to the attainment of those goals. The inflows from the tourism sector and related services are estimated at over $2 billion per year, which are currently endangered by the risk of failure of the temporary outfall. During the crisis, Barbados' reputation as a tourist destination suffered internationally, despite the limited area affected. While failure of the temporary outfall may not result in sewage on the streets, it will contaminate the nearshore waters and beaches from Worthing to Needhams Point, and require a return to emergency discharge to GHW. Therefore, finding a long-term sustainable solution to the temporary outfall is fundamental to sustaining the economic contribution of the country's people and key sectors. Additionally, the benefits to be accrued from finding a long-term sustainable solution to the temporary outfall are not limited to the tourism sector but are also expected in the areas of public health, environment, and recreational activities

4.17 **Analysis**: The conventional method of Cost Benefit and Economic Rate of Return (ERR) was not considered for this Project, given the dearth of reliable data to quantify benefits associated with addressing the 2017 - 2018 sewage crisis. As an alternative, a Least Cost Analysis was conducted. The analysis considered costs and benefits of three options. All three options are expected to improve the resilience of the SCSS. Conceptual designs were developed for all the options. The designs were used to inform estimate construction cost, maintenance cost and execution period. The options are as follows:

- Option 1: Repair/replace forcemain to Needham's Point;
- Option 2: Construct a new permanent marine outfall in the Worthing Beach area using Cut and Cover Technology; and
- Option 3: Construct a new permanent marine outfall in the Worthing Beach area using Trenchless Technology.

4.18 **Results**: The results of Least Coast Analysis are provided at Appendix 4.3.1, which indicate that Option 3 is the best option with a Net Present Value (NPV) of $38.4 mn, compared to $43.5 mn and $112.1 mn for Options 2 and 1, respectively. In addition to generating a favourable NPV, Option 3 is expected to reduce both marine and land-based construction work which could result in adverse socioeconomic impacts along the South Coast over an extended period. Moreover, Option 1 would also negate the operational cost savings already accrued by no longer having to pump effluent from Graeme Hall to Needham's Point.

MACROECONOMIC IMPACT

4.19 The primary macroeconomic objectives of GOBD over the medium term are to reduce CG debt, increase foreign exchange reserves and foster sustained and inclusive growth. Damage to the temporary outfall will result in pollution of the GHW and nearby beaches, with corresponding negative impacts on public health, foreign direct investment and the island's reputation as a place to live, work and rest. The current situation represents a threat to the real estate and tourism sectors, which are expected to play a major role in the economic recovery and accelerated growth of the Barbados economy. As such, the Project to construct a new permanent marine outfall on the South Coast is important to the economy as it provides the enabling environment for maintaining/increasing tourist arrivals and foreign direct investment, which can result in an improvement in the balance of payments, employment opportunities and additional income, which are all expected to have a favourable impact on the macro economy. GOBD will assume the debt service for this Project and CDB staff debt sustainability analysis shows that the proposed BSCOP will not

adversely affect the achievement of its debt targets. Additionally, the strong resolve and commitment of GOBD to the plans and targets identified in BERT, and the negotiated natural disaster clauses on new bonds in the domestic and external debt restructuring, strengthens the ability of GOBD to service its obligations in the future.

SOCIAL AND GENDER IMPACT ASSESSMENT

4.20 The Project offers significant short and long-term social impacts for residents and communities in Barbados. The Environmental and Social Impact Assessment (ESIA) [June 2019] identifies as a significant social risk the potential for an accidental spill or leakage during construction. However, the ESIA concludes that such accidental spill, although unlikely to occur, will be addressed in a comprehensive site management plan. Another potential negative impact on the directly affected population and potential risk to project implementation is the resolution of minor property encroachments occasioned during installation of the temporary outfall. To date, BWA has gained informed consent from 6 of the 9 affected landowners and continues investigations to locate and gain informed consent from the remaining landowners. This risk is mitigated by the pertinent legislation, and the Grievance Redress Mechanism (GRM). The Project will improve public health and safety conditions among communities as well as occupational health and safety within the commercial and tourism sectors along the South Coast. Moreover, the Project willcontribute to the sustained improvement of living conditions, livelihoods and income generation opportunities among the residential population.

4.21 **Living Conditions**: The failure of the SCSS resulted in numerous health and sanitation problems, including an infestation of vector/insects and an overflowing of manholes with detrimental effects on the directly affected communities. During the period, residents reportedly experienced many health problems and increased expenditure for medical expenses and infrastructural adjustments to private properties. The installation of the temporary outfall has facilitated the restoration of sanitary conditions in the directly affected communities. The construction of the new permanent outfall will contribute to the maintenance of health and sanitation for residents and communities along the South Coast.

4.22 **Livelihoods**: The Project will provide short-term employment opportunities for retail food vendors, during the construction phase, and will help safeguard livelihoods among guesthouses, restaurants and craft vendors in the area. In addition, the South Coast is a prominent tourism and commercial zone for Barbados with numerous hotels and businesses, popular beaches and marine activities. The construction of the new permanent outfall safeguards against the disruption of livelihoods and commercial and tourism sector activities as a result of the failure of the temporary outfall. The Project will help restore public confidence to support the recovery of commercial and tourism investments along the South Coast.

4.23 During the construction phase, the Environmental and Social Management Plan (ESMP) and GRM will provide adequate mitigation measures to safeguard the directly affected communities and businesses against noise, dust, night-lights, storage and handling of substances, equipment and other conflicts in marine and road traffic that could negatively affect community and worker health and safety. The construction method adopted will minimise the disruption of social and economic activities of the affected population. In addition, a SESO will be engaged to foster meaningful stakeholder engagement between the Project and all stakeholders, implementing a comprehensive public information, education and communication plan.

4.24 A Gender Action Plan is shown at Appendix 4.4.1. The Gender Marker Score of 2.0 was attained and is shown on the following table. That score means the Project is Marginally Mainstreamed. That is, the project has limited potential to contribute to gender equality. The Gender Marker Analysis resulting in the score is found at Appendix 4.5.

GENDER MARKER SCORE

Analysis	Design	Implementation	Monitoring & Evaluation	Score	Code
0.5	0.5	1.0	0.0	2.0	Marginally Mainstreamed (MM)

ENVIRONMENTAL ASSESSMENT

4.25 The Project is categorised as "A" based on CDB's Environmental and Social Review Procedures as it has the potential to adversely impact sensitive environments. The area associated with the Works is located in Barbados' low-lying south western coastal corridor which has mixed land use - predominantly tourism, commercial and residential. The area comprises beaches, and sensitive ecosystems/habitats, including a Ramsar designated wetland site, shallow water with sea-grass beds, and highly productive reefs that support economic activities such as recreational scuba diving.

4.26 An ESIA for the Project was prepared by independent consultants (see Appendix 4.6) within the context of relevant legislation including the Health Services, Marine Pollution and Safety and Health at Work Acts, and EPD's Wastewater Standards. As a condition precedent to first disbursement, BWA is required to submit to CDB, evidence of Planning Unit, Prime Minister's Office (PU-PMO) approval of ESIA.

4.27 The works will commence 1km onshore in GHW and conclude approximately 1km offshore at a depth of 45m. Effluent will be discharged via a diffuser on the seabed which will be exposed to currents and wave action.

4.28 The adverse environmental impacts during construction will result from:

1. Landside works - clearing, excavation, filling and tunneling; and
2. Marine operations - undersea pipe and anchor installation and removal; and decommissioning of the temporary outfall,

4.29 Key adverse impacts resulting from these activities include:

1. Elevated dust and noise levels and reduced air quality in the vicinity of the Works;
2. Accidental spillage of pollutants such as lubricants and fuels;
3. Re-suspension of polluted sediment; and
4. Damage to an estimated 500m^2 of coral and less than 500m^2 of sea-grass habitats, including sections of highly productive reefs.

4.30 Mitigation measures to address landside-related impacts include: construction site management, dust suppression, occupational health and safety planning , and traffic management. Mitigation measures for addressing marine-related impacts include: route selection to minimise coral damage, wastewater disposal management, noise control, turbidity control and management, sea turtle protection, marine contaminant spill prevention and response, and benthic protection. A decommissioning plan for the temporary outfall has been developed to provide guidelines for managing that process and to minimise harmful impacts to the marine environment.

4.31 Effluent discharge from the permanent outfall will (i) improve shoreline water quality through enhanced effluent dilution, plume dispersion and bacterial die-off; and (ii) maintain GHW's water quality by reducing the risk of the wetland being used for emergency discharge. Benefits include (i) restoration of wetland recreational activities; (ii) reduced risk of beach contamination; and (iii) improved aesthetics. Modelling simulations suggest that there remains a risk of nearshore seawater quality exceeding swimming standards approximately four times per year, due to landward movement of the effluent's surface plume, during storm conditions. This risk is mitigated by the fact that nearshore recreational use will not be permitted, nor likely, in those conditions, and is balanced against the additional cost of discharging further

offshore in deeper water, and the planned upgrade of SCSTP, which will eliminate the risk.

4.32 Mitigation costs have been included in the Project's construction cost estimates and a draft ESMP developed for inclusion in bid documents (see Appendix 4.6.2). Monitoring of the Contractor's operations to ensure conformance with the mitigation measures stipulated in the ESMP will be undertaken jointly by the construction supervision consultant and BWA, and regular reports provided to CDB. Environmental and social monitoring protocols have been established at several levels, including monitoring by the construction supervision consultant and contractor, quality assurance, water quality monitoring by EPD and coordination for compliance reporting by PU-PMO and BWA. Key aspects that will be monitored include: water quality, benthic habitats, sea turtles nesting and pre-construction translocation of benthic organisms.

RENEWABLE ENERGY & ENERGY EFFICIENCY ASSESSMENT

4.33 The Project has already demonstrated that it can result in energy efficiency gains. When SCSS's original outfall was in operation, electricity usage at SCSTP was 175,000kWh/month. Commissioning of the temporary outfall dropped that figure to 33,000kWh/month, due to the pipe being shorter, straighter and having less head. Further savings are expected with the proposed larger diameter pipe.

CLIMATE CHANGE VULNERABILITY ASSESSMENT (CCVA)

4.34 The main climate-related vulnerabilities of the project area can be summarised as: more frequent hurricanes and storms, sea-level rise, extreme precipitation, and high temperatures. These parameters are likely to expose outfall infrastructure to increased risk of damage from storm surges, wave action, flooding, inundation, and increases in the amount of stormwater entering the system. Preliminary findings of the climate risk and vulnerability assessment suggest that climate change presents no significant impacts to the Project in any of the three major pipeline zones (Zone A – buried under water; Zone B – buried under sea; and Zone C – exposed under sea). There is potential for minor adverse impacts in Zone C from both wave and current action as a result of high wind events, which may cause excessive load on the pipe and/or scour of the seabed. The pipe in this zone will be anchored with collars or armour mattresses, designed to resist the worst case loadings from multiple scenarios of wind speed, storm size and direction of approach.

PAS GENERAL COMMENTARY

4.35 Using CDB's Performance Assessment System (PAS), there is a high probability that the expected outcomes will be achieved efficiently, and will be sustainable during the operational life of the Project.

PAS TABLE

Criteria	Score	Justification
Relevance	Highly Satisfactory	The Project is a high priority for GOBD and BWA, who termed the situation to which this project responds a national crisis. It responds to an urgent and critical need to stabilise SCSS with the inherent benefits to the tourism sector and Barbados as a whole. The expected outcomes of the Project are consistent with GOBD's Strategic Plan and CDB's Barbados Country Strategy and its Strategic Objectives and Corporate Priorities.

Effectiveness	Highly Satisfactory	The Project outcomes are expected to be fully achieved. The works methodology represents the quickest and least socially and environmentally impactful way to construct the new outfall, after consideration of several alternatives. The project management arrangements will utilise BWA's personnel who are already familiar with CDB-funded projects. Consultation and communication with key stakeholders have occurred and are expected to continue throughout implementation. Procurement has been advanced to ensure that there is little lag between contract award and the availability of financing, while ensuring maximum competition from a limited field of potential contractors.
Efficiency	Satisfactory	The Project will contribute to the maintenance and future achievement of social, economic and environmental benefits, at the least cost.
Sustainability	Satisfactory	The Project will reduce BWA's operational costs, complementing other ongoing initiatives in that area. Coupled with GOBD's policy initiatives within the wastewater sector, including the creation of another revenue stream, the pursuit of energy efficiency and renewable energy initiatives, ongoing institutional reform and the re-establishment of a maintenance programme, BWA is in an improved position to sustain itself and its wastewater infrastructure.
Overall Score	Highly Satisfactory	

5. RISK ASSESSMENT AND MITIGATION

RISK JUSTIFICATION

5.1 A summary of key risks impacting the Project is outlined in Table 5.1.

TABLE 5.1: SUMMARY OF RISKS ASSESSMENT AND MITIGATION MEASURES

Risk Category	Risk Type	Description of Risk	Mitigation Measures
Developmental	Performance - Supplier/Consultant/Contractor	Use of specialist technology new to the Caribbean may result in overruns and delays.	While new to the Caribbean, the technology has been used under the anticipated conditions, the procurement process seeks to ensure broad competition amoung the limited field of bidders, and qualification criteria have been selected to ensure the contractor will have the relevant skills, experience and financial ability to undertake the works.
Developmental	Budgetary/Local counterpart funds	GOBD and BWA's current financial positions may affect their ability to provide counterpart funding.	BSCOP's counterpart funding comprises mainly funds already expended and regular operational expenditure. BWA has applied to the Ministry of Finance for an exemption with respect to Value Added Tax, which will remove BWA's and their consultants', contractors' and

Risk Category	Risk Type	Description of Risk	Mitigation Measures
			suppliers' tax obligations.

6. IMPLEMENTATION AND PROJECT MANAGEMENT

BORROWER

6.1 GOBD may, pursuant to Section 3 (1) of the Loans (Caribbean Development Bank) Act, Chapter 97A of the Laws of Barbados (the Loans (CDB) Act), in such manner and on such terms and subject to such conditions as may be agreed with CDB, borrow, or guarantee the borrowing of, such sums from CDB as are required for the purpose of financing or promoting economic and social development in Barbados. An agreement between GOBD and CDB in respect of any amount so borrowed must be made in the name of GOBD and may be signed on behalf of GOBD by the Minister responsible for Finance or by a person authorised thereto in writing by the Minister. A copy of the Agreement must be laid before the House of Representatives as soon as possible after it is concluded. All amounts required for the repayment of any sums borrowed or guaranteed by GOBD under the authority of the Loans (CDB) Act, and the payment of all interest and other charges in respect of such sums, are charged upon and payable out of the Consolidated Fund.

EXECUTING AGENCY ANALYSIS

6.2 BWA is a statutory corporation, which was established pursuant to the Barbados Water Authority Act, Cap. 274A of the Laws of Barbados (the Act) on October 8, 1980. It commenced operations on April 1, 1981. BWA's statutorily prescribed functions include a requirement to:

1. prepare and submit to the Minister from time to time proposals for the establishment of efficient, coordinated and economical sewerage systems capable of meeting the need for sewerage services throughout Barbados;

2. prepare details of schemes for the development and supply of sewerage services and to construct, maintain and operate such schemes;

3. keep under constant review the quality, reliability and availability of sewerage services and the rates to be charged for these services;

4. design, construct, acquire, provide, operate and maintain sewerage works for the purpose of receiving, treating and disposing of sewage;

5. conduct research programmes and prepare statistics for its purposes; to disseminate information and advice with respect to the management, collection, and treatment, of sewage.

6.3 Responsibility for the policy and general administration of BWA rests with its Board of Directors (the Board). The Board may with the approval of the Minister, appoint a person to be GM of the Authority, who shall be an employee of BWA. The GM is subject to the directions of the Board and is responsible to the Board for the execution and day-to-day management of the affairs of BWA.

6.4 Accordingly, BWA is empowered to execute the Project in respect of which the financing is being sought.

6.5 As noted earlier, BWA is currently executing WatSNUP, a CDB-funded project. The Project is currently behind schedule, partly due to delays in finalising the institutional arrangements to support the transfer of funds from a designated account at CBB into a BWA operating account. That situation has been resolved and has contributed to a marked improvement in the pace of implementation of the Project. In general, WatSNUP has been implemented in accordance with the terms and conditions of Loan No. 33/OR-BAR. The two Loan conditions that over the past BWA has been challenged to maintain are submission of the annual audited financial statements, and maintaining its receivables at 45 days. BWA has made substantial progress on the submission of the audited financial statements, and was able to bring receivables under the stipulated limit in FY 2017 and FY 2018, only slightly exceeding it (by one day) in FY 2019.

PROJECT MANAGEMENT

6.6 BWA's PMO will manage the Project. PMO comprises an acting Project Manager, two PCs, a Project Officer, a Finance Officer, two Engineering Assistants, a Clerical Officer and a Secretary - a Procurement Officer is also being engaged. PMO is currently managing at least four capital projects, including the CDB-financed WatSNUP. BSCOP will add at least three contracts. CDB's staff has concluded that BWA and PMO will require additional support to implement the Project. The Technical Advisor to BWA's Board, whose qualifications and experience are acceptable to CDB, has served as BWA's PC to date. However, to permit the Technical Advisor to reallocate time to other key strategic initiatives within BWA, it will be a condition of the Loan that BWA assign the Technical Advisor to act as interim PC and select and engage a consultant by April 6, 2020, with qualifications and experience acceptable to CDB, to perform the functions of PC. It will also be a condition of the Loan that BWA engage a SESO with qualifications and experience are acceptable to CDB, to perform the functions of SESO by April 6, 2020. The Terms of Reference (TOR) for PC and SESO, both of which are to be funded through the Loan, are set out at Appendices 6.4.1 and 6.4.2.

6.7 WatSNUP's PSC already comprises representatives pertinent to BSCOP. It will be a condition precedent to first disbursement, that GOBD extends the responsibilities of WatSNUP's PSC to include BSCOP, and supplement its membership for project specific discussions with BSCOP's PC, a representative of the Coastal Zone Management Unit (CZMU), and a representative of the affected landowners. The duties and composition of BSCOP's PSC are set out at Appendix 6.4.3.

6.8 A project management organisation chart is set out Appendix 6.5.1.

IMPLEMENTATION

6.9 The Project is to be implemented over a period of 24 months commencing from CDB’s Board of Directors' approval. The Junction-to-Outfall work is estimated to take eight months (March 2020 to October 2020), and will carry a 12-month defects liability period. It will be followed one month later by the decommissioning of the marine side of the temporary outfall, which will have a 6-month defects liability period. Environmental monitoring by the construction supervision consultant will continue to October 2021. The proposed Project Implementation Schedule is presented in Appendix 6.1.1.

PARTICIPATION OF BENEFICIARIES AND STAKEHOLDERS

6.10 The preparation and appraisal of this project involved consultation with a wide range of stakeholders. Meetings were held with representatives of: BWA's management, PMO and WWD; Ministry of Finance (MOF); Ministry of Health (MOH); EPD; CZMU; PU-PMO, Ministry of Lands; and Intimate Hotels. Overall, the discussions provided opportunities for feedback as stakeholders' opinions and concerns were expressed and, as necessary, are being incorporated in project design. This principle of stakeholder participation will be maintained during project implementation through the BWA's communications arm, SESO and the ESMP.

DISBURSEMENT

6.11 Disbursement of the CDB Loan will be made in accordance with CDB's Disbursement Guidelines for CDB-financed Projects (January 2019). First disbursement is projected to occur by March 31, 2020. Final disbursement is expected by December 31, 2021. An Estimated Quarterly Disbursement Schedule is presented in Appendix 6.2.

DESIGNATED ACCOUNT

6.12 The Borrower shall open and maintain a Designated Account (DA) in accordance with CDB's Disbursement Guidelines for CDB-Financed Projects (January 2019), for CDB's share of eligible expenses on project components.

6.13 In addition to the DA, the Executing Agency shall open and maintain an Operating Account (OA) at a commercial bank or institution in Barbados acceptable to CDB, into which funds from DA shall be transferred to be used exclusively for CDB's share of eligible expenses. The OA will be subject to an audit at project completion.

PROCUREMENT

6.14 CDB financed components shall be procured in accordance with CDB's Procurement Policy for Projects Financed by CDB (November 2019), and CDB's Procurement Procedures for Projects Financed by CDB (November 2019). The Junction-to-Outfall Works involves a proprietary type of trenchless technology, for the reasons laid out in Paragraph 4.02. As most of the contractors with the license to use the technology are from non-CDB member countries a waiver is sought to extend eligibility for this contract to countries which are not CDB member countries to maximise competition. The estimated value of the waiver being requested is $22 mn. The Procurement Plan is provided at Appendix 6.3.

MONITORING AND REPORTING

6.15 PC will have overall responsibility for monitoring and reporting during implementation. Thereafter that responsibility shifts to BWA's GM for the duration of the Loan. Part of project monitoring involves audits of BSCOP and its accounts. It will be a condition of the Loan that BWA engage an External

Auditor whose qualifications and experience are acceptable to the Bank. The TOR for the External Auditor are set out at Appendix 6.6.1. It will be a condition of the Loan that BWA shall furnish, or cause to be furnished, to CDB the reports listed in Appendix 6.6.2 in such form or forms as CDB may require, not later than the times specified therein for so doing.

7. TERMS AND CONDITIONS

7.1 Terms and Conditions of the Loan

No	Subject	Terms and Conditions of the Loan
1.	**Parties**	Bank: Caribbean Development Bank (CDB) Borrower: Government of Barbados (GOBD) Executing Agency: Barbados Water Authority (BWA)
2.	**Amount of Loan**	The Bank agrees to lend to the Borrower an amount not exceeding the equivalent of twenty nine million eight hundred thousand United States dollars (USD29,800,000) (the Loan) comprising: Ordinary Capital Resources (OCR): Twenty nine million eight hundred thousand United States dollars (USD29,800,000)
3.	**Purpose**	The purpose for which the Loan is being made is to assist the Borrower in financing the construction of a new permanent marine outfall for the South Coast Sewerage System in Barbados (the Project).
4.	**Repayment**	The Borrower shall repay the amount withdrawn from the Loan Account in sixty (60) equal or approximately equal and consecutive quarterly instalments commencing two (2) years following the date of this Loan Agreement or on such later date as the Bank may specify in writing.
5.	**Interest**	The Borrower shall pay to the Bank interest at the rate of four decimal eight percent (4.8%) per annum (variable) on the amount of the Loan withdrawn and outstanding from time to time, payable quarterly.
6.	**Commitment Charge**	The Borrower shall pay to the Bank a commitment charge at the rate of one percent (1%) p.a. on the amount of the Loan unwithdrawn from time to time. Such charge shall accrue from the sixtieth (60^{th}) day after the date of the Loan Agreement and shall be payable quarterly.

No	Subject	Terms and Conditions of the Loan
7.	**Payments by the Executing Agency on behalf of the Borrower**	Except as the Bank may otherwise agree, Section 3.11 of the General Provisions, which required that debt service payments be made by the Executing Agency on behalf of the Borrower, shall not apply to this Loan.
8.	**Withdrawal and Application of Loan**	Except as the Bank may otherwise agree, total disbursements of the Loan shall not exceed in the aggregate seventy percent (70%) of the cost of the Project. Except as the Bank may otherwise agree, amounts withdrawn from the Loan Account(s) shall be used to finance the components of the Project allocated for financing by the Bank as shown in the **Project Cost, Financing and Phasing Plan** for the Project up to the respective limits specified therein. The amounts withdrawn from the Loan Account shall not be used to meet any part of the cost of the Project which consists of identifiable Taxes and Duties. The Borrower and the Executing Agency shall comply with the Bank's "*Disbursement Guidelines for CDB-Financed Projects*" published in January 2019, which publication is in effect at the date hereof and which may be amended from time to time by the Bank.
9.	**Period of Disbursement**	The Bank shall have received an application for first disbursement of the Loan by March 31, 2020 or such later date as may be specified in writing by the Bank. The Loan shall be disbursed up to December 31, 2021 or such later date as may be specified in writing by the Bank.
10.	**Procurement**	Except as provided below, procurement shall be in accordance with the procedures set out and/or referred to in the Loan Agreement between the Bank and the Borrower, or such other procedures as the Bank may from time to time specify in writing. *CDB's Procurement Policy for Projects Financed by CDB (November 2019) and CDB's Procurement Procedures for Projects Financed by CDB (November 2019).* In respect of procurement relating to the Junction-to-Outfall Works contract, country eligibility shall be extended to countries which are not CDB Member Countries.

No	Subject	Terms and Conditions of the Loan
		The Borrower and the Executing Agency shall comply with the procurement requirements set out in the **Procurement Plan**. Any revisions to the **Procurement Plan** shall require the Bank's prior approval in writing.
11.	**Additional Condition(s) Precedent to First Disbursement**	The Bank shall not be obligated to make the first disbursement of the Loan until the Borrower has furnished or caused to be furnished to the Bank, evidence acceptable to the Bank, that the following condition/s has/have been satisfied: The Borrower has extended the responsibilities of the PSC from the ongoing CDB-funded WatSNUP Project to include BSCOP and its membership has been supplemented for Project specific discussions with the BSCOP PC, a representative of the CZMU and the representative of the affected landowners. The Executing Agency has received all requisite statutory, planning, building and environmental permits, licenses and/or other approvals in respect of each Infrastructure Works contract. The lands required for the Infrastructure Works are vested in the Borrower free from all encumbrances and without covenants, stipulations or conditions which may adversely affect the Project, or alternatively the Borrower has made arrangements satisfactory to the Bank to enter into possession of or acquire the relevant rights over such lands for the purposes of the Project. Planning Unit, Prime Minister's Office (PU-PMO) approval of the Environmental and Social Impact Assessment.
12.	**Project Implementation**	Except as the Bank may otherwise agree, the Borrower shall implement the Project through the Executing Agency. Except as the Bank may otherwise agree, the Executing Agency shall (a) carry out the Project at all times with due diligence and efficiency, with management personnel whose qualifications and experience are acceptable to the Bank and in accordance with sound technical, environmental, administrative, financial and managerial standards and practices; (b) institute and maintain organisational, administrative, accounting and auditing arrangements for the Project, acceptable to the Bank; and (c) promptly disclose any event related to integrity, ethics and compliance of the Borrower, the Executing Agency or any other party related to the Project which may in any way effect the execution of the Project.

No	Subject	Terms and Conditions of the Loan
13.	**Project Management**	The Executing Agency shall assign the Technical Advisor to act as interim PC to initiate the implementation of the project and shall, in accordance with the procurement procedures applicable to the Loan, select and engage a PC by April 6, 2020 who shall be responsible for the overall management of the Project and who shall carry out the services outlined in the **TOR** for **Project Coordinator**. The Executing Agency shall, in accordance with the procurement procedures applicable to the Loan, select and engage a SESO by April 6, 2020, who shall carry out the services outlined in the **TOR** for **Social and Environmental Safeguards Officer.** The Borrower shall retain and, for the duration of the Project, maintain the PSC of WatSNUP and extend their responsibilities to include the Project, with the composition and functions set out in the **Duties and Responsibilities of Project Steering Committee**.
14.	**Engagement of Consultants**	The Executing Agency shall, in accordance with the procurement procedures applicable to the Loan, select and engage consultant(s) to provide the following consultancy services: **Project Coordinator** **Social and Environmental Safeguards Officer** **External Auditor** The Executing Agency may retain the services of the consultants previously appointed to prepare designs and contract documents and to provide construction supervision services under the Project. The qualifications and experience of any person(s) subsequently appointed to provide these services shall be acceptable to the Bank. The Borrower shall within a time frame acceptable to the Bank implement such recommendations from the abovementioned consultant(s), as may be acceptable to the Bank.
15.	**Engagement of Contractors**	The Executing Agency shall, in accordance with the procurement procedures applicable to the Loan, select and engage contractors to carry out the works to be financed by the Loan.
16.	**Maintenance of Infrastructure**	The Borrower and the Executing Agency shall keep the buildings, works and other infrastructure financed from the Loan, or cause the same to be kept, in good repair and condition and shall provide the financial and other resources required to

No	Subject	Terms and Conditions of the Loan
		adequately maintain the infrastructure financed from the Loan. For the duration of the Loan, the Executing Agency shall submit to the Bank annual costed maintenance plans for the SCSS within four (4) months of the end of its financial year.
17.	**Additional Funds**	The Borrower and the Executing Agency shall be responsible for meeting any amount by which the total cost of the Project exceeds forty-two million three hundred and fifteen thousand United States dollars (USD42,315,000).
18.	**Counterpart Contribution**	Except as the Bank may otherwise agree, the contribution which the Borrower and/or the Executing Agency is required to make to the Project shall be expended by the Borrower and/or the Executing Agency in a timely manner on the components of the Project allocated for financing by the Borrower as shown in the **Financing Plan**, up to the respective limits set out therein. Total Counterpart Financing: twenty five million thirty thousand Barbados dollars (BBD25,030,000).
19.	**Reports and Information**	Except as the Bank may otherwise agree, the Executing Agency shall furnish or cause to be furnished to the Bank the reports and other information set out in the **Reporting Requirements** in the form specified therein, or in such form or forms as the Bank may require, not later than the times specified therein for so doing.
20.	**Other Condition(s)**	The Executing Agency shall provide the Bank with audited financial statements of its operations for the periods ending March 31, 2018 and March 31, 2019 by June 30, 2020 and shall submit to the Bank its audited annual financial statements and applicable management letter within six months of the close of each financial year for the duration of the Loan. The Executing Agency shall inform the Bank when the appointment of Director of Projects, Research and Planning has been made and when any subsequent appointments are made to the position of Director of Projects, Research and Planning as well as to the positions of General Manager, Director of Engineering and Director of Finance in the Executing Agency. The Borrower shall provide sufficient financial support to enable the Executing Agency to meet its operating expenses and debt service obligations.

APPENDICES TO CHAPTER 1 - STRATEGIC CONTEXT AND RATIONALE

APPENDIX 1.1 MACROECONOMIC CONTEXT DETAILS

APPENDIX 1.1.1

MACROECONOMIC CONTEXT

1. CONTEXT

Reviews under the IMF Extended Fund Facility (EFF) for Barbados

1.1 GOBD embarked on the BERT programme in mid-2018, aimed at restoring fiscal and debt sustainability, increasing reserves, and accelerating growth. BERT is being implemented in three phases. Phase I was initiated on June 11, 2018, and focused on: (a) broadening the tax base; (b) improving the progressivity of the tax system; and (c) strengthening tax administration while protecting the most vulnerable. Phase I also involved the restructuring of debt which aimed to reduce the debt stock and interest payments to more sustainable levels through reduced coupons, grace periods for principal repayments and extended maturities. Phases II and III prioritise expenditure reduction through a review and analysis of the CG and SOEs expenditure and measures to boost growth. Implementation of Phase II of BERT commenced in the third quarter of 2018, and Phase III is expected to commence in 2020.

1.2 GOBD has made a strong start in implementing BERT. The quantitative program targets for the First Review of the BERT programme in March 2019 and the targets for June 2019 have been satisfied, with some targets being exceeded. The June 2019 target for the government's primary surplus was met with a wide margin, with the government running a primary surplus of 2.4% (annual) GDP in the first quarter of FY 2019/20, compared with the target of 1.8%. This was mainly due to the over performance of the VAT and personal income taxes and continued expenditure restraints particularly in the categories of: wages and salaries, goods and services and capital expenditure. The favourable fiscal performance bodes well for achieving the government's primary surplus target of 6.0% of GDP for FY 2019/20. International reserves were also well over program targets at end-June. Progress is being made by the authorities in furthering good-faith discussions with external creditors. With the satisfactory completion of this review, another tranche of funding was made available to the GOBD to the tune of $48.70 million (mn). This brings the total disbursements as at June 2019 under the EFF to $497.40 mn. The IMF issued a press release on September 6, 2019 which indicated that "Barbados continues to make good progress in implementing its ambitious and comprehensive economic reform program".

1.3 GOBD has also made strong progress in implementing the structural benchmarks under the EFF, including those that contribute to an improved business climate such as a Sandbox regime to regulate Fintech start-ups set up in October 2018 and a new Planning and Development Act passed in January 2019. The government has also introduced a system for monitoring SOE arrears on an ongoing basis and has submitted a consolidated report on the performance of SOEs to parliament. However, there have been delays on two structural benchmarks: the introduction of the Central Bank law which was pushed back from June 2019 to December 2019 and the introduction of the actuarial review of the pension system which was pushed back from June 2019 to December 2019. These delays were the result of capacity constraints in the GOBD. The Second Review of the EFF is scheduled for November 2019 to examine the performance criteria as at the end of September 2019. Details of the quantitative performance criteria targets and actual

data and the progress with the implementation of the structural benchmarks related to the IMF EFF are highlighted in Table 1.

TABLE 1: BARBADOS PROGRAM MONITORING: QUANTITATIVE PERFORMANCE CRITERIA UNDER EFF

(BDS$ millions, unless otherwise indicated)

	EFF Target March 2019	Actual Data March 2019	EFF Target April - June 2019	Actual Data April - June 2019	EFF Target July - September 2019	Actual Data July - September 2019
Fiscal Targets						
Performance Criteria						
Floor on the CG Primary balance	315	354	125	250	282	n.a.
Non-accumulation of CG external debt arrears	0	0	0	0	0	n.a.
Ceiling on Transfers and Grants to Public Institutions	732	675	104	88	209	n.a.
Ceiling on Public Debt	12,921	12,853	12,853	12,625	12,689	n.a.
Indicative Targets						
Ceiling on CG Domestic Arrears	1,246	293	280	279	265	n.a.
Floor on Social Spending	50	101	10	10.3	22	n.a.
Ceiling on Public Institutions Arrears	n.a.	n.a.	284	185	254	n.a.
Monetary Targets						
Ceiling on Net Domestic Assets of the CBB	1,992	1,876	2,006	1,860	2,006	n.a.
Floor on Net International Reserves	717	889	893	938	901	n.a.

Structural Benchmarks	Deadline	Status
Government to conduct a comprehensive review of the tax system, with inputs from IMF technical assistance.	End June 2019	Completed
Governor General to proclaim the Financial Management and Audit Act.	End July 2019	Completed
Government to conduct a comprehensive review of all tariffs and fees charged by SOEs.	End September 2019	In Progress
Parliament to enact an amended Central Bank Law aimed at enhancing the Central Bank's institutional, personal and financial autonomy.	End December 2019	In Progress
The Barbados Revenue Authority to adopt measurable performance targets that increase on-time filing for corporate Income Tax and VAT.	End December 2019	In Progress
Government to conduct an actuarial review of the civil service pension system with a view to reforming the system.	End December 2019	In Progress
Customs department to deploy staff to the exemptions monitoring unit and undertake at least eight exemption verification assignments.	End December 2019	In Progress

Real Sector

1.4 A key pillar in the BERT programme is to foster stronger economic growth. GDP growth in Barbados has been weak since the onset of the global recession. Economic activity, which averaged 3.1% in the lead-up to the global recession (2005-2008), averaged -0.6% during the period 2009-2018. This was caused by the declining competitiveness of the economy, occasioned by: (i) sluggish tourism growth; (ii) a weak institutional framework for doing business; (iii) deteriorating physical infrastructure including water

resources, sewage, and solid waste systems; and (iv) investor uncertainty as a result of an unsustainable fiscal situation. Economic activity contracted further by an estimated 0.2% during January to September 2019 and is expected to remain weak in the coming months.

1.5 Key to restoring economic growth in the short-term is the need to boost the critical service sectors (including tourism and financial services) which contribute approximately 60% of GDP (directly and indirectly). Issues related to public health such as the south coast sewage crisis and the associated negative publicity, if sustained, can adversely affect the tourism sector and the livelihoods of persons in that sector, which could slow the pace of economic recovery. The restoration of, and improvement in, wastewater management services can therefore assist in efforts to safeguard the economic recovery of the domestic economy.

1.6 Inflation pressures eased since the second half of 2018, due mainly to the removal of the National Social Responsibility Levy. Inflation declined to 3.7% in 2018 from 4.5% in 2017. Data for the first quarter of 2019 also reveal a slowing of inflation to 2.5% compared to 4.7% in the same 3-month period in 2018.

TABLE 2: SELECTED INDICATORS

	2014	2015	2016	2017	2018
Real GDP Growth (%)	0.0	2.5	2.6	0.6	(0.4)
Average Inflation (%)	1.8	(1.1)	1.5	4.5	3.7
Unemployment (%)	12.3	11.3	9.7	10.0	10.1
Primary Balance (% of GDP)	(0.5)	(2.0)	2.2	3.1	3.5
Gross Central Government Debt (% of GDP)*	137.0	144.2	151.2	148.4	126.3
Gross International Reserves (months of import cover)	3.4	3.1	2.3	1.5	3.4

Sources: Central Bank of Barbados and Ministry of Finance, Economic Affairs and Investment

Central Government Fiscal Operations and Debt

1.7 Barbados recorded persistent fiscal imbalances, which pushed up the public debt and fostered an unsustainable fiscal situation. In the 10 years to 2017, the fiscal deficit averaged 7.2% of GDP. The consecutive deficits led to a sharp rise in Central Government debt to 148.4% of GDP as at December 2017. The BERT programme initiated a phased plan to transform the public finances, effective June 2018, focused on: broadening the tax base, strengthening tax administration, reducing expenditure with emphasis on SOEs and comprehensive debt restructuring. The fiscal consolidation is ongoing, with the authorities targeting a primary surplus of 6.0 percent of GDP in FY 2019/20 and will maintain this for the next 5 years (FY 2019/20 – FY 2024/25) and then slowly moderate the primary surplus target. This strengthened fiscal trajectory will assist to reduce the debt trajectory to 115% of GDP by 2023 and 85% of GDP by 2028.

1.8 The FY2019/20 budget provides a solid basis for the targeted fiscal consolidation of 6% of GDP. The adjustment effort is supported by several new taxes, ongoing reforms in public financial management, a reduction of transfers to SOEs and adequate provisions for social safety nets and capital expenditure. If necessary, the authorities stand ready to take additional measures to reach the targeted primary surplus. The planned adoption of a fiscal rule in 2020 will help sustain the adjustment effort over the medium and long term. Reform of SOEs is critical for achieving the primary surplus target and maintaining it over the medium term.

1.9 A public debt restructuring exercise is complementing the fiscal consolidation. The restructuring of domestic public debt, completed in November 2018 has helped to substantially reduce the public debt

burden without jeopardising financial stability. The restructuring resulted in an immediate reduction in CG debt to GDP ratio of about 22 percentage points in nominal terms to 126.3% of GDP as at December 2018. Claims of private sector creditors were restructured mainly through lengthening of maturities and reduction of interest rates, while claims of public sector creditors were restructured through a combination of upfront haircuts, lengthening of maturities, and reduction in interest rates.

1.10 The rapid completion of the domestic part of the debt restructuring exercise has been very helpful in reducing economic uncertainty, and the new terms agreed with domestic creditors have put debt on a clear downward trajectory; plans are being developed to address the impact of the debt restructuring on public agencies. GOBD launched an Exchange Offer to the Barbados External Creditors Committee[1] on November 5, 2019 towards the resolution of the External Commercial debt default. The finalisation of the external debt restructuring is expected to cause a further reduction in the debt stock, reduce uncertainty and improve the prospects for accelerated economic activity.

External Sector

1.11 The fixed exchange rate has served as a key anchor for macroeconomic stability. Central to maintaining the fixed exchange rate peg is the quantity of foreign exchange reserves. Reserves, which reached a low of $220 million (5-6 weeks of import coverage) at end-May 2018, have more than doubled since then mainly due to lending from international financial institutions and the ongoing external commercial debt moratorium.

1.12 Most recently, in July 2019, Moody's credit rating agency upgraded Barbados' issuer ratings to Caa1 from Caa3. The upgrade reflected the combination of a material improvement in fiscal and debt metrics as well as the expectation that the Government's improving policy framework and ongoing fiscal and structural reforms will help place the Government's debt burden on a downward trajectory.

Financial Sector

1.13 The financial system remains stable, notwithstanding the impairment to commercial bank's capital buffers, resulting from Government's debt restructuring and the adoption of the International Financial Reporting Standard (IFRS) 9 accounting standard. As a result, the aggregate capital adequacy ratio fell to 13% from 17% one year earlier. However, these levels remain above the prescribed minimum benchmark of 8%.

1.14 Preliminary data on deposit-taking institutions indicate a small decline in credit to the non-financial private sector, while deposits held in domestic currency were up by 1% for the first 3 months of 2019. The performance was on par with the corresponding period of 2018.

2. OUTLOOK

2.1 CDB maintains its forecast that economic activity will be flat in 2019. In the nine-month period, January to September 2019, the economy contracted by 0.2%, but strengthened tourism performance in the final quarter should slightly improve economic activity. On the upside, the expected conclusion of the external debt negotiations will strengthen the macroeconomic environment by reducing uncertainty and may accelerate activity on stalled construction projects or foster new private sector construction activity. Over the medium term, growth is projected to return to close to its medium-term average of about 2%.

[1] The Committee is comprised of regional and international financial institutions, pension funds, regional central banks and individual bondholders, which together represent just under 60% of the Eligible Debt.

2.2 Risks to the BERT program and economic activity include limited implementation capacity, untested ability to maintain high primary surpluses over an extended period, and risks related to the external debt restructuring process. Additional challenges include reforming the civil service pension system and strengthening the effectiveness of Customs.

2.3 CDB debt sustainability analysis shows that the proposed BSCOP will not adversely affect the achievement of GOBD debt targets to reduce the debt to GDP ratio to 100% of GDP by FY 2023/24 and further to 60% of GDP by FY 2033/34. CDB analysis reveals that the project marginally contributes to an increase in the debt to GDP ratio of 0.04% and the debt to GDP ratio is estimated at 98.2% of GDP in FY 2023/24, which is below the target of 100% of GDP.

APPENDICES TO CHAPTER 2 - PROJECT DESCRIPTION

APPENDIX 2.1 COMPONENT DETAILED DESCRIPTION

Project Preparation

- Project preparation comprising:

1. Temporary Outfall Works comprising a marine contract and a landside contract. The landside contract comprised the construction of a Junction Box, the upgrade of a service road, and the installation of a 700m long, 450mm dia buried ductile iron pipe by open cut from SCSTP to the Junction Box. The marine contract comprised the installation of two HDPE pipes (200mm and 300mm dia) from the Junction Box to the discharge point 800m offshore and 30m below sea level. The HDPE pipes are buried up to the shoreline, then anchored on the surface of the seabed. Both pipes include a ductile iron section over the reef. Both contracts were executed in a month and completed in December 2018, with a six-month defects liability period. The marine works serves as temporary works for the construction of the new permanent outfall. The landside works will be incorporated in the permanent Works. BWA financed.

2. Study, design and construction supervision services associated with the marine and landside temporary outfall contracts. Completed June 2019 with end of monitoring programme. BWA financed.

3. Project management comprising PMO's PC, Finance Officer, Procurement Officer, Project Officer, Engineering Assistant, Clerical Officer and Secretary (none dedicated solely to the Project) plus costs of community consultations, communications etc. BWA financed.

Land

- Approximately 16,000 sq.m. of land are required for the Works and is valued at $1.39 per sq.m ($15 per sq. ft). Approximately 10 private properties will be affected by the Works.

Infrastructure Works

- Works contracts comprising:

1. Junction-to-Outfall Works to install an approximately 1,200m long, 750mm (30") diameter HDPE forcemain pipe from the Junction Box to the offshore diffuser point 1,000m offshore and 45m below sea level. The underground aspect of the works will utilise Direct Pipe(TM), a trenchless technology. The undersea section will commence 900m offshore once the underground section exits the seabed, and will either be installed using the same technology or lowered into place on the seabed along with the 60m long diffuser. It will be secured on the seabed with concrete anchors or mattresses. Procurement has commenced using a design-build approach in a two-stage process

(technical and financial bids), with financial bids expected in November 2019, contract award in January 2020, construction start in February 2020 and completion in October 2020. Loan financed.

2. Plant-to-Junction Works to replace the landside portion of the temporary outfall with a larger HDPE pipe, using an open trench approach. Loan financed.

3. Decommissioning Works comprising mobilisation of marine equipment, removal of pipelines and concrete blocks inside of nearshore reef, removal of steel lines crossing the nearshore reef, removal of offshore lines to diffuser, and removal of offshore concrete blocks to designated storage area. To follow three months after commissioning of the new outfall, with a one-month duration. Loan financed.

Engineering and construction-related services

- Engineering and construction related services comprising Design and Construction Supervision services for the permanent outfall including engineering, oceanographic studies, benthic surveys, topographical surveys, bathymetric surveys, economic assessment, social and environmental impact assessment and monitoring. Includes design and construction supervision services associated with the decommissioning of the marine side of the temporary outfall. BWA signed a Memorandum of Understanding (MOU) with consultants for provision of those services on April 24, 2019, which should be completed in November 2021. BWA funded.

Other Project Support Services

- Other Project Support Services comprising the engagement of an External Auditor to conduct audits of the Designated Account and Operating Account. Loan funded.

Project Management

- Project management comprising:

1. The engagement of a PC and a SESO, to commence April 2020, respectively. Loan funded.

2. Support by BWA's PMO which currently comprises two PCs, a Finance Officer, a Project Officer, a Clerical Officer and a Secretary. BWA is in the process of engaging an in-house Procurement Officer. BWA funded.

3. augmentation of the CDB-funded WatSNUP PSC with a representative of the CZMU and a representative of the affected land owners, to provide oversight of the Project. GOBD/BWA funded.

APPENDIX 2.2 RESULTS MONITORING PLAN

Indicator	Baseline	Year 2019	Year 2020	Year 2021	Responsibility for Data Collection
1.1 Ability to resist a Category 1 Hurricane (Yes/No)	No; 12/12/2019				BWA GM
1.2 Reduced monthly energy consumption at SCSTP (MWh)	33; 11/21/2019				BWA GM

Indicator	Baseline	Year 2019	Year 2020	Year 2021	Responsibility for Data Collection
1.1 Temporary outfall decommissioned (Yes/No)	No; 12/12/2019				PC
1.2 New 750mm dia. outfall commissioned (Yes/No)	No; 12/12/2019				PC

APPENDICES TO CHAPTER 3 - FINANCING PLAN

APPENDIX 3.1 PROJECT COSTS AND PHASING PLAN

PROJECT COSTS PHASING AND FINANCING PLAN

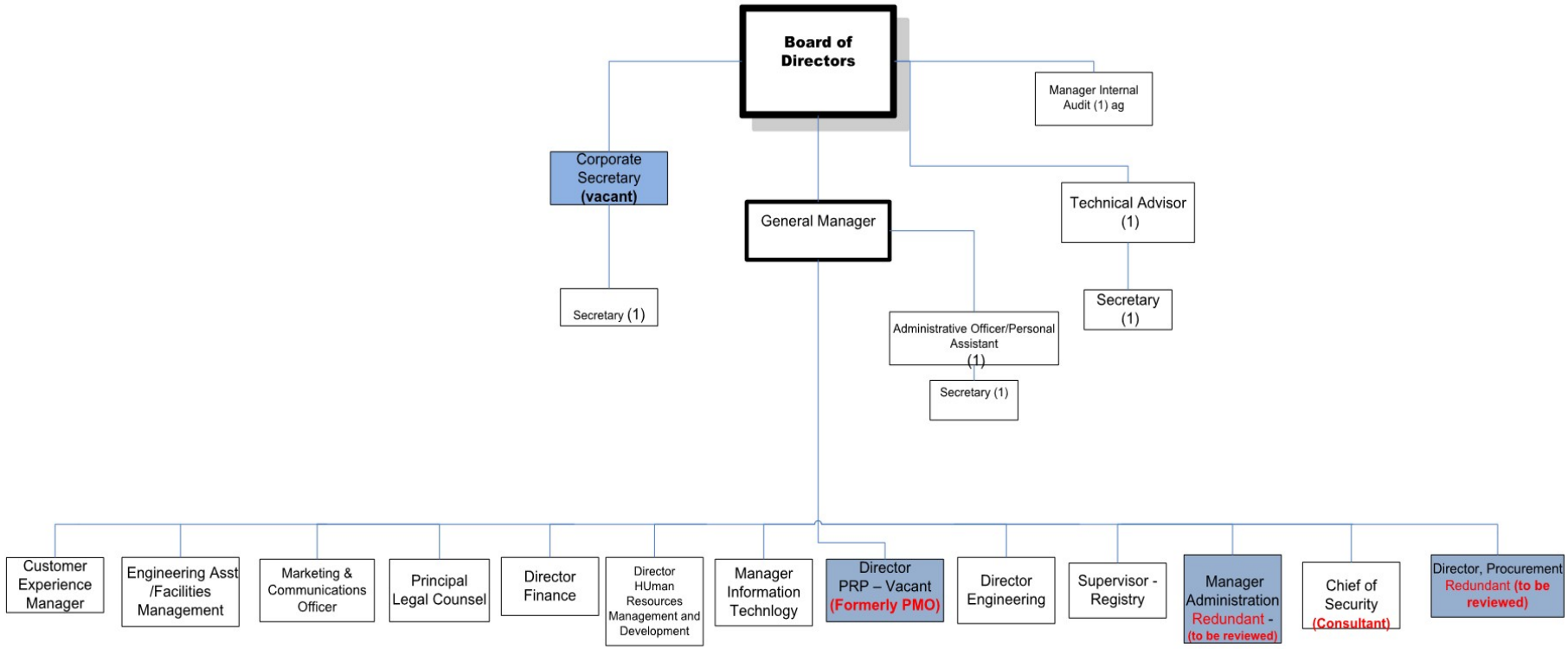
Components	OCR-USD		COUNTERPART		Total
	Equity and Market Resources	Total	GOBD	BWA	
2019 TOTAL					
Project Preparation		-			
Land		-	2,583,000	3,683,000	6,266,000
Base Cost		**-**	**2,583,000**	**3,683,000**	**6,266,000**
Physical Contingency		-	-	-	-
Price Contingency		-	-	-	-
Total Project Cost		**-**	**2,583,000**	**3,683,000**	**6,266,000**
Interest During Implementation		-	-	-	-
Commitment Fees		-	-	-	-
Total Financing		**-**	**2,583,000**	**3,683,000**	**6,266,000**
Percentage Financing	**0.00%**	**-**	**41.22%**	**58.78%**	**100.00%**
2020 TOTAL					
Infrastructure Works			-		
Engineering and Construction-related Services			-		
Other Project Support Services	25,215,166	25,215,166	-	1,734,000	26,949,166
Project Management			-		
Base Cost	**25,215,166**	**25,215,166**	**-**	**1,734,000**	**26,949,166**
Physical Contingency	3,775,417	3,775,417	-	90,900	3,866,317
Price Contingency	363,274	363,274	-	115,600	478,874
Total Project Cost	**29,353,857**	**29,353,857**	**-**	**1,940,500**	**31,294,357**
Interest During Implementation	-	-	1,225,484	-	1,225,484
Commitment Fees	-	-	127,656	-	127,656
Total Financing	**29,353,857**	**29,353,857**	**1,353,140**	**1,940,500**	**32,647,497**
Percentage Financing	**89.91%**	**89.91%**	**4.14%**	**5.94%**	**100.00%**
2021 TOTAL					
Engineering and Construction-related Services			-		
Other Project Support Services	75,334	75,334	-	1,734,000	1,809,334
Project Management			-		
Base Cost	**75,334**	**75,334**	**-**	**1,734,000**	**1,809,334**
Physical Contingency	7,533	7,533	-	90,900	98,433
Price Contingency	363,276	363,276	-	115,600	478,876
Total Project Cost	**446,143**	**446,143**	**-**	**1,940,500**	**2,386,643**
Interest During Implementation	-	-	919,116	-	919,116
Commitment Fees	-	-	95,744	-	95,744
Total Financing	**446,143**	**446,143**	**1,014,860**	**1,940,500**	**3,401,503**
Percentage Financing	**13.12%**	**13.12%**	**29.84%**	**57.05%**	**100.00%**
TOTALS					
Project Preparation					
Land					
Infrastructure Works	25,290,500	25,290,500	2,583,000	7,151,000	35,024,500
Engineering and Construction-related Services					
Other Project Support Services					
Project Management					
Base Cost	**25,290,500**	**25,290,500**	**2,583,000**	**7,151,000**	**35,024,500**
Physical Contingency	3,782,950	3,782,950	-	181,800	3,964,750
Price Contingency	726,550	726,550	-	231,200	957,750
Total Project Cost	**29,800,000**	**29,800,000**	**2,583,000**	**7,564,000**	**39,947,000**
Interest During Implementation	-	-	2,144,600	-	2,144,600
Commitment Fees	-	-	223,400	-	223,400
Total Financing	**29,800,000**	**29,800,000**	**4,951,000**	**7,564,000**	**42,315,000**
Percentage Financing	**70.42%**	**70.42%**	**11.70%**	**17.88%**	**100.00%**

APPENDICES TO CHAPTER 4 - PROJECT VIABILITY

APPENDIX 4.1 INSTITUTIONAL ASSESSMENT

APPENDIX 4.1.1

PRESENT ORGANISATIONAL STRUCTURE OF THE BARBADOS WATER AUTHORITY – GENERAL MANAGEMENT 2019



APPENDIX 4.2 FINANCIAL ANALYSIS

APPENDIX 4.2.1

SUMMARY OF BWA's HISTORICAL FINANCIAL PERFORMANCE

HISTORICAL INCOME STATEMENT SUMMARY

HISTORICAL BALANCE SHEET SUMMARY

This information is withheld in accordance with one or more of the exceptions to disclosure under the Bank's Information Disclosure Policy.

APPENDIX 4.2.2

ASSUMPTIONS USED IN THE PROJECTED FINANCIAL ANALYSIS

This information is withheld in accordance with one or more of the exceptions to disclosure under the Bank's Information Disclosure Policy.

APPENDIX 4.2.3

PROJECTED INCOME STATEMENT SUMMARY

This information is withheld in accordance with one or more of the exceptions to disclosure under the Bank's Information Disclosure Policy.

APPENDIX 4.3 ECONOMIC ANALYSIS

APPENDIX 4.3.1

LEAST COST ANALYSIS

USD' 000

		Option 1 [a]		Option 2 [b]		Option 3[c]	
Year		Cost	Discounted Present Value	Cost	Discount Present Value	Cost	Discount Present Value
1	Investment Cost	90,000	80,357	34,000	30,357	30,000	26,786
2	O& M	4,500	3,587	1,700	1,355	1,500	1,196
3	O& M	4,500	3,203	1,700	1,210	1,500	1,068
4	O& M	4,500	2,860	1,700	1,080	1,500	953
5	O& M	4,500	2,553	1,700	965	1,500	851
6	O& M	4,500	2,280	1,700	861	1,500	760
7	O& M	4,500	2,036	1,700	769	1,500	679
8	O& M	4,500	1,817	1,700	687	1,500	606
9	O& M	4,500	1,623	1,700	613	1,500	541
10	O& M	4,500	1,449	1,700	547	1,500	483
11	O& M	4,500	1,294	1,700	489	1,500	431
12	O& M	4,500	1,155	1,700	436	1,500	385
13	O& M	4,500	1,031	1,700	390	1,500	344
14	O& M	4,500	921	1,700	348	1,500	307
15	O& M	4,500	822	1,700	311	1,500	274
16	O& M	4,500	734	1,700	277	1,500	245
17	O& M	4,500	655	1,700	248	1,500	218
18	O& M	4,500	585	1,700	221	1,500	195
19	O& M	4,500	522	1,700	197	1,500	174
20	O& M	20,000	2,073	1,700	176	1,500	156
21	O& M	1,000	93	3,400	315	3,000	278
22	O& M	1,000	83	3,400	281	3,000	248
23	O& M	1,000	74	3,400	251	3,000	221
24	O& M	1,000	66	3,400	224	3,000	198
25	O& M	1,000	59	3,400	200	3,000	176
26	O& M	1,000	53	3,400	179	3,000	158
27	O& M	1,000	47	3,400	159	3,000	141
28	O& M	1,000	42	3,400	142	3,000	126
29	O& M	1,000	37	3,400	127	3,000	112
30	O& M	1,000	33	3,400	113	3,000	100
Net Present Value			**112,144**		**43,529**		**38,408**
Least Life Cycle Cost Rank			**3**		**2**		**1**
Discount Rate 12%							

[a] This options assumes USD20m in repairs/upgrade in year 20. Operating costs = 5% in years 1-20; 5% of upgrade in years 21-30

[b] Operating costs = 5% in years 1-20; 10% in years 21-30 for option 2

[C] Operating costs = 5% in years 1-20; 10% in years 21-30 for option 3

APPENDIX 4.4 SOCIAL ANALYSIS

APPENDIX 4.4.1

GENDER ACTION PLAN

Project Outputs	Activity Planned	Responsibility	Time
Overall Strategies:	Sensitization of employers over non-discriminatory workplace practices, employment and benefits of diversity in employment opportunities to ensure equal opportunities for women, men and young persons during project implementation and monitoring.	BWA	Ongoing
	Stakeholders are integrated into design, implementation and Monitoring & Evaluation (M&E) of project.	BWA/Social and Environmental Safeguards Officer (SESO)	Ongoing
Output 1:	Gender Sensitisation Awareness Strategy and Training of BWA PCs, Engineers, Specialists, Heads of Department (including the Manager, Marketing and Communications), Superintendents, Foremen and Contractor Management Team in employment opportunities, gender responsive behaviour and interactions, sexual harassment, conflict resolution, adequate facilities, worker health and safety considerations and sexual and reproductive health during implementation of the project.	BWA Management Team/SESO	Q2, 2020
Output 3: Inclusive M&E	Pre and post-test of the awareness and sensitisation on social and gender issues on the project and data disaggregation by sex (male/female) and age group (under 30 years and 30 years and over).	BWA/SESO	Ongoing

APPENDIX 4.5 GENDER MARKER ANALYSIS

Project Cycle Stage	Criteria	Score
Analysis 1	Consultations with relevant categories of males and females and relevant gender-related public/ private sector organisations and Non-Governmental/ Community-Based Organisations will take / have taken place	Yes
Analysis 2	Socioeconomic, Sector and/or Institutional analysis considers gender risks and/or gender disparities that impact the achievement of project outcomes.	No
Design 1	Project interventions / policies address existing gender disparities.	Yes
Design 2	Project objective / outcome includes the enhancement of gender equality or the design of gender-responsive policies or guidelines.	No
Implementation 1	Implementation arrangements include either: Capacity building initiatives to enhance gender mainstreaming of the executing and/or implementing agency. Or Active participation of representatives of gender-relevant stakeholders in project execution.	Yes
Implementation 2	Terms of Reference of consultancy/project coordinating unit/project management unit includes responsibilities and resources, including budgets for gender mainstreaming.	Yes
Monitoring and Evaluation 1	Sex-disaggregated data included in the baselines, indicators and targets of the RMF. Or Collection of sex-disaggregated data is part of the project.	No
Monitoring and Evaluation 2	At least one gender-specific indicator at the outcome and/or output level in the RMF or included in tranche releases of PBLs.	No

Analysis	Design	Implementation	Monitoring & Evaluation	Score	Code
0.5	0.5	1.0	0.0	2.0	Marginally Mainstreamed (MM)

APPENDIX 4.6 ENVIRONMENTAL ANALYSIS

APPENDIX 4.6.1

SUMMARY OF THE ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT REPORT

1. INTRODUCTION

1.1 This appendix summarises the Environmental and Social Impact Assessment (ESIA) and other related studies undertaken by independent consultants as part of the preparation of the Barbados South Coast Outfall Project (BSCOP). The study was reviewed by the Caribbean Development Bank (CDB) and classified as Category "A" under CDB's Environmental and Social Review Procedures (ESRP) since there is a risk of significant adverse environmental impacts in a very sensitive environment. CDB's ESRP require that these risks be minimised, managed or eliminated through appropriate project design. It will be a condition precedent to first disbursement that the Barbados Water Authority (BWA) submit to CDB, evidence of approval of the ESIA by the Planning Unit, Prime Minister's Office (PU-PMO).

2. BACKGROUND TO PROPOSED PROJECT

2.1 The South Coast Sewerage System (SCSS) was designed to collect and treat sewage generated within a 300 m wide by 10 km long section of coastal road corridor (Highway 7) along Barbados' South Coast (Oistins to Needham's Point). The sewage is processed to the primary level at the South Coast Sewage Treatment Plant (SCSTP), which is located immediately adjacent to the Graeme Hall Wetland (GHW) at Worthing. The plant was designed in 1988-1990 and construction was completed in 2002. Effluent from the plant was discharged to the sea via an outfall at Needham's Point approximately 6 km away.

2.2 Evidence of problems with the SCSS first emerged in November 2017, when sewage started overflowing from manholes along Highway 7. This problem persisted and resulted in significant environmental and socio-economic impacts. Following several unsuccessful attempts to repair localised failures in the sewer pipes with the Needham's Point Outfall (NPO) in operation, six deep injections wells were installed to allow the BWA to pump effluent from SCSTP into the subsurface. However, these wells failed, which led to a decision to discharge the effluent from SCSTP into GHW, and to intermittently drain the wetland into the sea through an existing canal and the sluice gate at Worthing Beach. This resulted in localised but significant adverse impacts particularly to the GHW as well as approximately 3 km of the coastal/marine environment along the South Coast. This untenable situation was resolved with the construction of an emergency outfall in late 2018, at Worthing Beach, Christ Church, approximately 1 km from SCSTP. This step facilitated repairs to the sewer network and an end to sewage in the streets. The emergency outfall discharges effluent 800 m offshore in a water depth of 30 m. It is a significant improvement over discharging at the shoreline through the canal/sluice gate. However, it was designed as a temporary solution, and there is need for improved effluent dispersion which requires discharge in deeper water further offshore. In addition, it is not sufficiently robust to survive strong wind events.

3. DESCRIPTION OF PROPOSED PROJECT

3.1 The feasibility study for the proposed project has recommended that a robust solution can be achieved with the construction of a permanent outfall, utilising a 750mm diameter, high density polyethylene (HDPE) pipe connected to a 60m long diffuser located 1,000m offshore at a depth of 45m. Trenchless technology is proposed to facilitate installation from a junction box on land to the marine environment, with open-cut to be utilised to bring the pipe from the plant to the junction box. In the former

case, a 24-hour, 7-day operation is envisaged for a period of 6 months. As part of the Project the temporary outfall will be decommissioned.

4. DESCRIPTION OF THE EXISTING ENVIRONMENT

4.1 Barbados has a tropical, oceanic climate with an average temperature of 26.8°C, and no drastic changes in either seasonal or daily temperatures. Weather seasons can be classified as either wet or dry, with the wet season coinciding with the Atlantic hurricane season, which runs from June to November. Monthly average rainfall ranges from a peak of approximately 168.4mm (6.63in) during the wet season, to a low of approximately 39mm (1.53in), during the dry season.

4.2 The Project is located in the coastal corridor on the western portion of the south coast of Barbados extending from Mount Charlie (reef/dive site) offshore of Dover and westward to the existing Needham's Point outfall. Seaward boundaries include the Bank Reef while landward boundaries consists of the coastal corridor including the Graeme Hall Nature Sanctuary. Land use in the area is dominated by tourism and related services, commercial establishments, agricultural lands and residential homes. The project area is a major contributor to Barbados' tourism industry through the provision of numerous tourist accommodation, beaches, diving and water sport activities. The area comprises sensitive ecosystems/habitats including a Ramsar designated wetland site, shallow water with sea-grass beds, and highly productive reefs.

Terrestrial and Marine Environments

4.3 Geology/Soils: The terrestrial portion of the BSCOP site is in the Coral Region of Barbados. In this Region the shallow earth structure consists of a soil layer resting upon a limestone rock layer; which is underlain by a dense impermeable clay sub-stratum known as the Oceanics (known to be over 900m deep in areas).

4.4 The terrestrial portion of the project site includes the 37-hectare (91 acres) GHW, a designated Ramsar wetland site since 2006. GHW has an average elevation of roughly 0.9 to 2.0 m Above Mean Sea Level (AMSL). The bird population of GHW includes doves, finches and egrets (during soil tilling and roosting in the trees on a night) have been observed at GHW. Rats, bats, monkeys, and mongoose have been observed in the vicinity of the site given the dense vegetation to the south and current agricultural practices. Plant life includes varied species of flora, with the predominant species being the White and Red Mangroves, Rush, Crab Grass and Tassel Pond Weed (ARA, 1997). Freshwater marshy areas north of the lake are dominated by sedges, or rush, and crab grass. Six main habitat types dominate the marine portion of the project area, namely, sand, coral rubble/reef rock, seagrass, cohesive shallow productive reef, patch reef, and bank reef. In general, the habitat types progresses sequentially from the shore outward.

4.5 Benthic Habitats: The outfall will enter the shoreline at Sandy Beach, which is characterised by a shallow reef that consists primarily of coral rubble, much of which is flatter pieces of coral rubble less than 30 cm in size (from approximate visual observation). There is minimal living coral in this region and that which exists is of very little significance.

4.6 Water Quality: Water quality is of significant importance to local residents and tourism. As such, any solution that does not adequately address the water quality will result in a range of adverse impacts across the biophysical, social and economic environments. The Environmental Protection Department (EPD) undertakes routine water quality testing of nearshore water to test for bacteria that indicate the extent of fecal matter in the water. For this testing, EPD uses Intestinal Enterococci as the fecal indicator bacteria.[2]

4.7 A review of the Enterococci levels measured at Worthing Beach for the period of record (2001 to 2018) generally showed higher levels in the early 2000's followed by a gradual reduction through to 2014, with the exception of a few high samples in 2011 and 2014. The values increased significantly after 2014, presumably as a result of the issues that started to develop with the SCSS. In addition, an eight week water sampling and laboratory analysis of water quality was also completed for this study (including measurements before and after the construction of the temporary outfall), for an area 300 to 500m east and west of the temporary outfall diffuser, approximately in line with the typical current patterns. The results of this sampling showed significant variability in quality at varying depths, with higher readings sometimes occurring near the surface while at other times happening at depth. However, nearshore quality was in line with what was expected.

4.8 Waves and Currents: The water currents along the South Coast are very complex, being influenced by tides, large-scale oceanographic currents, eddies in the lee of South Point, and wave induced currents in the nearshore. A five-month wave and current study at six locations along the South Coast in 2018 provided data that were used to develop a calibrated numerical modeling system for simulating nearshore hydrodynamics and effluent dispersion along the South Coast and the potential effectiveness of the South Coast Outfall.

4.9 Sewage Effluent: Effluent data from the SCSTP representing 15 samples spanning the period January 10 to October 10, 2018 formed part of the analysis for this study. Analysis of this effluent data showed limited improvement in the quality of the effluent as it passed from the SCSTP to the sluice gate. The data were used for model simulations of the temporary and proposed marine outfalls.

Socio-Economic Environment

4.10 The total number of residential structures (households) and commercial properties (businesses) within the direct project area was 118 and 31 respectively. During the conduct of the ESIA, 70 households (60%) and 23 businesses (74%) were surveyed. Of the 70 residential surveys completed, 55.7% of the respondents were female and 44.3% were male. In addition, 70% of the respondents lived in the community for over 20 years. Similar to the residential sample, more women (52%) than men (48%) were represented in the commercial respondents' sample. Just over half, 52.1% of the commercial respondents who were interviewed owned the businesses. The remaining 47.9% executed various roles in the businesses.

4.11 The results of the baseline study confirm that between 2015 and 2018, when SCSS failed, 83.1%% of the residents in the sample who reside adjacent to GHW suffered the inconvenience of odours and mosquito infestation. In some cases, more females than males reported experiencing the effects of the odours and mosquitoes on a daily basis. To help safeguard themselves from the problems, residents were forced to make unbudgeted purchases for mosquito repellent, insecticides, bug swatters, air freshener, disinfectant and mosquito nets. Some residents experienced health challenges including several mosquito borne diseases, which added to their expenses. Infrastructural expenses were also incurred by residents to avoid the flow of the effluent on their properties. After the installation of the temporary outfall in December 2018, the inconveniences of the odours and mosquitoes almost completely disappeared, as did the additional expenses.

4.12 The majority of commercial respondents, 82.6%, reported sewage related problems of strong odour, mosquitoes and other public health and worker safety issues between 2015 and 2018. Accordingly, 78.9%

[2] Marine water quality data are available from sampling and testing undertaken by the Environmental Protection Department (EPD) covering the periods 1993 to mid-2014, and 2014-2018 using a range of parameters were used for this

and 57.9% stated that odours and mosquitoes, respectively, affected their businesses, and 26.3% had effluent flowing on their properties. Several businesses were forced to close during this period, including restaurants and bars, apartments and guesthouses and the Graeme Hall Nature Sanctuary. The staff and students of the local school within the directly affected area had to be temporarily relocated across three other locations. Businesses reported an overall decline in clientele as customers avoided the area. The Survey reported that, similar to the residents, money was spent on insect repellents and protective gear and there was a reduction in productivity due to sick leave. With the installation of the temporary outfall, only one business reported ongoing problems attributed to sewage. All the other businesses reported that they were no longer affected by odours and mosquitoes. Nonetheless, bookings for accommodation at one property declined because of the negative publicity on social media.

5. LEGAL, INSTITUTIONAL AND POLICY FRAMEWORK

5.1 Environmental management in Barbados is the responsibility of the Ministry of Environment and National Beautification. EPD lies within this Ministry and has primary responsibility for environmental regulation in relation to noise, water and air quality.

5.2 The Health Services Act is a key piece of legislation for this project. This Act serves to ensure the "*promotion and preservation of the health of the inhabitants of Barbados*". Section 6(1) (a & b) of this Act states that "*The Minister may construct, repair and maintain sewers and make provision by means of sewerage disposal works or otherwise for effectively dealing with the contents of such sewers*".

5.3 The Barbados Water Authority Act, Cap. 274A of the laws of Barbados (Section 5 (h)) empowers the Authority "to design, construct, acquire, provide, operate and maintain sewerage works for the purpose of receiving, treating and disposing of sewerage. Section 14 (1) provides the authority the power to "enter upon premises for the purposes of laying pipes or for using the water of any stream, spring, or pond thereon".

5.4 The Marine Pollution Control Act protects the marine environment, important in its own right, and critical to fisheries and tourism livelihoods and recreational practices of locals.

5.5 Other legislative requirements include compliance with the Safety and Health at Work Act, which makes provisions for (a) securing the health, safety and welfare of persons at work; (b) protecting other persons against risks to health and safety in connection with the activities of persons at work; and (c) controlling the release of certain emissions into the environment.

5.6 PU-PMO is the lead agency responsible for regulatory review and approval of development and coordinates/liaises with other Government agencies to facilitate this process. Ministries and authorities with other specific responsibilities for the environmental and socio-economic aspects of this project, include the Ministry of Energy and Water Resources – specifically BWA; the Ministry of Maritime Affairs and the Blue Economy – specifically the Coastal Zone Management Unit, with primary responsibility for management and protection of coastal resources; and the Ministry of Labour and Social Partnership Relations – specifically the Labour Department, with responsibility for ensuring decent work standards.

Relevant International Conventions

5.7 The Cartagena Convention for the Protection and Development of the Marine Environment in the Wider Caribbean (Cartagena Convention) is a regional legal document for the protection of the Caribbean Sea. The Convention is supported by three technical agreements of Protocols, including the Land-based Sources of Pollution Protocol, which includes regional effluent limitations for domestic wastewater (sewage). Barbados acceded to the Protocol on June 29, 2019, thus pledging its political commitment to

implementing measures to reduce and control marine pollution from all land-based sources and activities within its territory.

6. ANALYSIS OF ALTERNATIVES

6.1 Two options were considered for constructing the outfall. These options were assessed against a set of criteria covering both environmental and social sensitivities.

Option 1: – Restore Force Main Connection to Needham's Point Outfall

6.2 Numerical modelling suggests that NPO provides slightly better dispersion of effluent than a new outfall in the Worthing Beach area. However, this option would require major land-based construction works and related disruption along a 6 km section of Highway 7.

Option 2: – Create New Marine Outfall at Worthing Beach

6.3 Two broad methodologies were considered for installing a new marine outfall in the Worthing Beach area, as follows:

(a) Cut and Cover Construction: Excavating a trench across the beach and nearshore zone, laying the outfall pipe in the trench and covering it with the excavated materials, and possibly an erosion resistant cover layer (riprap or pre-fabricated mattress system).

(b) Trenchless Construction: Drilling or tunnelling underground from an onshore "launch point" to the offshore target location.

Preferred Option and Marine Route

6.4 The trenchless construction method was selected as the preferred option given its primary comparative advantages including significantly less impact on the marine environment, with respect to turbidity and sedimentation and the minimal socio-economic disruption associated with inconveniences posed by traffic congestion, damage to urban infrastructure, loss of revenue to commercial enterprises, and the health and safety of workers and residents.

6.5 The preferred route was determined based on the need to minimise environmental impacts and maximise the performance of the outfall within appropriate design/construction parameters. This was determined to be a south-western outfall path in water depths in the range of 45 m, using an alignment that minimises coral damage by mainly following open sandy patches.

7. ENVIRONMENTAL AND SOCIAL IMPACTS

7.1 Environmental and social impacts were screened against the following criteria: marine biological environment, terrestrial biological environment, sediment transport, water quality, air quality, geology and sea-floor sediments, navigation, and social factors.

Environmental Impacts during Construction

7.2 The key adverse impacts are related to:

(a) **Destruction and dislocation of terrestrial flora and fauna**: During construction, noise and disturbances will cause small temporary adverse impacts on fauna in GHW. There is

also potential for the loss of some protected swamp vegetation such as red and white mangroves.

(b) **Destruction and Dislocation of Marine Flora and Fauna:** small temporary and localised adverse impacts on marine flora and fauna from disturbance to sediments is expected. However, due to the localised nature of the disturbance, the predicted adverse impacts on sediment transport during construction will be minor.

(c) **Water Quality:** During site preparation and laying of the pipes, elevated levels of suspended sediments will be released into nearshore coastal waters. However, this will generally be localised and sediment traps (on landside) can be used to reduce these impacts. The risk of pollution from spills associated with use of construction equipment and vessels, will be reduced by applying construction best practice in their storage, use management and waste disposal.

(d) **Changes in Benthic Habitats:** The primary risk to the benthic habitat is the release of drilling mud into the marine environment, either due to pressurised mud escaping through the overburden or discharge at the outlet upon breakthrough conditions. Habitat losses in direct and indirect impact zones have been estimated to include 500 m^2 of reef and 500 m^2 of seagrass respectively.

Social and Gender Impacts during Construction

7.3 The key impacts are related to:

(a) **Traffic Disruption:** Construction of the outfall will result in intermittent impacts on traffic associated with landside works. Residents, commuters and businesses could be experience delays brought about by the temporary increase in traffic along the access road and heavily used roadway between the landside of the project and the Worthing Beach. Deterioration of the surrounding roads is also possible because of the usage by the construction vehicles.

(b) **Potential Injury to Workers and the Public**: Landside and marine operations including traffic movements could create risky situations leading to accidents and injury to workers and the public.

(c) **Construction Nuisances:** These impacts could arise from noise, dust, light and air pollution (increased emissions of exhaust gases and fine particles) associated with the excavation, laying and trench filling activities and use of heavy equipment and machinery. Dust increases during construction, and it settles on the properties of the adjacent residents and businesses. Although these temporary impacts are likely to be more severe on residents and owners of commercial establishments, the potential impact on the school which is adjacent to the construction zone is of particular concern.

(d) **Short-term Employment and Economic Opportunities:** During the construction phase, jobs will be created for skilled and semi-skilled persons. The construction phase can also be a boost for the persons operating small retail businesses in the area, especially food and beverage, because the construction workers will provide them with additional customers. Conversely, construction activities will take place during summer, a peak tourism season, which could lead to a decline in bookings for the accommodation businesses in the area.

Environmental, Social and Gender Impacts during Operations

7.4 Effluent from the diffuser will result in localised but permanent reduction in the quality, biodiversity and integrity of any corals or other benthic organisms located in the immediate area surrounding the diffuser. However, these impacts will be limited by the buoyancy of the effluent plume and the high dispersion rates anticipated from the diffuser.

7.5 A reduction in water and reef quality in the area surrounding the diffuser may reduce the attractiveness of the area. Marine-based businesses such as watersports and fishing are therefore expected to be negatively affected to the extent that reef damage around the diffuser reduces the attractiveness of the area. It is expected that these losses will be partially mitigated through resource substitution (fishers and recreational operators utilising other sites).

7.6 The permanent outfall will contribute to the sustained improvement of living conditions among residents and communities along the south coast. This will result from a reversal of the negative environmental conditions that resulted from failure of the sewerage system which was manifested in numerous health and sanitation problems, including an infestation of vector/insects and an overflowing of manholes.

8. ENVIRONMENTAL AND SOCIAL MANAGEMENT, MONITORING AND REPORTING REQUIREMENTS

8.1 A draft Environmental and Social Management Plan (ESMP) for the construction and operation of the outfall has been prepared. The aspects relevant to the construction phase will be incorporated in the works bid documents. A three-tier project monitoring system has been established for the Project which includes approval of the Contractor's Environmental Protection Plan (EPP) and monitoring of compliance by the Engineer and contractor, quality assurance, and co-ordination for compliance reporting by PU-PMO and BWA.

8.2 Requirements for preventative and mitigation measures along with responses will be conveyed to the Contractor(s) through the Conditions of Contract and the Specifications. The Contractor(s) will be required to submit an EPP for review and approval by the Engineer. The EPP will detail the Contractor's approach to managing environmental risk, meeting his/her contractual obligations and satisfying applicable environmental regulations and local laws. It must also include names of persons within the Contractor's organisation who are responsible for ensuring adherence to the EPP. The EPP will incorporate international guidance on "best practices" (such as that presented in CIRIA C741D, BS8555, ISO 14001, ISO 14031 and ISO 14046).

8.3 Key environmental parameters to be monitored include: water quality; benthic habitats, sea turtles and pre-construction translocation of benthic organisms.

TABLE 1: SUMMARY OF KEY IMPACTS AND MITIGATION MEASURES - CONSTRUCTION

Aspect	Potential Negative Impacts	Mitigation Measure
Environmental		
Construction Preparation	Noise and disturbance	• Inform adjacent residents and business owners about completed and planned construction activities, including anticipated construction traffic. • Undertake awareness training to ensure that all staff is aware of ESMP of construction activities.
Site Work	Destruction and dislocation of terrestrial fauna	Terrestrial Environmental Monitoring
	Destruction of marine fauna	• Pre-construction translocation of Benthic Organism • Sea Turtle Management Plan • Benthic Monitoring Programme
	Elevated dust level	Dust control measures
	Noise and air emissions	The equipment that will be used on the construction site should be equipped with mufflers and appropriate sound attenuation devices. Work onsite should also be conducted during specifically set times with appropriate traffic routing in place.
	Vibrations	With respect to vibrations, it is expected that the Contractor would have the required insurance policies to cover any legitimate claims made as a result of any damage that may occur during the construction phase
	Light	Lighting Plan
	Solid waste , sanitary discharges and construction waste	• Provision and maintenance of portable toilets. • Requirements for secure waste disposal containers. • Separation of wastes and reuse/recycling where applicable. • Burning of garbage will not be permitted. • Removal and disposal of construction debris and other wastes at approved sites. • Procedures to secure, transport and dispose of chemical or other hazardous wastes. • Evidence of a disposal facility's acceptance of the solid waste included in the waste disposal plan.
Transportation and Re-fueling	Potential for spills/leaks reaching surface run-off	• These risks can be effectively mitigated through the development and execution of a comprehensive ESMP that incorporates

Aspect	Potential Negative Impacts	Mitigation Measure
		international guidance on best practices for construction projects (for example, CIRIA C741D; BS8555; ISO 14001; ISO 14031, ISO 14046). • Regular maintenance of vehicles and machinery to identify and repair minor leaks and prevent equipment failures. • On-site re-fuelling and maintenance of vehicles/machinery in designated areas. Line these areas with an impermeable surface and install oil traps. • Clean up any spills immediately, through containment and removal of free product and appropriate disposal of contaminated soils. • Keep spill containment and clean-up equipment at all work sites and for all polluting materials used at the site.
Movement of Vessels	Seawater pollution	• Temporary buoys should demarcate the construction zone • Marine construction equipment should be lit at night. • Operators of the equipment and vessels will be vigilant concerning other marine users and adhere to local regulations. • Information for issue of Notice to Mariners by the Harbour Master must be provided prior to start of construction. • Environmental Monitoring and Management Plan
Installation of Outfall	Sea-water pollution Sea-bed pollution – re-suspension of polluted sediments.	Water Quality Monitoring
Social Impacts		
Site Work	Accident or injury to communities and the general public.	• Ensure that access to the construction site is restricted and appropriate signage. • Control access to all working areas. • Stakeholder Engagement Plan. • Grievance Redress Mechanism (GRM).
	Disruption to road traffic, commercial activities. Congestion and blockage of access to residences,	• Clear and appropriate signage should be installed to indicate the construction zone as well as any diversion routes. • Signs for diversion routes should be placed along the entire route, not merely at the two ends of the

Aspect	Potential Negative Impacts	Mitigation Measure
	building, shops and road-way.	diversion. Flag persons should be utilised if required. • Public Service Announcements should be run in print, electronic and on social media to ensure that road users are told at least 24 hours in advance of upcoming traffic delays or road closures and diversions. • Transport of material and equipment should be scheduled for off-peak hours, to the extent practical. • Measures taken to reduce erosion of temporary roadbeds by construction traffic, especially during wet weather. This will include measures to minimise the amount of mud transported onto paved public roads by vehicles or runoff. • A programme of road improvement should be included to ensure that the quality of the adjacent roads and other associated infrastructure in the nearby communities is upgraded after the construction.
	Unsafe working conditions	Construction Site Management Plan
	Hazardous materials causing health risks	• Develop (or adapt and implement) procedures for the safe transport, handling and storage of potential pollutants in drip trays or bonded areas. • Keep Safety Data Sheets for all hazardous materials on site and ensure that they are available for reference by staff responsible for handling and storage of materials.
Decommissioning of Emergency Outfall	Marine water degradation	• Decommissioning Plan

TABLE 2: SUMMARY OF KEY IMPACTS AND MITIGATION MEASURES – OPERATIONS

Aspect	Potential Negative Impacts	Mitigation Measure
Environmental		
Discharge of untreated water by diffuser	Sea water pollution	Water Quality Monitoring
Discharge of untreated water by diffuser	Seabed pollution	Water Quality Monitoring

Aspect	Potential Negative Impacts	Mitigation Measure
Discharge of untreated water by diffuser	Changes in benthic communities	Benthic monitoring programme
Maintenance of outfall systems	Short-term impairment of water quality and ecosystems impacts	• Water Quality Monitoring • Benthic Monitoring Programme
Social Impacts		
Operations, including Maintenance	Poor health and safety practices may result in serious risk to workers	Emergency Response Plan
	Degraded water quality	Water quality monitoring
	Bad perception of outfall	Communication Programme

A Summary of the Draft Environmental and Social Monitoring Plan is shown at Table 3. The Project Management Team includes the skills required for adequately supervising the environment and social components of the Project.

TABLE 3: SUMMARY OF THE ENVIRONMENTAL AND SOCIAL MONITORING PLAN

What	How	Who	When
Pre-Construction Translocation of Benthic Organisms	Translocation of benthic organisms, in particular coral, urchins and conch.	Contractor	Before Construction
Erosion/Sediment Control	Monitoring and reporting procedures in accordance with the requirements of the erosion and sediment control plan and local laws and regulations for both terrestrial and marine aspects of the construction. • Air Quality/ Noise: Monitoring and measurement from time to time for quality assurance and correlation with Contractor's monitoring programme. • Risk to Water Quality: Water quality measurements at impacted locations in Graeme Hall for quality assurance of Contractor's water quality programme. • Monitoring for ecological damage: in areas of GHW utilised	Contractor	During Construction

What	How	Who	When
	for construction temporary works		
Turbidity	• Turbidity readings • Silt curtain effectiveness monitoring	Contractor	During construction
Water Quality	• Monitoring of sediment and erosion • Enterococci levels	• Contractor • EPD • BWA	• During construction • Post construction
Benthic Monitoring	Qualitative assessment of benthic habitat within sampling sites based on Baseline Marine Ecological Report	Contractor	During construction
Sea Turtle Management	Sea Turtle Management Plan	Contractor/Barbados Sea Turtle Project	Before, during and after construction
Stakeholder Management	GRM	Contractor/Consultant	Before and during construction

Source: W.F. Baird & Associates Coastal Engineers, Ltd, 2019.

Public Consultations and Information Disclosure

8.4 Several meaningful research activities and key expert consultations were conducted with key stakeholder, including public, private and civil society organisations. In an effort to design a nationally appropriate permanent outfall, expert consultations were held with the Ministries of Health, Environment, Energy and Water Resources, Maritime Affairs and the Blue Economy as well as the Barbados Sea Turtle Project, and BWA. In addition, a Social and Gender Impact Assessment was conducted, which included administered surveys among 70 residents and 23 businesses in the directly affected project area. In addition to the research activities and key expert consultations, a meeting with the affected Land Owners was convened on Tuesday, October 29, 2019, at Alcott House, Worthing, Christ Church to appraise the landowners of the proposed construction of a permanent outfall to replace the temporary outfall. The meeting sought a resolution to the encroachment of 9 properties during the upgrade of the cart road that runs parallel to the existing north-south canal of the temporary outfall. The 6 of 9 landowners who were present, expressed support for BSCOP and informed consent, via signed letters from those landowners, was subsequently submitted. To date, the BWA has been unable to locate/contact the remaining 3 landowners.

8.5 BWA and Baird & Associates convened a Town Hall Meeting among key stakeholders to discuss the ESIA Report on BSCOP on November 12, 2019 at the Hawthorn Memorial Church, Worthing, Christ Church. The ESIA Report was made available at four locations, including Worthing and Oistins Police Stations, PU-PMO and BWA Headquarters. The Meeting discussed plans for the placement of a permanent outfall in the area, the projected time schedule; potential environmental and social impact of the works, benefits of the project as well as the environmental and social management and mitigation measures to address predicted impacts. Some of the key issues discussed in the meeting included: construction impacts (particularly dust), location of the outfall diffuser; potential shoreward movement of the plume, water quality monitoring, potential for mosquito infestation, potential impact of the works on turtles, tertiary sewage treatment and waste water reuse, and the design life of the outfall. These issues have all be directly or indirectly addressed in the Project.

8.6 Overall, the public consultations, meetings, research activities provided opportunities for invaluable information, key expert engagements and feedback as stakeholders' opinions and concerns were expressed and, as necessary, were integrated in project design.

Grievance Redress Mechanism

8.7 A comprehensive GRM and template has been designed for BSCOP. The GRM designates the primary responsibility for the management of the grievance mechanism to the Social and Environmental Safeguards Officer (SESO). A grievance redress committee, at the project level, comprising the BWA appointed Project Coordinator, a staff member of the BWA and a representative from the Contractor would support the SESO in the operations and management of the GRM.

8.8 This Committee will have responsibility for among other things, receiving and investigating grievances, developing resolutions and actions to rectify any issues, maintaining a grievance register, and raising awareness of the GRM among project personnel and the community.

8.9 The GRM includes provisions for all project personnel, residential and business community members to be made aware of the channels for addressing grievances that may arise during the construction and operational phases of the Project. Communication about the GRM can be done by the SESO during introductory meetings with the community, as well as via radio, television and social media. Practical guidance is provided within the GRM, for screening, acknowledgement, investigation, resolution, appeal, follow-up, and closeout of all grievances.

8.10 The BWA will receive monthly updates on stakeholder grievances. It is anticipated that information outlining the number of grievances, time to resolution and outcomes of grievances will be communicated utilising the grievance register.

9. CONCLUSION

9.1 Overall, most of the potential adverse negative impacts will occur during the construction phase; however, these are generally short-term, localised construction related nuisances, which can be successfully mitigated. During the construction phase, the ESMP and the GRM will provide adequate mitigation measures to safeguard the directly affected communities and businesses against noise, dust, night-lights, storage and handling of substances, equipment and other conflicts in marine and road traffic that could negatively affect community and worker health and safety. The construction method adopted will minimise the disruption of social and economic activities of the affected population. In addition, the SESO will be engaged to foster meaningful stakeholder engagements between the Project and all stakeholders, implementing a comprehensive public information, education and communication plan.

9.2 The beneficial impacts of the project are significant including improved public health with the elimination of opportunities for the flow of sewage into residences, commercial establishment and roadways and related issues (strong odours and extended beach closures). Second, there will be improved recreational water quality. Third, water quality in the GHW will continue to improve, thus eliminating negative impacts to the terrestrial fauna of this Ramsar designated wetland.

APPENDIX 4.6.2

SUMMARY OF DRAFT ESMP

Aspect	Potential Negative Impacts	Mitigation Measure	Responsibility	Cost Estimate
Construction – Environmental Impacts				
Construction Preparation	• Noise and Disturbance • Night-lights with 24 hour operations	• Inform adjacent residents and business owners about completed and planned construction activities, including anticipated construction traffic. • Undertake awareness training to ensure that all staff is aware of ESMP of construction activities.	Project Manager	Project costs
Site work	Destruction and dislocation of terrestrial fauna	• Terrestrial Environmental Monitoring.	Contractor	Project costs
Site work	Destruction of marine fauna	• Pre-construction translocation of Benthic Organism • Sea Turtle Management Plan • Benthic Monitoring Programme.	Contractor	Project costs
Site work	Elevated dust level	• Dust control measures.		
Site work	Noise and air emissions	• The equipment that will be used on the construction site should be equipped with mufflers and appropriate sound attenuation devices. Work onsite should also be conducted during specifically set times with appropriate traffic routing in place. • With respect to vibrations, it is expected that the Contractor would have the required insurance policies to cover any legitimate claims made as a result of any damage that may occur during the construction phase.	Contractor	Project costs
Site work	Solid waste, sanitary discharges and construction waste	• Provision and maintenance of portable toilets • Requirements for secure waste disposal containers • Separation of wastes and reuse/recycling where applicable • Burning of garbage will not be permitted • Removal and disposal of construction debris and other wastes at approved sites	Contractor	Project costs

Aspect	Potential Negative Impacts	Mitigation Measure	Responsibility	Cost Estimate
		• Procedures to secure, transport and dispose of chemical or other hazardous wastes • Evidence of a disposal facility's acceptance of the solid waste included in the waste disposal plan.		
Transportation and refueling	Potential for spills/leaks reaching surface run-off	• These risks can be effectively mitigated through the development and execution of a comprehensive Environmental Monitoring and Management Plan that incorporates international guidance on best practices for construction projects (for example, CIRIA C741D; BS8555; ISO 14001; ISO 14031, ISO 14046). • Regular maintenance of vehicles and machinery to identify and repair minor leaks and prevent equipment failures. • On-site refuelling and maintenance of vehicles/machinery in designated areas. Line these areas with an impermeable surface and install oil traps. • Clean up any spills immediately, through containment and removal of free product and appropriate disposal of contaminated soils. • Keep spill containment and clean-up equipment at all work sites and for all polluting materials used at the site.	Contractor	Project costs
• Movement of vessels • Resuspension of polluted sediments	Seawater pollution	• Temporary buoys should demarcate the construction zone • Marine construction equipment should be lit at night • Operators of the equipment and vessels will be vigilant concerning other marine users and adhere to local regulations • Information for issue of Notice to Mariners by the Harbour Master must be provided prior to start of construction. • Environmental Monitoring and Management Plan.	Contractor	Project costs
• Installation of outfall	Sea-water pollution Sea-bed pollution	• Water Quality Monitoring	Contractor	Project costs

Aspect	Potential Negative Impacts	Mitigation Measure	Responsibility	Cost Estimate
Construction - Social Impacts				
Site work	Accident or injury to communities and the general public	• Ensure that access to the construction site is restricted and appropriate signage. • Control access to all working areas • Stakeholder Engagement Plan • Grievance Redress Mechanism	Contractor	Project costs
	• Disruption to road traffic, commercial activities, • Congestion and blockage of access to residences, building, shops and road-way • Night-lights with 24 hour construction operation	• Clear and appropriate signage should be installed to indicate the construction zone as well as any diversion routes. • Signs for diversion routes should be placed along the entire route, not merely at the two ends of the diversion. Flag persons should be utilised if practical. • Public Service Announcements should be run in print, electronic and on social media to ensure that road users are told at least 24 hours in advance of upcoming traffic delays or road closures and diversions. • Transport of material and equipment should be scheduled for off-peak hours, to the extent practical • Measures taken to reduce erosion of temporary roadbeds by construction traffic, especially during wet weather. This will include measures to minimise the amount of mud transported onto paved public roads by vehicles or runoff. • A programme of road improvement should be included to ensure that the quality of the adjacent roads and other associated infrastructure in the nearby communities is upgraded after the construction.	• Contractor • BWA	Project costs
	Unsafe working conditions	• Construction Site Management Plan	Contractor	Project Costs
	Hazardous materials causing health risks	• Ensure that contaminants • Develop (or adapt and implement) procedures for the safe transport, handling and storage of potential pollutants in drip trays or bonded		

Aspect	Potential Negative Impacts	Mitigation Measure	Responsibility	Cost Estimate
		areas. • Keep Safety Data Sheets for all hazardous materials on site and ensure that they are available for reference by staff responsible for handling and storage of materials.		
Decommissioning of Emergency Outfall	Marine water degradation	• Decommissioning Plan	BWA	
Operations – Environmental Impacts				
Discharge of untreated water by diffuser	Sea water pollution	• Water Quality Monitoring	• EPD • BWA	
	Seabed pollution	• Water Quality Monitoring	• CZMU • BWA	
	Changes in benthic communities	• Benthic monitoring programme	CZMU	
Operations - Social Impacts				
Health, Safety and Emergency Response	Poor health and safety practices may result in serious risk to workers	• Emergency Response Plan	BWA	
Public Health and Safety	Degraded water quality	• Water quality monitoring	BWA	
	Bad perception of outfall	• Communication Programme	BWA	

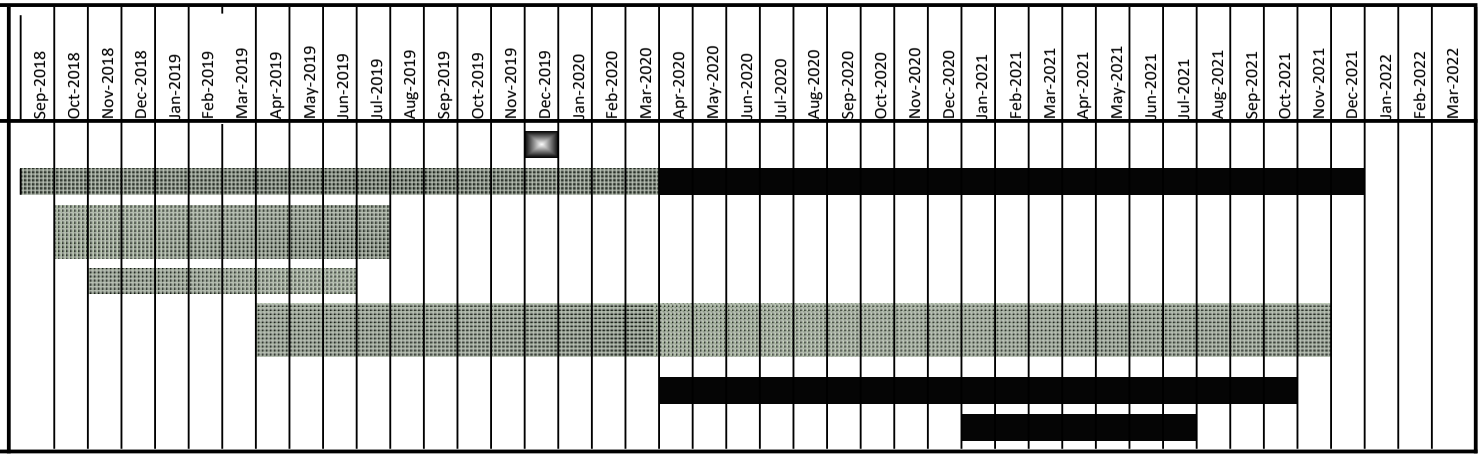
APPENDICES TO CHAPTER 5 - RISK ASSESSMENT AND MITIGATION

There are no appendices related to Chapter 5 (Risk Assessment and Mitigation)

APPENDICES TO CHAPTER 6 - IMPLEMENTATION AND PROJECT MANAGEMENT

APPENDIX 6.1 PROJECT IMPLEMENTATION SCHEDULE

Barbados South Coast Outfall Project
IMPLEMENTATION SCHEDULE



Key:

CDB Financing

Counterpart

Milestone

APPENDIX 6.2 ESTIMATED QUARTERLY DISBURSEMENT SCHEDULE

ESTIMATED QUARTERLY DISBURSEMENT SCHEDULE

Year	Quarter	OCR-USD	Finance Charges	Total	Cumulative
2020	2020 - Q1	6,483,904	-	6,483,904	6,483,904
	2020 - Q2	6,483,906	-	6,483,906	12,967,810
	2020 - Q3	7,875,049	-	7,875,049	20,842,859
	2020 - Q4	8,510,998	-	8,510,998	29,353,857
Sub-total		**29,353,857**	**-**	**29,353,857**	**29,353,857**
2021	2021 - Q1	114,286	-	114,286	29,468,143
	2021 - Q2	110,619	-	110,619	29,578,762
	2021 - Q3	110,619	-	110,619	29,689,381
	2021 - Q4	110,619	-	110,619	29,800,000
Sub-total		**446,143**	**-**	**446,143**	**29,800,000**
Total		**29,800,000**	**-**	**29,800,000**	**29,800,000**

APPENDIX 6.3 PROCUREMENT PLAN

All Estimated Costs Are In USD

A. General

1. **Project Information**

Country:	Barbados
Borrower:	Government of Barbados
Project Name:	South Coast Outfall Project
Executing Agency	Barbados Water Authority

2. **Bank's Approval Date of the Procurement Plan:** December 12, 2019

3. **This Procurement Plan is valid until:** May 12, 2021

4. **Prior Review Thresholds:** Procurement decision subject to prior review by the Bank.

Procurement Method	Prior Review Threshold	Comments
LIB		
NCB		
ICS		
CQS		

5. **Reference to relevant Procurement Guidelines**

- Procurement Policy and Procedures for Projects Financed by CDB (2019)

6. **Any Other Special Procurement Arrangements**

7. **Procurement Waivers**

A waiver of CDB's Procurement Policy for Projects Financed by CDB (November 2019), and CDB's Procurement Procedures for Projects Financed by CDB (November 2019) is sought to permit country eligibility for the Junction-to-Outfall Works contract to be extended beyond CDB member countries to all countries. This is required in order to maximise competition, given that the contract will utilise a proprietary type of trenchless technology determined to be best suited for the application, and most of the contractors licensed to use the technology are from non-CDB member countries. The estimated total value of the waiver is USD 22mn.

B.**Goods Works and Non-Consulting Services**

Ref No.	Contract (Description)	Estimated Cost	Procurement Method	Prequalification (Yes/No)	Review by Bank (Prior/Post)	Expected Bid-Opening Date	Comments
73596-W-15	Junction-to-Outfall Works		LIB	Yes	Prior	December 2019	Two stage bid process
73596-W-20	Temporary Outfall Decommissoning Works		NCB	No	Prior	August 2020	
73596-W-21	Plant-to-Junction Works		NCB	No	Prior	June 2020	

C. **Consulting Services**

Ref No.	Assignment (Description)	Estimated Cost	Selection Method	Review by Bank (Prior/Post)	Expected Proposal Submission Date	Comments
73596-C-1	Design & Construction Supervision Services - Permanent Outfall		NBF	n/a		
73596-C-17	External Auditor		CQS	Prior	March 2020	
73596-C-5	Project Coordinator		ICS	Prior	December 2019	
73596-C-8	Social and Environmental Safeguards Officer		ICS	Prior	December 2019	

D. Procurement Capacity Building activities for the Implementing/Executing Agency

- Implementation support to the procurement process by CDB team.

E. Summary of Proposed Procurement Arrangement

Project Components / Contracts	CDB ('000)				NBF ('000)		Total Cost ('000)
	CQS	ICS	LIB	NCB	Counterpart	Co-Financing	
Infrastructure Works	-	-			-	-	
Junction-to-Outfall Works	-	-		-	-	-	
Plant-to-Junction Works	-	-	-		-	-	
Temporary Outfall Decommissoning Works	-	-	-		-	-	
Engineering and Construction-related Services	-	-	-	-		-	
Design & Construction Supervision Services - Permanent Outfall	-	-	-	-		-	
Other Project Support Services		-	-	-	-	-	
External Auditor		-	-	-	-	-	
Project Management	-		-	-	-	-	
Project Coordinator	-		-	-	-	-	
Social and Environmental Safeguards Officer	-		-	-	-	-	
Summary Costs						-	

Goods, Works and Non-Consultancy Services

- NCB - National Competitive Bidding
- ICB - International Competitive Bidding
- RCB - Regional Competitive Bidding
- LB - Limited Bidding
- DS - Direct Selection
- FA - Force Account
- CP - Commercial Practices
- APA - Alternative Procurement Arrangements
- NBF - Non-Bank Financed
- Other

Consultancy Services:

- QCBS - Quality and Cost-Based Selection
- QBS - Quality-Based Selection
- FBS - Fixed Budget Selection
- LCS - Least-Cost Selection
- CQS - Consultants' Qualification Selection
- DS - Direct Selection
- CP - Commercial Practices
- APA - Alternative Procurement Arrangements
- ICS - Individual Consultants Selection
- NBF - Non-Bank Financed
- Other (as above)

This information is withheld in accordance with one or more of the exceptions to disclosure under the Bank’s Information Disclosure Policy.

APPENDIX 6.4 PROJECT MANAGEMENT DUTIES AND RESPONSIBILITIES

APPENDIX 6.4.1

DRAFT TERMS OF REFERENCE
PROJECT COORDINATOR

1.1 The Project Coordinator (PC) will report to the Project Manager of the Project Management Office (PMO) of the Barbados Water Authority (BWA). He/she will be responsible for coordinating and monitoring all aspects of the implementation of the Project. PC shall be assigned exclusively to the Project and will be supported by the professional and administrative staff of the PMO. PC's duties will include, but will not be limited to:

(a) managing the selection and engagement of consultants and supervising these consultancies;

(b) facilitating the procurement of the works contracts and overseeing the management of those works contracts;

(c) representing, liaising with, and advising BWA on, all aspects of the Project;

(d) expediting the submission to the Caribbean Development Bank (CDB) of claims for disbursement;

(e) liaising with CDB on the Project;

(f) preparing and submitting to CDB, a Monthly Progress Report in the form specified by CDB, within 30 days of the end of each calendar month, commencing the end of the first full month following the commencement of the assignment;

(g) keeping separate accounts for project-related expenditures and disbursement activities;

(h) submitting to CDB, after review, and in a timely manner, the reports prepared by the consultants;

(i) submitting to CDB, reports on the results of the Design and Monitoring Framework; and

(j) preparing and submitting to CDB, a Project Completion Report (PCR), within three (3) months of final disbursement of the Loan.

1.2 Prospective candidates should have a minimum of the following qualifications:

(a) a Masters Degree or equivalent in Civil Engineering, or Construction Management with a minimum of 10 years' experience in the management and implementation of civil engineering projects; or

(b) a Bachelors Degree or equivalent in Civil Engineering, Construction Management or Project Management with a minimum of 15 years' experience in the management and implementation of civil engineering projects.

(c) Experience in the water/wastewater sector and with projects funded by Multi-lateral Development Banks will be considered assets.

BUDGET
(USD)

Item	**Total**
Project Coordinator	144,000
Total	**144,000**

APPENDIX 6.4.2

DRAFT TERMS OF REFERENCE
SOCIAL AND ENVIRONMENTAL SAFEGUARDS OFFICER

1. BACKGROUND

1.1 Human development achievements in Barbados since 1990 are trending upward, with long and healthy life, quality education and training, and a decent standard of living. The 2018 Human Development Statistical Update (HDSU) ranked Barbados among the high human development countries with a Human Development Index (HDI) of 0.8. Life expectancy at birth in 2018 was 76.1 years (78.1 years for females and 73.3 years for males). According to the 2018 HDSU, the expected years of schooling was 15.3 years per child with a measureable difference between females (16.7 years) and males (13.9 years). The Barbados Economic and Social Report (2017) outlined that significant investments in quality education, accessible healthcare services, inclusive social services and the economic empowerment of citizens have fostered these high human development attainments in Barbados.

1.2 Nonetheless, the sustainable development of Barbados, like other Caribbean islands, is threatened by the issues of a changing population structure as well as increased poverty and vulnerability. First, Barbados has registered a negative population growth rate of 0.4%, over the past three years, characterised by low birth rates and a high dependency ratio (50.4) among the Barbados population. There is an emerging demographic shift towards a greater proportion of persons aged 65+ (14.95%), compared to the child population ages below 14 years (19%). In addition, the 2016 Barbados Survey of Living Conditions (BSLC) outlined that increased poverty and vulnerability threaten to undermine the economic resiliency and social development accomplishments of Barbados. The 2016 BSLC revealed increased poverty and vulnerability over the past seven years. The prevalence of poverty increased from 15.1% in 2010 to 17.5% in 2016. Comparatively, the vulnerable population also grew from 10.4% to 11% during the same period. The BSLC outlined cogently that there was a significant gender component between poor female (21%) and males (14%) as well as vulnerable females (13%) and vulnerable males (10%).

1.3 Moreover, the BSLC (2016) outlined that the most vulnerable populations within the poverty profile of Barbados are large households with multiple children, female-headed households in the geographical parishes of St. John (23.9%) and St. Joseph (20.26%). The most significant observable marker for the poorest households was an absence of utilities of flush toilets, water piped into dwellings and electricity. The absence of flush toilets, water piped into dwellings and electricity were significant variables among the poorest 20% (Quintile) of the Barbados population. On average, the BSLC estimates of utilities among households within the poorest quintile for flush toilets, pipe-borne water and electricity were 70%, 75% and 78%, respectively. Comparatively, the estimates for flush toilets, pipe-borne water and electricity among the households within the richest quintile were 98%. The most significant physiological deprivation, among the utilities measurements, was the absence of flush toilets, which was 30% among households within the poorest quintile.

1.4 Despite the current economic challenges and pressures experienced by Barbados, a significant proportion of the population, including poor and vulnerable persons, households, communities, older persons, children, persons with disabilities and the unemployed, depend on Government's provision of social infrastructure and essential utilities for their survival and well-being. The fiscal pressures to sustainably finance public investments in health, water, sanitation, public utilities and social protection programmes sometimes result in poor operation and maintenance of infrastructure with serious consequences for vulnerable communities and populations. For example, during the period 2015–18, the failure of the South Coast Sewerage System negatively impacted the health, well-being, livelihoods and investments of residents, businesses and visitors to Barbados. This situation, among other development

challenges, demonstrate that strategic interventions for the provision of water, sanitation and health services are imperative for inclusive and sustainable human development.

2. OUTCOME

2.1 The broad outcome of the Technical Assistance is enhanced capacity of the Barbados Water Authority (BWA) to implement the Social and Environmental Safeguards (SES) for the South Coast Outfall Project. The environmental and social impact assessments (ESIA) for the project identified several potential impacts that may arise during the construction and operations phases of the project. The Government of Barbados (GOBD) and the Caribbean Development Bank (CDB) are committed to ensuring that these issues are adequately addressed. This requires that the country/project have adequate capacity to monitor the implementation of measures to address these impacts as well as to capitalise on benefits associated with the project. Specifically, this consultancy entails:

(a) support to BWA in incorporating the Environmental and Social Management Plan (ESMP) and Grievance Redress Mechanism (GRM) developed from the ESIAs to provide adequate mitigation measures to safeguard the directly affected communities and businesses against noise, dust, storage and handling of substances, equipment and other conflicts in marine and road traffic that negatively affect community and worker health and safety;

(b) provide support to the Project Coordinators (PC), Environmental Specialists, Departmental Heads (including the Manager, Marketing and Communications), Superintendents and Foremen in conforming to protocols, regulations and requirements for the SES standards of BWA projects; and

(c) lead the design and implementation of meaningful stakeholder engagement between the project and all stakeholders, including implementing the GRM and a gender responsive public information, education and communication plan.

3. SCOPE OF ASSIGNMENT

3.1 The SESO will promote constructive partnerships and communication between BWA and the communities on issues relating to project implementation. The consultant will be responsible for implementing community engagement activities and gender sensitisation strategy and training as set out in the Stakeholder Engagement Plan (SEP) and Gender Action Plan (GAP). Among other activities, the SES consultant will:

(a) Review SEP with a view to identifying and documenting any gaps in the: (i) stakeholder identification and analysis that was undertaken; (ii) stakeholder engagement programme (for example, information to be disclosed, format and communication methods; stakeholder consultation methods); and (iii) schedule for the various stakeholder engagement activities. Information in the ESIA should be used to support SEP review and implementation. The SEP must be updated to address any gaps identified.

(b) Finalise draft ESMP, following consultations with key institutional and community stakeholders; and assist with implementing the ESMP for the project as required, advising the Project Management Office on any deviations from the ESMP and/or new or emerging environmental and social risks.

(c) Provide support for establishment of environmental monitoring protocols including for terrestrial and marine habitats, quality assurance procedures to ensure implementation of

mitigation measures, monitoring and response; and coordination with and reporting on compliance to Government regulatory agencies such as the PU-PMO and the BWA. Support the PC in meeting all national regulatory requirements for the project.

(d) Review the bid documents and certify that environmental and social mitigations, recommended in the ESMP are fully addressed, ensuring that environmental and social safeguard instruments are integrated in the bidding documents and construction contracts.

(e) Provide timely feedback to BWA on concerns raised by community leaders and to community members on project implementation, concerns raised or important decisions taken by BWA in accordance with agreed protocols.

(f) Develop public information, education and communication plan along with BWA, Non-Governmental Organisations, and Community-Based Organisations to educate community members about the project and encourage their continuous buy-in and active participation throughout the project cycle, with particular attention being paid to obtaining information from the less vocal persons in the communities through the use of differential participation techniques.

(g) Identify potential grievances or project risks/opportunities; include, but not be necessarily limited to assist BWA with management of grievances lodged through the GRM of the SEP.

(h) Support BWA managers as needed (for example, during the local labour recruitment process by assisting with drafting gender-responsive local hiring policies and procedures), especially where community requirements are being solicited.

(i) Develop Gender Sensitisation Strategy and Training of BWA PCs, Engineers, Specialists, Heads of Department (including the Manager, Marketing and Communications), Superintendents, Foremen and Contractor Management Team in employment opportunities, gender responsive behaviour and interactions, sexual harassment, conflict resolution, adequate facilities, worker health and safety considerations and sexual and reproductive health during implementation of the project.

(j) Facilitate stakeholder participation at all relevant levels in accordance with the identified needs of the different categories of stakeholders, particularly women. This may include other activities – participatory assessments and problem-solving of issues, concerns and opportunities, focus group discussions, information-sharing, and community meetings.

(k) Assist in evaluating the social, environmental and economic impacts of project activities on the well-being of community members using participatory approaches.

(l) Conduct pre and post-test of the awareness and sensitisation on social and gender issues on the project and data disaggregation by sex (male/female) and age group (under 30 years and 30 years and over).

(m) Assist PCs in ensuring that the implementation of the project activities is in conformance with Barbados and CDB environmental and social requirements.

(n) Prepare and submit monthly to the PC, inputs including well-documented, evidence-based compliance reports, for inclusion in the monthly progress reports to CDB; and finally for incorporation into a Project Completion Report.

(o) Promote awareness of the community and workers' health and safety directly associated with the project and assist in designing and delivering environmental and social capacity-building activities that may arise for the BWA and/or related agencies.

4. QUALIFICATIONS AND EXPERIENCE

4.1 The consultant should possess the following minimum qualifications:

(a) a post-graduate degree or equivalent qualification in the Social and Environmental Sciences, including Sociology, Anthropology, International Development, Environmental Science or other relevant discipline; and

(b) a minimum of ten years' relevant practical experience encompassing stakeholder engagement practice, community development, and/or social research using participatory approaches.

5. PLACE OF WORK AND IMPLEMENTATION ARRANGEMENTS

5.1 The consultant will report to the PC, who will have responsibility for the overall management and implementation of the consultancy. The consultant will work in close collaboration with the PCs, Manager, Marketing and Communications, Engineers and Environmental Specialists of the BWA who will facilitate the consultant by providing access to relevant documentation and other pertinent information necessary for the completion of the assignment.

6. DURATION

6.1 The duration of the assignment is 90 working days over an 18-month period.

7. REPORTING REQUIREMENTS

7.1 The SESO will be required to provide the following:

(a) Inception Report detailing the approach to be adopted to successfully deliver the expected outputs, two (2) weeks after commencement of the assignment.

(b) Draft Capacity Development Plan for the transfer of knowledge to PCs and Environmental Specialist and relevant Staff, BWA, within two (2) months of commencement of the assignment.

(c) Draft SEP, including the GRM covering training methodology, approaches, tools, resource requirements and timeframe as detailed in Section 3 (iv) and (vii) within six (6) weeks of the submission of the Inception Report. Final Training Plan presented at least three (3) weeks after the feedback is submitted on the Draft Plan.

(d) Draft gender responsive public information, education and communication plan (Draft IEC Strategy) to improve public health and safety conditions among communities as well as occupational health and safety during the implementation stages of projects.

(e) Technical Analysis Report of the social, environmental and economic impacts of project activities on the well-being of, within in the final quarter of the 18-month period working, including the intended and unintended impacts to the directly affected communities and key stakeholders.

7.2 All reports must be produced and submitted to PC, in print, pdf and their original electronic editable format.

SUMMARY BUDGET
(USD)

Financing Source(s)	**USD**	**%**
CDB	58,500	100
Total	**58,500**	**100**

APPENDIX 6.4.3

DUTIES AND RESPONSIBILITIES OF PROJECT STEERING COMMITTEE

OBJECTIVE

1. The Project Steering Committee (PSC) is to provide a mechanism for support, feedback, guidance, stakeholder participation and interagency coordination during project implementation, and to act as a catalyst for an ongoing coordination mechanism after implementation has been completed. The PSC will be required to meet as required, but not less than quarterly.

SCOPE OF DUTIES AND RESPONSIBILITIES

2. The duties of the PSC shall be as follows:

(a) familiarisation with the arrangements for project implementation, including the intended project outcome, outputs, scope, financing arrangements, reporting requirements, implementation schedule, and other details contained in the appraisal report and financing agreements;

(b) monitor progress in implementation of the Project towards achievement of the project output and project outcome;

(c) ensure that potential threats to timely project implementation are identified and addressed;

(d) facilitate the taking of policy decisions by the relevant authorities to ensure timely fulfilment of loan conditions;

(e) review work plans on a quarterly basis and ensure that recommendations with respect to adequate budgetary allocations are made, procurement activities are executed as scheduled, and that adequate controls exist;

(f) ensure that stakeholder participation is appropriate and sustained throughout implementation and that stakeholder expectations are addressed;

(g) ensure that the Project remains aligned to the policy and strategic objectives of the Government of Barbados (GOBD);

(h) discuss the perspective of the entities from which its members are drawn on various issues, informed by the consultation of PSC members with their respective organisations;

(i) monitor the performance of the Project Management Office; and

(j) champion the Project, advocating for achievement of the project outcomes.

COMPOSITION

3. PSC will be chaired by the General Manager (GM) of the Barbados Water Authority (BWA), with

the Project Coordinator (PC) serving as Secretary. In addition, PSC shall comprise the following members:

(a) Chief Technical Officer, Ministry of Transport, Works and Maintenance or his/her nominee;

(b) Permanent Secretary (PS), Ministry of Energy and Water Resources (MEWR), or his/her nominee;

(c) PS, Ministry of Finance, Economic Affairs and Investment (MOF), or his/her nominee;

(d) PS, Ministry of Health and Wellness (MOH), or his/her nominee;

(e) Head, Environmental Protection Department (EPD), or his/her nominee;

(f) Chief Town Planner, Town and Country Development Planning Office (TCDPO), or his/her nominee;

(g) Head, Coastal Zone Management Unit (CZMU), or his/her nominee;

(h) Head of the Bureau of Gender Affairs, or his/her nominee;

(i) Representative, Barbados Chamber of Commerce;

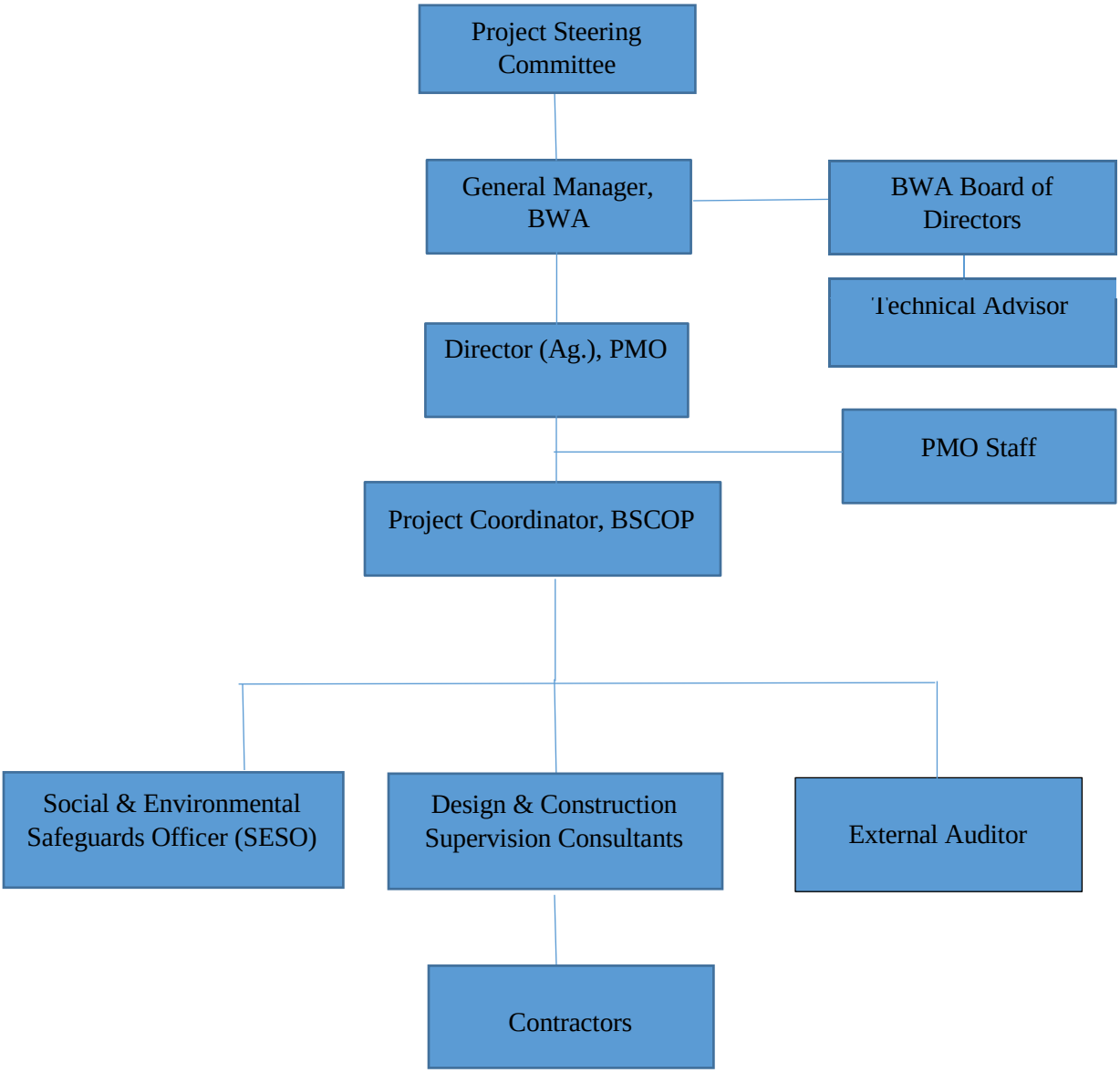
(j) Representative, Government Press and Public Relations; and

(k) Representative of the affected land owners.

APPENDIX 6.5 PROJECT ORGANISATION CHART

APPENDIX 6.5.1

PROJECT MANAGEMENT ORGANISATIONAL CHART



APPENDIX 6.6 REPORTING REQUIREMENTS

APPENDIX 6.6.1

DRAFT TERMS OF REFERENCE
EXTERNAL AUDITOR
SOUTH COAST OUTFALL PROJECT - BARBADOS

1. BACKGROUND

1.1 The Government of Barbados (GOBD) has applied for financing from the Caribbean Development Bank (CDB) (the Bank) for the "South Coast Outfall Project – Barbados". It is anticipated a Financing Agreement will be entered for a loan of an amount not exceeding USD29,800,000 to be assigned from CDB's Ordinary Capital Resources (OCR).

1.2 The Barbados Water Authority (BWA) is the Executing Agency for the Project. The expected outcome of the Project will be a resilient and energy efficient outfall for the South Coast Sewerage System. Key components of the Project include:

(a) **Land** comprising public and private property to be utilised for the permanent Works.

(b) **Infrastructure Works** comprising the construction and decommissioning of the temporary outfall, and the construction of the permanent outfall. The permanent work will comprise the installation of a 750mm diameter, 1,200m long HDPE pipe using trenchless technology and connected to a 60m long diffuser located 1,000m offshore at a depth of 45m.

(c) **Engineering and Construction-Related Services** associated with the study, design and supervision of the temporary and permanent works. A consulting firm has been engaged to provide the engineering; geotechnical, marine and topographical surveying; social, environmental and economic impact assessments; and monitoring.

(d) **Other Project Support Services** comprising the engagement of an External Auditor to monitor project accounts.

(e) **Project Management** comprising the engagement of a Project Coordinator (PC), Social and Environmental Safeguards Officer (SESO), to serve in BWA's Project Management Office. Oversight will be provided by the Project Steering Committee for the ongoing CDB-funded Water Supply and Network Upgrade Project, which will be augmented with relevant stakeholders.

1.3 The Terms and Conditions of the Loan to allow GOBD/BWA to open and maintain a Designated Account (DA), through which all eligible expenditure under the Project, and only such activities, will be financed. Where a DA is opened, GOBD/BWA is required to:

(a) operate such account in accordance with the Terms and Conditions for the Operation of the

DA set out in the Disbursement Guidelines For CDB-Financed Projects (January 2019);

(b) establish and maintain internal controls for the proper operation of the DA, including the use of statements of expenditure prepared and certified by GOBD/BWA, in form and substance acceptable to CDB, to support the payments and application; and

(c) retain the statements of expenditure and supporting documentation for inspection and verification and shall permit CDB or its nominee to perform an annual performance audit of the DA and all disbursements made against the statements of expenditure in relation to

1.4 The terms and conditions also require BWA to open and maintain an Operating Account (OA).

2. OBJECTIVE

2.1 The objective of the audit engagement is for the Auditor to prepare a Project Audit Report and:

(a) express an opinion (or disclaim an opinion, if applicable) as to whether the DA has been operated in compliance with the Terms and Conditions for the Operation of the DA; and

(b) provide information related to the evaluation of the internal control system, which will be performed within the scope provided in the International Standards for Auditing (ISA).

3. RESPONSIBILITY IN THE PREPARATION OF SPECIAL PURPOSE FINANCIAL REPORTS

3.1 GOBD/BWA responsibilities will include the following:

(a) Providing access to its accounting, budget and financial records, files, financial management systems and the staff involved, as required for the preparation and the presentation of the Project Audit Reports mentioned in Section 2 above, as well as the notes to the Reports and related reconciliations, if applicable.

(b) Establishing internal controls relevant to the preparation of these reports in a manner that they are free from material misstatements due to fraud or error.

(c) Enabling the signing of the Project Audit Reports by the highest executive authority for the Project. The audit client is GOBD/BWA, and as such, is responsible for delivering the Project Audit Reports to the Bank.

(d) Ascertaining that the Project Audit Reports submitted to the Bank satisfies the requirements specified in this Terms of Reference (TOR), which constitute an integral part of the audit services contract. This verification of the audit services by Management will appear in writing and will be required for final payment of the contract.

(e) Authorising the Project's Auditor to provide, directly to the Bank, any information it may request relating to the conduct of their audit. Alternatively, Management will obtain rights to inspect audit working papers associated with the audit services.

3.2 The Auditor's responsibilities will include the following:

(a) Working closely with a Project Coordinator, assigned by GOBD/BWA to act as the utility's

representative on these matters.

(b) Ensuring that any financial reports, as well as the notes to the Project's financial reports and related reconciliations are prepared based on the Terms and Conditions established in the Financing Agreement.

(c) Planning their audit work so as to comply with the agreed TOR; documenting in their work papers, the evidence of the application of audit procedures, as well as their conclusions and recommendations.

(d) Taking full responsibility for the delivery of the whole audit service, irrespective of whether individual audit tasks/activities are subcontracted to other auditors.

(e) Ensuring the technical quality of their audit reports in accordance with the ISA, ISSAI or equivalent local standards[3].

(f) Accepting the quality reviews that the Bank may conduct, and taking full financial responsibility for rework and/or additional audit procedures that may be required to resolve any deficiencies identified by the client and/or the Bank upon their review of audit service deliverables. The Auditor will be committed to make all working papers (physical or by audit software) and other documents related with the audit engagement available, subject to this TOR and to allow their examination by Management. To facilitate further clarifications required by the Bank, the Auditor should ensure that:

(i) The audit observations/findings, conclusions and recommendations included in the reports are duly supported in the working papers by sufficient, relevant, and competent audit evidence.

(ii) There is adequate cross-reference between the reports and the corresponding work papers.

(iii) The documentation is filed.

(iv) There is sufficient and competent evidence that a risk analysis required by ISA 315 for the planning and implementation of the tests has been conducted.

The Bank staff may contact the Auditor directly to request additional relevant information related to the audit engagement subject to these TOR. The audit firm must respond to these requests in a timely manner.

(g) Request in writing, the confirmation of the amounts disbursed and the balances available according to the Bank's records.

(h) As part of the planning process, the Auditor must obtain access to, and develop an understanding of, the basic documents related to the operation of the Project. These are, among others:

(i) Financing Agreement.

[3] International Standards on Auditing such as ISA (issued by the International Federation of Accountants) and the International Standards of Supreme Audit Institutions (ISSAI) issued by the International Organisation of Supreme Audit Institutions (INTOSAI). The Bank may accept the borrowing member country auditing standards provided that they do not differ significantly from the ISA and/or ISSAI.

(ii) Project Disbursement Letter.

(iii) CDB's Procurement Policy for Projects Financed by CDB (November 2019), and CDB's Procurement Procedures for Projects Financed by CDB (November 2019), as updated from time to time.

(iv) Risk management documentation (including documentation of risk mitigation action plans).

(v) CDB Disbursement Guidelines for CDB-financed Projects (January 2019).

(vi) Progress monitoring reports.

(vii) Audit report from the previous period (in cases when there is a change of auditors).

(i) It is advisable that the Auditor conducts an entrance and exit meeting with members of the Management and, when deemed necessary, with the Bank's officials, in order to discuss matters related to the audit engagement.

3.3 Following ISA 580 "Written Declarations", the Management shall provide the External Auditor with a Letter of Representation that expresses, among other aspects that:

(a) it has provided the Auditors with all information and access to it, in accordance with the TOR for the audit engagements; and

(b) all transactions have been recorded.

4. SCOPE AND STANDARDS TO APPLY

4.1 The audit must be conducted in accordance with the Internal Standards on Auditing[4]. These standards require that the Auditor comply with the ethical requirements of independence and quality control; in addition, the Auditor must plan and perform the audit to obtain a reasonable assurance about whether the financial statements are free from material misstatements. The audit should include the assessment of the accounting policies applied proving that they are appropriate and reasonable. The audit should also include an assessment of the operation of the DA to determine the extent of compliance with Financing Agreement.

4.2 It is expected that the Auditor considers the following requirements without diverging from the application of the ISA:

(a) ISA 240 "the Auditor's Responsibilities relating to fraud in an Audit of Financial Statements". The Auditor must identify and assess the risks of material misstatement in the Financial Statements due to fraud and obtain sufficient and appropriate audit evidence in relation to these risks, through the design and implementation of appropriate responses.

(b) ISA 250 (Revised) "Consideration of Laws and Regulations in an Audit of Financial

[4] Although the implementation of ISA is promoted, the Auditor's work may be placed in the context of INTOSAI (ISSAIs) Auditing Standards; or the national norms, standards, and practices compatible with the International Standards for Auditing.

Statements". The Auditor must recognise that the non-compliance of the Entity with the laws and regulations may materially impact the Financial Statements in the design and implementing audit procedures, and in assessing and communicating the results thereof.

(c) ISA 260 (Revised) "Communication with those charged with Governance". The Auditor is required to report to the governing body of the institution on his responsibilities in relation to the audit of the DA and preparation of the Special Purpose Financial Statements, as well as a general description of the scope and timing; and report, in due time, on significant and relevant facts observed.

(d) ISA 315 "Identify and assess the risks of material misstatement in the Financial Statements, through understanding the entity and its environment, including the entity's internal control".

(e) ISA 330 "The Auditor's Responses to Assessed Risks". The Auditor should obtain sufficient appropriate audit evidence on the risks assessed related to material misstatement through the design and implementation of appropriate responses to such risks.

(f) ISA 510 "Initial Audit Engagements – Opening Balances". In the case of a first audit engagement, the Auditor should obtain sufficient and appropriate audit evidence on whether the opening balances contain errors that may materially impact the Financial Statements of the period to be audited within the framework of the Project.

4.3 To verify the fulfilment of fiduciary requirements included in the Financing Agreement, the Auditor, under the ISA Framework, must perform tests and/or procedures to confirm, among others, that:

(a) CDB funds have been used, in accordance with the relevant Financing Agreement Terms and Conditions.

(b) Goods, works, and services financed have been procured in accordance with the CDB Procurement Guidelines or other guidelines deemed acceptable to the Bank; the Auditor should conduct physical verification tests, based on risk considerations.

(c) Investments and expenses made are supported by the necessary documents and records, and accounting nomenclature have been adhered to, in relation to all the activities and expenses of the Project.

(d) Conversion of local currency to US dollars has been made in accordance with the requirements of the Financing Agreement and the guidelines for the implementation of the disbursement methods between the Bank and GOBD/BWA.

(e) Internal controls implemented by the Management, related to the financial reporting – have been evaluated in their design and effectiveness through audit procedures. These procedures will be performed in accordance with the requirements of ISA 315 "Identification and Assessment of the Risks of Material Misstatement through the Knowledge of the Entity and its Environment". The Auditor must obtain an understanding of relevant internal control for the audit. The main consideration of the Auditor is if a relevant control prevents, detects, and corrects material errors when a transaction is processed, or information disclosed, and his/her related assertions. In addition, the Auditor must communicate appropriately to those charged with governing the institution and management, the internal control deficiencies identified during the audit engagement

which, in their professional judgement, are materially enough applying ISA 265 "Communicating significant deficiencies in the Internal Control to those charged with Governance and Management".

5. REPORTING REQUIREMENTS

5.1 The Auditor is required to issue the following reports, within 30 days of the close of the BWA's financial year, which ends March 31 each year:

(a) Independent Auditors' Report on the Financial Statements and/or DA. Where Financial Statements are to be audited, the report must contain an opinion on whether the statements have been prepared, in all material aspects, in compliance with the applicable financial information framework and the Terms and Conditions established in the Financing Agreement. Where the DA is to be audited, the report must contain an opinion (or disclaim an opinion, if applicable) as to whether the DA has been operated in compliance with the Terms and Conditions for the Operation of the DA. The Auditor should prepare the report according to requirements established in ISA 800 (revised) (See model in Attachment 4).

(b) Internal Control Report. In this report, also known as the Management Letter, the Auditor must provide information related to the assessment of the internal control system to the highest authority of the Recipient of CDB Financing and/or Executing Agency. In the same letter, the Auditor shall describe the main observations arising from this evaluation, as well as any other finding during the audit.

5.2 The Bank requires that the Auditor's report includes recommendations on the following items, where applicable:

(a) Comments and findings related to the accounting records, and the control processes reviewed during the audit engagement.

(b) Deficiencies and material weakness in controls and systems.

(c) Deviations in the application of accounting principles.

(d) Non-compliance with terms and conditions stated in the Project Financing Agreement.

(e) Expenses considered ineligible and that have been paid from the DA/OA, from balances otherwise advanced by the Bank, requested for reimbursement to the Bank, or from Bank funds obtained via other disbursement modalities.

(f) Expenses that do not comply with tax legislation or other applicable laws.

(g) Aspects that drew the Auditor's attention during the conduct of the audit engagement that would have a significant impact on the Project's implementation.

(h) Status of the implementation of audit recommendations raised in previous engagements, as applicable. The Auditor should just include the recommendations that are still pending or partially implemented.

(i) A risk assessment of the audit findings, including project management comments.

6. INTENDED USERS OF THE REPORT, LIMITATION OF USE, AND DISTRIBUTION

6.1 The Auditor's Report on the DA & OA and the Internal Control Report, which are presented separately, are only intended for the Recipient/Executing Agency and CDB.

6.2 Three (3) hard copies of the following: Auditor's Report and the Internal Control Report, as well as the version in pdf and it original electronic format, must be submitted by the Auditor to the GOBD/BWA.

7. INPUTS

7.1 It is anticipated that the external audit engagement will require a maximum of 10 person-days.

8. QUALIFICATIONS AND EXPERIENCE

8.1 The engagement partner should be a qualified chartered accountant with membership of one or more professional accountancy bodies, e.g. Association of Chartered Certified Accountants, and holds a relevant external audit-practicing certificate. The engagement partner should have at least 10 or more years of relevant external auditing experience.

APPENDIX 6.6.2

MONITORING AND REPORTING REQUIREMENTS

Report	Time of Submission
1. Monthly Progress Report, (including progress and projections on each component, sub-component or contract; the budget; disbursements; work plan; outcome indicators, communications and consultations; procurement; and schedule) prepared by PC.	Within 30 days after the end of each calendar month, commencing the end of the 1st full month following loan approval, and continuing until submission of the Project Completion Report (PCR).
2. Procurement documentation, as determined by the method of procurement, prepared and/or submitted by PC.	As required.
3. Consultants' Reports, submitted by the PC.	As per the TORs.
4. PCR prepared and submitted by PC.	Within three months of the final disbursement of the loan.
5. Audited Annual Financial Statements, prepared by independent auditors, and including a management report, submitted by GM, BWA.	Within six months of the end of the financial year.
6. Annual maintenance plan and report for the SCSTP and SCSS, including activities undertaken during the past year and budgeted work plan for upcoming year, submitted by GM, BWA.	Within four months of the end of the financial year.